

# ‘Global Cities’ Appendix — Supplemental Data Documentation for Prime Locations

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## Abstract

This appendix provides a documentation for the global city dataset accompanying the paper *Prime Locations*.<sup>1</sup> It provides references and details on the construction of all data used in this paper. Moreover, it contains a detailed documentation for each city in the dataset, specifying the sources and showcasing most of the data through maps and plots.

To gather comparable data on cities across time and space is a challenging task. The data have been collected over the course of many years, in which we placed much weight on accuracy and consistency rather than a quick data collection. This means that we have not relied on sources from private or company websites and public encyclopaedias. While websites such as wikipedia provide a good overview about a city’s history, the information given there is often incomplete, sometimes not appropriately sourced, and sometimes plainly wrong. In contrast, the endeavour to find the date and place of a city’s foundation often starts with a history book about the city. Sometimes, we could rely on the careful work of others who documented the histories of cities of certain regions (see e.g. Ring et al., 1996, for Asian cities). However, given the nature of our dataset, providing snapshots at certain points of time, we had to use a multitude of sources for each city. From reading many of these histories, two qualitative conclusions emerge. On the one hand, each city’s history is unique in many respects, for example due to the role of “local politics.” On the other hand, there seem much more similarities between their histories than any biographer of a city would admit. There are phases of growth, decline, natural disasters, upheaval and war. In fact, it is those similarities that this database tries to capture and make available for the research community.

Each city’s documentation consists of four sheets. The first sheet documents the population growth over the last two centuries and disasters are marked in these graphs. The second sheet provides two maps with all the point data used in this study: a birds eye view showing the full extent of the metro area and another map, zooming into 4km around the modern city hall. The third sheet provides a “source table,” listing all references used and providing additional comments and clarifications, if needed. On the last sheet, we provide some summary statistics on concentration measures which are the focus of our study.

While we go as much into detail as possible, we can not exclude the possibility that we omit information, given extent of our dataset, both in the time and geographic dimension. If you spot errors, please contact us (t.n.albers@lse.ac.uk).

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<sup>1</sup>We thank Alice Neht, Peter Jeffrey, and Tiantong Song for assistance in the data collection. All errors remain ours.

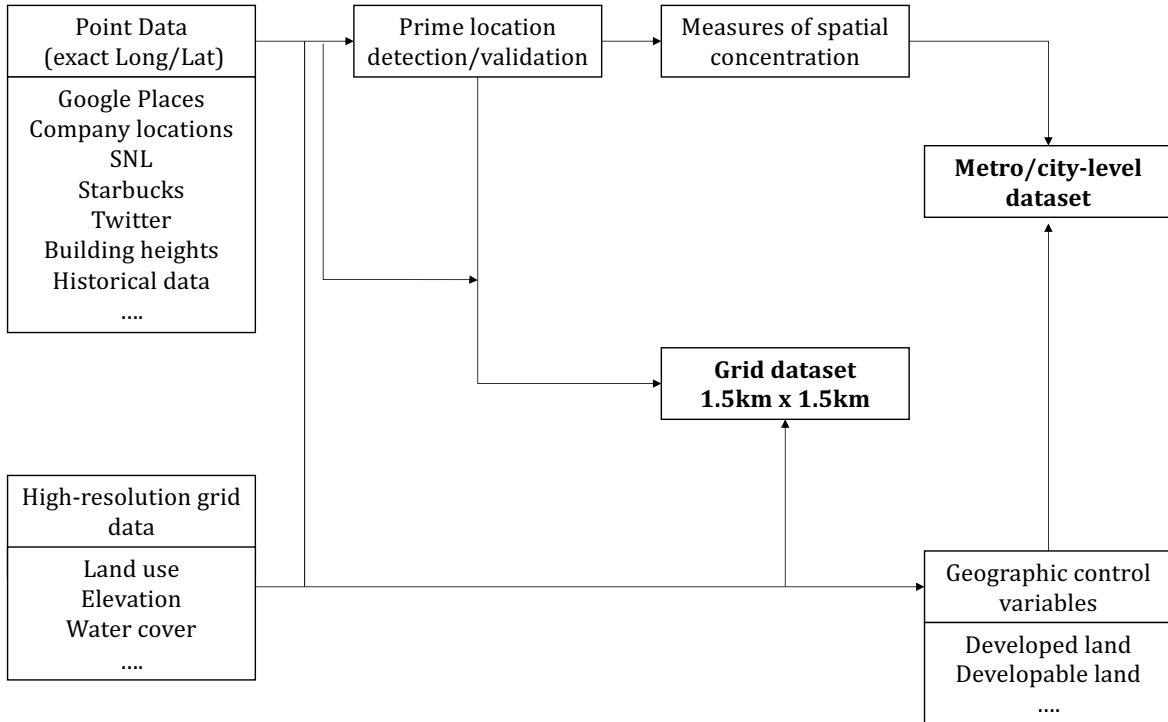
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# 1 Dataset dimensions, selection of cities, and definitions

Figure 1 provides an overview about the structure of the data employed in this paper.

Figure 1: Data sets employed in the paper



We work with two different datasets - a **grid-level dataset** (1.5km x 1.5 km cells  $\rightarrow$  total of  $N = 46,338$  cells in 125 cities) and a **metro/city-level dataset** ( $N = 125$  cities). For the **grid-level dataset**, we chose 1.5km x 1.5km cells as an American mile seems a more appropriate unit than the 250x250 small bloc level. All data originate from two types of sources, either **point data** or **high-resolution grid data**.

We use the **high-resolution grid data** (250m x 250m cells) containing information on geographic controls such as land use, elevation, and water cover directly as inputs for our final lower resolution grid data. Moreover, we create shares of developable and developed land as well as fragmentation indices for the metro/city-level dataset (including our 125 cities). Finally, the high-resolution grid data is already employed when detecting prime locations based on our point data (such as SNL data, Starbucks, Twitter data, building heights etc) as discriminating between undevelopable and developable land is important (see definitions below).

We use the **point data** on establishments, historic features, etc to detect prime locations and thereafter create the city-level measures of spatial concentration at the city/metro level. Furthermore, we use the data on establishments and prime-locations in the grid-dataset to show that our results hold in both dataset dimensions.

## 1.1 Collection of point data for Metro-level dataset - selection of cities

To get a meaningful metro-area as the unit of analysis, a potential location has to fulfil three attributes: (i) the location must have a minimum number of SNL’s prime office space buildings such that the algorithm has a chance to identify it, (ii) it should either be of a substantial size itself or belong to a larger metro area of a substantial size, and finally (iii) the locations that are combined as a metro should not only be sufficiently large in terms of the number of buildings but should have some relevance broadly defined (e.g. population, population rank in the system of cities within a country etc).

Correspondingly, our selection process works operates in three stages:

1. we identify metro areas as clusters of nearby “cities” (according to SNL definition) with SNL buildings, to which we merge Starbucks franchises. We define “core cities” as cities (defined by median  $x$  and  $y$  coordinates) that dominate all other cities within 30km in terms of the number of establishments (SNL and Starbucks). All non-core cities are then assigned to the nearest core city if a core city is within 30km. Each cluster of one core and potentially several non-core cities constitutes a metro area (a metro can also be constituted of one core city alone).
2. We keep metros in our sample that a) belong to a metro area with at least 25 SNL buildings or 25 Starbucks franchises in order to ensure that we have sufficient mass in the metro so that the clusters likely represent meaningful concentrations.<sup>2</sup>
3. We manually process the resulting data set to make sure that the metro name corresponds to conventions, i.e. we choose the name of a well-known non-core city if the core city is less known but was selected by the algorithm as a core city because of the larger number of buildings. We drop some few identified metro areas, which despite passing the identification thresholds appear of limited relevance, e.g. Princeton, Mountain View, Parsippany.

This leaves us with 129 potential metros of which we drop Busan (South Korea), Fukuoka (Japan), Kaohsiung City (Taiwan), and Taichung City (Taiwan). For these cities, we were unable to find adequate source material for the historic part of the dataset. For all other 125 cities we collect modern and historical point data.

## 1.2 Grid dataset

We combine and use a number of different datasets at the city level. To operationalize this, we define for each city a 250m grid, to which we merge different our different datasets. One of the questions in defining city-grids is the spatial extend of the city, which we allow to be endogenous in the following way: We start from the SNL database which is our main dataset and drop any individual office buildings that are more than 30km away from the city-median (based on the other office locations) in either  $x$  or  $y$  coordinates. For each city, we then use an algorithm to create midpoints for 250m grids for the entire city area spanned by the widest  $x$  and  $y$  coordinate still found in the SNL data, plus allowing for an additional 5km-buffer around these. This leaves us with 250m grids for each city, to which various data sources can be spatially merged. Crucially, all office space that falls within a grid is assigned to that particular grid. We then use this grid-level office space information to detect concentrations, as well as relations to other variables such as land-cover.

It is important to point out that this methodology may in rare cases produce counterintuitive results. For example, the foundation place of Fort Lauderdale falls into Miami’s grid rather than its own. In such a case, we assign as the foundation grid cell/city hall grid cell, the one that is closest to the actual place. Likewise, some readers may find the extent of a given city too large or too small. We decided not to change any grids that came out of the above process to improve the exposition and replicability.

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<sup>2</sup>In very rare cases, the 25-establishment rule may be violated as neighbouring metros are overlapping (e.g. Ft. Lauderdale and Miami) when detecting the metros. Yet, we ensure that they do not overlap in our dataset, i.e. that each grid cell is unique.

## 2 Urban biographies

We have coded the spatial history of the 125 cities in our sample based on a wide variety of sources. Typically, these are books specific to the cities or websites created by local history associations. The following paragraphs discuss definitions. The corresponding sources are found in the accompanying source sheets for each city.

### 2.1 First Settlement

This variable accounts for the year of the first recorded settlement. Typically, we would refer to the first written accounts of a city unless there is convincing archaeological evidence.<sup>3</sup> For example, we do not record native settlements in North America as (i) there are no written records with exact dates and locations and (ii) American settlements would rarely “replace” a native settlements. Instead, they would be in the same area, but not at the same spot as the native settlement. In contrast, cities in other parts of the world such as Mexico, Europe and China have records that go back long time and we are able to approximately locate the first settlement and estimate the date of establishment. When locating the coordinates for the settlement, we are as accurate as possible (relying on old maps and documents). Yet, the measurement error is likely growing the further we go back in time.

### 2.2 Seat of the First Political Institution

With this variable, we describe the first permanent seat of the first government institution, which is in much cases a courthouse or city hall. However, in other cases this could be a castle or palace. This is not only because municipal governments as such are a relatively new invention, but that we would find different types of governance in different regions. For example, cities in Japan were not governed by a municipal council until the 20th century. Coding strictly the first city hall would suggest that there was no centre of municipal power until (in historic terms) very recently, which is obviously not the case. This is also true if one goes back in time for European cities as the case of London demonstrates.

### 2.3 City and Town Halls in 1900 and 2000

We locate the first city or town hall and then those in 1900 and 2000. If there was no building as such, we take the seat of the governor or magistrate, from which the city was governed.

### 2.4 Government Types

We document the government types in each city for the years 1850, 1900, 1950, and 2000. There are 4 categories: (0) no government (1) municipal/county (2) state (3) federal (4) international. As international organisations, we categorise institutions such as the World Bank, the United Nations, the League of Nations, and the WTO. In brief, every organisation that has an important stake in international politics.

### 2.5 Disasters

We record the following types of disasters for each city between 1800 and 2000:

- Natural Disasters
  - Hurricanes
  - Floods
  - Earthquakes
- Manmade Disasters
  - Fires
  - Civil Wars
  - International Wars

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<sup>3</sup>This is the case for some neolithic settlements in Europe and China.

We then decide whether disaster can be considered as having caused minor destruction or major destruction to the city’s real estate stock. The definition is not free of subjectivity, but finding an objective measure of what is a major disaster seems impossible. Except for a few cases, there are no estimates of the monetary value of destruction and such accounting may vary significantly across time and space. Moreover, the destruction of 5 blocs in a hypothetical city in 1850 America could be considered as being a “major disaster” if that city only consisted of 20 blocs. However, the same destruction might be not considered as major in modern day New York. Likewise, to decide whether the damage caused by hurricanes and floods for the first half of the 20th century often proves difficult at the margin. We therefore record all disasters that might qualify as major and give references to provide the reader with an idea, how we came to our decision. Again the further we go back in time, the scarcer the information is. In case of international wars, we record them as not missing if the city is affected in any way. A “0” implies that the war affected the city as it served as a military base but never was under attack, whereas the alternative coding corresponds to destruction.

## 2.6 Population

### 2.6.1 City population

In order to make population data comparable across the cities, we need a number of benchmark years. Our final dataset contains the number of inhabitants for 1800, 1850, 1900, 1950, and 2000 and the growth rates in between. However, for a large number of cities the data for these years exactly are not available. To improve comparability, we collect as many data as possible for around these benchmark years and produce estimates for the benchmark years. Typically, the maximum deviation from the benchmark year is two to 5 years such that these estimates are very accurate and far from being guesstimates. The appendix lists for every city which years we consider to make these interpolation. We employ the following exponential interpolation based on annualised growth rates, which is favoured by economic historians working with long-run data (Williamson, 2014). In the first step, the algorithm measures the annualised compound growth rates for any two years we have data for:

$$g_{b,f} = \frac{Y_f}{Y_b}^{\frac{1}{f-b}} - 1 \quad (1)$$

where  $g_{b,f}$  is the annualised growth rate for the years between base year  $b$  and the final year  $f$  and  $Y$  denotes the respective population levels. The routine then asks whether an original population estimate in the benchmark years 1800, 1850, 1900, 1950, and 2000. For any missing year  $i$  of these five benchmark years, the routine takes the growth rate  $g_{b,f}$  between the two closest original estimates years  $b$  and  $f$  and creates a level estimate for the benchmark year  $i$  by interpolating from  $Y_b$  using the following formula:

$$Y_i = Y_b * (1 + g_{b,f})^{i-b} \quad (2)$$

Finally, we calculate annualised compound growth rates between the benchmark years in the same fashion as in equation 1. This population measure refers to the city as such, not to the metro area, to ensure consistency throughout time.

### 2.6.2 Metro population

The problem of this measure is its inconsistent areal definition across space and time. We deem this data therefore particularly incomparable in the longitudinal dimension. It may nevertheless be a good control for the size of the global city in the cross-section. Except for the Swedish cities data are from United Nations Population Division (2014).<sup>4</sup>

### 2.6.3 Population of surrounding cities in 1850

Administered by the Buringh and Centre for Global Economic History (2018), the clio-infra database on urban settlement pools past data collection and estimation efforts (e.g. from Bairoch (1988), Bosker

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<sup>4</sup>For the Swedish cities, see city-specific source sheets.

et al. (2013), Bosker and Buringh (2017)). It covers all settlements in the world that had 5000 inhabitants and above in 1850 except for China. Chinese data are from Reba et al. (2016) which is, in turn based on Chandler's (1987) data. These data are of lesser quality than those for the rest of the world. For our purpose, this shortcoming is largely irrelevant in practice.<sup>5</sup>

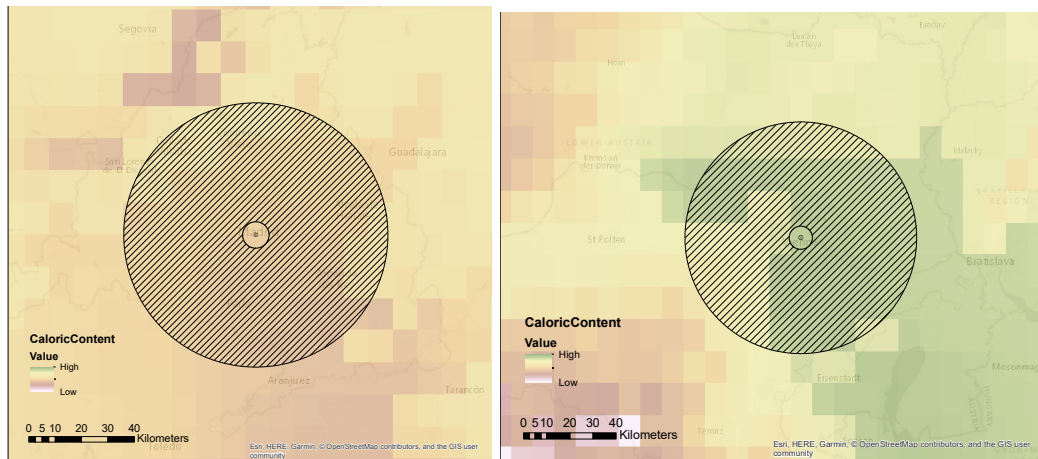
### 2.6.4 Population grid

For 2010, we also gather data on the *Gridded Population of the World Dataset Version 4.10* dataset by Center for International Earth Science Information Network - CIESIN - Columbia University (2017). The dataset is constructed by using survey and census data and interpolates where little data points are available. As a result, there is a data point for each location. We have used the data for the year 2010, 10th revision.

### 2.6.5 Caloric potential 1900

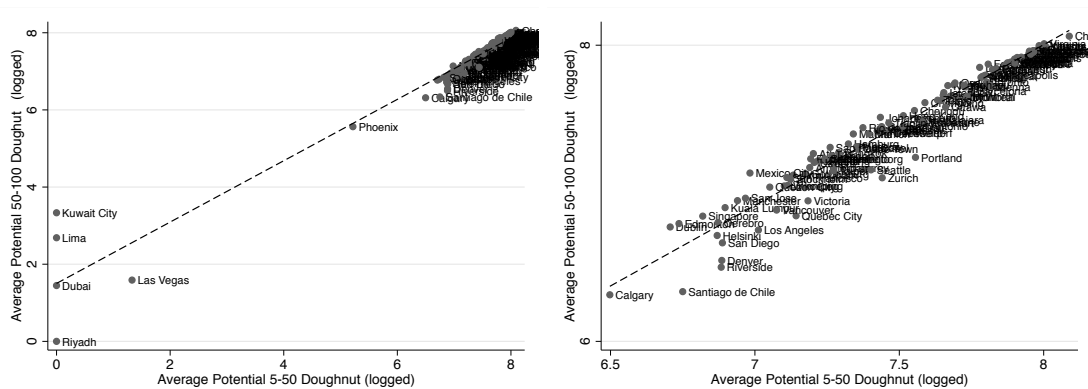
In order to calculate the caloric potential, we rely on the average caloric potential grid data for the world (post-1500) provided by Galor and Özak (2016).<sup>6</sup> Using these data, we calculate the average caloric potential in an outer ring of the city as demonstrated in Panels a) and b) of Figure 2.

Figure 2: Caloric potential around Madrid and Vienna



(a) Caloric Potential - Madrid

(b) Caloric Potential - Vienna



(c) Full Sample

(d) Excluding those with logged potential of less than 6

*Note:* Figure shows the caloric potential of the hinterlands of Madrid and Vienna. For details, see text

<sup>5</sup>We only use data on surrounding cities for estimating the subway-potential. A possible underestimation of Chinese cities' potential to be connected by railways appears historically irrelevant. The government did not allow to be develop significant railway systems in this pivotal period.

<sup>6</sup>Downloadable at <https://ozak.github.io/Caloric-Suitability-Index/>.

We compute two versions of the index. In the first version, the inner ring has a radius of 5 km and the outer ring has a radius of 50 km. In a second version, we use an inner ring with a radius of 50 km and an outer ring with a radius of 100 km. Panels c) and d) of Figure 2 show that this choice cannot have large effects as the two versions are - unsurprisingly - almost perfectly correlated. As we are concerned about within-city amenities, we thus take the second version as our preferred specification.

Table 1: Correlation between agricultural and caloric potential

	Agricultural Potential			
	Full Sample		Excluding “Outliers”	
Caloric Potential	0.707*** (15.92)	0.715*** (12.94)	0.216** (2.12)	0.334*** (2.75)
<i>Region FEs</i>	No	Yes	No	Yes
<i>N</i>	125	125	119	119

*t* statistics in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Outliers are defined as those cities with an average logged caloric potential  $< 6$ .

To test the validity of the caloric potential data, we make use of more fine grained agricultural suitability data by Zabel et al. (2014). Reassuringly, the two measures are highly correlated as indicated by Table 1.

## 2.7 Colonial occupation in 1800

Regarding the coding whether a city in our sample was part of a colonial empire in 1800, we proceed as follows:

- For the United States, we use a map provided by the University of South Florida (<https://etc.usf.edu/maps/pages/700/797/797.htm>) to determine whether the cities lie in colonial or independent territories.
- All Chinese, European (including Ireland), and Japanese cities are coded as independent.
- Bangkok, Dubai, Kuala Lumpur, Kuwait, Moscow, Riyadh, Seoul, and Singapore are coded as lying in independent territories in 1800.
- Canadian and Australian cities are coded as lying in colonial territory (part of the British empire).
- South African cities and Jakarta are coded as lying in colonial territory (part of the Dutch empire).
- Buenos Aires, Lima, Santiago de Chile, Quezon City, and Mexican cities are coded as lying in colonial territory (part of the Spanish empire).
- Brazilian cities are coded as as lying in colonial territory (part of the Portuguese empire).

## 2.8 Rapid Transit

### 2.8.1 Opening Years

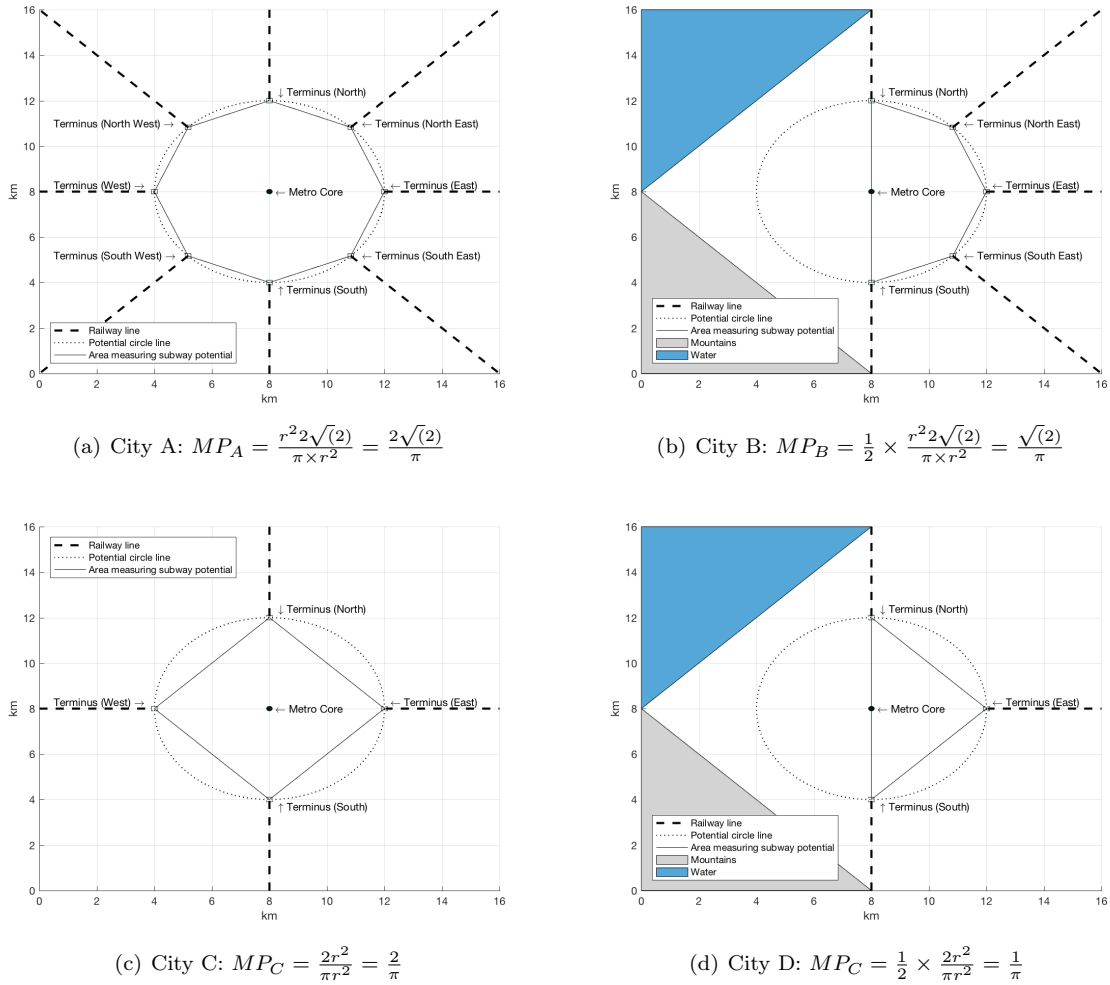
We refer to the opening system of a rapid transportation system within cities following the definition of Gonzalez-Navarro and Turner (2016). This means that we exclude commuter trains. For each city, we document the city-specific source for the opening year in the accompanying city sheets. In many cases, our coding aligns with the one of Gonzalez-Navarro and Turner (2016). However, we noticed some omissions. For example, Vienna had a “Stadtbahn,” which is not in their dataset and Stockholm had a “pre-metro” system. Berlin’s “Ringbahn” (circle line) is not in their dataset although it is clearly a rapid transit system. The deviations from the Gonzalez-Navarro/Turner dataset are all documented in the city-specific source sheets.



## 2.8.2 Subway potential

In virtually all cases, the adoption of subways was a response to severe congestion problems that plagued emerging cities from the mid-19th century onwards. To a first approximation congestion appeared because of two reasons. Firstly, the sheer population size, area, and thus population density influenced congestion by making streets more crowded. Secondly, the magnitude and organisation of the flow of goods and people in, out, and across the city induced congestion. The number of unconnected ports of entry and exit, namely railway termini, the distance between them, and their spatial configuration determined the importance of this factor for the city's congestion as Daniels and Warnes (2007, p. 10) discuss for London.

Figure 3: Spatial configurations of rail termini



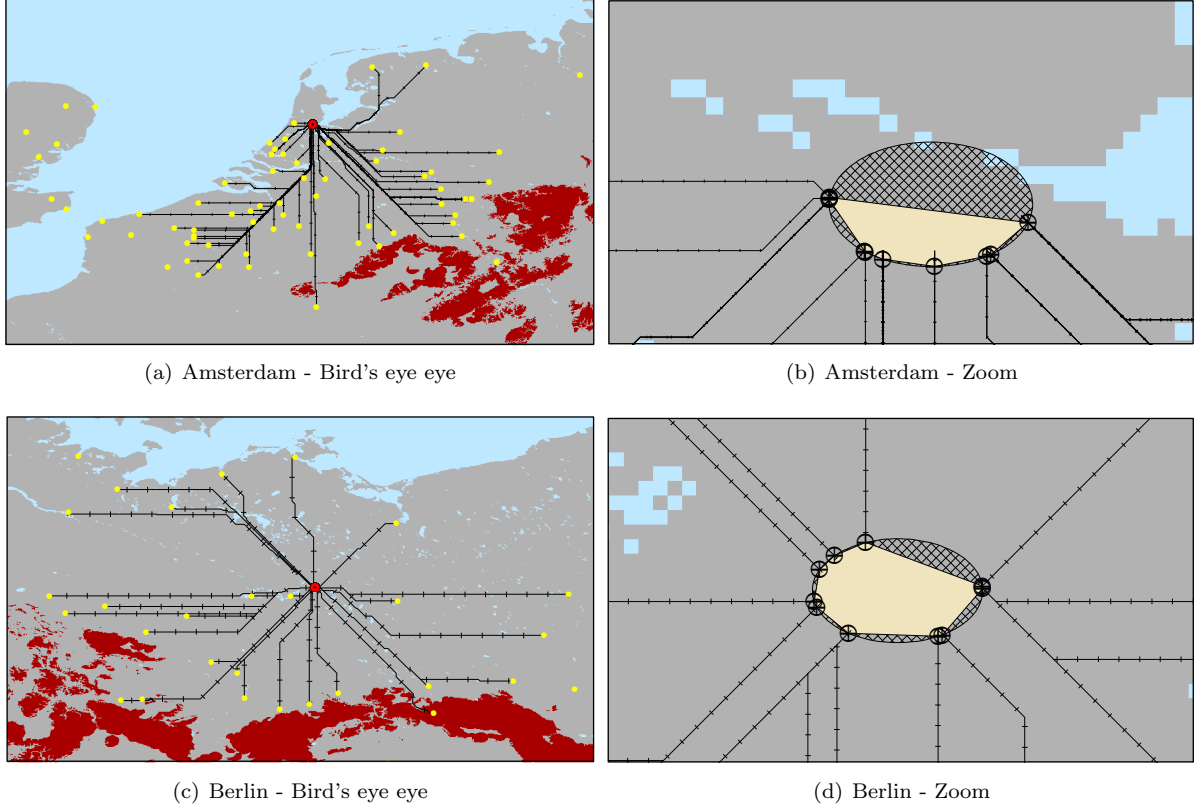
How can we operationalize and generalize the insight that the probability of adopting a metro system is a function of the geometry and number of railway termini? Figure 3 displays four different stylised cities, which exhibit variation along these two dimensions. For each of these cities, a good summary statistic capturing the geometry and number of railway termini is what we call the subway potential. The subway potential is approximated by the area  $A_i$  connecting all railway termini divided by its theoretical maximum which is given by the area of the circle depending on radius  $r_i$ .

$$RP_i = \frac{A_i}{\pi r_i^2}$$

This, of course, implies that cities with two or less stations are assigned a zero subway potential as they are unlikely to build a circle line.

Beyond this threshold, however, geometry plays a major role as stylized example above shows. The subway potential of *City A*  $RP_A$  covers a larger area than the halved octagon connecting the railway termini in *City B*. And even though city *City B* has more nodes (5), its subway potential is smaller than that for *City C* and only  $\sqrt{2}$  times larger than that of *City D*.

Figure 4: Subway potential in Amsterdam and Berlin



Notes: Black lines are least-cost paths to any city with a population of at least 15000 in 1850 (the yellow dots). Light-blue shaded areas are oceans, rivers and lakes. Dark-brown shaded areas are mountains. The grey-shaded areas are the remaining land mass.

What then determined the number of termini and their spatial configuration historically? Naturally, the answer lies in the big railway expansion beginning in the mid-19th century.<sup>7</sup> Whether a certain railway and thus a new terminus station was built or not, was an economic decision. For private companies, it only made sense to build a line if it was commercially-viable. This commercial viability, in turn, was a function of the size of the city that was to be connected. Fortunately, a large dataset on urban settlement by the clio-infra project exists, which covers all global urban settlements except for those in China in 1850. For China, we rely on data from Reba et al. (2016).<sup>8</sup>

We restrict these data to cities with more than 15,000 inhabitants within the radius of 300 km of one of our 125 metros. We derive the parameters from Hornung (2015) who compiled data on the initial railway nodes in Germany.<sup>9</sup> Instead of using straight line distances, we compute least costs paths assuming that

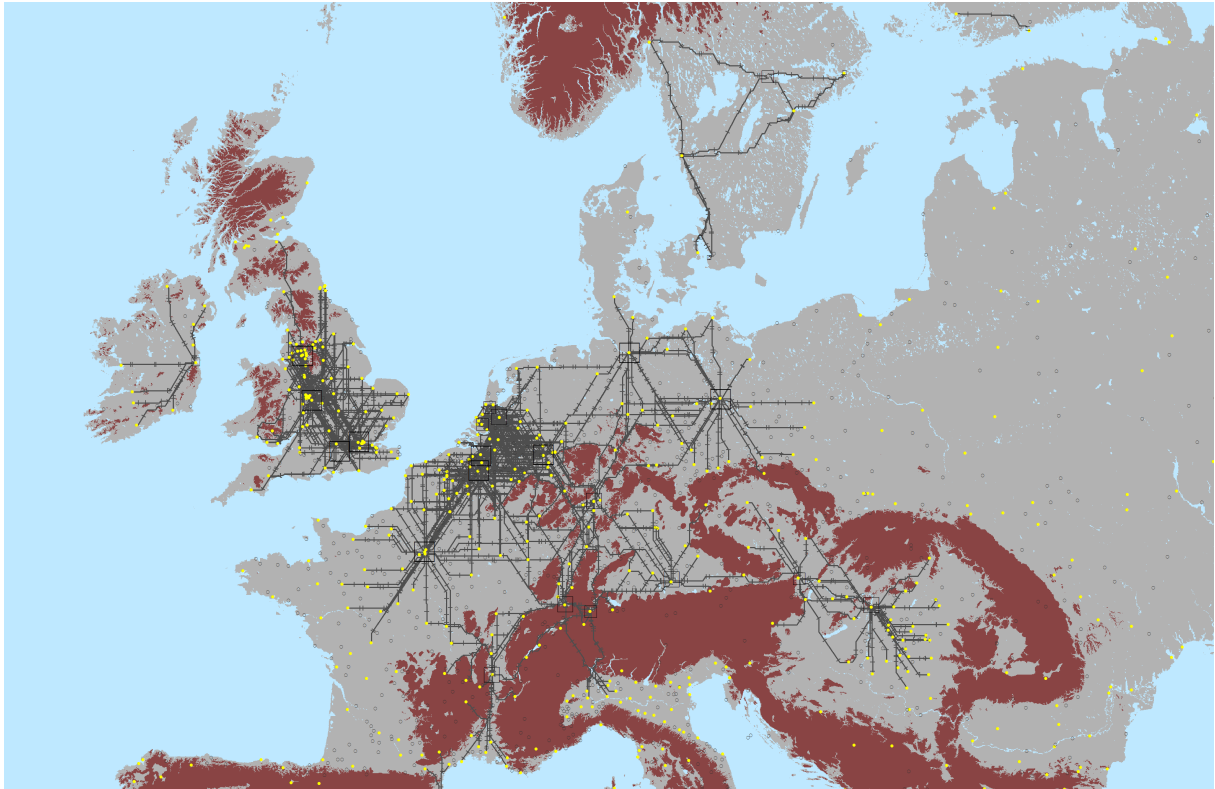
<sup>7</sup>The dating of the railway age varies by country. In the United Kingdom, it is conventionally dated to the 1830s (Gourvish, 1988, p. 87), in the United States to the 1840s (Taylor 1967, p. 309). In Germany, the first connections were built in the late 1830s, but only from 1860-1880 would a “coarse network” be established (see Hornung 2015, p. 701 and 703 for a discussion of this periodisation). For other, countries the adoption and serious expansion of railway networks started significantly (Mitchell and Palgrave Macmillan, 2014).

<sup>8</sup>Administered by the Buringh and Centre for Global Economic History (2018), the clio-infra database on urban settlement pools past data collection and estimation efforts (e.g. from Bairoch, 1988; Bosker et al., 2013; Bosker and Buringh, 2017). It covers all settlements in the world that had 5000 inhabitants and above in 1850 except for China. Chinese data is not directly comparable and is derived from Reba et al. (2016) which is, in turn based on Chandler’s (1987) data. In reality, the potential underestimation of Chinese cities’ subway potential is not problematic at all as significant railway systems were not allowed to be built.

<sup>9</sup>See Table 1 and Appendix Table C1. We wish to emphasize that our results are not particularly sensitive to varying either of these parameters.

building a railway crossing mountainous terrain with a railway will be 7 times more expensive than a land connection.<sup>10</sup> By assuming that it will be 1000 times more expensive to cross water, we ensure that the least cost algorithm suggests a route crossing water only when absolutely necessary. We record a potential railway terminus for each city at the point where the potential railway intersects with a circle with a radius of  $r_i = \bar{r} = 4$  km. Since we normalize on the area of the circle, our rail potential measure is not dependent on the choice of this radius. However, as discussed in Section ??, the 4-kilometer radius represents a good approximation of historic core cities in many contexts. Figure 4 shows the results for two cities - Berlin and Amsterdam.

Figure 5: Subway potential in Europe



Notes: Black lines are least-cost paths to any city with a population of at least 15000 in 1850 (the yellow dots). Light-grey shaded dots are towns with a population between 5000 and 15000 in 1850. Light-blue shaded areas are oceans, rivers and lakes. Dark-brown shaded areas are mountains. The grey-shaded areas are the remaining land mass.

It can be easily seen that not all cities in within the Great Circle distance of 300 km can be reached. For example, the least cost path from Amsterdam to Calais, unlike the great circle distance, requires to pass around the bays around Amsterdam and thus becomes longer than 300km. It is thus ignored in the calculation of Amsterdam's subway potential. Likewise this is true for cities in the east of England, which would require to cross the English channel. The particular geography of Amsterdam as a coastal city thus leads to a significantly lower subway potential than Berlin has. Indeed Figure 5 demonstrates that there is ample variation of our measure not just for these two cities but across a large set of cities across Europe.

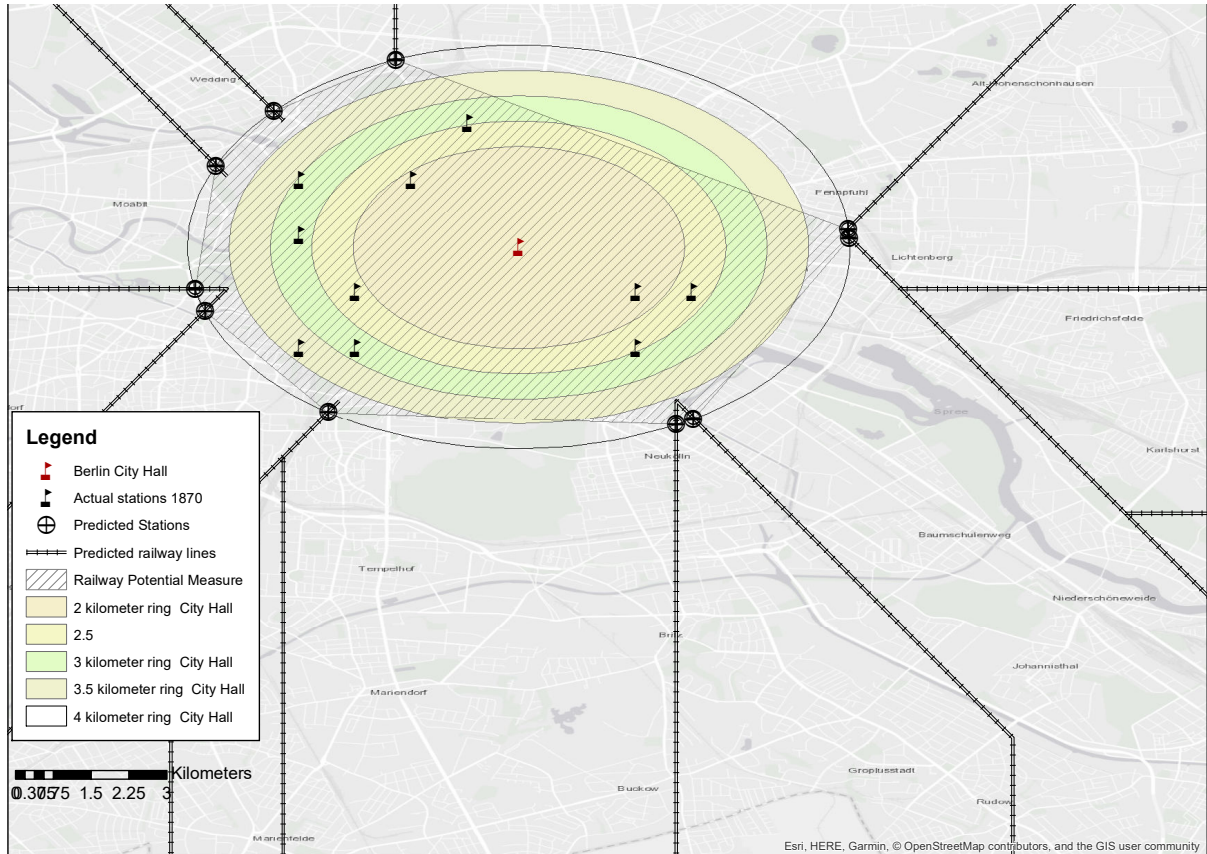
The case of Amsterdam is also illustrative for another reason. It shows that subway potential and market potential are two different measures. As a city at the sea, Amsterdam was a commercial (and indeed financial) center of the time. However, due to its geography, it had less subway potential than Berlin even though its market potential was larger. Section 2.9 discusses the differences for the global set

<sup>10</sup>We derive this number from a report Special Committee in Relation to Cost of Railroad Construction of the Minnesota Senate in 1893. The expertise by engineers puts the cost of railroads between USD 8,400 and 35,000 depending on the terrain and time built (Lloyd, 1893, p. 15). This corresponds to the ratio of 3 of the bonds for the flat land parts of the line (USD 16,000) to bonds for the mountainous parts of the line (USD 48,000) issued for the construction of the Pacific Railroad (Billings, 2012, p. 706). However, as these, unlike our very detailed raster data on mountains and water bodies (see Appendix 4.5), likely reflect rather long distances including parts with obstacles, we decide to set the ratio to 7.

of cities.

Finally, a natural way to test the *historical* relevance of our instrument is to compare the railway stations that were actually built with those predicted by our subway potential variable. Figure 6 does this exercise for Berlin, for which we digitized the actual railway termini from a map from the 1870s.<sup>11</sup> Berlin’s railway stations were located 2-3.5 kilometer around the historic city hall. If we extended our predicted railway lines towards the city centre, we predict the location of most stations with high accuracy (recall that our rail potential measure is independent of the choice of radius  $r_i$ ).

Figure 6: Predicted vs actual stations in Berlin



Another validation does not stem from the map itself, but lies in the (historical) naming of these stations. They were typically named after the cities that the railways (the actual historical and our predicted ones) would lead to. This was the case for 8 of the 10 stations on the map: Hamburger Bahnhof, Anhalter Bahnhof, Potsdamer Bahnhof, Görlitzer Bahnhof, Stettiner Bahnhof, Dresdener Bahnhof, Frankfurter Bahnhof, and Leichter Bahnhof. The remaining two were named after the directions they were going to: Nordbahnhof and Ostbahnhof.

## 2.9 Market potential

We follow (Donaldson and Hornbeck, 2016) and define market access using their historic trade costs (per kilometer) and the elasticity of trade flows with respect to trade costs (trade elasticity)  $\Phi = -8.2$ :

$$A_i^1 = \sum_j P_j^1 \times \tau_{i,j \neq i}^\Phi$$

where  $j$  indexes all settlements with more than 5000 inhabitants in 1900, world-wide.  $P_j^1$  the population of city  $j$  in 1900.  $\tau_{i,j}$  measures trade cost between cities  $i$  and  $j$  as the least cost path. We allow for three

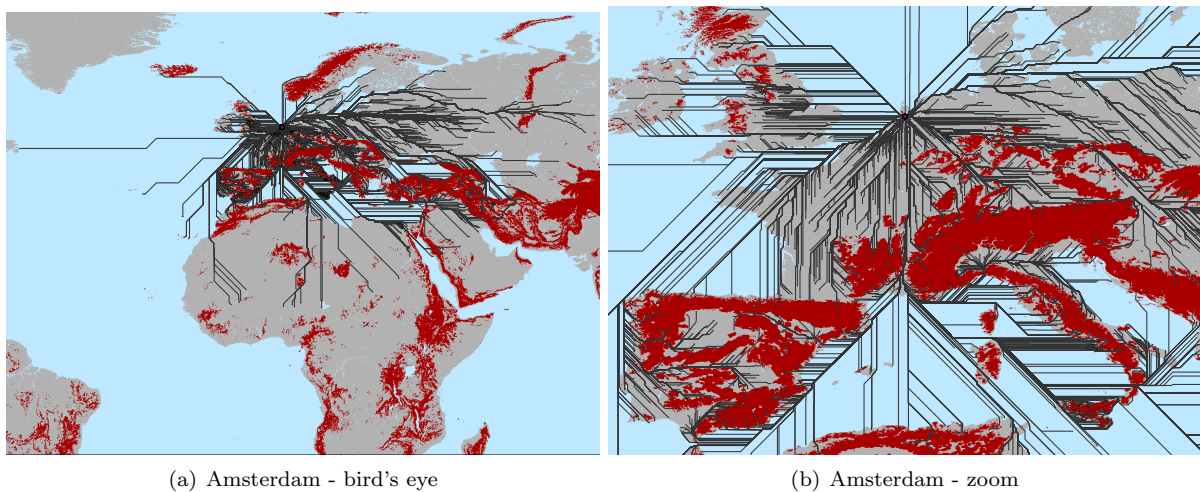
<sup>11</sup>The map was downloaded from <https://tools.wmflabs.org/historicmaps/berlin/>.

different potential modes of transportation (i) over land via railway (assuming \$ 0.0063 per kilometer) (ii) via wagons to cross mountains (assuming \$ 0.231 per kilometer) and (iii) shipping over water (assuming \$ 0.0049 per kilometer). All parameter values are from Donaldson and Hornbeck (2016).<sup>12</sup>

In practice, we compute least cost paths using the algorithm provided by ESRI's ArcGis. Owing to the global scale of our analysis we execute the least-cost-path computation city by city taking the following steps and adjustments:

1. Restrict sample of surrounding cities to those within a 40 degrees (about 4440 km) great distance radius.
2. Create a convex hull around these to limit the geoprocessing extent.
3. Compute cost-distance and cost direction rasters.
4. Compute least cost paths.
5. The least-cost algorithm computes distances in a planar rather than geodesic manner. The resulting distortion of the distance measurement is not uniform across cities - it increases towards the poles. We thus apply as a reasonable approximation to the true adjustment factor the factor  $a_{mj} = \frac{\text{Geodesic Distance}_{mj}}{\text{Euclidean Distance}_{mj}}$  for the cost of any given origin-destination combination.
6. For those cities lying beyond the 4440 kilometer radius, we extrapolate trade costs based on a regression of the log of trade cost on the log of great circle distance across our sample within the radius ( $N = 127,790$ ).

Figure 7: Market Access Amsterdam



Notes: Black lines are least-cost paths to any city with a population of at least 5000 in 1900. Light-blue shaded areas are oceans, rivers and lakes. Dark-brown shaded areas are mountains. The grey-shaded areas are the remaining land mass.

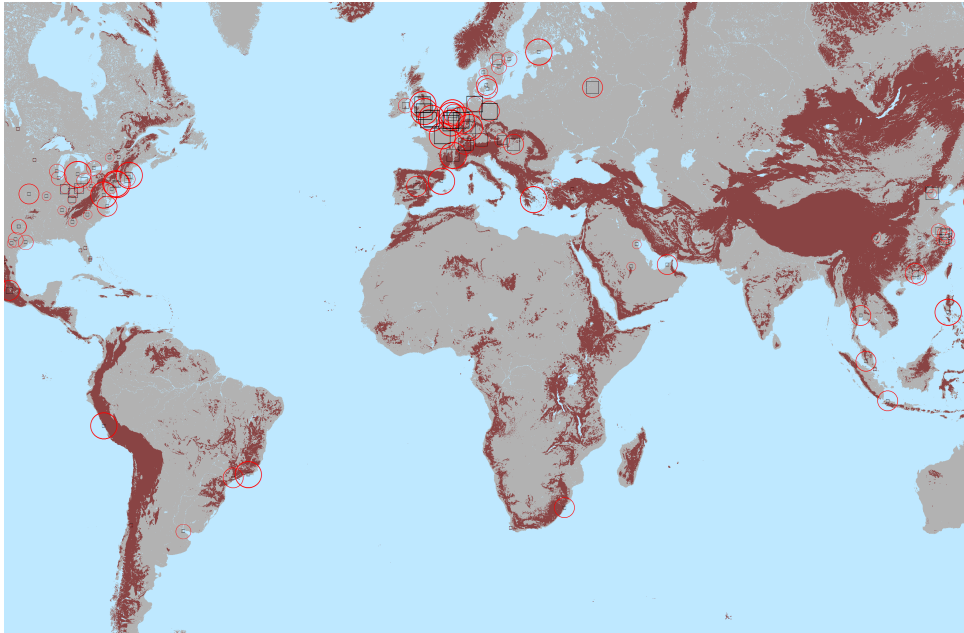
Figure 7 illustrates the results for Amsterdam. The left pane shows the connection to all cities within the 4440 km radius, whereas the right pane zooms in on Europe. It is obvious that, contrary to the railway potential, being at the ocean is an asset as it increases the market potential.

The difference between market access and railway potential for all cities in our sample is illustrated in Figure 8, in which the size of the circle signals market access and the size of the rectangles represents the magnitude of the railway potential. There are indeed cities with a large market access but small amounts of railway potential.

How does our market access measure compare to existing studies? Since our historic city-specific market access measure is novel, the best we can do is to benchmark our data against a recent study on the long-run evolution and importance of market potential by Jacks and Novy (2018) at the country level. They provide estimates for market potential and market access at the country level for the year

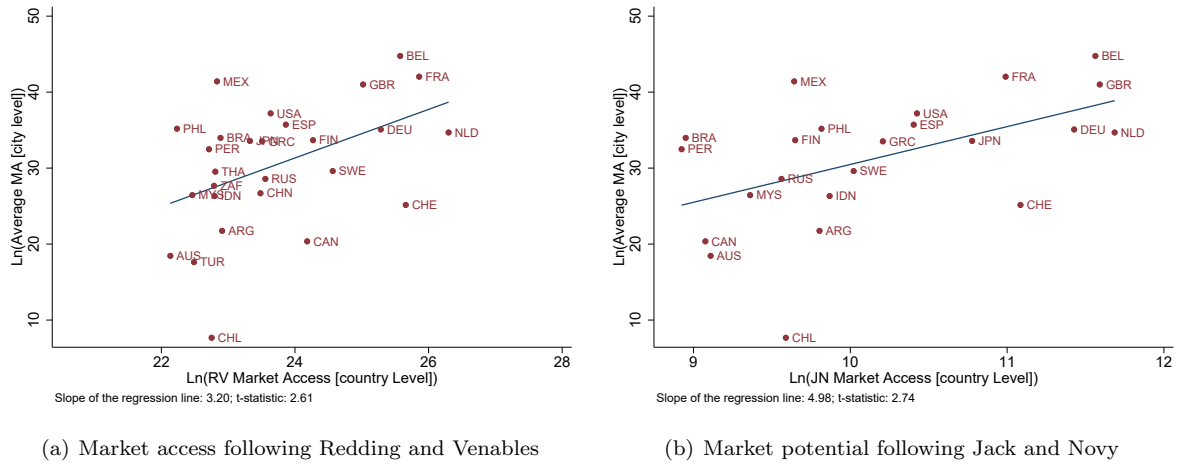
<sup>12</sup>Since Donaldson and Hornbeck (2016) focus on the US exclusively, they can allow for a more complex cost structure.

Figure 8: Market Potential vs. Rail Potential (World)



Notes: The size of the red circles is proportionate to market access. The size of the black squares is proportionate to subway potential. Light-blue shaded areas are oceans, rivers and lakes. Dark-brown shaded areas are mountains. The grey-shaded areas are the remaining land mass.

Figure 9: Market Access - Comparison with existing estimates



Data on the respective x-axes of the plots, including the estimates of market access in the vein of Redding and Venables (2004), are from Jacks and Novy (2018). Data on the y-axes represent our estimates at the metro level, which are averaged by county and then logarithmized.

1910. They compute two versions of market potential/market access, one following their own derivation and another one following Redding and Venables (2004). In order to bring our data to a national level, we average them by country and then take the logarithm. Figure 9 shows the corresponding graphs. Reassuringly, our market potential is strongly correlated with existing measures at the country level. Chile is an interesting outlier for that matter as it highlights the importance of taking the domestic terrain into account, which existing measures do not do.

## 2.10 Validation of 1900 city halls as historic prime locations

### 2.10.1 Building height data

The data are from the (proprietary) Emporis database (see Appendix 3.5 for details).

### 2.10.2 1880 US census

We use the 1880 10% census from IPUMS USA and the shapefiles showing the 1880 enumeration districts (ED) for 39 cities in the US in 1880 from the ‘Urban Transition Historical GIS Project’ (Logan et al., 2011). We match the 26 cities that are in our Global Cities dataset (Providence, RI; Boston, MA; Newark and Jersey City, NJ; Brooklyn, NYC Manhattan/Bronx, NY; Washington DC; Atlanta, GA; Nashville, TN; San Francisco and Oakland, CA; Denver CO; Saint Louis, MO; St Paul and Minneapolis, MN; Milwaukee and Chicago, IL; Detroit, MI; Indianapolis, IN; Cincinnati, Columbus, and Cleveland, OH; Allegheny, Pittsburgh, and Philadelphia, PA). We match the 3,230 ED from those cities with the 1880 census data and compute for each ED the count of people who report working in prime service industries. The latter comprise the ind1950 codes 716 (Banking and credit agencies), 726 (Security and commodity brokerage and investment companies), 736 (Insurance), 746 (Real estate), 756 (Real estate-insurance-law offices), 806 (Advertising), 807 (Accounting, auditing, and bookkeeping services), 808 (Miscellaneous business services), 879 (Legal services), and 898 (Engineering and architectural services). Finally, we compute the surface of each ED and its distance (from the centroid) to the nearest 1900 city hall and the nearest foundation place. Since we only keep cities for which we have that information in our Global cities dataset, this is the distance to the 1900 city hall and foundation place of that city. We use 1880 residence-based industry because this pre-dates both automobile and telephone and also the development of mass transit. People were thus unlikely to work very far from where they lived. We choose a threshold of 6km, which corresponds to 1h30 walk at 4km/h, i.e., a daily round-trip of 3 hours. We think that longer commutes were negligible at that period.

### 2.10.3 International Chamber of Commerce list

The publication “The Organisation of the International Chamber of Commerce” by the The Organization of the International Chamber of Commerce (1922) contains names and addresses of members and associated members. These are typically business association and banks. We keep only those for which address data are available and locate those via googlemaps. The digitised data are available upon request.

### 2.10.4 Historic places data by the National Park Service

The National Park Service provides geocoded data and excel data online: <https://www.nps.gov/subjects/nationalregister/data-downloads.htm>. We employ the following release: ‘Spreadsheet of NRHP Listed properties (listings up to January 8, 2020)’. To isolate historic prime service establishments, we keep buildings, of which the primary or any of the alternative names contain one of the following keywords (case insensitive):

- Bank, saving, trust, financial, finance
- Insurance, insurer
- Real estate
- Association

### 3 Modern data on prime locations

Data are labeled according to 3 uses: (i) city selection, (ii) core dataset , and (iii) validation.

#### 3.1 Google places data (core dataset)

We use Google’s Nearby Places API to scrape the coordinates of all Places of Interest (POI) associated with specific keywords and located in our sample of global cities (see Table 2 for the associated keywords).

Table 2: Prime Service Establishments by Industry

Type of Firm	Search term(s)	Establishments
Accounting Firm	accountant	58,862
Central Bank	central bank	298
Consultancy	consultant; consultancy	15,251
Insurance	insurance	30,827
Investment Bank	investment bank	2,432
Law Firm	law firm	24,056
Stock Exchange	stock exchange	179
$\Sigma$		131,905

While Google’s API identifies all POI within a circle with a user-specified centroid and radius (with a maximum of 50km), it returns at most 60 POI per search query. To collect the universe of POI despite this truncation, we therefore apply an iterative search strategy for each city-keyword pair:

1. We perform an initial scrape on each city’s centroid, using a radius of 50km. If the query returns less than 60 POI, we stop.
2. If the query returns 60 POI, we perform additional scrapes within 4 circles with 25km radius each, shifting their centroids by 25km in each inter-cardinal direction from the original circle’s centroid.
3. We continue to divide these circles into 4 overlapping subcircles in the same manner until the respective query returns less than 60 POI.
4. Finally, we delete all duplicates.

As each step of our iterative search strategy generates sub-circles that cover the whole area of their parent, we are guaranteed to yield the universe of all POI within our area of interest matching the specified keywords. Overall, we end up with a sample of 131,905 establishments. We merge these to our grid dataset, which results in dropping a substantial amount of them.

The data are not uniformly distributed across companies, which can be rationalised by the different type of prime industries. In many countries, law firms and accounting firms are run by individuals, which increases their number relative to other industries such as investment banks.

#### 3.2 Global prime service companies (core dataset)

Table 3: Global Prime Service Establishments by Industry

Industry	Establishments	Share
Accounting Firms	799	14.07
Consultancies	404	7.11
Investment Banks	467	8.22
Law Firms	360	6.34
Insurance	310	5.46
Co-Working	2,995	52.74
Stock Exchange	217	3.82
Central Bank	127	2.24
$\Sigma$	5,679	100

Table 3 shows our sample of offices of cleanly identified global industry leaders (either by the *Financial Times* and respective industry magazines). We identify 5,679 establishments in our 125 city sample,



containing the offices of the Top-4 Accountancy and Tax Firms, Top-5 Consultancies, Top-10 Law Firms, Top-10 Investment Banks, top-3 Insurances, and two providers of global office and co-working space (see Table 4 for details).

We then retrieve the coordinates of all the offices of the respective companies via their websites. Where coordinates are not available, we retrieve addresses instead. We transform these into coordinates via a self-written matlab-program, which queries the google API. In addition to the global companies, we also collect the addresses of all central banks and stock markets of the countries in our sample as well as their domestic regional and international representations.<sup>13</sup> Finally, we drop all observations that do not fall within a 50 km radius of the central point of any of the 125 cities.

Table 4: Global Prime Service Companies and Establishments

Establishment Type & Company name	Source	N	Coordinates	Address
<i>Accounting firms</i>				
Ernest & Young	Company's website	197		X
Deloitte	Company's website	215		X
PWC	Company's website	194		X
KPMG	Company's website	193	X	
<i>Consultancies</i>				
Accenture	Company's website	118		X
Boston Consulting Group	Company's website	89	X	
McKinsey	Company's website	99	X	
Booz Allen	Company's website	51		X
Bain	Company's website	47	X	
<i>Law firms</i>				
Kirkland	Company's website	15	X	
Latham	Company's website	25		X
BakerMcKenzie	Company's website	54	X	
DLA Piper	Company's website	65	X	
Skadden	Company's website	22	X	
Dentons	Company's website	71		X
Clifford Chance	Company's website	21	X	
Sidley Austin	Company's website	19	X	
Hogan Lovells	Company's website	39		X
Allen Overy	Company's website	29	X	
<i>Investment banks</i>				
JP Morgan	Company's website	56	X	
Goldman Sachs	Company's website	59	X	
Merill Lynch	Company's website	49	X	
Morgan Stanley	Company's website	45	X	
Citibank	Company's website	43		X
Barclays	Company's website	31	X	
Credit Suisse	Company's website	57		X
Deutsche Bank	Company's website	74	X	
Wells Fargo	Company's website	24	(X)	
HSBC	Company's website	29		X
<i>Global insurances</i>				
Allianz	Company's website	128	X	
Axa	Company's website	1377	X	
Prudential Financial	Company's website	45	X	
<i>Co-working &amp; office space rental</i>				
Regus	Company's website	2,253		X
WeWork	Company's website	742		X
<i>Other prime establishments</i>				
Stock markets	Websites	217	X	
Central banks	Websites	127	X	

<sup>13</sup>To identify all potential stock exchanges, we rely on a list compiled by Meri Paterson (<http://www.meripaterson.com>). We then visit the websites of the exchanges and retrieve their addresses. For the central banks, we visit the website of the central banks of the countries in our sample. Furthermore, we add the headquarters and international representations of the ECB and the BIS.

### 3.3 SNL data (city selection/validation)

The SNL dataset is a commercial dataset by SNL real estate research <http://www.snl.com/Sectors/RealEstate/>.

### 3.4 Starbucks data (city selection/validation)

The Starbucks data are from <https://opendata.socrata.com/Business/starbucks/cxf4-mc6k>, which provides the location of all Starbucks shops as scraped from the shop finder from the Starbucks website. This was an open source dataset scraped by an unknown author. We manually checked and corrected data points where necessary.

### 3.5 Tall buildings data (validation)

The *Emporis* dataset contains information of high buildings across the world and is typically considered the most comprehensive of its kind. The dataset is on the level of the individual building and includes buildings that no longer exist, which prevents the mechanical survival bias. It contains the geographic coordinates, the construction year, and various building attributes of which the height is the one that is most comprehensively covered. Another such variable with good coverage is building use, which provides information of the type of building, i.e. whether it contains offices, apartments, hotel, some other functions (e.g. churches, stadium, etc). This information can be grouped to meta-categories residential, commercial, other as discussed in Ahlfeldt and McMillen (2018).

### 3.6 Social media data (validation)

Geotagged photos come from Eric Fisher's Geotaggers World atlas. Data scientist Eric Fisher obtained a worldwide data set of photos of from picasa and flickr via the APIs of the respective platforms. We are grateful to him for sharing the data with us. He argues high photo densities reflect places of human interest.

### 3.7 Twitter (validation)

For half of the cities in the sample, we bought twitter data from the social-media company *gnip*, which is now owned by twitter. The data cover those tweets, which were categorised by the provider as relating to business and are only available for roughly half of the 125 cities.

### 3.8 Employment plant level data (validation/employment weighting)

For six cities in our sample, we were able to gather establishment-level data for prime services. In particular, we rely on the following 2 data providers:

- For **New York, Philadelphia and Boston**: Data are from the National Establishment Time Series (NETS), a consistent time-series version of the Dun c& Bradstreet (D&B) archival data provided by Walls & Associates (no website; contact: [dwalls2@earthlink.net](mailto:dwalls2@earthlink.net)):

These data contain a quasi-exhaustive picture of all establishments that figure in the D&B databases and have a DUNS number. We have establishment location (latitude and longitude), employment, and primary industry (NAICS 6-digit) code. More than 95% of establishments and employment are geocoded to the most precise (block-face) level.

- Data for **Montreal and Toronto** come from the Scott's National All Business Directories, a private data set maintained and provided by the Scott's Directories (<https://www.scottsdirectories.com/>).

These data are not exhaustive but provide a large sample (based on the Canadian Business Register) of business service establishments in the major Canadian cities. Establishments are geo-referenced based on their postal codes, which are very accurate in the major metropolitan areas. The postal code conversion files (PCCF) allow to map the postal codes to geographic coordinates and the census geography. We thus have information on latitude, longitude, primary industry (NAICS 6-digit) codes, and employment at the establishment. NAICS codes and employment are self-reported. While industry codes do accurately reflect the establishments' main line of business, employment figures provide only an approximate idea of size.

### 3.9 County Business Patterns (Validation)

The US Census Bureau (2016) provides data on establishments and employment at the ZIP code level as defined by the US Postal Service as of 2014. The County Business Patterns data covers “covers most of the country’s economic activity” but excludes “self-employed individuals, employees of private households, railroad employees, agricultural production employees, and most government employees” (US Census Bureau , 2018). The data is provided at the US Postal Service ZIP Code level. This has three implications for the usability of the data. Firstly, because of data protection, the Census Bureau uses a technique called noise infusion to make it impossible to identify certain company characteristics. By its very definition (and level), it should not be a concern for the metric we are presenting here. Secondly and also due to data protection concerns, the Census Bureau provides only tabulated data (e.g. 0-19 employees) for some zip codes. In these cases, we assume the mean of the tabulated class. Finally, as ZIP codes can be either post boxes of single (large) firms or areas, no information is given on the area associated with them in this source. It is thus necessary to match same with other census data to arrive at sensible spatial unit.

In order to do so, we match the data to ZIP Code Tabulation Area (ZCTA) which approximates the US Postal Service ZIP code areas for census purposes. Unfortunately, the Census Bureau itself does not provide a crosswalk file to harmonise these online. However, John Snow Inc. provides a file via the UDS-Mapper by the American Academy of Family Physicians, which links ZIP codes to the ZCTAs. While their website only provides the 2017 version of the matching file, the 2015 version is archived at Github.<sup>14</sup> Using this crosswalk file, it is possible to match 38,782 of the 38,792 US Postal Service ZIP codes with the US Census Bureau ZCTAs. The 10 US Postal Service ZIP codes that are not matched host 493 employees. Unfortunately, the US business pattern data also has a large residual group for which no ZIP code level data is given - hosting 3,542,088 employees in 20,035 establishments. These are employers without a fixed location within the county or state.<sup>15</sup> The degree to which this omission in the data collection affects the results is unknown. However, they are comparatively small part of the sample in terms of employees (2.9%) and in particular in terms of establishments (0.27%). We thus assume that any potential non-randomness of their omission does not affect our results. As the County Business Pattern Data does only provide data on zip codes that have either at least one establishment or one employee, a number of ZTCAs remains unmatched. It is safe to assume that these either are purely and almost purely residential ZCTAs or host almost exclusively government offices. Such areas make up about 2 % of the total sample of 33,022 ZCTAs, many of which lie outside of metropolitan areas.

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<sup>14</sup>Specifically, it can be downloaded at JJ Chen’s github profile: <https://github.com/jjchern/zipcta/tree/master/data-raw>.

<sup>15</sup>This could be either due to respondents not declaring or being actually without a fixed location.

## 4 Data on urban form & physical geography

### 4.1 Definition of developable, undevelopable, and developed land

We use a combination of three different remote sensing datasets to create definitions for developed, developable and undevelopable land at the metro- and at the grid-level. These are (1) elevation data, (2) data on waterbodies, and (3) landcover data .

#### (1) Elevation data and slopes

For elevation data, we rely on the work by Danielson and Gesch (2011). These authors provide a global elevation dataset at the 225m level. We merge these data to our city grids and then for each grid point compute the slopes to all adjacent grid cells. Each grid is then assigned the highest slope within this set of adjacent grid midpoints. In terms of elevation, we define a grid cell as undevelopable if the slope between its own and the centroid of any adjacent cell exceeds 20%.<sup>16</sup>

#### (2) Waterbodies

We employ high-resolution data on water to define grid-level indicators. This is based on the global water database (Feng et al., 2016), which provides a 30m x 30m grid on global waterbodies. If the centroid of our 250m x 250m cell lies in a waterbody, it is classified as undevelopable.

#### (3) Landcover

For landcover, we use the AVHRR Global Land Cover Classification data at the highest resolution available, which is at 1km (Hansen et al., 2000). This is a global raster data that classifies each pixel into one of the following thirteen categories: (0) Water, (1) Evergreen Needleleaf Forest, (2) Evergreen Broadleaf Forest, (3) Deciduous Needleleaf Forest, (4) Deciduous Broadleaf Forest, (5) Mixed Forest, (6) Woodland, (7) Wooded Grassland, (8) Closed Shrubland, (9) Open Shrubland, (10) Grassland, (11) Cropland, (12) Bare Ground ,(13) Urban and Built.<sup>17</sup> We define land as developed if the centroid falls in a cell that is “urban and built (13)”.<sup>18</sup>

#### Summary of definitions

- Undevelopable land: takes value of 1, if centroid-to-centroid slope exceeds 20% for any of the adjacent cells **or** centroid lies in water.
- Developable land: takes value of 1, if undevelopable land takes value of 0.
- Developed land: takes value of 1, if centroid lies in cell classified as urban and built (13) in the global land use classification.

### 4.2 Elevation Distance Gradient

We calculate the elevation distance gradient with the following regression:

$$\ln(E_g) = \alpha + \beta \ln(d_g, i) + \epsilon_g \quad (3)$$

where  $\ln(E_g, k)$  is the logarithm of the elevation of grid cell  $g$ , which is within 5 kilometers of our grid cell of interest  $i$ .  $d$  is the distance between the grid cell  $g$  and our grid cell of interest  $i$ . Correspondingly,  $\beta$  is the elevation distance gradient.

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<sup>16</sup>Note that Saiz (2010) use a slightly lower slope of 15 % to define undevelopable land. However, upon inspection of a few cities such as Abu Dhabi, 20% appeared to be a more reasonable cutoff.

<sup>17</sup>See <http://glcf.umd.edu/data/landcover/data.shtml>.

<sup>18</sup>While it is unfortunate that we derive these data from a much less-fined grid (1km x 1km versus 250m x 250m) as no data with higher resolution is available, we only use this variable at the metro/city level analysis. For this purpose, using a 1km x 1km strikes us as a warranted simplification.

### 4.3 Irregular shape index

Harari (2018) shows that the shape of cities matters and that geographic constraints can change the path of urban development. She suggests a measure similar to ours. In our implementation, the irregular shape index for metro  $m$  ranges from 0 to 100 by taking the following form:

$$S_m = \left( 1 - \frac{\frac{128}{45\pi} \sqrt{\frac{D_m}{\pi}}}{\frac{1}{N_m^2} \sum_i^{N_m} \sum_j^{N_m} d_{ijm}} \right) * 100 \quad (4)$$

where  $\frac{1}{N_m^2} \sum_i^{N_m} \sum_j^{N_m} d_{ijm}$  is the average distance between developed (/developable) grid cells in metro  $m$ ,  $\sqrt{\frac{D_m}{\pi}}$  is the radius of a circle with the same surface area  $D_m$  as the developed (/developable) area,  $\frac{128}{45\pi} \sqrt{\frac{D_m}{\pi}}$  is an approximation of the average distance between uniformly distributed points within a circle with the same surface area  $D_m = N_m * 0.25^2$  as developed (/developable) area ( $N_m$  is the number of developed (/developable) grid cells in a metro  $m$ , 0.25 (km) is the length of each side of each grid cell).

### 4.4 Fragmentation index

Additionally, we calculate a fragmentation index. It ranges from 0 = no fragmentation (all cells clumped together) to 100 = full fragmentation (every grid cell isolated).

$$F_m = \frac{\sum_i^{N_m} u_{im} \forall \text{ developed } i}{N_m} * 100 \quad (5)$$

Where  $u_{im}$  is the length of a grid cell's circumference bordering undeveloped (/undevelopable) land. It is approximated by the number of edges bordering undeveloped cells, multiplied by 0.25 (km), the length of each side of each grid cell.  $N_m$  is the number of cells, equivalent to the total circumference of grid cells (4 x 0.25 km) in a scenario in which grid cells are perfectly dispersed (i.e. a counterfactual in which developed/developable grid cells would not border each other).

### 4.5 Other definitions of terrain

For our analysis of market and rail potential in the 19th century, we require data on mountainous terrains, oceans, and inland water bodies. To this end, we employ the land cover data for the detection of grid cells with water and a 250m raster on mountains from the United States Geological Survey called the Global Mountain Explorer (<https://rmgsc.cr.usgs.gov/gme/>) based on earlier work by Körner et al. (2011).

## 5 Auxiliary data used in prime locations

### 5.1 US metro GDPs— sources and imputation of sectoral data

#### 5.1.1 Sources

**GDP Data for Metropolitan Statistical Areas (MSAs)** are from the Bureau of Economic Analysis: “Gross Domestic Product by Metropolitan Area, Advance 2016, and Revised 2001-2015.” September 20, 2017 release (download here). These data are consistent with the national accounts release: “Gross Domestic Product by Industry and Input-Output Statistics.” November 3, 2016 release (download here). The non-MSA part of GDP is the difference between the national and the MSA value added.

**Population data** are from The Population Division of the U.S. Census Bureau provides population data. We use the data publicised as “Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2017” (Release Date: March 2018). The data can be accessed through the Census Bureau’s website.

#### 5.1.2 Imputation of missing data

Because of data privacy concerns, the data for the lower level service sectors for a number of MSAs are not publicised in the regional accounts provided by Bureau of Economic Analysis (2018). The missing values for the MSAs are shown in Table 5 by the numbers of MSA missing and the value in total MSA GDP for the respective industry missing. However, they are included in the higher-level regional and industry aggregates. For each of the prime services, we know the valued added produced inside and outside all MSAs, which are displayed in Table A2 in the main paper.

Table 5: Prime Services Value Added in MSAs - Shares of Non-missing Data

Industry	Coverage	
	% of MSAs	% of MSA GDP in industry
All Industries (Metro-GDP)	100	100
Manufacturing	90.34	87.22
<i><b>Prime Service Industries</b></i>		
Finance and insurance	89.56	93.04
Real estate	77.81	84.76
Professional, scientific, and technical services	76.5	67.63
Management of companies and enterprises	68.15	59.78

*Note:* Own calculation. See table ?? for underlying sources.

In smaller MSA’s, a part of the data on the relatively fine prime-service level is missing because of confidentiality and privacy issues. For each industry  $i$ ,  $z$  MSA observations are given and  $382 - z$  observations are missing such that we can rewrite the MSA-related term from above as follows:

$$\sum_m^{n=382} VA_{i,m} = \sum_m^{n=z} VA_{i,m} + \sum_{mm}^{382-z} VA_{i,mm} \quad (6)$$

where  $VA_{i,mm}$  describes the missing data in MSA  $mm$ . While we do not know the  $VA_{i,mm}$  for each individual of  $382 - z$  MSAs having missing data, their aggregate value added  $\sum_{mm}^{382-z} VA_{i,mm}$  can be

computed as the difference of  $\sum_m^{n=382} VA_{i,m}$  and  $\sum_m^{n=z} VA_{i,m}$ .

With this sum of all value added that is not allocated to a certain metro at hand, what remains to be done is to distribute it in a way broadly consistent with the economic size of the MSA  $mm$ . To approximate the value added produced in prime sector  $i$ , we thus weigh the remainder by the share of

MSA  $mm$  in the total value added of all MSAs that have a missing value for the particular industry. The total value added is known for each of the MSAs.

$$VA_{i,mm} = \frac{VA_{mm}}{\sum_{mm} VA_{mm}} * \sum_{mm}^{382-z} VA_{i,mm} \quad (7)$$

We also use this approach for the few cases, for which no manufacturing data exist. While this extrapolation approach is necessarily inexact, it seems reasonable and justified for our purpose. Most importantly, we present all results with and without interpolated data. In general, this methodology allows us to produce very reasonable metro-level estimates of industry shares for those observations that are missing.

Table 6 compares the results with and without the imputation. It becomes apparent that the imputation has a dampening effect on both the effect on the share of manufacturing and the effect on the share of prime services. The reason may be that in relatively small metros, one large provider per industry might exist and that the corresponding data are deleted because of confidentiality concerns. Because of the fact that such omission is obviously non-random, we prefer the results including the imputed data.

Table 6: Relationship of prime services and population agglomeration - effect of imputation

	Share of prime services		Share of manufacturing	
	with imputation	w/o imputation	with imputation	w/o imputation
ln(population)	0.0364*** (14.13)	0.0434*** (11.45)	-0.0183*** (-4.75)	-0.0299*** (-4.95)
constant	-0.243*** (-7.32)	-0.352*** (-7.38)	0.377*** (7.33)	0.524*** (6.48)
$N$	382	195	382	195

Note:  $t$  statistics in parentheses; \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

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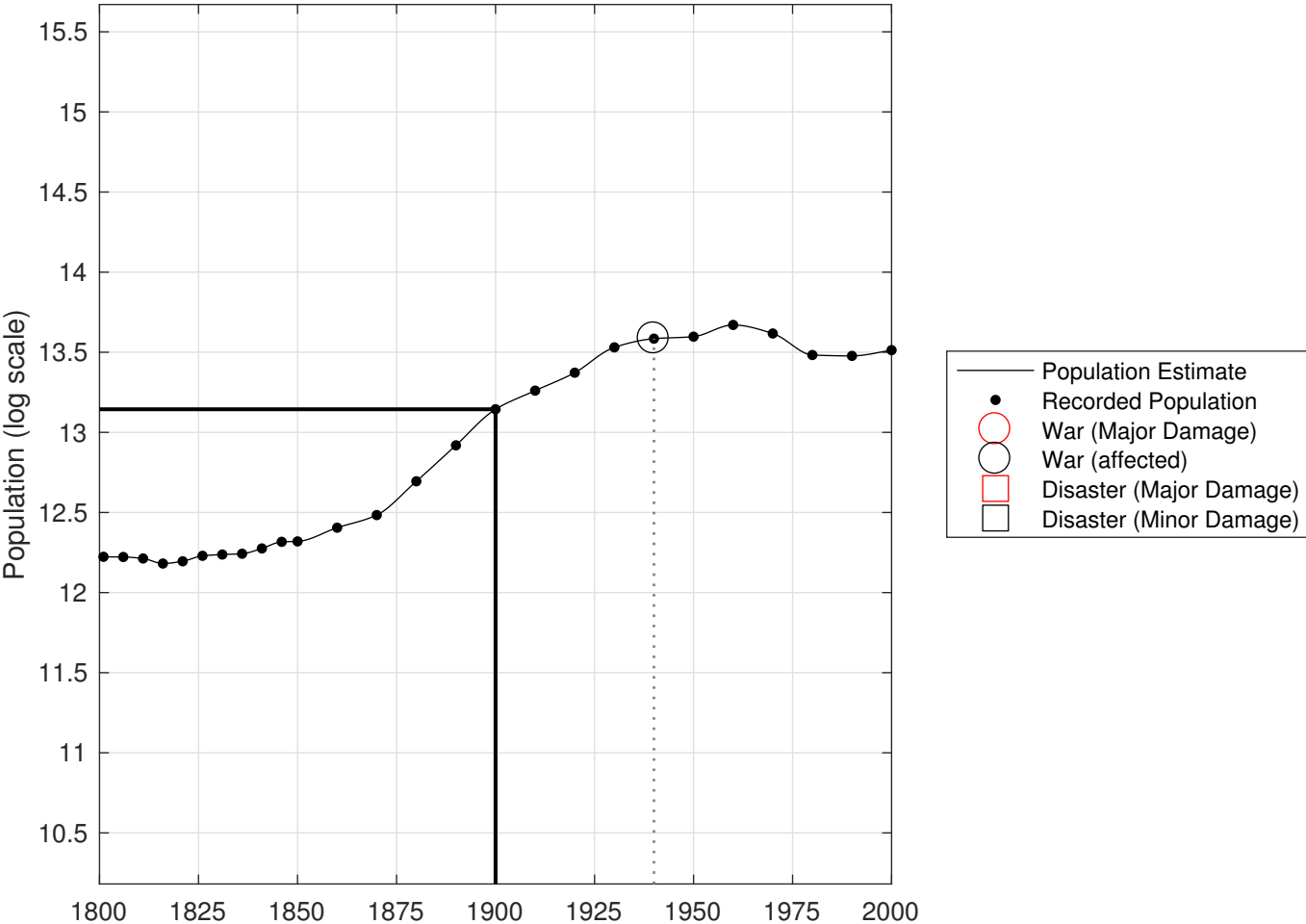


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# A All Cities (except Chinese)

## A.1 Amsterdam

Figure 10: Amsterdam



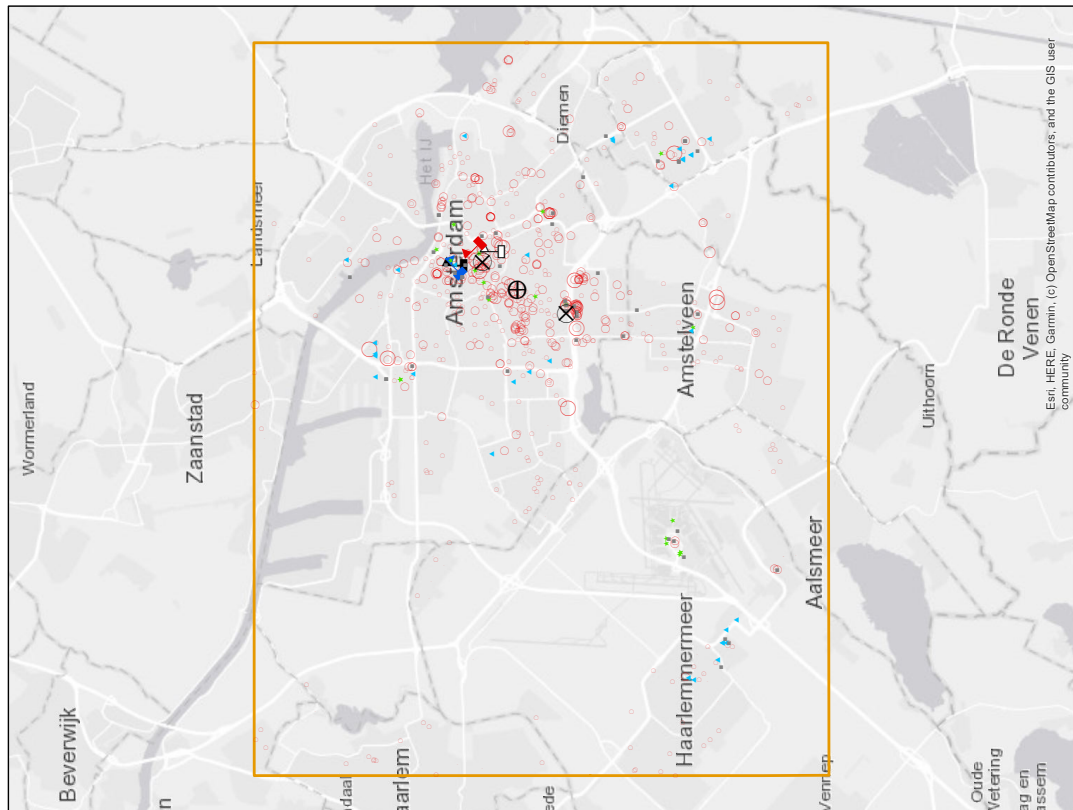
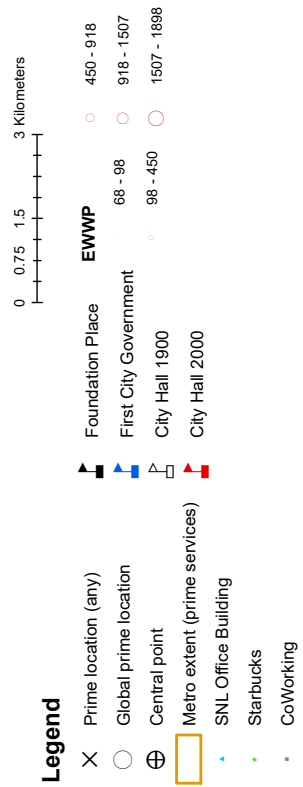
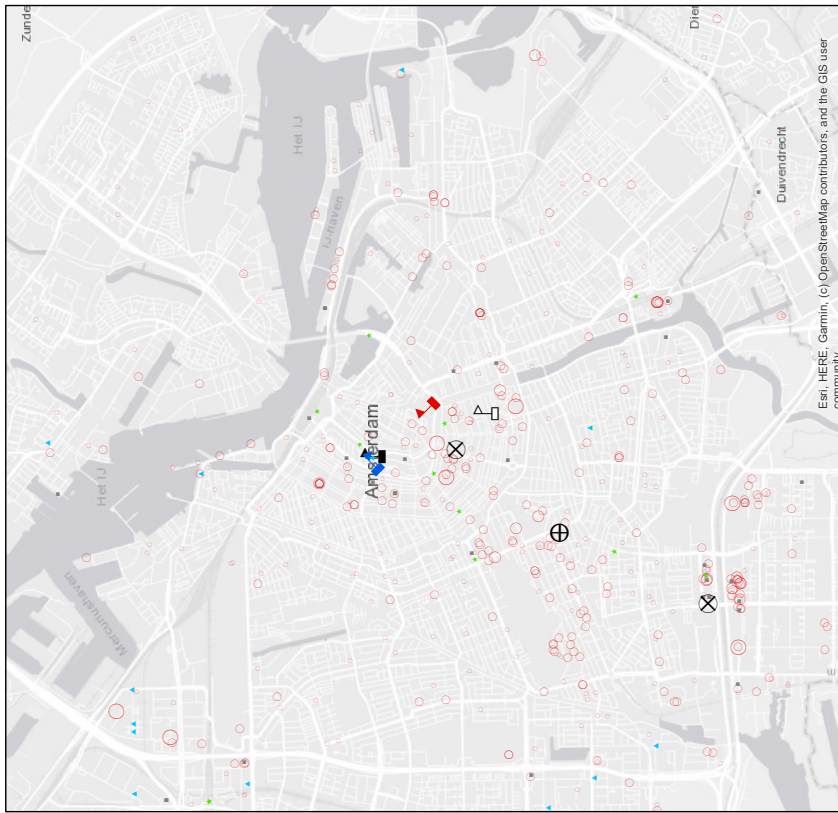


Table 7: Sources: Amsterdam ( Netherlands )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1250	Amsterdam City Marketing (2014b)
First Political Institution	1655	Koninklijk Paleis Amsterdam (2014)
City Hall	1900	Koninklijk Paleis Amsterdam (2014)
City Hall	2000	Amsterdam City Marketing (2014a)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Cybriwsky (2013, p.10)
<i>Population Data (1800-2000)</i>		
City Population	1796, 1801, 1806, 1811, 1816, 1821, 1826, 1831, 1836, 1841, 1846, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000, 2009	Van Leeuwen and Oeppen (1993, Table 9), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1977	Pucher and Lefevre (1996, 93)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1940 <sup>a</sup>	Amsterdam City Marketing (2014b)

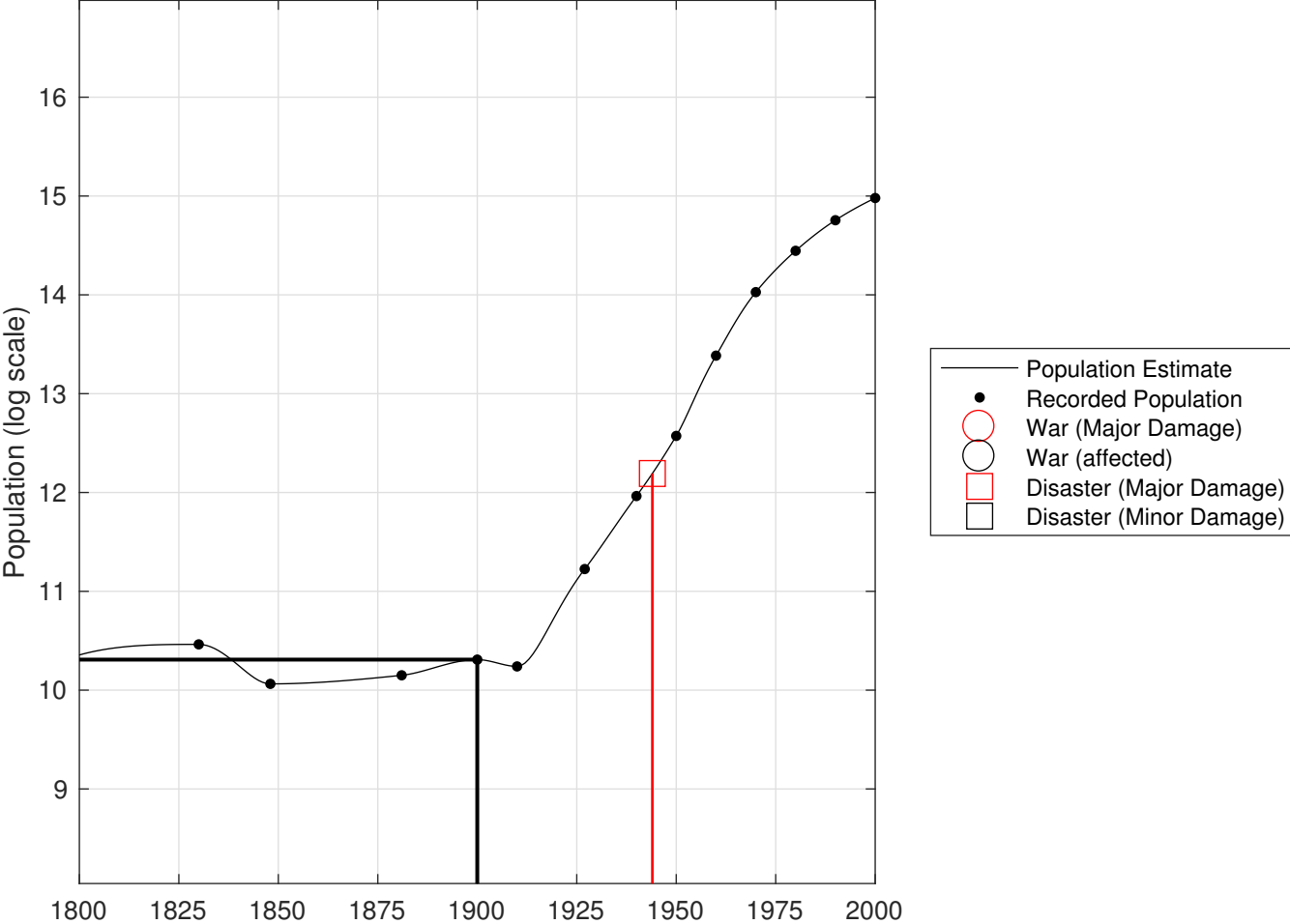
<sup>a</sup>German Occupation until 1945 and deportation of Jews led to a decrease of the population by 10 %. Yet, there was little damage to the building stock.

Table 8: Concentration Measures - Amsterdam

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	6.08
Cumulative density of employment-weighted PP distances at 750 m	%	27.10
Average distance between all prime locations	in kilometres	1.62
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.54
Weighted average distance from EWPPs to 1900 CH	in kilometres	4.34
Average from all prime locations to 1900 CH	in kilometres	1.91
Average distance from global prime locations to 1900 CH	in kilometres	2.32

A.2 Ankara

Figure 11: Ankara



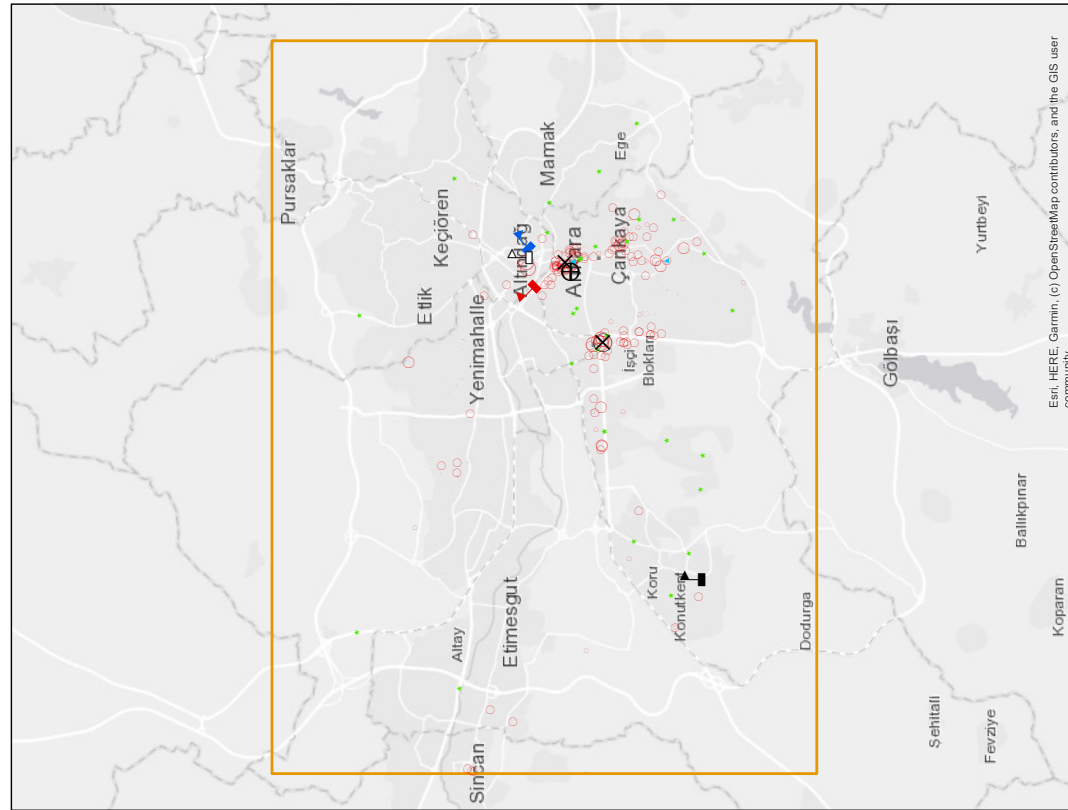
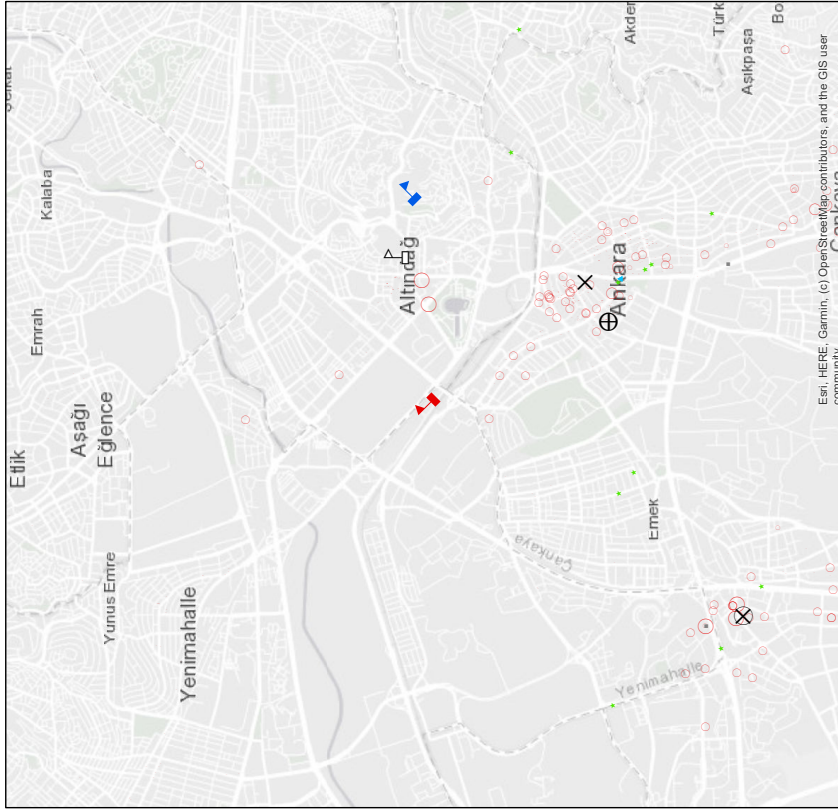


Table 9: Sources: Ankara ( Turkey )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	-4000	Hurriyet Daily News (2012)
First Political Institution <sup>b</sup>	-1400	Kacar (2010, p. 48)
City Hall <sup>c</sup>	1900	Wagner & Debes (1914), Dernburg (1892, p. 80)
City Hall	2000	Greater Municipality of Ankara (2014)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900, 1950 <sup>e</sup> , 2000	Birken (1976, p. 130-132), Encyclopaedia Britannica (2013a)
<i>Population Data (1800-2000)</i>		
City Population	1785, 1830, 1848, 1881, 1900, 1910, 1927, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Behar (1996, Table 2.13), Bonné (2001, p. 224), Mitchell (2007, p. 42), Batuman (2013, p. 581)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>f</sup>	1996	Özgür (2011, 149)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	1944 <sup>g</sup>	Ozmen and Kocaepe (1999, p. 3)
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>Excavations revealed structures from 3000 to 5000 BC, so we took the 4000 BC as a guesstimate and the location of the excavations.

<sup>b</sup>The Castle is the oldest apparent structure, which would have been used for governing the city. It was built by the Hittites, which means it was built most likely 1600-1200 BC, we take 1400 BC as a guesstimate here.

<sup>c</sup>The Konak used to be the Pascha's/governor's seat (Dernburg, 1892, p. 80). We infer the seat of the Ottoman governor from a 1914 map.

<sup>d</sup>It seems it had a regional function before 1867, when it became capital of a new Ottoman Province

<sup>e</sup>Became capital in 1923.

<sup>f</sup>LRT opening in 1996, metro in 1997.

<sup>g</sup>Bolu-Gerede Earthquake

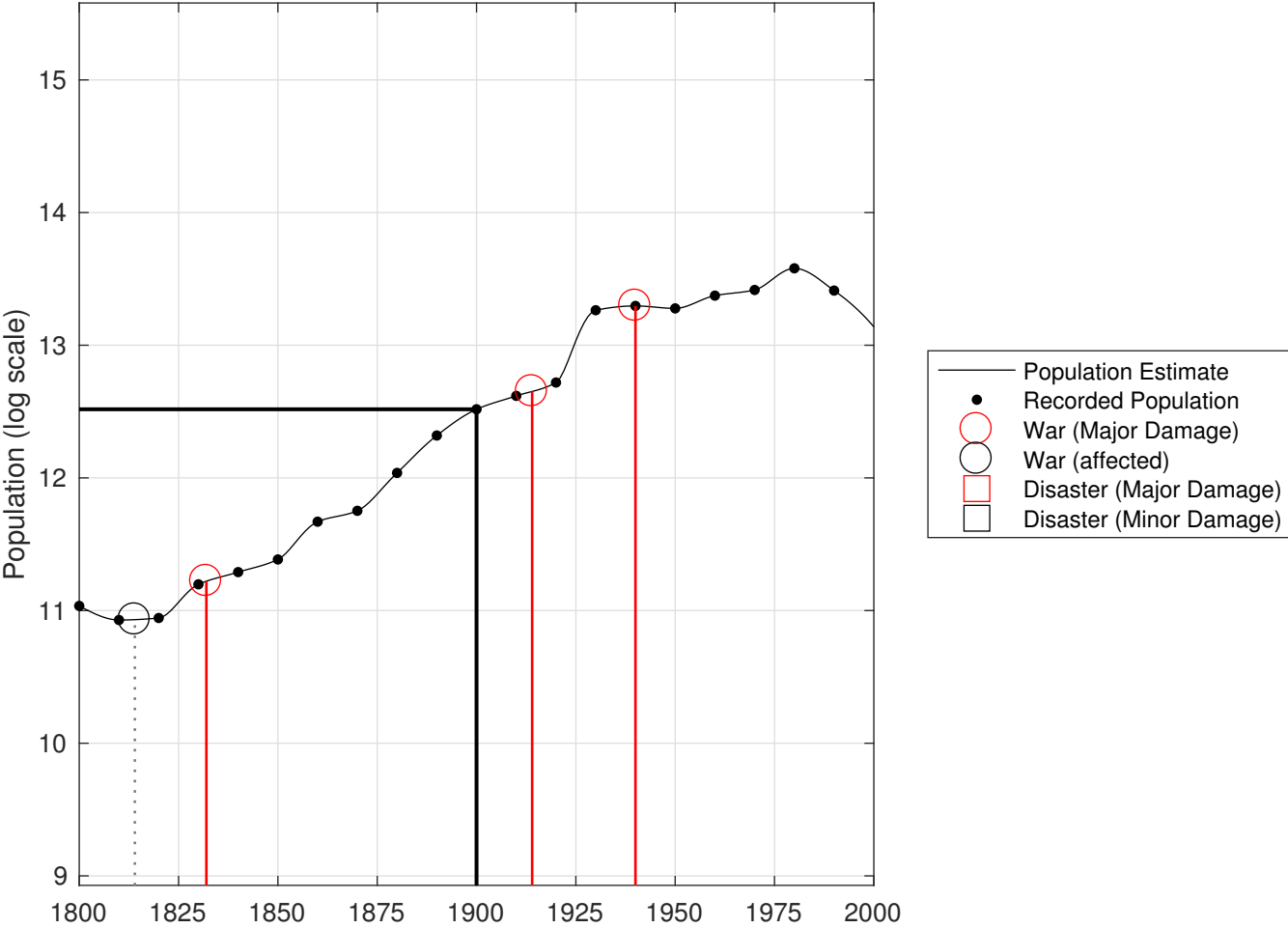


Table 10: Concentration Measures - Ankara

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	6.55
Cumulative density of employment-weighted PP distances at 750 m	%	13.27
Average distance between all prime locations	in kilometres	2.02
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.21
Weighted average distance from EWPPs to 1900 CH	in kilometres	5.59
Average from all prime locations to 1900 CH	in kilometres	3.04
Average distance from global prime locations to 1900 CH	in kilometres	5.46

A.3 Antwerp

Figure 12: Antwerp



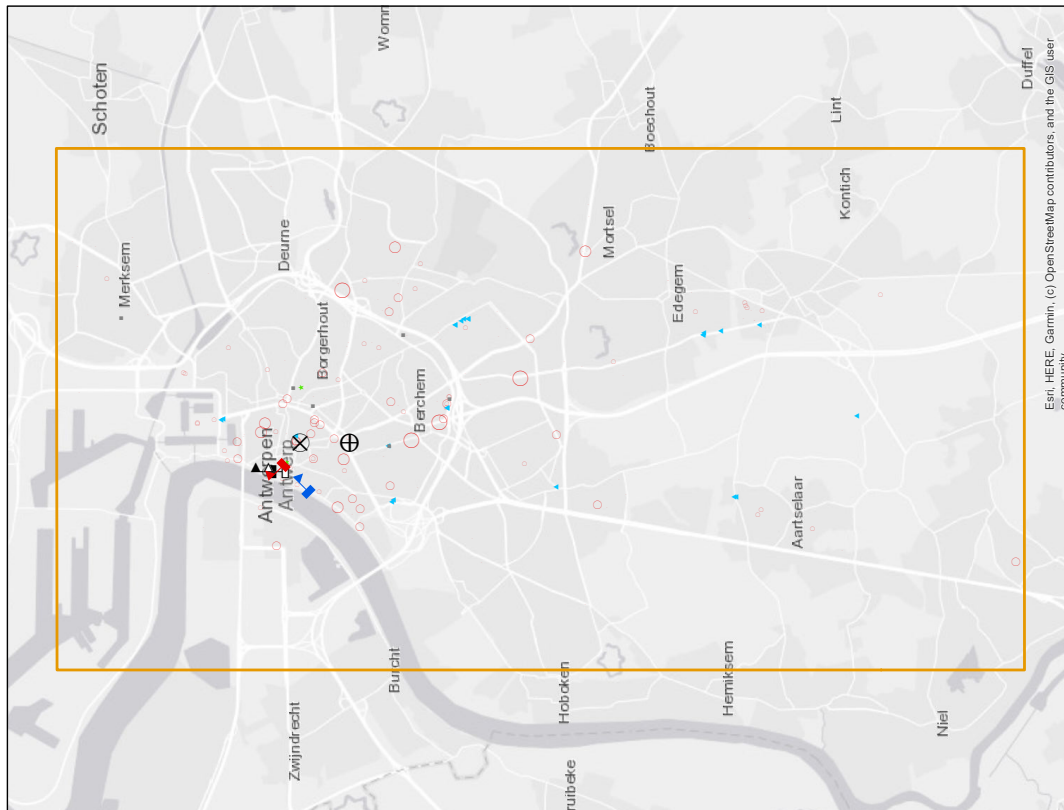
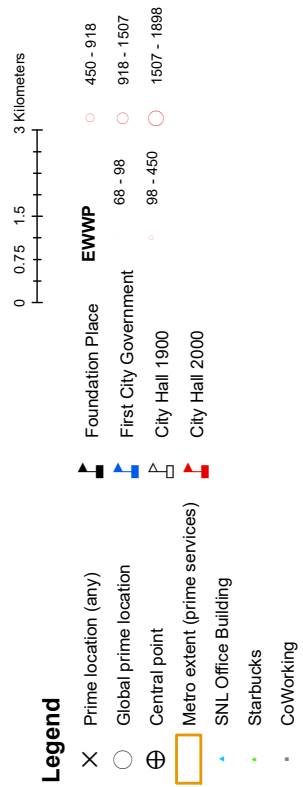
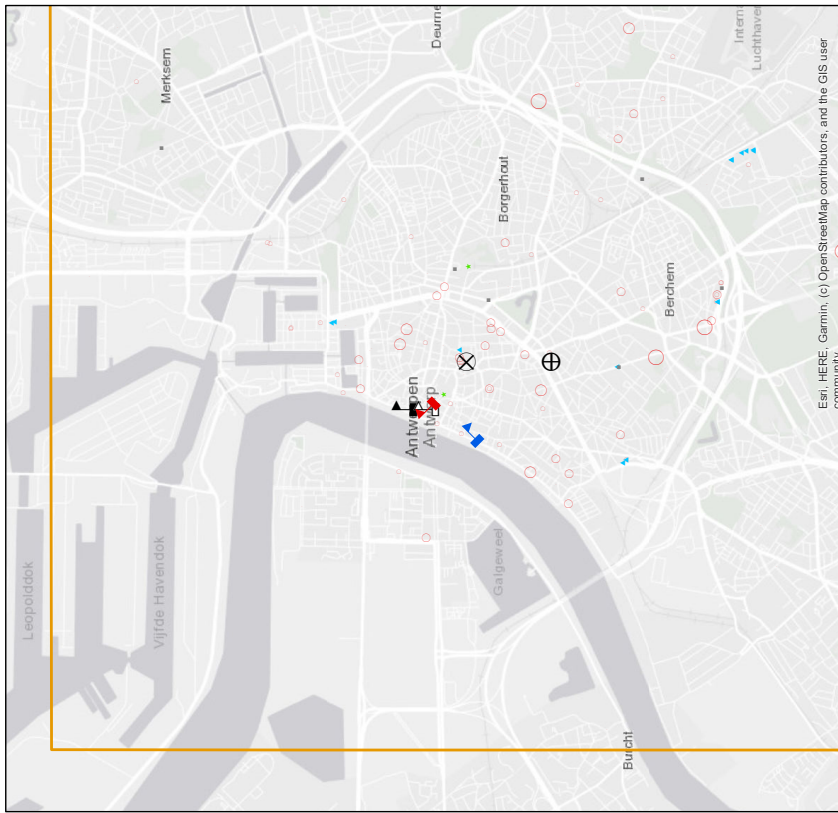


Table 11: Sources: Antwerp ( Belgium )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	-250	Verhulst (1999, p. 13)
First Political Institution <sup>b</sup>	-650	Verhulst (1999, p. 14), Harreld (2004, p. 18), Erfgoed (2014)
City Hall <sup>c</sup>	1900	Harris (2005)
City Hall	2000	Harris (2005)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900, 1950, 2000	Aitchison (1798, p. 691)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1810, 1820, 1830, 1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2003	Degradand (1840, P. 18), Porter (1834, p. 577), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>e</sup>	1975	Goldsack (1980, 83)
Number of Stations	1910, 1940, 2010	Schwandl (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1814 <sup>f</sup> , 1832 <sup>g</sup> , 1914 <sup>h</sup> , 1940 <sup>i</sup>	Bickers (1993, p. 103), United Service Journal (1833, p. 289f), Höltz (1847), Klekowski and Klekowski (2014, p. 69), de Tourettes (1840, p. 75)

<sup>a</sup>Findings indicate settlement around here from the 2nd and 3rd century AD, hence we assume 250 BC. It could have been a fortification, but an urban character is unlikely.

