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## MODE OF THE PAST OR PROMISE FOR THE FUTURE?

### Cycling in China and the Sustainability Challenge, 1955–Present

In today's Global North, cycling – and e-biking for that matter – is promoted as a sustainable alternative to the private mobility of cars. In particular, policymakers in the US and Europe are placing high hopes on e-bikes as a sustainable urban solution for the future. Despite the green status of bicycles as ecologically sustainable vehicles, most people and governments embrace cycling for economic rather than ecological reasons. The urban bicycle – other than its touring or sports equivalent – has been a practical solution for working-class transit needs for over a century. Bicycles offer people great flexibility, low maintenance, fuel independence, and relative invulnerability when facing bad road conditions. In rural areas and small towns in many parts of the world, bicycles are the only form of fast, flexible, affordable, and reliable transport. And compared to walking, cycling enlarges people's action radius almost fifteen times, giving access to job opportunities otherwise unavailable to the working poor. In many countries, however, cycling is still associated with poverty rather than being thought of as a sustainable mobility solution.<sup>1</sup>

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1 I am very grateful to editors Christopher Neumaier, Helmuth Trischler, and Jan-Holger Kirsch for their comments. My special thanks go to SUN Qi for excellent comments, insights, and fact-checking and to XU Tao for locating relevant references to Chinese sources; to BAO Maohong, PAN Haixiao, WANG Zhen, XIA Mingfang, Stefan Landsberger, John Flowers, Louis Warren, Paul Sutter, Harriet Ritvo, and Peter Cox for their insightful suggestions and to the members of Works-in-Progress at the Rachel Carson Center for Environment and Society, Munich, Germany, for their careful reading of earlier drafts. The research has been supported by grants from the LMU Rachel Carson Center, 2013–2016.

China represents a particularly intriguing case. For half a century or so, communist China was known as the bicycle kingdom before its government began neglecting – and actively discouraging – cycling in the 1990s. Its vibrant cycling culture is under siege, despite the government’s ambition, formulated in 2013, to make China the world’s first ›Ecological Civilization‹, thus reconciling the contradictions between economic development and environmental issues. Chinese policymakers have not embraced the sizeable traditional cycling and e-biking culture for its potential as a solution for sustainable urban mobility.

In the following, I will show how China’s case offers a unique insight into the dilemmas and contradictions of cycling when a country is facing economic, social, and ecological sustainability challenges. The first section discusses the reasons why the state made China a veritable bicycle kingdom, the first of its kind, between the 1950s and 1990s in order to sustain its economy. The second section describes China’s turn towards a car-based model of economic growth and middle-class lifestyle and its policy of discouraging cycling between 1994 and 2008. The final section maps the ecological and social sustainability challenges and contradictions of this policy. It explores how today’s planners associate cycling – and e-cycling in particular – with poverty and the past. The article concludes by asking whether China is ready to combine the bicycle’s social and ecological sustainability potential with the quest for green leadership underpinning its 2013 strategy to become the world’s first ›Ecological Civilization‹.

## 1. Creating Autarky, Creating a Bicycle Nation, 1955–1993

For a few decades, China represented the world’s premier bicycle nation. In Western literature and travelogues, the tinkling of bicycle bells was firmly established as a familiar phrase to describe the downtown hustle and bustle. The trope of tinkling bicycle bells often denoted chaos in the streets, the disturbing sign of the presence of working-class and colonial peoples. In the Cold War context of China, however, the sound of bicycle bells acquired a special meaning. To sympathetic observers, the sound gauged the progress of communism. In the movie *China: The Surprising Country* (1966), the Australian educationalist, author, film-maker, and China enthusiast Myra Roper described the ›myriads of bicycle bells, twanging around us‹.<sup>2</sup> Sinologist Ross Terrill similarly wrote appreciatively in his book *800,000,000: The Real China* (1972) about the ›late afternoon rays, as Peking sang with bicycle bells of people riding home‹, and how ›among sounds, the cicadas compete with bicycle

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2 Myra Roper, *China: The Surprising Country*, London 1966, p. 128.

bells.<sup>3</sup> Since 1994, when the party chose to follow the West in adopting automobility as an important engine for economic growth, bicycles have fallen out of favor with China's central and local planners. The 1990s policy marked a dramatic shift from the state's active encouragement of cycling.

Unlike other countries in the world, China's fame as a bicycle nation between the 1950s and 1990s was a product of the centralized communist state. Soon after China's Revolution, the communists – despising the exploitation of workers embodied by the rickshaw – decided that the bicycle would be the workers' modern machine for personal transportation.<sup>4</sup> A persistent anecdote tells how in the 1950s, Mao Zedong asked science historian Joseph Needham for advice on whether ›his people‹ should have cars or whether he should make them stay on bicycles. The British professor, who cycled all around bicycle-friendly Cambridge, remarked that he used one himself and found it quite satisfactory. ›Fine‹, said Mao, ›then we'll stick with bicycles.‹<sup>5</sup> The story is most likely apocryphal, but aptly symbolizes cycling's pivotal role in post-revolutionary China.

For the communist leaders, the pro-bicycle policy made a lot of sense. Their decision had little to do with ecological sustainability and more with their drive for China's economic autarky. Bicycles had proven essential during the many years of economic crisis, war, and revolution when oil and steel were in short supply. These pedal-powered machines had proven indispensable when basic infrastructures collapsed. Not only did the US-led blockade force China to be self-sufficient; the authorities were also struggling to build a comprehensive public transit system. The country was poor, its needs large, and its resources limited. In this economic context, the state's encouragement of cycling made strategic sense.

Pro-cycling policies emerged between the 1950s and 1990s, when promoters of automobility in the industrializing Global North succeeded in decentering bicycles as a modern machine to demonstrate the inevitability of automobility's surge and

3 Ross Terrill, *800,000,000: The Real China*, Boston 1972, pp. 62, 114. In the same year, bicycle bells had an entirely different ring for the Committee of Concerned Asian Scholars. In 1972, intellectuals outside the country sounded the alarm, associating the ringing of bicycle bells with the discord of China's Cultural Revolution: ›The sounds of Peking are a cacophony of horns honking: truck horns, bus horns, and bicycle horns, with bicycle bells ringing shrilly above them.‹ Likewise the *Wall Street Journal Asia* journalists Warren H. Phillips and Robert Keatley wrote in their critical *China: Behind the Mask*, Princeton 1973, p. 4: ›China's people, like the country itself, are a kaleidoscope of contrasts and contradictions. Screen out the horns and the tinkle of bicycle bells, for example, and there is a puzzling quiet about this capital of the People's Republic of China.‹

4 Despite its ideological misgivings, the Chinese Communist Party (CCP) did not remove rickshaws immediately. On 1 March 1956, as part of the so-called Socialist Transformation policy, the authorities sent the last two rickshaws to the Shanghai Municipal Museum. 上海公用事业志编纂委员会, *上海公共事业志*, 上海: 上海社会科学院出版社2000年版, 第281页. [Shanghai Public Utilities Compilation Committee (ed.), *Gazette of Shanghai Public Utilities*, Shanghai 2000, p. 281].

