DRAFT

HERTFORD & WARE CYCLING STUDY

MAIN REPORT

Prepared for Hertford Civic Society, Hertfordshire County Council, East Hertfordshire District Council and Ware Town Council.

By Sustrans, 35 King Street, Bristol BS1 4DZ. January 1994.

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by

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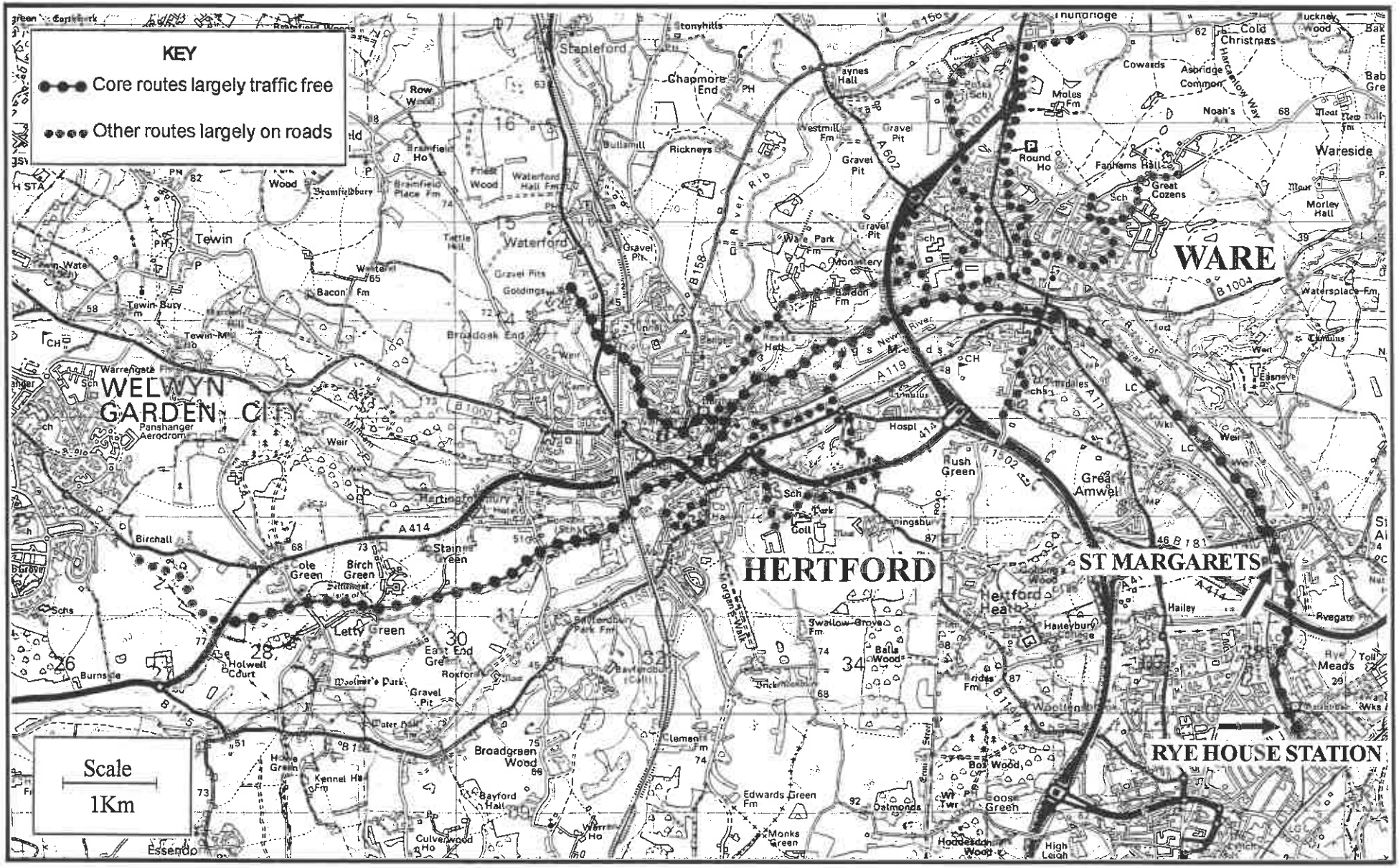
Fig 1:


KEY
Core routes largely traffic free
Other routes largely on roads
Scale
1Km
WELWYN GARDEN CITY
HERTFORD
WARE
ST MARGARETS
RYE HOUSE STATION
Stapleford
Waterford
Tewin
Broadoak End
Stanstead Abbotts
Hertingfordbury
Panshanger Aerodrome
Birchall
Cole Green
Birch Green
Stainey Green
Letty Green
Holwell Court
Burnside
Woolmer's Park
Gravel Pit
Broadgreen Wood
Bayford Hall
Essendo
Rickneys
Chapmore End
Waterford Hall Fm
Bacon Fm
Goldings
Hall
Rush Green
Great Amwell
Hertford Heath
Hailey
Balls Wood
Swallow Grove Fm
Edwards Green Fm
Monks Green
Oatmonds
Goose Green
Hoddesdon Wood
High Leigh
Wareside
Cold Christmas
Cowards
Asbridge Common
Noah's
Fanhams Hall
Great Cozens
Morley Hall
Watersplace Fm
Round Ho
Moles Fm
Gravel Pit
Ware Park
Montgomery
Baldon Fm
Hospl
Rye Meads
Bay Wood
Hailey
A602
B158
A119
A414
B1004
B181
B1502
B1197

1. Summary of report

"*When I see an adult on a bicycle, I have hope for the human race*" - H.G.Wells.

There is a new mood abroad in the land. Planners and transport specialists are saying that the country cannot accommodate more traffic, more roads, more congestion and more environmental degradation. The public have been saying the same for rather longer. Hertfordshire is one of the authorities leading the way. Last autumn, they set out the need to shift away from wholesale reliance on the car when the County published its "*Travelwise*" programme.

This study of Hertford and Ware is exploring one of these options. In many ways the bicycle is an ideal vehicle for our crowded and polluted planet. If means can be found of integrating into our transport system so that people can use it for some of the shorter journeys, then it would be of great benefit to us all. As three-quarters of all our journeys are less than 5 miles in length, this could be a good proposition. Denmark, for instance, has managed to take the bicycle to account for 20% of all journeys. It is no long a poor man's form of travel. In fact in Denmark it is estimated that visitors to the countryside by cycle spend more there than do the same number of motorists - simply because they can't carry so much stuff!

But there are formidable obstacles to popularising cycling. It is rightly perceived as dangerous. There are very few places where it is safe to cycle. It is not seen as the done thing to do, and the motorist is still unduly favoured in national policies.

Hertford & Ware are good places to start to make a change. They are small compact towns where distances are short. They are historic towns where wholesale road reconstruction is inappropriate. They are well served by train routes so the population is used to travelling other than by car. And they have a magnificent opportunity in the shape of the Lee Valley towpath to make a first class cycling route between the town centres.

This study examines all the opportunities for making improvements to encourage cycling in the town towns. This includes traffic calming, modifications to road junctions to make the cycle routes easier and safer, new links to avoid main roads, cycle racks at strategic locations and a whole range of policy matters designed to reinforce the concept that the authorities actually consider cycling important. The report suggests that within the heart of the two towns, walking and cycling should be considered the most appropriate, and therefore the most encouraged, forms of transport.

Fig 1 sets out the routes proposed, whilst **Fig 2** suggests a programme in order of priority to bring into being a series of useful and popular routes.

Proposed programme of measures to encourage cycling

Implementation of these proposals is described in two phases

Phase 1

ONE Folly Bridge, Hertford to Ware Lock

Hertford & Ware are fortunate in having the River Lee Navigation as a common thread running through both towns. It forms the basis of an ideal cycle route - level, safe, attractive and direct. This is where the authorities should focus if they wish to demonstrate the popularity of a quality cycle route. We recommend that their programme of endeavour should start here.

TWO Extend Riverside Route to Goldings & Ware Station

Once the first part of the riverside route is in place, the route should be extended to Goldings, partly because the County Council Highways Department resides here and it will be of great symbolic importance that they practice what they propose, and partly because the river valley and parkland here is most attractive and can serve as a public place for citizens of Hertford.

From Ware Lock, the riverside route should be extended eastwards to connect to Ware Library and Station to give more useful destinations at that end.

THREE Road scheme and development opportunities

Care should be taken to ensure that good quality cycle routes are incorporated in current road and development schemes so as to ensure that cycling is provided for at the same time as this considerable expenditure is going ahead.

These opportunities include:

- Improve the approaches to the proposed A414 Cole Green Way Subway and extend a cycling route to Welwyn Garden City.
- Ensure a good quality cycle route across the southern end of the Wadesmill bypass improvements to Thundridge.
- Make a good route from Port Vale through the McMullen development and Sele Mill to reach North Road for Hertford North Station.

FOUR Minor works

A series of relatively minor works which can make life much easier and more convenient for cyclists.

- Formalise cycling on the tarmac path from Hartham Pool to Benger Hall and modify gate at end of St Leonard's Road.

- Reconstruct wicket gate and approach paths to level crossing at Rowley's Road to allow a convenient link from the residential areas to the east of Hertford to the riverside route.

- Erect a slow down barrier to permit cyclists to use Church Steet subway under Gascoyne Way so they can reach the County Hall area.

- Build the crucial link to Wodson Park Sports Centre to allow cycle access there from Palmer Road.

- Formalise the link through Church Street Car Park, Ware.

FIVE Other measures

- Erect prominently placed bike racks in the centre of Hertford & Ware and at the very entrance to prominent buildings.

- Introduce mapping and town plans which emphasise cycling and walking routes.

- Implement policies to emphasise in a public manner that the Councils support cycling. This could include a range of measures to encourage cycling by way of sponsored rides, school competitions, openings of all sorts by officials and dignatories on bikes, etc.

Fig 2 Costings of Phase 1

1. River Lee towpath :	
Folly Bridge to Ware Lock	£97,000
2. River Lee towpath to Goldings & Ware Station	£55,000
3. Development and road scheme opportunities	
A414 Cole Green Way	n/a
Wadesmill Bypass	n/a
McMullen & Sele Mill development	n/a
4. Minor works	
Hartham Pool to Bengeo Hall	£3,000
Rowley's Road level crossing	£2,000
Church Steet Subway, Hertford	£2,000
Link to Wodson Park Sports Centre	£12,000
Church Street car park, Ware	£500
5. Other measures	
Prominent & central cycle racks	£3,000
Publicity & mapping	£3,000

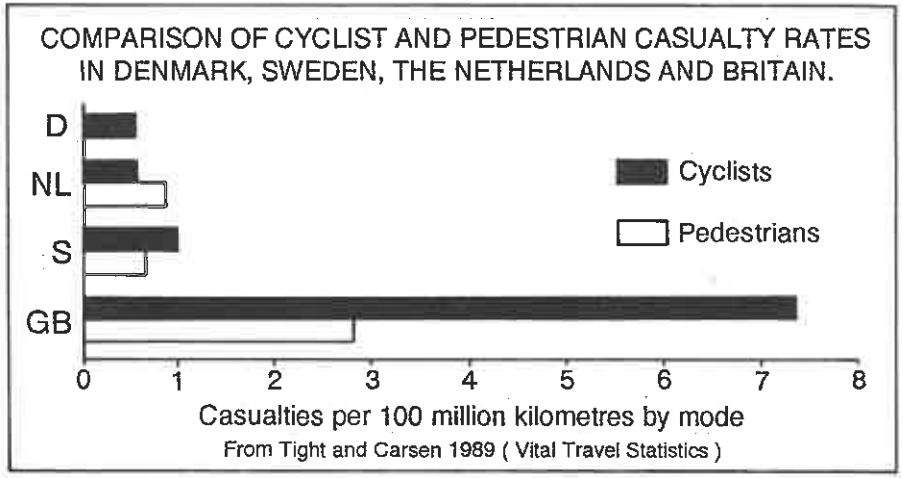
Phase 2

Once the measures described in Phase 1 are in place then it would be timely to review their popularity and use, as well as to work through the remaining proposals and suggestions in this report as they become possible or as they fit in with wider traffic management or development schemes.

1. Traffic-calming and establishment of further routes as proposed in this study as other programmes and policies dictate. These are costed in Appendix 4.

2. Collaborate with extension along Lee Valley to Waltham Abbey and beyond, and encourage neighbouring authorities to devise high quality routes into their urban area.

Fig 3



2. Background to this Study

The Study was commissioned by Hertford Civic Society in partnership with the County Council, East Hertfordshire District Council and Ware Town Council. This favourable combination of interested parties has afforded the study considerable support. In particular the County Council launched their wider initiative in October 1993 to reduce the relentless growth of traffic, whilst the Civic ~~Trust~~ Society contributed considerable local knowledge.

Sustrans has been designing and building cycle routes for over a decade. They view cycling as a particularly appropriate form of transport for this crowded and polluted country and their chief concern has been to devise practical strategies for encouraging more people to cycle.

Although cycling has long been at a low level in Britain, there are a number of reasons for considering policies to change this. Appendix 1 puts the case for encouraging cycling, including:

(a) Tackling the problems of excessive traffic, with its resulting noise, congestion, pollution and land take. As approximately half of all journeys made are under 2 miles in length, and three-quarters under 5 miles, there is considerable scope for cycling many of these trips.

(b) Accidents and casualties on the roads remain high and despite reductions in the overall number, Britain has one of the worst records in Europe for walkers and pedestrians. **Fig 3** compares this country with a number of others, on the basis of accidents per distance travelled. It is perhaps not surprising that as a consequence of this danger the number of cycling journeys made in Britain is correspondingly less.

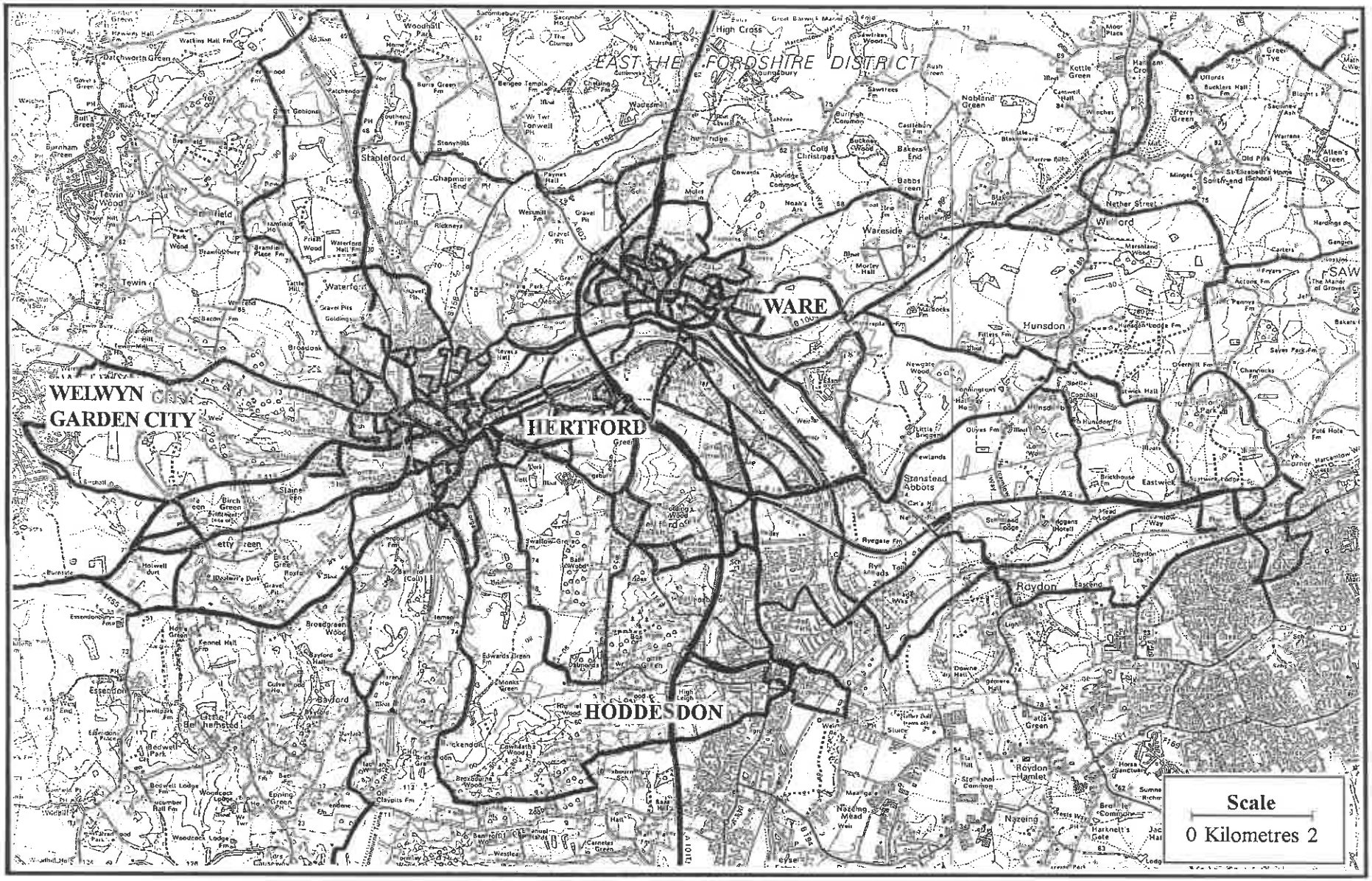
(c) The dominance of the motorcar has brought about a very great restriction on the freedom of individuals to walk or cycle. Nowhere is this better illustrated than amongst children who cannot drive and for whom the cycle is the sole independent means of travel.

(d) A reduction in personal fitness and health. Some 70% of the British population are less fit than they should be.

(e) General environmental concerns. The motor car is a major consumer of resources and if Britain is to meet its commitments made at the Rio Conference on environmental issues, use of the car will have to diminish rather than increase.

(f) Experience in neighbouring European countries demonstrates that cycling can be a popular part of transport policies. For instance, in Denmark cycling now accounts for 18% of all journeys. This is despite the fact that Danish terrain is very similar to much of lowland Britain and Denmark has an even higher level of car ownership. Many of our European neighbours also have what Britain lacks - a balanced transport strategy designed to enable individuals to use appropriate means of transport for varying trips.

These then are reasons enough for setting out on the task of examining how cycling could be encouraged here in Hertford and Ware.


EAST HERTFORDSHIRE DISTRICT
WARE
HERTFORD
WELWYN GARDEN CITY
HODDESDON
Scale
0 Kilometres 2

3. The Study method and arrangement of this report

Survey for this Study has involved a great deal of cycling in the area. **Fig 4** shows the routes covered. This survey work has enabled a close examination of practical opportunities, backed up by discussions with individuals with detailed knowledge of the area.

The Study has been managed by a Working Party, drawn from all the sponsoring groups. At its meeting on September 30 1993, a party of nine, including representatives of the organizations sponsoring the study, cycled along a demonstration route from Trinity Centre in Ware to Goldings in Hertford to examine the sorts of problems which would have to be resolved on the ground. **Fig 5** shows the route of the Working Party Ride.

This report is the result of these findings and deliberations. Most of the detailed recommendations are set out in various appendices. These include:

a) The description of a number of routes

b) A compilation of the practical measures which can be taken to encourage cycling, both through construction works on the roads and through wider policy matters.

This arrangement of separate appendices enables this report to be kept to a manageable length without sacrificing detail for future use.

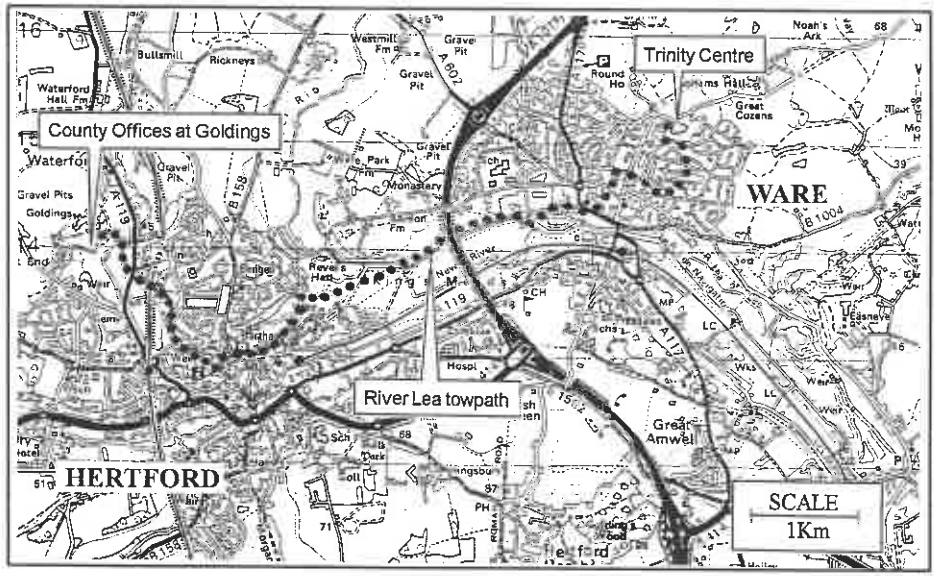


Fig 5: Demonstration route examined by working party, Sept 30th, 1993.

4. The setting

4.1 Physical setting

The most striking physical feature of the area is the valley of the River Lee (spelt Lea in its upper reaches). Several left-bank tributaries flow in from the north and carve valleys in the chalk hills. As a consequence, although the terrain rarely exceed 120 metres in elevation, there are many steep hills.

Away from the built-up areas, the landscape of the chalk country to the north is typically dominated by broad arable fields, reminiscent of many parts of eastern England. By contrast, the hills to the south of the Lee tend to be more poorly drained and are either given over to woodland or pasture. The Lee and Stort valleys comprise low-lying grazing meadows, although over wide areas, the floodplain of the rivers has been considerably diminished by the lakes left behind by gravel extraction.

4.2 Pattern of settlement

The twin towns of Hertford and Ware both lie in the Lee valley. It is quite unusual to find two towns so close together (4 kms between town centres) and yet quite distinct from one another. Both towns are of some antiquity and retain attractive old town centres, and both have suffered only limited suburban development. The compactness of Hertford and Ware contrasts markedly with most other towns of Hertfordshire, including nearly all the neighbouring towns, which have undergone recent and rapid growth.

The two towns are surrounded by open countryside, especially to the north. There are a number of commuter villages in the surrounding countryside within 6 kms of the two towns. It is only to the south-east down the Lee Valley that an almost continuous corridor of urban development runs southwards from Hoddesdon through Cheshunt to Greater London at Enfield.

4.3 Transportation

In isolation, two towns the size of Hertford and Ware, even with their flourishing economies, would not be expected to suffer acute traffic problems. When, however, we consider the regional setting of the two towns, a very different picture is apparent.

Lying within close range of Greater London, economic activity within the area and the transport links are dominated by the capital. Motorways and other main roads built to high standard converge on London and traverse the area under study. The proximity of Greater London and of several large towns in south-east Hertfordshire and west Essex results in large flows of commuter traffic - not only to and from London but also transversely across the area. To these must be added substantial local and long-distance commercial traffic serving London and local towns.

A more detailed evaluation of the traffic problems of Hertford and Ware is given in **Appendix 5**.

5. The role of cycling

Within the context of heavy traffic, cycling is increasingly seen as an attractive alternative and has many advantages for short journeys. This report is primarily concerned with utility and commuting cyclists who wish to use their bikes for a variety of essential journeys. Consideration of utility cycling should not, however, ignore recreational cycling. In many places, it has been the experience that provision of safe recreational cycling routes has encouraged cyclists to broaden their horizons to think of cycling as a viable alternative to the car for utility journeys as well.

The cyclist can jump on his or her bike and thread a way through traffic, however congested the roads are. This, and the absence of a serious parking problem at one's destination, frequently mean that a cyclist can accomplish a journey of modest distance (say up to 10 kms) in less time than a motorist. To this may be added the health benefits of the physical exercise involved. Less tangible, but nevertheless vitally important benefits include the reduction of pollution and congestion. The benefits of cycling to the individual and to the community are summarised in **Appendix 2**.

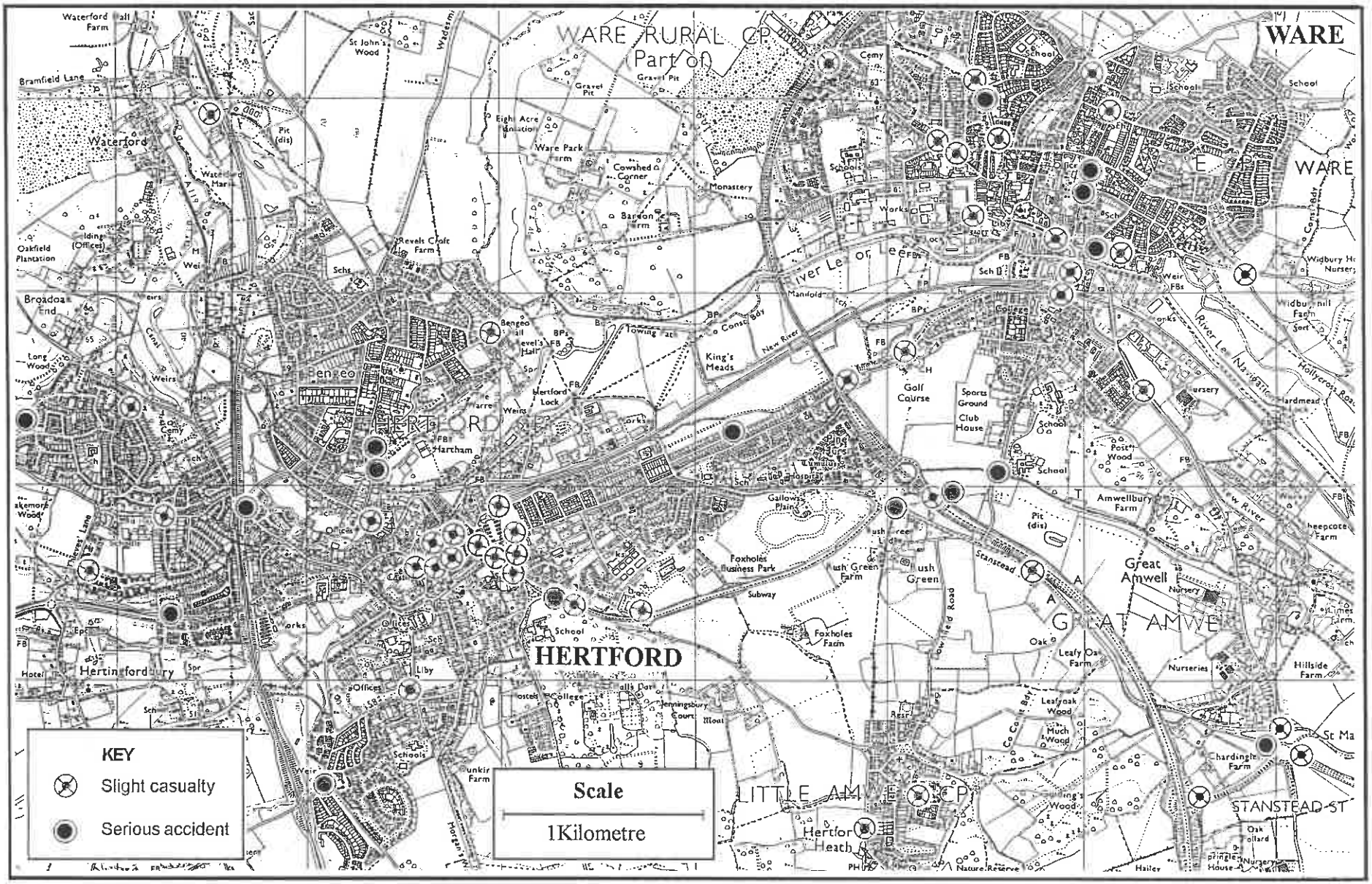
Unfortunately, the current climate of opinion and the poor provision for the needs of cyclists is such as to discourage a large number of potential cyclists from taking to the road. Amongst the reasons often cited for NOT cycling are:

1. Danger from motor traffic.
2. The exertion involved.
3. The weather.
4. Lack of security.

The dangers from motor traffic are all too real. Even if sharing the road with heavy motor traffic may be a little bit safer than perceived, it is nevertheless not a pleasant experience. Where possible cycling can be encouraged by traffic reduction measures - to reduce the amount of motor traffic on the roads and traffic calming - to reduce the speed of motor traffic. The greatest encouragement to cycling, however, is by the provision of 'green' or 'exhaust-free' routes which are completely clear of motor traffic. The engineering details of traffic reduction, traffic calming and green routes are described in another part of this report.

The exertion involved in cycling is likewise exaggerated. The perception of cycling as 'hard work' is often based on experience with old, often poorly maintained machines, possibly only single-speed. Most modern bikes are equipped with at least 12 gears which make light work of all but the most severe gradients. It is true that cycling for more than 5 kms or so may well be 'aerobic'. A major contribution can be made by employers by providing changing facilities and showers at places of work.

The English weather is something we cannot do much about, but its shortcomings are greatly exaggerated. It only rains for 3% of the time on average; this leaves 97% of the time dry. Other meteorological factors which can discourage cycling are cold and wind. Vigorous cy-


WARE RURAL CP
Part of
WARE
HERTFORD
HERTFORD CP
LITTLE AMWELL CP
GREAT AMWELL
Waterford
Bengeo
Hertingfordbury
Hertford Heath
Foxholes Business Park
Golf Course
Sports Ground
Club House
King's Meads
Gallows Plain
Amwellbury Farm
Great Amwell
Stanstead St
KEY
Slight casualty
Serious accident
Scale
1Kilometre

cling will, however, normally warm up a cyclist to a very acceptable level, whilst the wind is rarely too much of a problem within a built-up area.

The problem of security is two-fold. One aspect is the risk of cycle theft - although this is less than the risk of car theft. Provision of secure cycle storage at places of work, places of sport and entertainment and in shopping areas, can go a long way towards reassurance. The other aspect of security is of personal security on routes away from roads with regular motor and foot traffic. This risk is again more of a perceived than an actual problem. It is made worse by the short hours of daylight in winter. Any project for long off-road cycle routes which are to be used by cycle commuters should give consideration to lighting along the way.

Our Study was unable to make any precise assessment of the number of cycling trips being made at present. A questionnaire of 150 pupils from school revealed that a large proportion of the pupils had bikes, but that few used them. Nationally some 90% of men and 66 % of women can cycle and there is no reason to think that it would be different here.

That local people do cycle is unfortunately borne out by the cycle casualty figures for the area. **Fig 6** shows a plot of these over the last 3 years. The Departent of Transport quotes average costs to the comunity of:

£750,000	per fatality
£75,000	per serious casualty
£6,000	per slight casualty.

On this basis, cyclist accidents in this area alone are coting the community some £400,000 per year. Pedestrian casualties are just as bad.

The remainder of this study is devoted to a consideration of how these potential facilities for cycling can be developed to increase the levels of cycling within the area.

6. The Study

In this Study we have mainly been examining ways in which the circumstances on the ground can be improved for cyclists. Can their environment be made safer and more attractive?

This is usually achieved by a combination of measures on existing roads such as cycle lanes at advanced stop lines at traffic lights; by traffic calming techniques in which the speed and volume of motor traffic is reduced to 10 or 20 mph at which levels it is much more compatible with other users of the road space - walkers and cyclists; and by building special traffic-free routes so that cyclists can move away from the conflict of traffic altogether.

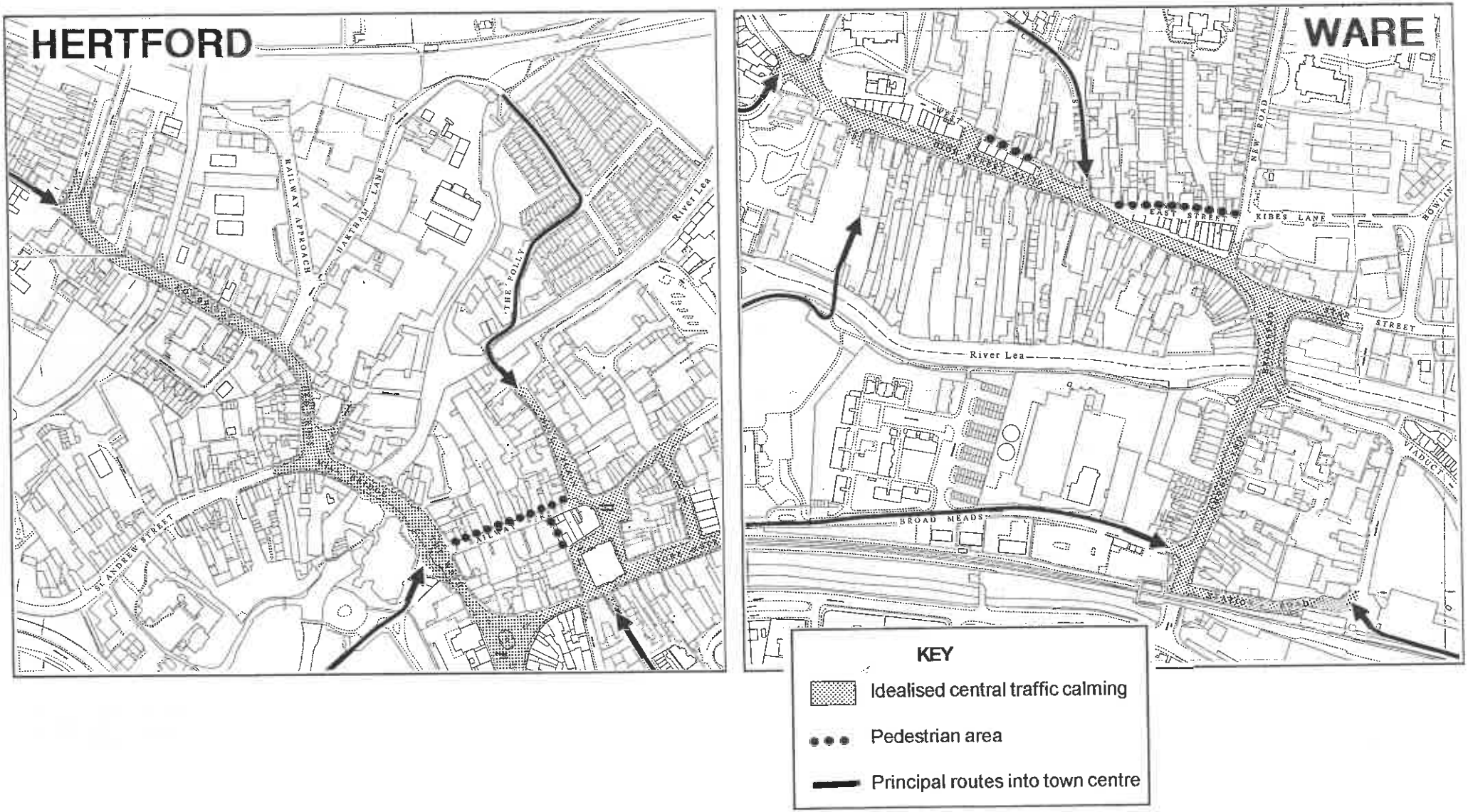
Any practical policy is a combination of all three approaches. Usually an authority attempts to string together a series of measures to make meaningful routes. The ones proposed in this Study are described in **Appendix 4**. The objective is to create a series of routes, which taken in combination with relatively quiet residential roads will enable a large proportion of the population to make more of their local journeys in more safety and with more confidence. This will be achieved by promoting safe alternatives on some of the more dangerous sections and by signing. Above all, the creation of these routes will be seen as an official statement that cycling is desirable and is being encouraged.

This chapter looks at the different angles from which one can approach the provision for cyclists. Depending upon the individual, different sorts of journey will be more important, and the Councils might prefer to invest in the journey to work, or recreational trips, for instance, to initiate their policy.

6.1 Traffic calming initiatives

This is probably the most important type of measure which can improve matters for cyclists. It is the speed and volume of traffic which is so incompatible with the exposed cyclists. If the whole town was to be reduced to 20mph or less then cycling would be much easier throughout the area. This is not wishful thinking. In Holland the "Woonerf" system has been in operation for nearly 20 years where traffic speeds are reduced to 10 mph. Numerous urban areas in the country have effective speed limits of 20kph (15mph). Traffic-calming is now at last accepted by the Department of Transport and cities such as York and Leicester have ongoing programmes tackling a number of streets each year. This work has been found to be very cost effective in reducing accidents and improving the quality of life of residents. Not only do cyclists benefit, but of course pedestrians and residents also do so to an equal measure.

As Hertford and Ware are both historic towns, traffic calming will be an effective option, whereas the construction of new road capacity is not. We recommend that the central areas of both towns are enhanced by traffic calming schemes designed to a **maximum speed of 15mph**. This central area should extend as far as the beginning of some of the residential minor roads as this would enable cyclists to reach the town


HERTFORD
WARE
River Lea
BROAD MEADS
KEY
Idealised central traffic calming
Pedestrian area
Principal routes into town centre

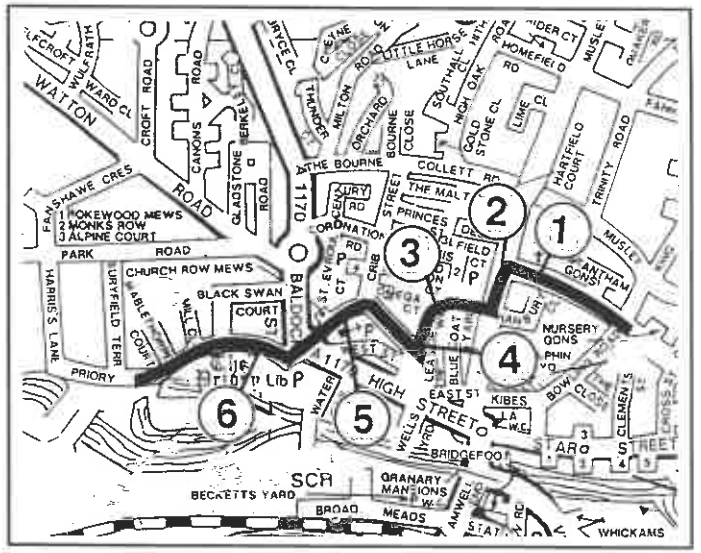
centre much more easily. **Fig 7** shows the appropriate areas.

This Study has not detailed what might be done, as the options are various and outside the scope of this report. But one objective would be to make it clear to motorists that they were entering a zone which belongs to the local residents, and that within that zone walkers and cyclists were the preferred travellers and should be given consideration and preference. Within this traffic calmed area there will be small pedestrian zones where cyclists are discouraged, but care should be taken to ensure that these are not such as to cause serious inconvenience to cycling routes or to force cyclists back onto busy trafficed roads.

6.2 Special routes

By way of illustration, we show a route through Ware which was observed to be used by staff cycling to Glaxo. It makes use of a short-cut through the car park and a short pedestrian path to provide a route which avoids the town centre. Cyclists are always looking for such opportunities! **Fig 8** draws this up to show how it could be formalised, including a section of two-way cycle use of a one-way street (Church Street), and a protected crossing of High Street. In fact we will recommend later in this report that this protected crossing forms the western end of a traffic-calming scheme for the whole of the High Street as far as Bridge Foot.

Fig 8 - Route to Glaxo



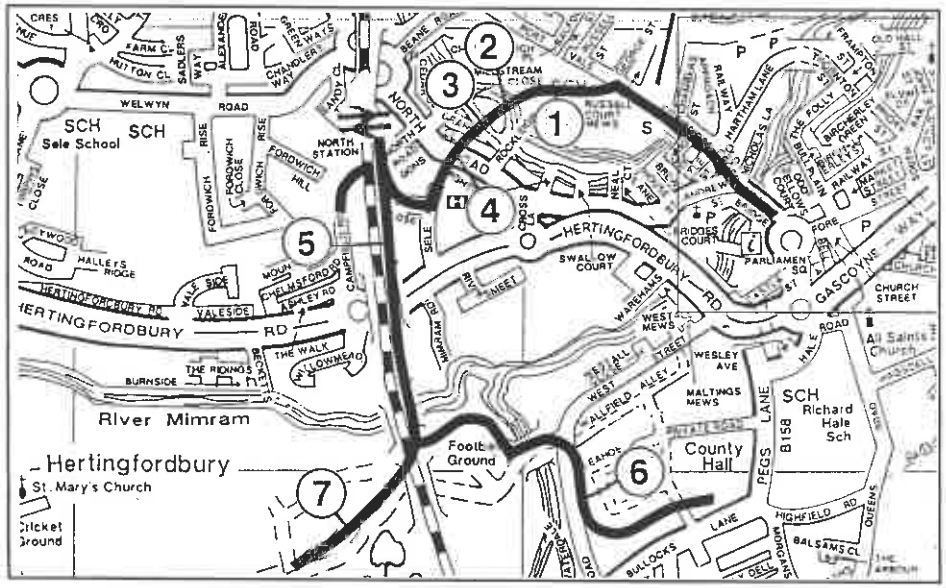
1. King Edwards Road is fairly level and not busy.
2. Almost straight over New Road to car park access. This could be improved with traffic-calming to New Road.
3. Car Park access is lightly trafficked and a cul-de-sac.
4. Through car park and use a short length of linking path to reach Church Street. This needs formalising with dropped kerbs.
5. This section of Church Street would need to be modified to allow 2-way traffic flow. (This can be achieved by reducing the one-way section to a very short length at its western end with a cycle bypass).
6. Straight over the end of High Street to reach Priory Street. A raised crossing here could form the start of traffic calming along the High Street to Bridgefoot.

6.3 Routes to stations

Leaving a car at the station all day is expensive and wasteful of resources. If passengers are driven to and from the station this adds to peak hour congestion, as well as committing someone to be a chauffeur. In Hertford and Ware, the stations are fairly central and reasonably accessible, so not much can be done to make shorter routes. Much, however, can be achieved by making more attractive routes and options for Hertford North are shown in **Figs 9** & **10**. Here we can visualise two largely traffic-free routes to the station, one via new developments to make a path from the town centre avoiding the long trek down the busy St Andrews Street and North Road. The other runs along the remains of the former Welwyn Branch railway to make a route to the County Hall area. This latter in particular avoids roads which are completely unsuitable for cycling, produces a shorter route and gives access to the principal employer in the area. Of particular advantage would be the making of a new link direct to the platform from the Fordwich Hill footbridge. This is possible via the remains of the Welwyn Branch line.

Stations (and many other destinations) will require good cycle racks. In the case at Hertford North we recommend that these are both sited at the low level in full view of the ticket office and at the high level platform for convenience.

Fig 9: Possible routes to Hertford North Station



1. Path to be incorporated in new development to reach the riverside.
2. New footbridge required.
3. Path incorporated along side of Sele Mill redevelopment to reach North Road.
4. Protected crossing of North Road to Hospital entrance and path to station footbridge.
5. Link via remains of old railway and new bridges.
6. New path up hill to County Hall.
7. Cole Green Way.

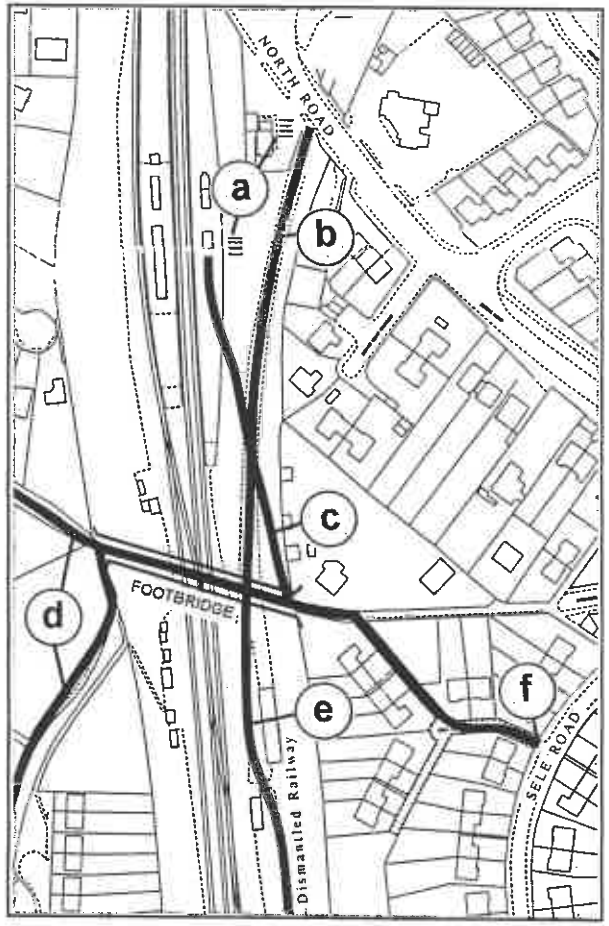
Fig 10: Detail of link to footbridge near Hertford North Station

a. Hertford North Station. Cycle racks could conveniently be put beside the London platform and adjacent to the booking hall.

b. Construct long ramp at 1:20 down to North Road on line of existing disused railway. The material excavated for this can be used to make a new ramp up to the footbridge for direct access to the station.

c. Build up new ramp to edge of footway.

d. Existing paths to Sele School, Fordwich Hill area and Health Centre.



e. Proposed connection to Cole Green Way and traffic-free route to County Hall.

f. Sele Road closed to traffic.

6.4 Routes to schools

One of the most extraordinary changes in travel patterns in recent years has been in the journey to school. Dr Mayer Hillman, of the Policy Studies Institute, has shown how between 1970 and 1990 the proportion of 8 year old allowed to go to school on their own has plummeted from 80% to 10%. This change has been brought about by a fear of danger on the streets, and has resulted in more danger as more children are driven to school and less people are about on foot in the streets. Dr Hillman estimates that this chauffeuring is now costing the nation between £10 and £20 billion annually, as well as depriving children of their independence and of the opportunity for them to develop qualities of initiative and self-reliance. Instead, children are indoctrinated to regard their ultimate ambition as joining the ranks of car-drivers and car-owners when they reach the appropriate age.

In secondary schools the change is often evident in long racks of cycle storage abandoned and empty.

Cycle routes to schools should be a key priority, for the fitness and independence of the pupils, and in order to indicate that society considers cycling a mature and worthy way of travelling. Cycle racks should be provided at the school entrance under the surveillance of the office staff, and staff car parking should be swept around the back of the school to emphasise its lesser status!

Fig 11 shows a route to Chauncy School as an example. This route would provide an attractive route direct to Bridge Foot and the Railway Station. In fact we have found it difficult to devise good routes to cater for the whole length of many journeys to school in this area, although many could benefit from the small details shown here.

There are a number of measures which could be adopted to create the climate in which cycling would once again take its place as a major mode of travel to school.

These are:-

1. Provision of safe routes between schools and their catchment areas.

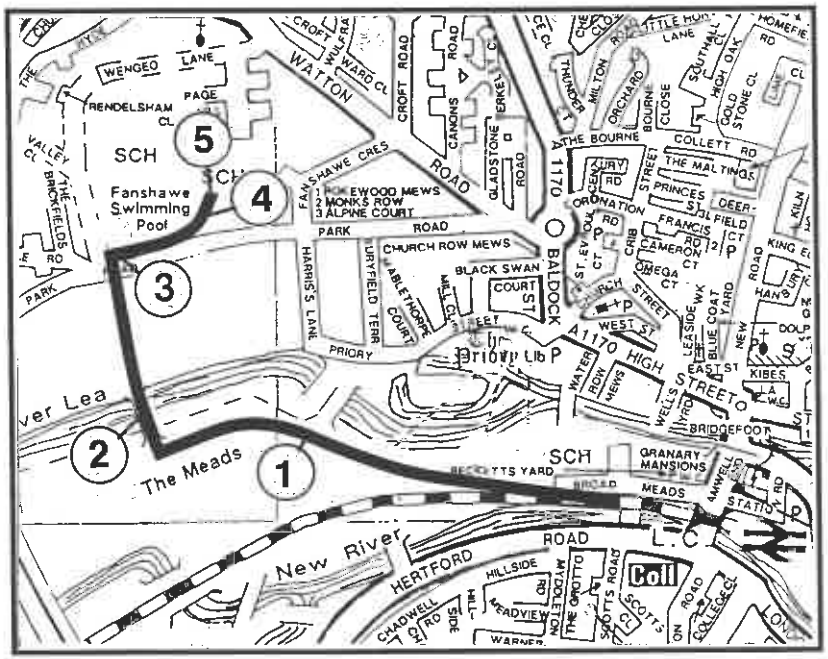
2. Provision of adequate, secure and sheltered cycle storage at schools.

3. Other measures to reduce the apparent advantages and status of the motor car, best described under the heading of "culture".

Safe routes to schools

All the secondary schools lie on, or close to, one or more elements of the proposed cycleway network. Some extra links are needed to connect particular schools with their catchment areas.

Fig 11: Route to Chauncy School



1. Riverside path and new link from Broad Meads.
2. Footbridge.
3. Raised pavement crossing of Park Road.
4. Use existing separate footpath beside Park Road. Link from Park Road.
5. Bike parking outside school office and main entrance.

Cycle storage

The provision of cycle storage at schools is generally woefully inadequate, as indeed is cycle parking at all places frequented by the public throughout the town.There are three inter-related elements to be considered in the provision of adequate cycle storage:

a) Physical support for the like. The varieties of wheel-holding type of racks range from barely adequate to the completely useless slots in a block of concrete. Stands which support the frame and to which the like can be secured find most favour nowadays.

b) Protection from the weather - this implies a roof and possibly walls. This arrangement, however, militates against security from theft. Possibly the best arrangement is a canopy made of translucent material protecting well beyond the stands underneath.

c) Security from theft. This can be achieved by one or both of two means:

   i) Controlled access to the cycle storage area by a gate which is only unlocked at the beginning and end of school.

   ii) Siting in a central position which is readily overseen. One such position could be a central courtyard, out of sight of the road, and the general public, but over looked by the surrounding classrooms. Another favoured position is the forecourt of the school by the main entrance and overlooked by the school office.

Culture

There are various other means of a largely psychological nature which can be used to reduce the apparent advantage and status of travel by car relative to that by bike.

a) Removal of car parking from the front of the school (which as seen above is a good location for cycle storage), especially of such privileges as reserved bays for senior staff.

b) Stringent restrictions on car-parking for pupils within school grounds.

6.5 Routes to hospitals and health centres

In 1992 the British Medical Association published its book "*Cycling: towards health and safety*". It expressed concern about the deterioration of the nation's health due to our sedentary lifestyles, and the consequence this would have for illness. It recommended that cycling

was the most practical way of improving the health of a wide section of the population.

It follows then that cycling to and from hospitals and clinics should be made as attractive and safe as possible. Again cycle parking should be prominently provided at the main entrance and cars removed from this area.

The Hertford County Hospital in North Road, which it is understood is due to be developed as a day and diagnostic hospital is well situated on the proposed route out from Hertford Town Centre to the Sele Estate.

The position of the East Herts Hospital on Stanstead Road is more problematical as it lies at the top of a hill. Shared use of the footway up Stanstead Road is not practicable, but there may be some scope for developing a route into the back of the hospital from the grounds of the school.

6.6 Sports and recreational facilities

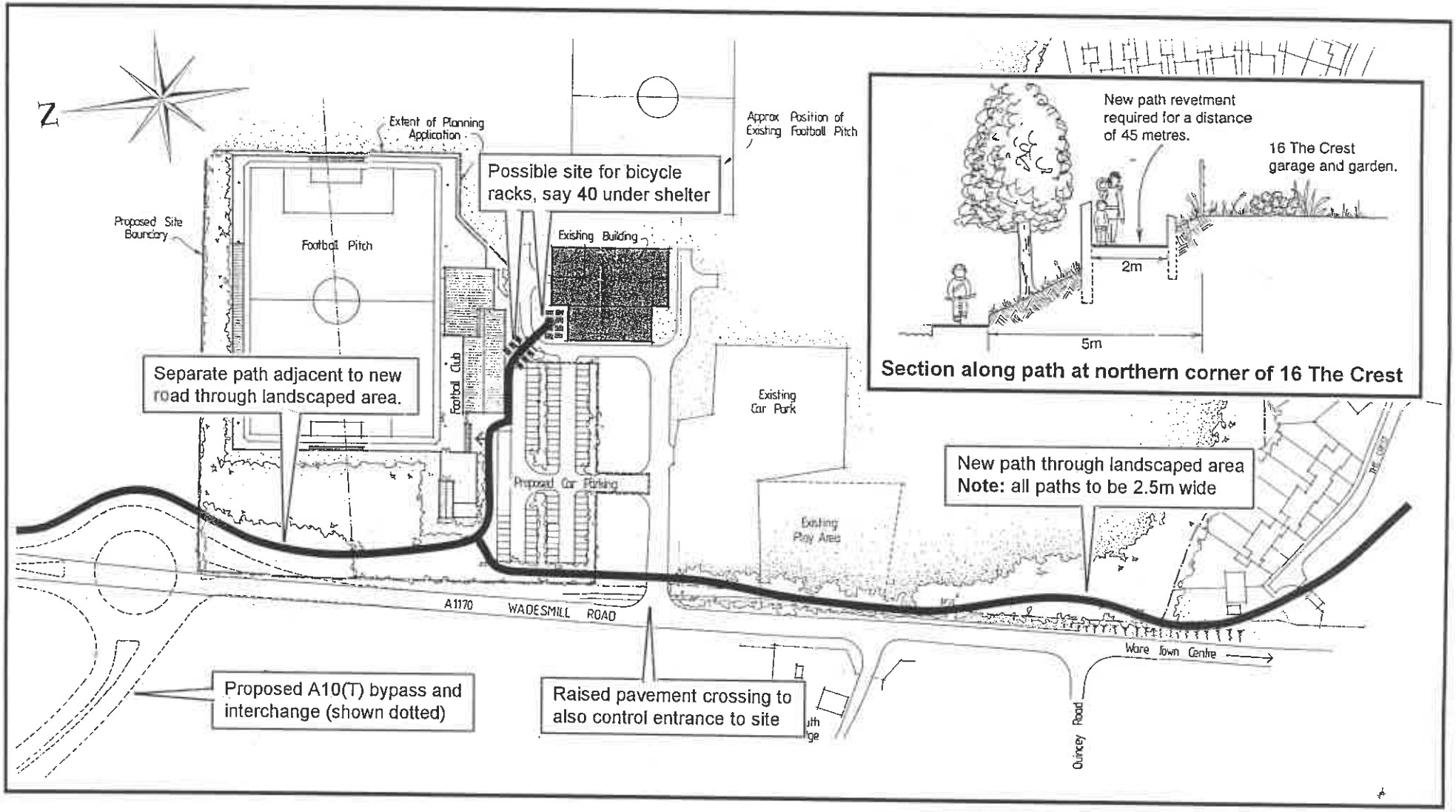
Sports Centres are for improving health and fitness. A good quality cycle route to and from all playing fields and other sports facilities should be seen as an integral part of the facilities. In the case of Ware the Sports Centre is a little out of town, and a direct cycle route will make them accessible to a much larger range of people.

