



Analysis Of User Preference For Traffic Information Service In Beijing

Man Li

IP Network Laboratory (IPNL)

Hitachi (China) Research & Development Corporation

Outline

1. Background
2. Analysis Method
3. Analysis Results of Beijing
4. Conclusion

- Motivation
 - User preference based traffic information service is required.
 - Probe cars have been used widely.
- Method
 - Analyze user preference based on historical probe car data

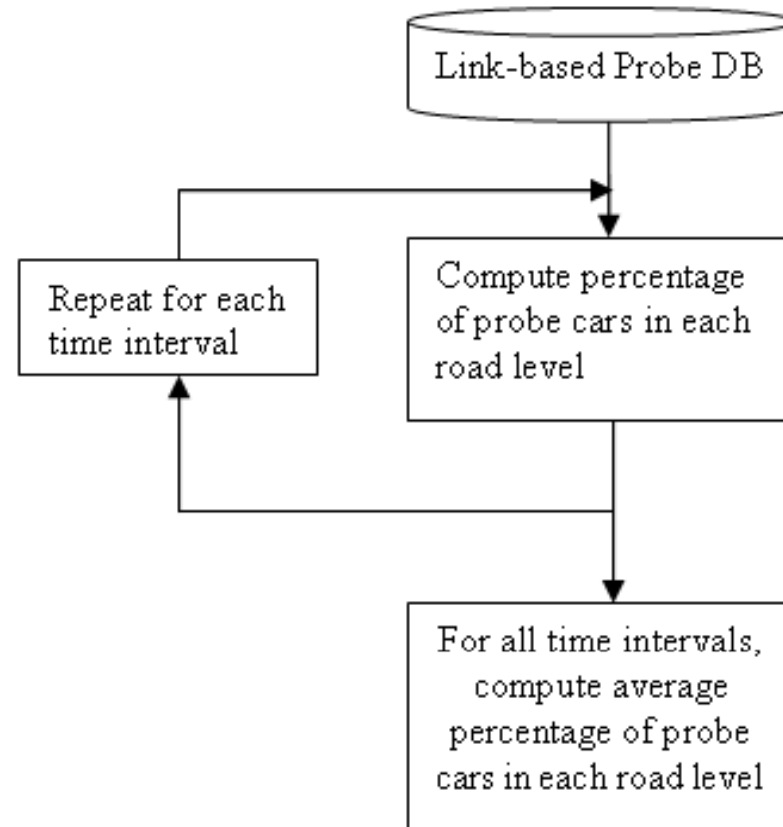
Compared with other analysis method, the method has following advantages:

- High accuracy
 - Cover the whole road network.
- Real time
 - By using telecommunication techniques, probe car data can be transmitted to data processing center in real time .

Analyze different road levels by following measures:

- Choice Probability
 - The probability of drivers to choose each road level in daily life.
- Usage Ratio
 - The distance ratio of different road levels used by probe cars and their factual distance.
- Load
 - The ratio of factual travel speed and designed travel speed.

- Calculate Choice Probability



- Calculate Usage Ratio

$$\text{Usage Percentage (L)} = \text{UsedTL(L)} / \text{FactTL(L)}$$

UsedTL(L) : the total length of road level L used by probe car.

FactTL(L) : the factual length of road level L.

- Calculate Load

$$\text{LoadWD(L)} = \text{FactSpd(L, WD)} / \text{DesSpd(L)}$$

FactSpd(L, WD): factual average travel speed of road level L for the whole day.

DesSpd(L) : designed speed of road level L.

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Analysis Results (Beijing, China)

- Probe car data

City	Beijing, China
Time term of data	May, 15, 2007 – July, 10, 2007.
Total number of days	57 days
Total number of links	10982

- Road level

Road Level	Meanings	Limited Speed
1	Expressway	<u>100 km/h</u>
2	Main road	<u>70 km/h</u>
3	Others	<u>40 km/h</u>

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Analysis Results (Beijing, China)

● Choice Probability

Road Level	Choice Probability
1: Expressway	58%
2: Main Road	60%
3: Others	45%

Greater probabilities of choosing expressway and main road indicate that drivers of Beijing prefer high level road.

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Analysis Results (Beijing, China)

● Usage Ratio

Road Level	Length Percentage	Usage ratio
1: Expressway	15.4%	857660.46%
2: Main Road	36.3%	756443.15%
3: Others	48.3%	652550.57%

Almost half of roads in Beijing are lower level roads (level 3); however, their usage ratio is lowest.