<sup>b</sup>Exact date unclear, but a fortification was here in the 7th century. From the castrum, administrative tasks were carried out. The site of St. Michaels is found online (Erfgoed, 2014).

<sup>c</sup>Today's city hall was erected in 1561-1566.

<sup>d</sup>Antwerp becomes provincial capital in 1796 and there is no apparent change of this status afterwards.

<sup>e</sup>First line only 1.2 miles, second line finished in 1981. It is a pre-metro system connected to the tram system, but partly underground. We count the underground stations only accordingly. The system was planned as metro system, but was then operated by trams only (Schwandl, 2016).

<sup>f</sup>English troops occupied the city after three days of "bombardement." However, we could not find any information of the extent of the bombardement specifically targeted at Antwerp.

<sup>g</sup>Belgian Independence Movement. It seems that some damage was done to the city as "Moerser" weapons were used extensively, which is why we code "major destruction," although the extent is not entirely clear.

<sup>h</sup>Besides the destruction by the Germans, the Belgian army destroyed parts of the suburbs to have a free-fire zone. It seems that the city was not completely flattened as "the great number of projectiles used were shrapnel, which generally burst above the roofs" (Klekowski and Klekowski, 2014, p. 83)

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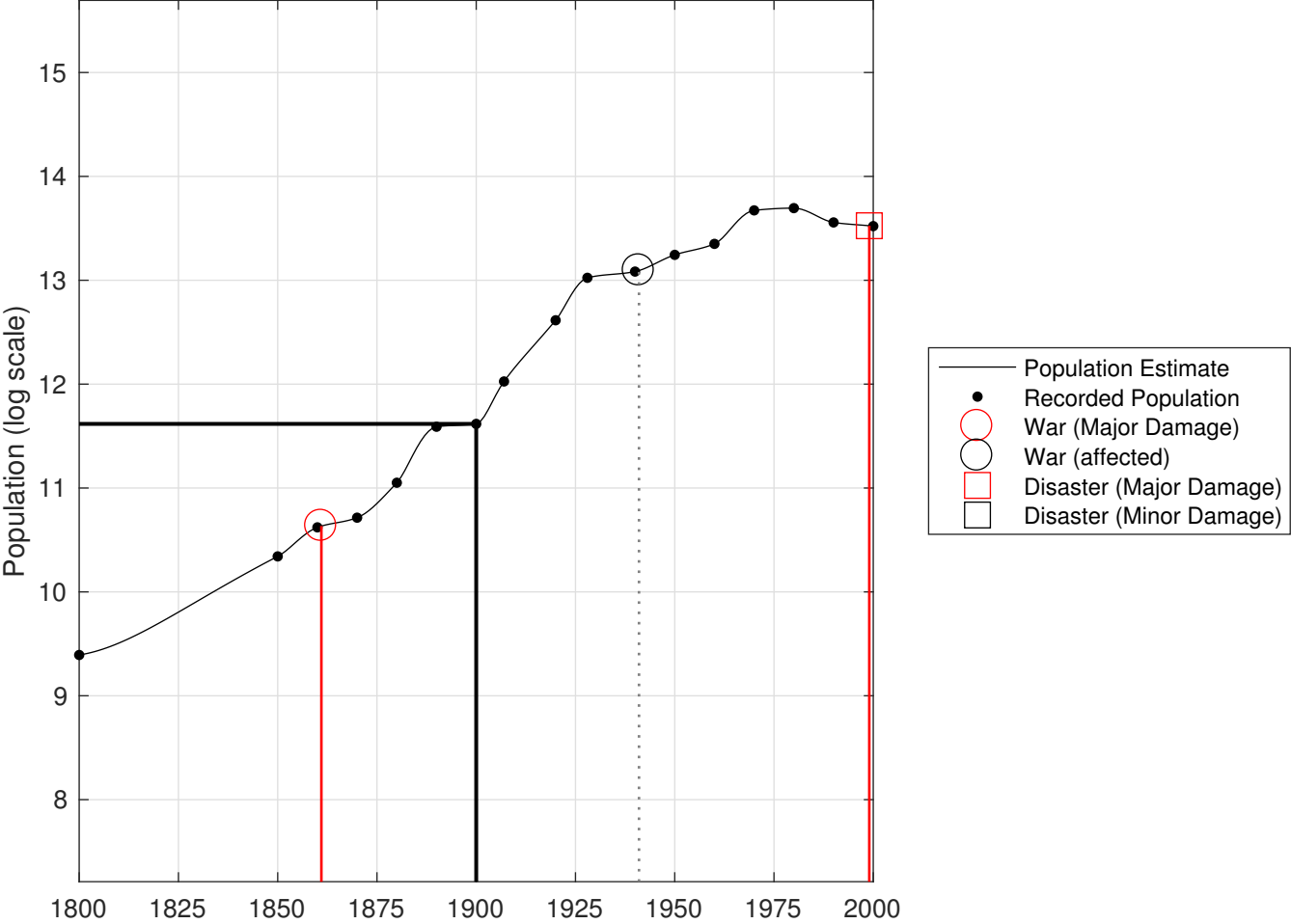
<sup>3</sup>German Occupation in 1940 and later air raids by the allies.

Table 12: Concentration Measures - Antwerp

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	3.98
Cumulative density of employment-weighted PP distances at 750 m	%	13.40
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.19
Weighted average distance from EWPPs to 1900 CH	in kilometres	3.33
Average from all prime locations to 1900 CH	in kilometres	0.67
Average distance from global prime locations to 1900 CH	in kilometres	0.67

A.4 Athens

Figure 13: Athens



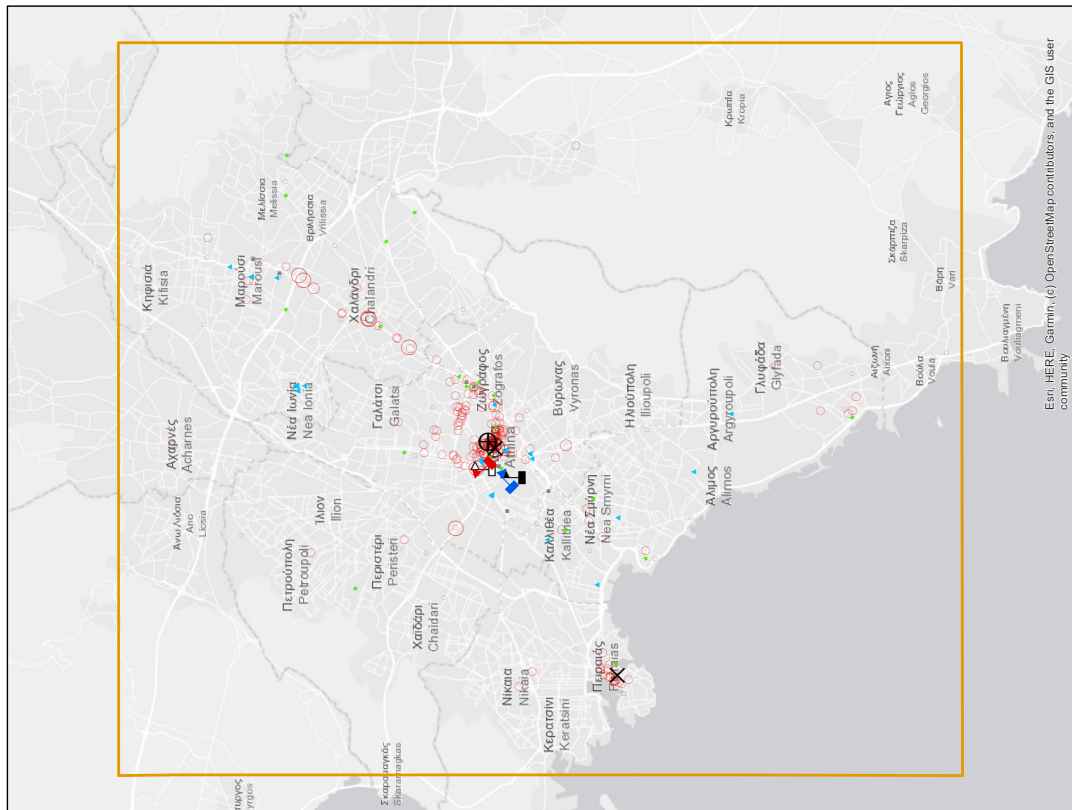
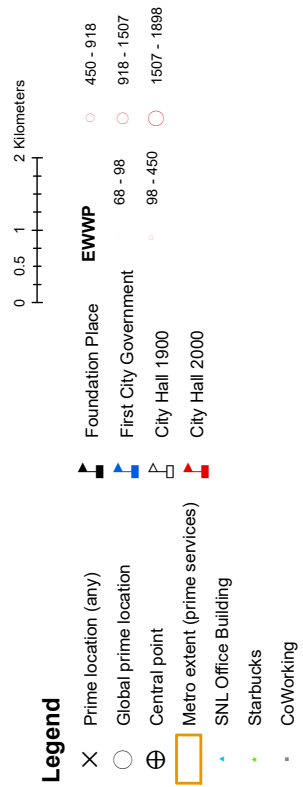
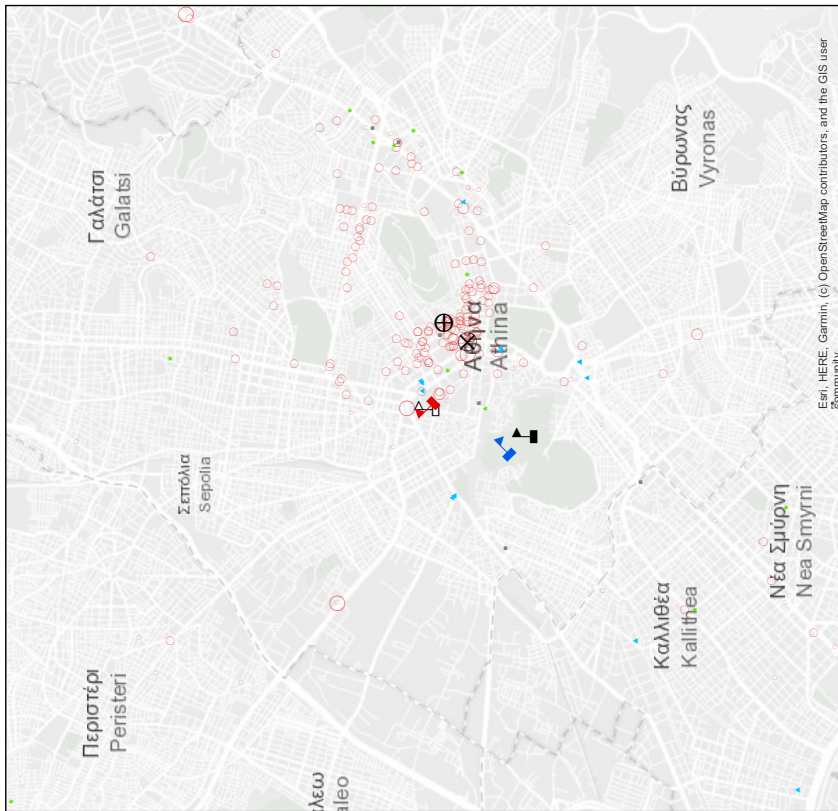




Table 13: Sources: Athens ( Greece )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	-3000	Thompson and Wycherley (1972, p. 2)
First Political Institution <sup>b</sup>	-600	Thompson and Wycherley (1972, p. 19)
City Hall	1900	Ministry of Culture and Sports (2012)
City Hall <sup>c</sup>	2000	City of Athens (2014)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900, 1950, 2000	Cybriwsky (2013, p. 24)
<i>Population Data (1800-2000)</i>		
City Population	1750, 1800, 1850, 1860, 1870, 1880, 1890, 1900, 1907, 1920, 1928, 1940, 1950, 1960, 1970, 1980, 1990, 2000, 2007	Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>e</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1869	Kassens-Noor (2012, 68)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	1999 <sup>f</sup>	Elenas (2003)
Fire(s)	2009 <sup>g</sup>	Amiridis et al. (2012)
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861 <sup>h</sup>	Campbell and Sherrard (1968, Chapter 3)
International War(s)	1941 <sup>i</sup>	Mazower (2001)

<sup>a</sup>Neolithic settlement at the foot of the current Acropolis.

<sup>b</sup>The Agora is the first reported "center of community life"

<sup>c</sup>Official Address of the Mayor's Office.

<sup>d</sup>It became capital in 1837, apparently no change thereafter.

<sup>e</sup>Footnote from United Nations Population Division (2014): data refer to the localities of Calitha, Peristrion and Piraeus, among others.

<sup>f</sup>Around 100 buildings collapsed. We code it as a major event though given the size of the city, a relatively small number of buildings collapsed.

<sup>g</sup>Destruction of Houses, decrease in air quality.

<sup>h</sup>Independence War against Ottomans lasted until 1933.

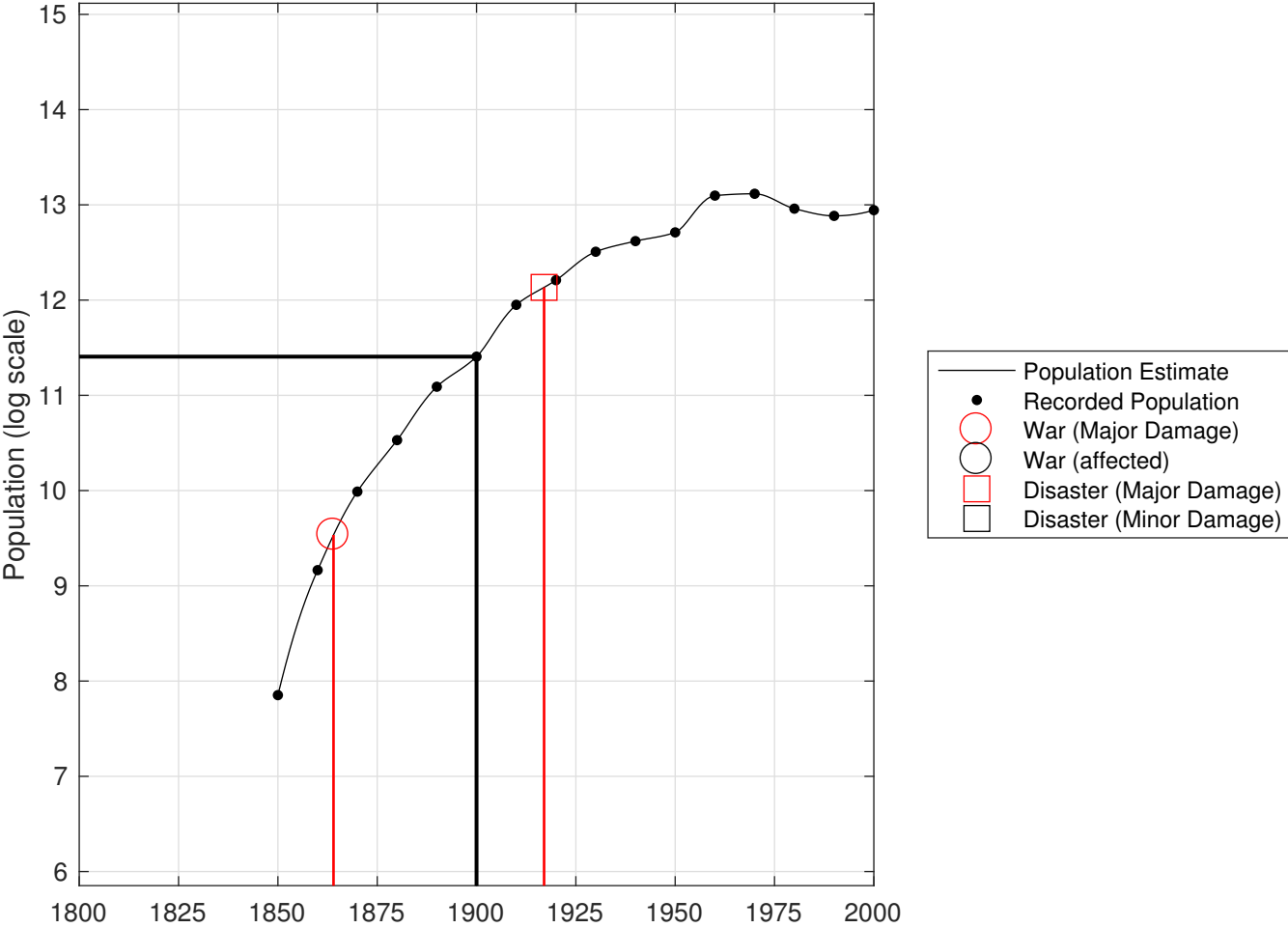
<sup>i</sup>German/Italian Occupation, famine but no physical capital destruction.

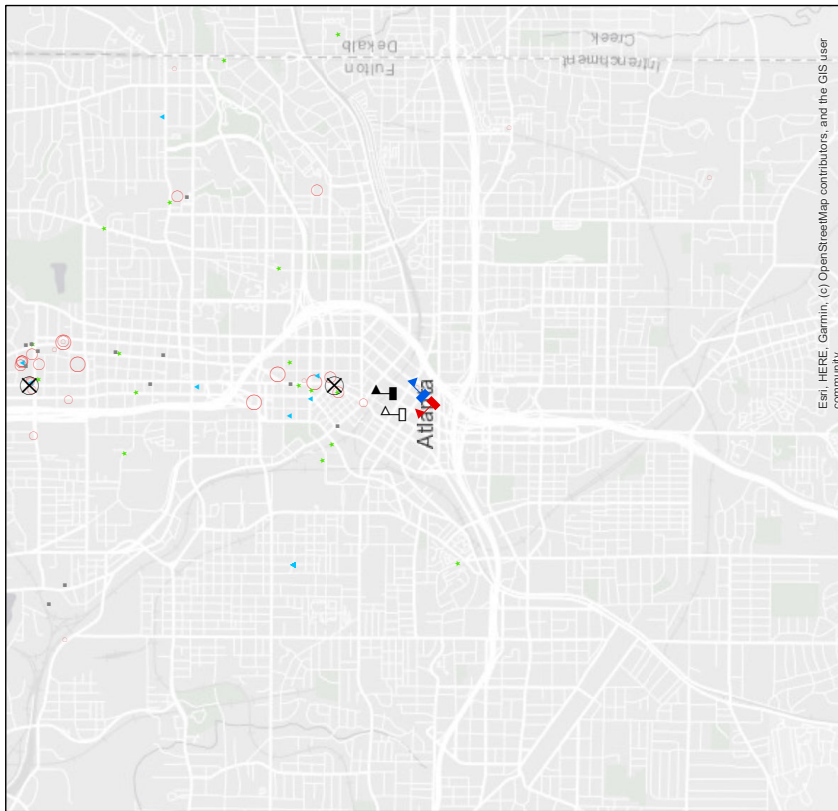
Table 14: Concentration Measures - Athens

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	6.08
Cumulative density of employment-weighted PP distances at 750 m	%	8.70
Average distance between all prime locations	in kilometres	4.60
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.57
Weighted average distance from EWPPs to 1900 CH	in kilometres	4.07
Average from all prime locations to 1900 CH	in kilometres	2.26
Average distance from global prime locations to 1900 CH	in kilometres	0.85

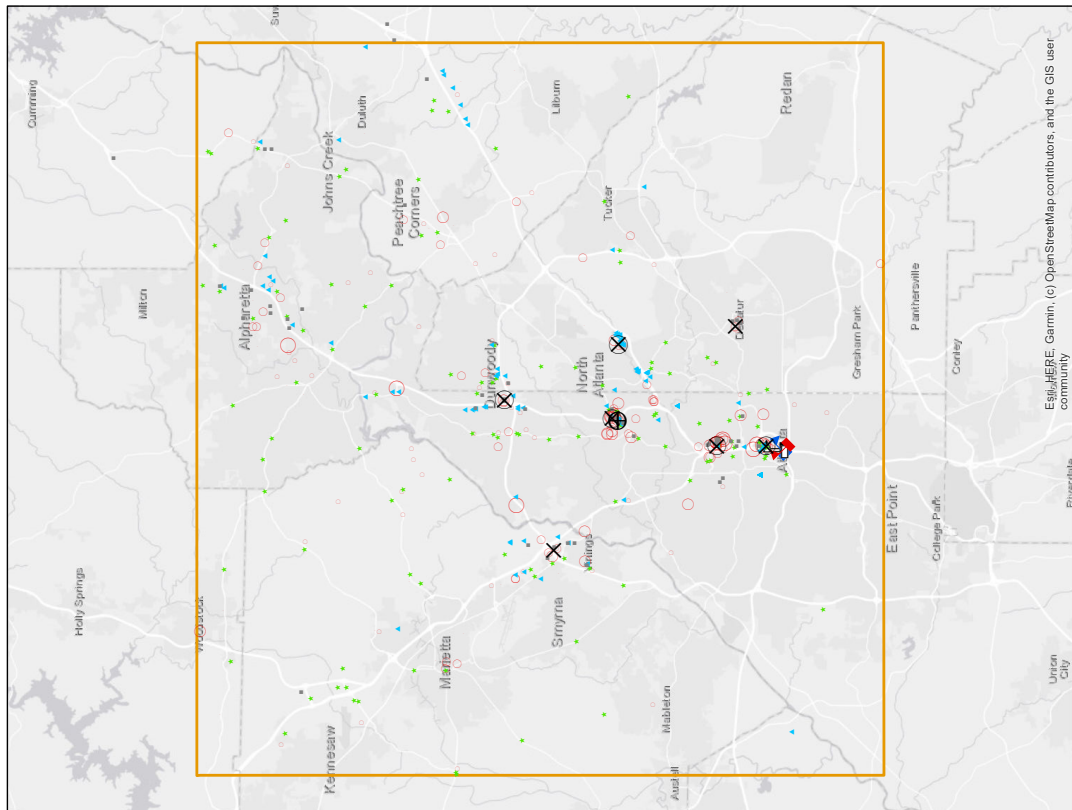
A.5 Atlanta

Figure 14: Atlanta





- Legend**
- ⊗ Prime location (any)
  - Global prime location
  - ⊕ Central point
  - ▭ Metro extent (prime services)
  - ▲ SNL Office Building
  - ▲ Starbucks
  - CoWorking
  - ▭ Foundation Place
  - ▭ First City Government
  - ▭ City Hall 1900
  - ▭ City Hall 2000
  - EWWP 450 - 918
  - EWWP 918 - 1507
  - EWWP 68 - 98
  - EWWP 98 - 450
  - EWWP 1507 - 1898



- 0 3.75 7.5 15 Kilometers

Table 15: Sources: Atlanta ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1837	Russell (1988, p. 20)
First Political Institution	1854	Garrett (2011a, p. 356)
City Hall	1900	National Park Service (2014)
City Hall	2000	National Park Service (2014)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>b</sup> , 1900, 1950, 2000	Russell (1988, p. 6)
<i>Population Data (1800-2000)</i>		
City Population	1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Gibson and Jung (2005a, p. 76), U.S. Census Bureau (2012a)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1979	Gournay et al. (1993, 17)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	Garrett (2011b, p. 700)
Fire(s)	1917	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1864 <sup>c</sup>	Russell (1988, p. 114), Encyclopaedia Britannica (2015a)
International War(s)	None recorded	

<sup>a</sup>A zero mile stone was placed as the end of a railroad. Atlanta's name back then was simply "Terminus." It was replaced only shortly after, we follow the later one as it is locatable.

<sup>b</sup>No city hall in 1850.

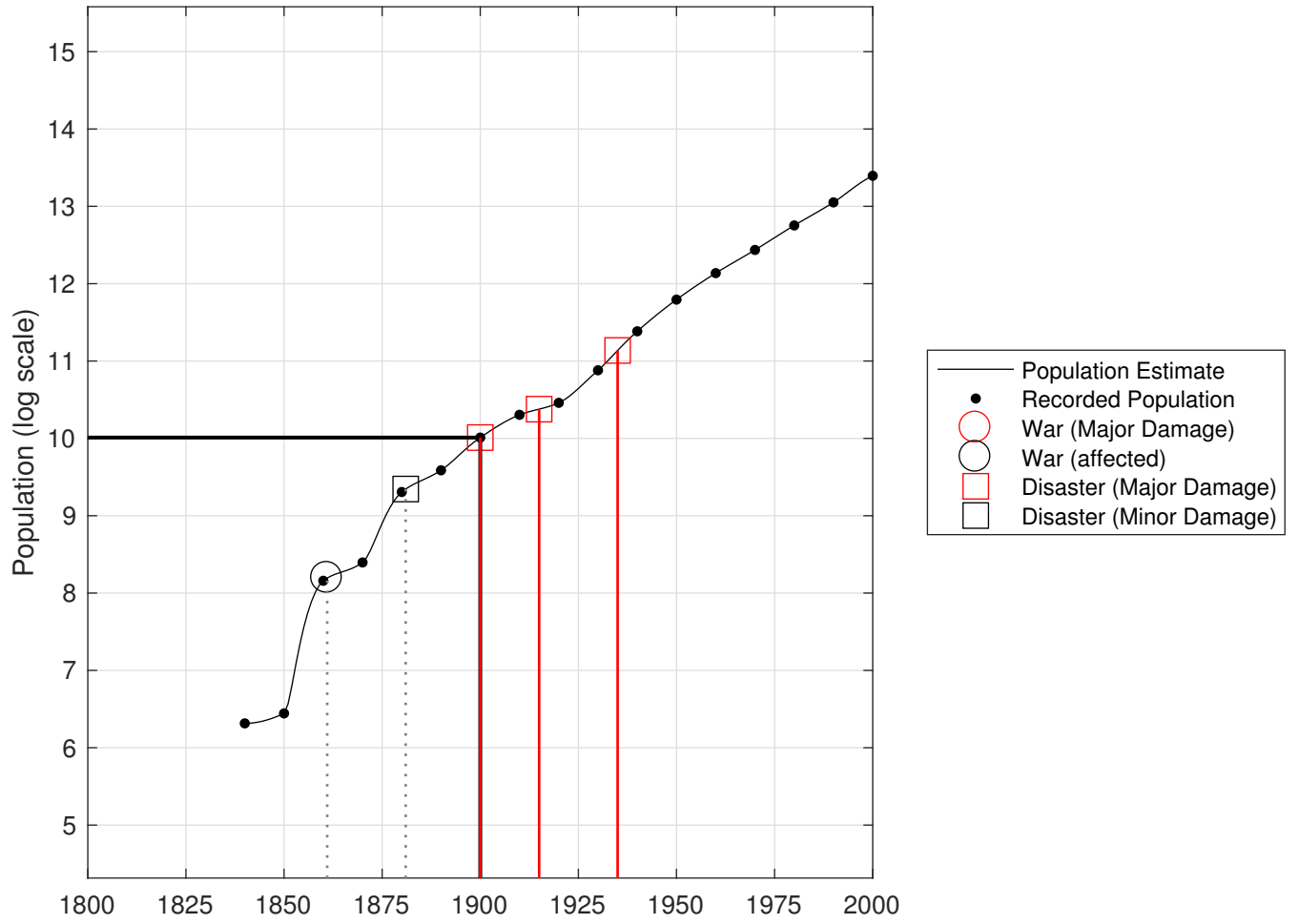
<sup>c</sup>According to Encyclopaedia Britannica (2015a) "much of the city had been burned."

Table 16: Concentration Measures - Atlanta

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	14.54
Cumulative density of employment-weighted PP distances at 750 m	%	36.39
Average distance between all prime locations	in kilometres	9.45
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.34
Weighted average distance from EWPPs to 1900 CH	in kilometres	14.44
Average from all prime locations to 1900 CH	in kilometres	7.88
Average distance from global prime locations to 1900 CH	in kilometres	7.29

## A.6 Austin

Figure 15: Austin



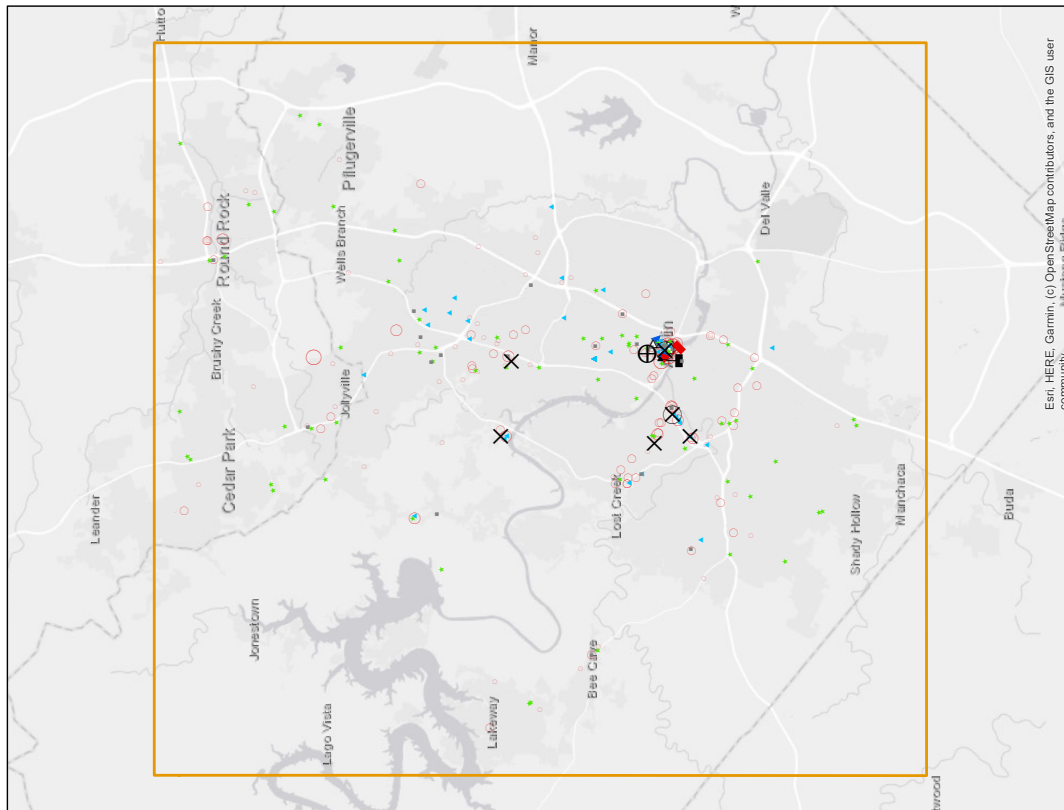
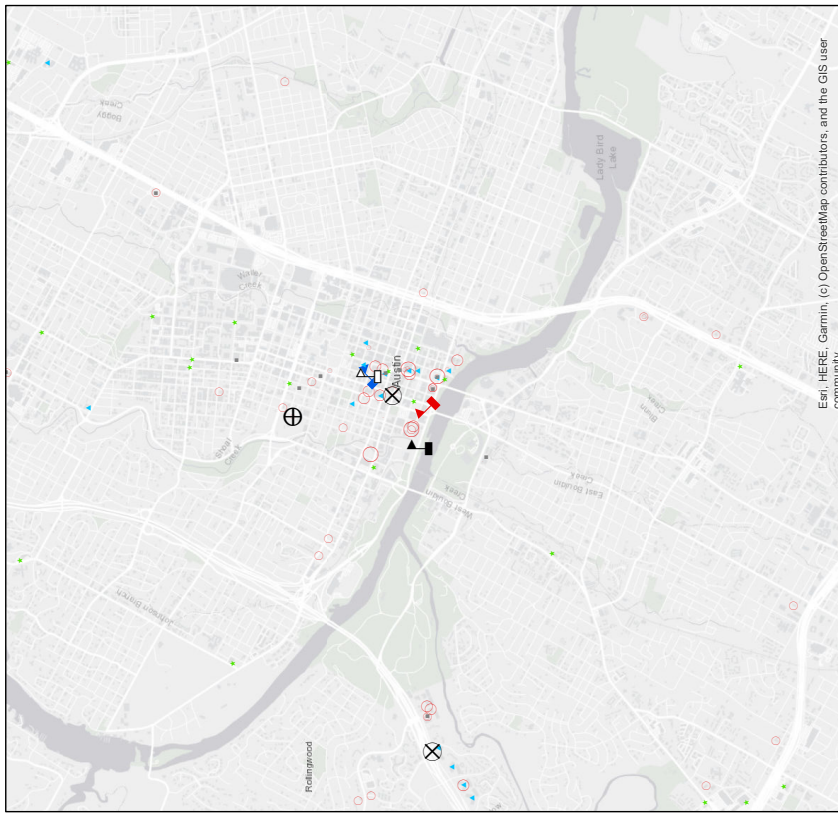




Table 17: Sources: Austin ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1837	Wharton (2013, p.192(201))
First Political Institution <sup>b</sup>	1839	Humphrey (2010), Martin (2009, p. 42)
City Hall	1900	Martin (2009, p. 23)
City Hall <sup>c</sup>	2000	United States Green Building Council (2010)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900, 1950, 2000	Humphrey (2010)
<i>Population Data (1800-2000)</i>		
City Population	1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000, 2010	City of Austin (2013), Gibson and Jung (2005a)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>e</sup>	2010	Collier et al. (2013, 442)
Number of Stations	1910, 1940, 2010	Yu (2015a)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1881 <sup>f</sup>	Austin Fire Museum (2014)
Hurricane(s)	None recorded	
Flooding(s)	1900, 1915, 1935	Dooling and Simon (2012, p. 191f)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861	Tucker (2015, p. 762)
International War(s)	None recorded	

<sup>a</sup>There was a catholic mission for a year at where now is Zilker park (Ryan, 2010), but as this was not permanent, we refer to the village of Waterloo as the first permanent settlement in the Austin area.

<sup>b</sup>The city of Austin was established as the capital of Texas. Given its small size, we assume that municipal government tasks were discussed in the capitol.

<sup>c</sup>Construction started in 1999 and finished in 2004.

<sup>d</sup>It appears that the Texas government was established before the Austin Government.

<sup>e</sup>A LRT line opened in 2010, but is not in the 2010 cross-section of Turner's data. It has 9 stations and thus we change the number of stations to 9 (Yu, 2015a).

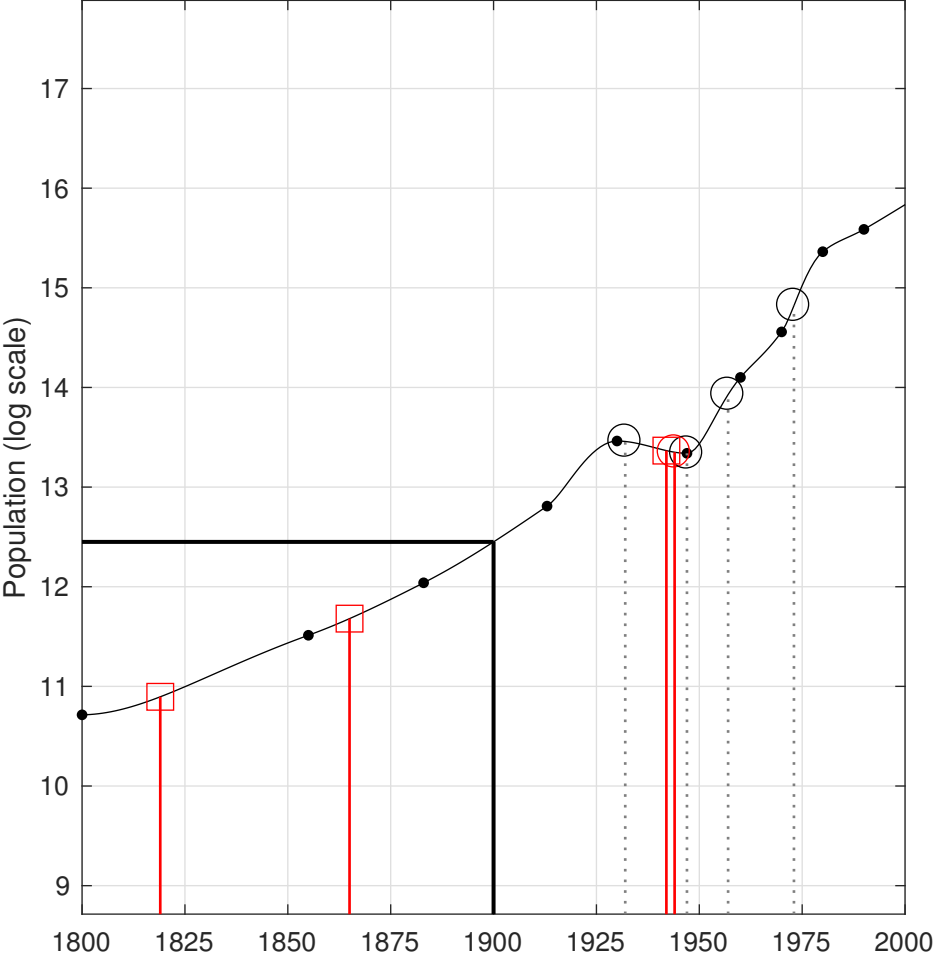
<sup>f</sup>The capitol burned down, but apparently no other buildings were affected. There are no other events given in the list of historically significant fires by Austin Fire Museum (2014).

Table 18: Concentration Measures - Austin

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	12.85
Cumulative density of employment-weighted PP distances at 750 m	%	28.83
Average distance between all prime locations	in kilometres	6.07
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.06
Weighted average distance from EWPPs to 1900 CH	in kilometres	9.18
Average from all prime locations to 1900 CH	in kilometres	2.85
Average distance from global prime locations to 1900 CH	in kilometres	1.04

A.7 Bangkok

Figure 16: Bangkok



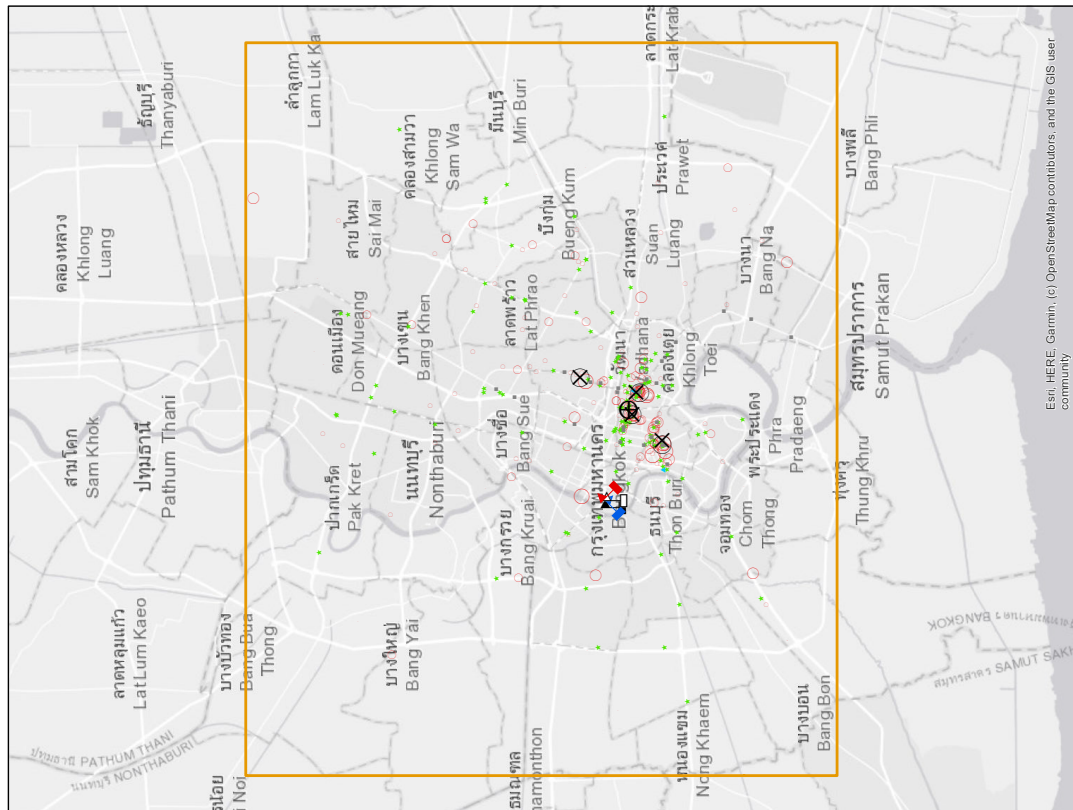
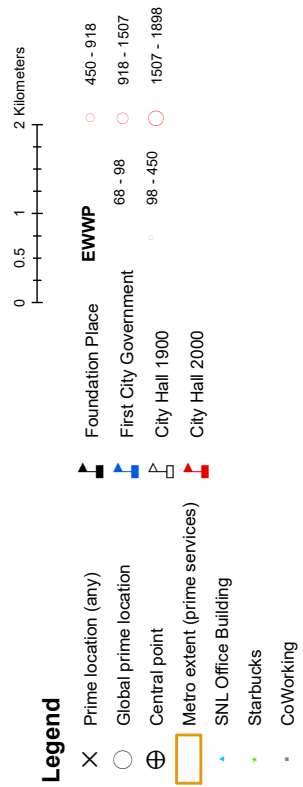
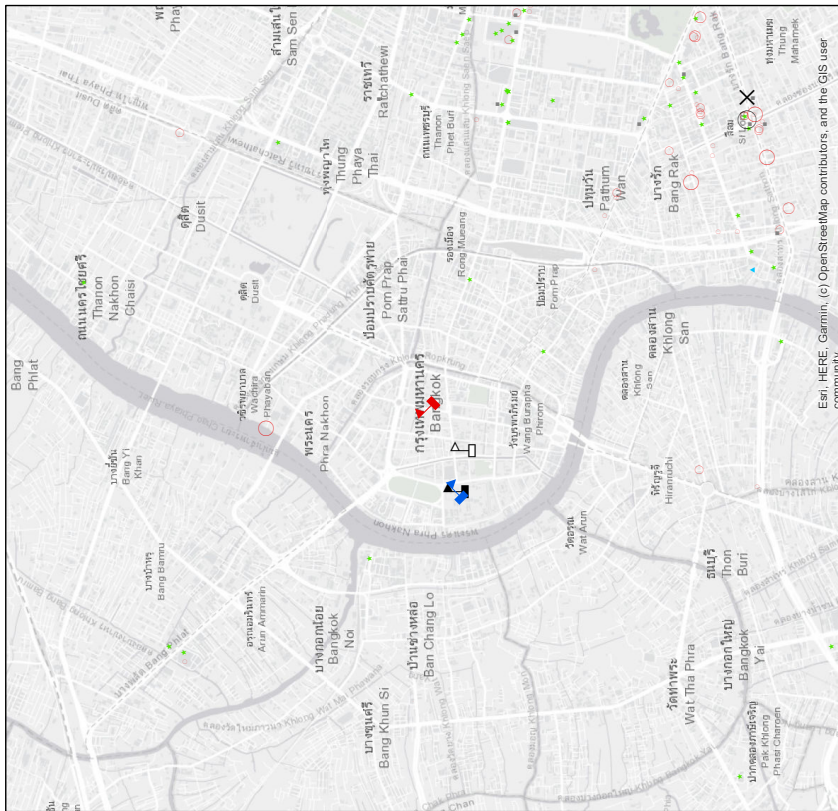


Table 19: Sources: Bangkok ( Thailand )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1510	Ring et al. (1994, p. 96f)
First Political Institution <sup>b</sup>	1785	Ring et al. (1994, p. 96f)
City Hall <sup>c</sup>	1900	Askew (2005, p. 41), Sternstein (1982, p. 28)
City Hall <sup>d</sup>	2000	Sintunawa (2009, p. 2)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>e</sup> , 1900, 1950, 2000	Warren (2002, p.15), Ring et al. (1994, p. 96f)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1855, 1883, 1913, 1930, 1947, 1960, 1970, 1980, 1990, 2002	Ouyyanont (1997, p. 248), Chandler (1987, p. 404), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1999	Jenks (2003, 311)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1865 <sup>f</sup>	O'Neil (2008, p. 176)
Hurricane(s)	None recorded	
Flooding(s)	1819, 1942 <sup>g</sup> , 2011	Hill (2011, p. 1), Daniel P. Aldrich and Sawada (2014, p.75)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1932, 1947, 1957, 1973, 2006 <sup>h</sup>	Keyes (2014)
International War(s)	1944 <sup>i</sup>	Grossman (2009, p. 15)

<sup>a</sup>There have been settlements around here, but what would become Bangkok in the end of the 18th century was a small fishing village found in the early 16th century, which is why we assume 1510 as the first settlement year. As these settlers had to leave when the King decided to establish a city there in 1782, we take the location of the Grand Palace as the location of this settlement. The distinction between Bangkok and Thon Buri is not always drawn (Sternstein, 1982, p. 5). Later French and Dutch military outposts would be here.

<sup>b</sup>The construction began in 1782 and the king moved here in 1785.

<sup>c</sup>The Ministry of the Capital was formed in 1892 (Askew, 2005, p. 41). We take a map of 1901 to locate the local government (Sternstein, 1982, p. 28).

<sup>d</sup>The address of the Metropolitan government is given on page 2 of the document.

<sup>e</sup>Capital since 1782.

<sup>f</sup>This fire destroyed 70 buildings in Bangkok's center. There have been other fires that had high death tolls, but were mostly limited to few buildings.

<sup>g</sup>Bangkok is frequently flooded. The floods in 1819 and 1942 were heavier than the 2011 flood and thus are coded as causing major destruction, although the actual extent is unknown.

<sup>h</sup>The "civil wars" listed here are mainly military coups. We could find no evidence for significant destruction in Bangkok in the wake of these.

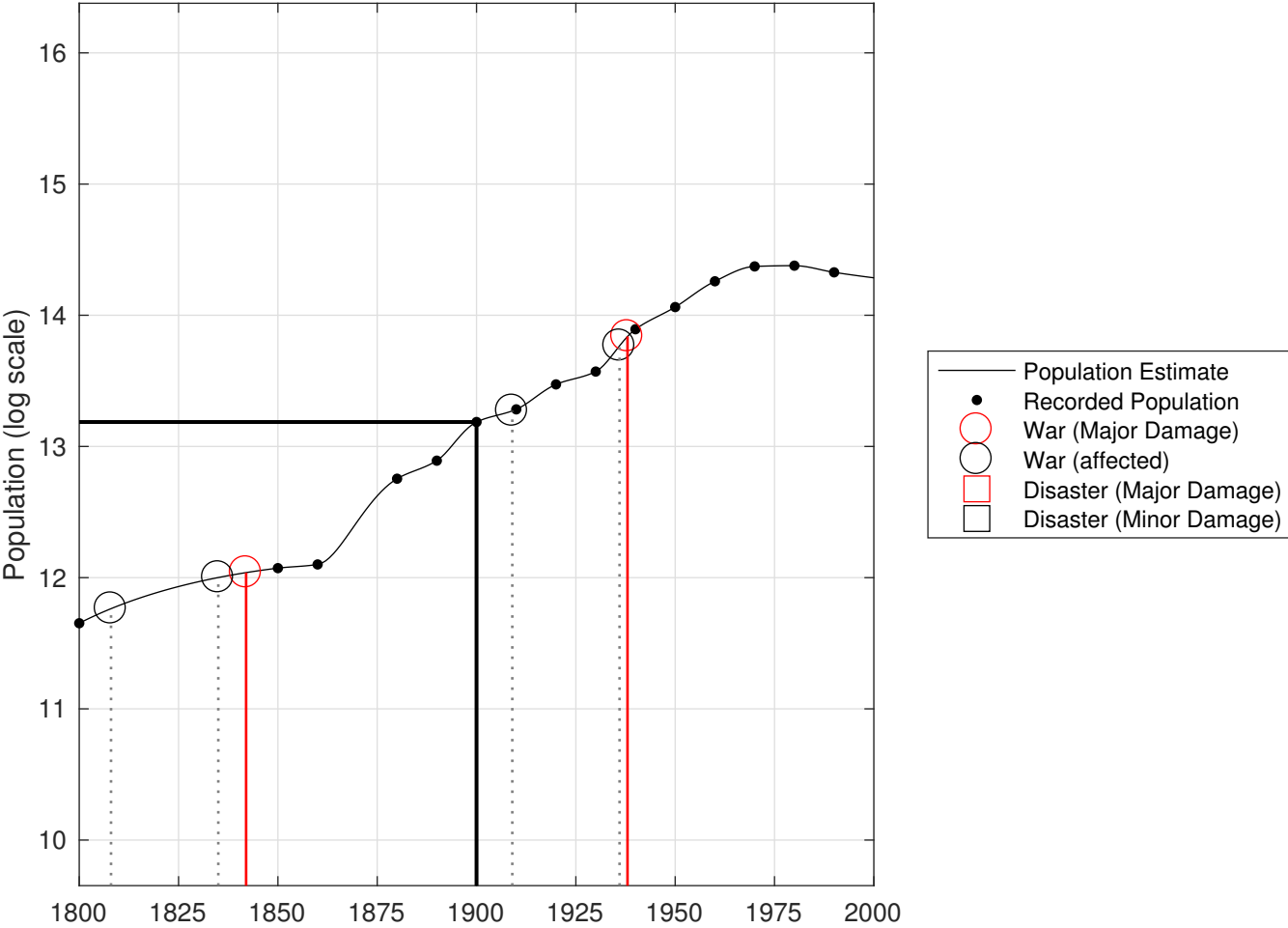
<sup>i</sup>Occupation by Japan and later Allied air raids.

Table 20: Concentration Measures - Bangkok

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	8.36
Cumulative density of employment-weighted PP distances at 750 m	%	17.76
Average distance between all prime locations	in kilometres	2.88
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.48
Weighted average distance from EWPPs to 1900 CH	in kilometres	8.55
Average from all prime locations to 1900 CH	in kilometres	6.18
Average distance from global prime locations to 1900 CH	in kilometres	6.16

A.8 Barcelona

Figure 17: Barcelona



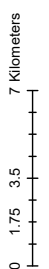
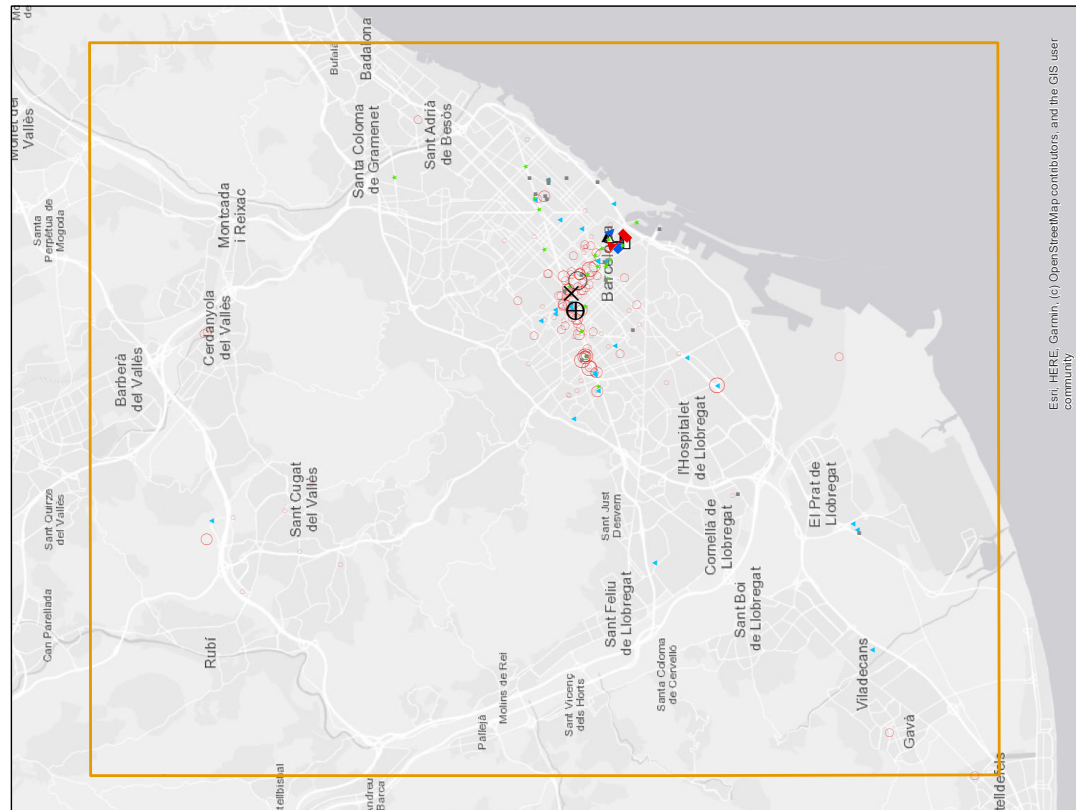
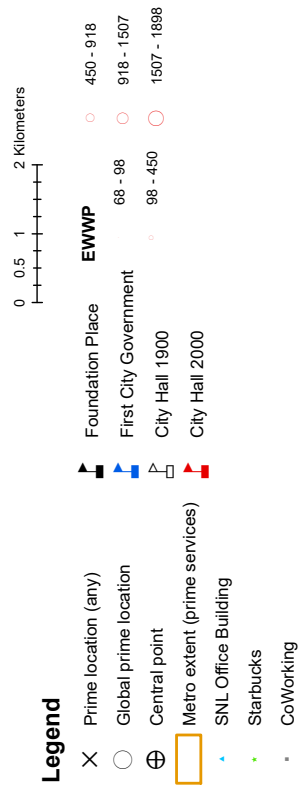
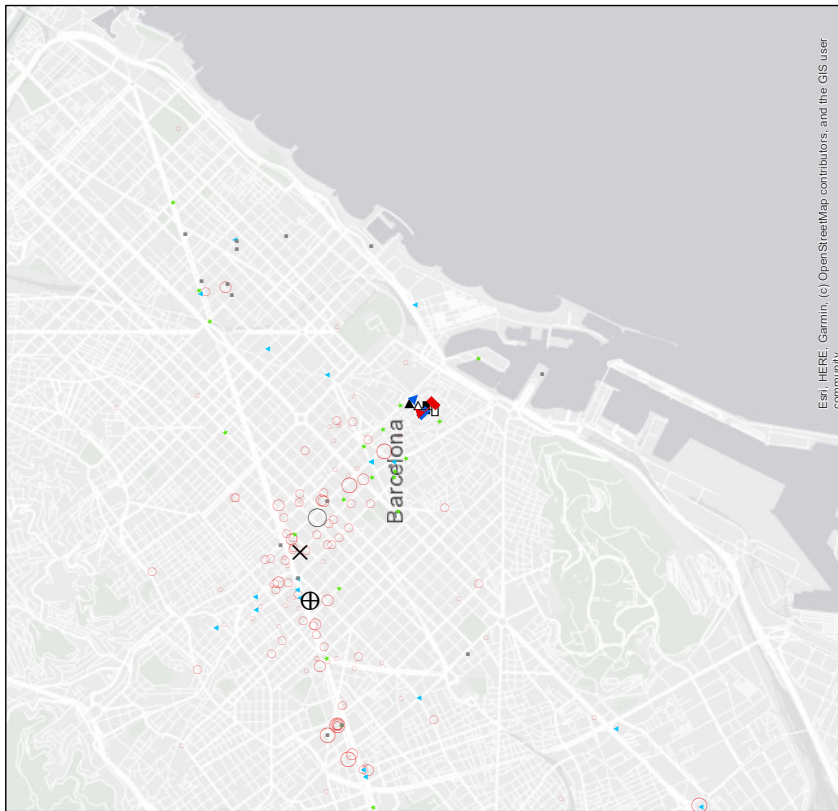




Table 21: Sources: Barcelona ( Spain )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	-4000	Simonis (2010, p. 21)
First Political Institution <sup>b</sup>	-50	Hughes (1992, p. 65), Museo D'història de Barcelona (2014)
City Hall <sup>c</sup>	1900	Hughes (1992, p. 122)
City Hall	2000	Hughes (1992, p. 122)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900, 1950, 2000	Connell (2014)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1860, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2003	Harrison (1978, p. 22), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>e</sup>	1863	Generalitat de Catalunya (2016)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1835 <sup>f</sup> , 1842 <sup>g</sup> , 1909 <sup>h</sup> , 1936 <sup>i</sup>	Clarke and Hutton (2013, p. 183), Kantowicz (1999, p. 342), Editors of Blackwood's Edinburgh Magazine (1837, p. 596), Connell (2014)
International War(s)	1808 <sup>j</sup> , 1938 <sup>k</sup>	Salvadó (2013, p. 74), Simonis (2010)

<sup>a</sup>Traces of a Neolithic settlement.

<sup>b</sup>The romans needed at least one ceremonial building close to the forum; when they made Barcelona a town which was the temple of Augustus.

<sup>c</sup>Apparently no change from 1400 on, when this city hall was built.

<sup>d</sup>No apparent change from 1850 on, although the form of the state changed from time to time.

<sup>e</sup>The tube proper only opened in 1924 (Buseti, 2015), but this date refers to an innerurban commuter train, which is still part of today's metro system.

<sup>f</sup>Six churches were burnt during this anti-clerical riot.

<sup>g</sup>During the bombardement of Barcelona following an inner-spanish conflict, more than 400 houses were destroyed (Clarke and Hutton, 2013, p. 183).

<sup>h</sup>The tragic week: 12 churches and 40 conventos were set on fire and two hundred workers died. However, given the size of the city and that the scope of destruction was limited and the extent of collateral damage is hard to reconstruct from available sources, we decide not to code this conflict as a major disaster.

<sup>i</sup>Spanish Civil War.

<sup>j</sup>Napoleonic War of 1808-1814: Occupation of Barcelona.

<sup>k</sup>Air raids on Barcelona.

Table 22: Concentration Measures - Barcelona

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	4.58
Cumulative density of employment-weighted PP distances at 750 m	%	7.61
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.33
Weighted average distance from EWPPs to 1900 CH	in kilometres	4.03
Average from all prime locations to 1900 CH	in kilometres	2.09
Average distance from global prime locations to 1900 CH	in kilometres	1.68

A.9 Basel

Figure 18: Basel

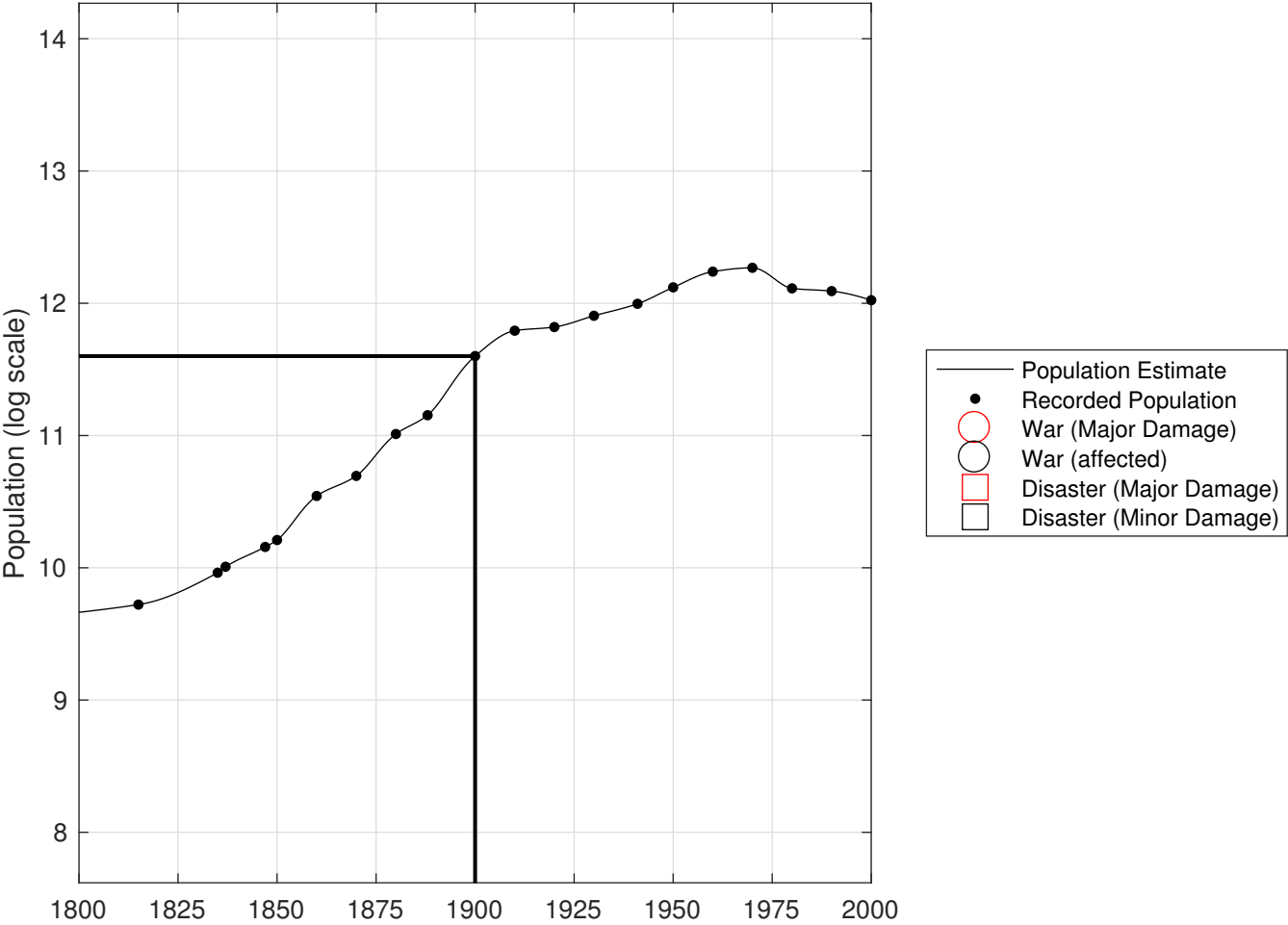




Table 23: Sources: Basel ( Switzerland )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	-250	Kanton Basel Stadt (2014)
First Political Institution <sup>b</sup>	250	Kanton Basel Stadt (2014)
City Hall	1900	Staatskanzlei des Kantons Basel-Stadt (2012, p. 2)
City Hall	2000	Staatskanzlei des Kantons Basel-Stadt (2012, p. 2)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>c</sup> , 1900, 1950, 2000	Degen and Sarasin (2010)
<i>Population Data (1800-2000)</i>		
City Population	1774, 1815, 1835, 1837, 1847, 1850, 1860, 1870, 1880, 1888, 1900, 1910, 1920, 1930, 1941, 1950, 1960, 1970, 1980, 1990, 2000	Statistisches Amt Basel (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>d</sup>	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>There are neolithic traces, but the Kelts were the first to establish something similar to a settlement.

<sup>b</sup>The Romans built a castelum, which we consider as the first administrative body. The real first town hall of Basel (in the sense of the word nowadays) was built in 1504.

<sup>c</sup>Foundation of the Kanton in 1833, no major changes afterwards

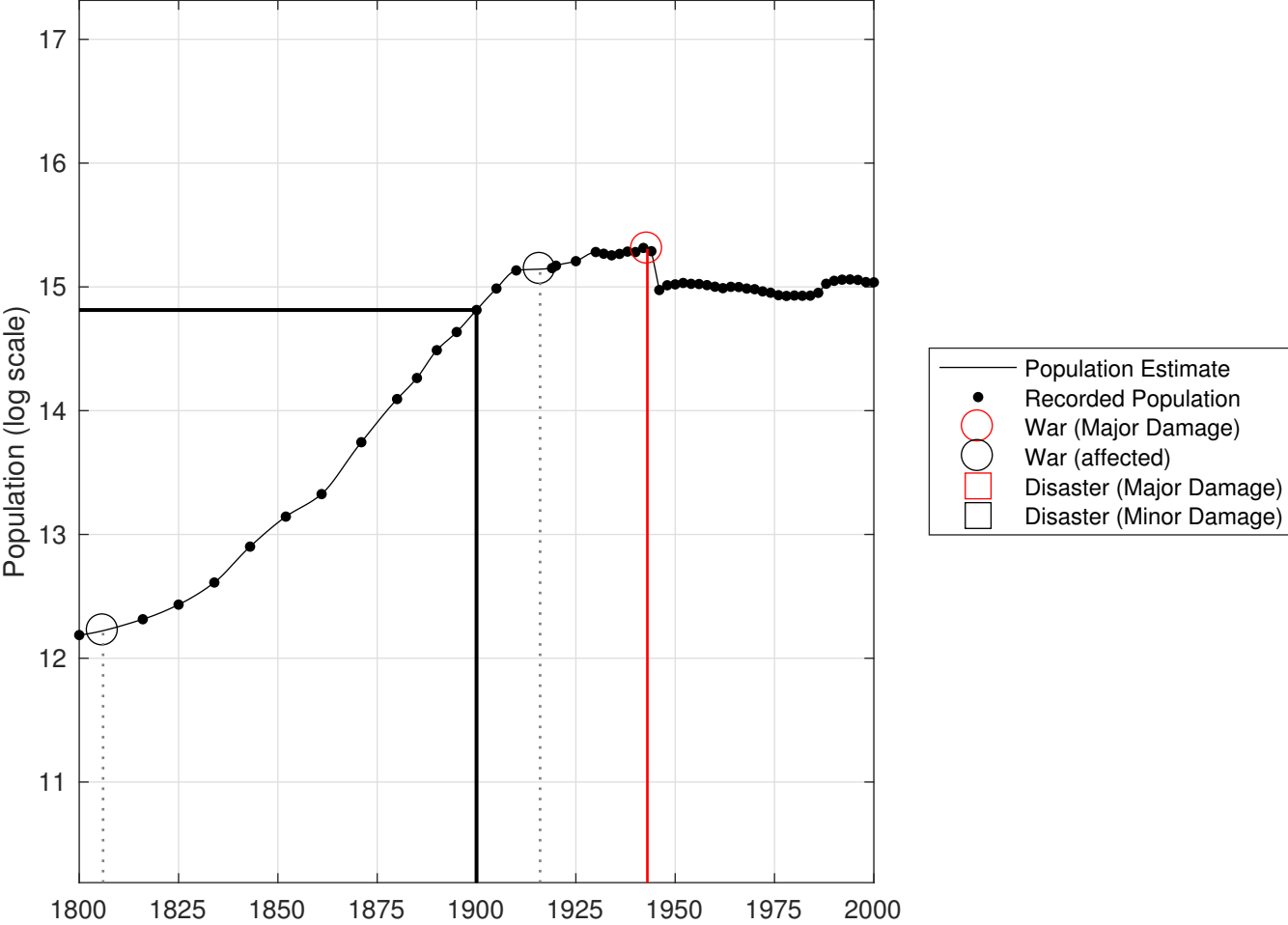
<sup>d</sup>There is a tram system since the late 19th century, but no system matching the definition by Gonzalez-Navarro and Turner (2016)

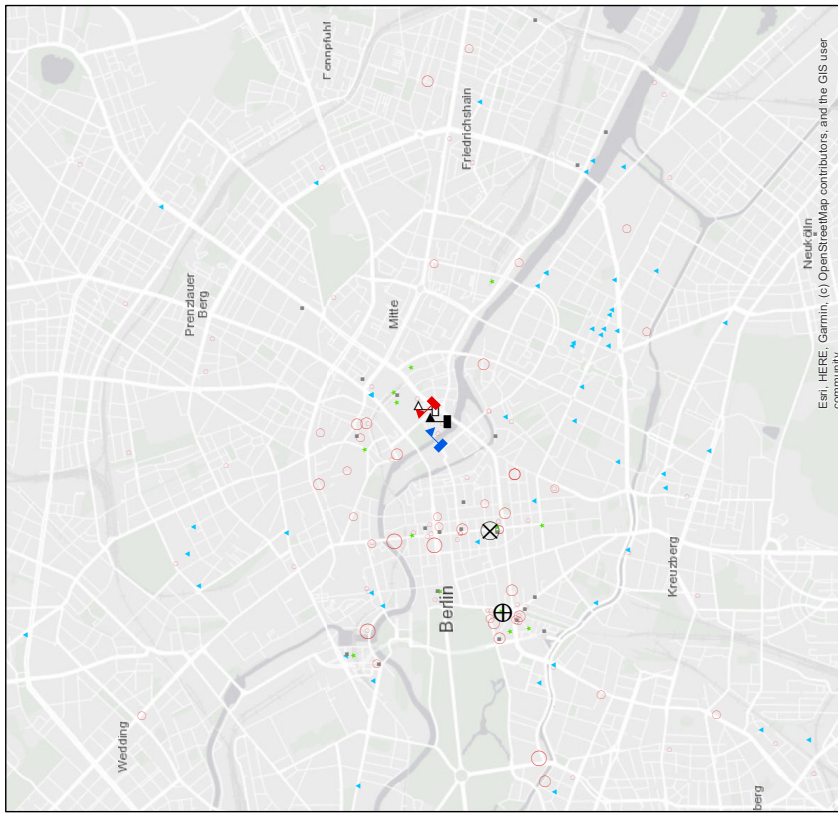
Table 24: Concentration Measures - Basel

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	1.61
Cumulative density of employment-weighted PP distances at 750 m	%	2.25
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.85
Weighted average distance from EWPPs to 1900 CH	in kilometres	1.25
Average from all prime locations to 1900 CH	in kilometres	0.79
Average distance from global prime locations to 1900 CH	in kilometres	0.79

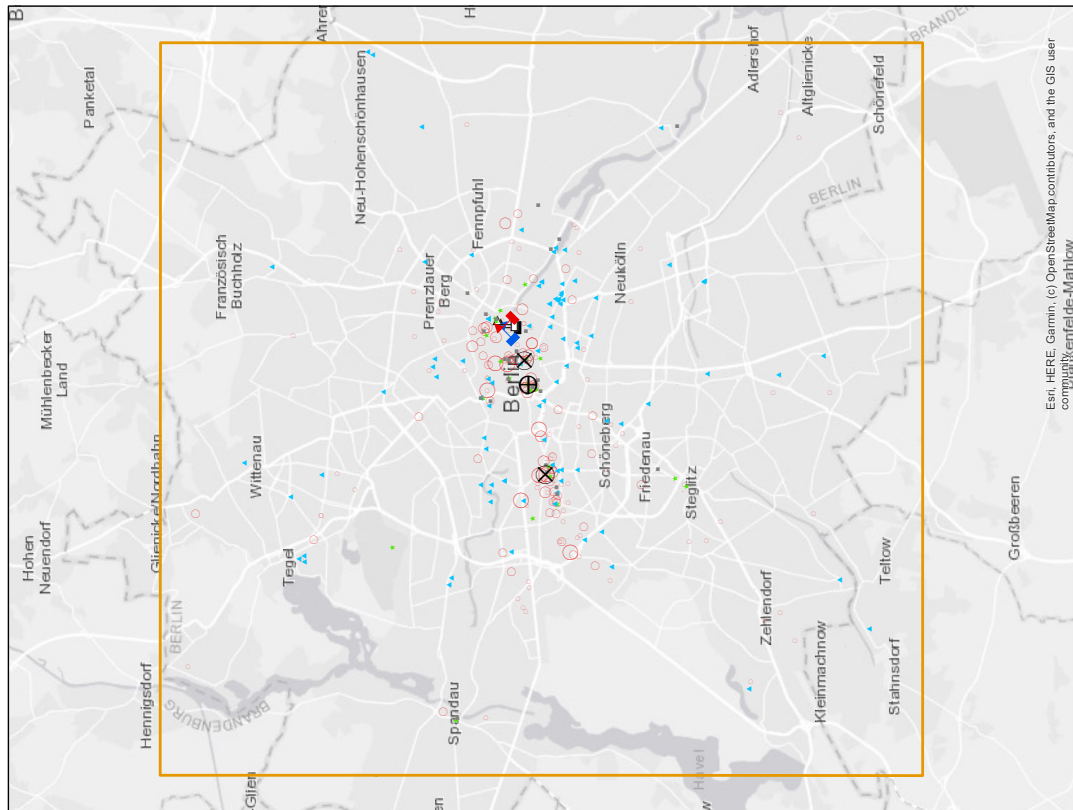
A.10 Berlin

Figure 19: Berlin





- Legend**
- ✕ Prime location (any)
  - Global prime location
  - ⊕ Central point
  - Metro extent (prime services)
  - ▲ SNL Office Building
  - Starbucks
  - CoWorking
- Foundation Place**
- ▲ 450 - 918
  - ▲ 918 - 1507
  - ▲ 68 - 98
  - ▲ 98 - 450
  - ▲ 1507 - 1898
- First City Government**
- ▲ City Hall 1900
  - ▲ City Hall 2000



- 0 2.75 5.5 11 Kilometers



Table 25: Sources: Berlin ( Germany )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1200	Dietrich (1960, p. 59)
First Political Institution <sup>b</sup>	1307	Dietrich (1960, p. 70)
City Hall	1900	Dietrich (1960, p. 202)
City Hall	2000	Dietrich (1960, p. 202)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>c</sup> , 1900, 1950, 2000	Cochrane and Jonas (1999), Leggiere (2002)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1816, 1825, 1834, 1843, 1852, 1861, 1871, 1880, 1885, 1890, 1895, 1900, 1905, 1910, 1919, 1920, 1925, 1930, 1932, 1934, 1936, 1938, 1940, 1942, 1944, 1946, 1948, 1950, 1952, 1954, 1956, 1958, 1960, 1962, 1964, 1966, 1968, 1970, 1972, 1974, 1976, 1978, 1980, 1982, 1984, 1986, 1988, 1990, 1992, 1994, 1996, 1998, 2000	Berlin (2000, p. 25f), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>d</sup>	1872	Reinhardt (2014, 352)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1806 <sup>e</sup> , 1916 <sup>f</sup> , 1943 <sup>g</sup>	Dietrich (1960, p. 162), Dietrich (1960, p. 297), Allen (1998)

<sup>a</sup>Coelln as part of Berlin was first mentioned in 1237, there are some archaeological accounts of settlements that reach further back, but for consistency, we only focus on historical sources

<sup>b</sup>Apparently there was a common Rathaus on the "Lange Brücke", as it is not documented when this was built, we take the unisono declaration as the year.

<sup>c</sup>I consider Prussia as the state here; it was the Prussian capital around 1850

<sup>d</sup>Opening of the "Ringbahn" for passenger transport.

<sup>e</sup>Napoleon's conquest and occupation of Berlin, 1806-1808

<sup>f</sup>Berlin was only indirectly affected by World War I, e.g. through wartime scarcity.

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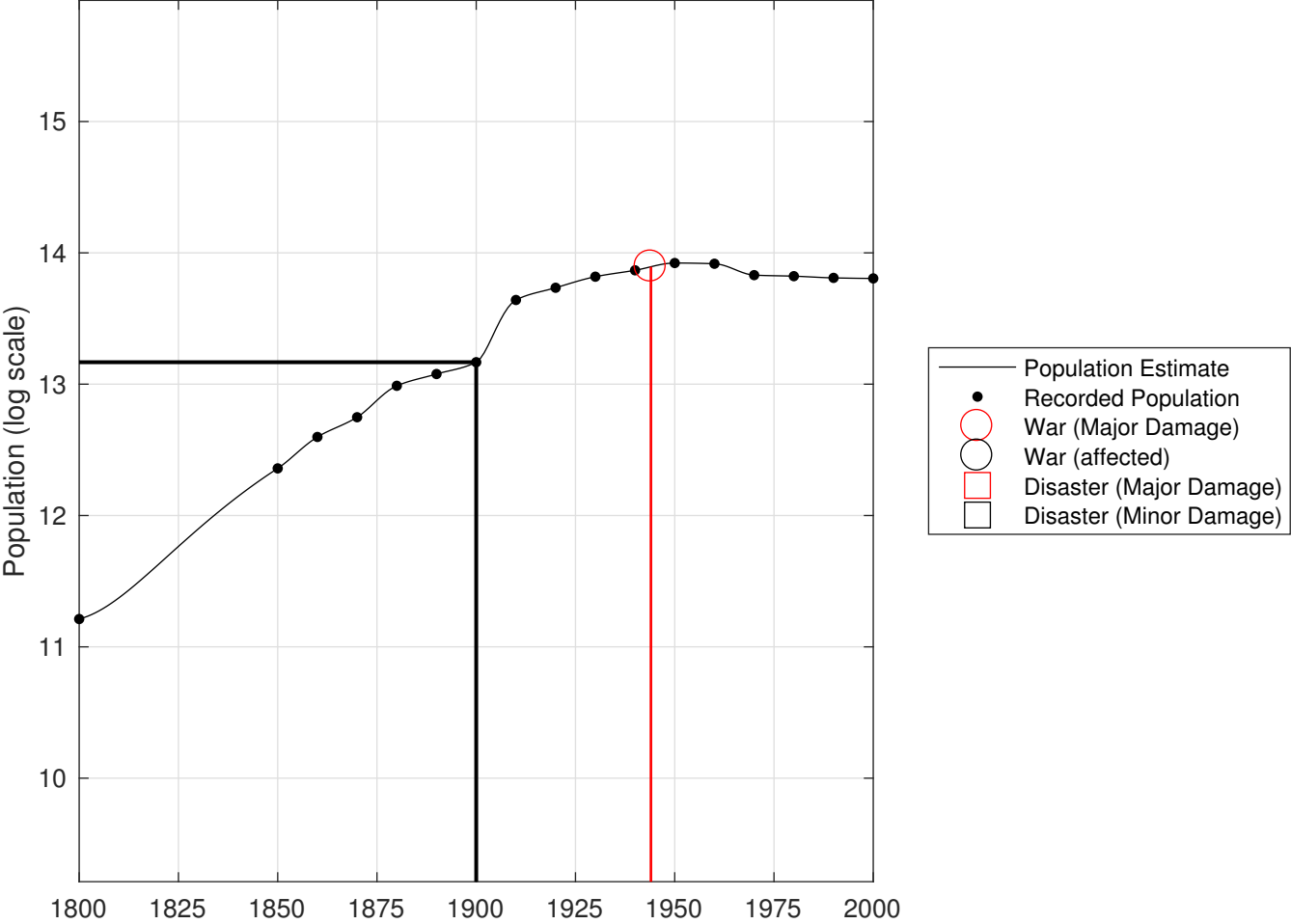
<sup>9</sup>Berlin bombings World War II: most of the city destroyed (Encyclopaedia Britannica, 2015b, see also).

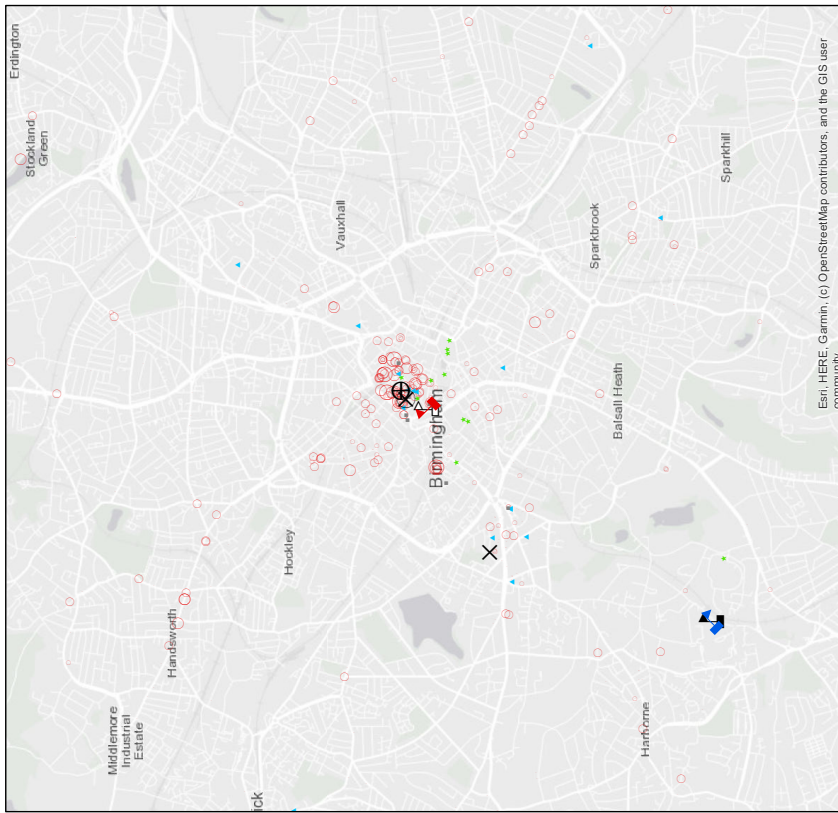
Table 26: Concentration Measures - Berlin

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	5.85
Cumulative density of employment-weighted PP distances at 750 m	%	16.14
Average distance between all prime locations	in kilometres	2.10
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.95
Weighted average distance from EWPPs to 1900 CH	in kilometres	4.89
Average from all prime locations to 1900 CH	in kilometres	3.74
Average distance from global prime locations to 1900 CH	in kilometres	3.74

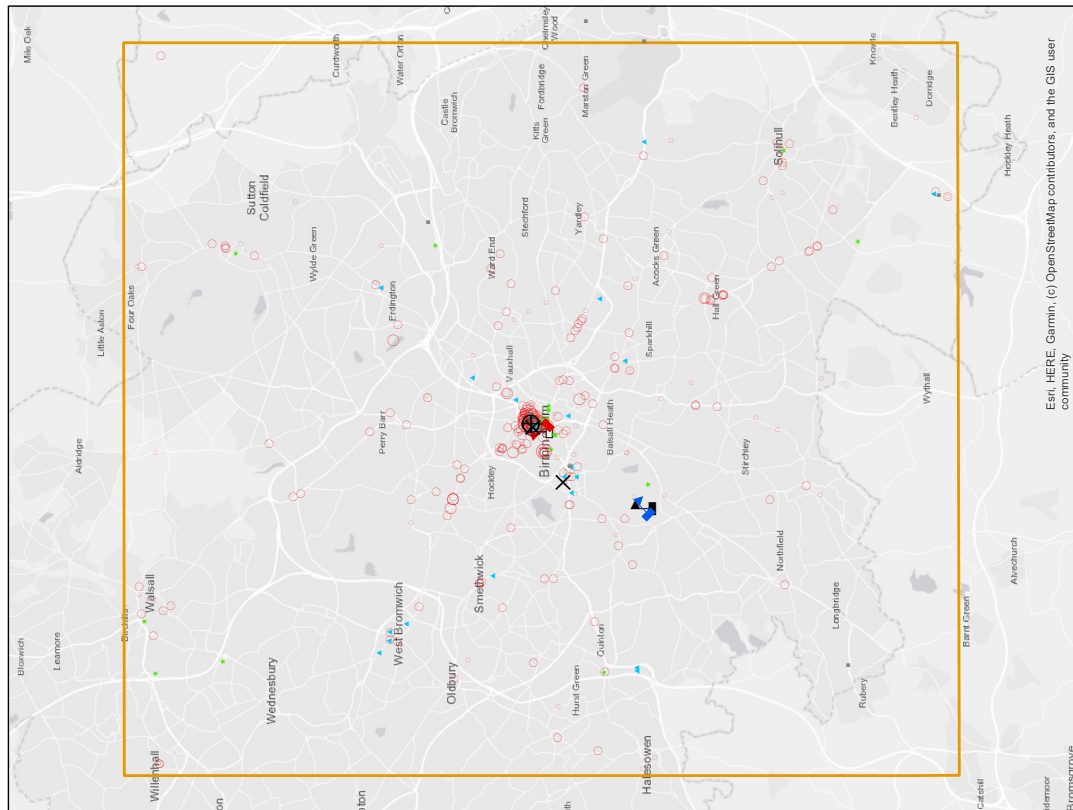
A.11 Birmingham

Figure 20: Birmingham





- Legend**
- X Prime location (any)
  - Global prime location
  - ⊕ Central point
  - Metro extent (prime services)
  - ▲ SNL Office Building
  - ▲ Starbucks
  - ▲ CoWorking
  - ▲ Foundation Place
  - ▲ EWWP
  - 450 - 918
  - 918 - 1507
  - 68 - 98
  - 98 - 450
  - 1507 - 1898
  - City Hall 1900
  - City Hall 2000



- 0 2.25 4.5 9 Kilometers

Table 27: Sources: Birmingham ( United Kingdom )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	50	Birmingham City Council (2013)
First Political Institution	50	Birmingham City Council (2013)
City Hall	1900	Birmingham City Council (2014)
City Hall	2000	Birmingham City Council (2014)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	The National Archives (2014)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>a</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>b</sup>	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1944 <sup>c</sup>	British Broadcasting Corporation (2005), Chinn (2003, p. 226)

<sup>a</sup>Footnote from United Nations Population Division (2014): For Birmingham, Manchester, and Newcastle upon Tyne, data from 1951 to 1971 refer to Conurbation, while data from 1981 to 2011 refer to Urban area (including Greater Manchester). For Birmingham (West Midlands) the limits of the urban area have been modified in 2011. For Sunderland, data from 1951 to 1981 refer to Sunderland and Whitburn urban areas, while data from 1991 to 2011 refer to Sunderland, Whitburn, Washington, Chester-le-Street and 9 other sub-divisions of the urban agglomeration. The limits of the urban agglomerations of Newport and Reading-Wokingham have been modified between 1981 and 1991.

<sup>b</sup>Only commuter rail network, which does not qualify as an MRT according to Gonzalez-Navarro and Turner (2016)

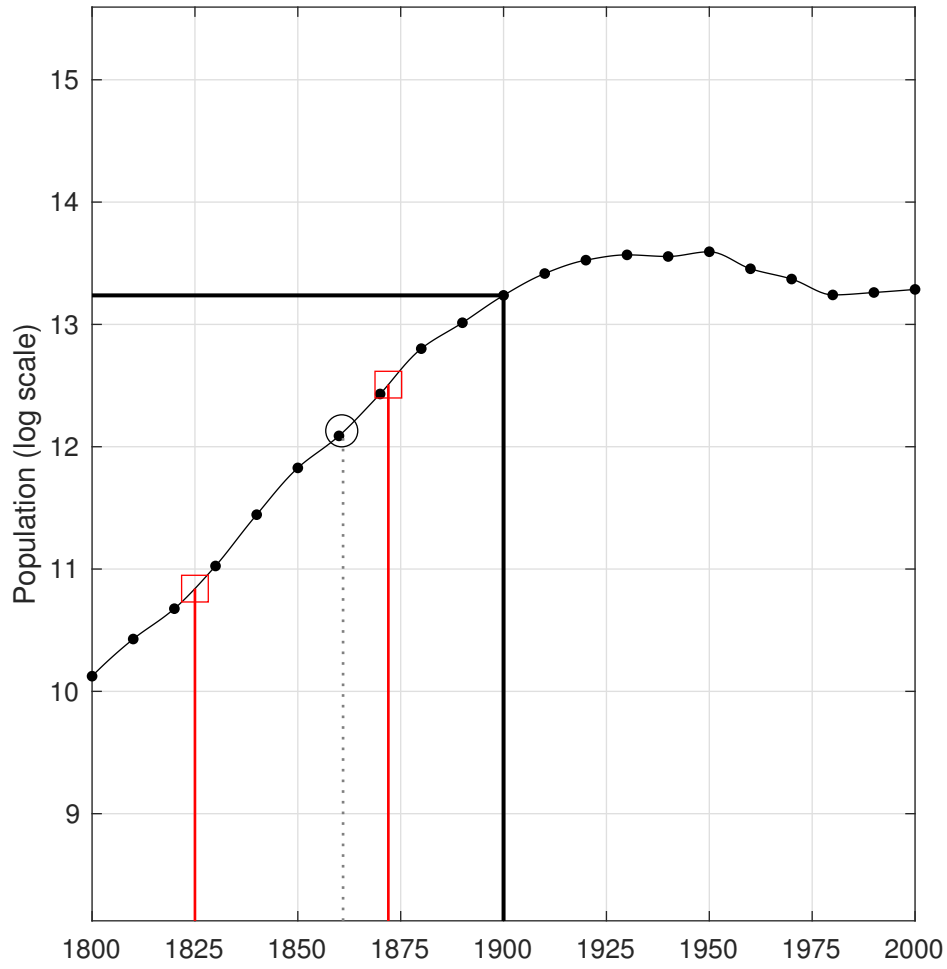
<sup>c</sup>Very destructive German Blitz bombings during World War II. According to Chinn (2003, p. 226) 12931 houses were completely destroyed and ten thousands more were damaged. Moreover, Encyclopaedia Britannica (2015c) documents the event.

Table 28: Concentration Measures - Birmingham

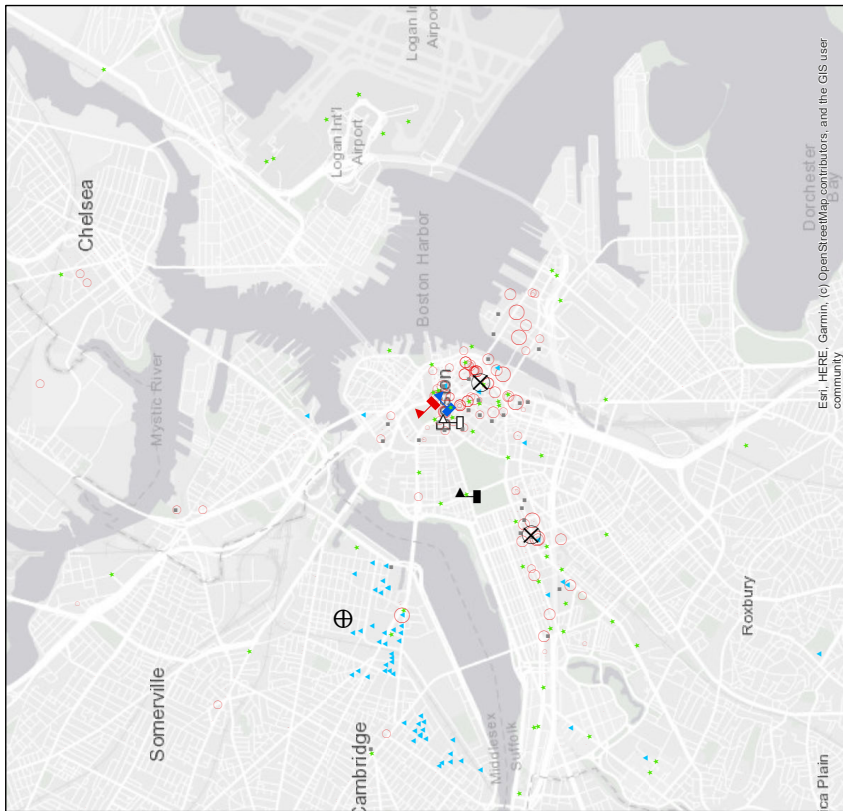
<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	6.87
Cumulative density of employment-weighted PP distances at 750 m	%	10.58
Average distance between all prime locations	in kilometres	0.96
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.84
Weighted average distance from EWPPs to 1900 CH	in kilometres	4.33
Average from all prime locations to 1900 CH	in kilometres	0.41
Average distance from global prime locations to 1900 CH	in kilometres	0.25

## A.12 Boston

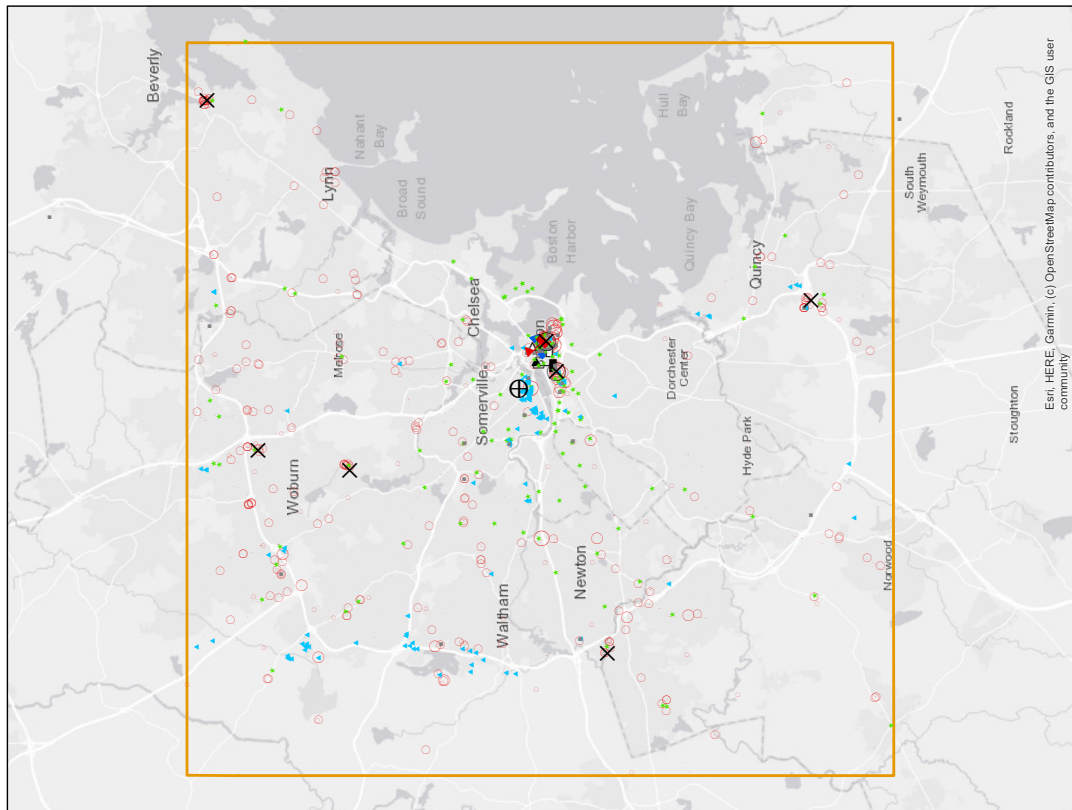
Figure 21: Boston







- Legend**
- ✕ Prime location (any)
  - Global prime location
  - ⊕ Central point
  - ▭ Metro extent (prime services)
  - ▲ SNL Office Building
  - ▲ Starbucks
  - CoWorking
  - ▲ Foundation Place
  - ▲ First City Government
  - ▲ City Hall 1900
  - ▲ City Hall 2000
  - EWWP 450 - 918
  - 68 - 98
  - 98 - 450
  - 918 - 1507
  - 1507 - 1898



- 0 3.5 7 14 Kilometers

Table 29: Sources: Boston ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1623	Crane (1896, p. 3)
First Political Institution <sup>b</sup>	1632	Collins (2005, p. 9)
City Hall	1900	Bergen and Bostonian Society (1990, p. 13)
City Hall	2000	Carr (1992, p. 88)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Embassy of the United States of America (2013)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1810, 1820, 1830, 1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Gibson and Jung (2005a, p. 63), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1894	Cheney and Sammarco (2000, 7)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1825 <sup>c</sup> , 1872 <sup>d</sup>	Braveley (1889, p. 149), Bergen and Bostonian Society (1990, p. x)
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861 <sup>e</sup>	Hull (2011, p. 61)
International War(s)	None recorded	

<sup>a</sup>First permanent settlement founded by Rev. Willaim Blackstone.

<sup>b</sup>“The colonists built [...] a first ‘meeting house’ in 1632. [The incised granite lintel over the doorway of today’s 25 State Street serves as the marker]”

<sup>c</sup>About 50 stores were destroyed. Considering the size of the city, we consider this as major.

<sup>d</sup>Great Boston fire.

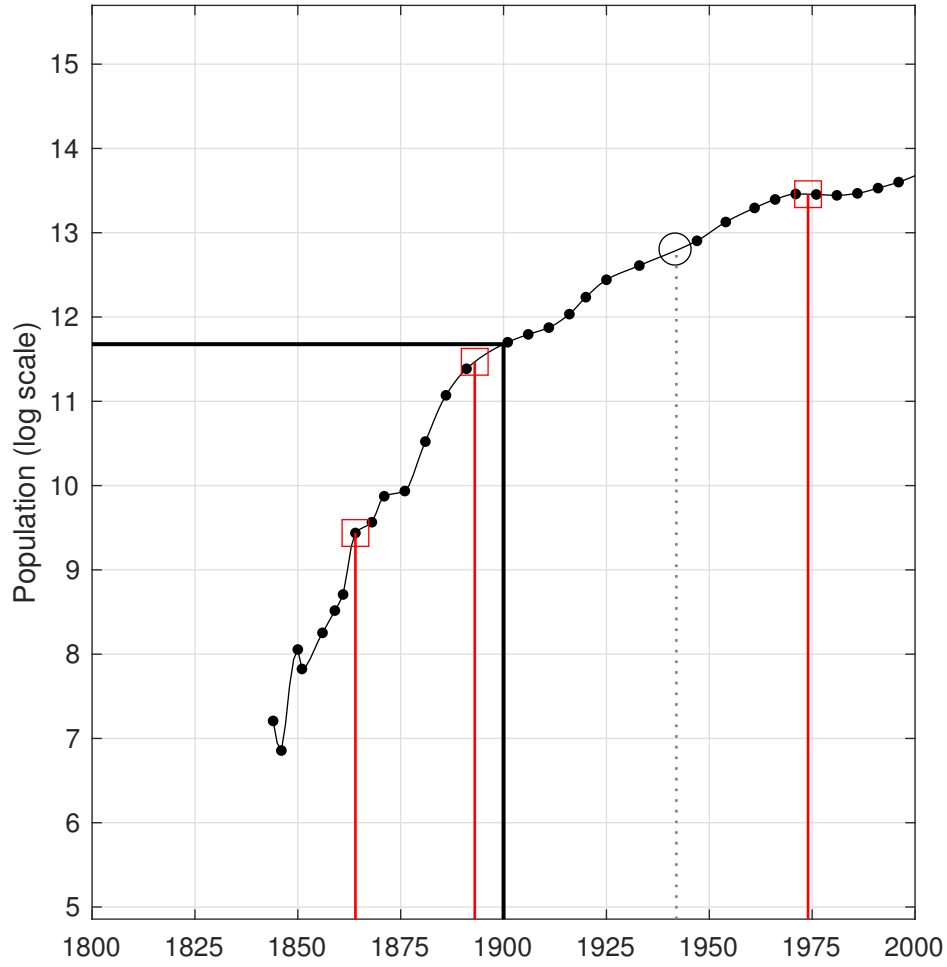
<sup>e</sup>Boston had military outposts during the civil war but was apparently never attacked.

Table 30: Concentration Measures - Boston

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	15.62
Cumulative density of employment-weighted PP distances at 750 m	%	37.35
Average distance between all prime locations	in kilometres	16.62
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.68
Weighted average distance from EWPPs to 1900 CH	in kilometres	11.07
Average from all prime locations to 1900 CH	in kilometres	6.12
Average distance from global prime locations to 1900 CH	in kilometres	0.74

## A.13 Brisbane

Figure 22: Brisbane



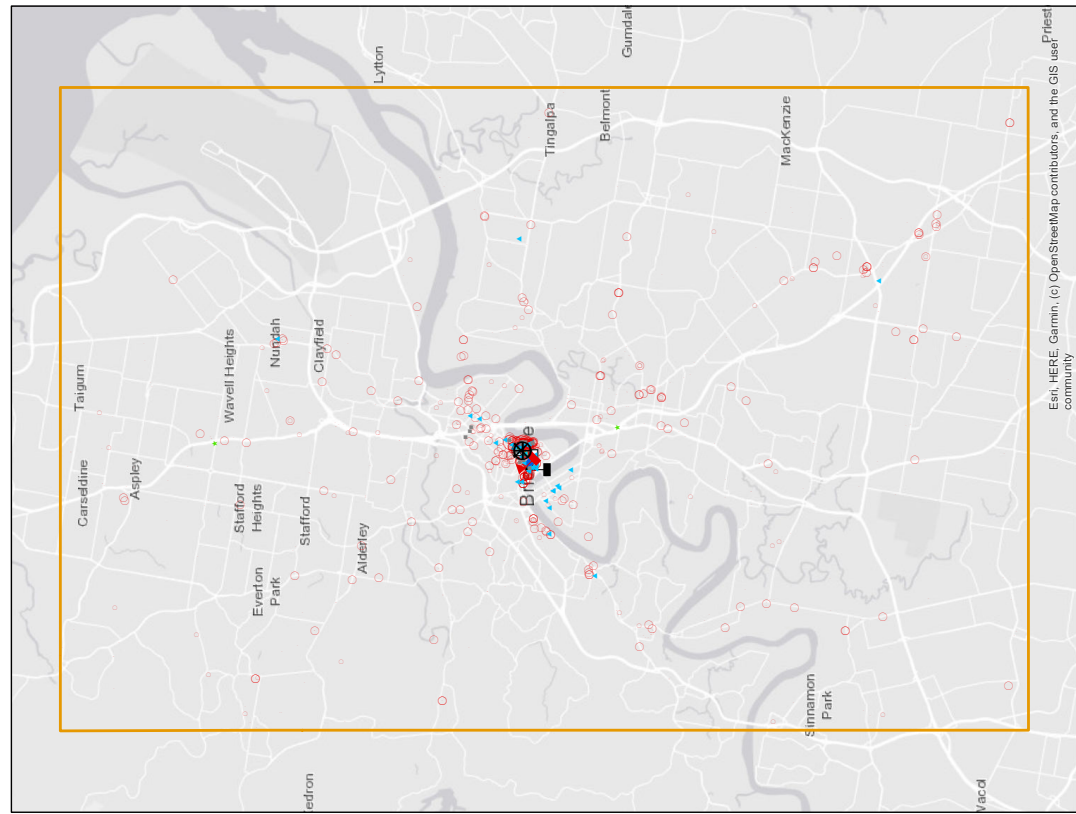
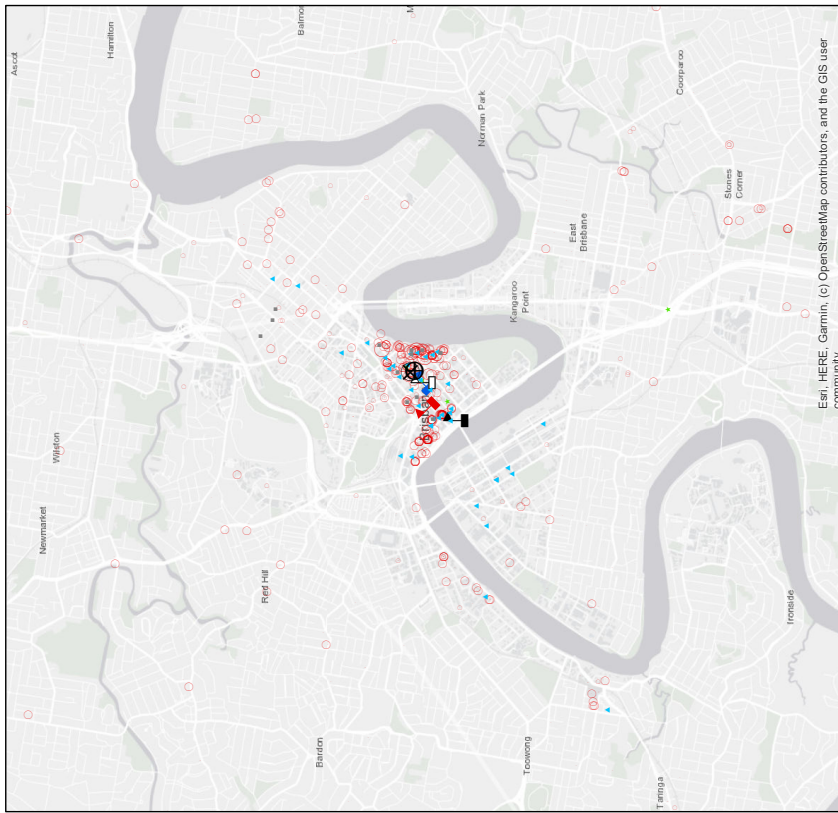


Table 31: Sources: Brisbane ( Australia )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1824	Greenwood and Lavery (1959, p. 24)
First Political Institution <sup>b</sup>	1866	Greenwood and Lavery (1959, p. 89)
City Hall	1900	Greenwood and Lavery (1959, p. 428)
City Hall	2000	Brisbane City (2014, p. 9)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>c</sup> , 1900, 1950, 2000	Encyclopaedia Britannica (2015d)
<i>Population Data (1800-2000)</i>		
City Population	1844, 1846, 1850, 1851, 1856, 1859, 1861, 1864, 1868, 1871, 1876, 1881, 1886, 1891, 1901, 1906, 1911, 1916, 1920, 1925, 1933, 1947, 1954, 1961, 1966, 1971, 1976, 1981, 1986, 1991, 1996, 2001	Australian Bureau of Statistics (2006), Queensland Government Statistician's Office (2015), Centre for the Government of Queensland (2015)
Metro Population <sup>d</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1864	Brisbane City (2014, p. 141)
Hurricane(s)	None recorded	
Flooding(s)	1893, 1974 <sup>e</sup>	Beattie et al. (2014, p. 66), Gunn (2010a, p. 93)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1942 <sup>f</sup>	Brisbane City (2014, p. 30)

<sup>a</sup>First landing was at the nowadays customs house, but the actual settlement at Victoria Bridge/Williams Street.

<sup>b</sup>Photograph used to locate the town hall on queens street (intersection with edward street).

<sup>c</sup>It was proclaimed a municipality only in 1854 and capital of Queensland in the same year.

<sup>d</sup>Footnote from United Nations Population Division (2014): Refers to Greater Brisbane.

<sup>e</sup>1200 homes were destroyed.

