The role of public policies in promoting the safety, convenience & popularity of bicycling

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Abstract

In the special issue on bicycling of WTPP (Volume 7, Number 3), Heath Maddox questions the potential of public policies to encourage bicycling. This response to the Maddox critique argues that he seriously misinterpreted the concept of public policy, considering only a small subset of the many policies that can facilitate bicycling. He does not adequately examine the impacts of special cycling facilities. Moreover, Maddox ignores virtually all other transport policies as well as all land-use, housing, taxation, education, training, law enforcement and public relations policies. This counterpoint article re-emphasises the crucial importance of a wide range of public policies to increase the safety, convenience and attractiveness of cycling. In order to generate the necessary political support for such policies, this article recommends focussing on the enormous public health benefits that would derive from increased cycling.

Keywords

Bicycling, Germany, land-use, non-motorised transport, obesity, physical exercise, public health, public policy, traffic safety, travel behaviour, U.S.A.

Introduction

In his recent article in this journal, Heath Maddox questions the potential of public policies to encourage bicycling (Maddox, 2001). In particular, he contests my earlier finding that public policies were essential for permitting the dramatic growth in bicycling in Germany from the mid-1970s to the mid-1990s (Pucher, 1997).

Although he provides no empirical evidence of his own, Maddox summarises the views of a few German 'experts' he selected. On the basis of that selective literature review, Maddox draws the conclusion that the bicycling boom in Germany occurred, at best, independently of supportive public policies and, at worst, in spite of public policies that supposedly hindered bicycling.

Maddox's Misinterpretation of Public Policy

The most serious problem with Maddox's critique is his misunderstanding of what I had meant by the term 'public policy'. Although Maddox never elucidates precisely how he defines this key term, it is clear that his definition is far narrower than my own. As I have laid out in detail in four of the articles I have written about urban transport in Germany, a wide range of public policies have supported the 'green' transport modes of walking, bicycling, and public transport (Pucher & Clorer, 1992; Pucher, 1997; Pucher, 1998; Pucher & Dijkstra, 2000). They include not only transport policies but also land use policies, housing policies, taxation policies – even education, training and law enforcement policies. By no means are they limited to the very narrow concept used by Maddox, which includes only the provision of separate facilities such as bike lanes and paths. This is the only aspect of public policy that Maddox considers for its impact on bicycling levels.

Even his consideration of special facilities is sharply limited. Although he repeats my own time-trend statistics on bicycling modal split shares in Germany, Maddox does not include any statistics at all to back up his vague claim that the timing of special facility provisions did not coincide with growth in bicycling. As he does throughout his article, Maddox bases his claims not on specific empirical evidence but on references to the general conclusions of selected German 'experts.'

Maddox's misinterpretation of my public policy hypothesis is further confirmed by his own listing of the most important factors causing the German bicycling boom. Based on his review of the literature, Maddox attributes the boom to four supposedly exogenous factors: high petrol prices, urban roadway congestion, suburbanisation, and environmental awareness. These factors, however, are hardly exogenous. The first three factors, in particular, are largely the outcome of public policies.

Maddox does not seem to be aware that 60%-70% of the very high price of petrol (gasoline) in Europe is due solely to taxation. Moreover, almost all of the petrol price differential between the U.S.A. and the EU is due to the much higher taxes imposed on petrol in Europe (International Energy Agency, 2001). As of 2001, the total tax on a litre of petrol in Germany was DM 1.45 (= $0.65), compared to a total tax of only $0.10 per litre in the U.S.A. Thus, German taxation of petrol is more than six times higher. The percentage of taxes in the final retail price of petrol is 71% in Germany, compared with just 26% in the U.S.A. (International Energy Agency, 2001).

Clearly, this tax policy is not aimed at promoting bicycling in particular. Nevertheless, both the German federal government as well as the European Union have explicitly supported high taxation of petroleum-based fuels to slow down global warming, encourage energy conservation, and promote alternatives to the private car such as bicycling, walking and public transport.

