The Beijing Nonlocal Vehicle Policy Choice under B.T.H. Collaborative Development

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Keywords: B.T.H. Collaborative Development; Nonlocal Vehicle Management; Regional Integration

Abstract: This paper investigated the number and spatial distribution of Beijing nonlocal vehicle, combed the development of nonlocal vehicle management policy. Found that the economic gap between Beijing and the surrounding cities has been widening in the past 10 years, which has led to the rapid growth of nonlocal vehicle in the city. Under the condition of B.T.H collaborative development, the existing nonlocal vehicle management policy will impede the economic development of B.T.H region. Travel demand management policies should consider the features of regional integration process, so as to form an effective policy arrangement.

1. Introduction
After eighteenth national congress of the CPC, the collaborative development among Beijing, Tianjin and Hebei (B.T.H. collaborative development) has become one of the hottest issues. Since 2015, a series of development plans on national level have been introduced, the B.T.H. urban agglomeration is moving towards a new stage. With the continuous development of regional cooperation, the number of nonlocal vehicle travelling between Beijing and neighbor cities has expanded rapidly, which has become the core issue affecting the regional road traffic. Since 2007, Beijing has established a vehicle management system guided by driving restriction, car purchasing restriction and nonlocal vehicle restriction. Tianjin and Shijiazhuang also implemented different degrees of vehicle management measures in 2014 and 2015 respectively. In the process of traffic integration in B.T.H. region, how to manage nonlocal vehicle has become a key point to improve the city traffic and the urban resources circulation efficiency.

2. Literature Review
The key figure of nonlocal vehicle management is whether the vehicle has an equal travel rights. Some related problems have been discussed by media, but not much attention has been paid to it. In fact, research on inner-city vehicle travel management is far deeper than inter-city. The most reasonable explain is that the affection on city traffic condition of nonlocal vehicle trips is less than the local one.

Most of the inner-city vehicle travel management research is about the driving restriction and road congestion price\textsuperscript{[1,2,3,4]}\textsuperscript{1}. Same as the achievements on Beijing inner-city vehicle restriction\textsuperscript{[5,6,7]}, however, the academic literature of inter-city trips only contributes a small part. But that problem plays an important role in understanding the urban vehicle travel behavior in China.

At present, many big Chinese cities prefer to choose identity discrimination policy to control the growth of nonlocal vehicle, the logic hidden behind the "identity discrimination" runs counter to the equal travel rights. It can be regarded as a policy choice of local protectionism in some way, this measure can not meet the basic requirements of regional integration. But it is a dilemma for the traffic management of super large city. The nonlocal vehicle management is the simplest and the most practical way to control the growth of nonlocal vehicle. If fully liberalized, it is bound to exert influence on the existing vehicle management system. It could even further lead to a bad road traffic condition.
This paper investigated the number and spatial distribution of Beijing nonlocal vehicles, and studied the effect on local city traffic brought by them, point out the reasons why the local authorities meet the dilemma and discuss the selection of nonlocal vehicle management policy.

3. Number and Spatial Distribution of Beijing Nonlocal Vehicle

The academia has been disputed about the number of Beijing's nonlocal vehicle. Some essay indicated that the number of them outside Beijing is about 140 thousand. According to the investigation of Beijing Traffic Management Committee, the number of long-term nonlocal vehicle in 2015 is about 200-300 thousand. And in this paper, the number and spatial distribution of nonlocal vehicle in Beijing was estimated by using a simple random sampling method where the 183 samples of streets were randomly selected from 9 districts.

Investigation data shows that nonlocal vehicle in Beijing mainly distributed in functional area and development area, the number increasing gradually from inside to outside, but there are some differences between the northern and southern outer ring area (Table 1), the proportion of nonlocal vehicle in northern region such as Shunyi, Yanqing is significantly less than the southern part, like Tongzhou and Fangshan.

This difference probably comes from the frequency of economic activities. Most of the northern region are ecological conservation area, the population agglomeration degree and speed of economic growth in these region are relative low, leading to a lower volume of nonlocal vehicle trips. Meanwhile, the southern region adjacent to the big cities in Hebei province like Baoding and Shijiazhuang, such a big economic transaction demands between them attracts a large number of nonlocal vehicle travel demands.

Table 1. Statistical Test of the Nonlocal Vehicle Proportion in Different Regions.

<table>
<thead>
<tr>
<th></th>
<th>Mann-Whitney Test</th>
<th>Kolmogorov-Smirnov Test</th>
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<tbody>
<tr>
<td></td>
<td>U</td>
<td>P</td>
</tr>
<tr>
<td>Southern-Northern</td>
<td>2169.5</td>
<td>0.01</td>
</tr>
<tr>
<td>Eastern-Western</td>
<td>2605.5</td>
<td>0.355</td>
</tr>
</tbody>
</table>

p<0.1, **p<0.05, ***p<0.01

In addition, the nonlocal vehicle in the core area accounted for less than 1.9% of the total nonlocal vehicle, and the functional area ranged from 10% to 19%. The development area was about 12% to 25%, and the ecological conservation area was relatively small, which is about 15%.

It comes out that the estimated number of Beijing nonlocal vehicle at present is roughly 730 thousand, which accounts for 17% of total number of motor vehicles in Beijing.