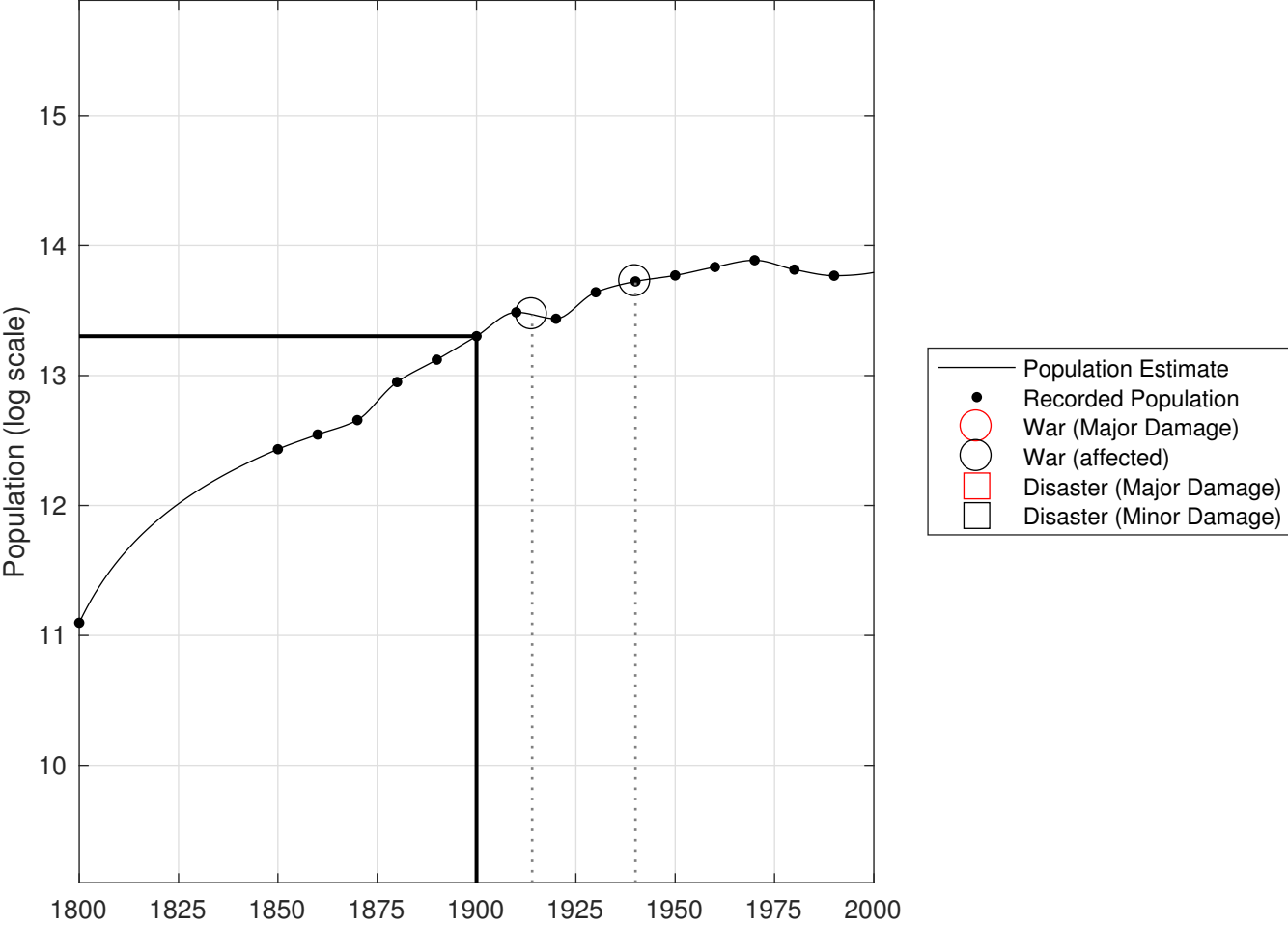
<sup>f</sup>Brisbane was an important American military headquarter for the Pacific War

Table 32: Concentration Measures - Brisbane

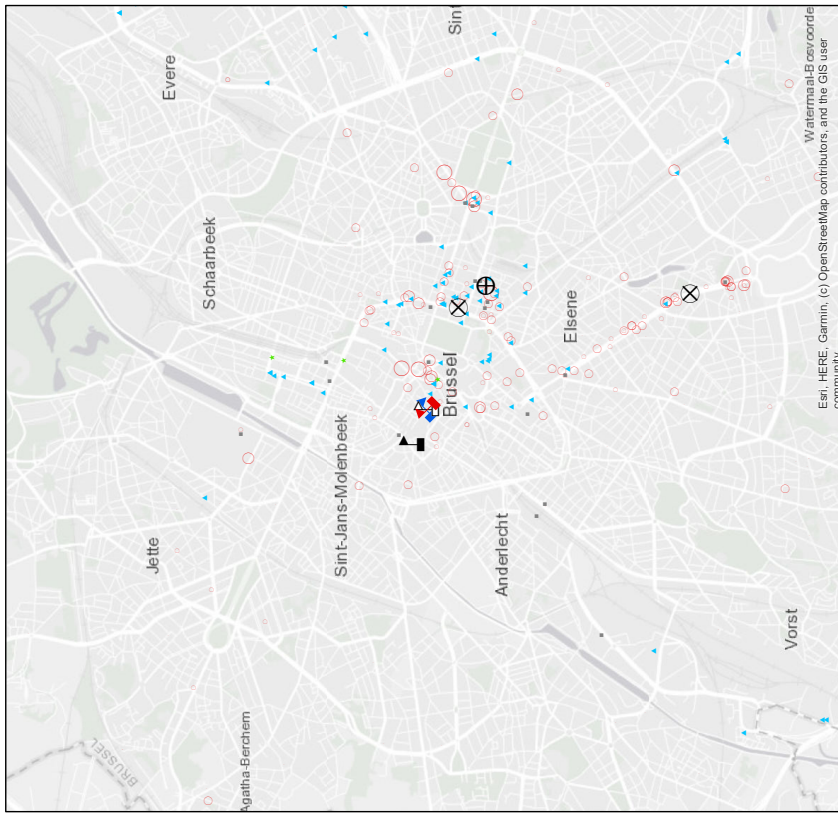
<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	5.28
Cumulative density of employment-weighted PP distances at 750 m	%	5.51
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.87
Weighted average distance from EWPPs to 1900 CH	in kilometres	3.18
Average from all prime locations to 1900 CH	in kilometres	0.17
Average distance from global prime locations to 1900 CH	in kilometres	0.17

A.14 Brussels

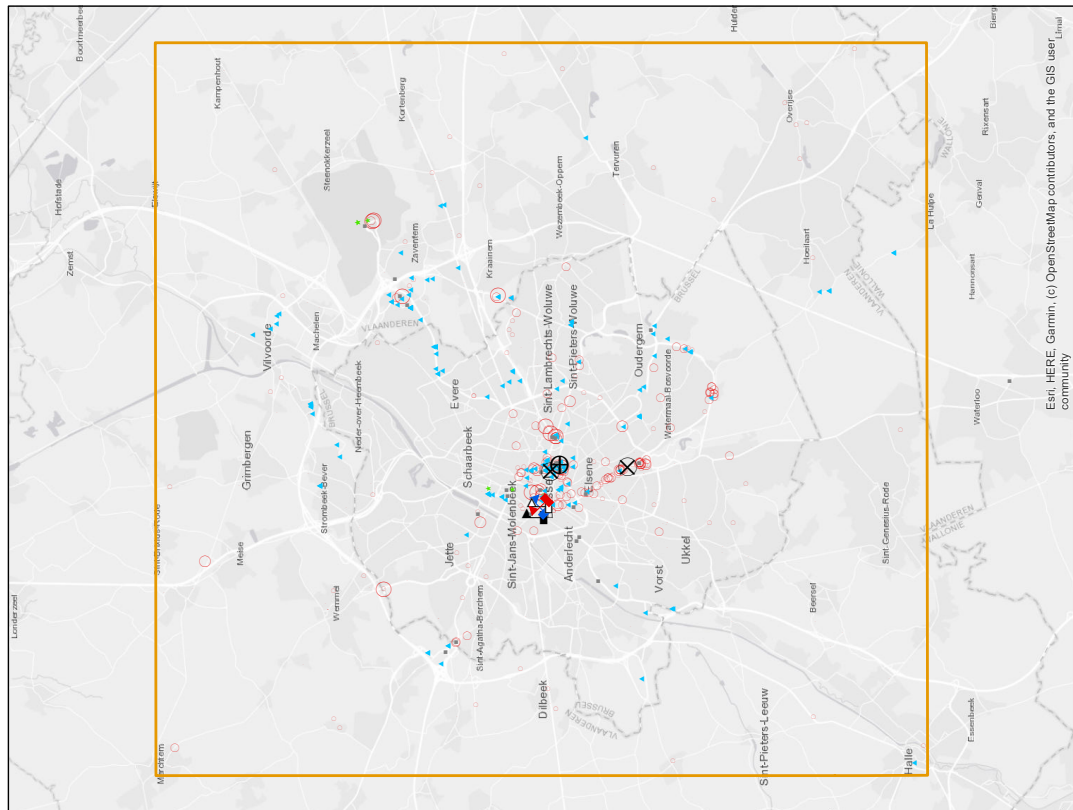
Figure 23: Brussels







- Legend**
- ✕ Prime location (any)
  - Global prime location
  - ⊕ Central point
  - ▭ Metro extent (prime services)
  - ▲ SNL Office Building
  - ★ Starbucks
  - CoWorking
  - ▲ Foundation Place
  - ▲ First City Government
  - ▲ City Hall 1900
  - ▲ City Hall 2000
  - EWWP 450 - 918
  - EWWP 918 - 1507
  - EWWP 68 - 98
  - EWWP 98 - 450
  - EWWP 1507 - 1898



- 0 2.5 5 10 Kilometers

Table 33: Sources: Brussels ( Belgium )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	695	State (2004, p. 269)
First Political Institution <sup>b</sup>	1402	City of Brussels (2014, p. 1)
City Hall	1900	City of Brussels (2014, p. 1)
City Hall	2000	City of Brussels (2014, p. 1)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>c</sup> , 1900, 1950, 2000 <sup>d</sup>	Elmhorn (2001, p. 24), Elmhorn (2001)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2003	Atkins et al. (2007, p. 78), Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>e</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>f</sup>	1969	State (2015, 285)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1914 <sup>g</sup> , 1940 <sup>h</sup>	Verniers (2014, p. 7)

<sup>a</sup>There had been some settlements in the region before, but this seems this is the "original center" of Brussels. A chapel was built in 695. Earlier settlements were neolithic and thus we ignore them.

<sup>b</sup>From the beginning of the 14th century, buildings next to the famous town hall were used. Today's townhall was initially built in 1402 and has remained the seat of the mayor.

<sup>c</sup>Became capital in 1830 when the Kingdom of Belgium was created.

<sup>d</sup>Became capital of Europe.

<sup>e</sup>Footnote from United Nations Population Division (2014): Data refer to the population of Brussels-Capital Region and "communes" of the agglomeration and suburbs.

<sup>f</sup>This is the opening for trams running underground and stopping at so-called "premetro" stations. The opening of the subway proper was 1976.

<sup>g</sup>Occupation by Germans, no serious destruction mentioned.

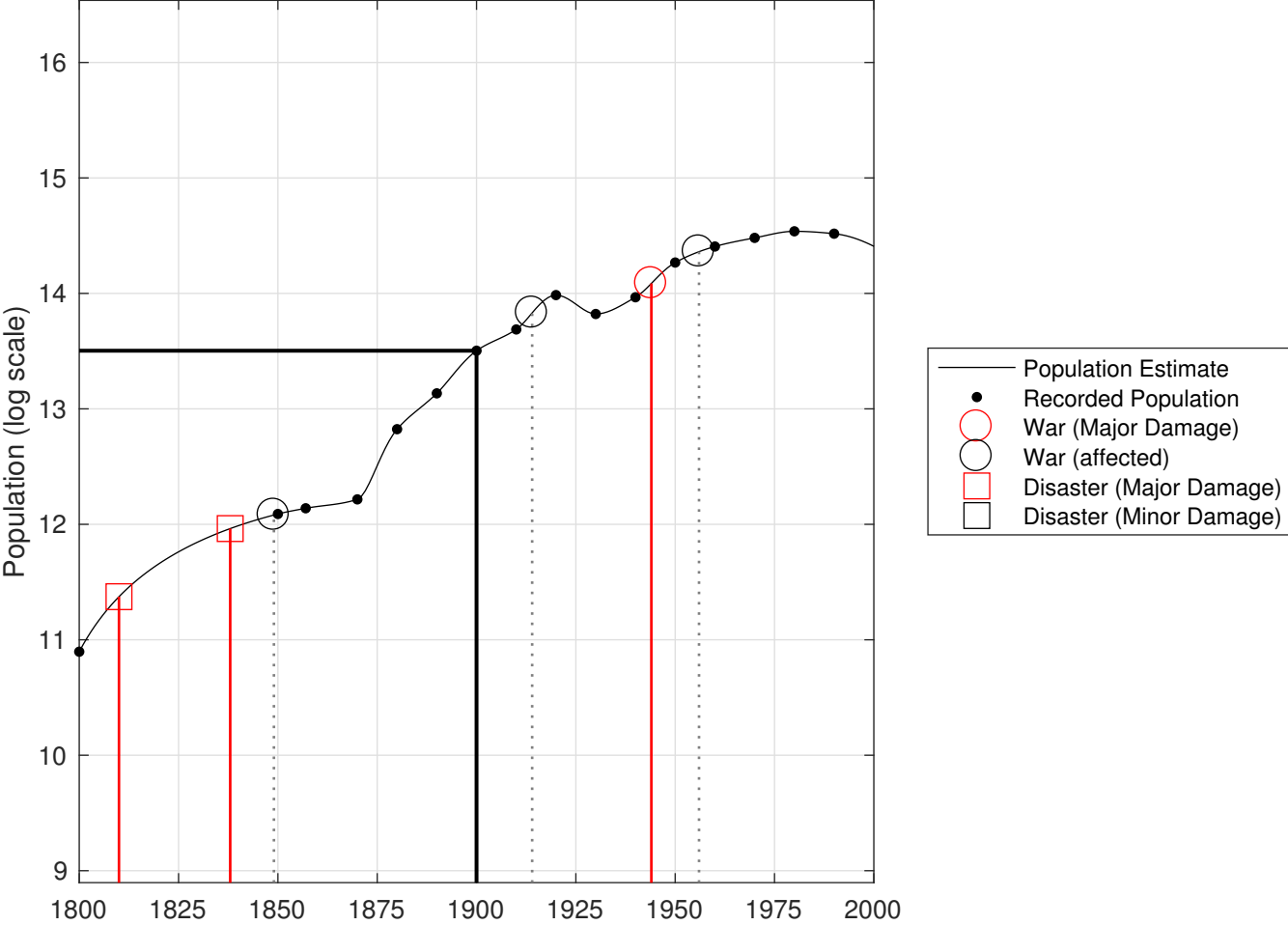
<sup>h</sup>Occupation by Germans, but no serious physical destruction mentioned.

Table 34: Concentration Measures - Brussels

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	6.08
Cumulative density of employment-weighted PP distances at 750 m	%	15.43
Average distance between all prime locations	in kilometres	1.27
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.12
Weighted average distance from EWPPs to 1900 CH	in kilometres	4.40
Average from all prime locations to 1900 CH	in kilometres	2.11
Average distance from global prime locations to 1900 CH	in kilometres	2.11

A.15 Budapest

Figure 24: Budapest



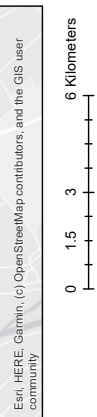
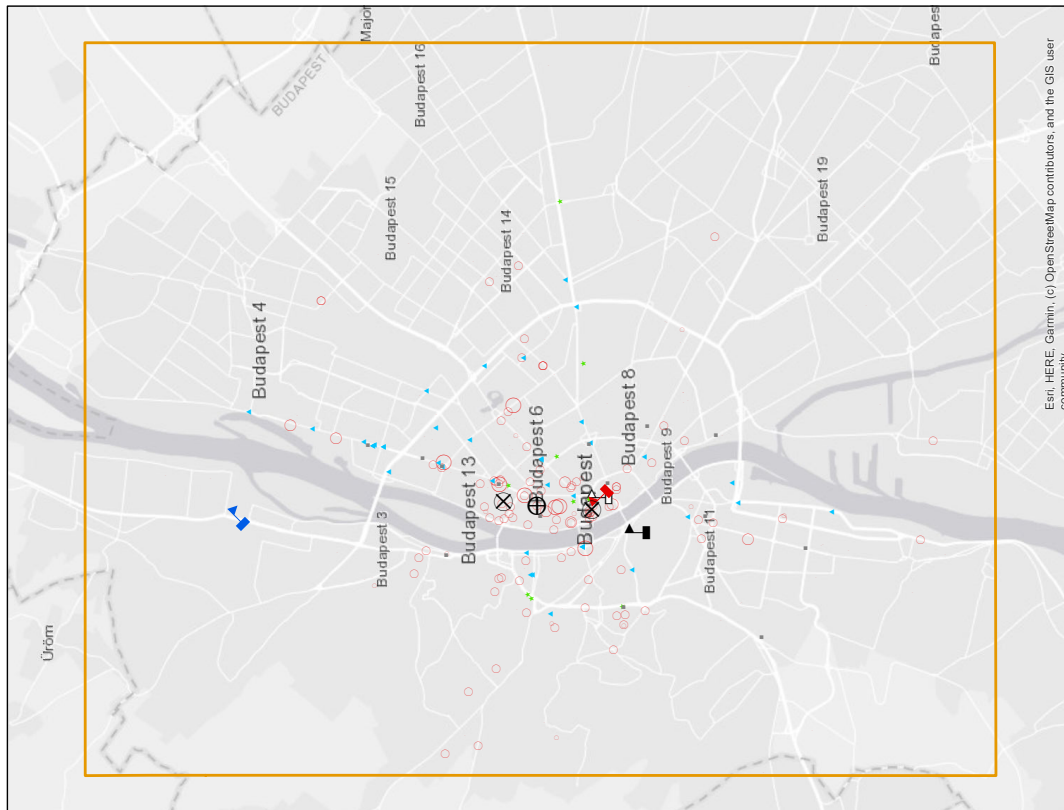
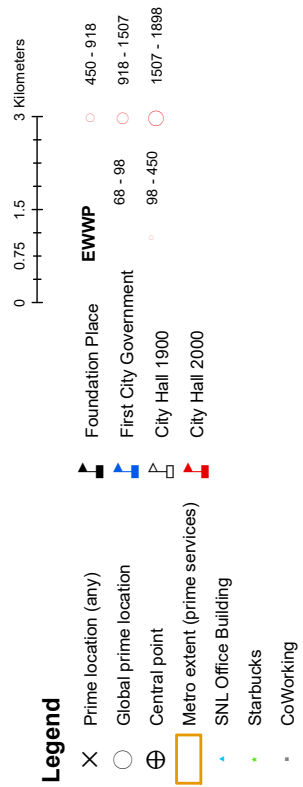
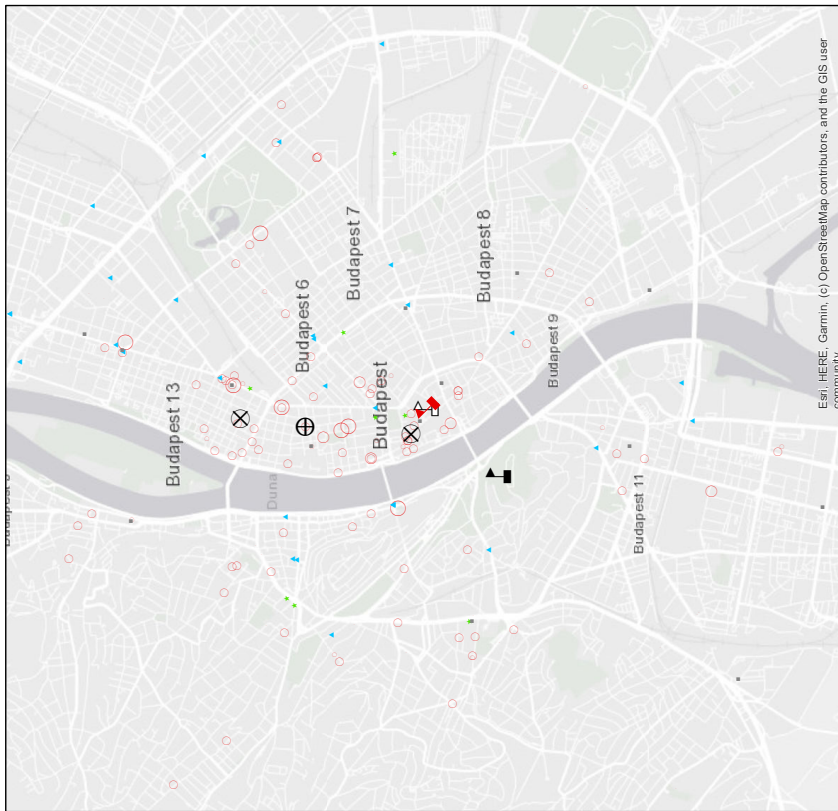


Table 35: Sources: Budapest ( Hungary )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	-100	Enyedi and Szirmai (1992, p. 3)
First Political Institution <sup>b</sup>	50	Enyedi and Szirmai (1992, p. 4)
City Hall <sup>c</sup>	1900	Frojmovics and Komoróczy (1999, p. 68)
City Hall	2000	Frojmovics and Komoróczy (1999, p. 68)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900, 1950, 2000	Lendvai (2012, p. 240)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1857, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2003	Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1896	Osterhammel (2011, 446)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1810 <sup>e</sup>	Jacobs (2006, p. 182)
Hurricane(s)	None recorded	
Flooding(s)	1838 <sup>f</sup>	Enyedi and Szirmai (1992, p. 13)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1956 <sup>g</sup>	Adam (2010)
International War(s)	1849 <sup>h</sup> , 1914 <sup>i</sup> , 1944 <sup>j</sup>	Enyedi and Szirmai (1992, p. 6), Ungvary et al. (2006, p. xvi), Riez (2008)

<sup>a</sup>We take the centroid of the hill; celtic settlements at the slope of the hill.

<sup>b</sup>Dating is not exact, but it happened "in the first century." Hence we assume 50 AD.

<sup>c</sup>Acquired by the city council in 1896.

<sup>d</sup>Pest became capital in 1848.

<sup>e</sup>Destruction of Taban district by fire.

<sup>f</sup>Encyclopaedia Britannica (2015e) suggests that more than half of the houses in Pest were destroyed.

<sup>g</sup>Hungarian Revolution of 1956 left traces, but did not lead to a full destruction of the cities although the soviet union intervened with tanks.

<sup>h</sup>Habsburg Empire occupies Buda and Pest until compromise of 1867 is formed

<sup>i</sup>Deprivation of the inhabitants.

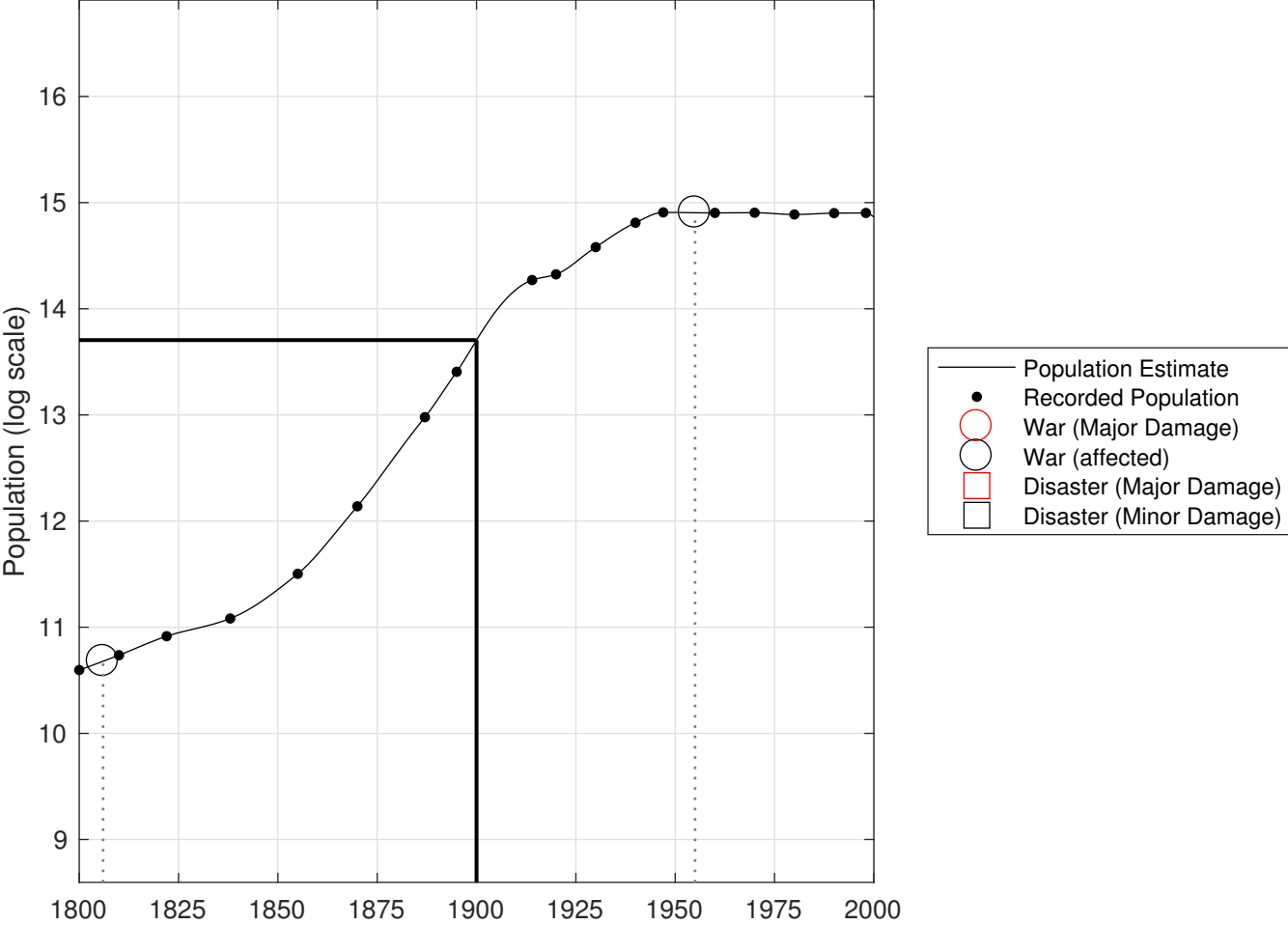
<sup>j</sup>There were also air raids by the Soviets in 1942, but the major ones were in March 1944. When the Soviets took the city back, more than a quarter of the city's buildings and factories were destroyed or damaged (Encyclopaedia Britannica, 2015e).

Table 36: Concentration Measures - Budapest

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	3.51
Cumulative density of employment-weighted PP distances at 750 m	%	11.04
Average distance between all prime locations	in kilometres	0.94
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-1.01
Weighted average distance from EWPPs to 1900 CH	in kilometres	2.57
Average from all prime locations to 1900 CH	in kilometres	1.10
Average distance from global prime locations to 1900 CH	in kilometres	1.10

A.16 Buenos Aires

Figure 25: Buenos Aires





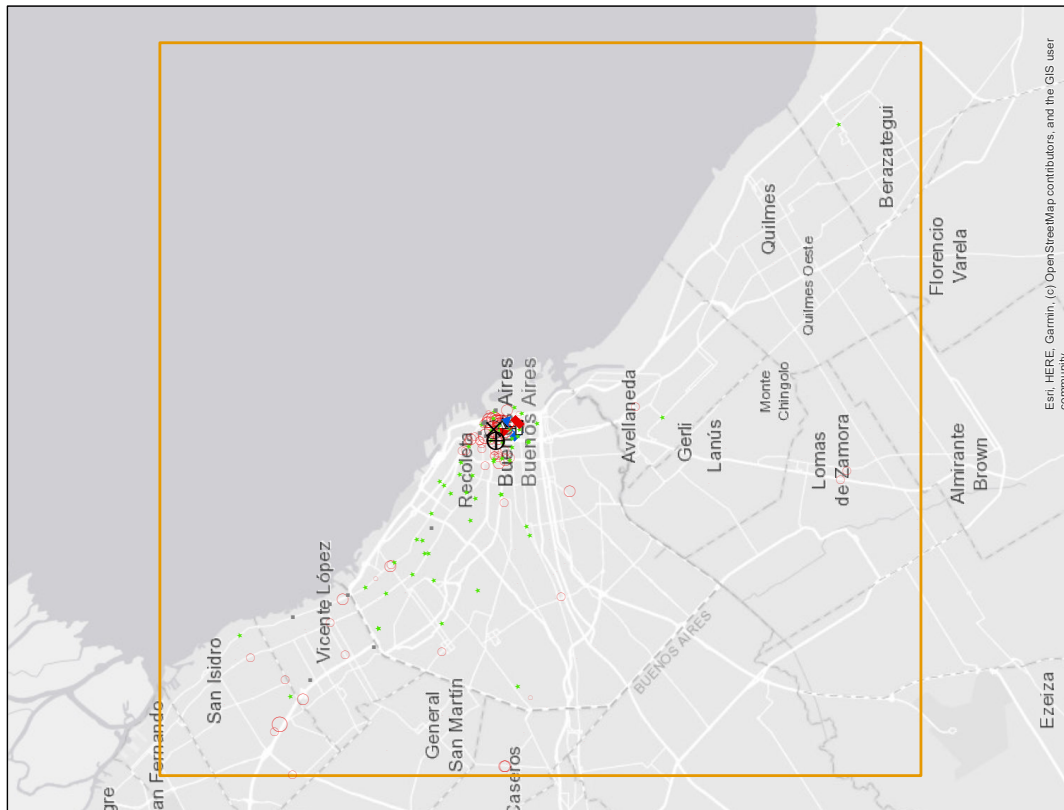
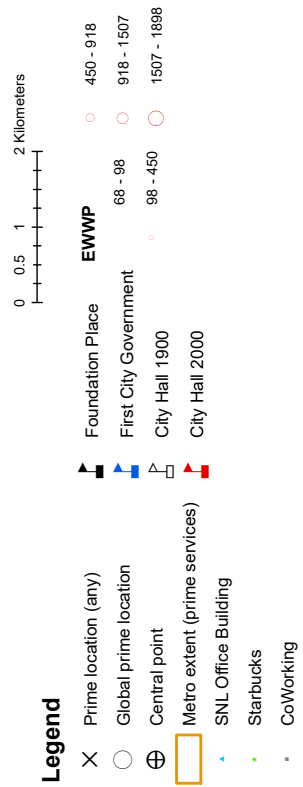
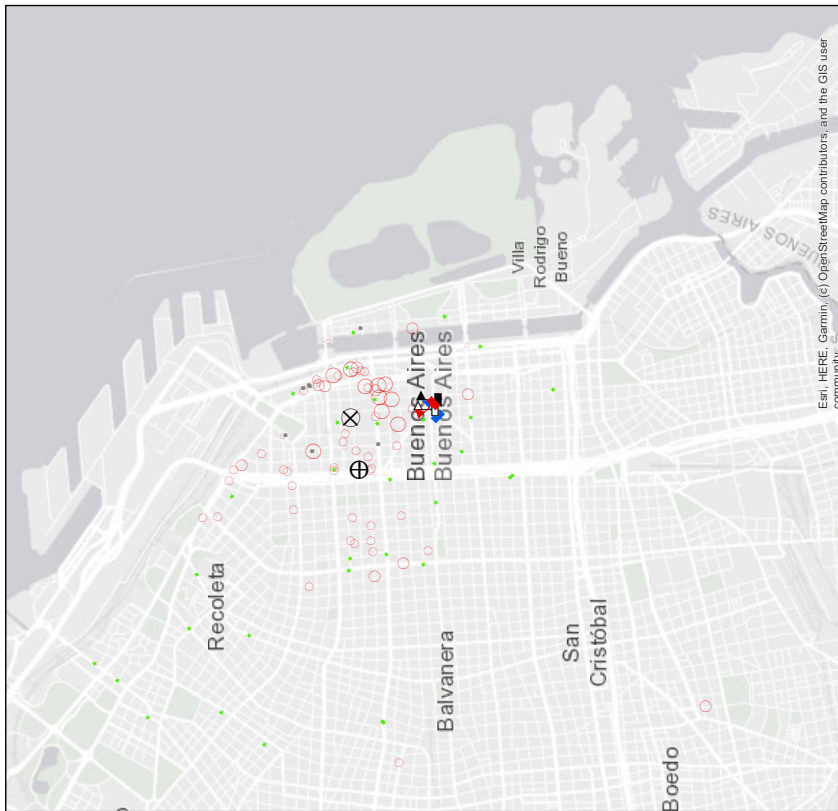


Table 37: Sources: Buenos Aires ( Argentina )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1580	Keeling (1996, p. 13f)
First Political Institution	1612	Schávelzon (2000, p. 89)
City Hall	1900	Gosciniak and Berghausen (2007)
City Hall	2000	Gosciniak and Berghausen (2007)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>b</sup> , 1900, 1950, 2000	Keeling (1996, p. 12)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1810, 1822, 1838, 1855, 1870, 1887, 1895, 1914, 1920, 1930, 1940, 1947, 1960, 1970, 1980, 1990, 1998, 2001	Lall et al. (2009, p. 166), Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>c</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1913	Osterhammel (2011, 446)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1955 <sup>d</sup>	Allmark (2008, p. 843)
International War(s)	1806 <sup>e</sup>	Ferns (1953, p. 61)

<sup>a</sup>There was an earlier settlement in 1536 at the same site, but that one only lasted for 5 years.

<sup>b</sup>Argentina was not founded then, but Buenos Aires had regional power.

<sup>c</sup>Footnote from United Nations Population Division (2014):Refers to Gran Buenos Aires. Data for 2001 and 2010 refer to the urban agglomeration including Buenos Aires city, 24 districts of Gran Buenos Aires and some districts of the suburbs.

<sup>d</sup>Generally, there have been numerous coups, but we just included the one that let to the bombing of Plaza de Mayo. In general, it is hard to find information about how many buildings were hit.

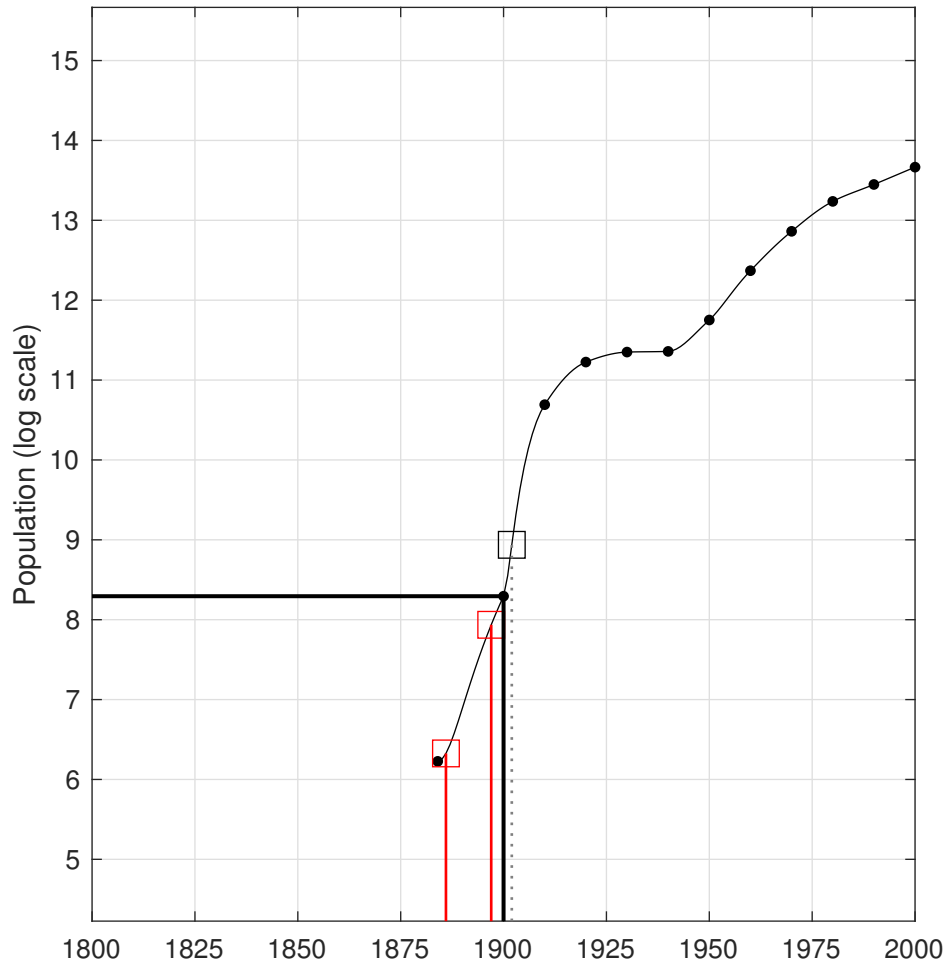
<sup>e</sup>British invasion of 1806.

Table 38: Concentration Measures - Buenos Aires

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	7.36
Cumulative density of employment-weighted PP distances at 750 m	%	5.60
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.86
Weighted average distance from EWPPs to 1900 CH	in kilometres	4.80
Average from all prime locations to 1900 CH	in kilometres	0.83
Average distance from global prime locations to 1900 CH	in kilometres	0.83

## A.17 Calgary

Figure 26: Calgary



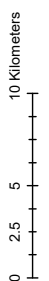
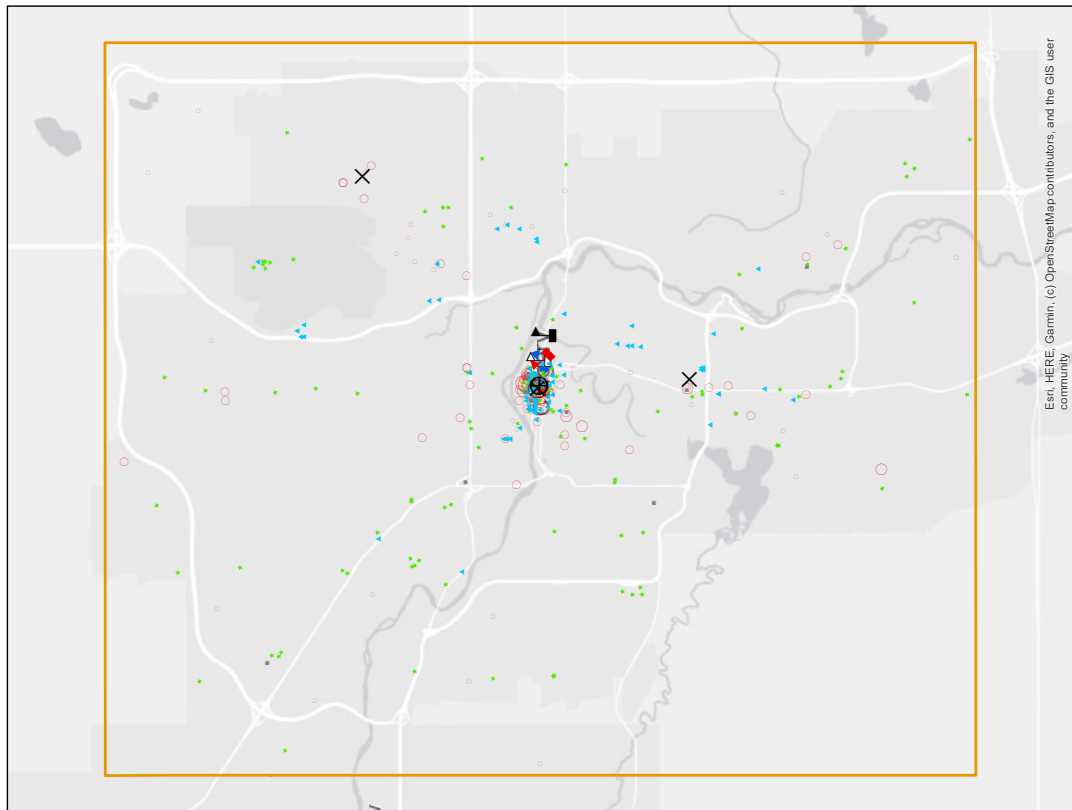
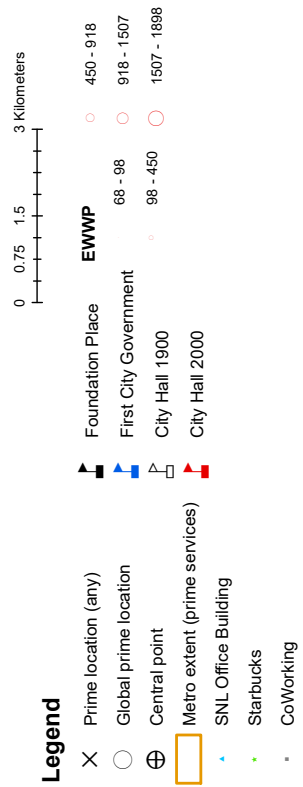
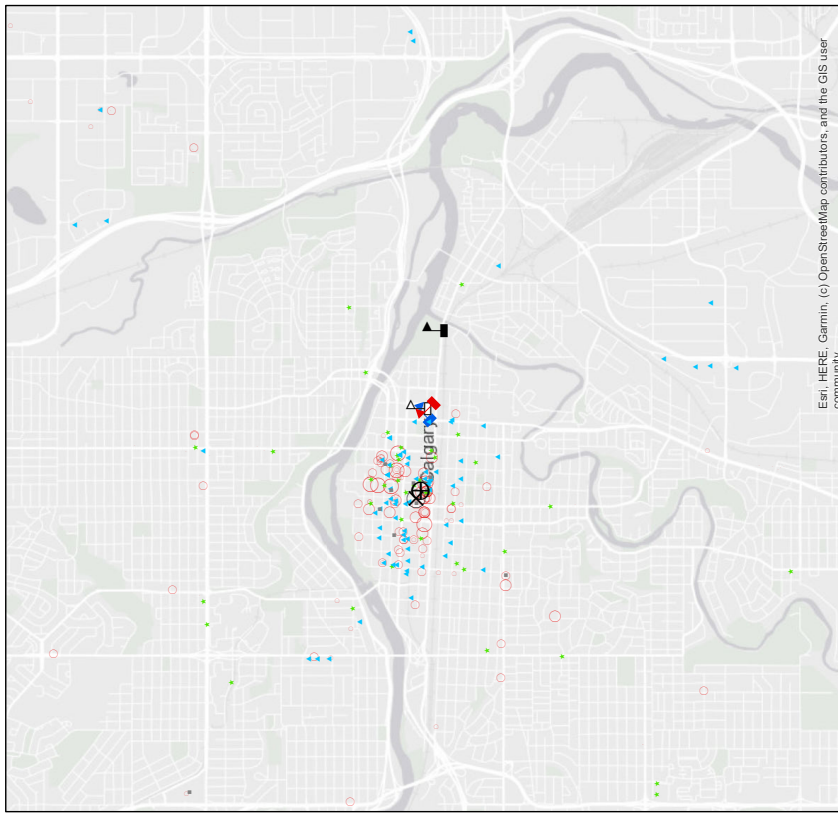


Table 39: Sources: Calgary ( Canada )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1875	Belanger (2009, p. 55)
First Political Institution	1884	Calgary Herald (2011)
City Hall <sup>b</sup>	1900	(Dankova, 1995, p. 6)
City Hall	2000	Parks Canada (2015a)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	The City of Calgary (2014)
<i>Population Data (1800-2000)</i>		
City Population	1884, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Government of Alberta (2015), Calgary Public Library (2014b), Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>c</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>d</sup>	1981	Brebbia (2009, 32)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1886 <sup>e</sup>	CBC News (2011)
Hurricane(s)	None recorded	
Flooding(s)	1879, 1897, 1902 <sup>f</sup> , 2013	CBC News (2013), CBC News (2013), Calgary Public Library (2014a)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>There was previous a single European settler arriving in 1872, but it seems a real settlement rather than a single farm only emerged in 1875 with the erection of a fort to counter whiskey trade.

<sup>b</sup>The new structure of 1907 "replaced" the old town hall of 1895. Therefore, we assume it was in the same place.

<sup>c</sup>Footnote from United Nations Population Division (2014): Refers to the Census Metropolitan Area.

<sup>d</sup>LRT system

<sup>e</sup>The fire destroyed 18 buildings, which was given the size of the new town "a large proportion of the building stock" (CBC News, 2011).

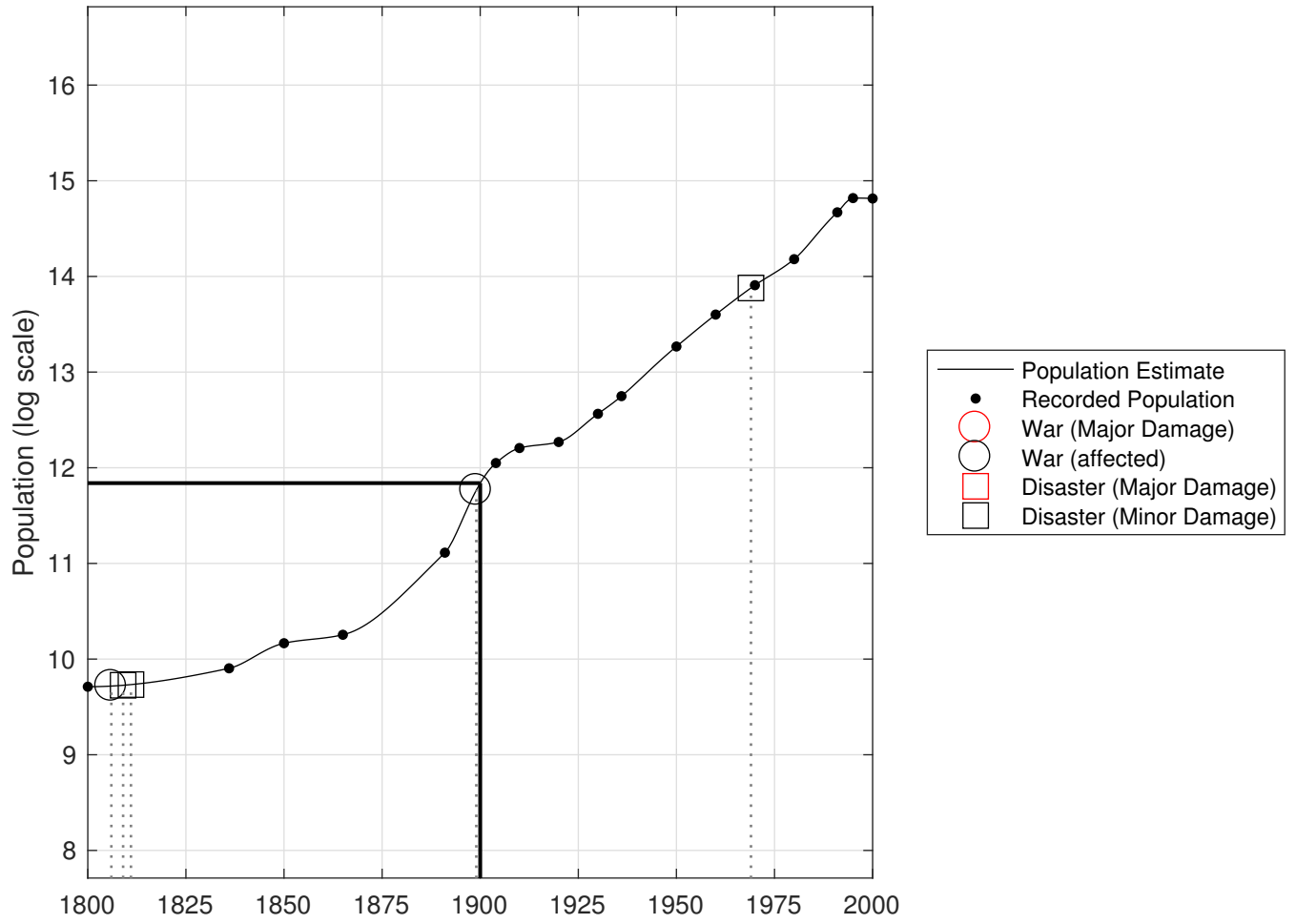
<sup>f</sup>The flood of 1902 damaged a bridge and other floods followed (1915, 1923, 1929, 1932, 1950, 2005, 2013). However, the 1902 flood does not qualify as having caused major destruction as the did not wash away buildings.

Table 40: Concentration Measures - Calgary

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	4.81
Cumulative density of employment-weighted PP distances at 750 m	%	3.86
Average distance between all prime locations	in kilometres	6.17
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.56
Weighted average distance from EWPPs to 1900 CH	in kilometres	3.24
Average from all prime locations to 1900 CH	in kilometres	1.54
Average distance from global prime locations to 1900 CH	in kilometres	0.99

## A.18 Cape Town

Figure 27: Cape Town





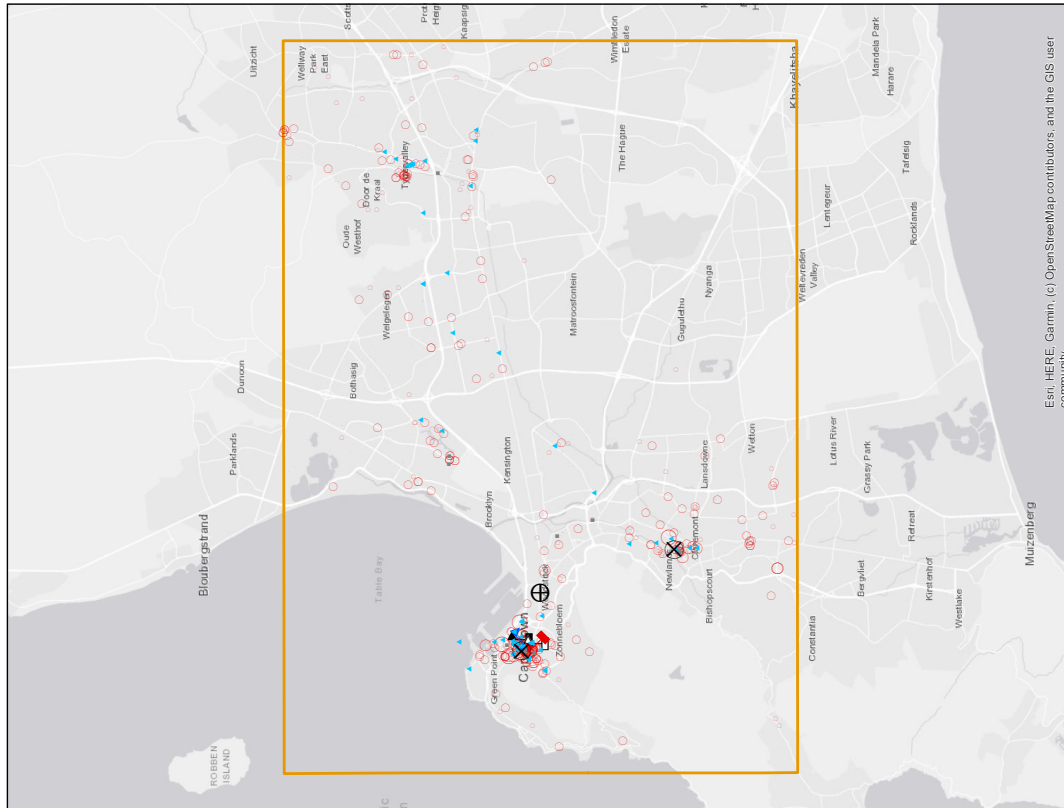
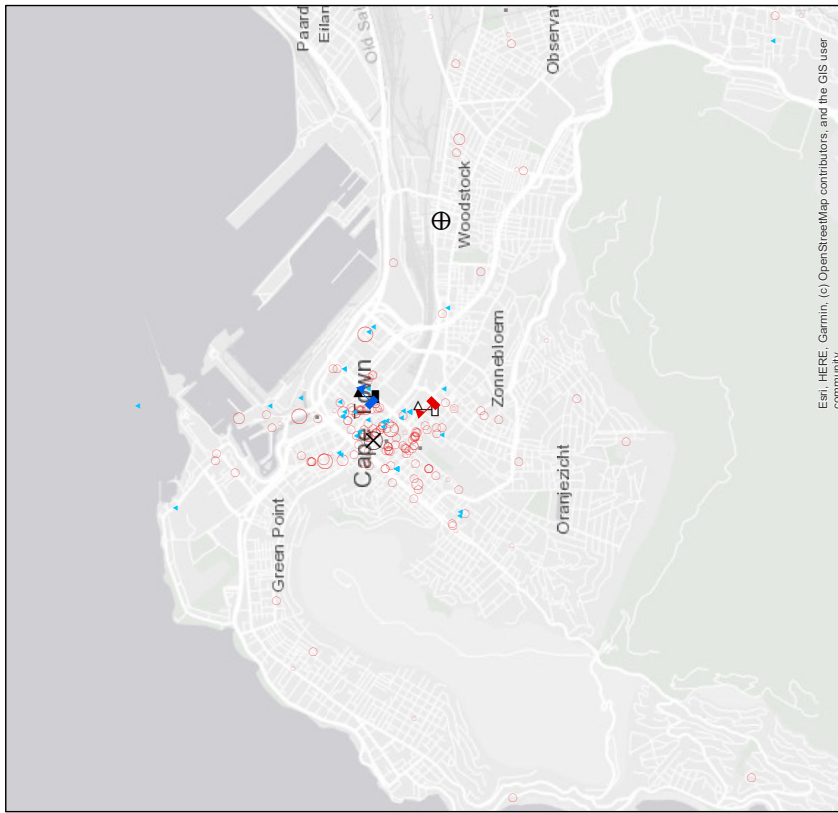


Table 41: Sources: Cape Town ( South Africa )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1652	Elphick and Giliomee (2014, p. 111), Abrahams (1993)
First Political Institution <sup>b</sup>	1652	Elphick and Giliomee (2014, p. 111), Abrahams (1993)
City Hall <sup>c</sup>	1900	South African History Online (2015b)
City Hall	2000	South African History Online (2015b)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	South African History (2015a)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1836, 1850, 1865, 1891, 1904, 1910, 1920, 1930, 1936, 1950, 1960, 1970, 1980, 1991, 1995, 2000	(Worden et al., 1998, p.89), (Shillington, 2004, p. 214), Mitchell (2007, p. 41), Chandler (1987, p. 53), South African History (2015b), United Nations (2012)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	1809 <sup>d</sup> , 1811 <sup>e</sup> , 1969 <sup>f</sup>	Editors of the Monthly Magazine (1810, p. 369), Van Lill (2004, p. 57)
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1806 <sup>g</sup> , 1899 <sup>h</sup>	Tucker (2009, p. 1047), Grehan and Mace (2014, p. 92)

<sup>a</sup>We take the erection of the first fort as the first settlement and first governmental institution.

<sup>b</sup>Castle of Good Hope.

<sup>c</sup>Construction started in 1900.

<sup>d</sup>Only one building collapsed and many left damaged. This event is not classified as a major disaster.

<sup>e</sup>According to this author's Mercalli scale, no serious to the majority of houses were done at any earthquake.

<sup>f</sup>According to this author's Mercalli scale, no serious to the majority of houses were done at any earthquake.

<sup>g</sup>British capture of Cape Town, but no damage reported in this source.

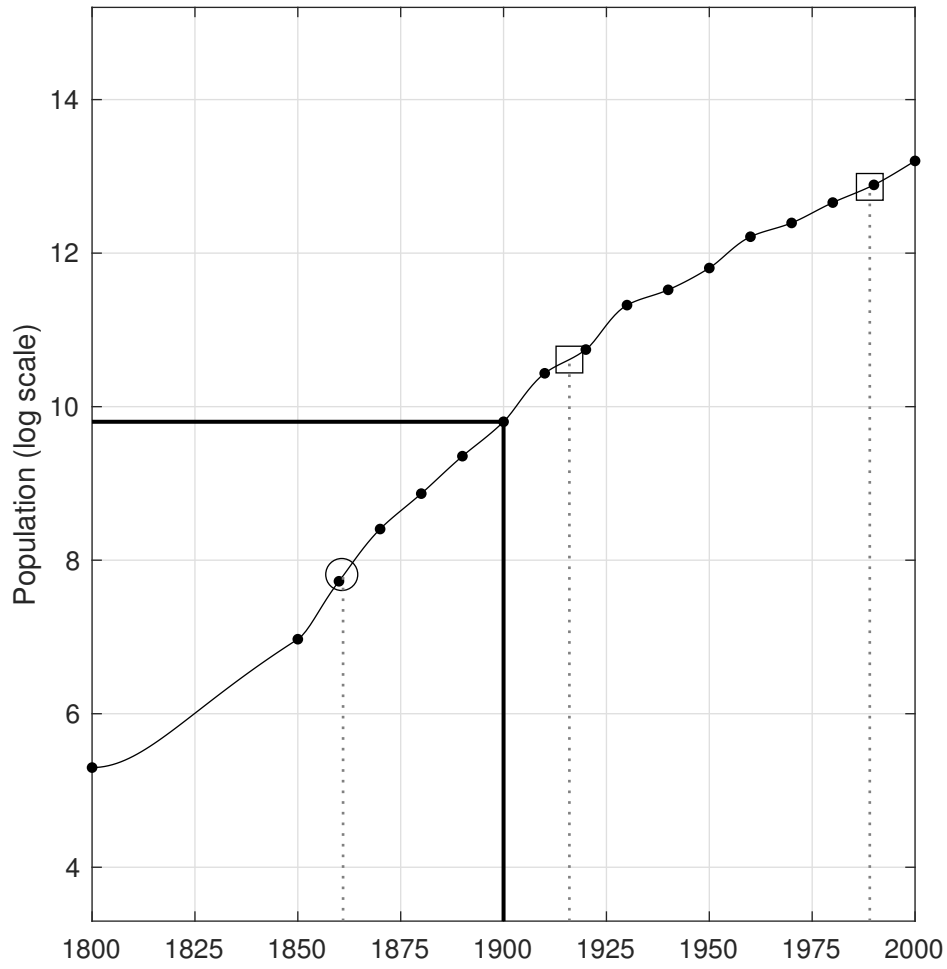
<sup>h</sup>Large Prisoners of War Camp in the second Boer war.

Table 42: Concentration Measures - Cape Town

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	10.51
Cumulative density of employment-weighted PP distances at 750 m	%	13.39
Average distance between all prime locations	in kilometres	3.75
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.36
Weighted average distance from EWPPs to 1900 CH	in kilometres	7.91
Average from all prime locations to 1900 CH	in kilometres	1.88
Average distance from global prime locations to 1900 CH	in kilometres	1.88

## A.19 Charlotte

Figure 28: Charlotte



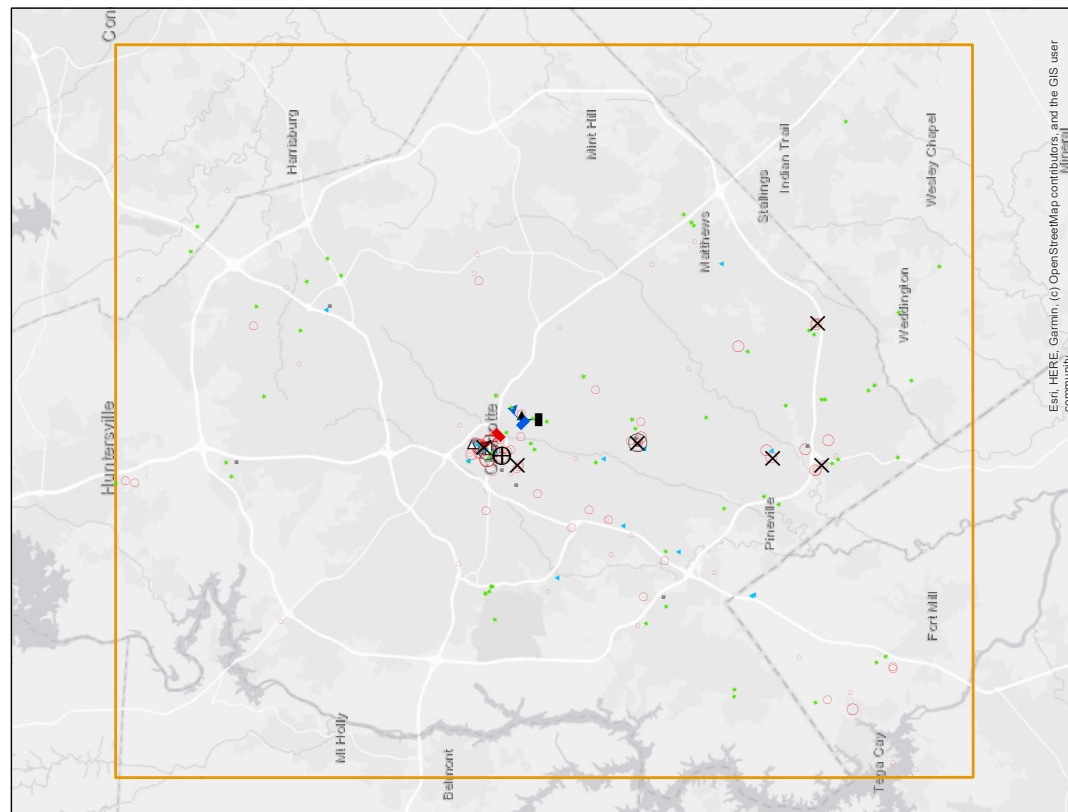
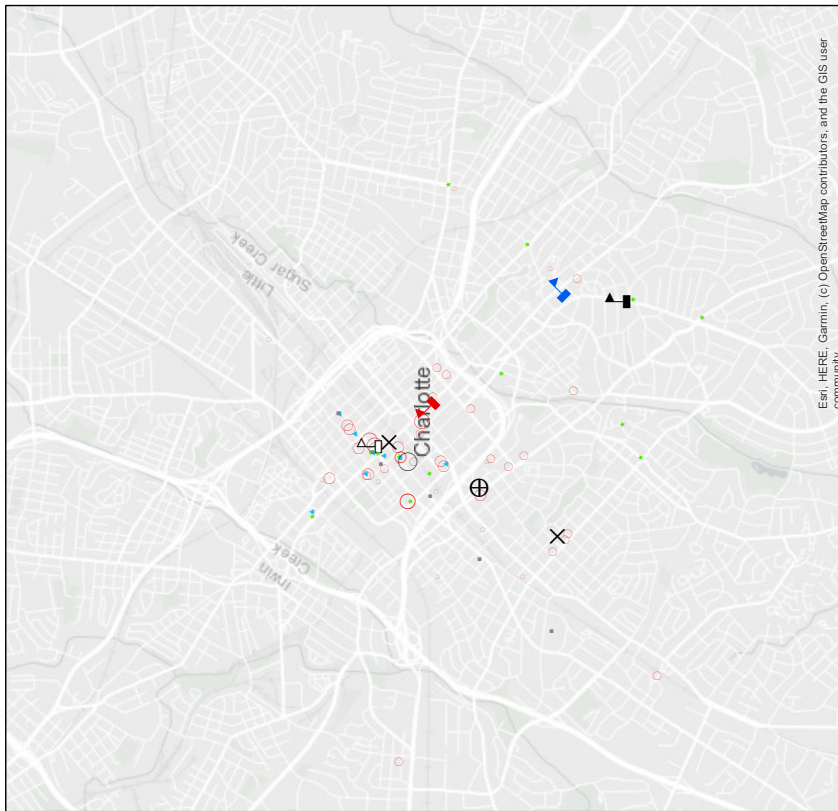


Table 43: Sources: Charlotte ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1753	Hanchett (2015)
First Political Institution <sup>b</sup>	1763	Morrill (2015)
City Hall	1900	Charlotte-Mecklenburg Historic Landmarks Commission (1980)
City Hall	2000	Charlotte-Mecklenburg Historic Landmarks Commission (1980)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Hanchett (2015)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Gibson and Jung (2005a, p. 85), UNC Charlotte - J. Murrey Atkins Library (2015), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	1916 <sup>c</sup> , 1989 <sup>d</sup>	Kratt (1992, p. 148), Kratt (1992, p. 266)
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861 <sup>e</sup>	Charlotte Mecklenburg Library (2015)
International War(s)	None recorded	

<sup>a</sup>Founded by Thomas Spratt.

<sup>b</sup>First court session was held here.

<sup>c</sup>This hurricane caused what is considered the Great Flood. However, damage was centered on trees, bridges and roofs. It does not seem to have washed many houses away from the account given here. No floods given in Charlotte-Mecklenburg Storm Water Services (2015) qualify as major destruction floods.

<sup>d</sup>A heavy hurricane causing 250 \$ in damage. However, it does not seem that it washed away many houses.

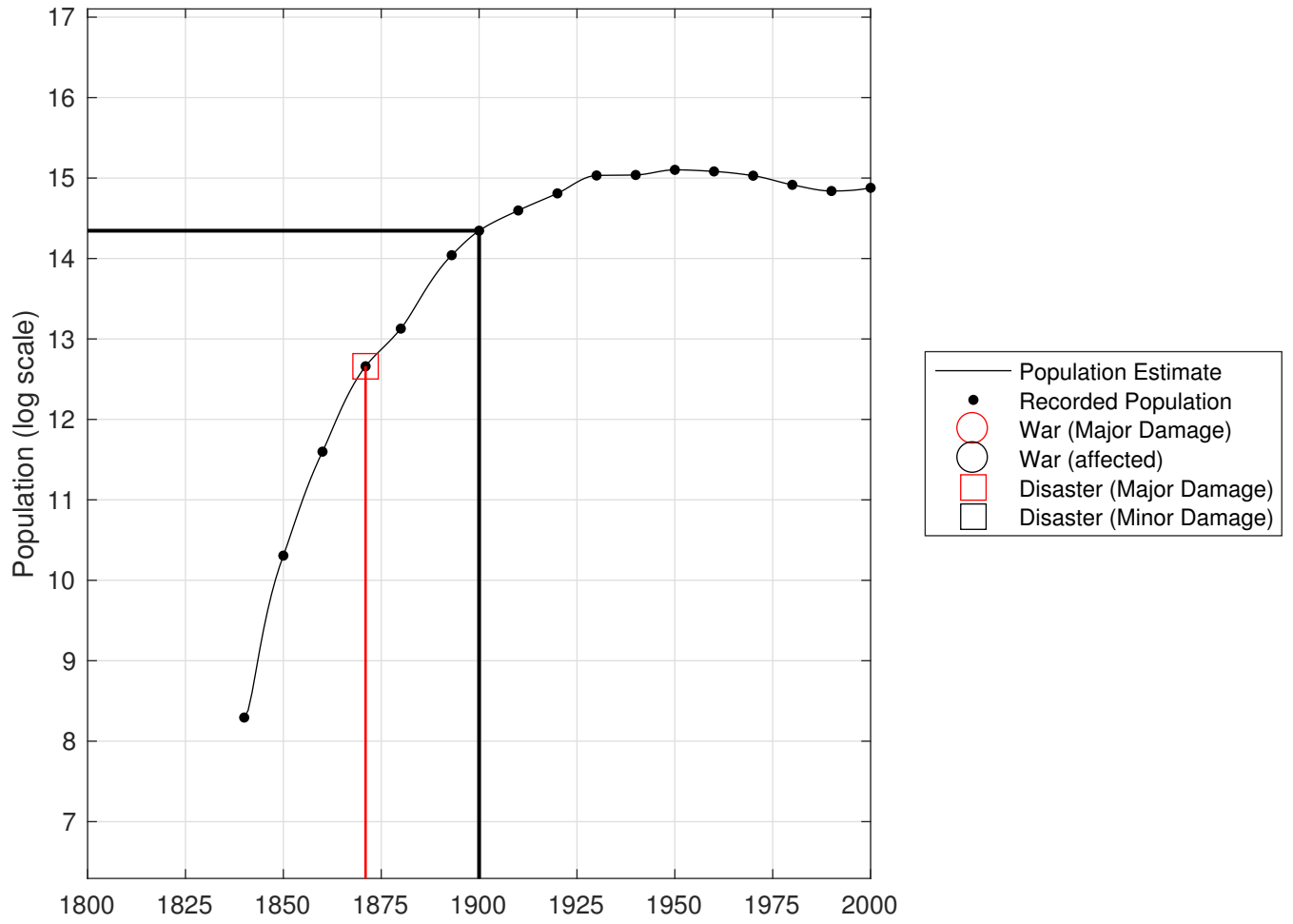
<sup>e</sup>Charlotte becomes military base as the navy yard is moved from Norfolk here.

Table 44: Concentration Measures - Charlotte

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	11.54
Cumulative density of employment-weighted PP distances at 750 m	%	16.50
Average distance between all prime locations	in kilometres	9.12
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.49
Weighted average distance from EWPPs to 1900 CH	in kilometres	7.94
Average from all prime locations to 1900 CH	in kilometres	5.10
Average distance from global prime locations to 1900 CH	in kilometres	1.74

## A.20 Chicago

Figure 29: Chicago





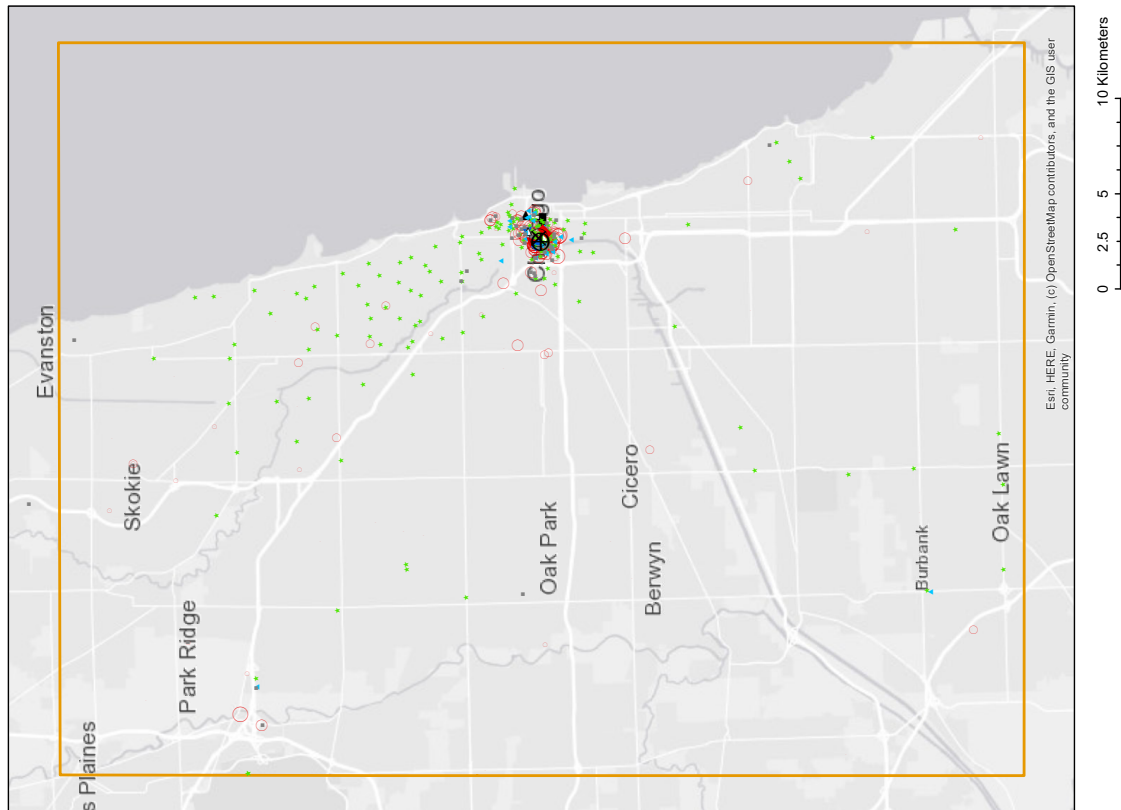
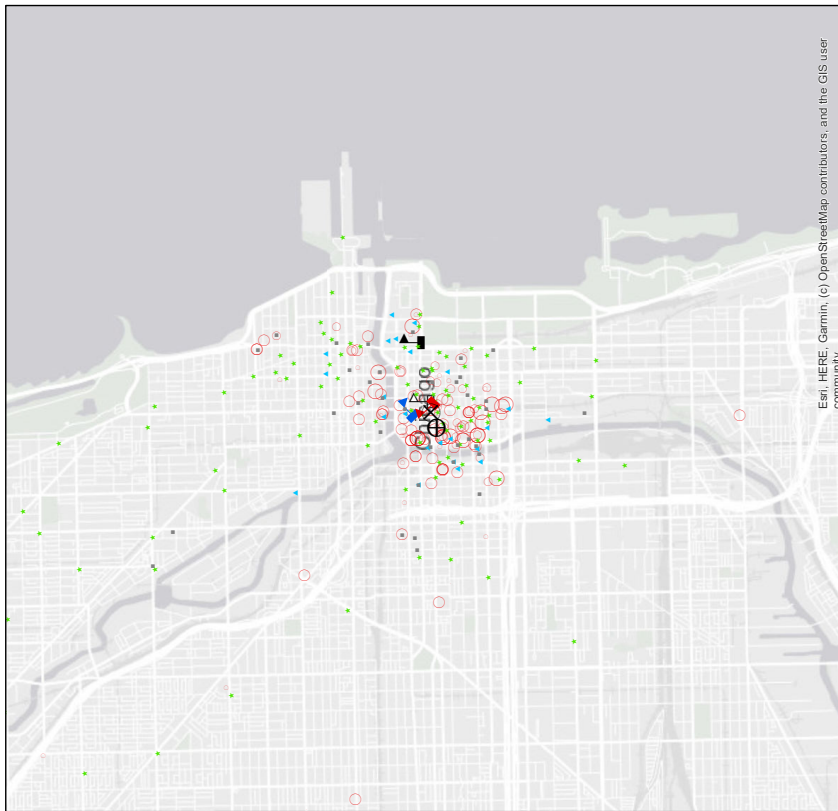


Table 45: Sources: Chicago ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1830	Pierce (1937a, p. 1)
First Political Institution	1837	Historic American Buildings Survey (1981, p. 3-9)
City Hall	1900	Historic American Buildings Survey (1981, p. 3-9)
City Hall	2000	Historic American Buildings Survey (1981, p. 3-9)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Pierce (1937a)
<i>Population Data (1800-2000)</i>		
City Population	1840, 1850, 1860, 1871, 1880, 1893, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Angel et al. (2012, p. 273), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>b</sup>	1892	Vuchic (2007, 38)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	Pierce (1937b, p. 3-6), Mayer and Wade (1969, p. 120)
Fire(s)	1871	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>“First legal geographic location.” Map by Pierce, approximated coordinates by using maps.google.com

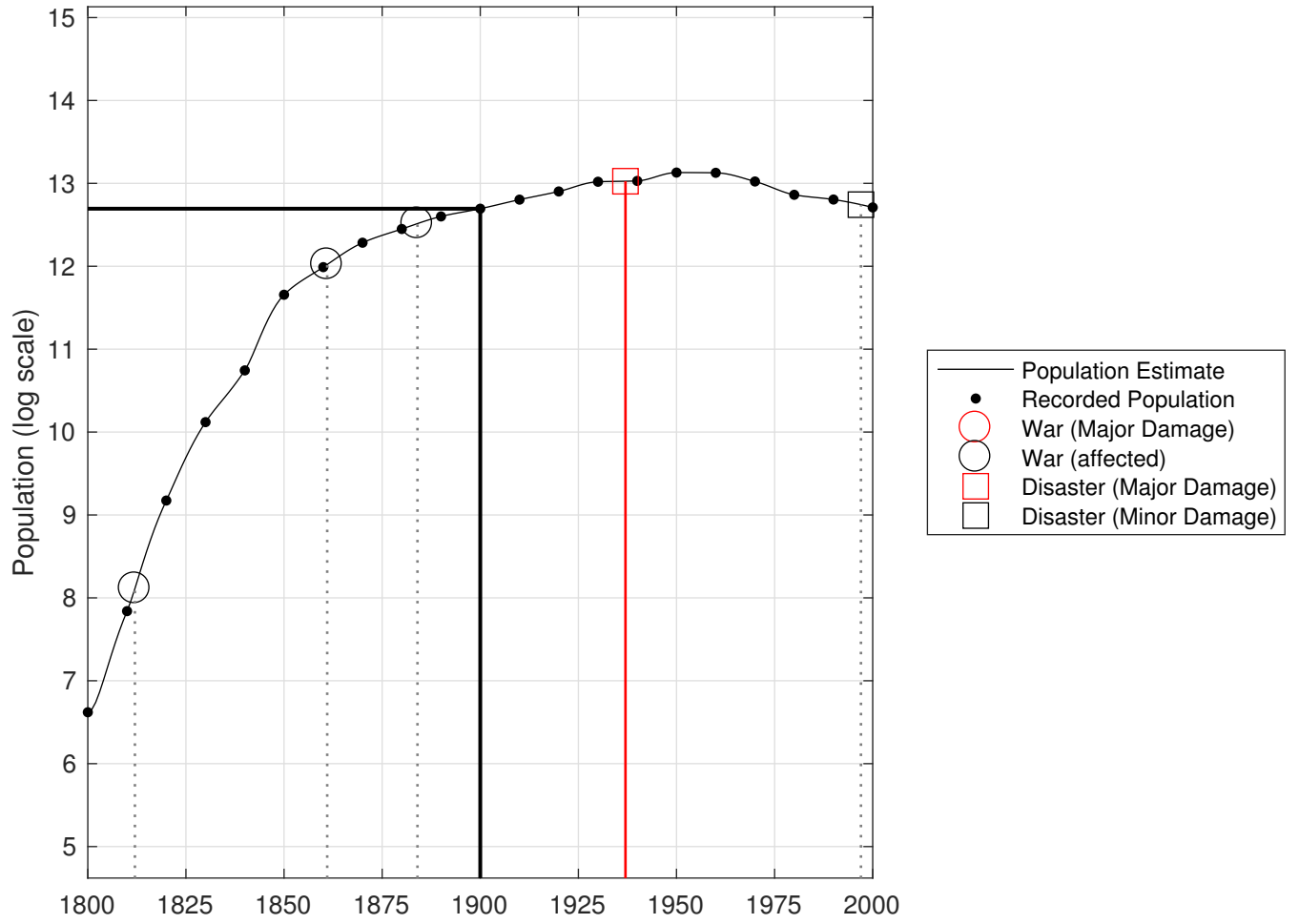
<sup>b</sup>In 1897, the loop was electrified.

Table 46: Concentration Measures - Chicago

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	3.80
Cumulative density of employment-weighted PP distances at 750 m	%	2.54
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-1.36
Weighted average distance from EWPPs to 1900 CH	in kilometres	2.26
Average from all prime locations to 1900 CH	in kilometres	0.18
Average distance from global prime locations to 1900 CH	in kilometres	0.18

## A.21 Cincinnati

Figure 30: Cincinnati



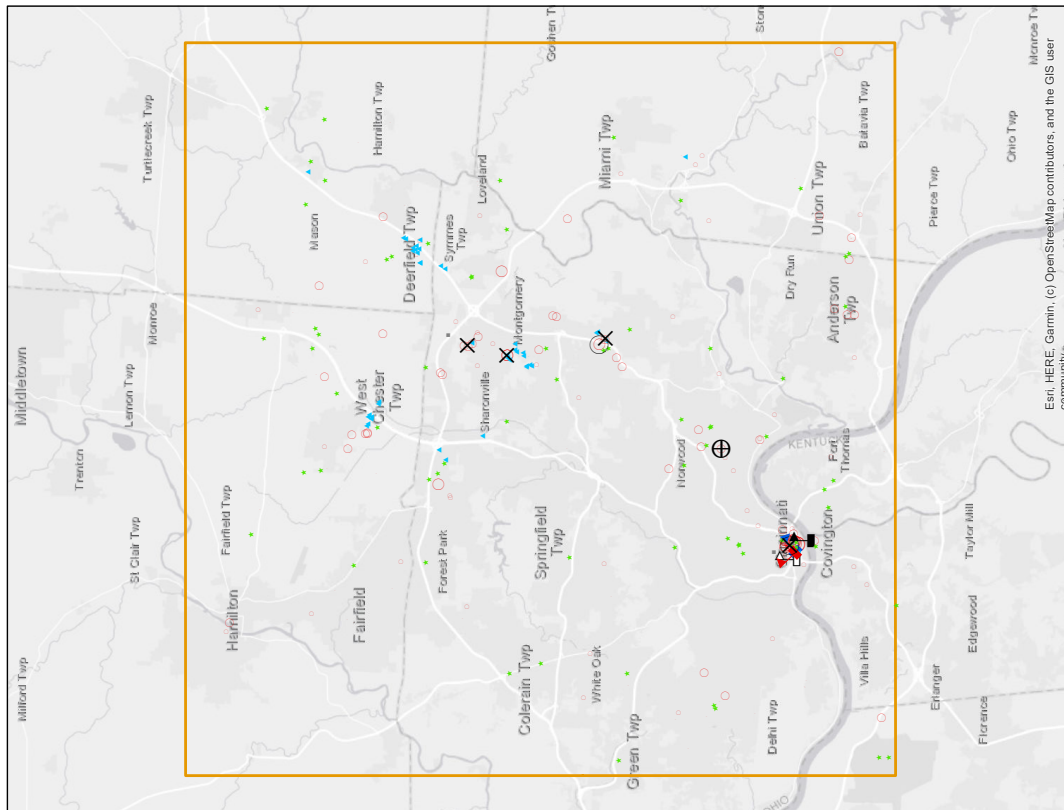
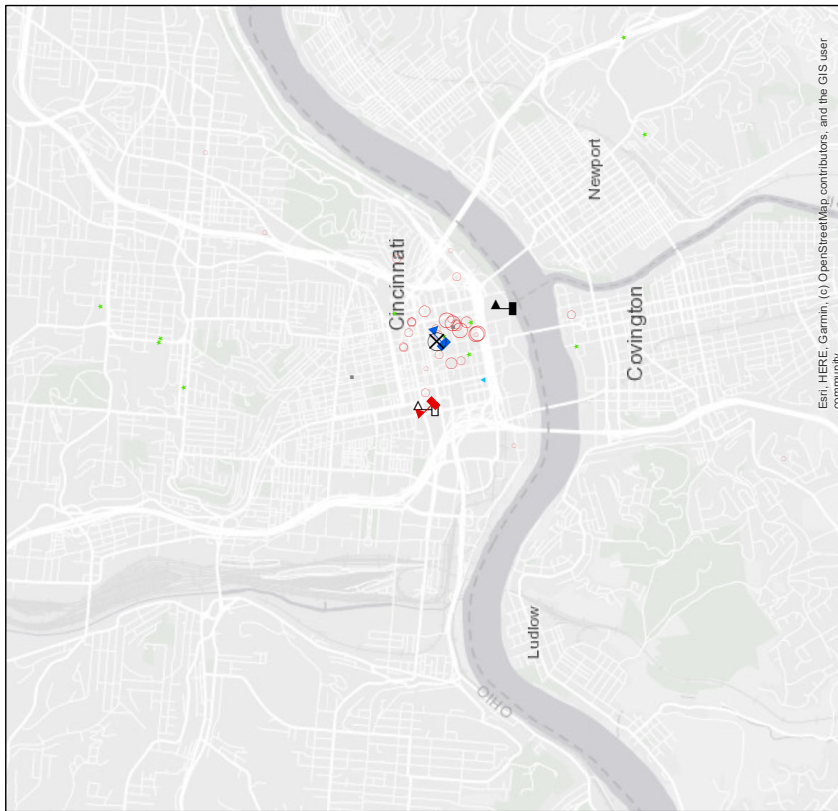


Table 47: Sources: Cincinnati ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1788	Cincinnati Museum Center (2015)
First Political Institution <sup>b</sup>	1802	Ohio State Archaeological and Historical Society (1943, p. 180)
City Hall	1900	Ohio State Archaeological and Historical Society (1943, p. 202)
City Hall <sup>c</sup>	2000	Ohio State Archaeological and Historical Society (1943, p. 202)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Cincinnati Museum Center (2015)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1810, 1820, 1830, 1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Gibson and Jung (2005a, 89), Robinson & Fairbank (1829, p. 151), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	1937 <sup>d</sup> , 1997 <sup>e</sup>	Davis (2009, p. 194), Woellert (2009, p. 25)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861 <sup>f</sup> , 1884 <sup>g</sup>	Grace and White (2003, p. 23), Tucker (2013a, p. 373)
International War(s)	1812 <sup>h</sup>	Stagg (2012, p. 60)

<sup>a</sup>Another settlement name Columbia had been established at the present location of the airport a month earlier, but this is the location which would soon be named Cincinnati.

<sup>b</sup>This is the location of the first courthouse after the incorporation as a town in 1802.

<sup>c</sup>The building from 1893 is apparently still in use today.

<sup>d</sup>This flood was associated with a fire, which burned over three and a half square miles (including ten factories). Spring floods were quite regular, but this flood is considered the most devastating recorded flood. There were other mentionable floods (e.g. 1832, 1883, 1884), but their actual extent of their damage is unknown to the authors. The 1937 is even mentioned in Encyclopaedia Britannica (2014a), which is why it's coded as having caused heavy destruction.

<sup>e</sup>While some severe damage to the outskirts of Cincinnati seems to have been done, structures mostly resisted the floods.

<sup>f</sup>There was only a threat against Cincinnati and the city was then an important military post.

<sup>g</sup>Courthouse Riots: about 50 people died and the courthouse was burned. It is not classified as causing major destruction to the city though.

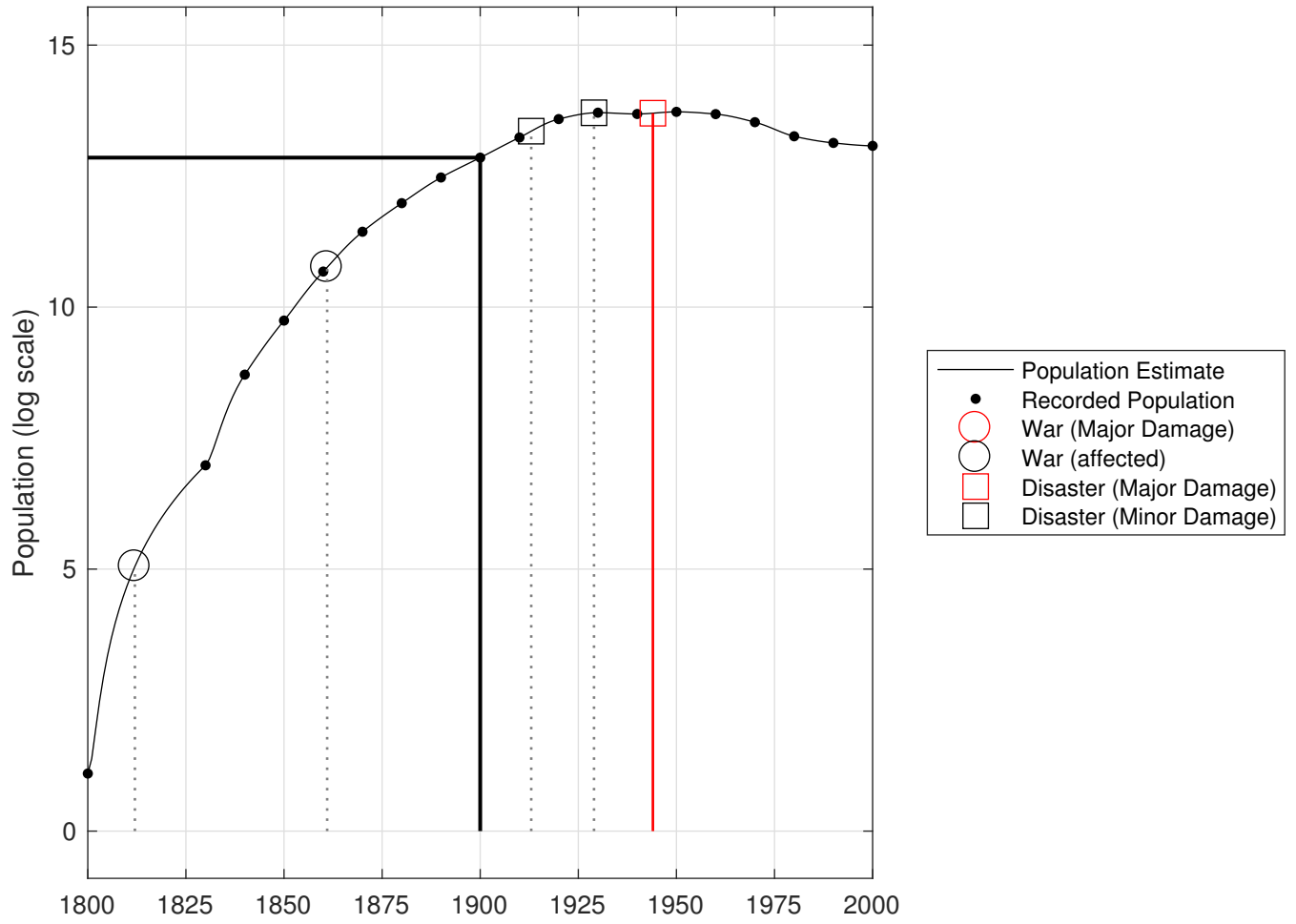
<sup>h</sup>A lot of men were drafted in Cincinnati.

Table 48: Concentration Measures - Cincinnati

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	16.01
Cumulative density of employment-weighted PP distances at 750 m	%	35.67
Average distance between all prime locations	in kilometres	9.32
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.56
Weighted average distance from EWPPs to 1900 CH	in kilometres	13.10
Average from all prime locations to 1900 CH	in kilometres	5.18
Average distance from global prime locations to 1900 CH	in kilometres	2.38

## A.22 Cleveland

Figure 31: Cleveland





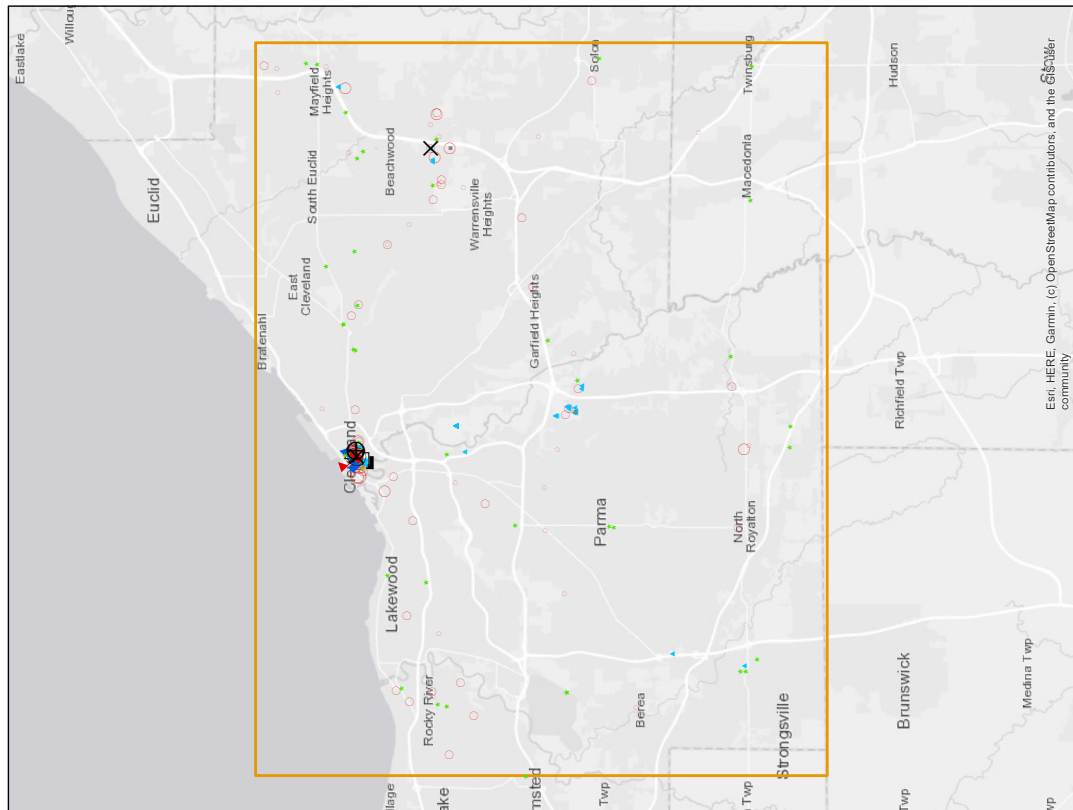
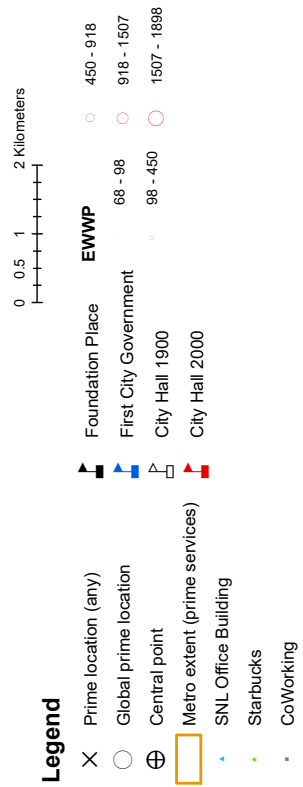
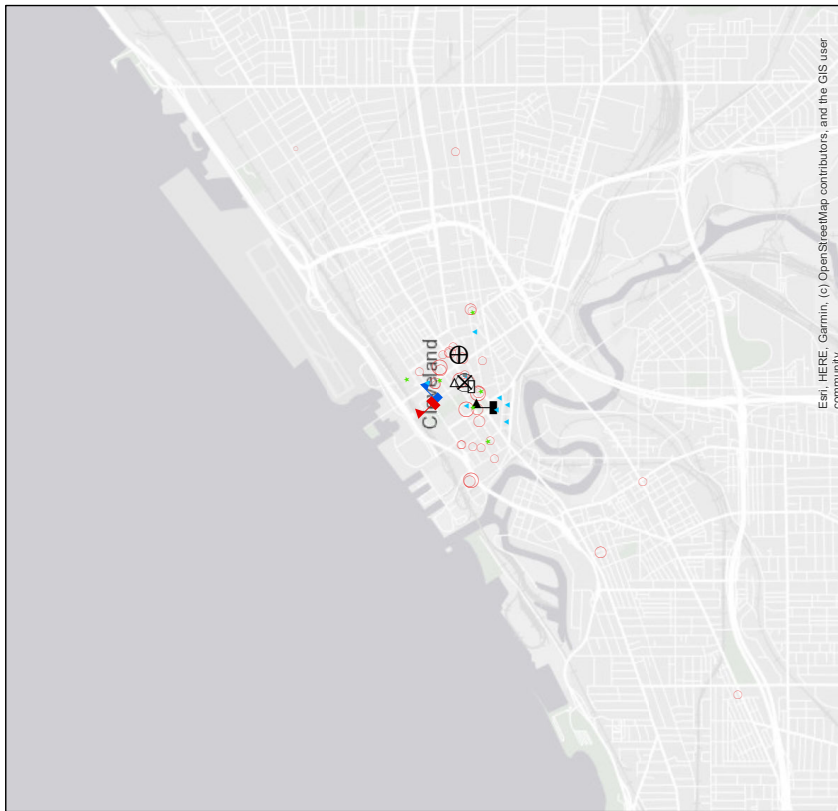


Table 49: Sources: Cleveland ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1796	CSU Center for Public History & Digital Humanities (2015)
First Political Institution <sup>a</sup>	1802	Center for Public History (2015)
City Hall	1900	Center for Public History (2015)
City Hall	2000	Center for Public History (2015)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Center for Public History (2015)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1830, 1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Hurt (1998, p. 201), Gibson and Jung (2005a), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>b</sup>	1913	Greater Cleveland Regional Transit Authority (2016, 245)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1929, 1944	Ohio Inspection Bureau (1929, p. 3), Ohio History Central (2015)
Hurricane(s)	None recorded	
Flooding(s)	1913 <sup>c</sup>	Ohio Historical Society (2015)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861 <sup>d</sup>	Case Western Reserve University (2014)
International War(s)	1812	Case Western Reserve University (2015)

<sup>a</sup>City administrative issues took place in Kingdury's home, which is now the site of the federal building.

<sup>b</sup>In accordance with Gonzalez-Navarro and Turner (2016), we take 1913 as the starting date. This refers to the first LRT system.

<sup>c</sup>The Ohio seemed to not have affected Cleveland as much as there are harly references and foremost no reference given in the deatiled timeline of Cleveland's history by Western Reserve Historical Society (2015).

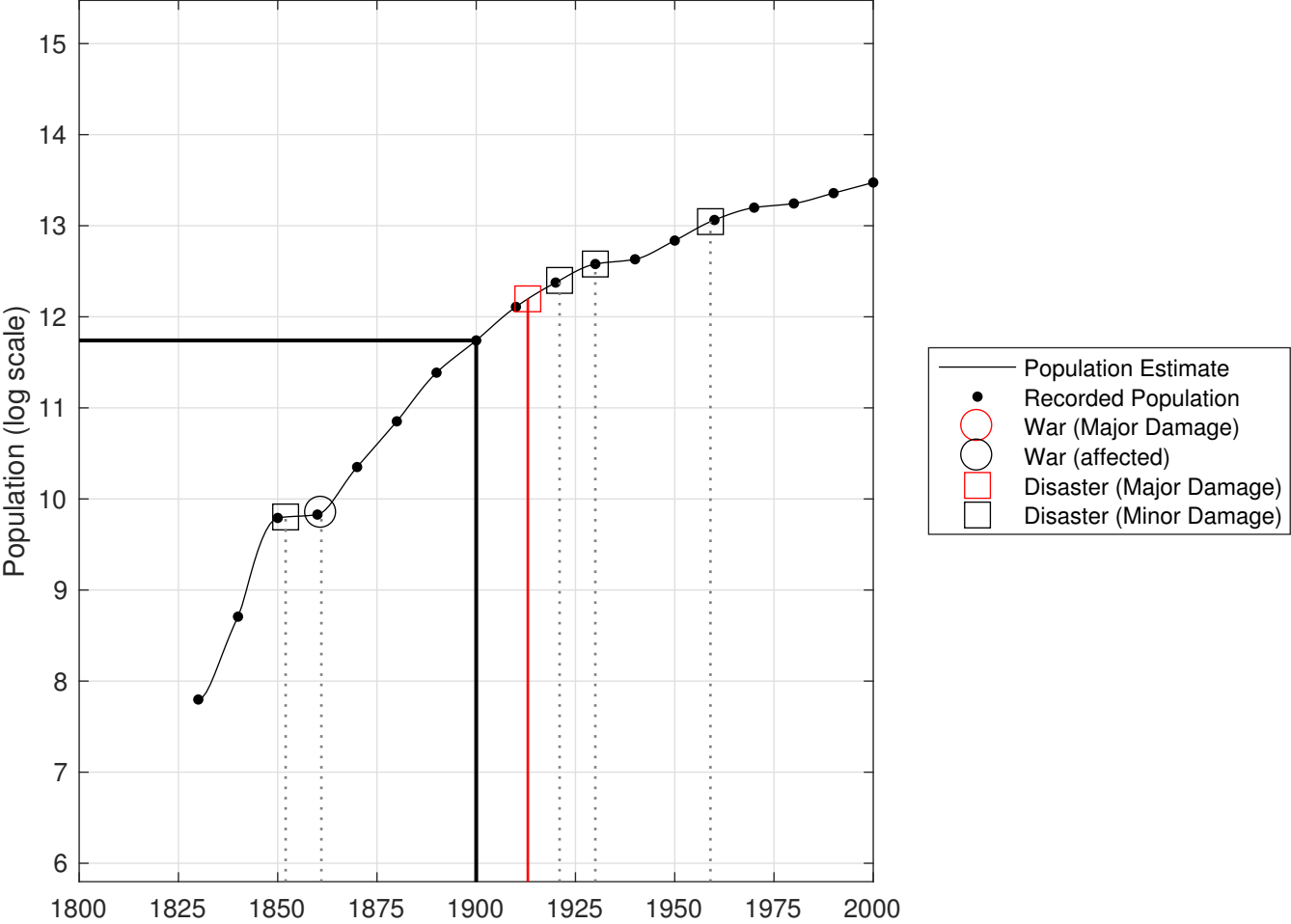
<sup>d</sup>There were civil war camps in Cleveland.

Table 50: Concentration Measures - Cleveland

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	12.23
Cumulative density of employment-weighted PP distances at 750 m	%	19.39
Average distance between all prime locations	in kilometres	8.49
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.82
Weighted average distance from EWPPs to 1900 CH	in kilometres	8.11
Average from all prime locations to 1900 CH	in kilometres	1.46
Average distance from global prime locations to 1900 CH	in kilometres	0.04

A.23 Columbus

Figure 32: Columbus



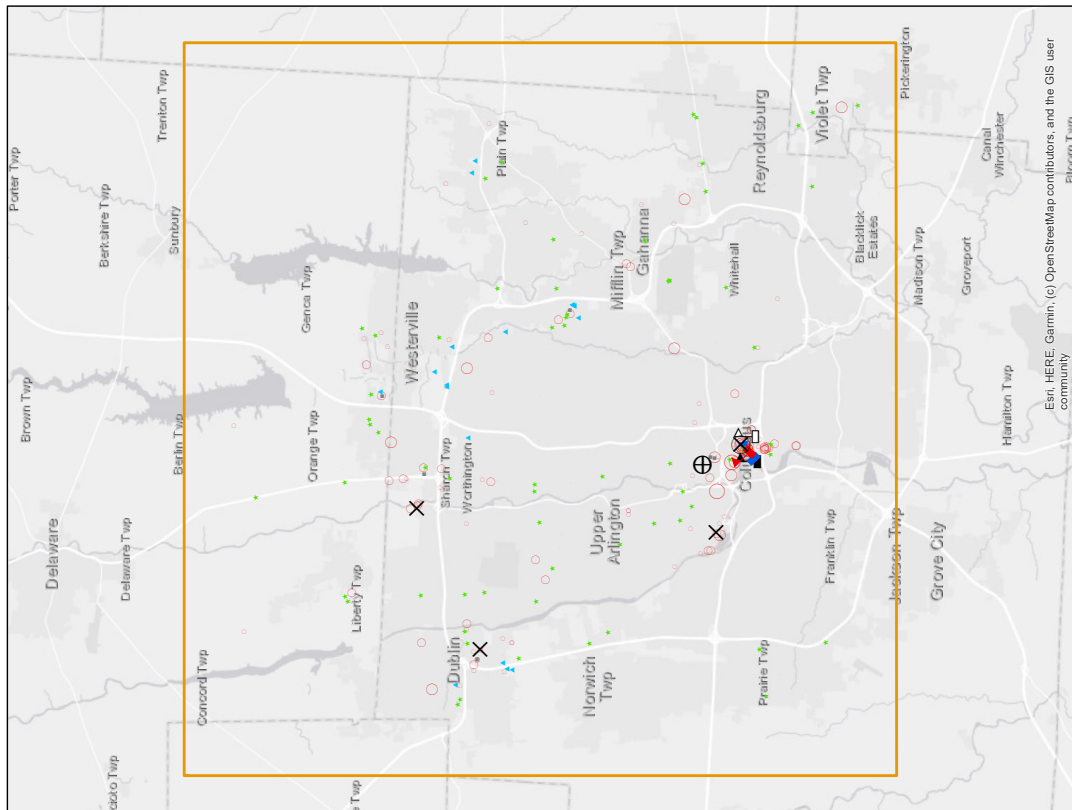
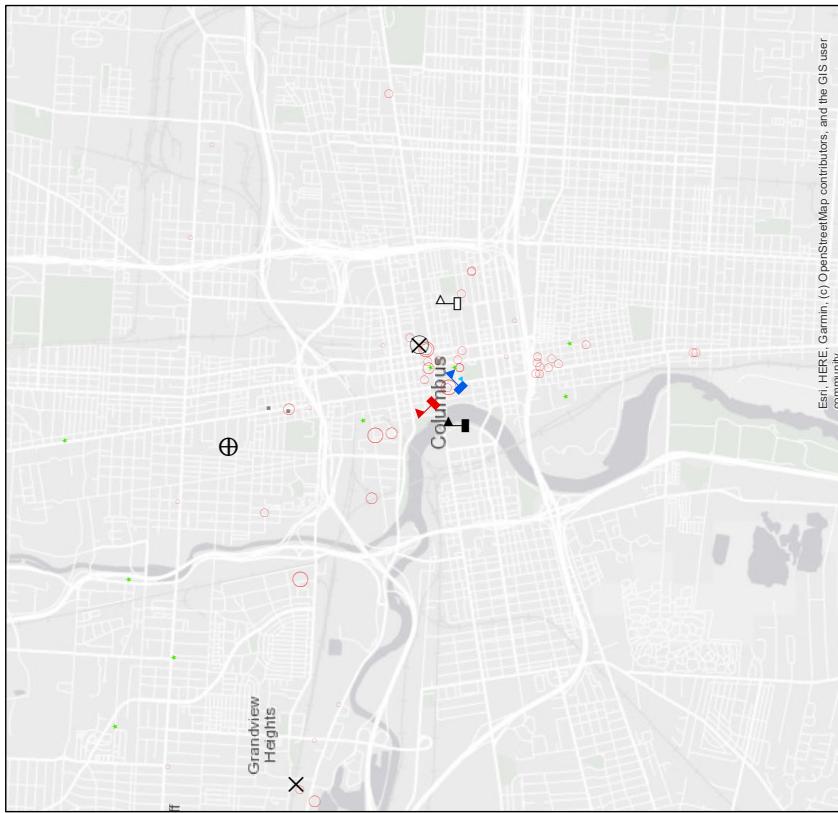


Table 51: Sources: Columbus ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1797	Betti et al. (2013, p. 45)
First Political Institution <sup>b</sup>	1814	The Columbus Dispatch (2012)
City Hall	1900	The Columbus Dispatch (2012)
City Hall	2000	The Columbus Dispatch (2012)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	The Columbus Dispatch (2012)
<i>Population Data (1800-2000)</i>		
City Population	1830, 1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Gibson and Jung (2005a, p. 90), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1852 <sup>c</sup> , 1921 <sup>d</sup> , 1930 <sup>e</sup>	The Columbus Dispatch (2012)
Hurricane(s)	None recorded	
Flooding(s)	1913, 1959 <sup>f</sup>	The Columbus Dispatch (2012), The Columbus Dispatch (2012), Hinds (2013), Ludlow (2013)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861 <sup>g</sup>	The Columbus Dispatch (2012)
International War(s)	1812 <sup>h</sup>	The Columbus Dispatch (2012)

<sup>a</sup>This is the first settlement in Franklinton from which Columbus would grow out on the other site of the river shortly later (The Columbus Dispatch, 2012).