Fig 12 shows a crucial link from the head of The Crest cul-de-sac to reach the Wodson Park Sports complex. This would provide immediate access to the northern part of Ware whereas at present the Centre is virtually inaccessible to all but motorists given the heavy traffic and narrow pavement along Wadesmill Road.

The Hartham Pool in Hertford is well located with regards to potential routes and it already has an ingenious cycle rack which is well located immediately outside the main entrance.

Good cycle storage is also important at the location for spectator sports.

Fig 12: Route to Wodson Sports Centre from The Crest, Ware



6.7 Links to the surrounding countryside

Probably the most extensive facilities available to cyclists at present are the nearby minor country roads, many of which are lightly trafficked and most attractive.

The problem lies in reaching them. Not only does the cyclist have to travel through the town on unsuitable roads, but is often faced with a length of main road before reaching the minor road in question. Most of the roads into the countryside from the towns are main roads, or, if not classified, still carry considerable amounts of through traffic. To some extent, the road network can be supplemented by maintenance and upgrading of suitable bridleways at the edge of the built-up area which ultimately give access to the quieter lanes further into the countryside.

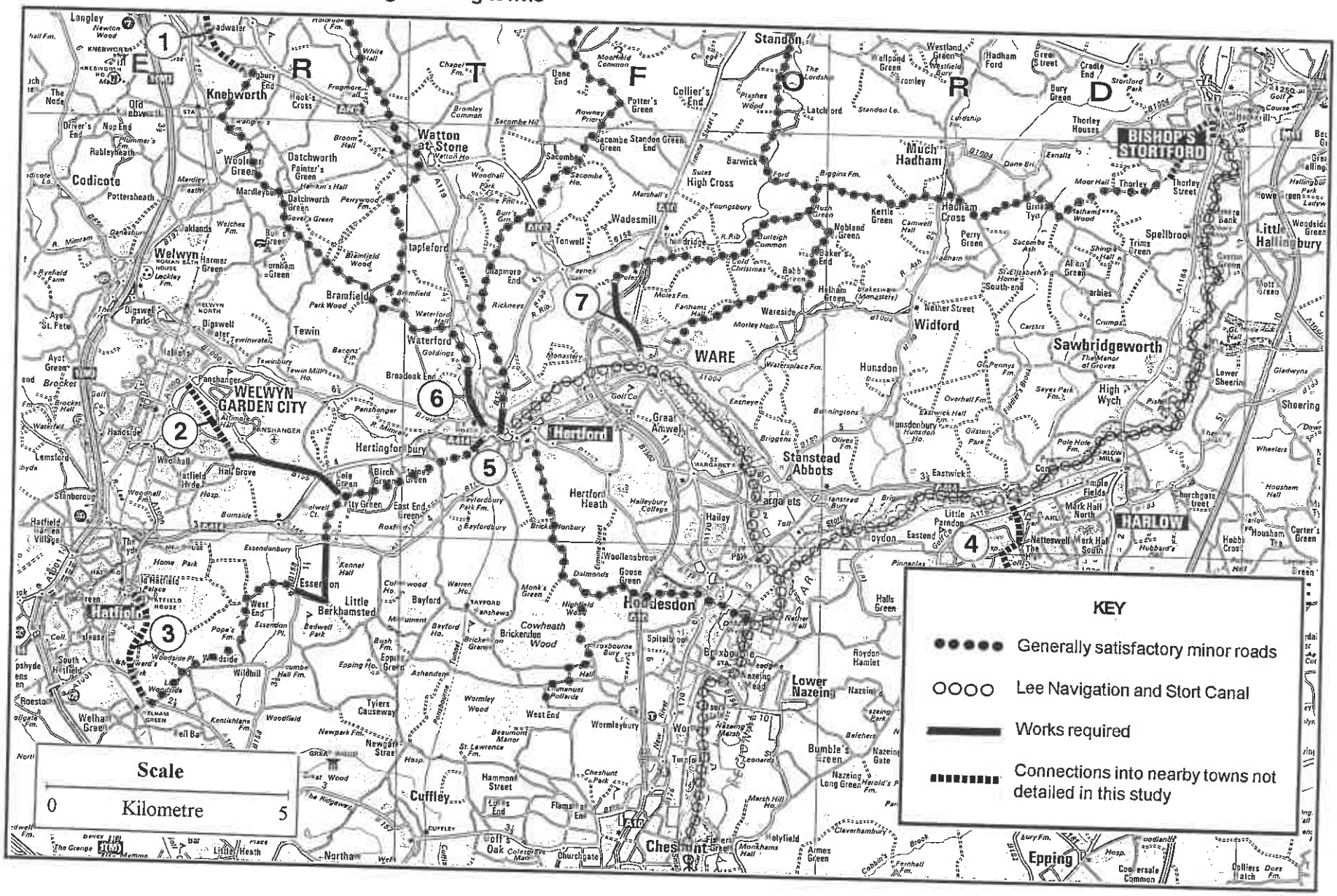
For instance, Bramfield Road going north-west from Hertford branches off the A119 (North Road). Furthermore, the first kilometre of Bramfield Road is much used by lorries travelling to and from the gravel extraction site. Another example is the road to Cold Christmas north of Ware which is cut off by the A10.

Fig 13 illustrates the problem and focuses on the works which will be needed to give access to the countryside. The most useful routes are those which reach right to the town centre and in this respect Hertford & Ware are fortunate in having the Lee Navigation with its continuous towpath running through both areas. This has the potential for becoming a route of the highest quality and one which acts as a focus for cycling policy in the area.

This corridor is likely to feature prominently in any cycling strategy for the area because it is largely traffic-free. This means that it will be the one place in this area where novice cyclists of all ages can gain confidence before going on to tackle routes which make more use of roads. As a consequence this route is likely to be the principal catalyst for changing travelling habits. Indeed, if a good quality cycling route between Hertford and Ware does not convince a commuter between those two towns to cycle rather than drive, then probably nothing will in the present climate. We anticipate that this route would be so direct, so attractive, and so quick, that it would in fact be very popular with regular travellers.

For this reason the Lee Valley Route is given pride of place in this Study and written up in some detail in **Appendix 3**. This appendix describes a continuous route running as far as Waltham Abbey to illustrate the very considerable recreational opportunity that also exists here for the people of Hertford and Ware. It could be a full day out for a family group, and one on which there were ready options for returning by train. Where such journeys are made in preference to an alternative car trip, this could start a real trend towards a less motor orientated travel pattern in the area.

Fig 13: Links to the countryside and neighbouring towns



6.8 Routes to neighbouring towns

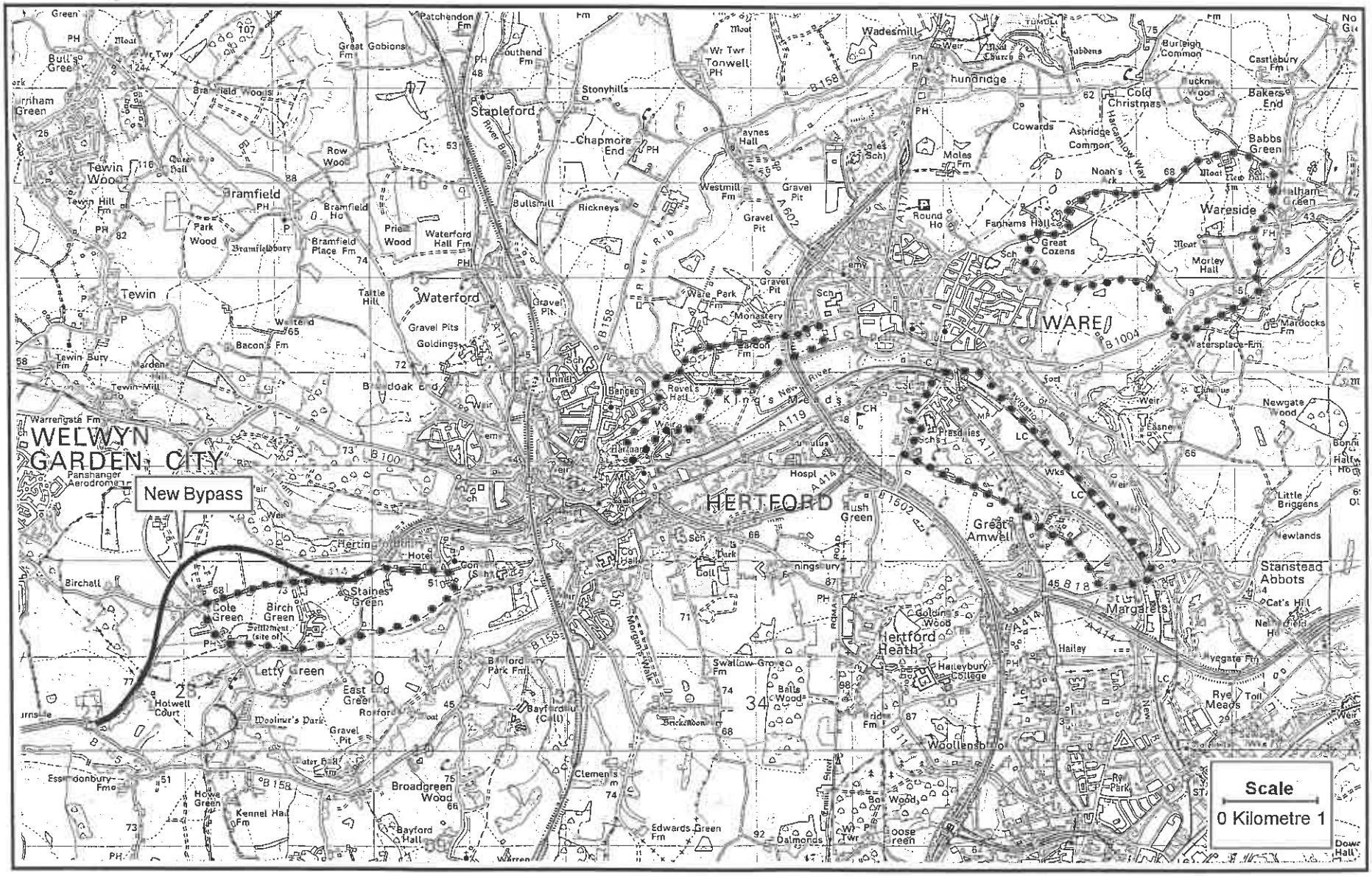
Although straying somewhat beyond the boundaries of Hertford and Ware, a study of this kind can not be considered complete without consideration of links to neighbouring towns. These are important not only as routes in themselves - in that people from Hertford may want to visit Bishop's Stortford for instance and vice versa, but because such routes will give access to minor roads and hence village communities throughout the area.

The best opportunities are provided by the towpath route which will give access downstream to Hoddesdon and Broxbourne and, via the Stort, up to Harlow; whilst the Cole Green Way could be extended with considerable advantage in towards Welwyn Garden City. From Welwyn Garden City, there is some scope for continuing on to Hatfield, although there are gaps in the provision of safe cycling routes in this direction at present.

As with Hertford and Ware, there is the corresponding problem of finding safe ways into neighbouring urban areas. There are also points along almost every minor road route where difficult roads need to be crossed, or even used for access, and the resolution of these problems will require some works even in the countryside. Finally there is the matter of traffic on the minor roads themselves. This frequently goes much too fast, and on some roads which form "short cuts" between main roads, for example, the volume of traffic is high. Attention should be given to ways of reducing traffic speeds in rural as well as urban areas. The idea of village gateways, becoming common in Europe, where "features" are placed on the approaches to villages at the point where speed restrictions to perhaps 30 mph are introduced. The purpose, and effect, of these gateways is to mark the transition from the open road, to a community's "living" space - namely the village streets. In the open countryside itself some work could be done to reduce traffic on the selected roads by means of careful signing and the avoidance of such schemes as "scenic drives"!

We would also like to see the introduction of access only regulations to selected country roads to further reduce traffic to the minimum. This is common in France and Germany where there is, in effect, a tertiary network of minor roads which is very lightly trafficked and so particularly suitable for cyclists. Once the problem of getting safely into the countryside has been resolved, attention can be given to the question of safe cycle routes to neighbouring towns. It has to be admitted that the scope for providing safe routes to neighbouring towns is presently limited.

Fig 14. Examples of circular routes



6.9 Circular routes

It has been quite common for local authorities to publish circular cycling routes. These quite commonly ring the County boundary and mayh well be the only cycling feature in the area, for example, Cumbria Cycle Way. However unless works are undertaken it is highly unlikely that such routes will be particularly successful because they will have numerous deficiencies along the way. They may represent the best that can be done without recourse to expenditure, but that alone will not, and indeed has not, led to any real popularity for cycling.

We suggest that there is not a great benefit from putting much effort into making long circular routes in the countryside. Clearly if some of the inter-urban routes we have been suggesting are implemented, then there is scope for creating circuits by linking these together by minor roads - but this can be done by various means, not the least by the publication of good maps.

In one particular case, however, there is the opportunity for a rather attractive local circuit between Hertford and Ware which can be created without much difficulty and although only 6 kms in length, contains a wide variety of views and landscape. It would be very worthwhile implementing such a route at an early stage, as it serves to act as a valuable introduction to cycling as well as a pleasant family outing.

6.10 Cycle Parking

Cycle parking facilities need to be prominent, central and convenient. Prominent because the Council will wish to make it clear that cycling is to be encouraged. Central and convenient, so that the public can enjoy shorter journeys and quicker times than they can by other modes.

A major deterrent to the use of bicycles is the presently poor standard of cycle parking facilities in many places. The elements which go to make up satisfactory cycle storage are described under the heading of "Cycling to Schools".

Urgent consideration needs to be applied to the provision of cycle parking at different locations.

At places of work, all employers should be given every encouragement to provide adequate cycle storage. This should be within the secure perimeter of the works where applicable. Where there is no secure perimeter, the siting of cycle parking should be within sight of the reception area or security guard and/or in a locked out-building to which only cycling employees have access.

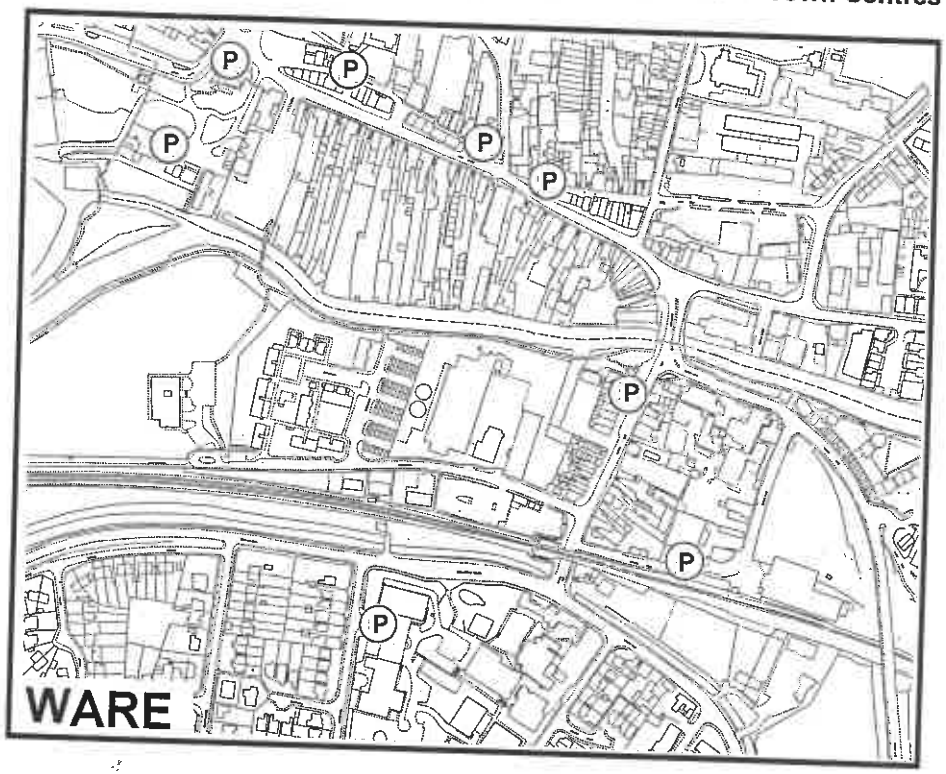
It is important to provide safe and secure cycle storage, particularly at railway stations, where people undertaking long journeys can switch modes between cycling and public transport.

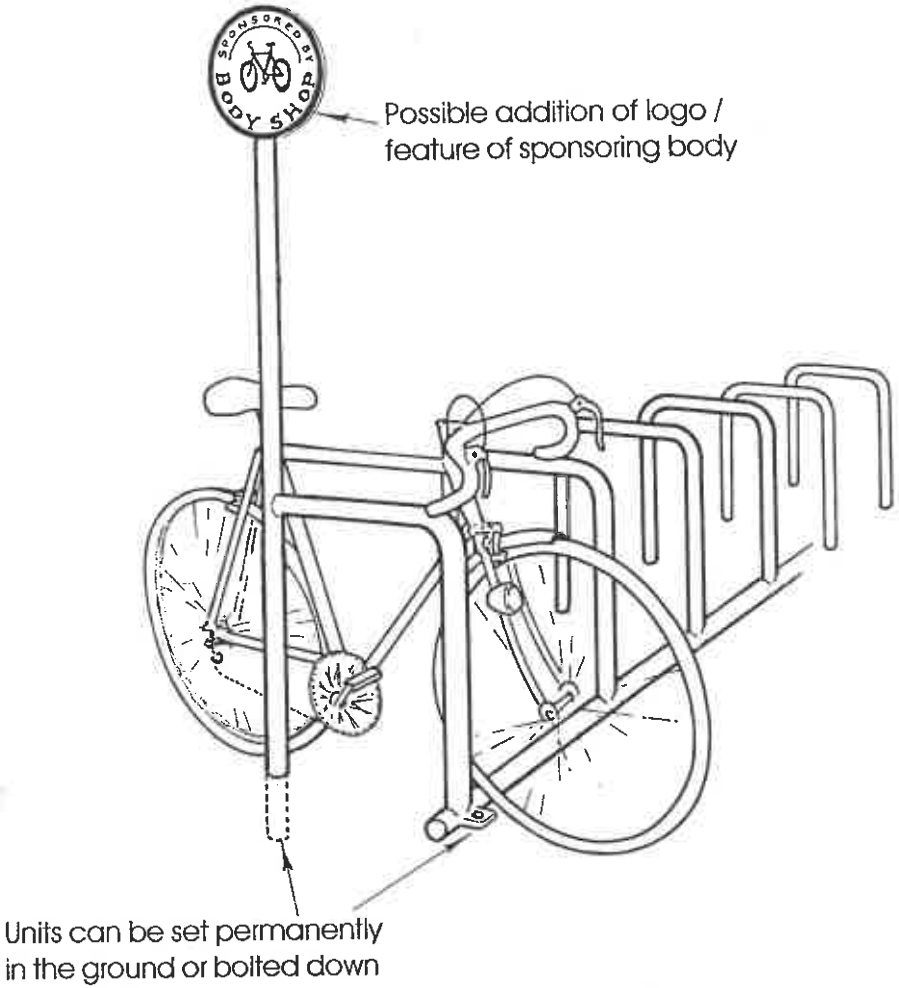
It is particularly appropriate that at sports and leisure facilities, safe cycle storage should be provided within sight of the box office or pavilion. Good cycle storage is also important at the location for spectator sports.

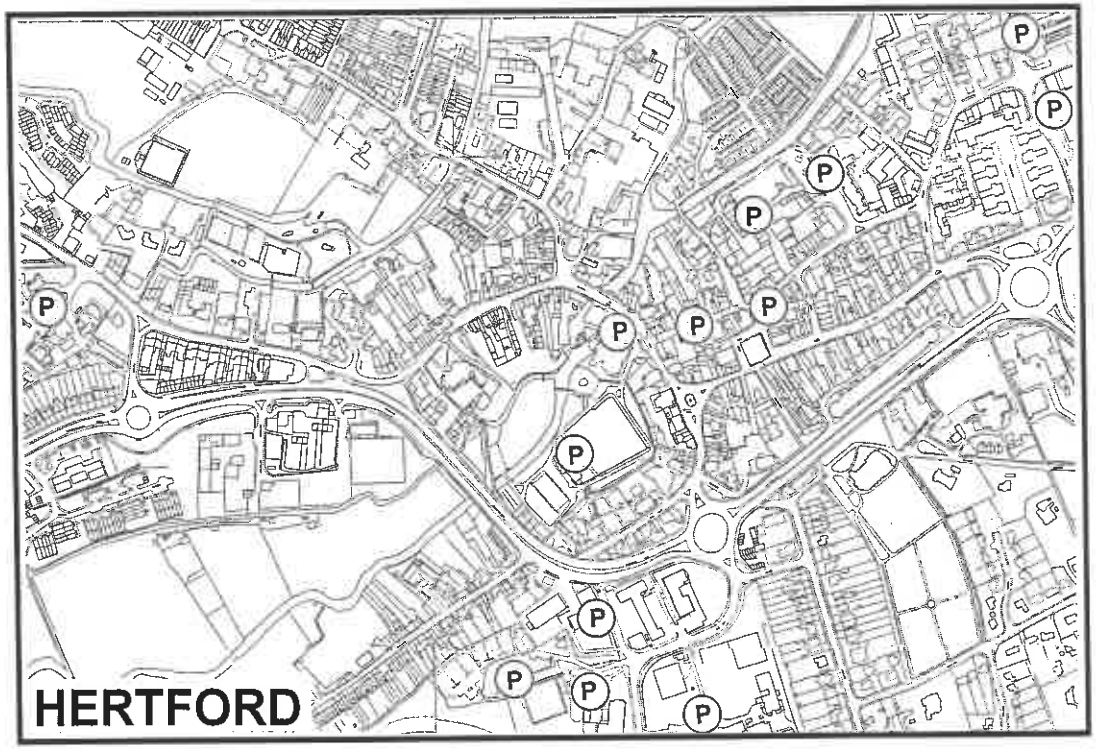
Nearly all the shops are concentrated in the centre of the two towns. Cycle storage in the form of Sheffield racks, to which cycles can be secured should be sited in easily visible locations in the town centres, not hidden away from sight. **Fig 14** shows a convenient central location in Hertford. Cycle stands could be designed as sculptural features and their location should be in those very places where the traditional urban planner would normally seek to have a piece of attractive paving to take up a fragment of central space for which there is no particular defined use.

The health benefits of cycling are being increasingly recognised. It is therefore particularly appropriate that cycling by staff and visitors to hospitals and health centres should be encouraged, particularly by the provision of safe storage.

Fig 15: Cycle parking in Hertford and Ware Town Centres




SPONSORED BY
BODY SHOP
Possible addition of logo / feature of sponsoring body
Units can be set permanently in the ground or bolted down


HERTFORD

6.11 Planning and development

All new development should include provision for cycling and should contribute to making a safe route to and beyond the development. For instance, an office or industrial project should include plans for the construction for a safe cycling route back to the centre of town, in just the same way that it would have to include the cost of road modifications in the vicinity of the development.

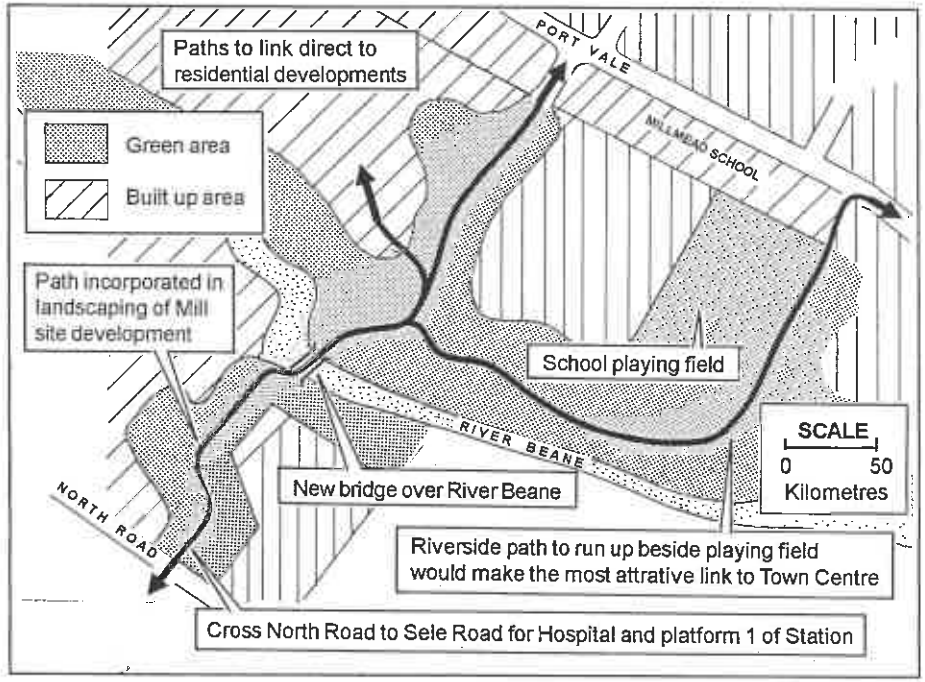
We have referred to a number of examples of this already - Ware Station for instance.

Fig 16 illustrates the particularly worthwhile example to make an approach to Hertford North Station, across land made available by the redevelopment of the McMullen's sports ground. Here the creation of a public path will require the positive foresight of the authority to ensure that a useful link can be created, and one moreover which is quite direct and placed in an attractive setting away from the town's main roads.

6.12 Road schemes

Road improvements and new highways are a special form of development which should give particular thought to how best to cater for walkers and cyclists. Each new project whether it is a new length of road or a junction modification provides some opportunity for improv-

Fig 16: Cycle routes incorporated in new developments



ing facilities for cycling. Avon County is one Council which has followed this policy for a number of years and radical measures have been introduced to help cyclists as part of wider schemes.

In addition to provision for cyclists to cross new roads safely, and, if necessary, pass along them, there are opportunities to be realised by the release of traffic from old main roads onto new bypasses. There are two major road schemes being implemented at present. The Cole Green bypass is at present under construction and on its completion, the old course of the A414 should become a quiet backwater. This will not, in fact, provide any better a route to the west of Hertford which is already well served by the Cole Green Way, but will offer the opportunity of making a circular tour.

The Wadesmill bypass is presently at the design stage. Its completion will not, however, offer greatly improved facilities, as the old A10 is a straight road serving quite a sizeable population in the villages of Thundridge, Wadesmill and High Cross.

6.13 Council premises

The County's Council's offices have a huge and specially built multi-storey car park which epitomises the Council's present commitment to the motor car. **If the local authority is serious, and wishes to be taken seriously about its intention to promote cycling, it must set a good example in this respect.** To make any fundamental change in that policy will be difficult, but a valuable start can be made here by implementing the following measures:

1. A purpose-built route from Hertford North station.

2. Prominent cycle racks outside each main entrance.

3. Changing and shower facilities.

4. Preferential mileage rates designed to make cycling at least as attractive as motoring.

5. A lead from civic dignatories and others to use bikes where possible, thereby demonstrating that cycling is a proper way of travelling for normal adults.

6. The provision of similar facilities, especially of secure cycle storage, at other Council managed establishments, particularly libraries, museums and schools (as discussed earlier).

6.14 Publicity

The proposed new facilities for cycling are likely be under-utilised unless adequately publicised.

Ideally, cycling facilities should be added to Ordnance Survey maps and other tourist maps. At present the Ordnance Survey does not show cycle facilities in any standard way by means of a conventional sign. Representations should be made to the Ordnance Survey to this effect. In the meantime the County Council should consider publishing their own map of the area of the county in four sheets. Such a map should be based on the Ordnance Survey 1:50 000 series, with an overprint of tourist details and other features of interest, as well as the evolving network of cycle routes.

In the short term, possibly the best solution is to take the commercially published street maps and overprint whem with colour to highlight cycle routes.

7. Drawing things together

The last section of this report has set out examples of almost all the sorts of initiatives which could be taken in Hertford and Ware. If widespread traffic calming was introduced, if priority routes were created for cyclists, if special links were built to enable cyclists to ride quiet country roads and if the Council resolved to promote cycling as an integral part of its transport policy, then cycling would certainly flourish.

The maps of the two towns would change. For local people, in particular, the walking and cycling routes would begin to form a much more visible and tangible part of their towns. For children and those without transport, today's maps might fade and be subtly revised to show their ways of travelling as the more important routes when compared with the major roads which stand out today.

Figs 17 & 18 show these maps combining all the proposals set out so far.

7.1 A practical programme

With the best will in the world, changes of this magnitude do not happen overnight. Existing commitments and priorities need to be modified and prejudices need to be overcome. The rate of change will be influenced by a combination of external imperatives arising from worldwide resolves to challenge environmental degradation and resources depletion, and individual resolves to increase personal fitness, to reduce accidents and to provide for children and those without vehicles in an equitable manner.

The rate of change will be influenced by the Council's policies and decisions - whether to provide a real place for cyclists or not. The most effective programme will be the one which produces an early demonstration of the popularity of cycling - the one which encourages the public to take up cycling again, for whatever purpose.

In this context, the towpath of the River Lee stands head and shoulders above all other individual proposals. It has the potential of providing a direct, level and attractive route between the two town centres, and one which is so short that cyclists might easily find it provides quicker journey times door to door at the busier times of the day. This is a route which will cater for the journey to work (particularly to Glaxo), to school and all manner of recreational and personal journeys. It is straightforward to create and relatively cheap to make. **We recommend the creation of this riverside path as a first priority in any cycling programme.**

Upgrading of the towpath route should be rapidly followed by an extension to Goldings, both to give access to the countryside to the northwest and to the Council offices at Goldings itself. At the eastern end, the towpath route should be extended at least as far as Rye Station (for an easy return to Hertford!) and the junction with the Stort Navigation and its towpath to Harlow. Neighbouring authorities should be

Fig 17: Proposed routes in Hertford

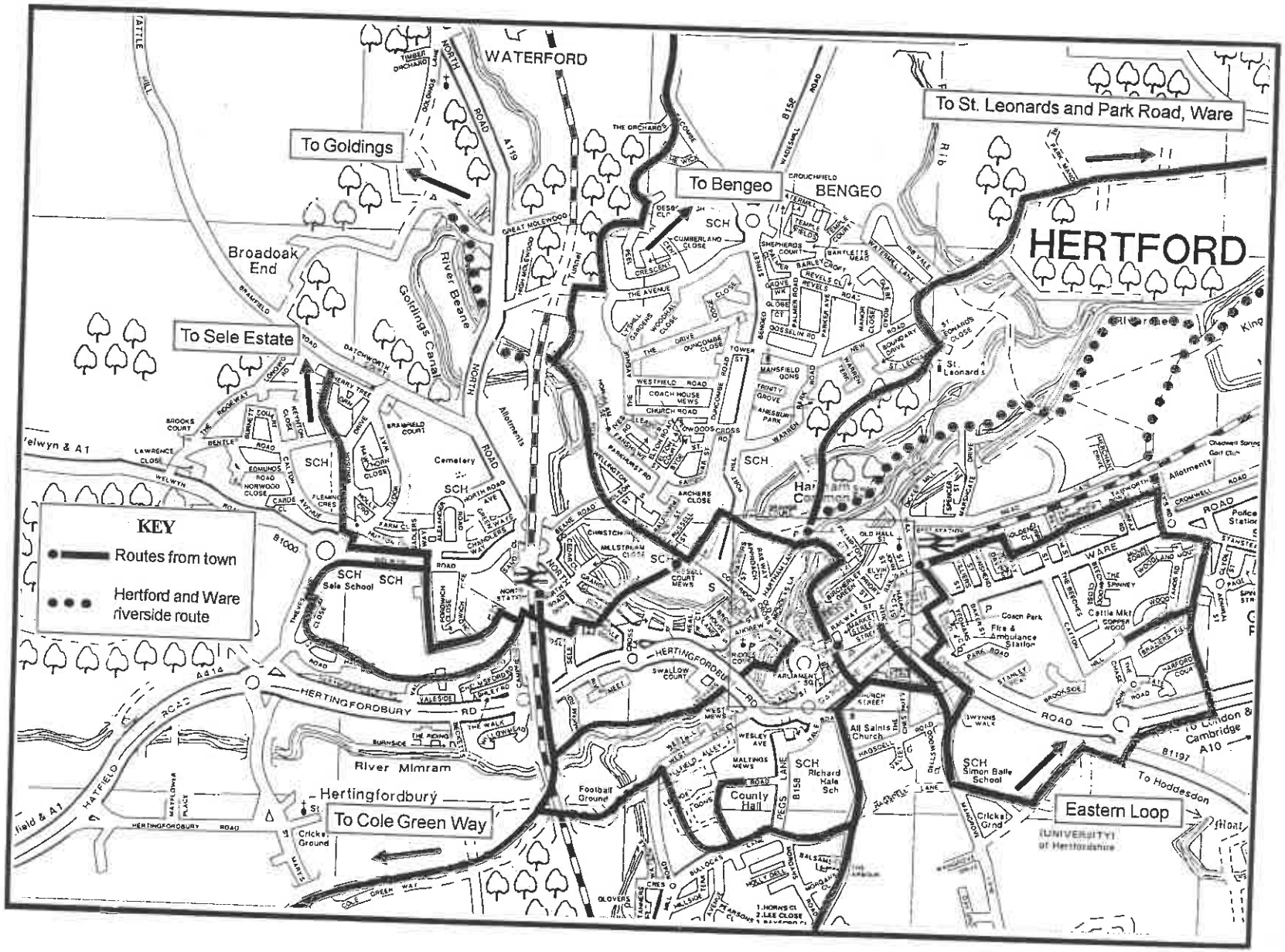
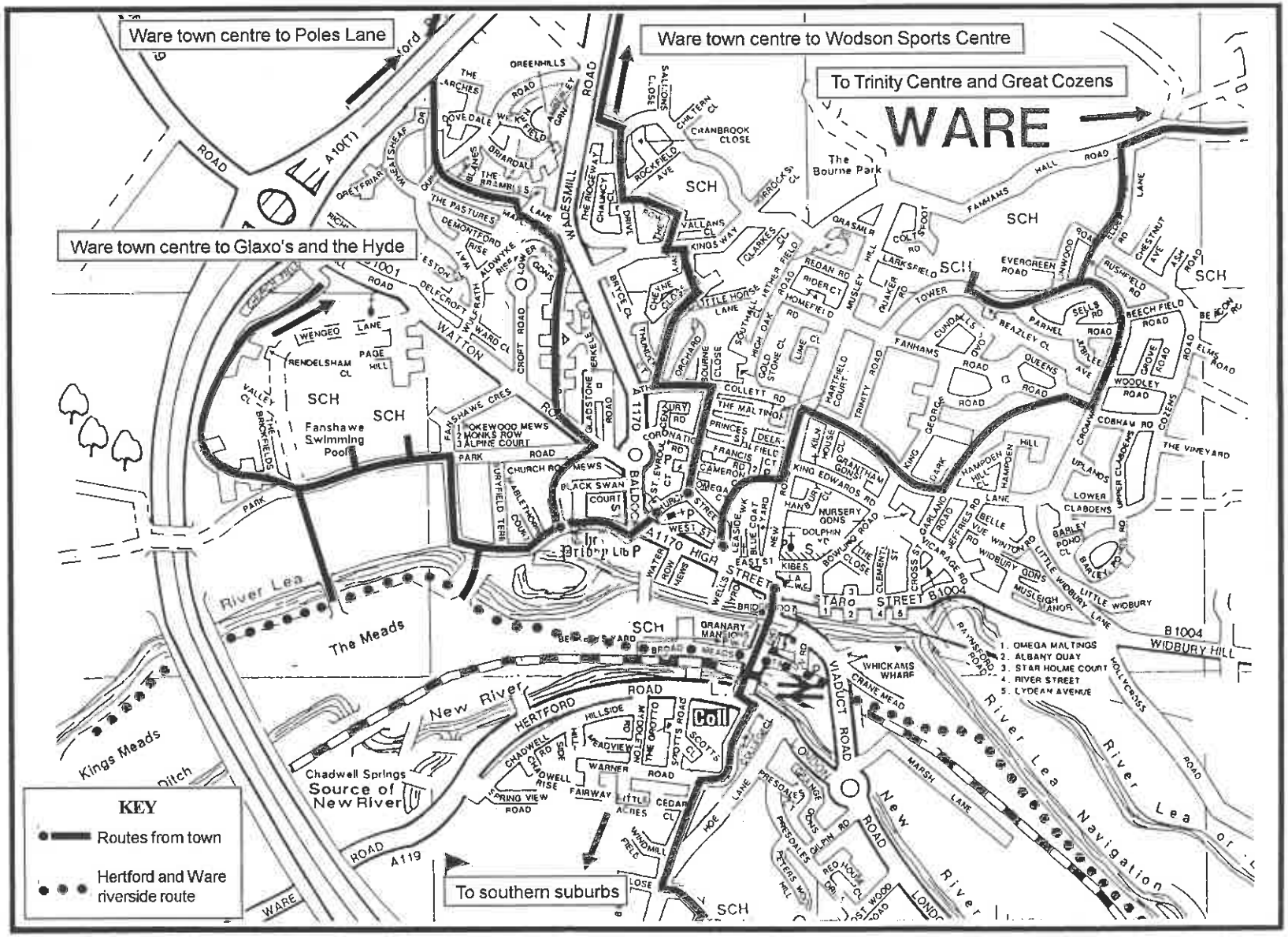


Fig 18: Proposed routes in Ware



approached with a view to linking up with improvements along the Lee Valley through the Lee Valley Park (where there are extensive cycle routes) and Waltham Abbey. The Council should initiate a programme to turn this into a Regional Route leading to the Thames.

At Hertford, the link should be made between Hertford North station and the Cole Green Way (the area's other level and traffic-free route) and this should be improved to the District Boundary. Negotiation should be put in hand with neighbouring authorities to extend the Cole Green Way towards the centre of Welwyn Garden City. Around the central spine routes afforded by the towpath route and the Cole Green Way, the other proposed routes described in this report should be added, as and when the opportunities arise.

Road schemes such as the A414 dualling at Cole Green, and the A10(T) Wadesmill Bypass should both make careful provision for cyclists.

The expansion of sports facilities at Wodson Park should include a cycle route back to the residential parts of town as an essential and integral part of their scheme.

All traffic calming measures and other road modifications resulting from other policies should all include priority measures to encourage cycling.

In these various ways the balance of transport provision should be gradually, but increasingly tilted towards encouraging cycling and discouraging motoring.

Fig 2 set out a possible programme of works. Whilst many details remain to be resolved, the spine cycle route at the centre of it all is ready to be implemented immediately.

8. Technical matters

For ease of reference, most practical construction details have been separated off into the various appendices. **Appendix 3** covers the towpath route and Cole Green Way from one side of East Hertfordshire to the other. **Appendix 4** covers a selection of routes through the towns which be developed given relatively minor investment in small works and changes to existing road layouts. **Appendix 9** has been specially written for this Study and covers design details of selected measures on roads such as advanced stop lines and raised pavement crossings, giving examples of other authorities which have used them. This appendix also gives a bibliography of publications concerned with engineering for cycling.

It is proper at this point in the main report to discuss some general matters of importance including -

- The establishment of a **cycle project team**.
- The walking and cycling partnership including **shared use** of selected paths and spaces.
- The place of **sculpture** and landscape design.
- **Maintenance matters**.

8.1 Cycle Project Team

Authorities with a positive cycle programme, for example Avon and Lothian, have cycling teams dedicated to this work. Ideally Hertfordshire County Council would have a cycling group of at least 3 officers who focused on cycling issues and ensured that all highway and transport schemes in the County included careful provision for the cyclist.

The County has produced an initial handbook of guidelines, but this is rather slight compared with those produced by other authorities such as Central Region in Scotland. At the very least, examples of the standard followed in the appendices of this report are required, together with the backing of a Council policy that they will be implemented.

Some input will also be required at the District level, particularly in the matter of ensuring that all development schemes have measures to extend the network of cycle routes, and proper cycle racks. District initiatives can also take the lead on routes away from the road, for example, the Lee towpath.

But at the centre, it is the Transport Policy Authority which must make the running, and for this a dedicated Cycle Project Team is required, with a brief and a budget!

8.2 Shared use of routes by walkers and cyclists

Walkers have as equally difficult a time as cyclists. **Fig 3** showed how they too find travelling more dangerous than in some European countries. They are faced with discontinuities at every road crossing, with pavements broken or blocked by illegal parking, by frustrating flights of steps, by endless statutory services excavations and by filth (particularly from dogs) in their way.

By combining resources for both classes of users, walkers can both assist, and benefit from, improvements for cyclists. It is not appropriate for cyclists to use the pavement beside roads in urban centres except in a few very particular circumstances. However paths well removed from traffic, such as the Lee Towpath, may often be quite suitable and there are many miles of satisfactory path elsewhere to confirm this.

For shared use, the path should normally be built up to a width of 2.5m with adequate verges. Vegetation which is crowded up on the edge of the path should be replanted further back

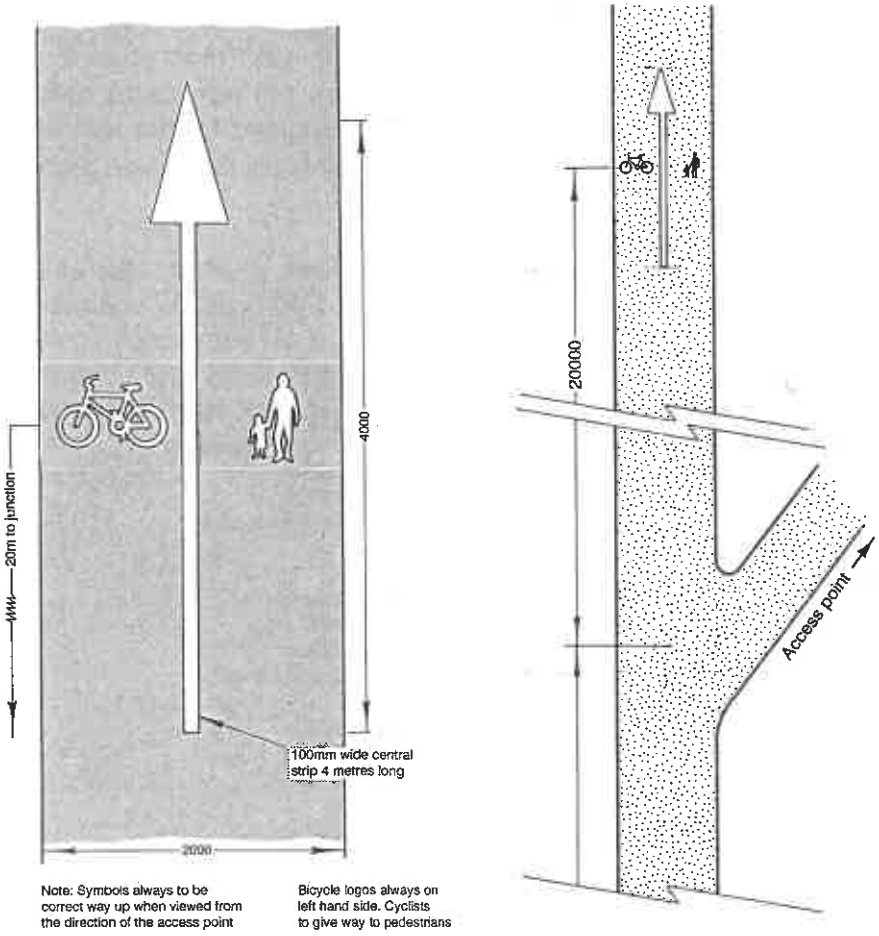
It is important, in all "shared-use" settings, that walkers and cyclists get on with each other. Both parties have a rough time on traffic-laden roads and, for all, the creation of space where motorised vehicles do not intrude is a blessed relief. If there is actual physical conflict between the two, it is always likely to be of a far less serious nature than that experienced by either of them in conflict with the car.

Where paths may be used by cyclists, we need to take into account not only the physical condition and the legal status but also width and possible conflict of interest with pedestrians on narrow paths. In general, the downhill speeds attained by cyclists on slopes of more than about 7% preclude shared use on hills.

On tarmac paths in urban areas it is crucial that both walkers and cyclists know that the path is for shared and equal use. This should be achieved by a combination of markers on the path surface, standard shared use signs on lighting columns, easily understood continuity, and widely available leaflets.

Signs on the path surface should be painted 10 metres either way from each entry point as shown in **Fig 19**. Over this distance a white dividing line will usually be required. Cyclists should be diverted to one side or another throughout the whole length of a section of path. Where possible they are best on the left (that is, the normal side) when going downhill (that is, when travelling faster). The standard DTp sign for shared use is shown and can be attached at frequent intervals to lighting columns. It is perhaps best to use too many to start with and then move most onto a fresh scheme once the first has become established.

Fig 19: Shared use path markings



Signposting is crucial to enable people to follow the route with ease. We recommend adopting the practical system used in Leicester with tape on existing street columns.

This could be augmented by the GR System used on National Walking routes in France which gives positive notice of turnings and junctions.

Leaflets should set out the whole of the proposed network as well as the pieces presently available, and should be designed so they can be updated regularly as the network expands.

At specific locations there will also be the need for direction signs to particular destinations and map based signs showing the whole network.

8.3 Sculpture and landscape design

Routes for cyclists (and walkers) should be made as attractive as possible. Their purpose, after all, is for enjoyment and to encourage the public to use them in preference to other modes.

Cyclists are used to travelling comparatively slowly. They can stop at will. They are exposed to the elements, both the sun and the rain. They can take notice of a detailed plaque describing the New River, or could take advantage of a shelter. Walkers particularly need seats at

frequent intervals. Both need the benefit of a varied landscape with a constantly changing view to give the journey more pleasure. In towns, avenue tree planting is a key device for "softening" the street and for securing the path from motor vehicles.
Milepost markers or sculpture can be an appropriate way to punctuate a longer route. Sustrans commissions markers as a matter of course on all its projects. They provide a target to reach, a place to linger at, and a means of interpreting the history or significance of that point. They will be particularly desirable along the long length of the Lee Valley towpath.

The signs and maps referred to earlier can be coordinated with sculpture and landscape and become objects of interest as well as information. Even street lighting, bollards and other mundane paraphernalia of paths and roads have been used as the starting point for imaginative work to create public places of greater interest and popularity.

8.4 Maintenance matters

Good paths need to be maintained in a good condition if they are to remain popular. Appropriate construction standards and appropriate maintenance regime are crucial to the success of these projects.

Paths adjacent to the highway, including cycle lanes, tend to accumulate all sorts of junk thrown to the side by cars and left lying in wait to puncture cycles. These areas must be carefully swept. They must be kept free of cars, particularly police cars, which in Bristol at least all too often use cycle lanes as convenient laybys. In new paths away from the highway the worst damage is often caused by the maintenance vehicles themselves - a Land Rover will quickly damage a stone waterbound path.

The public should be brought in and got involved, in what, after all is their space. Very often a part-time ranger can co-ordinate voluntary groups, schools and clubs. Sometimes a group will adopt a particular length of path. Individuals can dedicate memorial seats and so forth. It is a positive policy to seek the public's involvement in maintenance matters.

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Acknowledgements

Survey work for the preparation of this report was undertaken by Oliver Dixon and John Grimshaw of Sustrans. The report was written by Oliver Dixon and John Grimshaw, and edited by Janet Dixon. The maps were drawn by Rachel Toon and Andy Miles.

We are indebted for the unfailing help and support given to us throughout this project by:

Dr Malcolm Ramsay, Hertford Civic Society, for making it all possible, and the other members of the steering committee:
Elizabeth Townsend, East Herts District Council Planning Department
Mary Sapsford, Ware Town Council,
Rob Smith, Hertfordshire County Council Transportation Department
John Webber, Hertfordshire County Council Transportation Department
for their support, encouragement and technical input.
David Hope of the Hertfordshire County Council Planning and Environment Department for help with the recreational aspect.
David and Jill Atkins of the Ware Society, for a "home from home" in which our surveyor could rest his weary head!
John Hession, Sophie Bruton and Rob Parrish for putting the cyclist's point of view.
David Porter for researching cycling facilities in Welwyn Garden City and Hatfield.
And to many others for their help and advice on matters of detail.
If we have not endorsed their preferences, or drawn together proposals in ways which please all, this is entirely our responsibility.

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January 1994

DRAFT

HERTFORD & WARE CYCLING STUDY

APPENDICES 1, 2, 5, 6, 7, 8 & 10

Prepared for Hertford Civic Society, Hertfordshire County Council, East Hertfordshire District Council and Ware Town Council.

By Sustrans, 35 King Street, Bristol BS1 4DZ. January 1994.

Project Brief

1. **The impetus** for this study has come from the sense that there just cannot be any more traffic shoehorned into these towns, and that the current level of traffic is seriously damaging their fabric and degrading social and civic life in the towns. It is hoped that positive measures for encouraging walking and cycling can lead to a reduction of traffic, the creation of traffic-free areas and the possibility of a more attractive pair of towns to the benefit of local people, traders and visitors alike.

2. **The objective** of the study is to put forward a series of practical proposals for creating safe and attractive cycling routes in the towns and their immediate hinterland.

3. **The survey** will examine all opportunities for safe routes including the canal towpaths, riverbanks, disused railways, parks, public lands, bridleways and other open spaces. Routes through the two towns and links to each neighbouring town including Bishops Stortford and Stevenage should be devised if possible. Opportunities for leisure and tourist routes, for journeys to work and safe routes to school should be identified. As well as traffic free options, routes on minor roads and measures to make them acceptable and safe should be considered.

4. **Liaison with local groups.** Sustrans will contact as many local cycling groups as possible based upon the names to be provided by the commissioning partners. Where considered appropriate local knowledge and local proposals for cycle routes will be included in the report.

5. **Interaction with walkers.** The study will give great care to resolving any possible conflict with walkers by showing how shared use measures have operated elsewhere and by ensuring that the proposals extend the opportunities for walkers, not merely ask them to share with cyclists in places.

6. **The report** will assemble the findings of the survey, will put forward a series of practical opportunities, a possible programme of works suitable for completing by the year 2000 as a Millennium Scheme for the area, and will cost the works giving possible sources of funding and an estimate of the benefits of the route.

7. **Management of the project.** Sustrans will report to the coordinating committee as and when required. At this stage it is envisaged that an interim report will be made on Thursday 30th September, meeting in Hertford. The draft of the final report will be issued by the end of the year and Sustrans will then make a presentation to local councillors if required.

The meeting on 30th September will consist of a site meeting during the morning - possibly along the towpath of the River Lee Navigation - which will be open to councillors and others if required. Details of works to a Lee Valley route will be ready by September 30th so that the Councils can take an early decision for commencing works in the year 94/95 if they wish.

Sustrans *9.7.93.*

THE VALUE OF CYCLING : Why promote the use of the bicycle?

Sustrans is a national charity which designs and builds traffic-free routes for cyclists, walkers and people with disabilities. These routes are multi-purpose, used for leisure, touring, sport and safe commuting. We have already built over 250 miles of such routes and are working to produce a national network of trunk cycleways linked to important secondary routes and networks.

Interest in non-motorised travel is increasing rapidly, partly as a response to growing traffic problems, partly out of a renewed interest in personal health and fitness. For several years annual sales of cycles have been considerably above those for private cars, and cycle ownership in Britain is now 15 million (1).

As might be expected, Sustrans fully endorses the view that cycling is worthy of promotion. Many readers of this report may well be unconvinced, so it is worthwhile to rehearse various aspects of the value of cycling.

Sustainable Transport

Current discussion about transport policies takes place against the background of Government traffic forecasts issued in 1989 (predicting up to 142% increase in road traffic by 2025) at the same time as the White Paper announcing a doubling of spending on the roads programme (2).

These twin announcements were widely criticised as a step away from the trend towards sustainable forms of transport, which most organisations agreed were vitally necessary if traffic growth was not to inflict serious environmental damage and lessen the overall quality of life in Britain (3).

There is particular concern about some of the toxic pollutants emitted by motor vehicles such as carbon monoxide, nitrogen oxides and hydrocarbons. Not only harmful in themselves, under certain circumstances elements of these gases can combine to form acid rain and ground level ozone, which can severely affect natural habitats. Perhaps of even more concern is the increasing agreement that these pollutants damage health and cause respiratory difficulties. The considerable increase in asthma in Britain in recent years is probably mostly due to vehicular pollution. Although these pollutants can be reduced by catalytic converters, calculations have shown that such measures will be nullified by the effects of rising traffic levels (4).