5 Robert Temple, Obituary: Joseph Needham, in: *Independent*, 28 March 1995; Tom Buchanan, *East Wind. China and the British Left, 1925–1976*, Oxford 2012, p. 12.

cycling's decline.<sup>6</sup> In the Global South, however, cycling expanded – as it did in China.<sup>7</sup> Bicycles still maintained a favorable reputation as a modern form of transportation in 1950s China, and they were expected to last a lifetime. Bicycles were prized possessions – sold through factory cooperatives – and affordable only for the heads of households. Above all, the bicycle was a proven and reliable technology that, compared to cars, required relatively little dedicated infrastructure. In 1955, Mao began to encourage cycling as part of his New Democracy reform. That year, China's pro-bicycle policy took off in earnest. The Communist Party expanded the domestic industry to bring the bicycle within the reach of working-class families.<sup>8</sup> Between 1965 and 1979, the number of factories grew from 11 to 46. While in 1965, factories were producing 1.83 million bicycles a year, within two years, production almost doubled to 3.68 million; five years later, it had doubled again to 6.23 million.<sup>9</sup>

The economic reforms of the late 1970s brought decollectivization of agriculture, opened the country to foreign investment, and allowed entrepreneurs to start businesses, while most industries remained state owned. Deng Xiaoping's 1979 policy of stimulating the country's light industry shifted the bicycle industry into the highest gear. By 1983, the sector employed a quarter of a million workers and produced 28 million bicycles annually.<sup>10</sup> Playing on the American dream of automobiles, Deng defined the consumerist goal of communist prosperity for all Chinese; bicycles played a key role in this vision for the future.<sup>11</sup> >Produce good quality products for a good life<, read a 1981 poster with the prominent image of a bicycle as prized possession capturing the new consumer policy. This policy generated China's unprecedented boom in the bicycle

6 Peter D. Norton, *Fighting Traffic. The Dawn of the Motor Age in the American City*, Cambridge 2008; idem, Four Paradigms: Traffic Safety in the Twentieth-Century United States, in: *Technology and Culture* 56 (2015), pp. 319-334; Ruth Oldenziel, Whose Modernism, Whose Mobility?, in: Robert Bud et al. (eds), *Being Modern. The Cultural Impact of Science in the Early Twentieth Century*, London 2018 (forthcoming).

7 Ruth Oldenziel/Adri A. Albert de la Bruhèze, Cycling in a Global World: Introduction to the Special Section, in: *Transfers* 2 (2012) issue 2, pp. 22-30. Innovation scholars tend to concentrate on processes of emergence and stabilization rather than on those of disappearance, partial continuity, resurrection, and persistence. The global history of cycling is not an easy narrative of rise and fall, as the history of China shows. Rather it is one of endless rediscovery, remaking, and repurposing. See: Elizabeth Shove, The Shadowy Side of Innovation: Unmaking and Sustainability, in: *Technology Analysis & Strategic Management* 24 (2012), pp. 363-375.

8 Edward J.M. Rhoads, Cycles of Cathay: A History of the Bicycle in China, in: *Transfers* 2 (2012) issue 2, pp. 95-120.

9 《中国轻工业年鉴》编辑部编：《中国轻工业年鉴（1949–1984）》，中国大百科全书出版社1985年版，第129页。[Yearbook of China Light Industry (1949–1984), Yearbook of China Light Industry Editorial Office, Encyclopedia of China Publishing House, 1985 Edition, p. 129].

10 Ibid.

11 >In the past five years, large shifts have taken place in rural China because of reform. [...] many peasants in China now can afford bicycles, sewing machines, radios, and watches. [...] a number of luxury goods have entered into the ordinary peasant family.< 邓小平，《在武昌、深圳、珠海、上海等地的谈话要点（一九九二年一月十八日—二月二十一日）》，《人民日报》1993年11月6日。[DENG Xiaoping, The Key Points of the Speeches in Wuchang, Shenzhen, Zhuhai, Shanghai, and elsewhere (18 January – 21 February 1992), in: *People's Daily*, 6 November 1993].

industry. With it, China established a global reputation as a bicycle kingdom at a time when many Western governments were investing heavily in the automotive industry and car infrastructures.<sup>12</sup>

More than any other Chinese-manufactured bicycle, the Flying Pigeon (*Feige*), domestically produced in Tianjin on China's northeastern coast, came to symbolize communist China. The coveted bicycle cost about two to three times an urban worker's monthly salary (or 150 yuan) in the 1970s.<sup>13</sup> With little money to spare each month, a family would have to save for at least two years before the man of the house could buy one. Moreover, the rationing policy meant families had to be on a waiting list for several years; having good connections helped. The high-status Flying Pigeon became one of three desired possessions for any newly-wed couple: for her a sewing machine; for him a wristwatch and a bicycle.<sup>14</sup>

As the central government ended rationing, relaxed price controls, and set some quality standards for production, prices came down. Cycling boomed, not only because the state invested in the mass production of bicycles and lowered prices. Workers' higher disposable incomes also explain the spectacular growth. For the first time, urban families could afford bicycles for their kids. It signified upward mobility. When Deng took over after Mao's death in 1978, most urban families owned one bicycle – often the male heads of the household. Agricultural workers benefitted as well, when the reform policy included the countryside for the first time, not just the centers of industry. On the eve of the 1978 restructuring of the economy, the ratio of agricultural to urban families who possessed a bicycle was 30:102 per every 100 families. The new policy resulted in higher incomes for agricultural families. By 1990, city workers still owned more bicycles, but rural families were catching up: the ratio of bicycle ownership had shifted to 118:180. (Urban) women also benefitted from the new policy. The more lightweight ›Phoenix‹ offered women an affordable alternative to the sturdy ›Flying Pigeon‹.<sup>15</sup>

For most Chinese workers, like their counterparts elsewhere in the world a few decades earlier, commuting by bicycle replaced getting to work on foot.<sup>16</sup> Traditionally, people worked where they lived – and walking served them well. Changes in spatial planning encouraged cycling. Now, authorities established new-town industries in rural areas. These industrial centers created longer commuting distances, and bicycles were better suited to bridging such distances than the customary practice of walking.

12 Rhoads, *Cycles of Cathay* (fn. 8).

13 Ibid.

14 Dan Koeppel, Flight of the Pigeon, in: *Bicycling*, January/February 2007, pp. 60-66; 梅丽霞, 《全球化、集群转型与创新型企业: 以自行车产业为例》, 科学出版社2010年版。 [MEI Lixia, *Globalization, Clusters Transformation, and Innovative Enterprises*, Beijing 2010, pp. 11-12, on China's bicycle industry as a case study].

15 Rhoads, *Cycles of Cathay* (fn. 8), pp. 107, 109.

16 Oldenziel/de la Bruhèze, Cycling in a Global World (fn. 7); Ruth Oldenziel et al. (eds), *Cycling Cities. The European Experience*, Eindhoven 2016.



Beijing rush hour 1979

(Photo: Pieter Fleury; courtesy PWP Corp. Pieter Fleury/Walther Grotenhuis)

The traditionally compact Chinese cities with their narrow lanes (*hutong*) facilitated cycling for short distances. In the early 1980s, city traffic statisticians discovered that 74 percent of the cyclists in the port city of Tianjin pedaled for less than 30 minutes to work (a maximum of about 10 kilometers).<sup>17</sup>

The lack of mobility alternatives also encouraged cycling. As a socialist administration, the regime expressed a commitment to mobility access for all: the party advanced collective forms of mobility by investing in public transit and low fares. Economically challenged as it was, however, China lacked the resources for extensive public transit like well-run bus systems, subways, and road construction to meet citizens' mobility needs. Buses were crammed with workers trying to jump on. Cycling filled the gap.<sup>18</sup> Some local authorities encouraged workers to commute by bicycle instead of by bus through a subsidy system set up to address capacity pressures.<sup>19</sup> Thus, the Chinese communist party's pro-bicycle policy offered an alternative to the over-extended public transit system, when the regime could not provide a comfortable commute for all.<sup>20</sup>

17 Rhoads, *Cycles of Cathay* (fn. 8), p. 107.

18 张文尝, 马清裕, 《城市交通与城市发展》, 北京, 商务印书馆, 2010年版。 [ZHANG Wenchang/MA Qingyu, *Urban Transportation and City Development*, Beijing 2010]; Victor F.S. Sit, Beijing: Urban Transport Issues in a Socialist Third World Setting (1949–1992), in: *Journal of Transport Geography* 4 (1996), pp. 253–273.

19 Rhoads, *Cycles of Cathay* (fn. 8), p. 107.

20 Sit, Beijing (fn. 18); Andrew Spencer, Urban Transport in China: Whither the Bicycle?, in: Terry Cannon (ed.), *China's Economic Growth. The Impact on Regions, Migration and the Environment*, London 2000, pp. 210–225, here p. 212. On the intimate relationship between cycling and public transit, see also: Ruth Oldenziel/Adri A. Albert de la Bruhèze, A Century of Urban Cycling, in: Oldenziel et al., *Cycling Cities* (fn. 16), pp. 7–16.