<sup>b</sup>This is actually a state house as Columbus became state capital in 1814, but was incorporated as a city only years later. However, given the small size of the city, it is likely that the municipal council met here. See also that the following reference suggests that the councilmen of the “Borough of Columbus” met here (Howe, 1850, p. 171).

<sup>c</sup>State capitol destroyed.

<sup>d</sup>City hall destroyed.

<sup>e</sup>Prison destroyed. All these fires were mostly limited to single structures and are thus not coded as having caused major damage.

<sup>f</sup>Not classified as major as the damage was less severe in 1913 and no lives were lost (Barrett, 2006, p. 88)

<sup>g</sup>Columbus used as union staging ground.

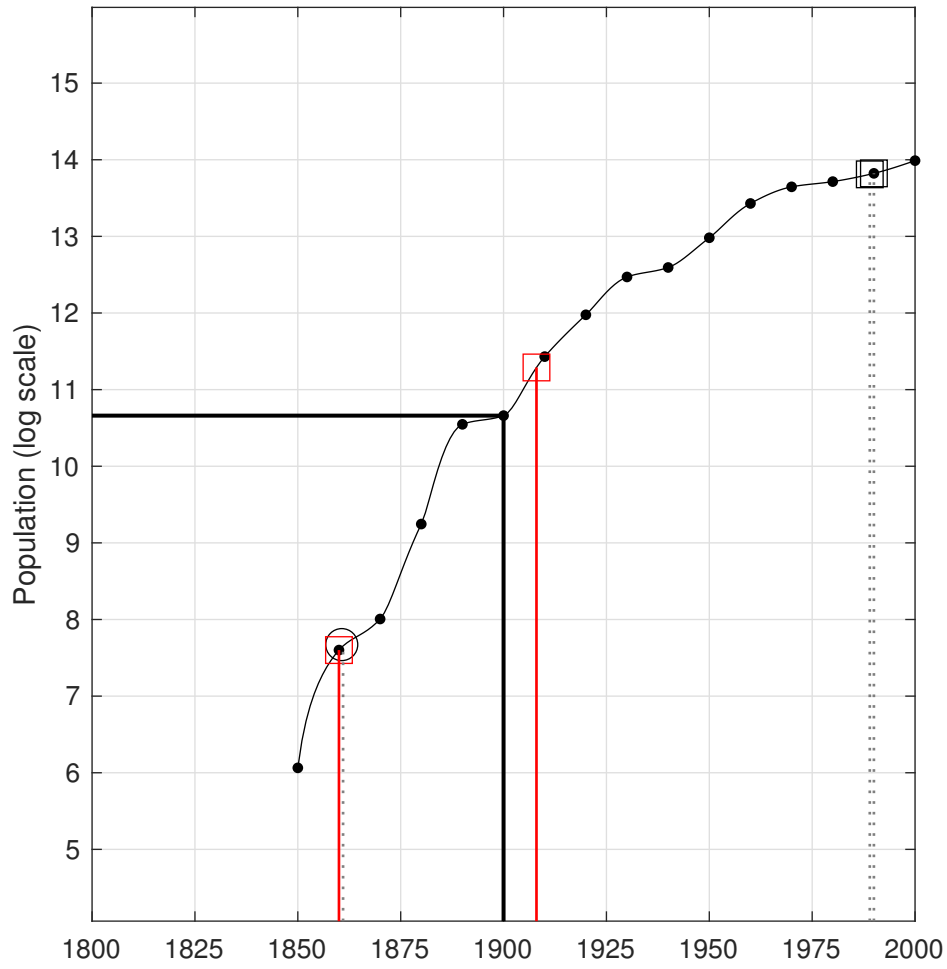
<sup>h</sup>Columbus used as staging ground and command centre.

Table 52: Concentration Measures - Columbus

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	12.70
Cumulative density of employment-weighted PP distances at 750 m	%	26.64
Average distance between all prime locations	in kilometres	10.08
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.08
Weighted average distance from EWPPs to 1900 CH	in kilometres	9.72
Average from all prime locations to 1900 CH	in kilometres	5.75
Average distance from global prime locations to 1900 CH	in kilometres	0.56

## A.24 Dallas

Figure 33: Dallas





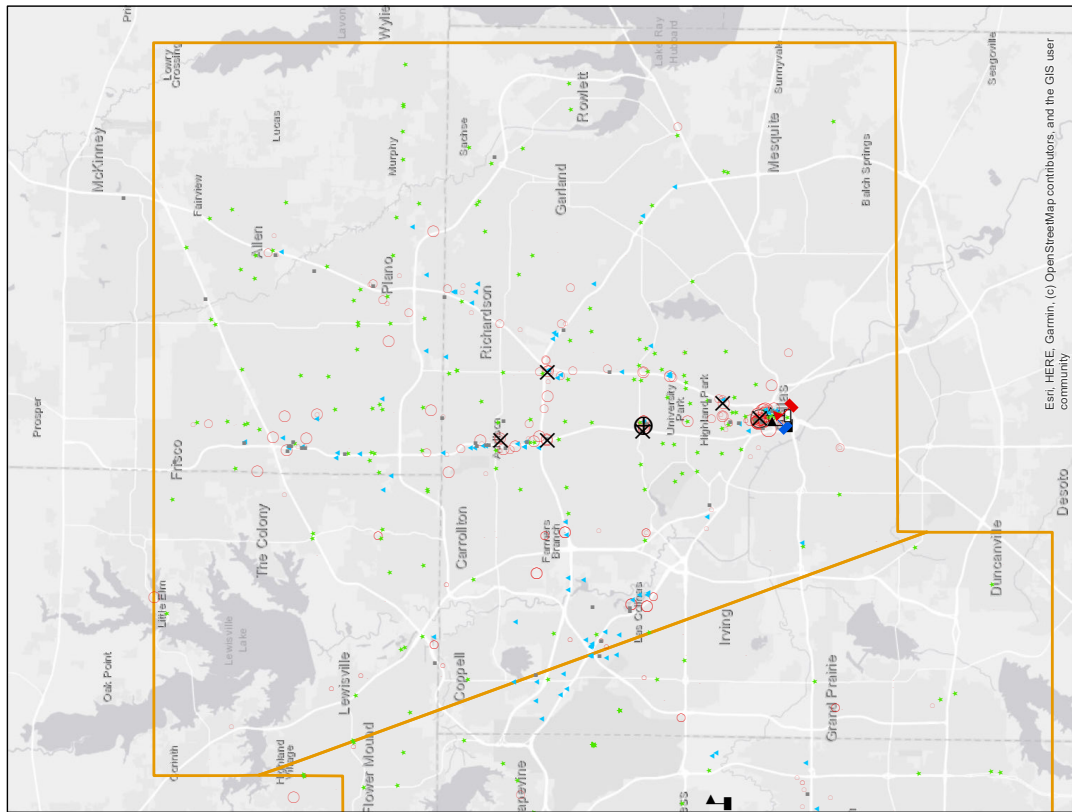
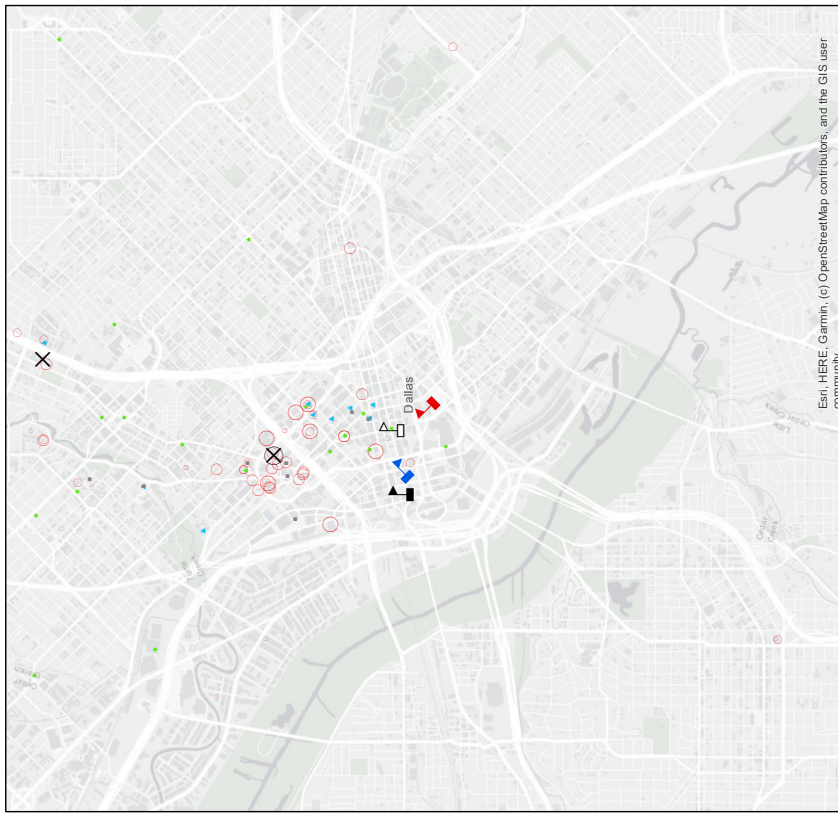


Table 53: Sources: Dallas ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1841	Gerem (2004, p. 319)
First Political Institution <sup>a</sup>	1872	Smolovik and Slate (2014)
City Hall	1900	Smolovik and Slate (2014)
City Hall	2000	Smolovik and Slate (2014)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>b</sup> , 1900, 1950, 2000	City of Dallas (2015)
<i>Population Data (1800-2000)</i>		
City Population	1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Texas State Historical Association (2015)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>c</sup>	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1860 <sup>d</sup>	City of Dallas (2015)
Hurricane(s)	None recorded	
Flooding(s)	1908 <sup>e</sup> , 1989 <sup>f</sup> , 1990 <sup>g</sup>	U.S Army Corps of Engineers (2015)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861 <sup>h</sup>	City of Dallas (2015)
International War(s)	None recorded	

<sup>a</sup>First permanent structure for city administration. Before that, rented spaces were used.

<sup>b</sup>Dallas county formed in 1846.

<sup>c</sup>Potentially, one could count the LRT system opened in 1996 (Collier et al., 2013, p. 443), but many parts of this system are on street level making it seem tram like. Thus we follow Gonzalez-Navarro and Turner (2016).

<sup>d</sup>“A fire originating in the W. W. Peak Brothers Drugstore spread to the other buildings on the square and destroyed most of the businesses.” Given the small size of Dallas (681 inhabitants) at this point of time, the event is classified as a major disaster.

<sup>e</sup>Left 4000 homeless and is thus considered as having caused major damage.

<sup>f</sup>Only thirty homes are destroyed and thus not classified as a major event.

<sup>g</sup>Houses are only damaged and thus this flood is not considered as “major.”

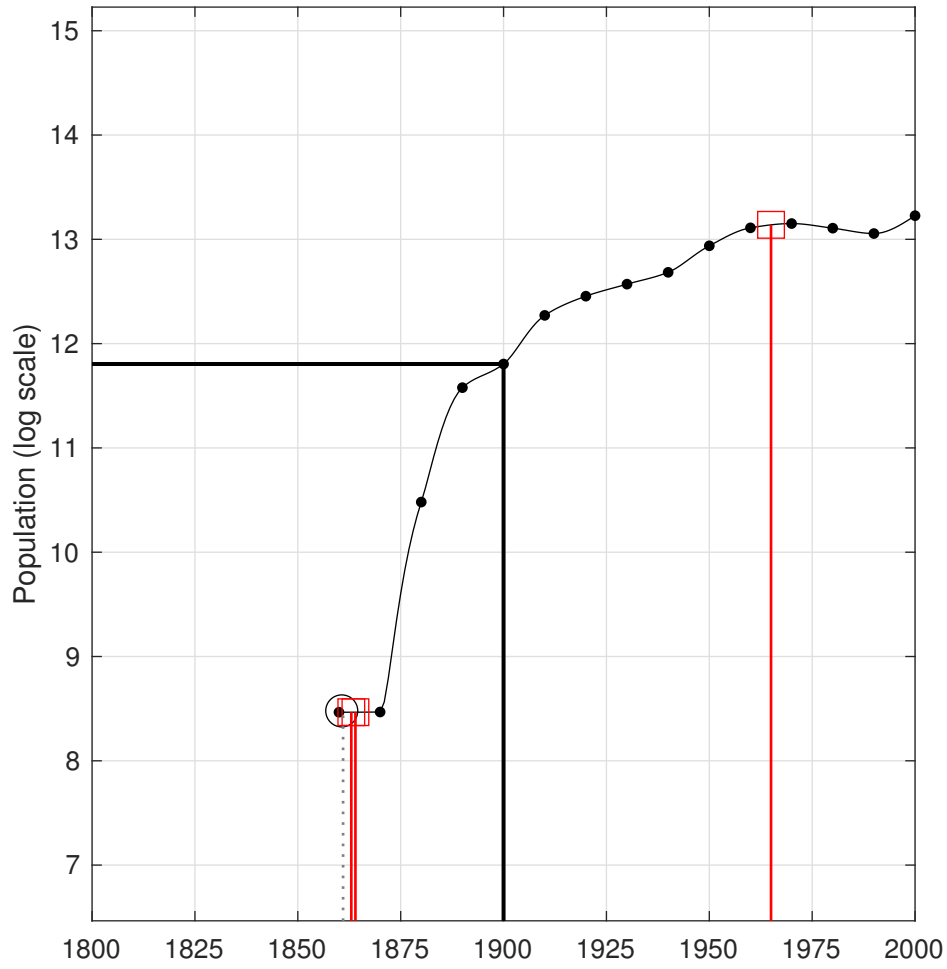
<sup>h</sup>Dallas served as a quartermaster and commissary post, but was never attacked.

Table 54: Concentration Measures - Dallas

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	15.44
Cumulative density of employment-weighted PP distances at 750 m	%	30.62
Average distance between all prime locations	in kilometres	7.81
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.13
Weighted average distance from EWPPs to 1900 CH	in kilometres	13.15
Average from all prime locations to 1900 CH	in kilometres	5.73
Average distance from global prime locations to 1900 CH	in kilometres	1.32

## A.25 Denver

Figure 34: Denver



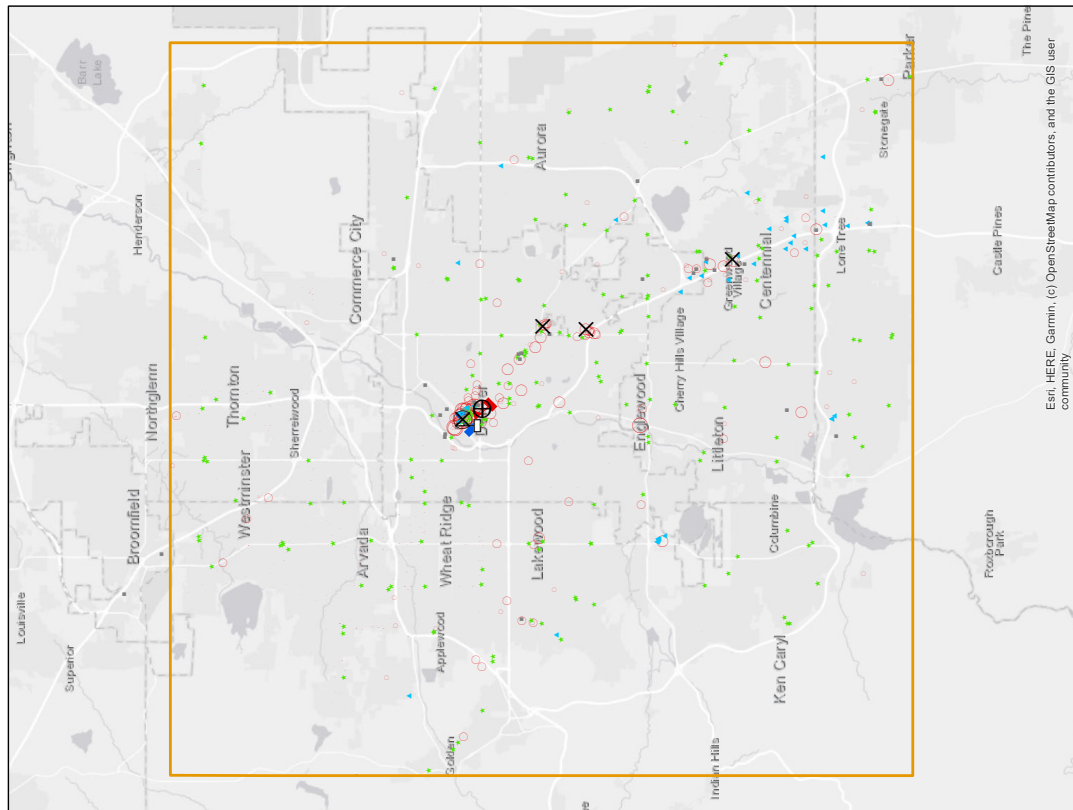
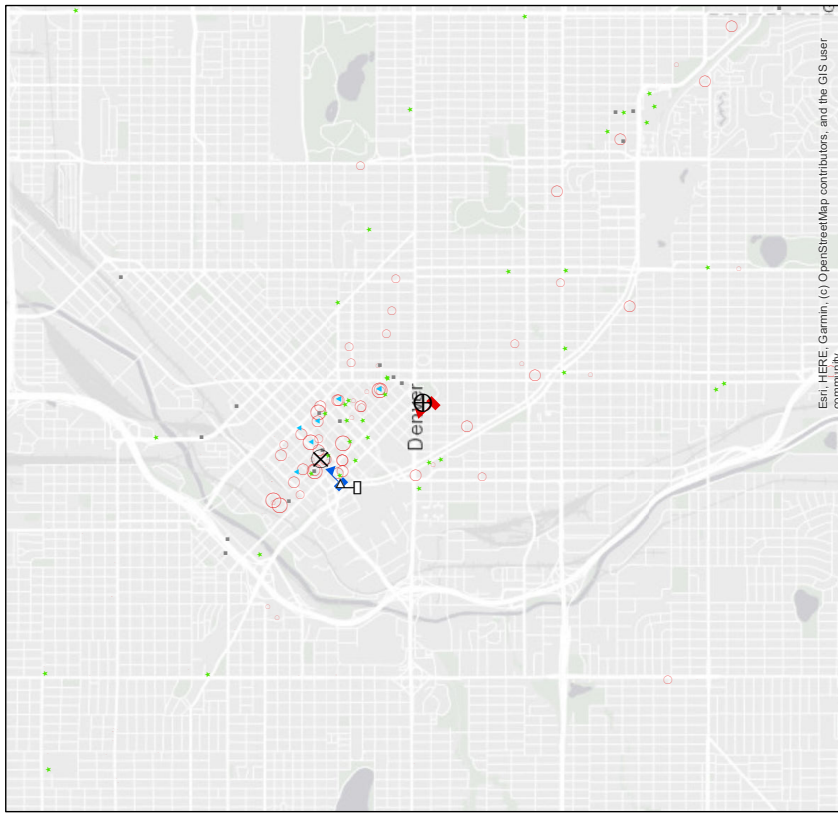


Table 55: Sources: Denver ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1858	National Park Service (1973, Section 8)
First Political Institution <sup>a</sup>	1860	Smiley and Times (1901, p. 633)
City Hall	1900	Rose and Hopkins (ca. 1886-1901)
City Hall	2000	Civic Center Conservancy (2014)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>b</sup> , 1900, 1950, 2000	National Park Service (1973, Section 8), City and County of Denver (2015)
<i>Population Data (1800-2000)</i>		
City Population	1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Gibson and Jung (2005a), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1994	Noel (2015, 181)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1863 <sup>c</sup>	Smiley and Times (1901, p. 369)
Hurricane(s)	None recorded	
Flooding(s)	1864 <sup>d</sup> , 1965 <sup>e</sup>	Nelson (2007, p. 216), Heos (2010, p. 9), Smiley and Times (1901, p. 372)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861 <sup>f</sup>	Colton (1959, p.43)
International War(s)	None recorded	

<sup>a</sup>The council met in Apollo hall in 1860 and shortly later Denver was incorporated as a town. Then Apollo hall is where today's Lincoln Hall stands (Pierson and Gallagher, 2006, p. 59).

<sup>b</sup>Denver not founded in 1850. The capital was created in 1867.

<sup>c</sup>The "Great Fire" destroyed most parts of the inner city. Also mentioned in Encyclopaedia Britannica (2015g) and thus coded as having caused heavy destruction.

<sup>d</sup>Many buildings were wrecked and swept away. Thereafter, there were more floods but none as severe as this one. Also mentioned in Encyclopaedia Britannica (2015g) and thus coded as having caused heavy destruction.

<sup>e</sup>This flood caused heavy damage (500 \$ US Dollar) and swept away bridges, cars, and homes. We classify it as having caused major destruction. This is a borderline case as it is not known how many structures were destroyed.

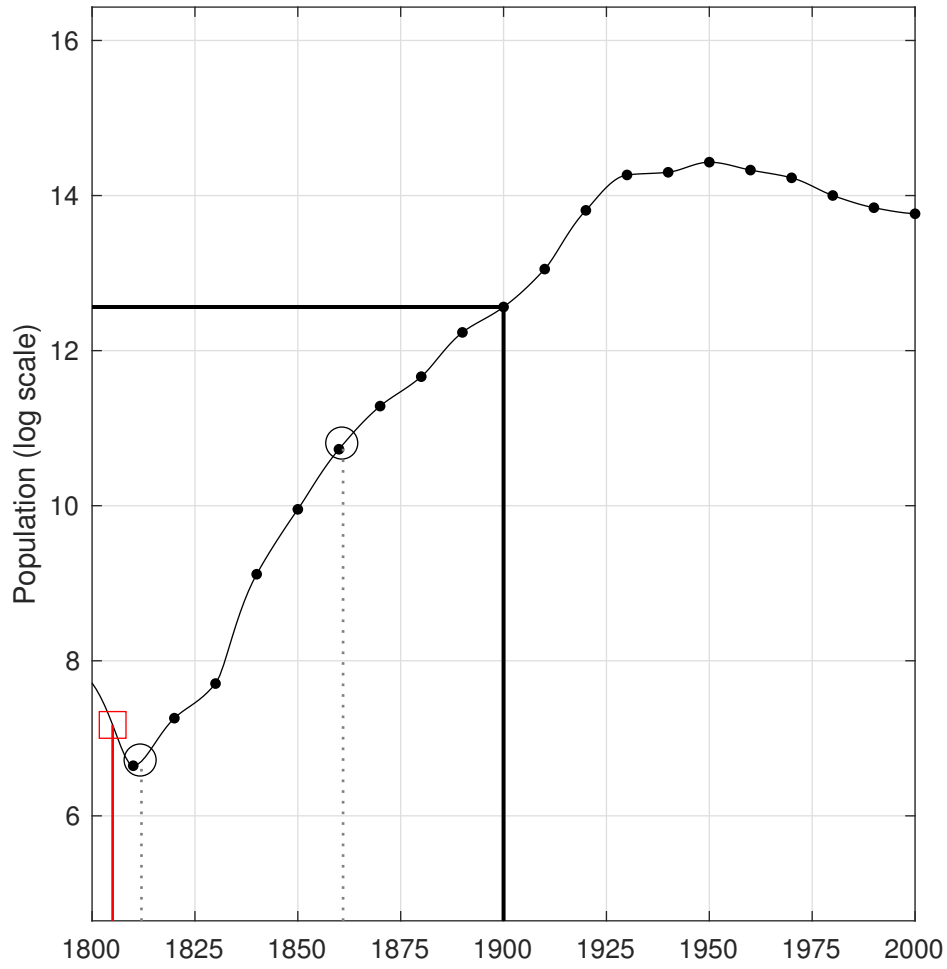
<sup>f</sup>Denver had a military camp from 1861 onwards.

Table 56: Concentration Measures - Denver

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	13.67
Cumulative density of employment-weighted PP distances at 750 m	%	26.67
Average distance between all prime locations	in kilometres	7.21
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.16
Weighted average distance from EWPPs to 1900 CH	in kilometres	9.13
Average from all prime locations to 1900 CH	in kilometres	3.53
Average distance from global prime locations to 1900 CH	in kilometres	0.43

## A.26 Detroit

Figure 35: Detroit





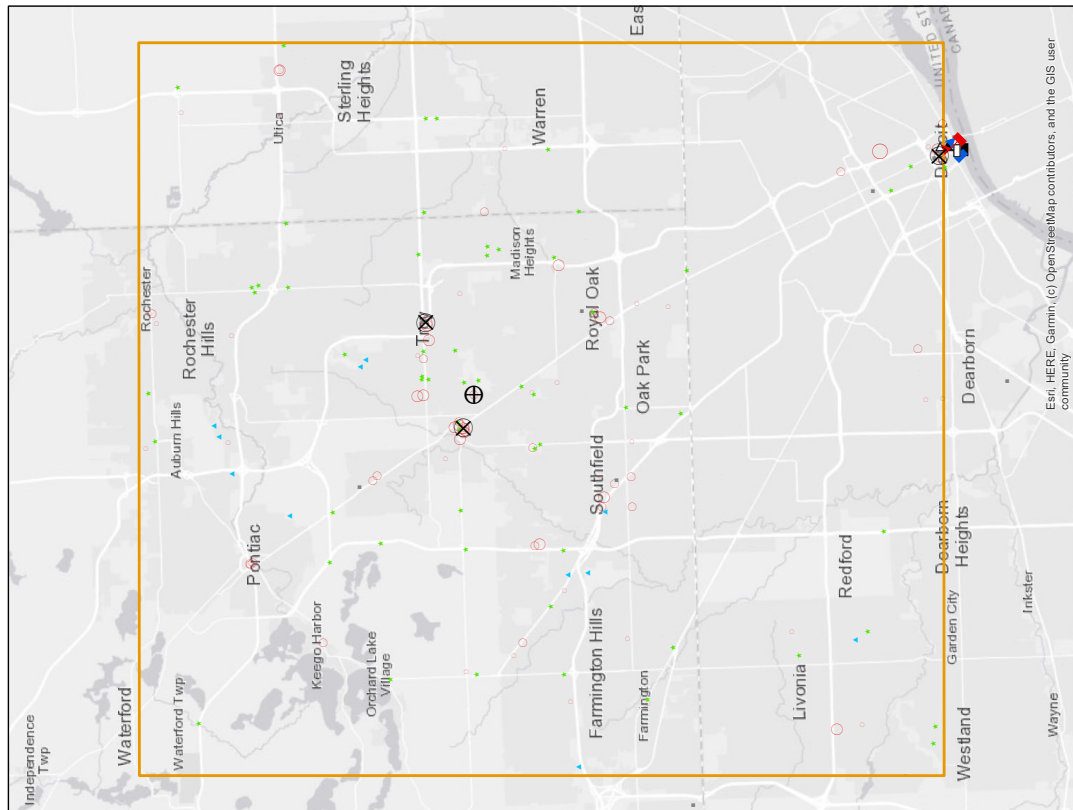
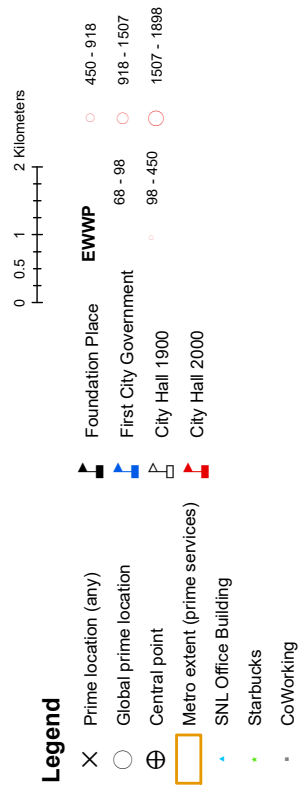
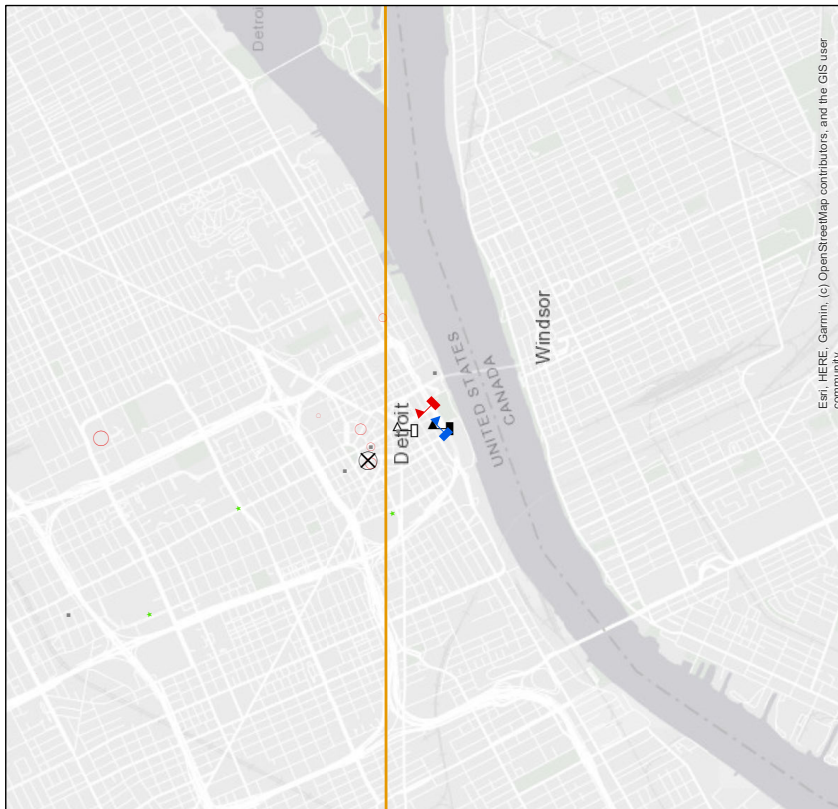


Table 57: Sources: Detroit ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1701	Ashlee (2005, p. 474)
First Political Institution <sup>a</sup>	1707	Detroit Historical Society (2015c)
City Hall	1900	Austin (2012, p. 11-41)
City Hall	2000	Austin (2012, p. 29)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Sasser (2014)
<i>Population Data (1800-2000)</i>		
City Population	1787, 1796, 1810, 1820, 1830, 1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Gibson and Jung (2005a, p. 66), Detroit Historical Society (2015a), Detroit Historical Society (2015b), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1987	Kantor and Judd (2015, 104)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	Detroit Historical Society (2014b), Encyclopaedia Britannica (2015h)
Fire(s)	1805	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861 <sup>b</sup>	Detroit Historical Society (2014c), Tucker (2015)
International War(s)	1812	Detroit Historical Society (2014a)

<sup>a</sup>At this time, the French commander of detroit Antoine de La Mothe Cadillac is granting land to French settlers. We consider this as a government function. Most likely, he resided in the fort, which he built in 1701, which we use the coordinates of.

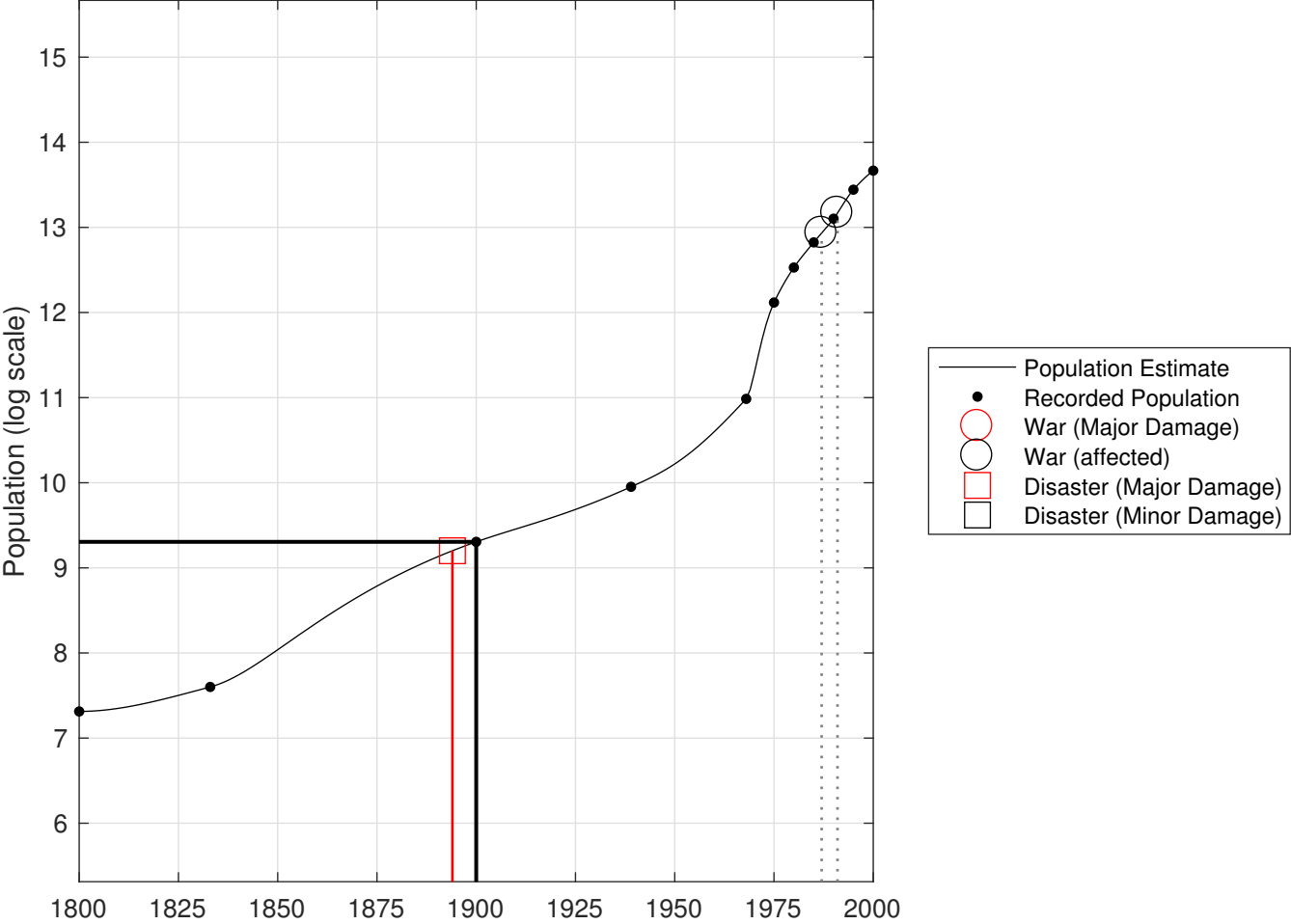
<sup>b</sup>Many soldiers were recruited here, but no important military post.

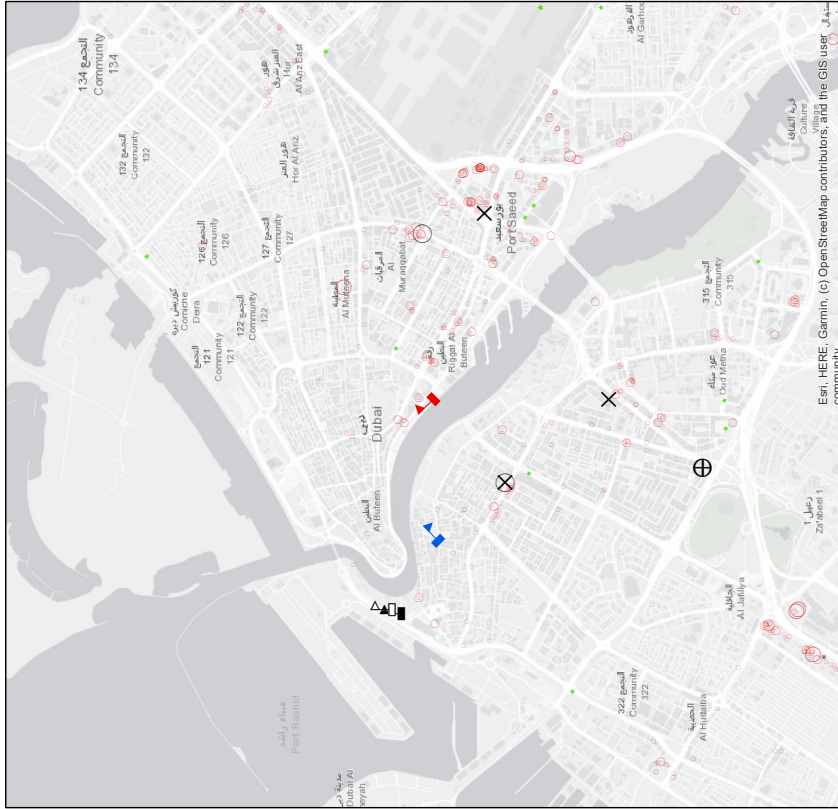
Table 58: Concentration Measures - Detroit

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	15.80
Cumulative density of employment-weighted PP distances at 750 m	%	47.08
Average distance between all prime locations	in kilometres	13.06
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.00
Weighted average distance from EWPPs to 1900 CH	in kilometres	24.30
Average from all prime locations to 1900 CH	in kilometres	21.52
Average distance from global prime locations to 1900 CH	in kilometres	21.58

A.27 Dubai

Figure 36: Dubai





- Legend**
- ✕ Prime location (any)
  - Global prime location
  - ⊕ Central point
  - Metro extent (prime services)
  - ▲ SNL Office Building
  - ★ Starbucks
  - CoWorking
  - ▲ Foundation Place
  - ▲ First City Government
  - ▲ City Hall 1900
  - ▲ City Hall 2000
  - EWWP 450 - 918
  - 68 - 98
  - 98 - 450
  - 1507 - 1898

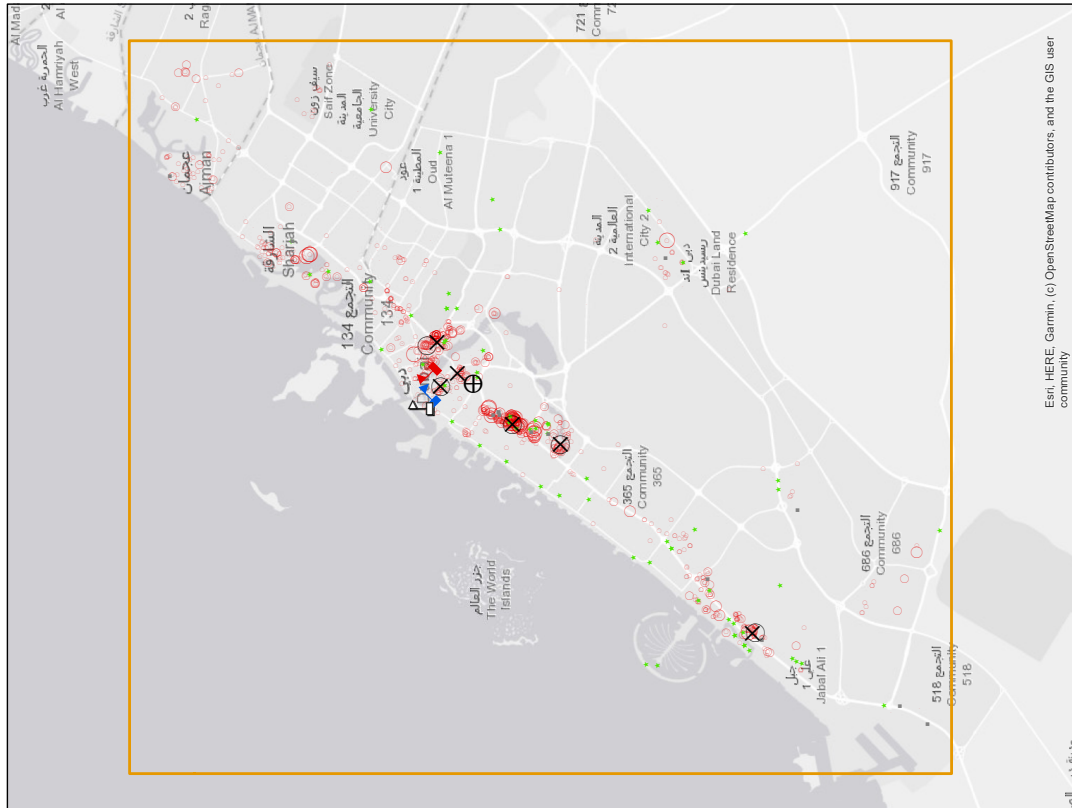


Table 59: Sources: Dubai ( United Arab Emirates )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1550	Krane (2009), Government of Dubai (2014)
First Political Institution	1799	Ministry of Foreign Affairs (2014)
City Hall <sup>b</sup>	1900	Department of Tourism and Commerce Marketing (2014)
City Hall	2000	Dubai Municipality (2014)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Dubai Municipality (2014)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1833, 1900, 1939, 1968, 1975, 1980, 1985, 1990, 1995, 2000	(Ramos, 2012, p. 77), Ramos (2012, p. 56), Elsheshtawy (2010, p. 60)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	2009	UN Habitat (2013, 45)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	Elsheshtawy (2010, p. 107)
Fire(s)	1894 <sup>c</sup>	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1987 <sup>d</sup>	British Broadcasting Corporation (2014)
International War(s)	1991 <sup>e</sup>	British Broadcasting Corporation (2014)

<sup>a</sup>1590: European traveller mentions small fishing settlement, supposedly at the creek (see second source - this is where it was located on the maps of the 16th c). Dubai was also settled before, but then not anymore. We assume 1550 as it is unlikely that the settlement was just built 1590.

<sup>b</sup>Sheikh Saeed's seat, erected in 1896.

<sup>c</sup>Fire leading to almost complete destruction of the city and entire redevelopment. As this fire is not mentioned at all in the Encyclopedia Britannica it is only coded as "major."

<sup>d</sup>Coup attempt.

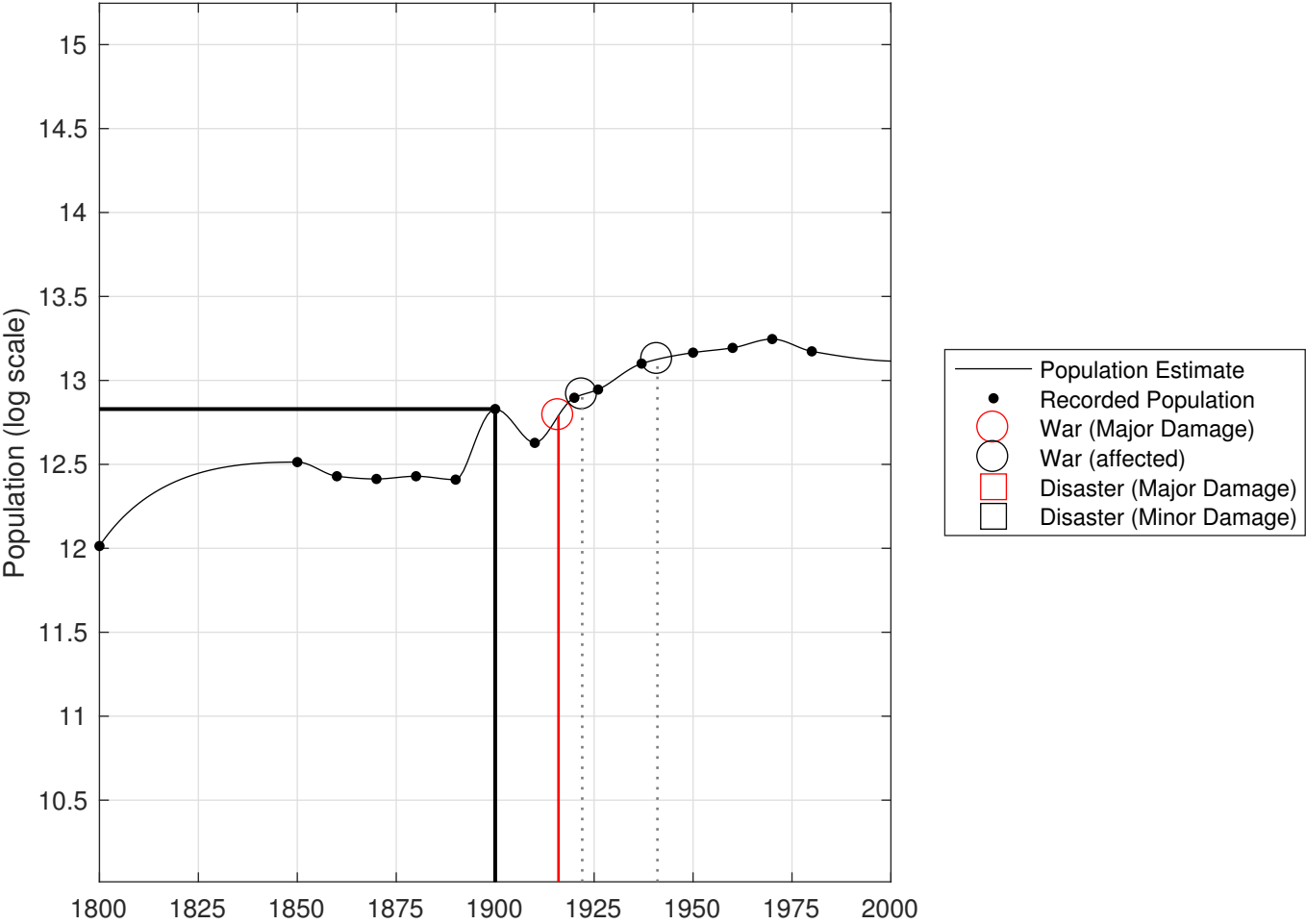
<sup>e</sup>Iraq invasion.

Table 60: Concentration Measures - Dubai

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	13.84
Cumulative density of employment-weighted PP distances at 750 m	%	25.85
Average distance between all prime locations	in kilometres	10.43
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.33
Weighted average distance from EWPPs to 1900 CH	in kilometres	10.52
Average from all prime locations to 1900 CH	in kilometres	8.30
Average distance from global prime locations to 1900 CH	in kilometres	8.63

A.28 Dublin

Figure 37: Dublin





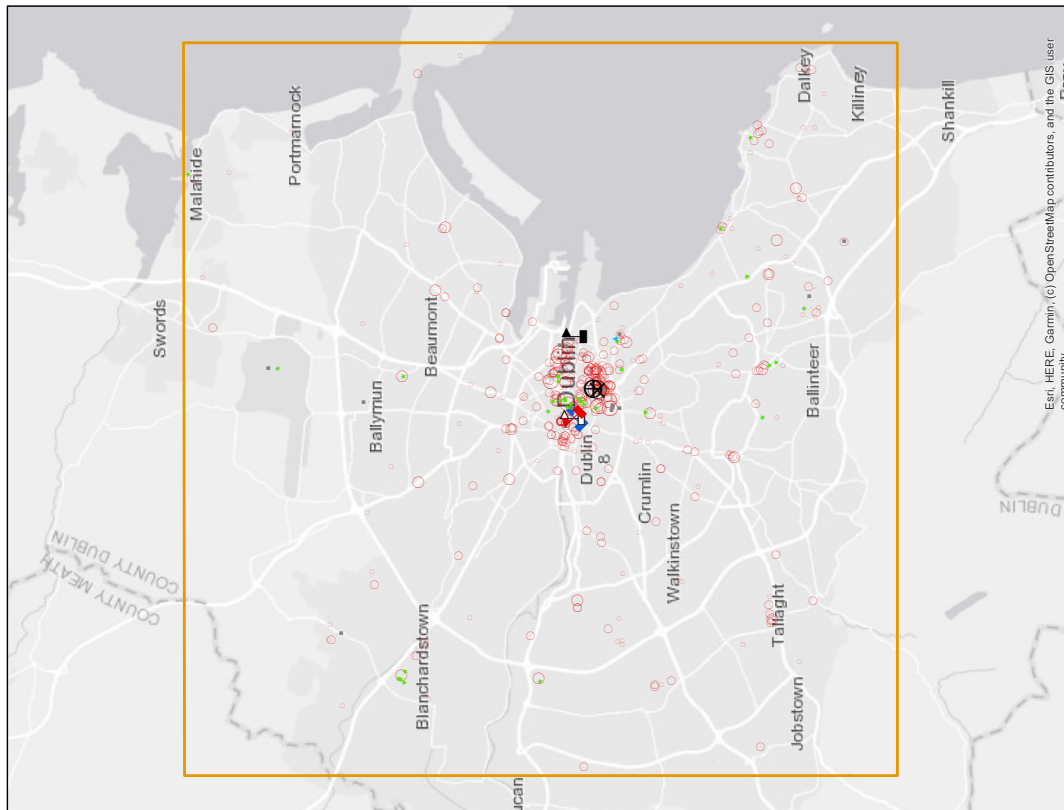
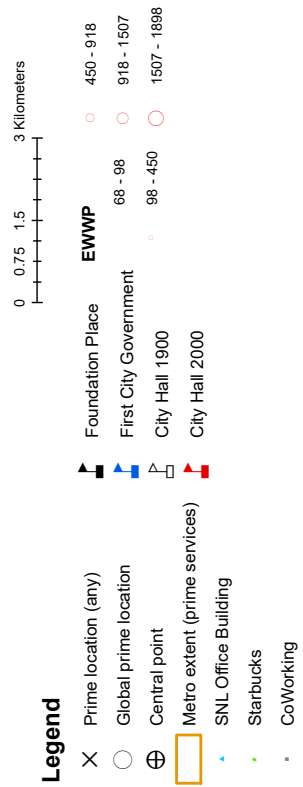
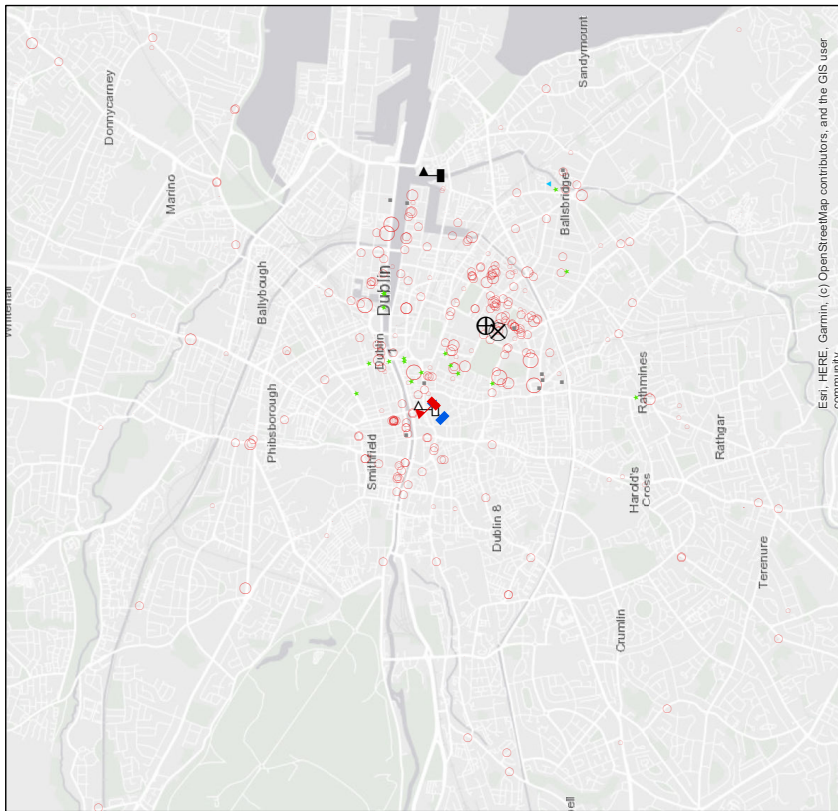


Table 61: Sources: Dublin ( Ireland )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	550	MacLaran (1993, p. 19)
First Political Institution <sup>b</sup>	837	MacLaran (1993, p. 20)
City Hall <sup>c</sup>	1900	Hopkins (2003, p. 103)
City Hall	2000	Hopkins (2003, p. 103)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950 <sup>d</sup> , 2000	Legislature of Ireland (2015)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1926, 1937, 1950, 1960, 1970, 1980, 2002	Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>e</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>f</sup>	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1916 <sup>g</sup> , 1922 <sup>h</sup>	Dorney (2012), Kostick and Collins (2000), Irish Fire Services (2010)
International War(s)	1941 <sup>i</sup>	Lydon (2012, p. 379)

<sup>a</sup>There are other more hypothetical settlement locations (e.g. The Dublin Penny Journal, 1832), but this sounds the most reasonable. The date though, is very approximate as it refers to a mentioning in a poem in the 6th century.

<sup>b</sup>We take the construction of a longport, a fortified harbour, as the starting point of government. According to MacLaran (1993, p. 20), there is a dispute in the literature about the exact location (two possibilities). We take the first option: “a site in the vicinity of the present day castle.”

<sup>c</sup>This building has been in use as the city hall since 1852.

<sup>d</sup>Establishment of Irish Free State in 1922.

<sup>e</sup>Footnote from United Nations Population Division (2014): Figures for 1991 were estimated using the ratio of the population in the urban agglomeration to that in the city proper as recorded in the 1986 census.

<sup>f</sup>There is a commuter rail in operation since 1984, which does not qualify as an MRT according to Gonzalez-Navarro and Turner (2016).

<sup>g</sup>Easter risings.

<sup>h</sup>Irish War of independence and Irish Civil War are treated as one event here as they followed each other directly (Gerwarth and Horne, 2013, p. 189). As the fire brigade does not record major fires except for the burning of the customs house (Irish Fire Services, 2010), the conflicts are coded as not having caused major destruction to the building stock. We do not code any IRA bombings as having caused major destruction. Regardless of their cruelty, they seldomly destroyed more than a building.

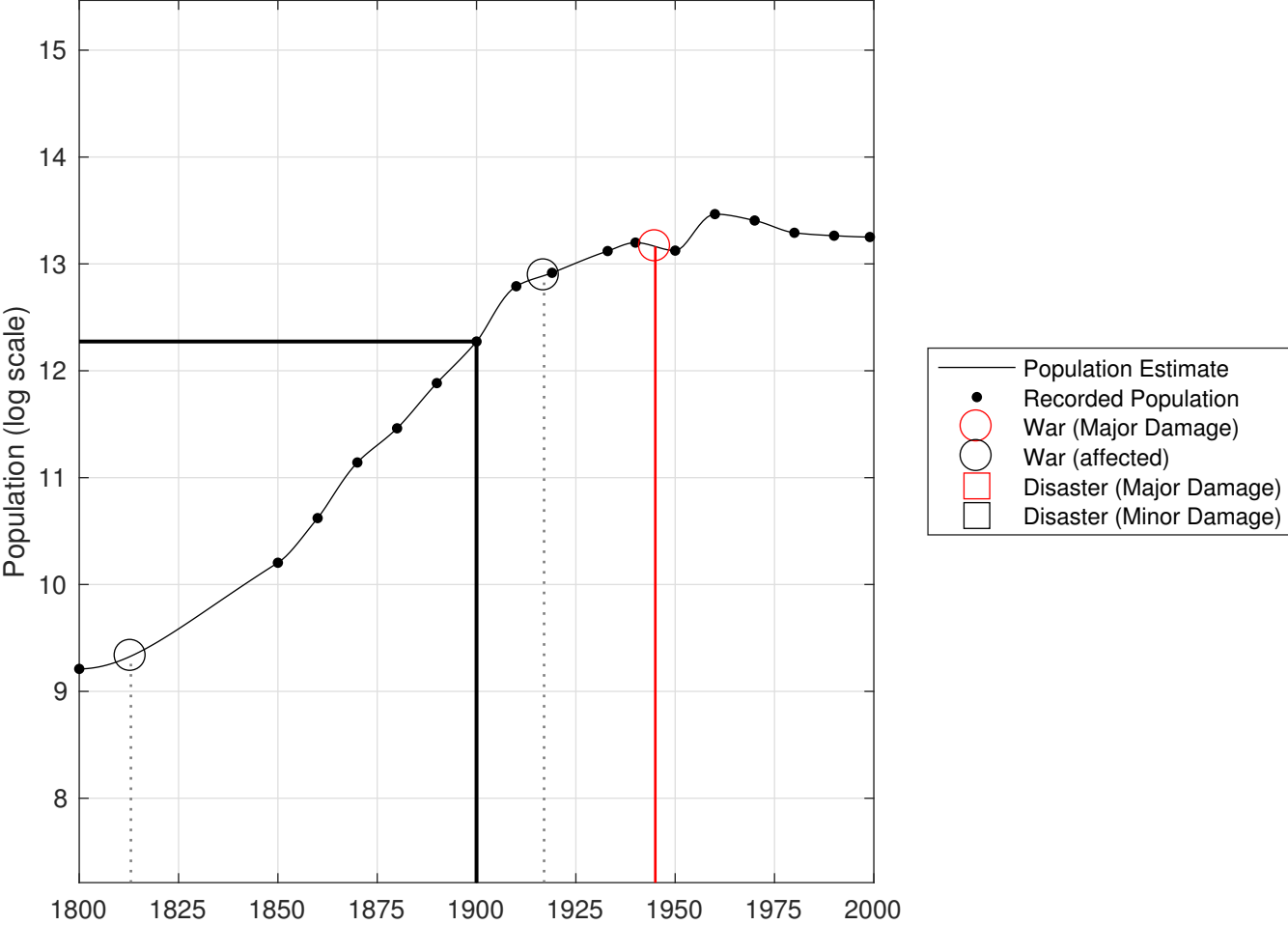
<sup>i</sup>Bombing of Dublin by the Germans. The destruction, however, is limited. “Only” 25 were destroyed and thus this event is not coded as having caused major destruction.

Table 62: Concentration Measures - Dublin

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	5.43
Cumulative density of employment-weighted PP distances at 750 m	%	10.90
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.41
Weighted average distance from EWPPs to 1900 CH	in kilometres	3.63
Average from all prime locations to 1900 CH	in kilometres	1.15
Average distance from global prime locations to 1900 CH	in kilometres	1.15

A.29 Duesseldorf

Figure 38: Duesseldorf



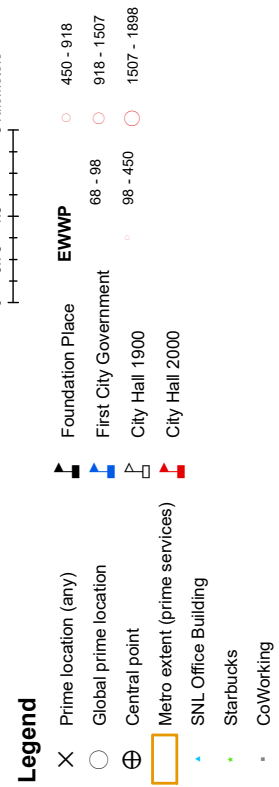
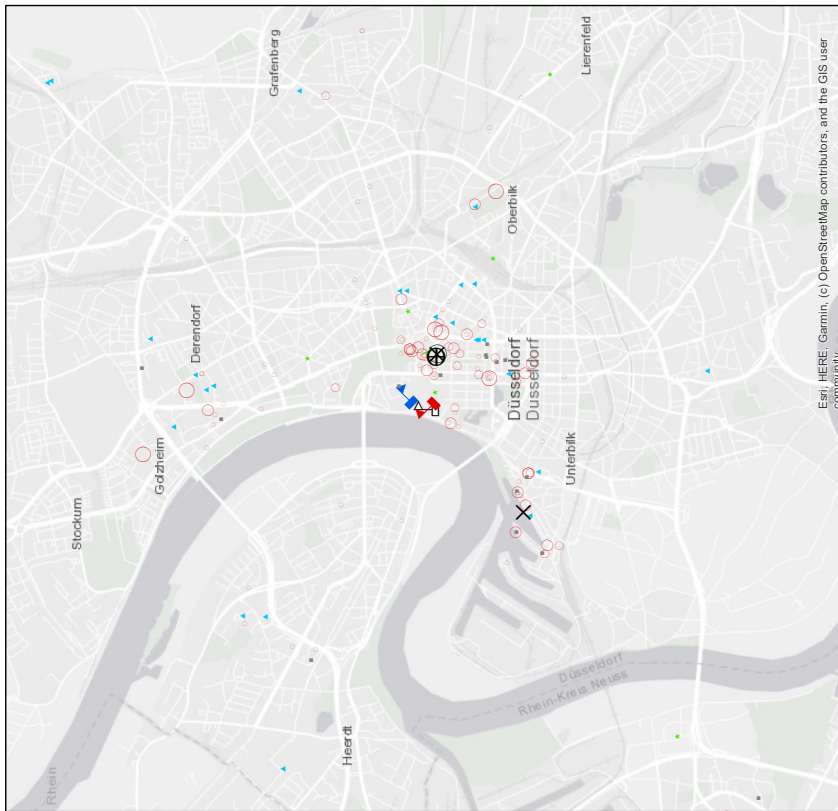


Table 63: Sources: Duesseldorf ( Germany )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	700	Henning (1981, p. 20) and Köln (2014)
First Political Institution <sup>b</sup>	1288	Henning (1981, p. 22)
City Hall	1900	Hinte and Bethge (2012, p. 26)
City Hall <sup>c</sup>	2000	Hinte and Bethge (2012, p. 26)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900 <sup>e</sup> , 1950, 2000	Henning (1981, p. 678), Dsseldorf (2014)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1919, 1933, 1940, 1950, 1960, 1970, 1980, 1990, 1999, 2010	Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1988	Grosche (2015, 25)
Number of Stations	1910, 1940, 2010	Schwandl (2016), Rheinbahn (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1813 <sup>f</sup> , 1917 <sup>g</sup> , 1945 <sup>h</sup>	Henning (1981, p. 561), Henning (1981, p. 677), Encyclopaedia Britannica (2015i), Stadtarchiv Dusseldorf (2014)

<sup>a</sup>Around 700, dusseldorf was founded on the Kaiserwerth with a chapel.

<sup>b</sup>This was possibly from where the ruling nobleman ruled the city around the time Duesseldorf was granted city rights.

<sup>c</sup>No change since 1900.

<sup>d</sup>Technically, it was a "Regierungsbezirk" in the Rhineprovince of Prussia, but it had a relatively large territory and thus we code it as a state.

<sup>e</sup>Technically, it was a "Regierungsbezirk" in the Rhineprovince of Prussia, but it had a relatively large territory and thus we code it as a state.

<sup>f</sup>Russians invaded Duesseldorf and ended French occupation.

<sup>g</sup>Important military base, one bombing.

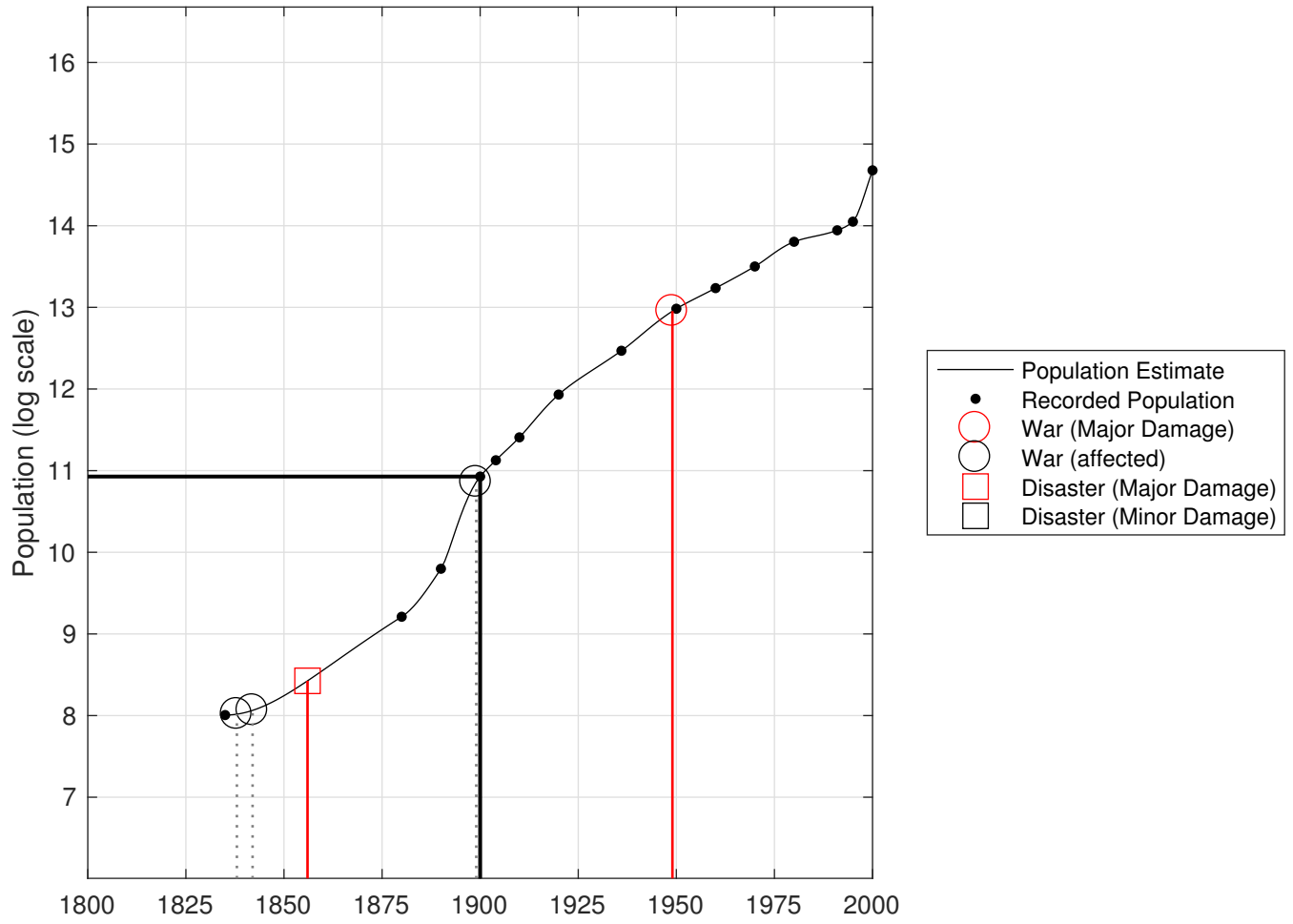
<sup>h</sup>Half of the city destroyed.

Table 64: Concentration Measures - Duesseldorf

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	3.36
Cumulative density of employment-weighted PP distances at 750 m	%	5.66
Average distance between all prime locations	in kilometres	0.98
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.40
Weighted average distance from EWPPs to 1900 CH	in kilometres	2.19
Average from all prime locations to 1900 CH	in kilometres	0.85
Average distance from global prime locations to 1900 CH	in kilometres	0.85

### A.30 Durban

Figure 39: Durban





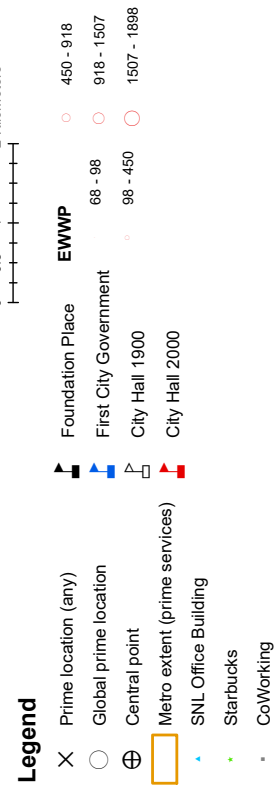
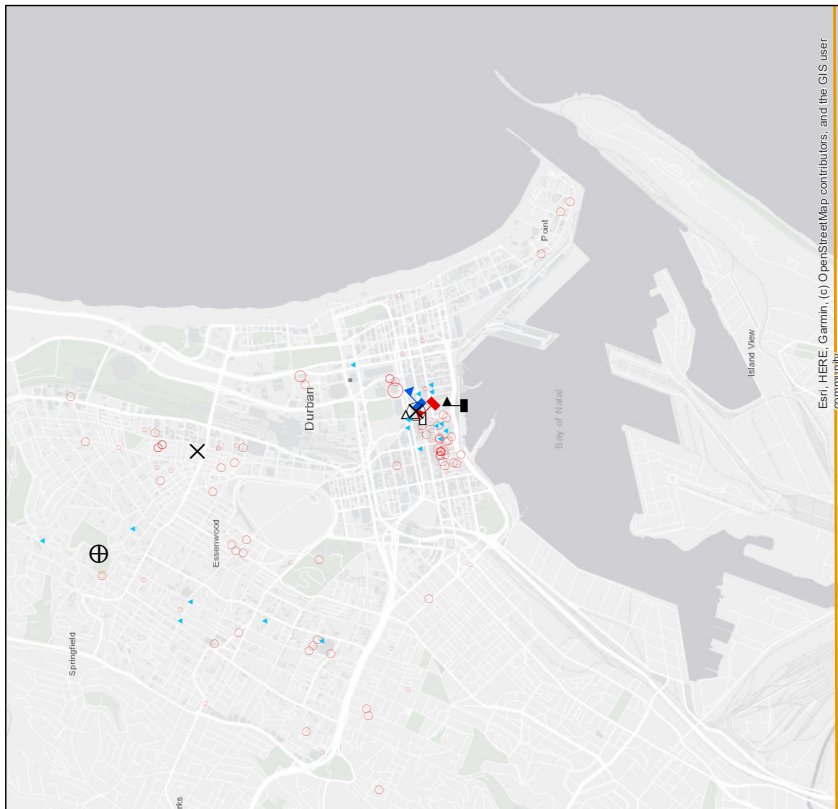
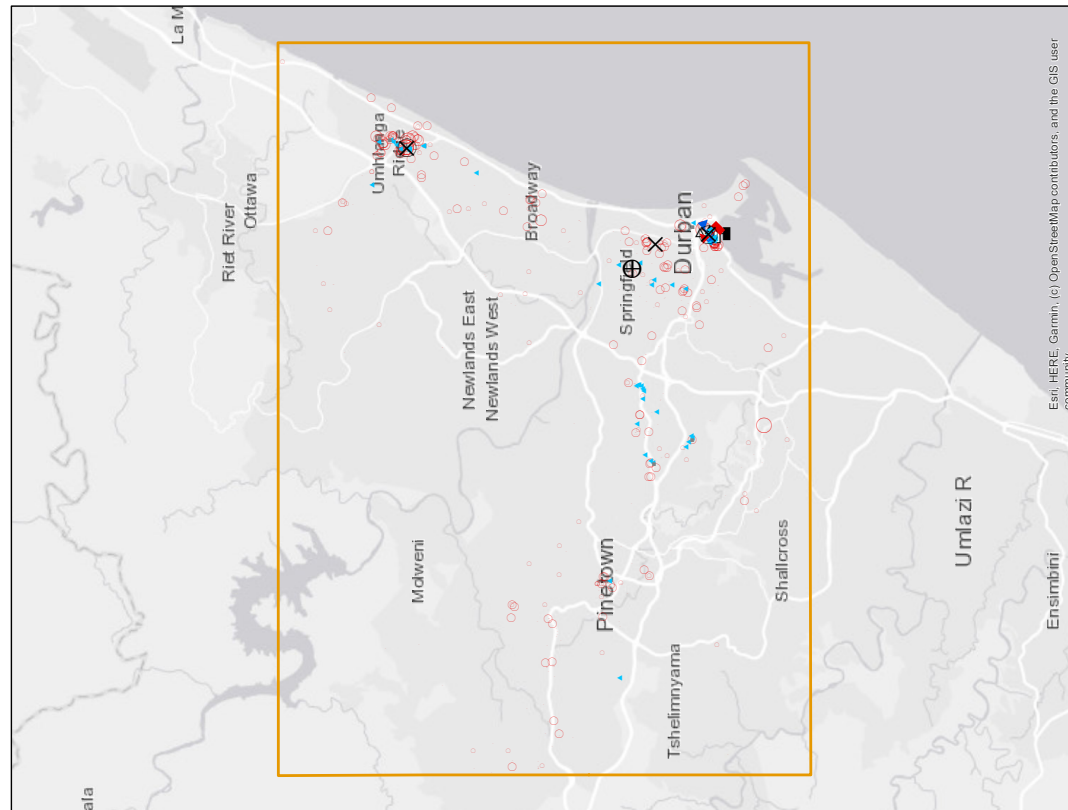


Table 65: Sources: Durban ( South Africa )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1824	South African History (2014b), Briggs (2012, p. 166)
First Political Institution <sup>b</sup>	1850	University of Natal (1968, p. 20)
City Hall	1900	University of Natal (1968, p. 20)
City Hall	2000	University of Natal (1968, p. 20)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>c</sup> , 1900, 1950, 2000	eThekweni Municipality (2011)
<i>Population Data (1800-2000)</i>		
City Population	1835, 1880, 1890, 1900, 1904, 1910, 1920, 1936, 1950, 1960, 1970, 1980, 1991, 1995, 2000	Briggs (2008, p. 37), Mitchell (2007, p. 41), Durban Local History Museum Trust (2009), United Nations (2012)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>d</sup>	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	1856 <sup>e</sup>	Henderson (1904, p. 24), Barnes (1984)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1949	South African History Online (2015a)
International War(s)	1838 <sup>f</sup> , 1842 <sup>g</sup> , 1899 <sup>h</sup>	Crowe (2012, Chapter V), Raugh (2004, p. 356), Olson and Shadle (1996, p. 782), Hammond (2012, p. 52)

<sup>a</sup>Close to the present-day city hall, but at the bay. Location is approximated.

<sup>b</sup>This is the first building found to be a town hall.

<sup>c</sup>Town was proclaimed in 1835.

<sup>d</sup>There is a suburban commuter rail, which does not qualify as an MRT according to Gonzalez-Navarro and Turner (2016).

<sup>e</sup>Some buildings such a saw mill were washed away and it seems that destruction was extensive. This flood was called the Great Durban flood in later publications (Henderson, 1904, p. 38).

<sup>f</sup>Occupation of Durban, no damage recorded.

<sup>g</sup>No record of extensive destruction during occupation. There was also an occupation in 1838, apparently without major destruction to the building stock.

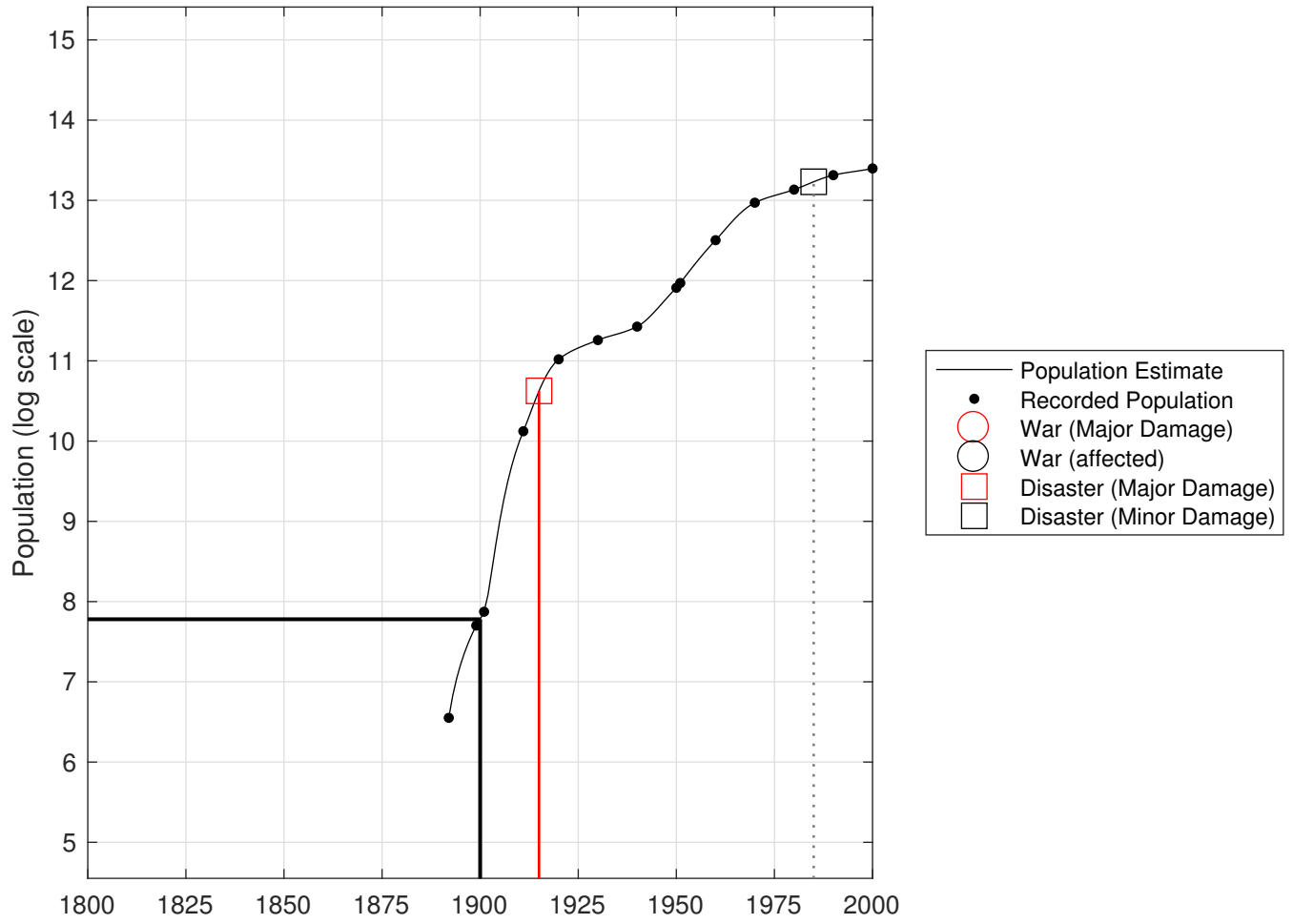
<sup>h</sup>Apparently important military base, but no (destructive) attack on Durban itself.

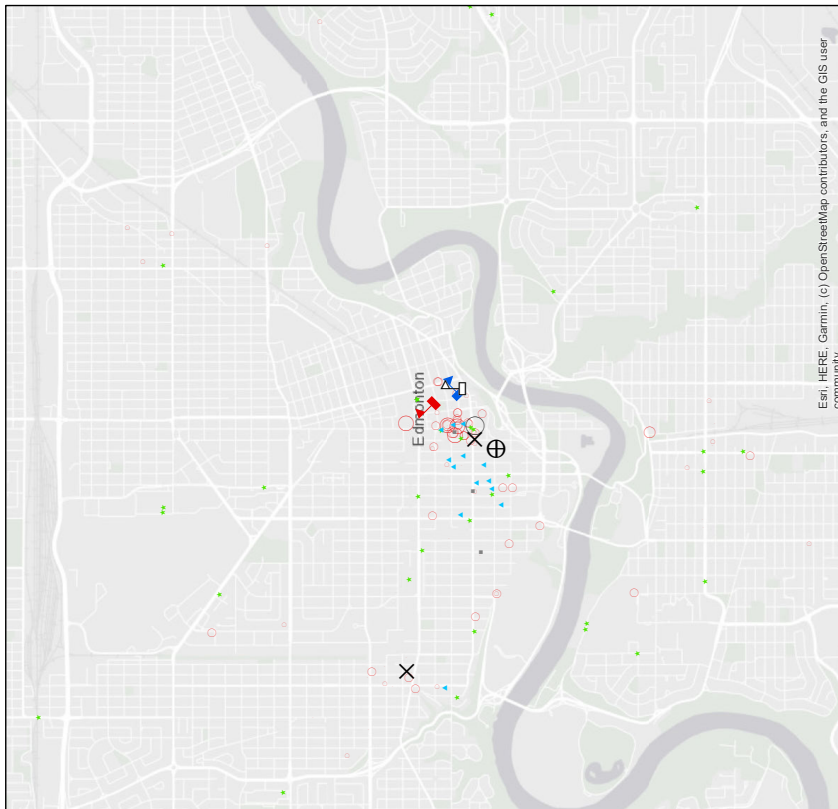
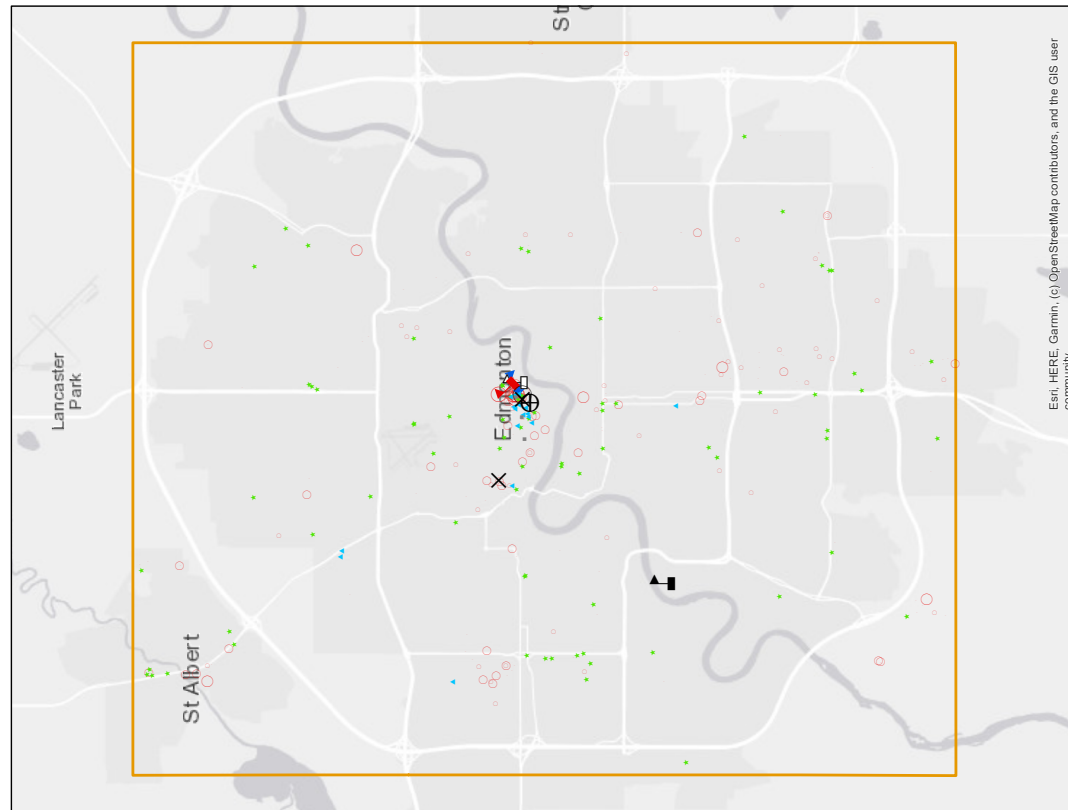
Table 66: Concentration Measures - Durban

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	11.43
Cumulative density of employment-weighted PP distances at 750 m	%	21.28
Average distance between all prime locations	in kilometres	6.39
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.68
Weighted average distance from EWPPs to 1900 CH	in kilometres	9.50
Average from all prime locations to 1900 CH	in kilometres	5.99
Average distance from global prime locations to 1900 CH	in kilometres	6.64

### A.31 Edmonton

Figure 40: Edmonton





- Legend**
- X Prime location (any)
  - Global prime location
  - ⊕ Central point
  - Metro extent (prime services)
  - ▲ SNL Office Building
  - Starbucks
  - CoWorking
  - ▲ Foundation Place
  - ▲ First City Government
  - ▲ City Hall 1900
  - ▲ City Hall 2000
  - EWWP 450 - 918
  - EWWP 68 - 98
  - EWWP 98 - 450
  - EWWP 918 - 1507
  - EWWP 1507 - 1898

Table 67: Sources: Edmonton ( Canada )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1795	Aubrey et al. (2004, p. XXIX), Fort Edmonton Park (2014)
First Political Institution <sup>a</sup>	1893	Cashman (2002, p. 94)
City Hall	1900	Cashman (2002, p. 94)
City Hall	2000	Aubrey et al. (2004, p. XXXII)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>b</sup> , 1900, 1950, 2000	Lai (2007, p. 92)
<i>Population Data (1800-2000)</i>		
City Population	1892, 1899, 1901, 1911, 1920, 1930, 1940, 1950, 1951, 1960, 1970, 1980, 1990, 2000, 2001	Stelter and Artibise (1984, p. 395), Goyette and Roemmich (2005, p. xxviii), City of Edmonton (2008)
Metro Population <sup>c</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1978	Vuchic (2007, 87)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	1985	Edmonton Journal (2012b)
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	1915 <sup>d</sup>	Edmonton Journal (2012a)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>Town hall within the fire and police station.

<sup>b</sup>Incorporation as a Town in 1892. It became provincial Capital in 1905.

<sup>c</sup>Footnote from United Nations Population Division (2014): Refers to the Census Metropolitan Area.

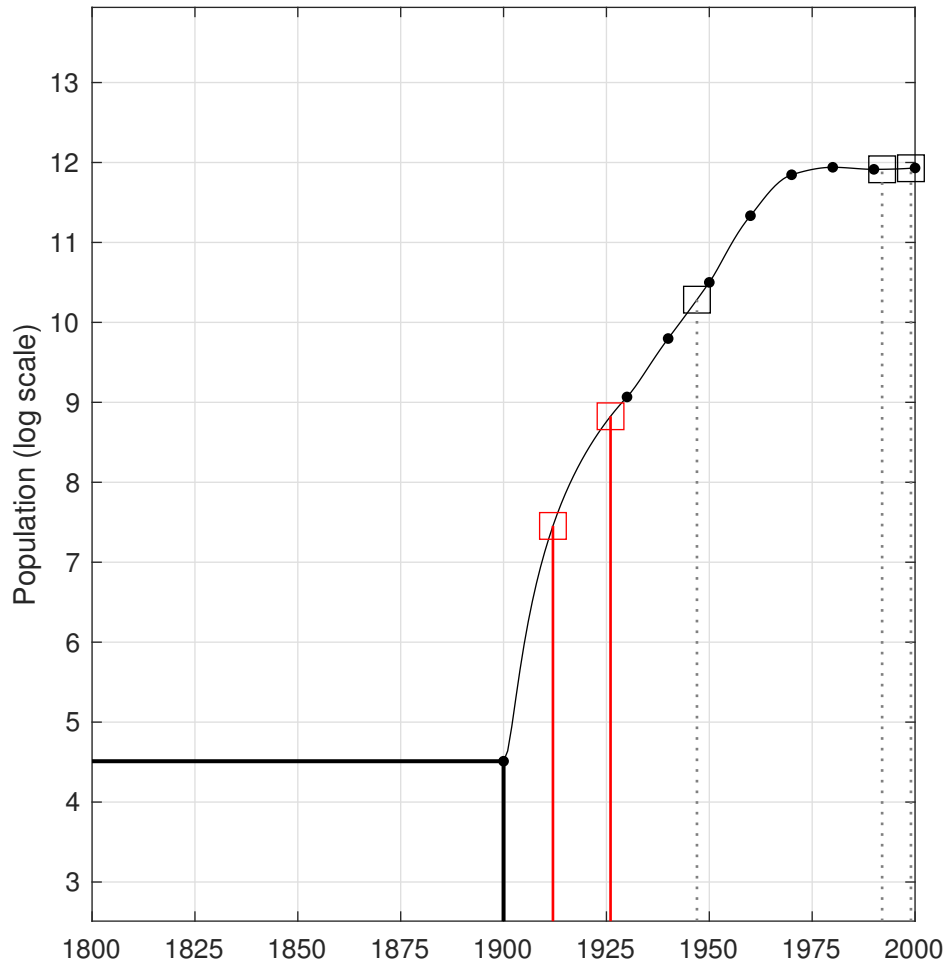
<sup>d</sup>This flood damaged 500 buildings heavily and swept 50 away completely. Given the small size of the city, we code this as a major event.

Table 68: Concentration Measures - Edmonton

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	7.90
Cumulative density of employment-weighted PP distances at 750 m	%	15.07
Average distance between all prime locations	in kilometres	1.32
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.26
Weighted average distance from EWPPs to 1900 CH	in kilometres	5.29
Average from all prime locations to 1900 CH	in kilometres	0.90
Average distance from global prime locations to 1900 CH	in kilometres	0.49

### A.32 Fort Lauderdale

Figure 41: Fort Lauderdale





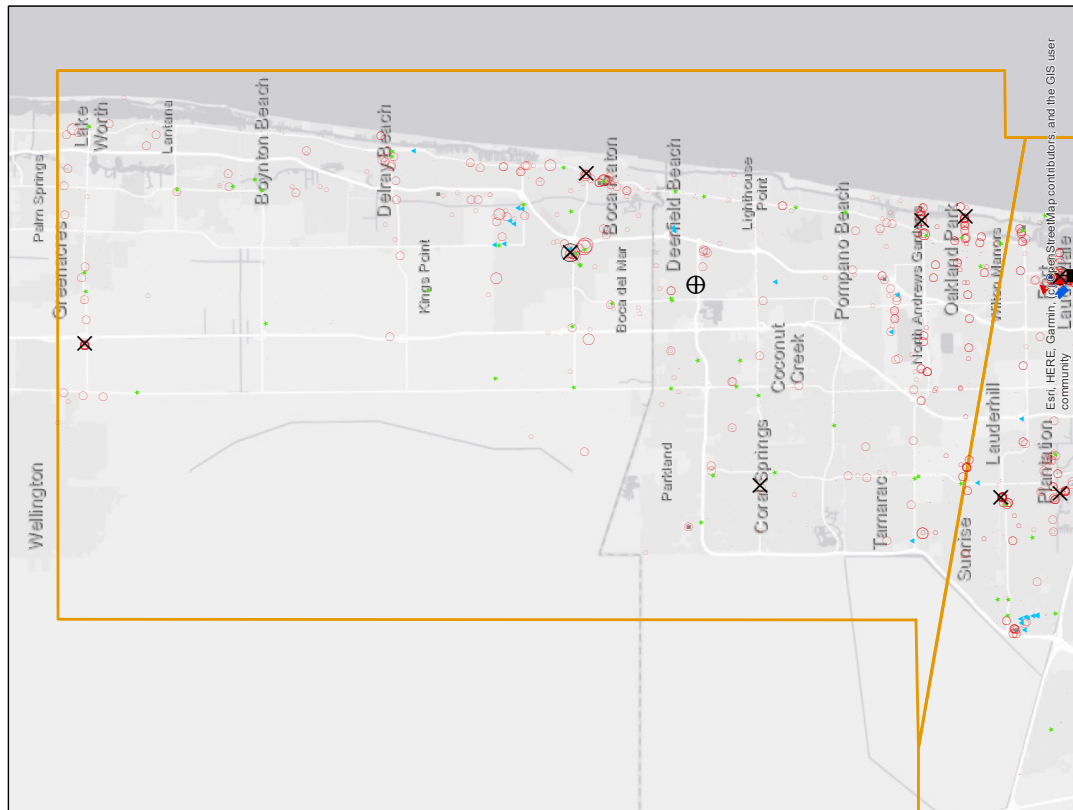
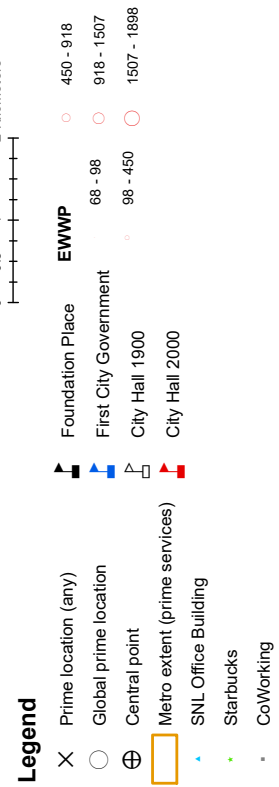
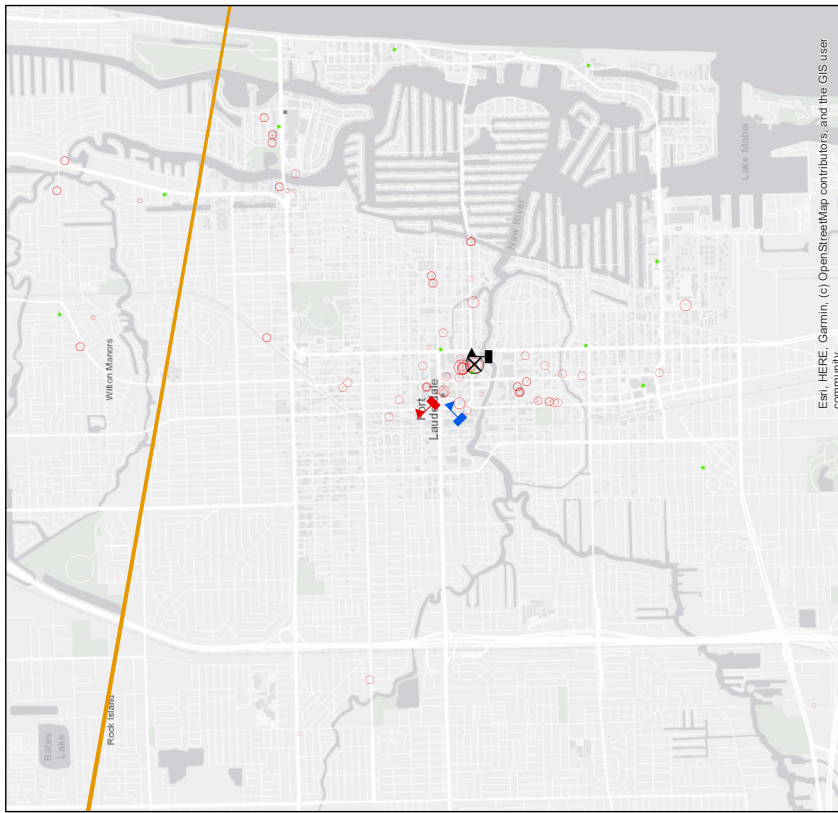


Table 69: Sources: Fort Lauderdale ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1893	Historic Stranahan House Museum (2015), Gillis (2004, p. 16)
First Political Institution <sup>b</sup>	1914	Gillis (2004, p. 23)
City Hall <sup>c</sup>	1900	City of Fort Lauderdale (2015)
City Hall <sup>d</sup>	2000	Gillis (2004, p. 126)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900 <sup>e</sup> , 1950, 2000	City of Fort Lauderdale (2015)
<i>Population Data (1800-2000)</i>		
City Population	1900, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Cattelino (2008, p. 23), Gibson and Jung (2005a, p. 43), Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>f</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>g</sup>	None	
Number of Stations	1910, 1940, 2010	NaN
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1912	City of Fort Lauderdale (2015)
Hurricane(s)	1926 <sup>h</sup> , 1947 <sup>i</sup> , 1992 <sup>j</sup> , 1999 <sup>k</sup>	Gillis (2004, p. 37), Gillis (2004, p. 62), Gangler (1999)
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>There was a temporary settlement earlier related to the erection of the seminole war. However, it was quickly abandoned afterwards and what was to become Fort Lauderdale was born in 1893 according to the historical sources.

<sup>b</sup>This is the first permanent seat of the city council established in 1911.

<sup>c</sup>Fort Lauderdale did not formally exist as a town or city until 1913. Hence there was no city hall in 1900.

<sup>d</sup>This city hall was built in 1969 and remains in use until today.

<sup>e</sup>Not formally incorporated until 1913.

<sup>f</sup>By the UN definition, Miami and Ft Lauderdale belong to the same metropolitan area.

<sup>g</sup>There is no metro system matching the definition by Gonzalez-Navarro and Turner (2016).

<sup>h</sup>This hurricane destroyed many structures in Fort Lauderdale.

<sup>i</sup>There occurred massive damage to infrastructure and roofs and windows of houses. However, it seems that few homes got completely destroyed or swept away by the storm and the related flood (Barnes, 2007, p. 173).

<sup>j</sup>Hit more Southern parts of Dade County much harder. Damage in Fort Lauderdale supposedly limited.

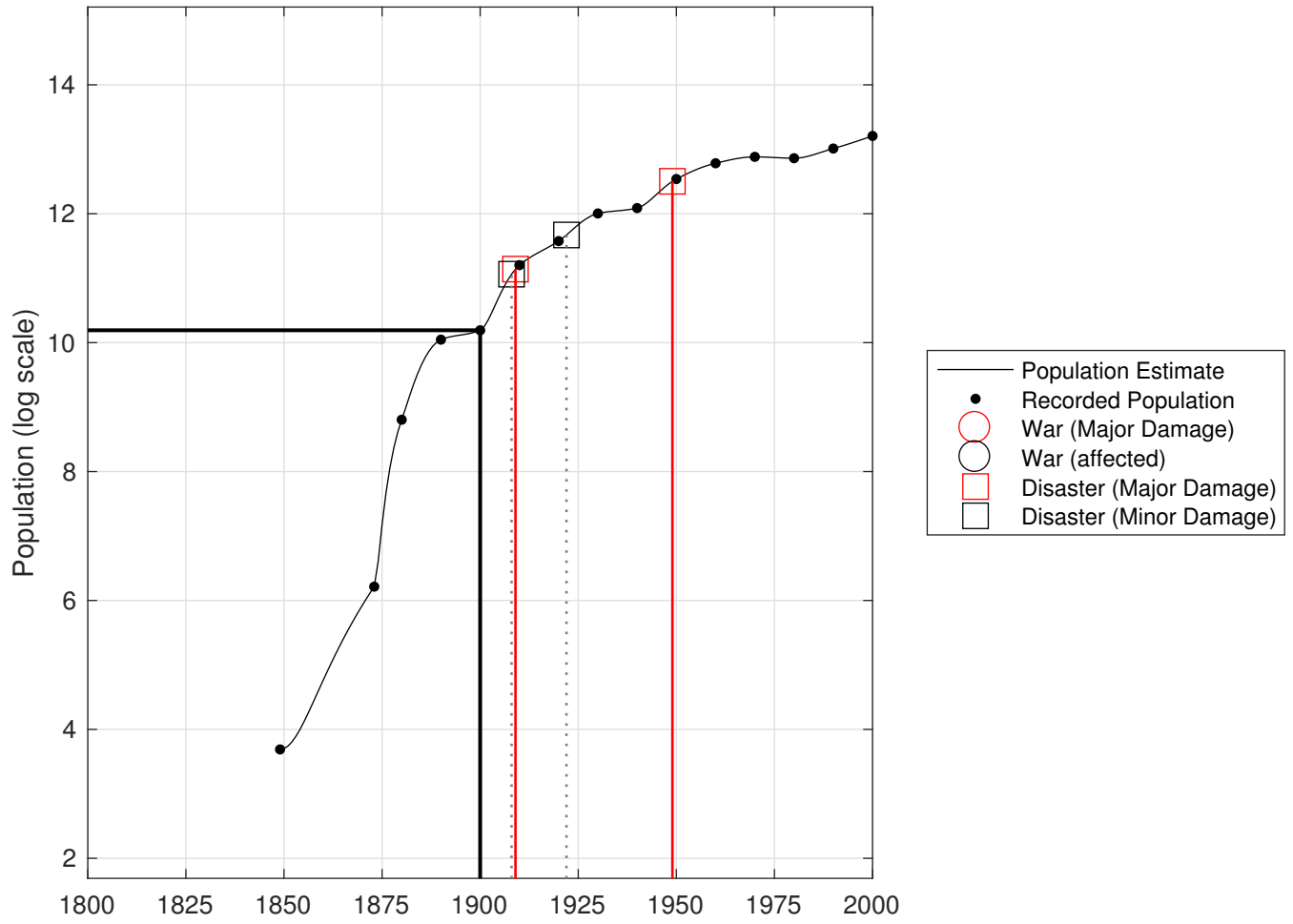
<sup>k</sup>Hurricane Irene caused only little destruction in Fort Lauderdale.

Table 70: Concentration Measures - Fort Lauderdale

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	21.03
Cumulative density of employment-weighted PP distances at 750 m	%	96.72
Average distance between all prime locations	in kilometres	20.04
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.15
Weighted average distance from EWPPs to 1900 CH	in kilometres	25.48
Average from all prime locations to 1900 CH	in kilometres	24.61
Average distance from global prime locations to 1900 CH	in kilometres	27.65

### A.33 Fort Worth

Figure 42: Fort Worth



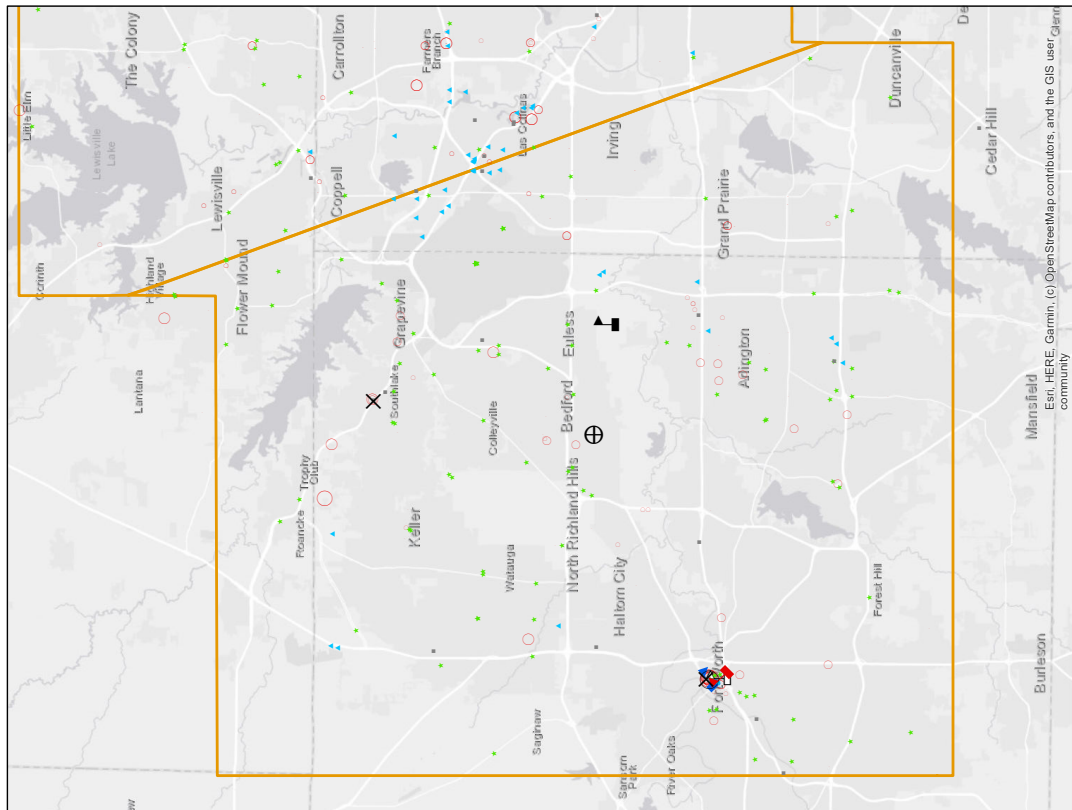
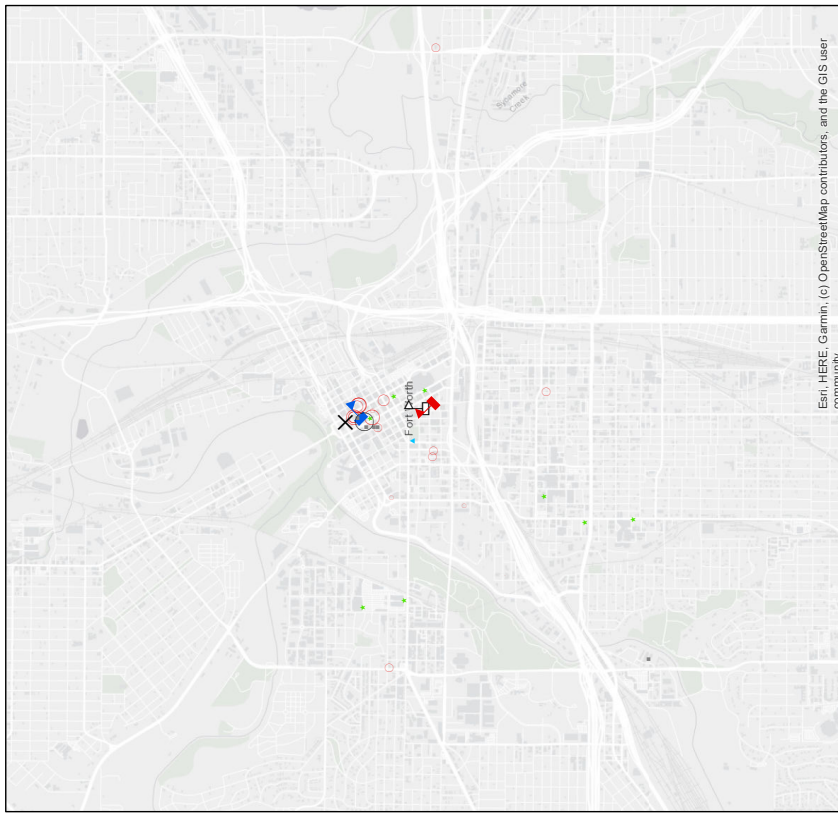


Table 71: Sources: Fort Worth ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1840	Landmark Preservation Committee (2015)
First Political Institution	1876	Rafferty and Reynolds (2003, p. 186)
City Hall	1900	City of Fort Worth (2015)
City Hall	2000	Gerem (2000, p. 165)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>a</sup> , 1900, 1950, 2000	Selcer (2014)
<i>Population Data (1800-2000)</i>		
City Population	1849, 1873, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Gibson and Jung (2005a, 103), Selcer and Potter (1995, p. 119), City of Austin (2014, p. 21), Selcer (2014)
Metro Population <sup>b</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>c</sup>	None	
Number of Stations	1910, 1940, 2010	NaN
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1909 <sup>d</sup>	McGown (2003, p. 34)
Hurricane(s)	None recorded	
Flooding(s)	1908, 1922 <sup>e</sup> , 1949 <sup>f</sup>	McGown (2003, p. 104)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>Established as a town in 1853 and incorporated as a town in 1873.

<sup>b</sup>By the UN definition, Dallas and Ft Worth belong to the same metropolitan area.

<sup>c</sup>There is no metro system matching the definition by Gonzalez-Navarro and Turner (2016).

<sup>d</sup>Destroyed 300 buildings, which is given the city size a lot.

<sup>e</sup>The floods of 1908 and 1922 were apparently not as serious as the one in 1949 and are thus classified as major disasters as no information about the number of destroyed buildings could be found.