Similarly, Maddox proposes urban roadway congestion as a factor in the bicycling boom as if public policies had no role at all in influencing congestion levels. In Germany, in particular, the expansion of roadway supply was deliberately held far below the rate of growth of private motor vehicle use, at least partly to discourage a further modal shift to the private car. Moreover, in sharp contrast to the U.S.A., the extensive autobahn network in Germany does not reach into the urban cores of most metropolitan areas (Transportation Research Board 1998; Pucher, 1998). That limited supply of high-speed motorways and arterials within German cities unquestionably was an important public policy decision. It has contributed to the high levels of urban roadway congestion cited by Maddox's experts as a reason for growth in cycling.

Maddox cites the increasing trip distances caused by suburbanisation as the third factor explaining the bicycling boom. He claims that increased trip distances in Germany led to a shift from walking to cycling. Maddox does not present any empirical evidence of this impact, but let us assume that Holz-Rau (1991), the expert he cites on this issue, is correct. My own publications on German travel trends also show a fall in walking modal split shares just as cycling modal split shares have risen (Pucher 1998; Pucher & Dijkstra 2000). Thus, the alleged impact is at least plausible.

Nevertheless, public policies in Germany have been largely responsible for creating a suburban environment where bicycling remains a feasible travel option – in sharp contrast to the U.S.A. Zoning and building codes, as well as detailed planning regulations, ensure that all German suburbs have sidewalks and either bikeways and bike lanes or traffic calming to facilitate bicycling. Moreover, the average density of German suburbs is over twice as high as in the U.S.A., thanks partly to land-use policies that sharply restrict the supply of land for development around German cities (Pucher & Clorer 1992; Pucher, 1998). Thus, while trip distances in the suburbs are longer than in the central city (perhaps favouring cycling over walking), they are not usually so long (as in American suburbs) as to make the private car the only feasible transport option.

The density of German suburbs, their mixing of residential and commercial land uses, their design and layout, their provision with sidewalks and bikeways or bike lanes, and their traffic calming ***all*** represent important public policies. I explicitly included these factors in the range of policies I used to explain the growth of cycling in Germany (Pucher, 1997; Pucher & Dijkstra, 2000).

One of my articles cited by Maddox deals with the co-ordinated, self-reinforcing package of transportation, land use, housing and tax policies in Germany that together have encouraged public transport, walking and cycling (Pucher ,1998). I specifically explained the need to view these policies as an integrated whole, since it is the overall package of policies that is so effective, not any isolated policy or subset of policies. Although he had access to all of my articles, Maddox does not even include all my transport policies when examining my hypothesis, let alone the many other public policies I have discussed in so much detail over the past two decades in comparing urban transport in the U.S.A. and Europe.

The fourth factor Maddox lists is growing environmental awareness. That obviously is not a public policy itself, but it has been crucial to the adoption of policies throughout Europe that have promoted bicycling as well as walking and public transport. One can only wonder, however, how important this vaguely mentioned factor could have been on its own. The U.S.A. has also experienced an extraordinarily widespread and influential environmental movement over the past three decades, but with virtually no perceptible impact on raising cycling levels.

Misunderstanding about the Role of Public Policies

In addition to misunderstanding the very broad range of public policies I had advocated, Maddox misinterprets the role I had intended to assign to public policies. He suggests that my main hypothesis in the 1997 article was that 'the bicycling boom was… sparked initially by planners and policy makers with a unified goal in mind'. Nowhere in my article did I make such a statement. I never claimed that the policies I listed were part of some unified pro-bicycling

master plan, designed in advance and carried out in precise co-ordination, with a uniform goal in mind.

My main hypothesis was that a wide range of public policies were absolutely crucial to facilitating, enabling, and to some extent, even engendering the bicycling boom from the 1970s to the 1990s. Whether or not such public policies furnished the initial spark is not as important as Maddox claims. The sustained 20-year boom would never have occurred without the accompanying public policies that supported it. That is the important point I wanted to make. It is a point that Maddox can hardly have missed. Maddox himself notes that 'the German literature generally indicates that public policies have played a key role in maintaining high and growing rates of bicycle use in recent years'. Since that is quite similar to my own hypothesis, I find it baffling that Maddox devotes so much of his article to contesting that very notion. At any rate, he seems to lose sight of the main point while focusing on the less important issue of whether public policy initiatives were the initial stimulus to the boom.