In short, China's new status as the world's bicycle kingdom from the 1970s to the 1990s resulted from Deng's industrial policy encouraging bicycle manufacturing and from declining prices, higher disposable incomes, changes in spatial planning, the lack of mobility alternatives, and cycling's high cultural status.

As it turns out, the government's positive attitude to cycling was short-lived. In 1994, the central government's economic and urban planning radically shifted the equation for cycling, when policymakers opted for car production and urbanization on a grand scale. At this point, the planners seemed to have little awareness of the air pollution – even though examples in the US and Europe had shown the enormous ecological challenges and traffic congestion that urban automobility was causing in that decade. The party's decision resulted from its desire to transform China into an economic powerhouse.

## 2. From Bicycle Nation to Car Country, 1994–2008

If Deng fulfilled the Chinese dream of a bicycle for every household, he was also the leader responsible for China's radical and fundamental shift towards cars. Thanks to economic reforms in the 1990s, China opened to the world economy and embraced capitalist development. The second phase of Deng's reforms involved privatization, contracting out state-owned industries, and lifting price controls. Owning a car came to represent an ideal life. Just as once a bicycle had been desirable for a new couple, in today's China, owning a car, together with an apartment, has become the symbol of a family's success. Indeed, owning a car and a house makes a bachelor stand out in the marriage market.<sup>21</sup>

In July 1994 – only fifteen years after Deng had pushed the cycling industry – the communist party decided to encourage the automotive industry and allow workers to own private cars. Chinese leaders now touted cars as the vehicle of the future.<sup>22</sup> Car manufacturing was to be a pillar industry and drive the nation's economic growth; its subsequent two-digit growth rate impressed economists.<sup>23</sup> This decision for car-based economic growth was not necessarily the result of a policy vision about people's mobility

21 Michelle FlorCruz, *The Price of Happily Ever After: Negotiating Marriage in Modern China*, in: *International Business Times*, 24 April 2013.

22 Rhoads, *Cycles of Cathay* (fn. 8); 《汽车工业产业政策》(国家计划委员会 1994年2月19日), 《中华人民共和国国务院公报》1994年第15期, 第630-638页。[Automobile Industry Policy (State Planning Commission, 19 February 1994), in: *Gazette of the State Council of the People's Republic of China* 15 (1994), pp. 630-638]; 中国汽车工业协会、中国汽车工业咨询委员会: 《中国汽车工业史(1991–2010)》, 北京, 机械工业出版社2014年版。[China Association of Automobile Manufacturers/China National Consulting Committee of Automotive Industry (eds), *The History of China Automotive Industry, 1991–2010*, Beijing 2014].

23 World Bank, GDP growth (annual percent), URL: <<http://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=CN>>.

needs. The Chinese planners sought technological parity with the West. Since the First World War, worldwide military planners considered motorized transport (trucks, tanks, and cars) a must for winning wars. Cars, moreover, were a sign of advanced technological knowledge in electronics as well as in manufacturing. Car manufacturing promised to be China's engine for the economy at large. Such thinking was in line with standard ideas on economic growth everywhere in the Western world: economists and policymakers embraced this economic model. So did unions. Globally, the labor movement, interested in relatively high-paying jobs, supported the automotive industry and the economic vision it promoted. Moreover, social democratic leaders around the 1960s envisioned that these high-paid workers should have their own cars as well.<sup>24</sup> In short, China's 1994 choice fell in line with the dominant economic thinking. The party announced the shifting of economic gears, however, at the time when a strong countercurrent in the Global North was offering an alternative for more sustainable urban mobility.

Building on this counternarrative, at least one critical voice questioned the shift. On 9 August 1994, a month after the party had resolved to invest in the automotive industry, the Beijing sociologist Zheng Yefu, who had studied history in China before doing his master's degree in sociology at the University of Denver in the US, fundamentally questioned the wisdom of the party's decision. He voiced his critique in an opinion piece, entitled ›Critique of Car Civilization‹ published in the famous *Guangming Daily* newspaper, Deng's platform for his economic reform two decades earlier.<sup>25</sup> Zheng asked: was the party's decision motivated by profits and vanity or by a true desire to facilitate social life? Was the policy shift a wise move?

To Zheng, the issue was not whether China was able to produce private cars for everyone – its industry certainly could, he thought – but whether the country should ›enter car civilization‹. For his opposition, Zheng mobilized American car critics like sociologist Daniel Bell and cultural analyst Lewis Mumford. The decision to shift to privately owned cars was not a matter of merely introducing a new technology. In his opinion, it required investing in large infrastructural support systems as well as in a massive energy supply. The sociologist pointed out to his Chinese readers that the US government spent half its revenues on car infrastructure. Although cars may once have been attractive, those advantages no longer existed, he argued. Motorists in New York travelled 6 kilometers per hour in 1913 – and still travelled at this speed in the 1990s. Why, then, did China want to enter a car society if there were so few advantages? Foreign companies and domestic industry had a stake in and were seduced by the potential profits of car manufacturing. Ordinary Chinese were lured by the car's social status.

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24 On the economic and consumer ideologies of automobility, see for example: Gijss Mom, *Atlantic Automobility. Emergence and Persistence of the Car, 1895–1940*, New York 2015. Regarding the contradictions in socialist regimes: Lewis H. Siegelbaum, *Cars for Comrades. Life of the Soviet Automobile*, Ithaca 2008, and his *The Socialist Car. Automobility in the Eastern Bloc*, Ithaca 2011. See also: Bernhard Rieger, *The People's Car. A Global History of the Volkswagen Beetle*, Cambridge 2013.

25 ZHENG Yefu, 轿车文明批判 [Critique of Car Civilization: Way Back a Hundred Years], in: *Guangming Daily*, 9 August 1994.

The Beijing sociologist warned, however, that the car's promise of individual freedom masked its gigantic hidden costs for society. The state would have to deal with issues like traffic congestion and accidents. Moreover, he predicted, the decision to invest in China's car industry would set a precedent of divestment from public transit systems.

Zheng argued that an automotive future was not inevitable in China's march towards economic progress. He cited alternatives from abroad. Since the 1970s, Copenhagen's citizens had launched a campaign to reduce cars and use bicycles instead. Birmingham, Leeds, Edinburgh, Amsterdam, and 34 other cities established ›car-free city‹ coalitions in 1994; and the Swiss had voted against foreign cars in the Alps in 1993. China should not adopt ›America's old car culture‹, he insisted. He was not against the market economy and open competition as such. Nor did he contest the Chinese people's right to buy cars. Instead, China should conduct a real cost-benefit analysis before investing in private car mobility; the planners' guiding principle should be the economies of scale and calculating the real costs for society. That meant passing on to car owners the hidden social costs, he believed. Zheng urged that the state should invest instead in public transit and in bicycles.

Zheng's warning and suggestions for an alternative mobility path came as several bicycle consultants from the Netherlands travelled to Beijing in 1995 for a World Bank-sponsored conference on China's urban transport development strategy.<sup>26</sup> The Dutch consultants supported a bicycle-based future as part of the newly established national Bicycle Master Plan to solve their country's traffic jams. In those years, the NGO Worldwatch Institute and the World Bank sponsored conferences and papers promoting the bicycle as ›The Vehicle for a Small Planet.‹<sup>27</sup> In vain. Zheng – and the Western bicycle consultants, for that matter – lost the battle to the car-governed future. As Zheng had predicted, in order to fulfill the car-centered vision, the central state geared the nation's resources towards getting more freeways and parking lots.

The car-dominated modernist vision was a transnationally shared phenomenon. China was no exception. In the Shanghai and Beijing Planning Exhibition halls, gigantic scale models conveyed what would become Deng's future vision and what Zheng was to so pointedly criticize.<sup>28</sup> The Shanghai and Beijing scale models echoed General Motor's Futurama exhibit at the 1939 New York World's Fair with its corporate vision for a car-governed future in 1960: dividing traffic into fast and slow lanes.<sup>29</sup>

26 Anton D. Welleman/Cees J. Louisse/Dirk M. Ligtermoet, *Bicycles in Cities*, paper presented at the China Urban Transport Symposium, in: Stephen Stares/ZHI Liu (eds), *China's Urban Transport Development Strategy: Proceedings of a Symposium in Beijing, 8-10 November 1995*, Washington 1996, pp. 213-251.