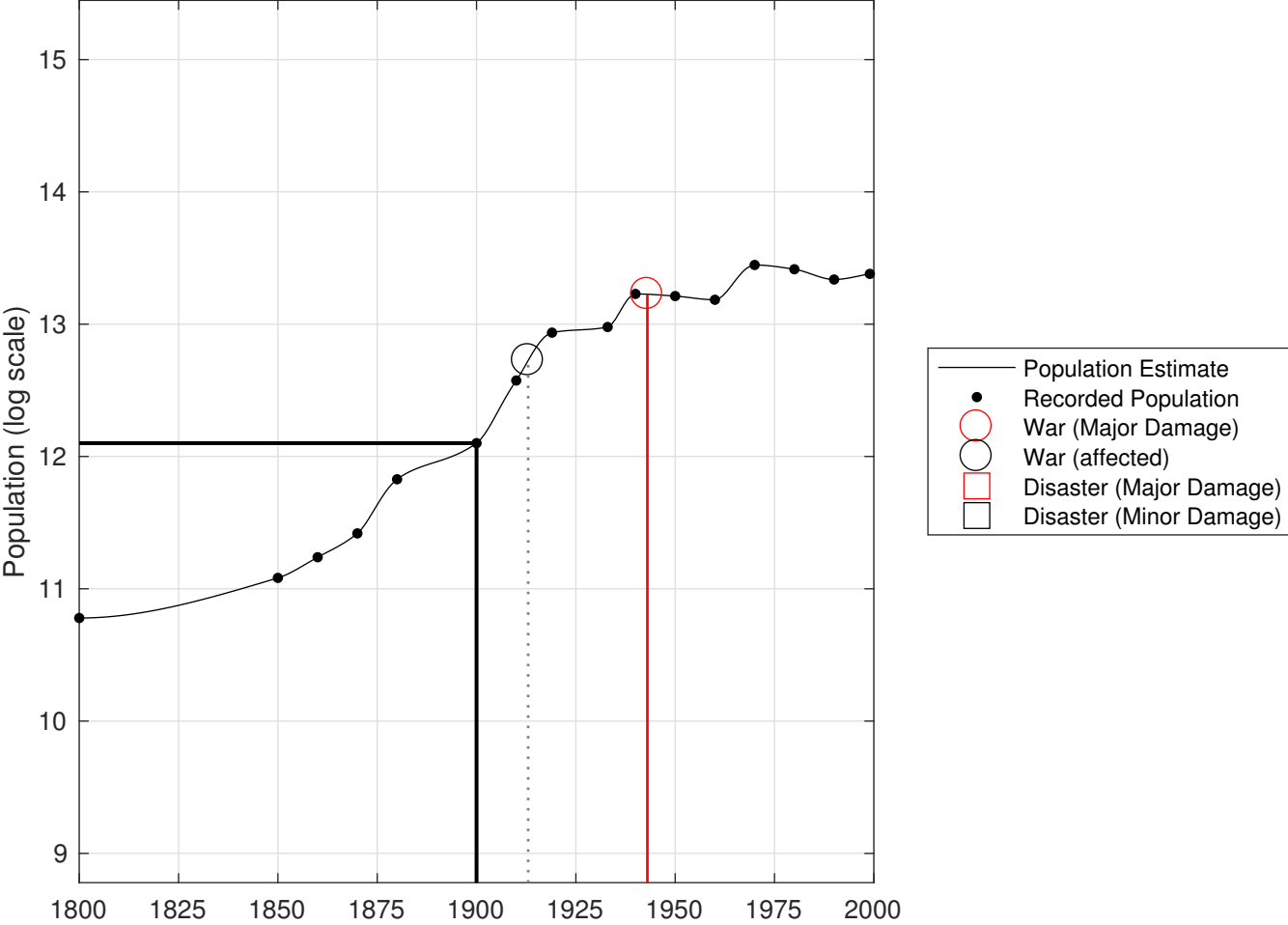
<sup>f</sup>Destroyed about 1000 structures and is thus considered as a major disaster.

Table 72: Concentration Measures - Fort Worth

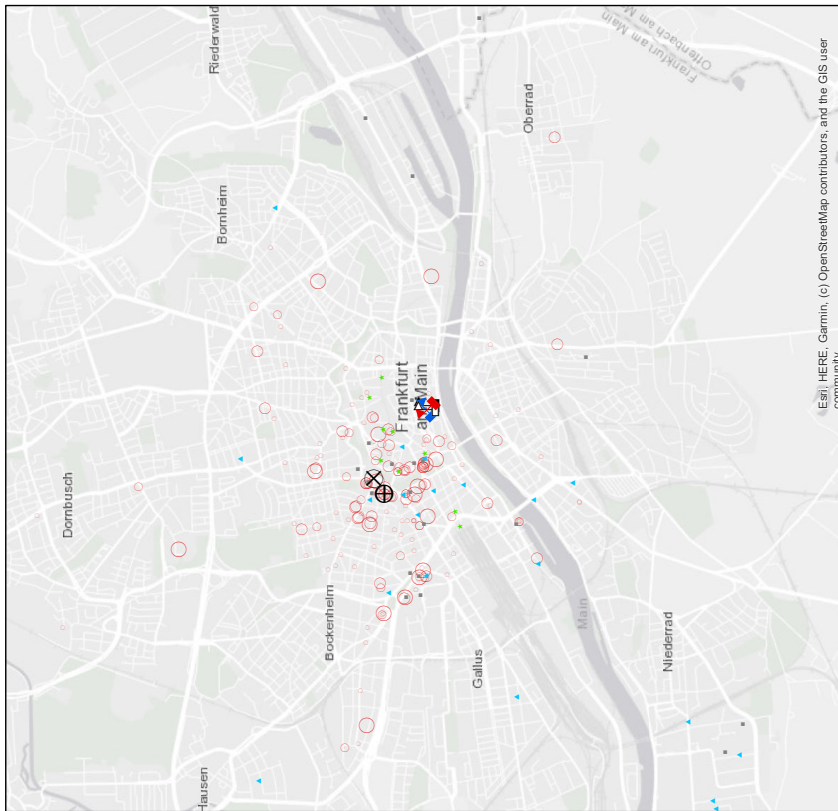
<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	23.24
Cumulative density of employment-weighted PP distances at 750 m	%	65.13
Average distance between all prime locations	in kilometres	14.26
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.18
Weighted average distance from EWPPs to 1900 CH	in kilometres	14.57
Average from all prime locations to 1900 CH	in kilometres	4.32
Average distance from global prime locations to 1900 CH	in kilometres	0.57

A.34 Frankfurt

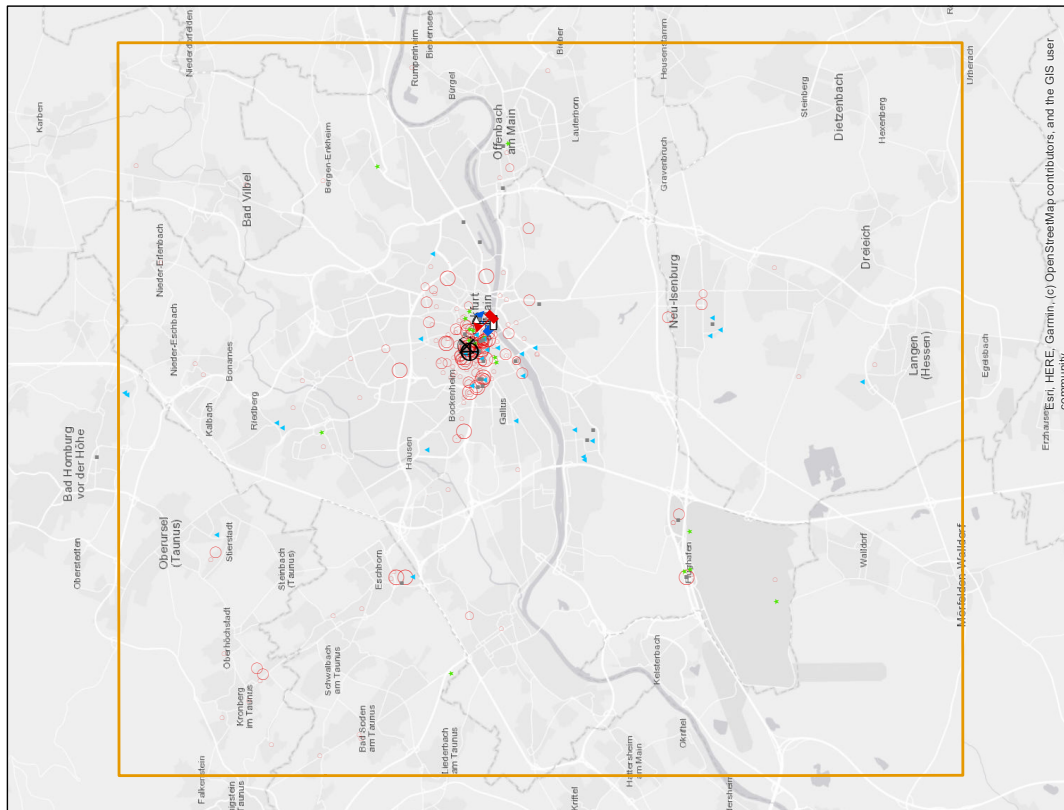
Figure 43: Frankfurt







- Legend**
- ✕ Prime location (any)
  - Global prime location
  - ⊕ Central point
  - Metro extent (prime services)
  - ▲ SNL Office Building
  - Starbucks
  - CoWorking
- Foundation Place EWWP
- 450 - 918
  - 918 - 1507
  - 68 - 98
  - 98 - 450
  - 1507 - 1898
- First City Government
- ▲ City Hall 1900
  - ▲ City Hall 2000
- Scale: 0 0.75 1.5 3 Kilometers



- Scale: 0 2.25 4.5 9 Kilometers

Table 73: Sources: Frankfurt ( Germany )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	83	Stadt Frankfurt am Main (2014d), Nordmeyer (2015)
First Political Institution <sup>b</sup>	531	Stadt Frankfurt am Main (2014d), Nordmeyer (2015)
City Hall	1900	Stadt Frankfurt am Main (2014c)
City Hall	2000	Stadt Frankfurt am Main (2014c)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Stadt Frankfurt am Main (2014b), Stadt Frankfurt am Main (2014a)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1860, 1870, 1880, 1900, 1910, 1919, 1933, 1940, 1950, 1960, 1970, 1980, 1990, 1999, 2009	Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1968	Verkehrsgesellschaft Frankfurt am Main (2008, 3)
Number of Stations	1910, 1940, 2010	Schwandl (2016), Rhein-Main Verkehrsbund (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1913 <sup>c</sup> , 1943 <sup>d</sup>	Stadt Frankfurt am Main (2014b), Nordmeyer (2015), Encyclopaedia Britannica (2015j)

<sup>a</sup>This is an approximate year for the Roman military outpost. Please note that was a scattered celtic settlement in this area as early as 450-350 BC.

<sup>b</sup>It is not clear whether the Roman settlement was actually turning into a city, which is why assume it did not. In around 500 the Franks start settling and build a castle. Frankfurt is growing out of this castle and this is considered, the time where it started to become a city. The first mentioning by the name "Franconofurd" in a document is only in 794. However, by then it was already an important city.

<sup>c</sup>There were also 11 air raids on Frankfurt during World War I. However, the article does not specify any major destruction during World War I to the building stock, but emphasises the problems of mass unemployment and malnutrition.

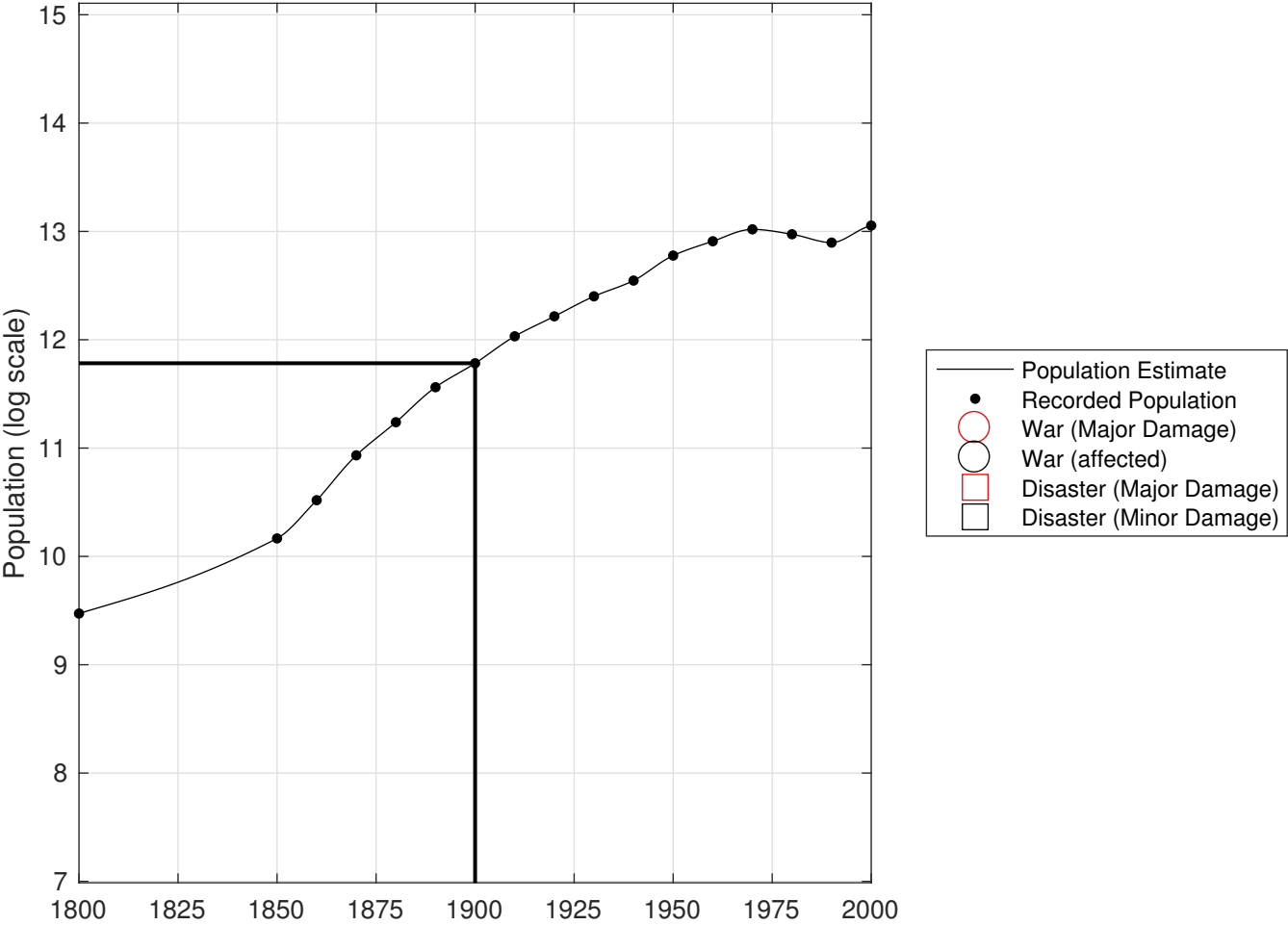
<sup>d</sup>Encyclopaedia Britannica (2015j) mentions that the old town of Frankfurt was "mostly destroyed," which is why we code it as major.

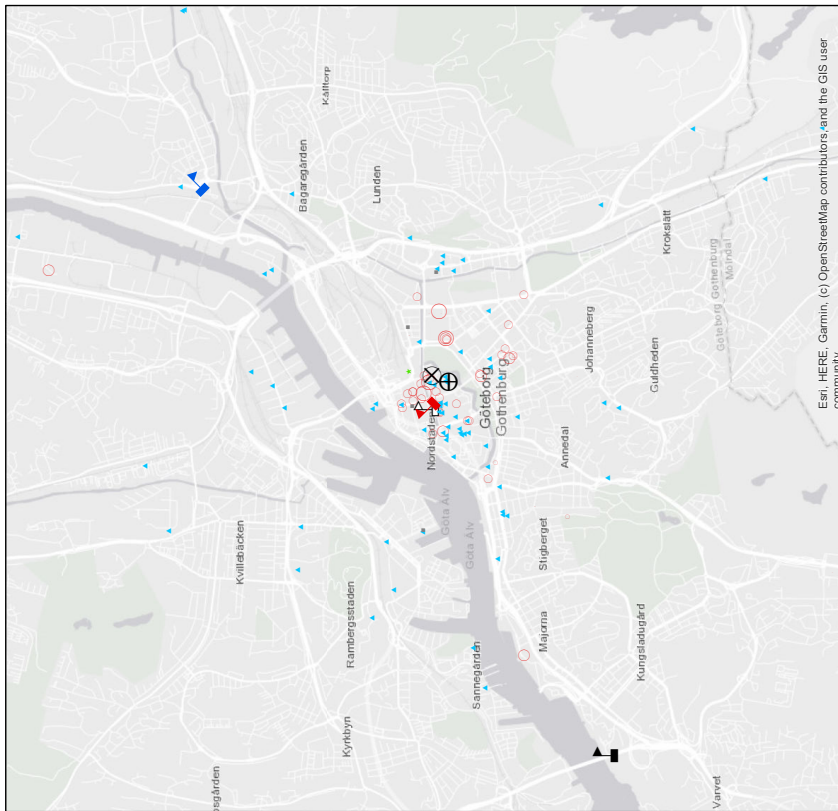
Table 74: Concentration Measures - Frankfurt

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	4.05
Cumulative density of employment-weighted PP distances at 750 m	%	4.71
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.71
Weighted average distance from EWPPs to 1900 CH	in kilometres	2.84
Average from all prime locations to 1900 CH	in kilometres	0.95
Average distance from global prime locations to 1900 CH	in kilometres	0.95

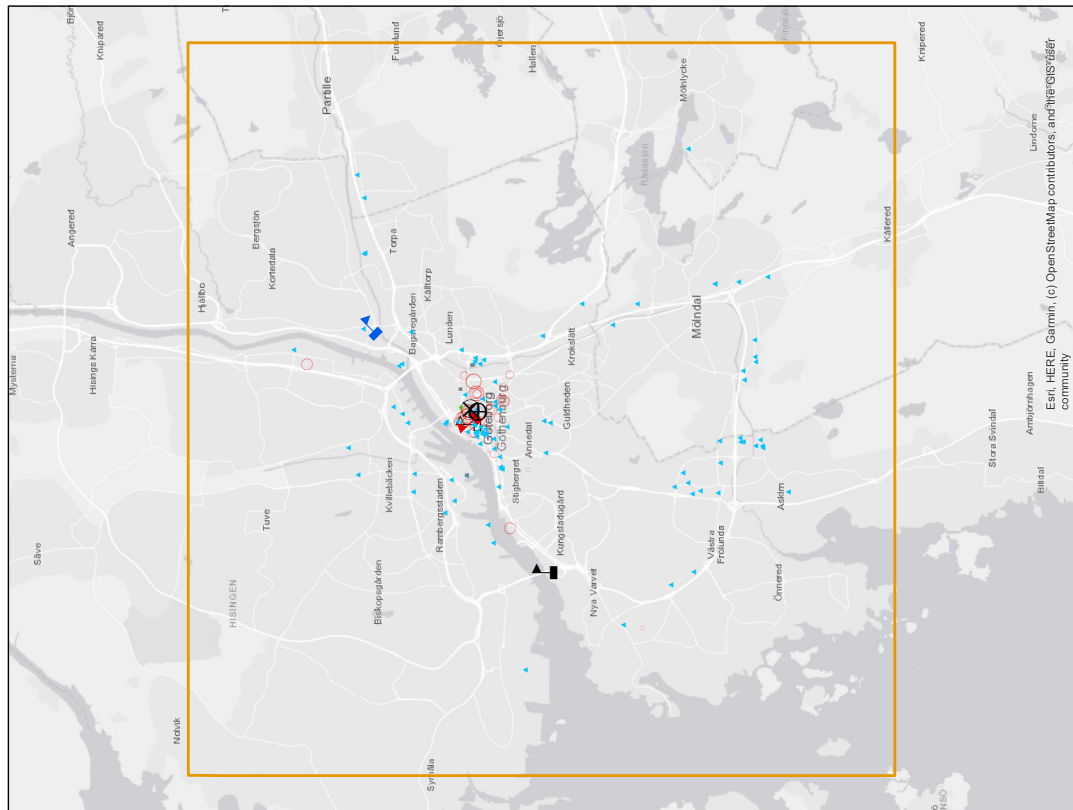
A.35 Gothenburg

Figure 44: Gothenburg





- Legend**
- ✕ Prime location (any)
  - Global prime location
  - ⊕ Central point
  - ▭ Metro extent (prime services)
  - ▲ SNL Office Building
  - Starbucks
  - CoWorking
  - ▲ Foundation Place
  - ▲ First City Government
  - ▲ City Hall 1900
  - ▲ City Hall 2000
  - EWWP 450 - 918
  - 68 - 98
  - 98 - 450
  - 918 - 1507
  - 1507 - 1898



- 0 2.25 4.5 9 Kilometers

Table 75: Sources: Gothenburg ( Sweden )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1350	Bondeson (1971, p. 3)
First Political Institution <sup>b</sup>	1473	Björklund (2015), Bondeson (1971, p. 3)
City Hall <sup>c</sup>	1900	Darwin Porter (2011)
City Hall	2000	Darwin Porter (2011)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Holm and Tourist Office (2014)
<i>Population Data (1800-2000)</i>		
City Population	1750, 1800, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000, 2009	Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>d</sup>	None	
Number of Stations	1910, 1940, 2010	NaN
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>There was a settlement called Nya Lodöse in 1473, from which later on Gothenborg would be founded. There was also a castle at today's Älvsborgsbron bridge founded in the 14th century. We thus take 1350 and the place of this fortress as the the first settlement of what today is Gothenburg. This was not an extensive city with city-like function, which is why we record it only as a settlement.

<sup>b</sup>The actual city with the name Gothenburg was only founded in 1621 (Official Tourism and Travel Information - Visit Sweden, 2014; Holm and Tourist Office, 2014). However, Nya Lödöse can be considered the original city, not at least because it's today called old town of Gothenburg. It is not exactly clear where the exact location of the government building was, which is why we approximate it where the memorial stone for the city used to stand (Gamlestadtorget).

<sup>c</sup>This site hosts the city hall since 1672.

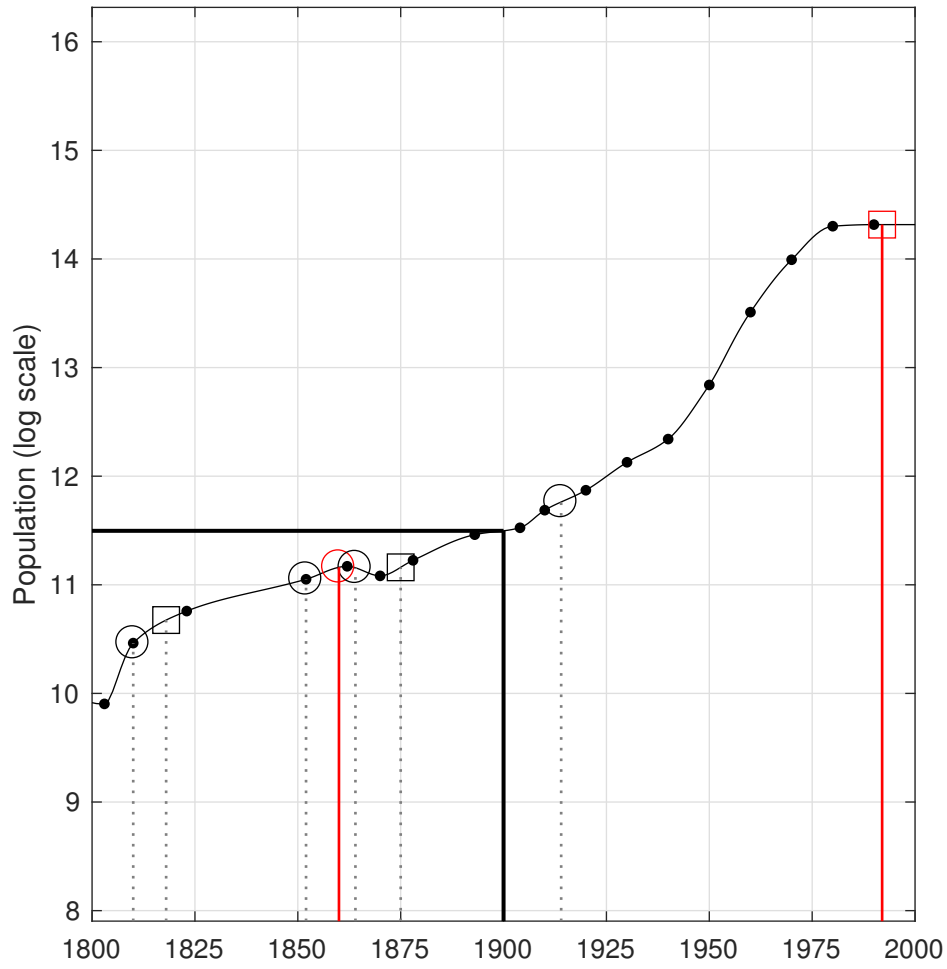
<sup>d</sup>There is no metro system matching the definition by Gonzalez-Navarro and Turner (2016).

Table 76: Concentration Measures - Gothenburg

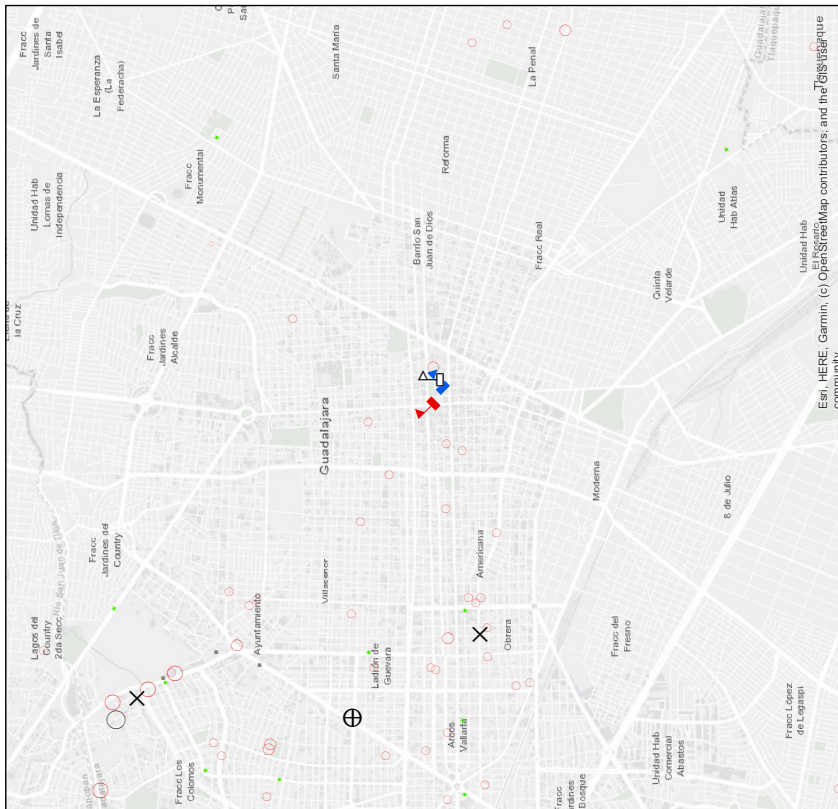
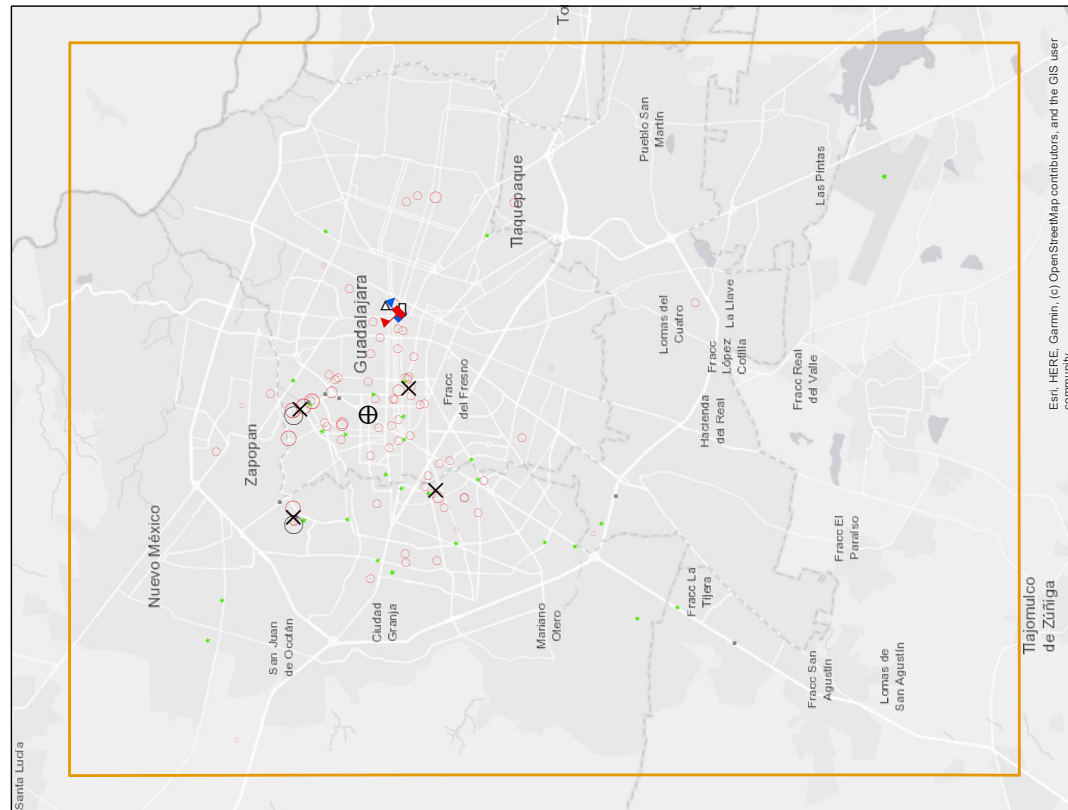
<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	1.51
Cumulative density of employment-weighted PP distances at 750 m	%	2.31
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-1.31
Weighted average distance from EWPPs to 1900 CH	in kilometres	1.02
Average from all prime locations to 1900 CH	in kilometres	0.37
Average distance from global prime locations to 1900 CH	in kilometres	0.37

### A.36 Guadalajara

Figure 45: Guadalajara







- Legend**
- ✕ Prime location (any)
  - Global prime location
  - ⊕ Central point
  - ▭ Metro extent (prime services)
  - ★ SNL Office Building
  - Starbucks
  - CoWorking
  - ▲ Foundation Place
  - ▲ First City Government
  - ▲ City Hall 1900
  - ▲ City Hall 2000
  - EWWP 450 - 918
  - 68 - 98
  - 98 - 450
  - 1507 - 1898

Table 77: Sources: Guadalajara ( Mexico )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1542	Guadalajara City Council (2015)
First Political Institution <sup>a</sup>	1542	Adyuntamiento de Guadalajara (2015), Kofoid and Kofoid (1843, p. 364)
City Hall <sup>b</sup>	1900	Adyuntamiento de Guadalajara (2015)
City Hall	2000	Adyuntamiento de Guadalajara (2015)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Guadalajara City Council (2015)
<i>Population Data (1800-2000)</i>		
City Population	1793, 1803, 1810, 1823, 1852, 1862, 1870, 1878, 1893, 1904, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2010	Shirley and Neill (2013, p. 237), Van Young and Coatsworth (2006, p. 35), Cook and Borah (1971, p. 62), International Bureau of the American Republics (1904), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	2009	Middleton (2003, 152)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	1818 <sup>c</sup> , 1875 <sup>d</sup>	Marley (2005, p. 231), Meyer (2010, p. 43)
Fire(s)	1992 <sup>e</sup>	Organisation for Economic Co-operation and Development (1998, p. 142)
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1860 <sup>f</sup> , 1852, 1914 <sup>g</sup>	Marley (2005, p. 231), Marley (2005, p. 234), Marley (2005, p. 237)
International War(s)	1810 <sup>h</sup> , 1864 <sup>i</sup>	Marley (2005, p. 230), Marley (2014, p. 43)

<sup>a</sup>First city council convened at the day of arrival and the town was granted city rights even before as Guadalajara was moved several times. As there were only 200 people in total (Van Young and Coatsworth, 2006, p. 30), we assume that the council met at the initial foundation place (Guadalajara City Council, 2015).

<sup>b</sup>The government seat in a building at the corner of the streets Morelos and Liceo.

<sup>c</sup>The exact damage is not known, but many buildings (including the cathedral) were severely hit. However, there is no real indication how extensive the damage was.

<sup>d</sup>We found no indication that Guadalajara was hit severely by the Great Jalisco earthquake in 1932 (see e.g. The Brisbane Courier, 1932, p. 9), although it damaged the cathedral.

<sup>e</sup>Gas explosion in the sewer system - 1000 Buildings destroyed.

<sup>f</sup>Fall of Guadalajara, many buildings destroyed.

<sup>g</sup>Mexican revolution, but no recorded damage could be recorded.

<sup>h</sup>During the War of Independence, Guadalajara was occupied for a short time. The city grew later as many refugees from rural areas came.

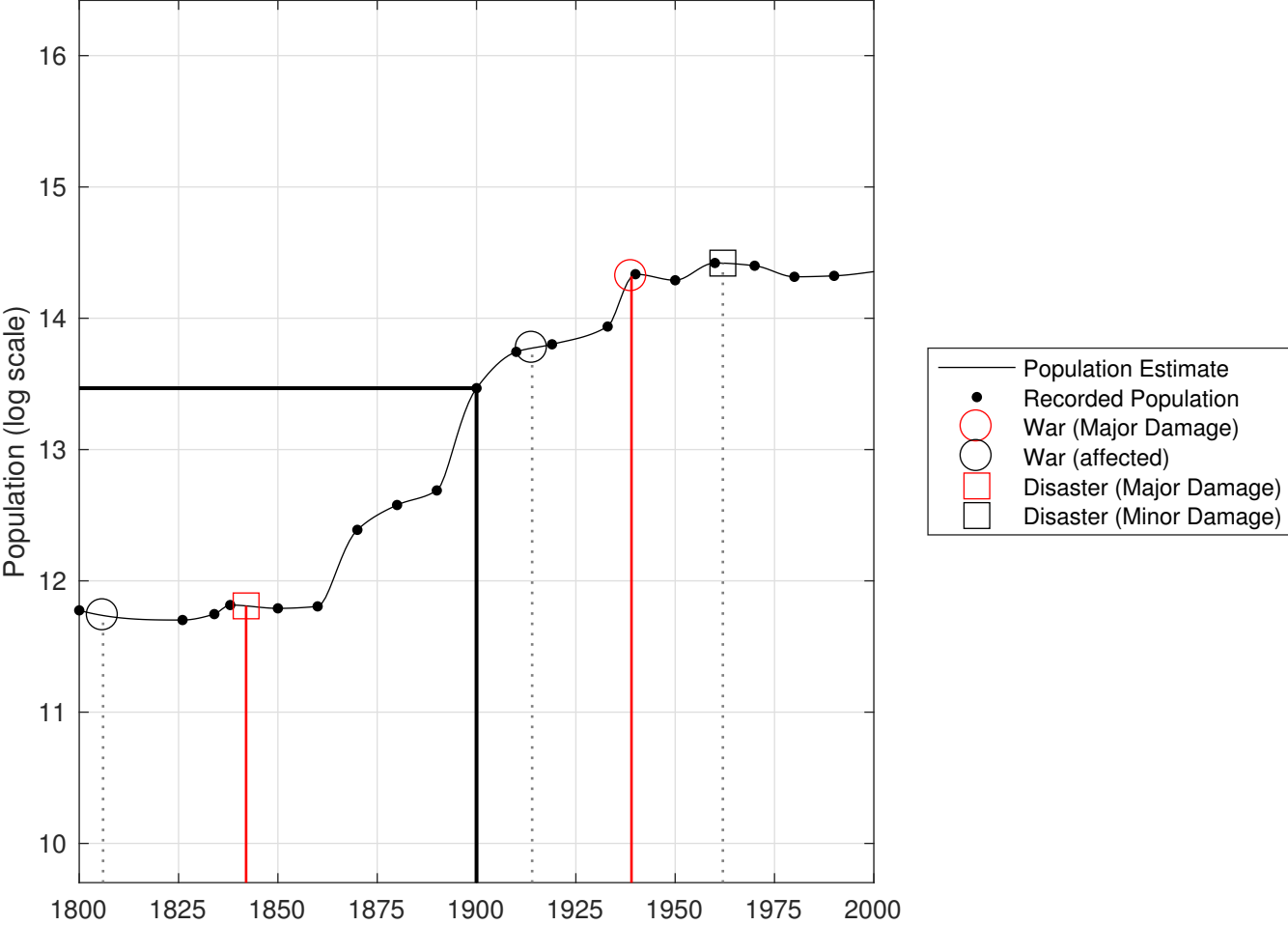
<sup>i</sup>French Occupation, but no damage recorded.

Table 78: Concentration Measures - Guadalajara

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	4.86
Cumulative density of employment-weighted PP distances at 750 m	%	17.97
Average distance between all prime locations	in kilometres	3.53
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.25
Weighted average distance from EWPPs to 1900 CH	in kilometres	4.91
Average from all prime locations to 1900 CH	in kilometres	5.23
Average distance from global prime locations to 1900 CH	in kilometres	5.98

A.37 Hamburg

Figure 46: Hamburg



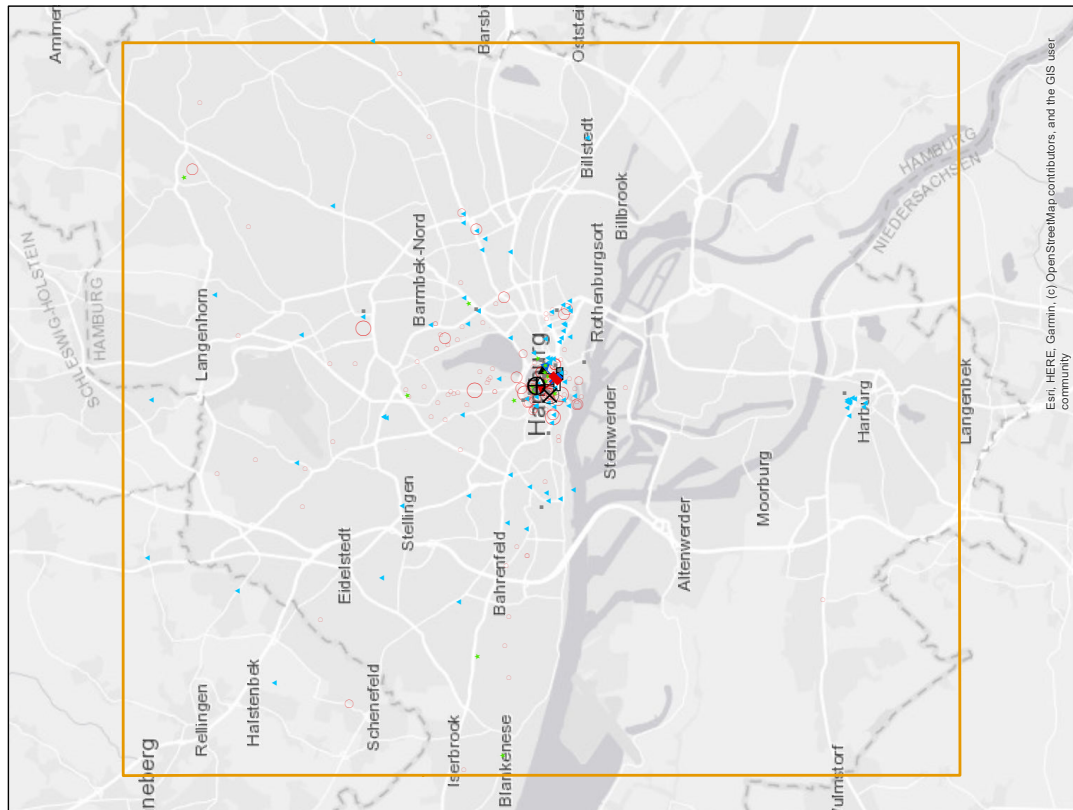
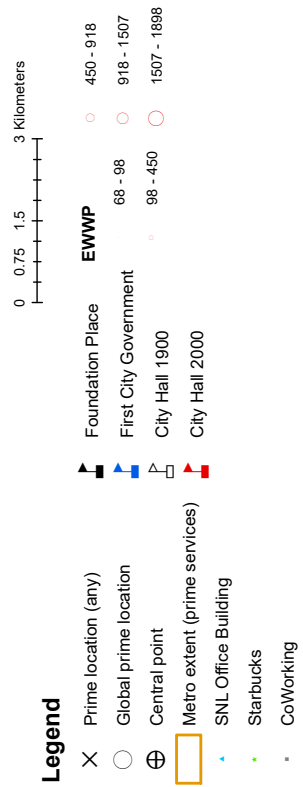
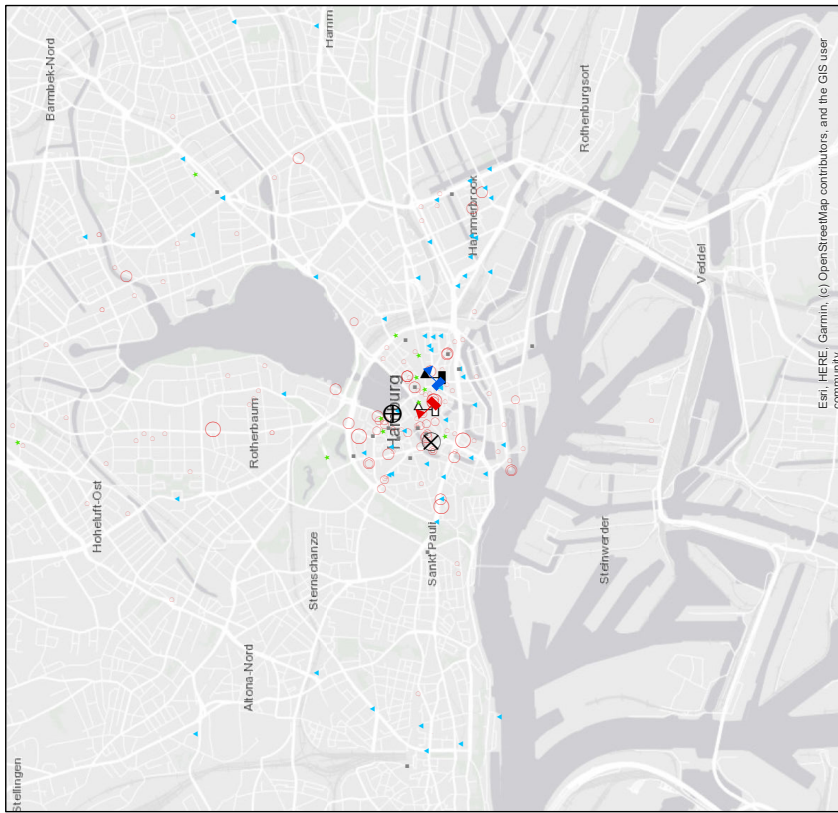


Table 79: Sources: Hamburg ( Germany )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	830	Konjack (2014b)
First Political Institution <sup>b</sup>	832	Konjack (2014b)
City Hall	1900	Konjack (2014a)
City Hall	2000	Konjack (2014a)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Konjack (1999)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1826, 1834, 1838, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1919, 1933, 1940, 1950, 1960, 1970, 1980, 1990, 2002, 2009	Laurent (1841, p. 146), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1866	Reinhardt (2011, 78)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1842 <sup>c</sup>	Thöming (2014)
Hurricane(s)	None recorded	
Flooding(s)	1962	Thöming (2014)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1806 <sup>d</sup> , 1914 <sup>e</sup> , 1939 <sup>f</sup>	Konjack (2014b), Encyclopaedia Britannica (2015k)

<sup>a</sup>Location of Hammaburg, a settlement of 2000 farmers, craftsmen, and fishermen.

<sup>b</sup>Archbishopery Hamburg is founded and we take the location of the first church (St. Marien) as the location.

<sup>c</sup>This fire destroyed a quarter of the city according to Encyclopaedia Britannica (2015k). According to Thöming (2014), it was even 50 % of the old town.

<sup>d</sup>Occupation by Napoleon which lasted until 1814.

<sup>e</sup>Affected by a sea blockade and high population loss.

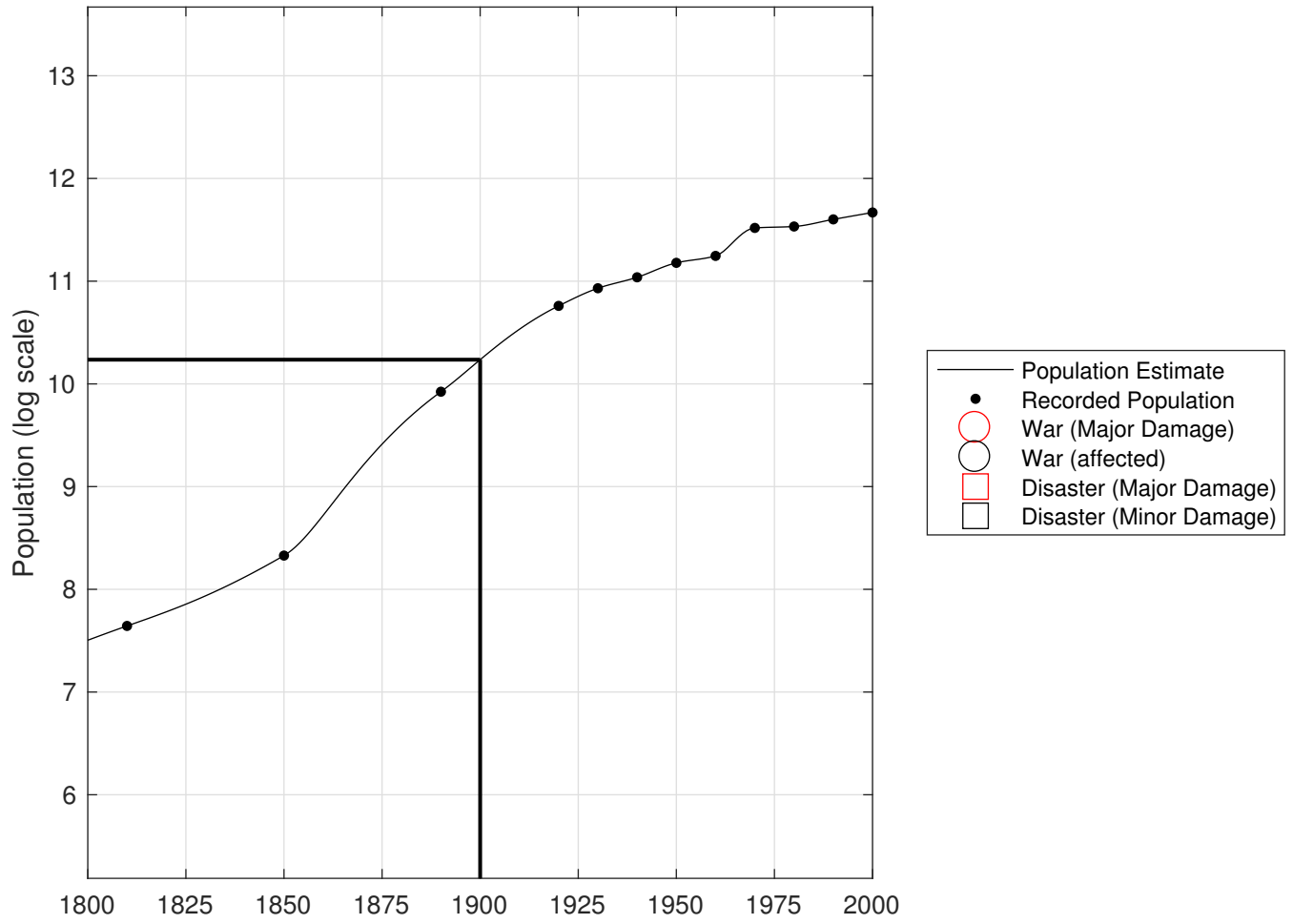
<sup>f</sup>According to Encyclopaedia Britannica (2015k), 55 % of all residential areas and 60 % of the harbour instalations were destroyed.

Table 80: Concentration Measures - Hamburg

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	3.71
Cumulative density of employment-weighted PP distances at 750 m	%	5.18
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-1.37
Weighted average distance from EWPPs to 1900 CH	in kilometres	2.35
Average from all prime locations to 1900 CH	in kilometres	0.37
Average distance from global prime locations to 1900 CH	in kilometres	0.37

### A.38 Helsingborg

Figure 47: Helsingborg





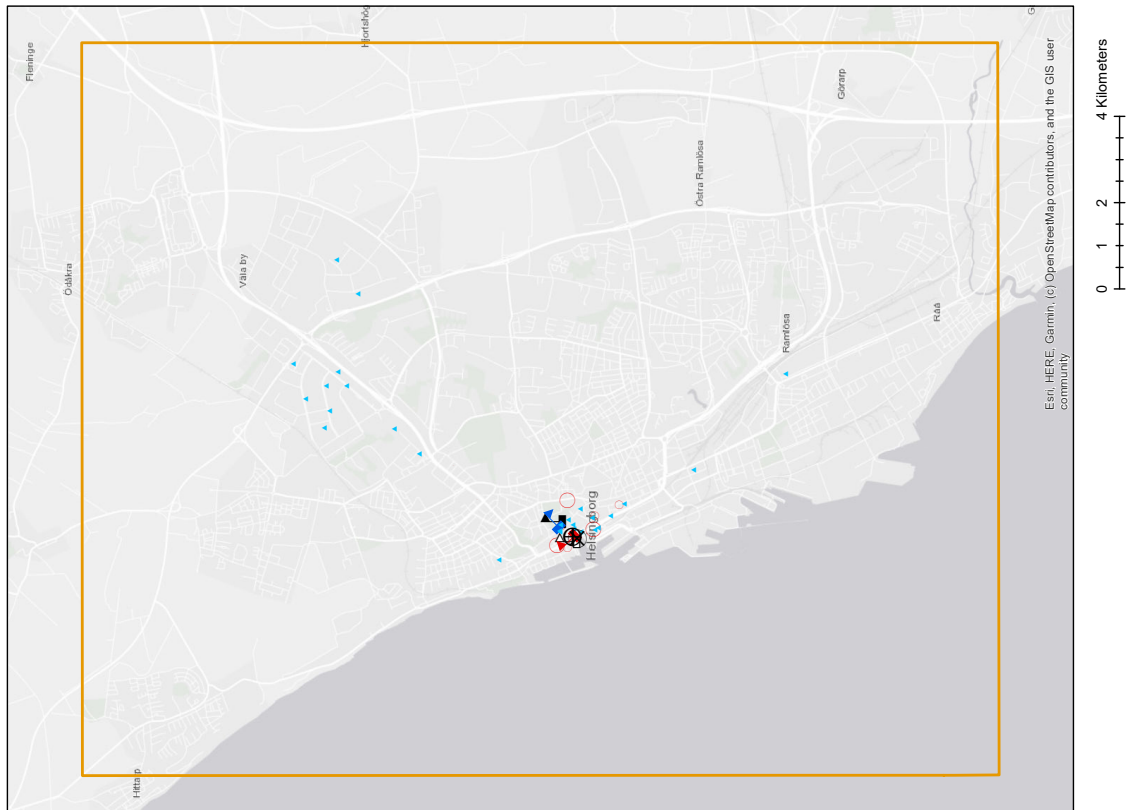
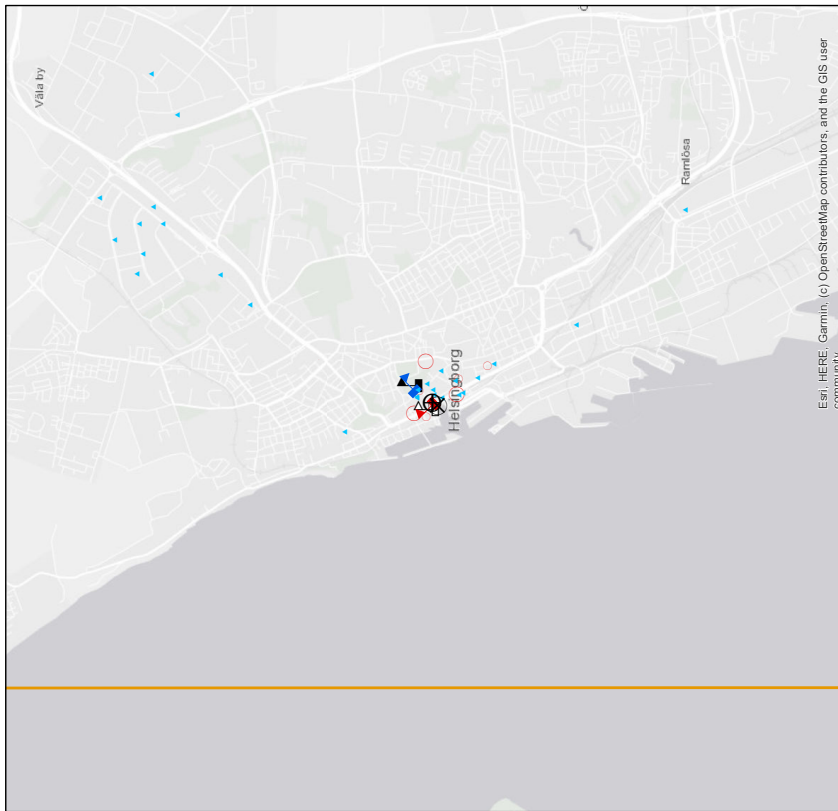


Table 81: Sources: Helsingborg ( Sweden )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1085	Helsingborg Stad (2014)
First Political Institution	1150	Proctor and Roland (2014, p.162)
City Hall <sup>a</sup>	1900	Helsingborg Stad (2014)
City Hall	2000	Helsingborg Stad (2014)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Helsingborg Stad (2014)
<i>Population Data (1800-2000)</i>		
City Population	1770, 1810, 1850, 1890, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Statistiska centralbyran (2001, p.58), Stads- och kommunhistoriska institutet (2014a)
Metro Population <sup>b</sup>	2015	Statistics Sweden (2016)
<i>Rapid Transit System</i>		
System Opening <sup>c</sup>	None	
Number of Stations	1910, 1940, 2010	NaN
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>City hall was built in 1890s.

<sup>b</sup>Refers to 2014 (province Skane).

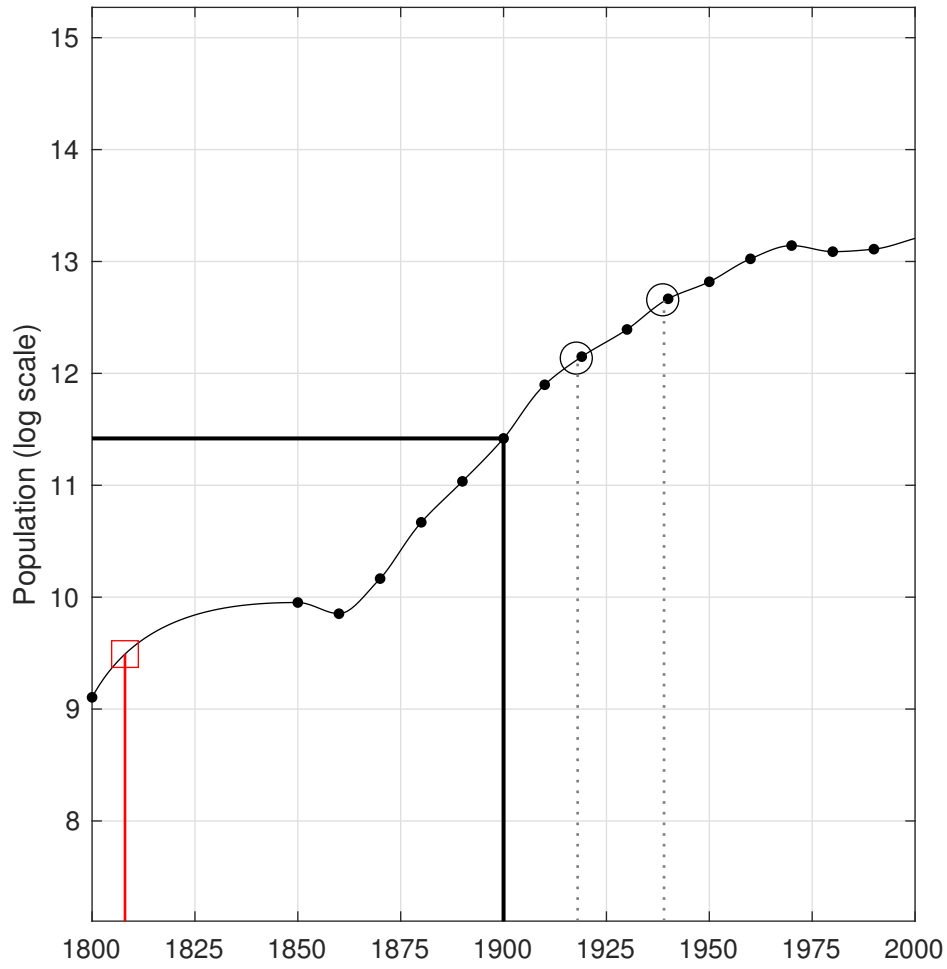
<sup>c</sup>There is no metro system matching the definition by Gonzalez-Navarro and Turner (2016).

Table 82: Concentration Measures - Helsingborg

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	0.60
Cumulative density of employment-weighted PP distances at 750 m	%	1.24
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-1.23
Weighted average distance from EWPPs to 1900 CH	in kilometres	0.39
Average from all prime locations to 1900 CH	in kilometres	0.13
Average distance from global prime locations to 1900 CH	in kilometres	0.13

### A.39 Helsinki

Figure 48: Helsinki



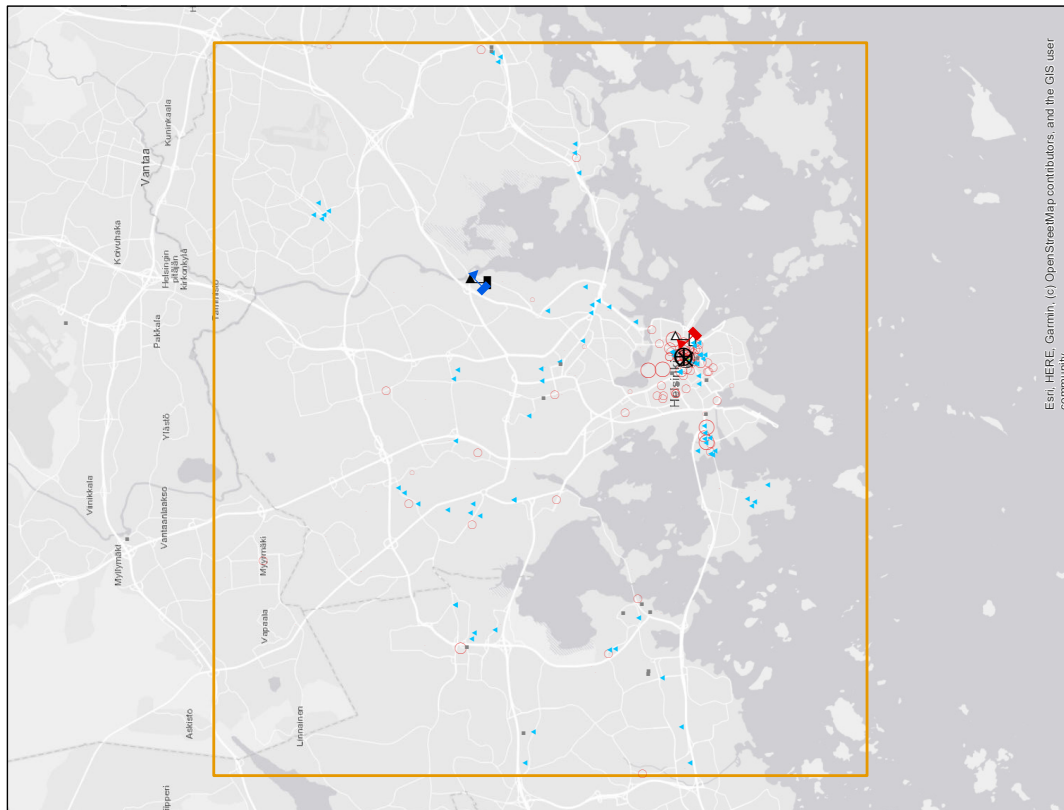
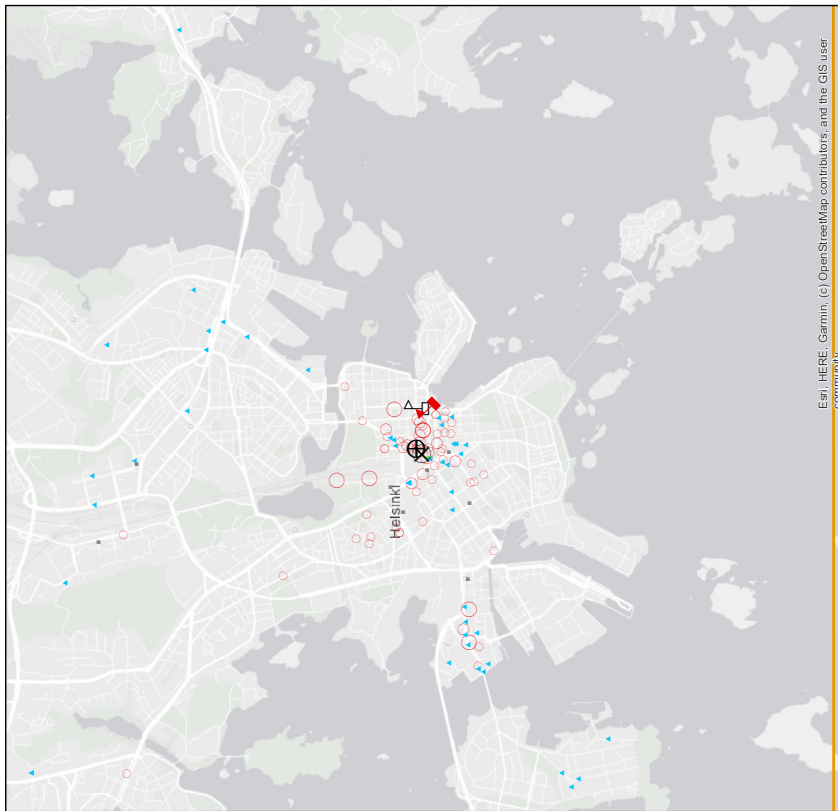


Table 83: Sources: Helsinki ( Finland )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1550	Helsinki kapaunki (2014), Isohanni (2011, p. 13), Kent (2004, p. 10), Snellman et al. (2012, p. 2)
First Political Institution <sup>b</sup>	1550	Helsinki kapaunki (2014), Isohanni (2011, p. 13), Kent (2004, p. 10), Snellman et al. (2012, p. 2)
City Hall	1900	Saresto (2014)
City Hall	2000	Helsinki kapaunki (2011)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>c</sup> , 1900, 1950, 2000	Helsinki kapaunki (2011)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1919, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2003, 2009	Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1982	McKey et al. (2016, 377)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	City of Helsinki (2014), Encyclopaedia Britannica (2015l)
Fire(s)	1808 <sup>d</sup>	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1918	City of Helsinki (2014)
International War(s)	1939 <sup>e</sup>	City of Helsinki (2014), Stadt Helsinki (2015)

<sup>a</sup>King Vasa founded Helsinki in 1550 and forced merchants to settle there. The exact location from Snellman et al. (2012, p. 2) His initial plan was to make it an important trading city competing with Tallin, but he failed Kent (2004, p. 10). Later Helsinki's location was moved to the modern one.

<sup>b</sup>We assume that the town hall was built immediately after the foundation of the city by the king.

<sup>c</sup>Capital of Grand Duchy of Finland.

<sup>d</sup>Great fire under Russian occupation. Helsinki was "burned to the ground" (Encyclopaedia Britannica, 2015l).

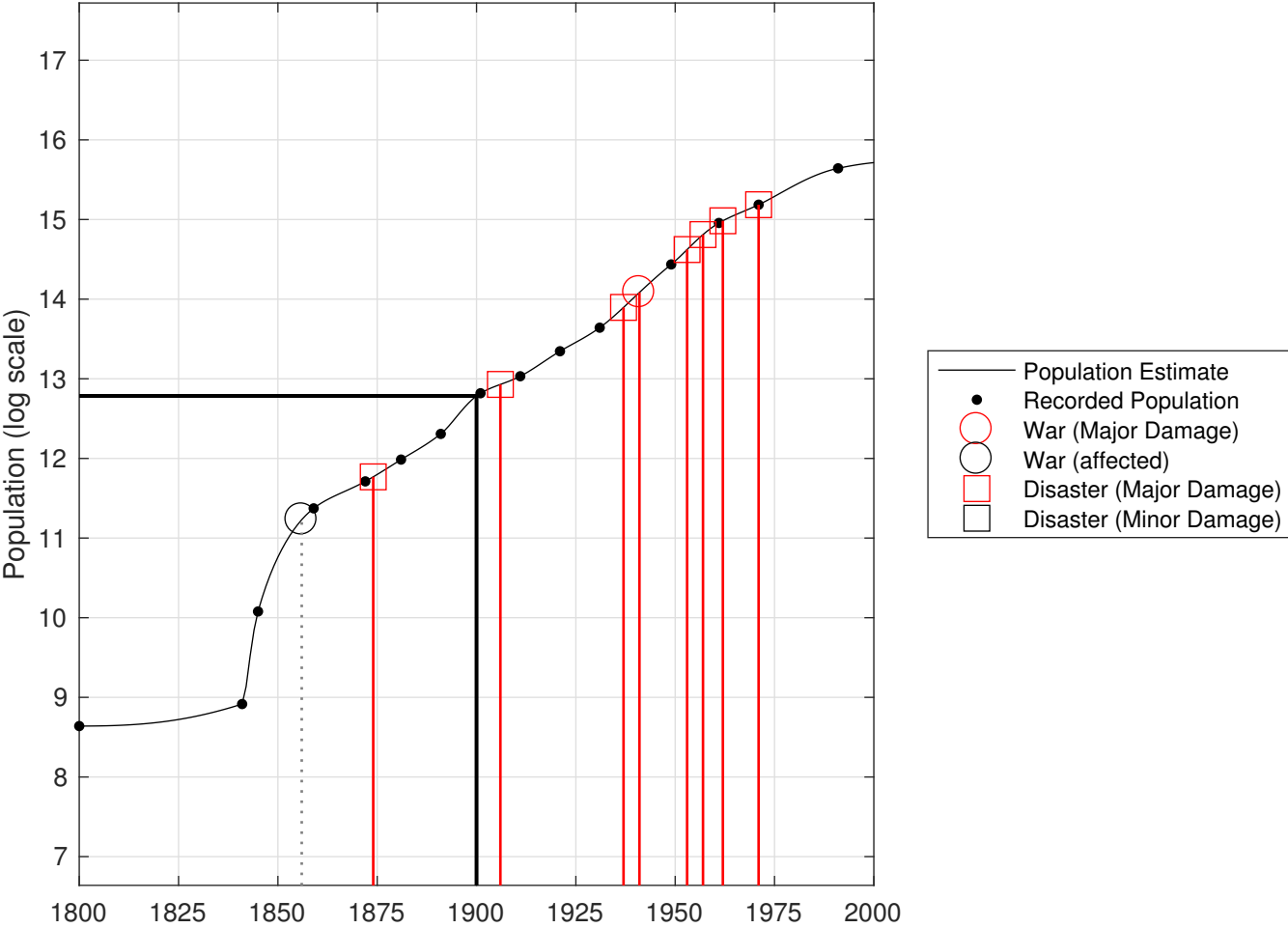
<sup>e</sup>Only 100 houses were destroyed during World War II (Stadt Helsinki, 2015)

Table 84: Concentration Measures - Helsinki

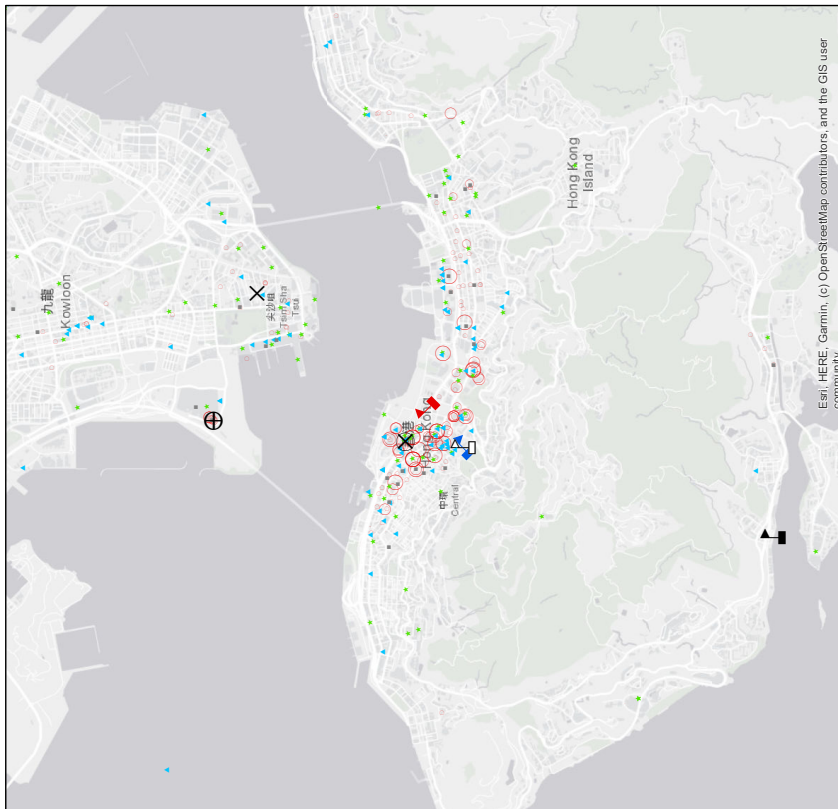
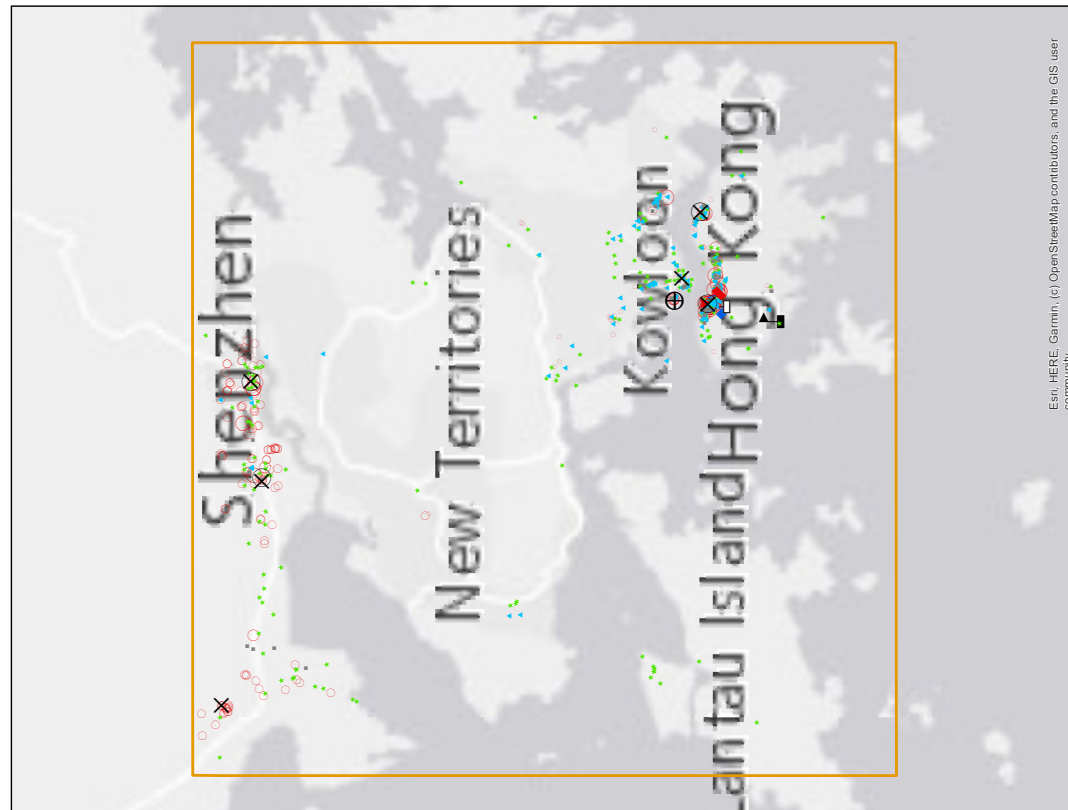
<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	3.07
Cumulative density of employment-weighted PP distances at 750 m	%	3.14
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.40
Weighted average distance from EWPPs to 1900 CH	in kilometres	2.08
Average from all prime locations to 1900 CH	in kilometres	0.51
Average distance from global prime locations to 1900 CH	in kilometres	0.51

A.40 Hong Kong

Figure 49: Hong Kong







- Legend**
- ✕ Prime location (any)
  - Global prime location
  - ⊕ Central point
  - ▭ Metro extent (prime services)
  - ▲ SNL Office Building
  - Starbucks
  - CoWorking
  - ▲ Foundation Place
  - ▲ First City Government
  - ▲ City Hall 1900
  - ▲ City Hall 2000
  - EWWP 450 - 918
  - EWWP 68 - 98
  - EWWP 98 - 450
  - EWWP 918 - 1507
  - EWWP 1507 - 1898

Table 85: Sources: Hong Kong ( China )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1368	Carroll (2007, p. 10), Shelton et al. (2013, p. 2)
First Political Institution <sup>b</sup>	1855	Roberts et al. (1992, p. 94)
City Hall <sup>c</sup>	1900	Roberts et al. (1992, p. 94)
City Hall <sup>d</sup>	2000	Chan (2013, p. 138)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>e</sup> , 1900, 1950, 2000 <sup>f</sup>	Preston and Rowe (2005, 65-75)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1841, 1845, 1859, 1872, 1881, 1891, 1901, 1911, 1921, 1931, 1949, 1961, 1971, 1991, 2001	Fan (1974, p. 1-2), Census and Statistics Department (2002, p. 15), Census and Statistics Department (1997, p. 20), Chan and Lo (2010, p. 28)
Metro Population <sup>g</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1979	Matilla (2011, 13)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1953 <sup>h</sup>	Ure (2012, p. 163)
Hurricane(s)	1874, 1906, 1937, 1957, 1962, 1971 <sup>i</sup>	Ward (1991, p. 33), Hong Kong Observatory and Social Development (2003, p. 88-90)
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1856 <sup>j</sup> , 1941 <sup>k</sup>	Preston and Rowe (2005, p. 66), Preston and Rowe (2005, p. 66), Shelton et al. (2013, p. 60), Leung (2015)

<sup>a</sup>We follow Shelton et al. (2013, p. 2) in deciding "from where the metropolis grew", which is Hong Kong Island. Earlier settlements in other parts of Hong Kong have been recorded, e.g. 111 Bc in the west of Kowloon (Roberts et al., 1992, p. 99). The first reliable source documents the establishment village-like settlements of Hong Kong Island in Ming dynasty (Carroll, 2007, p. 10), i.e. villages in the south of Hong Kong Island. Hence as the date of the first settlement, we take the first year of Ming Dynasty. To get a closer estimate where exactly this settlement was we combine this information with Southern District Office (2014) which records a transshipment port in present-day Aberdeen during the Jiajing reign (1521-1567) of the Ming dynasty.

<sup>b</sup>The Government House - residence of the Governor of Hong Kong from 1855-1897 / there was also a city hall, but de facto governance - I assume was carried out from the governors office. Moreover, the city hall was a donation and hosted rather cultural events.

<sup>c</sup>The Government House - residence of the Governor of Hong Kong from 1855-1897 / there was also a city hall, but de facto governance - we assume - was carried out from the governors office. Moreover, the city hall was a donation and hosted rather cultural events.

<sup>d</sup>City council was dissolved in December 1999, but it was based in this building until then.

<sup>e</sup>Colonial Capital until independence from Great Britain.

<sup>f</sup>Special administrative region of the People's Republic of China.

<sup>g</sup>Footnote from United Nations Population Division (2014): Data for Hong Kong consist of the population of Hong Kong

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Island, New Kowloon the new towns in New Territories and the marine areas.

<sup>h</sup>Mentioned in Leung (2015), but centered in one neighbourhood only.

<sup>i</sup>No specific hurricane is mentioned in Leung (2015), but they resulted in urban redevelopment.

<sup>j</sup>First Opium War : no major destruction in Hong Kong recorded, but it was an important military base ( I assume) and also was considerably expanded (the British part) after the war.

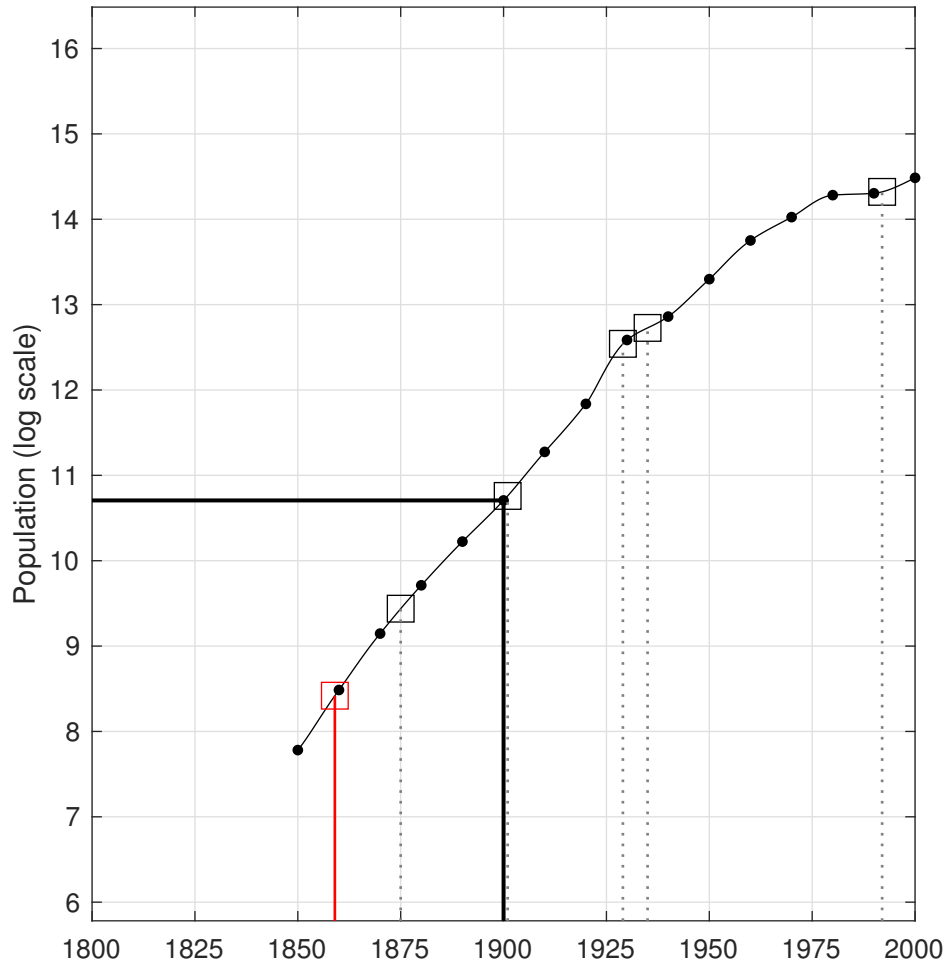
<sup>k</sup>Japanese occupation: "Massive destruction of the building stock" (Shelton et al., 2013, p. 60).

Table 86: Concentration Measures - Hong Kong

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	17.46
Cumulative density of employment-weighted PP distances at 750 m	%	14.90
Average distance between all prime locations	in kilometres	19.68
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.68
Weighted average distance from EWPPs to 1900 CH	in kilometres	13.51
Average from all prime locations to 1900 CH	in kilometres	9.16
Average distance from global prime locations to 1900 CH	in kilometres	6.33

## A.41 Houston

Figure 50: Houston



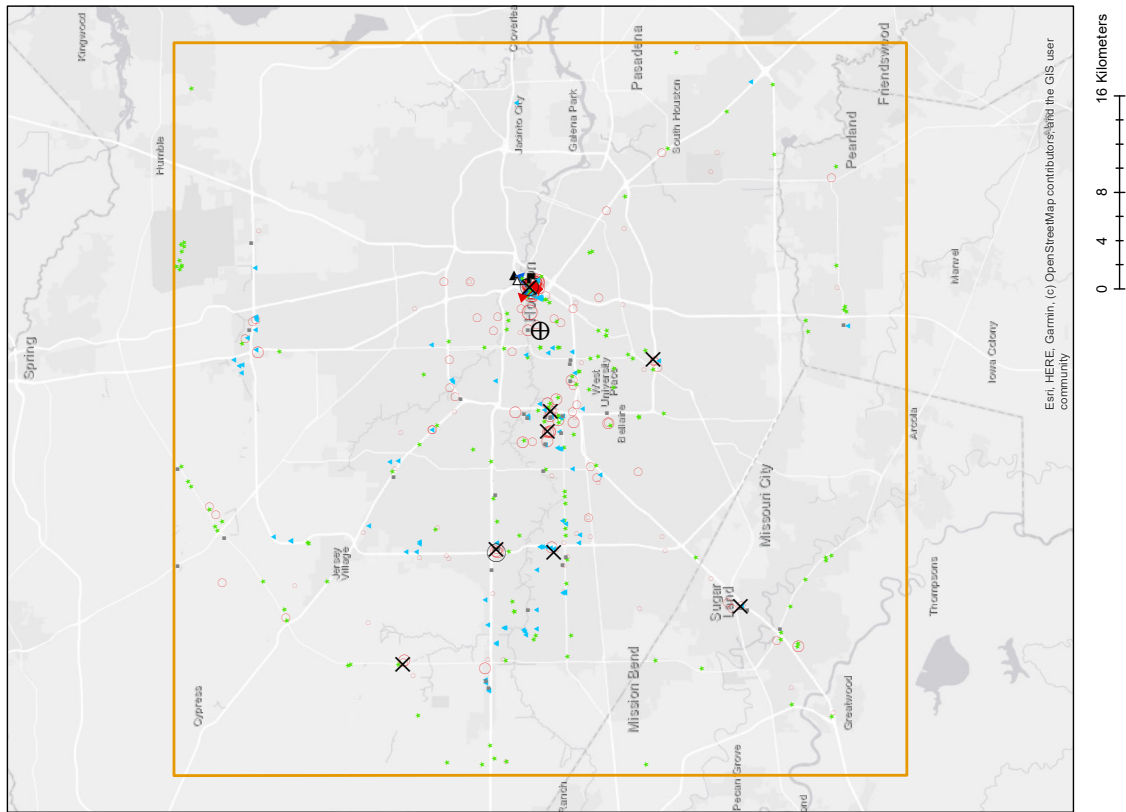
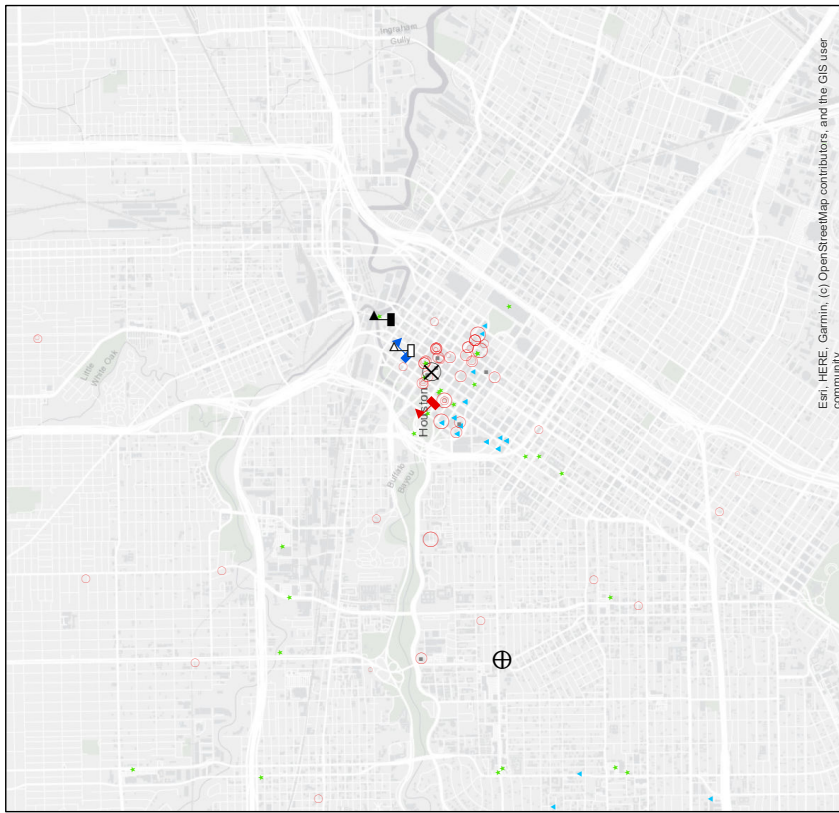


Table 87: Sources: Houston ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1836	Lardas (2013, p. 25)
First Political Institution <sup>b</sup>	1841	City of Houston (2014)
City Hall	1900	City of Houston (2014)
City Hall	2000	City of Houston (2014)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	City of Houston (2014)
<i>Population Data (1800-2000)</i>		
City Population	1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Gibson and Jung (2005a, p. 104), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>c</sup>	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1875 <sup>d</sup> , 1859 <sup>e</sup> , 1901	Nathan-Garner (2009, p. 32), Green (1915, p. 23), City of Houston (2014)
Hurricane(s)	2001 <sup>f</sup> , 2008	Nathan-Garner (2009, p. 31-33)
Flooding(s)	1837, 1929, 1935, 1992, 2003 <sup>g</sup>	Weather Research Center (2014)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>Allens Landing.

<sup>b</sup>The first mayor was elected in 1837, but this seems to be the first permanent city hall.

<sup>c</sup>There is a LRT system in place since 2004, but it does not satisfy the criteria as it runs partly on street level.

<sup>d</sup>City hall was destroyed in the "1870s" and again in 1901, but no record could be found of a huge fire causing destruction throughout the city.

<sup>e</sup>"Destroyed many Houston homes and businesses."

<sup>f</sup>We do not consider hurricane Alicia of 1983 as a major event. It destroyed a lot of glazing but not necessarily structures.

<sup>g</sup>None of the floods reported by the *Weather Research Center* qualifies as major by our definition, except for the one in 2001 which was due a hurricane and thus classified as such.

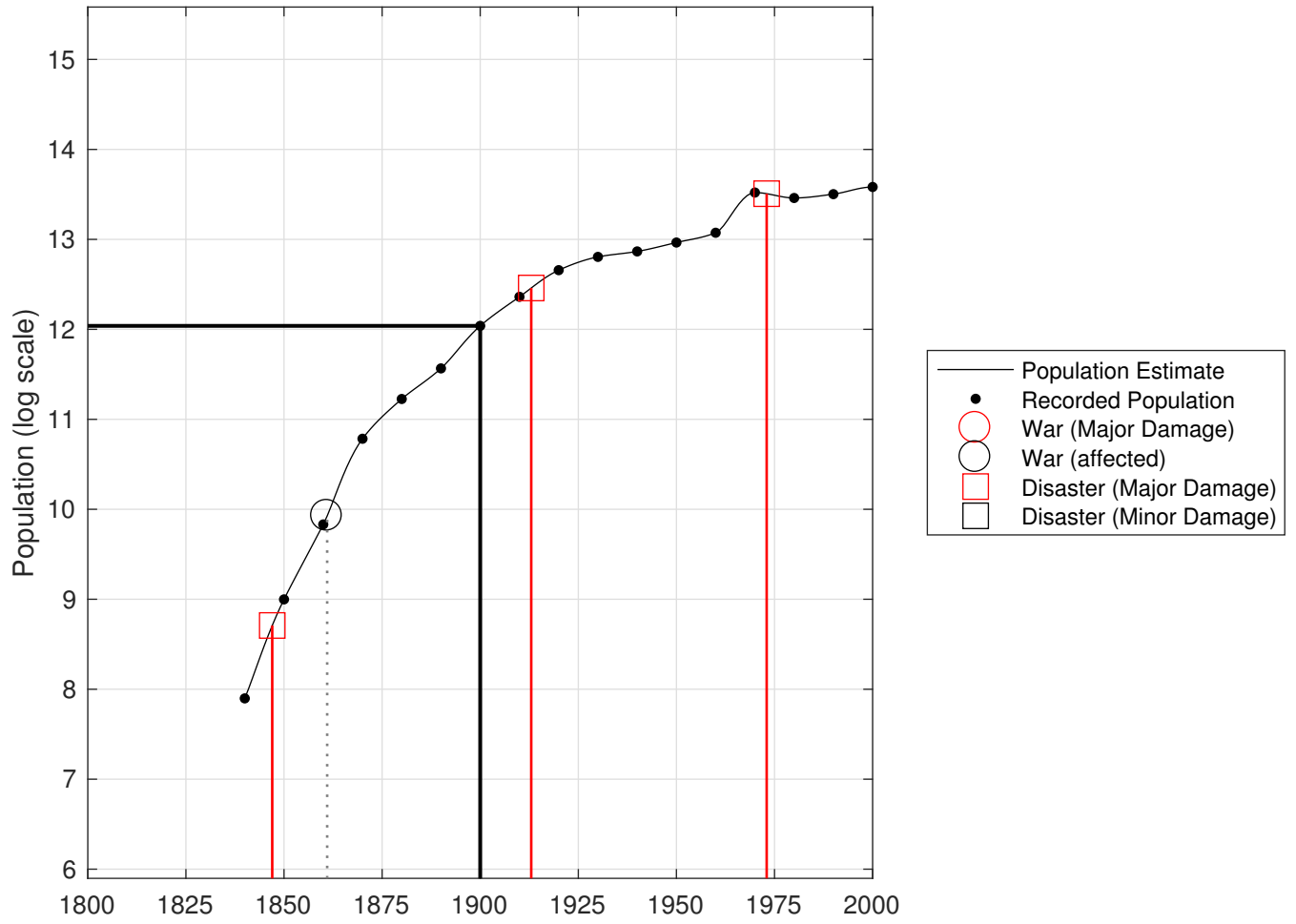
Table 88: Concentration Measures - Houston

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	13.52
Cumulative density of employment-weighted PP distances at 750 m	%	20.53
Average distance between all prime locations	in kilometres	11.90
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.12
Weighted average distance from EWPPs to 1900 CH	in kilometres	9.93
Average from all prime locations to 1900 CH	in kilometres	4.39
Average distance from global prime locations to 1900 CH	in kilometres	1.89



## A.42 Indianapolis

Figure 51: Indianapolis



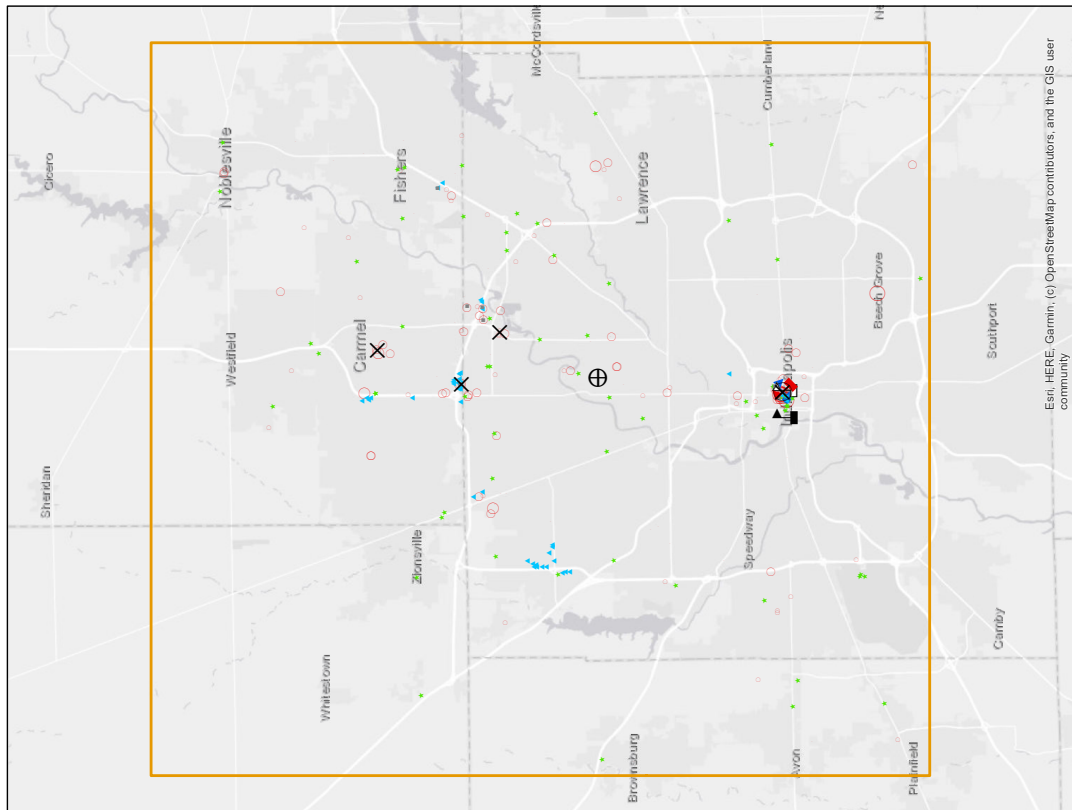
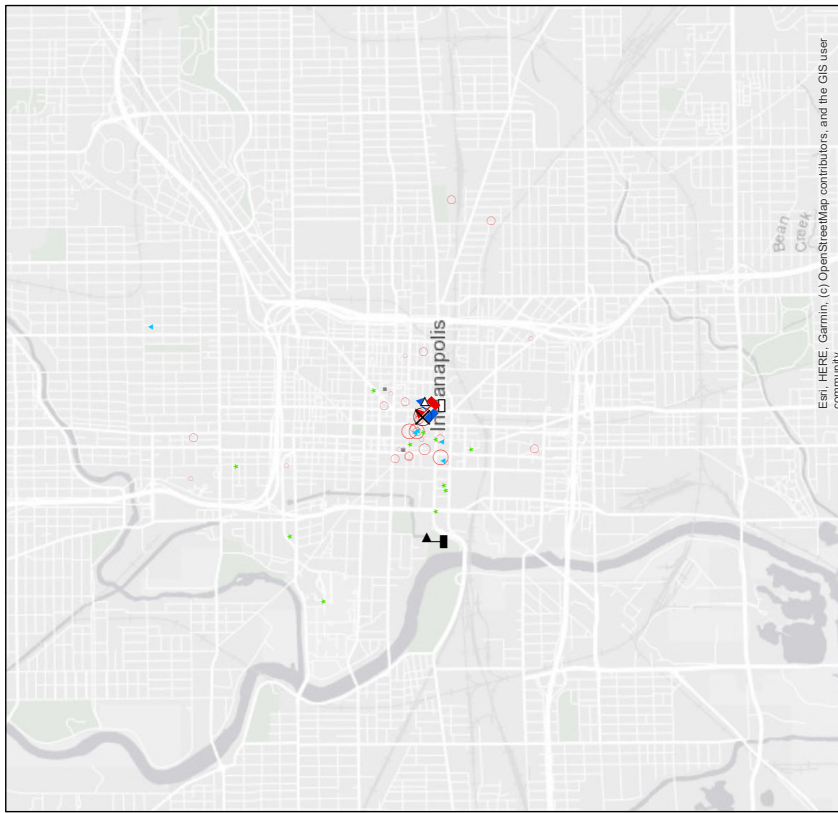


Table 89: Sources: Indianapolis ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1820	Bodenhamer and Barrows (1994, p. 1479)
First Political Institution <sup>a</sup>	1824	Bodenhamer and Barrows (1994, p. 1479), Bennett (1996, p. 5-8)
City Hall <sup>b</sup>	1900	Bodenhamer and Barrows (1994, p. 429)
City Hall	2000	Bodenhamer and Barrows (1994, p. 430)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Lorentz (2014)
<i>Population Data (1800-2000)</i>		
City Population	1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000, 2010	Gibson and Jung (2005a, p. 52-53), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1973 <sup>c</sup>	Roembke (1998)
Hurricane(s)	None recorded	
Flooding(s)	1847 <sup>d</sup> , 1913	Brown (1868, p. 46), Henry (1913, p. 73)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861	Nicholson (2006)
International War(s)	None recorded	

<sup>a</sup>Old plans indicate the location of the courthouse, which was used as the meeting house for the council.

<sup>b</sup>This is where the old meeting house was. The first big city hall was finished in 1910 and located in 202 Alabama street. At the spot of the old meeting house, the new city hall was erected in 1962.

<sup>c</sup>The fire destroyed 84 businesses and caused an estimated loss of 5.321 m US dollars.

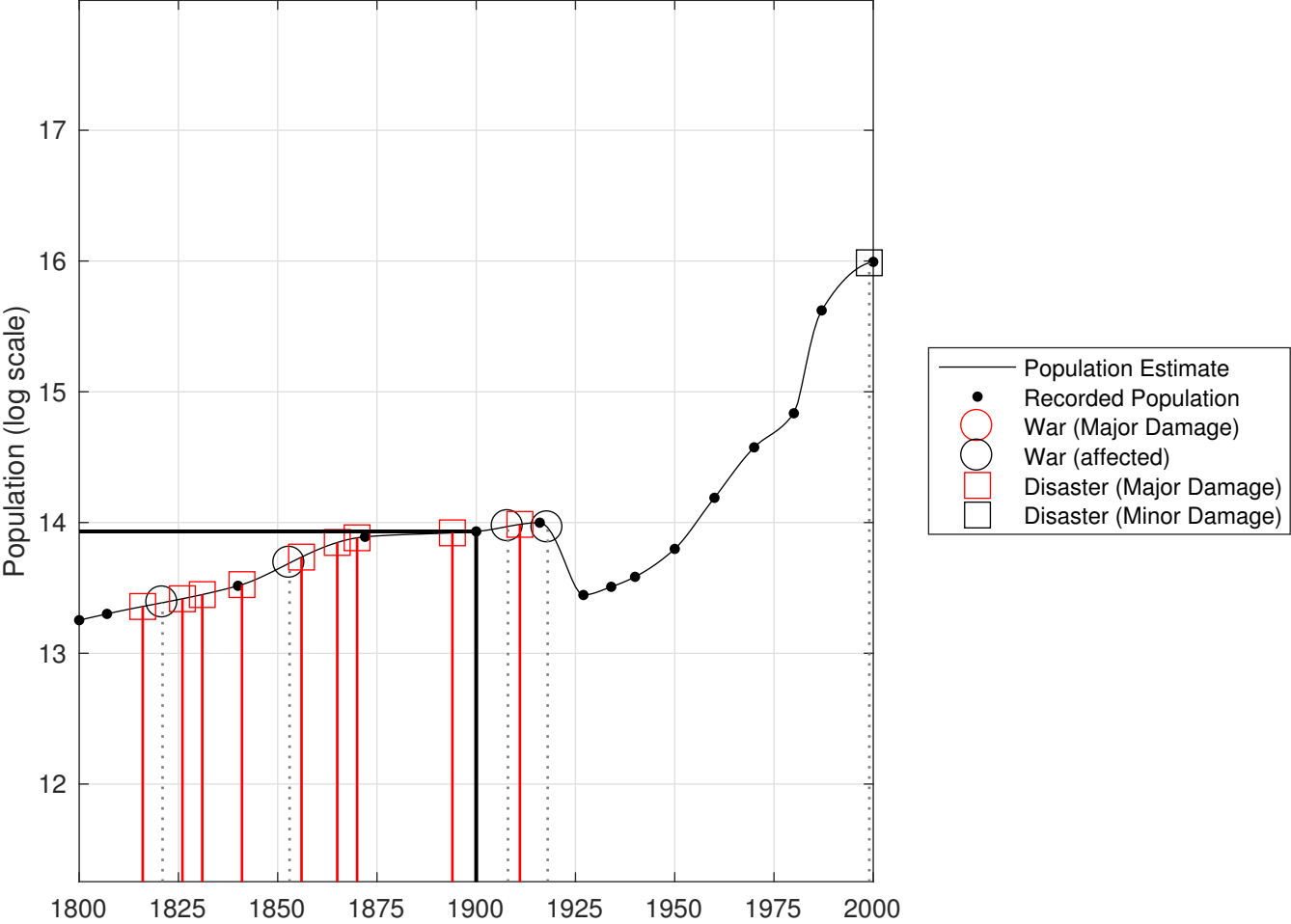
<sup>d</sup>It seems as if heavy destruction was caused at least in parts of the city. Even tax cuts were granted. Other floods occurred in 1828 and 1857, but their extent in terms of damage is unknown.

Table 90: Concentration Measures - Indianapolis

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	13.90
Cumulative density of employment-weighted PP distances at 750 m	%	34.96
Average distance between all prime locations	in kilometres	8.93
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.41
Weighted average distance from EWPPs to 1900 CH	in kilometres	12.21
Average from all prime locations to 1900 CH	in kilometres	5.71
Average distance from global prime locations to 1900 CH	in kilometres	0.17

A.43 Istanbul

Figure 52: Istanbul



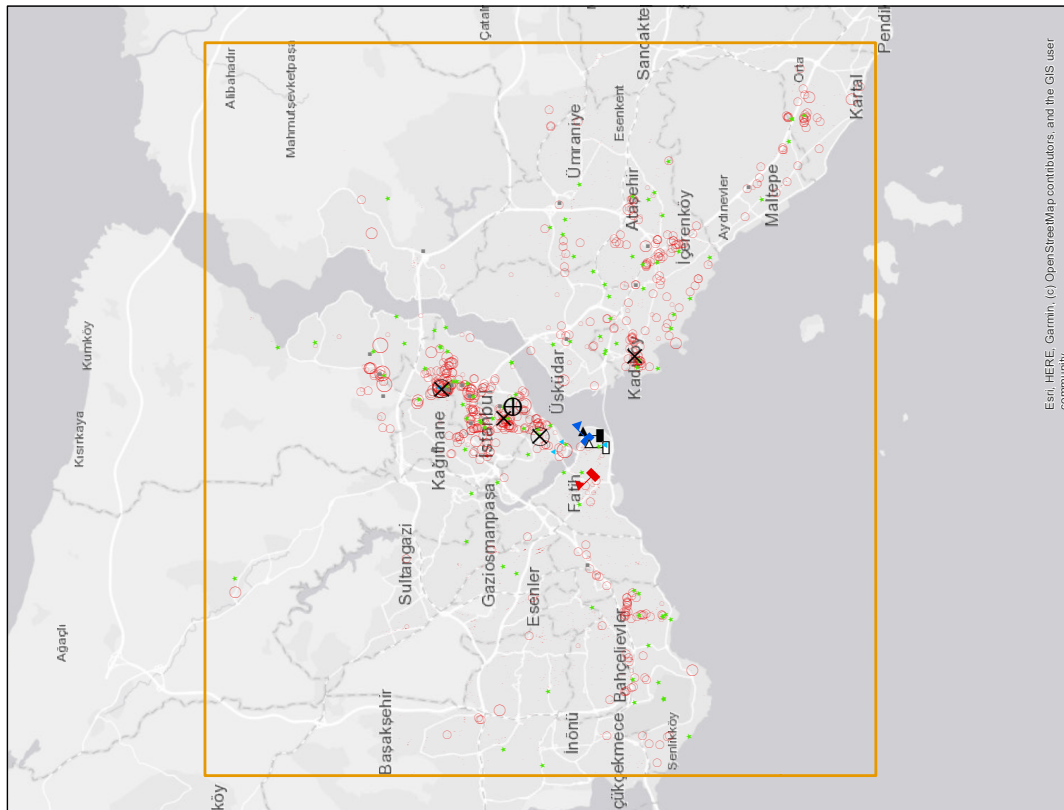
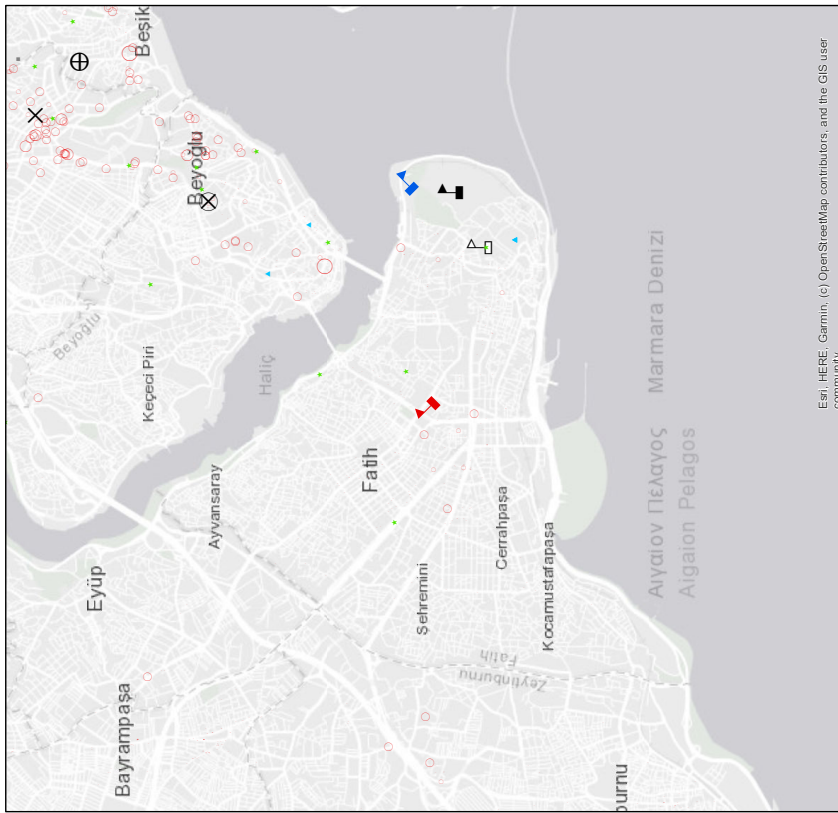


Table 91: Sources: Istanbul ( Turkey )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	-1000	Howard (2012, p. 70), Maxwell (2010, p. 19)
First Political Institution <sup>b</sup>	-657	Howard (2012, p. 70), Maxwell (2010, p. 19)
City Hall <sup>c</sup>	1900	Yazici and Kaya (2009, p. 715)
City Hall	2000	Fleet et al. (2006, p. 446)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900, 1950, 2000	Ehrlich (2015a)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1807, 1840, 1872, 1900, 1916, 1927, 1934, 1940, 1950, 1960, 1970, 1980, 1987, 2000	Chandler (1987, p. 240), Angel et al. (2012, p. 277), Mitchell (2007, p. 43)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>e</sup>	1989	Özgür (2011, 149)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	1841, 1894, 1999 <sup>f</sup>	Papadopoulos et al. (2000, p. 187), Musiano and Salini (2009, p. 238), Brauch et al. (2011, p. 650)
Fire(s)	1816 <sup>g</sup> , 1826 <sup>h</sup> , 1831, 1856, 1865, 1870 <sup>i</sup> , 1908 <sup>j</sup> , 1911 <sup>k</sup> , 1918 <sup>l</sup>	Shallus (1817, p. 114), Kansu (1997, p. 199), Duben and Behar (2002, p. 34), Gul (2009, p. 36), Çelik (1993, p. 53f), Brassey (2010, p. 66), Tegg (1854, p. 712)
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1821 <sup>m</sup> , 1908	Frary (2015, p. 98), Ehrlich (2015a)
International War(s)	1853 <sup>n</sup> , 1918 <sup>o</sup>	Encyclopaedia Britannica (2015f), Ehrlich (2015a)

<sup>a</sup>First proven settlement.

