

# Achieving a Cycling-Friendly Ireland A National Cycling Promotion Policy

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by:

Cork Cycling Campaign  
Dublin Cycling Campaign  
Galway Cycling Campaign  
Limerick Cycling Campaign  
Maynooth Cycling Campaign  
Skerries Cycling Initiative  
Waterford Walk Cycle Campaign

[www.cyclist.ie](http://www.cyclist.ie)

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#### Note for readers

This document has been adapted for publication from a submission given to the Minister for Transport, Mr. Noel Dempsey TD in May 2008 (Version 1.0). It covers many issues not usually given a general airing in the Irish town planning and traffic management literature. The main body on pages 1 to 24 provides a general overview of these issues. For those who want more information, an appendix on pages 25 to 47 goes into greater detail on the various legislative, educational and roads management issues that arise.

#### Authors' note

This document has been drafted as a consensus position document by a coalition of Irish Cycle Campaign groups. Each of these groups is actively engaged in researching and identifying best practice for cycling promotion in Ireland. Our working assumptions and recommendations are constantly being reviewed with reference to the most recent research available. Thus this document represents a “snapshot” of the thinking that has developed within the Irish Cycle Advocacy community as of May 2008. Feedback is welcome and can be directed to any of the advocacy groups listed on the title page.

#### Photographs and illustrations

Robert Fitzsimons (Dublin Cycling Campaign), Dr. Mike Mckillen (Dublin Cycling Campaign). Adam D'Arcy (Cork Cycling Campaign), Shane Foran (Galway Cycling Campaign), Stan Carey (Galway Cycling Campaign), Simon Comer (Galway Cycling Campaign). James Nix (Limerick Cycle Campaign). Picture of cycle carriage arrangement on page 12 is courtesy of Dave Holladay of the CTC.

## Introduction

Almost everyone can cycle, yet fewer people are cycling than ever before. Our towns and cities are struggling to deal with increasing motorised traffic congestion and its negative effects on the economy, environment, climate and community, yet these urban areas are generally hostile places for cyclists. Public health is suffering from an environment that actively promotes a sedentary lifestyle.

The current situation is unsustainable, and it will not change without concerted political and judicial intervention. Successful promotion of cycling requires not just education and encouragement; it also depends on cycling being afforded parity of esteem with driving, in terms of planning, road design and transport policy.

Some local authorities might argue that they have spent millions on cycling infrastructure in urban areas to no avail, since very few cyclists use them. Our report shows that providing cycle lanes without related measures to reduce traffic volume and speed, and to alter cycle-hostile junctions, will not increase levels of cycling and may put cyclists at greater risk of injury or death. A key message is that inappropriate cycle lanes are worse than no cycle lanes at all, and unfortunately, many existing cycle lanes in Ireland are unsuitable and unsafe for cyclists. This document also explains why attempts to segregate and restrict cyclists on the roads, in the name of 'safety', actually disadvantage cyclists, increase injury and fatality rates, prioritise motorised travel and ensure that urban cycling remains a minority activity.



This report strongly advocates a hierarchy-of-provision approach<sup>1</sup> to encouraging cycling. The Hierarchy lists provisions in five levels of decreasing priority; cycle lanes, at level 5, should be considered only after the options in levels 1–4 have been exhausted:

1. Traffic speed reduction and enforcement.
2. Traffic reduction, particularly of HGVs.
3. Junction treatment and traffic management, e.g. modifying or removing urban roundabouts, eliminating slip roads and left-only turns, adding Advanced Stop Lines for cyclists to junctions (contingent on the necessary legislation and training).
4. Increasing road space and overtaking space for cyclists.
5. Hard shoulders, cycle lanes and cycle paths.

Many of us fondly remember the freedom we had as children to cycle and walk around and explore our local area; we may also remember more neighbourhood interaction and trust than we know today. Our car-centred culture diminishes this social interaction. The dangers associated with Irish car culture lead some parents to restrict their children's independence, and to prohibit once-commonplace activities such as exploring their neighbourhood by bike. This leads inexorably to sedentary lifestyles and associated health problems.

Countries like Denmark and the Netherlands have successfully promoted active transport to school, thereby ensuring a new generation for whom cycling is a natural, safe activity. Children and young people want to cycle – let us enable them to do so. Research with Green Schools Ireland shows that providing 'special' or 'extra' cycling facilities is not necessary for this to happen.

The key recommendations of this report are as follows:

There is a need for widespread education and training: cycle training for all schoolchildren; appropriate training for Gardaí, town planners and HGV drivers; and a public awareness campaign focusing on safe cycling and safe driving around cyclists.

Active enforcement is essential, as the law must be seen to be enforced or it will be ignored. Special enforcement initiatives should be undertaken which routinely target law breaking by motorists, cyclists and pedestrians.

Traffic volume needs to be reduced; traffic speed reduced and enforced. Junction redesign, appropriate road space and signage for cyclists are essential to encouraging cycling and improving cyclist safety. We advise caution in the use of segregated cycle paths in urban areas. Appropriate and sufficient bike racks must be provided in central, safe areas. Public transport companies must allow the carriage of bicycles.

It is essential to establish national, statutory oversight bodies for the provision of sustainable roads infrastructure and the promotion of alternative modes of transport in Ireland.





# Section 1: The Status of Commuter Cycling in Ireland

## 1.1 The marked decline in commuter cycling over past two decades

Citizens who cycle to school, college or work are entitled to feel that some authorities and drivers of motorised vehicles treat them as second-class citizens on the road. Cyclists are often disparaged because they get in the way of faster vehicles and momentarily impede their progress. There is an implicit assumption that no cyclists own cars, and a widespread misconception that they cannot afford one.

Commuter cycling has been in marked decline since the 1980s among adults and children alike. In 1986 a total of 23,635 primary level pupils cycled to school; in 2006 only 4,087 did so – a 5.8-fold decline. Only 1,044 (25.5%) of these were girls. It is therefore not surprising that the Census of Population 2006 report on mode of travel (Question #17) revealed that only around 1.9% of adults used a bike to go to work; only 4% of school pupils cycled, and of these only a tiny fraction were girls.<sup>2</sup> Despite this, Ireland still retains the potential for significant re-uptake of cycling. The aggregate town data for Census 2006 give the following proportions for commuters living within 5km of their place of work or education: workers 30%, 3rd-level students 36% (70% in Galway), 2nd-level students 56%.<sup>3</sup> For a reasonably fit adult or teenager, a 5km cycle should take no more than 20–30 minutes.

The car has consolidated its position as 'king' when it comes to commuting. Census 2006 revealed that about 70% of adult workers use a car or goods vehicle to commute. More than half of primary pupils were driven to school by car. Remarkably, 44,000 primary pupils were driven 1km or less to school. Another 105,000 were driven 4km or less. (A school trip by bike up to 4km is well within the capability of most 10–12 year olds.)

The state and local authorities have spent millions of Euro on cycling infrastructure but with no marked increase in commuting cyclists. This is because of a lack of understanding about what it takes to promote cycling as something positive for both the individual (liberating, healthy, low-cost, door-to-door travel, etc.) and the community (safer roads, reduced congestion, non-polluting, low carbon emissions, small road space occupancy, lower morbidity, etc.). No real attempts have been made to understand the factors that have led to the aforementioned reduction in cycle-commuting numbers, and to ask why newcomers don't take up cycling in droves, when congestion makes journey times by car or bus so long, unpredictable and frustrating.



Figure: The state's focus on cycle facilities has not caught the public imagination

Irish society is struggling to deal with an overrun in greenhouse gas emissions and chronic traffic congestion, partially because of a failure to understand what commuting cyclists need. Part of the blame can be laid at the foot of successive governments and policy-makers who are mostly car drivers. Car drivers who do not cycle city commutes cannot understand what cyclists have to face – it requires experiential learning in commuting traffic. What passes for cycling policy is often seen by cyclists as patronising (“we know what's good for you”). It is policy based largely on ignorance and on selectively picking individual aspects of models from elsewhere in Europe, without any apparent regard for the original educational, legislative, town planning or traffic management contexts.

Any new policy initiatives must be directed at reversing the decline in cycling, e.g. by targeting schoolchildren and adult commuters, and by tackling the policies that led to the decline in the first place. The question should be asked: what policy changes are needed to reverse the decline in utility cycling (children cycling to school, adults cycling to work, to the shops, etc.), when destinations lie within 10km?

It goes without saying that many citizens are leading excessively sedentary lifestyles; this is manifest in the current obesity crisis. Some studies indicate that up to 16% of primary pupils are overweight.<sup>4,5</sup> The latent morbidity costs to individuals and communities are immense. Cycling can help reverse this trend, because it is excellent aerobic exercise. But the decision about whether children cycle to school lies primarily with their parents – if parents perceive cycling to be hazardous, with a significant risk of injury or death, then this fear will determine their decision-making. Fear also occupies the mind of potential adult cyclists. We know anecdotally that this may be the principal reason that adults don't take up or return to cycling as a mode of transport, or quit soon after trying it. The 'fear' factor should not be underestimated. Our analysis indicates that people are afraid to cycle principally because:

- Good conditions for cycling do not exist, and a culture of designing public roads with adequate thought for cyclists has yet to be properly established.
- Too many goods vehicles, particularly HGVs, have unfettered access to urban areas.
- Urban speed limits are still set too high (50km/h, rather than 30km/h, is the norm).
- Road traffic law enforcement does not deal effectively with law-breaking drivers who, for instance, endanger riders by overtaking too closely (overtaking cyclists with <1.5m clearance constitutes dangerous overtaking in France and Germany).
- Standard driver instruction and testing do not deal adequately with how motorised traffic should interact safely with cyclists.
- Spatial strategy and planning and development controls have failed to enhance the environment for cycling.

The plight of rural dwellers who might wish to use their bicycle for commuting is even more stark, due not only to greater distance from work or school but also to dependence on roads with speed limits (80km/h and 100km/h) that are far too fast, considering the width and quality of the road and the traffic mix. Poor spatial planning and inadequate development controls place new housing developments, with a lot of commuting traffic based on car use, within existing unimproved rural road infrastructure that then becomes markedly cyclist- and pedestrian-hostile. The qualities and characteristics of Irish rural roads also influence the extent of cycling tourism. Visitors remark on how hazardous it is to cycle around our countryside (the proximity of goods vehicles is often cited), and this deters repeat visits.<sup>6</sup>

## 1.2 The right of cyclists to ride on public roads

The bicycle is classed in international and Irish law as a vehicle.<sup>7</sup> At the 1968 Vienna Convention on Road Traffic, the UN Economic and Social Council (Economic Commission for Europe) declared the bicycle to be a vehicle and the cyclist to be a driver. Under Article No.1:

- (i) *"Cycle" means any vehicle which has at least two wheels and is propelled solely by the muscular energy of the persons on that vehicle, in particular by means of pedals or hand-cranks*
- (v) *"Driver" means any person who drives a motor vehicle or other vehicle (including a cycle)*



Figure: The cyclist is a driver, the bicycle his vehicle

The presence of bicycles on public roads predates the arrival of motorised vehicles. Cyclists do not pose an extraordinary danger to others or the environment. Nor are they burdened with certain extra responsibilities placed on drivers of motor vehicles due to the inherent hazard and risk associated with larger and faster vehicles. This increased risk and environmental damage (road surface degradation, exhaust emissions, etc.) is why motorists, and not cyclists, are required to have a driver's license, register the vehicle, submit to vehicle standards' surveillance, undergo driver training and testing and carry liability insurance.

A national cycling policy must include the following objectives and values:

1. Motorists need to be made aware of the legal status of cyclists (as drivers of vehicles) in driver training, instruction and testing regimes. In particular, dangerous overtaking of cyclists by motorised vehicles should be defined as an approach of <1.5m. This needs to be specified in legislation and in the *Rules of the Road*.
2. Cyclists are entitled to make full use of any vehicle lane and to position themselves defensively by commanding the lane, where appropriate, for the sake of safety (see photo, below). Motorists need to be made aware of this in driver training, instruction and testing regimes. This also needs to be made clear in the *Rules of the Road*.
3. There has to be parity of esteem, at the very least, with other vehicle types. Cyclists' extreme vulnerability must be taken into account, and their relative 'slowness' must not be used to restrict bike access to roads, particularly in urban areas.



Figure: cyclist making full use of the lane approaching a roundabout

The following should also be addressed:

1. Local authorities must end their propensity to treat riders as pedestrians, requiring them to dismount in order to transit road works, cross junctions, traverse narrow bridges, etc.
2. The *Rules of the Road* (2007) should be subjected to urgent revision.
3. Driver training, instruction and testing regimes must be urgently updated to deal more thoroughly with safe interaction between drivers and cyclists in traffic.
4. Statutory law relating to cycling needs must be reviewed to ensure clarity. For example, the legality of flashing LED-type lights needs to be clarified. The situation where retailers can sell a bike without supplying and fitting bells, mudguards and lights needs to be reviewed, since traffic law requires all of these safety features. The no-parking restrictions on clearways, bus lanes and cycle facilities need to be reviewed – all-day restrictions should be the norm on any facilities used by cyclists. Lifting parking restrictions at 7:00pm makes no sense from a cycling safety perspective – in less dense traffic, vehicle free-speeds tend to be higher and therefore more dangerous to cyclists.



### 1.3 Car-is-king syndrome on urban roads

On the private car's journey to predominance in urban areas in Ireland, its promoters have striven to segregate cyclists off the road into reservations, principally cycle paths, where they will not impede traffic. This has created a very difficult situation for cyclists and those wishing to promote cycling. People who cycle sometimes feel they are the victims of a kind of transport apartheid, where the car is king and cyclists are not merely unloved but regarded as a nuisance, using an antiquated form of transport that gets in the way of progress. In effect there is no parity of esteem for the bike as a transport mode. The authorities do not seem to appreciate sufficiently how a car-centred culture is diminishing community identity and social interaction, and restricting children's independence, leading inevitably to more sedentary and unhealthy lifestyles.

There is no logic to this downgrading of cycling, since cyclists in urban areas frequently travel faster than cars and don't slow down motorised traffic. The fact that up to six cyclists can occupy the road space of a car, and many more for parking, has yet to penetrate the public imagination. Car dominance led inexorably to the development of segregated cycle paths or tracks or road space sharing (on-road cycle lanes), where the cyclist has arguably come off worse because of the widespread construction of too-narrow and otherwise substandard cycle lanes within already narrow vehicle lanes. In the Greater Dublin Area, the Dublin Transportation Office (DTO) has been the lead agency in coordinating the construction of cycle lanes and tracks by the various local authorities. Millions of Euro have been spent for very little return in the form of additional cycling commuters.

The development of substandard cycle lanes is nowhere more evident than in the Quality Bus Corridor (QBC) system constructed primarily in the Greater Dublin Area by the Quality Bus Network Office (QBN). The primary goal here would seem to be to favour the movement of buses rather than the safe transit of cyclists. Many bus lanes are too narrow, and a bus or coach cannot safely overtake cyclists within the lane. Where there is conflict between the safety requirements of cyclists and the need to facilitate buses, cyclists lose out.

Another matter to be considered is the extent and quality of the road and traffic engineering skills relating to the design, provision and maintenance of roads infrastructure within the local authorities, the National Roads Authority (NRA), DTO, QBN office and the Rail Procurement Agency (RPA). Since policy makers and law-enforcers are mostly car drivers, they have little experiential knowledge of what it's like to be a commuting cyclist. There should be a formal requirement for these public officials to undertake regular and formal bike trips on the road, or to assess their own schemes upon completion from the perspective of a cyclist, not a motorised vehicle driver. In the case of An Garda Síochána, at least some senior personnel at HQ and divisional levels should be formally required to cycle urban roads on a regular basis. Cyclists would suggest that 'institutional blindness' results from this neglect to understand what it is like to be a utility cyclist.

