

# Beijing City Lab

Wang M, Zhou J, Long Y, 2014, Where to harvest social capital outside the ivory tower: Visualizing university students' trip destinations with smartcard data. Beijing City Lab. Working paper #54

## **Where to Harvest Social Capital outside the Ivory Tower: Visualizing university students' trip destinations with smartcard data**

Cities are regarded as the greatest invention that makes us richer, smarter, greener, healthier and happier (Glaeser, 2012). Part of the secret of successful cities lies in innovations facilitating by face-to-face interactions. Interactions enhance the social capital of interacting parties. Universities are where innovations, face-to-face interactions and social capital are commonplace. But universities are not islands in the open sea of the social and economic transformations. Traffic, information and financial flows between universities and other locations can be used to show connections between the ivory tower and the society. In our studies, we use the weekday smartcard data from April 6, 2010 to April 9, 2010 (totally 158,262 transit trips, including bus-only, bus plus subway and subway-only trips) to identify and profile the most popular destinations of the student riders from the “985 universities” and associated transit trip flows in Beijing. “985 universities” are the top 39 universities designated by the Chinese Central Government. There are eight of them located in Beijing, making the city home to the most “985 universities” in China. We define “popular destinations” as bus and subway stations where a student transit rider stays longer than one hour before he starts a second transit trip.

We argue that the popular destinations are equally important places like university campuses where people interact, innovate and increase their social capital. Associated transit trip flows show, at least partially, how universities and colleges are connected to popular destinations and where the strongest ties between them exist. Figures 1 to 3 visualize the popular destinations and associated ties. Not surprisingly, areas adjacent to the “985 universities” campuses such as Zhongguancun (“A” in Figure 1) contain the most popular destinations. The financial district (Xidan, “B” in Figure 1) and the central business district (Guomao, “C” in Figure 1) have the second most popular destinations. Other areas such as Yonghegong, Liuliqiao, Sanyuanqiao and Asian Game Village (“D” to “G” in Figure 1) also have a notable number of popular destinations. These areas have a high density of office buildings, shopping malls and/or restaurants. Figure 2 visualizes the strongest ties between the university campuses and the popular destinations. Strong ties exist between the universities and Guomao and between the universities and Yonghegong. Most of the strongest ties are within the 3<sup>rd</sup> ring road, where there are the highest concentration of high-income residents, high-profile entities and high-paying jobs in Beijing. But somewhat to our surprise, the ties between the “985 universities” are not among the strongest. Figure 3 shows where the students had been to after leaving their respective campuses and adjacent areas. The student riders did go to numerous destinations, similar to the general riders (Roth et al., 2011). But they rarely went to the areas south of the 3<sup>rd</sup> ring road, where there has been the highest concentration of low-income residents and low-paying jobs in Beijing. As a whole, therefore, our studies of university student riders indicate that there exist only weak ties between the top universities and the most disadvantaged areas in Beijing. This is slightly different from what Roth et al. (2011) has found about the general riders in London. Per Roth et

al. (2011), most stations in London control their own regions and seem to have their own distinctive basins of attraction. In Beijing, student riders from top universities tend to favor or avoid certain stations or regions, regardless the distance.

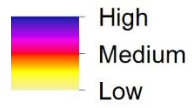
**References:**

Roth, C., Kang, S. M., Batty, M. and Barthélemy, M. 2011. “Structure of urban movements: Polycentric activity and entangled hierarchical Flows” PLoS ONE **6(1)** e15923.

Glaeser, E. 2012. *Triumph of the City: How Our Greatest Invention Makes Us Richer, Smarter, Greener, Healthier, and Happier*. New York: Penguin Books.