Additionally, catalysts have no effect on emissions of carbon dioxide, the main global warming gas. The average car emits 4 tonnes of carbon dioxide a year, and rising traffic levels make attainment of the Government target, of stabilising carbon dioxide emissions at 1990 levels by the year 2000, look almost impossible.

Increased motorisation brings a series of other problems - noise, waste of resources, landscape degradation, land loss to quarrying and danger to other road users. Despite overall improvements in reducing road

deaths and injuries, non-motorised users remain particularly vulnerable. Even with a rather conservative valuation system, the economic cost of road casualties in Britain is reckoned to be about £6.3 billion per annum [5].

Types of trip

There is a huge potential to convert journeys from the private car to other modes. 75% of all journeys in Britain are 5 miles or less. Half of personal trips are 2 miles or under [6]. Creating the right environment should encourage large numbers of non-motorised trips, and Sustrans' experience bears this out. Our first disused railway line conversion between Bristol and Bath is now used for well over one million journeys annually.

The ultimate potential for cycle use has been researched by Waldman in 1977 and Earth Resources Research in 1991 [7]. The former calculated that in the safest, most attractive circumstances 43% of U.K. journeys to work could be by cycle. The latter updated the study and arrived at a figure of 47%, with 30% being the average readily possible for many urban areas. Interestingly 31% of trips to work in Copenhagen are by bicycle, and the Dutch city of Groningen has a cycling modal share of over 50%.

Urban cycling

There is by now considerable experience of successful provision for urban cycling. Basel (Switzerland) and Graz (Austria) both doubled cycle use over a five year period. The German 'Cycle-Friendly Towns' experiment offers detailed evidence of ways to increase cycle use [8]. At home some of the most determined efforts to increase cycling are in Leicester, Oxford, York and Scotland's Central and Lothian regions.

A concensus has by now emerged that cycle facilities by themselves are but part of the solution. Pro-cycling policies should be accompanied by area-wide traffic calming, traffic management measures, reduced levels of car-parking, and priority for public transport.

These radical measures, always controversial at their inception, have met with remarkable success in continental cities. In Groningen, for example, a planned programme to replace urban motorways, car parks and through traffic with cycle and bus lanes, pedestrian streets and greenery has led to economic resurgence, booming rents and a halt to population outflow. The very businesses which stridently opposed these measures, claiming that if the cars went, so would their customers, now clamour for further traffic restraint [9].

From the cyclists' viewpoint dedicated routes on and off the highway should be backed by special crossing facilities at main roads, cycle parking and improved links with public transport. Particular efforts can

be made to tackle journeys to work, shops, offices and places of education.

Schools should be a special focus of attention. In 1971 80% of 7 & 8 year old children walked or cycled to school without supervision: by 1990 the figure was 9% [10]. Motorised traffic on 'escort trips' is now a recognised source of early morning congestion.

For whatever purpose, cycle trips in urban areas reduce noise, pollution and congestion. Cycling is a highly efficient use of road space, and very cost-effective in parking terms. Non-motorised modes 'return streets to the people' and make urban living more attractive. They improve the personal horizons of those without cars, and offer a real alternative to car use for short journeys, thereby making sustainable planning more feasible.

The common public perception of a hostile street environment is fed in part by the removal of many of the 'ordinary' citizens into cars, reducing the calming and comforting effects of populated streets and casual surveillance. A major success of the continental urban improvement projects referred to above has been the improved sense of individual security in urban streets.

Rural cycling

However, whilst there is a broad agreement about the benefits of urban cycling and best practice in planning this, rural cycling has been comparatively neglected, together with detailed discussion on traffic problems.

Yet rural areas face higher than average forecasts of traffic growth. The seminal study here is the Countryside Commission's 1992 report 'Trends in Transport and the Countryside', which revealed that average traffic levels could treble over little more than 30 years. The results would be acute congestion at popular locations, a spread of noise, danger and intrusion, and a growing urbanisation and fragmentation of rural areas.

Sustrans believes that it is time to consider a new role for non-motorised modes in rural areas, linked - as in towns - with a broad package of other measures to halt the growth in car traffic. Elements of a new programme should include:

- Safe cycle and pedestrian routes to schools, shops and major tourist attractions.
- Rural traffic-calming measures.
- Particular attention given to safe routes linking urban and rural areas.
- Creating non-motorised routes to areas of ecological and landscape importance

- Widespread use of 'Park and Ride' and 'Park and Cycle' sites in vulnerable areas.

- Carefully designed cycle access to public transport net works, with safe approaches and good cycle parking.

- The creation of rural networks of cycle/pedestrian routes, using quiet roads, upgraded bridlepaths, derelict land, and land recently taken out of agricultural or military use.

- The creation of a national network of cycle routes similar to those implemented for Denmark and The Netherlands and proposed for Spain and France [11].

Additionally, all organisations concerned with rural affairs should re-evaluate the role of staff and visitor movement in the creation of traffic problems, and consider new approaches as a way of solving these.

Health and Receation

Both urban and rural cycling are tied up with a new-found interest in health and recreation. This was given considerable official sanction in the BMA's recent publication 'Cycling: Towards Health and Safety'.

This report not only discusses official policy towards cycling, but is an essential source book on a wide range of topics associated with its benefits. These are considered under four main headings:

- Increased fitness
- Lower risk of heart attack
- Losing excess weight
- Lessening stress

This study quotes a report which concluded that occasional cyclists enjoy a fitness level 5 years younger than the average, and regular cyclists a level 10 years younger.

It is the fitness benefits of cycling which commend it so strongly to organisations in the field of public health. Programmes for exercise and for reducing heart attacks are the two main target areas in the Department of Health's 'Health and the Nation' programme. The Health Education Authority has stated that it would like to see cycling double over the next 5 years [12].

Such interest is given sharper focus by findings highlighting the general unfitness of the population. The Allied Dunbar National Fitness Survey discovered that 70% of men and 80% of women were below their appropriate levels of fitness. Other surveys have underlined the general lack of physical fitness of school children who no longer walk or cycle to school.

To counteract such concerns many organisations, such as the Sports Council, have placed greater stress on recreation and 'informal' rather than competitive sport [13]. This is where the accessibility of cycling scores heavily. 90% of men and two-thirds of women can cycle, and

many view it as a 'normal' mode of transport and recreation.

It is these inter-related benefits of improved health and public popularity which causes some experts to rate cycling so highly. The Director of the National Fitness Survey, in a personal capacity, has concluded that: 'Cycling presents the greatest possiblities of any activity for realizing the goal of recruiting significant percentages of our sedentary population to physical activity' [14].

The value of cycling

Cycling can thus be seen to have considerable benefits in terms of:

- Improved health
- Accessibility and popularity
- An environment-friendly mode

Moreover it has further benefits in terms of income generation, job creation, and value for money.

Detailed research on the value of cycle tourism and recreation is so far lacking. British Tourist Authority figures for 1991 suggested that cycling as a 'main activity' might be worth £77 million annually, but this excludes a broad range of other activity. In Denmark, where provision for cyclists is immeasurably better, cycle-tourists in one area studied were found to spend more, per capita, than motorists [11]. In any event, the economic benefit of cycle touring is well disseminated across an area, rather than focussed on the honeypots: cycle tourists support village shops and pubs, small hotels and B & B's.

The Countryside Commission analysed the types of recreational cycling and divided this into aspects such as casual cycling, day touring, cycle hire, mountain biking, sport and fullscale cycle holidays [15]. It concluded that the potential for all these activities was either medium or high. Sustrans has calculated that annual usage of its proposed Dover-Inverness route might be 20 million [16].

Sustrans has also concluded that the 1,000 miles of this projected National route might be constructed for £20 million. By contrast, the same figure is estimated to be the cost of one mile of the projected M25 widening project.

Thus, building a national network of similar high-grade routes would be excellent value for money and would stimulate both tourism and immediate job creation. Cycle path construction is local, labour intensive work, and creates over twice as many jobs per pound as roadbuilding.

Conclusion

Cycling increasingly fits in with official policies on sustainable transport, public health , recreation and 'quiet enjoyment'. Increased levels of both urban and rural cycling are not only realistic, they are useful measures to be deployed in the fight to contain traffic growth.

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Traffic problems in Hertford and Ware

Main roads

Lying within close range of Greater London, economic activity within the area and the transport links are dominated by the capital. One of the principal elements of the road network is the A10 which was the original main road from London to Cambridge, Ely and King's Lynn. Although it has been supplanted in this role by the construction of the M11 motorway, whilst other northbound traffic tends to follow the A1 and A1(M), the A10 still carries very high volumes of the traffic. Much of the road is dual carriageway including the bypass to the west of Ware.

The other main element in the road network is the A414. This road parallels the M25 and for some traffic serves as a relief road to the M25. It connects Chelmsford and Harlow and the towns of southern Hertfordshire to the M1 and the western limb of the M25.

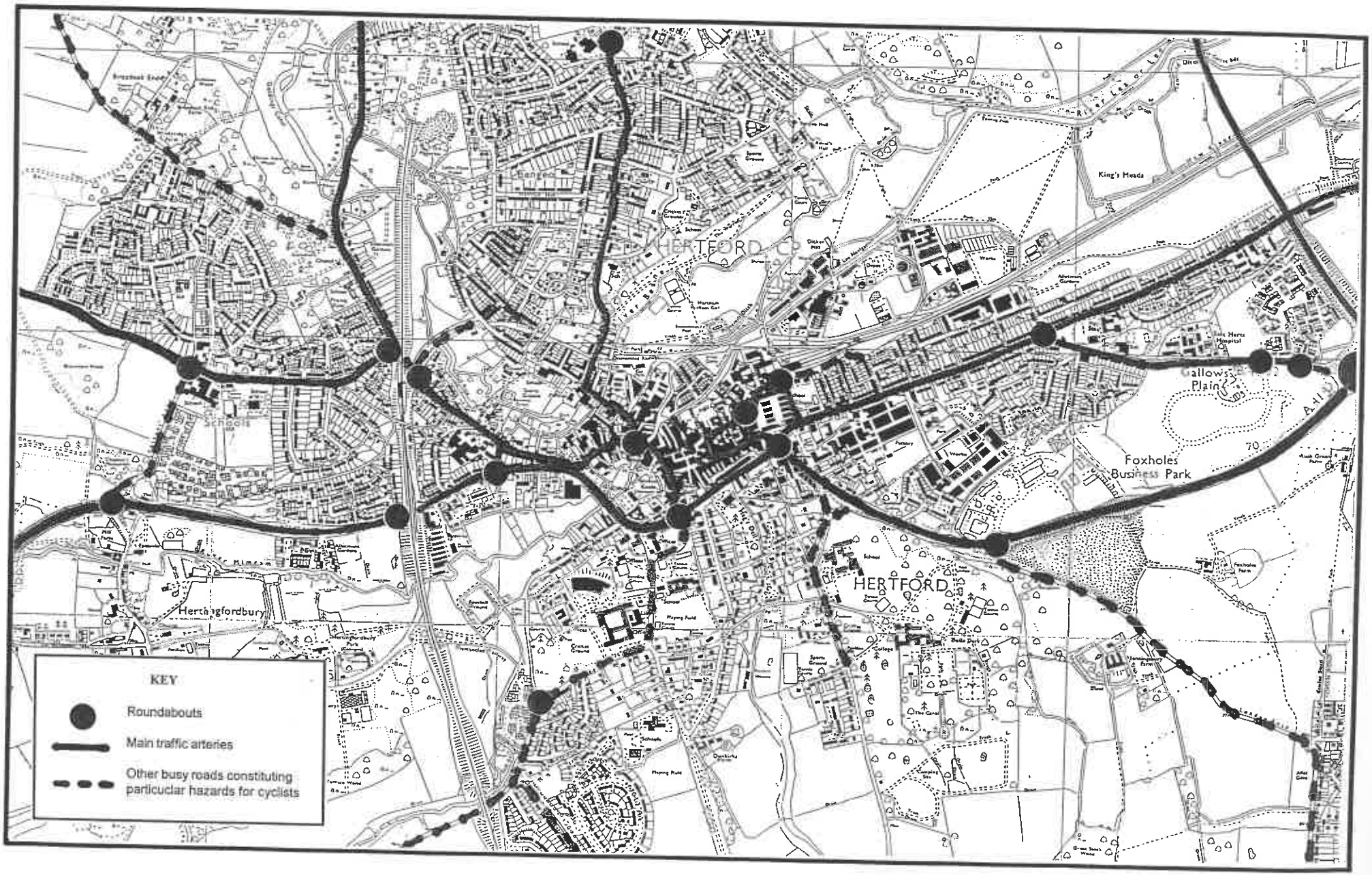
There are a number of other classified roads in the area which have principally a local function connecting the various towns with each other. The A602 has a wider significance as a primary route connecting the A10 at the Ware bypass with the A1 at Stevenage.

In the last two decades, the traffic problem has been addressed principally by the construction of new arteries - the A1(M) and M11 and further afield, the M25 - and new bypasses - the A10 round Hoddesdon and Ware, the A414 round Stanstead Abbotts and eastern Hertford and close to Hertford town centre. Further work is in hand on the construction of the Cole Green bypass on the A414, and the Wadesmill, High Cross and Colliers End Bypass, on the A10. With the completion of these two projects, both the main traffic arteries of the area will be dual-carriageway throughout.

This road-building and road-improvement programme has not, however, brought any lasting solution to the traffic problems of the area. The construction of new roads and bypasses may bring relief to old High streets, village centres and residential areas, but this relief is often short-lived. With the expansion of economic activity, traffic levels rapidly expand to fill the new road capacity. Commuting by car over longer and longer distances becomes feasible - although hardly pleasant - and there is a drift of population away from the older urban areas of Greater London to the more attractive environment of the new towns and commuter villages. Such a population is imbued with the car 'culture' and apart from commuting, generates disproportionate amounts of local traffic. In an attempt to avoid the delays caused by the congestion on the new roads, traffic is often tempted or even forced back on to the old urban and village roads.

Rail transport

As an alternative to road travel, the rail network offers an attractive option which has much less environmental impact. Hertford is served by two commuter railway lines - one from Moorgate to Hertford North and on to Stevenage, the other from Liverpool Street up the Lee Valley


HERTFORD
HERTFORD
Foxholes Business Park
Gallows Plain
King's Heads
A414
KEY
Roundabouts
Main traffic arteries
Other busy roads constituting particuclar hazards for cyclists

Appendix 5

to terminate at Hertford East. Whilst the road expansion programme has continued apace, however, the rail network has suffered from a long history of under-funding and decline.

Traffic problems in Hertford

The traffic problem is exacerbated within Hertford and Ware by the nature of the old street pattern. This contrasts with the opportunities for traffic planning from first principles provided in the neighbouring new and greatly-expanded towns.

The centre of Hertford stands on the plain of the River Lea which is criss-crossed by several waterways, mill-races and back-waters. There has been limited growth of the town along the Ware Road to the east, and along the valleys of the Mimram and the Beane.

For the most part, however, the suburban growth of Hertford has been up the slopes of the valleys and along the spurs between the valleys. Access to these suburbs is necessarily by steep hills, which are sometimes also main roads.

There are some long-established industries in the town centre and a number of industrial estates in various quarters of the town. As the historic county town, the biggest employer, however, is the county council, and there are offices at County Hall and at Goldings on the outskirts of the town off the Stevenage Road.

The main roads

The pattern of traffic movement in Hertford is dominated by the A414. It is nearly all dual-carriageway, except for a short section under the railway bridge. The central section, Gascoyne Way, was constructed in 1965-6.

Passing very close to the town centre, it serves the dual function of acting as a bypass for through traffic, and as an inner relief road for traffic within the town which just needs to circumvent the town centre. It effectively severs the town into a northern and southern half, with a number of important establishments lying to the south. All motor traffic between the northern and southern halves of the town must pass through one of three roundabouts.

The suburbs of Hertford mostly lie on the valley slopes and spurs, and are mostly reached by steep busy main roads. Communication between the different suburbs usually involves dropping down to the central valley, thereby imposing further pressure on the A414.

The town centre experimental traffic scheme

An experimental traffic management scheme is presently in operation within the town centre. Whereas it would be premature to judge the

success of this experiment, or to anticipate what final solution may be adopted, this scheme is effective in eliminating all through traffic from the town centre, which is all channelled onto Gascoyne Way. One unsatisfactory feature of the experimental scheme is that it permits west-east traffic along the west end of Fore Street - ostensibly to relieve traffic on Gascoyne Way, the road which was designed to relieve the traffic on Fore Street!

The Frank Graham report

Frank Graham Traffic Consultants of Reading were responsible for devising the experimental town centre traffic management scheme and have recently submitted a report on traffic management within the whole of Hertford. The report considers a number of options, including a cycling option which seeks to maximise cycling within the town by provision of safe cycle routes. The effect of this and other options were subject to computer modelling to determine the final recommended option which includes elements from several of the options.

The report attaches considerable importance to cycling as an alternative mode of transport, which can go some way to reducing the traffic problems in the town.

A summary of the main recommendations of the report and a critique fo the cycle/pedestrian routes proposed appear in Appendix 6.
Hazards to cyclists and pedestrians

The sheer volume of traffic along the main roads of the town and the absence of safe and suitable alternative routes pose serious problems for cyclists and pedestrians alike. In particular, they cross the A414, which passes very close to the town centre, at their peril.

Throughout Hertford, many roundabouts have been installed which are well-known as hazardous for cyclists.

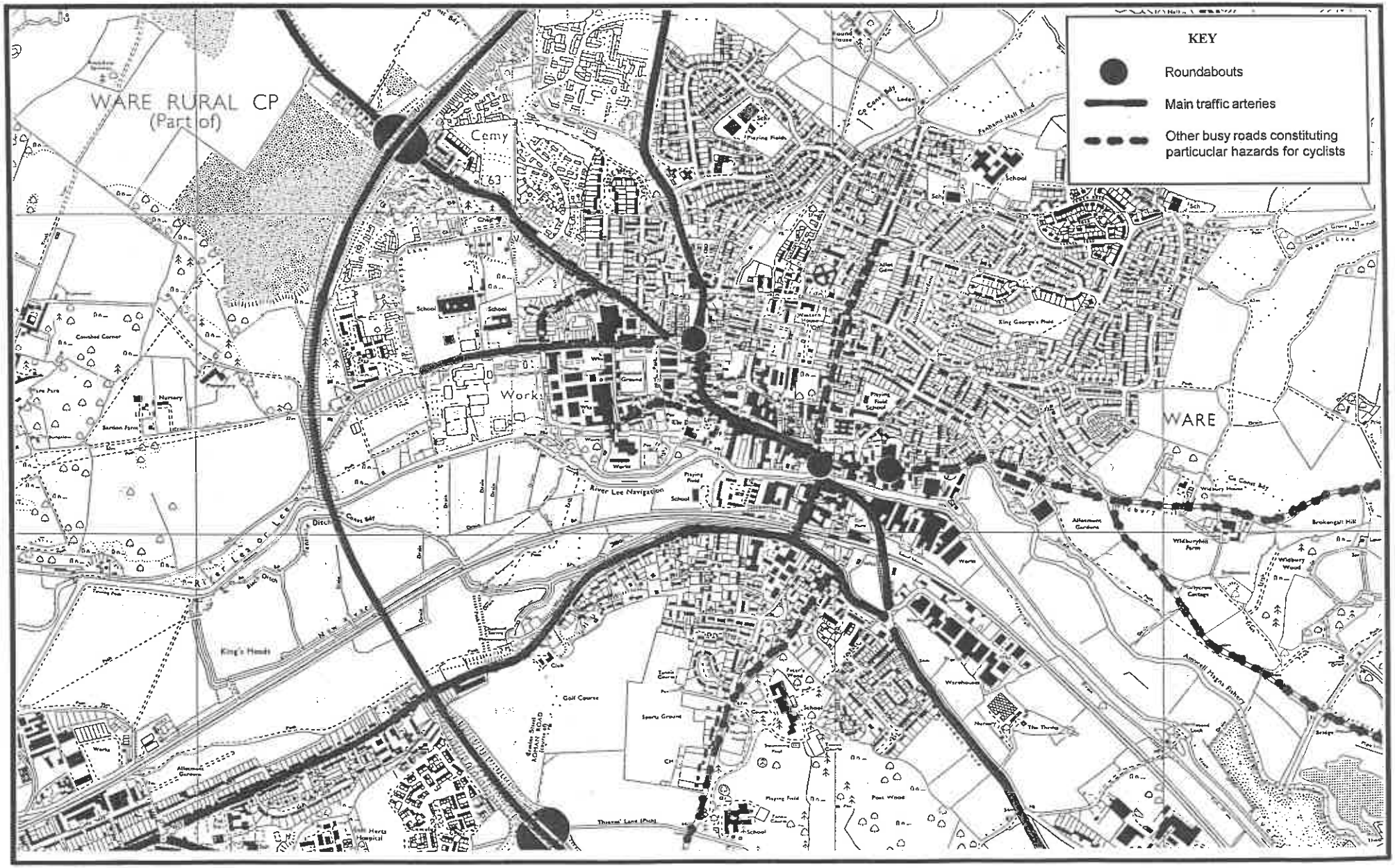
Traffic problems in Ware

By comparison, Ware is a slightly smaller town and is of more compact form. Again the town centre occupies the floor of the Lea valley. The residential areas lie mostly on the northern slopes, which is only dissected by one minor valley.

Employment is dominated by Glaxo's which occupies the western quarter of the town and has some 2,700 employees between two constituent companies. Access to the Glaxo site is difficult, by three narrow roads off Watton Road / Baldock Street with no through way out to the west. Other employers include smaller industrial estates in the lower part of the valley floor.

The main roads

Unlike Hertford, Ware is spared the worst of the through traffic. The A10 is carried on a viaduct over the Lea valley well to the west of the


KEY
Roundabouts
Main traffic arteries
Other busy roads constituting particuclar hazards for cyclists
WARE RURAL CP
(Part of)
WARE
River Lee Navigation
River Lee or Lea
Cemy
Works
Golf Course
Sports Ground
King's Meads
Amwell Nature Reserve

Appendix 5

town, and the A414 keeps to the south. Within the urban area, the main roads radiate from the town centre up some steep hills, although not all of these carry through traffic.

High Street

The High Street is narrow and carries all traffic from the residential parts of town and from Glaxo's which is bound for the sole bridge of the River Lea. Because of the circuitous nature of connecting roads, much of the traffic between the western and eastern parts of the upper town also passes along the High Street.

The Colquhoun Report

A report on traffic management in Ware has recently been published by Colquhoun Traffic Consultants. From various options suggested and subjected to computer modelling, the consultants recommended the construction of an inner relief road to take traffic round the High Street from the roundabout to Ware Bridge. This proposal was vigorously contested by local authority and residents, and has been rejected by the Planning authority, although the line of the proposed road has been reserved for possible future use. The line of the road is largely council-owned, and a proposal has been put forward to build a cycle route along the line. The western end of such a route would, however, terminate at Charvill's roundabout with no apparent safe route onward.

Glaxo's Proposals

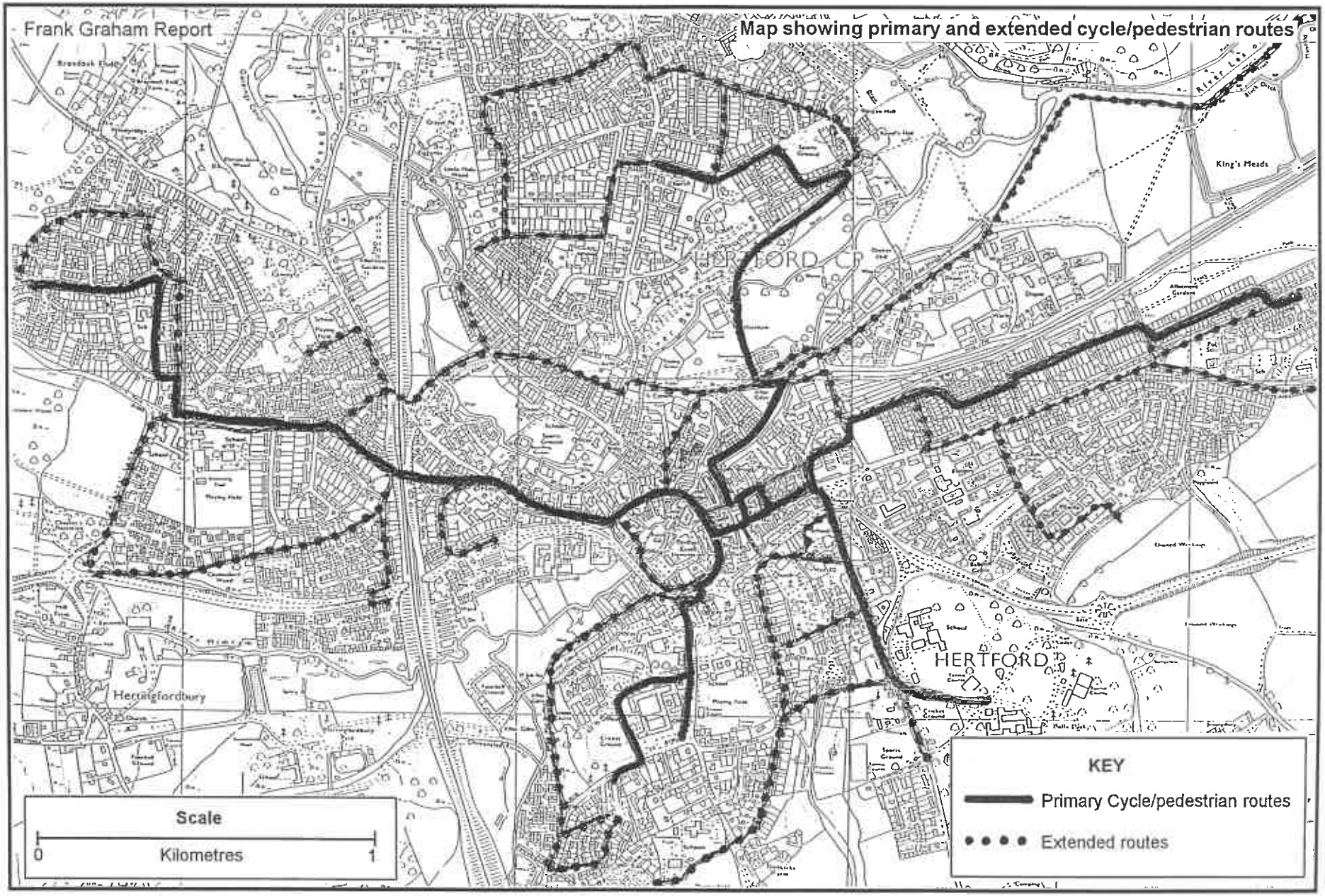
To relieve traffic problems in the roads leading to Glaxo's, approval has recently been given to plans which include the construction of a roundabout at the Watton Road/Park Road junction, realignment and widening of Park Road, and traffic calming at the southern end of Fanshawe Crescent.

Wadesmill, High Cross and Colliers End Bypass

Construction of this bypass, scheduled for possible completion in 1996, will include reconstruction of the interchange between the A1170 and the A10. Plans make provision for turns from the town via Wadesmill Road onto the southbound carriageway of the A10 and vice versa. Such turns are not possible with the present alignment. The new arrangement should serve to take some of the traffic away from the Watton Road interchange and Charvill's Roundabout.

Hazards to cyclists and pedestrians

The volume of traffic along the main roads of the town and the absence of safe, suitable alternatives pose serious problems for cyclists and pedestrians alike.


Frank Graham Report
Map showing primary and extended cycle/pedestrian routes
HERTFORD CP
HERTFORD
Hertingfordbury
King's Meads
Scale
0
Kilometres
1
KEY
Primary Cycle/pedestrian routes
Extended routes

Appendix 6

The Frank Graham Report

The text of the Frank Graham Report on Traffic in Hertford is now available. Although some more work remains to be done before the report is finally accepted, the general recommendations can be identified.

Road construction proposals include:

A) Construction of a southern bypass in the long term, to take traffic aways from the present course of the A414 through the town.

B) Opening up of a link road between Rowleys Road and Mead Lane along the line of the present pedestrian level crossing over the railway.

Unlike the Colquhoun Report for Ware, the Frank Graham report gives serious consideration to the need for improving facilities for cycling and stresses the advantages of pursuing the cycling option. The report identifies the development of a cycle/pedestrian route network in two stages:

1) A 1st phase of 5 primary routes radiating from the town centre.
2) An extended network.

Whilst this constitutes a commendable effort to switch travel to cycling and walking mode, the specific proposals for cycling have a number of practical shortcomings:

a) Where the initial network runs along roads, as for example along North Road and St Andrew Street, the report rather naively suggest that *"whilst not traffic calmed, these streets could be designated as cycle routes and white paint used to indicate safe areas of cycling. This would immediately provide for an alternative mode"*.

In practice, not many cyclists would be reassured of the protection from traffic provided by nothing more substantial than a white line. A more serious limitation is that no provision is suggested for the safe passage of cyclists at major road crossings and roundabouts. Without real initiatiatives in the way of traffic calming and/or reduction of traffic volume, a scheme based on such flimsy investment is likely to be rapidly discredited.

b) No details are given of the nature of traffic calming proposed. Some traffic calming is much more cycle-friendly than others.

c) The routes mentioned are described as being for cycle / pedestrian use, but no attention is given to the possible problems and conflicts that might arise from shared use. Such conflicts may arise:

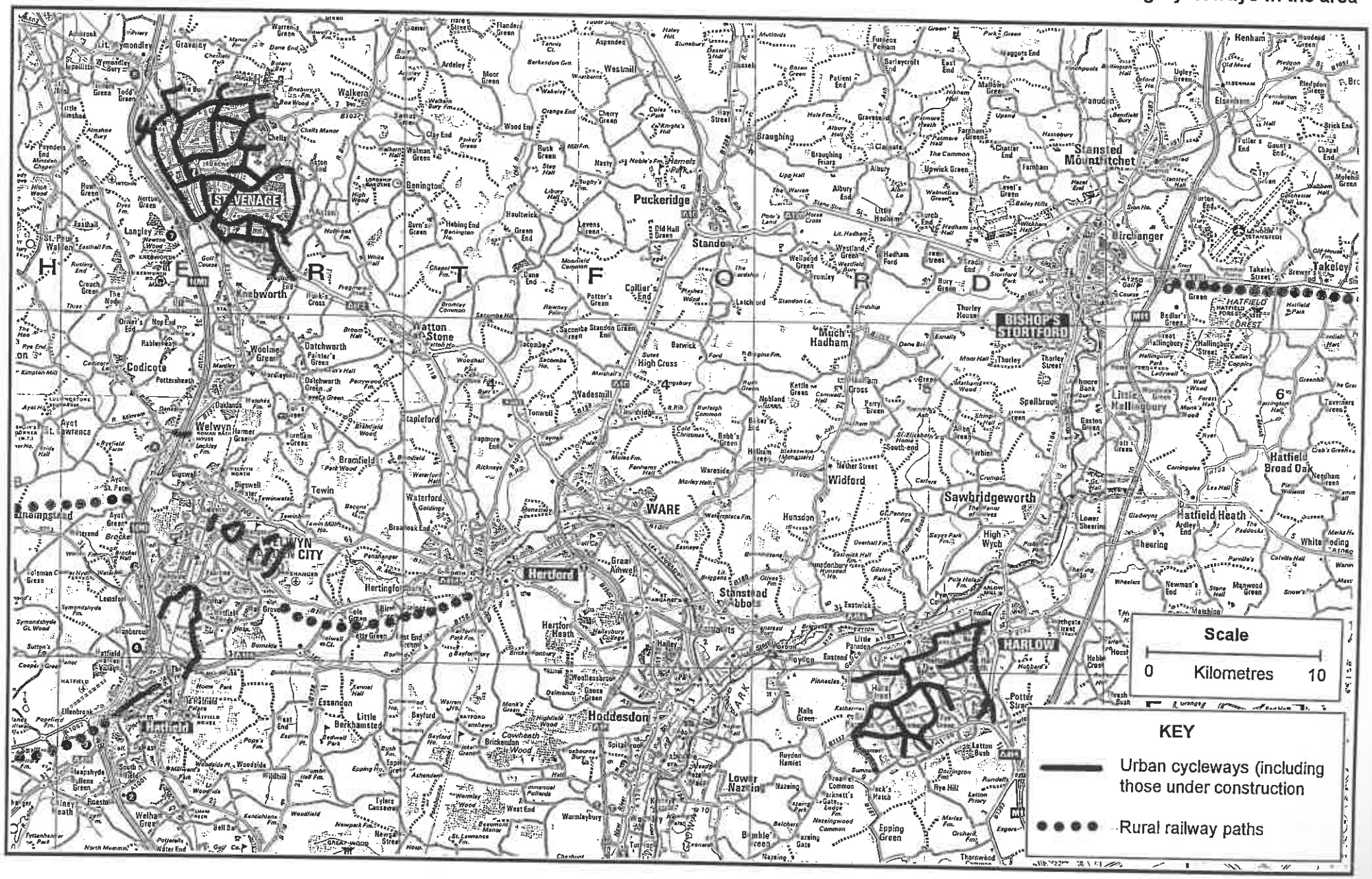
i) At the subways.
ii) Where paths are too narrow for cycling (as along the Castle Bridges).
iii) Where paths are too steep for shared use (as along the up per part of Rooke's Alley).
iv) Where pedestrian flows are too heavy.

d) The route to Bengeo is too circuitous to attract much use. We have also found no adequate answer to the problem of a safe route to the centre of Bengeo.

e) No account has been taken of the opportunities provided by new building plans and re-development.

f) The most obvious and easily-implemented cycle route of all -the towpath to Ware is only accorded low priority.

Existing Cycleways in the area



Appendix 7

Existing and potential facilities for cycling

Developing the cycling option obviously requires suitable roads, tracks or paths, and this section considers the existing network of rights of way and other tracks and paths in the area, with particular attention to the needs of cyclists. Within Hertford and Ware there are a limited number of measures which, whilst not specifically intended as such, incidentally make life easier for cyclists, by way of grade-separated crossings, traffic calming and other traffic management measures. There are also a number of potential opportunities for developing cycleways segregated from motor traffic.

Purpose-built cycleways

Stevenage is world-famous for the network of cycleways which form an integral part of the fabric of the town. Harlow, likewise, has a well-developed cycleway system. In both towns, however, there has also been a very substantial investment in a high-grade road network. As a result, motoring is too easy and trouble-free and the cycleway network as a result is greatly under-utlised.

Hertford and Ware, being of older foundation, and limited by local topography, do not have the privilege of a purpose-built cycleway network such as those enjoyed by new towns. It is much more difficult to identify opportunities for continuous lengths of off-road cycleways.

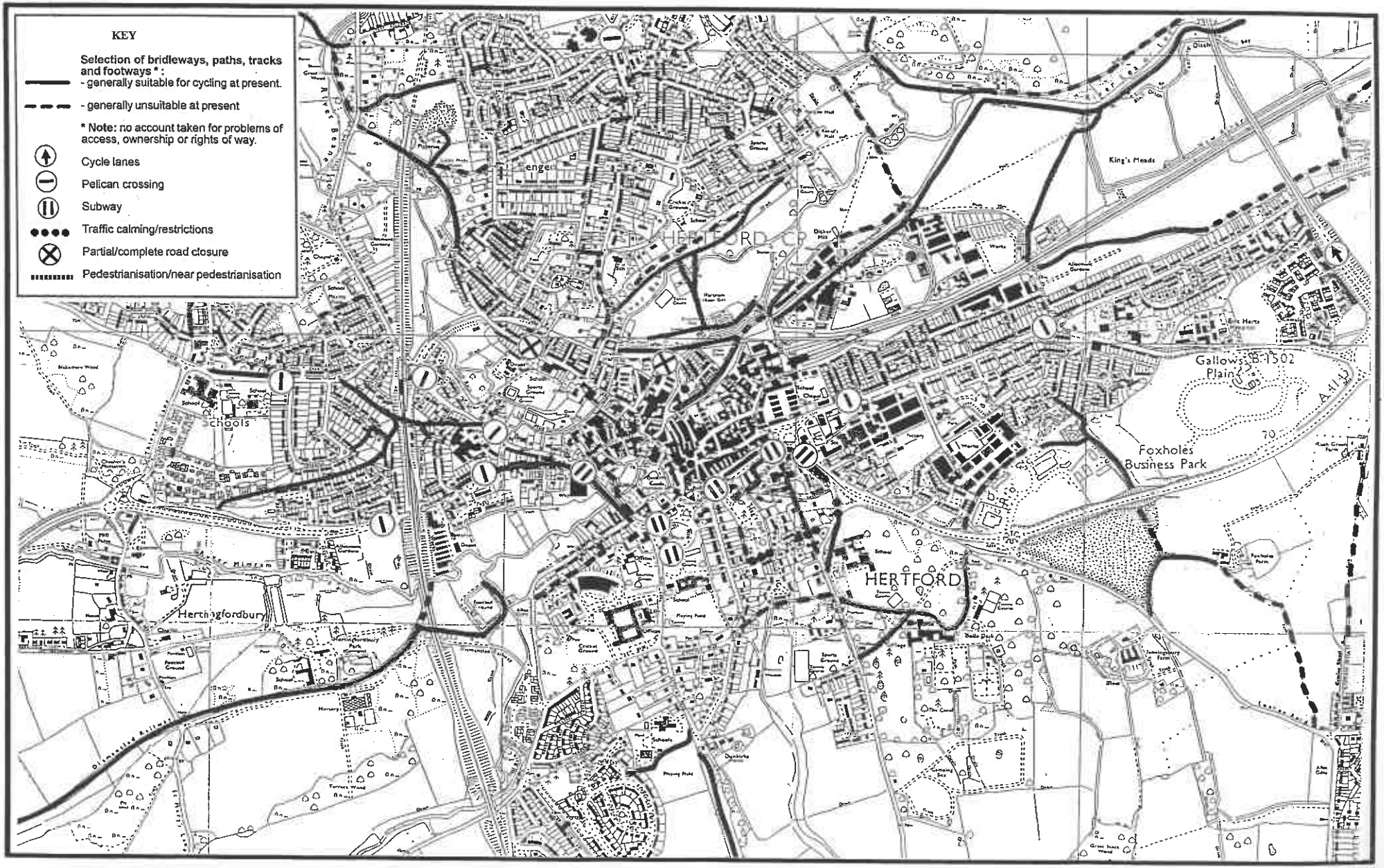
Public roads

In the past, cyclists have traditionally kept to public roads. As traffic volumes have increased, even cyclists with conventional 'sports' bikes have tended to consider using the better quality tracks and paths, whilst on busy roads, cyclists now habitually use the footways even if it involves bumping over kerbs. The enormous popularity of the 'All-terrain' or 'Mountain' bike in the last five years has greatly extended tthe range of tracks which cyclists are prepared to use.

In considering the existing network of public roads, we must take into account the attractiveness and safety for cyclists. The idea of cyclists using the main carriageway on all the 'A' and 'B' roads can immediately be dismissed as unsuitable by virtue of the volume of traffic and high speeds. To considerations of safety must be added objections on the grounds of traffic noise and fumes which combine to make cycling along classified roads a thoroughly unpleasant experience.

Further dangers to cyclists are posed by intersections, including those controlled by traffic lights, and especially by roundabouts. Cyclists are particularly at risk from traffic turning into or across their path, and when turning right across the line of traffic.

Currently, very little provision has been made for cyclists on existing classified roads in the area. Token cycle lanes where cyclists are separated from the main carriageway by nothing more substantial than a


KEY
Selection of bridleways, paths, tracks and footways * :
- generally suitable for cycling at present.
- generally unsuitable at present
* Note: no account taken for problems of access, ownership or rights of way.
Cycle lanes
Pelican crossing
Subway
Traffic calming/restrictions
Partial/complete road closure
Pedestrianisation/near pedestrianisation
HERTFORD CP
King's Meads
Gallows Plain
B1502
A414
Foxholes Business Park
HERTFORD
Hertingfordbury

Appendix 7

white line are found at the interchanges on the A10, together with 'cut-throughs' which ensure that cyclists cross the slip roads onto the main road at a right angle. Although this limited provision may be better than nothing for those cyclists brave or even foolhardy enough to ride the A10, finite resources would certainly be better applied elsewhere. On most unclassified roads in built-up areas, traffic flows and traffic speeds are lower than on classified roads. Nevertheless many urban streets are dangerous for cyclists; to the other elements already mentioned should be added the dangers posed by indiscriminately parked cars and jay-walking pedestrians.

On rural routes with generally faster-moving traffic, flows in excess of 1,000 motor vehicles a day are inconsistent with safe cycling.

Tracks and paths

The network of public roads is complemented by tracks and paths which are often used by and useful to cyclists. It is important to make the distinction between the physical state and the legal status of these 'off-road' components.

The type of surface encountered may range from tarmac or concrete to informal paths and tracks with little or no foundations which run alongside or across open fields.

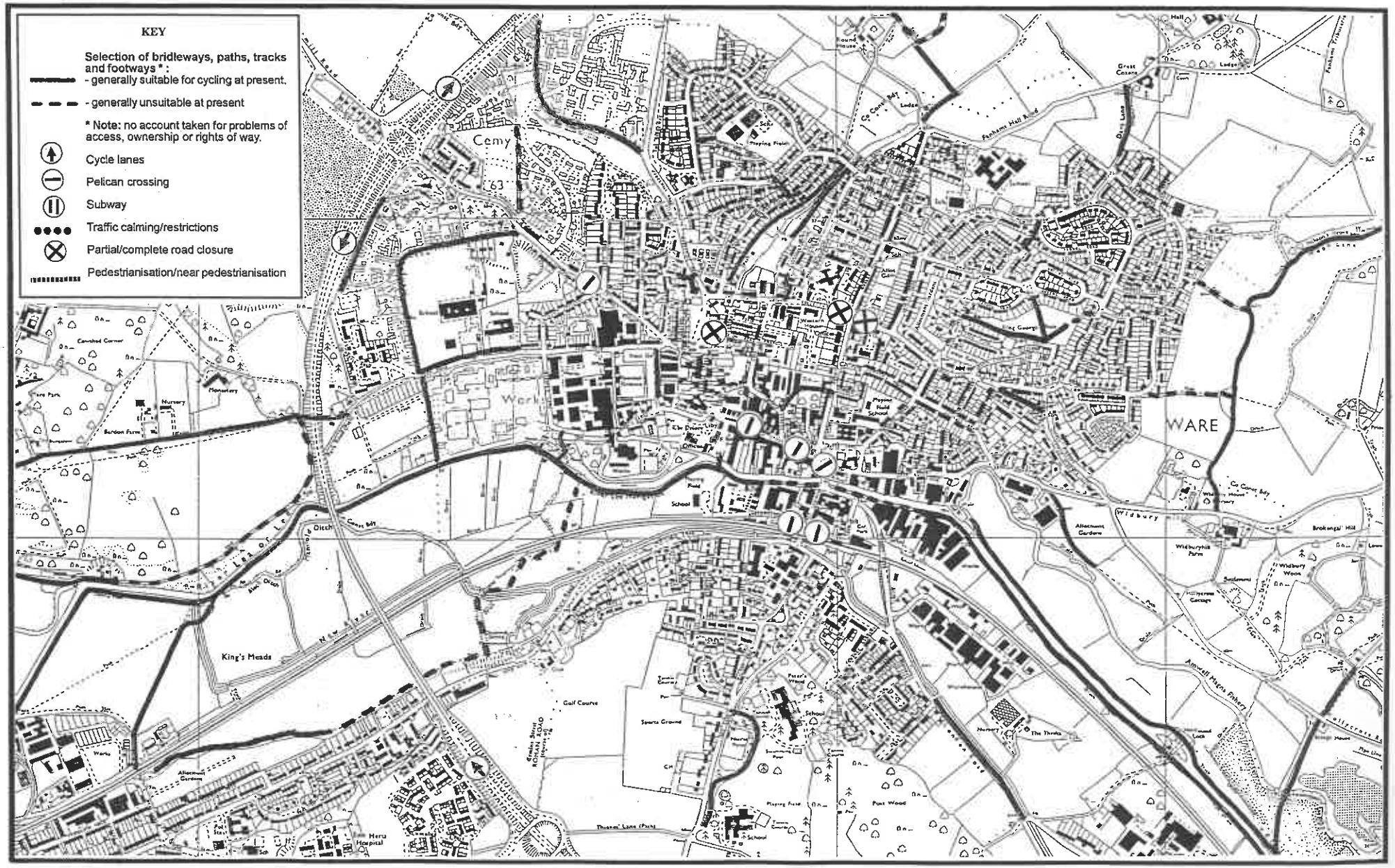
In addition to the state of the surface, we must also take into account the width of the way. A track less than 2 metres wide would normally be described as a 'path'; and where there is heavy pedestrian use, as within urban areas, there is a potential conflict of interest between cyclists and walkers.

There may be obstacles along tracks and paths, such as stiles which may be legally erected along public footpaths and illegal obstructions such as locked gates and barbed wire fences which act as a strong deterrent to cyclists.

There is an extensive network of farm roads with a good gravel surface in the area and in a number of cases, these form useful links for cyclists between sections of public road, or to avoid busy sections of main road.

The existence of an established way with a firm, well-drained surface confers no legal right for use by cyclists. Apart from public motor roads, there are three categories of right of way which can be legally used by cyclists:

1. 'Byways open to all traffic' on which all traffic, including motor traffic is permitted. In practice, the physical condition of most BOATs ensures that they are unlikely to be used by motor traffic.
2. Bridleways on which cyclists, horse-riders and pedestrians have equal rights.
3. 'Roads used as public paths' is an obsolescent category of right


KEY
Selection of bridleways, paths, tracks and footways * :
- generally suitable for cycling at present.
- generally unsuitable at present
* Note: no account taken for problems of access, ownership or rights of way.
Cycle lanes
Pelican crossing
Subway
Traffic calming/restrictions
Partial/complete road closure
Pedestrianisation/near pedestrianisation
WARE
Cemy
Work
King's Meads
Golf Course
Sports Ground
Hertford Hospital

Appendix 7

of way - mostly they are ancient roads in very poor physical state. Cyclists, horse-riders and pedestrians have equal rights to use RUPPs. There is an ongoing process of reclassifying RUPPs - in practice they are nearly all reclassified as either BOATs or bridleways.

Towpaths

Until recently, cycling on British Waterways towpaths was only permitted upon purchase of a permit, although this requirement was largely ignored by cyclists in practice. The policy of British Waterways towards cycling on towpaths is now under review, and the permit system has been suspended, pending a final statement. It is believed that a general permission to cycle on towpaths will be granted, subject to cyclists behaving responsibly. Local management will have the authority to prohibit cycling on those towpaths where there is serious concern about safety.

Lee Valley Regional Park

The Lee Valley Regional Park contains a large number of attractive paths, often made up to a good standard, and cycling on these paths has recently been increasing rapidly. The main path in the Park, however, is the River Lea towing path which is the responsibility of British Waterways. The Park Authority is keen to encourage cycling, although strictly speaking the policy on cycling is under review.

Urban Paths

Much of the above discussion on paths applies with some variations to urban areas with which this study is principally concerned.

There are a number of cases where old rights of way - whether byway, bridleway or footpath - have not been incorporated within the modern street pattern. Instead, they have been left as 'greenways' - traffic-free routes for pedestrians and cyclists. Examples include Dark Lane and Poles Lane in Ware, and Thieves Lane (part) and Rooke's Alley in Hertford.

The street pattern of inter-war housing often included short lengths of footpaths connecting neighbouring streets, although these are usually too narrow for cycling.

Post-war years have seen the growth of the cul-de-sac as a device to provide quiet, relatively traffic-free, residential areas, with motor access from a peripheral or spine road through the estate. In many cases, the street plan allowed for 'path heads' through from one cul-de-sac to another to provide short cuts for cyclists and walkers between one part of the estate and another and between adjacent estates. Although there are no extensive estates of this pattern within Hertford and Ware, there are a number of isolated examples of useful path-heads in the newer parts of the towns. It is standard practice to install barriers at each end of such paths which restrain cyclists from riding straight out

into what may be a busy road, and which prevent the passage of motor bikes.

It is noticeable that within urban areas, there is an almost automatic reaction to slap a "no cycling" notice onto footpaths. Sometimes, where the path is narrow (less than 2 metres wide) or carries very heavy pedestrian traffic, such a prohibition may be desirable; but there are many more places where this is not so, and where the cyclist is faced with the unenviable choice of cycling on paths (prohibited) or on roads (dangerous). It is pertinent to note that not all such "no cycling" notices do in fact carry the force of law, having been erected in response to representations by local residents without going through the procedure of raising the necessary "orders".

Footways and verges

At one time, the law prohibiting cycling on footways was rigorously enforced. Now, however, there are many cases where a wide footway is habitually used by cyclists seeking to escape the hazards of the adjacent busy road.

Where the paved footway itself is not of adequate width, there is often space on the adjoining verge to enlarge the footway. Within Hertford and Ware, opportunities for use of the footway are limited, but do include the south side of Hertingfordbury Road from West Street to the railway bridge and the north side of Welwyn Road at the top of the hill, where there is a broad verge.

Out in the country, there are some examples of main roads which support generous footways which - if they were ever used -certainly carry minimal pedestrian traffic today, but which could make useful cycle tracks.

Grade-separated crossings

An important element in any provision of cycle paths is segregation from motor traffic where main roads have to be crossed - known as grade-separated crossings in engineering parlance. This can be achieved by subways or bridges. The width of these is important if their use is to be shared between pedestrians and cyclists. According to the level of pedestrian traffic, 2.5 metres or more may be required before shared use is safe. The subways under Gascoyne Way (A414) in Hertford are an important resource in this respect but, completely inadequate with widths ranging from 2.2m to 2.6m.Of even more concern is the approaches to the subways. These may be by steep ramps and may include sharp turns. Particularly undesirable are the right angled turns from most of the ramps into the Gascoyne Way subways. The poor visibility not only creates a risk of collision, but also turns the subway tunnels into 'blind spots' which may be the scene of vandalism and crime. An evaluation of the Gascoyne Way subways appears in Appendix 8.

At-grade crossings

Where a grade-separated crossing is not possible - and they are very costly - there are various devices for making an at-grade crossing safer. The commonest of these is the 'Pelican' crossing controlled by pedestrian (and cyclist!) operated lights, and there are a number of such crossings in Hertford and also in Ware. The old-fashioned 'Zebra' crossing in which pedestrians have priority but have to establish this priority by launching out on to the crossing in the face of oncoming motor traffic is largely discredited nowadays, although an example survives in Baldock Street, Ware.

Other devices for making crossings safer include central traffic islands (including, possibly, a 'cattle pen' protected by railings). An example of pavement widening (and conversely, road narrowing) at a crossing point can be seen in Hertford where Rooke's Alley crosses Hagsdell Road, and at the bottom of Mangrove Road.

Pedestrian streets

In streets which are fully pedestrianized, or where motor traffic is so discouraged that they are virtually fully pedestrianized, cyclists are usually permitted to ride, although the high level of pedestrian traffic may make this unduly hazardous. This is the case, for example, in Maidenhead Street, Hertford and East Street, Ware.

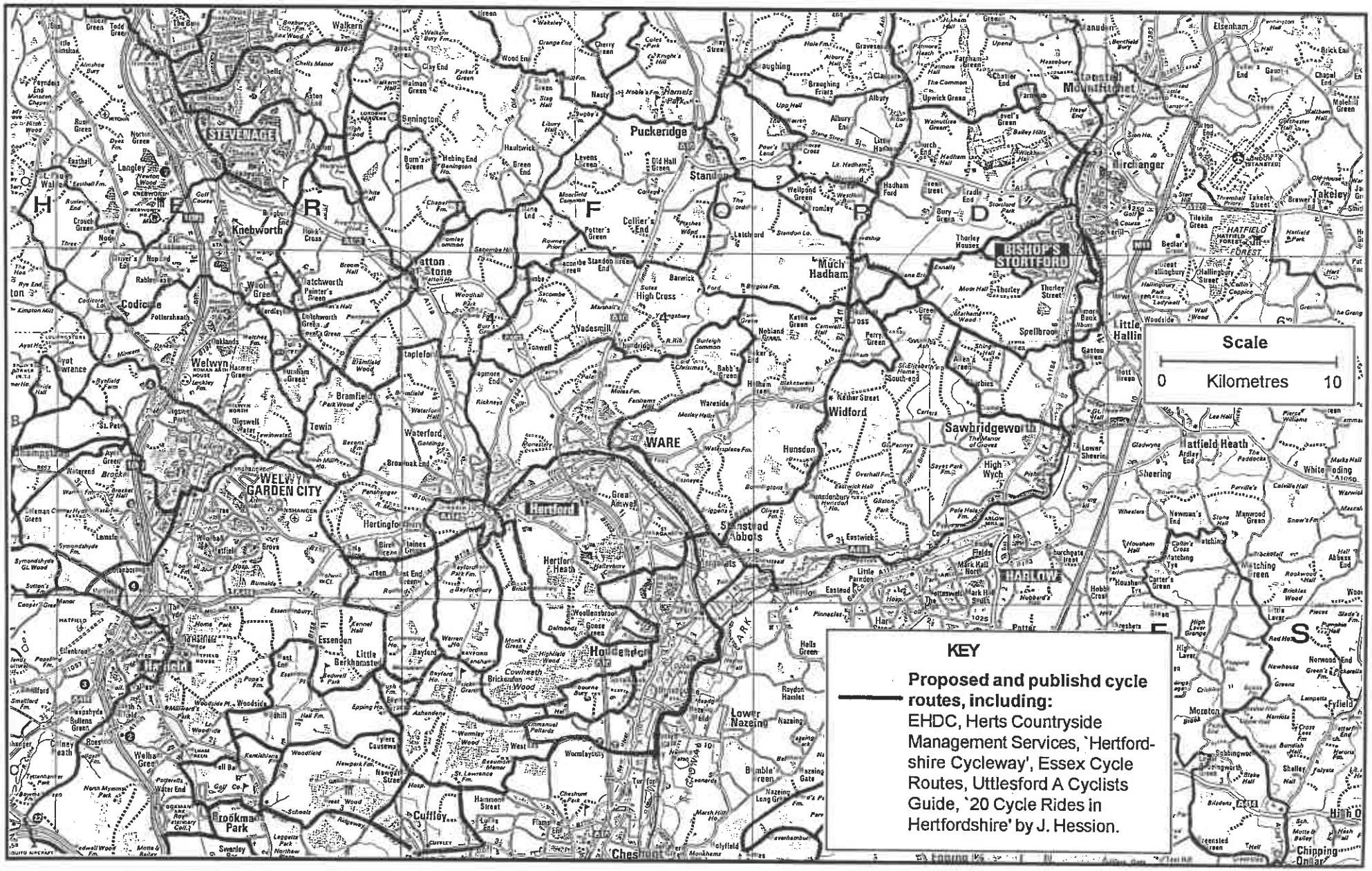
Traffic management devices

Cyclists are exempt from some traffic management orders - such as the restrictions on the west end of Fore Street, Hertford. In other cases, however, such as the prohibited right turn from Bridge Foot into Amwell End, Ware, cyclists often perform what is an illegal and highly dangerous manoeuvre to avoid long diversions or even greater dangers elsewhere. Road closures of Musley Lane, Collett Road and Coronation Road in Ware reduce the amount of motor traffic in those streets to the benefit of cyclists.