### 1.4 Parity of esteem



Utility cyclists in urban areas, where many junctions occur, don't necessarily require special facilities like cycle paths – they require the available roads infrastructure to provide them with direct, convenient routes where their particular safety needs are recognised. As drivers of vehicles who have the right to make lawful use of public roads, they are entitled to expect that their particular vulnerability be recognised by motorists and by the various authorities. They require parity of esteem, at the very least, with motor traffic. Or as John Franklin, the noted UK advocate of commuting cycling provision, puts it: "Cyclists should be accommodated as a respected mode of travelling

with as much right as anyone else to a decent journey. To provide for cycling on what space may be left after meeting the needs of other vehicles, from whatever funds remain, and to expect cyclists to be grateful for whatever they get is not acceptable. Cyclists deserve to be treated with dignity and to receive full professional commitment to their needs.”<sup>8</sup>

New hazard identification and risk analysis systems should be applied to making roads safer for vulnerable road users, by invoking the fundamental risk control hierarchy, whereby the needs of the most vulnerable in traffic take precedence. Government should do everything it can to secure cyclists’ rights and to promote the benefits of having more cyclists on our roads. This attitude shift must be fostered and sustained. Government must actively protect cyclists from motoring-lobby-inspired measures that deny cyclists the right to reach their destination in the shortest and safest way, that segregate cyclists from roads, and that directly discourage cycling as a travel mode. It must be made clear that cyclists in greater numbers on the roads are to be expected from now on, and encouraged as a primary public travel policy objective. That school-going children will be on the roads in much greater numbers must also be a stated policy objective.

The yardsticks by which policies are judged must be demonstrable increases in the numbers and proportions of students cycling safely to school or college, and of people cycling to work. The means to achieve these increases are detailed later in this submission. Central to implementing any policy changes will be the need for a national cycling/roads oversight body, suitably staffed and resourced, and given statutory powers along with a set of targets and deadlines for action.

## **1.5 Promoting increased modal share of commuter cycling**

Responsibility for modal change must not be left solely to the individual. Most motorists are not going to give up car dependency voluntarily and begin using a bike for commuting. Modal shift cannot be expected to happen solely on the basis of public information and advertising campaigns extolling the virtues of active transport. It is vital that the policy, planning and legal changes set out in this submission are made. It must be accepted that none of this can be achieved on a cost-neutral basis. In the longer term, however, the financial and all other benefits of increased cycling will easily outweigh any short-term costs.

Commuting to and from work, school or college will involve multi-modal travel options for some. Cycling has the potential to increase the range of public transport. Commuters might need to take their bike on board a commuter train for an onwards cycle to their place of work. Transport operator policies towards the carriage of bikes must change. Most operators currently ban bikes from being carried in their trains, trams, buses and coaches. This cannot be allowed to continue. The car cannot continue to be 'king'.



## Section 2: Policy on Cycling Promotion in Ireland

### 2.1 Why promote cycling? – Health benefits

Cycling is arguably the safest form of transport for Irish society. It has been estimated that the benefits of cycling, in terms of life years gained, outweigh the risks by 20 to 1.<sup>9</sup> The British Medical Association has found that, all things considered, the health benefits of regular cycling significantly outweigh any increased risk of injury. A large-scale study of 9,000 UK civil servants found that cycling 25 miles a week (or an hour per week on the trip to work) halves the risk of fatal and non-fatal heart disease.<sup>10</sup> In Denmark it has been found that regular adult cycle commuters show a 40% lower mortality rate than their non-cycling peers.<sup>11</sup> Ireland has among the highest levels of heart disease and obesity in the EU and is facing



a public health crisis of unprecedented gravity – as existing government "road safety" and transport policies force more and more cyclists and pedestrians off the roads. About 13,000 Irish citizens die of heart disease and related conditions annually, and the country is also facing a time bomb in the form of childhood obesity and an epidemic of associated conditions, such as type 2 diabetes. While the risks Irish cyclists face are very real, in societal terms far more Irish people have their lives cut short by not cycling than by cycling.

### 2.2 Why promote cycling? – Safety in numbers

A primary variable governing cyclist safety is the base number of cyclists on the roads. The more cyclists there are, the safer it becomes to be on a bicycle. This finding has been reported by various authors in relation to junction surveys and across whole areas.<sup>12,13,14</sup> An explanation is that when cyclists are more numerous, motorists are more aware of them, and compensate by driving more cautiously. The increased safety experienced by cyclists in the Netherlands, Denmark and Germany might partially be attributed to their numbers on the roads.<sup>15</sup> Cyclists do not as a rule kill anybody else, whereas for every motorist fatality more deaths can be expected among passengers and other road users. This suggests that the more motorists who can be persuaded to cycle, particularly young motorists, the fewer people overall who will be killed. In any case, increases in cycling levels do not necessarily have to be accompanied by any increase in cyclist deaths: cities such as Graz in Austria and Odense in Denmark have achieved significant increases in cycling levels while stabilising and reducing the levels of accidents among cyclists. The road safety measures that are most effective at encouraging cycling, such as speed restraint, also reduce deaths to all other road users. Arguably, the most important measures in improving cycling safety are simply to encourage more people to cycle and to encourage motorists to be more aware of cyclists.

### 2.3 Keeping the fear factor in perspective

As has been explained, the fear factor will need to be tackled as part of the effort to restore cycling as a form of transport, but it is important that these fears be recognised as an emotional response to both perceived danger and to real danger. When dealing with the responses to perceived danger, the solutions might be counterintuitive. For example, some children if left alone will instinctively run when crossing a road, because they see this as the safest way to cross. We need to teach our children how to cross safely: by stopping, looking, listening and then walking when the road is clear and continuing to look and listen.



Measures will be required to reduce actual road danger and educate cyclists to handle typical traffic situations. However, in empowering cyclists we need to set the road dangers they face in an appropriate context. It has become customary to portray cycling as an inherently risky activity compared to other forms of transport.<sup>1</sup> Cycling is not especially risky – the inherent risks of cycling are trivial. Because they paint motoring in the best light, interests associated with the car lobby often use comparisons based on death rates per kilometre of travel. Populations of adult motorists with significant distances of long distance travel on motorways are compared directly with populations of cyclists, including children, travelling mainly on urban roads. This type of comparison results in claims of up to 14-fold differences in the risk of death or injury of cyclists compared with motorists.<sup>16</sup> Such claims make for good anti-cycling propaganda but say very little about genuine risk levels.

If comparisons are based on adults, exclude long distance travel and compare risk per hour travelled, the differentials largely disappear.<sup>17</sup> Based on time exposure, cycling is actually safer than motoring in France and Denmark, there is not much difference in New Zealand, Germany, Sweden, Switzerland and the Netherlands, while it is more dangerous in Austria, Finland, Norway and Australia. For environments that might be more comparable with Ireland, such as the UK and Italy, cycling is



significantly more dangerous than motoring. In the UK it is estimated that per unit time spent travelling, cyclists are 3.5–4 times more likely to be killed than are motorists. This may still seem like a large difference, but fatal crashes are actually a rare event for motorists; a large increase in a small number can still result in a very small number. Based on UK figures it has been estimated that someone who cycles 5000 miles a year can expect a fatal accident every 5000 years, while the average regular cyclist can expect a fatal accident every 18,000 years. In other words, even in quite hostile cycling environments it is statistically possible to spend many lifetimes engaged in cycling without ever having a serious accident. In our efforts to promote cycling and improve safety we must always keep this fact to the fore.

## **2.4 Establishing the base use of our roads infrastructure**

Apart from the census every five years there is a statistical black hole when it comes to quantifying cyclists on Irish roads. It is difficult to talk credibly about increasing or promoting that which we do not measure. The state must insist on regular traffic counts of all road users on key routes. New indicators, such as turnover at bike parking spaces, need to be collected and collated nationally. Other data sources must be developed, such as some form of national travel survey and annual work- and school-based travel censuses.

When it comes to accident rates the situation is even worse – only fatal incidents are measured with any level of certainty. Means must be found, perhaps using Geographic Information System technologies, to include hospital data (both A&E and in-patient admission) and insurance statistics in cyclist road traffic accident data.

## **2.5 Cycling promotion structures**

There is a requirement for an expert advisory group to identify and develop appropriate best practice, be it infrastructure management, education, fiscal measures etc. To function effectively, this group must be composed and staffed such that it is in a position to dissociate itself from previously failed policies. It should be based around close cooperation with the cyclist advocacy groups. Once the new policies are developed, a strategic mechanism will then be required for ensuring their implementation. The Department of Transport will have a key role providing and managing infrastructure, but the overall cycling promotion effort will require cross-departmental activity and co-operation. Obvious stakeholders will be the Departments of Education; Justice, Equality and Law Reform; Environment and Local Government; Health; and Trade and Industry. This

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<sup>1</sup> "Did you know cycling can be more dangerous than riding a motorcycle?", Irish National Safety Council Leaflet

creates a requirement for a high-level group, staffed by senior civil servants, to co-ordinate necessary activities.

The above structure would handle the activities needed within Government to put a cycling-friendly environment in place, but this is not enough. As a form of transport, cycling will have to compete in an open market and a media environment dominated by powerful commercial interests. At the moment, alternatives to cycling, such as motoring, have the benefit of massively funded advertising campaigns in all print and broadcast media. In order to sell cycling to the public, a similar dedicated marketing effort is required (see 2.8 for more). The power of marketing should not be underestimated: a four-year “Traffic Reduction Community” project in the Austrian town of Langenlois saw cycling by adults grow from 3% to 14% almost entirely as a result of an information and marketing campaign.<sup>18</sup> This creates an argument for setting up a separate agency or dedicated office of cycling promotion, or for directly funding the national cyclists’ organisation to carry out and coordinate such a function. It might be possible to fund this effort by placing a levy on car advertising.

## **2.6 Commuter vs. recreational cycling**

In discussing cycling promotion it is important to distinguish between “recreational” cycling and “utility” or “transport” cycling. The former describes cycling as an activity in its own right. The latter describes the use of bicycles as a form of transport in reaching destinations. It is important to avoid the temptation to treat these as identical groups with identical needs. For instance, an off-road coastal route shared with pedestrians might serve the recreational needs of family groups cycling in a restrained manner with small children, but be completely unsuitable for fast adult commuter cyclists. What this illustrates is that investing funds in such recreational routes may do little to benefit utility cyclists. Funding of cycling should take into account the differing needs of both commuter and recreational cyclists. In assessing the performance of roads authorities, Government needs to be very precise about what is being measured. Local authorities should not be permitted to portray spending on recreational routes as fulfilling the obligation to cater for cyclists on the wider roads network.

## **2.7 Road-user education and school-related measures**

Road user education will be a key element in empowering more people to cycle, and in raising awareness of cyclists’ safety needs, among both motorists and cyclists themselves. The following measures are recommended:

- Re-write the *Rules of the Road* so that the advice to road users is integrated, reinforcing the idea that roads are spaces shared by motorists, cyclists and pedestrians. Explicitly integrate cyclist safety in the general advice, with cyclists included in all diagrams of typical traffic situations such as roundabouts, traffic signals and other junctions (explicitly specifying situations where the cyclist has the right of way). Specify 1.5m as the minimum clearance when overtaking cyclists.
- In a recent survey UK parents were asked what measures would make them most likely to let their children cycle to school. Over half (52%) cited cycle training for their children as the top measure.<sup>19</sup> Ireland must adopt a national standard for cycling training and incorporate it into the National Curriculum for all suitably able schoolchildren. Training should progress systematically through steps graded according to age and ability. Passing each stage should become as much of a “rite of passage” for younger children as driving lessons have become for older teenagers.
- Instruct school boards to develop and implement a pro-cycling student policy. A ‘skirt-only’ rule for girls mediates against cycling for girls. Students should be allowed to cycle to school wearing appropriate clothing, then change into school uniform. Facilities should be provided to allow pupils to change, shower or both.
- Subsidise bicycle repair and maintenance courses and school bicycle parking.
- Adopt a national cycling standard for adult cyclists, cycling trainers and Gardaí.



- Ensure that driver training schools increase awareness of the needs of cyclists, and include cycling-specific problems in tests. Introduce a *Cyclist & Pedestrian Safety* module into learner-driver courses. Following the introduction and maturation of school and adult cycling training courses nationwide, make the issuance of a provisional driving licence dependent on the possession of a *Certificate of Road Cycling Competence*, save in situations of physical incapacity. Commercial vehicle training courses should have a specific module on vulnerable road users, including cyclists.

## 2.8 Promotion through advertising, fiscal incentives, public bodies and business

Ultimately, increasing cycling levels is about achieving behavioural change. It may not always be an obvious point, but if there is a desire to encourage greater use of bicycles then the key supporting activity is to just encourage more people to cycle. Measures could include the following:

- Initiate a sustained campaign of cycling promotion through advertising in all media. Commuting distances up to 10km and school distances up to 4km should be considered routinely cyclable – even in rain, given the availability of modern breathable rain gear. The objective of this campaign is to radically alter our culture to one that understands and values the immense benefits which cycling brings to individuals and to society. A key objective would be to convey cycling as something that successful and progressive people do. The campaign must also reduce motorist hostility to cyclists by helping them to realise that cycling cuts road deaths, frees up road space and reduces journey times for everyone.
- Foster more visible cycling by our politicians and top government and local authority figures.
- Galvanise regional tourist boards to actively promote cycling. Develop a cycle-touring product based around the hard shoulder network and minor rural roads. Support links between tourist bodies and city/county councils in developing recreational cycle paths, especially along waterways, e.g. Shannon-Enne, Barrow/Nore/Suir, Royal and Grand Canals, and coastal routes such as Bray to Balbriggan. Examine large forested areas and some mountainous regions with a view to providing cycle trails, and also with a view to creating mountain-biking cycle trails, of which there are only two officially designated in the Republic. Recreational cycle routes should be off-road where possible and should otherwise use quiet rural roads and avoid industrial areas.
- Remove VAT on the sale of bicycles, bicycle parts, bicycle-specific clothing and bicycle repairs. Consider subsidising the price of commuter/city bicycles. To encourage local shopping on foot or by bicycle, consider introducing a tax on new shopping centre car parking spaces that do not lie within normal town boundaries. To reduce the occurrence of broken glass, which is a particular hazard to cyclists, legislation introducing container deposits should be enacted.
- Promote the benefits of cycling to business owners and employers, e.g. a fitter and healthier workforce (fewer sick days), better punctuality, reduced parking requirements.



## 2.9 Integration with public transport

Cycling integrates naturally with other transport modes. In Japan, Denmark and the Netherlands, public transport (particularly train travel) is integrated with cycling to the extent that it would be impossible to consider one without the other. Many train journeys start or end by bicycle: in 1991, 44% of Dutch train travellers went to their local station by bicycle and 14% used a bicycle at their destinations.<sup>20</sup> This use of cycling as an integral component of rail-based travel should be emulated in Ireland. Unfortunately, the reverse seems to be happening, with Iarnród Éireann removing bicycle carriage from their new trains, and secure modern bike parking being unheard of at most Irish train stations. Such parking arrangements must be provided at all public transport interchanges. Public transport companies must be required to carry bicycles, e.g. Iarnród Éireann to provide bicycle spaces on inter-city trains, bicycle carriages on commuter trains and, as an interim measure, permission to bring bicycles on board the rear carriage of commuter trains from 10am to 4pm, after 7pm and all day at weekends and on bank holidays. Bicycle carriage can also be facilitated on buses and trams – in some countries particular efforts are made to integrate cycling in a chain of multi-modal transport.



Figure: Flexible-seating arrangements on trains can cater for various uses.

## **Section 3: Infrastructure management – Designing and managing roads fit for cycling**

Cyclists are first and foremost roads users – the manner in which the roads are designed, policed and managed directly affects the utility and safety of cycling. Under all these headings, Ireland has followed policies and practices that often render our roads infrastructure unfit for purpose, in terms of cyclists' needs. Aspects of infrastructure and its management may be viewed as either cyclist-friendly or cyclist-hostile. In general, roads infrastructure based on prioritising motoring and attempting to create a state of constant "flow" for cars tends to be hostile to non-car-users. Restoring cyclist access to Irish roads will require a sea change in attitudes to traffic management. The objective must be to create a roads network that provides cyclists with direct, convenient routes that minimise unnecessary delay and wasted effort in reaching key destinations. There is no point implementing measures just to spend funds or to be seen to be "doing something for the cyclists". Unless a given intervention has a viable "business case" in terms of improving the level of service to cyclists, the default assumption must be to do nothing. Achieving a cycle-friendly roads infrastructure requires a multi-factorial approach involving traffic regulation and policing, town planning, road design and traffic management, maintenance and education. The goal must always be to improve the value of cycling as a form of transport to its users.