**Software:** Microsoft SQL Server 2014; ArcGIS 10.2

### Destination Hotspots



● 985 University Campuses

★ Tiananmen Sqaure

— Beijing Major Road

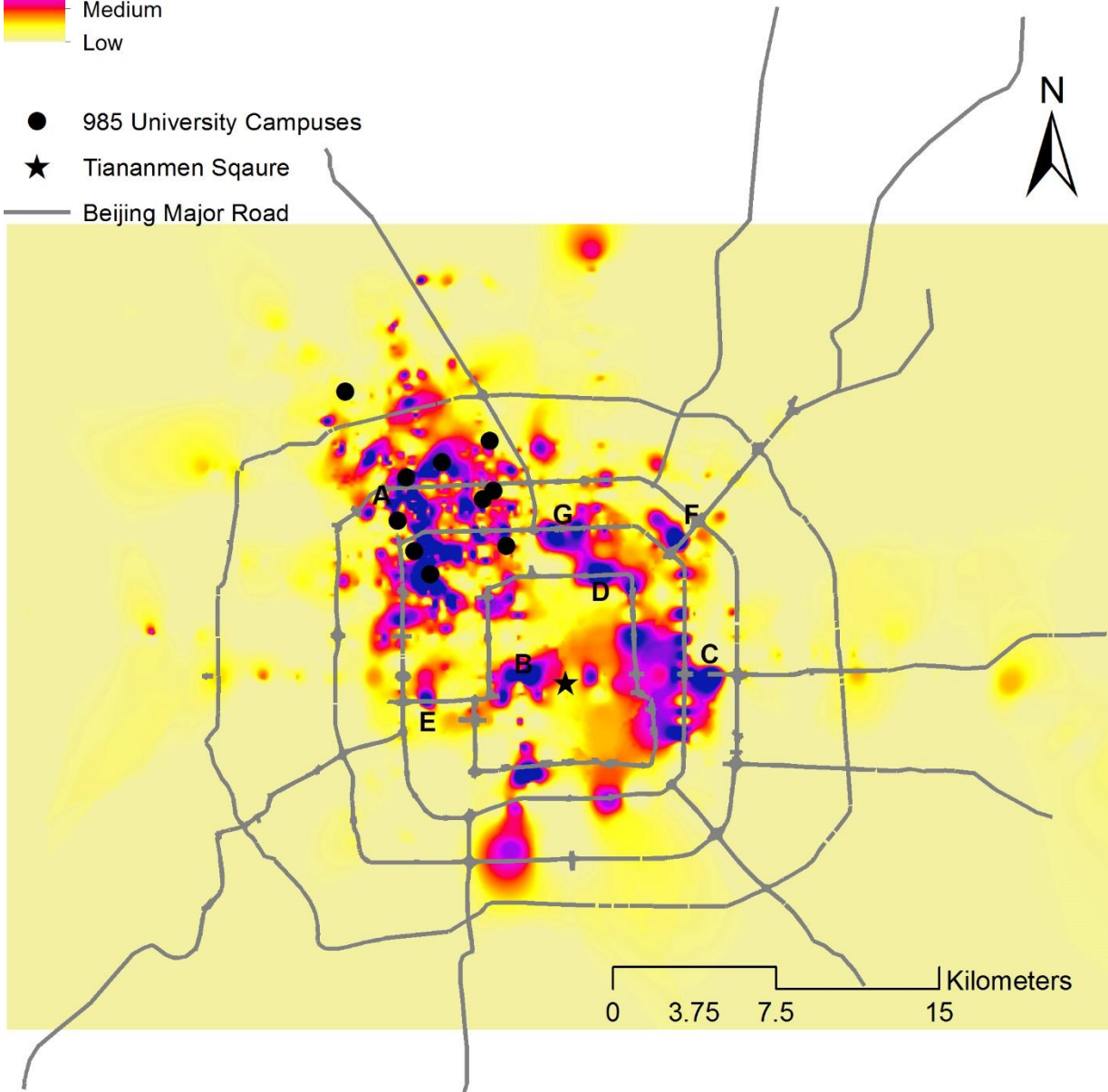


