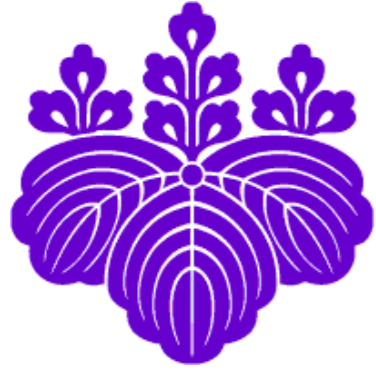


Asian Cities Person Trip Data Browser and Analyzer: Understanding Human Mobility from a Spatial Perspective



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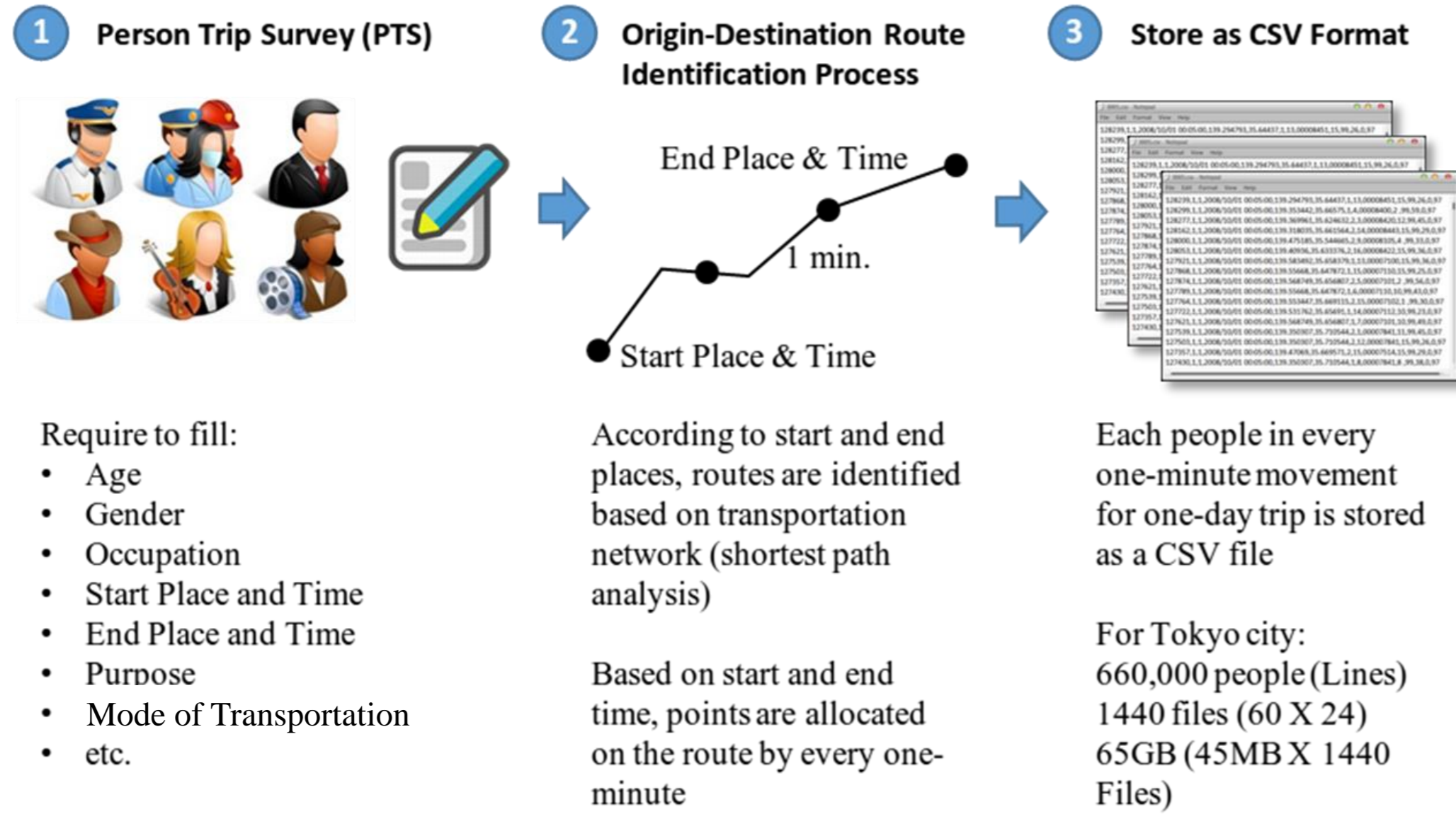
Contact address: <kokolwin@geoenv.tsukuba.ac.jp> Web: <http://giswin.geo.tsukuba.ac.jp/sis>