### **3.1 Legislation**

Article 67 of the 1993 Roads Act defines general duties of care for all road users. These comprise a duty to avoid personal injury, a duty to avoid injury to others, and a duty to avoid damage to both personal property and the property of others.<sup>21</sup> Clearly the traffic regulations that govern the use of the roads must be consistent with these aims. Unfortunately there are situations where the current traffic regulations are not consistent with the requirements of safety. A list of the main revisions needed is provided at 3.12 below. The detailed reasoning behind the proposed changes is set out in the context of specific traffic situations in the Appendix: *The Hierarchy of Provision expanded*.

### **3.2 Town Planning**

Towns with a dense network of interconnected streets are more likely to offer cyclists direct routes to various destinations. For Ireland, it will not be enough to tackle inappropriate road design and traffic management policies – the effects of car-centred town planning policies must also be confronted. For example, there needs to be a national program of works to eliminate the obstacles created by Irish cul-de-sac-based housing estate layouts. The focus here must be on creating a network of back-street routes, closed to high-speed motor traffic but available for use by younger child cyclists and less-confident adult cyclists. This is particularly important for creating safe school routes. Ireland will have to create the type of secondary roads infrastructure that other countries chose to plan into their towns as a matter of course. The "permeability" of the built environment to cyclists is a wider issue than just the roads. In accessing destinations, it is not acceptable for cyclists to have to lift bicycles over walls, carry them over their heads to get through stiles, or carry bicycles and shopping up and down steps. As with disabled access, there is a need for a Barcelona-Declaration-type programme that would impose a duty to ensure that cyclists' access needs are respected, by providing the necessary wheeling ramps, gaps and access arrangements. Finally, the cycling infrastructure does not exist as an end in itself – its primary purpose is to provide direct and convenient access to destinations. Town planners have a duty to ensure that obvious destinations such as schools, hospitals, offices, retail centres and industrial developments are kept within a reasonable cycling distance of the communities they serve.





### 3.3 Infrastructure delivery

In Section 4, we propose a Five-Year Plan to restore cyclist access to Irish towns and cities. However, the weakness of current policies is that provision for cycling is essentially left to the discretion of local authority officials. Achieving change will require a reversal in how work currently gets prioritised and allocated by Irish local authorities. At the moment, local authority officials propose schemes, apply for funding, and if successful apply the schemes. This means that work not applied for does not get done. In essence, unelected officials have a veto over the application of national policy. In order to address this, the Departments of Transport and Environment and Local Government must require that local authorities draft and submit a program of works based on a range of infrastructural measures specified by central government. The provision of general funds must be made dependent on local authorities first having submitted an approved scheme of works to restore cyclist access. Responsibility for project delivery must lie at city/county manager level, with reporting taking place directly to the higher-level coordinating group and/or relevant ministers. This mechanism does not bypass local democracy. Consultation will still be needed with local communities – perhaps via so-called cycle-forum-type structures. These can provide input for identifying the local “priority of work” for various communities. For instance, in some areas roundabouts might be the key infrastructural deficit to be addressed, while in others one-way streets might be a more pressing issue. Local knowledge will clarify this.

### 3.4 Bike parking and storage

Assuming that most people have access to a bicycle and the public roads network, a significant obstacle to be overcome in getting more people to cycle is the lack of somewhere to lock bikes securely. The absence of secure and convenient parking may be a significant suppressor of cycling demand among commuters who already have access to reasonably suitable roads. For schoolchildren, the Green Schools pilot schemes have shown that the basic lack of bike parking is one of the first obstacles to be overcome in increasing bicycle use. There is an acute shortage of suitable bicycle parking and storage arrangements in Irish urban areas. All major urban developments, park & ride areas and train stations should have suitable bike storage facilities. The state must actively ensure that all potential destinations for bicycle users provide suitable bicycle parking. This includes private developments as well as all state-funded public buildings such as hospitals, schools and colleges. Standards for approved bicycle storage, similar to other building standards for insulation and so on, must be imposed for new developments and dwellings. Targets must be set for the provision of bike parking, e.g. to have approved bike parking equivalent to 20% of car parking spaces in place in all urban areas by 2012.



### 3.5 Cyclists need properly constructed and maintained roads

Road surface conditions and roads maintenance are fundamental to the comfort and safety of cycling. Simple falls and collisions with roadside objects account for approximately 85% of injuries incurred while cycling.<sup>22</sup> The proper initial construction of roads and their subsequent maintenance – from regular sweeping to prompt detection and remediation of potholes and road openings – is a fundamental priority for any national cycling promotion strategy. Care must be taken to ensure that drainage is adequate and that drainage grates and gullies are of a position and type that does not endanger or discommode cyclists. Street lighting must be adequate, since after dark the dangers posed by road surface defects are multiplied. Poor surfacing, maintenance (see photographs) and the substandard and tardy reinstatement of roads are repeated complaints of commuter cyclists, and underline the need for a national inspectorate to audit and oversee the activities of Irish roads authorities.



Figures: Visible hazards due to lack of maintenance

Control of road works needs to be much tighter and to have regard for cyclist safety. The creators of road openings must be required to obey road works control protocols in the use of temporary steel plate covers, temporary fill, etc. Using “cyclists dismount” signs, or directing cyclists to cycle illegally and dangerously against the normal flow of traffic, is unacceptable. Penalties for non-compliance with reinstatement standards should be set higher, with operators bonded for compliance and the final arbiter being the new roads oversight body rather than the commissioning local authority. Maintenance is even more pressing for cycle lanes, recreational cycle paths and trails. Hence, where a local authority wishes to construct cycle-specific infrastructure, or to procure its construction by third parties, they should be required to show that they have the necessary maintenance plans and budgets in place beforehand.

### 3.6 Design guidance

Restoring safe cyclist access to Irish towns will require a sea change in road design philosophies and traffic management practices. Unsuitable documents such as the *DTO cycle facilities guidelines* and the *DTO traffic management guidelines* should be immediately removed from circulation. The UK Dept. for Transport’s *Manual for Streets* should be adopted in the meantime as guidance for non-arterial roads. Alternative design guidance that integrates cyclist and pedestrian issues must be either found or developed for main roads. Any new guidance must be drafted with the active participation of representatives from the Irish commuter cycling advocacy groups and be based on principles set out in *Cycle-Friendly Infrastructure* (1996) and related documents – see the *Hierarchy of Provision* below. The current system based on the infrequent release of “global” guidance documents must cease. In its place there should be a system of “advice note” guidance, whereby guidance on a particular topic is released as soon as it is ready. This will allow new ideas and guidance to be pushed out to Irish local authorities with minimum delay. It will also allow new guidance to be matched precisely to the national “priority of work” at any given time.

### 3.7 Training and Qualification for Engineers and Consultants

Most roads and traffic engineers are car drivers and not cyclists. Issuing new design guidance may be futile if those using it have no understanding of, or sympathy for, how cyclists are supposed to use the road. Unfortunately, many roads and cycle facilities are being designed by engineers who seem to have no idea how



cyclists are supposed to use the road, and who have no apparent knowledge of the standard safe cycling techniques. The manner in which our roads are managed should not place citizens outside the law, undermine cyclists' understanding of the traffic regulations, or inhibit the practice or teaching of the standard safe cycling techniques. Examples include traffic signals where cyclists can only proceed on red, junctions where straight-on or right-turning cyclists are directed inside streams of left-turning traffic, and schemes that encourage cycling on the right against normal conventions, whether explicitly or implicitly.

The Government must stipulate that all local authority roads engineers, and any engineer wishing to tender for Government roads contracts, be required to take an approved cycling skills course. This should be seen as a standard requirement for all consultants, much like the current requirement for mandatory professional indemnity insurance. All relevant public officials must be required to take regular and formal bike trips on the road and to assess their own schemes upon completion. Roads engineers and planners must be required to cycle any roads under development, so as to have experiential understanding of the safety and suitability of their designs under a variety of traffic densities and times of day. Those involved must be in a position to show that their proposals conform to the traffic regulations and are consistent with the standard safe cycling techniques. They must also be able to show that the designs proposed represent an improvement over the existing level of service and road safety provision for cyclists.

There is also an identified deficit in the professional training available to engineers and planners. The Irish third level system does not currently offer formal education on vulnerable road user issues. It is of vital interest to the state that an approved module on these matters be included in any graduate and post-graduate courses involving road design or traffic management.

### **3.8 National roads oversight body**

It is unrealistic to expect that the staff, particularly senior staff, of local authority roads and planning departments will voluntarily turn their backs on a lifetime of work spent promoting private car use at the expense of other transport modes. This creates a requirement for a *national roads oversight body* with the statutory power to intervene and block roads schemes and traffic management policies that are hostile to the goal of restoring cyclist and pedestrian access to our towns and cities. The new body will exercise oversight over all Irish roads authorities, including the NRA and the proposed Dublin Transport Authority, would act as a roads-design and planning clearing-house, and provide Ombudsman-like functions in terms of infrastructure provision and management. In this regard the sustainable travel unit of the Department of Transport (DoT) is a welcome first step. Independent road safety audits should be an integral responsibility of the oversight body.

We have identified the following structural requirements for the new entity:

1. It must be national, with an unequivocal remit for rural and small town environments as well as larger urban areas.
2. It must serve as a supervisory agency and have the power to veto any schemes that do not conform to national policy on the promotion of access by vulnerable roads users. This requires that it be centred on the DoT, or that it be a separate statutory body with NRA-like or Bord Pleanála-like functions. It must be either an umbrella body above the NRA and Bord Pleanála (and to which both are answerable) or a fixed component of a restructured NRA (which becomes the "national transport infrastructure" agency). The weakness of having it within such a body is that it could be subject to interference by car and bus interests. There is also an argument for stripping the current roads assessment functions away from An Bord Pleanála, who are seen to be part of the problem in terms of imposing inappropriate road design policies.

The national oversight body must be robust and persistent. This is a weakness of having it within the DoT, e.g. as a "sustainable travel unit". The lesson of similar entities like the UK DfT's *English Regions Cycling Development Team* is that they may not survive a change of Minister. We therefore argue for setting up a separate statutory agency by an Act of the Oireachtas.

### 3.9 Speeding

Of all the traffic management measures available to encourage more cycling and ensure cyclist safety, speed limit enforcement and reduction are the most important. Many adult Irish cyclists are able to tolerate sharing the ordinary roads network with even quite heavy traffic, provided base speeds are kept to 50km/h or below. The primary sense of threat does not come from “traffic” as such but from speeding, aggressive acceleration and close overtaking. Parents cannot be expected to let their children use cycle lanes when cars are being driven at excessive and dangerous speeds one metre away. Speeding traffic relegates even adult cyclists to within inches of the kerb, a pattern of behaviour that leaves them more vulnerable than ever to the most common type of car-bicycle collision.

Many of the problems caused by inappropriate roads infrastructure, such as one-way streets and slip roads, derive from the fact that they encourage higher traffic speeds. Other problem locations, such as roundabouts, cannot be expected to function safely for cyclists unless speed restrictions are stringently applied. The speed limits currently being applied are in many cases too high; 30km/h is often more suitable for residential streets while for minor rural roads and country lanes 60km/h is more appropriate. Achieving speed restraint on roads used by cyclists, both urban and rural, must be given top priority. The Irish state must recognise this and urgently challenge the culture of speeding on Irish roads.

#### 3.10 Road design and traffic management

The Roads Act 1993 states: *Section 13.- (5) - In the performance of their functions [...] a road authority shall consider the needs of all road users.* Despite this, some Irish roads authorities have at best ignored cyclists and pedestrians as road users and at worst treated them as obstacles to motorised traffic. There has been an overwhelming focus on pandering to the perceived needs of private motor traffic at the expense of all other considerations. In Ireland, “traffic management” has become a euphemism for “traffic catering” rather than the reasonable and equitable management of public roads as a space shared by all road users. Examples of unsuitable urban road infrastructure include:

- One-way streets
- Gyratories
- High-flow roundabouts
- Slip-roads
- Inappropriate traffic signal arrangements
- Inappropriate cycle “facilities”
- Inappropriate lane widths
- Inappropriate “traffic calming”

The result is an urban roads network that is designed and managed in a way that frequently makes it unfit for purpose, in terms of facilitating safe convenient access for vulnerable road users. Likewise, some rural roads are overly urbanised, with verges being progressively lost to traffic through “hedge-to-hedge” tarmac. This has to stop - an integrated approach will have to be adopted acknowledging that rural roads are for multiple users. Cyclists, pedestrians and children will utilise the rural roads again if they are given better protection through improved traffic management and driver behaviour. While the underlying physical deficiencies can be mitigated to some extent by improved enforcement and education, a national program of works is also required to undo the damage that has been done by car-focused practices. The starting point must be decisive intervention to block the further construction of inappropriate and cyclist-hostile roads infrastructure. The next step must be a nationwide audit to establish the extent of the unsuitable road design and management problem. Then a program of remedial works can be properly planned and initiated.

### 3.11 Prioritising the work - The *Hierarchy of Provision*

In 1996, the British Cyclists' Touring Club (CTC) and the Institute for Highways and Transportation jointly produced the document "Cycle-Friendly Infrastructure: Guidelines for Planning and Design".<sup>23</sup> It defined a hierarchy of measures for cycling promotion in which the goal is to convert a more or less cyclist-hostile roads infrastructure into one that encourages and facilitates cycling. We have adapted and expanded it to frame our discussions on roads management under Irish conditions (see next section and appendix). The explicit purpose of the *Hierarchy* is to anticipate and frustrate the tendency to jump straight into constructing cycling-specific infrastructure. Constructing X kilometres of cycle-track is not a valid objective. Valid objectives are to increase total cyclist numbers, reduce journey times, reduce physical effort, reduce delay, improve access and improve comfort. Our interpretation of the *Hierarchy* encompasses the classic three "Es": Education, Enforcement and Engineering. It provides a sequential checklist for prioritising roads management interventions under all these headings. For the sponsors of cycling promotion projects, the process of working through the *Hierarchy* needs to be clearly defined. The purpose of project delivery is not to "deliver" projects; the purpose is to achieve the types of objectives outlined above. At all stages, stakeholders must keep detailed records of the reasons and justifications for choosing or rejecting steps in the *Hierarchy*. Before rolling out similar schemes, there must be a systematic review process to establish actual effects, whether positive or negative. The detailed reasoning behind the *Hierarchy of Provision* and the associated policy instruments and legislative measures are set out in the appendix, where each subsection corresponds to each step in the *Hierarchy*.

Finally, the construction of roads infrastructure is not exclusively a government function. The *Hierarchy* is just as relevant to assessing the roads associated with private planning applications. It must be equally stringently applied both at the "planning" and "taking in charge" phases. Cycle tracks should not be constructed frivolously to act as some form of marketing tool for a proposed property development. Inappropriate cycling infrastructure and facilities are self-defeating and have been associated with avoidable death and injury. The thrust of the *Hierarchy of Provision* is that segregated cycle facilities are a treatment usually reserved for roads with heavy or high-speed traffic. Conversely, putting segregated cycle facilities into minor residential roads and housing estates implies intent to make these environments places that are dominated by high-speed or heavy traffic. This is not consistent with the normal function of streets in such environments. Property developers and others associated with planning must be subjected to close supervision, to ensure that public safety and the liveability of local roads are not sacrificed to ill-informed fashions among architects and town planners.