To some extent, this is the usual chicken-and-egg problem. Which came first? From my perspective, it does not really matter much, while Maddox seems to base his entire article on that question. The same question could be posed for the role of roadway and parking facilities in promoting the growth of private car ownership and use. Clearly, there have been important exogenous trends in per capita income and suburbanisation that have stimulated the demand for car travel. Nevertheless, without significant expansions in roadway capacity, parking and other facilities, the growth in car use would not have been nearly as dramatic as it has been.

Similarly, whatever exogenous factors might have helped spark the initial rise in bicycle use, there can be no doubt that public policies were crucial in facilitating and encouraging the long-term boom.

Public Policies & Cycling Safety

Totally aside from the impact of public policies on the amount of cycling, there is the equally important issue of cycling safety, which Maddox completely ignores. There can be no question whatsoever that the specific pro-cycling policies adopted in Germany have enormously enhanced the safety of cycling there (Pucher & Dijkstra 2000; Pucher 2001). To a large extent, German safety policies have been identical to their cycling promotion policies:

- separate bike paths and lanes, bicycle streets and special bike routes;
- intersection modifications and signal priority for cyclists;
- traffic calming of residential neighbourhoods;
- restrictions on auto use in cities (especially on through traffic);
- better education and training of both motorists and cyclists;
- enforcement of traffic regulations protecting cyclists; and
- urban design oriented toward pedestrians and cyclists instead of cars.

As the bicycling boom progressed, the same policies that encouraged more cycling also permitted safer cycling, so that the total number of cyclist fatalities in Germany fell by 66% between 1975 and 1998 (Pucher & Dijkstra, 2000). The cyclist fatality rate per kilometre cycled fell even more sharply in those 23 years, since the total amount of cycling almost doubled.

Does Maddox also ascribe that enormous achievement in greater safety to exogenous factors having nothing at all to do with policy? Would he abandon all such public policies simply because he does not think they sparked the initial growth in cycling? Does he think that the dramatically improved safety of cycling in Germany had no role at all in encouraging more cycling and thus sustaining the bicycling boom?

Clearly, one of the main impediments to more cycling in the U.S.A. is the widespread perception that bicycling is extraordinarily dangerous (Pucher *et al.*, 1999). On a per kilometre basis, cycling is indeed dangerous in the U.S.A., almost eleven times as dangerous as private car travel in the U.S.A. and more than four times as dangerous as cycling in Germany (Pucher & Dijkstra, 2000). In 1995, there were 109 cyclist fatalities per billion km cycled in the U.S.A., compared to only ten car occupant fatalities per billion passenger km. In the same year, Germany had less than a fourth as many bicyclist fatalities per billion km cycled (25 vs. 109 in the U.S.A.). The almost complete lack of German-style bicycling safety policies in the U.S.A. is certainly one reason for the much greater danger of cycling in American cities.

As emphasised by Pucher and Dijkstra (2000), bicycling itself is not inherently dangerous. It is the lack of appropriate conditions for cycling that makes it dangerous in the U.S.A. Cycling, in fact, can be made very safe, as indicated by the dramatically lower fatality rates in the Netherlands and Germany. The U.S.A. also has the potential to make bicycling safe, but only if American cities adopt the same range of comprehensive policies listed above. In many respects, this means giving bicyclists and pedestrians priority in urban transport, as in the Netherlands and Germany. That is the general policy orientation so sorely lacking in every American city. It is the policy change that would make the most important difference of all in

encouraging more sustainable transport systems in the U.S.A.

In short, Maddox ignores the important problem of cycling safety and the role of public policy in improving cycling safety in Germany. Public policy actions that increase cycling safety and thus its overall appeal surely *should* be considered when evaluating the role of public policy in promoting cycling.

Maddox's Vague Call for Political Action

Having rejected, or at least downgraded, the role of specific public policies in promoting cycling, Maddox proposes bicycling advocacy as the most effective way to spark a bicycling boom in the U.S.A. In particular, he recommends 'broadening and intensifying political action' and 'harnessing…any groundswell of support for cycling. to help create a mutually reinforcing situation in which community activism intersects with policy and planning'. Maddox himself notes that this suggestion sounds facile, as indeed it does. He provides no details at all on how to generate or harness such a groundswell of political support for cycling.