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Analysis Results (Beijing, China)

● Load

Road Level	Expressway	Main Road	Others
Average Speed of Day	51.69	38.97	32.35
Average Speed of Rush Hour	49.04	35.07	29.65
Designed Speed	100	70	40
LoadWD	51.69%	55.67%	80.84%
LoadRH	49.04%	50.10%	74.13%

Load of expressway is heaviest especially in rush hour.

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Analysis Results (Beijing, China)

- Microscopic Analysis



Fig. 1(a) Route A (3.2 km, 11mins)



Fig. 1(b) Rout B (3.7 km, 6 mins)

It shows that choose main roads rather than low level roads will save travel time greatly.

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Analysis Results (Beijing, China)

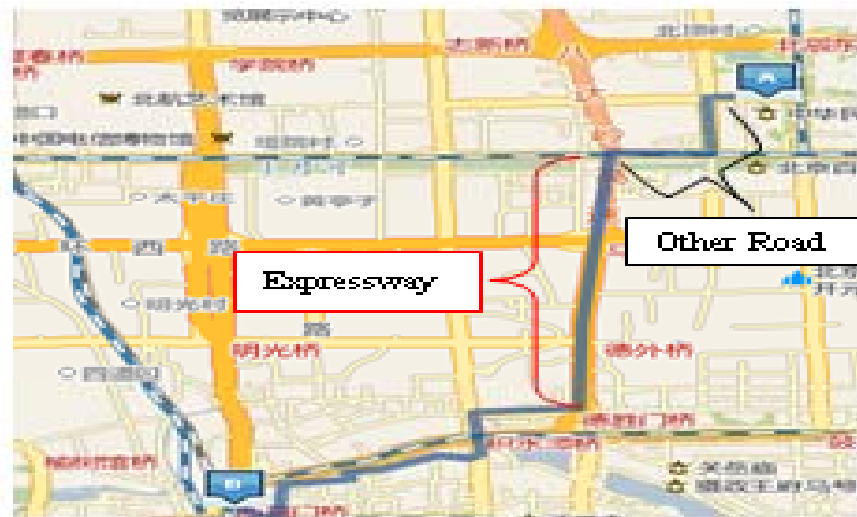


Fig. 2(a) Route A (7.6km, 21min)

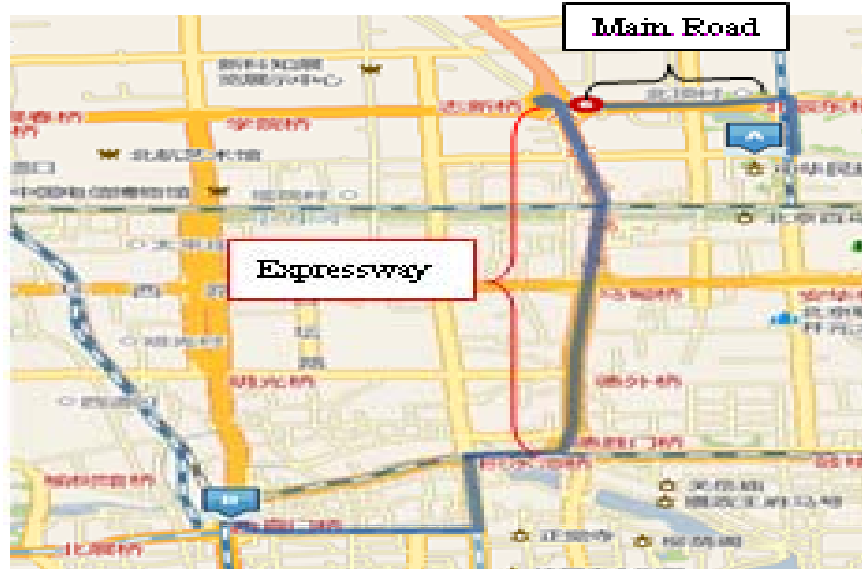


Fig. 2(b) Route B (9.3km, 13min)

Compare with route A, route B detours to a main road firstly and use longer expressway, so this total travel distance is longer than route A. However, its travel time is shorter than route A.

- Traffic information service(Hitachi)
 - Real-time traffic information service (2006)
 - Statistical data based traffic information prediction service (2007)
 - User preference based traffic information service (2008-now)
- User preference analysis
 - Road level choice
 - OD distribution
 - Frequentest routes



Thanks for listening!

liman@hitachi.cn