## The Hierarchy of Provision – Ireland 2008

- H1 Traffic speed reduction.** This is the single most important measure for restoring cyclist access to Irish towns. The primary emphasis must be on enforcement, particularly through widespread hidden speed-cameras. Physical measures are also needed, such as changing the perceived “design speeds” of roads and eliminating one-way street systems.
- H2 Traffic reduction.** Can traffic levels be reduced, particularly those of HGVs? Measures include banning HGVs from local roads with mixed traffic, building bypasses to divert through traffic, implementing road pricing schemes, and using environmental road closures to discourage through traffic.
- H3 Junction treatment and traffic management.** Providing road systems that are safe for, and permeable to, cyclists.
- H3.1 Non-signalised junctions: Modify or remove urban roundabouts and dismantle related gyratory systems that use one-way streets. Remove cycle-lanes from roundabouts. Eliminate “free-flow” arrangements, particularly slip roads, dedicated left-turns, merges and diverges. Modify T-junctions to reduce entry curvature, excessive visibility and width of entering roads. Modify or remove dangerous and inappropriate cycle facilities, particularly non-signalised cycle-paths and inappropriately narrow (<2m) or positioned cycle lanes (e.g. cycle lanes inside left-turn-only lanes).
- H3.2 Signalised junctions: Introduce traffic control systems that recognise cyclists and give them equal or increased priority; eliminate or modify left-turn-only lanes in general and left filters at traffic lights, consider advanced stop lines (ASLs) and bypasses for cyclists at traffic signals, and cyclist-specific traffic signals.
- H3.3 Eliminate one-way street systems and make remaining one-way streets two-way for cyclists. Exempt cyclists from banned turns and access restrictions.
- H3.4 Eliminate engineered pinch-points and road narrowings. Replace village gateway schemes with measures that take cyclist safety into account.
- H4 Ensure cyclists receive adequate space.** Provide cyclists with more space, regulate overtaking behaviour, provide logo-only routes, restrict on-street car parking, remove narrow cycle lanes (<2m wide) or mark wide kerb lanes, and provide shared bus/cycle lanes of appropriate width.
- H5 Hard shoulders, cycle lanes and cycle paths.** Having considered, *and where possible implemented*, all the above, what wide hard shoulders, cycle paths or wide cycle lanes, if any, are now necessary? (*Cycle-Friendly Infrastructure* places such segregated arrangements at the bottom of its hierarchy of provision.)

### 3.12 Changes needed to traffic and parking regulations

As set out in the appendix, a range of changes are needed to bring the Irish traffic and parking regulations into line with best practice and the requirements of a modern and efficient roads infrastructure. These requirements and changes are as follows:

- Immediate revocation of compulsory use regulation covering cycle tracks.
- Suspension of the 1998 cycle track regulations and their replacement with regulations using terminology based on common English usage and based on a schedule setting out minimum design standards.
- New traffic regulation specifying legal minimum passing distances (1.5m) by motor traffic when overtaking cyclists.
- Traffic regulation specifying that motor traffic may, or must, cross solid white lines or enter hatched areas if necessary to comply with the law on legal minimum passing distance.
- Traffic regulation forbidding motor vehicles from overtaking cycle traffic at specified locations, such as road narrowings.
- Traffic regulation forbidding motor vehicles from overtaking cyclists in the same lane when approaching, circulating and leaving roundabouts.
- Traffic regulation permitting cyclists to overtake or filter on the left, either in all or in defined circumstances.
- In the context of overtaking or filtering by cyclists, a traffic regulation is needed to specify that motor traffic may not deliberately drive two abreast in the same traffic lane, and may not deliberately obstruct, or must provide free passage to, cycle traffic passing on the left.
- Traffic regulation permitting cyclists to use left-turn-only lanes to go straight ahead.
- A traffic regulation may be needed to specify that motor traffic facing a green left signal must wait behind cyclists waiting for a straight-through signal.
- Traffic regulation making one-way streets in built-up areas two-way for cyclists by default.
- Traffic regulation giving legal status to road verges and hard shoulders as *de facto* traffic lanes; providing specific protection to pedestrians and cycle traffic using them, and imposing a specific duty to yield on any other traffic crossing road verges or hard shoulders to enter or leave roadways.
- A regulation imposing a "hierarchy of care" similar to that in Scandinavia, Germany and the Netherlands, that places on motorists a greater legal responsibility for the safety of vulnerable road users, particularly children.
- Amendment of the traffic regulations to redesignate "bus lanes" as "bus/cycle lanes" and clarify taxicabs' use of "bus/cycle lanes".
- The existing prohibition on cyclists using contra-flow bus/cycle lanes must be revoked.
- A traffic regulation is needed to specify that in shared spaces, such as pedestrian zones, cyclists must drive at a speed and manner that defers to the presence of pedestrians.
- The existing prohibition on cyclists entering pedestrian zones must be revoked.
- A traffic regulation designating "cycle priority" streets and roads, and specifying that drivers of motor vehicles must drive at a speed and manner that defers to the presence of cyclists.
- Traffic regulations to close public roads to motorised through traffic, by making them "residents only", "agricultural/forestry traffic only" and so on, thus creating safe cycling routes by eliminating rat runs for motorised traffic.
- Revision of the traffic and parking regulations with regard to halting on double yellow lines or cycle tracks to load or unload goods.



### 3.13 Vehicle standards and other judicial and enforcement measures

In addition to the changes in the regulations, the following measures are required, all of which have law enforcement implications:

- Improve vision aids on trucks for drivers to see cyclists (and pedestrians) at all levels and angles. Legislation must be introduced, and rigorously enforced, to make ‘cyclops’ mirrors on trucks mandatory.
- Fitting legally compliant lights to bicycles must be made mandatory at the point of sale. The current legal lighting specifications need review with reference to the types of bicycle lighting systems currently being sold.
- For cyclists, reading the intentions of other drivers is an important safety skill. A review is required of the use of so-called “privacy glass” that obscures drivers from view.
- Adopt into Irish law the EU directive which bans the fitting of forward projections (such as bull bars) to motor vehicles.<sup>24</sup> Make this a requirement for NCT compliance.
- Investigate judicial measures that might increase cycling safety, e.g. motorist liability in accidents involving cyclists and pedestrians; sentencing of people convicted of culpably killing a cyclist or pedestrian. In Scandinavia, the ‘hierarchy of care’ places extra responsibility on drivers for the care of vulnerable road users.
- Require An Garda Síochána to create a unit dedicated to combating bicycle theft.
- A review is needed of the enforcement mechanisms applicable against cyclists who infringe the traffic regulations. Consideration to be given to extending the “on the spot” fine system to cyclists.



## Section 4: Five-Year Plan for Cycling

Based on the various legislative, promotional and infrastructural activities already outlined, we have put together an indicative 5-year plan for a program of works to restore cyclist access to Irish towns and cities.

### 4.1 One-year targets

- DTO Cycle Facilities Manual and DTO Traffic Management Guidelines rescinded, with the interim adoption of the UK Dept. for Transport's *Manual for Streets*.
- Legislation that obliges cyclists to use cycle paths revoked
- Privatised speed camera service initiated.
- Base-line traffic counts of all urban road users to be established.
- High-level expert advisory committee appointed (which can advise on other targets).
- Pending inspection by new roads oversight body, Minister to order temporary halt to:
  - Cycle-track construction by local authorities
  - New urban roundabout construction by local authorities
  - Schemes creating additional one-way streets by local authorities
  - Schemes creating stacking lanes at signalised junctions.
  - 2 + 1 conversions of rural roads
- Revised edition of *Rules of the Road* published.
- Advertising campaign to advise motorists of the legal requirement to yield to cyclists at roundabouts and at other cyclist-hostile locations.
- Advertising campaign to show motorists how speed restraint reduces congestion.
- Advertising campaign to advise cyclists of their status as drivers in law, and to remind them of the associated responsibilities and rights, e.g. don't cycle on footpaths, use lights at night, respect pedestrian crossings.
- Cyclists permitted to carry bicycles on the rear carriage of commuter trains.
- Local authorities to begin national audits or surveys of cyclist-hostile infrastructure, in order to quantify:
  - Roundabouts
  - One-way streets
  - Road narrowings
  - Narrow traffic lanes e.g. those caused by QBC schemes
  - Other inappropriate cycling infrastructure (cycle tracks, narrow cycle lanes, etc.)

### 4.2 Two-year targets

- Speed camera service in place covering all urban areas, using random checks with hidden equipment. Enforcement targets based on compliance e.g. V85 (85th percentile speed) rather than the base quantity of detections.
- New road design guidance in place or in process (via guidance notes on particular topics, such as roundabouts, pinch points, bike parking, junction and cycle path design).
- New national roads oversight body in place.
- Interdepartmental government committee in place to develop, monitor and oversee implementation of funding plan.

- All local authorities, under direct supervision by external advisory agencies, to initiate drafting of plans for remedial works to roundabouts, one-way street systems and other cyclist-hostile road features, such as inappropriate (footway-type) cycle tracks.
- All major urban centres to have pilot schemes in place to open pedestrian zones and selected one-way streets to cycle traffic.
- Pilot application of lower 30km/h limits at selected roundabouts.
- All local authorities, under direct supervision of external advisory agencies, to identify streets for pilot application of 30km/h limits.
- National school curriculum for cycle training adopted and in place.
- Training modules on vulnerable road users in place for learner and commercial drivers.
- Legislation in place to ban HGVs from urban centres.
- On-road cycle training to have begun in secondary schools.
- Draft program of bypasses around urban centres.
- Approved graduate- and post-graduate-level road/traffic curricula for engineering students to be in place.
- Road traffic accident statistics involving injury to cyclists to be extended to hospitals (A&E and in-patient data).
- Travel statistics to be extended to schools – bike travel censuses, etc.

### **4.3 Three-year targets**

- 5% of public parking in urban areas to be for bicycles.
- Key road/traffic engineers and planners in all local authorities to have passed cycling proficiency course.
- Initial low-cost safety upgrades of urban roundabouts, entailing warning signs and speed ramps on entries and exits.
- Pilot application of camera-enforced lower speed limits at unmodified roundabouts.
- Schemes in place to dismantle one-way street systems.
- Set one-year target to have all single-lane one-way streets made two-way for cyclists.
- Begin program of bypasses around urban centres.
- Set targets for introducing 30km/h zones in urban areas.
- Local authorities subject to regular external audits of road surface quality, drainage and maintenance standards.
- National hotline or recording system in place for reporting road surface quality, drainage and maintenance problems.
- Compulsory on-road cycle training in place for secondary school students and learner drivers.
- All urban safety statistics published using Geographic Information System type mapping, and related back to the figures in the regular (total user) traffic counts now in place.

#### **4.4 Five-year targets**

- Minimum of 10% of parking in urban areas to be for bicycles.
- Bike parking available at all secondary schools and public transport interchanges; bicycle carriage available for 10% of customers on interurban trains.
- All single-lane one-way streets made two-way for cyclists by default.
- All pedestrian zones open to cyclists at least part-time.
- V85 (85th percentile speed) down to the applied speed limit in all urban areas.
- Program of works completed that will remove or modify roundabouts or reduce speeds on roundabouts in urban areas.
- Program of bypass-building around urban centres in place.
- 30–40% of urban streets to be in 30km/h zones.
- Hard shoulder network extended to arterial "N" roads in urban areas.
- All schools to provide cycle training.
- Where bypasses are in place, traffic restrictions (especially HGV bans) to be imposed in urban areas.

## **Appendix: The *Hierarchy of Provision* expanded**

### **H1 Traffic Speed Reduction**

#### **H1.1 Key Measures**

Of all the traffic management measures available to encourage more cycling and ensure cyclist safety, speed limit enforcement and reduction are the most important. Many adult Irish cyclists are able to tolerate sharing the ordinary roads network with even quite heavy traffic, provided base speeds are kept to 50km/h or below. The primary sense of threat does not come from “traffic” as such but from speeding, aggressive acceleration and close overtaking. Enforcing urban speed limits must be given top priority. As of 2001, the Netherlands had an estimated 1,500 speed/red-light camera installations.<sup>25</sup> The Irish state must match this effort and give absolute priority to rolling out random speed camera enforcement, especially to routes used by cyclists.

In addition to enforcement of the standard 50km/h urban speed limits, limits of 30km/h (20mph) and lower are more appropriate for many urban roads with mixed traffic. The Netherlands set targets for 30km/h limits on 70% of urban roads. Graz in Austria has applied 30km/h limits to 75% of its streets since 1994 and has achieved steady growth in cycling.<sup>26</sup> In Hilden, Germany, 24% of trips are taken on two wheels – this rate was achieved mainly with traffic calming and 30km/h zones.<sup>27</sup> Closer to home, Portsmouth is working toward becoming the UK’s first “20mph city”, with the lower limit being applied to all residential roads. The current Irish ministerial advice restricting 30km/h limits to areas that are already traffic-calmed is unhelpful, and defeats the purpose of having such a measure available. In rural areas, speed limits must match both the function and layout of the road. If a county council has permitted the ribbon development of households with children along a rural route, then the speed limits must be revised to take account of the road’s residential function. Marking boreens and other minor rural roads with unjustifiable 80km/h or 100km/h limits must cease. Lower limits such as 60km/h must be applied on narrow country lanes, and the need for care around pedestrians and cyclists in these constricted environments must be stressed in driver training.

Engineering measures that physically alter road layout or appearance, to actively or passively slow traffic down, also have a limited role, but such measures may be futile unless the underlying culture of speeding in urban areas is directly challenged. The concept of “traffic calming” should be broadened to include physical measures that revise the perceived design speeds of roads, “living street” and “shared space” type schemes, and associated measures such as eliminating one-way street systems and removing centre-line markings from roads. Conversely, some Irish “traffic calming” schemes, particularly those with road narrowings, are viewed as extremely cyclist-hostile, and such designs have been implicated directly in death and injury to cyclists. This is covered in more detail below, in the section on road narrowings and pinch points.

#### **H1.2 Home zones**

As of 1999, the Netherlands had over 6000 *woonerven* or “home zones”, where cyclists and pedestrians have legal priority over cars and where a motorised speed limit of “walking speed” applies.<sup>28</sup> Germany uses similar zones and legislation. There is a need for similar “home zone” legislation in Ireland.

#### **H1.3 Speed enforcement: Lessons from the UK**

The objective of speed enforcement is not to generate revenue or statistical conviction counts. The objective must be to secure a change in attitude to speeding among the motoring public and thereby secure a safe roads environment for all. In December 2001, the UK Minister for Transport ruled that cameras should be clearly visible, to avoid motorists being “surprised” by them.<sup>29</sup> This policy of using mainly visible speed cameras at fixed locations has been deplored by groups representing vulnerable road users as having no



scientific basis, and has been challenged via the High court.<sup>30</sup> Notwithstanding their attempts to be motorist-friendly, the UK government's speed camera policies have also generated considerable resentment among groups associated with the motoring lobby, who have also argued that this use of speed cameras has adversely affected road safety. The UK experience provides a salutary lesson in how not to conduct a national speed enforcement programme. It underlines the need for a national information campaign to "sell" the importance of tackling speeding and to win the hearts and minds of the public over to the need for speed restraint. There must be a focus on the wider benefits, not just on crash prevention. The message must go out that speeding *per se* is a source of traffic congestion and delay. For example, motorists who choose to speed make it hard or impossible for others to choose to walk or cycle, or let their children walk or cycle. Speed restraint means potentially 20% less traffic during school term. Motorists who speed from traffic jam to traffic jam are merely lengthening the queues of cars, with little if any decrease in their own journey time.

## H2 Traffic Reduction

### H2.1 Key measures

In many European cities with high cycling levels, the starting point was active motorised traffic removal and reduction programmes. In the 1970s the Dutch city of Delft began restricting private car traffic from crossing the city centre.<sup>31</sup> Groningen was divided into four zones that cannot be crossed by private motor-traffic, which must use the ring road instead.<sup>32</sup> Cyclists and other traffic pass freely between the zones, and cycling accounts for at least 50% of trips. Reducing car parking capacity is an associated method: Copenhagen's renewal as a sustainable city can be traced to a policy, adopted in the 1970s, of reducing available car parking capacity by several per cent a year. London's congestion charge has resulted in a significant increase in cycle use in the affected area. If necessary, car traffic in Irish urban areas must be restricted by similar means. A massive public relations effort is required by government and local authorities to explain to the population why this is beneficial. The unsustainability of ever-increasing car density must be signalled firmly in public policy. If the volume of commuting cars is not reduced, it will be very difficult to provide the safe space needed to produce an increase in commuter cycling.