![Figure 1. Spatial Distribution of Nonlocal Vehicles in Beijing.](image)

Considering the trip purpose, the demand for nonlocal vehicle travel in Beijing can be divided into three types: transit demands, short-term arrival demands and long-term travel demands. While the transit demands and short-term arrival demands constitute a temporary travel demands. Base on the data provided by Beijing Traffic Management Committee, the number of temporary travel nonlocal vehicle is around 30 thousand (including transit purpose).
4. The Dilemma of Nonlocal Vehicle Management in Beijing

The implementation of the nonlocal vehicle management policy in Beijing began in 1979. At that time, the nonlocal vehicle outside need to apply for an introduction letter to Beijing, similar to the "exit and entry" management. Since then, due to the growing number of vehicles in long-term travel demands, the Traffic Management Bureau opened the long-term entry permit management in 1994. 2005 Beijing license policy once released, but after 2008, the policy got tighten again.

In general, the policy of nonlocal vehicle management in Beijing is gradually tightened. The essence of this phenomenon is that the local management authorities believe that the number of nonlocal vehicle in Beijing is increasing too fast, and that large-scale nonstandard travel is not conducive to urban traffic easing. Increasing nonlocal vehicle travel frequency in local area brings more harm to local traffic condition than its benefits.

On the surface, the implementation of the car purchasing limitation policy led to the increasing number of nonlocal vehicle in Beijing. Under the condition of limited purchasing, Beijing's local license has become a scarce resource, residence will never have a local car license until they "win the car license lottery", this scarcity is reflected in the opportunity cost of queuing. The only alternatives for people who has strong demand to purchase cars is to buy a nonlocal car license, which makes the nonlocal license popular.

But in fact, the increase in nonlocal vehicle is not only related to the car purchasing limitation, but also closely related to the local population, economy and job opportunities. For a decade, the resident in Beijing has increased by 4.77 million people. Meanwhile, Beijing's GDP has also increased from 428.33 billion Yuan in 2004 to 2133 billion Yuan in 2014, thus driving the rapid growth of income per capita. Compared with the surrounding cities of Hebei and Tianjin, the development of Beijing's economy and society has brought a lot of job opportunities, resulting in a siphon effect and attracting a large number of migrant population. The influx of migrant population and the agglomeration of nonlocal vehicle are the inevitable result of the widening economic gap between Beijing and the surrounding cities.

For the authorities, nonlocal vehicles’ travel behavior is not standardized, and it has disrupted the local traffic and weakened the effect of Beijing's existing vehicle management in a way, some relevant measures must be implemented to curb growth in Beijing nonlocal vehicle. At the same time, the implementation of the Beijing existing nonlocal vehicle policy barriers the B.T.H. regional integration process to a great extent, which brings high economic and social cost, such a big cost constricts the regional economic development. Existing policy doesn’t follow the target of B.T.H. collaborative development, such difficulties have posed challenges to local traffic management authorities.

5. Summary

The Principle of Nonlocal Vehicle Management in Beijing. The choice of nonlocal vehicle management policies, especially under the condition of regional convergence, should first adapt to the common goal of regional development, then make coordinated policy arrangements according to the traffic conditions respectively.

Regional integration is not an overnight move, the regional coordination of Beijing, Tianjin and Hebei needs to undergo rapid growth and steady growth two stages. The first stage is the fusion stage of regional coordinated development, compared to the "isolated city era", cities in this stage will experience rapid growth in social and economic exchanges between the regional allies and this kind of coordination will induce a larger nonlocal vehicles’ travel demand, making a lush on the local traffic condition. Second, in the stage of steady growth, the B.T.H. region has already achieved a deeper integration, meanwhile, has formed a relatively stable and cooperative development mode, inter-city nonlocal vehicle travel demands appear to be smooth and stable. Therefore, the regional management of nonlocal vehicle also needs to consider the stage of its development. The relief of traffic congestion will benefit from implementing phased governance policies such as gradually opening up the nonlocal vehicle management.
At present, the B.T.H. regional development is step into the stage of rapid growth, in the integration phase government still need to strengthen the management of nonlocal vehicles’ travel demands through raising the threshold of entering the city. When nonlocal vehicle travel demands between cities are moving steadily, the authorities should formulate a fairer arrangement to equalize the travel rights, and gradually reducing the entry threshold to achieve the ultimate goal.

**The Policy Choice of Nonlocal Vehicle Management in Beijing.** The logic of available policy options is not to change the current management frameworks, taking not only the long-term arrival nonlocal vehicles’ impact on traffic congestion, but also the goal of the B.T.H. collaborative development into consideration.

(1) Relief the management of the entry permit letter, gradually cancelling the restrictions on the entry of nonlocal vehicle.

(2) Regulate the travel behavior of nonlocal vehicle. Improving the vehicle restriction measures in the outer suburbs, guide the nonlocal vehicle to choose P+R traffic trips, allowing them to enter the outer suburbs through P+R residence areas, and then choose other transportation modes into the city.

(3) Promote the traffic environment and increase the efficiency of bus transportation. Through the establishment of public transit lanes, the punctuality and speed of bus can be improved and the problem of commuting in specific areas is alleviated. Increase the effort to prevent illegal operation of nonlocal vehicle, strengthen the management of the nonlocal vehicle in tourism purpose.

(4) Increase the system level of urban motor vehicles management. Combined with three forces from Ministry of the environmental protection, transportation and housing construction, set up the comprehensive management mechanism.

(5) Establish a vehicle management platform among B.T.H. cities and share the information of nonlocal vehicles’ travel data.

**Acknowledgements**

This work was financially supported by the Beijing Social Science Foundation (20161jjd-2) and Beijing Changce Think Tank Foundation.

**References**


