

Segregated cycling and shared space in today's cities

Segregated cycling in urban traffic

Segregated cycling has been the dominant paradigm in cycling policies since the popularisation of the car wherever the bicycle has not been neglected or even actively discouraged by policy makers. Showcased for decades by Dutch-style bike lanes, segregated cycling has provided a quick-and-ready explanation for the high levels of urban cycling in the Netherlands and neighbouring countries, and has thus become a simple “model for action” for interested parties throughout the western world, making a profound impact on engineering choices and traffic regulations, indeed even on society’s perception of the bicycle and the political viability of cycling policies in a large number of countries.

Segregated cycling is a distinctly western concept, born in a very specific historical and social setting in which the car was believed to be the epitome of progress and the future of cities. However, many of the basic assumptions and beliefs that directed city transport policies during the 20th century are now challenged by both contemporary realities (pollution, congestion, the energy crisis) and by new conceptual frameworks, such as *Shared Space*.

For the purpose of this paper, a “Segregated Cycling Structure” will be defined as any device (for instance, a line, traffic sign, different coloured road surface, or barrier) that establishes or delimits an “appropriate” roadside position specifically for bicycle users on a road or street open to general traffic.

Cycling segregation and the ergonomics of traffic

Smooth, safe and fast traffic flow needs conditions where road users are not subjected to unnecessarily distracting elements and are forewarned of any hazard or restriction ahead. Simplifying and codifying the driving environment have thus been among the main concerns of traffic engineers over the last century, intent on optimising safety - and speed.

The *Shared Space* concept is largely a reaction against the unexpected and unwanted effects on pedestrians of excessive road signage in urban areas. Whatever these unwanted effects, albeit with one well-known exception, road signs and signalling were never meant to go against the basic behavioural principles of traffic.

The notorious exception mentioned above is, precisely, urban segregated cycle lanes. These are arguably the only traffic infrastructure that consists of a road sign and signalling system in urban areas that violates the principles of safe driving, as detailed in the table below:

Behavioural principles of traffic		... and cycling segregation
Right to road use	All road users have a right to enough space in front and around them to manoeuvre their vehicle safely.	Segregation restricts (either legally or socially) the right of bicycle users to use parts of the road as needed.

Vehicles must give way before entering another vehicle's path.

Correct driving side	Vehicles must be driven on the legal driving side of the road (the right side in continental Europe).	Segregated structures encourage wrong side riding in new cyclists. Two-way bike lanes effectively legalise wrong-side riding.
Speed positioning	Between intersections slower traffic drives closer to the edge of the road and faster traffic closer to the centre.	Segregated structures fix the cyclist's position on the road, regardless of their speed relative to surrounding traffic, and permits overtaking on the wrong side.
Right of way and giving way at intersections	By road hierarchy (minor road to major road), by order of arrival (first in first out), by position (giving way to the right in continental Europe).	Segregated structures create "exception areas" where the standard rules on giving way can be disregarded by bicycle users, or may even be legally waived.
Positioning by destination	At intersections vehicles position themselves in advance, according to the intended manoeuvre (moving on to the right side if going to turn right; approaching the left side if going to turn left).	Segregated structures keep a large proportion of bicycle users in unnatural positions for their travel needs and force both drivers and cyclists to make inappropriate manoeuvres that put cyclists at increased risk.

The outcome, from a strictly ergonomic point of view, is that segregated cycling structures, created ostensibly to protect cyclists, in fact result in an increasingly complex traffic environment that puts excessive pressure on the attention of car drivers, and requires abnormal and counterintuitive manoeuvres, lengthening their reaction times and increasing the probability of errors and accidents. It is hardly surprising that existing safety research flatly contradicts the widespread perception of the supposed safety of segregated bike lanes.