There is a need for measures to exclude through traffic from urban centres and school routes. This requires a national program of ring roads and town/village bypasses with stringently limited property access. Building strategic motorway infrastructure is pointless if traffic seeking to access it has to drive through our town and village centres to reach it. The Dublin Port Tunnel experience has shown that unless enforcement activity increases, the mere removal of heavy traffic leads to increased traffic speeds – directly defeating the purpose.<sup>33</sup> Therefore, providing bypasses around urban centres must be made contingent on simultaneously carrying out works to remove the spare capacity from the bypassed centres. This can involve environmental traffic cells, closing bridges and roads, removing stacking lanes at signalised junctions, dismantling one-way street systems, removing or modifying roundabouts, etc. In rural areas, the creation of new strategic roads infrastructure must be accompanied by markedly reduced speed limits and the stringent downgrading of any superseded road links. As with the Dublin Port Tunnel, diversion of heavy traffic cannot be permitted to facilitate the use of other routes as private 'racetracks'.

## H2.2 HGV Management

Collisions with HGVs are responsible for a significant proportion of cyclist fatalities in some urban areas, particularly Dublin. In urban situations, the classic HGV-cyclist crash involves cyclists getting caught on the inside of left-turning HGVs. How HGVs and cyclists interact must be specifically addressed in the revised *Rules of the Road*, the new *National Curriculum for Cycle Training* and the proposed *Vulnerable Roads User* training module for commercial drivers. Notwithstanding this, the routine mixing of cyclists with HGVs is unacceptable and must cease. Any national cycling program must have HGV management as a central strategy, and must commit to the eventual elimination of HGVs from roads with mixed traffic, particularly during school travel hours (8:30–9:30am and 3:00–5:00pm). The HGV strategy must include a commitment to diverting HGVs away from towns, villages and any rural roads not suitable for such vehicles. Where alternative routes are available, such as urban bypasses, the use of unsuitable roads by HGV drivers should become an automatic offence attracting penalty points, unless the driver can show good cause or has a permit. There is a need for strict imposition of vehicle standards – for goods vehicles in particular – with compulsory retrofitting of cyclops mirrors to all HGVs. The Gardaí will need to agree to a more frequent and a stricter vehicle and driver standards checkpoint regime. Just-in-time inventory management and the associated casualisation of the goods transport business are compromising cyclist safety, since such practices lead to avoidable HGV journeys and may encourage dangerous driving. The DoT and RSA must conduct a review of road haulage business practices that affect road safety.



Figure: Scene of HGV/cyclist collision

## H2.3 Routes for local traffic only



Figure: German plate creating Residents/Cyclists-only street

In Germany and France, an established traffic reduction measure for local roads in both rural and urban areas is to prohibit any through traffic that does not have business there: in France, the 'sauf riverains' sign; in Germany, the 'Anlieger frei' and similar signage. This immediately eliminates rat runs without any physical re-engineering. The roads remain open to cyclists, who benefit from traffic-free routes that also provide short cuts unavailable to other commuters. In rural areas, these regulations permit the creation of extensive cycle routes where the only other traffic is local residents and farmers accessing their land. There is a need for similar "Residents/Agricultural traffic only" regulations in Ireland.

## H2.4 Vehicle-restricted zones

While vehicle-restricted zones and pedestrian zones can be key traffic-reduction measures, they are arguably pointless if they inconvenience cyclists and public transport users. As with the requirement for roads restricted to local traffic, there needs to be a move toward the use of similar measures on selected city streets. Rather than all-or-nothing pedestrian zones, there should be more flexible systems, with city-centre roads that close to certain types of traffic at certain times of the day. There is longstanding guidance from the UK and Germany that banning cyclists from vehicle-restricted areas should be avoided, particularly where there are no suitable alternative routes. The state must set targets for local authorities to open all vehicle-restricted and pedestrian zones to cyclists by default. In Germany, it is also common for public transport services to retain access to

pedestrian zones. Cyclist access to such zones must naturally be made dependent on their using speeds that defer at all times to the presence of pedestrians. There may also be a need for legislation to address inappropriate and inconsiderate cycling in such environments.

### **H3 Junction treatment and traffic management.**

Junction design is crucial for cyclist safety, as evidenced by UK data (73% of car/cycle collisions occur at junctions<sup>34</sup>) and U.S. research (up to 89% of car/cycle collisions involve turning or crossing manoeuvres<sup>35</sup>). A 1997 U.S. review of 3,000 car/cycle collisions found that only 8.9% involved overtaking motorists.<sup>36</sup> To quote *Cycle Friendly Infrastructure*: “A cycle network is only as good as its weakest function and very often it's the junctions that are the weak links”. In general, junction designs that favour higher-speed turning, weaving and merging movements by motorists tend to be hostile for cyclists; features such as large entry curvature, slip-roads, merge lanes and high-flow roundabouts are associated with increased risk of car–cyclist collisions.

#### **H3.1 Junction alterations**

##### **H3.1.1 Merges, diverges, slip roads**

In the UK, recorded accidents at slip roads have a cyclist fatality rate six times higher than that on the network as a whole. The overall accident rate per cycle movement is also thought to be significantly higher. On dual carriageways it has been estimated that replacing a roundabout or signalised intersection with a grade-separated slip road results in a respective fourfold or tenfold increase in the injury accident rate for cyclists.<sup>37</sup> There may be an argument for such road designs in interurban arterial or motorway environments, but in urban areas the fact that a road happens to be a dual carriageway or happens to serve an arterial function does not provide any such justification. It is unacceptable to use road geometries or junction designs intended for interurban, high-speed environments on lower speed routes in or near urban centres. There is a repeated problem in Ireland of urban roads having design speeds that significantly exceed the stated speed limit. Not only does this endanger cyclists, it also brings the very concept of urban speed limits and their enforcement into disrepute.

##### **H3.1.2 Roundabouts and gyratories**

Large roundabouts of the design used in the UK and Ireland are typically laid out as a series of slip roads with flared entries tangential to the inner circle. On such roundabouts, cyclists have an injury accident rate 14–16 times that of motorists.<sup>38</sup> In the UK, a survey of over 8,000 experienced and mainly adult male Cyclists Touring Club members found that 28% avoided roundabouts on their regular journey if at all possible.<sup>39</sup> In some Irish cities such as Galway and Limerick, avoiding roundabouts is not an option for many people. When negotiating a roundabout by bicycle, the recommended safe-cycling tactic is for the cyclist is to use the junction in the same way cars do. Cyclists must get into the correct lane and transit the junction in a prominent lane position like any other vehicle. As an interim solution, cyclists could be protected with stringently enforced lower speed limits (e.g. 20km/h) at roundabouts.

There is a need for a specific traffic regulation forbidding motor vehicles from overtaking cyclists in the same lane when approaching, circulating and leaving roundabouts. All roundabouts must have signs advising motorists of the legal requirement to yield to cyclists in possession of the junction – this can be reinforced with “shared lane” markings on and approaching roundabouts. These solutions might not resolve the considerable problems faced by pedestrians, disabled people and less confident cyclists (see photo, below). The construction of such roundabouts in urban areas must halt immediately, until the designs can be vetted by the new roads oversight body. There needs to be a national program of remedial works to work towards eliminating all large high-capacity roundabouts on roads with mixed traffic, and modifying any remaining roundabouts so as to reduce entry and exit speeds and “flow”. A related issue in city centres concerns the use

of linked one-way streets to create what are effectively huge roundabouts or "gyratories". Examples of such gyratory systems include Dublin's D'Olier & Westmoreland Sts. and St. Stephen's Green. These are also inherently hostile to both cyclists and pedestrians and, like other high-flow roundabout designs, they have no place in a sustainable city. They should be dismantled with urgency.



Figure: Cyclists require space when negotiating normal traffic situations

### Cycle lanes on roundabouts.

The use of peripheral cycle lanes on roundabouts defies both accident analysis and standard safe cycling advice. Cycle lanes marked on several roundabouts by Dorset county council had to be removed after the casualty rate doubled.<sup>40</sup> A recent paper presentation on German roundabout design states: "Cycle lanes at the peripheral margin of the circle are not allowed since they are very dangerous to cyclists".<sup>41</sup> Thus, another obvious remedial measure to improve cyclist safety at roundabouts is to remove cycle lanes marked on them.



Figure: Pedestrians running at city-centre roundabout. There are serious problems with the use of such road designs at such locations

### H3.1.3 T-junctions

Collisions at T-junctions account for 40% of junction collisions. Historically, Irish road design practices favoured design features that are associated with increased speed by entering or turning traffic and with increased risk of collisions. Examples include large entry/exit curvature and excessive visibility envelopes. As with other inappropriate junction designs, a national program of remedial works is required to address these design flaws.



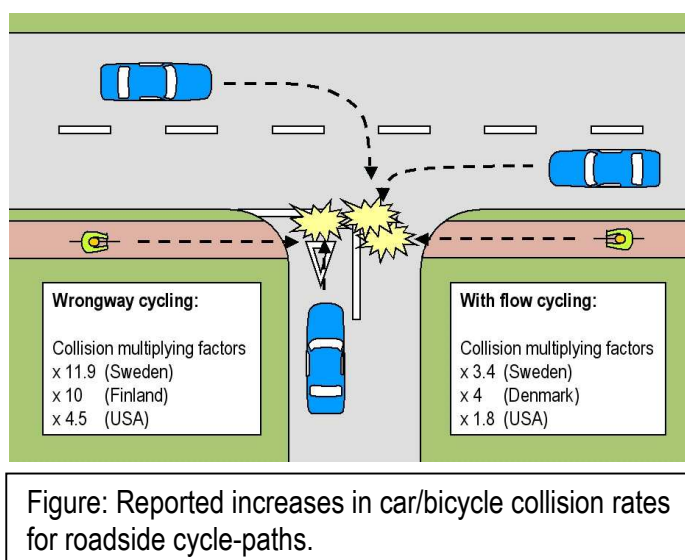
## Cycle facilities at non-signalised junctions

The key safety issue associated with roadside cycle paths and cycle-lanes is that they increase risks and conflicts that are already inherent in junctions. There is overwhelming evidence from other countries that unless they are very carefully designed, cycle facilities increase the risk to cyclists. Studies from the US,<sup>42</sup> UK,<sup>43</sup> Canada, Sweden,<sup>44</sup> Germany, Finland<sup>45</sup> and Denmark<sup>46</sup> have reported increases, many significant, in the rate and severity of junction collisions as a result of segregated cycle facilities (see Figure, below). Thus the current regulations that seek to force cyclists to use segregated cycle paths are completely unacceptable and must be revoked.

Particular concerns attach to roadside cycle-tracks, and to lanes that are two-way or that attract two-way use. Turning motorists are not accustomed to looking out for traffic moving at 30km/h from the 'wrong' direction on the wrong side of the road. A program of remedial works is required to identify and replace inappropriately designed cycle facilities.

Likewise, cycle path designs that simply remove priority from cyclists at every junction are unacceptable and must be removed, or modified

to restore normal priority to cycle traffic. Cycle lanes painted on the road also introduce junction conflicts. Narrow cycle lanes passing T-junctions inhibit cyclists from adopting the appropriate road position, and make them more vulnerable to being "cut up" by following traffic or by entering drivers. The current draft cycling infrastructure design guidance for the UK advises that, "If part of a cycle lane is too narrow for cyclists to remain conveniently within it, it may be safer to discontinue it".<sup>47</sup> The same issue applies in Ireland and a national program of works is needed to resolve the issue.



## H3.2 Traffic signals and control systems that respect cyclists

### Safety versus the traffic regulations

Signal-controlled junctions tend to be safer for cyclists than other designs such as roundabouts. However, the attitude of some cyclists to red traffic signals is a source of controversy and triggers condemnation even from some who are otherwise sympathetic. The issue of cyclist safety at signalised junctions requires honest and open discussion. In some cases the issue is clear-cut. For instance, the refusal of some cyclists to respect red lights at pedestrian crossings is unacceptable, and there is a clear requirement for robust action by the Gardaí to tackle this wherever it occurs. Other aspects of cyclist behaviour at traffic lights are less clear-cut since, as will be shown below, Irish traffic engineers have been training Irish cyclists to ignore red lights.

Those who would advise and educate cyclists must, in the first instance, have regard to the duties pertaining to personal safety and the safety of others that are enshrined in the Roads Act. The fact that some action may be lawful within the traffic regulations does not necessarily render it safe. Conversely, the fact that some action may be unlawful under the traffic regulations does not necessarily render it dangerous. Thus, simplistic assertions such as "always keep left", "always use cycle lanes" or "always stop at red lights" may act to cause, rather than prevent, avoidable deaths. Once these issues exist there is a duty to introduce them for discussion, though doing so does not imply approval of lawbreaking.

In the discussions below, arguments will be presented for facilitating cyclists in reaching the head of the queue



at junctions. The fact that such arguments can be made should not be construed as an argument that cyclists should always seek to get to the head of traffic queues. Prudence dictates that in some circumstances, a cyclist's best option may be to wait one or two vehicles back from the head of the queue (see photograph on page 4). However, this applies to all junctions and is a matter in which adult cyclists will have to exercise their own judgement. Similarly, the argument that safety is best served by requiring cyclists to always stop at red is not necessarily supportable. A review of deaths due to HGVs in London has given rise to a compelling, if controversial, argument that some cyclists are at increased risk of death and injury because they choose to obey red lights.<sup>48</sup> Essentially, a cyclist who halts and waits at a stop line may be in exactly the worst position if an adjacent lorry starts turning. As will be pointed out below, Irish traffic engineers have contrived to create situations where an apparently viable safety case could be made for cyclists proceeding past red lights in defined circumstances. The state has also contrived to create a situation where, at some locations, red-light regulations are being applied to cyclists without apparent justification in terms of safety or traffic management. The question which will ultimately arise is to what extent the safety of cyclists at traffic signals might be best left to training and instruction, and to what extent left to regulation.

### **Training cyclists to ignore traffic signals**

In Ireland, there is a perceived pattern of roads authorities simply ignoring cyclists when it comes to traffic signals (as with other road designs). It is arguable that several generations of Irish traffic engineers have been training several generations of Irish cyclists to ignore traffic lights. The use of excessively long signal-cycle times discriminates against both cyclists and pedestrians, and encourages cyclists and motorists alike to run red lights. Some traffic lights use detector systems that are supposed to trigger signal changes in response to waiting vehicles, including cyclists, but many Irish installations do not appear to respond to the presence of cyclists. Cyclists are put in the position of having to "run" red lights if no motorised vehicle arrives to trigger a signal change, i.e. cyclists have effectively been placed outside the law. The advent of cycle track construction has led to some designs where cyclists are explicitly obstructed during the green light phase and can only proceed when the lights are red (see photograph on page 36).

Some cities use urban adaptive traffic control (UTC) systems, which use linked traffic signals to manage traffic in response to changes in demand. This can have direct negative impacts on cyclists, pedestrians and public transport users. Where signals are arranged to provide private motor traffic with so-called "green waves", this can create "red waves" for these other road users. Using UTC systems to systematically inconvenience other transport modes so as to accommodate more private motor traffic will only drive increased traffic growth. The state must confront such activities by roads authorities and establish the equitable use of traffic signals for the benefit of all road users. If Irish roads authorities are not prepared to use road sensors or UTC systems that take account of cyclists, then the state must insist that signals are reverted to timer control using shorter traffic light phases to benefit pedestrians, cyclists and public transport. In the U.S., following dissatisfaction and protest over the operation of traffic-signal detector systems, some states, including Minnesota, Wisconsin, Georgia, Tennessee, Idaho and North Carolina, have now made red traffic signals advisory, i.e. equivalent to "stop" or "yield" signs for motorcyclists and/or cyclists under defined conditions.

