Urban Adaptation

The bicycle as urban transport - learning from cycle cities

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This paper is primarily about change and adaptation. On a finer level, it is about an adaptation method. Our cities and urban processes are nearing tipping point. Climate change, peak oil, health crisis, chronic congestion, sustainability. These are not only the biggest questions, or catchphrases, of our time, they are front and centre for planners and urban designers. We tackle them on a daily basis.

Our cities must adapt. To carbon efficient systems, sustainable systems. Our cities need to increasingly become more liveable, more healthy and encourage more interaction. The movement of people in our cities needs to be managed more efficiently. The one single thing that collectively answers these needs is the simple bicycle as a legitimate form of urban transport. The gamut of challenges bicycle transport addresses can no longer be ignored. In fact in some cities the legitimacy of bicycle transport is not ignored. On the contrary, it is wholeheartedly embraced, with almost 40 per cent of all trips undertaken on a bicycle[1,2]. Imagine for a moment that 40 per cent of trips in your own city were by bicycle. This is achievable. As an example, 50 per cent of all car trips in Australia are under 5 kilometres and 30 per cent are under 3 kilometres[3]. An easy bike ride.

This paper delivers the findings of a research tour on bicycle policy and infrastructure implementation in the most successful, and some emerging, cycle cities. It provides five key principles that planners and urban designers must understand when faced with the task of adapting their cities for bicycle transport.

The three primary case study cities were Amsterdam, Copenhagen and Berlin. Side trips were made to Paris, Rotterdam and Malmo. The research was undertaken in three phases. Firstly, in the primary case study cities, senior transport planners were interviewed. Secondly, the 30 minute bicycle travel zone (what we have called the No Excuse Zone in a previous behaviour change strategy) of each city was mapped, on bicycle. This exercise provided the base for the third phase; extensive documentation of the types of bicycle infrastructure, and how they integrate with the streetscape, in each city.

The five key principles are:

1. Encouragement

The aim of any bicycle strategy should be to make cycling an easy and obvious choice for many trips. Policy must prioritise cycling, as well as public transport and walking, rather than the private automobile.

2. Safety and directness

These are the two critical factors that must be delivered if cycling is to become a successful component of the urban transport mix.

3. Consistency

Consistency in treatment means legibility. Bicycle infrastructure must be clearly understood for what it is and how it works, by all street users.

4. The path of least resistance

Designated bicycle routes must provide the most appealing option for cyclists. The autonomous nature of the bicycle means that cyclists will choose the path they feel is the safest, the easiest or the most direct. This must be understood and appreciated in route and infrastructure design.

5. Get it right the first time

The importance of building bicycle infrastructure right the first time was pressed in all interviews during the research tour. If not, there can be serious ramifications for the transition to this mode of transport.

1. Encouragement

The effects of all modes of transport on the environment, economy and population health must be understood by both government and the community, with incentives and disincentives developed accordingly.

The bicycle has always been a regular component of traffic policy in Amsterdam. In fact, in Amsterdam the bicycle is prioritised in transport policy[4].

Although someone from a city like Sydney (or Christchurch) would remark at the lack of congestion and the unaggressive way various modes of transport interact in the inner city, the Amsterdam government believes "there are too many cars in Amsterdam[5], and they are acting to reduce vehicle use further in favour of cycling and public transport.

Standard on street parking costs are about five Euro per hour ($10 NZD); people that move into the inner city must wait six years for a parking permit; and highly polluting vehicles are banned[6]. The unavailability of parking is a powerful tool in decreasing car use. For example, 46 per cent of public transport users in Sydney say the reason they do not drive is because of the unavailability of parking at their destination[7].

In Copenhagen, one of the major roads into the city, Nørrebrogade, has recently been permanently closed to private vehicles. It is now a bus, bicycle and pedestrian boulevard. It is worth noting that the community, both business and residents, were overwhelmingly in favour of the removal of cars and car parking in favour of bicycle facilities and wider footpaths[8].

In both Amsterdam and Copenhagen a system named 'green wave' gives cyclists continuous green lights on commuter routes if they stay within a certain speed range[9,10]. The traffic light network of these cities is geared for cyclists first, motorists second.

And of course bicycles are allowed on ferries, trams and trains free of charge[11,12,13].

These are just some initiatives in place.

It is these types of incentives and disincentives that must be administered to allow other modes of transport to move ahead. Until private cars are clearly positioned behind bicycles and public transport in our planning, nothing will change, the city will remain dominated by cars.

Clearly the governments of these cities have recognised the bicycle as a preferred method of urban transport and through policy they proactively work to make it as attractive as possible.

2. Safety and directness

The perceived risk of injury is the foremost reason why cycling is unappealing in our cities. Likewise, commuters desire an efficient means of transport, from their door to their destination, and will choose accordingly. Bicycle infrastructure must be as safe and direct as possible.