Figure 1: The top trip destinations of the students

### Top 200 OD Flows

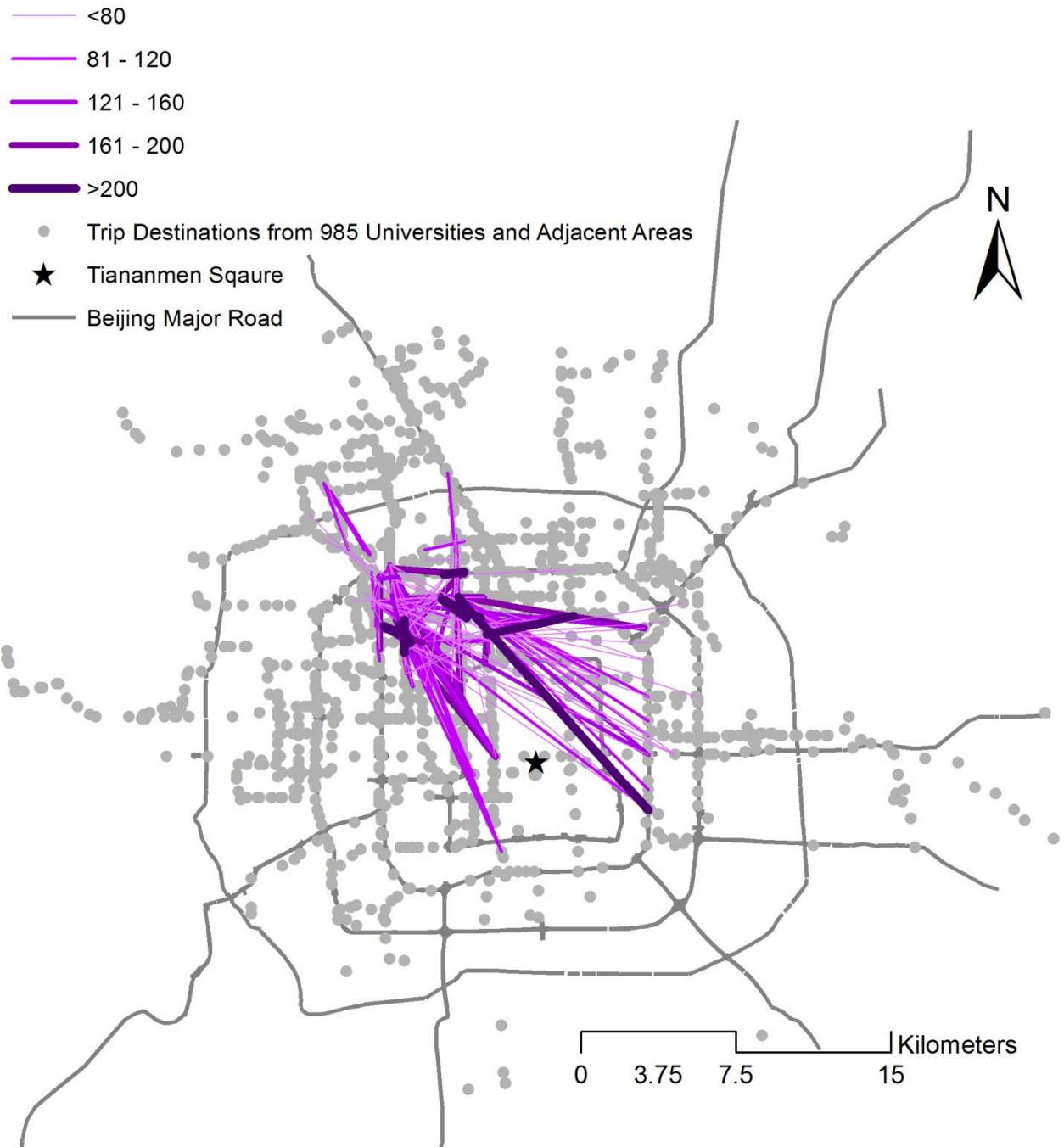


Figure 2: The top 200 ties between the campuses and other destinations