27 Marcia D. Lowe, *The Bicycle: Vehicle for a Small Planet*, Worldwatch Paper No. 90, Washington, DC 1989; Michael A. Replogle, *Non-Motorized Transport in Asian Cities*, World Bank Technical Paper No. 162, Washington, DC 1992.

28 Koepfel, *Flight of the Pigeon* (fn. 14).

29 Warren Sussman, *The People's Fair*, in: Helen A. Harrison (ed.), *Dawn of a New Day. The New York World's Fair, 1939/40*, New York 1980; Cotton Seiler, *Republic of Drivers. A Cultural History of Automobility in America*, Chicago 2008; Ruth Oldenziel, *CIAM and Cycling: Designing for Working-Class Mobility, 1930–1935*, submitted for: *Journal of Urban History* (under review).

Although we associate these ideas with American cities, the vision was first blueprinted in the international civil engineering community at the Permanent International Association of Road Congresses (PIARC), in particular at its 1926 conference in Milan. In the urban planning community, Le Corbusier's work inspired the Functional City at the *Congrès Internationaux d'Architecture Moderne* (CIAM) held on a ship bound for Athens from Marseilles in 1933.<sup>30</sup> Chinese planners came to embrace the high-modernist vision with a passion. The car-dominated models entered planning circles, even when pedestrians, cyclists, and bus passengers far outnumbered motorists in the urban landscape. China also imported algorithms calculating flows and traffic models to maximize car circulation which ignored pedestrians and cyclists and were based on Western experience.<sup>31</sup>

A year after the party had adopted automobility as an important pillar for economic growth, the central government issued *The Standard of Urban Road Traffic* (1995) – the government's first and only document giving explicit direction on how policymakers should deal with cycling. The manual declared that the high volume of cyclists on China's road was a problem. The policy blamed cyclists for the conflicts between motorized and non-motorized vehicles, despite previously warning motorists to obey traffic rules. The 1995 national guidelines instructed large city authorities to improve the traffic situation by taking the speed of cars as its standard.<sup>32</sup> The car-governed policy did not come from the central government alone. During the same period, some local authorities began adopting measures to reduce cycling in advance of the car's arrival. In Guangzhou, for example, its 1993 Transport Master Plan already advised cutting back cycling's share from 34 percent in 1992 to 13 percent by the 2010s.<sup>33</sup> Shanghai and Beijing followed. In its 2002 report, the Beijing Transport Institute, a new planning agency within the municipal government, called for the >continuous reduction of bicycles and other inferior forms of transport from their current overly high proportion.<<sup>34</sup> The same year, the *White Paper of Shanghai Urban Transport Development* sought to reduce cycling trips by 25 percent by 2005 compared to the 2000 level. The paper projected that cycling would only be useful for journeys of

30 Ruth Oldenziel/Mikael Hård, *Consumers, Tinkerers, Rebels. The People Who Shaped Europe*, Basingstoke 2013, chapter 4; Evelien van Es et al. (eds), *Atlas of the Functional City. CIAM 4 and Comparative Urban Analysis*, The Hague 2014.

31 Spencer, *Urban Transport in China* (fn. 20), p. 220; Ruth Oldenziel, *Accounting Tricks. How Cyclists and Pedestrians Were Thrown under the Bus*, paper presented at T2M Conference, Drexel University Philadelphia, September 2014.

32 ZHANG Hua/Susan A. Shaheen/CHEN Xingpeng, *Bicycle Evolution in China: From the 1900s to the Present*, in: *International Journal of Sustainable Transportation* 8 (2014), pp. 317-335.

33 MA Xiaoyi, *Enlightenment on the Variations in the Structure of Guangzhou Inhabitant Modal Share*, in: *Urban Transport of China 2* (2004), pp. 29-32. See also: 陆路、谭惠全、劳炯基、蔡穗声:《逐步取消自行车是解决广州市内交通问题的方向》,《开放时代》1990年第01期。[LU Lu et al., *Banning Bicycle Gradually is the Direction to Solve the Traffic Problems of the City of Guangzhou*, in: *Open Times* 1 (1990), pp. 53-56].

34 Cf. Koeppel, *Flight of the Pigeon* (fn. 14), p. 65.

under 30 minutes and ignored the prevalence of long-distance commuting on electric two-wheelers.<sup>35</sup> The forecast meant in the first instance sidelining the scores of cyclists to side roads to make way for the increasing – but still exceedingly modest – number of motorists on China's streets.

Indeed, between 1995 and 2013, all plans for new car-oriented roads were geared towards marginalizing bicycles through purposeful urban design. For existing streets, urban policymakers looked to create separate lanes for so-called ›fast traffic‹ and ›slow traffic‹ as a first step in phasing out cyclists. In the same year the party decided to invest in the car industry, the Bureau of National Technical Supervision issued a traffic manual, setting standards for road infrastructures that would enable cars (fast traffic) to be separated from cycles (slow traffic). Given that cyclists dominated all Chinese streets and traditionally cycled over the entire width of the road, the manual's instructions to relegate cyclists to separate paths or on-street lanes downgraded their status.<sup>36</sup> Implementing outright downtown bicycle bans represented another intervention in making way for the car-governed future. In 2004, for example, officials banned nine million cyclists from the main arteries of downtown Shanghai.<sup>37</sup> The effect was immediate. The proportion of non-motorized trips in downtown Shanghai fell from 23.2 to 19.5 percent in five years. By 2009, the authorities had prohibited non-motorized vehicles like bicycles on 10 percent of Shanghai's streets.<sup>38</sup> Just like in countries in the Global North that had previously opted for car-governed cities, when automobility finally did arrive, bicycle and car-related fatalities soared. Shanghai's traffic accidents almost doubled from 130,000 in 1994 to 243,000 in 1998.<sup>39</sup> In the public discourse over road safety, the hotly contested issue was whose safety needed protecting and whose mobility would get priority. In the case of accidents, the blame began shifting

35 到2005年, 全市自行车出行量将比2000年减少25%;到2020年, 自行车出行控制在30分钟以内。上海市人民政府编,《上海城市交通白皮书》,上海,上海人民出版社2002年。[Shanghai Municipal People's Government (ed.), *White Paper of Shanghai Urban Transport Development*, Shanghai 2002].

36 Bureau of National Technical Supervision, *Code for Urban Transport Planning and Urban Roads*, Beijing 1995, as cited in PAN Haixiao, Evolution of Urban Bicycle Transport Policy in China, in: John Parkin (ed.), *Cycling and Sustainability*, Bingley 2012, pp. 161-180, here pp. 163-166. Pan sees the new infrastructures as a positive development. In the first phase, cycling lanes downgraded the cyclists' status; in later phases, these bicycle lanes gave in some cases protection, when the number of cars on the roads increased and cycling declined. Nevertheless, the design was intended to facilitate cars. See: Ruth Oldenziel/Adri A. Albert de la Bruhèze, Contested Spaces: Bicycle Lanes in Urban Europe, 1900–1995, in: *Transfers* 1 (2011) issue 2, pp. 29-49.

37 Daniel Sperling/Deborah Gordon, *Two Billion Cars. Driving Toward Sustainability*, Oxford 2009, p. 219.

38 上海市城乡建设和交通委员会、上海市城综合交通规划研究所、上海市第四次综合交通调查办公室:《上海市第四次综合交通调查总报告》2010年11月。[Shanghai Urban and Rural Construction and Transportation Commission, The Shanghai Institute of Integrated Transportation Planning, The Fourth Shanghai Comprehensive Transport Survey Office, Shanghai Comprehensive Transport Survey Fourth General Report, November 2010].