Potential for recreational cycling

Hertford & Ware lie on the fringe of Greater London and beyond them to the north is open countryside with a maze of minor roads and quiet lanes. As a consequence this area is popular with cyclists and a number of guides and recommended route descriptions have been published. These are summarised in **Fig 4**. Although parts of many of these routes are excellent, all suffer from lack of continuity in that they inevitably have to make use of major roads at various stages of their journey. This makes them unsuitable to all but the most experience cyclists.

Fig 4. **Published and proposed recreational cycling routes**



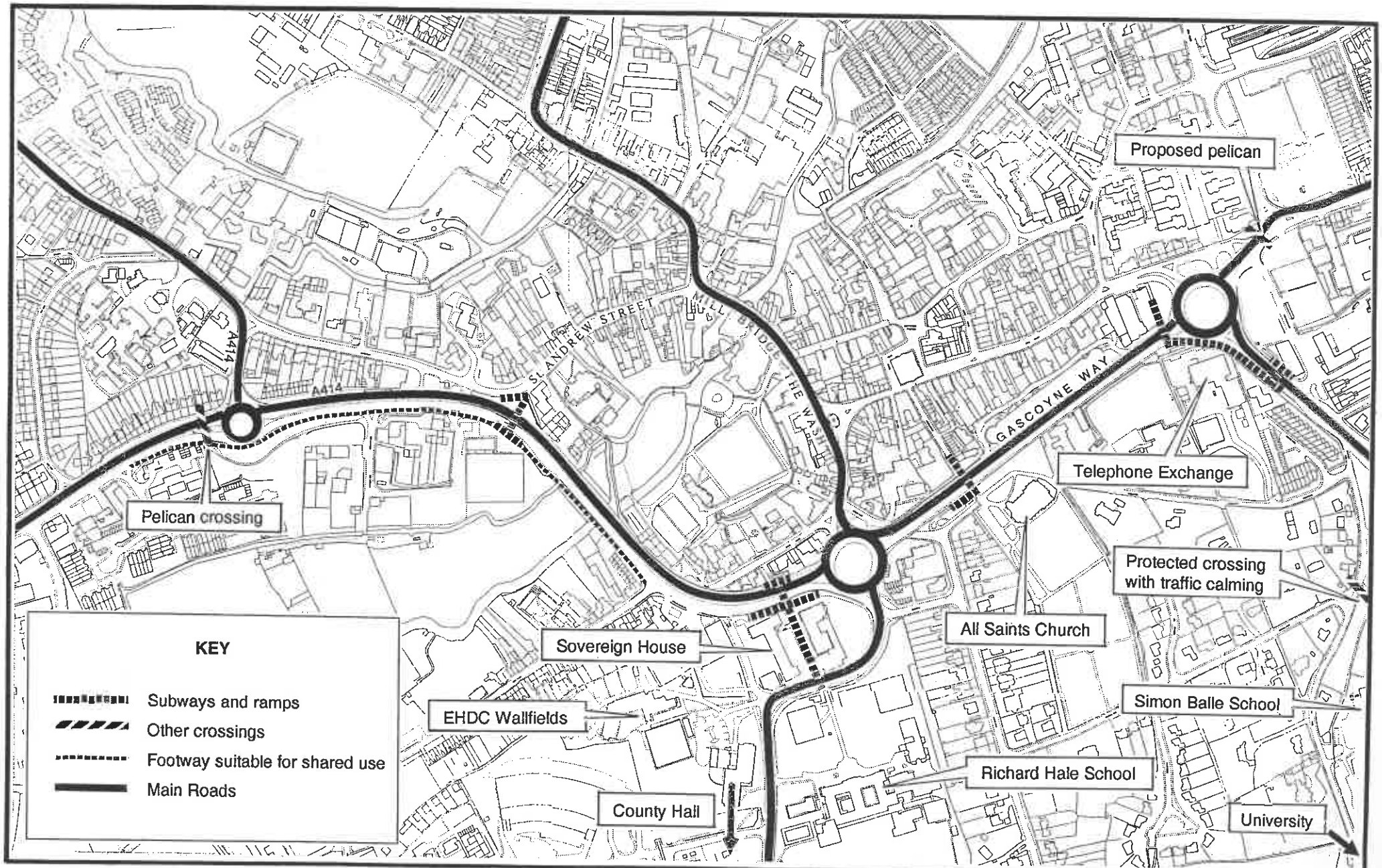
Railway Paths

Some of the most attractive of all cycle routes are provided by old railway lines. Running as they normally do between centres of population and with very gentle gradients, old railways on which a suitable surface has been laid can prove enormously popular with walkers and cyclists. Where the bridges over and under roads are retained, such routes also provide segregation from motor traffic. There are a number of disused railways in the region which have already been adopted as rural 'greenways' - in general open to walkers, cyclists and horse-riders with the status of bridleway.

There is a fine example within our area of study - the old cross-country line that ran from Hertford North via Welwyn Garden City and Harpenden to Hemel Hempstead. This line has been restored to greenway status over three separate sections.

The Cole Green Way is the nearest to Hertford and runs for 4 kms from Hertford Football Ground to a point on the A414 1.5 kms south-west of Cole Green. There is one point where passage under a road bridge is blocked, and there is only limited easy access to the way from the road network. At present, usage of the Cole Green Way is largely restricted to recreational use. Plans are in hand to extend the Cole Green Way westwards for 1.5 kms to the edge of Welwyn Garden City and this would then open up considerable potential for utility cyclists travelling between Hertford and Welwyn Garden City. Within Welwyn Garden, there is further scope for extending the route as far as Tewin Road.

Further west, the line is continued as the Ayot Greenway and the Nicky Line Footpath and Cycle Path.


Proposed pelican
Telephone Exchange
Protected crossing with traffic calming
All Saints Church
Simon Balle School
Richard Hale School
University
Sovereign House
EHDC Wallfields
County Hall
Pelican crossing
A414
A414
ST ANDREW STREET
MILL BRIDGE
THE WAL
GASCOYNE WAY
KEY
Subways and ramps
Other crossings
Footway suitable for shared use
Main Roads

Appendix 8

Gascoyne Way and Hertingfordbury Road

The pattern of traffic movement in Hertford is dominated by the A414. It is nearly all dual-carriageway, except for a short section under the railway bridge. The central section, Gascoyne Way, was constructed in 1965-6.

Passing very close to the town centre, it serves the dual function of acting as a bypass for through traffic, and as an inner relief road for traffic within the town which just needs to circumvent the town centre. It effectively severs the town into a northern and southern half, with All Saints Church, County Hall, the EHDC offices at Wallfields, the courts and other offices at Sovereign House, Simon Balle and Richard Hale Schools and the University all lying to the south.

All traffic from the north heading for the southern half of the town must pass through one of the roundabouts at either end of Gascoyne Way. All traffic from the south heading for the north has a choice of three roundabouts - including the Cross Lane roundabout on Hertingfordbury Road.

Very few cyclists travel along the central section of the A414. There is little need for them to do so, as the streets of the town centre enable them to bypass Gascoyne Way between the Cross Lane roundabout and Ware Road. There is, however, a wide footway along the southern side, suitable for shared use between the railway bridge and West Street.

Cyclists and pedestrians cross the A414 at their peril. There are altogether five subways built under the A414 as it passes through Hertford, but the width and design of these subways leaves a lot to be desired. There are also two Pelican crossings - just west of the Cross Lane and Campfield Road roundabouts.

Subways

With the exception of the Fore Street subway, all subways are 2.2m wide which is theoretically wide enough for shared use by cyclists and pedestrians, but all suffer from poor access and visibility.

Because Gascoyne Way is not elevated above surrounding ground level, all the subways are accessed by a ramp or ramps on either side, and some additionally by steps. Most of the ramps join the subway tunnel at a right angle, and no subway has ramps on either side aligned with the tunnel to give a clear run through. Schematic diagrams of all the subways are shown.

Originally, all the subway ramps had cycling prohibition notices on them, although many are now missing. Whether officially sanctioned or not, it is certain that, except possibly at the busiest times, cyclists will continue to ride through them. The main risk is that of collision at the right angled bends at the foot of the ramps, and it is recommended that barriers are erected at the bottom of the ramps to ensure that cyclists take these corners wide.

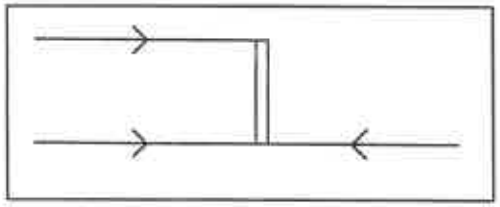
Some of the ramps have 180 degree bends on them which are too tight to be readily negotiated by cycle.

The poor visibility and narrow tunnels on all the subways mean that the subways may be perceived as unsafe from the point of view of personal security at night and other quiet times.

St Andrews Street subway

Traffic through this subway is relatively light. At the northern end, the western end of St Andrew's Street is at the very edge of the central business district.

On the southern side, a broad footway with light foot traffic gives access to the industrial premises of Warehams Lane and Mimram Road and to the residential estate of Riversmeet. Much of this ***footway*** is physically separated from the carriageway and is suitable for ***shared use***.

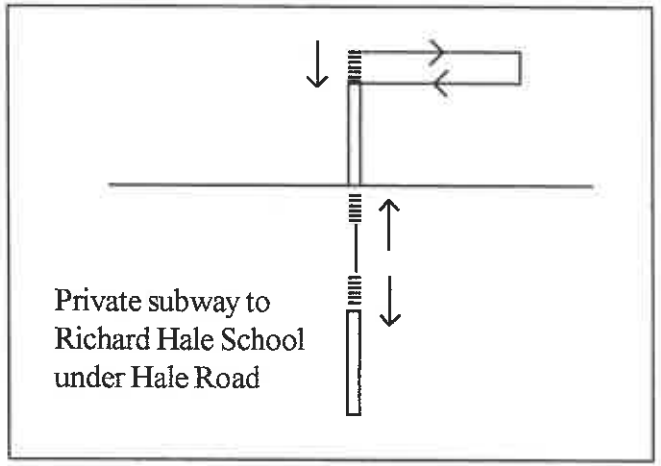


Castle Street subway

The steps at the southernend lead to the subway under Hale Road to Richard Hale School.

The total daytime population of County Hall, Wallfields, Sovereign House and Richard Hale School which all lie to the south of Gascoyne Way is possibly in excess of 5,000. As a result, this subway carries particularly heavy pedestrian traffic through to the Castle, Castle Street and the town centre, so that shared use may be considered undesirable.

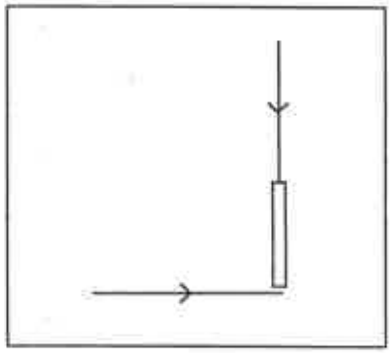
There may be some advantage in ***constructing new ramps*** aligned with the bore of the subway on both the north and south sides of the main road.

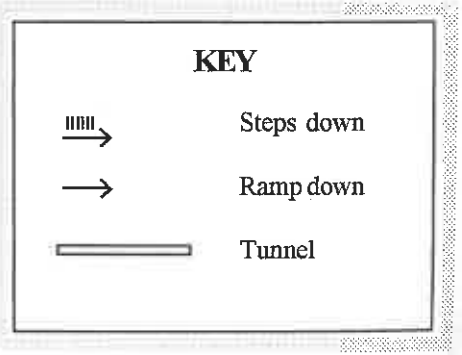


Castle Street subway

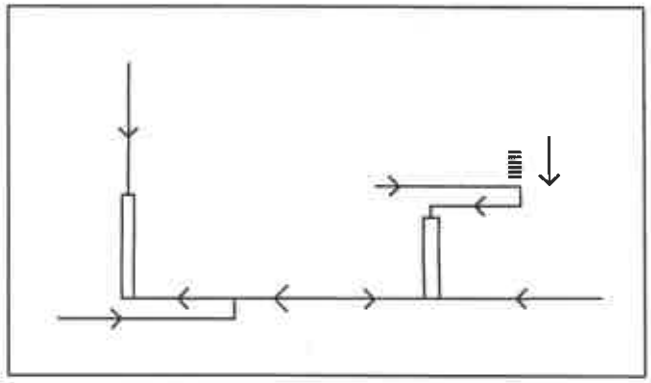
Church Street subway

The Church Street subway gives access to All Saints church and the Queens Road area, and is also used for access to the County Hall area from Fore Street.





Fore Street subway



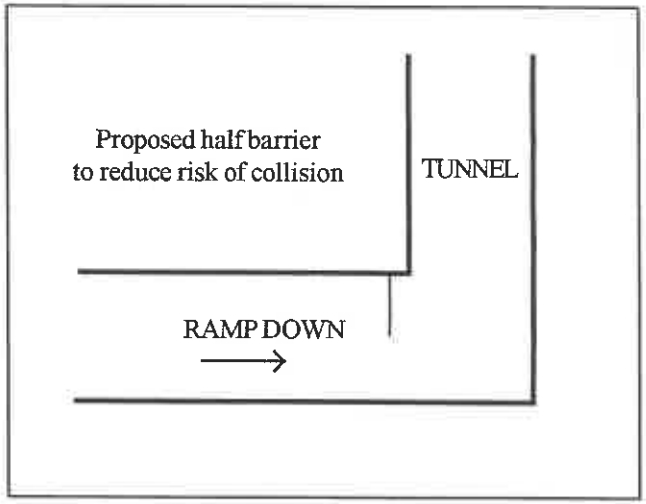
At 2.6m this is wider than the other subways and as a result, the right-angled corner at the bottom of the southern ramp into the tunnel can be negotiated with care without dismounting. This subway is relatively busy as it gives access to the BT telephone exchange, Simon Balle school and the University.

The ramps on the south side of the Fore Street and the Old London Road subways connect without returning to street level.

Old London Road subway

This subway is relatively little used as it does not give direct access to the central business district of the town. It connects the telephone exchange, School and University to the office and commercial area on the south side of Ware Road.

To access the north side of Ware Road and Tesco's on Mill Road, cycle and pedestrian traffic using this subway must use an unprotected crossing at the beginning of Ware Road. The *installation of a Pelican crossing* is recommended here.



Old London Road subway

Pelican crossings

Away from the town centre, there is a Pelican crossing immediately to the west of the Cross Lane roundabout, giving access to Riversmeet residential estate, and to the industrial estate on Mimram Road.

There is another Pelican crossing immediately west of the Campfield Road roundabout, giving access to Willowmead.

Unprotected crossings

Elsewhere along theA414, thee are crossings of the main road, identified by drop kerbs which are unprotected except for the benefit of the central reservation.

Schools Survey

All five secondary schools in the area were contacted to determine attitudes and policy towards pupils cycling. Even at Chauncy School which has the highest level of cycling, no more than 30 pupils cycle to school. Schools viewed the matter of cycling to school with a distinct lack of enthusiasm, and quoted traffic dangers and the security of cycle storage as negative reasons.

A questionnaire survey of pupils and staff at Chauncy school was conducted which gave an interesting insight into the whole matter of cycling.

222	-	questionnaires returned
136	-	walked to school
13	-	cycled to school
32	-	travelled by bus
40	-	travelled by car
1	-	travelled by train.

The number travelling by car was smaller than expected. This may be a function of the extreme traffic congestion caused by traffic to Glaxo's, but is no doubt also a measure of the compact pattern of Ware town, which make walking a feasible alternative for many. Many quoted walking times of 30 minutes or more to school, which they presumably find acceptable, but few considered the cycling alternative.

A more detailed analysis was undertaken on 100 of the returns from those who did not cycle to school which revealed the following:

85% owned a bike
60% had gained their Cycle Proficiency Award.

Reasons for not cycling to school included:

11%	-	No bike
2%	-	Inadequate bike
1%	-	Too far (valid)
2%	-	Too far (invalid)
15%	-	Too close
1%	-	Too hilly
1%	-	Problems of carrying luggage
5%	-	Social (ie preferred to walk with friends)
6%	-	Road dangers
12%	-	Preferred to walk
20%	-	Fear of damage or theft whilst at school
7%	-	Parental discouragement or prohibition.

(Some pupils quoted more than one reason.)

It will be noted that the principal reason quoted was fear of damage or theft whilst at school.

In response to questions from the same sample about the schools attitude to cycling and the provision of cycle storage, 77% considered that the school did not encourage them to cycle and 3% considered

that the school actively discouraged them from cycling.

There are in fact no proper facilities for cycle storage, and cycles have to be left on a grass bank at the side of the school. 54% considered that the provision of cycle storage was not satisfactory, for the following reasons:

21% No shelter
29% Lack of security
17% Other (general inadequate)
(Some pupils quoted more than one reason).

The inference is clear - the great majority of pupils have bicycles of which they are proud - and are reluctant to bring them to school where they are liable to theft or damage because of the absence of secure accommodation and shelter.

The question of danger on the roads received little mention -but no doubt would if the primary objection of inadequate storage was resolved.

DRAFT

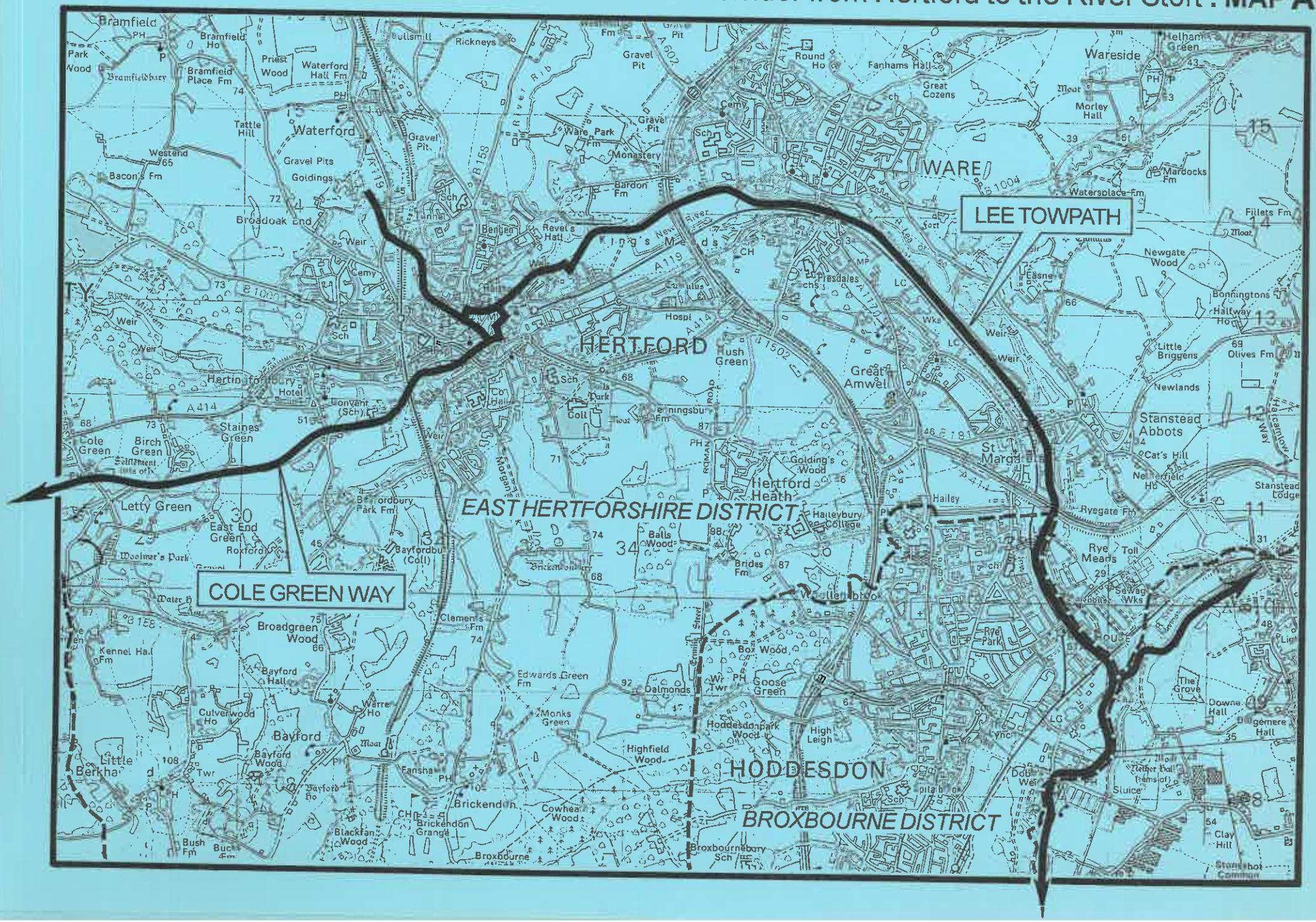
HERTFORD & WARE CYCLING STUDY

APPENDIX THREE

Prepared for Hertford Civic Society, Hertfordshire County Council, East Hertfordshire District Council and Ware Town Council.

By Sustrans, 35 King Street, Bristol BS1 4DZ. January 1994.

HERTFORD AND WARE CYCLING STUDY The Lee Corridor from Hertford to the River Stort : MAP A



Hertford & Ware Appendix III

Goldings & Cole Green Way to Hertford, Ware & St Margarets

Description of route shown in this appendix

This appendix details the cycling route recommended for early implementation in the Hertford & Ware Cycling Study (1994). The towpath of the River Lee Navigation, together with an extension to Goldings and a connection to the Cole Green Way represent by far the best opportunity for creating a level, attractive and largely traffic-free route in the area.

The function of such a route is manifold. It would be a direct link between the two towns and enable the public to cycle for many routine trips; it will provide a significant recreational facility on the doorstep of the two towns, thereby reducing the need to drive to more distant attractions; and because of its safe and traffic-free nature, it will allow novices of all ages to gain confidence in their ability to cycle and to appreciate the power and value of cycling to fulfill real journeys. In this last sense, the route described here can act as a catalyst to much wider cycling use, including cycling on the streets and roads in the area, where most routine trips will continue to take place.

The route may be broken down into a number of sections. The first to be built should be the length **between** Hertford & Ware. As this will be used for routine journeys to work and school it should be finished to a good standard in asphalt. This surface will be required in any case over the open meadows which are grazed by livestock and the works access section from Priory Street to the new River Intake Station.

This type of formal surface should be continued to Goldings, to Ware Station, and as far as the start of the Cole Green Way. But for this railway path itself, and the remainder of the towpath to St Margarets, a stone base will be more appropriate because these sections will be mostly used for leisure purposes.

The report recommends that the towpath is improved and repaired for cyclists, all the way through the Lee Valley Park to Waltham Abbey and indeed beyond to London. The whole length of the Lee is one of the very best opportunities to make a traffic-free path for cyclists (and walkers) in the vicinity of London.

Return to: Malcolm Ramsay, Dunkirks Farmhouse Southside
Queens Rd. Hertford SG13 8BJ
01992 500002 malcolm.ramsay789@btinternet.com

Estimate of Costs Phase 1

Folly Bridge, Hertford, to Priory Street Bridge, Ware

1.	Folly Bridge to Hartham Pool. Dropped kerbs, short ramps & small lengths of new path to connect up existing cul-de-sac roads and footpaths	3,000
2.	Hartham Pool to Hertford Lock, allow for new tarmac path, 2 metres wide laid on 2.5m wide stone base on polypropylene @ £25,000/km - 850m	21,000
	- new footbridge @	10,000
	- new access control at Hertford Lock	500
3.	Hertford Lock to New River Intake, allow for 2m wide tarmac path on stone base because of cattle damage Tarmac strip across grass crete overflow weir - 700m @ £25,000	17,500
	Allow for field access control at field end & gate	1,000
4.	New River Intake to Priory Street, allow for filling potholes & laying 3m wide bitmac to take access vehicles to Intake @ £20,000/km (1300m)	26,000
5.	Allow sum for signs	2,000
6.	Allow sum for seats & sculpture / marker if possible	10,000
7.	Allow for engineering & management	6,000
	TOTAL	**£97,000**

Possible sources of funds

British Waterways	10,000
N.R.A.	10,000
Sports Council/Countryside Commission	10,000
Hertford & Ware Town Councils together	7,000
East Hertford District	20,000
Hertfordshire County	40,000
	£97,000

Phase 2 to Goldings & Ware Station	
1. Crossing of Port Hill & link to Port Vale - sum	6,000
2. Modifying barrier in Port Vale to give cycle slot	1,000
3. Beane Road junction. Priority measures?	2,000
4. Repairs to Mole Wood Pumping Station Road	3,000
5. Crossing under North Road	15,000
6. New path through woods to Goldings - 300m @ £25,000	7,500
7. Signs	1,000
8. Engineering & management	3,500
Total to Goldings	**£39,000**

To Ware Station	
1. Construction of 550 of new or widened path to head of Broad Meads @ £25,000	14,000
2. One access control and gate	1,000
3. Signs	500
4. Engineering and management	1,500
Total to Ware Station	**£16,000**
Total estimate for Phase 2	**£55,000**

Further phases

Remains of work to Waltham Abbey requires repairs in the main and could be estimated at £10,500/km.

Shared use

We advocate that all off-road paths are for shared use - certainly between cyclists, walkers, those with prams and those in wheelchairs - and sometimes with horses as well. All these parties need much the same thing, namely traffic-free routes, that are carefully designed and well built to encourage their use. Shared use is good value for money and improves the security of all concerned by populating the paths to enhance casual surveillance.

Unfortunately it is normal for authorities to react against shared use. Pedestrians are seen as at risk from cyclists, whereas the reality is that both are vulnerable to motor traffic. Although Sustrans is not an advocate of cycling on the common footway, the shared use of carefully designated paths may be the only way of creating practcial routes. Sustrans have not found this to be a problem in practice, especially if the overall route creates real new links for walkers, as well as entailing shared use on existing paths. Pedestrians are equally deserving of improved facilities

It is also worth pointing out that the dire views put forward at public meetings are rarely substantiated in practice. Councils who are contemplating routes of this kind might find it useful to discuss their working in practice with nearby Councils who have actually got shared use routes on the ground.

Path widths

Widths can be various. We have come to the conclusion that paths can never be too wide. People are a gregarious lot and will walk side by side to take up the whole width of any path, as we have found on sections of the Kennet & Avon towpath which varies from 0.5m to 5.0m in width.

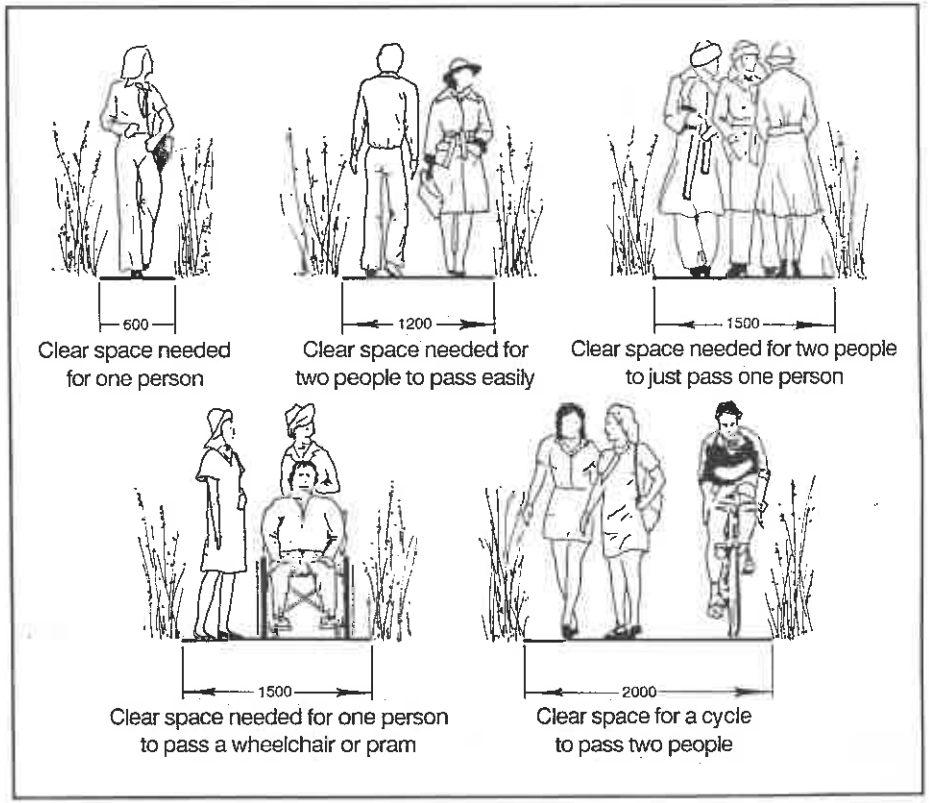


Fig showing path widths appropriate for different uses

2 metres is really the narrowest which can be recommended for shared use, and this relies upon having clear verges to allow groups to pass one another. 2.5m is recommended by the Department of Transport as the minimum, whilst 3.0m is common in urban areas. In some towns one finds parallel paths for walkers and cyclists separated by a low kerb. This is really very unsatisfactory, as the space is not effectively used with groups being unable to spread over the full width of the path. Rather we prefer a dividing white line which allows travellers to move to one side or another when passing, but otherwise allows as much space as possible for any particular group. One particular exception to this general rule should be observed: steep paths should be segregated because of the probable speed of cyclists.

Shared routes should always be signed as such, and cyclists should always be advised to give way to pedestrians. In practice, they normally do so, as shown by hours of video which formed the basis of the recent Transport Research Laboratory report on "Cycling in Pedestrians Areas". This concluded that "no real factors justify the exclusion of cyclists from pedestrian areas".

Routes for people with disabilities

Good quality off-road routes provide some of the few real facilities for wheelchair users. Indeed all these routes should be specifically designed for wheelchairs - ramp gradients should be gentle, and access controls, where used, should be appropriate.
It is sometimes forgotten that a very large proportion of the public are barred from rough field paths either because they haven't got the confidence to use them, the right sort of footwear and clothes, or perhaps even more commonly the energy and strength. Good quality paths on the urban fringe open up the countryside to a very wide range of the public. They are also suitable for people with visual impairment - grassed path shoulders define the route without the need for expensive tapping rails, and these paths are refreshingly stress-free without the ever present noise of motor traffic.

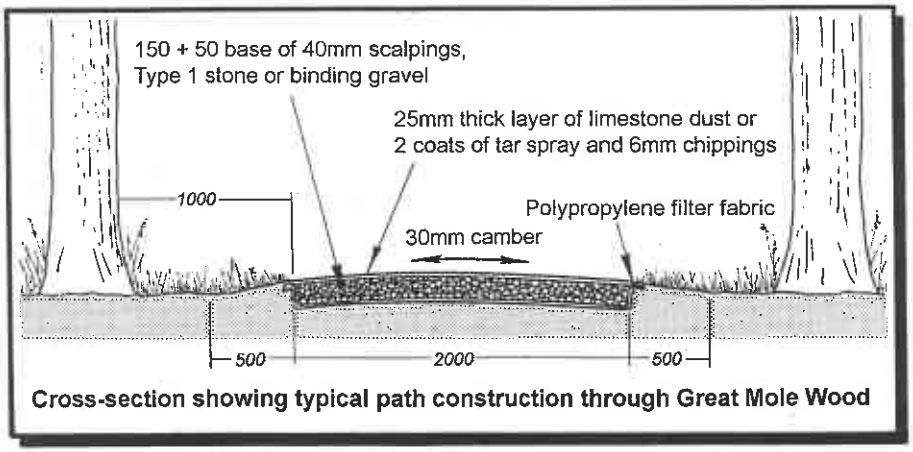
Providing for disabled and elderly people also requires thought to be given to access to public transport and convenient car parking sites, and seats along the way.

Appendix 3: Lee Corridor from Hertford to the River Stort

Map 1

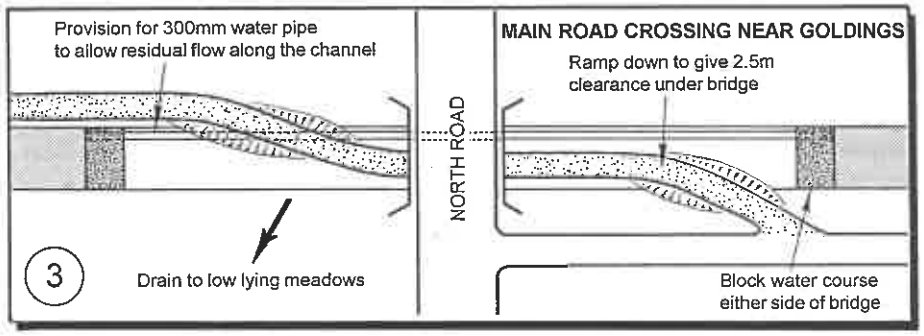
1. Tarmac drive to Goldings crosses a number of ornamental brick bridges with attractive views over meadowland.

2. Well worn path through woodlands. This will need to be constructed to give a 2m wide stone surface.



Cross-section showing typical path construction through Great Mole Wood

3. Pass under A119 by drawing a short section of the "millstream" as shown in the sketch. This arrangement is self-draining and will give a safe crossing of this busy road at a modest price.



4. This gravel track is in reasonable condition and passes under the railway via a high arch.

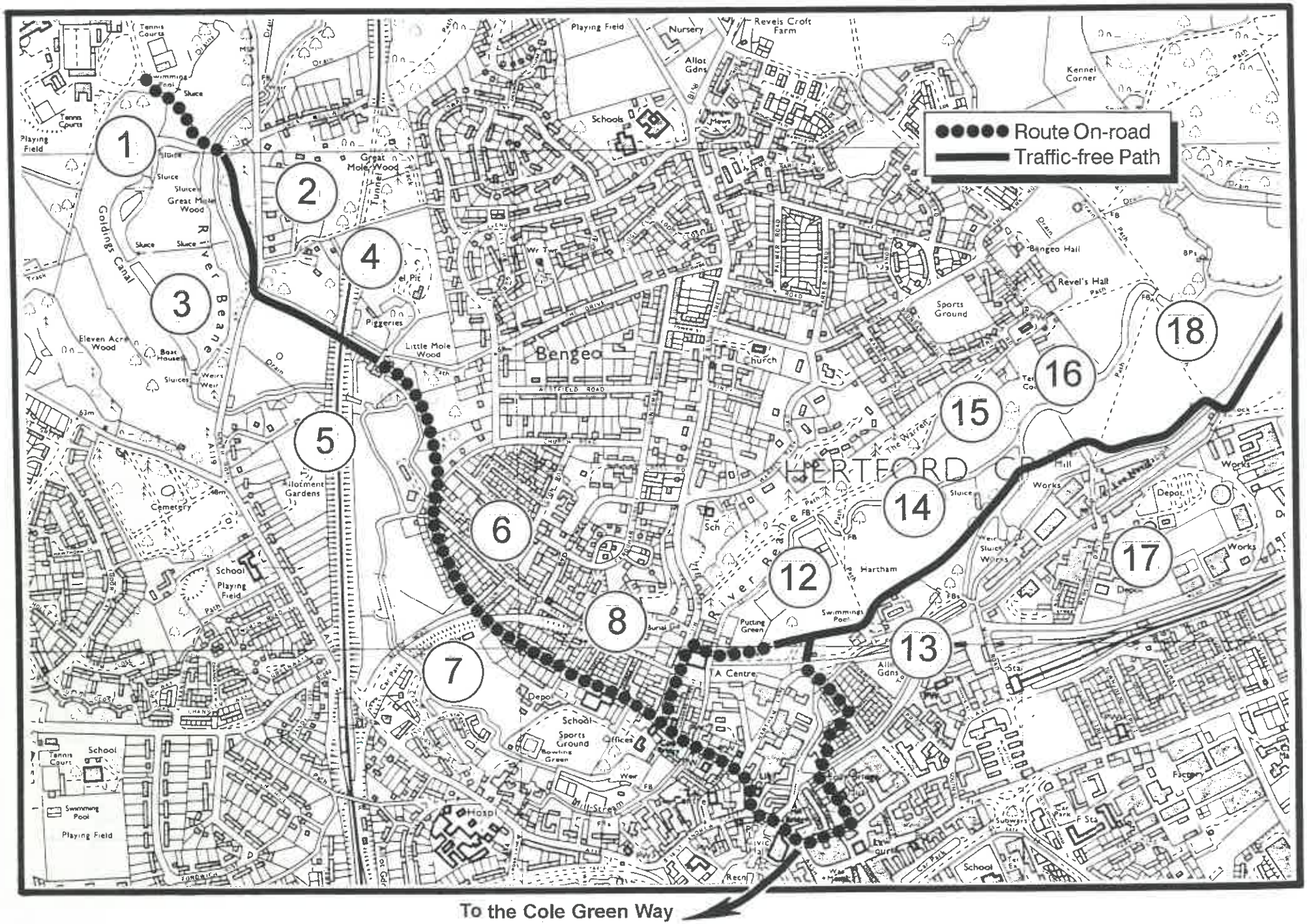
5. This section of Molewood Road is roughly tarred 2.5m wide as an access to the "mill". This is shown as a public right of way on foot and permission from the landowner may be required for formal cycle access.

6. Minor residential road.

7. Some traffic management desirable at Beane Road junction.

8. Port Vale is currently closed to through traffic, but a gap is needed for cyclists.

HERTFORD AND WARE CYCLING STUDY The Lee Corridor from Hertford to the River Stort : MAP 1



Map 1A

10a. Port Hill is a difficult road to tackle because of the humped back railway bridge. Probably the easiest option is to use these two residential culs-de-sac and link them together by crossing the track of the disused railway.

10b. Advisory crossing of Port Hill straight over to access to car park.

10c. Use access road to Sports Centre car park.

10d. There is no defined way through the car park. At the very least a link for cyclists between its two halves is required.

10e. It might (just) be possible to pass under the road via the old bridge. This would require agreement with the new trading estate at the head of Chambers Street. It would be physically possible to fit in a 3 metre wide corridor, fenced off from the industrial estate along the line shown. A new footbridge over the river would be required.

11a. An alternative route which takes in the town centre would require this whole length of the main road to be traffic calmed to make it suitable for ready use by cyclists. Such a measure might have wider benefits than just the encouragement of cyclists.

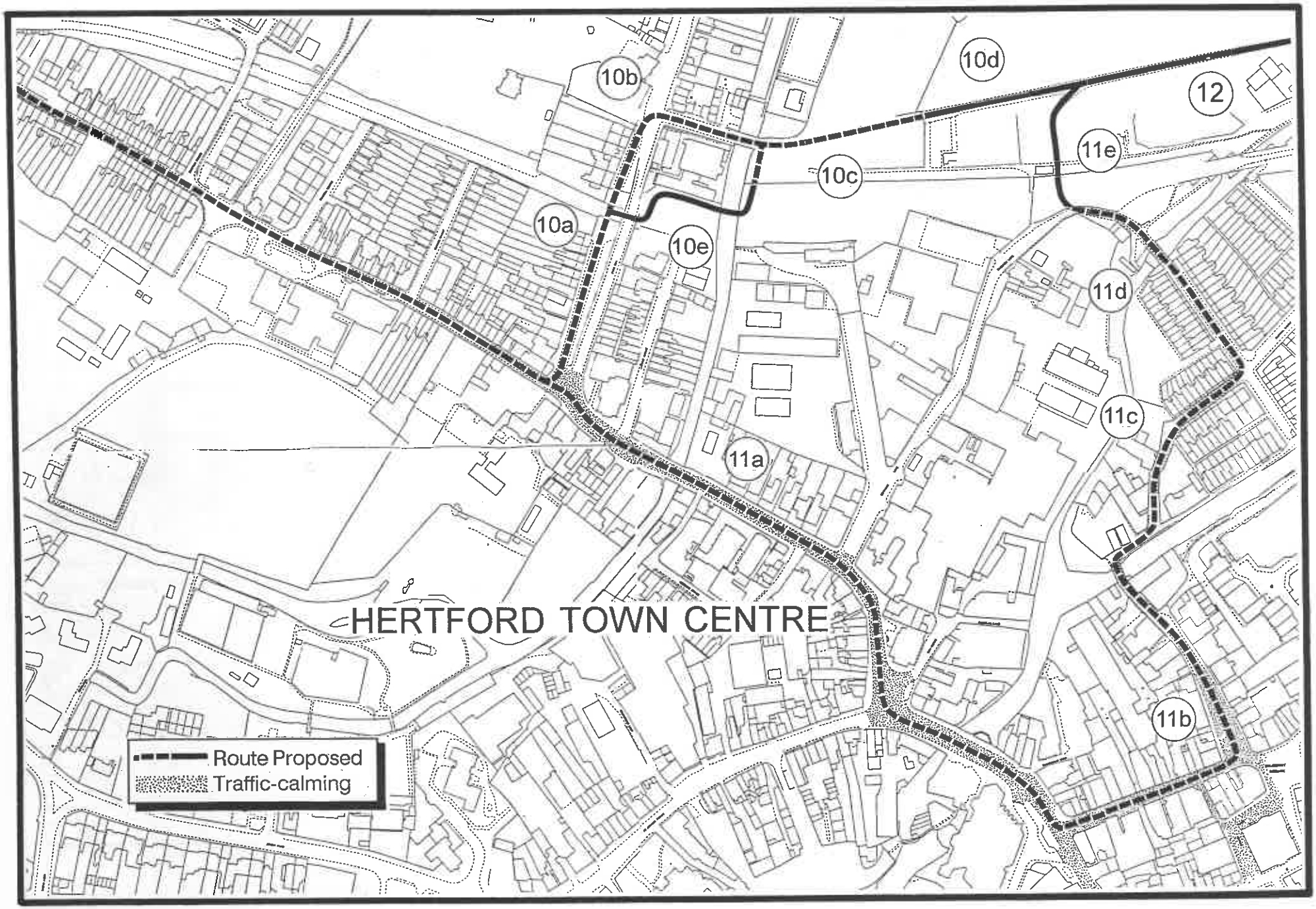
11b. Existing partly pedestrianised town centre.

11c. Residential cul-de-sac (The Folly and Thornton Street).

11d. Some modification needed to make a small ramp up to this bridge.

11e. A way across the car park roads needs to be defined and link paths built.

HERTFORD AND WARE CYCLING STUDY The Lee Corridor from Hertford to the River Stort : MAP1A



Map 1 cont...

12. Continue to the sports centre via the existing main path.

13. Excellent cycle racks.

14. New path constructed along edge of playing fields to meet the River Lee at its gauging station.

15. New bridge at the guaging station.

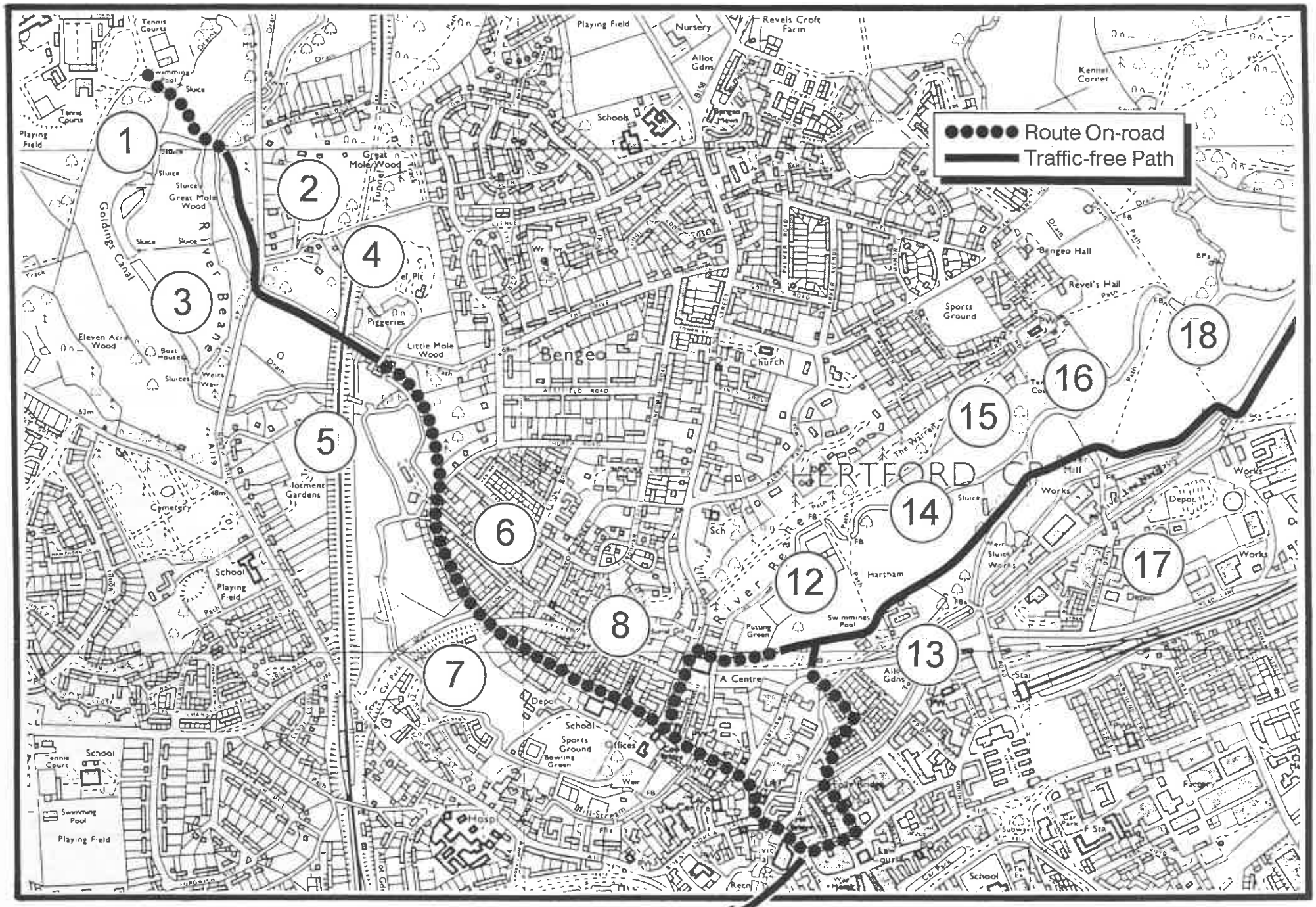
16. New path across rough grassland and then on around edge of playing fields on the top of slight ridge beside water channel to join the Lee Navigation at Hertford Lock.

17. We consider that the route shown is better than following the Canal towpath, partly because it is rather constricted through this industrial area, and partly because of the difficulty of handling the steps and footbridges at Mill Road.

18. New access control required here to accommodate bikes more freely. We suggest our standard access coupled with a weighted swing bar to make the unit stockproof.

View from Hertford Lock showing existing awkward barrier

HERTFORD AND WARE CYCLING STUDY The Lee Corridor from Hertford to the River Stort : MAP 1



Map 2

1. Fine section of canalside path with wide open views. The path needs reconstruction over this length. Either it should be fenced from livestock, in which case it can be left as a stone base, or it should be tarred to withstand cattle.

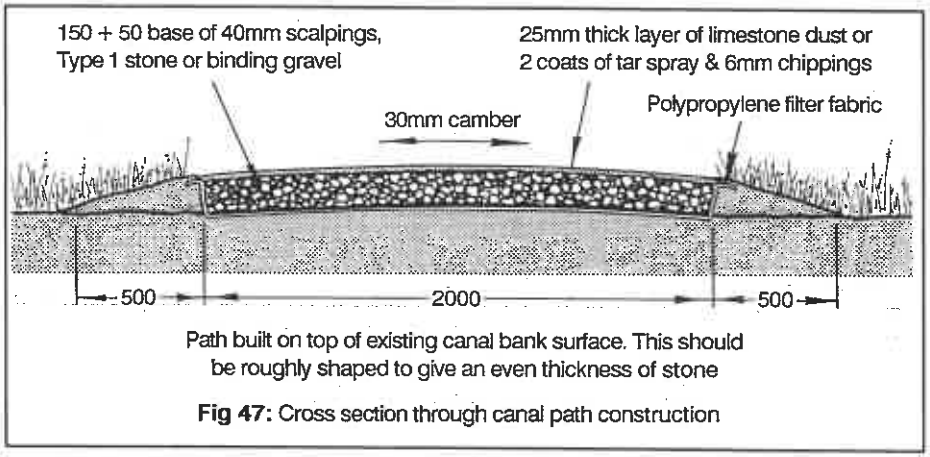
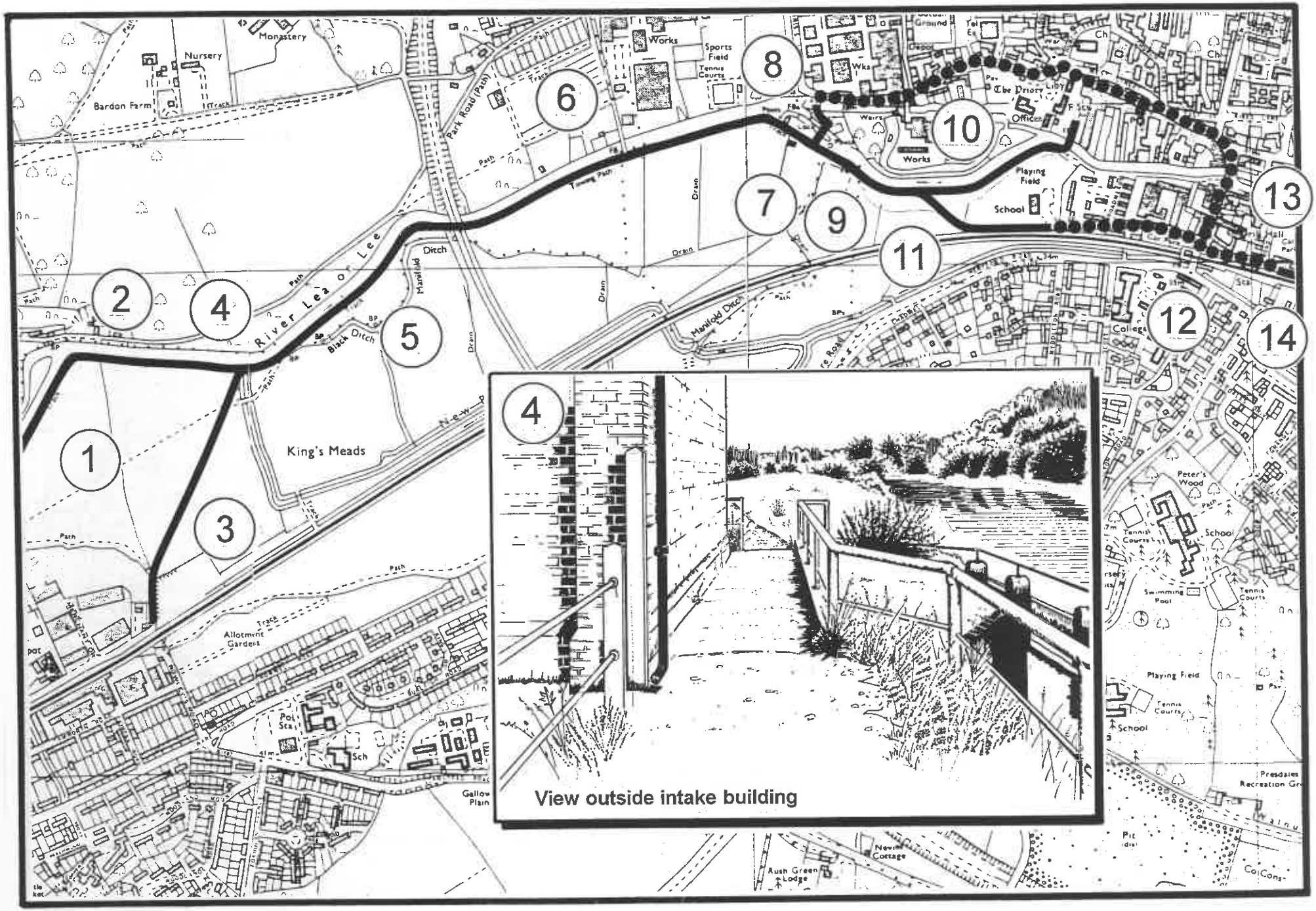


Fig 47: Cross section through canal path construction

2. Section of concrete blockwork acting as an overflow spillway. This will need asphalting to make it safe for cycling.
3. Good gravel road forms additional way into the eastern part of Hertford.
4. Narrow section in front of intake building is quite adequate as sightlines are good and the distance short.
5. This section of the towpath is a wide gravel track used by vehicles. It is badly potholed and rutted. If it is to become a servicable cycleroute either lorries will need to stop using it, or it should be finished with bitmac 3 metres wide.
6. Timber bridge with long timber ramp gives access to local schools.
7. Access gated here but adequate gap already exists for cycles.
8. Wide NRA bridge to Priory Street. This would lead to a satisfactory route through Ware if the High Street was to be traffic-calmed. These notes show the option of continuing with a largely traffic-free path via Ware Station.
9. Narrow tarmac riverside path could be widened to 2 metres without undue difficulty.
10. One option is to continue along a refurbished riverside path as far as the library bridge. But beyond this the space available becomes less and conflict with pedestrians rather more.
11. It may be considered better to build a new path over this section around the edge of this higher land to reach the track leading to Broad Meads. This will serve the primary school and give a direct link to the Station.
12. Cross Amwell End to reach Station Road. Some priority markings may be needed here.
13. Arrange adequate cycle parking at Ware Station.
14. Pass between former railway warehouse and back of station platform.