Furthermore, Maddox ignores the very active involvement of bicycling groups at all government levels in the U.S.A. Especially over the past decade, they have succeeded in inserting strong pro-bicycling provisions in federal transportation law. At the very least, the federal government now provides generous financing of cycling facilities and requires bicycling to be explicitly considered in any federally-financed roadway construction or improvements. At the state and local levels as well, bicycling advocates have successfully pushed for more separate facilities and special provisions for cycling. Moreover, nearly every state Department of Transportation now has a professional bike / ped advocate responsible for co-ordinating bicycling and pedestrian policies at the state level.

Maddox seems to view the need for political action as a new discovery on his part. Yet as Maddox himself notes, Wachs (1998) had already emphasised the importance of political action in getting pro-bicycling public policies adopted and implemented. He also cites one article where my colleagues and I specifically recommended 'broadening and intensifying political action' as one of many approaches in a multifaceted strategy to encourage cycling (Pucher *et al.*, 1999). In short, I had already included his favoured strategy in my own list of necessary measures.

Of course, it is not political action itself that will produce any growth in cycling, but the wide range of public policies that political action can succeed in getting adopted and implemented. No one denies that political support is necessary to generate the sorts of public policies I have been advocating. But it is only a means to an end.

Promoting Bicycling to Improve Public Health

Although Maddox does not even mention it, one of the most promising approaches to promoting more bicycling is through public health advocacy. As of 1999, 27% of all adult Americans were obese (body mass index = 30+) and 61% were overweight (body mass index = 25+) (National Center for Health Statistics, 2001). Public health professionals consider the problem of obesity in the U.S.A. to have reached epidemic proportions (Mokdad *et al.*, 2001). There is almost unanimous agreement on the need for more regular physical exercise. Many official organisations now specifically advocate the promotion of walking and / or cycling to get around town as the easiest, most affordable and most accessible means of physical exercise for most people (Dora, 1999; British Medical Association, 1997; Koplan & Dietz, 1999). Hillman and others have written extensively on this topic (Hillman, 1997). *Hillman, in fact, concludes that cycling provides such valuable cardiovascular exercise that it is a health risk* ***not*** *to cycle!* Indeed, he calculates that, in the UK, the life years gained through the health benefits of regular cycling offset the life years lost through traffic crashes by a ratio of 20–to–1 (Hillman, 1993).

Even in the sprawled, low-density metropolitan areas of the U.S.A., 49% of all trips are shorter than 3 miles, 40% are shorter than 2 miles, and 28% are shorter than 1 mile (U.S. Department of Transportation, 1998). Bicycling can easily cover all these distances. Yet less than one percent (0.9%) of all urban trips in the U.S.A. are made by bicycle. Thus, there is enormous potential for increasing cycling for urban travel in the U.S.A., generating public health benefits not only from the physical exercise cycling offers, but also from reductions in air pollution, noise and other environmental degradation.

Currently, I am co-principal investigator of a research project funded by the Robert Wood Johnson Foundation which specifically examines the role of our land-use patterns and transport systems in encouraging or discouraging walking and cycling. Similar research projects are being conducted throughout the country and publications on the topic are appearing with increasing frequency.

Maddox does not propose any specifics for generating widespread public support and political action to encourage bicycling. I would propose this public health emphasis, since everyone has a stake in improving their own health through more physical exercise. In the U.S.A., in particular, obesity is an ever-worsening epidemic that has been generating increasing coverage in the media (New York Times, 1999; The Economist, 2001). Americans need only look

around them and at themselves to see the alarming dimensions of the problem. Public health departments in every state, and hundreds of thousands of medical doctors and public health professionals, have the potential to spark the sort of groundswell of public opinion and individual action that Maddox only vaguely suggests in his article.

Even if such a strategy succeeds, it will only be with the aid of the entire gamut of public policies to make cycling safe, convenient and attractive as an alternative to the private car. In particular, it will be necessary to undertake many measures to improve the abominable safety record of cycling in the U.S.A. Otherwise, any rise in cycling might produce an unacceptable jump in cycling fatalities, thus short-circuiting whatever temporary increase in cycling would occur.

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