39 John Zacharias, Bicycle in Shanghai: Movement Patterns, Cyclist Attitudes and the Impact of Traffic Separation, in: *Transport Reviews* 22 (2002), pp. 309-322.

away from motorists. The process of discouraging cycling and pedestrianism echoed the policies implemented in the US and Europe between the 1920s and 1970s to make way for cars.<sup>40</sup>

Policy and practice did not always match, however. Despite projections of its demise, in practice cycling at first continued to grow in the megacity Shanghai by an average of 9 percent between 1995 and 2004.<sup>41</sup> Pro-car policies could also backfire. After local authorities in the harbor city Dalian had decided to blame the 1.6 million cyclists for obstructing car traffic and causing chaos, they made concerted efforts to get bicycles off the road.<sup>42</sup> Celebrating their bicycle-banning policies, the authorities ranked Dalian in 2000 as the best city in the Ministry of Public Security and the Ministry of Construction's 'Smoothing Project' – a translation of the car-based concept 'traffic flow' – to facilitate ('smooth') car flows and improve road safety. It called on other cities to emulate Dalian. Only three years later, the city faced its worst urban congestion.<sup>43</sup> Once triumphantly declared China's 'bicycle-free city', today Dalian is planning to rebuild its bicycle lane infrastructure and establish a public bicycle-sharing scheme.<sup>44</sup>

Policy and practice diverged in other ways as well. The image of clogged traffic on Shanghai's elevated expressway, snaking through the downtown area, came to dominate most (international) reporting on China's transition from a manufacturing nation to a consumer society. These narratives suggest that car-centered cities and traffic jams were just the inevitable price the country had to pay for economic advancement. Journalists often focused on cars in China to portray the nation's rising middle class and its consumption. To cite just one example, the US-based journal *Foreign Policy* reported dramatically how since 1986, auto use had increased sixfold in Beijing and cycling plummeted from nearly 60 percent to just 17 percent by 2010. The decline in cycling, however, was neither a natural nor an inevitable phenomenon, as the US publication suggested.<sup>45</sup> The declining figures, as we have seen, were the result of a deliberate policy to encourage automobility as the mode of the future and to discourage cycling as a mode of the past.

40 Adri A. Albert de la Bruhèze/Frank C.A. Veraart, *Fietsverkeer in praktijk en beleid in de twintigste eeuw. Overeenkomsten en verschillen in fietsgebruik in Amsterdam, Eindhoven, Enschede, Zuidoost Limburg, Antwerpen, Manchester, Kopenhagen, Hannover en Basel*, Eindhoven 1999; Oldenziel et al., *Cycling Cities* (fn. 16); Norton, *Four Paradigms* (fn. 6); idem, *Fighting Traffic* (fn. 6).

41 潘海嘯, 《中国城市自行车交通政策的演变与可持续发展》, 城市规划学刊 4 (2011), pp. 82-86 [PAN Haixiao, *The Evolving Cycle Transport Policy in China and Urban Sustainable Development*, in: *Urban Planning Forum* 4 (2011), pp. 82-86].

42 芦群, 李晓龙, 《“无自行车城市”的交通问题浅析》, 长沙铁道学院报(社会科学版) 9 (2003), pp. 29-31 [LU Qun/LI Xiaolong, *Mobility Analysis of Bike-Free City*, in: *Journal of Changsha Railway College* 9 (2003), pp. 29-31].

43 See fn. 41.

44 ZHANG/Shahen/CHEN, *Bicycle Evolution in China* (fn. 32).

45 As cited in Will Doig, *Carmaggedon is coming!*, in: *Salon*, 23 August 2013.

Most significantly, the media focus on the staggering gridlocks and growth figures is misleading. The reports consistently ignore modal split statistics – the percentage of travelers using a particular type of transport (cars, bicycles, walking, and public transit). These are most instructive. A year after the policy shift, in 1995, China had 2.5 million cars. Seventeen years later, there were 93 million. That number is still far less than the many hundreds of millions of (e-)cyclists plying the streets.<sup>46</sup> In 2011, for example, Beijing residents still overwhelmingly cycled (32 percent), walked (21 percent), or took public transit (26 percent) rather than drove (21 percent). Despite the pro-car policies, even in the port city Shanghai there was an even split between cyclists and motorists (20 percent each); most residents either used public transit (33 percent) or walked (27 percent).<sup>47</sup> Or, to put it more starkly: motorized mobility made up only a fifth of all movements in both cities (21 and 20 percent respectively).

Thus, news reports about China's rapid growth in automobility and decline in cycling often mask these modal-split statistics. By quoting figures on growth rates for cars and cycling's decline rather than modal-share figures, such reports reinforce a narrative of inevitable automobility and middle-class success. These accounts of inevitability conceal the real policy choices involved. Crucially, they ignore how policy crafted at the drawing table diverged from actual practice on the street.

### 3. ›Ecological Civilization‹ Car Futures, Public Transit Expansion, and Bicycle Bans

In August 2010, the international press highlighted the 10-kilometer traffic jam of trucks on the Beijing expressway to Mongolia that lasted ten days.<sup>48</sup> It was a future Zheng had predicted when rejecting the old American model of automobility for China. Facing an air pollution disaster and clogged arteries of gigantic proportions, the country was standing at the edge of a precipice. In the preparations for the 2008 Olympic Games in Beijing, policymakers and many Chinese citizens realized that new policy measures were urgently required to deal with the staggering problems of urban traffic and pollution. In 2007, a report to the 17<sup>th</sup> National People's Congress called for China to become the world's first ›Ecological Civilization‹. The Central

46 After 1994, China's central government issued two more policies to promote the automobile industry: ›Policy for Automobile Industry Development‹ (1 June 2004) and ›Energy Saving and New Energy Automotive Industry Development Plan, 2012–2020‹ (28 June 2012). FENG Xiuxia, Changing China, in: *China Daily. European Weekly*, 22 November 2013, p. 31.

47 Beijing Yearbook (2011), *Beijing Transport Report* (2005), and *Shanghai Yearbook* (2011), as cited in: Passenger Transport Mode Shares in World Cities, in: *Journeys*, November 2011, pp. 60–78.

48 Jonathan Watts, Gridlock is a way of life for Chinese, in: *Guardian*, 24 August 2010; Ananth Krishnan, China's 10-day traffic jam ›longest ever‹, in: *Hindu*, 24 August 2010.

Committee adopted this proposal at the next congress in 2013. China's central government issued a comprehensive law in 2016 to tackle air pollution.<sup>49</sup> In developing the policy, city governments rather than the central government often took the lead. China's central government introduced standards for air pollutants, modeled after European Union regulations introduced in 1992 and based on initiatives by the city governments of Shanghai and Beijing.<sup>50</sup> On the other hand, the central government introduced environmental protection measures through legal and economic instruments that depended on lower governments for their implementation.<sup>51</sup> With the adoption of the 2013 ›Ecological Civilization‹ blueprint, however, the environmental policy took center stage.

That same year, the party's ambition to become the world's first ›Ecological Civilization‹ found its way into the area of urban mobility standards for the built environment. The government-mandated 2013 manual, *Urban and Rural Housing Construction Unit Walking and Cycling Planning and Design Guidelines* modified the car bias of the 1995 guide. In consultation with the NGO China Sustainability Transportation Center, the manual made important amendments to an exclusively car-governed attitude to traffic. It urged designers to prioritize road space for pedestrians and cyclists and to segregate traffic whenever faced with limited space. In existing streets, planners had to give priority to pedestrians, cyclists, cabs, and public transit stops, in that order, before allowing cars.<sup>52</sup>

Despite the official amendments, the conflicting objectives of urban mobility and sustainability have resulted in zigzag policies. While the central government issued guidelines restoring the role of cyclists and pedestrians at the expense of motorists, it continued to stimulate car manufacturing and sales, fueled by a rising middle class eager to acquire cars and the lifestyle associated with them. To deal with clogged cities and air pollution, local governments sought to curb car ownership and use, while continuing to issue bicycle bans and build urban highways. Equally contradictorily, banning bicycles to make way for cars ran parallel to policies to curb automobility: Shanghai has limited parking and the number of new car license plates to 50,000 per

49 《中华人民共和国大气污染防治法》The People's Republic of China Air Pollution Prevention Law, passed by the 12th National People's Congress Standing Committee of the People's Republic of China at the 16th Meeting on 29 August 2015, and with amendments, came into force after 1 January 2016.