MOTIVATION

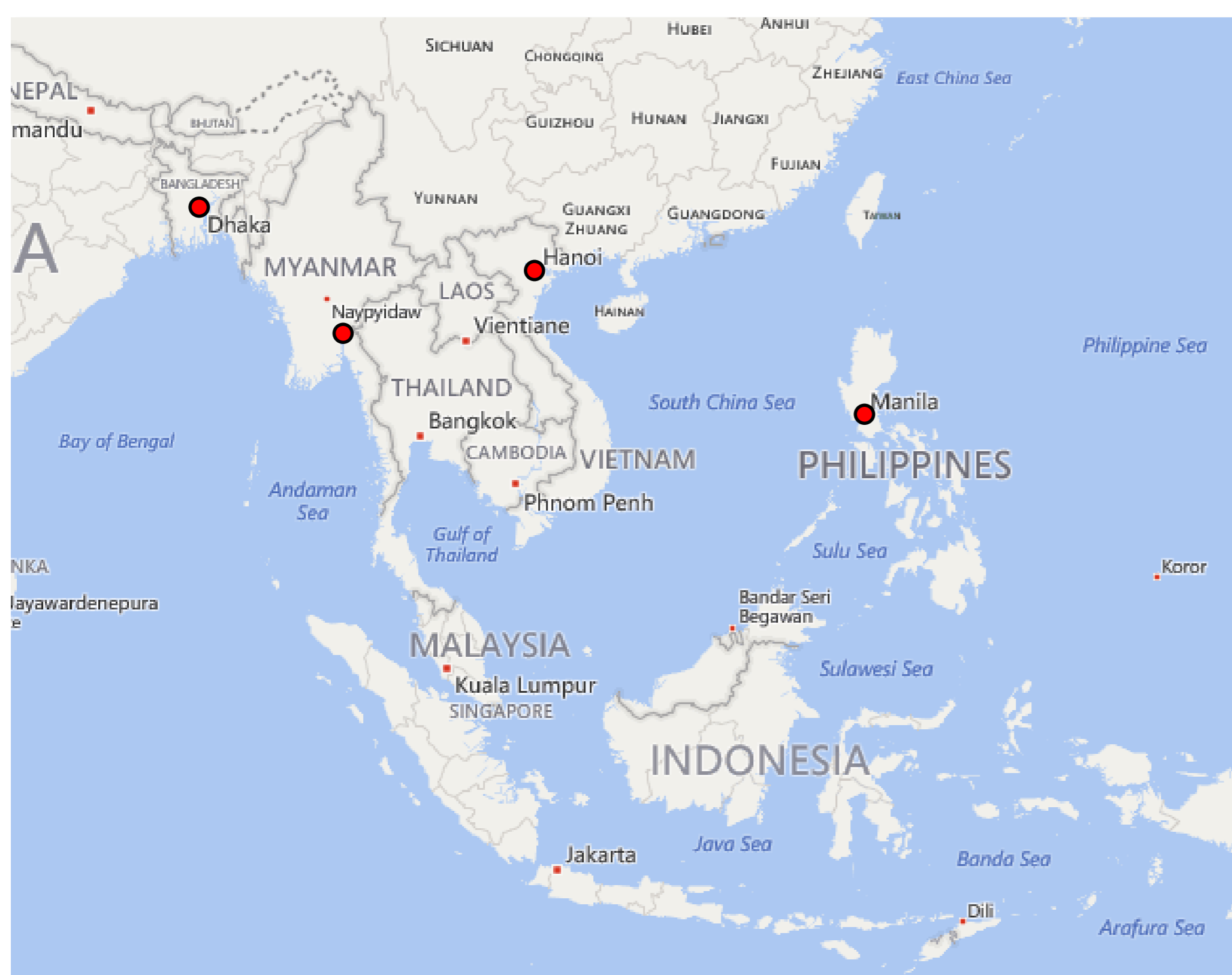
Understanding human mobility from a spatial perspective is important to enable urban transport planners, human geographers, social scientists and other spatial information users to improve public transport systems and socioeconomic planning by acquiring information about transportation modes by age, gender, occupation, purposes etc. As a result of advances in wireless communication technologies and location-enabled mobile devices, nowadays we can collect, store and integrate large amounts of geospatial data including cellular network data, mobile phone log data, real-time weather information, person flow data etc. However, handling these vast amounts of data requires high-speed computational power, complex database management systems and a considerable period of time to extract, manipulate and analyze the data for end users. Conversion of these vast amounts of data into GIS-ready data sets also requires knowledge of geospatial information, techniques and practices.