### **Narrow and long stacking lanes at traffic signals**

A significant problem in Ireland is the unfortunate practice of splitting roads into narrow lanes at traffic signals so as to store or "stack" queues of peak-hour traffic. This impedes cyclists because all the available road space has been dedicated to cars, creating a situation where some cyclists feel invited or required to cycle on the footway. Once they manage to reach the traffic signals and transit the junction, cyclists are forced into a narrow gap on the other side, into a lane barely wide enough for a single vehicle, let alone a car and bicycle travelling side by side.



Figure: substandard stacking lanes at traffic signals

(Pinch points are discussed in greater detail below.) Forcing cars and cyclists to race each other for narrow gaps might also provide cyclists with a safety incentive to run the lights and try to clear the junction before the other traffic starts moving. An alternative and legal tactic for cyclists is to adopt a prominent lane position, to block following cars from overtaking within the junction (see photograph on page 4) – something that requires a certain level of confidence under typical Irish traffic conditions. A related problem is excessively long stacking lanes, which are again focused on accommodating peak-hour traffic and which effectively turn sections of the road into dual carriageways (see photograph on page 1). These designs create a hostile cycling environment, where cyclists lawfully manoeuvring for right turns can find themselves caught with speeding traffic on their left and impatient drivers behind them.

It is a repeated lesson that simply 'throwing' road capacity at rush hour traffic tends to drive traffic growth and increase congestion. In essence, Ireland has a situation where road capacity for cyclists at traffic signals is being systematically removed, and cyclist safety and comfort are being systematically compromised, in order to facilitate and promote the growth of motorised traffic. This practice is actually advocated by the *DTO Traffic Management Guidelines*, which underlines the need for their immediate removal from circulation. As with other inappropriate local authority practices, strong intervention is required by central government to confront this problem and impose remedial works at affected junctions.

### **Dedicated left-turn-only lanes and left filters**

Conflicts with left-turning traffic, particularly HGVs, are responsible for a significant number of urban cyclist deaths. Such conflicts are central to, but not confined to, the problem of left-turn-only lanes. Since cyclists tend to proceed on the left there is a danger that, where left-turn-only lanes are used, straight-on cyclists will get caught inside streams of left-turning vehicles – potentially including HGVs. There should be a presumption against the use of dedicated left-turn lanes in urban areas, and where used they must be carefully designed. It is not acceptable for cyclists to be expected to merge to the right across lanes of following traffic, in order to go straight ahead. There needs to be a traffic regulation permitting cyclists to use left-turn-only lanes to go straight ahead.

Figure: Left-turn-only lane/slip road on road with mixed traffic



Figure: Cycle lane inside left-turn-only lane



A related issue is the use of dedicated left-turn filters (green arrows) at traffic signals. Straight-on cyclists who arrive at a red light can suddenly find themselves either trapped inside a stream of turning motor vehicles, or caught in front of a queue of traffic that now expects to move off. The state must order the removal of such left-filters unless there is adequate dedicated space available, such as an Advanced Stop Line (ASL, see below), where straight-on cyclists could wait. Left-filters at traffic lights are arguably another example of Irish citizens being placed outside the law.

A particular problem in Ireland is the use of cycle-lanes inside left-turn-only lanes. This dangerous practice is wholly unacceptable, as it puts straight-on and right-turning cyclists in an impossible situation while at the same time confusing the current legal presumption against overtaking left-turning traffic on the left, which – as previously mentioned – is a significant cause of deaths due to HGVs.

Cyclists who, through no fault of their own, find themselves faced with such road designs are entitled to expect that they will be given the full protection of the law. If the state wishes to retain the use of such road designs, then there is an explicit duty to provide the necessary supporting legislation. If left filter signals are to be retained, this would seem to impose a requirement for a traffic regulation stipulating that motorists facing a green left-arrow must wait behind cyclists already waiting in front of them for a straight-through traffic signal. If arrangements with cycle lanes running inside left-turn lanes are to be retained, then the regulations must explicitly state that turning drivers be required to stop and yield to cyclists passing on the inside.



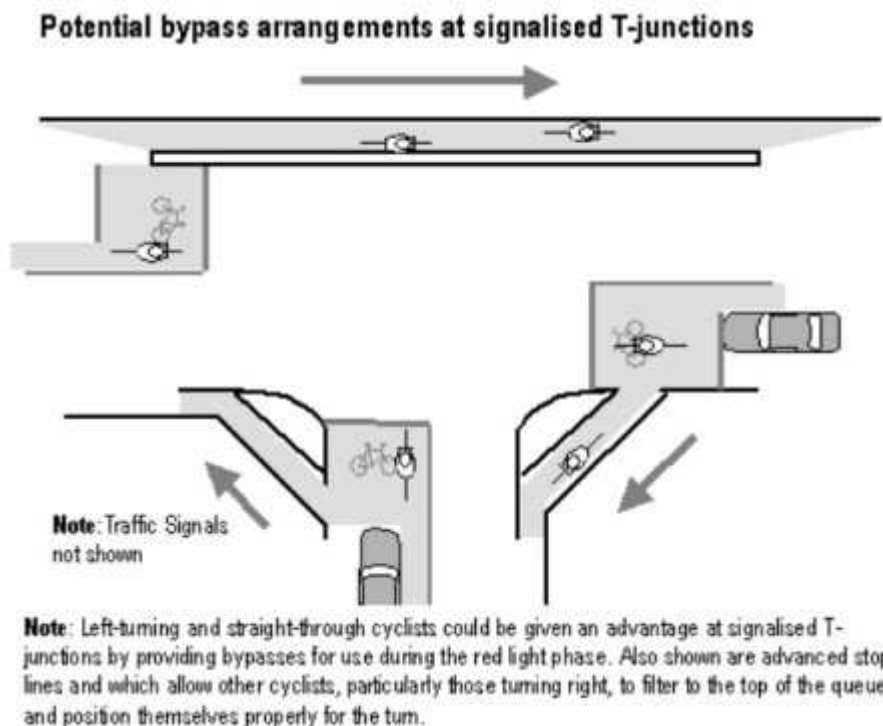
Figure: Cycle lane encouraging cyclists to pass inside left-turning HGVs

### Traffic signals at off-peak times

Many cyclists cannot see the point of being made to stop at red lights when there is clearly no other traffic present and when, provided they show due caution, they should be able to proceed without any danger and without interfering with other traffic or pedestrians. In Germany, the traffic regulations allow traffic signals to switch off at certain times of the day and the junction then reverts to priority-based (yield-sign-based) control. A related form of control could be achieved by switching to a flashing amber signal at certain times of the day.

### Cyclist-specific measures at traffic lights

Various cyclist-specific measures can be applied at traffic signals. In some cases these are adaptations to standard signal-controlled junctions, such as pre-green for cyclists, four-way flashing amber at off-peak times, bypass arrangements with or without signals, and Advanced Stop Lines (ASLs, see next page). Other junction designs, such as those using cycle paths, have an explicit requirement for separate traffic signals for cyclists.





## Bypasses and free left turns

Many cyclists cannot see any logic to forcing left-turning cyclists to always wait at red lights. Common sense dictates that when due caution is shown, cyclists should be able to make the turn without any conflict with crossing traffic or pedestrians. In some countries, left (right)-turning cyclists are simply granted an exemption at traffic lights. Under Article 68 of the Dutch Traffic regulations, cyclists can be granted a right turn on red through a simple plate attached to the traffic signal (see Figure, right).<sup>49</sup> “Right turns on red” for all vehicles has been longstanding practice in the U.S. Irish cyclists are entitled to ask why a similar exemption should not apply to them, given that the case is arguably much stronger for cyclists than for motorists. An engineering approach uses a simple bypass or channel constructed through the corner (see Figure on previous page). Care is needed to ensure that the merge between turning cyclists and crossing traffic minimises conflict.



rechtsaf  
voor  
fietsers  
vrij

Figure: Dutch plate permitting right turn on red for cyclists

These are not just issues for left-turning cyclists. At some signalised T-junctions, cyclists continuing straight on the uninterrupted side of the transverse arm could argue that they might reasonably proceed through a red light without causing conflict with turning traffic. The current traffic regulations permit the use of a flashing amber arrow signal at intersections for turning traffic – this could be adapted to create a version applicable only to cycle traffic, and useable either with or without bypass arrangements.

## Pre-green for cyclists

At complex signalised junctions, some cyclists feel safer getting in front of the other vehicles, and the stop line, during the red phase at the lights. This tactic allows the cyclist to clear the junction quickly once the lights go green, instead of being caught in the middle of two or more lanes of accelerating traffic. Although technically red-light running, cyclists will usually wait for an appropriate traffic signal. In countries such as Denmark, this principle is incorporated into some traffic signals by giving cyclists a specific pre-green for two or four seconds to allow them to get moving ahead of the other traffic.<sup>50</sup> Similar measures should be examined for use in Ireland.

## Advanced stop lines

Advanced stop lines (ASLs) are a variation on the pre-green concept. They involve a painted box or reservoir provided for cyclists in front of motorised traffic at signalised intersections, generally used in conjunction with some form of cycle-lane for filtering cycle traffic. They are extremely popular with cyclists, who can play to their strengths by regularising the practice of filtering to the top of queues during the red phase at traffic lights. Right-turning cyclists can take up a proper turning position, while straight-on cyclists can adopt and maintain a prominent position for transiting the junction safely within the main traffic stream. ASLs can help reduce the vulnerability of waiting cyclists at junctions with left filter lights. They are also advocated as a way of improving pedestrian safety, by increasing the separation between crossing pedestrians and waiting motor vehicles. Based on Danish research, ASLs should be arranged so that the stop line for motorised traffic is 5m back from the main traffic signal. This makes the cyclists clearly visible to HGV drivers, who have a blind spot up to 4m directly in front of the cab. Despite this it is apparent that, in Dublin particularly, some ASL installations are not deep enough; this leaves cyclists and pedestrians without adequate clearance from waiting traffic.



Figure: substandard ASL installation

Again there needs to be a national audit of existing ASL installations, to identify and modify any that fail to comply with best practice. Where ASLs are used, there is a need for enforcement by the Gardaí to prevent motorists abusing the space provided – stopping on ASLs should be made a specific offence under the traffic regulations and should incur penalty points. At present, Gardaí can only use the failing-to-halt-at-a-stop-line offence to deal with this infraction. Where ASLs are to be used at detector-based traffic signals, appropriate detectors must also be provided with the bike reservoir.

Although some waiting cyclists might be safest in ASL boxes in front of HGVs, there is concern about the use of nearside cycle lanes (on-road cycle tracks) to approach such intersections – specifically that these feeder lanes may encourage cyclists to “creep up” inside left-turning HGVs, a practice associated with extreme risk of death and serious injury in the event of misadventure. The standard safe cycling advice is that cyclists should avoid passing any large vehicle in the same lane at the head of a traffic queue. The use of ASLs and nearside feeder lanes has been associated with cyclist deaths in London. It has been argued that even if HGVs are fitted with cyclops mirrors, typical ASL arrangements may encourage cyclists to position themselves where a HGV driver may still not see them. The standard advice for cyclists is that they should only use such feeder lanes if the traffic signal is red and they are sure they can reach the reservoir before the light goes green.<sup>51</sup> If the signal is green, cyclists are advised to ignore any cycle lanes and stay within the main traffic stream. The Royal Society for the Prevention of Accidents advises that cyclists may be better off hanging back behind HGVs even if ASLs are present.

The Irish regulations pertaining to ASLs (SI 273/98, 274/98) state that they must be used in conjunction with a cycle-lane (on-road cycle track). By implication, the cyclist may only approach the second stop line by using the cycle lane. This regulation ignores cyclists’ need to position themselves according to their intended direction, and arguably places them outside the law if they follow standard safe cycling advice at such locations. If left-turning traffic is present, the regulation imposes a potentially fatal form of behaviour. It needs to be revised so that the first stop-line applies to motorists and the second to cyclists. These ASL safety issues underline the point that infrastructure should not be applied in the absence of the necessary legislation and road user training. The safety issues that arise also underline the fact that there may be a need for specific legislation to protect cyclists passing other traffic on the left.

### **Junctions that require separate traffic lights for cyclists**

In some cases, separate traffic signals for cyclists are absolutely necessary. It stands to reason that creating a completely segregated road system for cycle traffic requires separate traffic management and traffic light systems to control its connections with the rest of the roads network (this was acknowledged in the Irish literature as long ago as 1975). If there is a design requirement for cyclist-specific traffic lights, then simply providing them is not enough. Typical UK and Irish practice restricts pedestrians to a dedicated signal phase, separate from and usually much shorter than the green phase for motorists (e.g. 6-12 seconds vs. signal cycle times of anything up to 120 seconds).<sup>52,53</sup> Treating cyclists in a similar manner would amount to the systematic removal of capacity for cycle traffic and a systematic reduction in the level of service offered to cyclists. This is unacceptable. In Cambridge, the use of cyclist-specific traffic signals is reported to have resulted in increased delays for cyclists, leading some to ignore the cycle facilities and stay on the road.<sup>54</sup> A similar situation arose from a Parisian cycle path scheme in 1999: cyclists faced twice the number of traffic signals as motorised traffic and were expected to wait over one minute to get seven seconds of green time.<sup>55</sup>

If cycle-specific traffic signals cannot be achieved without imposing additional time costs on cyclists, then the base junction design must be revised or cyclists must be provided with unambiguous on-road routes through the junction, e.g. with shared lane road markings. By contrast, at some junctions with segregated facilities in Germany and elsewhere, all traffic in a given direction – motorists, pedestrians and cyclists – may get a green signal at the same time.<sup>56</sup> All transport modes get equal green time, and turning motor traffic must wait for cyclists and pedestrians to clear the junction before proceeding. There may be a need to move to a similar legislative framework in Ireland, combined with legislation permitting Irish cyclists to overtake on the left.



## The Irish situation

Despite the established requirement for separate traffic signals, there are various examples of Irish cycle path systems that were deliberately constructed without them. In Galway, a cycle-path system that requires traffic lights was used to connect a series of standard roundabouts, where by definition there are no traffic lights. Where the same cycle-paths include a signalised junction, cyclists have been provided with no lawful means to cross the junction. That this design required cyclist-specific traffic lights was first pointed out to Galway Corporation in 1987. In this case the cycle paths are obstructed when the traffic lights are green and cyclists may theoretically only proceed when the lights are red – a design which explicitly imposes unlawful behaviour. The state must insist that where such designs have been imposed, either the necessary traffic signals must be provided or the cycle paths must be removed or modified. Where neither is an option, cyclists must be provided with indisputable on-road routes through the junctions such as by using shared lane road markings.



Figures: Sub-standard cycle paths at Galway junction: during the green phase, pedestrians occupy the cycle path and associated access ramps. Cyclists may only physically proceed if the lights are red. (Technically, wheeling a bicycle against a red light is also an offence.)