Natural Cycling	Segregated cycling structures
Standard, simple environment.	More complex environment.
Stable attention requirements.	Stretches and disrupts attention requirements.
Standard traffic rules apply.	Special rules needed.
Cyclist is continuously within driver's view and area of visual awareness.	Cyclist is out of driver's view and area of visual awareness until the last moment.
Cyclist is where the driver is spontaneously paying attention.	Driver has to pay attention to where the cyclist might be.
Standard learned driving reflexes apply.	Special counterintuitive reactions needed.
Cyclist uses standard manoeuvres.	Cyclist forced to make abnormal low-efficiency / high risk manoeuvres.
Reasonably safe at any reasonable speed.	Only safe at low speed.
Cyclist's safety based on natural attention and learned reflexes of driver.	Cyclist's safety depends on drivers paying extra attention and acting against their learned

Shared Space

The *Shared Space* concept is not primarily concerned with cycle traffic, however it arguably clearly opposes the very tenets of the cycling segregation paradigm: the belief that urban space can be compartmentalised in such a way that cycle users and car drivers can go about their business paying minimal attention to each other, provided they pay attention to the special cycling signs (pavement colours and markings, vertical signals, etc.) and follow a specifically designed set of rules. Some divergences between segregation and shared space paradigms are noted below:

Cycling segregation	<i>Shared Space</i>
Signalling overload.	Minimises signalling.
Extra set of rules and regulations.	Minimises rules and regulations.
The rules must be heeded.	Other users must be heeded.
Barriers between users.	No barriers between users.
Minimises interaction and attention paid by users to other users.	Guarantees continuous interaction and attention paid to other users.
“Subjective safety” at the expense of real safety.	Real safety at the expense of “subjective safety”.
Tries to eliminate or reduce anxiety and uncertainty.	Uncertainty as a way to raise users' alertness and increase safety.
Infrastructure limits / dictates users' behaviour.	Maximum flexibility for users.
Takes judgement and responsibility away from users.	Puts the onus of judgement and responsibility on the users.
Safety confided in infrastructure.	Safety is users' responsibility.
Expected to serve users with no knowledge or skill.	Users expected to have knowledge and skill.
Undermines traffic culture and courtesy.	Needs and promotes traffic culture and courtesy.
Distrusts users' judgement.	Treats users as adults.

The *Shared Space* framework, in its most radical form, may appear to have limited application in large, modern cities. However, looked at strictly from an urban cycling point of view, *Shared Space* principles not only make a strong case for shifting from cycling segregation to integration-based policies in urban areas but also offer valuable criteria on how the new kind of integrated cycling structures can be built and what kind of obstacles will need to be overcome.

Shared space for cycling: natural cycling in normal streets

The application of the *shared space* concept to urban cycling immediately rules out the idea that cyclists have some kind of exclusive right to a portion of the public space: the bike lanes. Other arrangements need then to be sought.

Unless taken to its radical extremes, the talk about “shared space for cycling” begs the question: Shared space with whom? After decades of segregated cycling being the accepted model in most of Europe, the answer in large parts of the cycling and non-cycling population is likely to be: “Cyclists are to share space with pedestrians”. It is not hard to see that this path is bound to be a source of conflict and will eventually put the lid on growth in bicycle use.

So, for policy makers, the immediate challenge is to create an environment and a culture in which cyclists and drivers can and are expected to safely share traffic space: the roadway. This requires as much a cultural as an engineering shift, with some outstanding points already apparent:

1. Education (for both bicycle and motor vehicle users) is paramount, and needs much more attention and funding than it has traditionally been receiving.
2. The rules of driving behaviour must be uniform for all vehicle drivers. The status of the bicycle as a full-rights-and-duties vehicle needs to be underlined for both cyclists and motor vehicle drivers alike.
3. A street which presents real problems for integrated cycling probably presents greater problems for pedestrians. These wider problems must be addressed, taking priority over those specific to cycling. No pro-cycling intervention is acceptable if it undermines conditions for pedestrians.
4. Less is more: all else being equal, good general infrastructure for cycling (pavement width, design and maintenance criteria, traffic light vehicle sensors, adequate turning lanes, etc) is preferable to specific cycling facilities.

