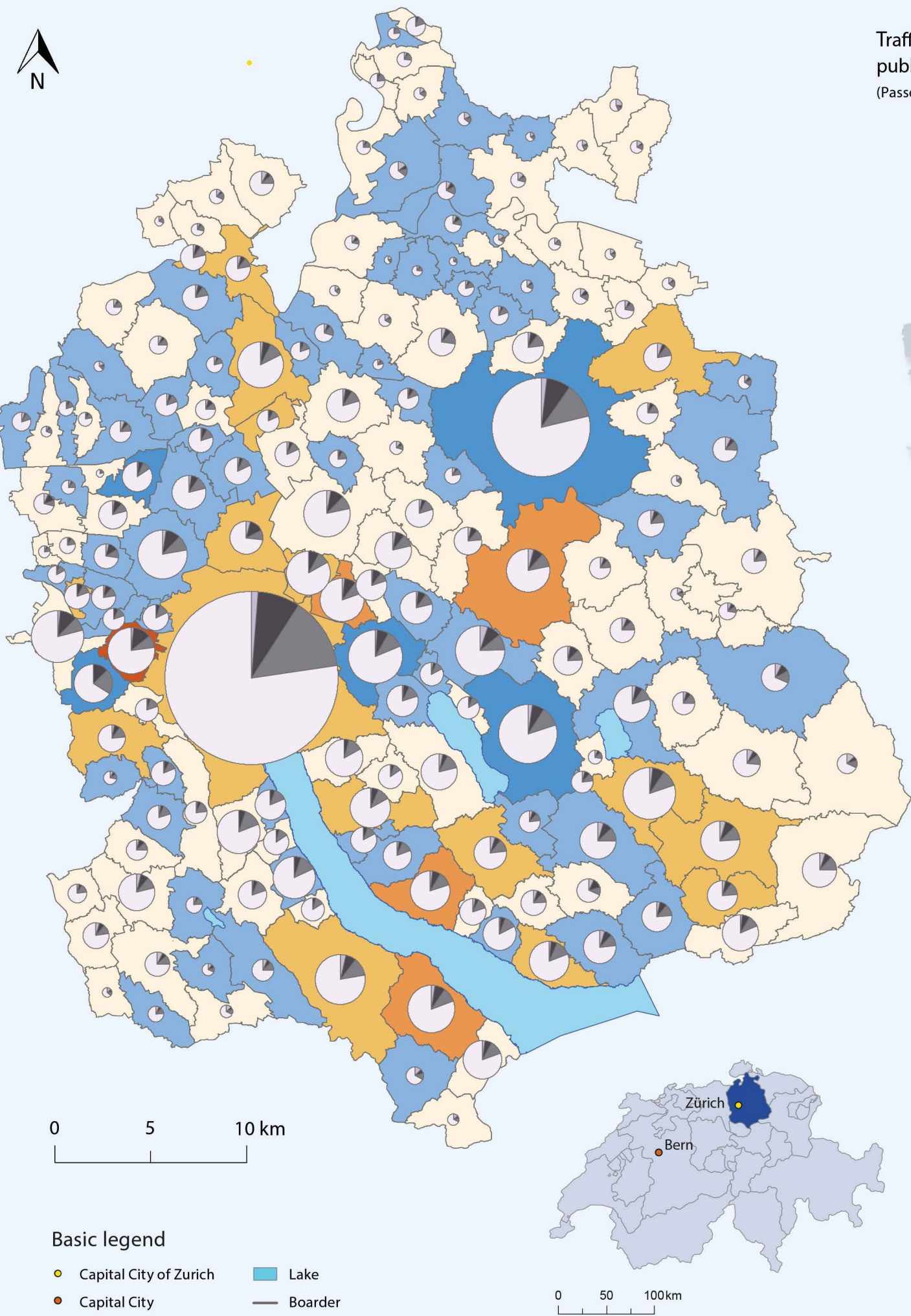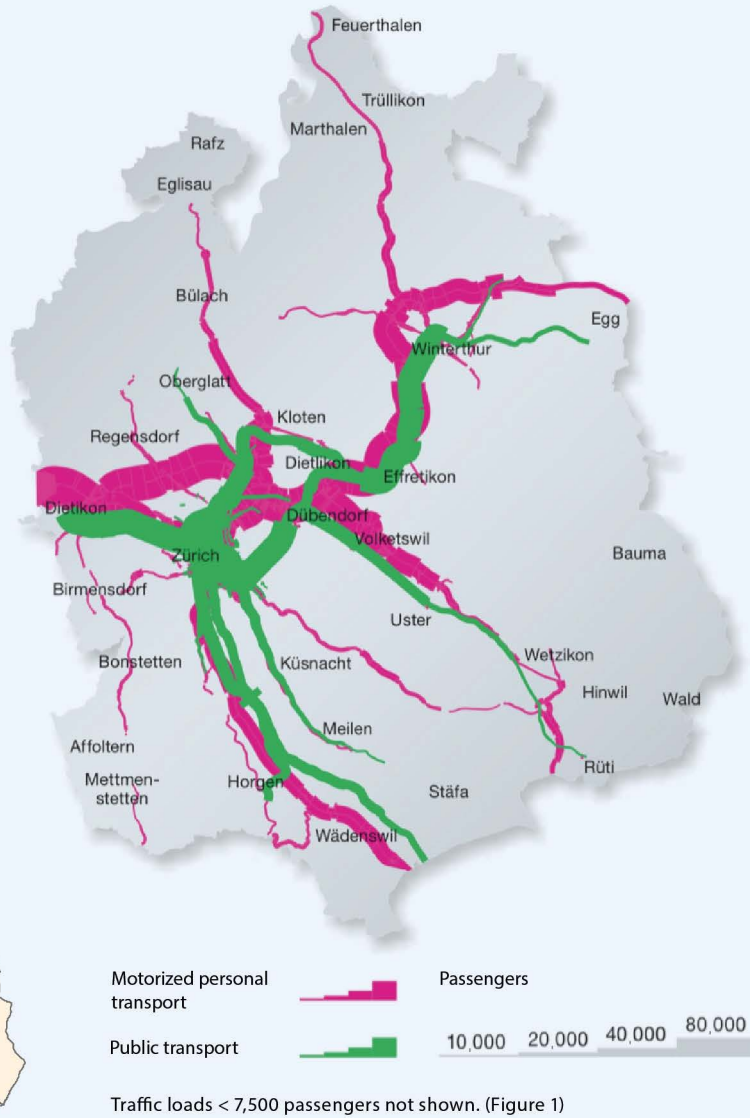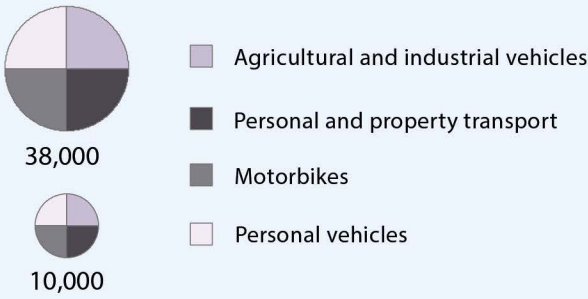# Traffic Accidents in Canton Zurich