## Pedestrian guardrails

Since pedestrian guardrails represent a very real hazard to cyclists, their use must be reviewed. The London study of HGV deaths already referred to apparently found that guardrails may have contributed to three deaths by trapping cyclists inside turning lorries.<sup>48</sup>



Figure: Pedestrian guardrails may increase the risks to cyclists

### H3.3 One-way streets, banned turns and restricted access

One-way street systems are a product of urban management that tries to keep motorised vehicles moving regardless of the costs to society. One-way street systems encourage speeding and have a negative effect on the urban environment for both pedestrians and cyclists. Denmark, a country with high cycling levels, makes no use of such systems. To quote the Danish Roads Directorate directly: "In contrast to, for instance Spain and the USA, no Danish towns have a network of one-way roads that can improve the traffic flow".<sup>57</sup> If one-way streets are applied to cyclists, they impose unnecessary trip length and inconvenience, an imposition with few if any traffic management justifications. In northern Europe, cyclists are frequently granted exemptions from one-way street restrictions. German research indicates that making one-way streets two-way for cyclists results in a reduction in the total number of collisions.<sup>58</sup> Contraflow cyclists may also be at reduced risk of certain types of accident, particularly so-called "dooring" incidents. In Belgium, all one-way streets in 50km/h zones are in principle two-way for cyclists.<sup>59</sup> Irish cyclists are frequently told that Ireland should emulate Denmark and the Netherlands as models for cycling promotion. An obvious place to start is by eliminating one-way street systems. The initial target should be to dismantle large one-way street systems as a traffic calming and reduction measure, followed by the provision of appropriately conceived two-way cyclist access on any one-way streets that remain.<sup>60</sup>

These are not just issues for Ireland. In the U.S., the use of one-way streets is the subject of often-acrimonious debate, with some communities trying to block the expansion of one-way street systems and many cities now looking at ways to removing one-way street systems as a means of improving the "livability" of town and city centres, by reducing the dominance of motorised traffic. To directly quote US commentators: *"One-way streets pose many threats for pedestrian and motorist safety, make city streets seem less safe, disproportionately impact poor and minority neighborhoods, hurt downtown businesses, reduce the property values of homes and negatively impact the environment and contribute to global warming. Conversions to two-way have already happened in more than 100 cities around the United States."*<sup>61</sup> As a starting point the Irish state must block the creation of additional one-way streets by Irish roads authorities. All roads authorities must then conduct surveys to define the extent of the one-way street problem, and initiate plans to upgrade the Irish urban roads network through their removal. How best to provide two-way cyclist access to one-way streets must receive detailed consideration in the new roads design guidance.

As with one-way streets, road closures and bans on left or right turns are frequently done in a manner that focuses only on managing motorised traffic. There is rarely any traffic management justification for including cyclists in such restrictions and – as with one-way streets and pedestrian zones – banning cycle movements frequently imposes longer and sometimes more unsuitable routes. A typical urban example is where traffic engineers direct all right-turning traffic to make a U-turn via a roundabout further down the road. Where road closures are imposed as a means of traffic reduction, applying the ban to cyclists would seem to directly defeat the purpose.

### H3.4 Road narrowings and pinch points

Road narrowings and pinch points are a source of concern for many cyclists, especially on roads with fast or heavy traffic. At such locations, some motorists will treat cyclists as an obstacle to be overtaken at all costs (see below: *Overtaking: Critical road sections*). A Transport Research Laboratory (TRL) review of traffic calming schemes using narrowings remarks: "Some illustrations show that the cyclist is effectively the principal speed-reducing 'feature'".<sup>62</sup> In a subsequent TRL study, respondents specifically stated that cyclists were being used as tools in such "traffic calming" schemes.<sup>63</sup> Deaths and injuries to cyclists have occurred at such pinch points. TRL 621 specifically refers to cyclists being wounded after being clipped by wing mirrors. At least one such incident has resulted in death, after a cyclist was struck in the head by a van's wing mirror at a pinch point (Mr. Allan Moir, aged 34, killed on A68 Scotland, January 2003). TRL 621 reports the view that the use of such pinch point installations had made cycling on some routes almost impossible without recourse to cycling on footways.

In the short term, a legal minimum passing distance (when overtaking) should be introduced. There needs to be additional regulation forbidding the overtaking of cycle traffic at specified locations. Even if these regulations are in place and enforced, however, they would only serve to underline the fact that some Irish roads authorities are effectively using unprotected human beings, theoretically including children, as traffic calming features on roads with heavy traffic. This is obviously unacceptable. A national program is required to identify, and wherever possible eliminate or widen, deliberately created pinch points of inappropriate lane width on all roads with mixed traffic and traffic speeds in excess of 30km/h. These include the various cyclist-hostile village gateway schemes that have been imposed at various rural locations. At some locations it might be possible to re-engineer the feature with cyclist bypasses, but such treatments would depend on the prior imposition of clear maintenance standards. In Germany and Spain, automatic red lights and enforcement cameras (traffic lights that go red if approaching traffic exceeds stated speed limit) are used at equivalent village gateway locations. These facilities reward rather than impose speed restraint and may represent the best means of replacing “gateway” features on main roads approaching our rural towns and villages, and thereby restoring safe access to local cyclists.

### Pinch points created by pedestrian crossings

Some narrowings have been created for the claimed benefit of pedestrians. There should be a stated presumption that, when a pedestrian refuge creates a dangerous narrowing and there is no clear pedestrian demand, then it needs to be removed. Similarly, there should be direct guidance that when a pedestrian refuge creates a dangerous narrowing, and a clear crossing demand exists, then alternative treatments, such as zebra or pelican crossings, must be favoured. If removal is not an option, then there must be a stipulation that speed ramps be included using either side of the feature. A review of engineered road narrowings should also include pelican crossings with central islands and not just refuges at uncontrolled crossings.



Figure: Some drivers will allow room for cyclists to pass through pinch points.

## H4 Providing more space for cyclists

### H4.1 Overtaking by motorists: minimum passing distance and road widths

There seems to be a particular problem in Ireland with close overtaking by motorists of cyclists and pedestrians. When combined with speeding, this behaviour threatens those subjected to it. The French traffic regulations specify minimum passing distances to be used by drivers when passing cyclists (1m on urban roads and 1.5m on rural roads).<sup>64</sup> German case law recognises a similar principle.<sup>65</sup> Ireland needs an equivalent traffic regulation. This measure also creates the requirement that motorists must be permitted, or even required, to cross solid white lines or enter ghost islands in order to pass cyclists with adequate space. German traffic law specifically allows the crossing of solid white lines when overtaking slower traffic in certain circumstances.



Figure: Plate reminding French drivers of overtaking requirements

In Ireland, however, the issue is not merely a case of ignorant or inconsiderate behaviour by motorists. Typical Irish road design practice favours lane dimensions that tend to

encourage close and inconsiderate overtaking manoeuvres by motorists. There is a critical road section or lane width that encourages dangerous overtaking manoeuvres by motorists. In 1995 an Austrian source<sup>66</sup> put this critical section at 2.8–3.75m, while *Cycle Friendly Infrastructure* (1996)<sup>67</sup> defined it as 3.1–3.9m. The issue has been discussed further in subsequent guidance, such as Lancashire County Council's *Lancashire: The Cyclists' County*.<sup>68</sup> The issue is conspicuously absent from the DTO *Traffic Management Guidelines* of 2003, a fact that underlines the need for their removal and revision.<sup>69</sup> On roads or lanes within the critical width, motorists may try to stay within the traffic lane while passing cyclists, resulting in dangerously inadequate clearance. At narrower lane widths, motorists are more likely to wait for gaps in the oncoming traffic and to pull out properly while overtaking, but this may depend on there being lower traffic speeds and volumes. Wide road sections provide more space for overtaking but may result in higher driving speeds. For Irish cyclists the crucial observation is that the standard Irish lane width of 3.65m is within the critical section that tends to encourage dangerously close overtaking. Design guidance and remedial interventions are needed to confront the problem. On some two-lane roads the simplest solution may be to simply remove central lane-markings; this also acts as a traffic calming measure.

#### H4.2 Logo-only routes and Shared lane road markings

The “safety in numbers” hypothesis reinforces the view that simply making motorists aware of the likely presence of cyclists is a key safety measure. There need to be “logo-only” routes, such as California-style *shared lane road markings* or equivalent treatments that have been tried in Australia and Scotland. For main roads where the required road width, surface quality or maintenance resources are not available, such measures represent an obvious alternative to more controversial treatments such as narrow or inappropriately conceived cycle lanes. They also represent an obvious treatment for locations where cyclists must, by definition, be prominently mixed in with the other traffic, such as at roundabouts and pinch points. The markings have the following objectives:

- Improve motorists' and cyclists' positions on roadways without cycle lanes or hard shoulders.
- Reduce aggressive motorist behaviour.
- Encourage correct cyclist behaviour.
- Inform motorists to expect cyclists on the roadway.
- Inform motorists that cyclists may legally adopt a prominent lane position.
- Inform cyclists how to position themselves safely in the lane with respect to the kerb, parked cars, etc.
- Increase the number of cyclists by helping them feel more comfortable.



Figure: example of a shared lane road marking

A San Francisco project studied the effect of various similar markings on the behaviour of motorists and cyclists.<sup>70</sup> The markings were positioned to allow a four-foot (1.2m) clearance with roadside objects such as parked cars. The markings caused an increase of over 2 feet in the distance between cyclists and passing motor vehicles, with the bike and chevron markings shown in the Figure (above right) having the greatest effect and causing the least confusion. An additional benefit was an increase in passing distances used by cyclists overtaking parked cars.

#### H4.3 Redistribution of the carriageway – wide kerb lanes

An obvious way of creating more space between cyclists and motorised vehicles is to provide wide kerb (nearside) lanes. These wider lanes increase the probability that motor traffic will be able to pass cyclists at a safe distance without having to change lanes. This is particularly important on routes with a high proportion of wide vehicles like buses or HGVs. These lanes also provide more room for cyclists to filter past queues of cars in congested conditions. *Cycle-Friendly Infrastructure* argued for a marked lane width of 4.25m;



subsequent guidance has increased this to 5.05m on roads shared with HGVs. The use of such wide lanes is specifically endorsed by *Cycling: The way ahead for towns and cities*, the European Commission policy document on cycle promotion.<sup>71</sup> In Ireland, there is a noted problem on some wider roads of motorists attempting to double up and form two queues of traffic – sometimes using cycle lanes to do so. This practice blocks the road and prevents less-confident cyclists from maintaining progress. It defeats the purpose of wide lanes and may require an additional road traffic regulation to address it, similar to the current restriction on cycling more than two abreast.



#### H4.4 Overtaking/Filtering by cyclists

One purpose of providing adequate lane widths is to allow cyclists to maintain progress by filtering forward past halted cars in congested conditions. While filtering/passing on the inside is explicitly permitted for cyclists in Denmark, the Netherlands<sup>72</sup> and Germany,<sup>73</sup> it is illegal in Ireland. Passing on the inside is not recommended in some circumstances – particularly where HGVs are turning left – but it is unrealistic, and may bring the law into disrepute, to expect child cyclists or less confident adults to either wait at the back of long queues of cars or overtake on the right. This situation is arguably another case where the state has placed a particular group of citizens outside the law. A specific traffic regulation is needed to permit cyclists to either overtake on the left or to filter forward in defined circumstances. There is an associated requirement for a traffic regulation to stop motorists deliberately pulling in to the kerb to block cyclists from passing. As already indicated, under German and Danish traffic law, turning cars and trucks are required to yield to cyclists and mopeds coming up on the inside – a similar regulation may be needed in Ireland.

#### H4.5 Bus/cycle lanes

The use of shared bus/cycle lanes is viewed as a successful cycle promotion measure in other countries and was placed higher on the *Hierarchy of Provision* than the use of segregated cycle facilities. Unfortunately, the concept has been debased by recent Irish practice. The Quality Bus Network (QBN) design office in Dublin has been described as “overtly hostile” to cyclists,<sup>74</sup> and there is compelling evidence for a similar attitude among the management of CIE and its constituent companies. Ideally a bus lane is a wide kerb lane (at least 4.5m) with plenty of space for buses to overtake cyclists. In urban areas the lanes for other traffic need only be 3m wide (or less in some





circumstances). Yet there are locations where Irish buses and cyclists have been forced to share constricted bus lanes while private motor traffic retains spacious lane widths. This must change. Where a two-lane road is converted to two lanes plus a bus lane, a key issue to be resolved is what lane widths are to be used across the entire road section? A 3m rather than 4.5m bus/cycle lane might be acceptable if the alternative is to mix HGVs and cyclists in a 3.25m lane on the other side of the road. Where sufficient space is not available for adequate lane widths, then much more demanding cost-benefit analyses should be applied to bus lane schemes. For instance, while providing a bus/cycle lane may have merit as a symbolic gesture, at some locations the volume of left-turning traffic may mean that bus journey times are unlikely to decrease regardless of the provision of dedicated space. Where substandard (<4.5m) bus lanes are used, strict instructions are needed regarding their management and they may require a 30km/h speed limit. There is a need for a root and branch review of bus lane schemes, particularly the QBN in Dublin, and for remedial measures to be identified and carried out. The current restrictions on cyclists using contraflow bus lanes must be dropped.

#### H4.6 The Irish situation: Aggressive behaviour by bus drivers

It is possible for cyclists and other traffic to share bus lanes successfully – this is a key cycling promotion measure in other countries. Irish commuter cyclists can travel at speeds of 30km/h or higher, so they cannot be expected to divert onto shared footways or footway-type cycle tracks. Irish cyclists will inevitably use bus lanes, but there are reports of Dublin Bus drivers showing appalling behaviour and seeking to run cyclists “off the road”.<sup>74</sup> Similarly, in Galway there appears to be a developing pattern of aggressive and threatening behaviour, particularly towards women cyclists, by bus drivers using the new bus lanes on the Dublin Road. There is a need for state intervention to address this threatening behaviour by bus drivers. Bus/cycle lanes are provided as a means of allowing other traffic to maintain progress past queues of private motor cars at times of peak traffic congestion – they do not exist as a “private race track” for public transport operators. In particular, bus timetables must be examined carefully to ensure that they conform to driver speeds that comply with the law. If bus driver behaviour cannot be changed through education, then the obvious next step is to impose 30km/h limits in bus lanes (If bus drivers wish to drive faster they can use the other traffic lanes to do so). The legislation is already in place to allow imposition of particular speed limits on particular classes of vehicle at specified locations. The use of bus/cycle lanes by taxi drivers also needs to be examined – for instance, should taxis without a fare on board be allowed to use bus lanes?

#### H4.7 On-street car parking

There is evidence of Irish roads authorities systematically removing road capacity from cyclists in order to provide on-street car parking, thereby creating traffic lanes of unsuitable width on roads with heavy traffic. In some cases they also derive revenue from these activities. That is to say, some Irish roads authorities are being permitted to profit financially from measures that directly defeat the stated national goal of encouraging bicycle use. In contrast, the starting point for Copenhagen’s revival of bicycle use was the systematic removal of car-parking capacity. Measures must be put in place to identify, and financially penalise, roads authorities



that misuse roads capacity on main routes for this purpose. Perceived weaknesses in current parking legislation should also be reviewed in this context, such as the statutory provision for loading/unloading for up to 30 minutes to deliver 'goods' (no definition provided) while parked on double-yellow lines or in a cycle lane.

#### H4.8 Providing more space – removal of narrow cycle lanes

The use of cycle lanes less than 2m wide, particularly those less than 1.5m wide, may result in cyclists receiving *less* clearance from passing traffic *than if there was no cycle lane there*.<sup>75</sup> There is a convincing case that all existing cycle lanes are reviewed, and that those of inadequate width be either widened to the 2m standard or removed altogether. The current draft cycling infrastructure design guidance for the UK advises that, “If part of a cycle lane is too narrow for cyclists to remain conveniently within it, it may be safer to discontinue it”. All roads authorities must be required to conduct surveys to establish the extent of the problem and, on that basis, to draw up plans for remedial works. An alternative treatment for main roads is the shared lane road marking set out above in Section H4.2.