HERTFORD AND WARE CYCLING STUDY The Lee Corridor from Hertford to the River Stort : MAP 2



View outside intake building

Map 3

1. Pass under side span of Viaduct Road.

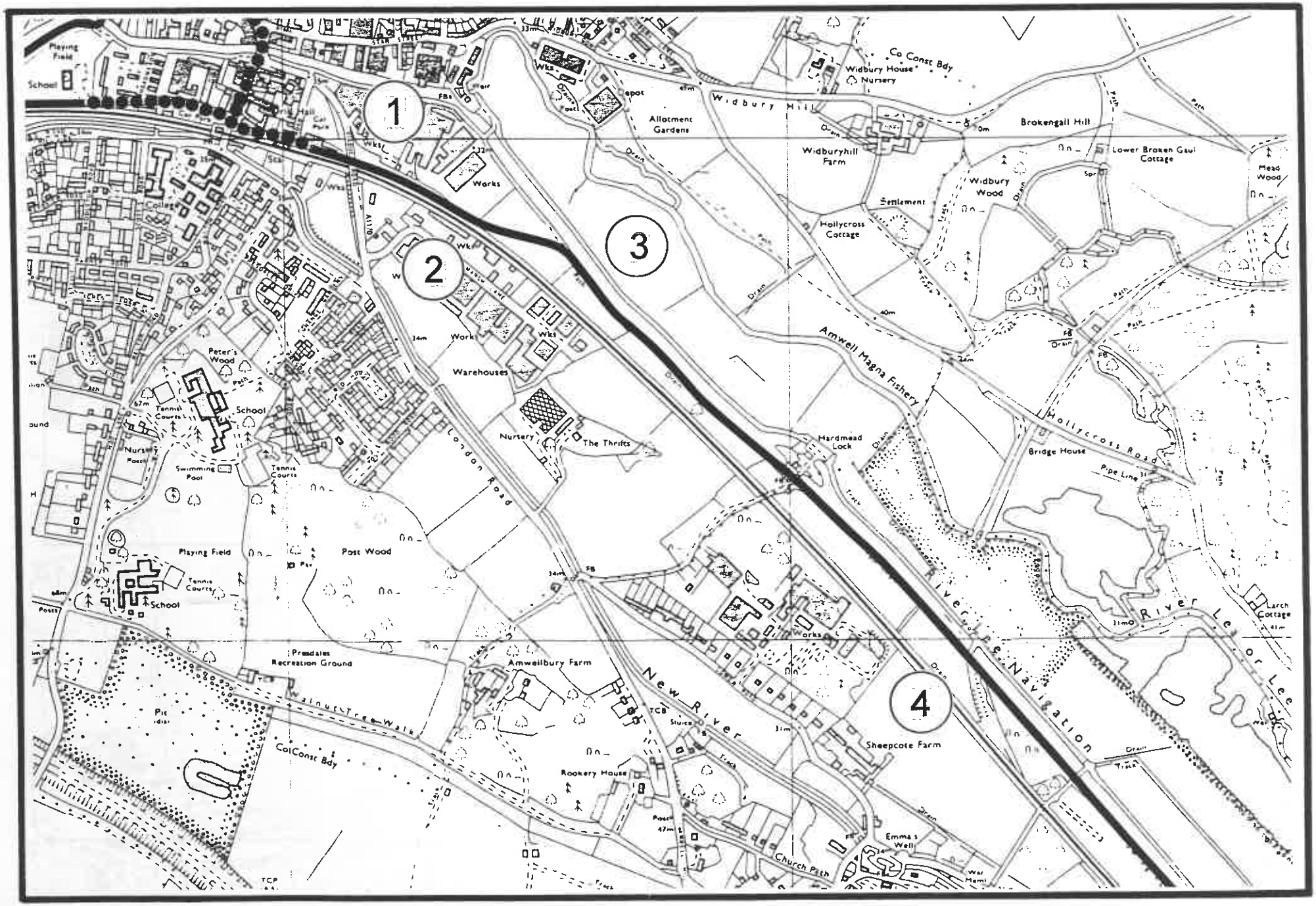
   Note that this is not the span being utilised by the developer to get access to his car park.

2. This waste site is proposed for development. There is ample room to allow for a wide tree-lined verge to this car park with, say, 5 metres between fences to provide for an attractive path to near the canal side.

3. The remainder of the canal towpath to the Stort Navigation is in reasonable condition. The whole could do with some refurbishment to make a good all-weather path, and certainly some diversions and attractions would be helpful for walkers over the next 5 kms.

4. Footbridge on line of former railway gives access to Hollycross Road.

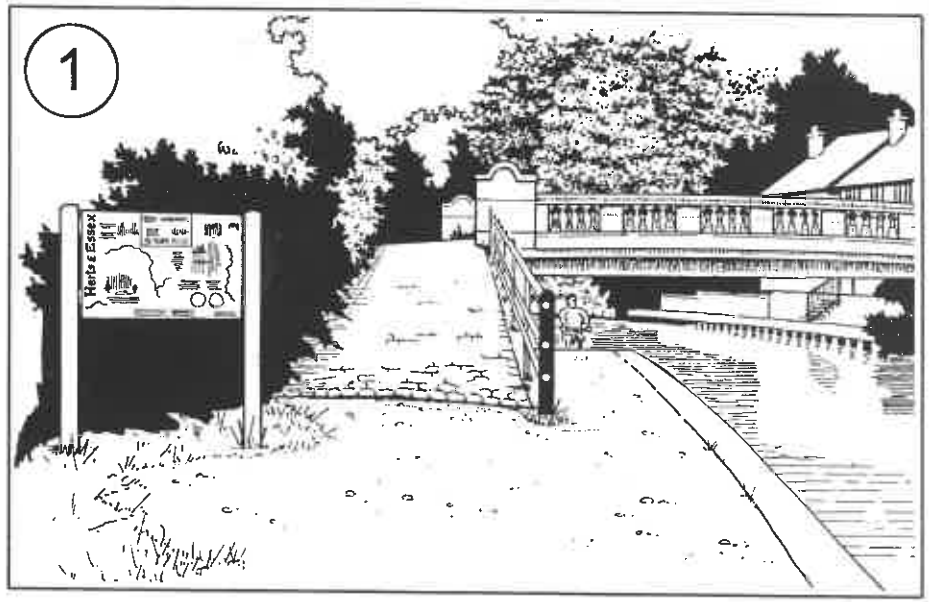
HERTFORD AND WARE CYCLING STUDY The Lee Corridor from Hertford to the River Stort : MAP 3



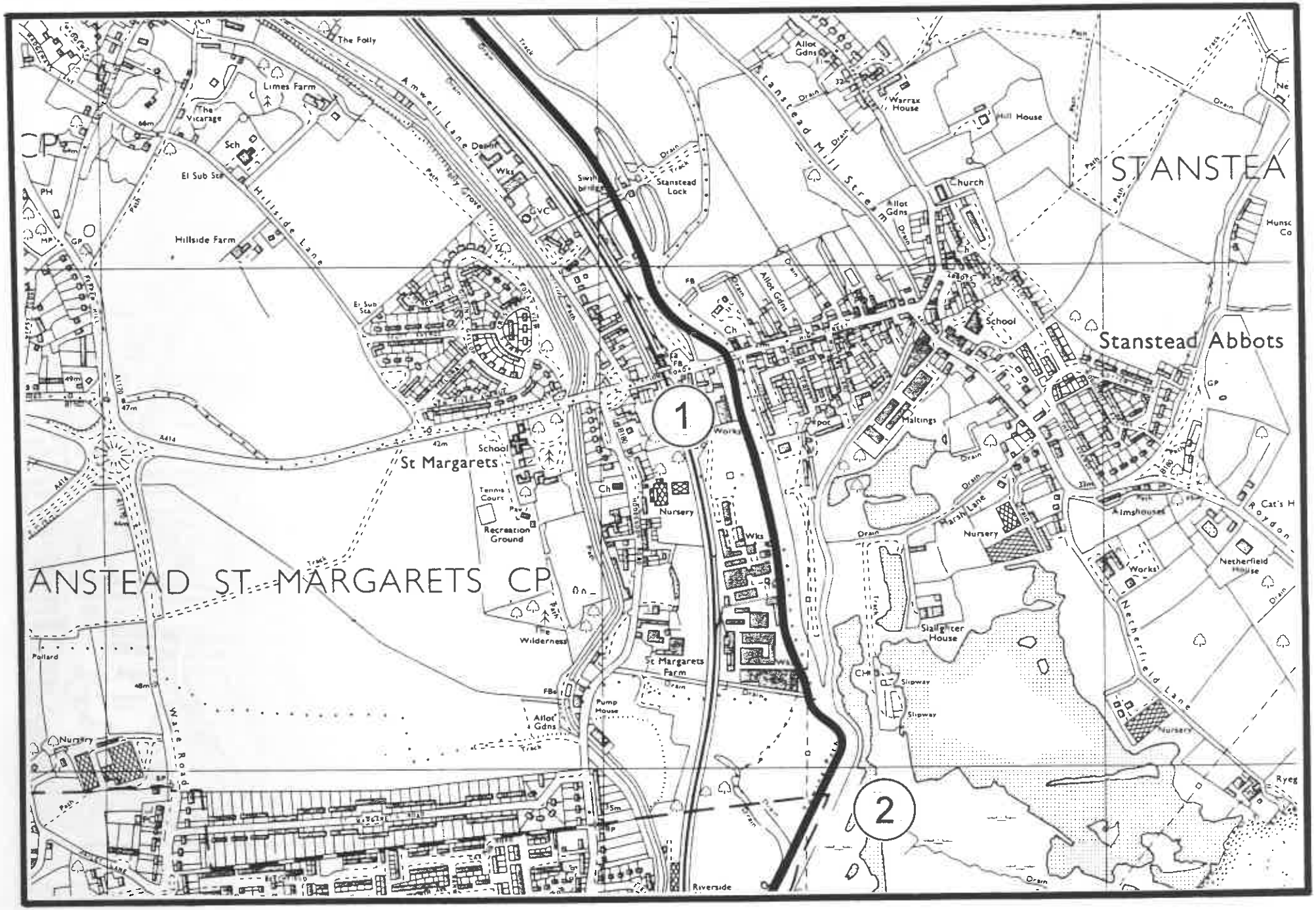
Map 4

1. Path goes under Station Road with a wide ramp from the south. This gives ready access to St Margaret's Station for the return to Hertford or Ware.

2. East Herts District Boundary.



HERTFORD AND WARE CYCLING STUDY The Lee Corridor from Hertford to the River Stort : MAP 4



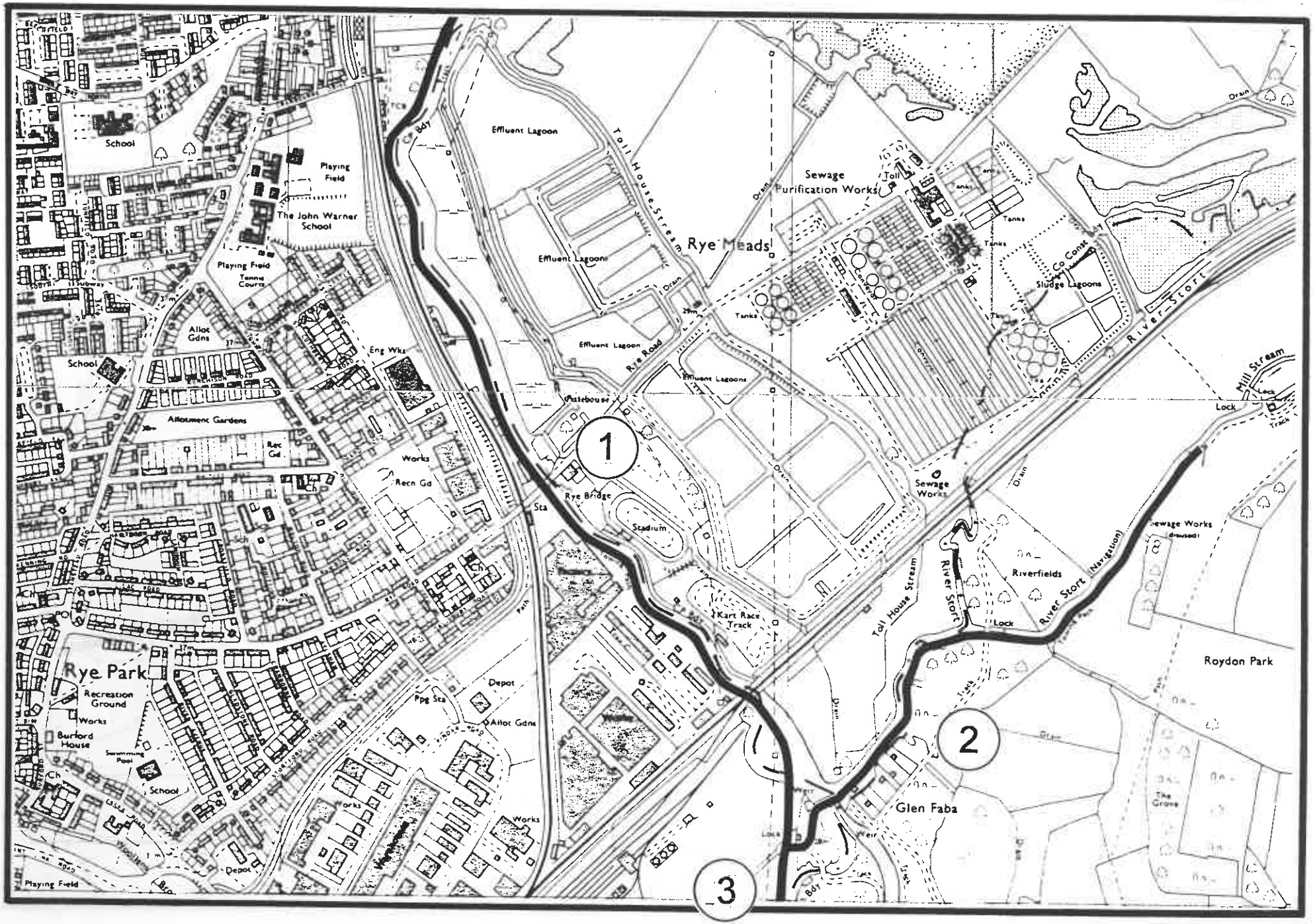
Map 5.

1. Rye Bridge is another good access to a railway station; as well as a large adjacent population in Rye Park.

2. The Stort Navigation towpath is considerably narrower than that of the Lee Navigation. Nonetheless it has great potential for an attractive route through to Harlow and Bishops Stortford.

3. Canal towpath can be followed quite easily to Lee Country Park and Waltham Abbey. This is all a good recreational area for residents ofHertford and Ware.

HERTFORD AND WARE CYCLING STUDY The Lee Corridor from Hertford to the River Stort : MAP 5



Map 6: The Cole Green Way

The one existing traffic-free route in the area which is formally designated for cycling is the Cole Green Way which is a narrow cinder surface path which makes use of the old railway from Hertford to Welwyn Garden City. The Way as at present constituted has a number of rather unsatisfactory features.

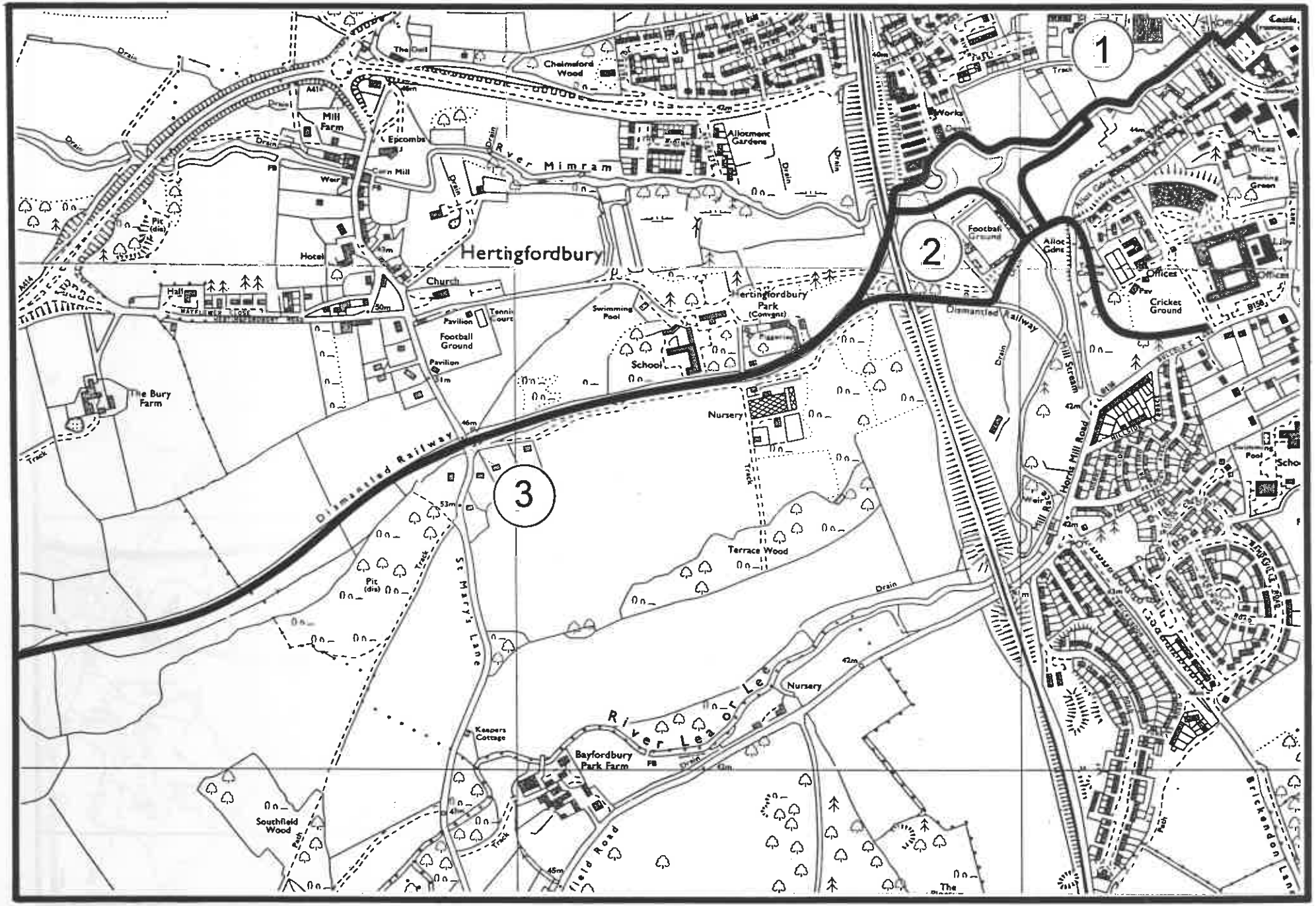
The only totally safe excursion which can be made using this route is out and home. There is no safe cycle route between the centre of Hertford and the eastern end of The Way. At its western end, The Way currently terminates at the A414 Hatfield Road, which is completely unsuitable for cycling and does not constitute a useful destination.

1. Possible extension back to Hertford North station, described in Appendix 4.

2. Access to the eastern end of Hertford Football ground. Informal parking.

3. Bridge across St. Mary's Lane.

HERTFORD AND WARE CYCLING STUDY The Lee Corridor from Hertford to the River Stort : MAP 6



Map 7

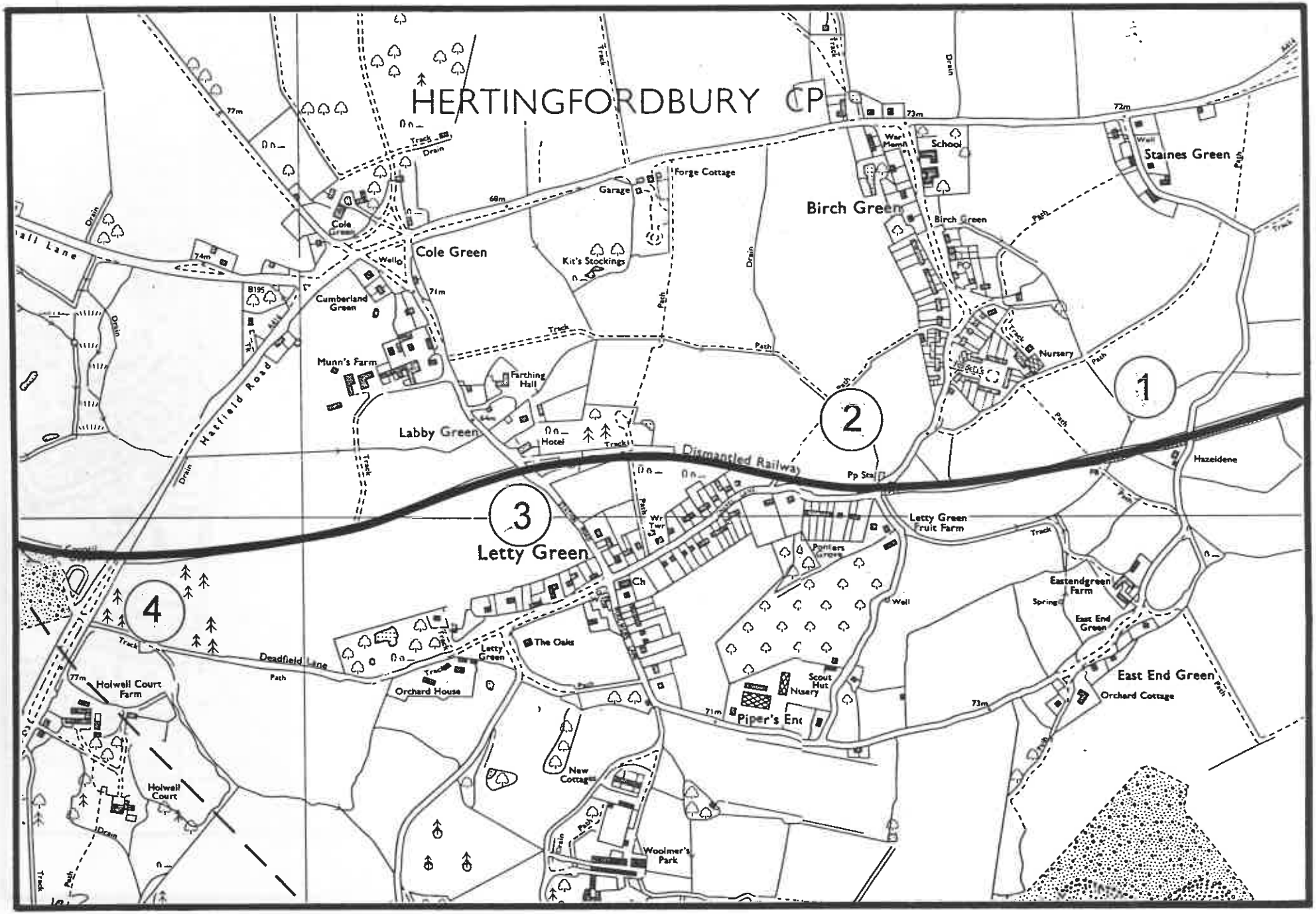
1. Bridge under road blocked. Steep ramps up to cross over road. Access needs improving.

2. Poor accessto Birch Green from bridge. Steps to south-east of bridge. Steep and overgrown ramp to north-east of bridge, also used by horses with muddy surface. *Access needs improvement.*

3. Main access at Cowper Arms by road up to car park and picnic area on old sidings.

4. Way currently terminates and is blocked at A414 Hatfield Road. Construction at the west end of the new Cole Green Bypass will provide a subway under the dual carriageway through which bicycles may readily pass, but will only carry the status of footpath. This should be enhanced to cycleway status with appropriate approach ramps.

HERTFORD AND WARE CYCLING STUDY The Lee Corridor from Hertford to the River Stort : MAP 7

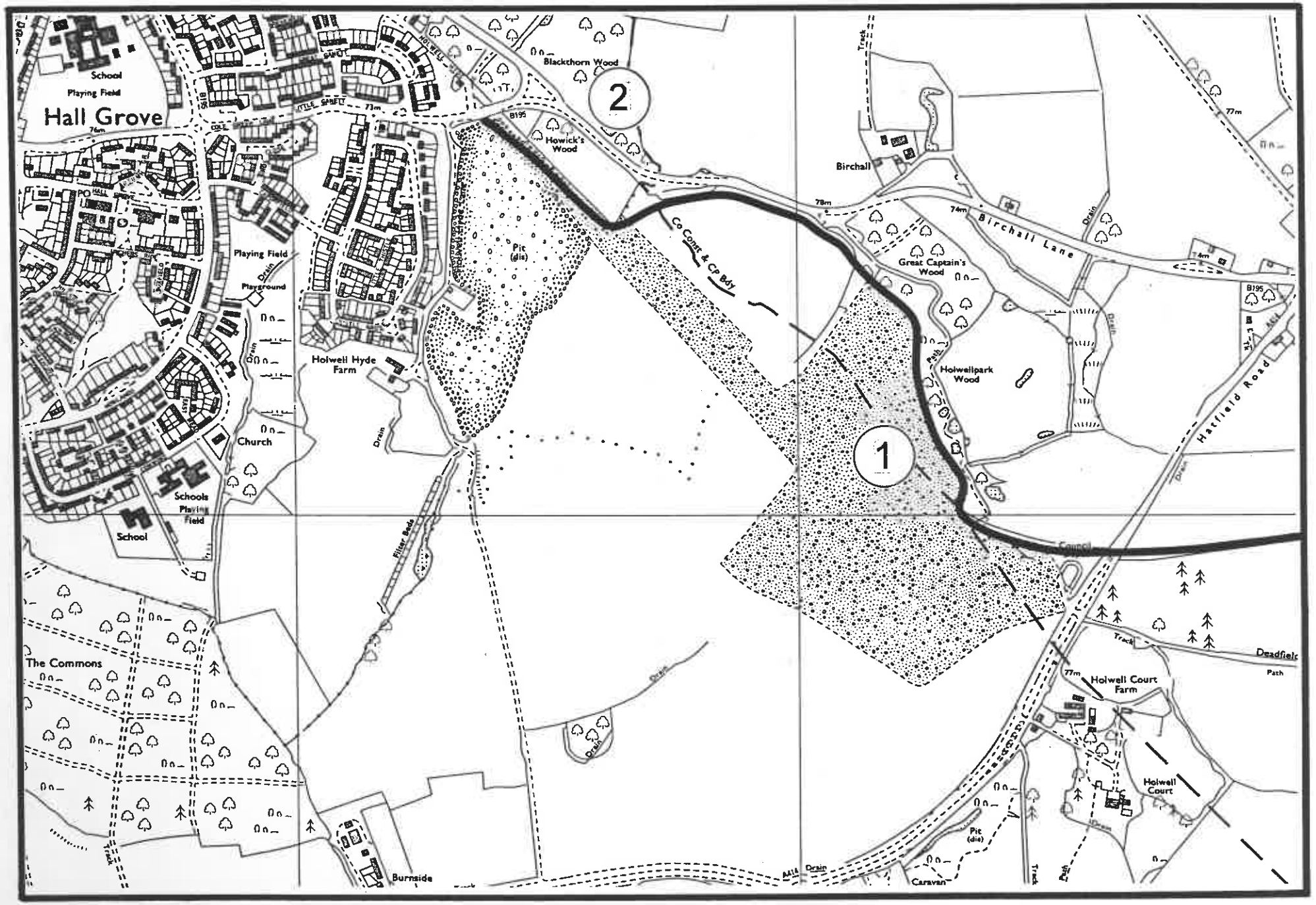


Map 8

1. Between Hatfield Road and Cole Green Way, Welwyn Garden City, the line of the old railway has largely been lost, with landfill on the site of the old gravel workings. It is expected that Hertfordshire Groundwork Trust in conjunction with Redlands,the owners of the land, will construct a new path along this route for completion by 1995.

2. Birchal Lane, B195, is busy, narrow and twisting. Although the opening of the Cole Green Bypass will relieve traffic at the the eastern end, the main part of this road will remain busy and totally unsuitable for cycling. The need for a safe way into Welwyn Grden City from the east renders the western extension of the Cole Green Way a matterof high priority.

HERTFORD AND WARE CYCLING STUDY The Lee Corridor from Hertford to the River Stort : MAP 8



Hertford and Ware Cycling Study

1994

Appendix 4

Other Route Proposals

Report prepared by Sustrans
for :
Hertford Civic Society,
Hertfordshire County Council,
East Hertfordshire District Council,
Ware Town Council.

A proposed network of cycle routes

As part of the study brief, Sustrans have devised a network of cycle routes which conform to the following criteria:

1. Make best use of the existing resources for cycling.

2. Special attention has been paid to crossing all busy roads by safe means. Where a grade-separated crossing is not feasible, due attention has been given to implementing measures which make the crossing as safe as possible.

3. Where the use of streets carrying motor traffic is unavoidable, to recommend such measures as are necessary to minimise the risks to cyclists.

4. Make connections between the main housing estates, the railway station, main areas of employment, shopping areas and sports and recreational facilities.

5. Where possible, to follow routes which are visually attractive.

6. Keep the costs of necessary extra works to a minimum, consistent with the other considerations above.

Components of the proposed network

The main elements of the proposed network are as follows:

1. A principal route which runs along the valley of the river Lee, making use of much of the existing towpath. Implementation of the first phase of this route will connect the two town centres and give ready access to Glaxo's. This route offers a level and easy route which has a largely rural aspect and has a high amenity and recreational quality.

   Future extensions of this route will continue down the river to Hoddesdon and give access to the Lee Valley Country Park. Upstream, a short extension would run up to the County Council offices at Goldings.

2. The Cole Green Way is an existing railway path, which at present is not well used as the end points are not readily accessible. Extensions of the path back to Hertford North station, Hertford Castle and County Hall would greatly improve the value of this route. At the other end, there are plans to extend the Cole Green Way to the edge of Welwyn Garden City. Further extension along the line of the old railway as far as Tewin Road would provide a good, level and attractive route between two urban centres.

3. A route from Hertford town centre to Ware via St Leonard's and Ware Park. This offers an attractive alternative to the towpath route and the possibility of a circular route.

4. A number of suburban routes radiating from the centre of Hertford:
   a. An eastern loop serving the Caxton Hill Industrial estate, the Foxholes Business Park, and the University.
   b. Queens Road, Mandeville Road and Brickendon Lane.
   c. Sele estate and Sele school, with a southern loop via Ladywood Road.
   d. Bengeo via Molewood Road.

5. A number of suburban routes radiating from the centre of Ware:
   a. Poles Lane.
   b. Glaxo's, Chauncy School and The Hyde.
   c. The southern suburbs and Presdale School.
   d. Trinity Centre and Great Cozens.
   e. Wodson Sports Centre and Thundridge.

Route details

The following sections contain detailed descriptions of recommended routes.

Map key

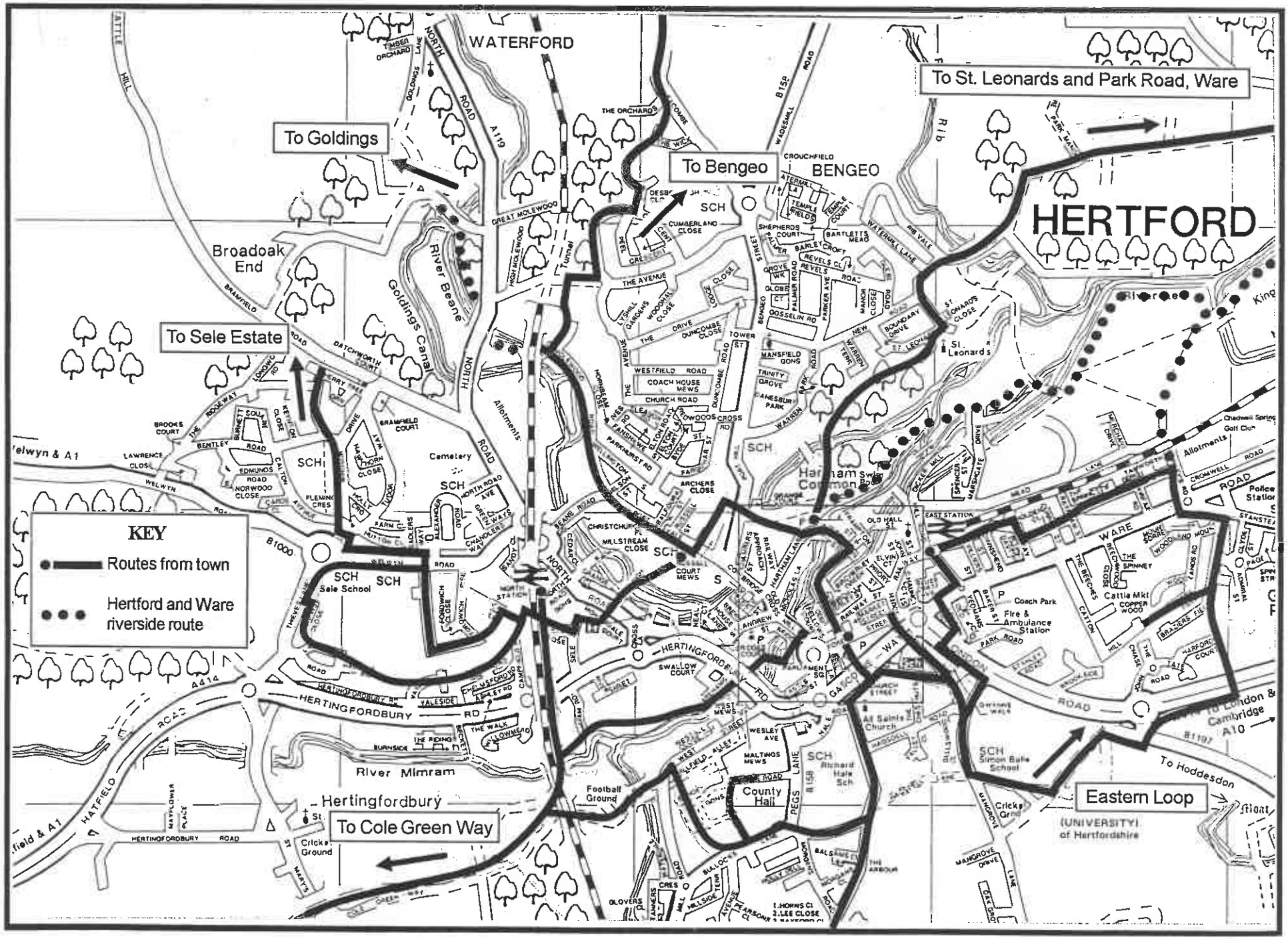
Each route is described by annotated maps and text. The route is shown on each map section, together with salient points identified by number or letter. The information is also amplified by supplementary maps, and stylised plans and sections.

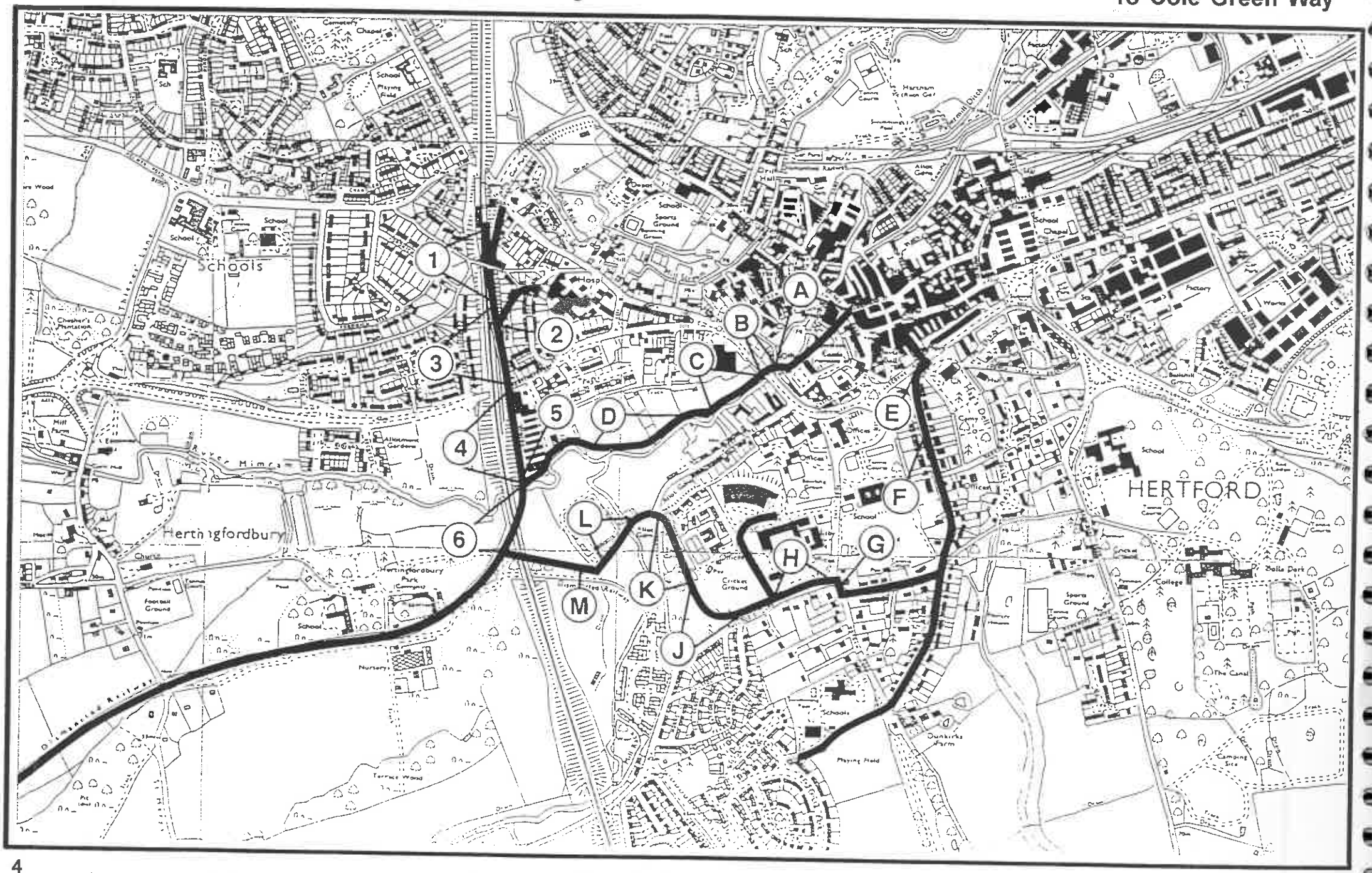
Text key

The main body of the text pages is devoted to an explanation of the points identified on the map by number and letter.

The works required to create a safe and satisfactory route are identified in the text. Work which is regarded as essential is identified by ***bold, italic and underlined text like this.*** Work which is seen as desirable, but not essential is identified by ***bold and italic text, not underlined, like this.*** Important constraints are identified by **bold, Roman text, like this.**

Map showing proposed routes in Hertford




To Cole Green Way
Schools
HERTFORD
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M

Cole Green Way extension to Hertford North Station and links to Hertford Castle and County Hall

The Cole Green Way can be made much more attractive to cyclists, not only by the proposed extension towards Welwyn Garden City (already in hand) but by an extension back to Hertford North station.

1. *Construct new path for total of 700m*, fenced off from tracks, along disused railway land south from Hertford North Station. *Construct ramp* up from booking hall on North Road. *Construct ramp* up to footbridge.

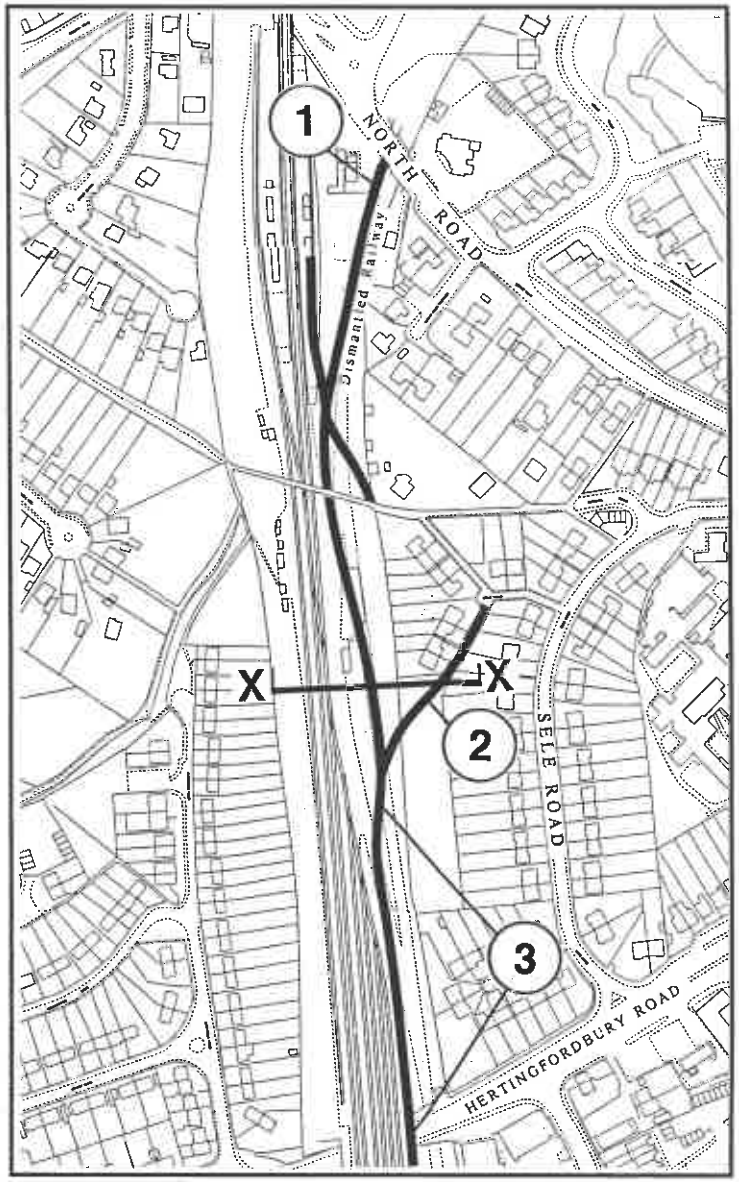
2. Link from the proposed Port Vale to Sele Estate route via a cul de sac off Sele Road that runs to the allotments. *Construct a new path on ramp* down the bank on railway land to join the path from the station.

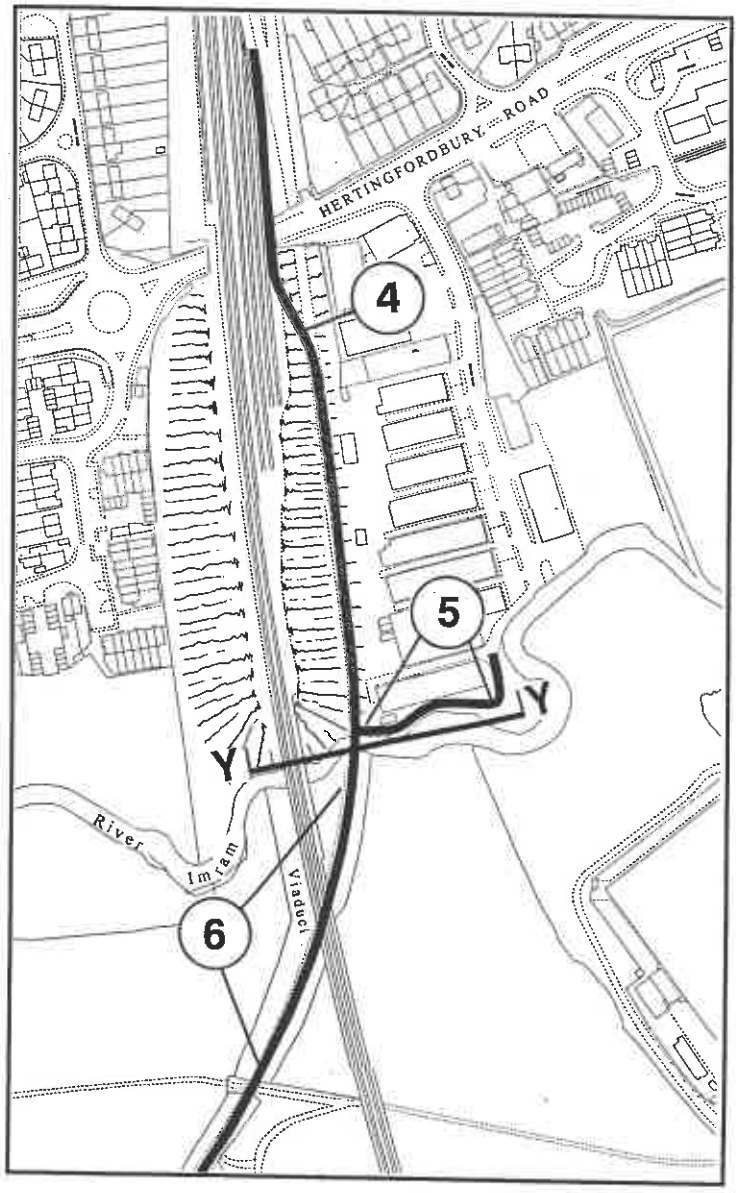
3. *New path ramps up* to the sidings. On the bridge over Hertingfordbury Road, there is a 4m space between the rails and the parapet; allowing 2.35m width of path. *Alternatively construct new side bridge* over the main road supported by the wing walls of the railway bridge.

4. *New path ramps down* to rejoin line of old railway, and drops below level of present line.

5. There is at present some foot traffic over the pipe bridge on the River Mimram. *Construct new bridge and new path* into the southern end of Mimram Road.

6. A rough and overgrown path follows the line of the old railway up to a point near the start of the present Cole Green Way. *Construct new path for 100m along this line*.




HERTINGFORDBURY ROAD
4
5
Y
Y
River Imram
Viaduct
6

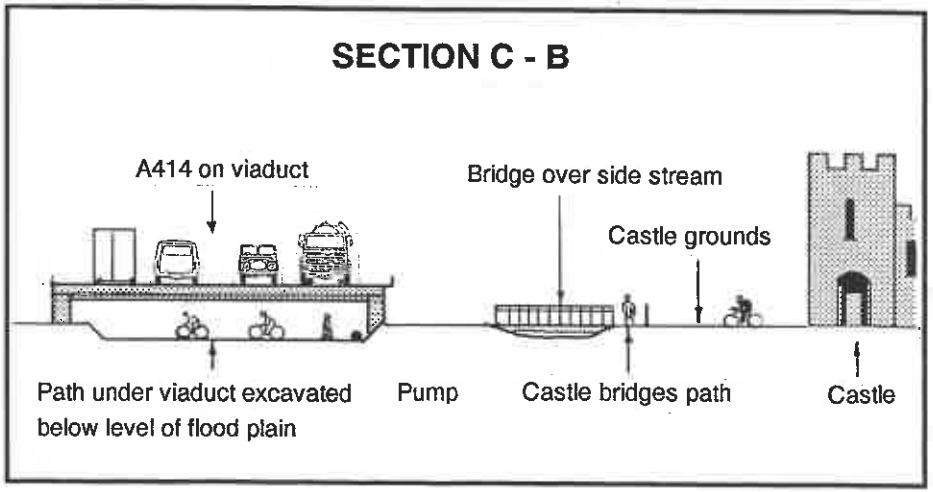
Link from Hertford Castle

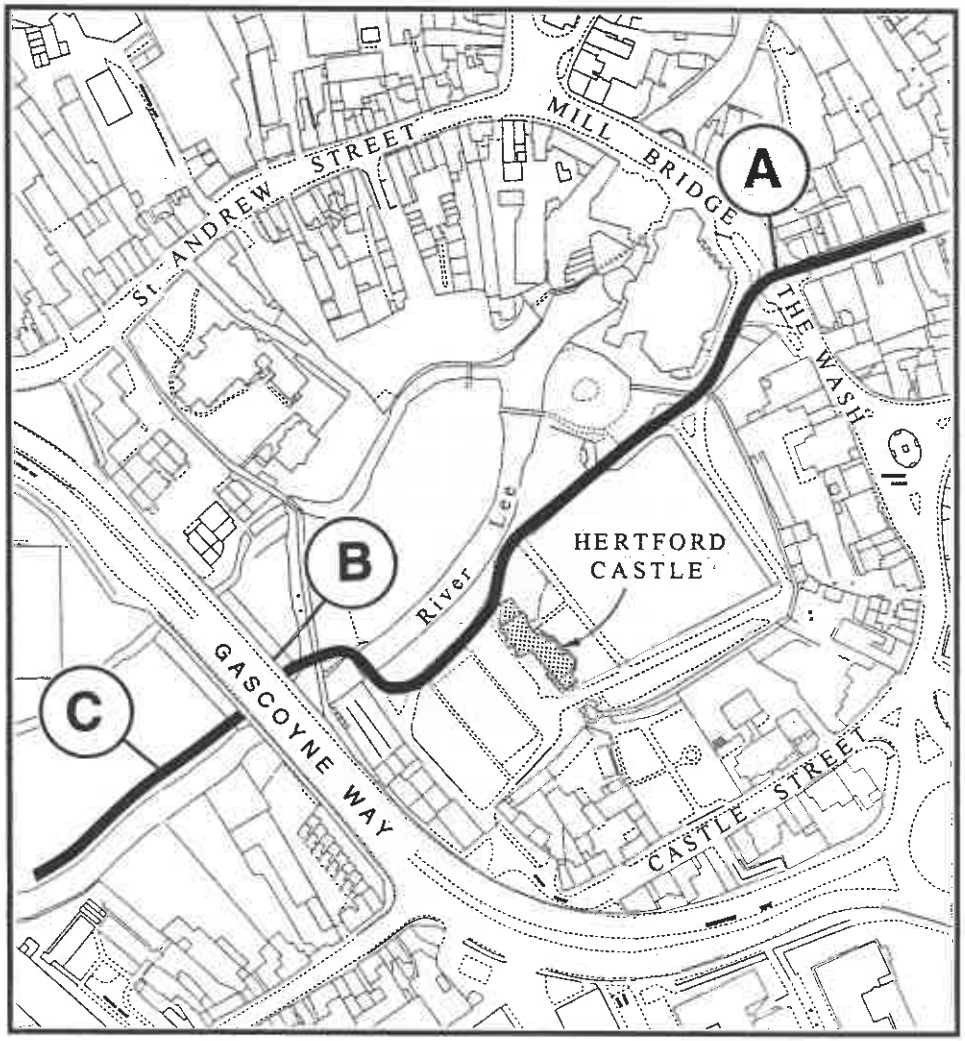
A. Cycle path starts at Pelican crossing by Castle Hall opposite Maidenhead Street and traverses grounds of Hertford Castle to leave by gate in north-west corner of grounds..

B. Cross Castle Bridges path and *construct new bridge over stream. Construct path under side span* of viaduct on A414 and *increase headroom by excavating to depth of 2m. Install pump for drainage.*

C. *Negotiate access and construct new path for 700m* across meadows in private ownership on north side of river.

D. Join Cole Green Way by the new bridge on the Mimram.





Link from Church Street and County Hall

E. From Fore Street, take Church Street and pass under Gascoyne Way by subway, which is too narrow for cyclists to ride. *Construct standard access control* at right angled bend at foot of ramp at southern end of subway.

F. A gentle climb up Queens Road and along Highfield Road. Apart from the large number of parked cars, these roads are generally quiet.

G. *Cross at splitter island* at junction of Bullocks Lane, Pegs Lane, Highfield Rd and Morgans Road. *Some extra traffic calming measures at this junction would be beneficial.*

H. *Shared use of broad footway for 100m* along north side of Bullocks Lane by County Hall.

J. *Reconstruct existing paths for 500m in total* through County Hall Woods round south and west side of Cricket Ground.

K. *Construct new path* down through meadows which form part of County Hall Woods, aligned to reduce gradient as far as possible and avoiding steps down onto West Street.

L. Follow existing road from West Street down to Football Ground.

M. Present end point of Cole Green Way.

Costings

Costings of the three components of this route are listed below.