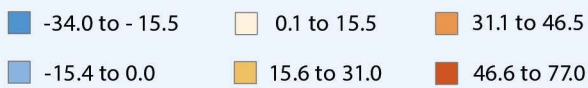The amount of accidents changed from 2016 to 2017 compared with the amount of different vehicles

Traffic load of motorized personal transport and public transport of canton Zurich in 2030
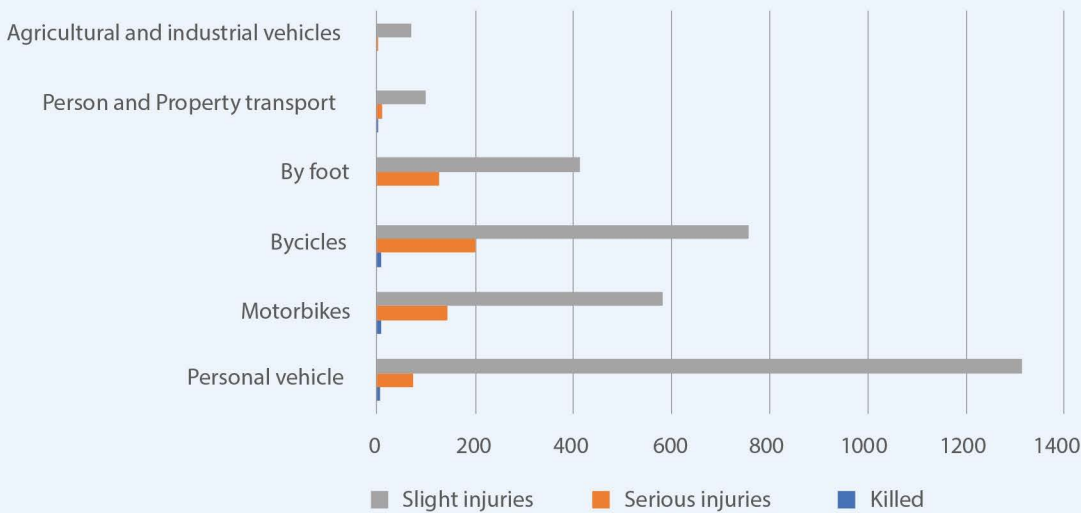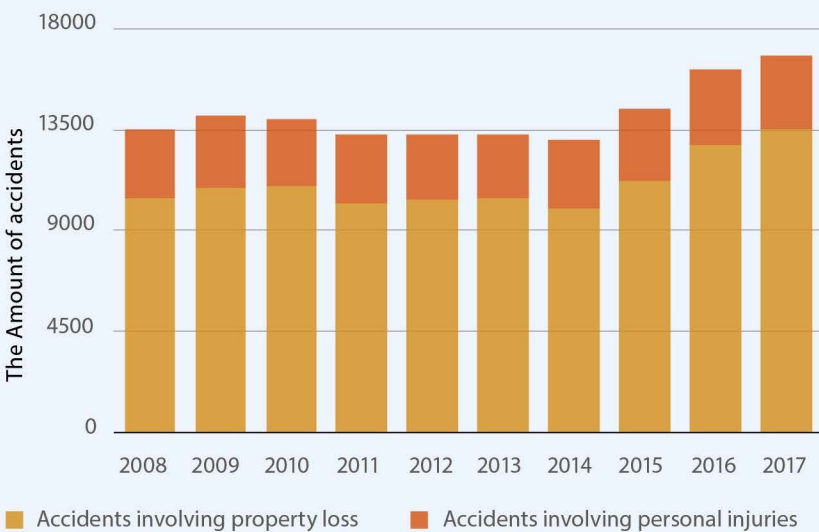
(Passengers of an average business day)

Motorized personal transport   Passengers

Public transport   10,000   20,000   40,000   80,000

Traffic loads < 7,500 passengers not shown. (Figure 1)

The amount of vehicles

38,000

10,000

- Agricultural and industrial vehicles
- Personal and property transport
- Motorbikes
- Personal vehicles

The total amount of accidents changed from 2016 to 2017

- -34.0 to -15.5
- 0.1 to 15.5
- 31.1 to 46.5
- -15.4 to 0.0
- 15.6 to 31.0
- 46.6 to 77.0

Basic legend

- Capital City of Zurich
- Capital City
- Lake
- Boarder

Zürich

Bern

0   50   100km

0   5   10 km

The amount of accidents of the different modes of transportation

- Agricultural and industrial vehicles
- Person and Property transport
- By foot
- Bycicles
- Motorbikes
- Personal vehicle

0   200   400   600   800   1000   1200   1400

Slight injuries   Serious injuries   Killed

Overview: consequences of accidents

18000

13500

9000

4500

0

The Amount of accidents

2008   2009   2010   2011   2012   2013   2014   2015   2016   2017

Accidents involving property loss   Accidents involving personal injuries

Jingwen Zhang, Linus Joos

GEO 123, G3-14

11.05.2018

Map of Accidents in Canton Zurich
The amount of accidents compared with the amount of different vehicles

Part 1

The main theme of this map is about the traffic accidents in Canton Zurich changed from 2016 to 2017. By comparison between different years and different communities, we would like to find out the main reason of traffic accidents so that we can offer some helpful suggestions, for instance, more police distribution or the enhance of protection measurements in some communities.

We chose this map theme because we would like to analyze an issue which is closed to our daily life and can also offer valuable information. When we searched on the website of Statistical Office of Canton Zurich, we found out Zurich canton police office has an archive of traffic accident statistics which is annually updated and detailed to each community so that it offered us the possibility to collect data for the choropleth map. In the annual report *Traffic Accidents Statistics, Communities in the Canton of Zurich, 2017*[1] we found out from 2008 to 2014, the annual amount of accidents is stable or even declining, however, from 2015 on, it increased rapidly comparing to previous years. This is also included in our map as a graph named "Overview: Consequences of accidents". In this case, we chose data of 2016 and 2017 to find out what might be the possible reason leads to such an unusual increase.