Figure: Sub-standard cycle lane

### H5 Hard shoulders, cycle lanes and cycle paths

#### H5.1 Overview

*Cycle-Friendly Infrastructure* and subsequent best practice places segregated arrangements such as these at the bottom of the hierarchy of provision. The object of sustainable infrastructure management must always be to achieve a default situation where cyclists and motorists share the same road space with a reasonable level of comfort and safety. Segregation is the option of last resort and should normally only be considered once all other measures in the hierarchy have been exhausted. Segregated space for cyclists can be achieved using a range of measures that are classified as follows:

1. “On-road” or “on-carriageway”
  - Cycle lanes
  - Hard shoulders
  - Cycle-priority streets
2. Roadside
  - Footway-type roadside cycle-paths (“cycle tracks”)
  - Shared use footways
3. Cycleways (roads dedicated to cycle traffic on their own alignments)

Roads or paths that are open to cyclists but not motorists can benefit cyclists where they provide links that are more convenient than the main road network, or help resolve obstacles. Examples include routes through pedestrian precincts and back street connections via residential estates. The use of separate cycle lanes, and roadside cycle-paths alongside or within existing roads, is highly controversial in terms of safety and cycling promotion. Separate cycle lanes or cycle tracks can seriously undermine safety if inappropriately designed or located. While it is possible to use separate facilities to promote cycling, it is also possible to use them for the opposite purpose: to remove priority from cyclists and give it to motorists. There is overwhelming evidence that various Irish roads authorities have effectively sought to use “cycle-tracks” in just such a manner. The apparent intent has been to increase the convenience and attractiveness of motoring at the expense of the safety, attractiveness and convenience of cycling. Much of the Irish cycling infrastructure constructed under the influence of the DTO and DTO design guidance is demonstrably not-fit-for-purpose in terms of either utility or recreational cycling. Some designs are demonstrably unsuitable for Irish conditions and have been

associated directly with avoidable deaths. In some cases the biggest obstacles Irish cyclists face on their daily commutes are the cycle facilities. In this regard, the current attempts to use the traffic regulations to coerce cyclists into using cycle facilities is viewed as offensive by cyclists, and the continuing existence of this legislation undermines any claims of good faith on the part of central government.

Badly conceived or constructed cycling facilities often make cycle conditions significantly worse than nothing at all. Thus Irish roads authorities should be directly prevented from either constructing cycle facilities, or procuring their construction by third parties, unless they have received express permission from some higher authority. As with the ordinary roads infrastructure, there needs to be a national audit of cycle facilities and a national program of remedial works to modify or remove devices that are inappropriately conceived or designed. No more “cycle-tracks” should be constructed in urban areas until the new roads oversight body is in place. As an interim measure, the state can specify that adequate road/lane widths be used on all main roads in urban areas.



## **H5.2 Education and awareness**

To operate safely, cycle facilities require increased rather than reduced skill and education among cyclists and motorists. There is a strong argument that the safety of cycling and cycle facilities in other countries depends in large part on the level of education and awareness among motorists. It can be argued that the cycle facilities in Germany, Denmark and the Netherlands succeed because they are part of a system where there were already large numbers of cyclists exerting a safety-in-numbers effect, where motorists first learn to use the roads as cyclists, and where motorists are also formally taught where and when to expect cyclists of all ages and how to behave safely in those circumstances. If the Irish state wishes to use cycle facilities as part of its policies, then it first needs to provide comprehensive road user education and cycle skills training. Road user education and awareness campaigns are not a luxury that can be sidestepped by building cycle facilities, but are in fact a prerequisite for the construction of any cycle facilities.

## **H5.3 Legislation**

The current regulations relating to cycling facilities are viewed as deeply flawed. The need to remove their compulsory use aspect has already been explained. The flaws in regulations regarding ASLs have also been explained. In addition, the 1998 cycle track regulations use confusing terminology in a manner that conflates important concepts and defies standard English usage. The attempt to use the term “cycle-track” to cover both on-road cycle lanes and roadside cycle-paths suggests that there was a fundamental lack of comprehension on the part of those who drafted this legislation. The 1998 regulations have also permitted local authorities to “turn off” cycle facilities, to become car-parking spaces at certain times of the day, leaving inadequate road space for cyclists using the road. This is unacceptable. These regulations need to be revoked without delay, and replaced with legislation based on best practice and clear language. There is an argument for drafting any new regulations with regard to a schedule setting out minimum design standards in terms of width, surface quality, obstructions, alignment, curvature and maintenance. A similar arrangement in Germany has allowed cycling groups to initiate legal action to have deficient cycling facilities declassified by the courts.



## H5.4 Maintenance of cycle facilities

As a rule, cycling-specific infrastructure such as cycle lanes and roadside cycle paths are more prone to collecting debris, and the impact of non-maintenance on cyclists is high. There is therefore a need for an increased maintenance effort over that given to ordinary roads. If a local authority cannot provide the required maintenance effort on the ordinary roads network, this raises questions about the prudence of investing capital in more maintenance-intensive cycling facilities. Thus, where a local authority wishes to construct cycle-specific infrastructure, or to procure its construction by third parties, they should be required to show the necessary maintenance plans and budgets in place beforehand.

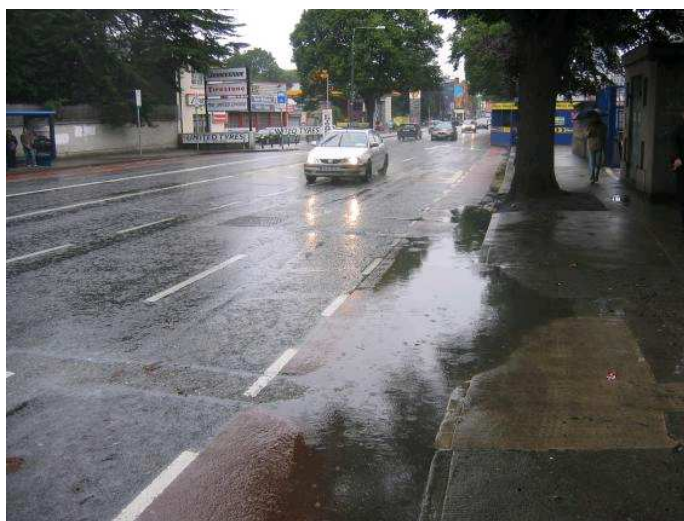


Figure: marking cycle lanes can maximise the impact of poor maintenance

## H5.5 Use of cycle facilities in urban areas

There are arguments for providing cycle facilities within existing urban roads, but only if they are correctly conceived and offer some increase in the level of service over the existing infrastructure. Given that in typical urban situations roadside cycle-facilities are inherently more conflict prone, “safety” must be abandoned as a primary justification for their construction (if only to avoid creating false expectations of safety among users and their families). For commuter routes in urban areas, the primary justification must be to increase the level of service, in terms of journey times, available to those commuting by bike. The safety of the designs used must be based on what will provide the best level of safety for the highest level of service. If a reasonable level of service cannot be achieved, then alternative on-road routes must be provided, such as by using shared lane road markings.

## H5.6 On-Carriageway solutions must be the default

Because of maintenance issues and problems with safety at junctions, the default treatments for cyclists must always be on-carriageway, such as wide kerb lanes, hard shoulders or cycle lanes. On-carriageway treatments serve the widest possible range of cyclist types with the highest assurance of a basic level of service. When they are abused (such as by illegal parking) or unmaintained, on-carriageway treatments result in the least disruption and inconvenience to cyclists. Some cyclists always use the carriageway, so not only must cycling on the carriageway be the default assumption for designers, but where off-road facilities are provided it may be assumed that many cyclists will continue to use the carriageway. The Dublin Cycling Campaign has this to say about cycle lanes:

- “Cycle lanes are a useful measure provided that they improve safety, priority, directness or comfort for cyclists without compromising any of these. Cycle lanes must be constructed to international best practice. All substandard cycle lanes should be removed: such “facilities” are worse than nothing, and often put cyclists at increased risk.
- Cycle lanes are most useful when they allow cyclists to bypass stationary motor vehicle traffic. They may also give increased comfort by providing an area unencroached by high-speed traffic, although this must be balanced against the false sense of security they may engender.
- Junctions must be designed so that cyclists do not lose priority or end up on the wrong part of the road. There must be no cycle lanes on the inside of left-only lanes: such a design increases the likelihood of

left-turning vehicles cutting up cyclists. The junction design should ensure that cyclists are visible to motorists.”

In Galway, cycle campaigners have taken the position that providing space for cyclists does not have to be achieved at the expense of either engendering a false sense of security in cyclists or exposing cyclists to the implied threat posed by the 1998 cycle track regulations. The Galway Cycling Campaign takes the position that where, after following the *Hierarchy of Provision*, a case can be made for providing “segregated” space, this is best achieved with standard hard-shoulder markings. The use of 2m hard shoulders as a means of facilitating cyclists was adopted as a default objective of the Galway City Development Plan 2005-2011.

### **H5.7 Footway-type facilities – roadside cycle paths**

In urban areas, the use of roadside cycle paths or “cycle tracks” is highly controversial in terms of both safety and cycling promotion. As already stated, footway-type facilities have serious safety problems at junctions. On a footway-type cycle-path, every driveway and property entrance also becomes a junction. They have serious maintenance problems: they are most likely to collect broken glass and other debris, and are less accessible to standard road sweeping equipment. The issue of surface quality has other implications. The majority of cycling-incurred injuries (up to 85%) result from simple falls, a common cause being surface defects. In a footway environment there are additional injury hazards due to lampposts, telegraph poles, bins, bollards and of course pedestrians, who are also at risk of injury. In many cases it is simply not possible to travel safely at normal Irish cycling speeds on a footway/roadside cycle-path. Finally, roadside-type cycle-paths almost inevitably attract some level of two-way use by some cyclists, causing increased hazard at junctions and increased hazards and obstruction to cyclists coming the other way.

### **H5.8 Shared use footways**

Converting roadside footways to shared use is highly contentious and as a “measure of first choice” is widely deplored by groups representing cyclists, pedestrians and disabled people. A fast adult cyclist can be expected to reach speeds of over 30km/h; it is therefore unacceptable to direct cyclists into a constricted space shared with pedestrians, particularly the young, elderly and vulnerable. The issue is best addressed by following the *Hierarchy of Provision* and by providing roads that are fit and safe for cycling. Where, after following the Hierarchy, a shared-use option is explored, it should be based on the assumptions that fast cycle traffic will continue on the carriageway, and that cyclists using the shared structure defer to pedestrians. This would allow for the use of some footways by younger child cyclists and escorting adults, such as on “safer routes to school” type schemes. Even here, footway cycling must be seen as an option of last resort, to be considered only after the hierarchy of other measures, which include reducing traffic, reducing speed, traffic calming, bypasses, eliminating rat runs, providing normal crossings, identifying back street routes (including footpaths/trails away from roads), restricting access by HGVs and so on.

Children are not immune to the laws of traffic, and the fact that a route is intended primarily for children requires more, rather than less, meticulous planning. Rather than pushing for shared-use routes so as to make it legal for children to use footpaths, a more viable option may be to recognise that smaller children tend to cycle on some footpaths and recognise this in the traffic regulations (Under German Law child cyclists under 8 must use the footway). The new cycling curriculum for schools should discourage this where it is inappropriate, and inform children and their parents how to do it as safely as possible where it is unavoidable. Even for younger children, cycling on the footway creates risks at junctions such as driveways and property entrances. It is possible to assist child cyclists by drawing up alternative sets of routes to and from particular destinations, which avoid problematic locations and awkward right turns. There is current U.S. guidance that while some level of footway cycling by children might be accepted, it is inappropriate to designate footways not designed to accommodate bicycle travel as bike ways (cycle tracks). Ultimately the main solutions for child cyclists lie with the Gardaí, traffic engineers and town planners, and with a more stringent and defined duty of care for motorists towards vulnerable road users, particularly children.



## H5.9 Roadside cycle facilities and bus stops

In 1998 the DTO distributed design guidance that recommended the unfortunate practice of routing cyclists directly alongside bus stops in a manner that made conflict with alighting passengers inevitable. Given that Irish cycle commuters can move at speeds of 30km/h or higher, this defied common sense and safe practice. Routing cyclists between buses and bus stops is something that has been tried in Denmark. In 2007, a Danish group made a presentation to the AGM of the European Cyclists Federation on the topic of accident patterns seen in Copenhagen following the construction of cycle lanes and cycle tracks – including such straight-through-the-bus-stop designs.<sup>76</sup> The meeting report states that there was a 17-fold increase in injuries involving collisions between cyclists and bus passengers. (The Danish document notes that the construction of cycle tracks and cycle lanes has had a net negative effect on safety in terms of accidents and injuries. The Danish authors sought to justify the increased injuries on the grounds that cyclists experience significant health gains from the regular exercise.) As with other deficient Irish road designs, there is a need for a program of works to identify and modify or remove any cycle facilities that have been routed directly alongside bus stops.



Figure: Routing cyclists inside bus stops has been associated with a 17-fold increase in collisions

## H5.10 Interurban routes and urban high-speed arterials

On high-speed routes with low junction densities, a viable safety argument can be made for segregated treatments for cyclists. However, on faster roads the same issues arise concerning what treatments will provide cyclists with the best level of safety for a given level of service within the resources available. In an ideal situation, cyclists would not have to 'rub shoulders' with high-speed traffic, be it on hard shoulders, cycle lanes or roadside cycle-paths. Ideally, cyclists could be catered for with wide, direct cycleways on separate alignments with all the appropriate junction treatments. Reality dictates that this is rarely possible, and even if the capital investments were available, the issue of ongoing maintenance would still arise, as it would with roadside rural cycle-paths.

Hard shoulders on Irish national routes have provided a huge *de facto* rural cycling infrastructure. They are not an ideal solution, but the separate space they provide promotes safety and comfort, and many such roads are arguably safer, more comfortable and more attractive cycling environments than the urban centres they connect. This long-standing function of the hard shoulder network must be officially acknowledged and protected. A traffic regulation is required to give legal status to road verges and hard shoulders as *de facto* traffic lanes, providing specific protection to the pedestrians and cycle traffic using them and imposing a specific duty to yield on any other traffic crossing road verges or hard shoulders to enter or leave other roads.

Ireland has a highly dispersed settlement pattern with houses strung along even major routes. Therefore some cyclists will always have to use major routes to access destinations and must be catered for within those routes. Residences along major roads are not just a source and destination for cycle traffic; they also complicate the taking of land to construct parallel cycleways. This suggests that Ireland will be left with hard shoulders as the default cycling provision on many routes for the foreseeable future. On main routes measures must be put in place to ensure that adequate width, surface quality, drainage and maintenance standards are applied to hard shoulders as well as to the roads they abut. Similarly, controls must be put in place to ensure that roads authorities are not permitted to sacrifice hard shoulders for measures designed to facilitate motor traffic – such as conversion to so-called "two plus one" roads. On high-speed roads there is

the option of using cycle-lanes as an alternative to hard shoulders. This raises several questions, one of which is whether it is appropriate to visually advertise a road as a “cycle route”, and theoretically invite novice cyclists, when traffic is travelling at 100km/h a metre away on the same surface. For such roads to be designated as cycle routes, traffic speeds would first have to be significantly reduced.

### H5.11 Recreational routes

Using separate cycleways or bike trails for promoting recreational cycling is less controversial than it is for utility cycling. Extensive interurban cycleway networks can be found in many northern European countries. These may use roads dedicated exclusively to cycle traffic, or minor rural roads whose use is otherwise restricted to local motor traffic and agricultural machinery. Denmark has had a national system of cycle routes since 1993. In Northern Europe, cycling tourism represents a significant proportion of overall tourist activity. According to the German National Cycling Strategy, cycle tourism is worth €5 billion to the German economy annually.<sup>77</sup> It is important to distinguish distinct sectors. There are the cycle tourists (or touring cyclists), adult cycling enthusiasts who will travel considerable distances over several days or weeks, exploring a country by bike. Ireland could quickly provide an enhanced product for the touring market by extending and upgrading the hard shoulder network, tackling village gateway schemes and identifying routes using suitable minor roads. At the other end of the scale are family groups seeking cycling opportunities with their children on less challenging routes. This type of cyclist will be more interested in local day trip type opportunities using circular routes or options that allow return by public transport with their bikes. Traffic-free or traffic-reduced environments could be developed for this market. Options that could be explored include routes through parks and forests and along canals, abandoned railways and coastal alignments. However, there may be challenges integrating safe cyclist access to these routes via the wider road network whether urban or rural. Using isolated corridors away from main roads has obvious attractions as traffic free routes in daylight. After dark, the same routes may prove quite impractical for and unattractive to cyclists, especially when they divert cyclists away from well-lit main roads onto unlit forest tracks or behind high hedges, evoking well-founded concerns regarding personal security, particularly for females walking or cycling alone. This creates the presumption that many cyclists will revert to adjacent roads at night-time regardless of the traffic conditions. This underlines the need to assume cyclists as “design users” of all roads regardless of the possible presence of other routes.



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