DATA AND METHOD



Data Source: People Flow Project, CSIS, University of Tokyo

AVAILABLE DATA FOR ASIAN CITIES



Asian cities such as Dhaka, Hanoi, Jakarta and Manila, person trip survey data includes many individual-level variables such as gender, age group, occupation, purpose of trip etc. and it is important to visualize human mobility in terms of social behaviors, for example, the temporal distribution of women's shopping activities, elderly people's trip purposes and the modes of transportation they use, trip purposes by gender or occupation etc. Use of a Web service to stream high-resolution and small-scale map data from Microsoft Bing Maps eliminates the cost and data-processing time and enhances person trip data visualization processes.

PERSON TRIP DATA STRUCTURE

Person Trip Attribute Information

Field Index and Description

Index	Field Name	Description
0	PID	Person ID
1	TNO	Trip number
2	SNO	Suntrap number
3	LON	Longitude position
4	LAT	Latitude position
5	GENDER	Gender
6	AGE	Age group
7	ZCODE	Current location by zone code
8	OCCUP	Person occupation
9	PURPOSE	Purpose to trip
10	MAGFAC	Adjustment Factor
11	MAGFAC2	Adjustment Factor
12	TCODE	Mode of transportation

AGE

Code	Age Group	Code	Age Group
0	0-5	10	50-55
1	5-10	11	55-60
2	10-15	12	60-65
3	15-20	13	65-70
4	20-25	14	70-75
5	25-30	15	75-80
6	30-35	16	80-85
7	35-40	17	> 85
8	40-45		
9	45-50		

TCODE

Code	Transportation Mode
1	Walking
2	Pedicab
3	Bicycle
4	Motocycle
5	Tricycle
6	Jeepney
7	Mini-Bs
8	Standard Bus
9	Taxi
10	HOV Taxi
11	Car/Jeep
12	School/Co./Tourist Bus
13	Utility Vehicle
14	Truck
15	Trailer
16	LRT
17	PNR
18	Water Transport
19	Others
99	Unknown