The project undertaken in the town of Pinto (Madrid) won a national award in Spain for its approach to the adaptation of the street network to bicycle users. The project illustrates some of the promises of **shared space for cycling** in urban traffic and also brings to light how the most important barriers to this path lie not with engineering problems or drivers' behaviour but rather in the social, political and activist environment that surrounds modern cycling.

Shared space for cycling in Pinto

Pinto (Madrid, Spain) is a town of 42,000 inhabitants. Despite excellent climate, gradient, street quality and traffic conditions and a great deal of sport-based cycling, utility cycling has been non-existent for decades in the locality. In recent years a slow, spontaneous growth in urban bicycle usage has been observed, mainly among young people, however the overall bicycle share in urban traffic remains negligible.

When the author was hired as a bicycle mobility consultant by the Pinto City Council in 2007, the dominant mindset among the town officials was limited to the traditionally accepted policy of creating “cycling ways” where possible, without much thought actually given to existing constraints or expected results. After a thorough analysis of the options and a lot of work clarifying concepts for the decision makers, the focus moved to studying the measures needed to improve cycling conditions in all the streets, regardless of the presence of “cycling structures”. This approach helped to identify a range of problems and barriers to cycling

that had hitherto been overlooked. Among these:

- A close-knit network of one-way streets that seriously hindered bicycle mobility in streets which were otherwise excellent for cyclists.
- Significant barriers to pedestrians and cyclists commuting to work.
- Barriers or difficulties for cycling as a result of the basic city layout, or design decisions centred on facilitating motor traffic.
- Different elements in streets which were hard to notice and which posed problems only for would-be cyclists trying to ride normally in the streets.

As a result, the decision was taken to:

- Aim for the integration of bicycle users as a natural part of urban traffic.
- Concentrate on providing real advantages to bicycle users (eliminating barriers, creating short cuts, improving the cycling quality of urban areas) without causing irregularity in the road network or undermining cyclists' status as vehicle drivers.
- Apply the basic criteria of uniformity and simplicity to all street alterations and newly created reserved lanes for bicycles.
- Make sure that any cycle signalling used underlined the status of the cyclist as a user with full rights and responsibilities as drivers.
- Consider the implementation of segregated cycling structures only as a last resort when no other integrating option was possible.
- Act decisively on cultural aspects and social perceptions in order to educate users and introduce cycle usage within the population's transport options.

In line with the goal to normalize cycling as part of the town *as it is*, most of the actions undertaken on the road network were directed at applying integrative "invisible" cycling criteria to the imminent street renovation programme in the city centre. Relatively little (only what was considered unavoidable) was done that could be tagged as "cycling structures", specifically:

- Creation of widespread bicycle parking facilities.
- Introduction of integrated cycling signalling in selected streets, mostly with the aim of educating both drivers and cyclists and increasing the latter's visibility.
- Introduction of two-way-cycling streets in areas where the one-way street network significantly hindered bicycle mobility.

The "two-way-cycling streets" (standard-structure "counterflow" lanes) became the defining feature of the project, not only because Pinto was the first city in Spain to apply the concept across the board, define strict criteria for implementation and attempt an official policy for this, but also because the two-way-cycling streets turned out to be the most difficult element for the population to understand and accept, and because these streets provoked social and political reactions that clearly illustrate how the segregation paradigm has become a major obstacle to cycling development.

[Image]

Two alternative configurations for a cycling counterflow. The segregation paradigm has so damaged the social perceptions of the risk of cycling that the segregated, anomalous configuration (2) is widely believed to be safer than the integrated, simplified one (1), both by the decision makers and the general population, who demands the installation of barriers, a different pavement colour and specific signalling “to make safe cycling possible”.