50 Sperling/Gordon, *Two Billion Cars* (fn. 37).

51 BAO Maohong, The Evolution of Environmental Problems and Environmental Policy in China. The Interaction of Internal and External Forces, in: John R. McNeill/Corinna R. Unger (eds), *Environmental Histories of the Cold War*, Cambridge 2010, pp. 323-340, here pp. 323-339; idem, Environmentalism and Environmental Movements in China since 1949, in: John R. McNeill/Erin Stewart Mauldin (eds), *A Companion to Global Environmental History*, Malden 2012, pp. 474-492, here pp. 484-487.

52 See section 12.2.2 of The Urban and Rural Housing Construction Unit Walking and Cycling Planning and Design Guidelines. 城市步行和自行车交通系统 规划设计导则住房城乡建设部 2013 年 12 月. On the background to the manual, see: China Sustainability Transportation Center, News: Chinese National NMT Guideline Issued, URL: <<http://www.chinasc.org/en/news/24/380>>.

year since 1998, and also made it difficult to get a driver's license.<sup>53</sup> Beijing, Hangzhou, Guangzhou, Guiyang, and Tianjin followed suit. Cities have also been more proactive. To combat automobility, most of China's wealthiest cities have been investing heavily in mass-scale public transit at a breathtaking rate over the past decade.<sup>54</sup> Guangzhou runs a rapid bus transit system larger than any other Asian city – a development that has become a model throughout the world.<sup>55</sup> Since the Olympics in 2008, Beijing in particular has been rapidly extending its subway system.

In facing the ecological challenges, however, the car-curbings and public-transit investment policies lack a comprehensive bicycle-based strategy to reinforce the commitment to sustainability. The omission is even more striking considering China's continually thriving cycling culture and its position as the world's largest bicycle manufacturer. The mobility initiatives ignore cycling's enormous ecological potential, its near-zero emissions, small land use, little wear and tear to roads, cost-efficiency, speed, and flexibility. Local authorities have created only modest cycling policies, mostly in response to citizens' demands. To fight air pollution, 200,000 Beijing residents pledged to reduce car use and go on foot or by bicycle in June 2010. Measures to ban bicycles from the center of Guangzhou by 2010 were scrapped after outraged citizen protests in the 1990s.<sup>56</sup> Shanghai has revoked its 2007 ban of bicycles downtown and announced it would convert some car lanes back to the original cycling lanes.<sup>57</sup> Recently, China's Deputy Minister of Infrastructure ordered that cycle lanes be restored in those cities that once had had them. The police are cracking down on bicycle theft.<sup>58</sup>

Those modest pro-cycling measures in response to citizens' demands have not prompted authorities to revisit their bicycle policy. Rather the policies are defensive and haphazard. Even the much highlighted bicycle-share programs are stand-alone initiatives.<sup>59</sup> The famous historic and tourist city of Hangzhou with 7 million people, facing traffic congestion and a deteriorating environment, launched its own ambitious bicycle-sharing program in 2008, within a year of the public-private JCDecaux Vélib' bicycle scheme's introduction in Paris. Hangzhou's system, with over 2,674 stations and 65,000 bicycles in 2012, is set to expand to 175,000 bicycles

53 Sperling/Gordon, *Two Billion Cars* (fn. 37), p. 220. In pioneering new policies, Chinese urban governments have followed the global trend. See also: Benjamin R. Barber, *If Mayors Ruled the World. Dysfunctional Nations, Rising Cities*, New Haven 2013.

54 For Beijing, see: 北京交通发展研究中心编, 《2015年北京市交通发展年度报告》, 北京交通发展研究中心网站 <<http://www.bjtrc.org.cn>>; for Shanghai, see: 上海市城乡建设和交通发展研究所编, 《2015年上海市综合交通年度报告(摘要)》, 《交通与运输》2015年第6期, 第7-11页。[Shanghai Institute of Urban and Rural Construction and Transportation Development (ed.), *Annual Report of Shanghai Comprehensive Transportation*, 2015 (Summary), in: *Traffic & Transportation* 6 (2015), pp. 7-11].

55 Doig, Carmaggedon is coming! (fn. 45); Sperling/Gordon, *Two Billion Cars* (fn. 37), pp. 221-222.

56 Thomas J. Campanella, *The Concrete Dragon. China's Urban Revolution and What it Means for the World*, New York 2008, pp. 220-221.

57 Sperling/Gordon, *Two Billion Cars* (fn. 37), p. 219.

58 Koepfel, *Flight of the Pigeon* (fn. 14); Campanella, *The Concrete Dragon* (fn. 56), pp. 220-221.

59 ZHANG/Shaheen/CHEN, *Bicycle Evolution in China* (fn. 32); Sherley Wetherhold, *The Bicycle as Symbol of China's Transformation*, in: *Atlantic*, 30 June 2012.

by 2020.<sup>60</sup> Such initiatives neither amounted to a dedicated, fundamental cycling policy nor integrated cycling into a comprehensive mobility strategy to achieve ecological and social sustainability.

The blind spot is widely shared. Twenty years later to the day, in 2014, sociologist Zheng revisited his original critique against automobility in his opinion piece entitled, 'Two decades of car debate'.<sup>61</sup> He had lost the battle in 1994 to his opponent Fan Gang, the automobility proponent who had a Chinese degree in Western economics and was professor at Beijing's top business school with exposure to the US during a stint at Harvard University. To his regret, Zheng won the war two decades later. Having advised the city of Beijing to deal with its urgent transport issues since 2010, Zheng was most fierce in his critique of the policymakers who – besides not daring to speak out against the problems they faced in their own jurisdiction – had been clueless about the growing resistance from Chinese citizens. Beijing officials who only travelled by luxury cars should be forced to take the bus, he sarcastically wrote, if China was to have a fighting chance of creating a sensible traffic policy. Throughout his career, Zheng had written numerous articles arguing that investments should be made in dedicated bus lanes; parking should be financed through fees reflecting the land-use prices; and car owners should bear the real costs of road construction. Despite his earlier call for bicycles to be encouraged, his focus had shifted almost exclusively to public transit. He no longer mentioned the bicycle as a sensible solution.

His omission was noteworthy because cycling, or, to be more precise, e-cycling was booming for long-distance commuting and delivery purposes. Underneath the elevated highways and flyovers that transport Shanghai's middle classes and capture the attention of journalists, a kind of 'underground' pedestrian and cycling city still dominates. Here, as elsewhere in China, we find urban workers, peddlers, and rural migrants moving around on a rich variety of locally produced battery-powered bicycles or scooters. An estimated 300 million commuters and migrants rely for their livelihood on the quiet, battery-powered e-bikes.<sup>62</sup> Otherwise unregulated, categorized as non-motorized, and allowed on bicycle lanes, e-bicycles and e-scooters provide commuters an affordable, flexible, and fast alternative to expensive cars, crammed busses, slower pedal-powered bicycles, and gasoline-powered motorcycles.<sup>63</sup> Workers consider them a lifeline, particularly in many small and medium-sized Chinese cities with outdated bus systems and minimal investments in subways.

60 PAN, Evolution of Urban Bicycle Transport Policy in China (fn. 36). On the background of Vélolib', see: Maxime Huré, Les réseaux transnationaux du vélo. Gouverner les politiques du vélo en ville. De l'utopie associative à la gestion par des grandes firmes urbaines (1965–2010), Thèse de doctorat en Science politique, Université Lyon 2 Lumière, 2013.

61 ZHENG Yefu, 郑也夫的博客: 轿车论辩二十年 [ZHENG Yefu's Blog: Two decades of car debate], 7 August 2014, URL: <[http://blog.sina.com.cn/s/blog\\_49ccddcf0102uxu2.html?tj=1](http://blog.sina.com.cn/s/blog_49ccddcf0102uxu2.html?tj=1)>.

62 LU Hongyong, China's Relationship with E-Bikes: It's Complicated, in: *Sixth Tone*, 3 May 2016, URL: <<http://www.sixthtone.com/news/787/chinas-relationship-with-e-bikes-its-complicated>>.