Example in Manila, Philippine GENDER

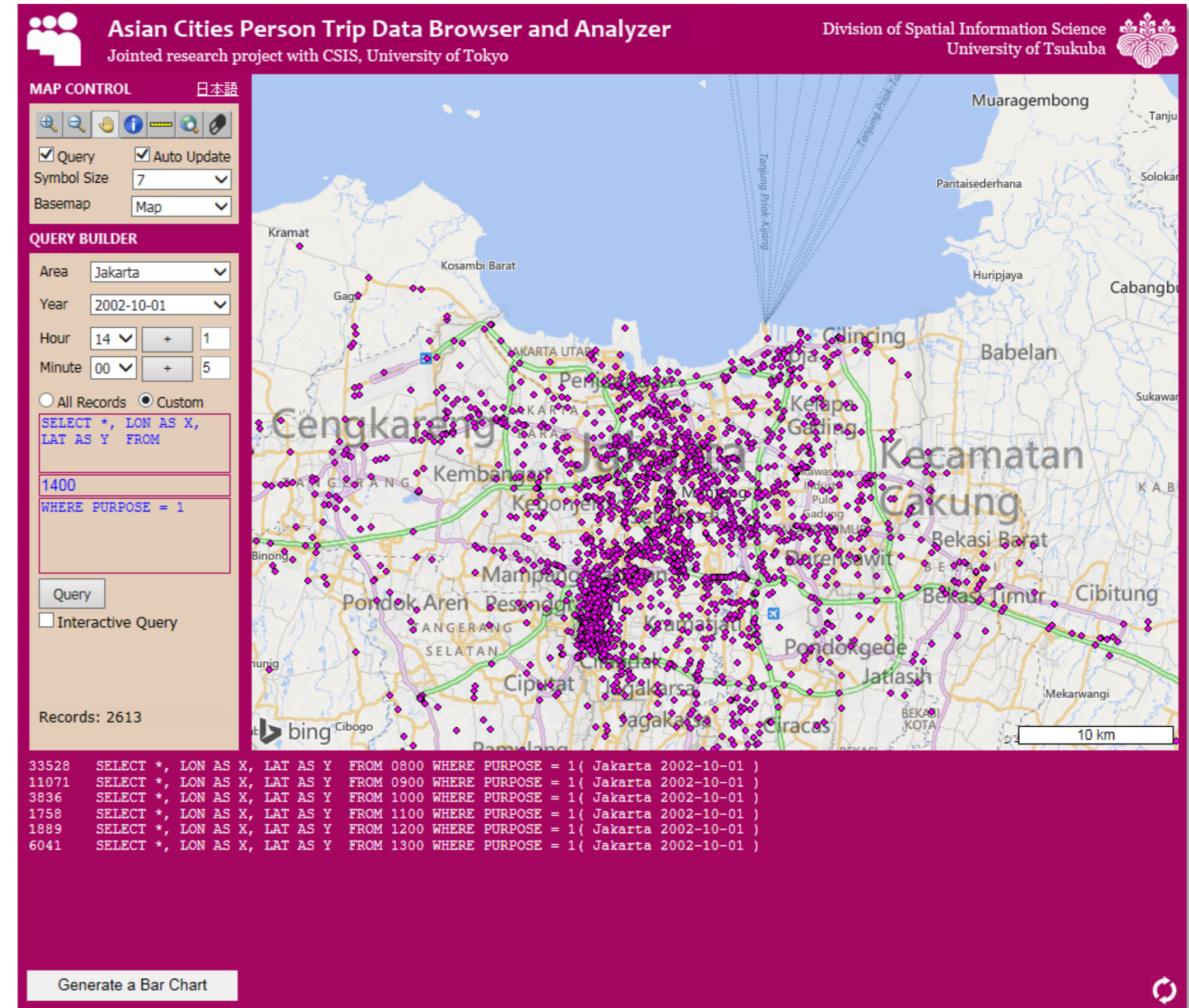
Code	Gender
1	Male
2	Female
9	NA

PURPOSE

Code	Purpose
1	To Home
2	To Work
3	To School
4	Private Business
5	Employer's Business
6	Medical
7	Social
8	Eating
9	Shopping
10	Church
11	Accompany other household members
12	Others
99	Unknown