Social and political reactions to the project

The three specifically cycling-related actions (bicycle parking, integrated cycling signalling, counterflow lanes) had immediate huge visibility and social impact, and significantly raised the level of awareness as regards the possibility of using bicycles in town. The counterflow cycling lanes were the most striking feature of the project, with a number of different reactions to them seen in different sectors of the population:

- General and grateful acceptance among local cyclists, who quickly understood their advantages and mode of use after an initial phase in which they saw the counterflow lanes as “traditional segregated bike lanes” and tried to ride them in both directions.
- A milder reluctance among car drivers, who felt the counterflow lanes put an increased responsibility on them, but who fairly quickly got used to them when realising that the counterflow lanes didn't strain their attention or reaction requirements.
- A general tendency among the non-cycling/non-driving public, and among less experienced cyclists, to consider the counterflow lanes as “bike lanes” and to consider them unsafe because of their lack of stereotypical elements of a “proper bike lane”: barriers, coloured pavement, etc.
- A notorious lack of support and even attention paid to the project by the political representatives of the Spanish cycling community. So much so that, despite it getting the National Award for Urban Sustainability, the project went largely unreported among cycling groups and unnoticed by the cycling public.
- A strategy by political opposition groups to manipulate and exploit the population's safety fears in relation to cycling to discredit the project as part of the local political game.

The project thus came to a standstill at the end of 2008 when, for unrelated political reasons, the composition of the City Council changed and the new team decided to stop pushing the programme and look instead again into the earlier idea of creating bike lanes out of the urban areas. At the time of writing, local bicycle users are working within the Local Agenda 21 to lobby the Town Council to continue the action planned by the preceding team.

Some conclusions

The project in Pinto highlights some significant obstacles facing any effort to develop a programme to

integrate and standardise the bicycle as a natural part of city traffic in Spain:

- The segregation paradigm foments - and simultaneously is sustained by - widespread and largely unjustified fears about urban cycling among the non-cycling population. Even in small towns with excellent traffic conditions, such as Pinto, the public is likely to take an alarmist view of the dangers of this traffic, and resist the idea that bicycles should be ridden as a normal part of regular traffic. The public has thus thoroughly taken on board the identification of bicycles and cycle lanes.
- The segregation paradigm is seriously limiting and twisting pro-cycling policies: Local political circles have little incentive to promote natural city cycling if this goes against the popular perception of “the dangers of cycling”. The creation of segregated cycling structures is often politically less risky and more rewarding, even if its cost is high, its adequacy in meeting real needs doubtful, and its effects on cycling promotion uncertain or even nonexistent in the end. The segregation paradigm favours high-expenditure and ready-made, opportunistic measures that often bear little relation to actual cycling problems but that provide political gain or simply conceal the lack of interest, commitment, or ideas of the decision makers.
- Likewise, local cycling groups, inasmuch as they choose to concentrate on political lobbying rather than facilitating cycling socially, benefit from maintaining the segregation paradigm because they legitimise their existence by the results of their lobbying and segregation policies (whatever their real effects on cycling) and offer faster and more clearly quantifiable results of political value to show their constituencies.
- In short, and as the situation in Pinto clearly shows, segregation policies do not respond to the real needs of urban bicycle users but rather to the vested interests of politicians and lobbying groups. For as long as this political / activist climate continues, the social fears and misconceptions concerning the real possibilities and safety issues of urban cycling will persist; the cycling culture of the population will continue to deteriorate; and a broad sector of potential cyclists who would otherwise (with the proper education and awareness campaigns) already be riding bicycles, will instead keep them in storage “until a safe bike lane network is built”.

In conclusion, a concerted effort and clear ideas will be needed to change society’s perception of cycling and make cycle use a regular feature of our cities. The pivotal point is the realisation that segregated cycling structures in urban areas are not a success to celebrate but rather are the sign of failure: the failure to create proper conditions for natural urban cycling. The *Shared Space* concept provides a promising framework for thinking and acting in this direction, however the energy to carry out the needed cultural transformation can only come from activists and expert groups who are, after all, the key leaders in understanding the real issues and influencing social perceptions and political decisions.