63 Jonathan X. Weinert/Chaktan Ma/Chris Cherry, The Transition to Electric Bikes in China: History and Key Reasons for Rapid Growth, in: *Transportation* 34 (2007), pp. 301-318.



(E-) Bicycle and scooter commuters dominate Shanghai streets, 2014  
 (Tim Adams, <[https://commons.wikimedia.org/wiki/File:Bicycle\\_and\\_scooter\\_commuters\\_in\\_Shanghai\\_China.jpg](https://commons.wikimedia.org/wiki/File:Bicycle_and_scooter_commuters_in_Shanghai_China.jpg)>, »Bicycle and scooter commuters in Shanghai China«, <<https://creativecommons.org/licenses/by/3.0/legalcode>>)

The world of battery-powered bicycles and scooters in China is unique. The industry developed outside the official state policy venues as a bottom-up innovation – almost by accident. So did their use. A mere 40,000 were sold in 1998. Not counting the traditional pedal-powered bicycles, today there are close to 300 million electric two-wheelers – about twice the number of middle-class car drivers – plying the streets.<sup>64</sup> By 2012, China accounted for about 93 percent of global e-bike sales.<sup>65</sup> Their growth exploded when local governments banned pedal-powered bicycles because authorities found them too slow for the new automotive advance and small entrepreneurs seized the opportunity to offer an electric and faster alternative. The electric two-wheeler industry

64 JI Shuguang et al., Electric Vehicles in China: Emissions and Health Impacts, in: *Environmental Science & Technology* 46 (2012), pp. 2018-2024.

65 Elliot Fishman/Christopher R. Cherry, E-bikes in the Mainstream: Reviewing a Decade of Research, in: *Transport Reviews* 36 (2016), pp. 72-91.

received another boost when the authorities banned gasoline-powered motorcycles for being too polluting and noisy – a ban initiated in Beijing in 1985, and adopted in 150 cities by 2015.<sup>66</sup> Government restrictions thus unintentionally created a new – and unregulated – market for electric two-wheelers.

The e-bicycles and e-scooters, however, have a low status in China today. Class is at the heart of the matter. Commuters from the countryside who depend on jobs and trade in the city, but cannot afford the high rents to live there, use electric two-wheelers as a welcome alternative to crammed busses and slower bicycles. It is the poor man's car. Workers and migrants find electric two-wheelers can bridge the great distances of the ever-expanding city limits and consume four to five times less than gasoline-powered motorcycles. Electric two-wheelers, moreover, sustain the army of poorly paid deliverymen, who keep the ›wheels of e-commerce‹ running, quickly collecting and delivering online-purchased goods to consumers.<sup>67</sup>

Recently, a grass-roots movement of working-class commuters, migrants, and delivery workers put the issue of cycling back on the political agenda, if only temporarily, when authorities started to target the electric two-wheelers with bans. To the great surprise of the Shenzhen authorities, banning e-bikes to create an easy flow for car traffic brought the local e-commerce sector with its dependence on bicycle-bound deliverymen almost to a halt. In China's third-biggest and newly-built city of Shenzhen near Hong Kong, local citizens supported by almost all the newspapers, including even the official, party-sponsored *People's Newspaper* and the *Xinhua News Agency*, rose up against the anti-bicycle and anti-scooter policies in 2016.<sup>68</sup> Citing concerns about road safety and battery-induced pollution, some local authorities have been skeptical about the e-bike development. Following Fuzhou and Zhuhai, Guangzhou became the third Chinese city to ban e-bikes in 2006.<sup>69</sup> Beijing also introduced a ban, but quickly retracted the policy.<sup>70</sup>

The resistance to the 2016 e-bike bans in many Chinese cities brought to light a potential alternative alliance to the car-based coalition. The bicycle industry through the China Bicycle Association (CBA) claimed the sector was worth 28 billion euros.

66 Jonathan Weinert et al., The Future of Electric Two-Wheelers and Electric Vehicles in China, in: *Energy Policy* 36 (2008), pp. 2544-2555; Weinert/Ma/Cherry, The Transition to Electric Bikes in China (fn. 63); Sperling/Gordon, *Two Billion Cars* (fn. 37), pp. 223-224; 陈权, 《“禁摩令”存废之争》, 《法制与社会》2016年第5期, 第62-63页。 [CHEN Quan, The Debate over the Abolition of the ›Motorcycle bans‹ Policy, in: *Legal System and Society* 5 (2016), pp. 62-63].

67 Chris Buckley, Beijing's Electric Bikes, the Wheels of E-Commerce, Face Traffic Backlash, in: *New York Times*, 30 May 2016.

68 CHAI Hua/XU Wei, Shenzhen's Clampdown on E-Bike Hits Courier Services, in: *China Daily*, 4 April 2016; Jon Khristian Maclang, Ban on E-bikes in 10 Beijing Roads Begins this Week, in: *Yibada*, 9 April 2016; Jan-Willem van Schaik, China Bans E-Bike Use in Major Cities, in: *Bike Europe*, 26 April 2016.

69 Weinert/Ma/Cherry, The Transition to Electric Bikes in China (fn. 63).

70 Christopher R. Cherry/Jonathan X. Weinert/YANG Xinmiao, Comparative Environmental Impacts of Electric Bikes in China, in: *Transportation Research Part D: Transport and Environment* 14 (2009), pp. 281-290.

The sector included e-vehicle businesses like the Zhejiang Luyan Vehicle Company. Moreover, the coalition also served the e-commerce businesses, which depended on the army of foot soldiers on their cargo e-bikes for quick deliveries. In response to the 2016 bicycle bans, David Hon, a Chinese-American physicist and entrepreneur of folding bikes, questioned the wisdom of the bans directly in an open letter to the Chinese government. He focused on the social aspects of sustainability: how could the government ignore the people who could not afford a car but had the desire for upward mobility? The e-bicycle bans would cause ›people who cannot afford to buy a car [to] lose their job‹. And without their e-bikes, ›How can poor people become wealthy?‹ He insisted e-bicycles and public transit would offer the true solution to China's ecological problems as an alternative to fossil-fueled vehicles.<sup>71</sup>

In Western parlance (but not in China), battery-powered bicycles have acquired green status. Both traditional bicycles and electric two-wheelers have little ecological impact on the community where they are used. When it comes to ecological sustainability, traditional bicycles win without a doubt on all counts; both their extremely modest production and their use create almost no ecological footprint. Electric two-wheelers' footprint, on the other hand, depends on how factories produce the (lead) battery, how the e-waste is recycled, and whether the local community fires its power plants with coal, waterpower, or nuclear energy. Sustainable e-bike usage is contingent on investments in alternatives to coal-fired power plants and in more sustainable batteries like Li(thium)-ion and Ni-MH (nickel-metal hydride).<sup>72</sup> Nevertheless, e-bike emissions, measured in terms of greenhouse gas (CO<sub>2</sub>), smog (Volatile Organic Compound, VOC), air pollution (Particulate Matter, PM), and ozone pollution (NO<sub>x</sub>), are much lower than those of gasoline-powered motorcycles, cars, and busses that are polluting both at the point of production and at the point of use.

Thus, China's sustainability challenge for mobility is not just a technical issue, but also a social one. In China, neither the term e-bike nor the ›green‹ association with sustainability has an equivalent, as David Hon, the Chinese-American entrepreneur, has pointed out. More significantly, in the planners' minds, the subaltern world does not – or should not – exist. Authorities revert to bicycle bans in an automatic reaction to what they consider the ›chaos‹ in the street and cyclists' ›undisciplined‹ behavior. The Chinese Communist Party considers these workers the representatives of old-fashioned mobility and their self-fashioned bicycles ›inferior forms of transport‹. To the planners, bicycles – battery-powered or not – are relics of the past standing in the way of progress. With this attitude, the planners embody the same technocratic outlook as their engineering and urban planner colleagues in Europe and the US earlier in the century. In China alone, government planning in 2004 was geared towards

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71 Cf. Schaik, *China Bans E-Bike Use in Major Cities* (fn. 68).

72 Cherry/Weinert/YANG, *Comparative Environmental Impacts* (fn. 70).

moving 300 million people from rural areas to cities by 2050.<sup>73</sup> People's mobility needs to shop, commute, and deliver goods for a living are being ignored and even brutally crushed.