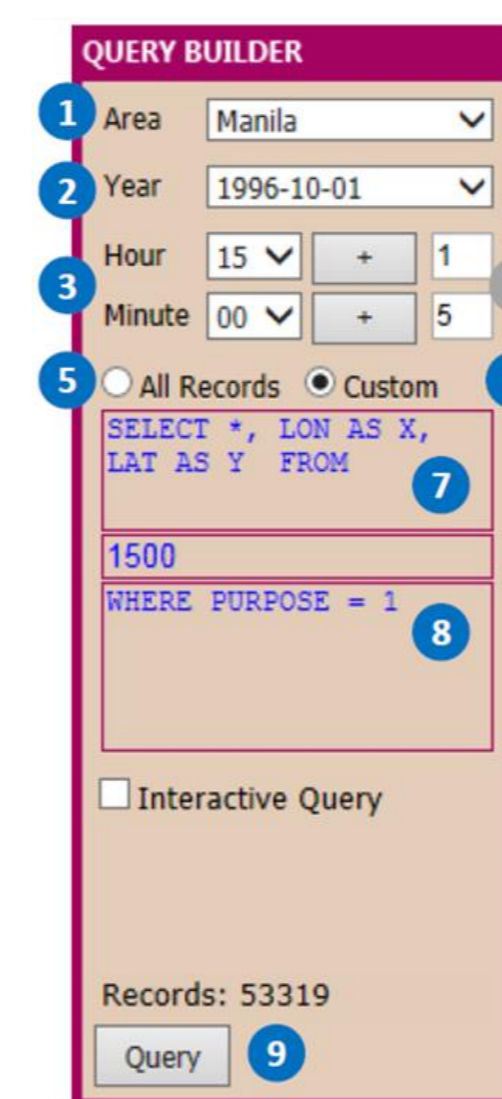
ASIAN CITIES PERSON TRIP DATA BROWSER AND ANALYZER

USER INTERFACE

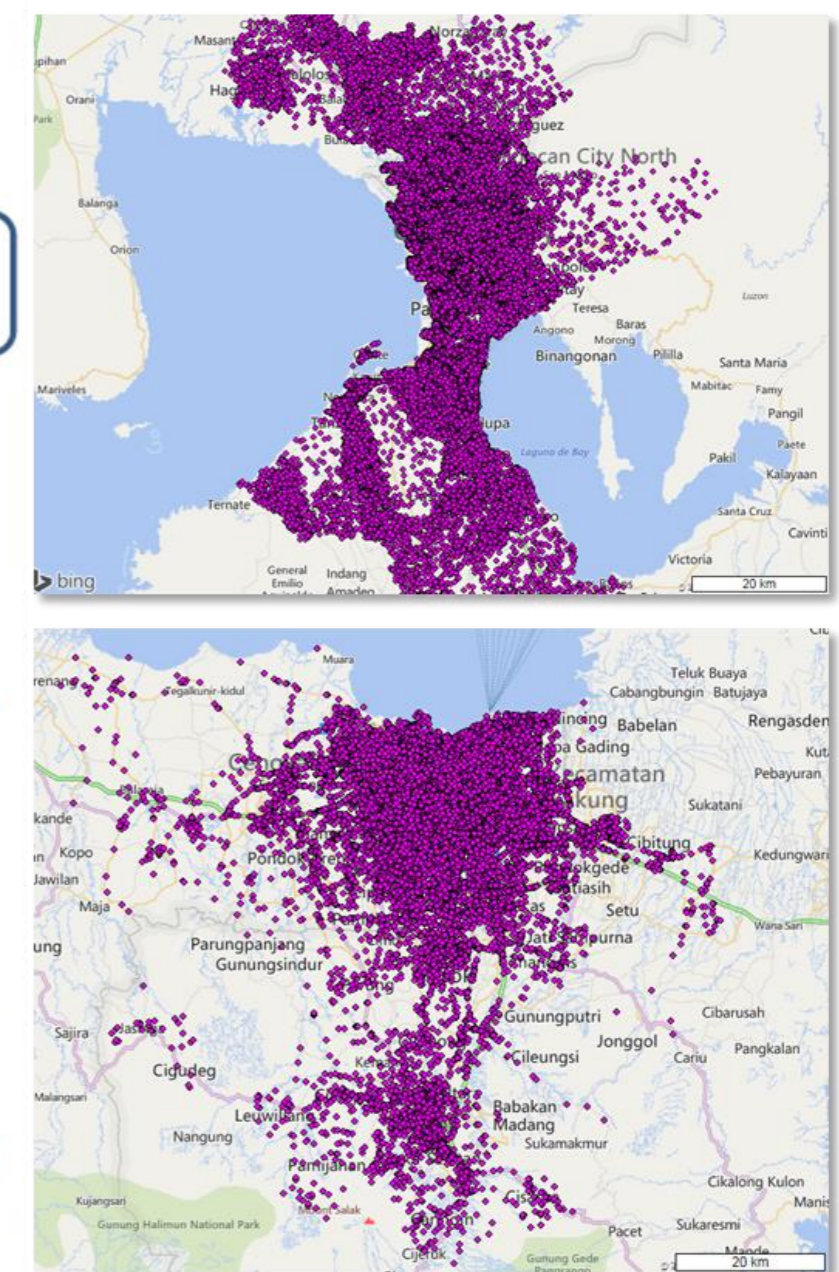


<http://land.geo.tsukuba.ac.jp/persontrips.asia>

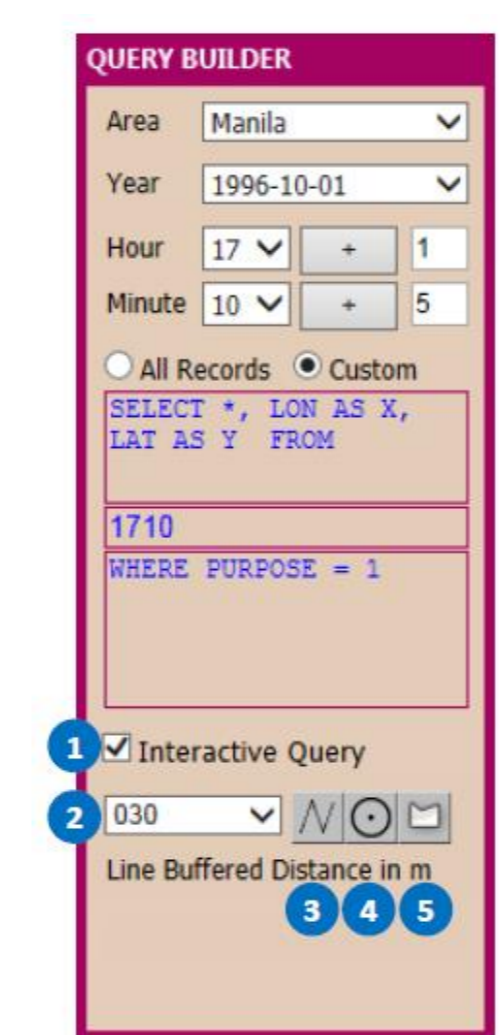
QUERY BUILDER



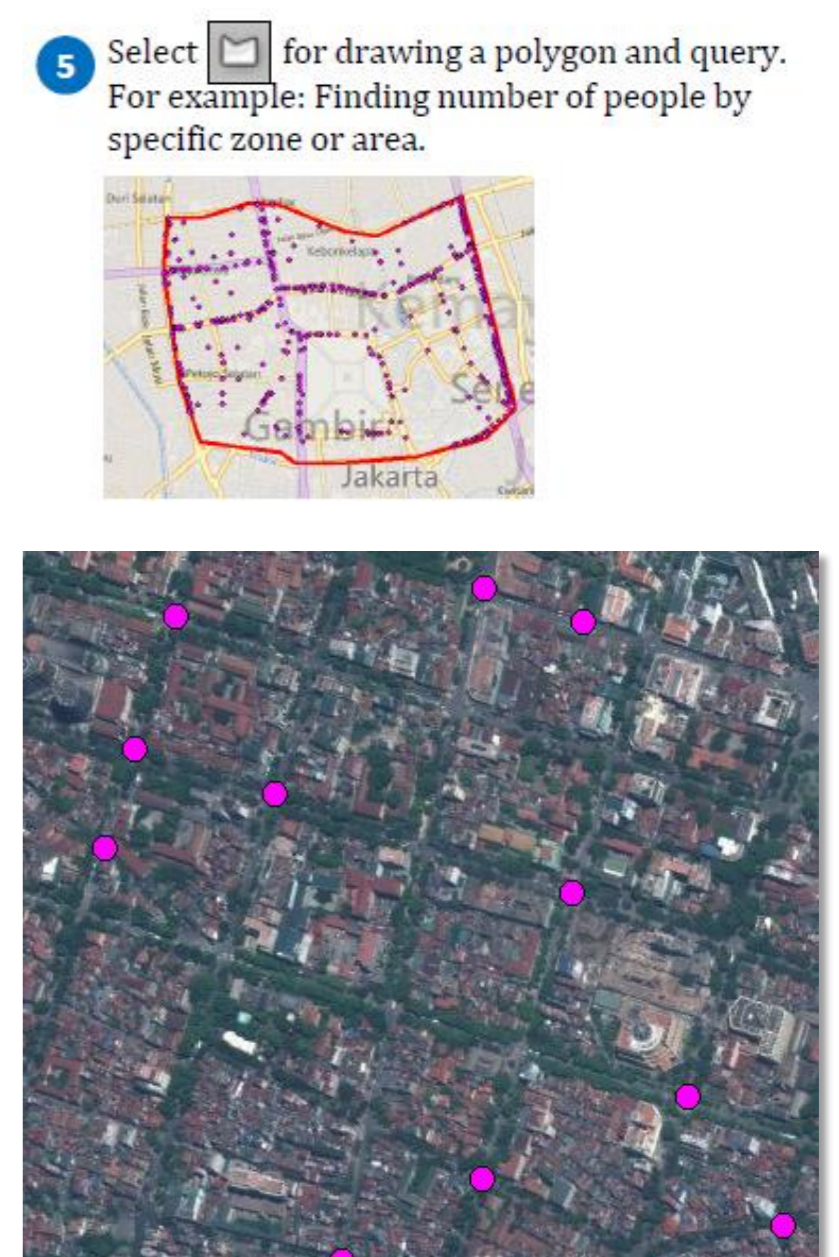
- Select Area (City)
- Select Year
- Select Hour and Minute
- Set Hour or Minute intervals (only for successive queries using + buttons) See Next "Query by Successive Time Intervals"
- Select All Records to return all records
- Select Custom to define the search category
- Under Custom search: Select desire column fields. For example: * for all fields <-> To return PID, AGE and GENDER fields only
SELECT PID, AGE, GENDER, LONG AS X, LAT AS Y FROM (Same as SQL Language)
- Database Table Name (Fixed, cannot edit)
Similar to Time
For Example
8:00 → 0800, 12:30 → 1230
- Search Conditions. For Example
People age between 20 and 30 who only travel for entertainment purposes
WHERE PURPOSE = 5 AND AGE BETWEEN 4 AND 5
- Click Query to start