<sup>b</sup>657 BC seems a consensus for the greek founding of Byzantium (Howard, 2012, p. 70) and as a colony it would have city-like functions. I combine this information with the one from a travelguide (Maxwell, 2010, p. 19)

<sup>c</sup>They moved a lot, but in this street was the building of the governors.

<sup>d</sup>Ankara was made capital in 1923

<sup>e</sup>LRT opening in 1992 metro in 2000. There is the Tunel underground, opened in 1875, but it has only 2 stations and is only about 500 meters long (Schiffer, 1999, p. 175).

<sup>f</sup>Only affected a small part of the city (Avcilar neighborhood), but a high death toll. None of the fires and earthquakes except for the 1999 one, is mentioned specifically in Ehrlich (2015a).

<sup>g</sup>1200 houses and 3000 shops were destroyed.

<sup>h</sup>6000 houses burnt down.

<sup>i</sup>The fire destroyed thousand of houses and killed hundreds of people.

<sup>j</sup>The fire destroyed 2000-3000 houses. Between 1853 and 1906, a total of 299 fires occurred (Çelik, 1993, p. 53f), of which we only count the largest ones.

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<sup>k</sup>We count the Aksaray and Balat fire together.

<sup>l</sup>The fire destroyed 7000 houses.

<sup>m</sup>This was a revolt related to the Greek war of Independence. However, it is not clear how much damage was done to the city. A massacre occurred.

<sup>n</sup>Important military base in the Crimean War (1853-1856)

<sup>o</sup>Allied occupation.

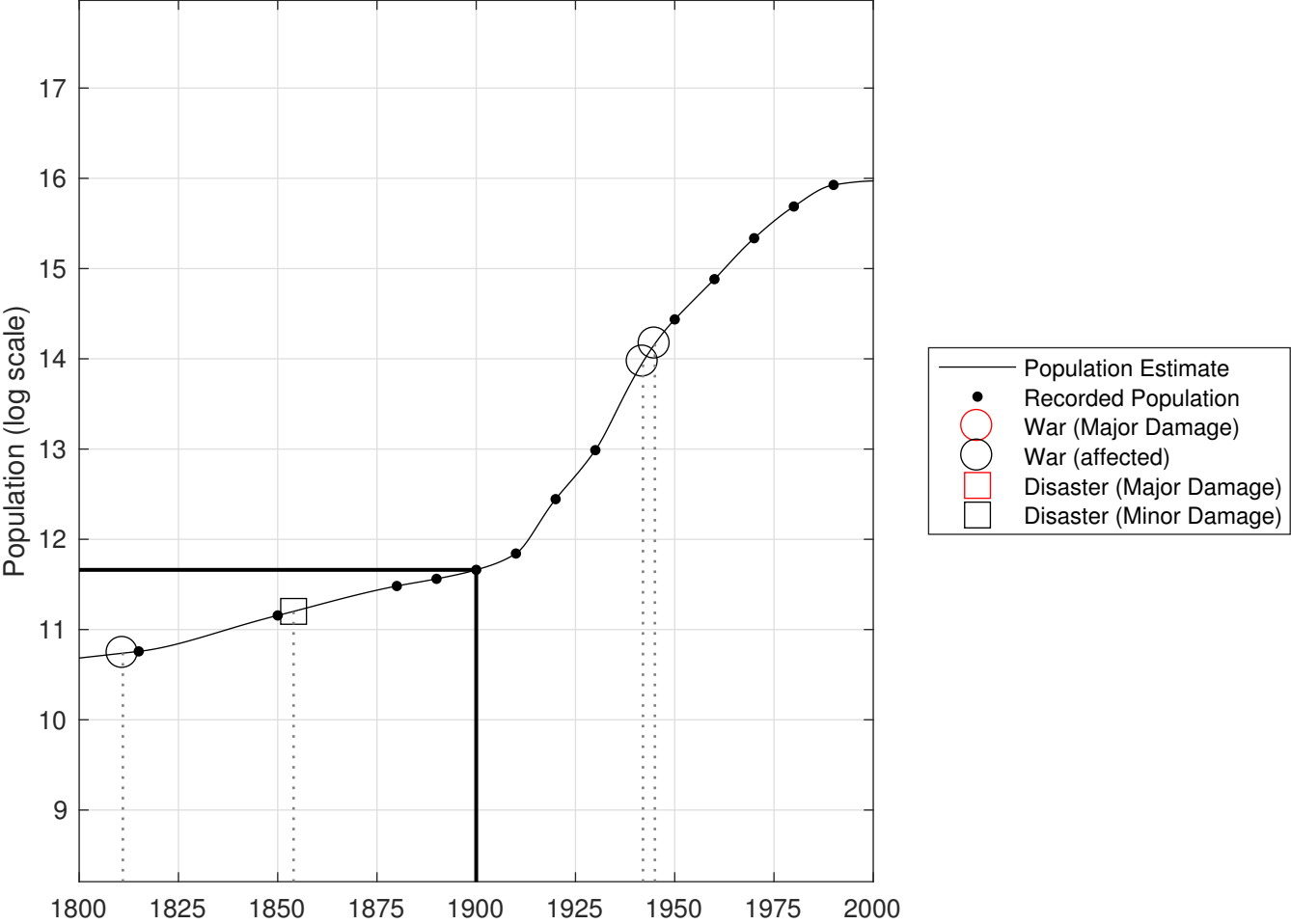


Table 92: Concentration Measures - Istanbul

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	11.27
Cumulative density of employment-weighted PP distances at 750 m	%	40.44
Average distance between all prime locations	in kilometres	4.43
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.04
Weighted average distance from EWPPs to 1900 CH	in kilometres	8.92
Average from all prime locations to 1900 CH	in kilometres	6.02
Average distance from global prime locations to 1900 CH	in kilometres	6.88

A.44 Jakarta

Figure 53: Jakarta



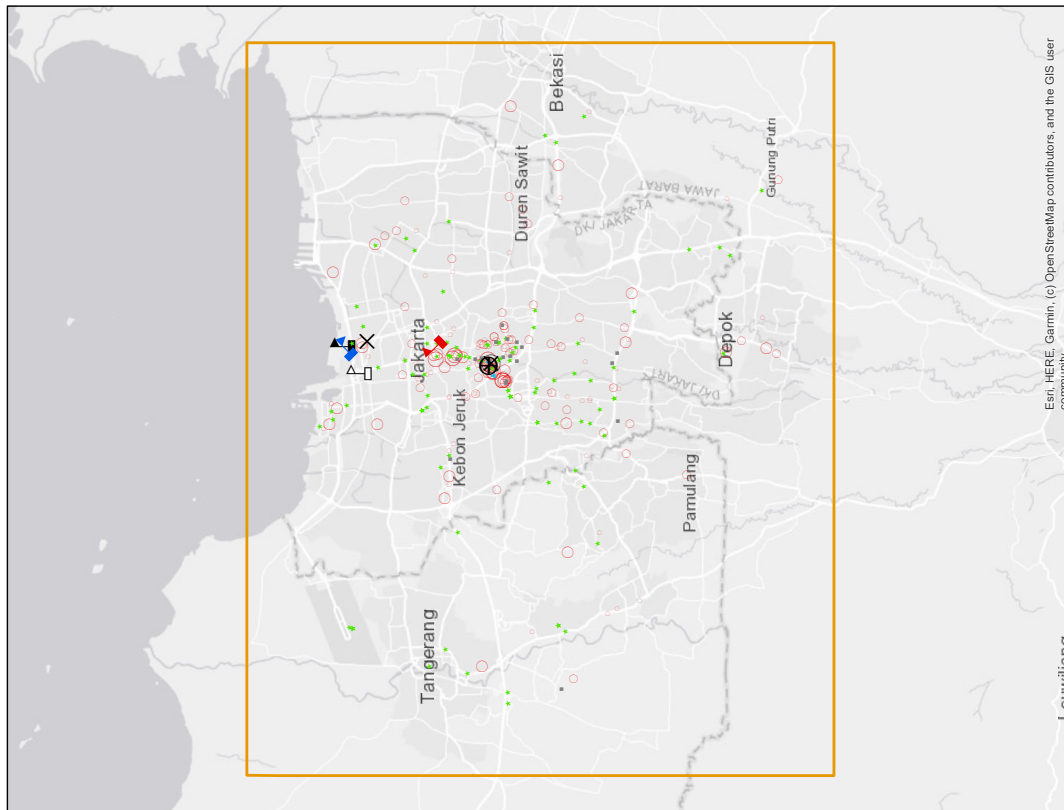
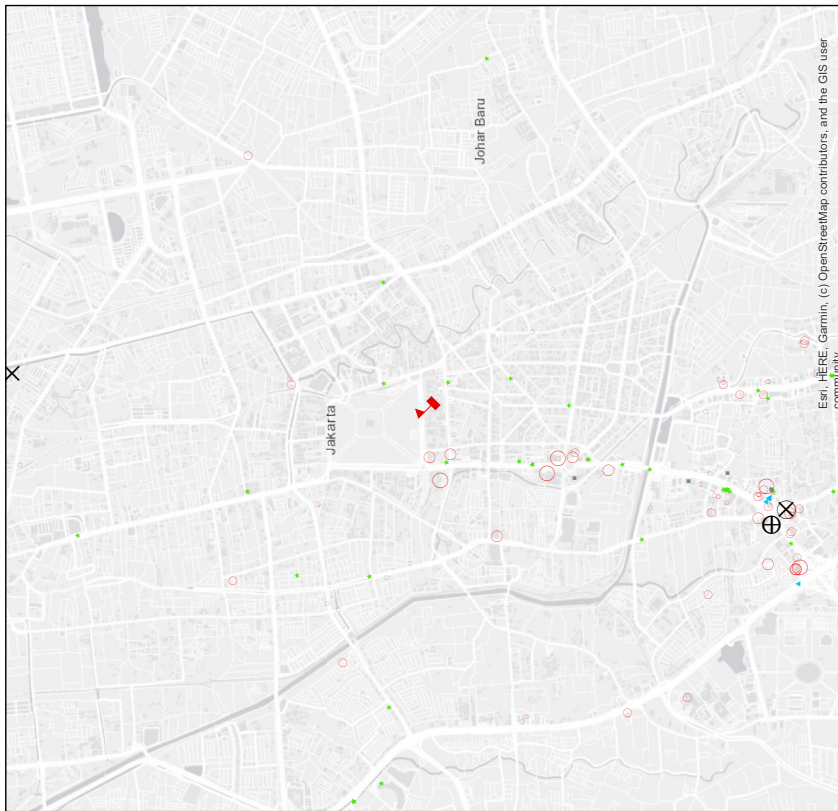


Table 93: Sources: Jakarta ( Indonesia )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	450	Waworoentoe (2013), Abeyasekere (1987, p. 4)
First Political Institution <sup>b</sup>	1527	Waworoentoe (2013), Abeyasekere (1987, p. 7-10)
City Hall <sup>c</sup>	1900	Abeyasekere (1987, p. 19)
City Hall	2000	Chattopadhyay and White (2014, p. 216)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900, 1950, 2000	Waworoentoe (2013)
<i>Population Data (1800-2000)</i>		
City Population	1643, 1815, 1850, 1880, 1890, 1900, 1910, 1920, 1930, 1950, 1960, 1970, 1980, 1990, 2001	Cybriwsky and Ford (2001, p. 202), Abeyasekere (1987, p. 52), Abeyasekere (1987, p. 81), Abeyasekere (1987)
Metro Population <sup>e</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>f</sup>	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1854 <sup>g</sup>	Abeyasekere (1987, p. 71)
Hurricane(s)	None recorded	
Flooding(s)	2007	Brinkman and Hartman (2009)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1945	Abeyasekere (1987, p. 56)
International War(s)	1811, 1942 <sup>h</sup>	Abeyasekere (1987, p. 134), Abeyasekere (1987, p. 57)

<sup>a</sup>Early settlement at the mouth of the Ciliwung as early as in the 5th century AD. According to Abeyasekere (1987, p. 4), it dates back to pre-historic time but we take the 5th century (evidence for the existence of a Hindu-Javanese civilisation) as the first settlement.

<sup>b</sup>From the twelfth century until 1527, the town and port Sunda Kalapa was governed from another city (Bacon and Collins, 2010, p. 23). In 1527, the Sultanete of Banten conquered the city and established a residence near the townsquare (which the Dutch found a century later, see Abeyasekere (1987, p. 6) ). We take this residence as the first town hall as it was a governing body of the city (see for a map Abeyasekere, 1987, p. 10).

<sup>c</sup>The first elections took place in 1908 and before it Jakarta was governed by the Dutch, apparently from their town hall built in 1710 (Abeyasekere, 1987, p. 118).

<sup>d</sup>Colonial capital until 1945, thereafter independent capital.

<sup>e</sup>Footnote from United Nations Population Division (2014): Data refer to the functional urban area, that is, contiguous areas which are consistently urban in character as indicated by levels of population density, economic functions and facilities. Jakarta covers five municipalities (kotamadya): Jakarta Selatan, Jakarta Timur, Jakarta Pusat, Jakarta Barat, and Jakarta Utara. Data for 1990 does not refer to the functional urban area. Appropriate estimates were derived by using the ratio of the population in the functional urban area to that of the population in the relevant municipalities as derived from the 1980 census.

<sup>f</sup>There has been an innercity commuter railway since 1923, which does not qualify as an MRT according to Gonzalez-Navarro and Turner (2016).

<sup>g</sup>No destruction of the business district but of a squalid area. Frequent fires, but there are not recorded as single events (Abeyasekere, 1987).

<sup>h</sup>Occupation of Java, Jakarta was a important for the Dutch troops, but apparently no big damage was done to the city.

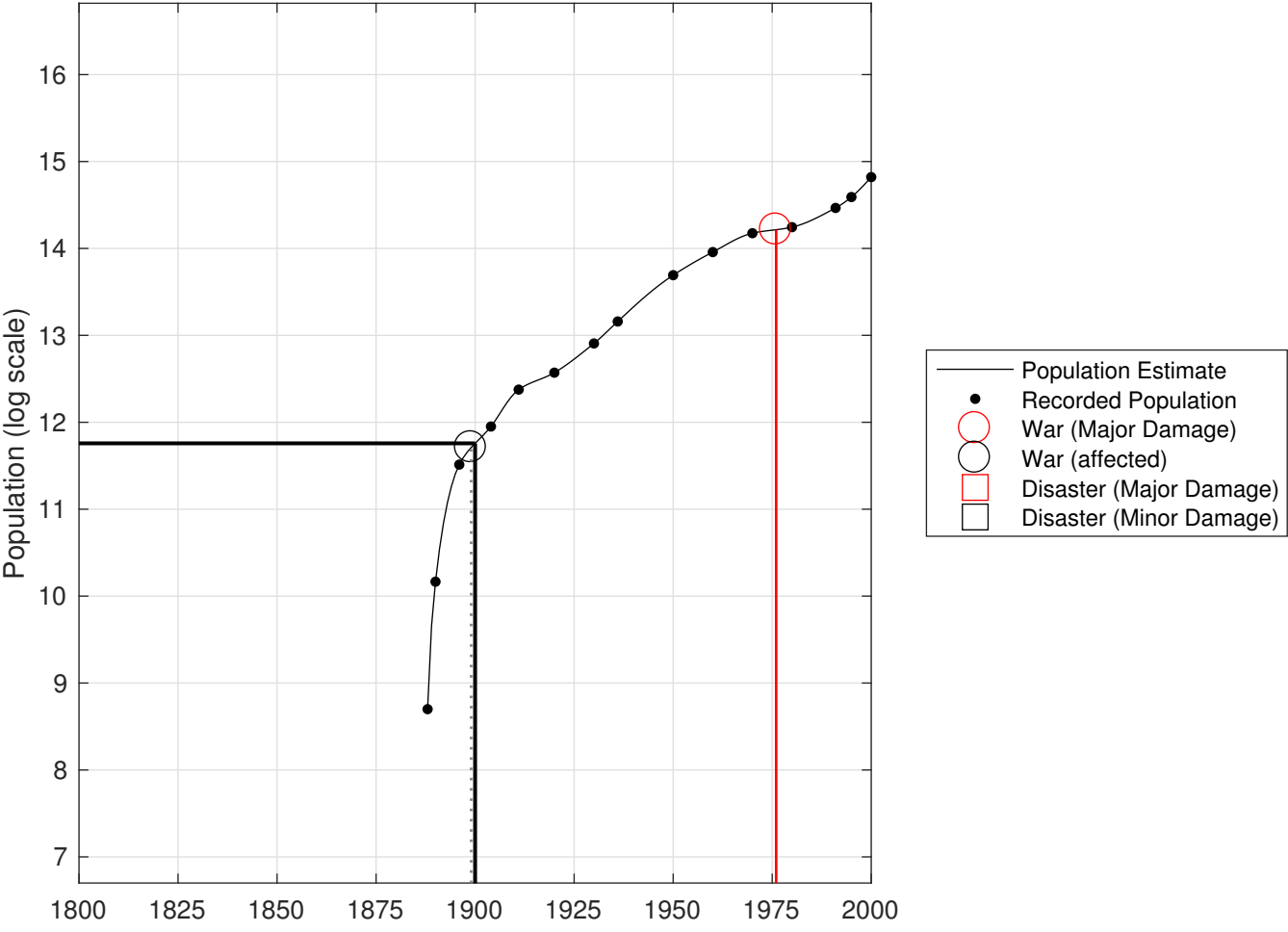


Table 94: Concentration Measures - Jakarta

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	9.24
Cumulative density of employment-weighted PP distances at 750 m	%	20.38
Average distance between all prime locations	in kilometres	4.29
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.18
Weighted average distance from EWPPs to 1900 CH	in kilometres	11.08
Average from all prime locations to 1900 CH	in kilometres	8.25
Average distance from global prime locations to 1900 CH	in kilometres	9.01

A.45 Johannesburg

Figure 54: Johannesburg



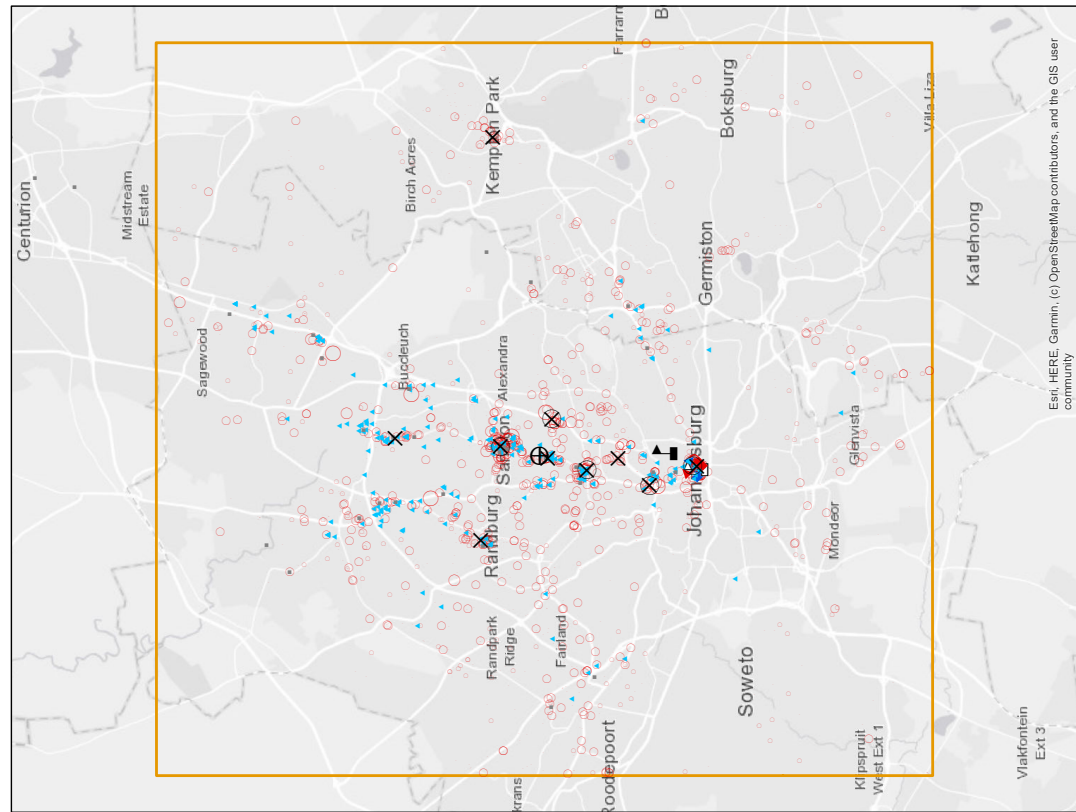
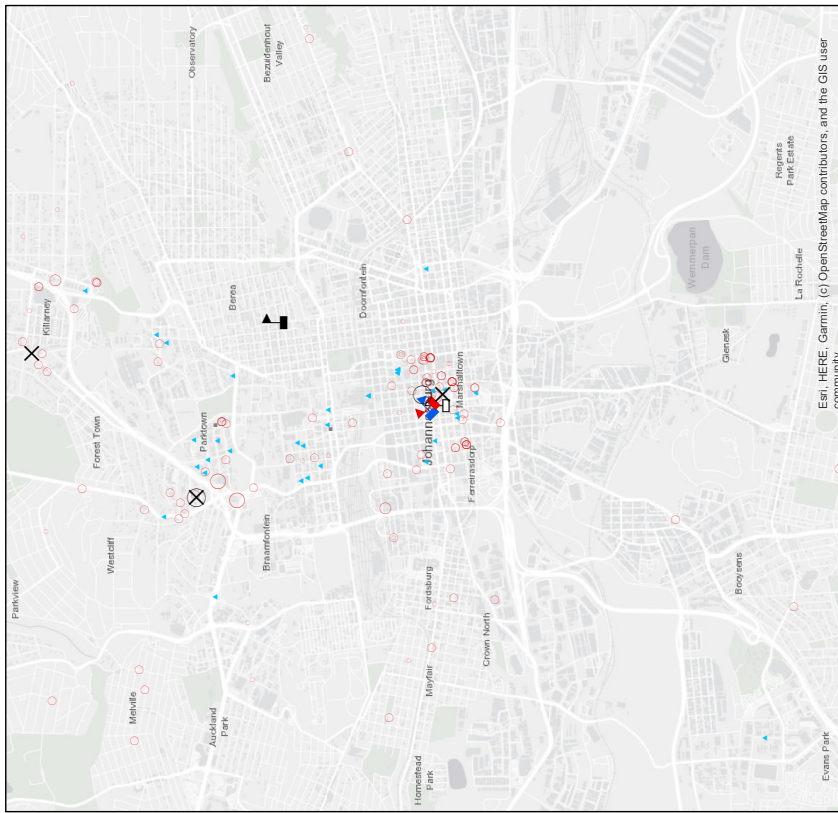




Table 95: Sources: Johannesburg ( South Africa )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1865	Barry and Law (1985, p. 5), Leyds (1964, p. 5)
First Political Institution <sup>b</sup>	1886	Barry and Law (1985, p. 22)
City Hall <sup>c</sup>	1900	Barry and Law (1985, p. 146)
City Hall	2000	Gauteng Tourism Authority (2015)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900, 1950, 2000	South African History (2014a)
<i>Population Data (1800-2000)</i>		
City Population	1888, 1890, 1896, 1904, 1911, 1920, 1930, 1936, 1950, 1960, 1970, 1980, 1991, 1995, 2000	Mitchell (2007, p. 41), Shillington (2013, p. 717), United Nations (2012)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1976 <sup>e</sup>	Wines (2006), Ndlovu (2006, p. 346)
International War(s)	1899 <sup>f</sup>	Encyclopaedia Britannica (2014i)

<sup>a</sup>Farm Randjeslaage was there in the 1860s, but left afterwards. It was the centroid of a number of farms.

<sup>b</sup>City founded and “miners commission had quasi government meetings.”

<sup>c</sup>Rented out by the city council. Contract was not renewed in 1902.

<sup>d</sup>Not yet established.

<sup>e</sup>Apartheid riots: Looting of buildings and a considerable death toll.

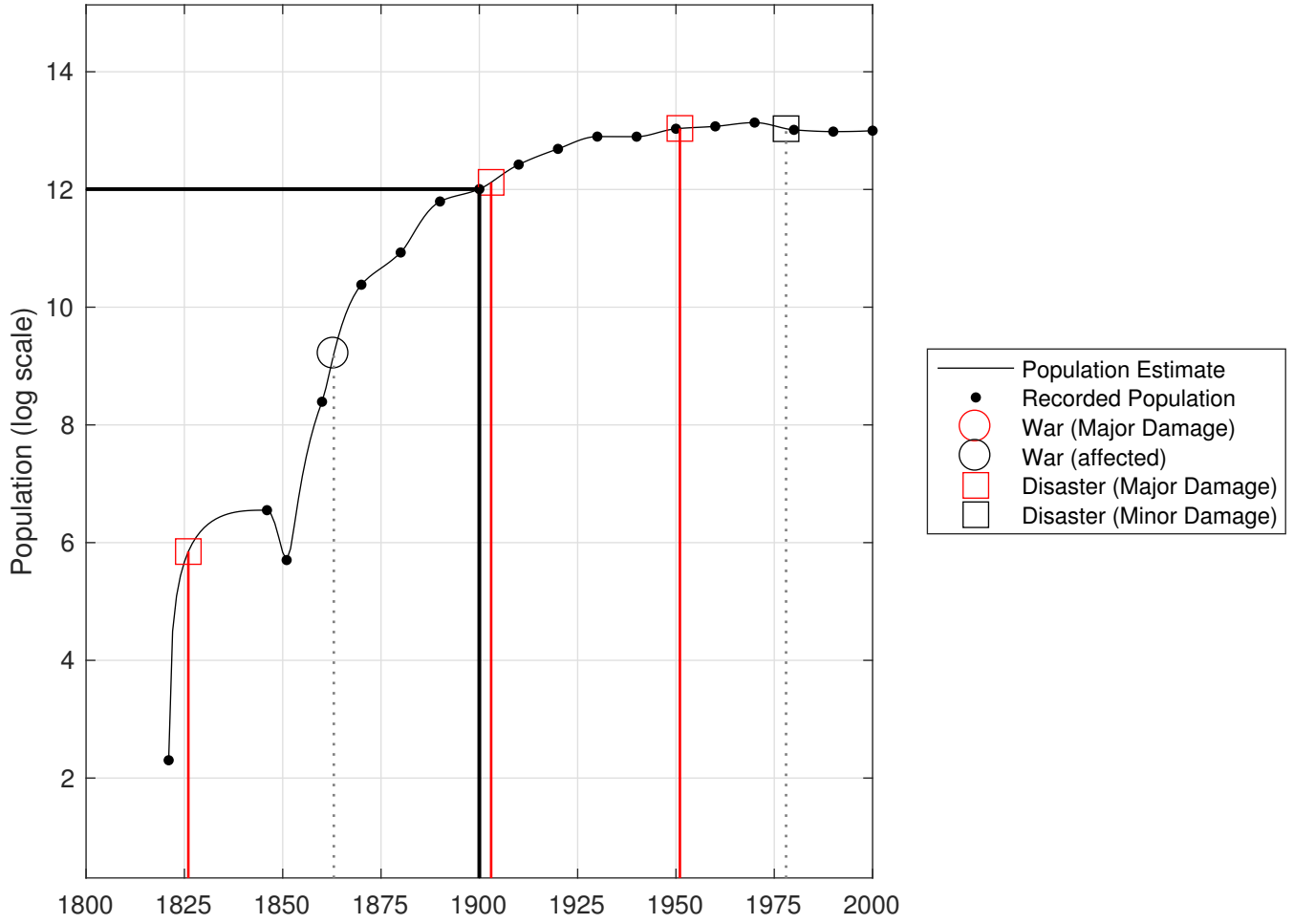
<sup>f</sup>Second Boer War, but no major destruction of the city.

Table 96: Concentration Measures - Johannesburg

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	13.76
Cumulative density of employment-weighted PP distances at 750 m	%	71.86
Average distance between all prime locations	in kilometres	8.64
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.00
Weighted average distance from EWPPs to 1900 CH	in kilometres	12.40
Average from all prime locations to 1900 CH	in kilometres	8.22
Average distance from global prime locations to 1900 CH	in kilometres	6.23

# A.46 Kansas City

Figure 55: Kansas City



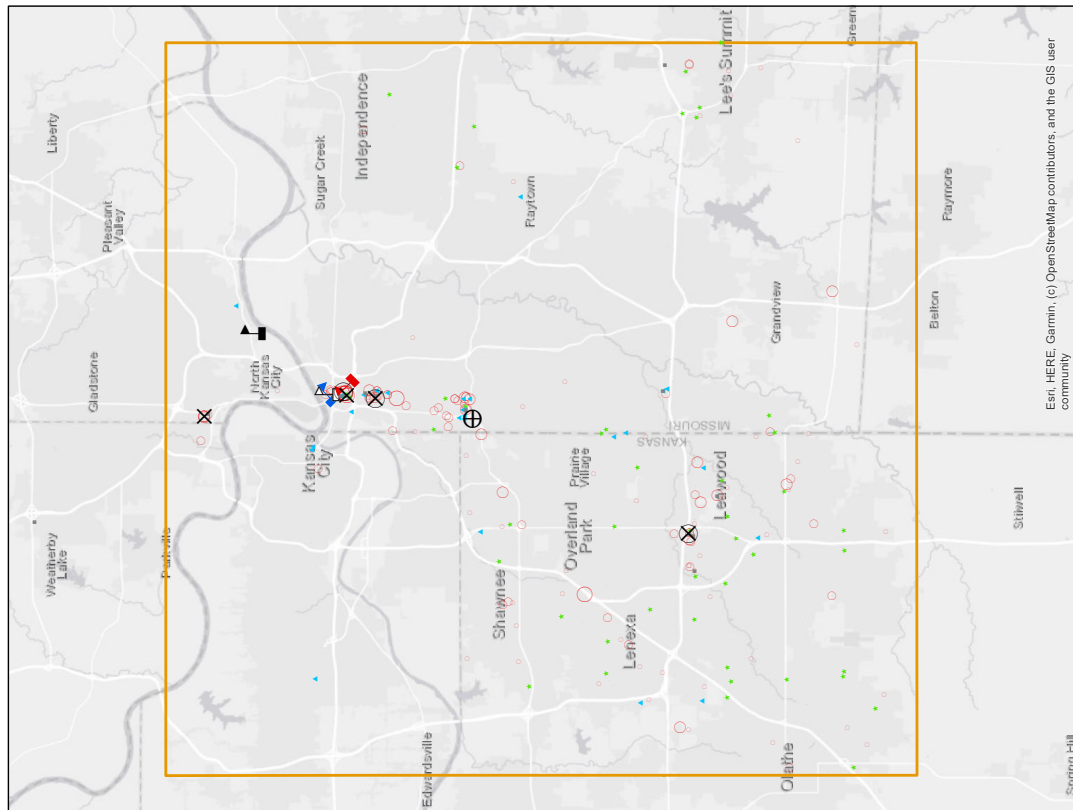
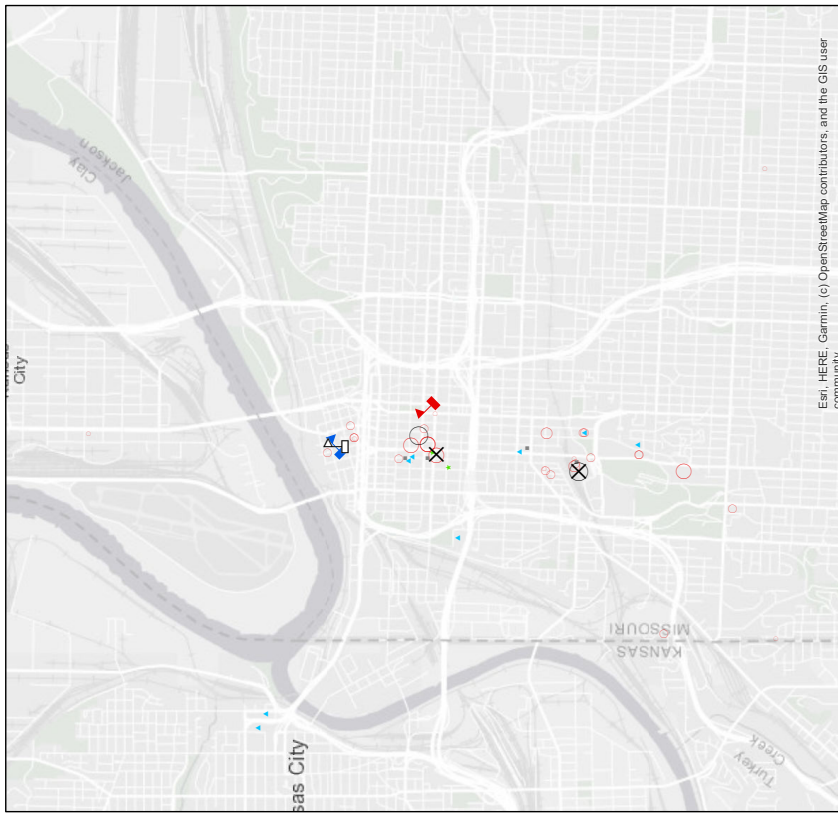


Table 97: Sources: Kansas City ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1821	Strausbaugh (2015)
First Political Institution <sup>a</sup>	1857	Little and Olinsky (2013, p. 32), Kansas City Public Library (2015)
City Hall	1900	Kansas City Public Library (2015)
City Hall	2000	Kansas City Public Library (2015)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>b</sup> , 1900, 1950, 2000	Smith and Kraig (2013, p. 407)
<i>Population Data (1800-2000)</i>		
City Population	1821, 1846, 1851, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Spalding (1858, p. 17), Spalding (1858, p. 19), Gibson and Jung (2005a, p. 71), Encyclopaedia Britannica (2015m), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1978	Long-Middleton and Stinemetz (2013)
Hurricane(s)	None recorded	
Flooding(s)	1826 <sup>c</sup> , 1903, 1951	Kansas Water Science Center (2001), City of Kansas City (2015)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1863 <sup>d</sup>	City of Kansas City (2015)
International War(s)	None recorded	

<sup>a</sup>This seems to be the first real city hall, although before 1857 city officials shared a building with the police at the same location. Kansas City was incorporated in 1848.

<sup>b</sup>Incorporated in 1848.

<sup>c</sup>Led to the relocation of the early settlement.

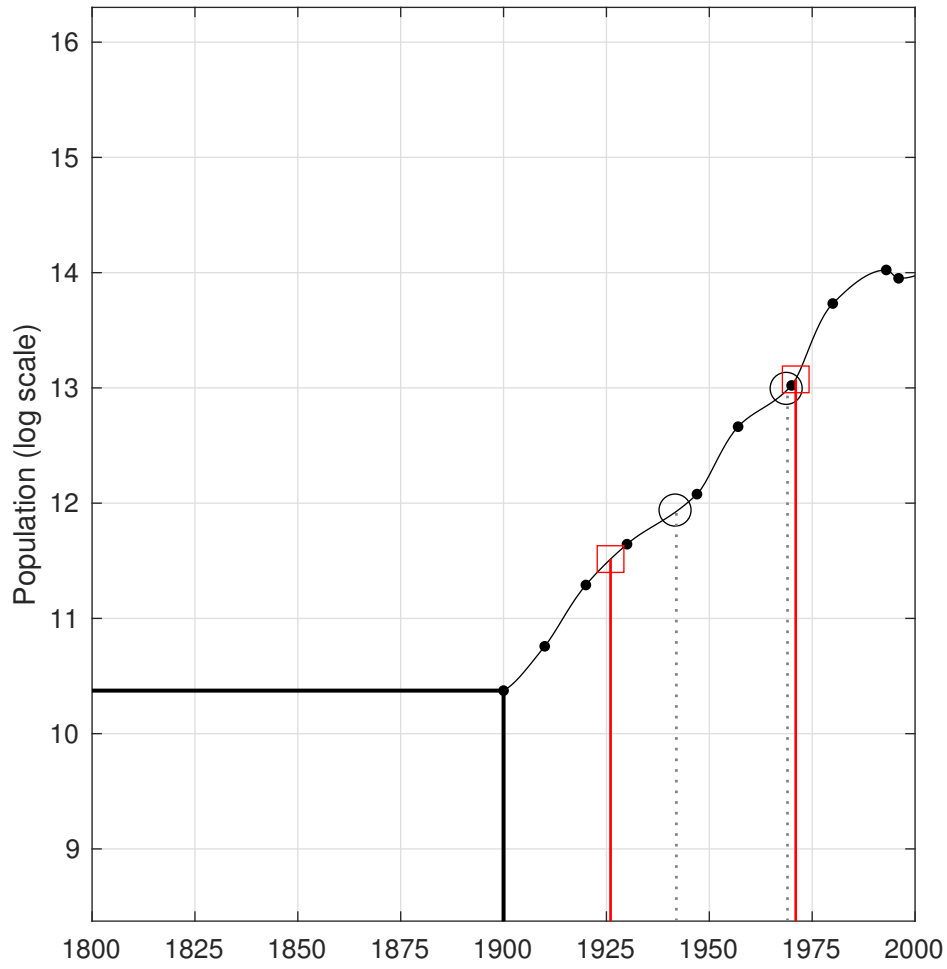
<sup>d</sup>Little or no destruction of the city, but it served as an important military base and was very close to the frontline.

Table 98: Concentration Measures - Kansas City

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	15.09
Cumulative density of employment-weighted PP distances at 750 m	%	41.22
Average distance between all prime locations	in kilometres	10.54
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.20
Weighted average distance from EWPPs to 1900 CH	in kilometres	13.81
Average from all prime locations to 1900 CH	in kilometres	5.88
Average distance from global prime locations to 1900 CH	in kilometres	5.66

## A.47 Kuala Lumpur

Figure 56: Kuala Lumpur



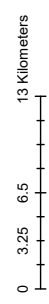
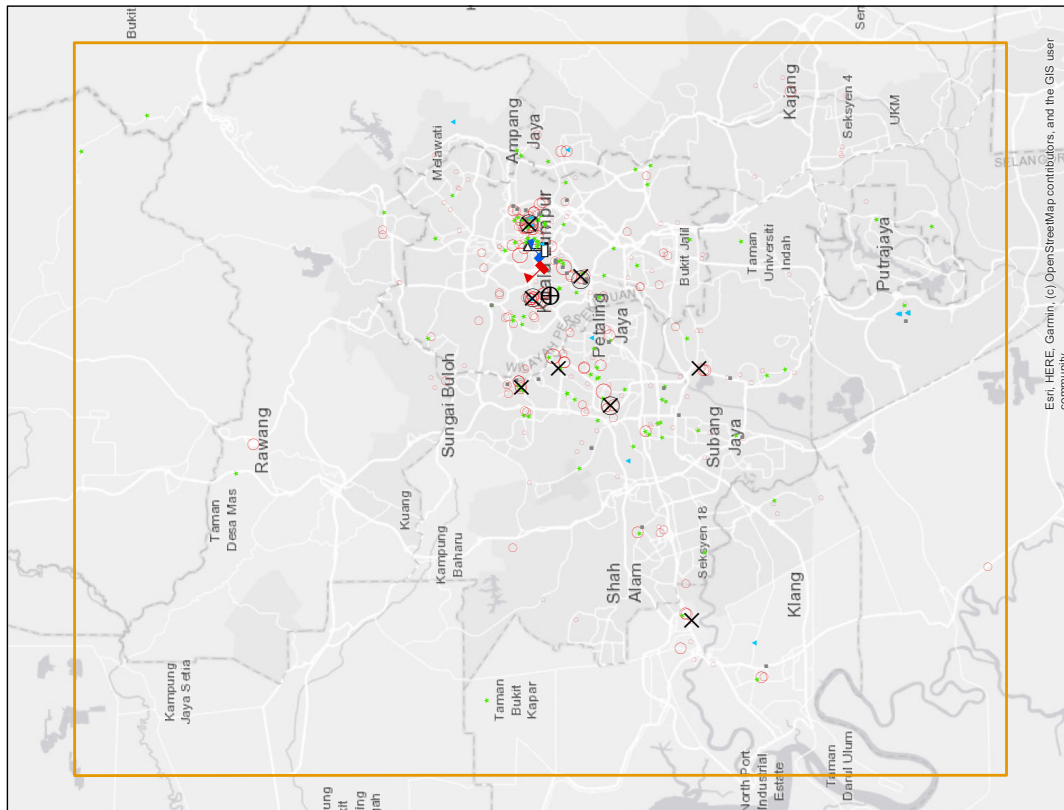
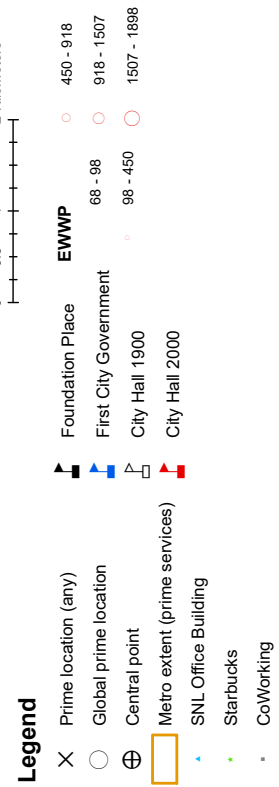
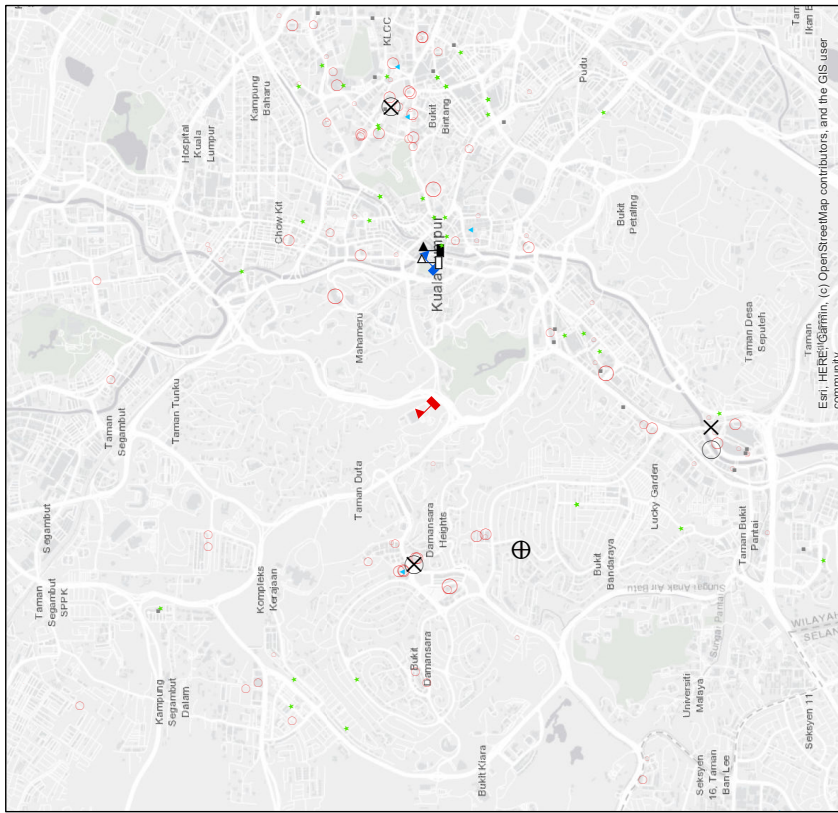




Table 99: Sources: Kuala Lumpur ( Malaysia )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1860	Jackson (2013, p.130)
First Political Institution <sup>b</sup>	1894	Malayian Tourist Authority (2014)
City Hall	1900	Malayian Tourist Authority (2014)
City Hall	2000	Encyclopaedia Britannica (2014c)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>c</sup> , 1900 <sup>d</sup> , 1950, 2000	King (2008, p.XXIII), King (2008, p.XXI), Encyclopaedia Britannica (2014c)
<i>Population Data (1800-2000)</i>		
City Population	1900, 1910, 1920, 1930, 1947, 1957, 1970, 1980, 1993, 1996, 2010	Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>e</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1996	Lye et al. (2009, 106)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1881 <sup>f</sup>	Yap (2013, p.405)
Hurricane(s)	None recorded	
Flooding(s)	1926, 1971 <sup>g</sup>	Abdullah (2006, p. 3), Merriman et al. (1993, p. 195)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1969	King (2008, p.XXIV)
International War(s)	1872, 1942 <sup>h</sup>	Fatt (2011, p. 25), Gullick (1994, p.1)

<sup>a</sup>Chinese settlers built a town the confluence of Kelang and Gombak rivers. There might have been scattered settlements before, but this usually considered as they founding date.

<sup>b</sup>This building hosted the British administration and various government bodies.

<sup>c</sup>Not yet established.

<sup>d</sup>It was colonial capital and later on capital of the independent country.

<sup>e</sup>Footnote from United Nations Population Division (2014): Refers to the Greater Kuala Lumpur. Kuala Lumpur is the capital and Putrajaya is the administrative capital.

<sup>f</sup>Destroyed the entire city together with a flood that year. However, as it is not mentioned in Encyclopaedia Britannica (2014c), we do not classify it as heavy.

<sup>g</sup>Kuala Lumpur has frequently been flooded, but those two floods are considered the worst, having caused widespread destruction and death.

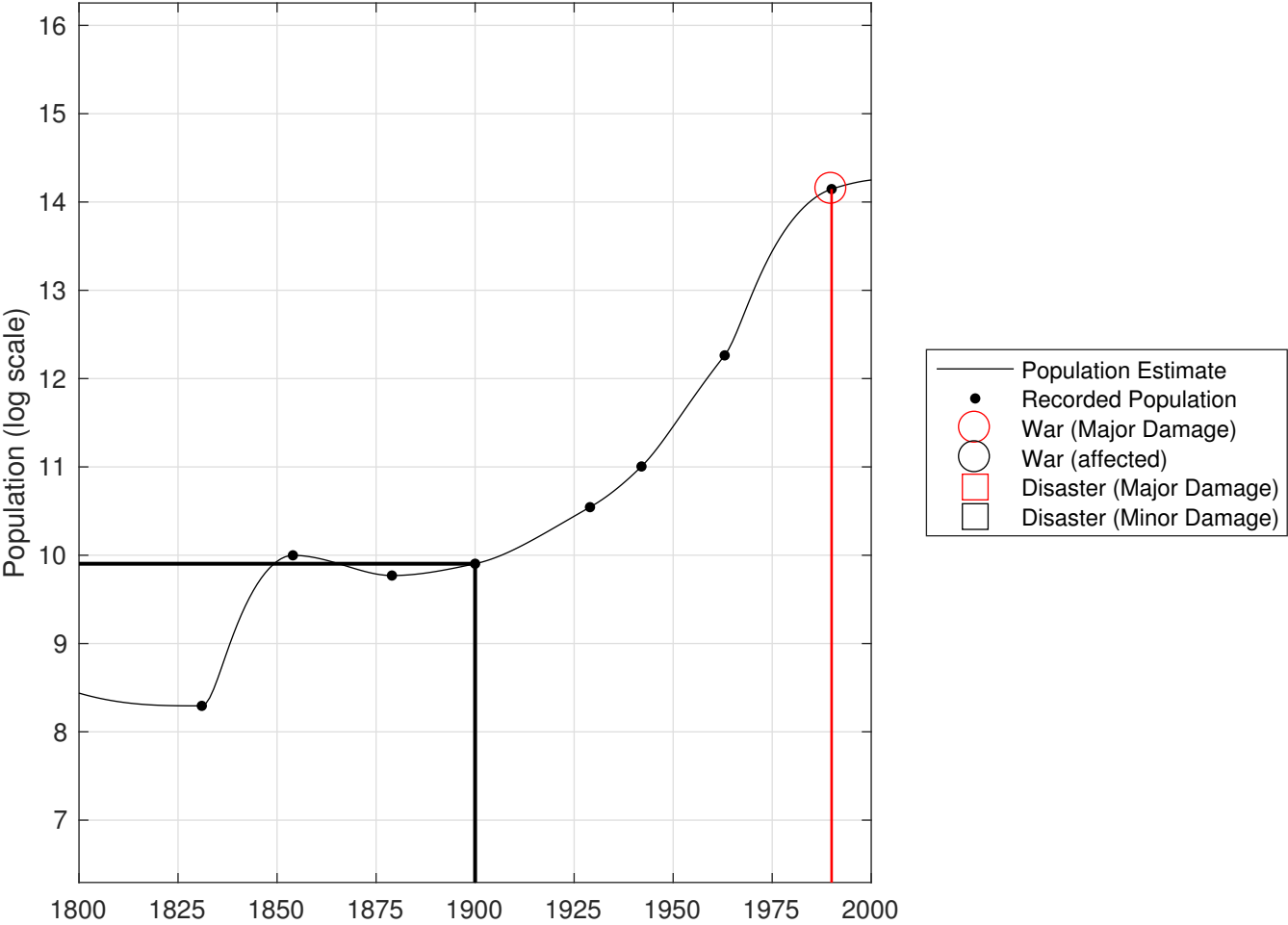
<sup>h</sup>Japanese occupation, but no references to significant physical damage could be located.

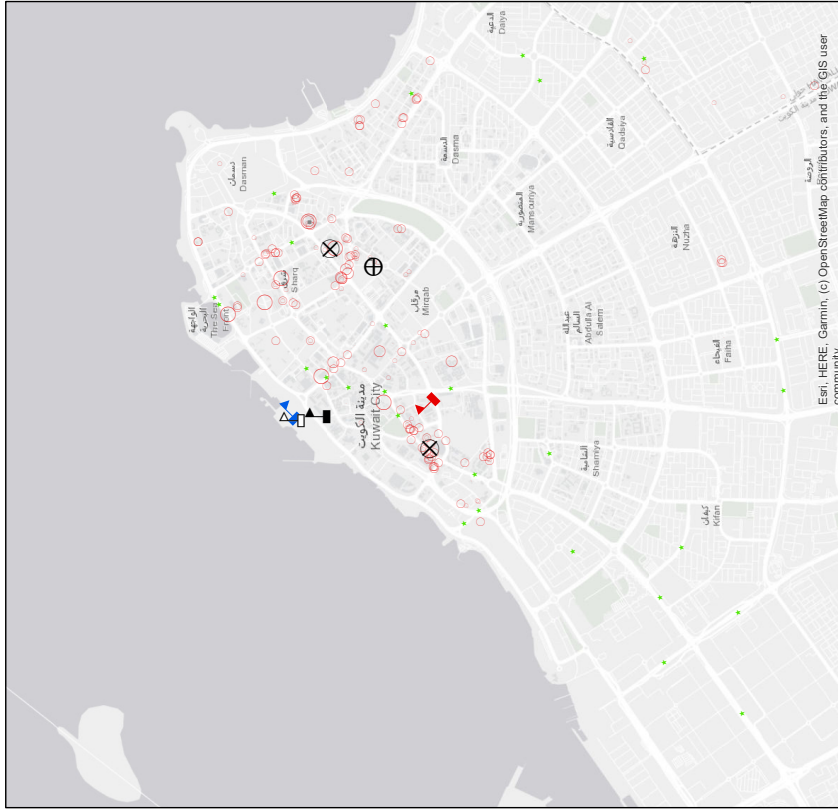
Table 100: Concentration Measures - Kuala Lumpur

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	11.80
Cumulative density of employment-weighted PP distances at 750 m	%	36.63
Average distance between all prime locations	in kilometres	9.97
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.15
Weighted average distance from EWPPs to 1900 CH	in kilometres	8.62
Average from all prime locations to 1900 CH	in kilometres	6.03
Average distance from global prime locations to 1900 CH	in kilometres	3.21

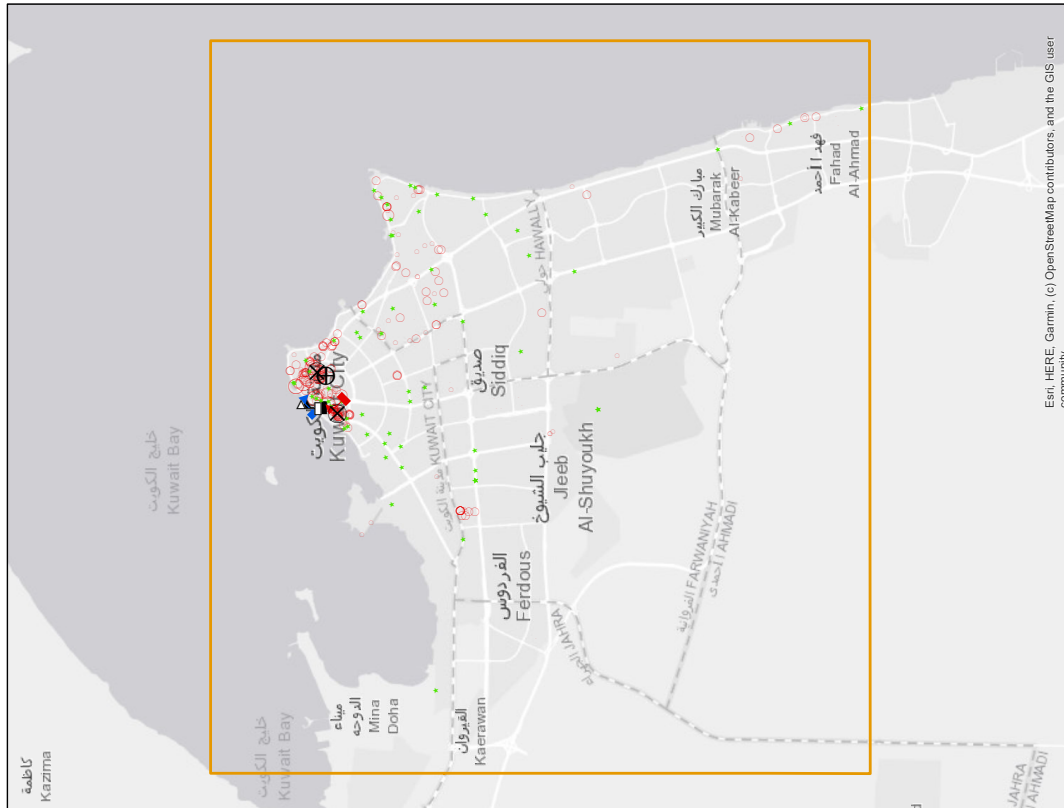
A.48 Kuwait City

Figure 57: Kuwait City





- Legend**
- ✕ Prime location (any)
  - Global prime location
  - ⊕ Central point
  - Metro extent (prime services)
  - ▲ SNL Office Building
  - ★ Starbucks
  - CoWorking
  - ▲ Foundation Place
  - ▲ First City Government
  - ▲ City Hall 1900
  - ▲ City Hall 2000
  - EWWP 450 - 918
  - 918 - 1507
  - 68 - 98
  - 98 - 450
  - 1507 - 1898



- Prime location (any)
- Global prime location
- Central point
- Metro extent (prime services)
- ▲ SNL Office Building
- ★ Starbucks
- CoWorking
- ▲ Foundation Place
- ▲ First City Government
- ▲ City Hall 1900
- ▲ City Hall 2000

Table 101: Sources: Kuwait City ( Kuwait )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1613	Al-Jassar (2009b, p.102)
First Political Institution <sup>b</sup>	1811	Al-Jassar (2009b, p.106)
City Hall <sup>c</sup>	1900	Gerhard Heck (2011, p.217)
City Hall <sup>d</sup>	2000	Sager et al. (2014, p. 35), Kuwait City Council (2015)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900 <sup>e</sup> , 1950, 2000	Al-Jassar (2009b, p.66), Al-Jassar (2009b, p.75), Al-Jassar (2009b, p.91)
<i>Population Data (1800-2000)</i>		
City Population	1765, 1831, 1854, 1879, 1900, 1929, 1942, 1963, 1990, 2001	Angel et al. (2012, p. 285), Al-Jassar (2009a, p. 73), Abdo (1989, p. 77)
Metro Population <sup>f</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1990 <sup>g</sup>	DiPiazza (2006, p.16),Archer (2013)

<sup>a</sup>Earlier military outpost built by the Bani Khalid tribe.

<sup>b</sup>Powerful families ruled the city (Arabic tradition of sheik system).

<sup>c</sup>No municipal government existed until the 1930s, so we take the center of power - the Seif palace.

<sup>d</sup>Kuwait has an elected municipal council since 1938 and this building was erected in 1960 (Sager et al., 2014, p. 32)

<sup>e</sup>From 1899 until 1961 under British Protectorate.

<sup>f</sup>Footnote from United Nations Population Division (2014): Data for 1985 and 1995 refer to the Governorates of Capital, Hawalli and Farwaniya. The number and names of governorates have changed over time as well as the limits of the urban agglomeration.

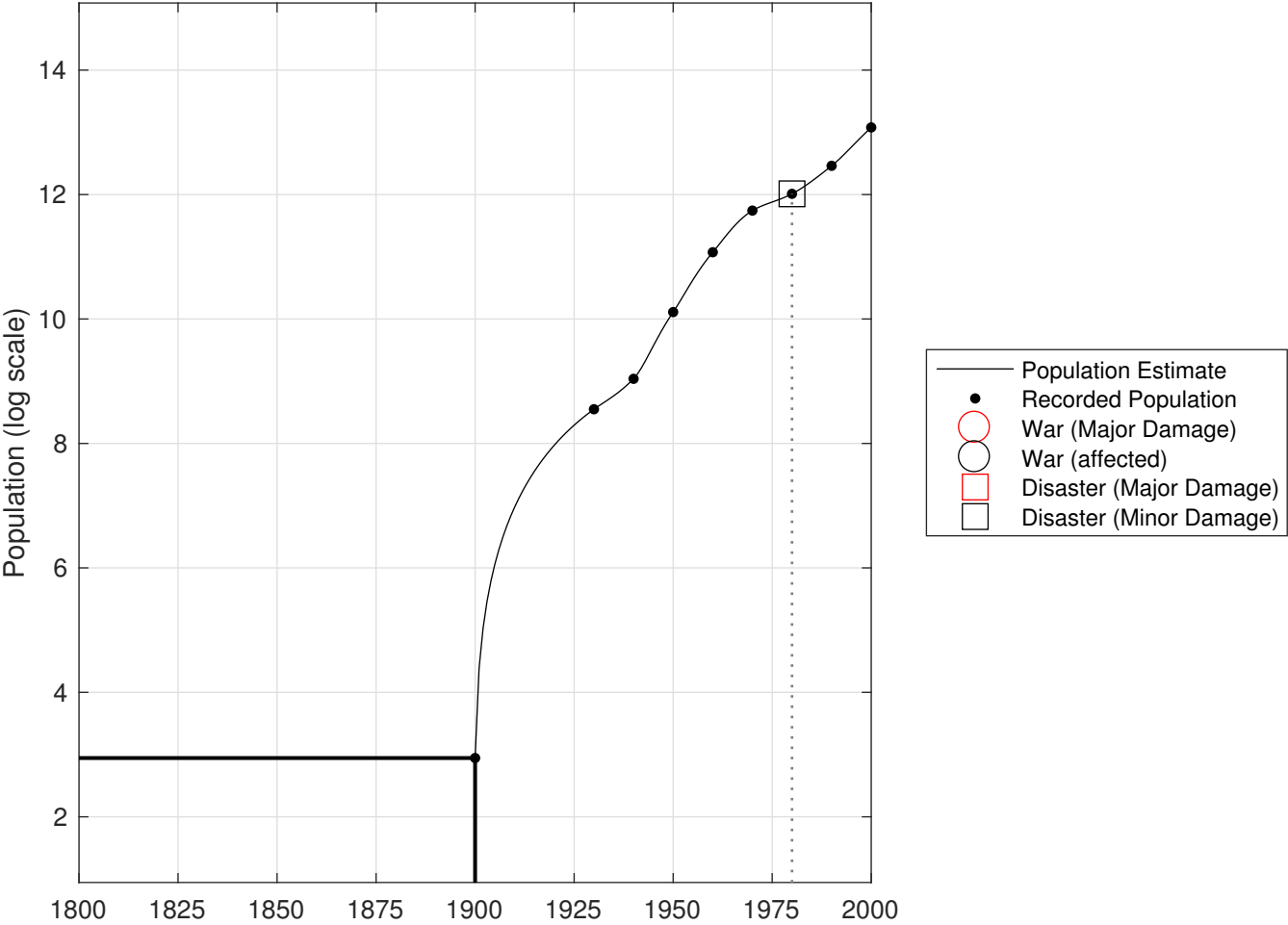
<sup>g</sup>Kuwait city was taken by Iraqi forces. Airstrikes occurred. We find no other major disasters affecting Kuwait city. As the extent of the damage in terms of percentages of destroyed buildings is unknown, this event is only coded as "major," although it is mentioned in Encyclopaedia Britannica (2014b).

Table 102: Concentration Measures - Kuwait City

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	6.28
Cumulative density of employment-weighted PP distances at 750 m	%	8.75
Average distance between all prime locations	in kilometres	1.22
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.50
Weighted average distance from EWPPs to 1900 CH	in kilometres	4.77
Average from all prime locations to 1900 CH	in kilometres	1.76
Average distance from global prime locations to 1900 CH	in kilometres	1.76

A.49 Las Vegas

Figure 58: Las Vegas



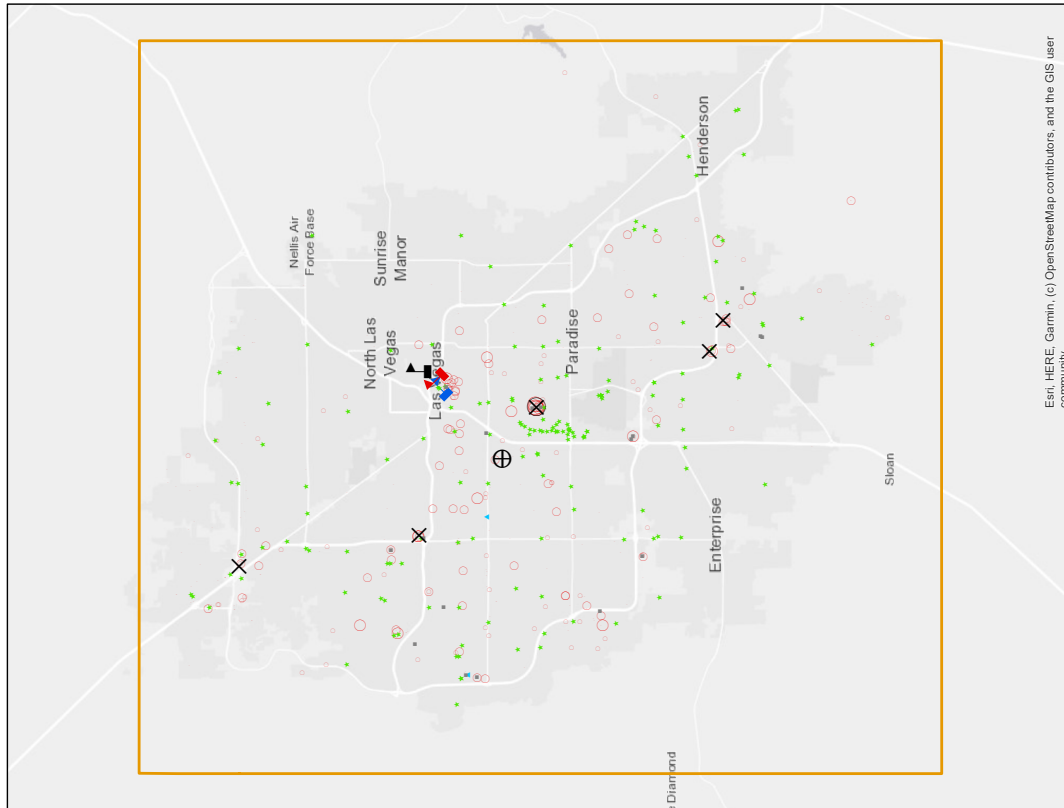
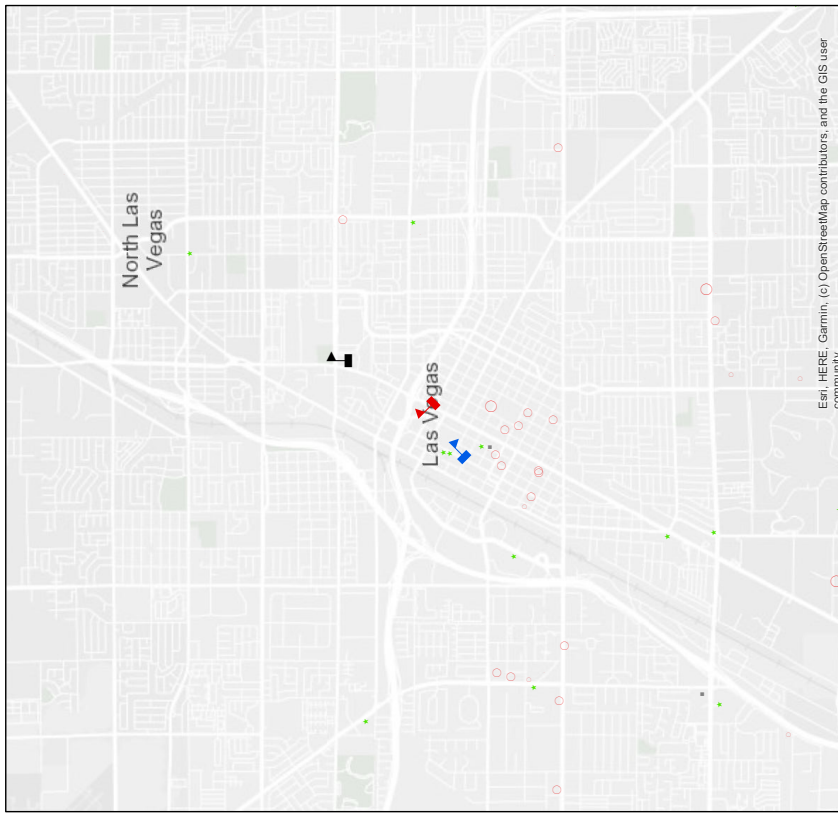




Table 103: Sources: Las Vegas ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1855	City of Las Vegas (2013)
First Political Institution <sup>b</sup>	1909	Clark County (2013), City of Las Vegas (2013)
City Hall <sup>c</sup>	1900	City of Las Vegas (2013)
City Hall	2000	Spillman (2012)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900 <sup>d</sup> , 1950, 2000	City of Las Vegas (2013)
<i>Population Data (1800-2000)</i>		
City Population	1900, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Burbank (2006, p. 26), Gibson and Jung (2005a, p. 75), United States Census Bureau (2015)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>e</sup>	1995	Land and Land (2004, 210)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	Las Vegas Sun (2008)
Fire(s)	1980 <sup>f</sup>	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>This was a Mormon Fort, which constitutes the first permanent settlement.

<sup>b</sup>First courthouse, where the county government and later city council met after the incorporation of 1911.

<sup>c</sup>Not yet a city and only a population of 19 inhabitants.

<sup>d</sup>Became seat of Clark county in 1909.

<sup>e</sup>This was a free line in the beginning and there were some interruptions. A proper revenue service only started in 2004 (Ainlay and Gabaldon, 2003, p. 151).

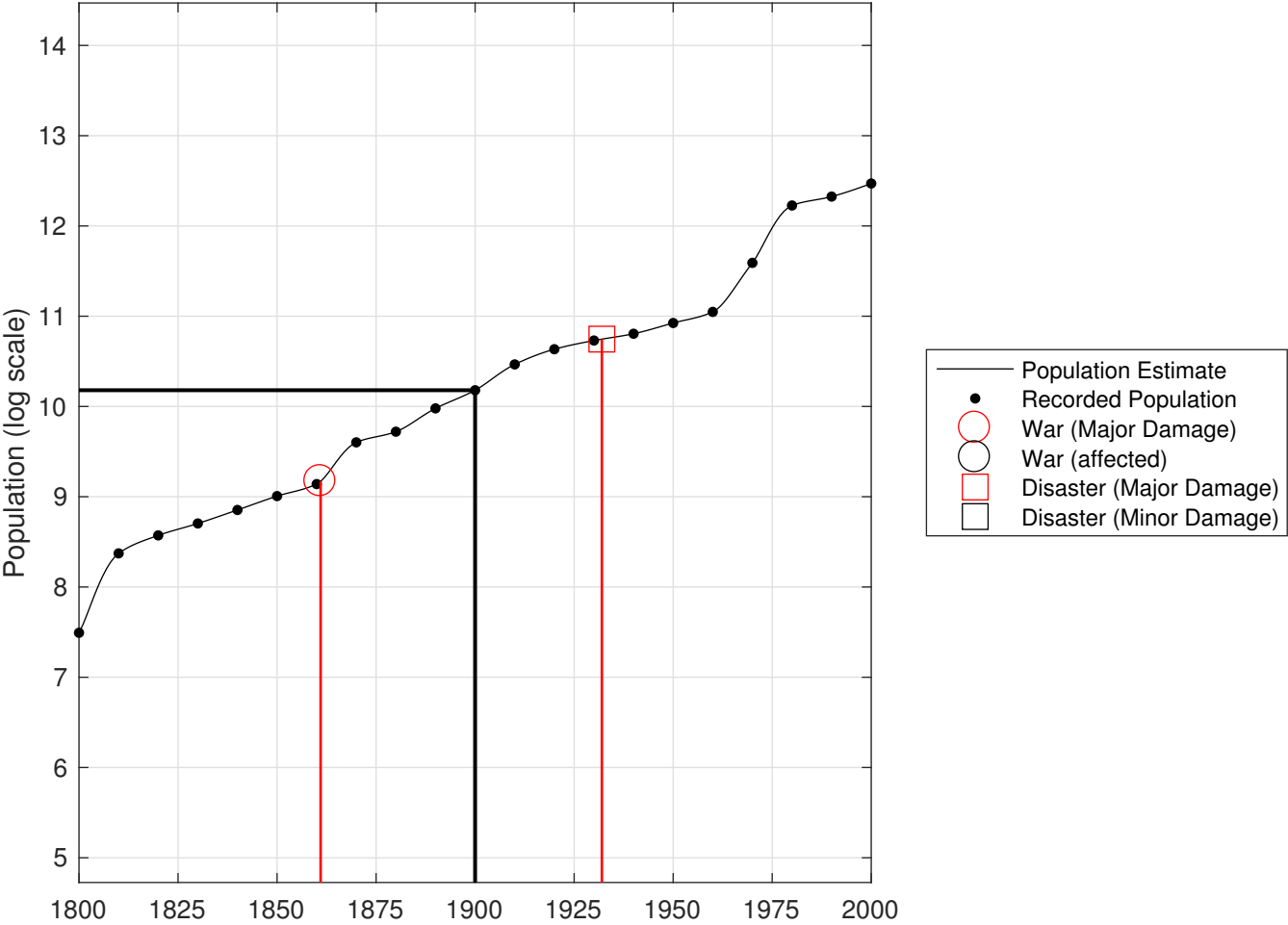
<sup>f</sup>The MGM Grand Fire: we do not code this as affecting the city although the death toll was high. While a large one, only one casino burnt down.

Table 104: Concentration Measures - Las Vegas

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	14.12
Cumulative density of employment-weighted PP distances at 750 m	%	69.88
Average distance between all prime locations	in kilometres	13.46
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.79
Weighted average distance from EWPPs to 1900 CH	in kilometres	11.23
Average from all prime locations to 1900 CH	in kilometres	10.21
Average distance from global prime locations to 1900 CH	in kilometres	5.93

A.50 Lexington

Figure 59: Lexington



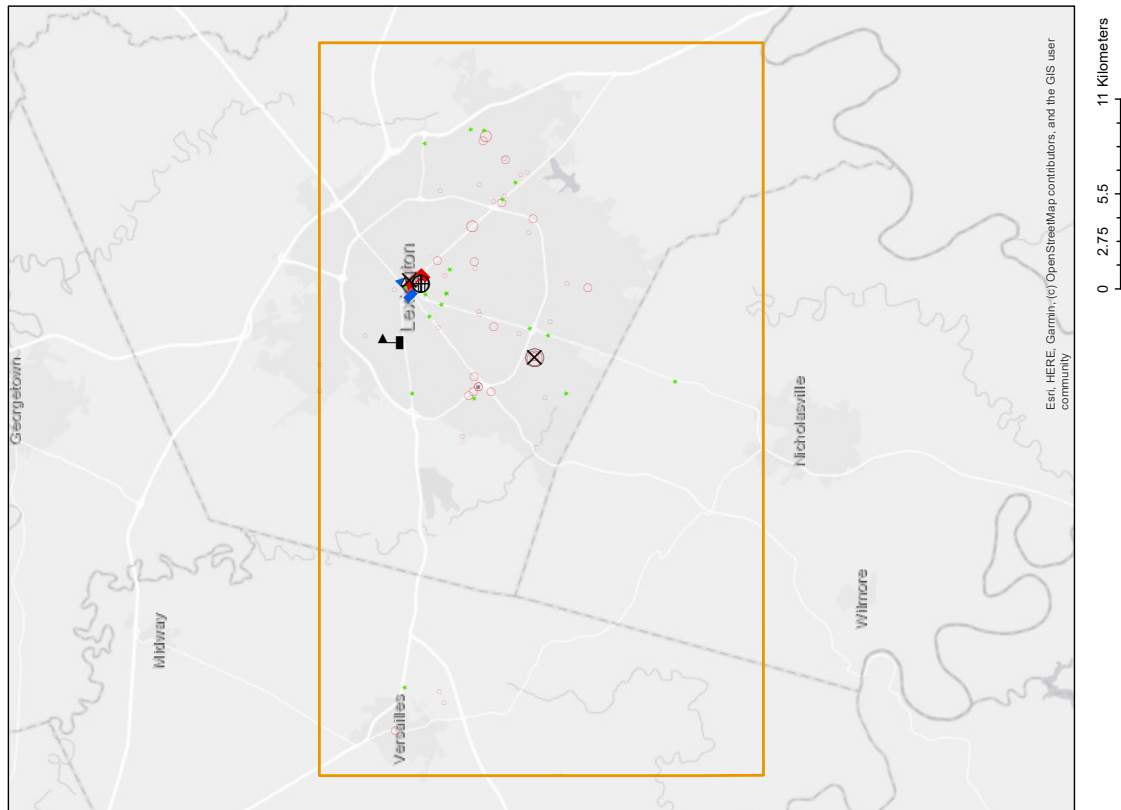
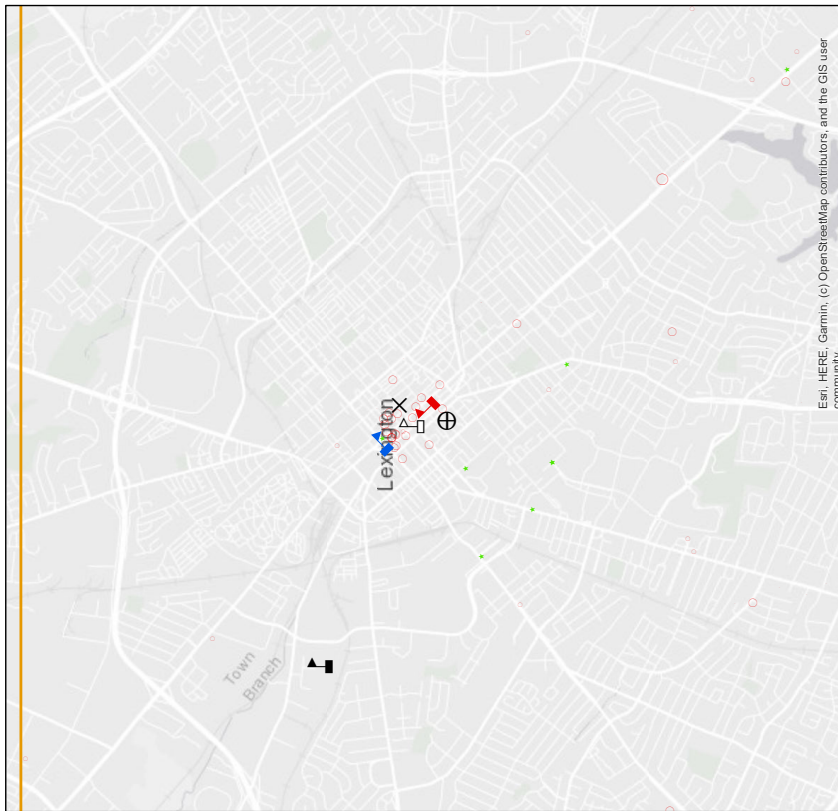


Table 105: Sources: Lexington ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1775	Dreistadt (2011, p. 14), National Park Service (2015c)
First Political Institution <sup>b</sup>	1782	Lexington History Museum (2015), Upton and Vlach (1986, p. 134)
City Hall <sup>c</sup>	1900	Wright (1982, p. 174), National Park Service (1984b, p. 3), Young-Brown (2008, p. 7).
City Hall	2000	National Park Service (1984a), Lexington-Fayette Urban County Government (2015)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	National Park Service (2015c)
<i>Population Data (1800-2000)</i>		
City Population	1790, 1800, 1810, 1820, 1830, 1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Gibson and Jung (2005a, p. 57), United States Census Bureau (2015)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>d</sup>	None	
Number of Stations	1910, 1940, 2010	NaN
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	1932 <sup>e</sup>	Wright (1982, p. 174)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861 <sup>f</sup>	National Park Service (2015a)
International War(s)	None recorded	

<sup>a</sup>McConnell springs is where the revolutionaries had their camp.

<sup>b</sup>The first courthouse was built here (the intersection of Main Street and Main Cross Street, now called Broadway (Lancaster, 2015, p. 241)).

<sup>c</sup>The government met in Jackson's Hall until the new building was finished in 1928 (Wright, 1982, p. 174), which was the city hall (National Park Service, 1984b, p. 3) and was located between Upper and Lime Streets (Young-Brown, 2008, p. 7).

<sup>d</sup>There is no metro system matching the definition by Gonzalez-Navarro and Turner (2016).

<sup>e</sup>We coded this flood as heavy as the damage was estimated a 1m in 1932 dollars and led to major changes in flood management. Floods before were not uncommon, but this one is considered the "worst flood in Lexington's history."

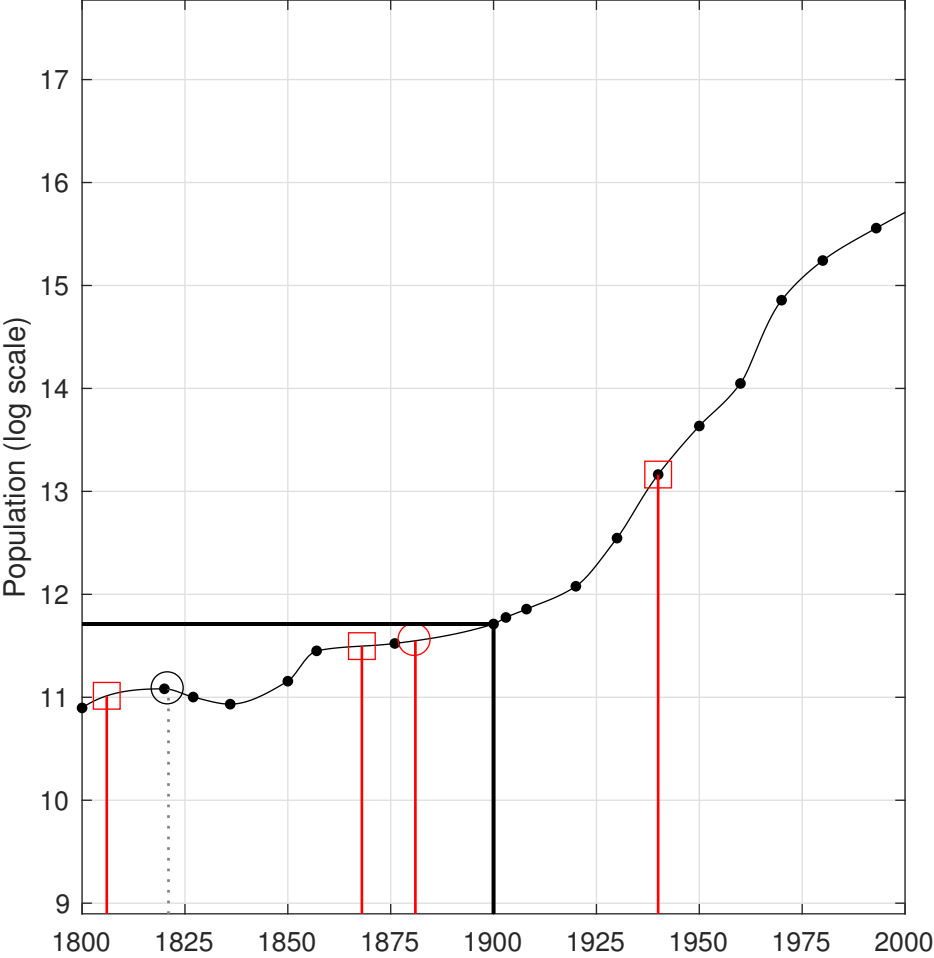
<sup>f</sup>They "burned the government stables and railroad depot before leaving Lexington."

Table 106: Concentration Measures - Lexington

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	6.22
Cumulative density of employment-weighted PP distances at 750 m	%	13.21
Average distance between all prime locations	in kilometres	3.32
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.38
Weighted average distance from EWPPs to 1900 CH	in kilometres	4.28
Average from all prime locations to 1900 CH	in kilometres	1.17
Average distance from global prime locations to 1900 CH	in kilometres	6.52

A.51 Lima

Figure 60: Lima



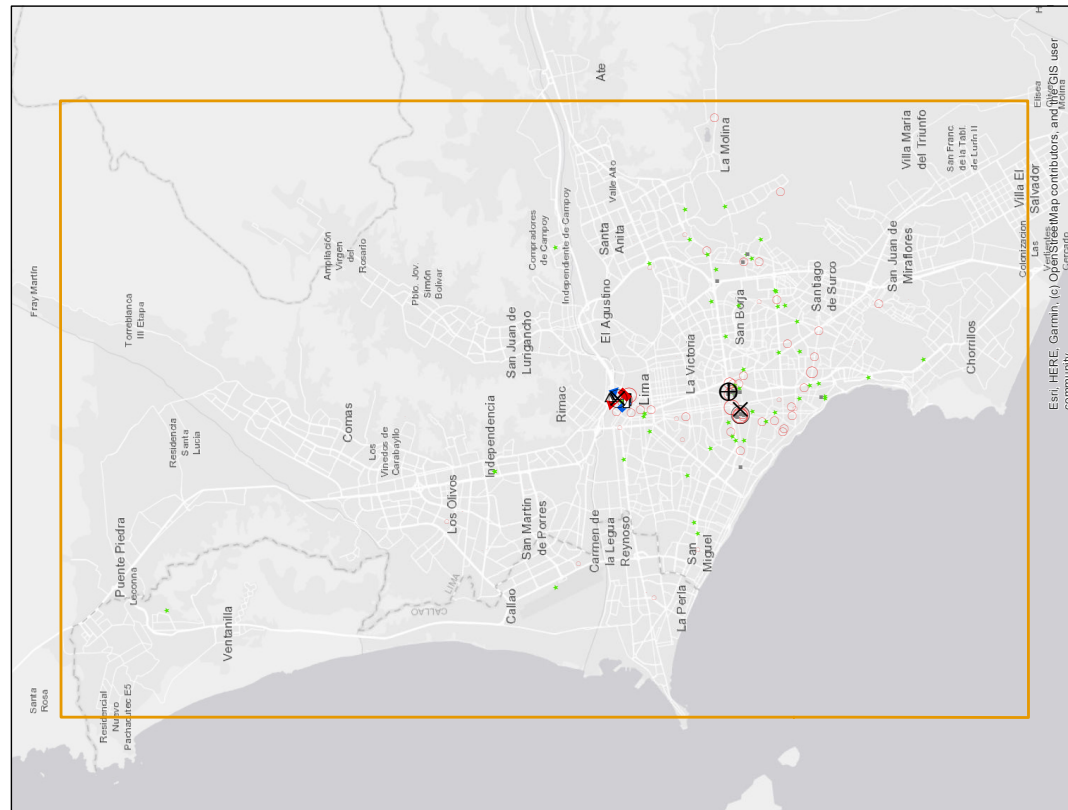
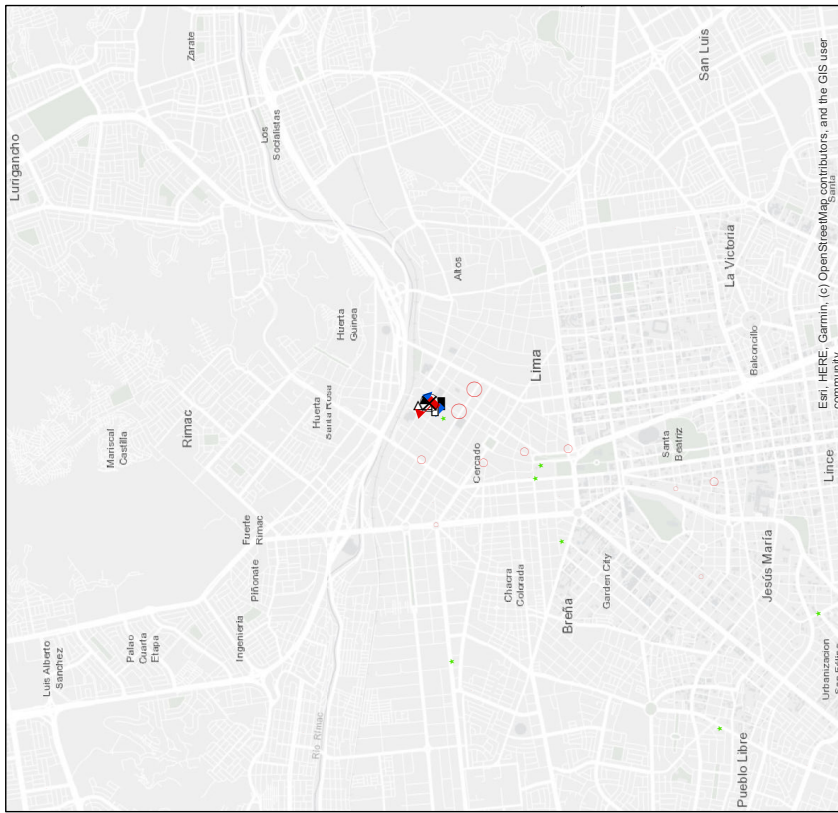




Table 107: Sources: Lima ( Peru )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1535	Osorio (2008, p. 153)
First Political Institution <sup>b</sup>	1535	Osorio (2008, p. 153)
City Hall <sup>c</sup>	1900	Osorio (2008, p. 153)
City Hall	2000	Osorio (2008, p. 153)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900, 1950, 2000	Encyclopaedia Britannica (2014, p. 152)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1820, 1827, 1836, 1850, 1857, 1876, 1900, 1903, 1908, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1993, 2003	Chandler (1987, p. 259), Chandler (1987, p. 494), Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>e</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>f</sup>	2003	UN Habitat (2013, 45)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	1806, 1868, 1940 <sup>g</sup>	Cates (1866, p. 133), Fuentes (1866, p. 5), Tucker et al. (2013, p. 252), Higgins (2005, p. 29)., Fuentes (1866, p. 5), Tucker et al. (2013, p. 252)
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1821 <sup>h</sup> , 1881 <sup>i</sup>	Marley (2008, p. 889), Chambers and Chasteen (2010, p. 90)

<sup>a</sup>In proximity to what would become Lima have been native villiages, when Pizarro founded it in 1535 (Donahue-Wallace, 2008).

<sup>b</sup>A cabildo (Spanish government building) was built here.

<sup>c</sup>Apparently, there has been no change in location ever since the foundation.

<sup>d</sup>Colonial capital before and capital of independent Peru since 1821.

<sup>e</sup>Footnote from United Nations Population Division (2014): Refers to Gran Lima, which consists of the capitals of the departments of Lima and Callao and surrounding populated centres.

<sup>f</sup>The regular service only started in 2012 due to the lack of funds, but a restricted service was first run in 2003 (Schwandl, 2016).

<sup>g</sup>Tucker et al. (2013, p. 252) mentions other earthquakes in 1966 and 1974, but usually the 1746 and the 1940 quake are considered the worst. The 1806 and 1868 are recorded and coded as having caused major destruction because sources easily found indicate so.

<sup>h</sup>Occupation, but no severe destruction mentioned although the war might have led to poor economic performance.

<sup>i</sup>War of the Pacific: looting and arson took place and many fled the city during the Chilean occupation. Besides that, we do not record any civil wars as no major destruction was caused, given one considers the 1992 bombing as of limited extent (Surhone et al., 2011). While mentioned in Robinson (2015), this event does not qualify as "heavy."

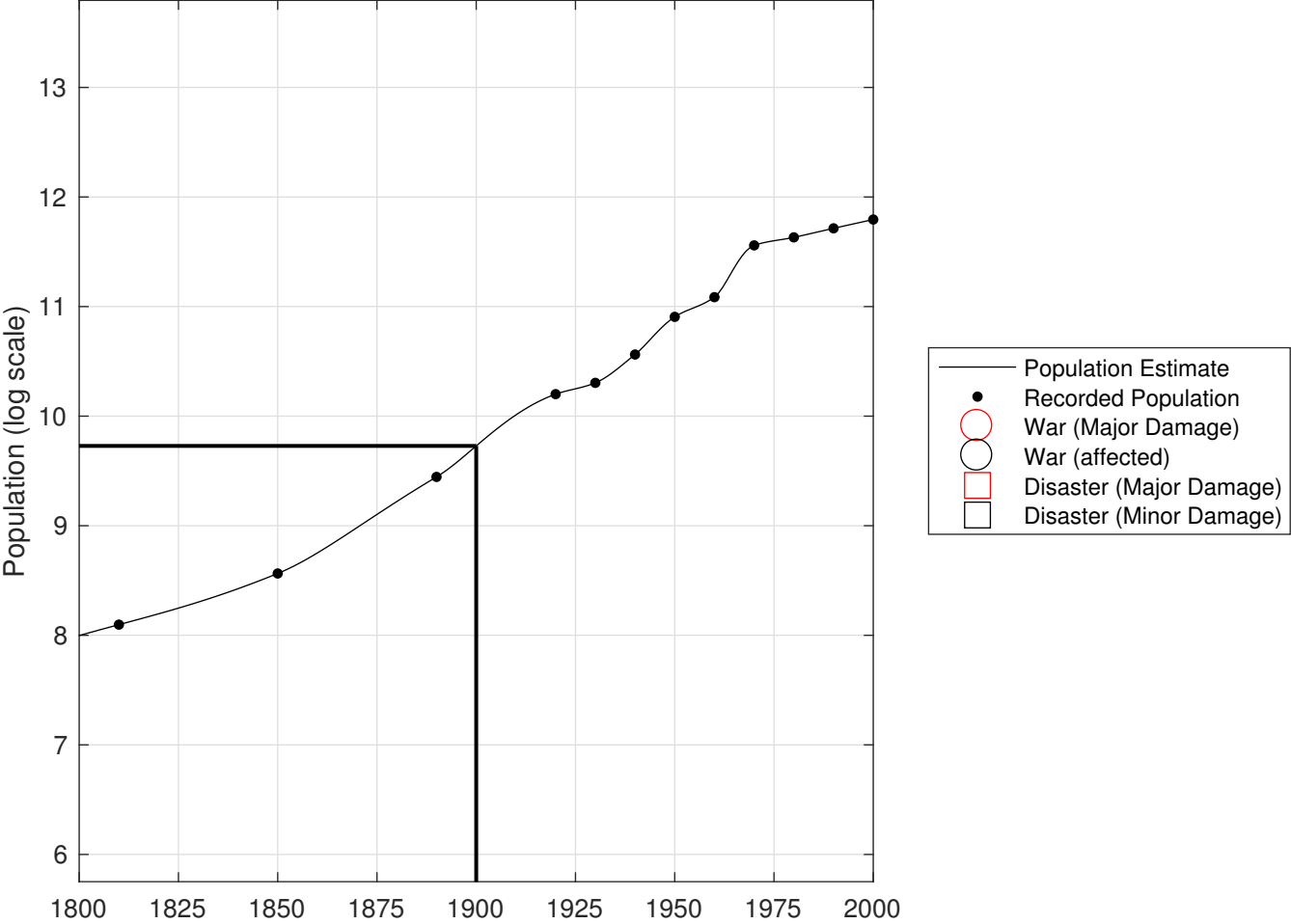


Table 108: Concentration Measures - Lima

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	5.78
Cumulative density of employment-weighted PP distances at 750 m	%	13.42
Average distance between all prime locations	in kilometres	2.84
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.08
Weighted average distance from EWPPs to 1900 CH	in kilometres	6.18
Average from all prime locations to 1900 CH	in kilometres	3.89
Average distance from global prime locations to 1900 CH	in kilometres	3.89

A.52 Linkoeeping

Figure 61: Linkoeeping



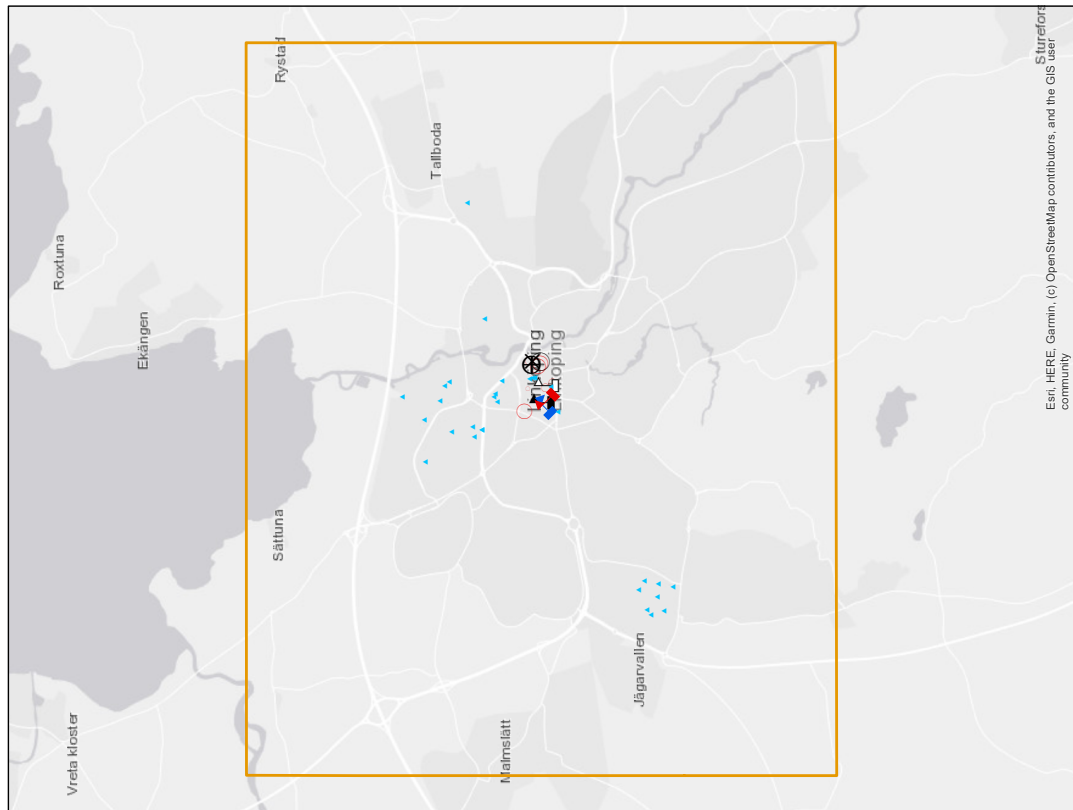
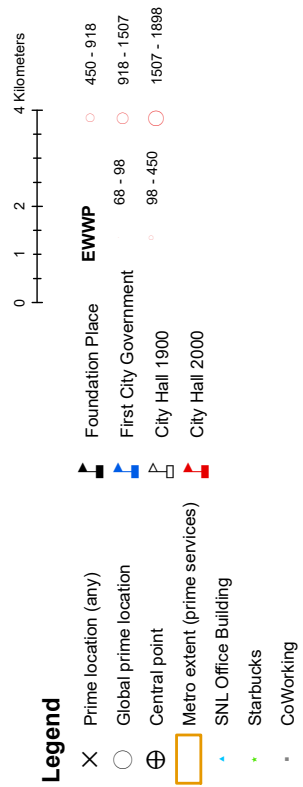
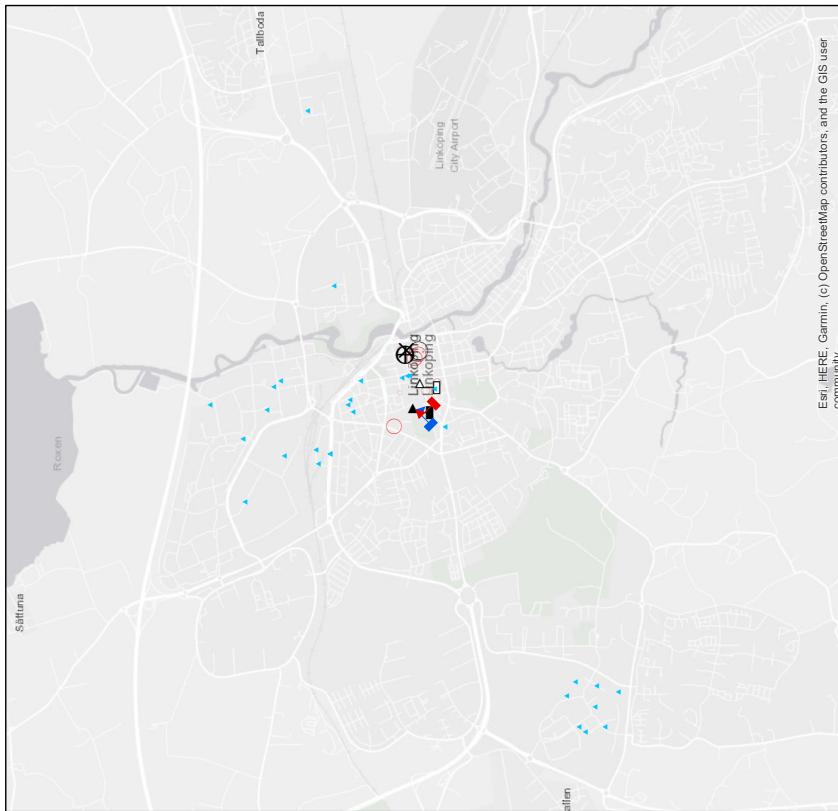


Table 109: Sources: Linköeping ( Sweden )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1100	Turistbyra (2014b)
First Political Institution <sup>b</sup>	1287	Turistbyra (2014a)
City Hall <sup>c</sup>	1900	Linköpings kommun (2014)
City Hall	2000	Linköping Tourist Center (2015)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000 <sup>d</sup>	Turistbyra (2014b)
<i>Population Data (1800-2000)</i>		
City Population	1770, 1810, 1850, 1890, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Statistiska centralbyran (2001, p.58), Stads- och kommunhistoriska institutet (2014b)
Metro Population <sup>e</sup>	2015	Statistics Sweden (2016)
<i>Rapid Transit System</i>		
System Opening <sup>f</sup>	None	
Number of Stations	1910, 1940, 2010	NaN
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>Linköping evolved from a bishopseat from the early 12th century on, which is why we assume 1100 for the first settlement. We could not find information on earlier settlements, although it is quite likely that there were.

<sup>b</sup>Linköping gained city rights around 1287 (Turistbyra, 2014b) and the place where now the castle stands has been the residence of the governor from the 13th century onwards.

<sup>c</sup>This is the location of the old City hall, built in 1799 and in use until 1921.

<sup>d</sup>Residensstad

<sup>e</sup>Refers to 2014 (province Östergötland.)

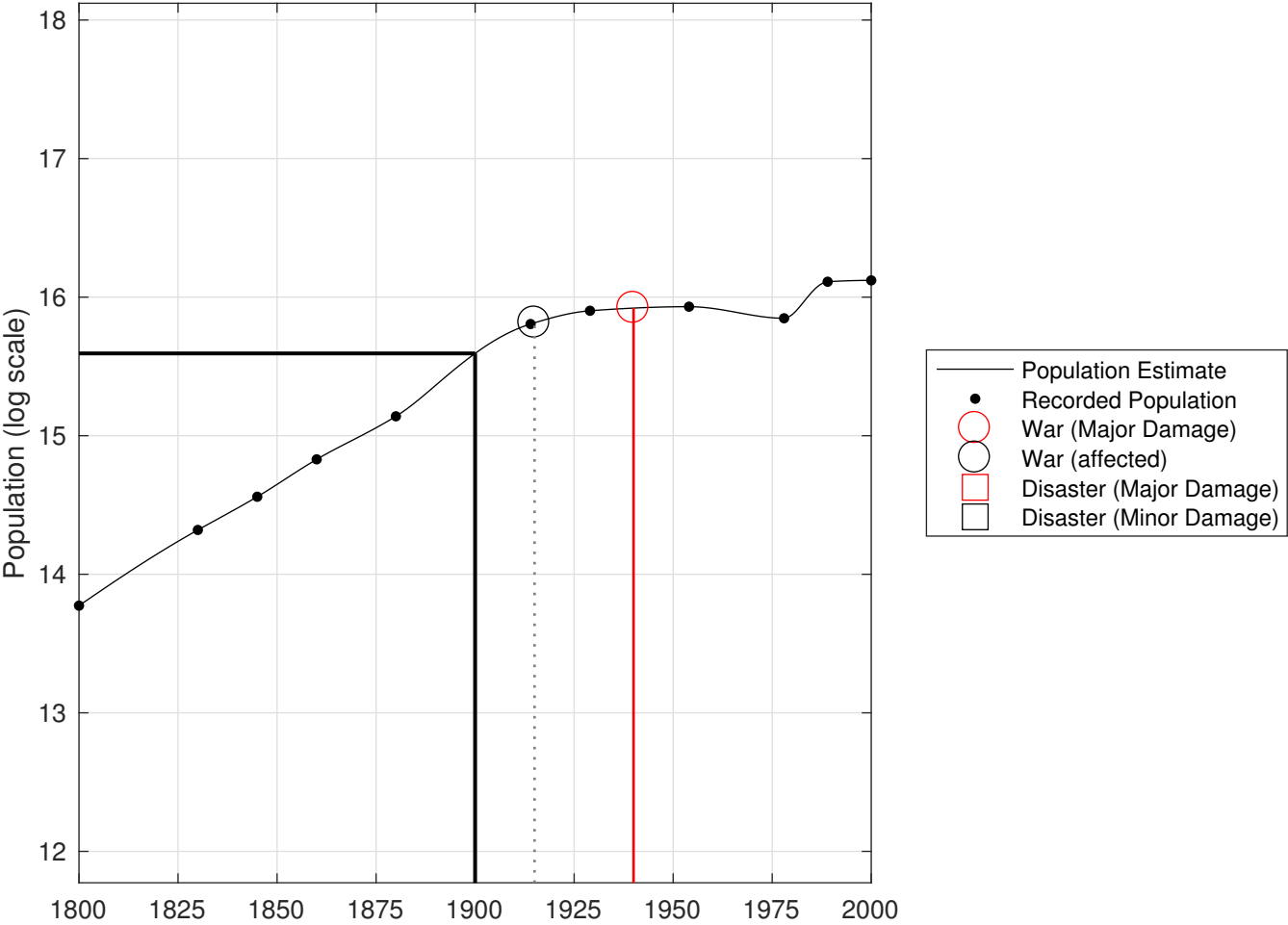
<sup>f</sup>There is no metro system matching the definition by Gonzalez-Navarro and Turner (2016).