### Trips from 985 University Campuses

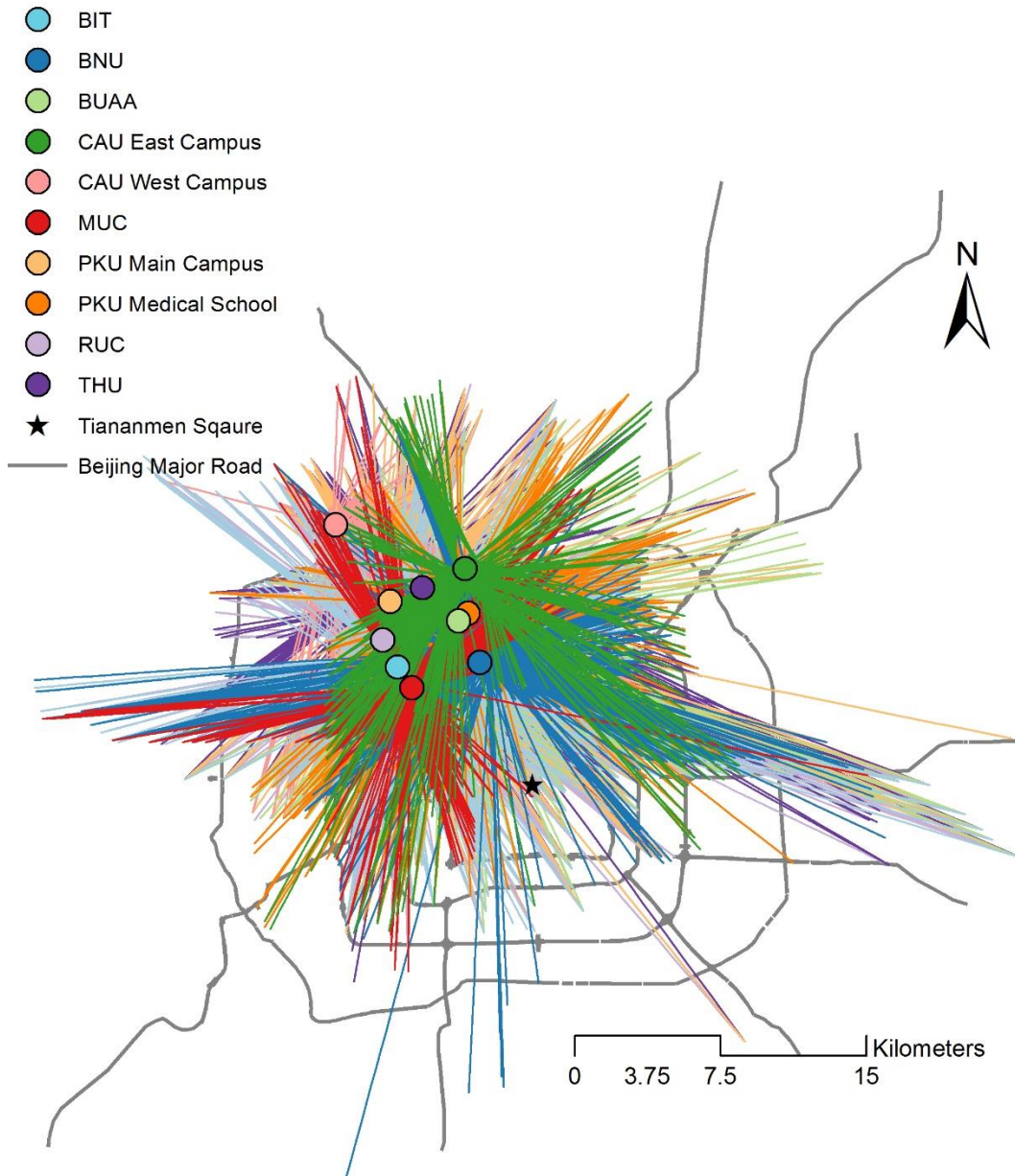


Figure 3: All the transit trips between the campuses and destinations