Extension along old railway

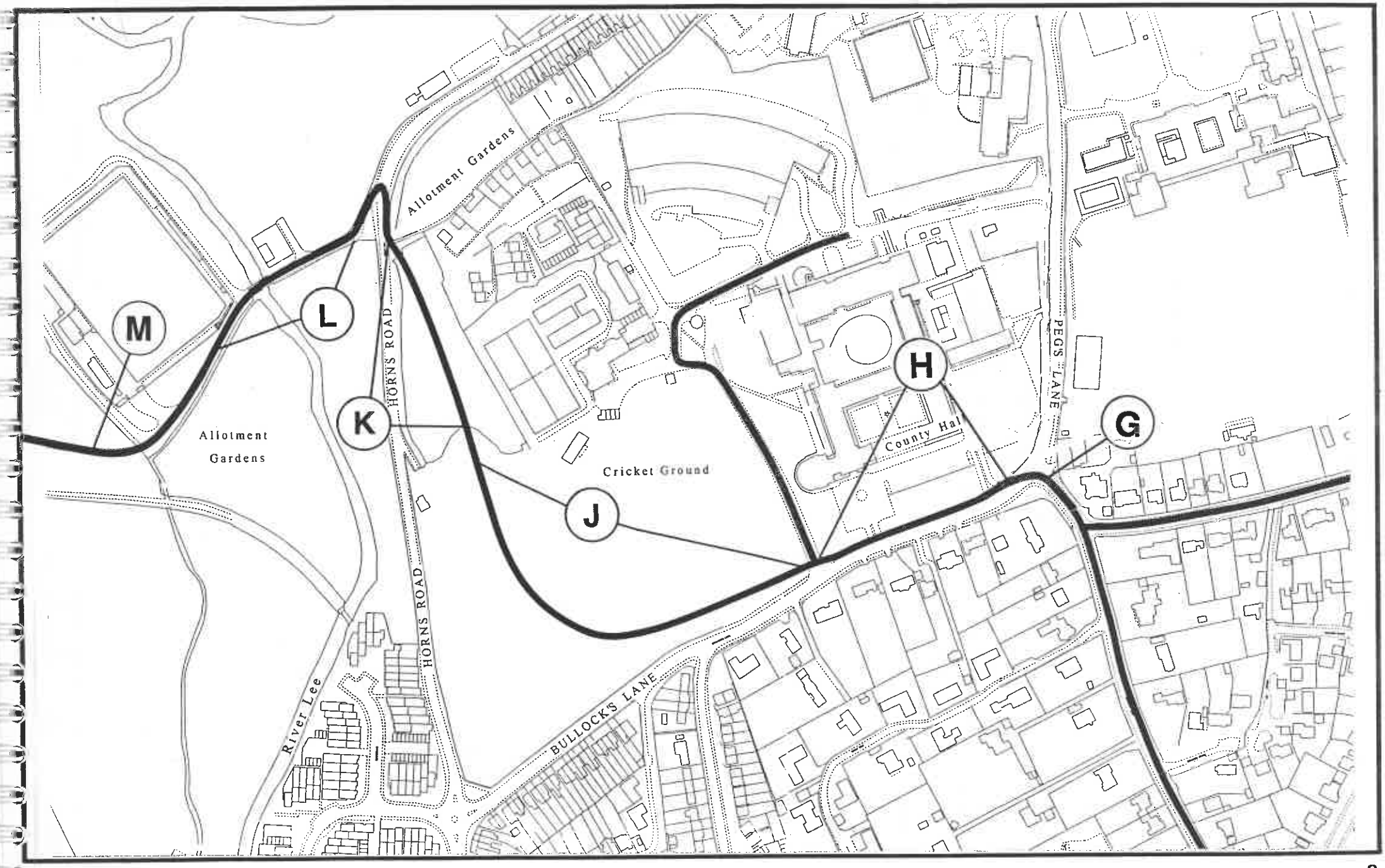
Works required	Qty	Unit cost	Total cost
New path construction	800m	20/m	16 000
Land acquisition	800m	4/m	3 200
Ramp construction	4	2 000	8 000
Footbridge	1	3 000	3 000
Signing	0.8 Km	1 000/Km	800
Total			**31 000**

Link from Castle

Works required	Qty	Unit cost	Total cost
New path construction	700m	20/m	14 000
Land acquisition	700m	4/m	2 800
Footbridge	1	3 000	3 000
Pump	1	2 000	2 000
Signing	1.0 Km	1 000/Km	1 000
Total			**23 000**

Link via County Hall

Works required	Qty	Unit cost	Total cost
New path construction	500m	20/m	10 000
Standard access control	1	500	500
Shared use of footway	100m	2/m	200
Signing	1.9 Km	1 000/Km	1 900
Total			**13 000**


M
L
K
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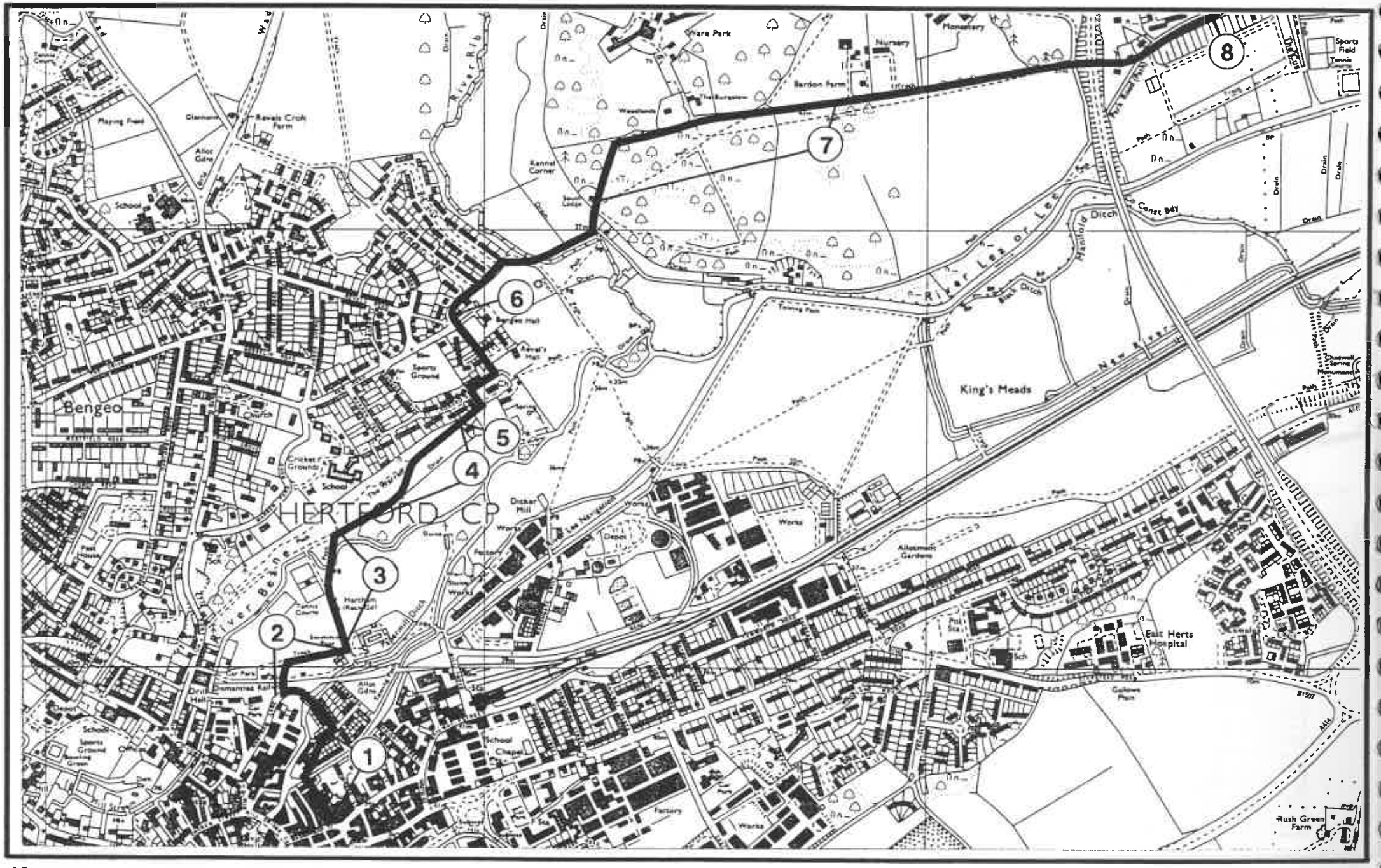
G
Allotment Gardens
Allotment Gardens
HORNS ROAD
HORNS ROAD
Cricket Ground
County Hal
PEGS LANE
River Lee
BULLOCKS LANE

Hertford and Ware Cycling Study

To St. Leonards and Park Road, Ware



Hertford Town Centre to St Leonards and Park Road, Ware

This route lies largely along existing traffic-free roads, has an attractive rural aspect and can be implemented for very little cost. Together with the towpath route, it makes a very pleasant circular ride.

1. Access from the town centre is along Bull Plain and the Folly into Thornton Street (see the description of the route to Bengeo).

2 Cross carpark. *Drop kerb required* to footway on northern side. Access to Hartham swimming pool.

3. Take narrow tarmac path across Hartham Common and cross stream by eastern of two bridges.

4. Turn right onto 2.5m tarmac road, completely traffic free which runs along the foot of the Warren.

5. A gate at the top of the road which some cyclists may find difficult. *Replace with standard access control.*

6. Follow Ware Park Road to foot of climb up to Ware Park.

7. At this point, the official right of way (a 'road used as public path') strikes off to the right and is largely overgrown. Further east this right of way is completely lost where it converges onto the farm road. *Negotiate right of way* along existing estate and farm road through to the bridge over the A10. *Provide standard access control* at the gate at Bardon Farm.

8. Route connects with the cycle routes in Ware at Trapstyle Road and Wengeo Lane.

Costings

Works required	Qty	Unit cost	Total cost
New drop kerb	1	500	500
Standard access control	2	500	1 000
Signing	3.3 Km	1 000/Km	3 300
Total			**5 000**

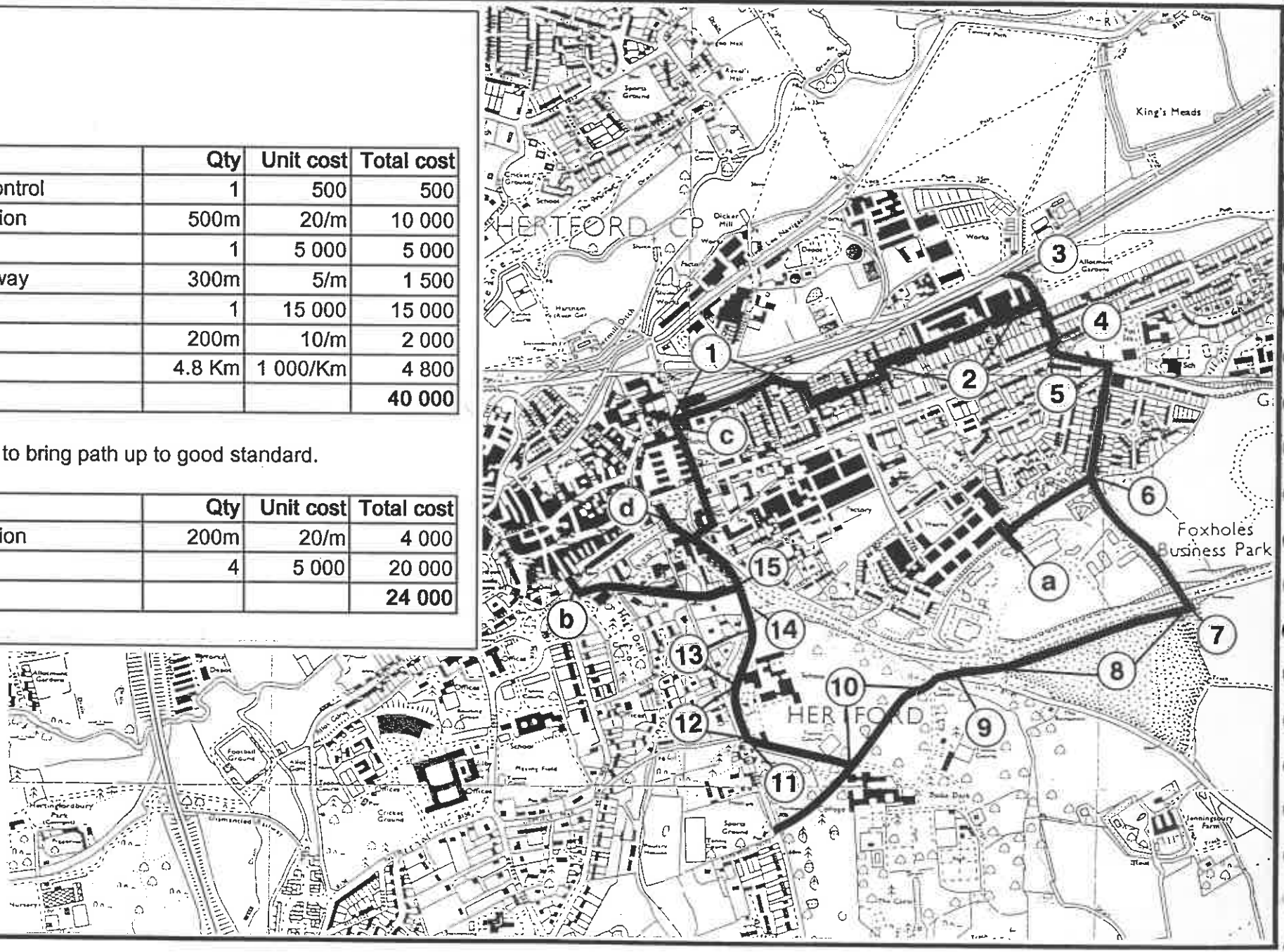
Costings

Essential work:

Works required	Qty	Unit cost	Total cost
Standard access control	1	500	500
New path construction	500m	20/m	10 000
Speed table	1	5 000	5 000
Shared use of footway	300m	5/m	1 500
Pelican crossing	1	15 000	15 000
Cycle lane	200m	10/m	2 000
Signing	4.8 Km	1 000/Km	4 800
Total			**40 000**

Extra work required to bring path up to good standard.

Works required	Qty	Unit cost	Total cost
New path construction	200m	20/m	4 000
Speed table	4	5 000	20 000
Total			**24 000**



Hertford Eastern Loop

A circular route connecting Hertford East Station, Ware Road, the eastern industrial estates, the University and Simon Balle School.

1. Route starts at Hertford East station. This section of Railway Street is dominated by car parking on the north side by rail travellers.

2. Talbot Street and Tamworth Road form a convenient alternative to Ware Road, and are quiet at normal times, but are inclined to get very busy when congestion on the Ware road is too bad at peak times. There is also a certain amount of commercial traffic destined for Tamworth Road. *Traffic calming required (speed table?) at Mill Road junction. The road should be raised to pavement level at all intersections along this route* to discourage through traffic.

3. From Mead Lane, access via foot level crossing to the Mead Lane Industrial Estate and the towing path route to Ware.
4. Cross by existing Pelican crossing just to west of Ware Road/ Stanstead Road junction.

5. *Shared use of footway for 100m* on south side of Stanstead Road. Drop kerbs already in place.

6. Continue along good path from head of Foxholes Avenue.
   a. Narrow 60cm informal path climbs hill to link up with Caxton Hill industrial estate and Foxholes Business Park. *Path needs reconstruction for 200m.*

7. Pass under A414 by broad subway.

8. *Construct new path for 500m* along edge of A414 over land restored from old gravel workings.

9. Cross old London Road (B1197) at splitter island.

10. Entrance to Balls Park and the University at Red Lodge. Members of the general public are not presently permitted to cycle in the Park. *Negotiate access for cyclists.*

11. One-way system. Southern gate is for exit, northern gate is for entry. *Provide contraflow cycle lane for 200m to northern gate.*

12. Way through to Simon Balle School, presently used informally as a short cut to/from the University. *Negotiate access for public use.*

13. *Shared use of footway for 200m.*

14. Use existing protected crossing with pavement widening at foot of Mangrove Lane to reach west side of Mangrove Lane.

15. At the far end of this loop, there are three branches:

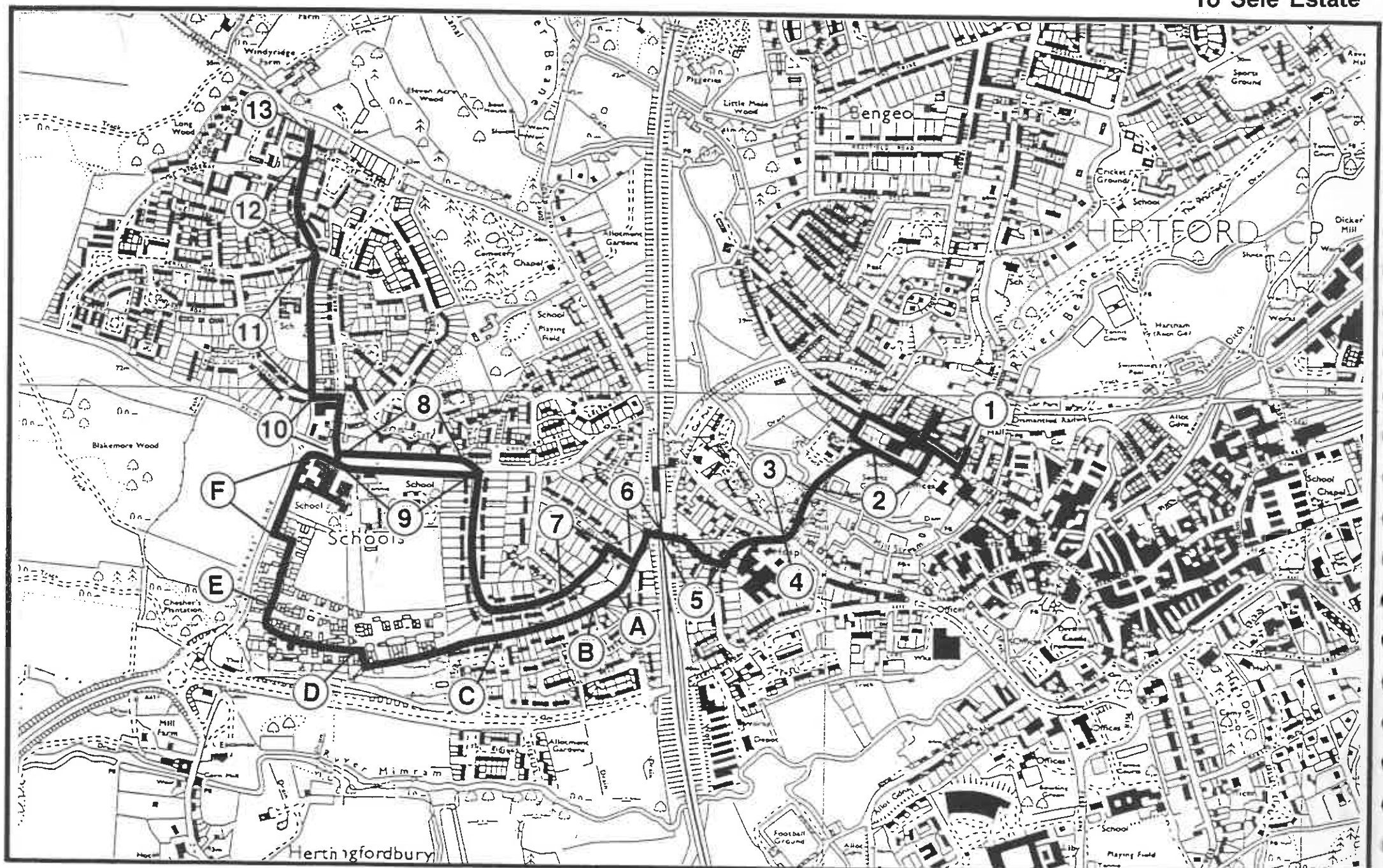
    b. Follow Church Path. Walk through Churchyard to access Church Street subway.

    c. Shared use of footway on west side of London Road to descend ramp to subway to Old London Road. This is 2.2m wide, which is wide enough for shared use, but is rendered unsuitable for cycling because of the right-angled bends at either end of the tunnel. *New Pelican crossing required* over Ware Road. *Traffic calming (speed table)* on Mill Road past Tesco's up to Hertford East Station.

    d. Western ramp up from Old London Road subway runs straight into ramp down to next subway. At 2.6m this is wider than the other subways, and although care is needed, the corner into the tunnel can be negotiated without dismounting. *Construct standard access control.* Ramp on northern side continues line of tunnel straight on up to east end of Fore Street.

Hertford and Ware Cycling Study

To Sele Estate



Hertford Town Centre to Sele Estate

At present, cyclists face considerable hazards reaching the western suburbs of the town. Opportunities are provided by the pending redevelopment of the McMullens sports field and Sele Mill sites. Safe routes to Sele School are included in these proposals.

1. Route starts from old railway via George Street or Port Hill.

2. Enter McMullens sports field either through the present entrance to the east of Mill Mead School or via McMullens depot to the west of the school. There are plans for residential housing on this field which include a riverside walk. It is important that a public route, suitable for cyclists is secured from Port Vale through to the river as part of any plans. *Construct new path for total of 150m.*

3. *Construct new bridge* over river and *continue new path* through Sele Mill which is now derelict. There are plans for redeveloping the Sele Mill site either for offices or for housing. *A public route through this site must be secured.*

4. Cross North Road at hospital by *new Pelican crossing* (or by *resiting Pelican crossing* west of Cross Lane) and go up hill to Sele Road (closed to motor traffic).

5. *Erect standard access* control at lower end of footpath (top end of Roystone Close) leading up to footbridge over railway. This should encourage cyclists to follow cul de sac off Sele Road, a better alternative which makes less use of narrow 1.2m footpath.

6. Cross footbridge 1.7m wide and turn sharp left into a 1.7m gravel path leading to the west. The path is narrow at this point and there is a blind bend which should be improved by *widening the path to 2.5m for 100m and cutting off the corner. Upgrade footpath status for this and the next section for approximately 300m to allow cycling.*

7. Turn up 2.1 m path head to Fordwich Hill and turn left along 1.7m path into Fordwich Rise.

8. Crossing of Welwyn Road by existing Pelican crossing and turn left along Welwyn Road. Existing footway can be *widened by use of very wide verge for 200m.*

9. Additionally, *construct new foot- and cycle-way* along verge on south side of Welwyn Road as far as Sele School. Provide *new Pelican crossing* over Welwyn Road to entrance to Sele School.

10. *Traffic calming (speed table?) required* at entrance to Windsor Drive. Large neighbourhood shopping centre at junction of Windsor Drive and Tudor Way.

11. Follow footpath section of Thieves Lane, with 1.5m tarmac. *Drop kerbs needed at each end. Upgrade footpath status to allow cycling.*

12. Upper end of Thieves Lane is quiet residential road.

13. Ramp for cyclists and pedestrians leads down on to Bramfield Road. Bramfield Road is not recommended as a route out of town because of the heavy lorry traffic up to the gravel pits on Tattle Hill.

Branch to Ladywood Road

From the rail footbridge, the path continues westwards, giving access off the side to Mount Road, Vale Side and Ladywood Road. From Ladywood Road, an alternative route runs up to Sele School.

A. An undulating 1.7m gravel path leads from the north end of the railway footbridge to the west. *Upgrade footpath status to allow cycling.*

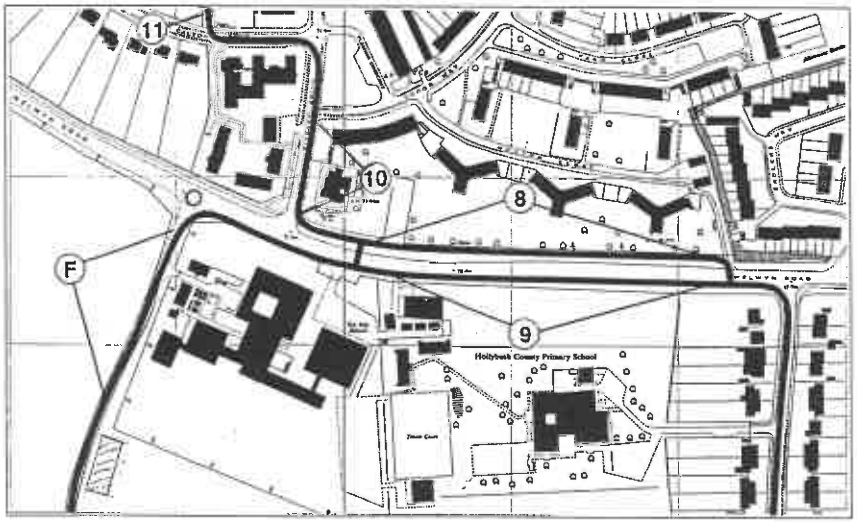
B. 1.4m path down into the top of Mount Road where a *ramp is required to replace 3 steps*.

C. *Replace 5 shallow steps with ramp* down to garages. Steep ramp then leads down to Vale Side.

D. Access at the western end of the path into the garage precinct off Ladywood Road.

E. *Shared use of footpath for 50m* through to Turpins Close .

F. *Shared use of footway for 20m* in front of houses on lower part of Thieves Lane. North of the houses, *path should be widened for 100m* by use of the verge. Access to Sele School from the south-west.



Costings

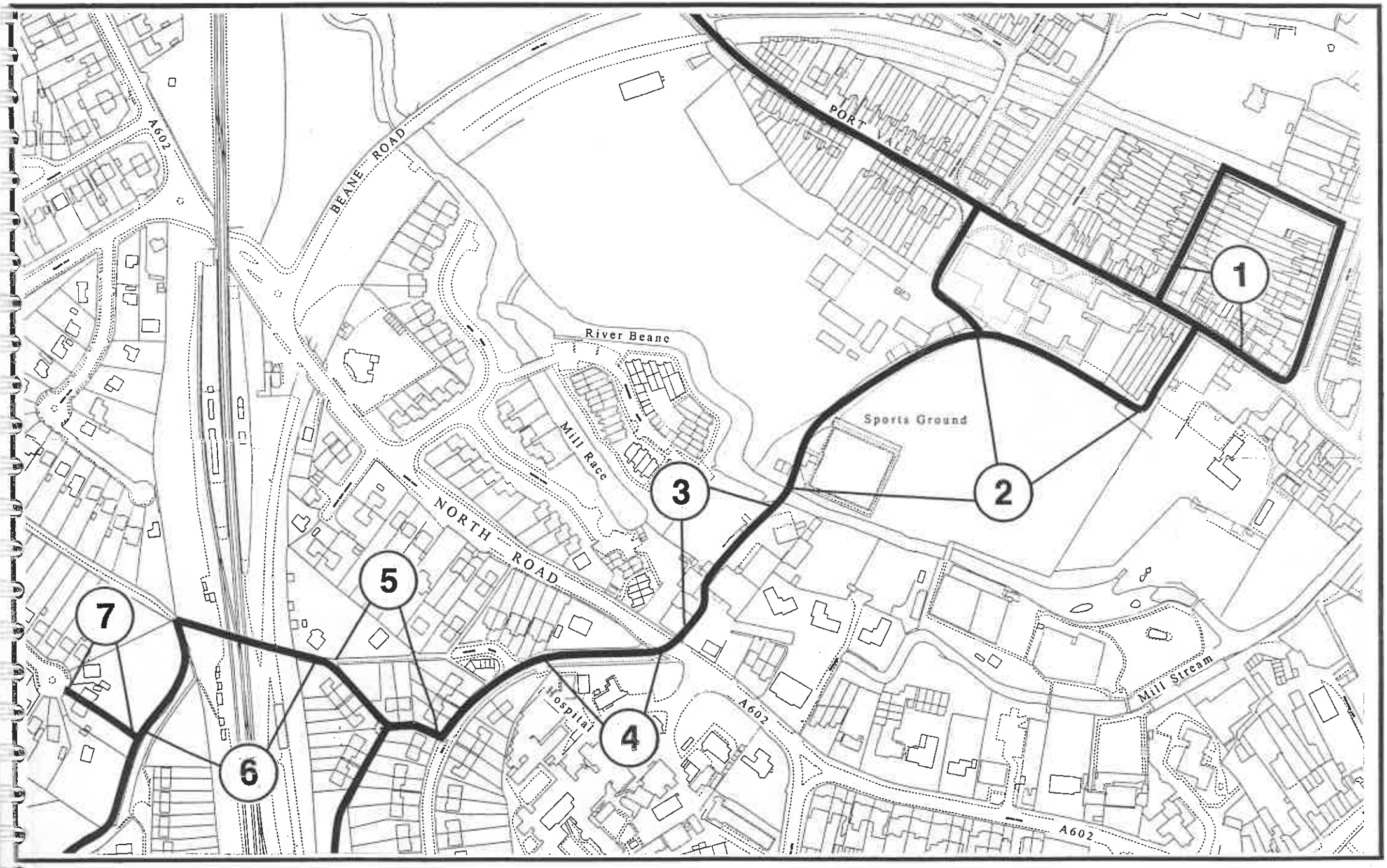
Essential work:

Works required	Qty	Unit cost	Total cost
New drop kerb	2	500	1 000
Standard access control	1	500	500
New path construction	150m	20/m	3 000
Path widening	500m	10/m	5 000
Speed table	1	5 000	5 000
Pelican crossing	1	15 000	15 000
Footbridge	10m	1 000/m	10 000
Shared use of footway	70m	2/m	140
Signing	3.8 Km	1 000/Km	3 800
Total			**43 000**

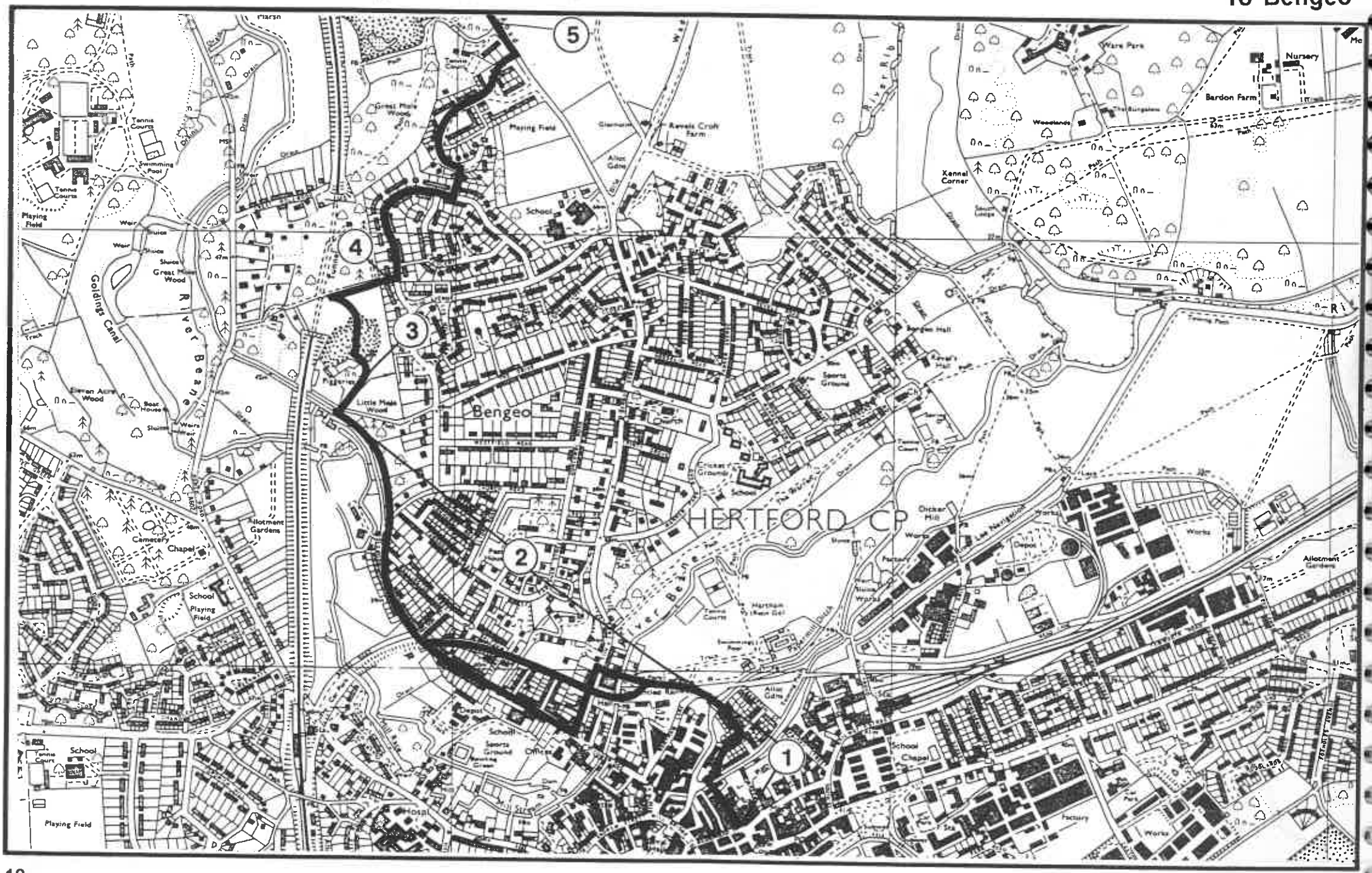
Extra work required to bring route up to high standard:

Works required	Qty	Unit cost	Total cost
Path widening	300m	10/m	3 000
Pelican crossing	1	15 000	15 000
Replace steps with ramp	2	150	300
Total			**19 000**

Hertford and Ware Cycling Study



Hertford and Ware Cycling Study



Hertford Town Centre to Bengeo

From the town centre, a route leads through Folly Island to join the primary route along the Lea valley up to Goldings. After following this primary route for a while, the route branches off to the upper part of west Bengeo. The main road to Bengeo via the B158 is very unsatisfactory. The old railway bridge and the hill on Port Hill both pose considerable dangers for cyclists, with steep gradients and inadequate footways; whilst Byde Street is little better.

1. The safest access from the town centre is along Bull Plain and the Folly into Thornton Street. The streets in Folly Island carry no through traffic and already include some mild traffic calming measures in the form of textured road surfaces on the bends. *Construct drop kerbs* to provide a clear run for cyclists through the road closure at the north end of Thornton Street.

2. From Hartham Common to Molewood Road, this route follows the primary route along the Lea valley and up to Goldings. See the description of that route for details. (The costings for this section are included here).

3. From Molewood pumping station, take track that climbs up to and through the old quarry. *Negotiate a right of way through the old quarry. Construct a good path for 300m.* The upper part of the quarry is steep and would need to be carefully designed to reduce the gradient.

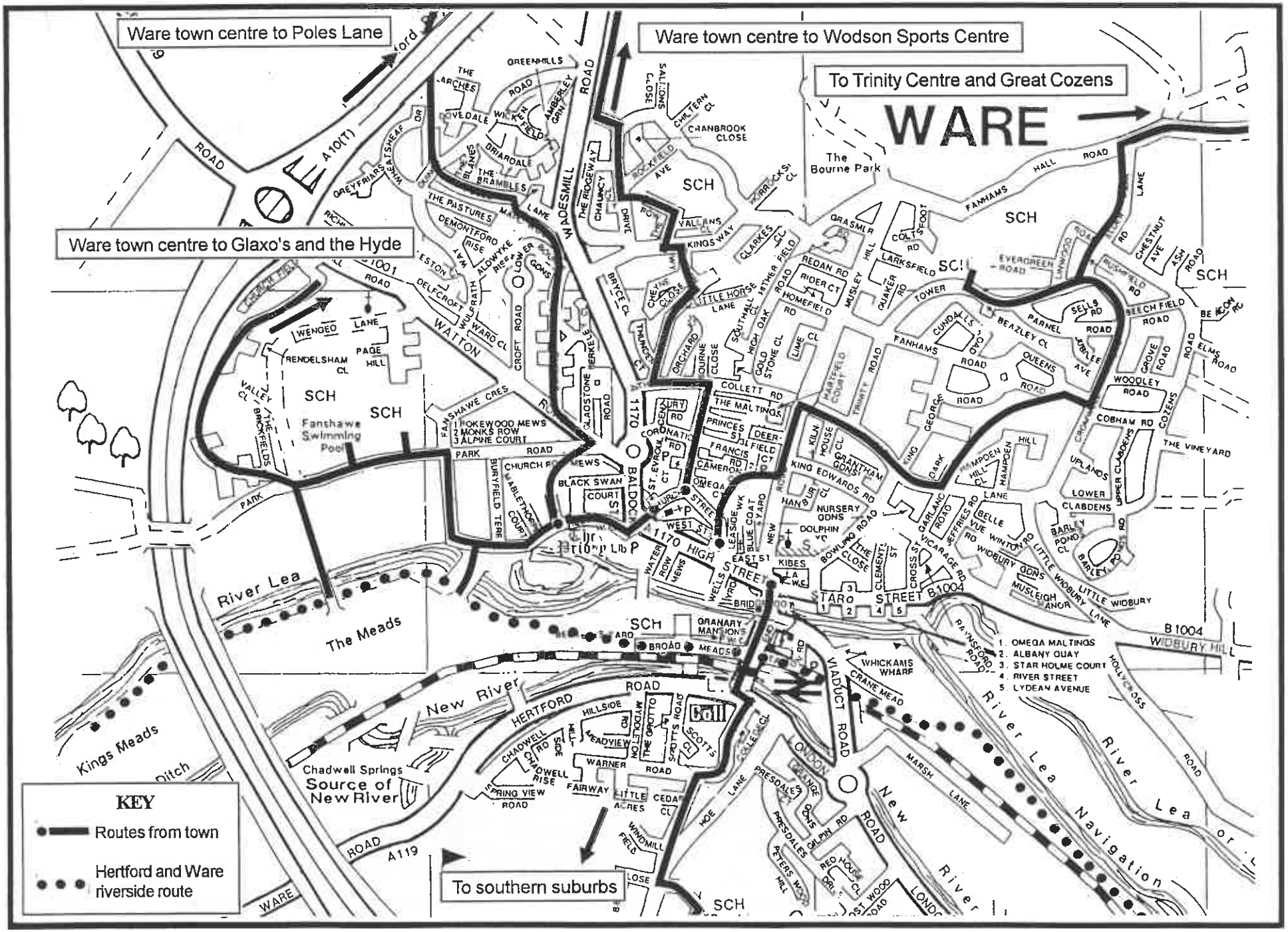
4. Go through path head into Cowper Crescent.

5. Onward connection via the Wick and the head of the cul-de-sac off the Wick to Saccombe Road.

Costings

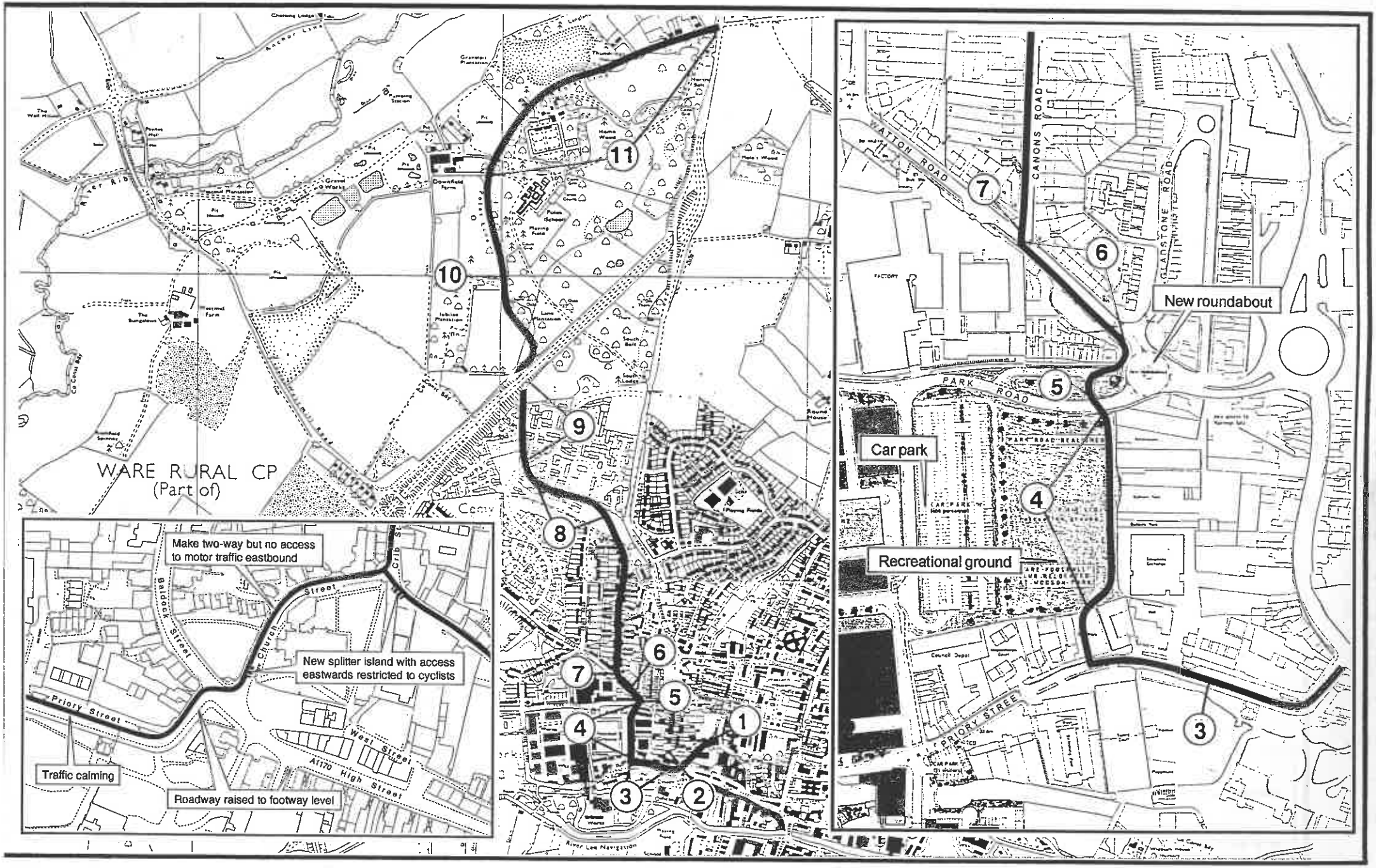
Works required	Qty	Unit cost	Total cost
New drop kerb	4	500	2 000
New path construction	350m	20/m	7 000
Land acquisition	300m	4/m	1 200
Speed table	- 2	5 000	10 000
Signing	1.4 Km	1 000/Km	1 400
Total			**22 000**

Map showing proposed routes in Ware



Hertford and Ware Cycling Study

Ware town centre to Poles Lane



Ware Town Centre to Poles Lane

This route provides access to the north-western part of the town and out to the country to the north.

1. Route starts from the junction of Crib Street and Church Street. *Make Church Street two-way, but with no access to motor traffic from the west for 100m.*

2. *Construct splitter island* at western end of Church Street. *Restrict access to east from Baldock Street/High Street for cyclists only. Raise level of west end of High Street to pavement level for 50m* to provide safe crossing point for cyclists from Church Street, the Library carpark and Priory Street, and to discourage through motor traffic from using the High Street.

3. *Traffic calming (speed table?)* along the lower end of Priory Street to discourage motor traffic for Glaxo's.

4. From carpark on north side of Priory Street, construction of a new path has already been offered by Glaxo's in return for planning consent for the construction of a multi-storey carpark on the site of the football ground on the west side of the Buryfields. *Ensure that the design of this path is cycle-friendly.*

5. *Protected crossing (pinch point?)* of Park Road. It is understood that planning approval has now been granted for the widening and realignment of the eastern end of Park Road and for the construction of a roundabout at the junction of Park Road and Watton Road. Cyclists turn right into service road at east end of Park Road, created by realignment of Park Road.

6. *Shared use of footway for 100m* in front of the New Rose and Crown and up the south side of Watton Road. This will enable cyclists to avoid the new roundabout planned for the Watton Rd/ Park Rd junction.

7. *New Pelican crossing* of Watton Road into Canons Road.

8. *Construct path for 100m* across public open space into Poles Lane. Poles Lane is 3m wide tarmac road with street lighting, which is almost completely traffic-free. It is the nearest thing Ware has at present to a purpose-built cycleway. *Erect access control* to prevent all except essential vehicles/owners vehicles.

9. Upper end of Poles Lane is 2m gravel path. Large subway at northern end leads to Downfield and Thundridge.

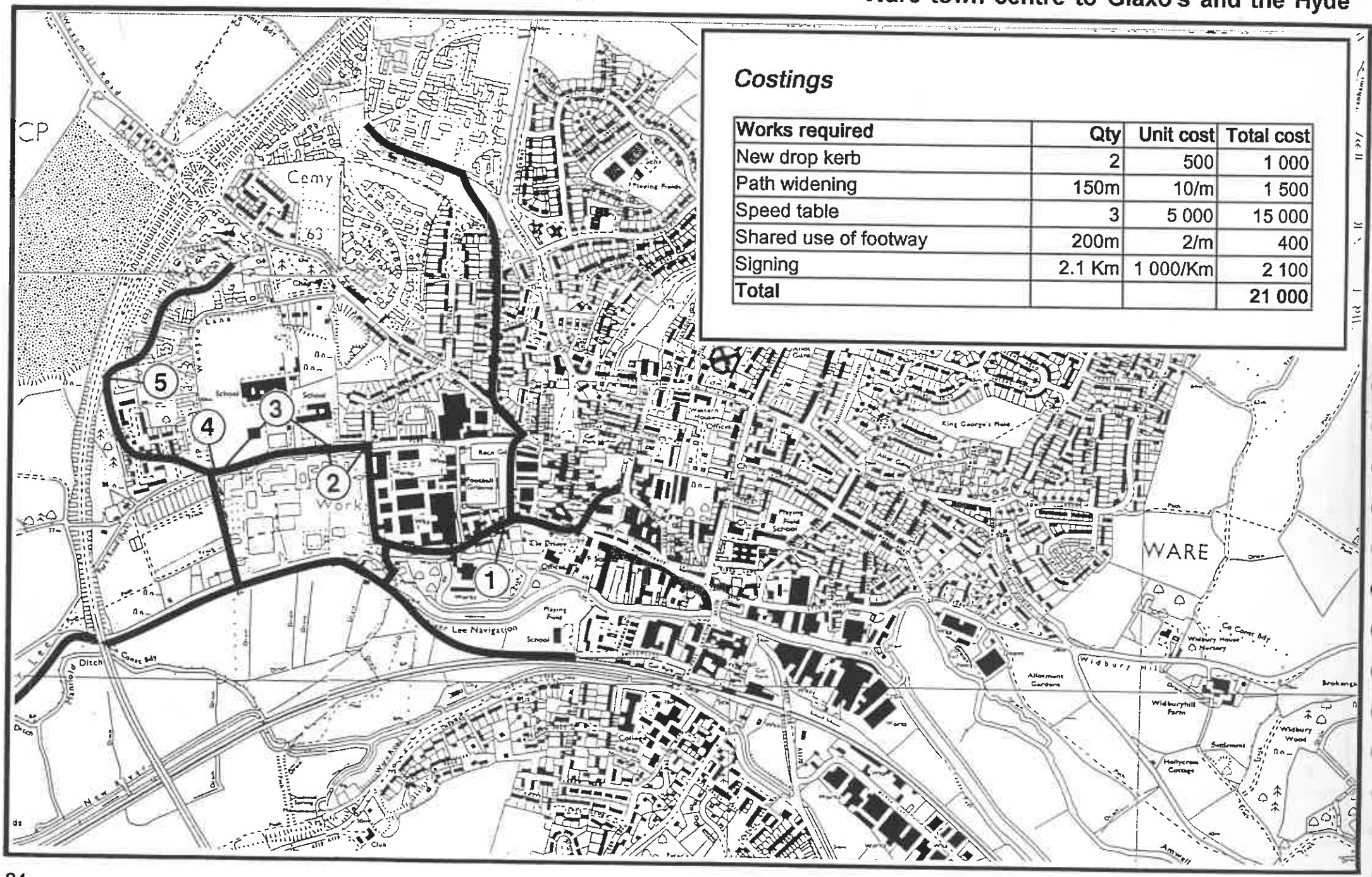
10. The lower lying parts of this path are badly drained and *need improved drainage and surfacing for 100m.*

11. Tarmac drive to the Sow and Pigs in Thundridge.

Costings

Works required	Qty	Unit cost	Total cost
Access control	1	1 000	1 000
New path construction	100m	20/m	2 000
Path maintenance and repair	100m	4/m	400
Shared use of footway	100m	2/m	200
Pelican crossing	1	15 000	15 000
Pinch point	1	8 000	8 000
Signing	3.1 Km	1 000/Km	3 100
Total			**30 000**

Ware town centre to Glaxo's and the Hyde



Costings

Works required	Qty	Unit cost	Total cost
New drop kerb	2	500	1 000
Path widening	150m	10/m	1 500
Speed table	3	5 000	15 000
Shared use of footway	200m	2/m	400
Signing	2.1 Km	1 000/Km	2 100
Total			**21 000**

Ware Town Centre to Glaxo's and The Hyde

This is an important route that gives access from the town centre to Glaxo's, by far the largest employer in Ware, and to Chauntsey's School. It continues on to the new suburbs alongside the A10 which are otherwise inaccessible except via the narrow upper reaches of Watton Road.

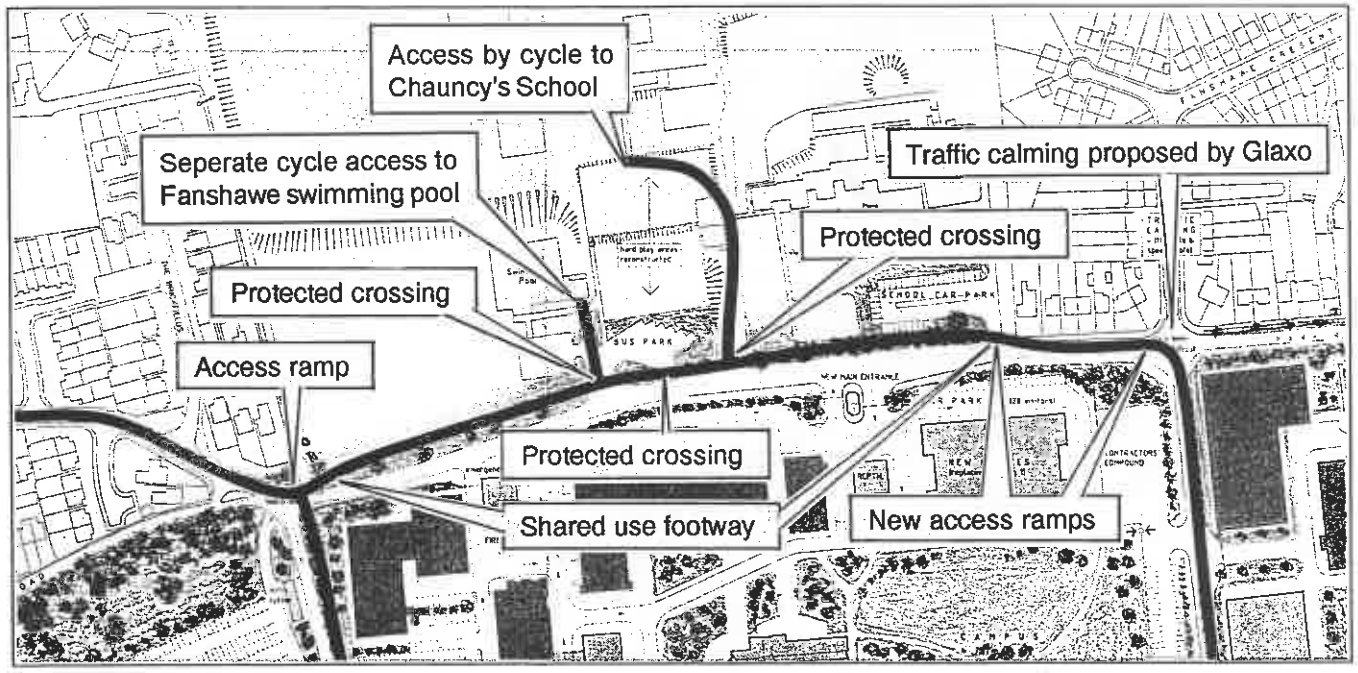
1. From the Poles's Lane route at Buryfields, continue along Priory Street and Harris Lane. Access to towpath route at Ware Lock.

2. *Traffic calming (speed table?) required* across Park Road immediately to west of proposed mini-roundabout at junction with Fanshawe Crescent. *Further traffic calming (speed table?) required* 50m further west at entrance to St.Catherine's School.