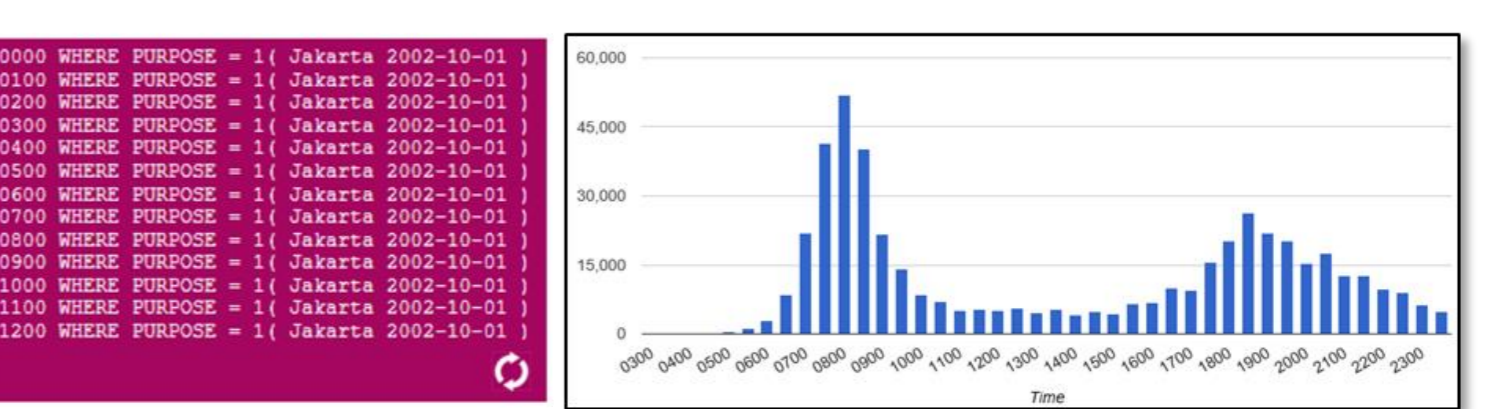
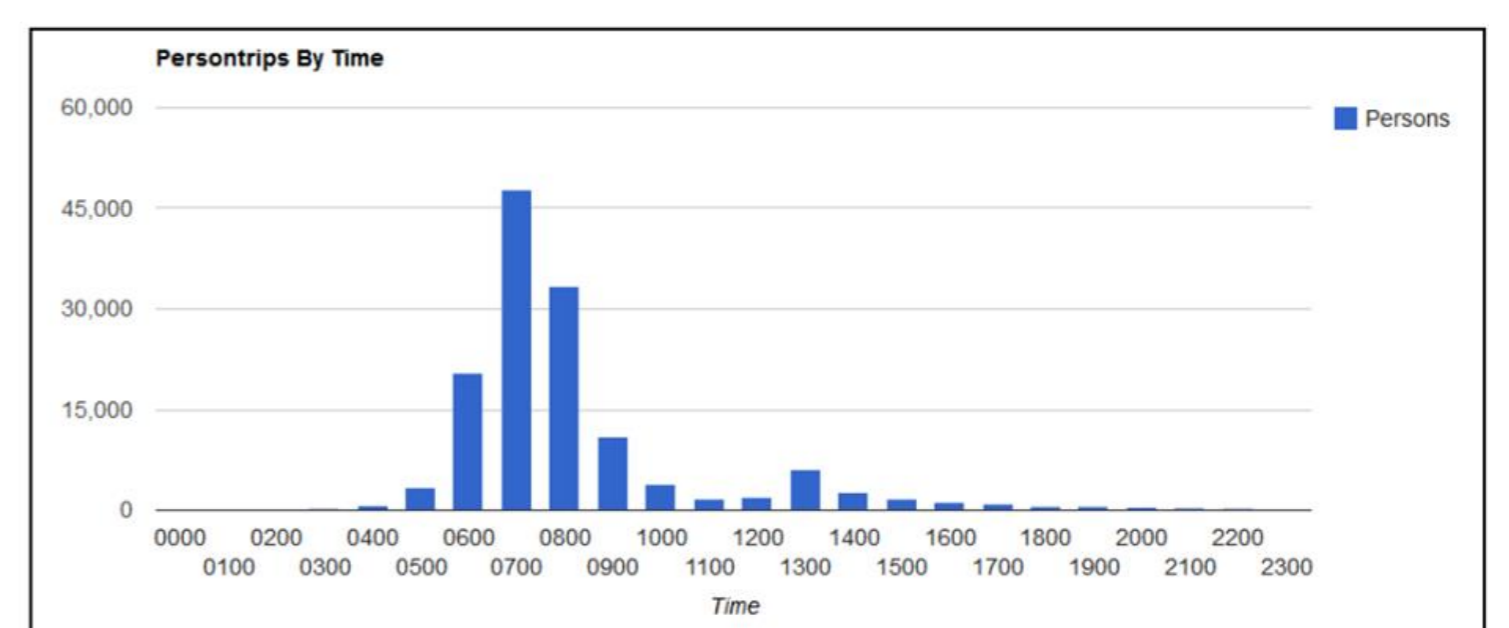
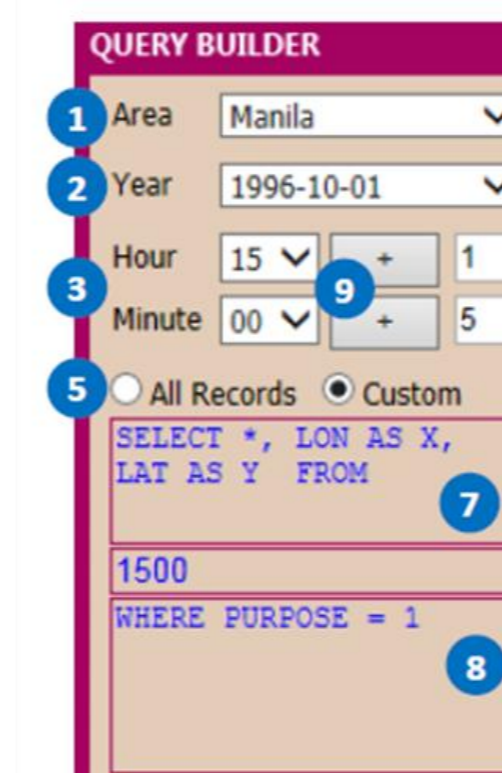
SPATIAL QUERIES



- Click on Interactive Query CheckBox
- Set Line Buffer distance in meter for Line Tool only
- Select [Line] for drawing a line on a map and query
For example: Finding number of people along the road or railway line (buffer distance 500m)
- Select [Circle] for drawing a circle with search radius
For example: Finding number of people by specific point with search radius 4 km



GRAPH GENERATION



Acknowledgements: We would like to thank to CSIS, University of Tokyo for providing Person Trip Survey data for this project.