E-bikes in China: Status, Challenges & Future

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Contents • 1. Current Development
• 2. Advantages
• 3. Challenges
• 4. Related Policies and Future
Current Status of E-Bikes in China

- Highly Popular, strong growth
- Main mode for short and medium distance travel
- Significantly Different Attitude & Policy towards E-bike
1. Development in China

Popular in most Chinese Cities. Exceeds 200M nationwide

Ownership (*10000)
E-bike Share by Cities

Data source: Jiangzhjiang University E-bike study, 2013
## What is the definition of E-bikes in China?

<table>
<thead>
<tr>
<th>parameters</th>
<th>Bicycles</th>
<th>Regular E-bikes</th>
<th>Motorized E-Bikes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearances</td>
<td><img src="image1.png" alt="Bicycle" /></td>
<td><img src="image2.png" alt="Regular E-bike" /></td>
<td><img src="image3.png" alt="Motorized E-Bike" /></td>
</tr>
<tr>
<td>动力功率（v/w）</td>
<td>—</td>
<td>36/250</td>
<td>48/380</td>
</tr>
<tr>
<td>车身净重（kg）</td>
<td>22</td>
<td>32</td>
<td>55</td>
</tr>
<tr>
<td>最大速度（km/h）</td>
<td>10-15</td>
<td>20</td>
<td>45</td>
</tr>
<tr>
<td>续航里程（km）</td>
<td>5-15</td>
<td>40</td>
<td>60-80</td>
</tr>
<tr>
<td>最大载重（kg）</td>
<td>—</td>
<td>100</td>
<td>250</td>
</tr>
</tbody>
</table>

符合国家政策规定
National Standard Compliance
What's on the Roads
Also on the Road – E-bike for Delivery
Current status

Lack of National Policy towards E-bikes, difficult for related ROW and management. Manufactures and city management don't take standards seriously.

<table>
<thead>
<tr>
<th>Paddles</th>
<th>Max Design Speed (km/h)</th>
<th>Weight (kg)</th>
<th>Power (w)</th>
<th>Voltage (v)</th>
</tr>
</thead>
<tbody>
<tr>
<td>《通用技术条件》2015</td>
<td>must</td>
<td>25</td>
<td>55</td>
<td>400</td>
</tr>
<tr>
<td>Draft of (not approved)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Standard 2015</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>《通用技术条件》1999</td>
<td>must</td>
<td>20</td>
<td>40</td>
<td>240</td>
</tr>
<tr>
<td>General Standard 1999</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Significant Differences in Local Policy

**Supporting Cities**
License Registration, ROW priority
not strictly complied

**Discouraged Cities**
fully or partially forbidden
Can’t implement well due to needs

**Many has unclear policies**

A few representative cities, not for all
Beijing: from April 11, 2016, E-bikes are forbidden in 10 streets

北京市对电动自行车的禁行规定，对全国各城市具有较强的影响力。This has great national impacts
Advantages of E-bikes in China
Clear User Advantage of E-bike:

1) As cities become bigger, E-bikes cover medium distances
2) Easy last kilometer for transit
3) Speedy and door to door
4) More energy efficient and no pollution on roads
5) Avoid congestion
6) Easy to ride
7) Low prices that fits for lower income populations
People need e-bikes and hope to keep it, especially in small-mid size cities with lower average income, inconvenient transit, mode share of e-bikes are high.

E-bike mode share are high in south China; E-bike replaced 50% - 90% of man-powered bikes.
Challenges

• 3.1 Unclear Mode and Function Definition

• 3.2 Safety Concerns
1) Are E-bikes considered non-motorized transport given its size and actual speed? (max 60KM/Hour)

2) Will E-bikes take place of public transit in smaller cities?

3) Will E-bike riders eventually become car drivers?
In Kunming, E-bikes are twice the volumes of cars, but only uses 1/6 of right of way.