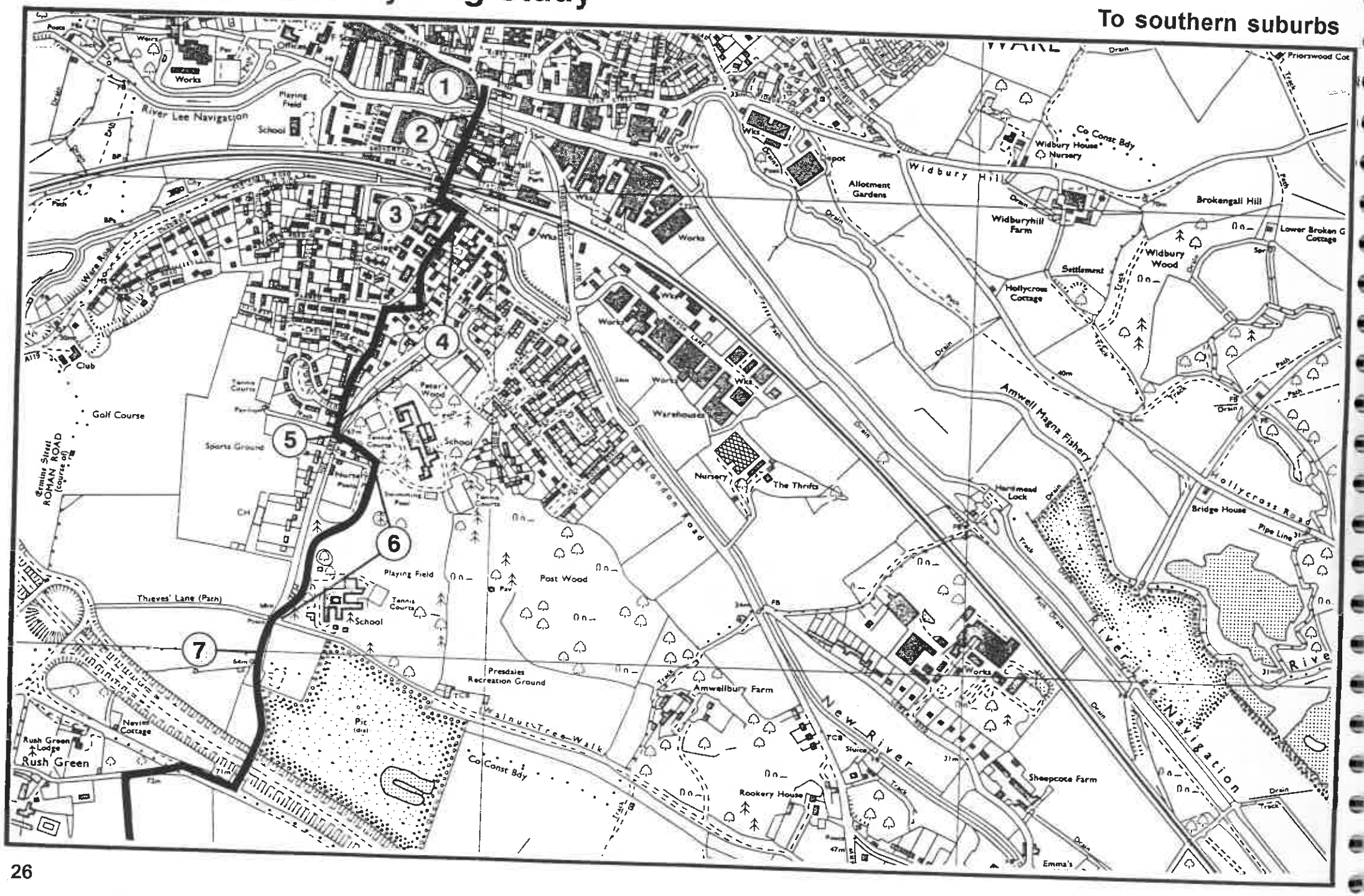
3. *Shared use of footway for 150m* on north side of Park Road. First 100m is separated from road by hedge. *Mark cycleway across entrance* to buspark at Chauntsey's School. To the west of the school entrance, *widen footway for shared use for 150m* by using part of wide verge.

4. *Traffic calming required (speed table?)* across Park Road at junction with Wengeo Lane and Trapstyle Road, and entrance to Glaxo's western carpark. Access by footpath down to new footbridge and towpath route. *Remove cycling prohibition* on this path.

5. *Shared use of 50m length of footpath* between head of Trapstyle Road and The Hyde. *Drop kerbs required* at either end.



Hertford and Ware Cycling Study



Ware Town Centre to southern suburbs

1. At present cyclists face considerable problems at the High Street/ Bridge Foot/Star Street roundabout. There is also a prohibition on right hand turns from Bridge Foot (Ware Bridge) into Amwell End. The traffic calming proposed for the town centre in another section will enable cyclists to reach the northern end of Amwell End safely.

2. The main hazard for cyclists in Amwell End is cars parked en echelon on west side of road. *Traffic calming (speed tables?) required* at either end of Amwell End. Access to station.

3. Cyclists should walk from southern end of Amwell End to the existing Pelican crossing to the east and then turn into Walton Road.

4. Walton Road provides a steep way up Presdales School, but is much safer than Hoe Lane. Access to back gate of Hertfordshire Regional College.

5. *Provide safe crossing (splitter island?)* at top of hill into drive into Presdales School.

6. *Negotiate permission for public* to follow road in school ground to Pinewood School to come back onto Hoe Lane at Walnut Tree Walk turn.

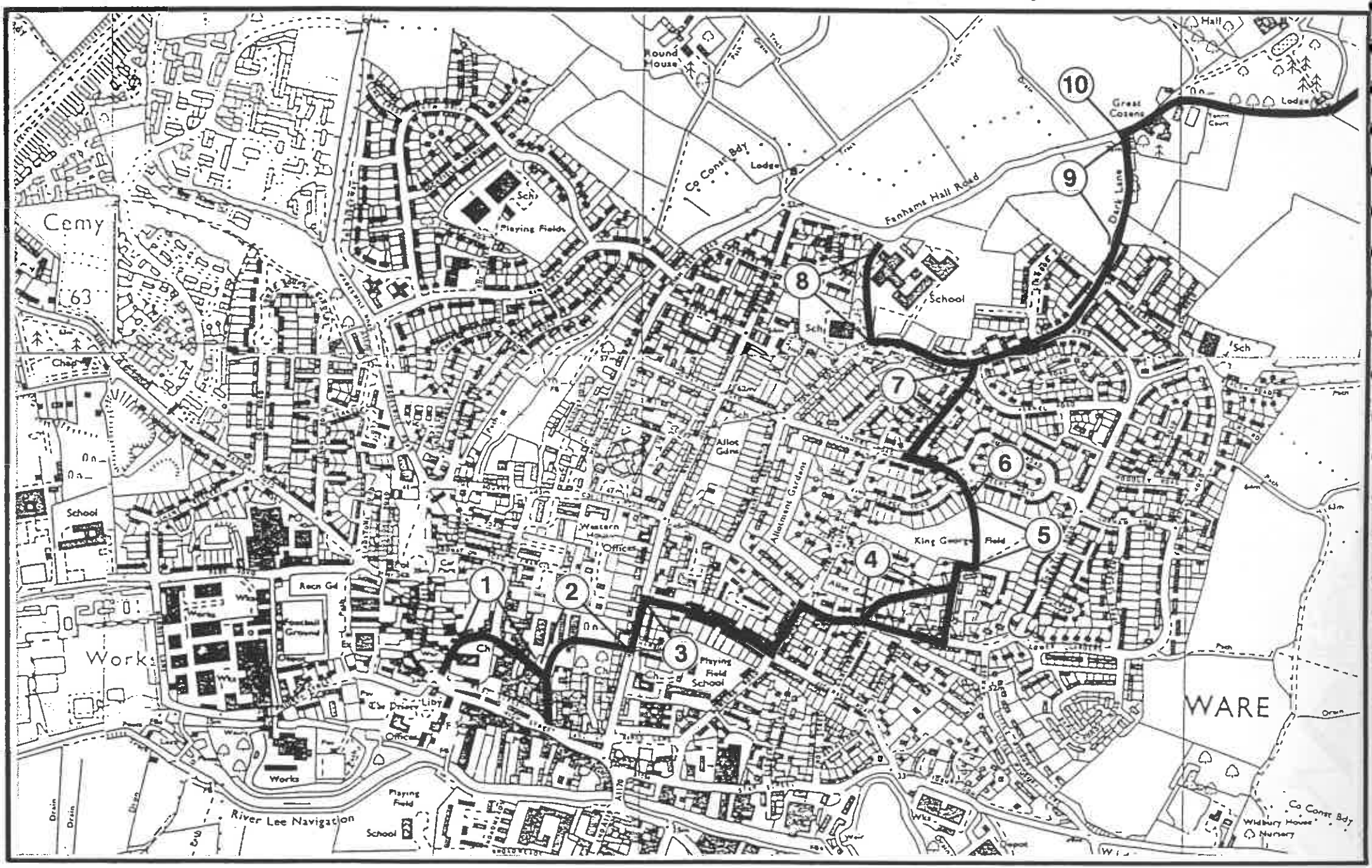
7. Out-of-town route to Hertford Heath.

Costings

Works required	Qty	Unit cost	Total cost
Speed table	2	5 000	10 000
Traffic island	1	4 000	4 000
Signing	1.1 Km	1 000/Km	1 100
Total			**15 000**

Hertford and Ware Cycling Study

To Trinity Centre and Great Cozens



Ware Town Centre to Trinity Centre and Great Cozens

This route provides a safe and attractive route out to the north-east corner of Ware. The fine views from King George Field are particularly noteworthy.

1. Church Street to be made two-way, but with no access for motor traffic from the western end, effected by a splitter island at the Church Street/Crib Street junction.

2. Leave Church Street via Tesco carpark and exit onto New Road. *Mark out cycle path* through car park.

3. *Traffic calming required (speed humps?)* along New Road for 100m.

4. Dark Lane is a steep gravel road, at least 2m wide. Narrows to footpath just at the top before entering Hampden Hill Close, but there is room between fence-lines to *widen path to 2m for 100m.* Whereas Dark Lane provides a gentler gradient for cyclists travelling north, cyclists coming in the opposite direction descend steeply onto Musley Lane and visibility is poor at this point. *Divert downhill cycle traffic* down Hampden Hill.

5. *Construct firm surface path for 100m* on line of faint path across King George's Field to the north. Fine views over Ware.

6. 2m tarmac path leaves field at northern edge into Queens Road.

7. Follow service road to garages, followed by 1.5m path through to Tower Road *(drop kerbs required).*

8. Access to Trinity Centre. *Construct and fence off path* along western edge of Trinity Centre (HCC owned) to provide permanent access through to Fanhams Hall Road.

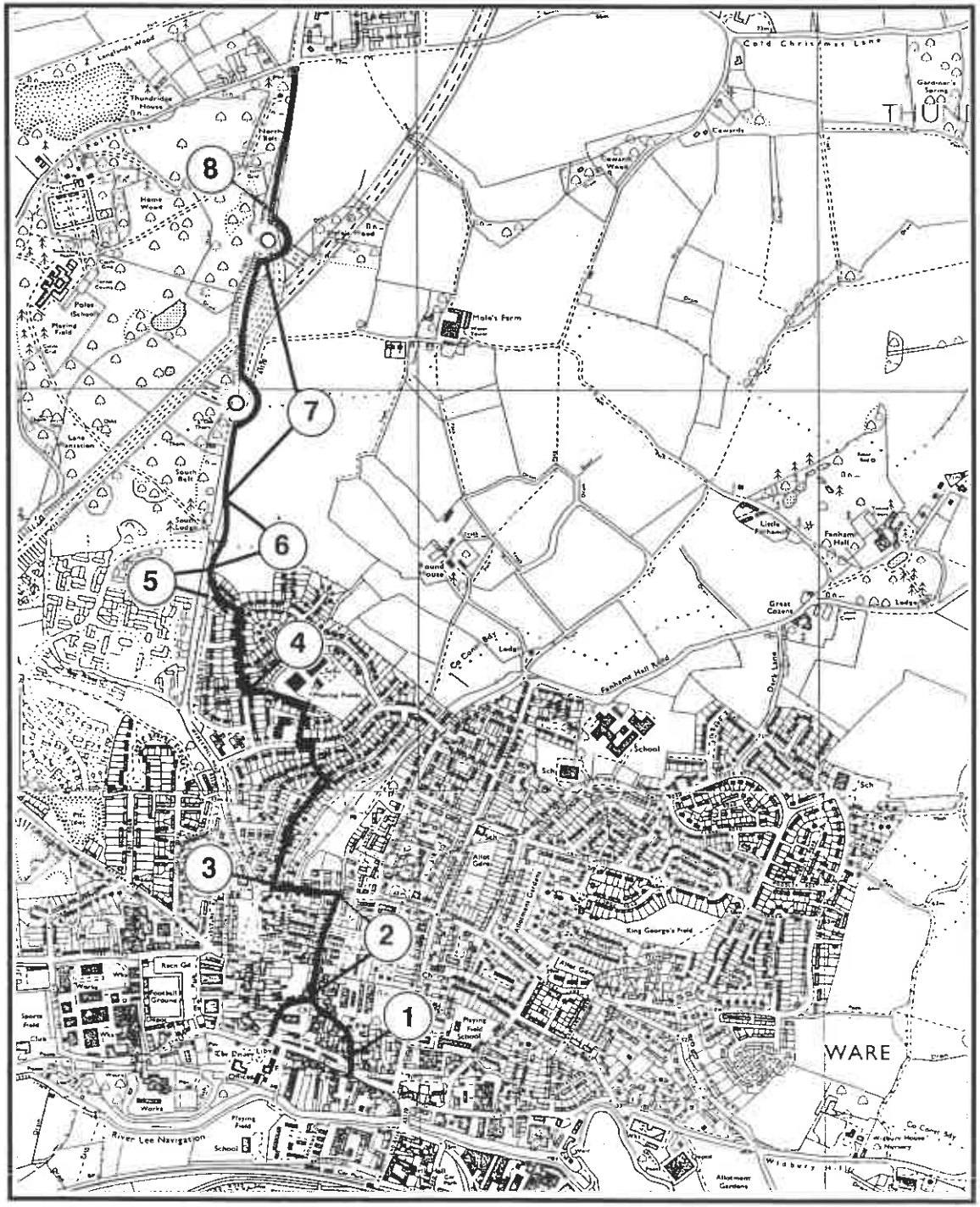
9. Dark Lane is only 1m wide, and needs to be *widened for 200m.* It is understood to carry bridleway status.

10. Reach Fanhams Hall Road at Great Cozens. This road provides a quiet country road route to Wareside.

Costings

Works required	Qty	Unit cost	Total cost
New drop kerb	2	500	1 000
New path construction	300m	20/m	6 000
Path widening	300m	10/m	3 000
Speed hump	2	1 000	2 000
Mark lane by two white lines	100m	1/m	100
Fencing	200m	6/m	1 200
Signing	2.8 Km	1 000/Km	2 800
Total			**16 000**

Map showing Ware town centre to Wodson Sports Centre



Ware Town Centre to Wodson Sports Centre and Thundridge

Lying on the edge of the town at the top of the steep and narrow hill on Wadesmill Road, the Wodson Sports Centre is extraordinarily difficult of access. It is only from the western suburbs via Quincy Road that this hill may be avoided. Anyone approaching from the town centre or the northern or eastern suburbs other than by car has a daunting task. The narrow footway is not encouraging for walkers and too narrow for cyclists. With the possible construction of a new football stadium on the site, the amount of traffic to the centre, and the problems for walkers and cyclists will only get worse.

1. Route starts from the junction of Crib Street and Church Street. *Make Church Street two-way, but with no access to motor traffic from the west. Construct splitter island* just east of junction. *Restrict access eastwards from Crib Street for cyclists only.*

2. Turn up Crib Street. Crib Street is narrow and takes some through traffic at busy times. *Traffic calming (speed table?) required* at the junction of Crib Street and The Bourne.

3. Turn into The Bourne. *Traffic calming (speed table?) required* at the junction of The Bourne and Milton Road to slow down traffic.

4. From the Kingsway shopping centre, route continues up The Green. 1.6m tarmac path through from Popes Row to Heath Drive with cycle chicanes at either end. *Construct drop kerbs* at either end.

5. From Heath Drive, turn into the Crest. *Construct new path for 50m* from the head of The Crest along top of bank above Wadesmill Road before turning into sports field. There is already a retaining wall at the foot of this bank

6. *Construct path along edge of field for 200m* as far as Wodson Sports Centre.

7. Continue along footway *(shared use for 1 000m)* along east side of A110. Road layout at the interchange is to change with construction of Wadesmill bypass. **It is understood that plans include drop kerbs and splitter islands** at the slip road to/from the northbound carriageway of the A10. The cycleway uses the footway on the east side of the existing bridge over the A10.

8. Leave footway to return to carriageway up to the Sow and Pigs in Thundridge. **It is understood that plans include drop kerbs and a splitter island** on the northern limb of Wadesmill Road just north of the northernmost of the two new roundabouts.

Costings

Works required	Qty	Unit cost	Total cost
New drop kerb	2	500	1 000
New path construction	250	20/m	5 000
Speed table	2	5 000	10 000
Shared use of footway	1 000m	2/m	2 000
Signing	2.5 Km	1 000/Km	2 500
Total			**21 000**

HERTFORD & WARE CYCLING STUDY

APPENDIX 9

On-Road Measures for Assisting Cyclists

Prepared for Hertford Civic Society, Hertfordshire County Council, East Hertfordshire District Council and Ware Town Council.

By Sustrans, 35 King Street, Bristol BS1 4DZ. February 1994

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Introduction

There is no standard work setting out how to design and build a comprehensive infrastructure for cyclists in Britain. Various authorities around the country have introduced a range of cycle paths and junctions to widely different standards. But these are extremely fragmentary and numerous urban areas have not one single facility.

A cycle-friendly policy is going to have to redress this. If cyclists are to be encouraged, then measures will have to be taken which provide them with safe and attractive routes, which make it clear to other travellers that cyclists are a valued method of transport positively encouraged by the authorities, and which take precedence over motorised traffic in the appropriate circumstances - particularly where a primary cycle route crosses a secondary road.

These notes review the principal documents published over the last 15 years and attempts to draw out their more salient points. These are set out in **Part 1**. **Part 2** then goes on to describe a series of positive on-road measures which will be an essential part of any cycle friendly strategy.

PART ONE : REVIEW OF PUBLICATIONS

1.1 Local Transport Note 1 / 78 : **WAYS OF HELPING CYCLISTS IN BUILT UP AREAS** was published by the *Department of Transport* in 1978. This note set out the problem of the vulnerability of cyclists and said that cyclists need to be protected over the whole of their route if possible. At that time the Department said that allowance should also be made for any trips which may be suppressed due to adverse conditions (1.9). This view itself was suppressed in subsequent statements from the Department which to this day is of the opinion that there is no evidence of suppressed demand. The rest of this note gave very rudimentary guidelines and as a consequence it led to few good routes on the ground. Paragraphs 1.4 - 1.6 though remain valid and are reproduced here.

1.4 **The problem**

There is no doubt that cyclists are vulnerable in traffic; 10.6% of all reported accidents in 1976 in built-up areas involved a pedal cyclist. In Great Britain the casualty rate per hundred million kilometres of travel in 1976 was 99 for all motor vehicle users, and 592 for pedal cyclists.(2) This latter figure was exceeded only by riders and passengers of two-wheeled motor vehicles, whose casualty rates for that year were respectively twice and three times as great as for pedal cyclists. Moreover, during the past ten years the casualty rate (per 100 million kilometres cycled) has increased by 23%. All casualties are a personal and social tragedy; but young casualties are particularly harrowing and, regrettably, some 43% of all cycle casualties in 1976 were in the age group 0/14 years, whilst an additional 17% were in the 15/19 age group.

1.5 A study of available statistics shows that the great majority of all cycling accidents occur in built-up areas and about half occur in peak hours. Although accidents occur throughout all routes used by cyclists, their greater vulnerability occurs at junctions, with "straight ahead" movements accounting for more casualties than left or right turns. There is no evidence of increased vulnerability at entrances to schools or factories.

1.6 Therefore cyclists need to be protected, if at all possible, over the whole of the route they use. The basic approach of segregated cycle routes is normally possible only in new towns or in areas of comprehensive redevelopment. The imaginative scheme in Stevenage is one example. Elsewhere, cyclists can be helped in a number of ways, eg. by providing cycle lanes on existing carriageways; by using lightly trafficked streets as cycle routes, or by providing signal-crossings. Clearly, what needs to be done will be dictated by the layout of the local streets and by the use made of the existing network. In some areas, particularly where the terrain is hilly, there are so few cyclists that special arrangements could hardly be justified - there will be claims of higher priority on the resources available. But in some towns -

particularly those with a flat terrain - cycling is important as a mode of transport; in certain towns for example at least as many people cycle to work as go by bus. In these and similar circumstances it behoves a local authority to treat cycling as an important mode when designing traffic management schemes. Often this will mean determining which routes are most used by cyclists and selecting those where something can be done immediately to help them. In this way an authority can improve the lot of cyclists step-by-step so that, in time, the town will have a network of safe cycle routes."

The hope in the last sentence remained a pious one. No positive support was given by the DoT either in policy or funding, and as a consequence no town has anything like a complete network with the possible exeption of one or two new towns. It did though lead to the Government's Consultation Paper on Cycling published in June 1981.

Many Government documents originate from the Department of Transport in London. They usually are applied to Wales, as well as England from the date of issue, but are usually only adopted by the Scottish office a few years later. Consequently not all the details shown in these notes are necessarily valid for Scotland yet.

1.2 **BICYCLE PLANNING: POLICY AND PRACTICE** (1982) by FoE Bicycles Campaigner *Mike Hudson and associates*. This was **the** reference for bicycle planning in the UK when published and there is still no substitute in terms of its comprehensive scope and high-quality presentation of the "Four E's" - **E**ngineering, **E**nforcement, **E**ducation and **E**ncouragement. It draws on international experience and sets out the way that a network of cycle routes should be planned, implemented, monitored and improved. It contains useful design criteria and traffic engineering details. Few local authorities have reached the general standards that it prescribes.

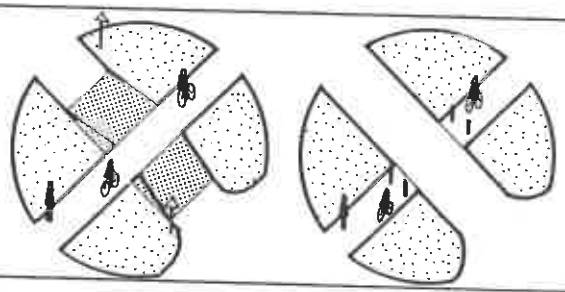
1.3 **SETTING THE WHEELS IN MOTION** - 1982, published by *Intermediate Technology Publications*, was one of a number of publications about this time designed to provide a more positive and practical approach for authorities which might want to put real schemes into practice. This report included "lessons from international experience" by Peter Trevelyan; a summary of discussions held at the School of Advanced Urban Planning in Bristol by Andy Holder; and examples of practical facilities in the UK by John Grimshaw of Sustrans. A page covering "road crossings" is reproduced overleaf.

1.4 In 1983, the *Institution of Highways & Transportation* produced their succinct guidelines - **PROVIDING FOR THE CYCLIST**. This was a very useful guide and cyclists hoped that it

Fig 1: Highway Crossings - Traffic engineering solutions. Sometimes the highway will have to be crossed at grade. Here are some options.

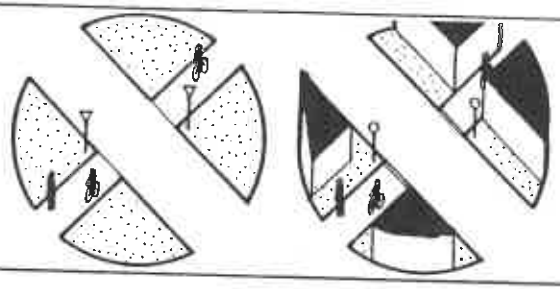
CROSSING MINOR ROADS

Driveways and minor access roads can cross a cycle path in an uncontrolled manner. At Stevenage and Milton Keynes the cyclist is warned of these crossings by simple posts in the line of the cycle path. It is better to also control the speed of vehicles by means of a chicane (narrowing of the road) or by raising the road level to meet that of the cyclepath (a form of sleeping policeman) as at South Fuzton : Milton Keynes Redway, where the vehicular flows are minimal.



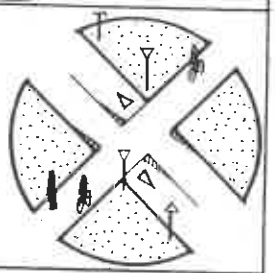
PRIORITY JUNCTION

A give way junction is suitable up to about 300 vph peak, where sightlines are good. A stop junction is suitable up to about 500 vph peak or where sightlines are poor.



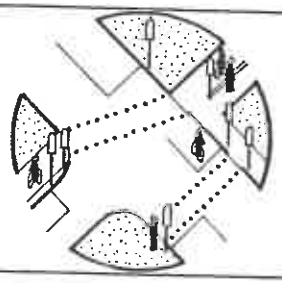
CHANGED PRIORITY JUNCTION

It is better to modify the priority of a road junction to allow the cyclepath (more usually an advisory route on a road) to have priority. Traffic on the minor road should be forced to appreciate this priority by means of an offset central island and a modified pavement line, so arranged that the minor road traffic cannot cross straight over.



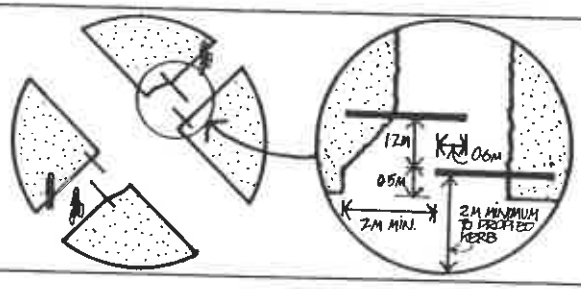
TRAFFIC LIGHT CONTROLLED CROSSINGS

The example shown here at Brickhill Drive, Bedford, shows how the cyclists are carefully separated from the pedestrians and shows how turning cyclists are stopped in turn at the pedestrian only lights that form part of the group.



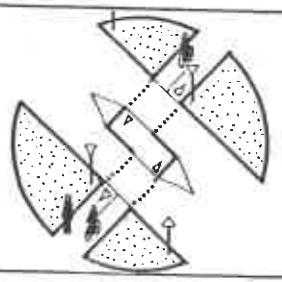
CHICANES

Where it is desirable to force the cyclists to stop, or at least to go very slow, as on the emergence of a cycle route on to a busy road or subway ramps, then chicanes can be used. They should be arranged so as to turn the cyclist towards the oncoming traffic.



BARRIER OR SHEEP PEN

This can be used to enable cyclists to cross a busy road in two stages by providing a refuge halt.



from "*Setting the Wheels in Motion*".

would become a standard for highway authorities throughout the country. In practice very few made use of it. Nonetheless many parts remained the best technical guide for a long time. For instance:

1.4 With Flow Cycle Lane

Where a heavily trafficked road is used by cyclists and it is not possible to create a cycle track in the verge or footway a cycle lane extending 1.5m from the kerb and defined by a broken hazard line (advisory) **Fig 2a** or a solid white line (mandatory) may be a suitable alternative and offer a degree of protection to cyclists **Fig 2b**. The decision to introduce this will depend upon the width of the carriageway and the condition of the edge of that carriageway. In favourable circumstances cycle lanes as narrow as 0.7m have been used. If the carriageway width is limited (under 7.3m) and vehicles would have to enter the cycle lane to pass vehicles in the other lane the advisory system is preferable but the cyclists are then less well protected. The mandatory system with a solid white line is advised even if some minor carriageway widening is required to leave sufficient width for other traffic.

Parking, unloading and loading should always be banned at least during peak hours and preferably during the working day (08.00 - 18.00 Mon - Sat). Careful attention must be paid to edge treatment, in particular gully gratings and channels. Signing

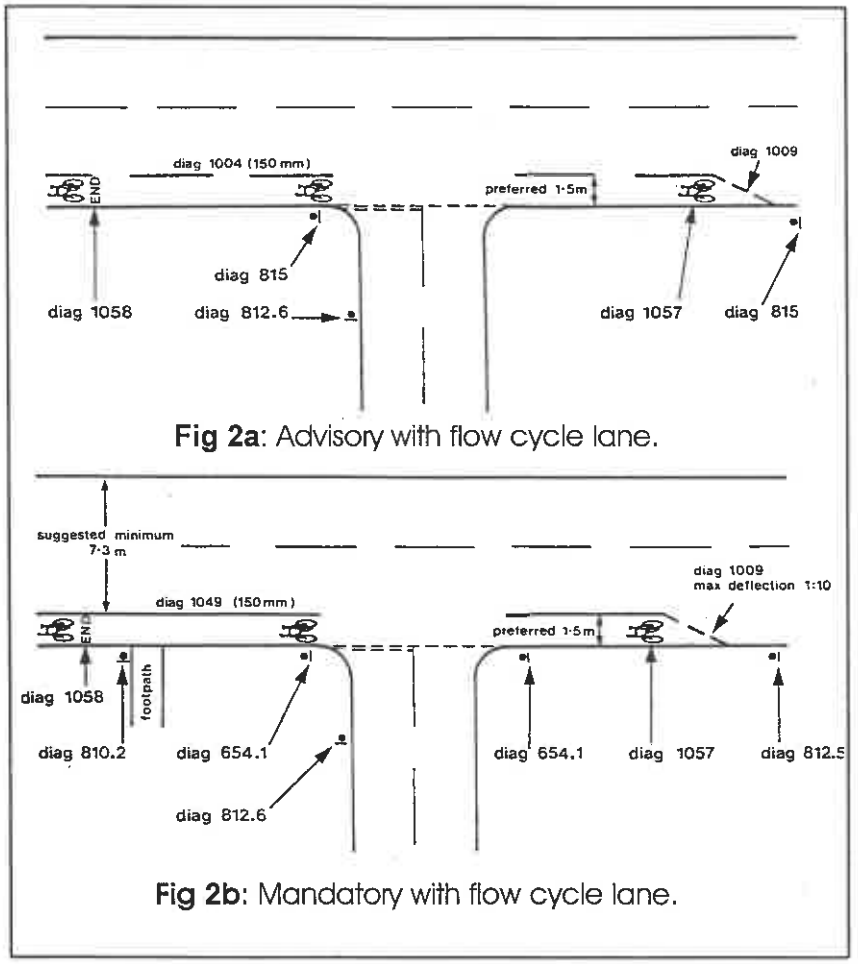


Fig 2a: Advisory with flow cycle lane.

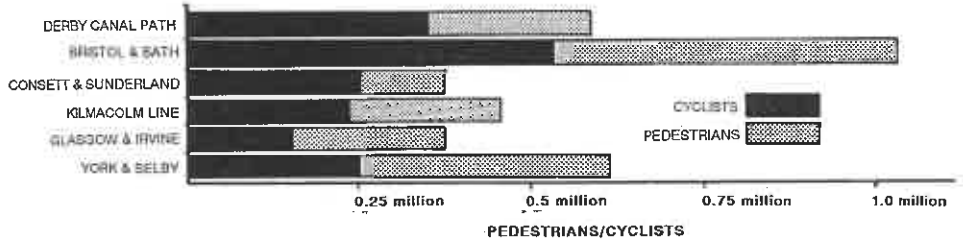
Fig 2b: Mandatory with flow cycle lane.

from "*Providing for the Cyclist*".

includes 812.5 advance warning for a with-flow cycle lane and at every intersection. Even if yellow lines are not provided the loading and unloading times should be indicated by signs and yellow kerb marks. Details are given in DEPARTMENT OF TRANSPORT (1978a). The lane is introduced legally by an order under Section 1, 6 or 9 of the Road Traffic Regulation Act 1967

Whilst this type of facility is a help to existing cyclists it gives little comfort to people who are afraid to cycle because of the danger from traffic because, crucially, it gives no protection at junctions and no continuity of route. The only place where this was being

Fig 3: Annual levels of use on various Sustrans paths, demonstrating the popularity of wholly cycle friendly routes.



achieved was on the off-road cycle routes being built by Sustrans and others. Here walkers and cyclists had priority over all other traffic and the use of these paths was correspondingly high.

This response served to demonstrate that there was a very large suppressed demand which could be realised if only good high quality, safe and attractive routes were built.

1.5 The *Department of Transport* then produced a series of **TRANSPORT RESEARCH LABORATORY REPORTS** and **TRAFFIC ADVISORY UNIT LEAFLETS** from 1985 to 1991. There were none in 1992 but 3 were brought out for the Velocity Conference in Nottingham in 1993. These notes dealt with individual demonstration schemes and devised solutions to shared use of subways, shared use of pelican crossings and other details. They form a very useful compendium of information for cycle practitioners to draw on, e.g. 1/86 & 2/87.

North of the Border the Scottish Development Department's 1/89 **CYCLING ADVICE NOTE** & 1/90 **MAKING WAY FOR THE CYCLIST** are both useful.

Again, for all their guidance, it is frustrating that these works did not lead to widespread real policies on the ground. For instance, 9/93 looked at **CYCLING IN PEDESTRIAN AREAS** and concluded "that observation revealed no real factors to justify excluding cyclists from pedestrianised areas", which suggested that cycling could be more widely permitted without detriment to pedestrians. However, cycling is routinely banned in virtually all pedestrianised areas which frequently force the cyclists to use major roads instead.

What is still lacking is the determination by the Transport Authorities to encourage cycling from the present low use in Britain of 2% of all trips, to something near the 20%, say, already achieved in Denmark.

One of the most useful of these advisory unit leaflets (1/87) must have slipped out inadvertantly. It was certainly before its time. **MEASURES TO CONTROL TRAFFIC FOR THE BENEFIT OF RESIDENTS, PEDESTRIANS AND CYCLISTS** sets out a whole range of traffic calming techniques for local streets which if widely promoted by the Department would do much to civilise our urban areas. A page is reproduced overleaf illustrating various measures with a careful attention to detail which would enormously improve general conditions for cyclists. The "Entry Treatment" feature has particular value for the continuity of walking and cycling routes across these minor road junctions.

1.6 **MAKING WAY FOR CYCLISTS,** Local Transport Note 1/89, published in June 1989 was the next optimistically titled publication from the *Department of Transport*. It gives advice on planning, design and legal aspects of providing for cyclists. This note supersedes all the previous guidance notes.

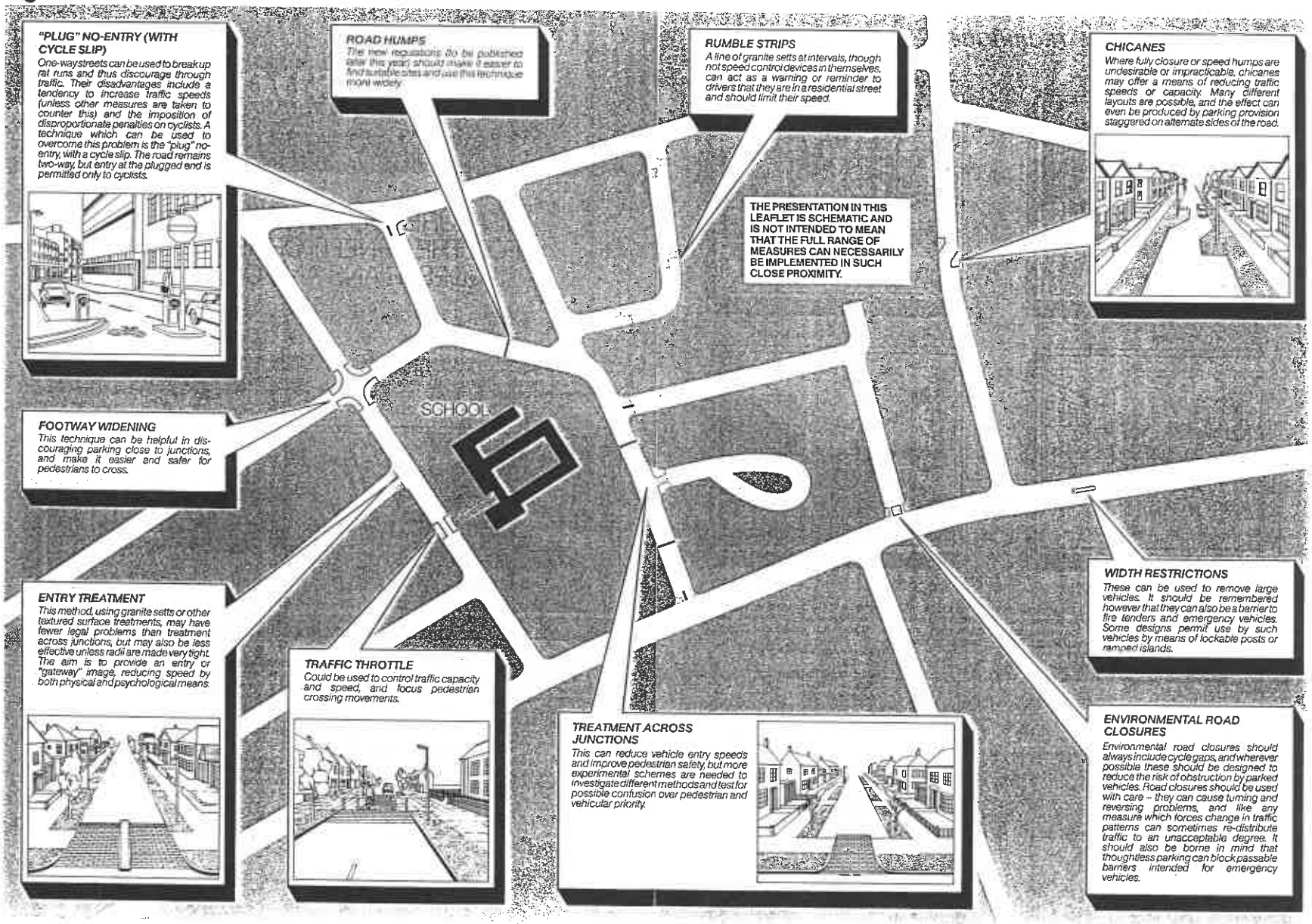
The notes restate that cyclists remain one of the most vulnerable groups of road users and confirms that the Department's main concern is to help make cycling safer. The Department considers that enhancing the safety of cycling may encourage more people to take up cycling, and existing cyclists to use their cycles more (2.3).

Although this is a welcome view and an acknowledgement of suppressed demand, this note remains simply a guidance note for those authorities which might wish to pursue cycling. It is a very brief document which simply restates accepted ideas and techniques and it falls far short of any technical manual setting cycling on a par with other modes of transport. Some local authorities have tackled this problem by publishing their own guidelines - for example Berkshire and Central Region.

1.7 **KILLING SPEED AND SAVING LIVES,** published in November 1992 sets out the Government's strategy for tackling excess speed on our roads. It suggests a speed of 20 mph as appropriate for urban areas and it indicates where this might be appropriate and how this might be achieved. These techniques of traffic calming are widely used on the Continent and have been applied with increasing frequency and success in Britain. Devon County Council published its own guide to traffic calming in 1991 and this remains a good standard reference.

Certain authorities have ongoing programmes of traffic calming and report good results in reducing accidents and making streets available again for residents use. For instance, both Leicester

Fig 4:


"PLUG" NO-ENTRY (WITH CYCLE SLIP)
One-way streets can be used to break up rat runs and thus discourage through traffic. Their disadvantages include a tendency to increase traffic speeds (unless other measures are taken to counter this) and the imposition of disproportionate penalties on cyclists. A technique which can be used to overcome this problem is the "plug" no-entry, with a cycle slip. The road remains two-way, but entry at the plugged end is permitted only to cyclists.
ROAD HUMPS
The new regulations to be published later this year should make it easier to find suitable sites and use this technique more widely.
RUMBLE STRIPS
A line of granite setts at intervals, though not speed control devices in themselves, can act as a warning or reminder to drivers that they are in a residential street and should limit their speed.
CHICANES
Where fully closure or speed humps are undesirable or impracticable, chicanes may offer a means of reducing traffic speeds or capacity. Many different layouts are possible, and the effect can even be produced by parking provision staggered on alternate sides of the road.
THE PRESENTATION IN THIS LEAFLET IS SCHEMATIC AND IS NOT INTENDED TO MEAN THAT THE FULL RANGE OF MEASURES CAN NECESSARILY BE IMPLEMENTED IN SCHOOL CLOSE PROXIMITY.
SCHOOL
FOOTWAY WIDENING
This technique can be helpful in discouraging parking close to junctions, and make it easier and safer for pedestrians to cross.
ENTRY TREATMENT
This method, using granite setts or other textured surface treatments, may have fewer legal problems than treatment across junctions, but may also be less effective unless radii are made very tight. The aim is to provide an entry or "gateway" image, reducing speed by both physical and psychological means.
TRAFFIC THROTTLE
Could be used to control traffic capacity and speed, and focus pedestrian crossing movements.
TREATMENT ACROSS JUNCTIONS
This can reduce vehicle entry speeds and improve pedestrian safety, but more experimental schemes are needed to investigate different methods and test for possible confusion over pedestrian and vehicular priority.
WIDTH RESTRICTIONS
These can be used to remove large vehicles. It should be remembered however that they can also be a barrier to fire tenders and emergency vehicles. Some designs permit use by such vehicles by means of lockable posts or ramped islands.
ENVIRONMENTAL ROAD CLOSURES
Environmental road closures should always include cycle gaps, and wherever possible these should be designed to reduce the risk of obstruction by parked vehicles. Road closures should be used with care – they can cause turning and reversing problems, and like any measure which forces change in traffic patterns can sometimes re-distribute traffic to an unacceptable degree. It should also be borne in mind that thoughtless parking can block passable barriers intended for emergency vehicles.
TAL 1/89.

and York report good progress.

In general, traffic calming has great potential for creating a situation suitable for cyclists. 20 mph may be a little too fast, especially when compared with the 20 kph debated in European circles. But in general the more the speed and the weight of the traffic can be reduced to nearer that of cyclists the more likely they are to flourish.

Care, though, should be taken to ensure that the traffic calming features are "cycle friendly". For instance road closures should always have gaps in them to allow cycles through, and speed humps and tables should be full width or have bypasses, rather than a narrow gutter for cyclists to get trapped in.

1.8 **THE BICYCLE AND CITY TRAFFIC** edited by Hugh McClintock in 1992 is a useful up-to-date reference. Whilst not a manual of cycling facilities, it describes a number of engineering measures such as advanced stop lines, cycle lanes and signal crossings for cyclists and the experience of implementing them in parts of Britain, continental Europe and the United States. Traffic calming as a means of helping cyclists is also covered.

The book provides a planning and political context to the business of promoting cycle routes and highlights some success stories, which will help less experienced local authorities. The quality of on-road facilities in the Netherlands and Denmark is in contrast with some of the inferior UK attempts - partly blamed on the DOT's "reluctance to allow the use of features common in cycle planning practice in (these) countries" (p114).

The book discusses the merits of on or off highway routes, cycle lanes and cycle facilities, and general traffic restraint.

It contains interesting debates on 'safety' issues, accidents, cycle culture and wider transport issues, with an important cautionary tale regarding the doubtful value of providing cycle facilities whilst letting traffic levels inexorably rise.

1.9 The definitive work published in English is the design manual for a cycle-friendly infrastructure published by the authorities in the Netherlands in August 1993. **SIGN UP FOR THE BIKE**, by CROW, sets out the philosophies of designing for the cycle in a pro-active way within a policy framework determined to give the cyclist priority over all other traffic in those areas where the encouragement of cycling is desired or fostered. We cannot summarise the whole of this weighty document here (300 plus pages), but the following pages draw out a few points which we consider will be helpful and useful to authorities wishing to encourage cycling in Britain.

The meaning of a bicycle-friendly policy is set out in some detail and can be summarised under five headings (p.24).

Coherence	The cycling-infrastructure forms a coherent unit and links with all departure points and destinations of cyclists.
Directness	The cycling-infrastructure continually offers the cyclist as direct a route as possible (so detours are kept to a minimum)
Attractiveness	The cycling-infrastructure is designed and fitted in the surroundings in such a way that cycling is attractive.
Safety	The cycling-infrastructure guarantees the road safety of cyclists and other road-users.
Comfort	The cycling-infrastructure enables a quick and comfortable flow of bicycle-traffic.

Each of the technical sections throughout the book is considered from these points of view.

Chapter 4 deals with the position of the cyclist with respect to traffic in considerable detail. The manual considers that "the volume of cycle-traffic here is not regarded as a factor which influences the necessity of a cycle-track. After all, danger on roads is not caused by cyclists. So the cycle-volume is not of any significance in the question of whether or not a cycle-track or cycle-lane is necessary. The cycle-volume does determine the urgency of a cycling-facility and the dimensions given to it". **Fig 5** looks at different speeds and volumes of motor vehicles to decide whether cycle lanes or tracks are appropriate.

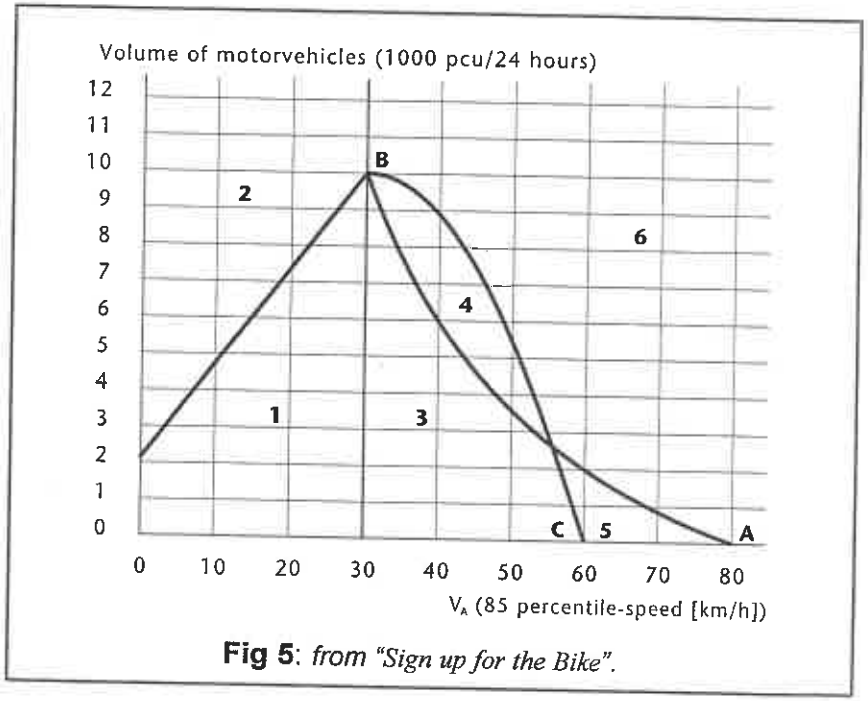


Fig 5: *from "Sign up for the Bike".*

Explanation of Fig. 5

N.B. The horizontal axis of the graph gives the actual speeds of motorized traffic and not the legally permitted speeds or the design speeds!

Area 1 If the V_{85} (85 percentile-speed) of motorized traffic is lower than 30 km/h, a mixed profile is generally to be recommended. Cycle-lanes or cycle-tracks can possibly still be constructed for the sake of subjective safety or the continuity of the cycling-network. No cycle-tracks or cycle-lanes should be constructed within a 30 km/h-zone.

Area 2 Combinations of very low speeds and very high volumes hardly ever occur. Pronouncements about cycling-situations in this area are therefore of no relevance.

Area 3 In general, a road without cycle-lanes or cycle-tracks is acceptable. However, they may still be desirable, depending on other road and traffic features (RONA road-category VII and VIII, design speed 60km/h; this is not equal to V85).

Area 4 A cycle-lane or cycle-track is desirable.

Area 5 A cycle-track is desirable, but motorised traffic volumes are so low that a road of mixed profile is also acceptable. Cycle-lanes are not be recommended.

Area 6 At these high speeds and motorized traffic volumes, cycle-tracks are always necessary.

The graph does not give a definite answer in all cases to the desired measure of separation. What the best solution is, often also depends on other factors. A few rules of thumb which can be given are:

- With a parking pressure of higher than 85%, cycle-lanes are not to be recommended. This means that during peak times (eg. late-night shopping) a minimum of 85% of parking-spaces are occupied. The chance of a cycle-lane being misused as a parking-lane is too great (double parking).
- A cycle-track or a cycle-lane can sometimes increase the continuity and recognizability of a cycle-route.
- On a road with a lot of important side-roads (volume of more than 1500 motor-vehicles per 24-hour period) a cycle-track loses some of its benefit: the comfort of interrupted

cycling is nullified through cyclists having to be alert at too many successive intersections. This does not apply of course when crossing small residential streets (volumes lower than 500 vehicles per 24-hour period), and certainly not if these open out onto a cycle-track with an exit construction. With volumes of between 500 and 1500 motor-vehicles per 24-hour period the local situation will be of great significance.

- With partial one-way traffic it is more desirable to have a - preferably physical - separation of oncoming cyclists than in other situations.

- On a road with trams, physical separation is usually desirable.

When it appears from the graph that the combination of speed and volume of motorized traffic leaves open various possibilities, the above mentioned considerations lead to physical separation being applied earlier on through cycle-routes. On the other hand, the choice on access cycle-routes will more quickly fall in favour of a mixed profile, to ensure that all desinations along the route have optimum accessibility.

This sort of analysis is not available in any British publication, probably because its findings would be largely academic in the absence of a policy determined to provide for cyclists.

Chapter 6 deals with junctions and notes that:

> A policy aimed at the promotion of bicycle-use, achieves most success by taking the slogan **right of way for bicycles** literally. If cyclists are given right of way, this will mean a minimization of waiting-times and increase in the chance of continuance and so a higher average travelling speed.
>
> In addition a considerable benefit is gained in comfort, because less energy is expended and the task of riding of cyclists is simplified.
>
> Removal of the right of way for cyclists leads to a greater complexity of riding task. The responsibility for avoiding conflicts lies completely with the cyclist. An accident is then always the fault of the cyclist.

This crucial question of continuity is also addressed in detail at the crossing of side roads and minor roads, where the primary cycle route is given priority over the secondary motor vehicle road. Without such a distinction, all such cycle routes in Britain suffer from discontinuities and consequently low levels of use.

Rights of way on through cycle-routes

Through cycle-routes should always have the status of a major road. The same considerations are associated with this as with the designation of a road for motorized traffic as major road. If the cycle-route coincides with a major road for motorized traffic there is no objection at all to letting cyclists benefit from the right of way. This also applies to cycle-tracks which are ridden in both directions, if the design is attuned to this.

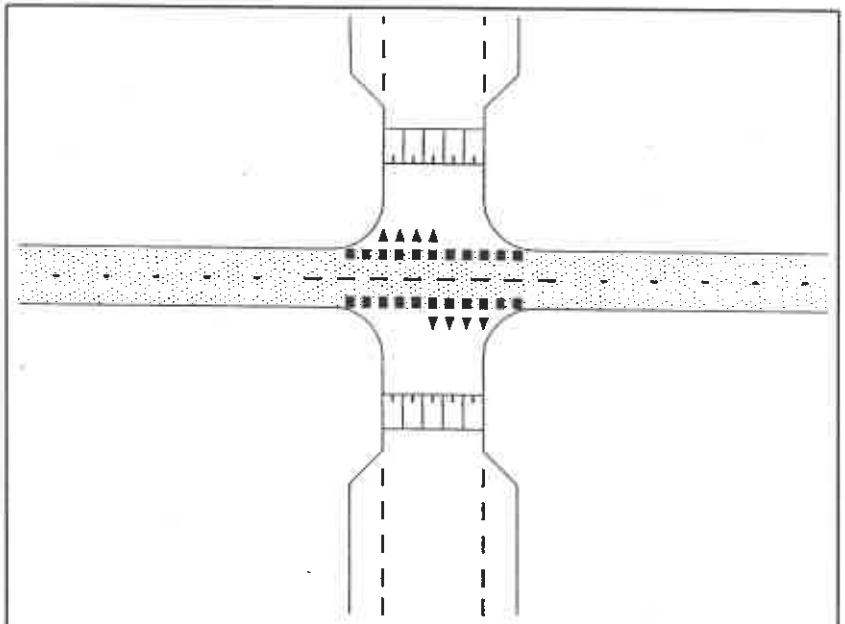


Fig 6: Cycle route with Right of Way over crossing road

from "Sign up for the Bike".

If a through cycle-route with its own alignment crosses a road for mixed traffic, then in principle this cycle-route should be given right of way; certainly if the volume of cycle-traffic is substantially greater than the volume of traffic on the road to be crossed and if it is obvious to road-users that the cycle-route is more important than the crossed road. This inequality can be emphasized in the design, for example by application of speed inhibitors for motorized traffic.

Within built-up areas, cycle-tracks with their own alignment may be given right of way over crossing traffic (without speed-limiting measures), when the rod concerned has a limited function and a maximum peak-hour volume of 250 mvl/hour at low speeds (V_{85} = 30km/h).

In situations where V_{85} lies between 30 and 50km/h, the speed of motorized traffic can be reduced by use of speed-limiting measures. Preference is given here to speed-control humps positioned at the bicycle-crossing. This solution is applicable on roads with a moderate traffic function and a peak-hour volume of 400 to 600 mvl/hour. With higher traffic speeds on the road to

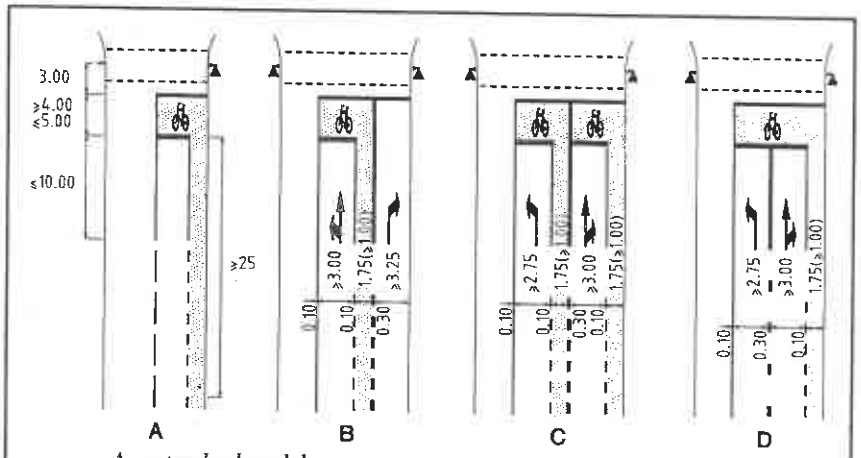
be crossed, bicycle-traffic can no longer force a right of way.

For situations outside the built-up area a limiting value of approximately 275 to 300 mvl/hour is applicable. Right of way for bicycles on isolated bicycle-crossing places outside the built-up area, is only to be applied if the speed of crossing traffic can be sufficiently lowered (e.g. on country-roads in recreational areas.