At the network level directness is paramount. In the past both Copenhagen and Berlin have embarked on the back street strategy[14,15]. This strategy ultimately failed in both cities. The reason is simple - back

streets are neither direct or visible. Some used the new higher quality back street facilities, however the vast majority of cyclists refused to deviate from the more direct routes.

At the detail level, two points must be remembered; Firstly, bicycle paths must be physically separated. From both motor vehicles and pedestrians. Both a level change and a material change is required. A buffer zone to cars and a simple 100mm kerb to pedestrians will suffice. Secondly, bicycle paths must be wide enough to allow easy overtaking. We must remember that all levels and ages of bicycle users should be comfortable choosing the bicycle. From young children going to school, to retirees on a morning outing. The last thing we want is cyclists nudging for space. As a minimum a one way bicycle path must be 1.7 metres wide[16]. The Roads and Traffic Authority of NSW (RTA) recommends 1.2 to 1.5 metres. The result of this width is that cyclists must leave the bicycle path in order to overtake, either on the footpath or the road. This significantly increases the risk of conflict.

3. Consistency

Consistency in treatment. This is critical to avoid confusion among all road users. Bicycle infrastructure and its presence in the public realm must be instantly recognised for what it is and how it works. An easy to understand system for cyclists, motorists and pedestrians will minimise confusion and maximise safety.

Motorists, cyclists and pedestrians must be certain of their own actions and aware of each other's movements. A set of design guidelines should be established to outline standard requirements with some flexibility for contextual conditions.

Retrofitting cities with a totally consistent typology is arguably easier said than done. In this case a clear strategy should be developed to implement a suite of typologies that can streamline over time.

Consistency of treatment will position cycling as a legitimate form of transport. A network possessing too much variation is not only confusing and subsequently unsafe, it is a sign that bicycle infrastructure is less important than other modes of transport, in particular cars. The privileged mode of transport will be the one that flourishes.

4. The path of least resistance

The independence and flexibility of the bicycle is exactly what makes it so appealing as a transport option. The autonomous and nimble nature of the bicycle means that cyclists will choose the path they feel is the safest, easiest and most direct, regardless of what a sign says. As lawless as this may seem, it is exactly this freedom of mobility that makes cycling so appealing. This needs to be understood and worked with.

This principle is related to three areas:

- directness
- surface quality
- barriers

Directness has been covered.

The details of surface material should never be underestimated. Extensive surveys by the Danish Road Directorate found that 100 per cent of cyclists are satisfied with continuous bitumen while only 40 per cent are satisfied with concrete slabs[17]. The seams and rough surfaces associated with concrete slabs provide an uncomfortable cycling experience. Bicycle paths should only be paved with smooth bitumen. Also Cracks, pot holes, longitudinal drain slots and the common road maintenance back fill, will all act as deterrents to the bicycle.

Barriers can come in various forms. Intersections that are complicated or do not cater for cyclists can create a threatening experience to many riders. Shared paths are a catalyst for conflicts. In Copenhagen shared paths are illegal. An attempt was made a few years ago to install a shared path along the lakes. The proposal was stopped in its tracks by the police, who argued they were simply unsafe, and their argument was backed up by various studies[18]. Contextual systems need to be taken into account such as garbage collection, bus stops, loading zones. These systems can all be designed and incorporated into successful bicycle paths without creating barriers. If not properly considered early in the design phase they can cause major barriers to the effectiveness of bicycle paths.

5. Get it right the first time

As stated earlier, all experts interviewed stressed this point[19,20,21,22]. The reasoning put forward was based on two points.

Firstly, inadequate infrastructure will not attract the potential volume of cyclists. If bicycle paths are perceived as being uncomfortable, unsafe or indirect, they will not appeal to a broad enough range of people and volume targets will not be met. Secondly, inadequate infrastructure will ultimately need to be redesigned and rebuilt within a relatively short period of time – not only a costly exercise, but one which will likely face opposition due to its record of ineffectiveness.

The result is infrastructure that does little to promote the potential of cycling, perpetuating misunderstandings and relegating the bicycle to the fringes of urban transport – a lost opportunity.

Conclusion

This paper has outlined the five key principles essential to understand when undertaking any bicycle strategic planning or infrastructure design. The bicycle as a legitimate form of transport is only now beginning to be recognised as a real possibility in many parts of the world. However it must be remembered that all the issues that will arise with this transition have been dealt with before. There is no need to reinvent the wheel, and make mistakes that have been made before. The simple and logical strategy is to understand the lessons that have been learnt by cities that are now successful cycle cities, review the current best practice on a global scale and then appropriate this knowledge for the local context.

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