In Kunming it provides 21% mode shares in commuting, with transit as 23.5%. E-bikes is 91% of total bikes.
No Guarantees for E-bike rights

Right of way

- Narrow bike lanes results in e-bikes in car lanes
- E-bikes and bikes speed difference result in accidents
- Roadside parking cause e-bike accidents
- Intersection capacity cannot handle large amount of E-bikes
- Conflicts with buses at station areas
- Helmet wearing is not enforces
- Quite and speedy e-bikes endangers pedestrians
E-bike Related Accidents

Wrong-way Driving Accidents
Function in cities

- city size and transit service level
- if transit level of services are low, E-bike shares tend to be high
- congestion levels and city management
- More congestion, more e-bikes

### E-bikes to cars

#### City Types

<table>
<thead>
<tr>
<th>City Types</th>
<th>Citi size</th>
<th>Transit share</th>
<th>E-bike share</th>
<th>Ownership e-bike/cars</th>
<th>E-bike function</th>
<th>Reprehensive Cities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>E-bike lead</strong></td>
<td>Medium-small</td>
<td>&lt; 15%</td>
<td>&gt; 25%</td>
<td>&gt; 1</td>
<td>Basic tool</td>
<td>Ningbo, Haikou</td>
</tr>
<tr>
<td><strong>E-bike &amp; Transit lead</strong></td>
<td>Huge-medium</td>
<td>15-25%</td>
<td>15%-25%</td>
<td>/</td>
<td>As important as public transit</td>
<td>Shanghai, Kunming</td>
</tr>
<tr>
<td><strong>E-bike supplement</strong></td>
<td>Huge</td>
<td>&gt; 25%</td>
<td>&lt; 15%</td>
<td>&lt; 1</td>
<td>As supplement of public transit</td>
<td>Beijing, Shenyang</td>
</tr>
</tbody>
</table>
3.2 Safety Issues – Difficult to overcome

- E-bike safety concerns (speedy, wrong direction riding)
  - Sources: lack of registration (legal issues)
    - Lack of registration: no unified management among departments (institutional)
Kunming, insufficient right of way
95% are over speed than 20 km/h, which is national standard in 99

20km/h is hard to be accepted. Professors and association call for increase to 25 km/h for people need.
National Recorded E-bike Related Accidents

![Bar chart showing the number of e-bike-related accidents from 2010 to 2014. The chart indicates an upward trend with the years 2010, 2011, 2012, 2013, and 2014 marked on the x-axis, and the number of accidents on the y-axis. The chart includes a line graph with markers to illustrate the trend.]
Lack of registration (Legal issue)

(1) Different city apply quite different policies
(2) Hard to register since e-bikes are illegal based on national code, and local manufactory protection for government economic income.

Different attitudes among departments (institutional)

(1) E-bike management authority belong to province level government.
(2) National ministries cant regulate strongly for now.
E-bike Parking Issue

- More parking space for e-bikes
- Low ratio land reserved for bike parking around stations, residential & office buildings.
- Normally e-bike parking on side walks
Stolen Bikes

- 1 e-bike stolen in each 0.8 km² each day, BJ
- Stolen belongs to parking without guards at residential buildings
- E-bike insurance is not well implemented. Although peoples call for it, only 2% riders purchased it in Wuhan for the first 2 months.
E-bikes development recommendations: what can we do?

Policy, Legal, Technique & Pilots
Recommendations

E-bike will exist for long in China, can not illuminate, ignore, suggestions as below:

4.1 Time for ministries work together to make national policy.

➢ Collect data on safety and speed to make new adaptable & acceptable national code;
➢ ROW provision technique & legalization;
➢ Push the registration policy & authority duties;
➢ Push professional standard punishment
电动自行车发展建议 Recommendations

4.2 加强规范管理，从生产、销售、注册、使用等各个环节着手；
Strengthen the management for production, sale, registration, using;

➢ 规范电动车生产，杜绝违规车的产生和销售；
Regulate production & sale for over standard e-bikes;
➢ 落实电动自行车保险和理赔业务链；
Develop the insurance link for e-bike;
➢ 加强电动自行车行驶违章处罚力度，促进行车安全性提升。
➢ Strengthen the punishment for illegal ridding based on registration and promote traffic safety improvement
4.3 Promote national technical code & standard for road design:

- provide ROW
- Intersections improvement for bikes safety and capacity;
- Improve bus station design to avoid conflicts & accident;
- Improve planning code to keep enough space for bike parking
Bike, e-bike separated design

PILOT PROJECT
- Henan Road
  From arterial to boulevard
Intersection priority

Bus stop improvement to avoid conflict between buses & bikes
Intersection Priority

Priority Signal and Spaces
Study the Actions for E-rental Bikes Under Fast Development of Dock-less Rental Bikes
Thanks for resources by:
Thanks!

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