Further on in the same chapter we come to advance stop lines (page 179) a feature beginning to appear in British towns. **Fig 7** opposite shows various combinations. These advanced stop lines are very useful from the point of view of road safety : particularly with regard to the ease of crossing and the surveyability of the junction. In Britain they have the added advantage of making a positive statement about cyclists.

Other aspects of the manual deal with cycle surfaces, with traffic calmed areas, with storage, furnishing cycle routes and a long section of temporary measures to be taken during road works.

Whilst this manual is thoroughly practical in a detailed way, the fundamental difference to anything published here is its certainty within the scheme of things in the Netherlands. By contrast we can only look and hope!



A = standard model
B = right-turning model
C = left-turning model
D = left-turning model without a separate green phase

Fig 7: Expanded bicycle streaming lanes, or ASL's

from "Sign up for the Bike".

1.10 TAKING CYCLING SERIOUSLY 1993. *ACC/ASC/AMA* Joint policy statement from the local government associations, which states that: 'Cycling should be treated as an important transport mode'. Discusses two basic principles of cycle planning, funding, general design issues, and the need for an overall strategic approach to cycling. The publication urges its member Councils to 'make up the gap' between British and Continental levels of cycle provision.

PART TWO - DESCRIPTION OF ON-ROAD MEASURES

This handbook is not a manual. It does not attempt to cover every cycling facility or traffic management technique. The measures described here are the basic elements of successful cycle routes in England and elsewhere. They are tried and tested, not experimental. They give cyclists priority over motor vehicles - or at least equal priority. To address decades of neglect and positively harmful traffic measures, priority for cyclists is now essential to achieve the 20% cycling target and reduce the impact of the motor car on our lives and environment.

The measures described in the following pages will need to be combined in various ways to create high quality routes of real use to the individual who cycles. It is the quality of these component parts which will determine the quality, and thus the usefulness and popularity, of the whole.

2.1 DROPPED KERBS

Dropped kerbs are amongst the cheapest and simplest measures that a highway authority can provide to assist cyclists. Yet they are often badly designed and constructed to the annoyance and danger of cyclists, wheelchair-users and pram-pushers alike. Perhaps they are the acid test of a cycle-friendly local authority?

Dropped kerbs are necessary to link two different levels along a cycle route, typically where a cycle track crosses or merges with a carriageway. They are normally installed in conjunction with other measures such as a footway converted to a cycle track or a signal-controlled cycle crossing.

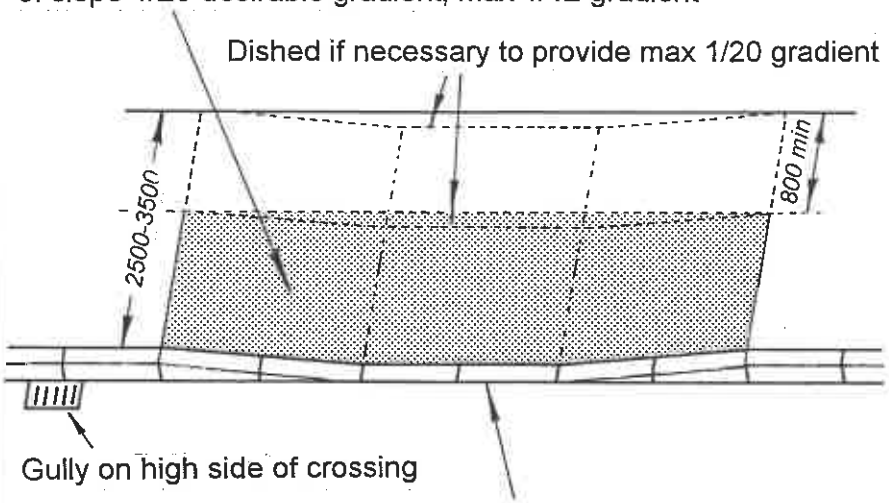


Fig 1: County of Avon - Arrangement of dropped kerbs.

Cyclists should not be expected to dismount at kerbs - that is not giving

cyclists priority. Cycle routes that are not convenient and continuous will not be used. Nor should cyclists have to "bump down" (or up) at dropped kerbs - motorists would hardly tolerate such design.

It is now well established that dropped kerbs can be designed and constructed to be **fully flush** with the carriageway. Dropped kerbs with an upstand are neither acceptable nor necessary. The IHT and DoT both endorse this. "Wherever possible, cycle tracks should meet side roads without a sudden change in level. Where dropped kerbs are used, they should be laid flush with the carriageway and designed to avoid problems over drainage. At difficult sites, half battered kerbs may provide a solution." (*LTN 1/89, para 5.22*). Avon County Council has insisted on fully-flush dropped kerbs at all cycle facilities installed in the county since 1991. There are many good examples in Bristol such as those at the Neptune Statue in the city centre. **Figure 1** is adapted from the Avon County Council standard detail for dropped kerbs. It is applicable to pedestrian crossings as well as cycleway access points. A tolerance of + / - 3mm is specified at the kerb / road surface interface to ensure a flush kerb.

References

IHT (1984) Guidelines for Providing for the Cyclist, p44.
DOT (1989) Making Way for Cyclists. LTN 1/89, para 5.22.

2.2 CYCLE GAPS IN ROAD CLOSURES

Roads are sometimes physically closed off to stop cars taking shortcuts through residential areas on unsuitable roads. As these closures are normally for environmental and safety reasons, there is rarely a need to stop cyclists using them. In fact, once closed, they are likely to be even more attractive as cycle routes.

Gaps for cyclists in road closures cost very little if included in the original scheme. Even later modification is cheap compared with most highway works.

The key features of a successful cycle gap are measures to prevent parked vehicles from blocking the gap and sufficient width for cyclists to conveniently pass through in both directions. Good visibility through the gap and convenient access to/from it are also essential.

A minimum width of 1m in each direction is normally necessary. If bollards are used to prevent cars using wider gaps, they should be clearly visible at night. The facility should be signed in advance with the "No through road" sign and the "Except cycle" plate. The closure and exemption should be signed. The appropriate signs depend on the details of the traffic regulation order or Town and Country Planning measures used to close the road. A "No motor vehicles" sign is common.

There are many examples of cycle gaps around the country. One forms part of the South-East Cambridge cycle route and is illustrated in TA Leaflet 9/89. Probably the most heavily used road closure gap is Deangate/Minster yard in York. Formerly used by 10,000 vehicles per day, it was closed to motor vehicles in 1991. It is now used by some 1200 cyclists per day who use it to avoid the York inner ring road.

A more typical residential road closure with a cycle gap is shown in **Figure 2**. A 3m gap, divided by a lockable bollard to allow emergency vehicle access, links Eldon Street and Neville Street. It is part of a comprehensive traffic calming scheme for The Groves area of York.

References

DOT (1989) Making Way for Cyclists. LTN 1/89, para 3.5.
DOT (1989) South East Cambridge Cycle Route. TA Leaflet 9/89.

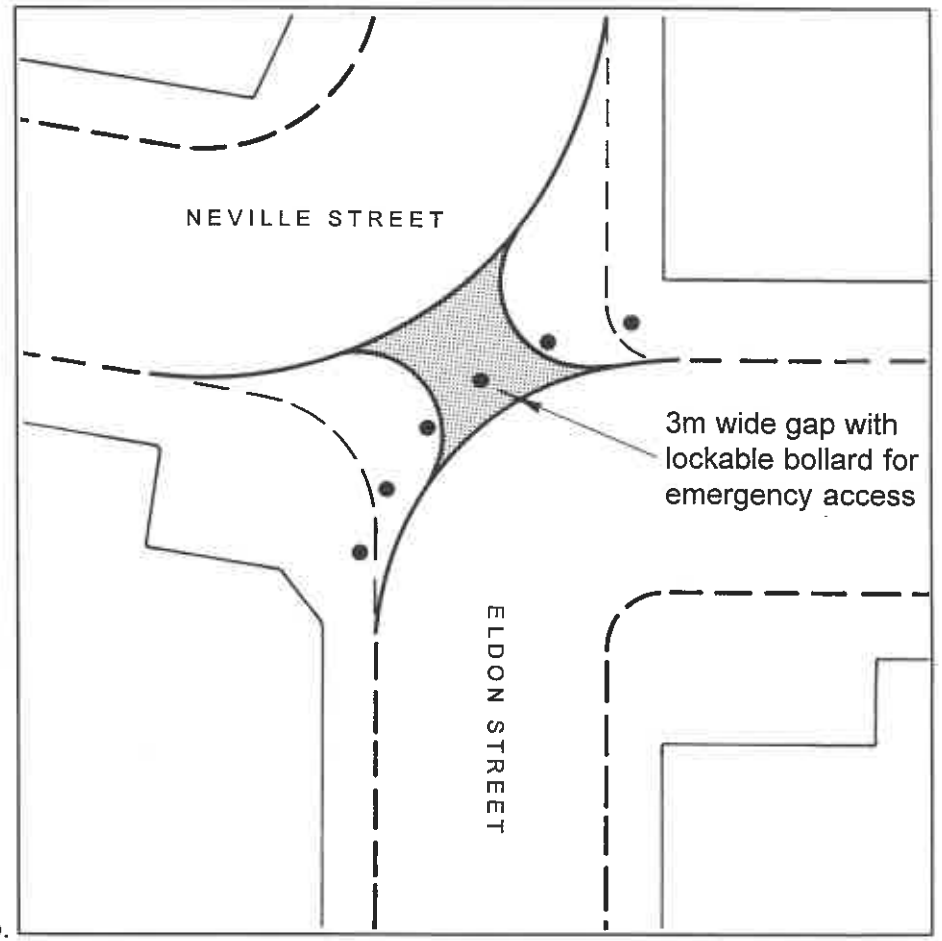


Fig 2: Road closure and cycle gap.

2.3 TWO-WAY STREETS FOR CYCLISTS

Cyclists need routes that are direct and usable in both directions. One-way streets are a double disadvantage as they are often introduced to speed up traffic ad often force cyclists to use lengthy and dangerous alternatives. One-way streets can be made two way for cyclists thus giving cyclists a useful priority over motor vehicles.

There are two main techniques: the contra-flow cycle lane and the "plugging" of a two-way street to motor vehicles at one end. In both cases, a cycle "slip" is provided which allows the cyclist to bypass the "No Entry" sign.

Contra-Flow Cycle Lane

This is a mandatory cycle lane (marked with a solid white line) at least 1.5m and preferably 2m wide. It is backed by a traffic regulation order banning loading and waiting at all times at the kerbside that borders the contra-flow lane. Entry into the lane is permitted via a cycle slip - a gap of approximately 1m between a bollard and the kerb at the "No Entry" junction. This is an established technique and has been proved to work well provided the waiting prohibition can be enforced. The Downing Street contra-flow cycle lane in Cambridge is an example of a successful scheme in difficult circumstances, used by about 2,000 cyclists per day. It is now a permanent feature and it has reduced accidents in the area.

Figure 3 shows the contra-flow cycle lane on Church Gate, Leicester. This scheme required a complete prohibition of waiting at all times on the opposite side of Church Gate.

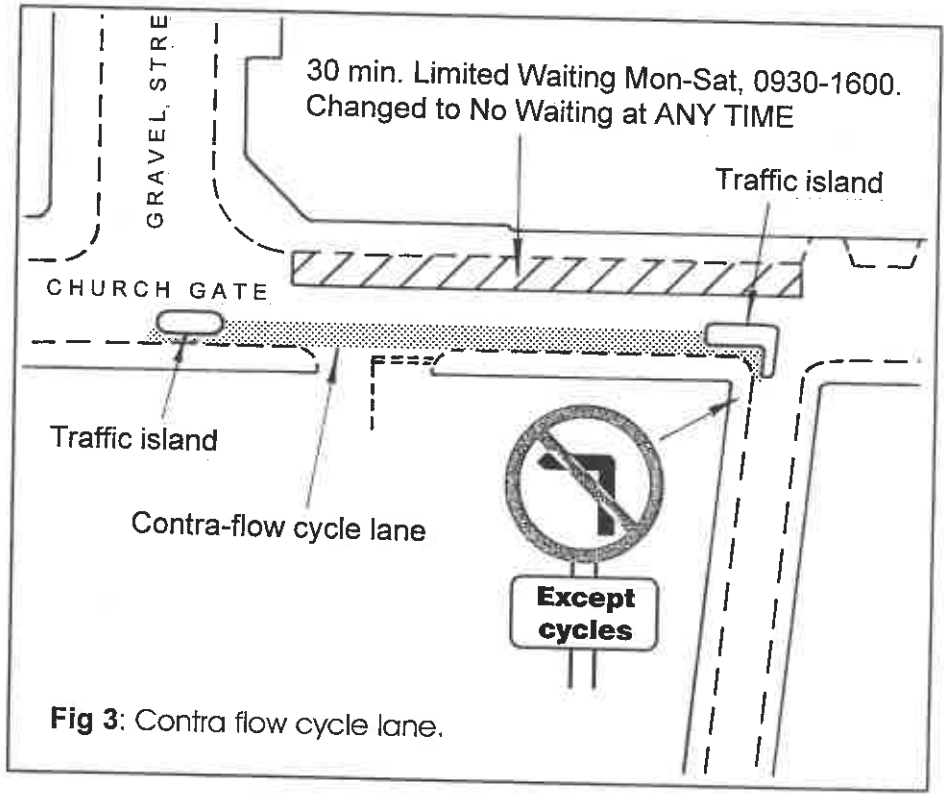


Fig 3: Contra flow cycle lane.

Plugging the Street

It is sometimes difficult to introduce and enforce parking bans so a more flexible technique is required. The legal status of the road remains (or is converted back to) two-way working but one end of the street is plugged to motor vehicles by means of "No Entry" restrictions. By providing a cycle slip as above, cyclists can bypass the plug and the road remains fully two way for cyclists. If some motor vehicles use the road in the "contra-flow" direction by turning within the street, cyclist safety will probably be improved as motorists and pedestrians will be more alert to two-way traffic. Obviously, the original purpose of the one-way system must be considered to decide the appropriate measures.

An example of a cycle slip and two-way street is Eldon Street/ Markham Street in York shown in **Figure 4**. A 760mm wide gap allows cyclists to enter. The nearside kerb has been built out to reduce the potential for parked cars to block the exit from the cycle slip.

Occasionally there is insufficient width at the junction to accommodate the cycle slip with bollard and island. This is usually due to the manoeuvring needs of large vehicles. Some authorities have replaced the bollard with a painted island or used the "No Motor Vehicles" sign. Others have exempted cyclists from the "No Entry" order, using the "Except Cycles" sign but the DOT will only authorise this in special circumstances. There is a good case for relaxing these regulations. It should be made simpler for local authorities to create two-way streets for cyclists. It is worth stating that when the Netherlands opened up one-way streets to general two-way cycle use, carnage was forecast. In practice there was none and it has worked well.

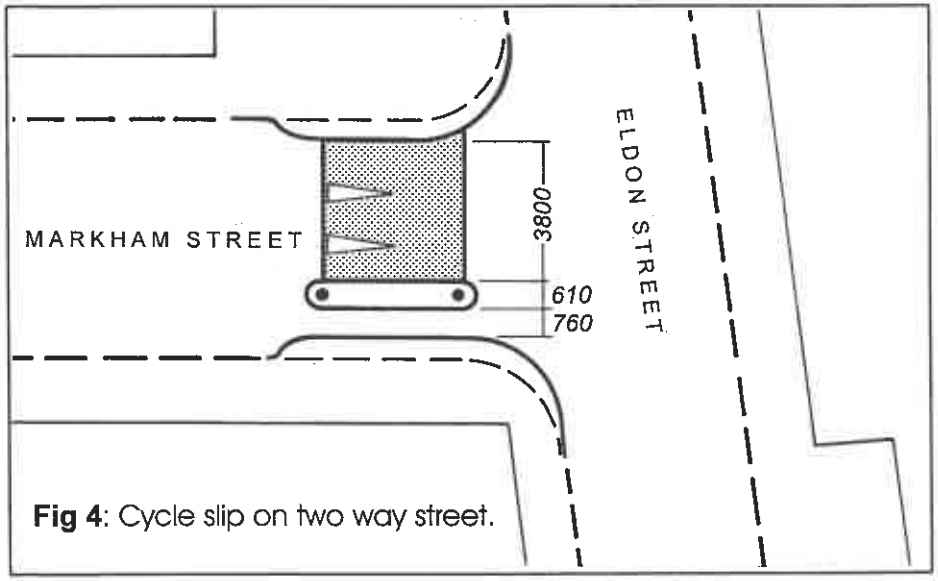


Fig 4: Cycle slip on two way street.

References

DOT (1986) Innovatory Cycle Scheme. London - Meymott Street, Southwark Cycle "Slip" Facility. TA Leaflet 8/86. - **DOT** (1989) Making Way for Cyclists. LTN 1/89, paras 3.4 & 5.6. **McClintock, H** (1992) The Bicycle and City Traffic.

2.4 EXEMPTING CYCLISTS FROM BANNED TURNS

At sites with safety, congestion or environmental problems, traffic may be prohibited from making certain turns by traffic regulation orders. As with physical road closures, there is usually no reason to include cyclists in the order and they should be exempted except when there are overriding safety considerations. Amending existing orders to exempt cyclists is another practical and inexpensive measure to give them priority. It also shows road users that cyclists need not be penalised for the problems caused by motor vehicles.

Exemptions for cyclists will often be associated with exemptions for buses and taxis. They may be at traffic lights or at priority junctions and may involve left, right or straight ahead manoeuvres. Useful guidance on appropriate traffic regulation orders and signing is given in "Keeping Buses Moving".

When exempting cyclists from banned straight ahead or right turn manoeuvres, protector islands with bollards, road markings and signs may be necessary to allow cyclists to wait safely in the centre of the road.

For example, on the Rea Valley cycle route in South Birmingham (a route surveyed by Sustrans in 1988),

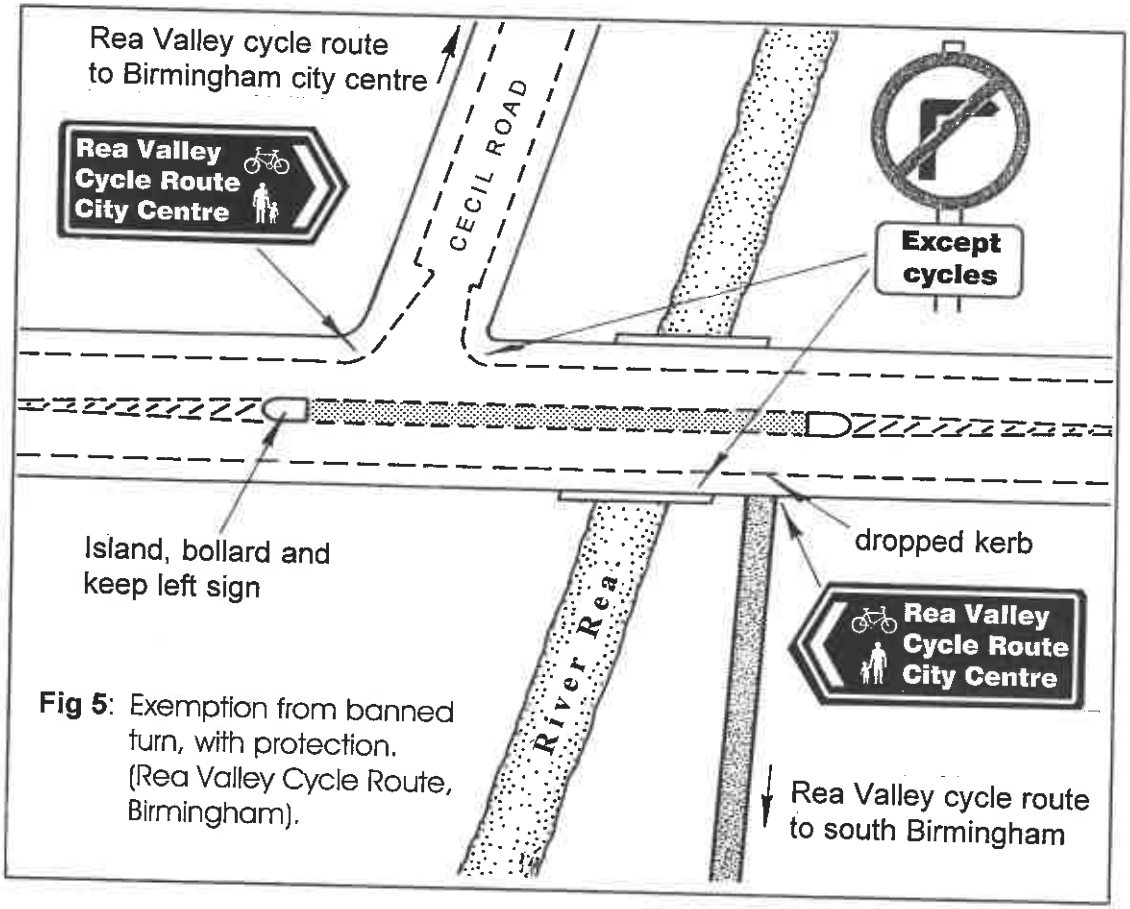


Fig 5: Exemption from banned turn, with protection. (Rea Valley Cycle Route, Birmingham).

cyclists are exempt from the ban on right turns from Dogpool Lane into Cecil Road. The ban was introduced to prevent motorists taking a shortcut through a residential area to avoid a busy junction. Exempting cyclists makes no difference to the objects of the ban and is essential to the continuity of the Rea Valley cycle route.

Traffic islands and bollards have been installed to protect cyclists waiting to turn. A 2m wide cycle lane/waiting area runs between the two protector islands. Motorists are given advanced warning by means of white lines and cross-hatching which extend some 60m to a bend at the east end of the facility. This is illustrated in **Figure 5**.

Reference

DOT (1991) "Keeping Buses Moving". LTN 1/91, para 7.2.

2.5 BUS / CYCLE LANES

In town centres and on urban main roads, bus/cycle lanes can greatly improve safety and convenience for cyclists. They give access to areas closed to general traffic and physically distance cyclists from cars and lorries. It may be easier to justify a bus/ cycle lane than a lane for only buses or cycles.

For most of the eighties the DOT showed no interest in bus priority measures; the majority of local authorities followed suit. However, this has now changed. Many highway authorities are promoting bus lanes and other bus priority schemes with the potential to give cyclists equal priority. Detailed guidance on policy and design is given in "Keeping Buses Moving" and this includes provision for cyclists.

DOT policy is quite clear regarding with-flow bus lanes: "It is recommended that cyclists should be allowed to use with-flow bus lanes and bus-only streets. There do not appear to be any significant difficulties with these measures." (LTN 1/89) And more recently: "Pedal cycles should be permitted to use kerbside withflow bus lanes for safety reasons." (LTN 1/91). Three metres is the minimum width for a bus lane. However, this does not permit a bus (2.5m maximum width) to overtake a cyclist without leaving the lane. Therefore, where the carriageway is wide enough, a 4m lane should be provided. In such cases, an advisory cycle lane can be provided within the bus lane and there are

examples of this in central London. However, this is not essential.

Contra-flow bus lanes are of equal importance to cyclists. These can also be used by cyclists provided that the entry and exit are safe for cyclists. To enable buses to overtake cyclists without leaving the lane, a minimum lane width of 4m is needed. However, for short stretches of bus lane or where the numbers of buses or cyclists are low, a 3m lane may be acceptable. The signs for a contra-flow bus lane require special authorization from the DOT so some negotiation will be necessary if these criteria cannot be met entirely.

Leicester - Britain's first Environment City - has a number of bus / cycle lanes that have beeen operating successfully for years. **Figure 6** shows the Taylor Road contra-flow bus / cycle lane.

References

DOT (1988) "Priority for Buses. With-flow Bus Lanes: An Introduction." TA Leaflet 2/88

DOT (1989) Making Way for Cyclists. LTN 1/89, paras 5.14-5.16

DOT (1991) "Keeping Buses Moving". LTN 1/91

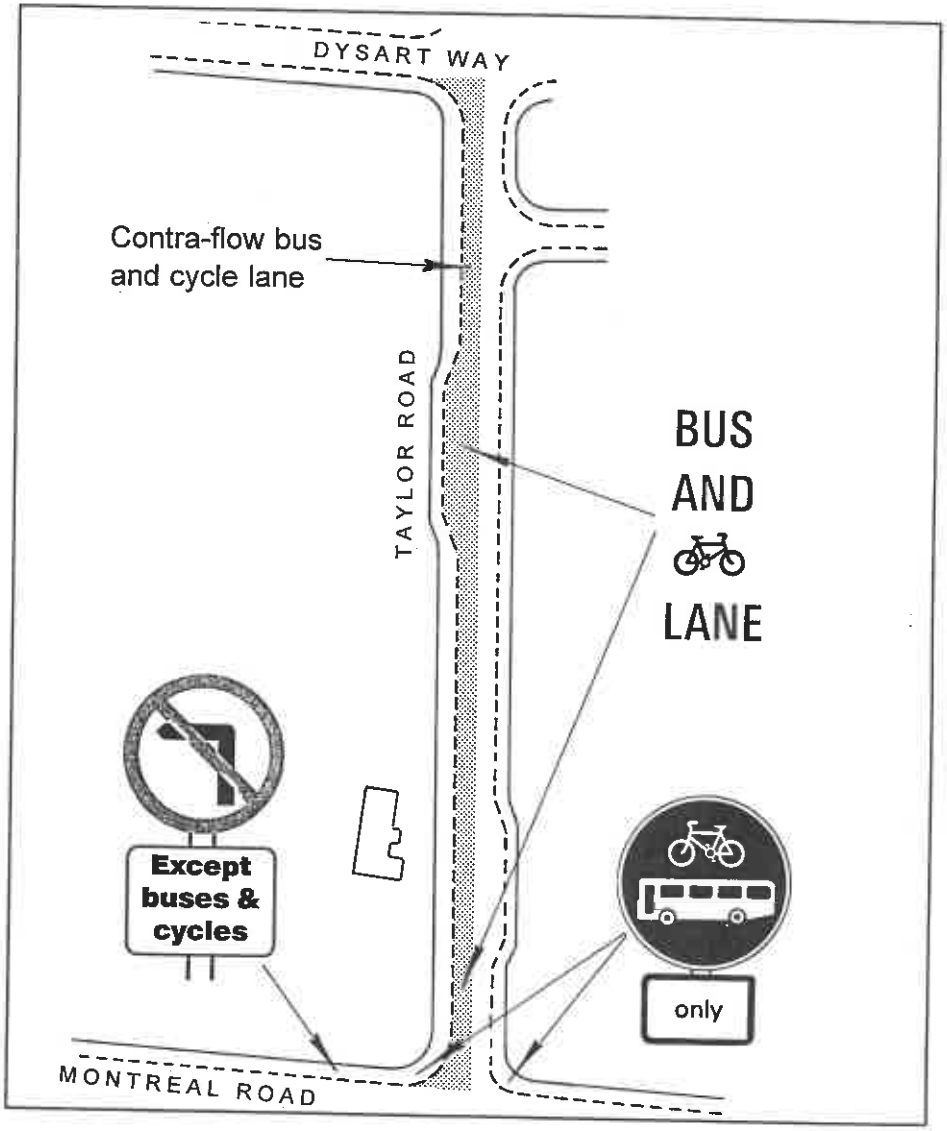


Fig 6: Contra flow bus and cycle lane.

2.6 SIGNAL-CONTROLLED CYCLE CROSSINGS

Where cycle routes cross busy roads, a signal-controlled cycle crossing will be necessary to enable cyclists to cross in safety. The DOT consider that it is unlikely that cyclists will be able to safely cross peak 2-way flows of 800 - 1,000 vph on a single carriageway road without signal control.

Signal-controlled cycle crossings have been in operation in England for over 10 years and there are now a variety of layouts for different requirements.

There are currently two basic types of signal-controlled cycle crossing authorised by the DOT for implementation by local highway authorities:

a) Parallel Cycle/Pedestrian Crossing;
b) Unsegregated cycle/pedestrian crossing - the Toucan.

Parallel Cycle/Pedestrian Crossing

The DOT does not permit cyclists to use Pelican crossings. Any cycle route that leads to a Pelican crossing is supposed to display "Cyclists Dismount" signs at the crossing. Despite the successful operation of Pelicans as "unofficial" combined cycle/pedestrian crossings in many parts of the country (Cambridge and Swindon are examples),cycling over Pelicans is not permitted.

Accordingly, a segregated crossing for cyclists and pedestrians was developed. The cycle crossing is parallel to, and up to 5m from, the pedestrian crossing. It is marked on the main carriageway by white squares (WBM 294). A separate set of signal heads is provided for cyclists and pedestrians.

The signals controlling the cyclists show red, amber and green aspects with cycle logos on amber and green. The signals controlling the pedestrians show the "Red man/Green man" 2 aspects. Main road traffic is controlled by the standard 3 aspect signals. The cyclist phase can be called up either by push-button operation or by buried loop-detectors. Advance loop detectors are preferable to minimise delays to cyclists (which may result in them ignoring the red signal) but push button facilities should also be installed as a back up (and as a bonus to pedestrians using the cycle crossing).

The technical details regarding parallel crossings are set out in LTN 1/86.

An example of a signal-controlled crossing is shown in **Figure 7**. - the Askham Bar Park & Ride site, York.

Of course, cycle-only crossings can be provided and these are easier and cheaper to install. In most cases, however, pedestrians will also need to cross, and therefore a combined facility is required.

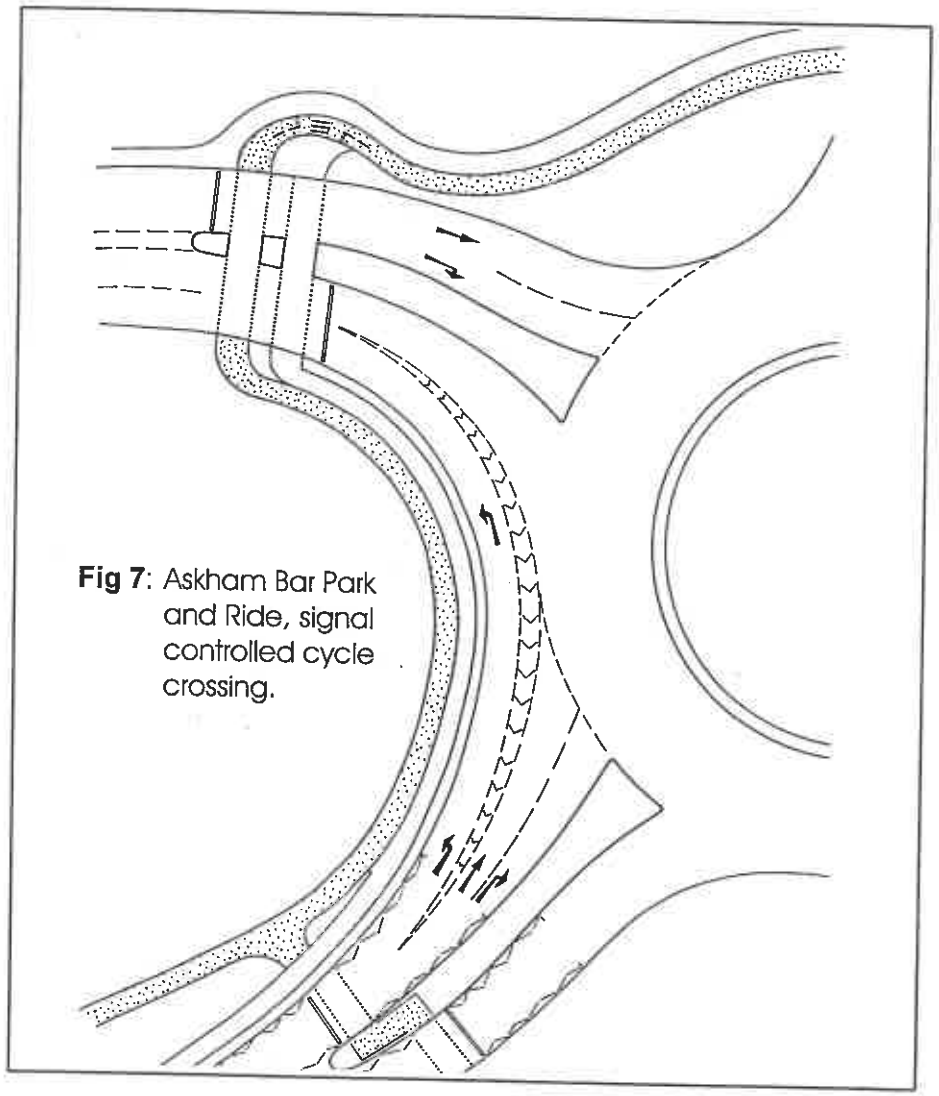


Fig 7: Askham Bar Park and Ride, signal controlled cycle crossing.

Although parallel crossings have been authorised since 1986, few local authorities have installed them. This is because they take up considerably more space and create more clutter than a Pelican crossing; they cost over twice as much to install and most local authorities are of the view that segregation at crossings is largely unnecessary. They also involve banning barring cyclists from turning across the pedestrian crossing, despite no evidence of safety problems to pedestrians. Parallel crossings probably have their uses in situations where flows of cyclists are particularly high (as on Queen's Road in Cambridge) but otherwise their use is limited.

"Toucan" unsegregated Cycle / Pedestrian Crossing

The "Toucan" (two can cross) is effectively a Pelican for cyclists and pedestrians. It was developed after the drawbacks of parallel crossings became evident. Local authorities were finally given the green light to install them in TA 10/93 - rushed out to forestall criticism of the DOT at the Velocity conference in Nottingham, September 1993.

The Toucan comprises the following basic features:

6) tactile surfaces on both approaches for the visually handicapped;
7) push buttons in each of the 4 corners;
5) unsegregated approaches (cycle/pedestrian segregation on

approaches was found to be unnecessary and ignored);
3) a crossing 4m wide (3m minimum);
4) vehicle detection on all approaches (main road);
1) 3 signal aspects to control cyclists and pedestrians: a "red man", "green man" and green cycle.;
2) 3 aspects to control main road traffic: red, amber and green, but not flashing amber.

TA 10/93 sets out the basic details of Toucan facilities and the results of the trials. It is evident that there is plenty of scope for further development but local authorities will be anxious to take advantage of this opportunity at least. Special signs authorisation, however, is still required for the cycle signal aspect. Apart from the lower costs of Toucan, they allow cyclists to turn left or right, thereby avoiding the issue of barred turns.

Toucans can be seen in operation in Exeter, Southampton and Cambridge amongst other towns and cities.

Reasearch and innovation continues by the DOT, TRL and local authorities to further develop cycle/pedestrian crossings. The Puffin, an "intelligent" pedestrian crossing that used infra-red detectors to monitor pedestrians, offers benefits of greater responsiveness and reduced delay. It seems likely that a cross between a Toucan and a Puffin will happen before long. One wonders what the hybrid offspring will be called!

Crossing Without Signals

During the eighties, many zebra crossings were replaced by Pelicans, and newly-installed crossings tended to be Pelicans rather than zebras. In many cases the main reason is to prevent delays to traffic rather than to benefit pedestrians. Now, however, there are signs that the zebra is returning, backed by traffic calming measures and research that questions the supposedly greater safety of Pelicans. It is now possible to combine zebras with special humps and to have a raised zebra crossing which emphasises pedestrian priority and improves safety.

A similar type of crossing is needed for cyclists. Just as the Toucan permits unsegregated crossing by cyclists and pedestrians, zebras should be adapted for unsegregated use by cyclists and pedestrians. This would provide a cheaper and more pedestrian/cyclist-responsive crossing which also eliminated unnecessary delays to motor vehicles.

The raised pavement crossings at junctions, such as those illustrated in TA 1/87, are usually provided for pedestrians but frequently used by cyclists too. Although motorists usually still have legal priority, practice shows that they are much more likely to give way to pedestrians and cyclists on the raised crossing.

References

DOT (1986) "Cyclists at Road Crossings and Junctions" LTN 1/86 - **DOT** (1993) "The Use of Puffin Pedestrian Crossings" Network Management and Driver Information leaflet. - **DOT** (1993) "Toucan : An Unsegregated Crossing for Pedestrians and Cyclists" TA Leaflet 10/93.

2.7 ADVANCED STOP LINES

Cyclists often find it difficult to turn right at traffic signals where many motor vehicles are going straight ahead or turning left. Even going straight ahead can be difficult when many vehicles are turning left. Experienced cyclists will position themselves at the front of the traffic queue to avoid getting "cut up". However, this usually involves crossing the stop line, which is an offence. It also makes it difficult for the cyclist to see the signals in some locations.

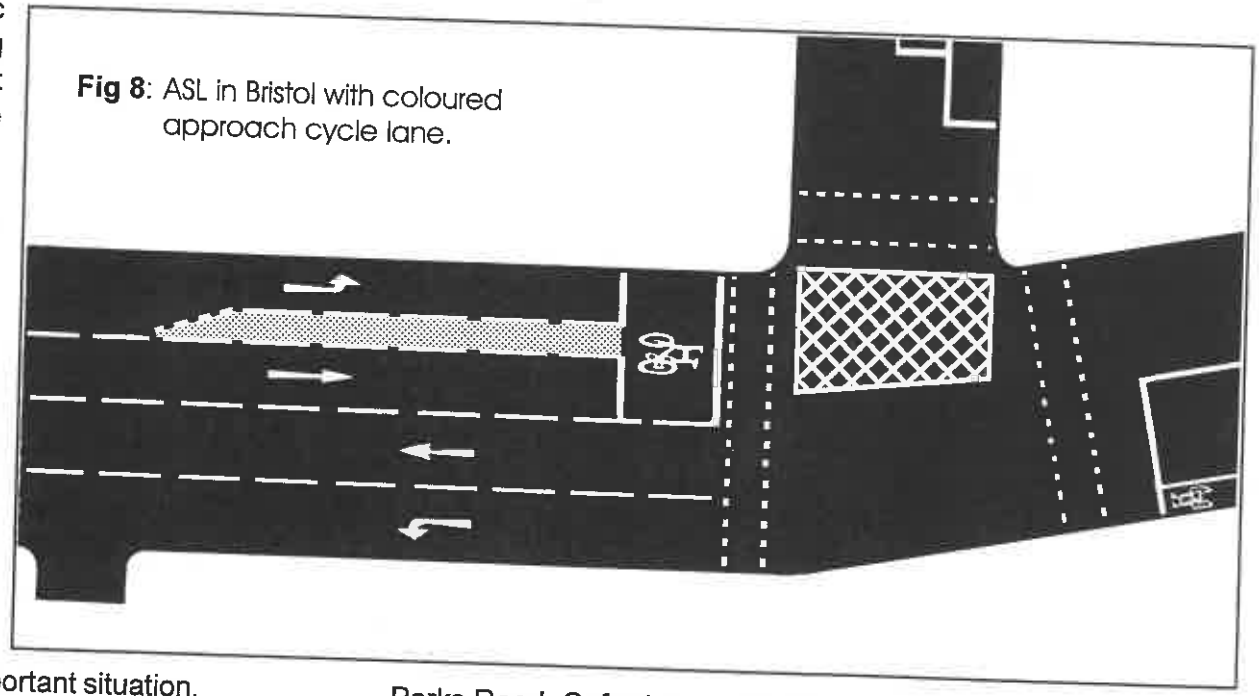


Fig 8: ASL in Bristol with coloured approach cycle lane.

Advanced stop lines for cyclists (ASLs) legalise this practice by providing a waiting area (reservoir) for cyclists between two stop lines - one for the motorists and an ASL for the cyclists. A cycle lane, usually on the left, allows cyclists to bypass the traffic queue and reach the waiting area. When the lights change the cyclists are then able to go turn or go ahead safely. ASLs therefore give cyclists a visible and practical priority in an important situation.

ASLs have existed in the Netherlands for many years. They are detailed in the CROW design manual reviewed in Part One of this handbook. The first ASL in Britain was installed in 1986 on Parks Road, Oxford as an experiment. They have subsequently been installed in a variety of layouts to meet different circumstances in at least a dozen towns and cities in England. The DOT no longer considers them to be experimental. Apart from benefitting cyclists, the ASL monitored in York showed an

increase in the peak-hour traffic through the junction.

The original DOT layout required a special additional signal head. However, Avon County Council has developed a simplified layout which requires no extra signals. Indeed, all it needs is some white paint and a cycle lane sign. Surfacing the cycle lane and waiting area in red or green helps to keep motorists out. This layout has also been used successfully in Cambridge and Manchester. The DOT are quite satisfied with the simplified ASL layout although they still insist on special authorization of the painted bicycle symbol in the waiting area.

Each location needs to be carefully assessed to determine the most appropriate layout and also signal timings. In some cases it is better to position the approach cycle lane between or to the right of the all-purpose traffic lanes. These layouts can be seen in Bristol. A good example is the ASL at Prince Street / The Grove which has an approach cycle lane (surfaced red) between the two traffic lanes to avoid conflicts with left-turning vehicles. **Figure 8**.

Unlike the Netherlands, the DOT does not allow the traffic signals at ASL's to turn green before the motorists get the green, nor does the DOT allow cyclists to turn left on red as the authorities do in Germany - a change adopted by West Germany from East Germany on reunification. Perhaps European integration will bring these advances?

Reference

DOT (1993) Advanced Stop Lines for Cyclists. TA Leaflet 8/93.

2.8 SIGNAL-CONTROLLED ROUNDABOUTS

Roundabouts, particularly large roundabouts and gyratories, are the most feared feature of the road network for cyclists. Even experienced cyclists will make detours to avoid certain roundabouts or sometimes dismount and wheel their bikes across the junction. They have good cause to do so: cyclists are some 14-16 times more likely than car users to suffer an accident at a roundabout. Over 50% of these accidents are due to motorists entering the roundabout and hitting cyclists who, of course, have right of way.

There are many things that highway authorities can do to make roundabouts safer for cyclists. These include reducing the width of the circulatory carriageway, increasing deflection on entry and improving signing, road markings and conspicuity. Southampton City Council has a policy of preferring signals to roundabouts, partly due to the dangers of roundabouts to cyclists. Where there are adequate subways (2.5 - 3 metre minimum with conveniently arranged ramps) then shared use by cyclists as well as walkers is a common solution (Cambridge, Bristol, Chelmsford).

Recently, many large roundabouts and gyratories have been signalised, ie entry to the roundabout is controlled by traffic lights on the approach arms. This has usually been done to increase capacity at peak times and to prevent some arms from being shut out by continuous flows from other arms. A side effect of this is to reduce the danger to cyclists as vehicles should no longer enter when traffic is circulating in front of them. Signal-control of roundabouts is now seen as the best technique for making large roundabouts safer for cyclists.

Avon County Council has installed signal control at two large roundabouts in central Bristol (St James Barton and Old Market). It has also signalised the Temple Gate/Inner Circuit Road gyratory. At the St James Barton and Old Market sites, advanced stop lines for cyclists have also been installed to further improve their safety. See **Figure 9**. The County Council is pleased with the reduction in cyclist casualties. Combining signal control and ASLs is recommended by the Traffic Director for London for the London Strategic Cycle Network.

Using traffic lights and advanced stop lines to improve conditions for cyclists at roundabouts requires no special authorization from the DOT other than that required for ASLs. It does require sophisticated design to get the correct signal timings and SCOOT is considered to be the best operating system. It is used in the Bristol schemes.

References

Allott & Lomax (1993) Cyclists and Roundabouts (Updated), Report for the Cyclists' Touring Club

County Surveyors' Society (1993) Accidents at signalised roundabouts, Report ENV/1-93

Hallworth, MS (1992) Signalling Roundabouts : Circular Arguments Traffic Engineering + Control, June

James, SE (1992) Signalling Roundabouts: Controlling the Revolution. Traffic Engineering + Control, November.

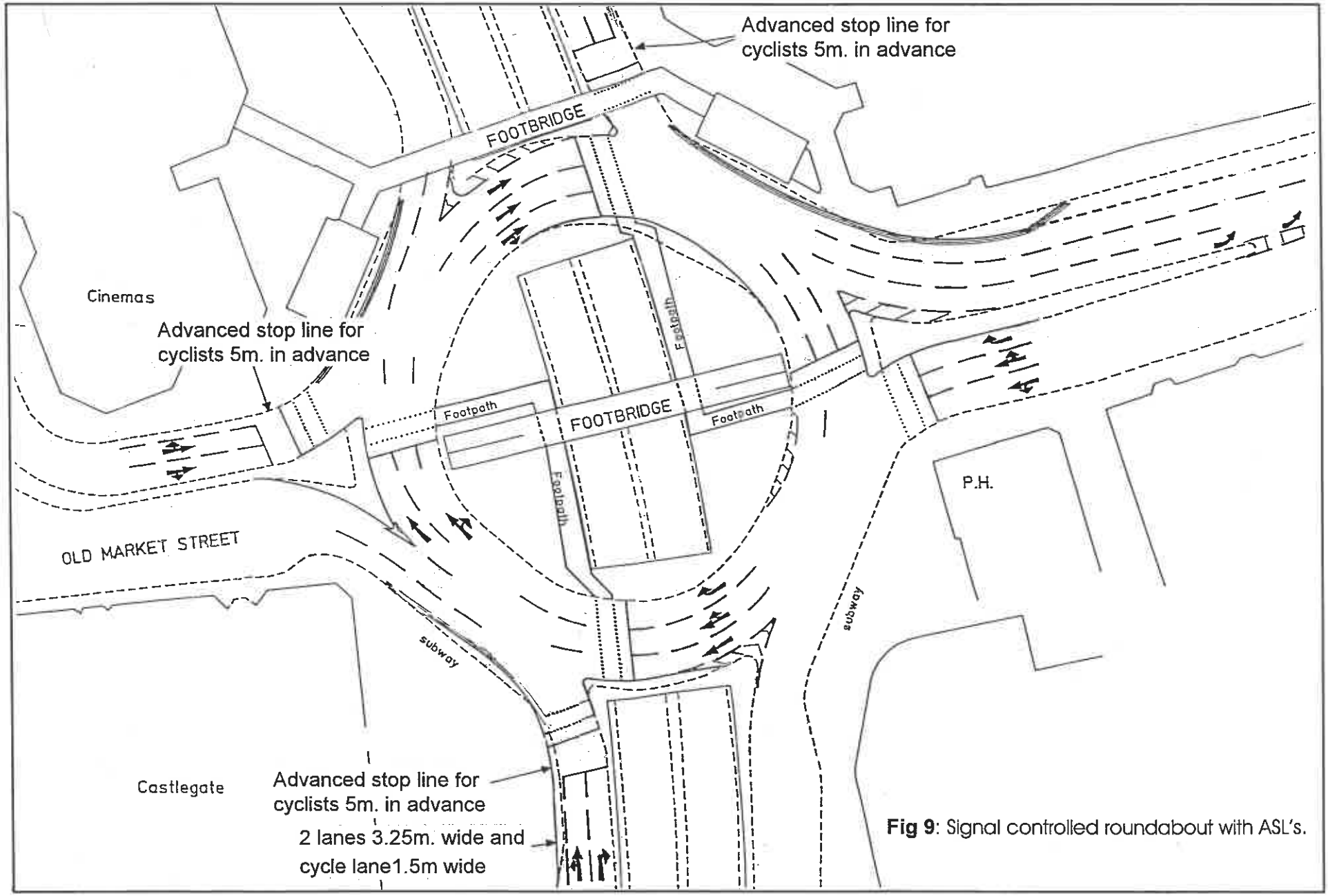


Fig 9: Signal controlled roundabout with ASL's.

2.9 CYCLISTS AND TRAFFIC CALMING

Traffic calming is obviously far more than a measure to assist cyclists. At its most radical it is a multi-disciplinary collection of techniques which can:

- redistribute road space away from motor vehicles to non-motorised road users
- reduce vehicle speeds and intrusiveness
- improve safety, particularly for vulnerable road users
- enhance the urban street scene
- give priority to particular road users such as cyclists and walkers.

The range of techniques used in UK traffic calming is growing fast, but we have still to catch up with Continental practice. Common techniques are speed humps, road narrowings, raised crossings, mini roundabouts and surface treatments. These are being integrated with 20mph speed restrictions in a number of areas such as The Groves, York.

Cyclists benefit from well-designed traffic calming measures as motor vehicle speeds and volumes are reduced. The particular needs of cyclists in traffic calming schemes are well described in "Cyclists and Traffic Calming" by Johanna Cleary for the CTC. This advice is not repeated here.

Traffic calming often provides the opportunity to give priority to cyclists as well as generally benefitting them through speed reduction measures, etc. In addition to the techniques described in the previous sections, such as cycle slips and road closure exemptions, cyclists can benefit from the following:

Bypasses

Bypasses for cyclists can be incorporated into the design of features such as speed humps, narrowings, chicanes, road closures, etc., where space permits. It is important that cyclists are not squeezed by motor vehicles. Bypasses avoid this problem and give cyclists priority. An example is the cycle bypass to the two-way chicane in Elmfield Avenue, part of the Muncaster area traffic calming scheme in York.

Speed Cushions

Speed cushions are effective in slowing vehicles and have certain advantages over speed humps. They do not create drainage problems, buses and emergency vehicles are able to straddle them, and cyclists are able to bypass them. Although not as effective in slowing vehicles as conventional speed humps, they are proving popular in traffic calming schemes that might otherwise attract opposition from bus operators and the emergency services. During 1993, at least a dozen local authorities, including Bradford, Sheffield and Scarborough, installed speed cushions. This followed trials in York.

The cushions are normally 1.6m-1.9m wide and 75mm high. They are constructed in a variety of materials including tarmac, block paving and pre-cast rubber blocks made from old tyres. Experience in York suggests that red tarmac is cheapest and most durable. The gap between kerb and cushion should be between 600mm and 1m to allow cyclists to pass without encouraging cars to enter it. Special authorisation from the DOT is needed before local authorities can install speed cushions. Speed cushions do not conform to the speed humps regulations, which do not allow a central gap or such a large gap between kerb and hump.

Speed cushions can be seen in several schemes in York, including Foxwood Lane where they are made of red tarmac. Cyclists can bypass the cushions either on the nearside or via the gap between cushions in the centre of the road.

Surface Treatments

Raised cobbles and other rough surfaces are often used to denote entry to an area that is calmed, or simply to slow traffic turning into a side road. These surfaces can be difficult for cyclists to negotiate safely. Providing paths in smoother materials through these areas gives priority and safety to cyclists without affecting the efficiency of the scheme. For example, at the New Street/ Temple Street junction in Birmingham city centre, a 500mm wide block-paved channel has been provided in the centre of the cobbles. (As Temple Street is one-way, a single central channel is correct.) The result is functional and attractive.

Most cycling will continue to take place on the existing road network. Traffic calming of individual areas, and whole communities and towns, is likely to be the most useful type of general policy to benefit cyclists.

Gateways

Creating 'gateways' to residential areas, villages, local centres, etc. helps to establish a sense of place and to reduce traffic speeds. Raised crossings that give greater priority and convenience to pedestrians can be effective. These should be used to give priority to cycle routes also. Good examples can be seen on the Isle of Dogs, London.

Small roundabouts with tight radii, placed at village gateways, can be very effective at reducing vehicle speeds on straight through roads. There does not need to be any junction to create the roundabout.

References

DOT 1/87 Measures to reduce traffic for the benefit of residents, pedestrians and cyclists.
Cleary, J (1991) "Cyclists and Traffic Calming" CTC
Devon County Council (1991) 'Traffic Calming Guidelines'.
DOT (1993) 'Traffic Calming Regulations'. HMSO.

2.10 MAPPING AND SIGNS

Almost all published mapping relates to roads and is aimed at guiding the motorist around the country. The Ordnance Survey 1:25,000 and 1:50,000 scales do show footpaths and bridleways, but these maps give no indication of the quality of the paths or of their continuity at roads. None of the marked mapping systems indicate cycle paths at all (other than the occasional route name alongside a disused railway).

The only mapping available consists of leaflets describing various individual routes put out by local authorities of a few examples of citywide networks of recommended routes e.g. Spokes in Edinburgh and the London Cycling Campaign in London.

Almost none of this material is widely available in bookshops, especially remote from the area, so it is almost impossible to find out what exists unless you already know.

Signing on the ground is little better. Although it may not appear to be significant the sight of a blue and white cycle sign is a great boost to the cyclist as it indicates that somebody in the area has thought about them as individual travellers.

Mapping of signs are the visible indications that somebody considers cycling to be important. Local highway authorities should publish 1:50,000 maps of their area showing all paths and proposed routes. The Ordnance Survey should be persuaded to revive their map style and symbols to facilitate this.

2.11 OTHER

New Towns

In new towns such as Stevenage and Milton Keynes, cycle / pedestrian networks are provided segregated from the main road network. In other new towns, such as Basingstoke, plans did exist for such a network, but, in the car-obsessed culture of the period, were never implemented.

New towns tend to have few, if any, traffic signal controlled junctions, many roundabouts and pedestrian subways. There is a much clearer distinction between major and minor roads. In these circumstances, the adaptation of traditional road layouts and street design described in this handbook is not always appropriate. Opportunities for segregated networks of cycle routes may be greater. Of critical importance is the continuity and quality of the routes. Primary cycle routes must have priority over secondary roads where they meet. These points should be defined by raised crossings and appropriate road markings. In no circumstances should "Cyclists Dismount" signs be erected. These are incompatible with cycle routes, just as "motorists must walk" signs would be incompatible with a motorway.

In Milton Keynes the Redway cycle/pedestrian routes continue across minor estate roads at the raised (Redway) level. However, the cyclists are supposed to give way to cars, so this is not true priority. Oxford City Council has recently installed raised crossings to give continuity and priority to cyclists on the Woodstock Road cycle route where it crosses side roads.