Table 110: Concentration Measures - Linkoepping

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	0.49
Cumulative density of employment-weighted PP distances at 750 m	%	1.29
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-1.23
Weighted average distance from EWPPs to 1900 CH	in kilometres	0.37
Average from all prime locations to 1900 CH	in kilometres	0.45
Average distance from global prime locations to 1900 CH	in kilometres	0.40

A.53 London

Figure 62: London





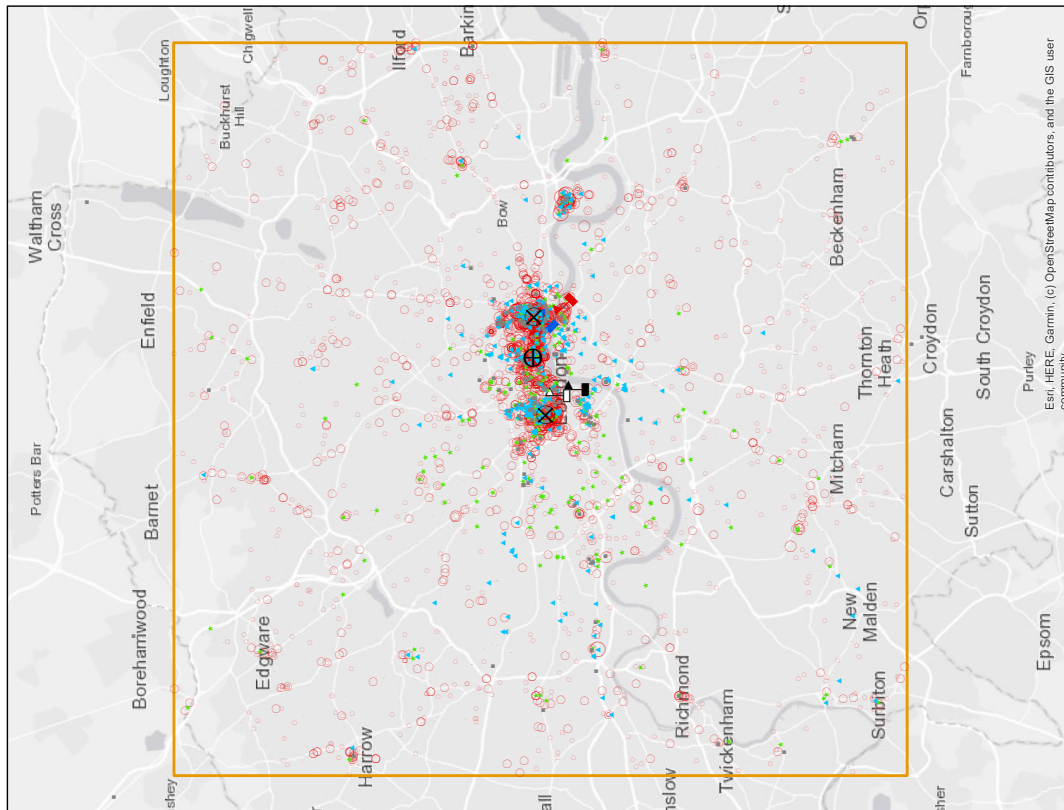
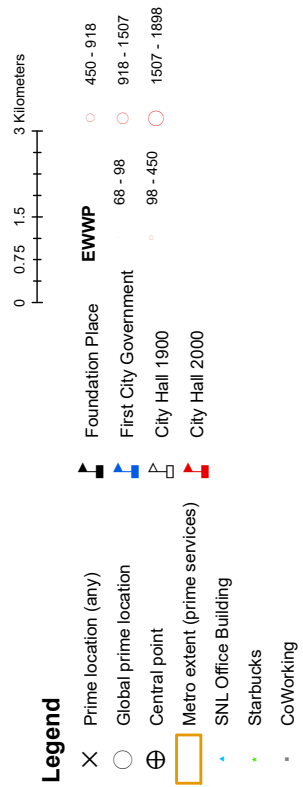
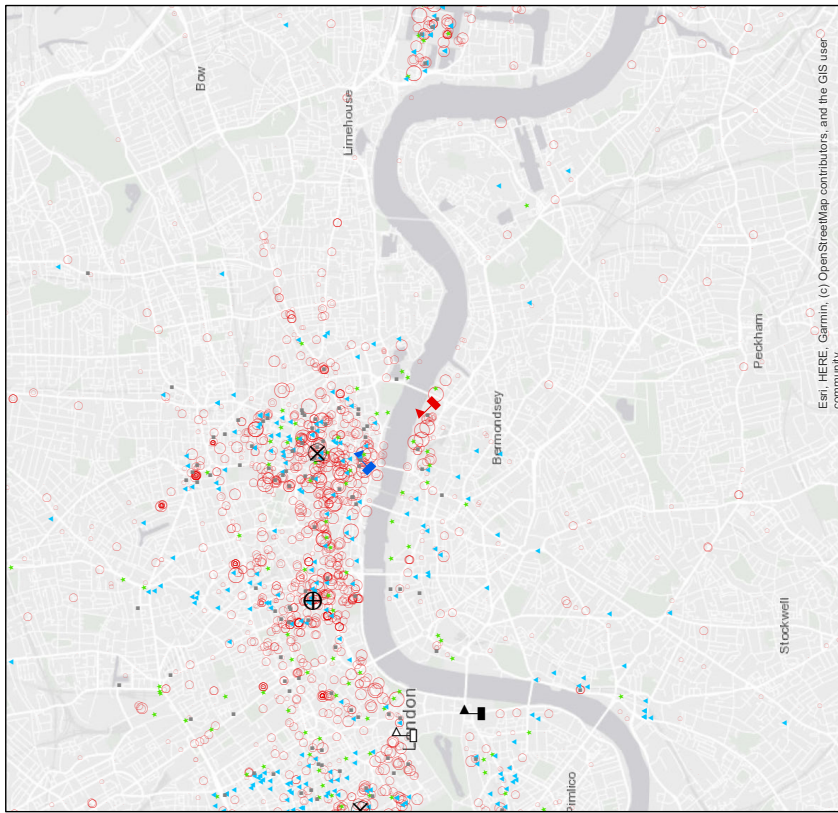


Table 111: Sources: London ( United Kingdom )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	50	Barber and Worms (2012), Sheppard (1998, p. 13)
First Political Institution	80	Sheppard (1998, p. 27)
City Hall	1900	Gibbon and Bell (1939, p. 273)
City Hall <sup>b</sup>	2000	Greater London Authority (2014)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Sheppard (1998)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1830, 1845, 1860, 1880, 1914, 1929, 1954, 1978, 1989, 2000	Angel et al. (2012, p. 288)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1863	Victor and Ponnuswamy (2012, 5)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1915 <sup>c</sup> , 1940 <sup>d</sup>	Sheppard (1998, p. 321f), Sheppard (1998, p. 333f), Hebbert (2015)

<sup>a</sup>Recent evidence points to the direction of Westminster, because a roman fort was there.

<sup>b</sup>There was no government for Greater London from the mid-1980s to 2000, from 2000-2002, it was not possible to find out where the mayor and GLA resided, thereafter they were in the new city hall.

<sup>c</sup>First world war zeppelin attacks.

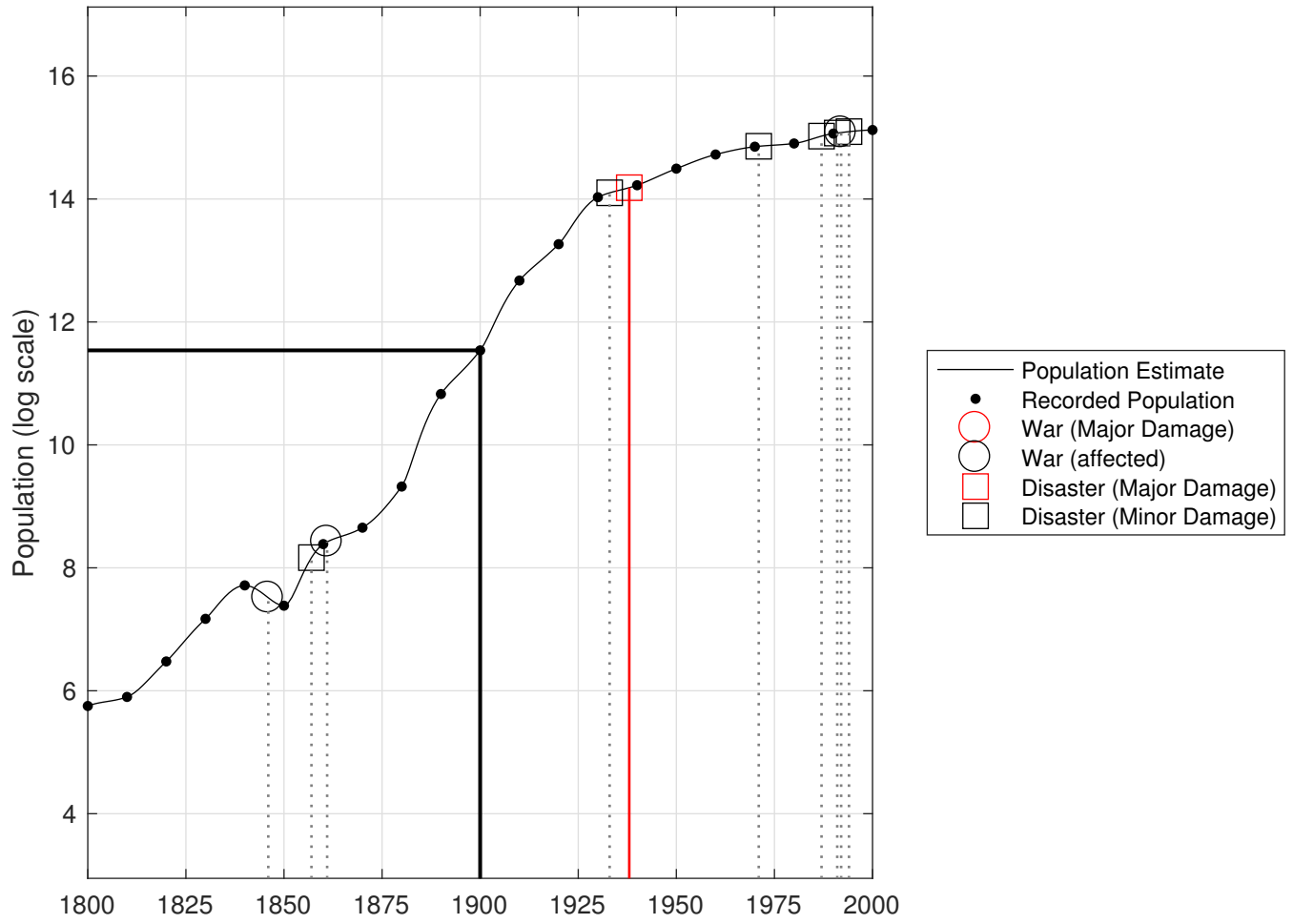
<sup>d</sup>The estimates of the damage to the housing stock vary greatly (see e.g. Clapson, 2009, p. 81), who claims than 100,000 buildings were destroyed and 1 million damaged. However, we consider the destruction as "heavy."

Table 112: Concentration Measures - London

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	8.69
Cumulative density of employment-weighted PP distances at 750 m	%	22.57
Average distance between all prime locations	in kilometres	1.96
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.70
Weighted average distance from EWPPs to 1900 CH	in kilometres	5.91
Average from all prime locations to 1900 CH	in kilometres	2.37
Average distance from global prime locations to 1900 CH	in kilometres	2.37

# A.54 Los Angeles

Figure 63: Los Angeles



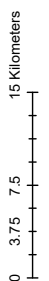
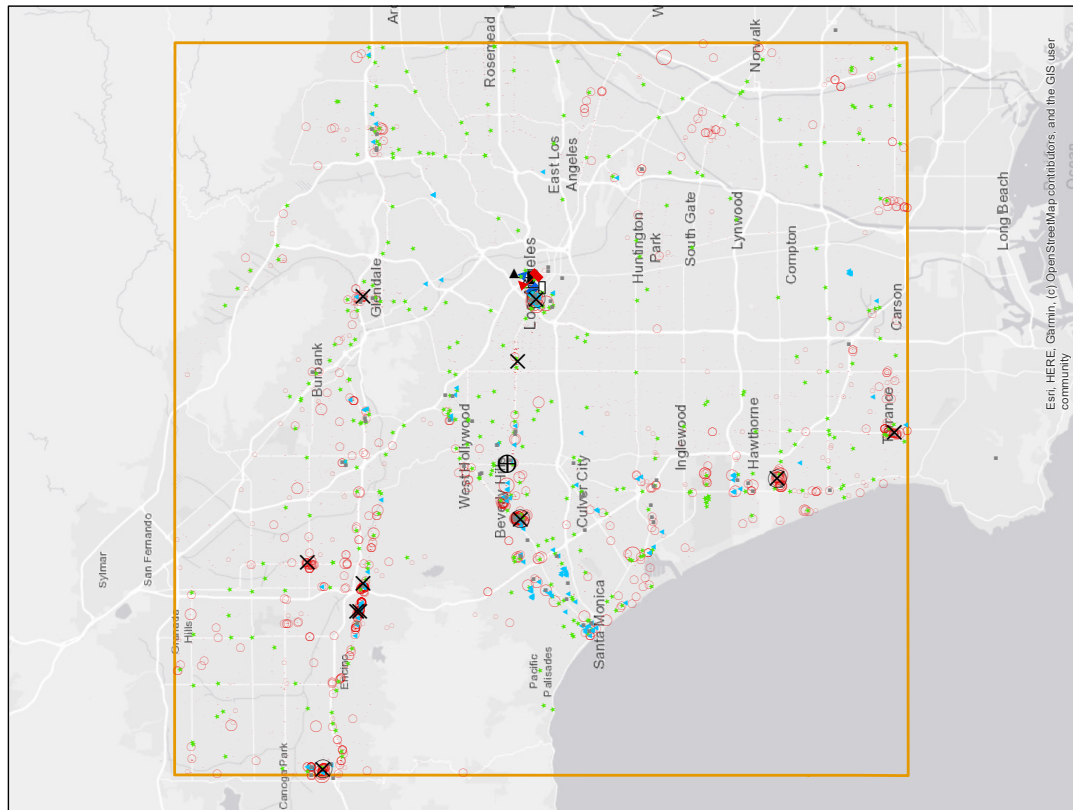
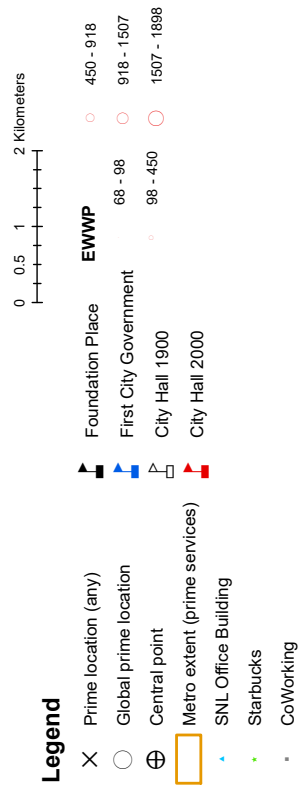
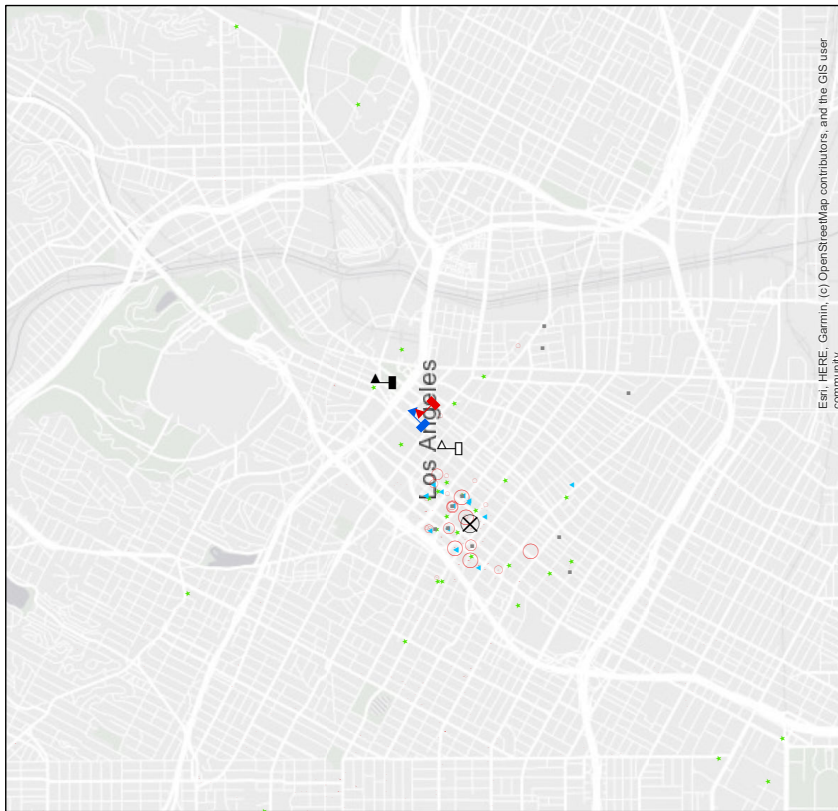


Table 113: Sources: Los Angeles ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1781	Ring et al. (2013a, p. 334), Estrada and Weber (2009)
First Political Institution <sup>b</sup>	1790	Ring et al. (2013a, p. 334), Estrada and Weber (2009)
City Hall	1900	Rasmussen (2001)
City Hall	2000	Rasmussen (2001)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Rasmussen (2001)
<i>Population Data (1800-2000)</i>		
City Population	1790, 1800, 1810, 1820, 1830, 1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Gibson and Jung (2005a, p. 32), Tucker (2013b, p. 369), De Graaf et al. (2001, p. 79), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1990	Walker (2007, 124)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	1857 <sup>c</sup> , 1933 <sup>d</sup> , 1971 <sup>e</sup> , 1987, 1991, 1994	L.A. County (2015), L.A. County (2015), Newton-Matza (2014, p. 70)
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	1938	L.A. County (2015); Gold (1999)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861 <sup>f</sup> , 1992 <sup>g</sup>	Epting (2015, p. 37), L.A. County (2015)
International War(s)	1846 <sup>h</sup>	Tucker (2013b, p. 370)

<sup>a</sup>There is disagreement in the literature about where the original plaza really was. It had been moved several times. Some claim it was a *little* bit further North-West while some claim it was more in the South-East. This location certainly provides a good compromise between the two and is actually the site that is commemorated for being the birthplace of Los Angeles for a long time.

<sup>b</sup>There was a town hall in 1790, from which the Alcalde (mayor) governed. The exact date is not known, but we assume 1790 as given in the source. It was most likely erected a few years earlier.

<sup>c</sup>LA county has experienced many earthquakes, causing a lot of property damage and casualties. However, we focus on the main area of LA city here. For example, the earthquake of 1857 is reported to have only caused scattered damage in Los Angeles (Newton-Matza, 2014, p. 70). The only earthquake coded as having caused a significant destruction of the building stock in Los Angeles is the one of 1933. There has been another earthquake in 1812 and two floods (1801 and 1815), but too little is known about their actual extent (Estrada and Weber, 2009, p. 26).

<sup>d</sup>The Long Beach earthquake hit mostly areas South of Los Angeles, although it caused some damage in Los Angeles itself.

<sup>e</sup>This hit mostly areas north of Los Angeles, although it caused some damage in Los Angeles itself.

<sup>f</sup>Not directly involved, but important military base.

<sup>g</sup>Rodney King riots: while 58 killed, we do not classify them as a major disaster as no large number of structures has been severely damaged.

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<sup>h</sup>American-Mexican War: Occupation of Los Angeles, but no severe damage to structures mentioned.

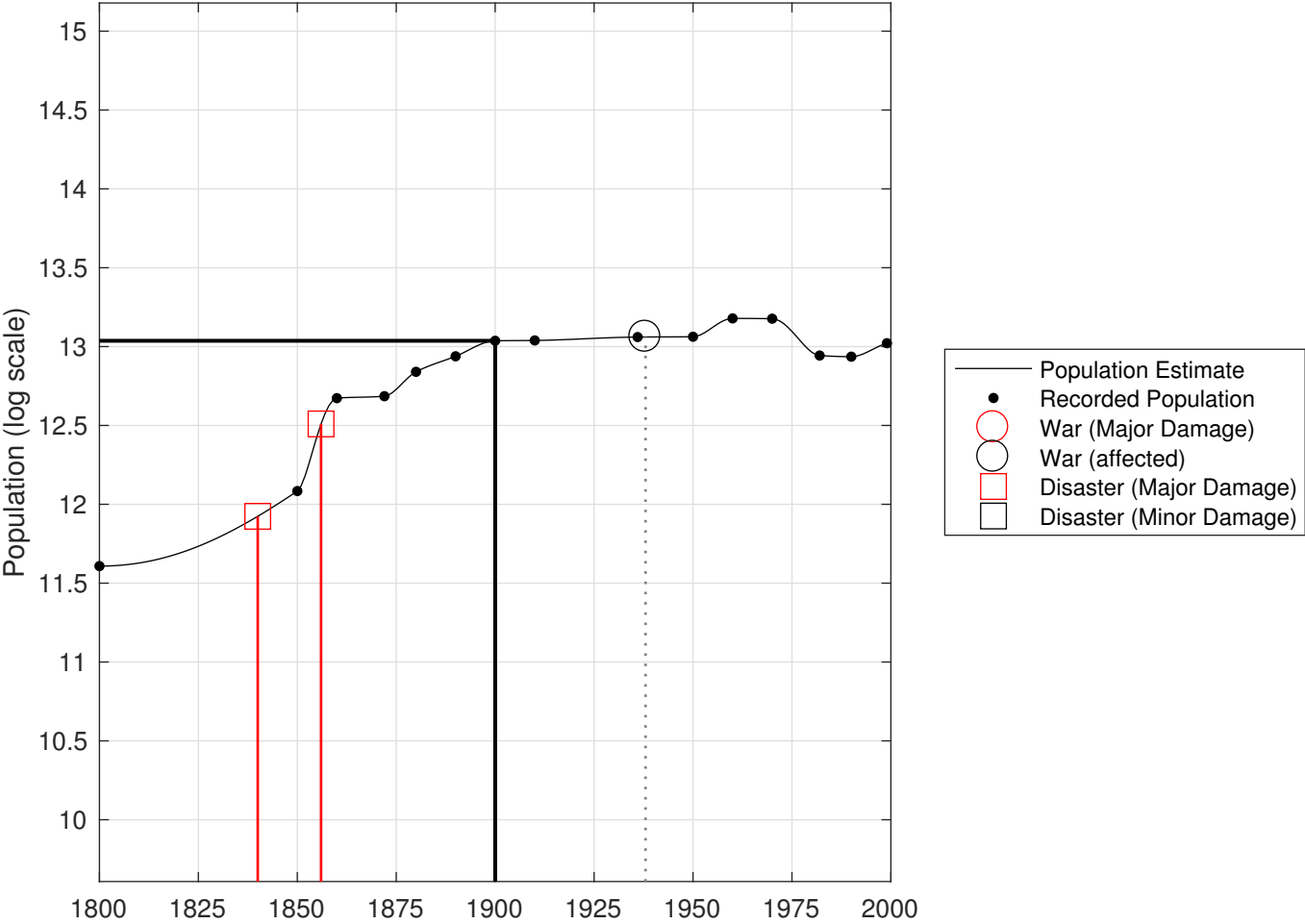
Table 114: Concentration Measures - Los Angeles

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	22.45
Cumulative density of employment-weighted PP distances at 750 m	%	106.96
Average distance between all prime locations	in kilometres	19.83
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.14
Weighted average distance from EWPPs to 1900 CH	in kilometres	19.01
Average from all prime locations to 1900 CH	in kilometres	18.59
Average distance from global prime locations to 1900 CH	in kilometres	17.31



A.55 Lyon

Figure 64: Lyon



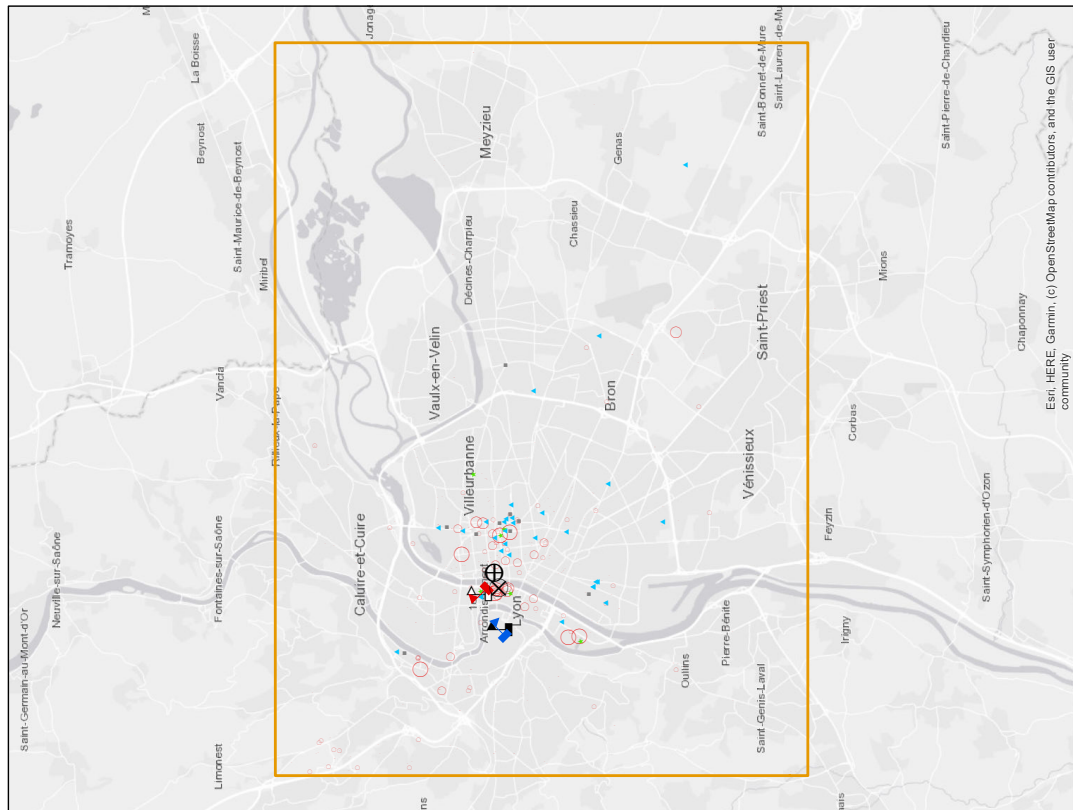
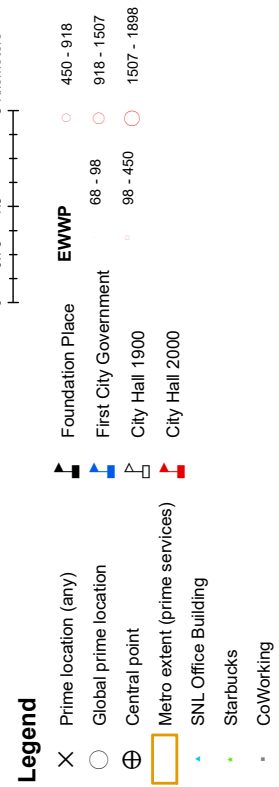
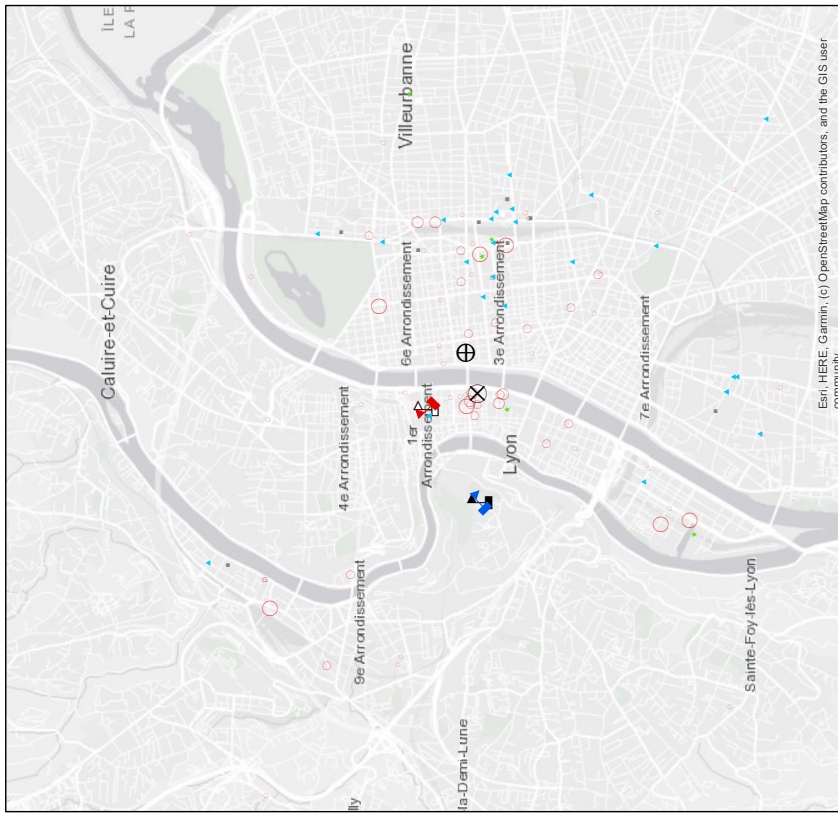


Table 115: Sources: Lyon ( France )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	-43	Rau (2014, p.9)
First Political Institution <sup>b</sup>	-43	Barbour (2007, p. 73)
City Hall	1900	Mairie de Lyon (2014)
City Hall	2000	Mairie de Lyon (2014)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Helmut Bott (2012, p.4), World Heritage Convention (2014)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1860, 1872, 1880, 1890, 1900, 1910, 1936, 1950, 1960, 1970, 1982, 1990, 1999, 2006	Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>c</sup>	1978	Tuppen (1977, 157)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	1840 <sup>d</sup> , 1856 <sup>e</sup>	Murray (1864, p. 394)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1938	Kerner and Doerenkamp (2011, p.17)

<sup>a</sup>Founded by the Roman Lucius Munatius.

<sup>b</sup>This was the site of the Roman forum. We chose this as the first government seat as Lyon seemed to be a thriving city in Roman times. We assume that it was built at the same time as the city was founded.

<sup>c</sup>There was a funicular line in operation already between 1891 to 1972. This Line (C) was reopened in 1974. It had only two stops though.

<sup>d</sup>This flood destroyed a whole suburb.

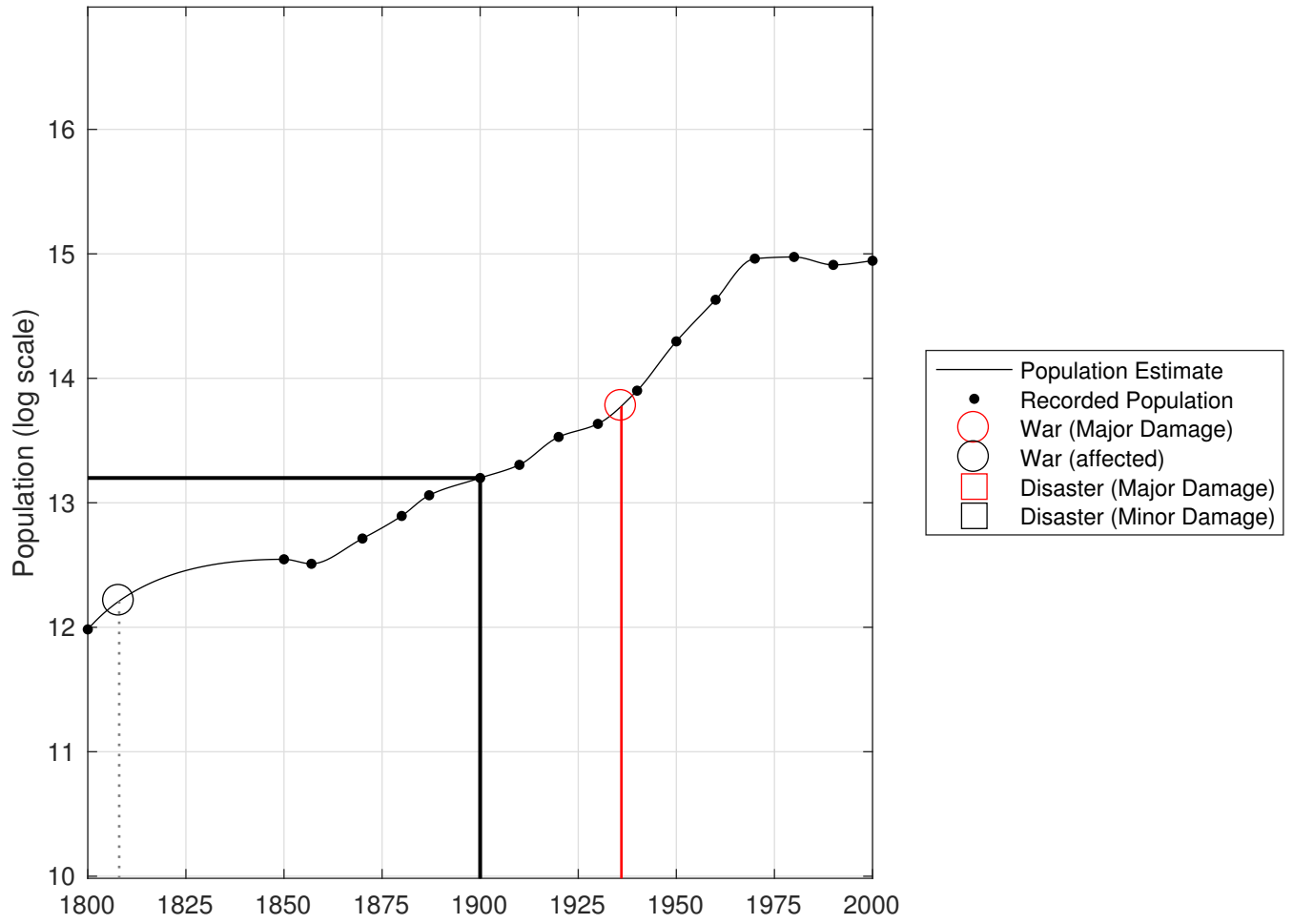
<sup>e</sup>This flood was considered worse than the 1840 flood, “destroying many houses with their inhabitants” (Murray, 1864, p. 394).

Table 116: Concentration Measures - Lyon

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	4.17
Cumulative density of employment-weighted PP distances at 750 m	%	11.74
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.08
Weighted average distance from EWPPs to 1900 CH	in kilometres	2.85
Average from all prime locations to 1900 CH	in kilometres	0.59
Average distance from global prime locations to 1900 CH	in kilometres	0.59

# A.56 Madrid

Figure 65: Madrid



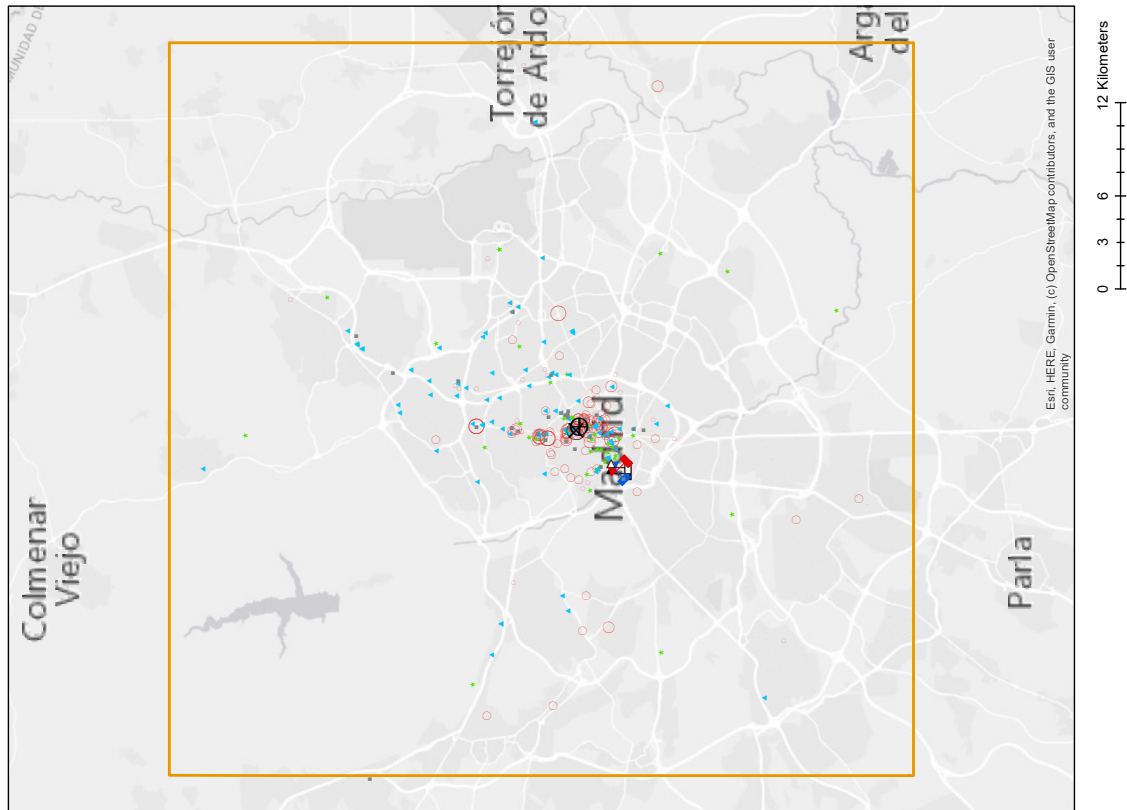
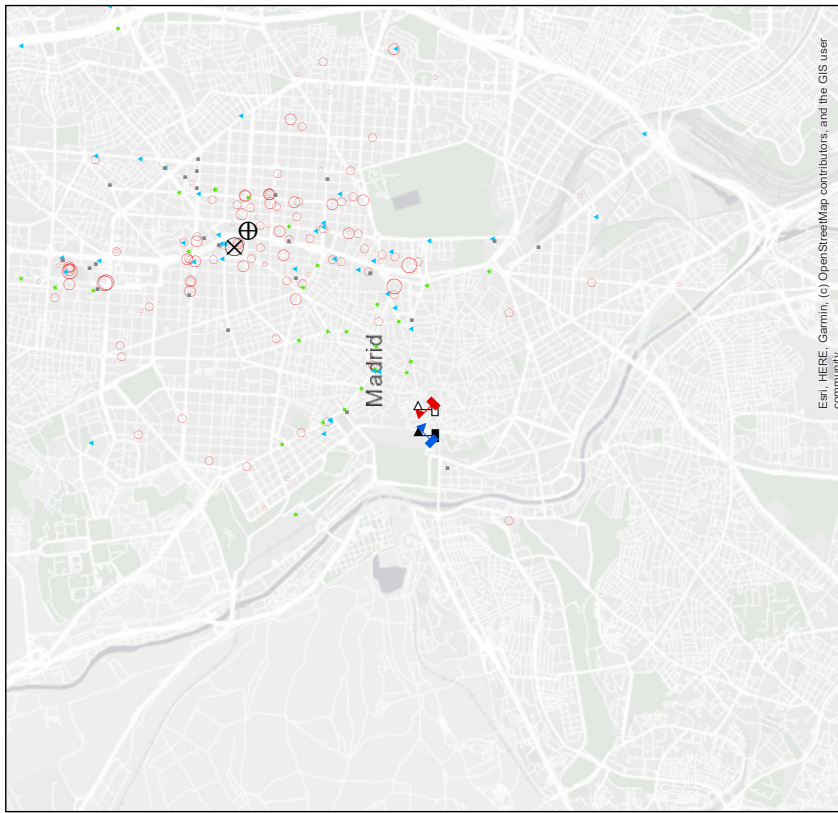


Table 117: Sources: Madrid ( Spain )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	865	Tourism Authority of Spanien (2014)
First Political Institution <sup>b</sup>	865	Tourism Authority of Spanien (2014)
City Hall	1900	Biehusen (2013)
City Hall <sup>c</sup>	2000	Biehusen (2013)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900, 1950, 2000	Tourism Authority of Spanien (2014)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1857, 1870, 1880, 1887, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000, 2008	Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1919	Matilla (2011, 12)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1936 <sup>e</sup>	Cybriwsky (2013, p.171)
International War(s)	1808 <sup>f</sup>	Cybriwsky (2013, p.171)

<sup>a</sup>The muslim Alcazaba (a fortress) was erected in 865 and constitutes first recorded settlement.

<sup>b</sup>The muslim Alcazaba was in the area where today's Santa Maria church is. We take this as the first place of power (approximation) and the year of the building of the Alcazaba as the date for the first political institution as the erection of the fortress was ordered by Emir Muhammad I..

<sup>c</sup>It has moved in 2007 to the palacio de comunicaciones.

<sup>d</sup>Madrid is capital since 1511.

<sup>e</sup>Spanish civil war.

<sup>f</sup>Occupation by Napoleon until 1813.

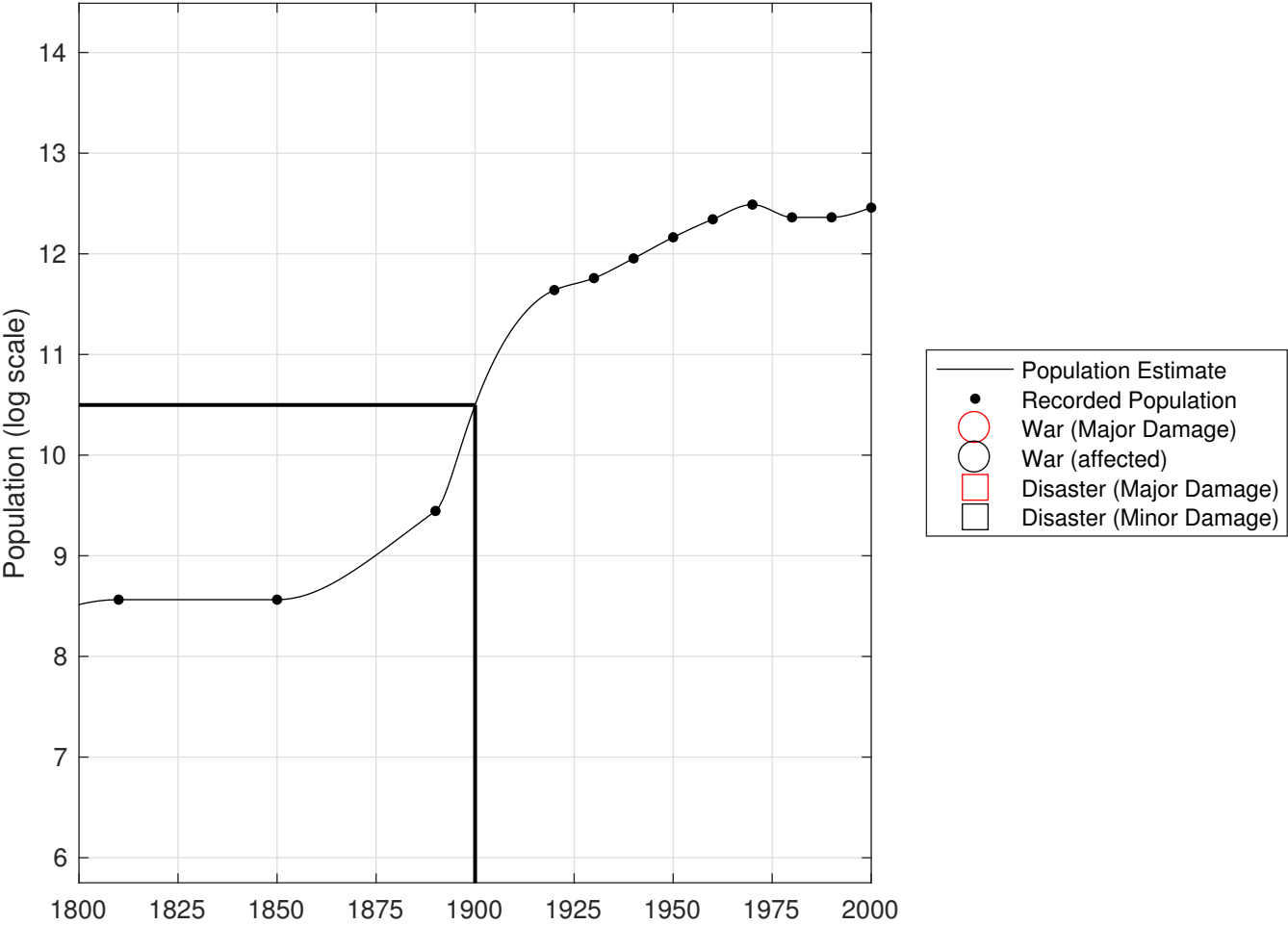
Table 118: Concentration Measures - Madrid

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	5.70
Cumulative density of employment-weighted PP distances at 750 m	%	9.34
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.60
Weighted average distance from EWPPs to 1900 CH	in kilometres	4.81
Average from all prime locations to 1900 CH	in kilometres	2.74
Average distance from global prime locations to 1900 CH	in kilometres	2.74



A.57 Malmoe

Figure 66: Malmoe



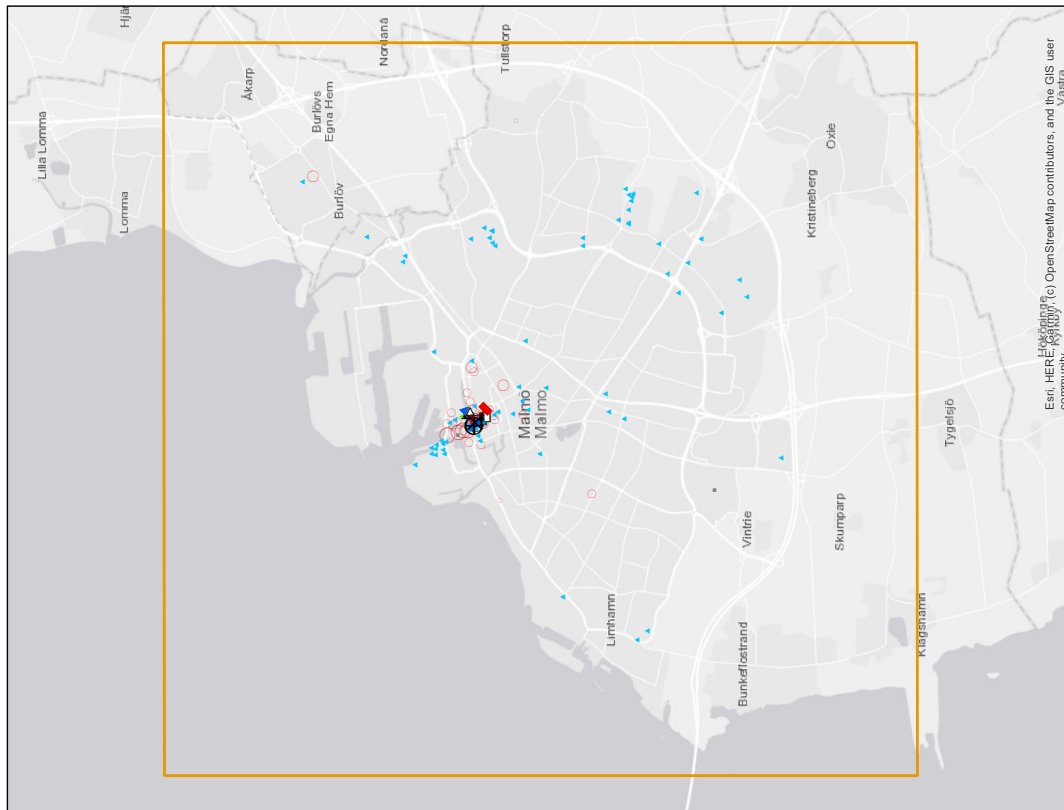
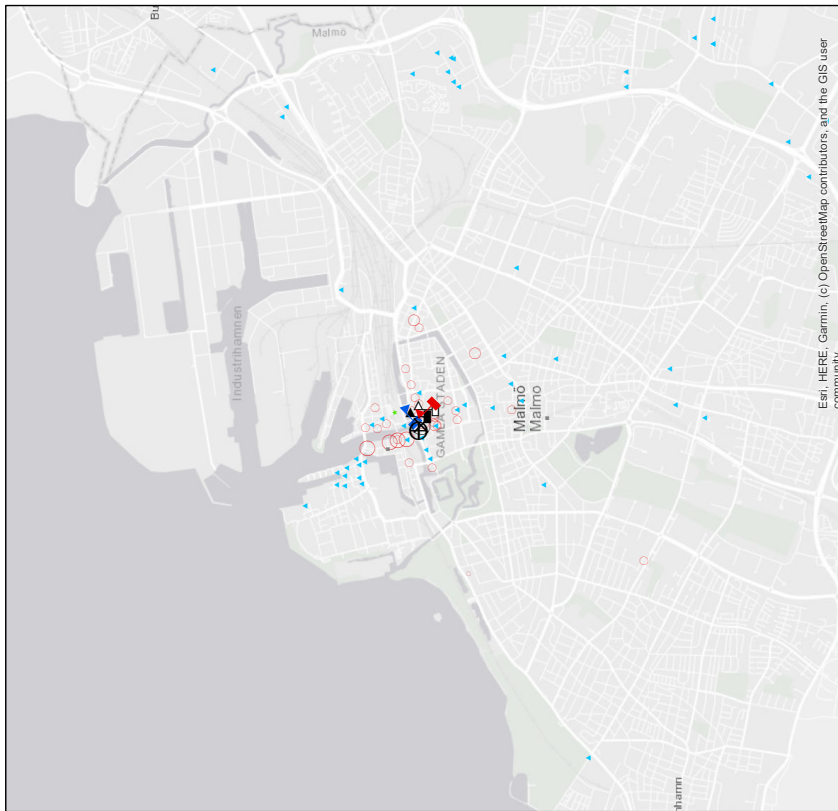


Table 119: Sources: Malmoe ( Sweden )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1145	Juling (2015, p. 93)
First Political Institution <sup>b</sup>	1254	Fotevikens Museum (2015)
City Hall <sup>c</sup>	1900	Knoller (2013, p.569)
City Hall	2000	Knoller (2013, p.569)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000 <sup>d</sup>	Britannica (2014a), Malmö Tourist Service (2014)
<i>Population Data (1800-2000)</i>		
City Population	1770, 1810, 1850, 1890, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Statistiska centralbyran (2001, p.58), Stads- och kommunhistoriska institutet (2014c)
Metro Population <sup>e</sup>	2015	Statistics Sweden (2016)
<i>Rapid Transit System</i>		
System Opening <sup>f</sup>	None	
Number of Stations	1910, 1940, 2010	NaN
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>This is the first mentioning of Malmoe and thus we take it as the first settlement.

<sup>b</sup>This is a rough approximation of the then city center and the year where Malmoe was officially founded and thus ruled.

<sup>c</sup>Errected in 1546.

<sup>d</sup>Residensstad since 1997

<sup>e</sup>Refers to 2014 (province Skane).

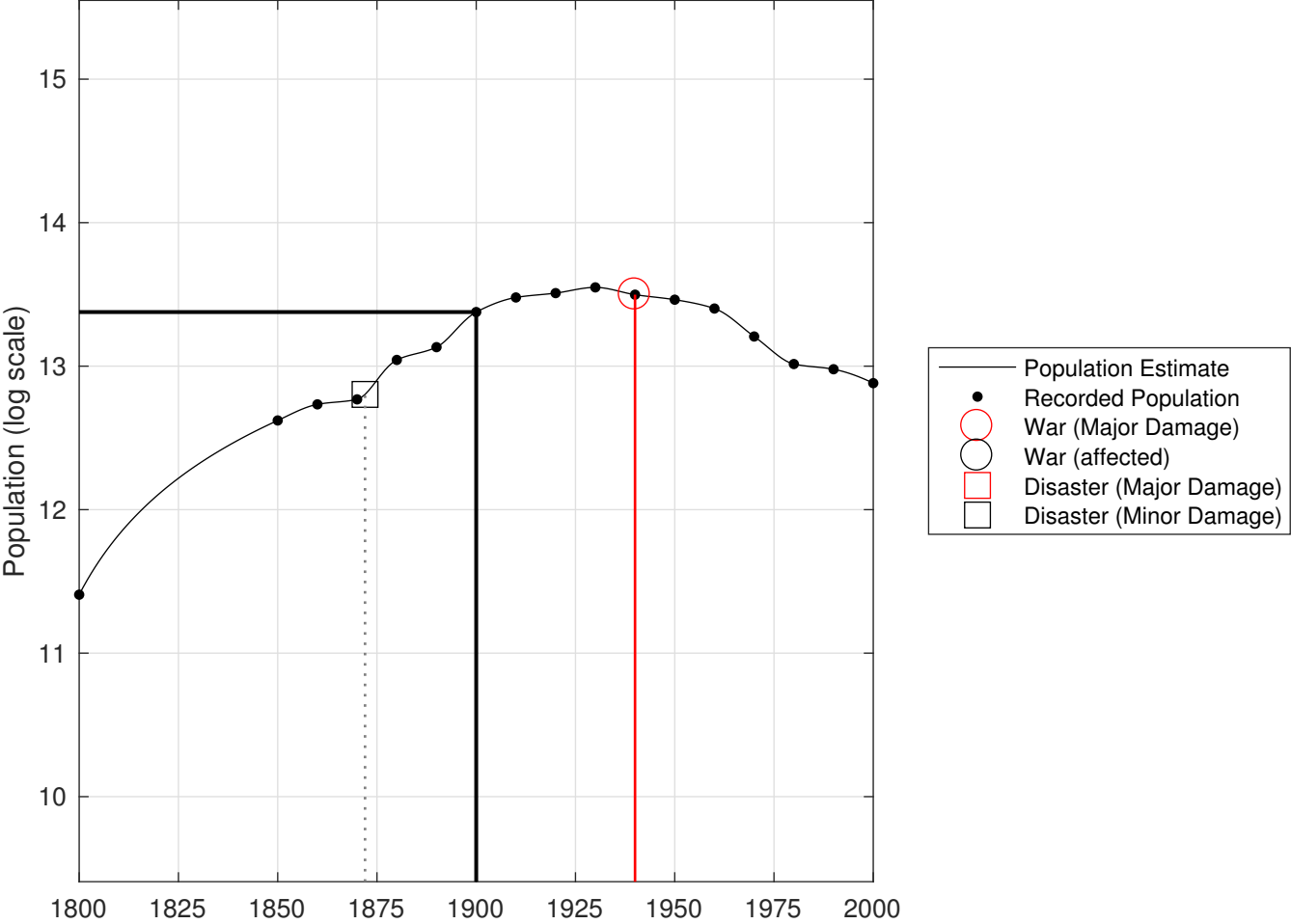
<sup>f</sup>There is no metro system matching the definition by Gonzalez-Navarro and Turner (2016).

Table 120: Concentration Measures - Malmoe

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	1.47
Cumulative density of employment-weighted PP distances at 750 m	%	1.95
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-1.36
Weighted average distance from EWPPs to 1900 CH	in kilometres	0.90
Average from all prime locations to 1900 CH	in kilometres	0.19
Average distance from global prime locations to 1900 CH	in kilometres	0.19

A.58 Manchester

Figure 67: Manchester



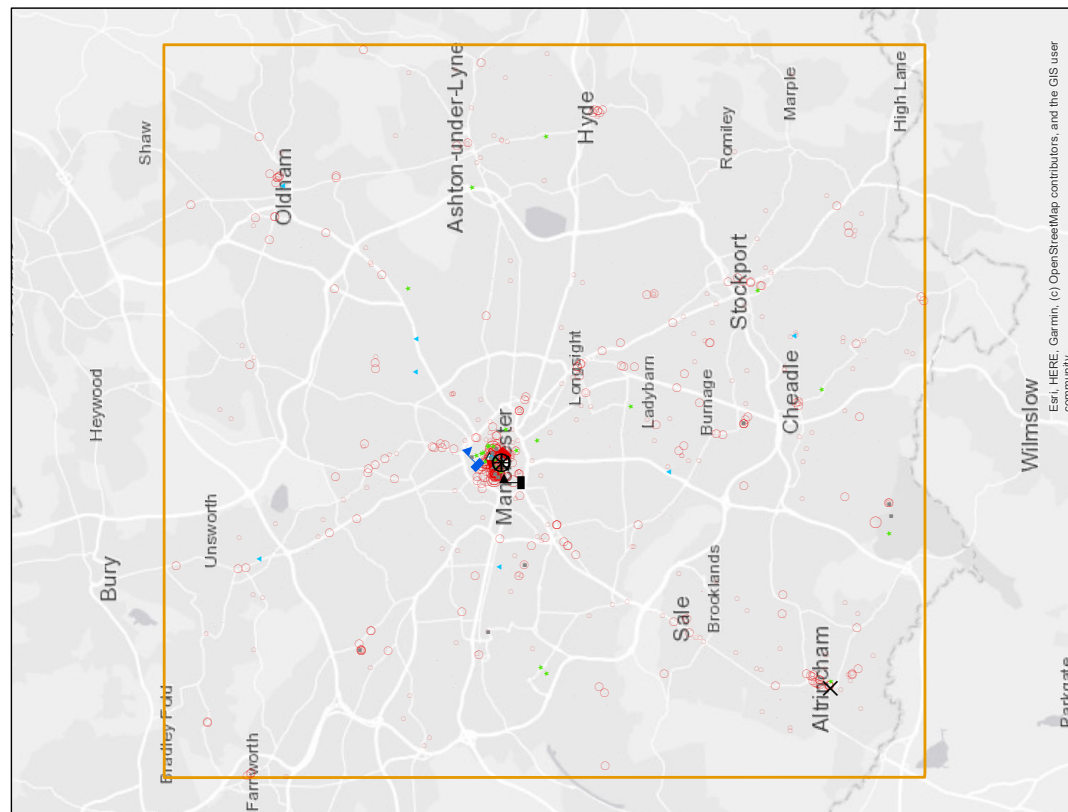
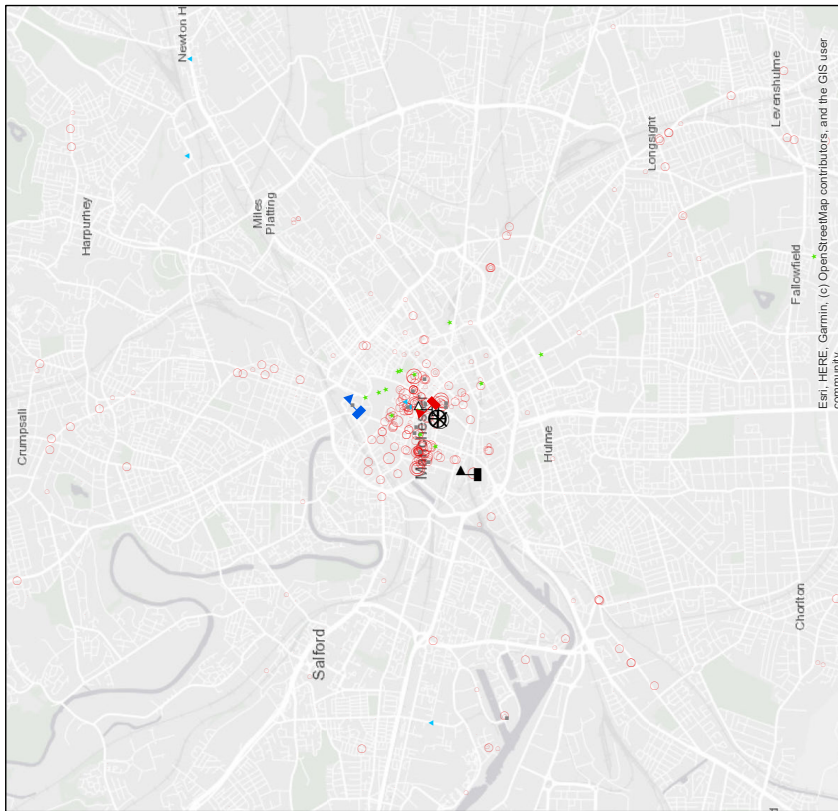


Table 121: Sources: Manchester ( United Kingdom )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	78	Museum of Science & Industry (2015, p. 2), Redhead (2008)
First Political Institution <sup>b</sup>	1136	McKechnie (1915, p. 2), Hibbert et al. (1830, p. 20)
City Hall <sup>c</sup>	1900	Hartwell (2001, p. 71)
City Hall	2000	Hartwell (2001, p. 71)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900, 1950, 2000	Carter (1962, p. 136)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>e</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>f</sup>	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	1872 <sup>g</sup>	Manchester City Council (2015)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1940 <sup>h</sup>	Phythian (2013)

<sup>a</sup>Site of a Roman Fort. The settlement was abandoned after the Romans left.

<sup>b</sup>In 923 Edward expelled the Danes from the city and rebuilt the fort. However, it became a proper city most likely only after the Norman conquest when Robert de Gresley became the first lord there and exercised power. The castle itself could have been built throughout a seventy year period, but this is when Manchester gained significance again and written history is again well documented.

<sup>c</sup>Incorporated in 1877, it remains the town hall until today.

<sup>d</sup>Incorporated as a borough in 1838 and as a city in 1853.

<sup>e</sup>Footnote from United Nations Population Division (2014): For Birmingham, Manchester, and Newcastle upon Tyne, data from 1951 to 1971 refer to Conurbation, while data from 1981 to 2011 refer to Urban area (including Greater Manchester). For Birmingham (West Midlands) the limits of the urban area have been modified in 2011. For Sunderland, data from 1951 to 1981 refer to Sunderland and Whitburn urban areas, while data from 1991 to 2011 refer to Sunderland, Whitburn, Washington, Chester-le-Street and 9 other sub-divisions of the urban agglomeration. The limits of the urban agglomerations of Newport and Reading-Wokingham have been modified between 1981 and 1991.

<sup>f</sup>Only has a tram system, which does not qualify as an MRT according to Gonzalez-Navarro and Turner (2016)

<sup>g</sup>Not classified as major flood as no severe destruction of building stop is reported (although bodies were washed away from a cemetery).

<sup>h</sup>World War II air raids.

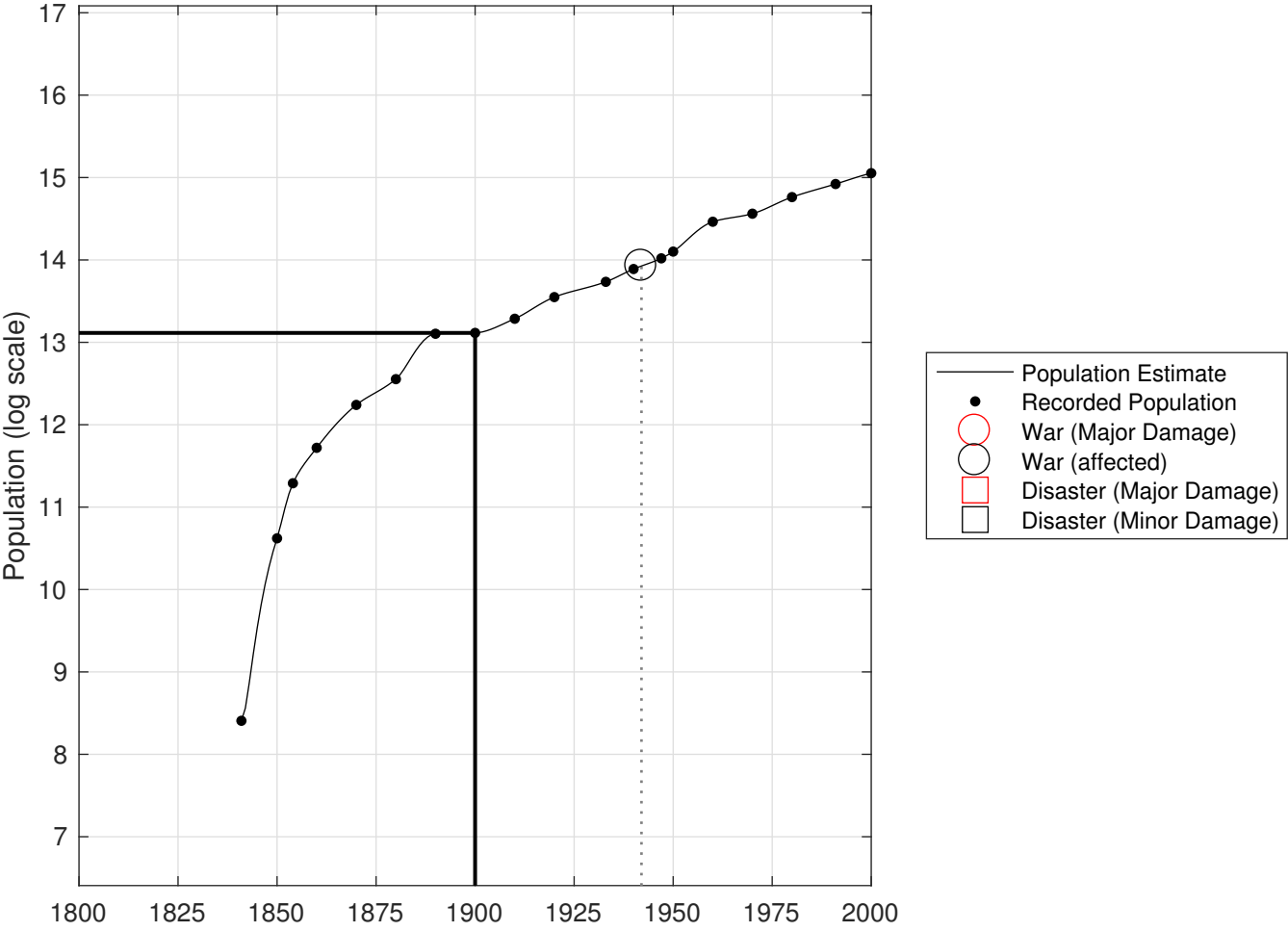
Table 122: Concentration Measures - Manchester

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	8.27
Cumulative density of employment-weighted PP distances at 750 m	%	12.03
Average distance between all prime locations	in kilometres	6.30
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.61
Weighted average distance from EWPPs to 1900 CH	in kilometres	5.40
Average from all prime locations to 1900 CH	in kilometres	1.56
Average distance from global prime locations to 1900 CH	in kilometres	0.19



A.59 Melbourne

Figure 68: Melbourne



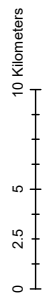
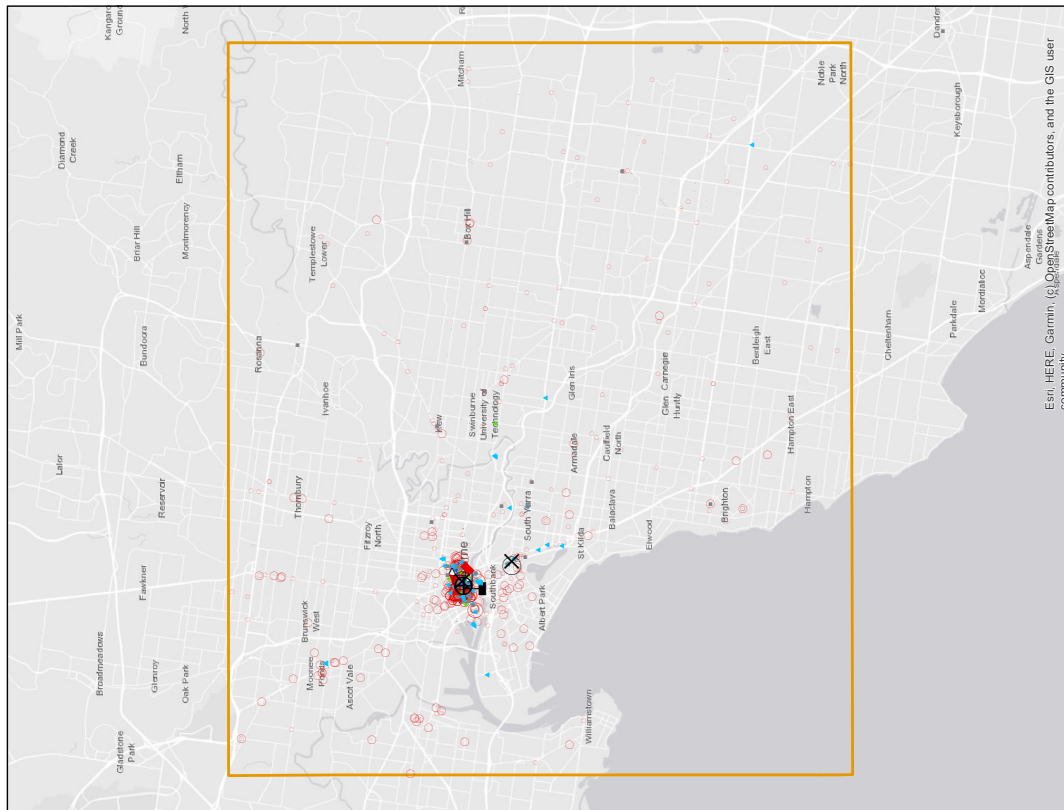
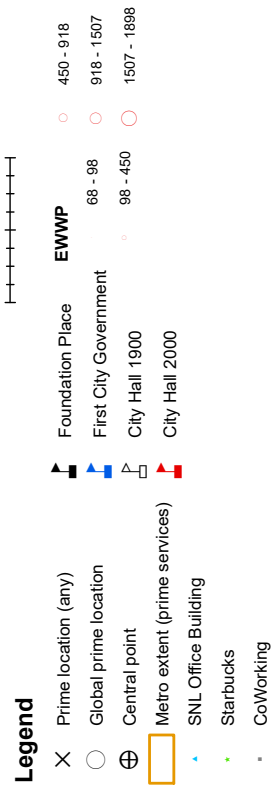
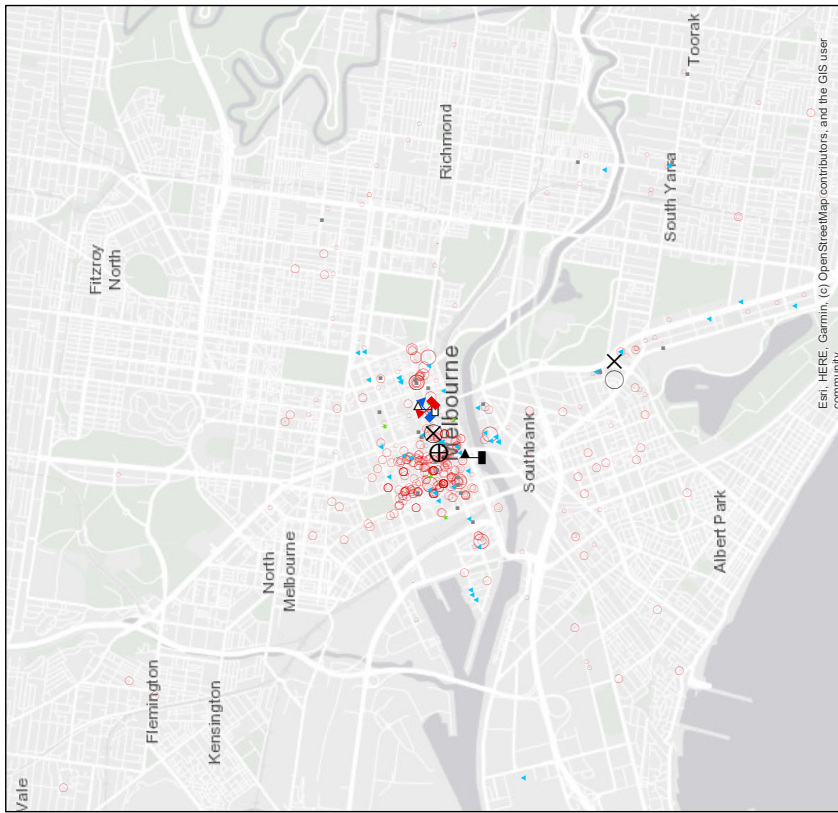


Table 123: Sources: Melbourne ( Australia )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1835	City of Melbourne (1997, p. 8)
First Political Institution <sup>a</sup>	1854	City of Melbourne (1997, p. 32, 34)
City Hall <sup>b</sup>	1900	City of Melbourne (1997, p. 34)
City Hall	2000	City of Melbourne (1997, p. 34)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>c</sup> , 1900, 1950, 2000	City of Melbourne (1997, p.21)
<i>Population Data (1800-2000)</i>		
City Population	1841, 1850, 1854, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1933, 1940, 1947, 1950, 1960, 1970, 1980, 1991, 2000, 2003	City of Melbourne (1997, p. 13), City of Melbourne (1997, p. 21), Satterthwaite (2005, p. 38), Mitchell (2007, p. 47)
Metro Population <sup>d</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>e</sup>	None	
Number of Stations	1910, 1940, 2010	Schwandl (2016), Public Transport Victoria (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1942 <sup>f</sup>	State Library of Victoria (2014)

<sup>a</sup>Before finishing the building and since 1842, the founding of Melbourne, the government rented another place temporarily.

<sup>b</sup>No change in city hall location apparently

<sup>c</sup>No indication that government status ever changed after separation of Victoria from New South Wales in 1851

<sup>d</sup>Footnote from United Nations Population Division (2014): Refers to Greater Melbourne.

<sup>e</sup>Melbourne has a quite advanced commuter rail system, which is in many respects metro like. This is particularly true for the city loop (Public Transport Victoria, 2016), which had started operating fully in 1985. This is a high frequency underground loop with 4 stations with trains running every 2.5 minutes in peak times. We classify this as a metro system and change the number of stations in 2010 to 5 accordingly (Schwandl, 2016). One could argue that the commuter train network is so extensive that it would qualify as a metro.

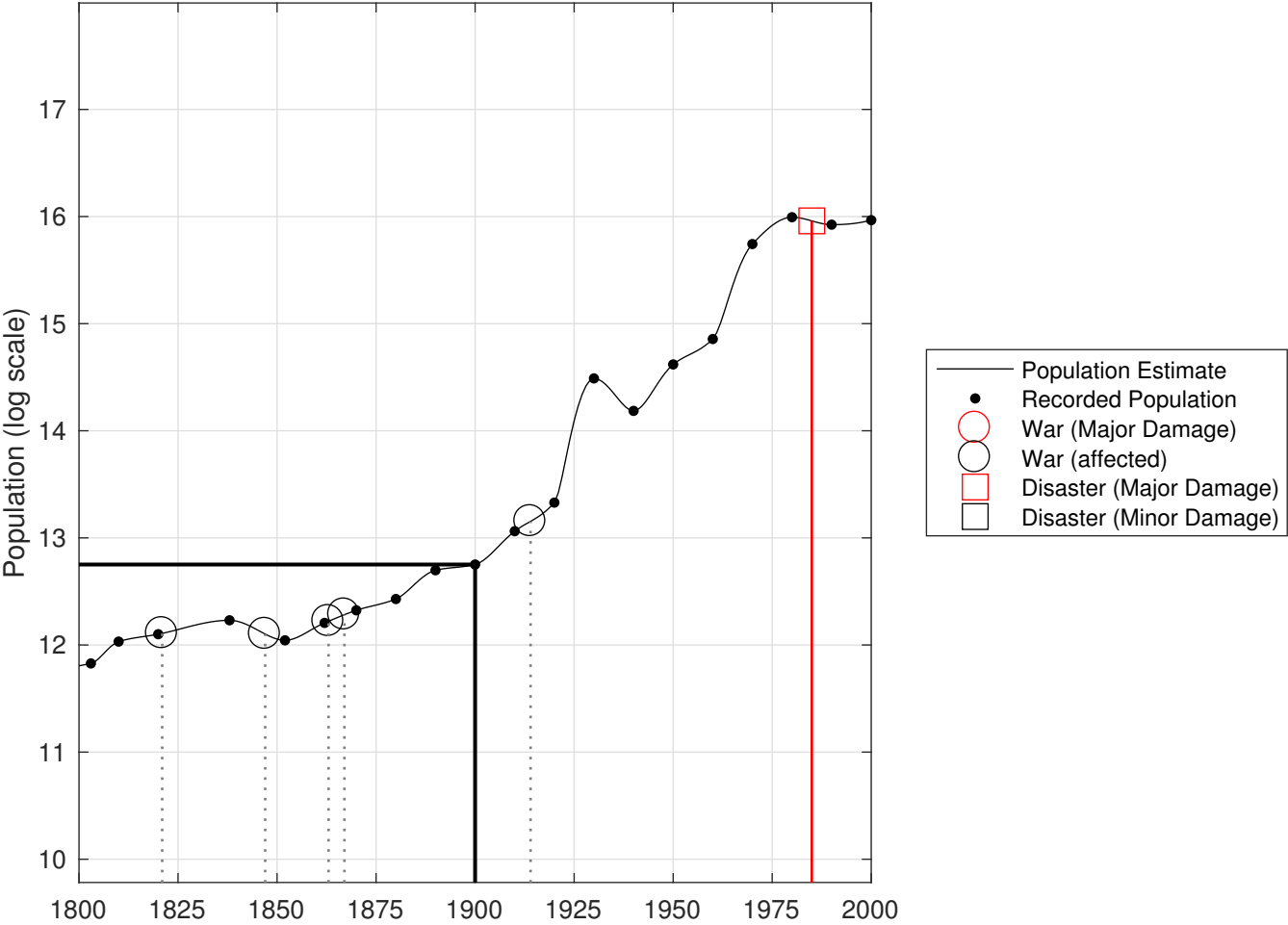
<sup>f</sup>Not directly involved in World War II, but was important American military base.

Table 124: Concentration Measures - Melbourne

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	6.51
Cumulative density of employment-weighted PP distances at 750 m	%	5.09
Average distance between all prime locations	in kilometres	1.03
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-1.11
Weighted average distance from EWPPs to 1900 CH	in kilometres	4.03
Average from all prime locations to 1900 CH	in kilometres	0.39
Average distance from global prime locations to 1900 CH	in kilometres	0.39

A.60 Mexico City

Figure 69: Mexico City



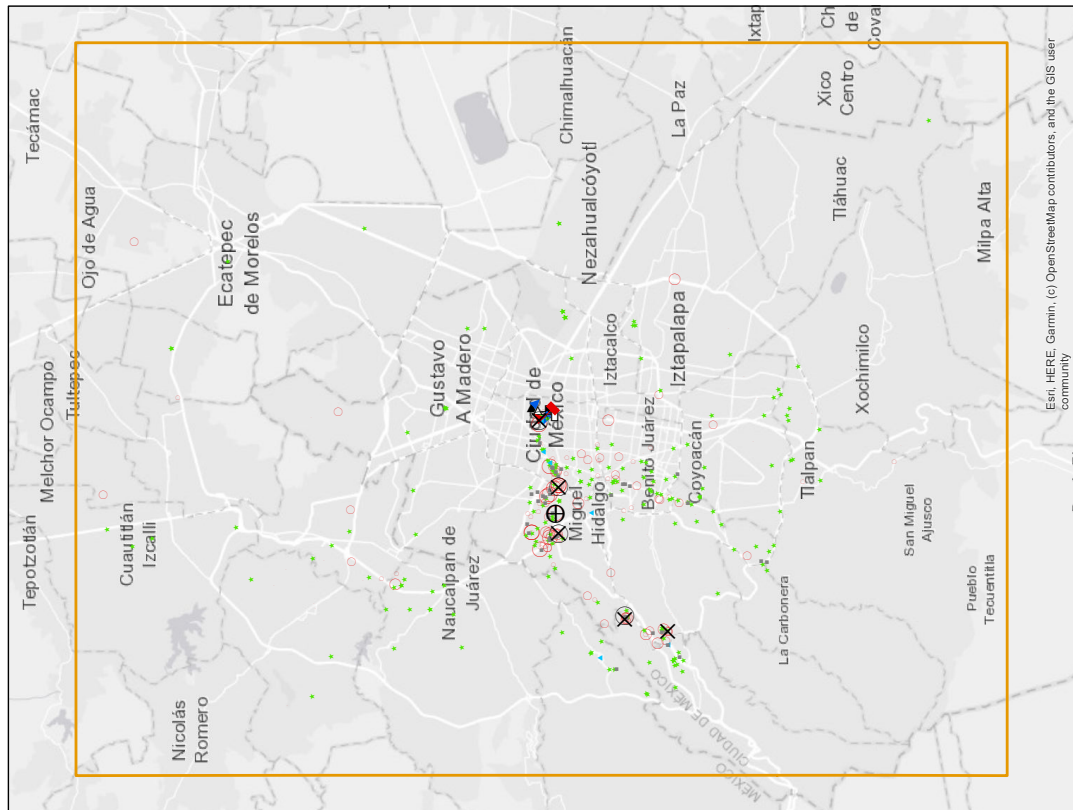
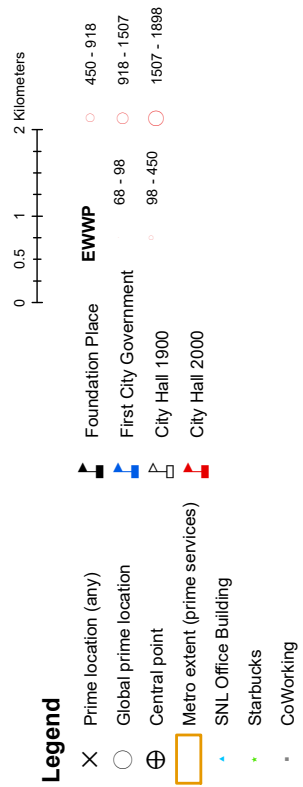
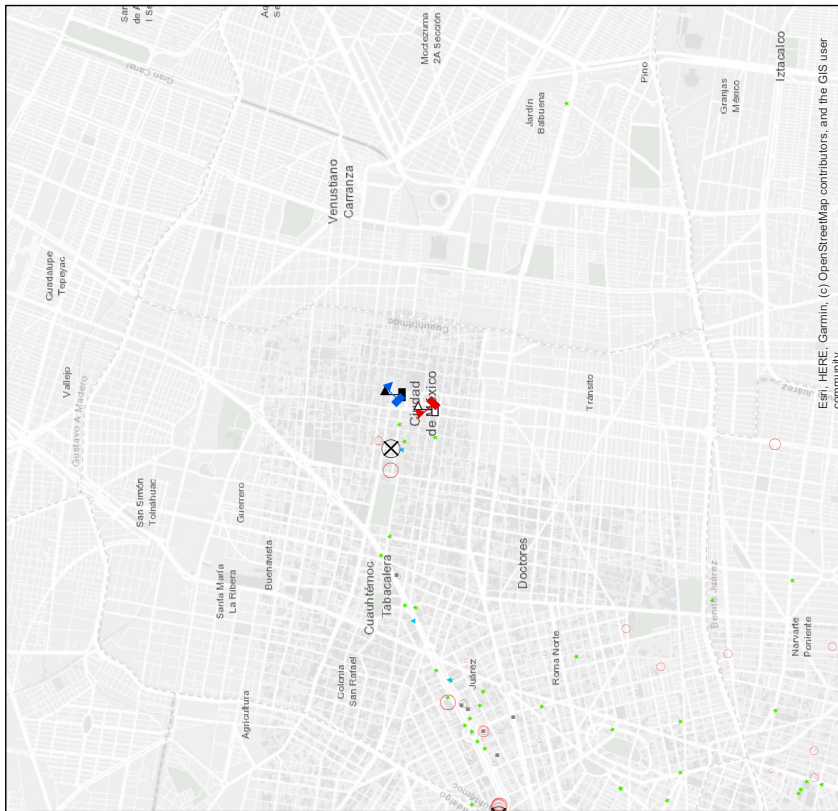


Table 125: Sources: Mexico City ( Mexico )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1325	Kandell (1988, p. 30), Luján (2005, p. 54)
First Political Institution <sup>b</sup>	1375	Luján (2005, p. 54), Hardoy (2014, p. 184)
City Hall	1900	Almandoz (2013, p. 163)
City Hall	2000	Almandoz (2013, p. 163)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>c</sup> , 1900, 1950, 2000	Slack and Chattopadhyay (2009, p. 165)
<i>Population Data (1800-2000)</i>		
City Population	1793, 1803, 1810, 1820, 1838, 1852, 1862, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	West (2001), Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>d</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1969	Institution of Civil Engineers (1990, 105)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	1985 <sup>e</sup>	Kandell (1988, p. 565f)
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1914	Kandell (1988, p. 429f)
International War(s)	1821, 1847, 1863, 1867	Tucker (2009, p. 1139), Kandell (1988, p. 339), Kandell (1988, p. 350), Tucker (2012, p. 724)

<sup>a</sup>The Atztecs went here in 1325, when it was still uninhabited island (Kandell, 1988, p. 30) - we assume that they settled first, where a few years later their first center would evolve into the temple mayor.

<sup>b</sup>It must be said though that first the city was governed in 4 different wards (Kandell, 1988). However, main government buildings were in the streets close to the temple mayor (Hardoy, 2014, p. 184) but it is likely that the main governance structures were close to the temple. Moreover, there is a debate when the temple was built, but 1375 seems the most reasonable data.

<sup>c</sup>Mexico City became capital in 1821 and there has not been any apparent change ever since.

<sup>d</sup>Footnote from United Nations Population Division (2014): Refers to the total population in seventy-six municipalities of the Metropolitan Area of Mexico City.

<sup>e</sup>While this earthquake was disastrous and is mentioned in Mautner (2015), the total number of collapsed buildings was relatively small and thus it is coded as major but not as heavy.

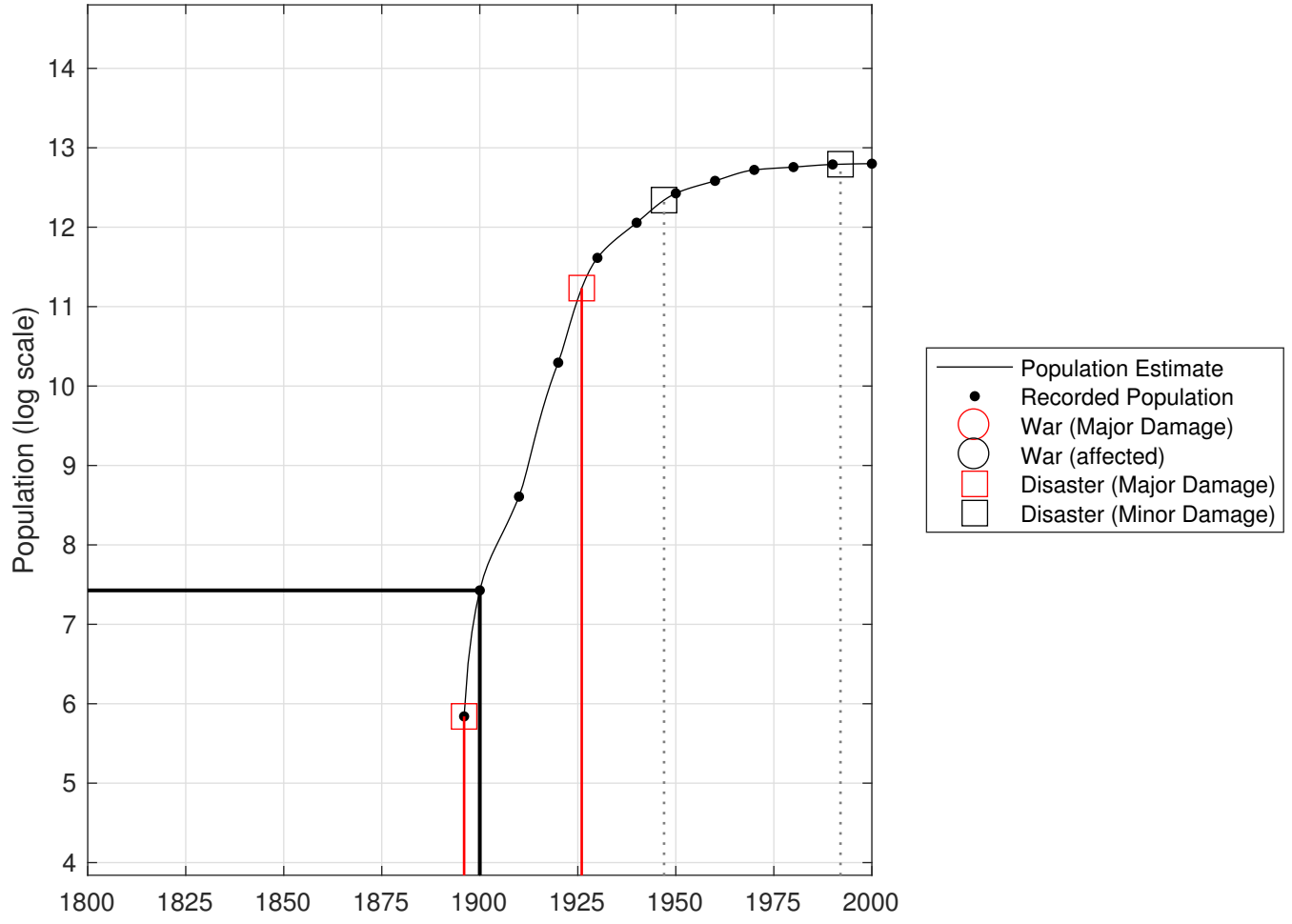
Table 126: Concentration Measures - Mexico City

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	8.21
Cumulative density of employment-weighted PP distances at 750 m	%	18.66
Average distance between all prime locations	in kilometres	6.36
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.23
Weighted average distance from EWPPs to 1900 CH	in kilometres	8.34
Average from all prime locations to 1900 CH	in kilometres	7.67
Average distance from global prime locations to 1900 CH	in kilometres	7.38



# A.61 Miami

Figure 70: Miami



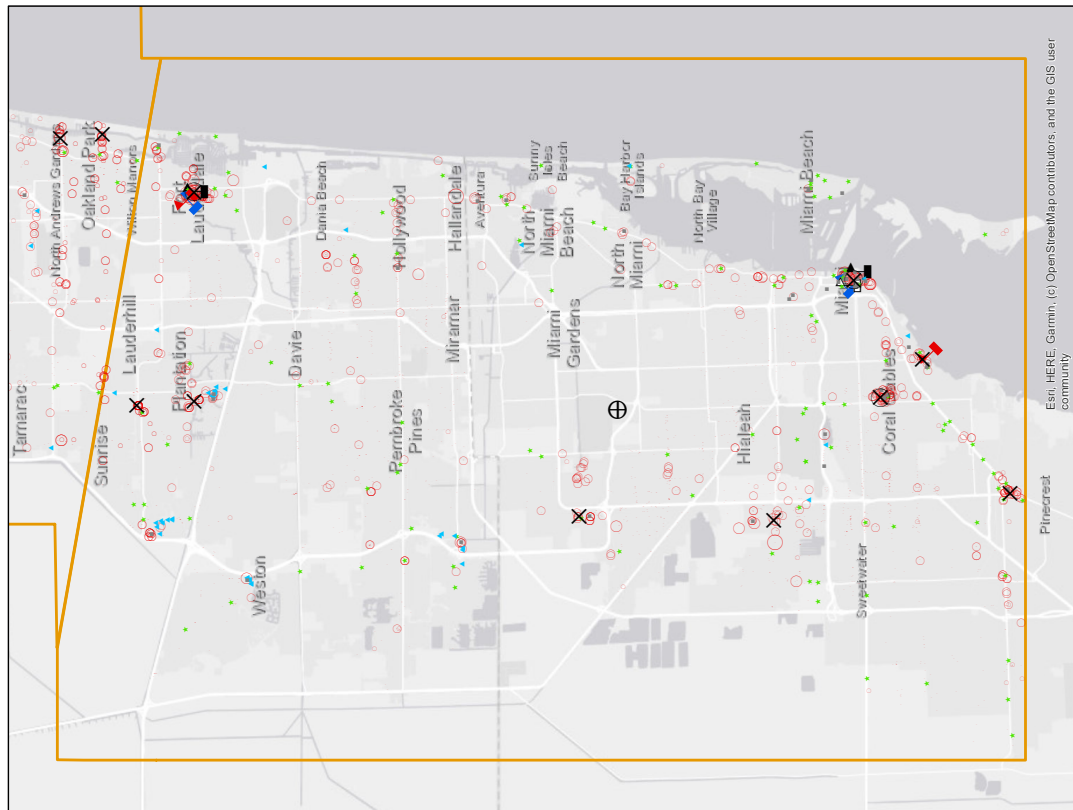
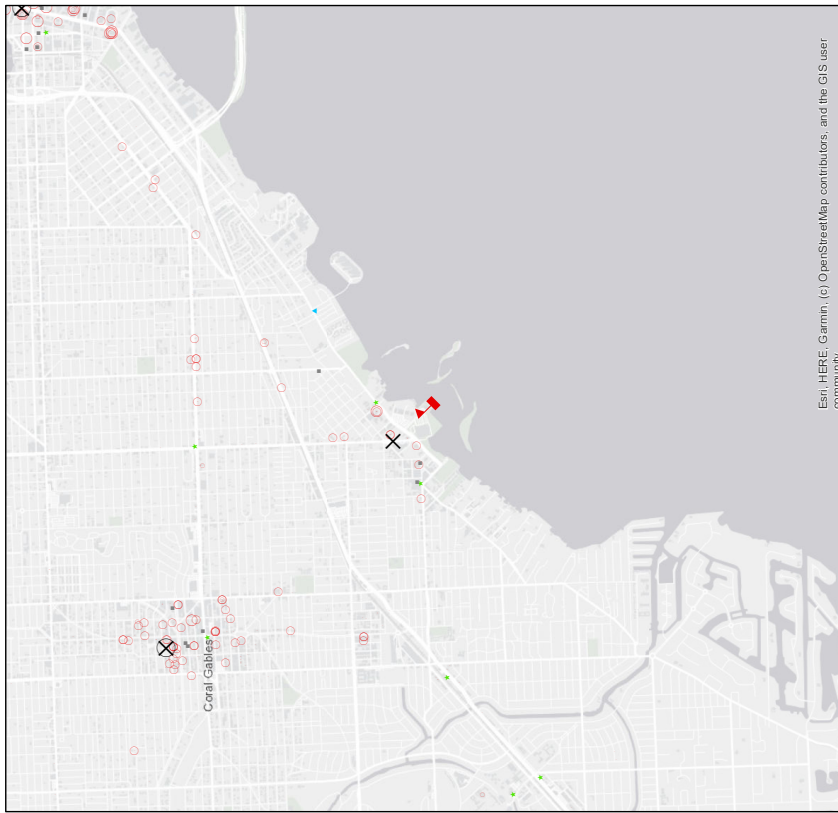


Table 127: Sources: Miami ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1871	Wiggins (1995, p. 5), Bickel et al. (2013, p. 251)
First Political Institution	1896	Wiggins (1995, p. 30)
City Hall <sup>b</sup>	1900	Eaton (1985, p. 9)
City Hall	2000	National Park Service (2015e)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>c</sup> , 1900, 1950, 2000	Wiggins (1995, p. 30)
<i>Population Data (1800-2000)</i>		
City Population	1896, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Catlin (1997, p. 24), Gibson and Jung (2005a, p. 44), George (1996), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1984	Administration (1988, 3–20)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1896	George (1996)
Hurricane(s)	1926 <sup>d</sup> , 1992 <sup>e</sup>	Allen (2012a), George (1996)
Flooding(s)	1947 <sup>f</sup>	Birch and Wachter (2013, p. 56)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>Credited to Brickell Family, close to Brickell park according to (Bickel et al., 2013, p. 251). There were some settlements in the area before, but they were abandoned.

<sup>b</sup>In 1899, the seat of the country was moved from Juno to Miami and this building was the courthouse until 1905.

<sup>c</sup>Area was not settled by 1850.

<sup>d</sup>Neither Encyclopaedia Britannica (2015n) nor George (1996) specify and exact amount, only that “1000s of homes were destroyed.”

<sup>e</sup>Damage was huge in the Miami-Dade County (Fronstin and Holtmann, 1994). However, Miami city was not the center of the hurricane (Allen, 2012a). No records could be found about the damage within Miami. We decide to code it as not having caused major destruction.

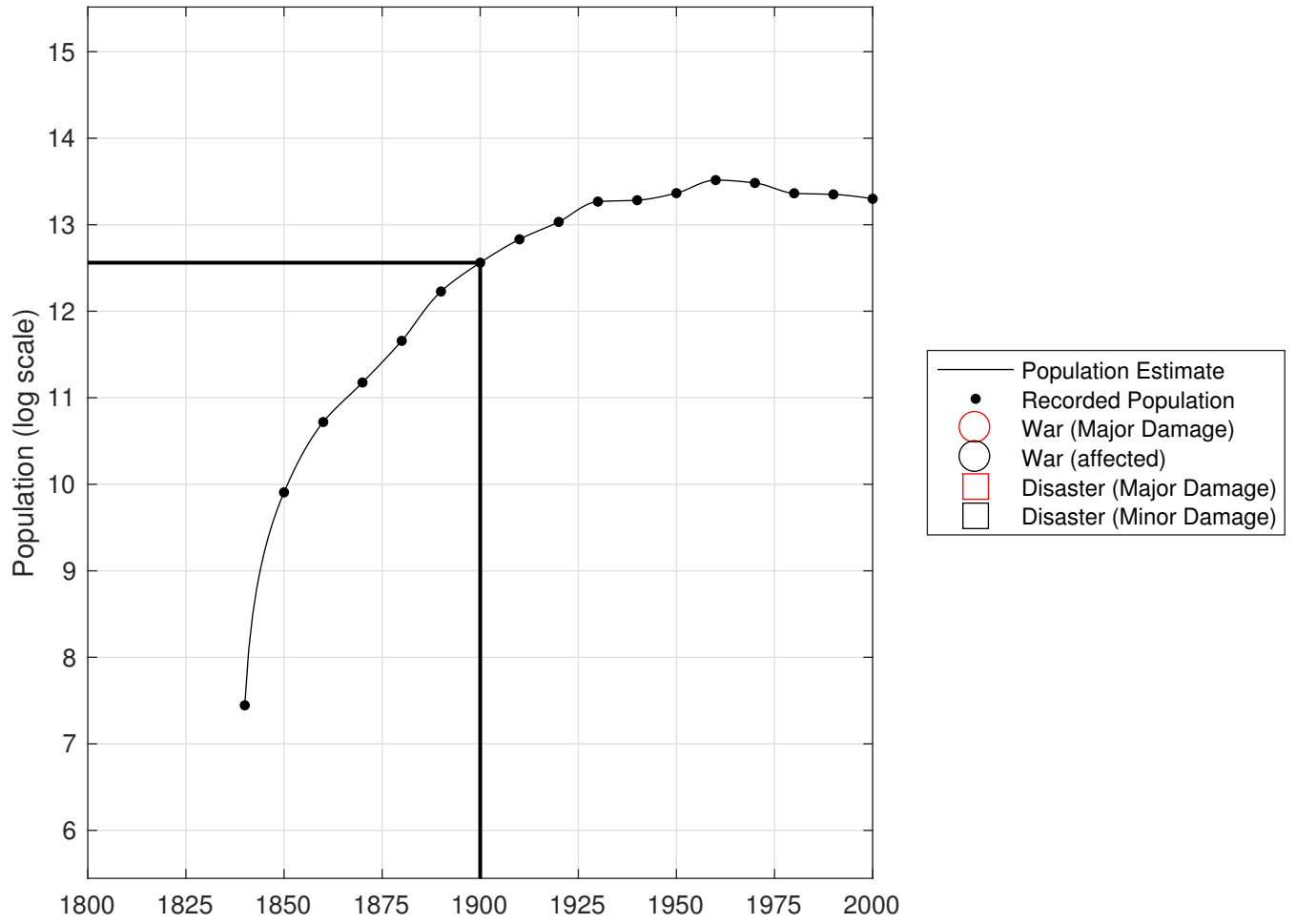
<sup>f</sup>The flood was related to a hurricane. While the damage of this hurricane and others was considerable (Birch and Wachter, 2013, p. 56), the actual damage to the building stock is not clear to us.

Table 128: Concentration Measures - Miami

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	24.45
Cumulative density of employment-weighted PP distances at 750 m	%	97.77
Average distance between all prime locations	in kilometres	23.65
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.49
Weighted average distance from EWPPs to 1900 CH	in kilometres	21.69
Average from all prime locations to 1900 CH	in kilometres	18.73
Average distance from global prime locations to 1900 CH	in kilometres	15.19

## A.62 Milwaukee

Figure 71: Milwaukee



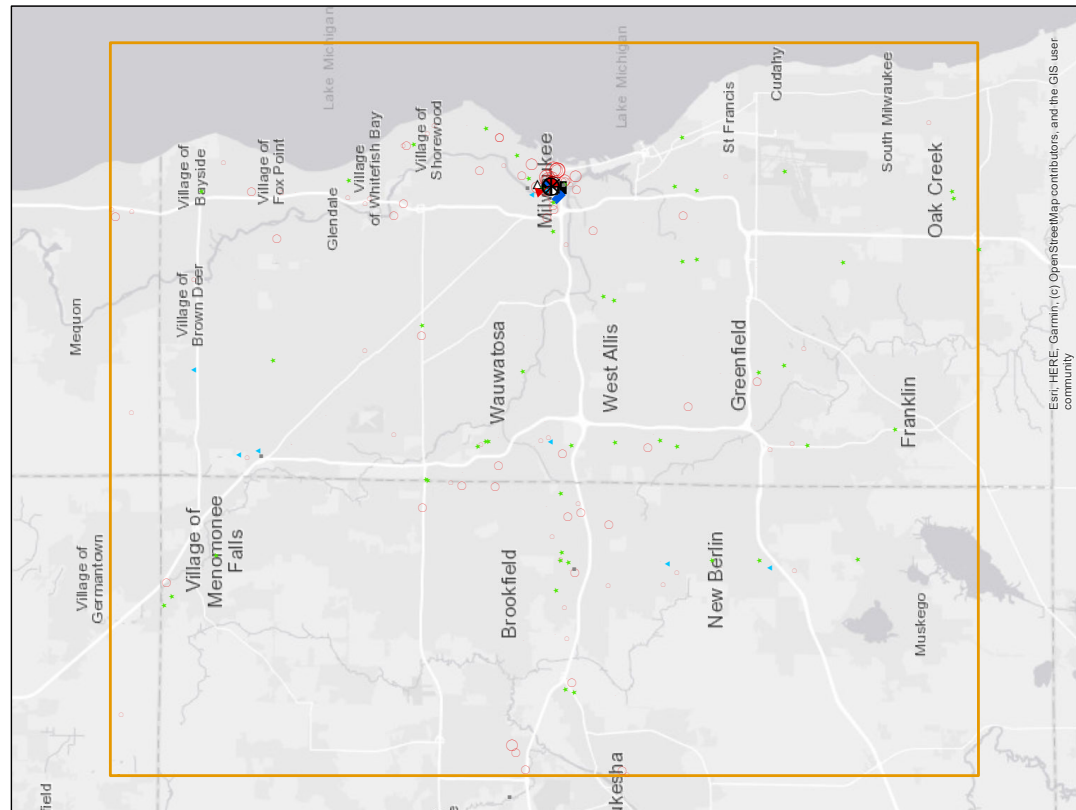
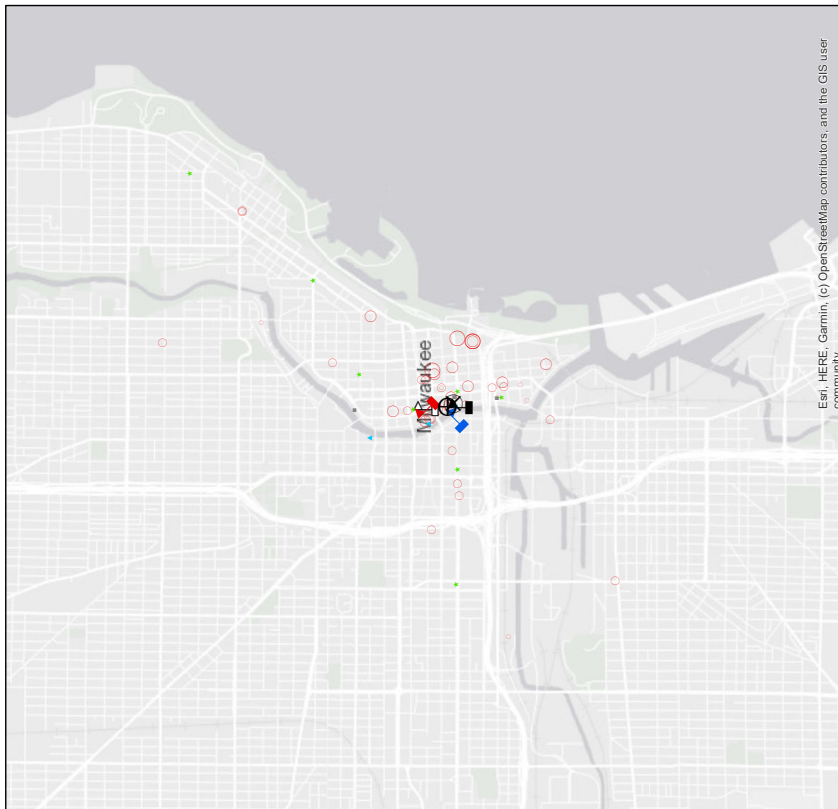


Table 129: Sources: Milwaukee ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1818	Milwaukee Historical Society (2011), Daniels (2010, p. 9)
First Political Institution	1846	City of Milwaukee (2015)
City Hall <sup>a</sup>	1900	City of Milwaukee (2015)
City Hall	2000	City of Milwaukee (2015)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Milwaukee Historical Society (2011)
<i>Population Data (1800-2000)</i>		
City Population	1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Gibson and Jung (2005a, p. 113), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>It has been at same site since the late 1890s.