Our target audience is Cantonal Police Office of Zurich, especially the resource producer Traffic Engineering Department[2] because it does have lots of concrete data to the level of each community and summary graphs in their annual reports, however, so far they do not have any comprehensive map which includes all useful data in an efficient way to analyze this issue. According to the data from Federal Finance

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[1] *Verkehrsunfallstatistik, Kanton Zürich, 2017*

[2] Verkehrstechnische Abteilung, Kantonspolizei Zürich

Administration, 2012, the financial task distribution percentage in the field of transport to each administrative level is federation of 54%, cantons 21% and communities 25%[3]. Therefore, in addition to canton level, some relevant offices in federation and community levels which are in charge of transport are also likely to use this map, e.g some policy makers who would like to enhance the use of helmets because according to the map, especially from the graph "The amount of accidents of the different modes of transportation" we can see that besides personal vehicle, bicycles and motorbikes also caused many injuries, especially serious injuries. This map will be also helpful to some media which are interested in this topic or to some journalists who want to find some resources which can support their ideas and easy to use.

The choropleth map is supported by 2 annual reports of Cantonal Police Zurich are used, namely *Traffic Accidents Statistics, Communities in the Canton of Zurich, 2017* and *Traffic Accidents Statistics, Communities in the Canton of Zurich, 2016*. Below the choropleth map there are 2 small graphs which offer general overview of this issue. They are also from the annual report 2017 mentioned above. In the pie chart, the data for "The amount of vehicles" is exported from Cantonal Road Traffic Office, Evaluation Statistical Office of Canton Zurich[4]. As for the map on the top right corner about the traffic flow in Canton Zurich is from the report *Aggregated Traffic Model, Canton Zurich* from Office of Transport, Department of Economic Affairs, Canton Zurich[5] in 2011. All the data we chose are from official database of Canton Zurich and are updated annually, which is not only reliable but also continuous.

Part 2

Bertin's visual variables we used in our map are location, size, color, orientation. Location and size are used in pie charts in the choropleth map to display the amount of vehicles in each community. Each pie chart has its own size according to the amount of vehicles and locates in the middle of each community on the map. In order

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[3] Eidgenössischen Finanzverwaltung, 2012

[4] Kantonales Strassenverkehrsamt, Auswertung Statistisches Amt des Kantons Zürich

[5] *Gesamtverkehrsmodell Kanton Zürich*, Kanton Zürich Volkswirtschaftdirektion Amt für Verkehr, 2011

to display the increase and decrease of the amount of accidents changing from 2016 to 2017 we chose warm tone and cold tone accordingly. As for orientation, we insert a north arrow on the top left of the map which is necessary because the theme of the map is about traffic and there is also a map of traffic flow.

The most important part in the classification for our map is to have a break exactly starts from value "0" so that manual interval is the ideal one, which we can manually add class breaks and set class ranges that are appropriate for our data. In the end the choropleth map has 6 classes with break value averagely around 16.

We can see that most accidents occurred in the near-by regions of cities like Zurich. In most cases, it does exist a spatial correlation between the amount of vehicles and the trend of accidents amount, namely where more vehicles has, increased more rapidly. However, we can not speak of a 100% correlation because there are also some communities like Winterthur have more vehicles but still decreased and some communities have less vehicles but increased rapidly, e.g. Schlieren and Illnau-Effretikon. This outcome can be attributed to the fact that the amount of vehicles is not the only reason influences the trend of accidents amount, besides, there can be many factors like local administration, work efficiency and cantonal transport planning, etc.

Part 3

After the choropleth map was mapped there are somethings different from expectation. From the result, the amount of vehicles is not consistent to the trend. For example, the community Schlieren at the left side of city Zurich does not have a huge amount of vehicles, but it is the most rapidly increasing community in the whole canton. At same time, although community Winterthur has a big amount of vehicles and also stands on the point of intense transport flow according to the map on top right, it still decreased. Therefore, it definitely worths a study for Cantonal Police Office of Zurich into Winterthur to get some valuable ideas and meanwhile take some measures in community Schlieren.

Another point we would like to mention here is the traffic flow map on the top right corner. It is a predicted model for 2030 by Office of Transport, Department of

Economic Affairs, Canton Zurich in 2011, which was based on their development plan in transport. We used this map to analyze whether the development plan of public transport in Zurich Canton is helpful to solve the problem of traffic accidents at present. Normally, the development of public transport should be helpful to reduce the possibility of traffic accident. When we compared choropleth map to the traffic flow map, we found out the green flow in the traffic flow map covers most parts of communities in the choropleth map where the amount of accidents increased rapidly except the north-west direction, the direction Zurich-Kloten-Bülach-Eglisau in specific. Generally the development plan of transport from Office of Transport is helpful to solve the problem of traffic accidents so far. However, when it is possible, the north-west direction also needs to be paid more attention in the future development plan.

Literature:

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