In the US and Europe, there may be high hopes for e-bikes as a sustainable solution for the future. The question is whether the distinctive bottom-up Chinese development of e-bikes can fulfill that role. In France, Germany, and the Netherlands, velopedes and scooters offered a transitional technology for cyclists as proto-car drivers in the period between the late 1950s and 1980s.<sup>74</sup> Likewise, in China, after four decades of choosing a unique path, the country's cyclists are offered an alternative in the form of e-bikes when they cannot (yet) afford a car, but could do so in the future with rising incomes.<sup>75</sup> For most planners and ordinary Chinese, electric two-wheelers today represent – in the most positive scenario – merely a transitional technology towards automobility.

Can this exceptional culture – born out of economic necessity and outside official planning policies – be turned into a sustainable alternative to China's national commitment to cars or to urban governments' investments in public transit systems? The future development of this mobility alternative largely depends on the policy for competing urban transit modes, including public transit and automobility. Institutionally and historically, cycling – as an individual form of mobility – regularly falls between the policy cracks in the epic struggle between automotive interests and public transportation systems. In this struggle, traditional bicycles and electric two-wheelers are a lifeline for those overlooked by the transportation grids. For more than a century, all over the world, urban cycling has thrived despite the lack of dedicated policies. Utility cycling often fills a gap when governments fail to provide the lower middle classes and the working poor with good, affordable transport systems – except in China, which did have a deliberate policy for a few decades. For China today, there are two possible scenarios when it comes to building on its cycling practice: e-bikes may provide a pathway towards sustainability or continue to function as a step towards automobility when income levels rise.

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73 United Nations, World Urbanization Prospects, 2014, URL: <<https://esa.un.org/unpd/wup/publications/files/wup2014-highlights.Pdfs>>. 2014年07月24日, 国务院印发《关于进一步推进户籍制度改革的意见》国发〔2014〕25号, 提出“严格控制特大城市人口规模。”北京、上海等超过1000万人口的特大城市陆续在其十三五规划中分别提出了, 人口规模在2020年的目标, 上海市是2500万人, 北京市是2300万人。On 24 July 2014, the State Council of China issued the policy no. 25 promoting a household registration system to >strictly control the population scale of megacity<. Cities with over 10 million people issued five-year plans for their 2020 population goals: Shanghai 25 million; Beijing 23 million; and Guangzhou and Tianjin each 18 million.

74 Bruhèze/Veraart, *Fietsverkeer* (fn. 40). See also Steinbeck, who argues that in Germany the motorbike was used earlier, more widely, and for longer than elsewhere. Frank Steinbeck, *Das Motorrad. Ein deutscher Sonderweg in die automobile Gesellschaft*, Stuttgart 2012.

75 I thank SUN Qi for this insight.

## 4. Conclusion

China, as articulated in its 2013 ›Ecological Civilization‹ strategy and confirmed by its signing of the Paris Climate Accords in 2015, is committed to reducing energy use, combating air pollution, and solving the problem of congested cities, along with other ecological challenges.<sup>76</sup> The thinking about sustainable mobility is still shaped by established notions of urban planning and a powerful car-based alliance. Indeed, the central government and local authorities have not decided how to deal with the new industry of this army of e-cyclists and their desire for upward mobility. Nor have they thought about how to exploit their ecological potential. A negative discourse accompanies (e-)cyclists at every turn in the road. ›These little locusts are such a pain for bus drivers‹, one such driver lamented, referring to e-bike riders. ›All too suddenly and often, they appear out of nowhere, fly across the street, and cut in line, regardless of how close they are to my bus.‹<sup>77</sup> In this image, cyclists – e-bikers in particular – are ›locusts‹, whose bikes' soundless engines render them ›silent killers‹, endangering the safety on the streets. The discourse represents a car-bound vision of mobility, in which policymakers and traffic engineers respond with more rules and separate roads, insisting that ›fast traffic‹ is the future and ›slow traffic‹ a thing of the past. Over and against the negative image, Western observers and the emerging Chinese bicycle-oriented alliance are presenting cycling as China's ›most sustainable [and] biggest adoption of green transportation in history.‹<sup>78</sup>

Similarly, as their ambitious eco-city prototype shows, China's planners have captured neither the ecological nor the social sustainability potential of electric two-wheelers. The environmentally sustainable urban master plan for Chengdu's Tianfu Ecological City to deal with the realities of air pollution, traffic congestion, and civic protest offers a hopeful alternative to the old urban planning model for a more sustainable future. It is a city where energy is to be cut by 48 percent, water use by 58 percent, waste by 89 percent, and carbon dioxide by 60 percent. In collaboration with the Beijing Vantone Real Estate Co., the Chicago firm Adrian Smith + Gordon Gill Architecture promises a compact city (15 percent taken up with parks), away from the suburban sprawl. In this blueprint, almost 25 percent is devoted to walking and road infrastructures. ›The city will be walkable within about 15 minutes, all but eliminating the need for most automobiles.‹ It is a city where half of the roads will be reserved for non-motorized traffic and electric shuttles.<sup>79</sup>

76 ZHU Guangyao, *Ecological Civilization: A National Strategy for Innovative, Concerted, Green, Open and Inclusive Development*, United Nations Environment Programme (UNEP), March 2016; ZHANG Chun, *China's New Blueprint for an ›Ecological Civilization‹*, in: *Diplomat*, 30 September 2015.

77 Quoted by LU, *China's Relationship with E-Bikes* (fn. 62).

78 See for example: Wade Shepard, *Why Chinese Cities Are Banning the Biggest Adoption of Green Transportation in History*, in: *Forbes*, 18 May 2016.

79 For the Masterplan for Chengdu, see the architects' web presentation: <[http://smithgill.com/media/pdfs/Tianfu\\_Ecological\\_City\\_for\\_web\\_3.pdf](http://smithgill.com/media/pdfs/Tianfu_Ecological_City_for_web_3.pdf)>; Alex Davies, *China Is Building a Huge Eco-City Where No One Will Need to Drive*, in: *Business Insider*, 2 November 2012; Adrian Smith/Gordon Gill, *Tianfu Ecological City*, in: *Architectural Worlds*, 28 March 2013, pp. 112-115.

This 2015 prototype vision for a sustainable urban China is based on pedestrianism and mass public transit – not on cycling. There is no mention of (e-)bicycles as a sustainable alternative to automobility, nor does the Tianfu Ecological City blueprint include bicycles as commuter vehicles; bicycles are not envisaged as a possible solution for before-and-after transport connected to mass public transit (bike-and-ride). Most significantly, electric-powered bicycles do not feature in the vision for long-distance commuting either, ignoring over 300 million hardworking commuters, migrants, and delivery workers who depend on them. What does enter the visual frame of the green city is a lone male cyclist in yellow spandex getting some exercise to counteract his supposedly sedentary middle-class lifestyle. While this male figure references a new exclusive middle-class and masculine cycling culture of leisure in Beijing and Shanghai, you are more likely to see this sports-oriented cyclist in Chicago than in Chinese cities.<sup>80</sup> More to the point, this culture denies China's home-grown utilitarian e-cycling culture of the masses.

Western policymakers may regard e-cycling as a possible avenue for sustainable mobility. In China, people's mass-scale and unique adoption of e-cycling has occurred in spite of the government's pro-bicycle or environmental mobility policies. The distinctive Chinese development of e-biking could be the missing link in an ecologically and socially more sustainable future, provided the e-bike phenomenon is incorporated into China's plans for the future. Should Chinese planners embrace (e-)cycling, together with public transit, they would be pioneers in reshaping sustainable urban mobility worldwide. China could then fulfill its 2013 quest for green leadership by becoming the world's first ›Ecological Civilization‹ in the area of sustainable urban mobility.

For additional images, see the internet version at  
<<http://www.zeithistorische-forschungen.de/3-2017/id=5521>>.

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80 Hilda Roemer Christensen, Is the Kingdom of Bicycles Rising Again? Cycling, Gender, and Class in Postsocialist China, in: *Transfers* 7 (2017) issue 2, pp. 1-20.