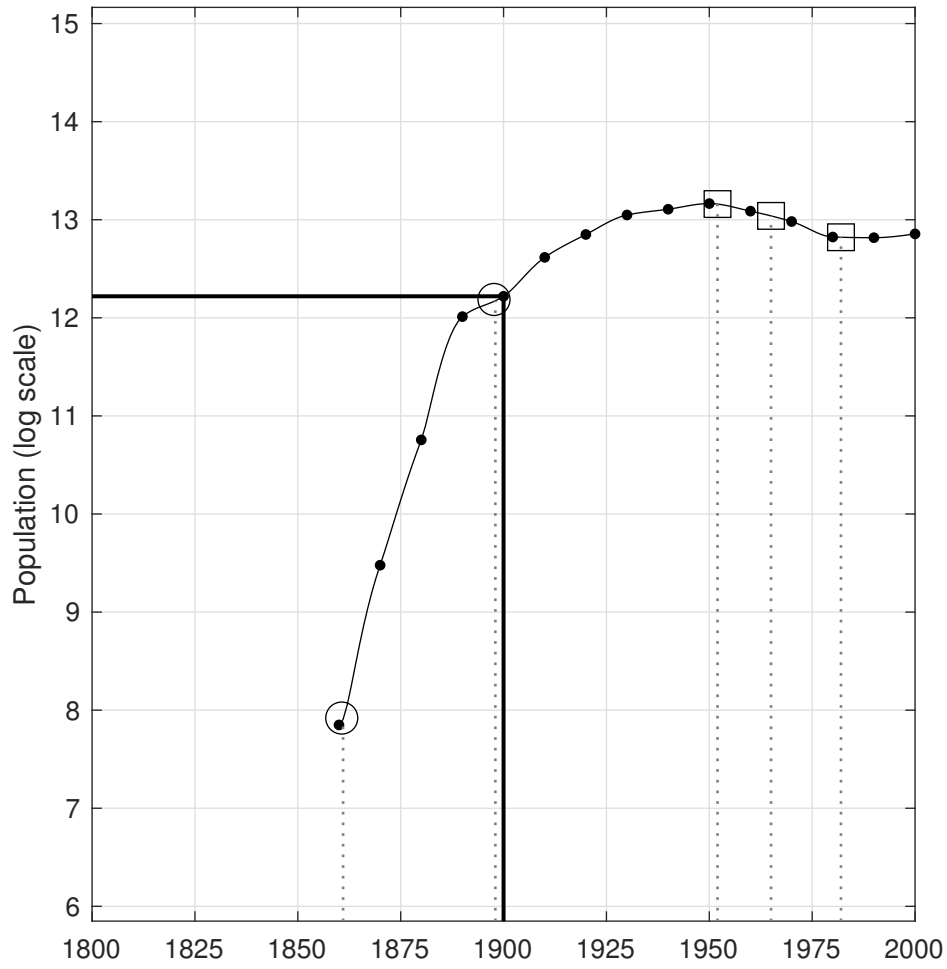
Table 130: Concentration Measures - Milwaukee

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	11.09
Cumulative density of employment-weighted PP distances at 750 m	%	15.96
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.91
Weighted average distance from EWPPs to 1900 CH	in kilometres	7.36
Average from all prime locations to 1900 CH	in kilometres	0.30
Average distance from global prime locations to 1900 CH	in kilometres	0.30



### A.63 Minneapolis

Figure 72: Minneapolis



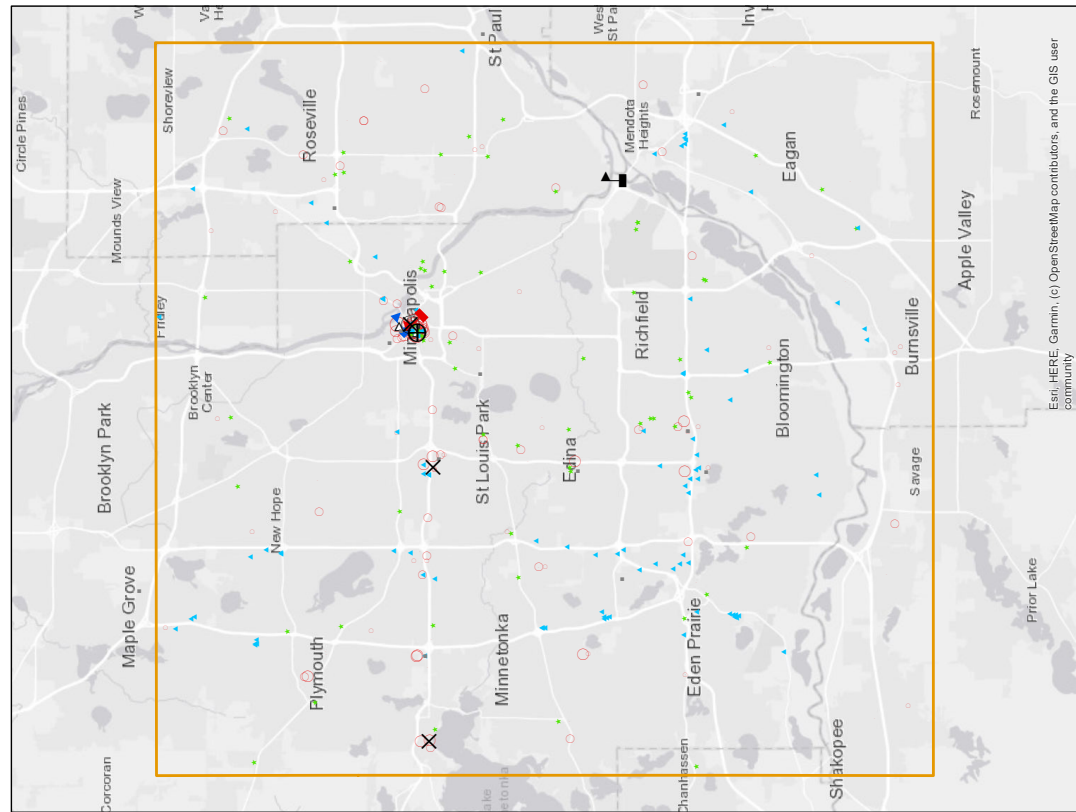
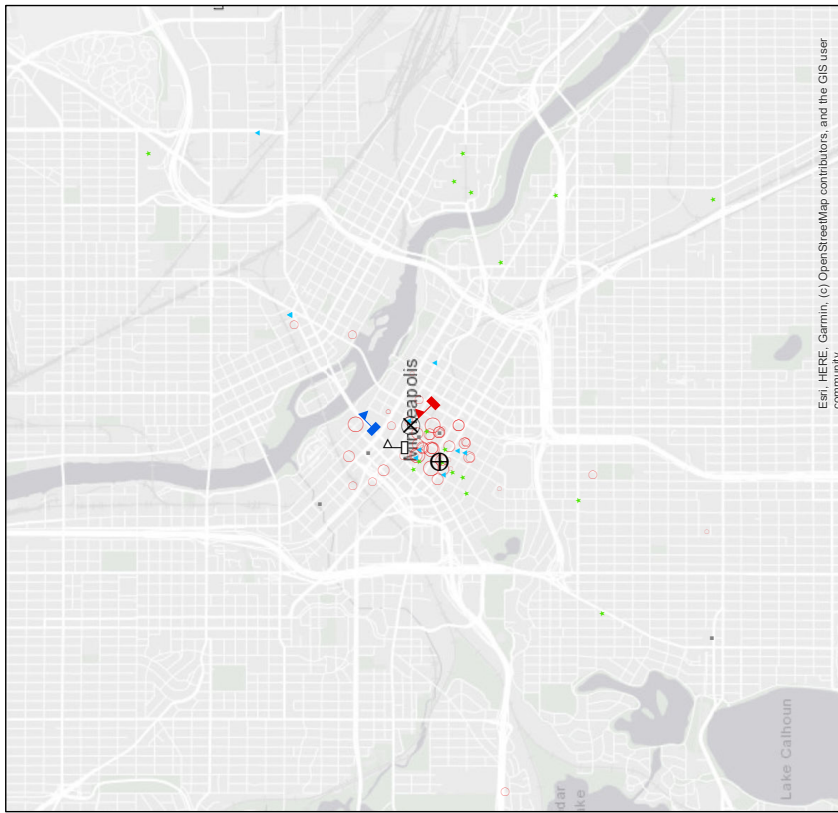


Table 131: Sources: Minneapolis ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1824	National Park Service (2015d)
First Political Institution <sup>b</sup>	1858	Millett (1992, p. 28), City of Minneapolis (2011)
City Hall	1900	City of Minneapolis (2011)
City Hall	2000	City of Minneapolis (2011)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>c</sup> , 1900, 1950, 2000	Millett (1992, p. 14)
<i>Population Data (1800-2000)</i>		
City Population	1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Gibson and Jung (2005a, p. 68), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1982 <sup>d</sup>	Quade (1983, p. 140)
Hurricane(s)	None recorded	
Flooding(s)	1965 <sup>e</sup> , 1952	Strub (1965, p. 120), National Park Service (2015b)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861 <sup>f</sup>	Minnesota Historical Society (2015)
International War(s)	1898 <sup>g</sup>	Minnesota Historical Society (2015)

<sup>a</sup>This is the location of the military post Fort Snelling.

<sup>b</sup>There was a then larger city (St. Anthony) on the other side of the river, which was founded a few years earlier. However, we take the township of Minneapolis as the birthplace of Minneapolis.

<sup>c</sup>Incorporated as a town only in 1856.

<sup>d</sup>A bloc in downtown containing businesses was destroyed, which caused severe damage. However, given the size of the city it is not classified as major damage.

<sup>e</sup>These floods were heavy, but as the extent of destruction is unclear, there are regarded as not having caused major destruction.

<sup>f</sup>Important army base in the Civil War.

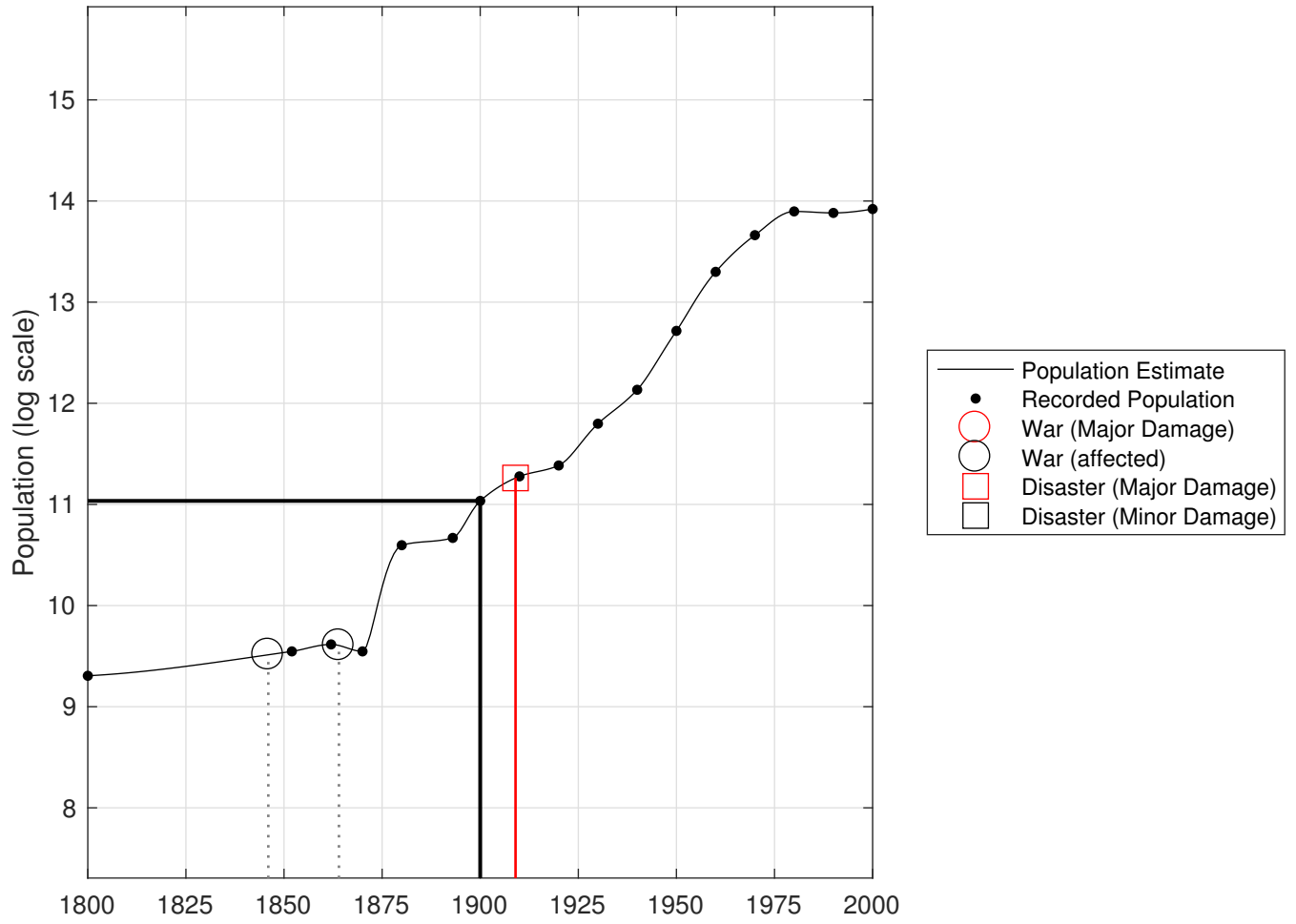
<sup>g</sup>Important fort during the Spanish-American War.

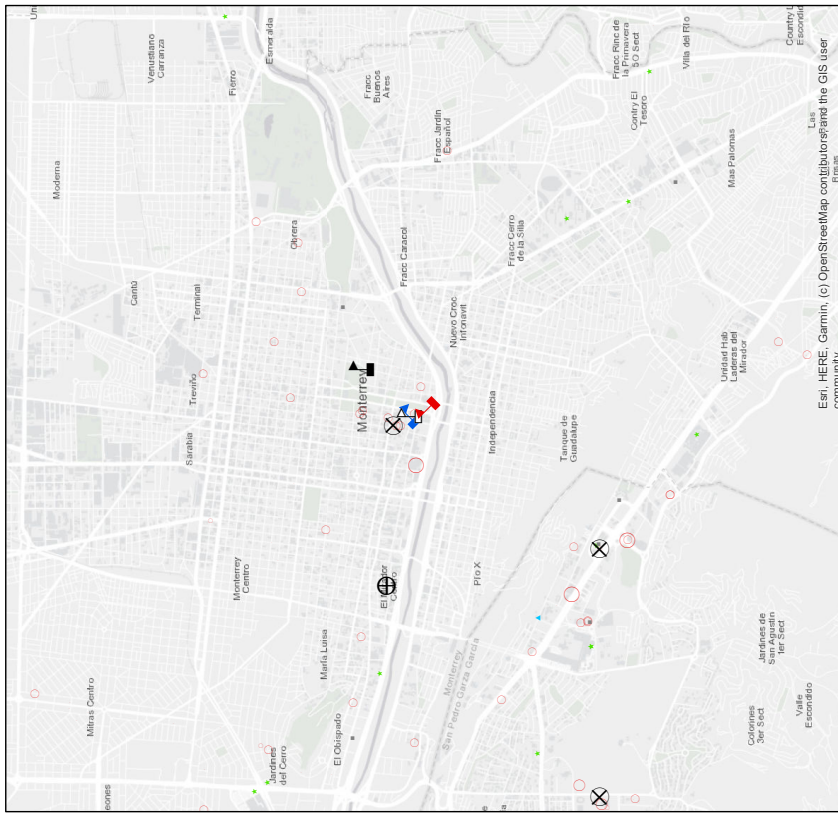
Table 132: Concentration Measures - Minneapolis

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	10.46
Cumulative density of employment-weighted PP distances at 750 m	%	14.50
Average distance between all prime locations	in kilometres	8.77
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.66
Weighted average distance from EWPPs to 1900 CH	in kilometres	6.83
Average from all prime locations to 1900 CH	in kilometres	2.01
Average distance from global prime locations to 1900 CH	in kilometres	0.28

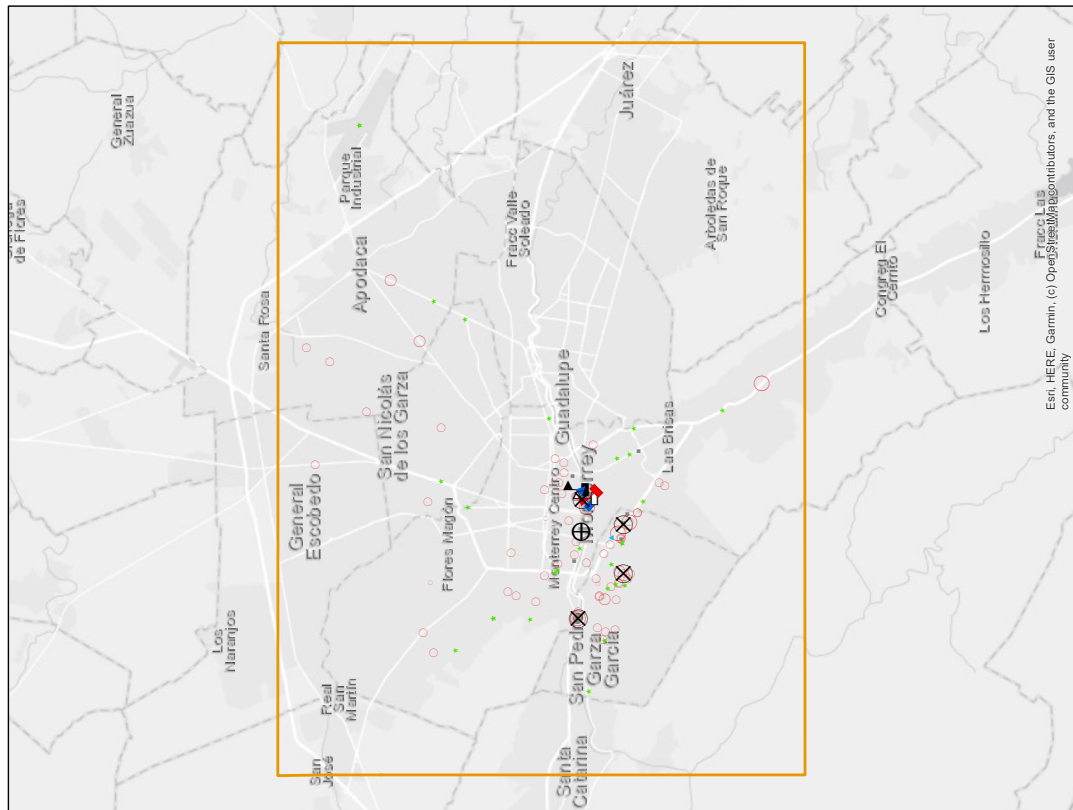
## A.64 Monterrey

Figure 73: Monterrey





- Legend**
- ✕ Prime location (any)
  - Global prime location
  - ⊕ Central point
  - ▭ Metro extent (prime services)
  - ▲ SNL Office Building
  - ★ Starbucks
  - CoWorking
  - ▲ Foundation Place
  - ▲ First City Government
  - ▲ City Hall 1900
  - ▲ City Hall 2000
  - EWWP 450 - 918
  - 68 - 98
  - 98 - 450
  - 1507 - 1898



- 0 2.75 5.5 11 Kilometers

Table 133: Sources: Monterrey ( Mexico )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1596	González (2014, p. 151)
First Political Institution <sup>b</sup>	1612	Municipio de Monterrey (2014)
City Hall <sup>c</sup>	1900	Municipio de Monterrey (2014)
City Hall	2000	Gobierno Municipal de Monterrey (2014)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900, 1950, 2000	Comité de Archivo y Biblioteca (2014)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1852, 1862, 1870, 1880, 1893, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Encyclopaedia Britannica (2014d), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1991	Middleton (2003, 152)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	Encyclopaedia Britannica (2014d), Editors of the Mining Magazine (1909)
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	1909 <sup>e</sup>	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	Hixson (2013, p. 97), Miller (1973)
International War(s)	1846 <sup>f</sup> , 1864 <sup>g</sup>	

<sup>a</sup>There had been 2 unsuccessful settlement attempts (the first 1577) shortly before. None of them lasted long. Judged from a range of different sources, all settlements have been in the same location.

<sup>b</sup>This seemed to have been the first city hall, though the evidence is not unambiguous.

<sup>c</sup>No apparent change in the cityhall, checked with numerous other less credible online sources

<sup>d</sup>Monterrey became regional capital in 1825 and stayed so.

<sup>e</sup>Flood recorded as “devastating.” It is clear from the sources that houses were swept away (Encyclopaedia Britannica, 2014d). As The Kingston Daily Freeman (1909, p. 6) reports that one entire quarter of the city was destroyed, we record it as “heavy.”

<sup>f</sup>US-Mexican War, 2 years of occupation. Destruction is mentioned, American soldiers behaved very badly, but no indication of severe damage to the city as a whole.

<sup>g</sup>French Occupation, no destruction of the city.

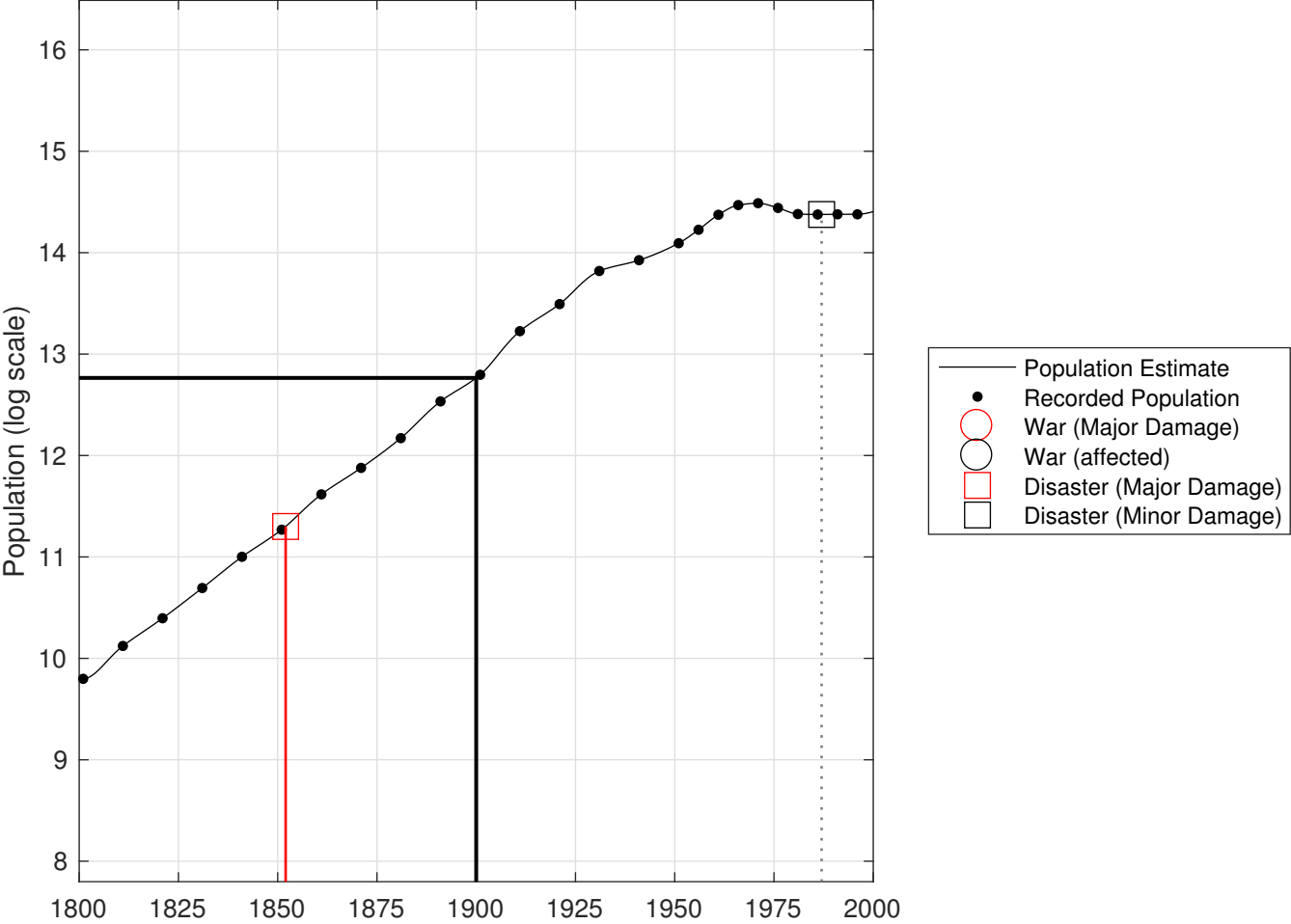
Table 134: Concentration Measures - Monterrey

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	7.51
Cumulative density of employment-weighted PP distances at 750 m	%	22.25
Average distance between all prime locations	in kilometres	3.29
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.52
Weighted average distance from EWPPs to 1900 CH	in kilometres	5.45
Average from all prime locations to 1900 CH	in kilometres	3.37
Average distance from global prime locations to 1900 CH	in kilometres	3.22



A.65 Montreal

Figure 74: Montreal



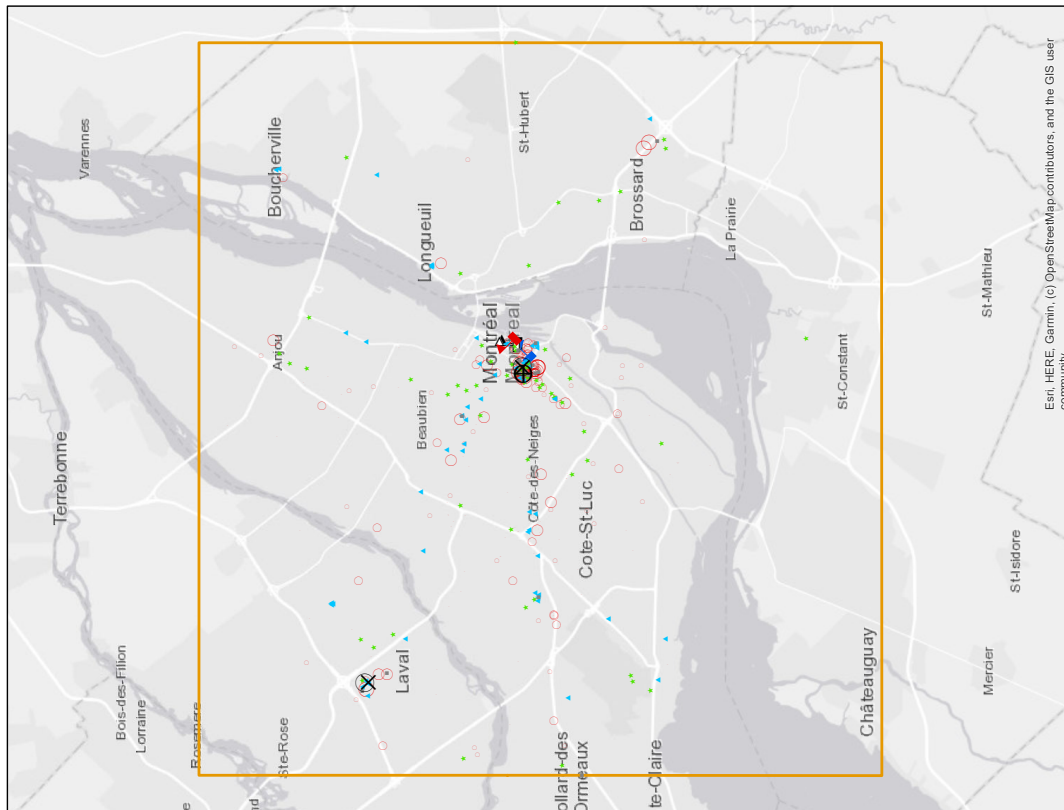
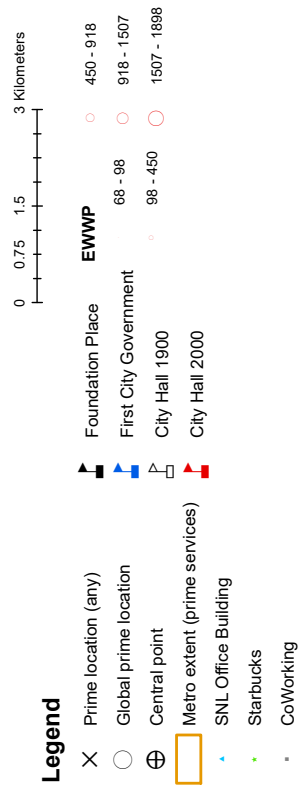
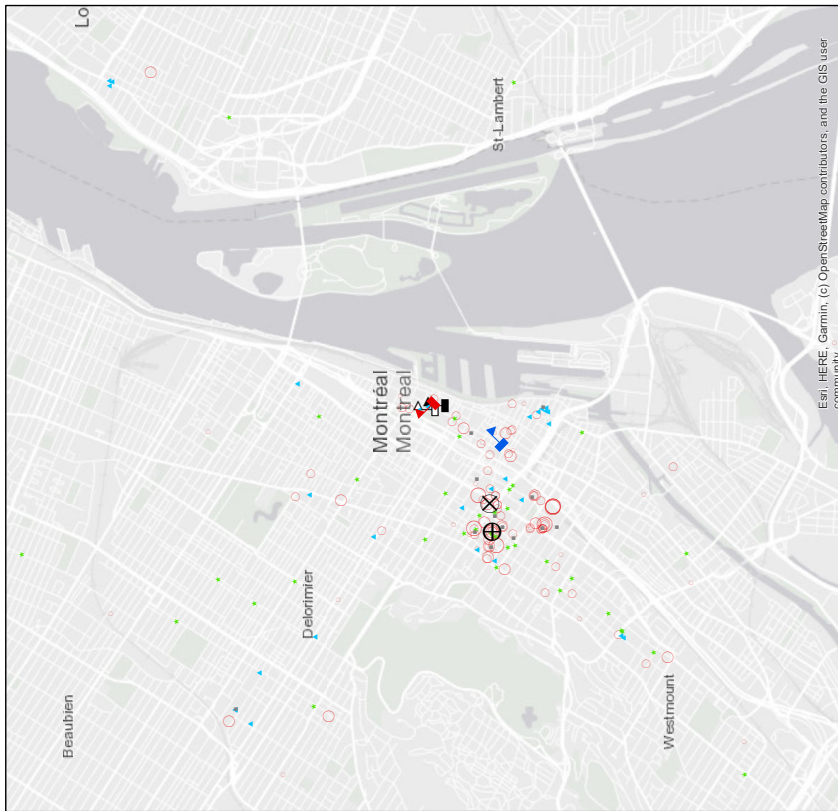


Table 135: Sources: Montreal ( Canada )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1641	Ville de Montral (2000)
First Political Institution <sup>b</sup>	1833	Gouvernement du Québec (2014), Ville de Montreal (2015a)
City Hall <sup>c</sup>	1900	Gouvernement du Québec (2014)
City Hall	2000	Gouvernement du Québec (2014)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900, 1950, 2000	Ville de Montreal (2015c)
<i>Population Data (1800-2000)</i>		
City Population	1791, 1801, 1811, 1821, 1831, 1841, 1851, 1861, 1871, 1881, 1891, 1901, 1911, 1921, 1931, 1941, 1951, 1956, 1961, 1966, 1971, 1976, 1981, 1986, 1991, 1996, 2001	Ville de Montreal (2015b)
Metro Population <sup>e</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1966	Paskins (2015, 35)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1852 <sup>f</sup>	Marsan (1990, p. 268)
Hurricane(s)	None recorded	
Flooding(s)	1987 <sup>g</sup>	Government of Canada (2015)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>Location of missionary settlement.

<sup>b</sup>This is the courthouse, where the first city council met and elected the mayor. An actual city hall would only be built in 1878. The location is named in Atherton (1914, p. 183) and 1930s map is used to locate the court house.

<sup>c</sup>Comment

<sup>d</sup>Incorporated as a city in 1833, but never capital status in Quebec.

<sup>e</sup>Footnote from United Nations Population Division (2014): Refers to the Census Metropolitan Area.

<sup>f</sup>This fire destroyed a very large part of the building stock and is also mentioned in Chevalier (2015).

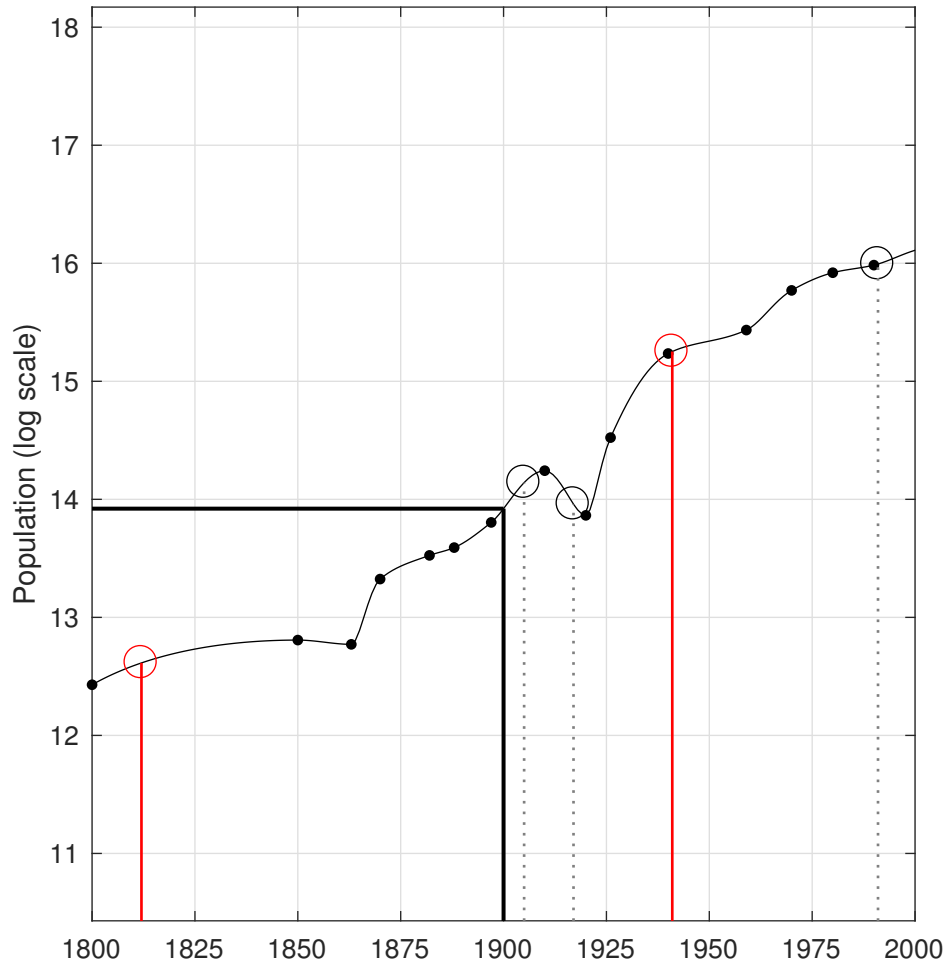
<sup>g</sup>While a heavy flood causing 40 million dollar damage, it did not cause severe destruction to the building stock itself.

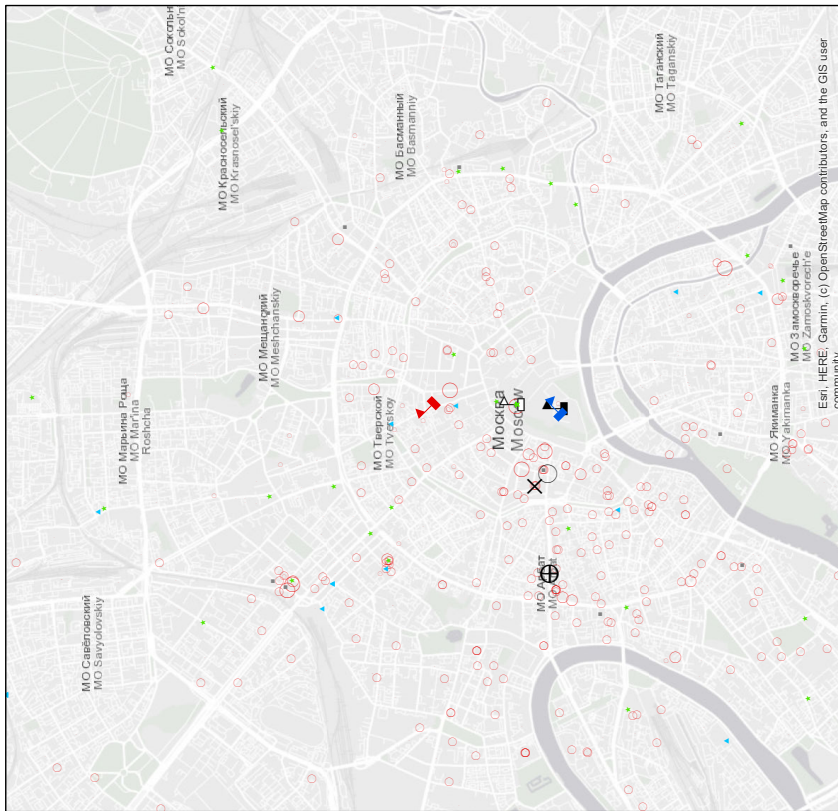
Table 136: Concentration Measures - Montreal

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	6.61
Cumulative density of employment-weighted PP distances at 750 m	%	7.16
Average distance between all prime locations	in kilometres	8.01
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.96
Weighted average distance from EWPPs to 1900 CH	in kilometres	4.84
Average from all prime locations to 1900 CH	in kilometres	2.28
Average distance from global prime locations to 1900 CH	in kilometres	2.28

# A.66 Moscow

Figure 75: Moscow





- Legend**
- ✕ Prime location (any)
  - Global prime location
  - ⊕ Central point
  - ▭ Metro extent (prime services)
  - ▲ SNL Office Building
  - ★ Starbucks
  - CoWorking
  - ▲ Foundation Place
  - ▭ First City Government
  - ▭ City Hall 1900
  - ▭ City Hall 2000
  - 450 - 918
  - 68 - 98
  - 98 - 450
  - 1507 - 1898

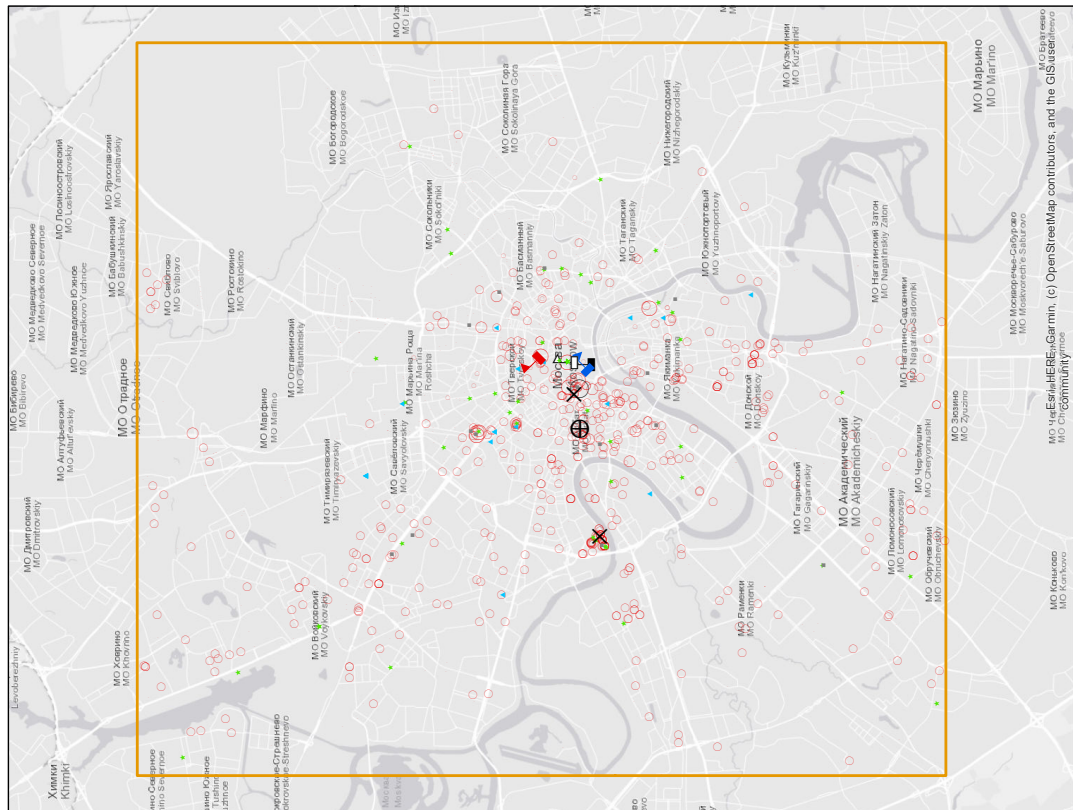


Table 137: Sources: Moscow ( Russia )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1147	Brooke (2006, p.4)
First Political Institution <sup>a</sup>	1156	Brooke (2006, p.3), Ring et al. (2013b, p. 497)
City Hall	1900	Brooke (2006, p. 56)
City Hall	2000	Bell (2002, p. 410)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950 <sup>b</sup> , 2000	Colton (1998, p.11), Colton (1998, p.26)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1863, 1870, 1882, 1888, 1897, 1910, 1920, 1926, 1940, 1959, 1970, 1980, 1990, 2002, 2010	Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1935	Victor and Ponnuswamy (2012, 5)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1905 <sup>c</sup> , 1917 <sup>d</sup> , 1991 <sup>e</sup>	Colton (1998, p.11), Colton (1998, p.51), Colton (1998, p.9)
International War(s)	1812 <sup>f</sup> , 1941 <sup>g</sup>	Brooke (2006, p.12), Ioffe (2015), Nagorski (2007, p.167), Stahel (2013, p. 222f)

<sup>a</sup>Fortification of the city by Yuri Dolgoruky at today's location of the Kremlin.

<sup>b</sup>Became capital again from 1918 on, between 1712-1818 St. Petersburg was the capital.

<sup>c</sup>Russian Revolution lasted until 1907.

<sup>d</sup>February Revolution: end of monarchy.

<sup>e</sup>August Coup, end of Sowjet Union

<sup>f</sup>Invasion by the French. Patriotic War of 1812. Russians themselves burnt the city down.

<sup>g</sup>World War II: Bombings were not as extensive as for other cities, but considerable damage was still done. We code it as major although it is mentioned in Ioffe (2015).

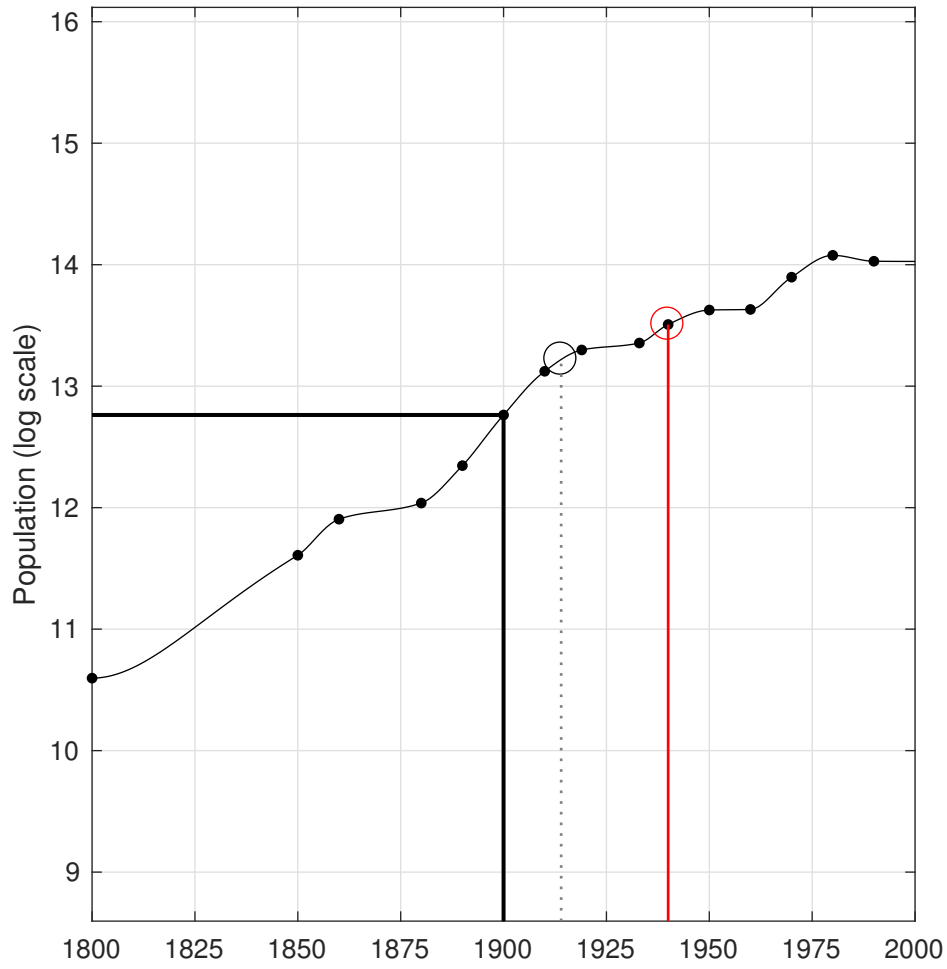
Table 138: Concentration Measures - Moscow

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	6.72
Cumulative density of employment-weighted PP distances at 750 m	%	36.70
Average distance between all prime locations	in kilometres	2.01
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.58
Weighted average distance from EWPPs to 1900 CH	in kilometres	4.98
Average from all prime locations to 1900 CH	in kilometres	3.08
Average distance from global prime locations to 1900 CH	in kilometres	0.86



## A.67 Munich

Figure 76: Munich



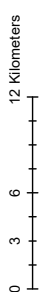
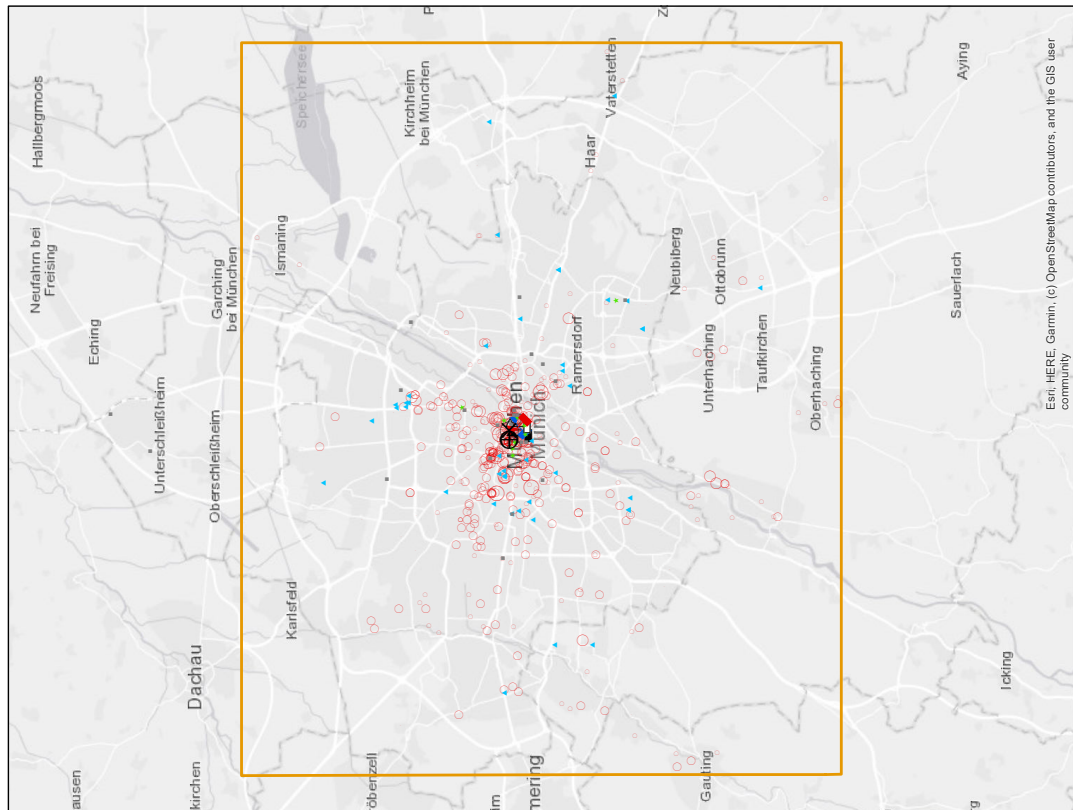
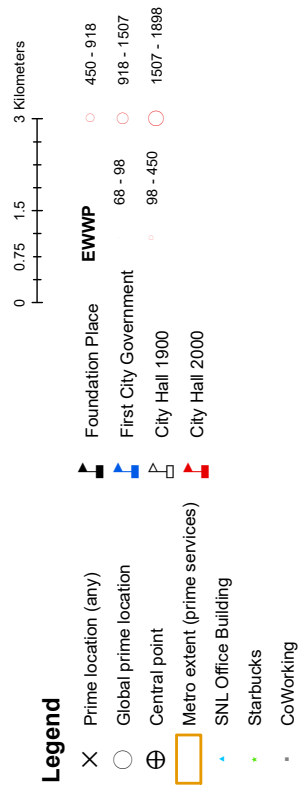
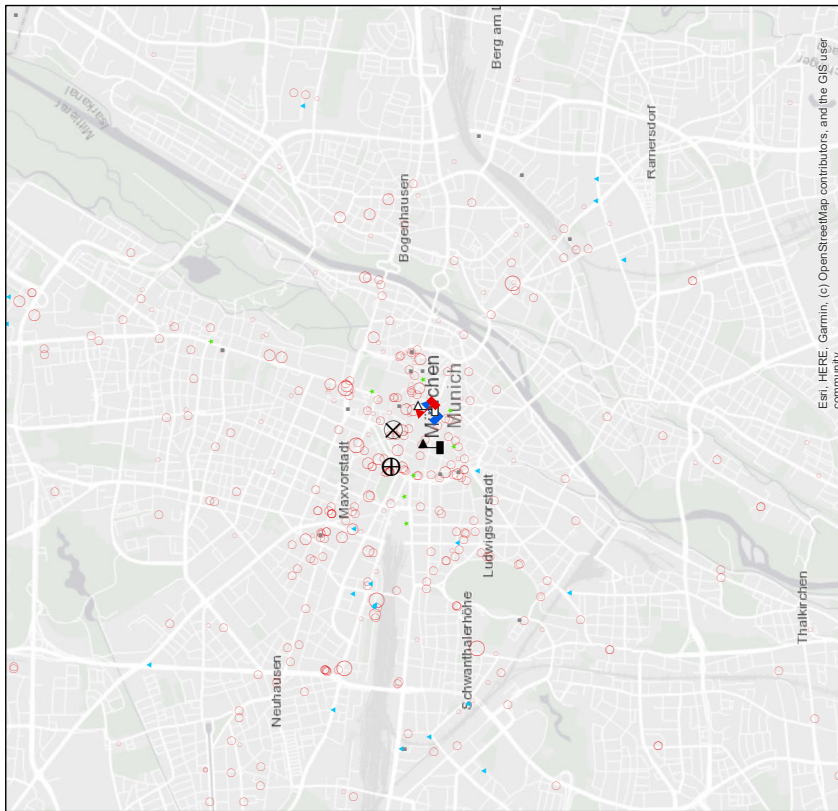


Table 139: Sources: Munich ( Germany )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	782	Bauer (2008, p. 18)
First Political Institution <sup>b</sup>	1158	Stadt München (2014a), Stadt München (2014c)
City Hall	1900	Stadt München (2014a)
City Hall	2000	Stadt München (2014a)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Stadt München (2014b)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1860, 1880, 1890, 1900, 1910, 1919, 1933, 1940, 1950, 1960, 1970, 1980, 1990, 2002, 2009	Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1971	Schmucki (2001, 327)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1914 <sup>c</sup> , 1940 <sup>d</sup>	Stadt München (2014b)

<sup>a</sup>In 782 a small areal was granted to order of St Benedict. This settlement was monastic and most likely at Altheimer Eck.

<sup>b</sup>Founded at the Schrammenplatz by declaration of Heinrich dem Lwen. This place is today Marienplatz (Bayrisches Hauptmünzamt, 2015). It is fair to assume that the seat of power was here. The first actual townhall was also built here later (Stadt München, 2014a).

<sup>c</sup>No severe destruction recorded in city timeline.

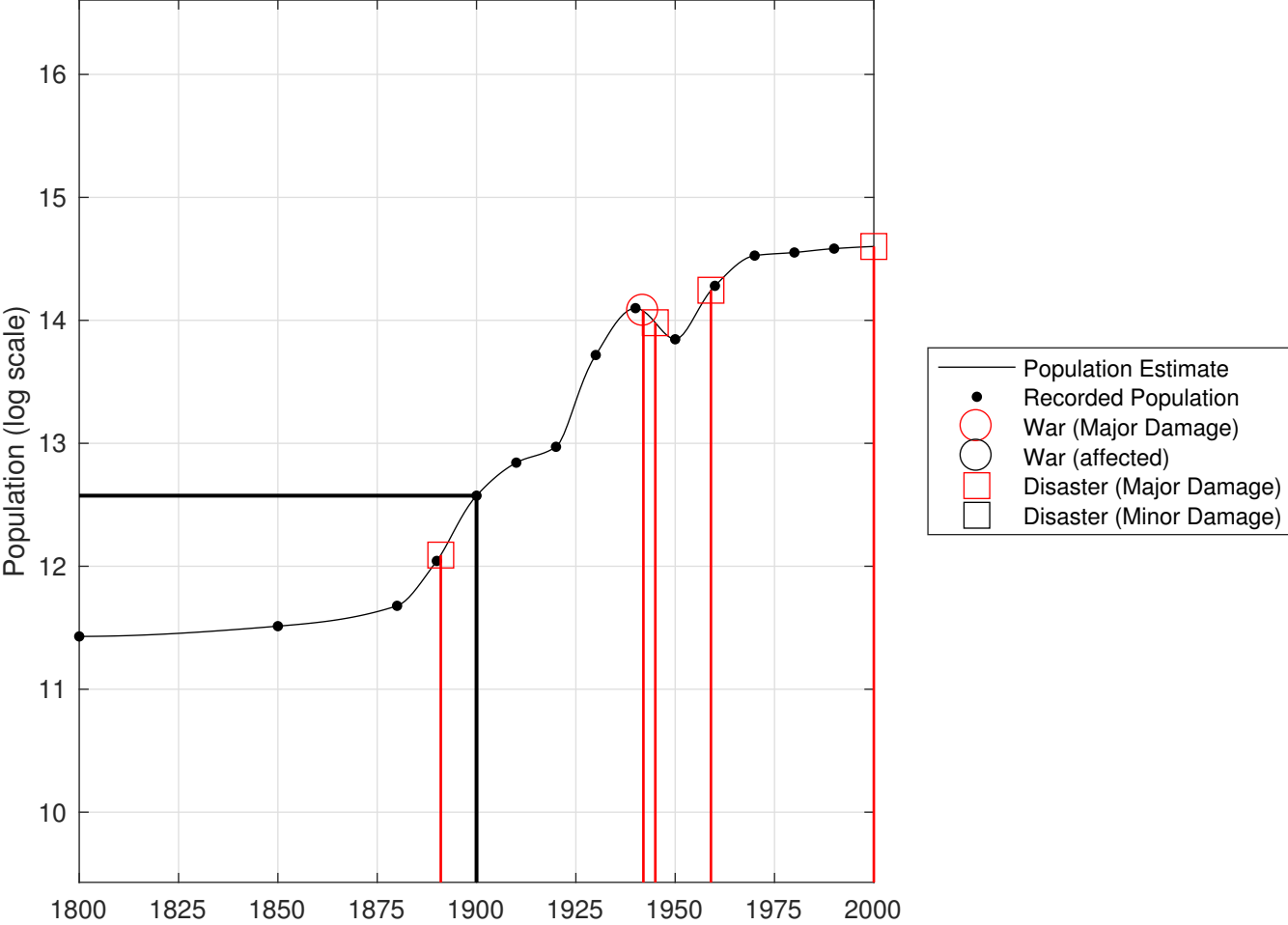
<sup>d</sup>Air raids on Munich destroyed more than 40 % of ist building stock (Encyclopaedia Britannica, 2014e).

Table 140: Concentration Measures - Munich

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	4.90
Cumulative density of employment-weighted PP distances at 750 m	%	13.40
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.79
Weighted average distance from EWPPs to 1900 CH	in kilometres	3.29
Average from all prime locations to 1900 CH	in kilometres	0.43
Average distance from global prime locations to 1900 CH	in kilometres	0.43

A.68 Nagoya

Figure 77: Nagoya



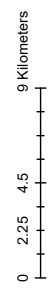
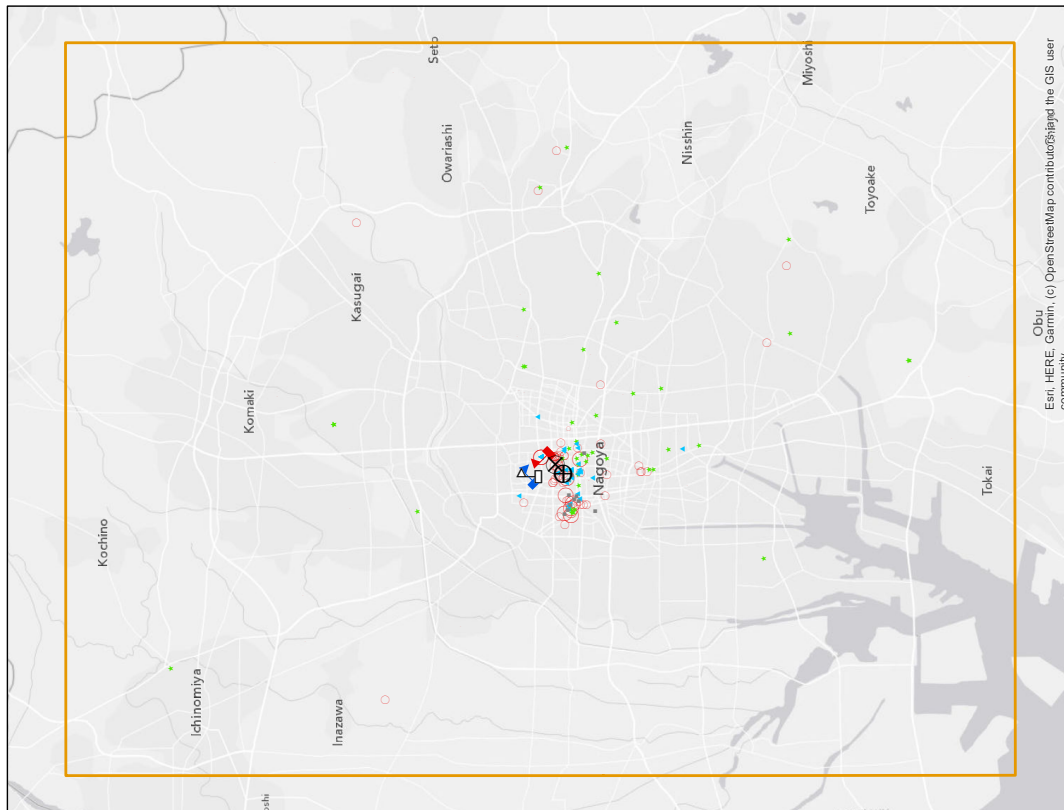
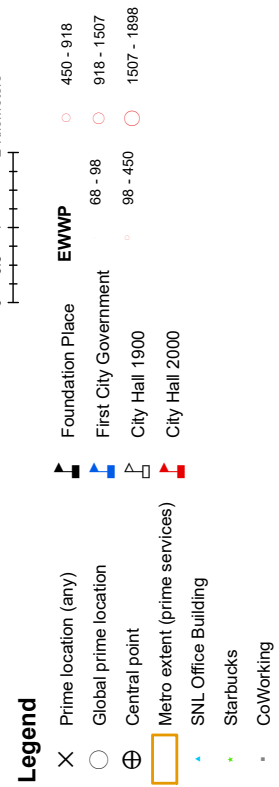
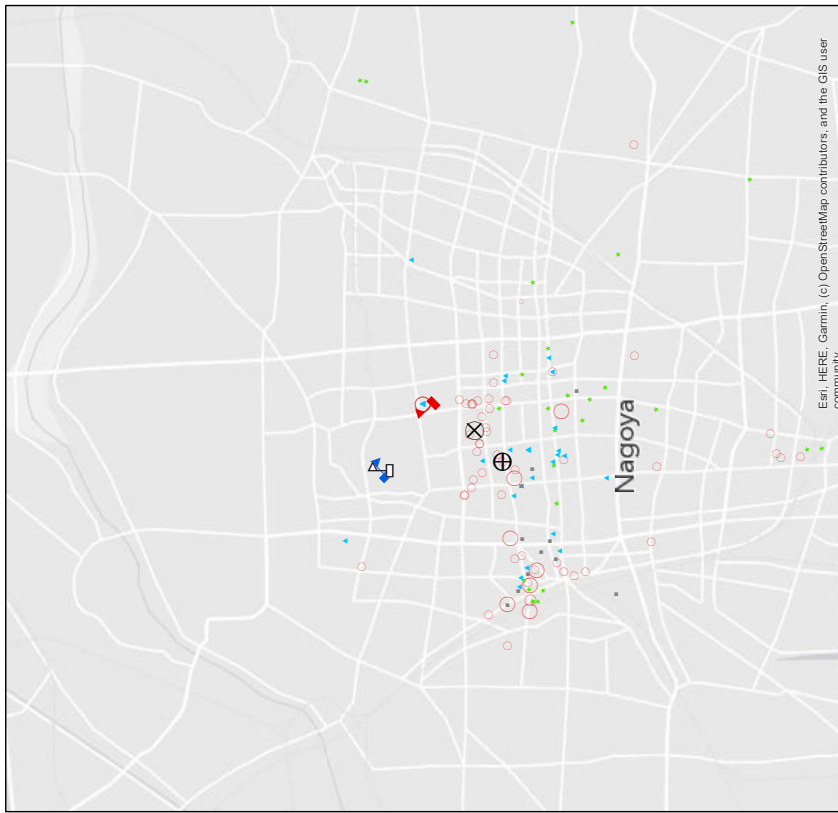


Table 141: Sources: Nagoya ( Japan )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1610	Nagoya City Council (2014, p. 2), Nagoya-shi City Council (1965, p. 5)
First Political Institution	1610	Nagoya City Council (2014, p. 2), Nagoya-shi City Council (1965, p. 5)
City Hall <sup>b</sup>	1900	Reynolds (2001, p. 91)
City Hall	2000	Reynolds (2001, p. 91)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>c</sup> , 1900, 1950, 2000	Hoover (2011, p. 203)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2004	Marzluff et al. (2008, p. 30), Morishima (1984, p. 59), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1957	Shelton (2012, 145)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	1891, 1945 <sup>d</sup>	Masaki et al. (1988, p. 81)
Fire(s)	None recorded	
Hurricane(s)	1959 <sup>e</sup>	Nagoya International Center (2010)
Flooding(s)	2000	Zhai et al. (2003)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1942 <sup>f</sup>	Sandler (2003, p. 178)

<sup>a</sup>The city was built around the castle founded in 1610. A shogun in power just moved an entire city to this strategic spot.

<sup>b</sup>A city hall was built in 1933 and seems to be the first one, thus we assume that the government stayed in the castle before.

<sup>c</sup>Owari capital was moved to Nagoya in the 17th century, no change occurred except for the creation of Aichi province of which Nagoya is still the capital (1871).

<sup>d</sup>Earthquakes in 1944 and 1945, which we count as one event here. They caused severe damage.

<sup>e</sup>"1,851 residents were killed, 118,000 buildings were damaged or destroyed" (Nagoya International Center, 2010).

<sup>f</sup>Air Raids destroyed almost 25 % Nagoya (Nagoya International Center, 2010), including Nagoya castle. On other disasters, no information could be found on Encyclopaedia Britannica (2013b).

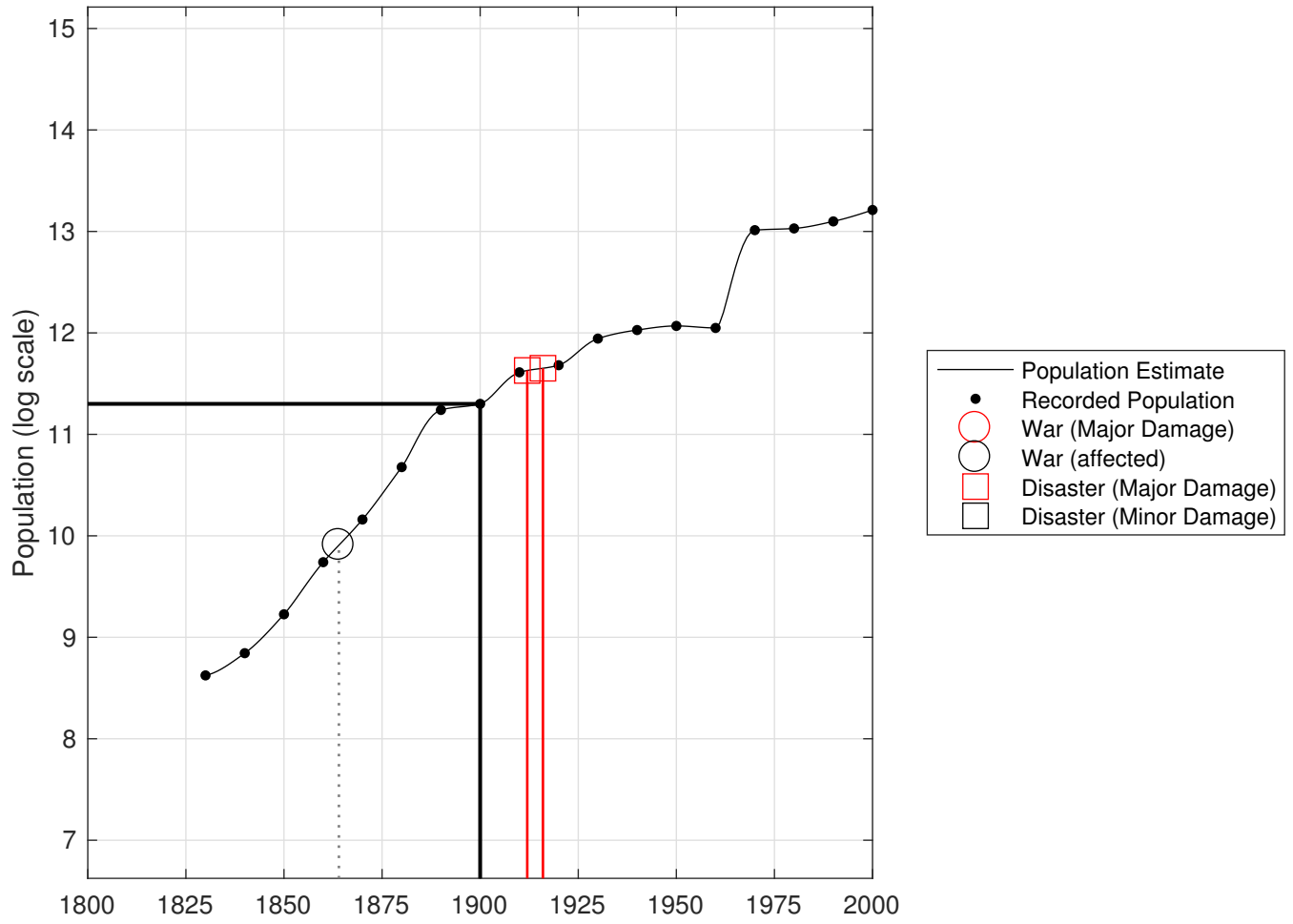
Table 142: Concentration Measures - Nagoya

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	3.36
Cumulative density of employment-weighted PP distances at 750 m	%	4.90
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.09
Weighted average distance from EWPPs to 1900 CH	in kilometres	2.72
Average from all prime locations to 1900 CH	in kilometres	1.11
Average distance from global prime locations to 1900 CH	in kilometres	1.11



A.69 Nashville

Figure 78: Nashville



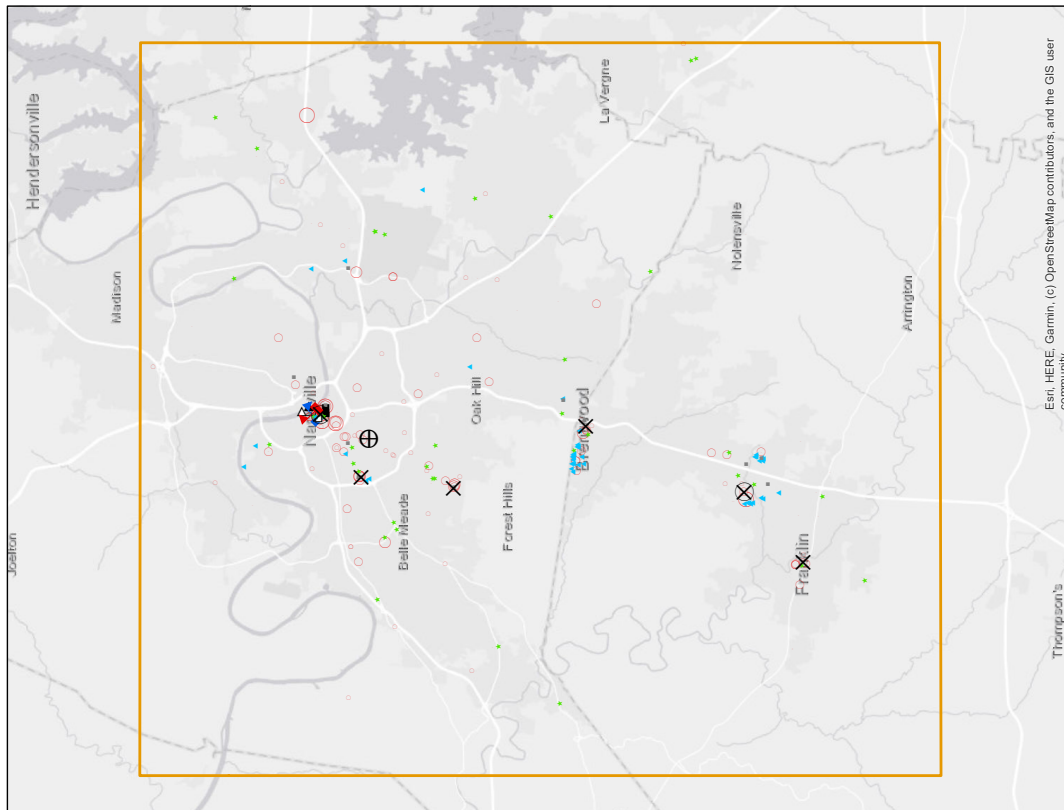
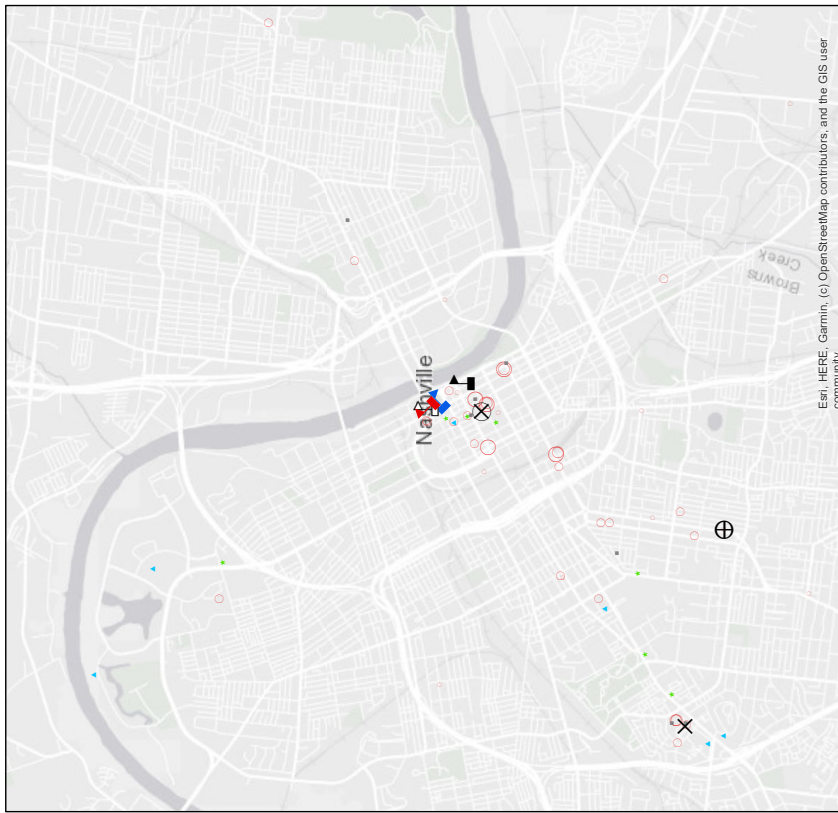


Table 143: Sources: Nashville ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1780	Alderman (1986, p. 52)
First Political Institution <sup>a</sup>	1783	L.P Williams & Co. (1860, p. 5), Caruso (1959, p. 269), Röbert (1880, p. 7)
City Hall	1900	Nashville Public Library (2015)
City Hall	2000	National Park Service (1987, p. 3)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>b</sup> , 1900, 1950, 2000	Thompson (2004, p. 165)
<i>Population Data (1800-2000)</i>		
City Population	1830, 1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Gibson and Jung (2005a, p. 100), Bureau (2004, p. V-19)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1916 <sup>c</sup>	Mills (2015)
Hurricane(s)	None recorded	
Flooding(s)	1912	Castro (2015)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1864 <sup>d</sup>	Smith (2011)
International War(s)	None recorded	

<sup>a</sup>Technically this was a courthouse, but dealt with city issues. It was erected at the "Public Square."

<sup>b</sup>Nashville became permanent state capital in 1843 and remained so ever since.

<sup>c</sup>500 houses burned down

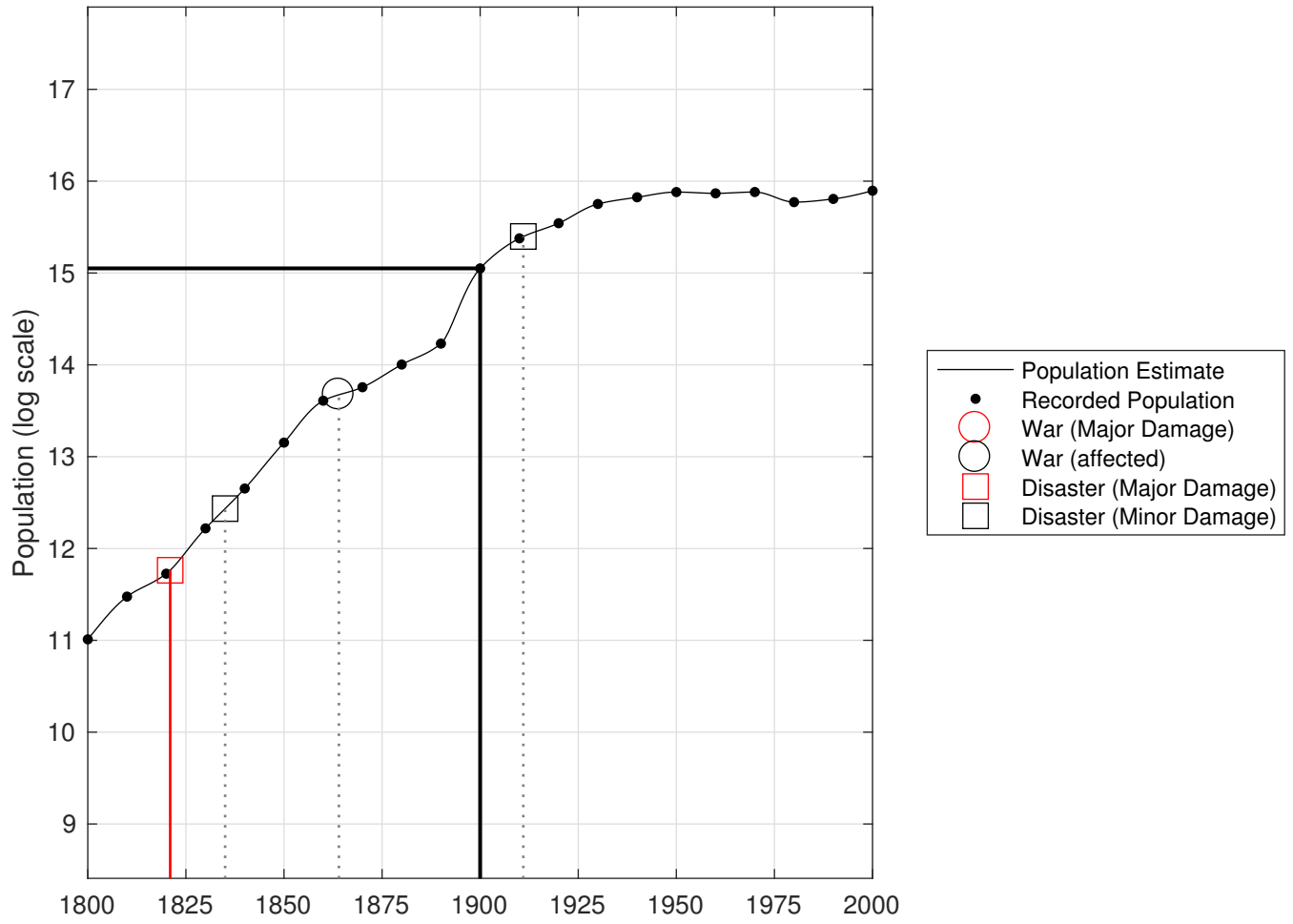
<sup>d</sup>The attackers retreated, but heavy casualties occurred on both sides.

Table 144: Concentration Measures - Nashville

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	11.97
Cumulative density of employment-weighted PP distances at 750 m	%	25.28
Average distance between all prime locations	in kilometres	11.83
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.70
Weighted average distance from EWPPs to 1900 CH	in kilometres	9.22
Average from all prime locations to 1900 CH	in kilometres	8.96
Average distance from global prime locations to 1900 CH	in kilometres	4.60

# A.70 New York

Figure 79: New York



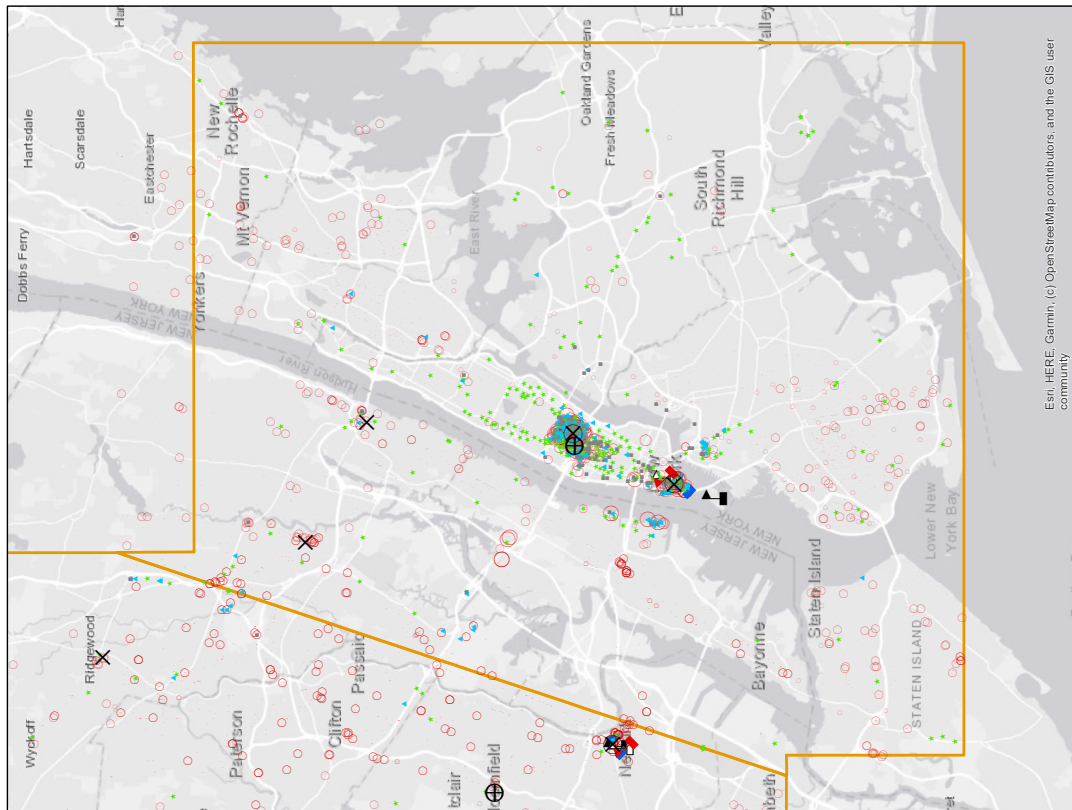
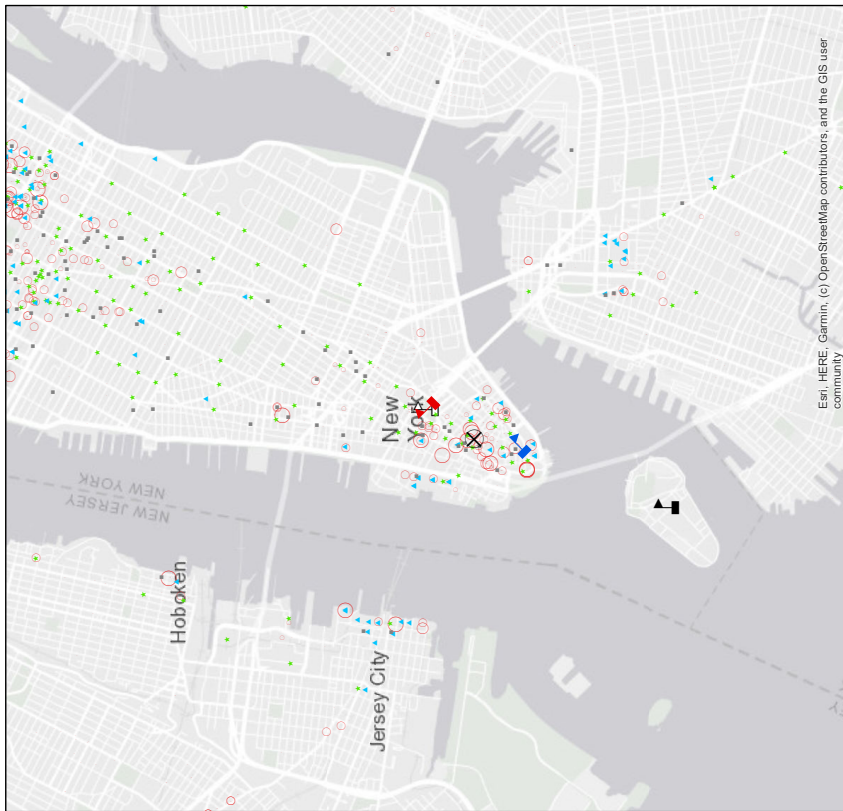


Table 145: Sources: New York ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1624	Diamonstein-Spielvogel (2011, p. 52)
First Political Institution	1653	City of New York (2015)
City Hall <sup>b</sup>	1900	Gabrielan (2000, p. 118), Leech (2007, p. 36)
City Hall	2000	Leech (2007, p. 36)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950 <sup>c</sup> , 2000	Network (2011), City of New York (2015)
<i>Population Data (1800-2000)</i>		
City Population	1790, 1800, 1810, 1820, 1830, 1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Gibson and Jung (2005a, p. 81), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1890	Victor and Ponnuswamy (2012, 5)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1911, 2001 <sup>d</sup> , 1835 <sup>e</sup>	McEnery (2011), City University of New York (2015)
Hurricane(s)	1821 <sup>f</sup>	Steinberg (2014, p. 331)
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1864 <sup>g</sup>	Grinspan (2013)
International War(s)	None recorded	

<sup>a</sup>We take the centroid of Governor's Island as the first settlement location as the Dutch settled here in 1624.

<sup>b</sup>Built in 1811, it has remained the city hall until today.

<sup>c</sup>New York became United Nations headquarter after the war.

<sup>d</sup>We code 911 as a major disaster given the death toll and destruction in Manhattan.

<sup>e</sup>These two fires destroyed thirteen buildings and two shops, which was given the size of the city not a large fire.

<sup>f</sup>The hurricane "caused significant destruction." The hurricane of 1938 and 1960 seem not to have hit New York city significantly (Steinberg, 2014).

<sup>g</sup>There were riots related to the civil war and many people died. However, only once the article mentions that a building was set on fire.

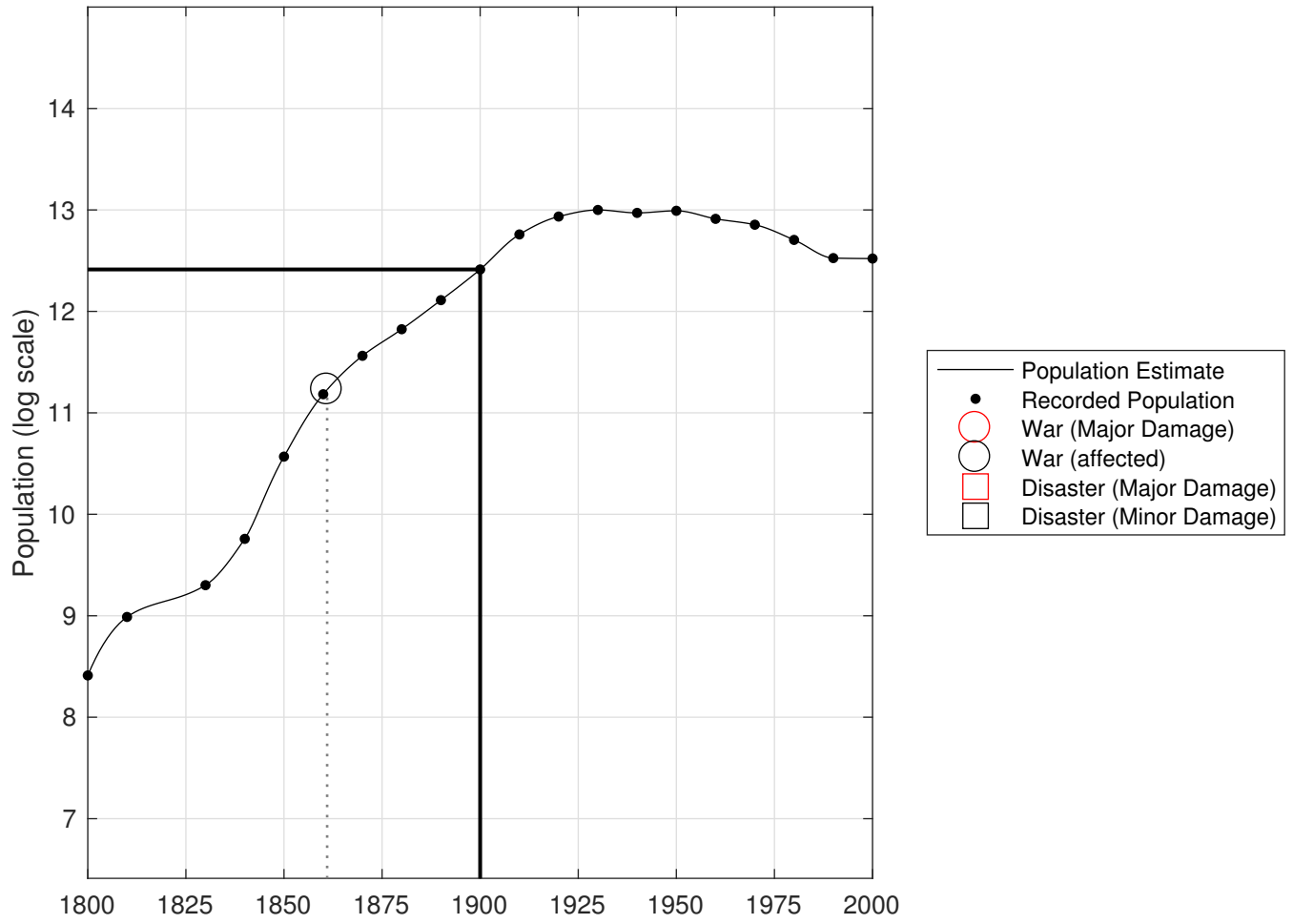
Table 146: Concentration Measures - New York

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	16.11
Cumulative density of employment-weighted PP distances at 750 m	%	37.62
Average distance between all prime locations	in kilometres	9.34
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.66
Weighted average distance from EWPPs to 1900 CH	in kilometres	10.21
Average from all prime locations to 1900 CH	in kilometres	5.67
Average distance from global prime locations to 1900 CH	in kilometres	3.91



A.71 Newark

Figure 80: Newark



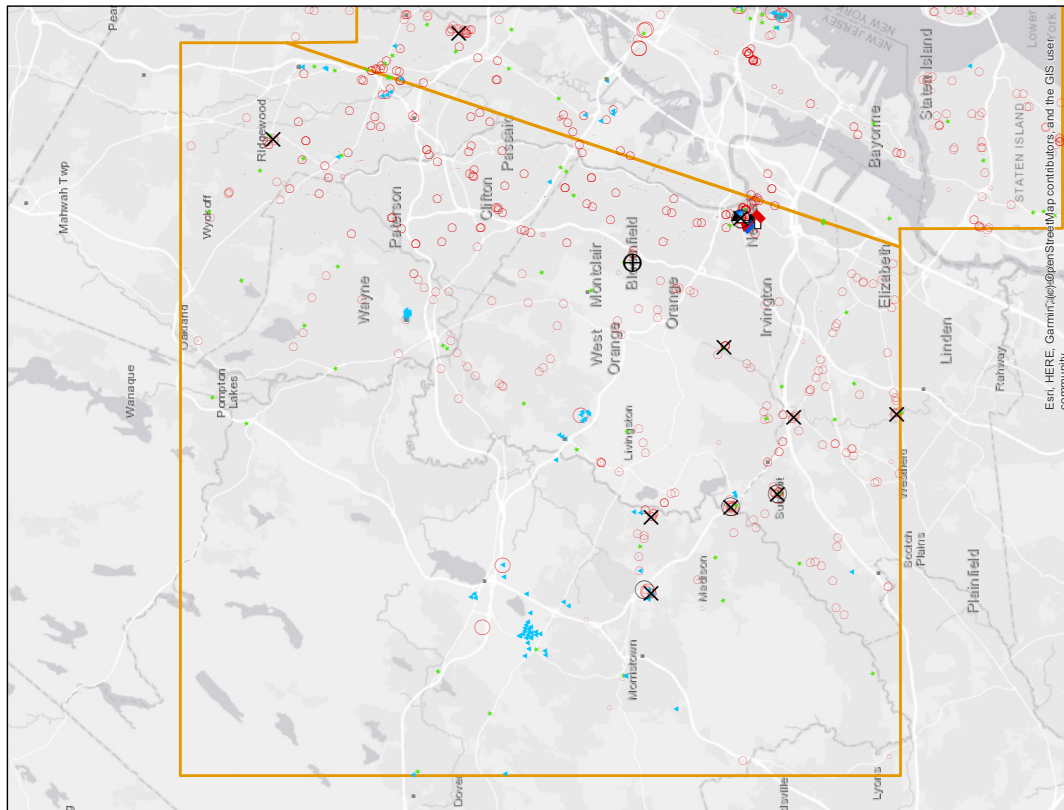
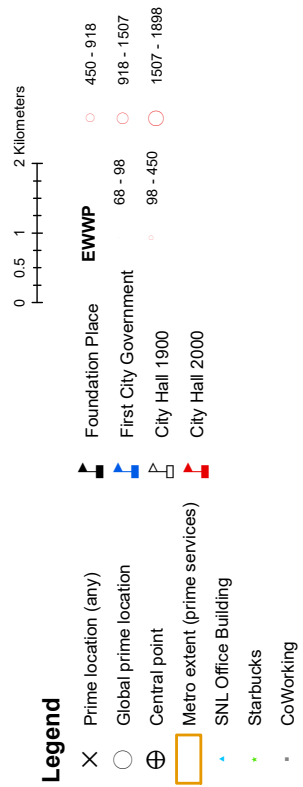
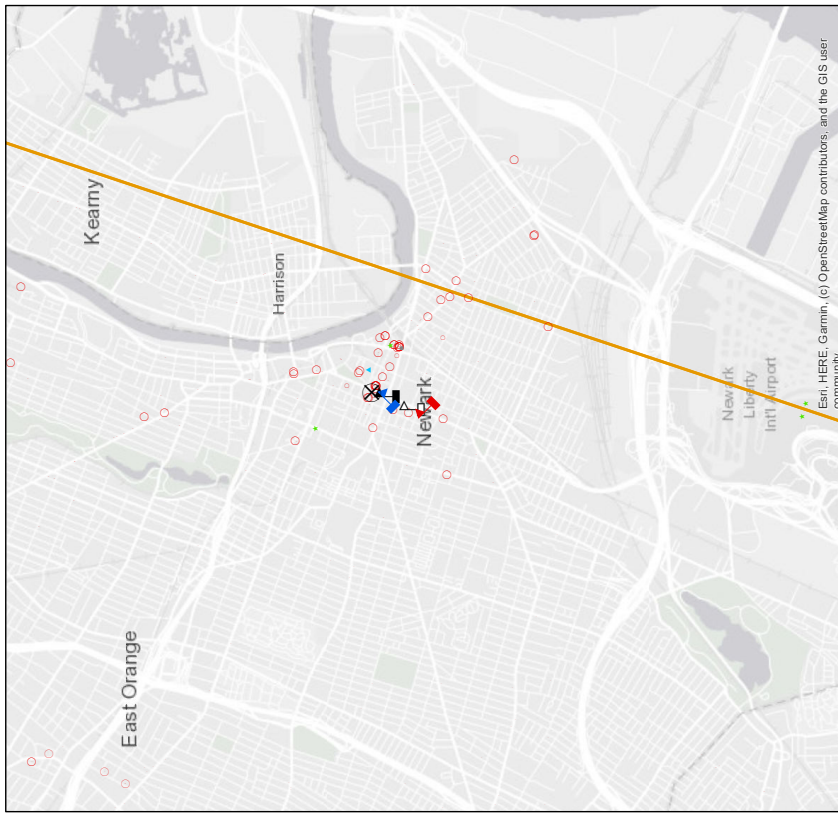


Table 147: Sources: Newark ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1666	Mumford (2007, p. 13)
First Political Institution <sup>a</sup>	1836	Urquhart (1913, p. 618)
City Hall	1900	Urquhart (1913, p. 623)
City Hall <sup>b</sup>	2000	Urquhart (1913, p. 624), Turner et al. (2003, p. 48 & 51)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>c</sup> , 1900, 1950, 2000	Urquhart (1913, p. 616)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1810, 1830, 1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Brewster (1832, p. 158), Karcher (1998, p. 164), Gibson and Jung (2005a, p. 78-79), Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>d</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>e</sup>	1935	Parkinson and Fisher (1996, 2)
Number of Stations	1910, 1940, 2010	Bianculli (2008, p. 137), Schwandl (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861 <sup>f</sup>	Tuttle (2009, p. 39)
International War(s)	None recorded	

<sup>a</sup>Newark was incorporated as a city. Beforehand meetings of the government took place in various places (Urquhart, 1913, p. 618). This was the first planned permanent structure although it lasted only for two years due to a fire. It was the Clinton street building, where is now a parking lot according to Gabriele and Nye (2011, p. 24).

<sup>b</sup>The present city hall is a building that was finished in 1906.

<sup>c</sup>Incorporated as a city in 1836, there has been no apparent change in Newark's status.

<sup>d</sup>By the UN definition, Newark belongs to the UN Metropolitan region.

<sup>e</sup>Counted as part of New York in Turner and Navarro.

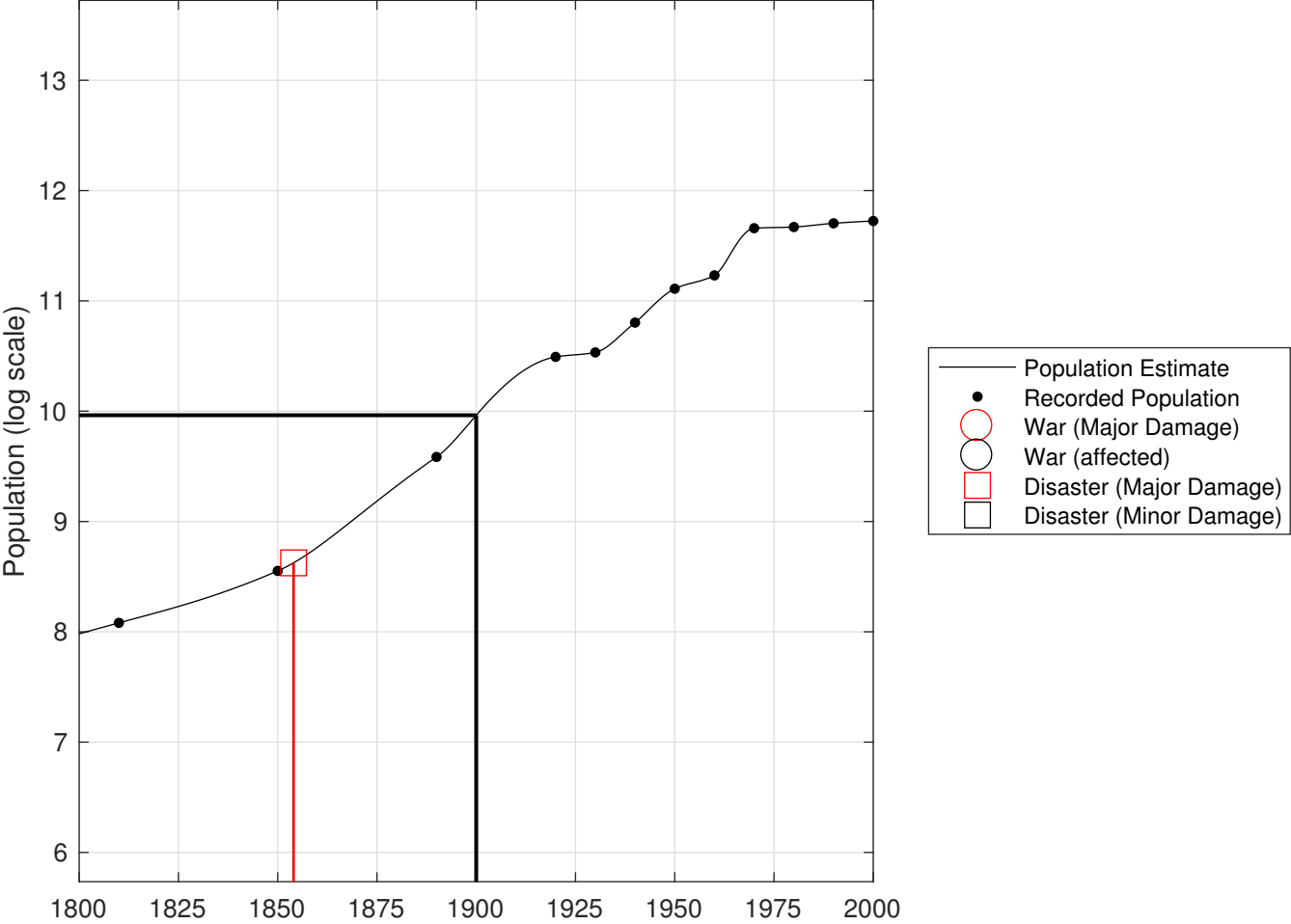
<sup>f</sup>Adverse effects on business, but apparently no actual involvement.

Table 148: Concentration Measures - Newark

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	17.51
Cumulative density of employment-weighted PP distances at 750 m	%	115.68
Average distance between all prime locations	in kilometres	13.73
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.70
Weighted average distance from EWPPs to 1900 CH	in kilometres	14.83
Average from all prime locations to 1900 CH	in kilometres	11.67
Average distance from global prime locations to 1900 CH	in kilometres	9.07

A.72 Oerebro

Figure 81: Oerebro



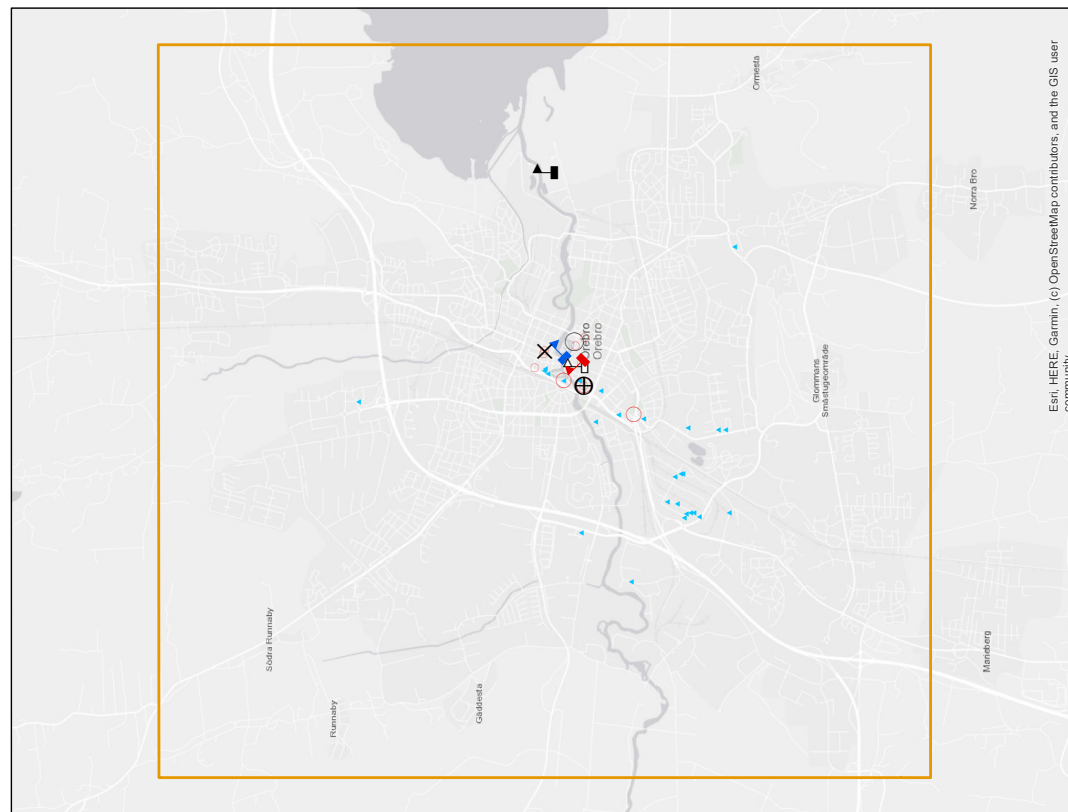
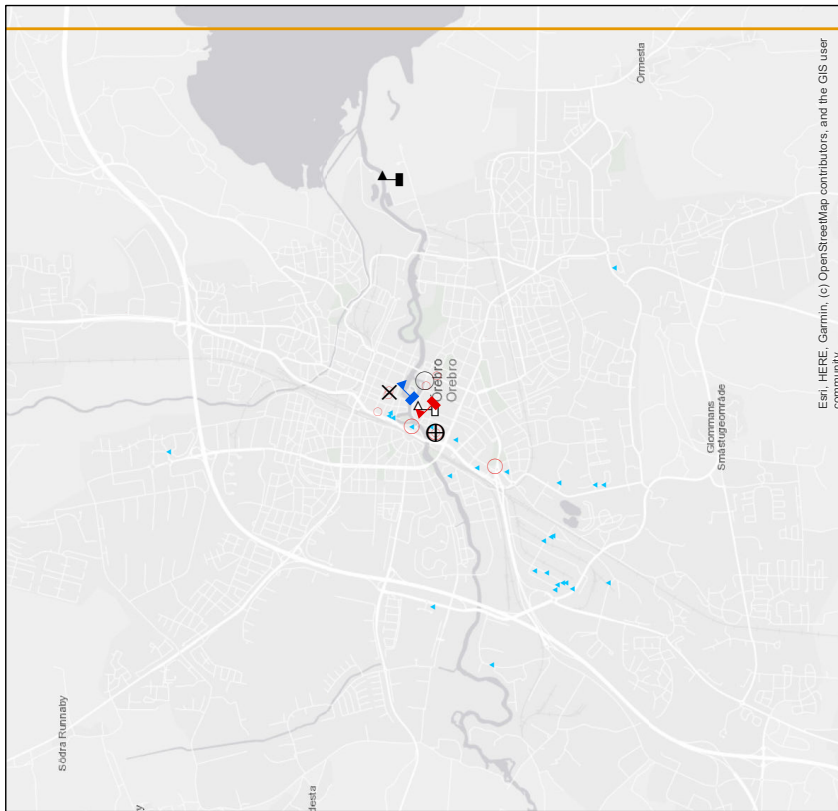


Table 149: Sources: Oerebro ( Sweden )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	850	Örebro kommun (2014b)
First Political Institution <sup>b</sup>	1265	Örebro kommun (2014b)
City Hall <sup>c</sup>	1900	Örebro kommun (2014c)
City Hall	2000	Örebro kommun (2014a)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900, 1950, 2000	Schack-Nielsen (2005, p. 8)
<i>Population Data (1800-2000)</i>		
City Population	1770, 1810, 1850, 1890, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Statistiska centralbyran (2001, p.58), Stads- och kommunhistoriska institutet (2014a)
Metro Population <sup>e</sup>	2015	Statistics Sweden (2016)
<i>Rapid Transit System</i>		
System Opening <sup>f</sup>	None	
Number of Stations	1910, 1940, 2010	NaN
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1854 <sup>g</sup>	Örebro kommun (2014)
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>There were small settlements in this area between 500-1200 and a little trade center at the river mouth. So I take 850 as the first settlement date

<sup>b</sup>Got city rights in 1260s and had a market place and city hall where St. Nicolai is today.

<sup>c</sup>town hall construction finished in 1863

<sup>d</sup>Counties (län) were formed in 1634, one of them named Oerebro and thus we assume that the government seat of that county was in the city. This did not change (though a second layer of local government was introduced in 1853, but again including Oerebro)

<sup>e</sup>Refers to 2014 (province Örebro)

<sup>f</sup>There is no metro system matching the definition by Gonzalez-Navarro and Turner (2016).

<sup>g</sup>City almost completely destroyed and largely rebuilt thereafter (Encyclopaedia Britannica, 2014f).

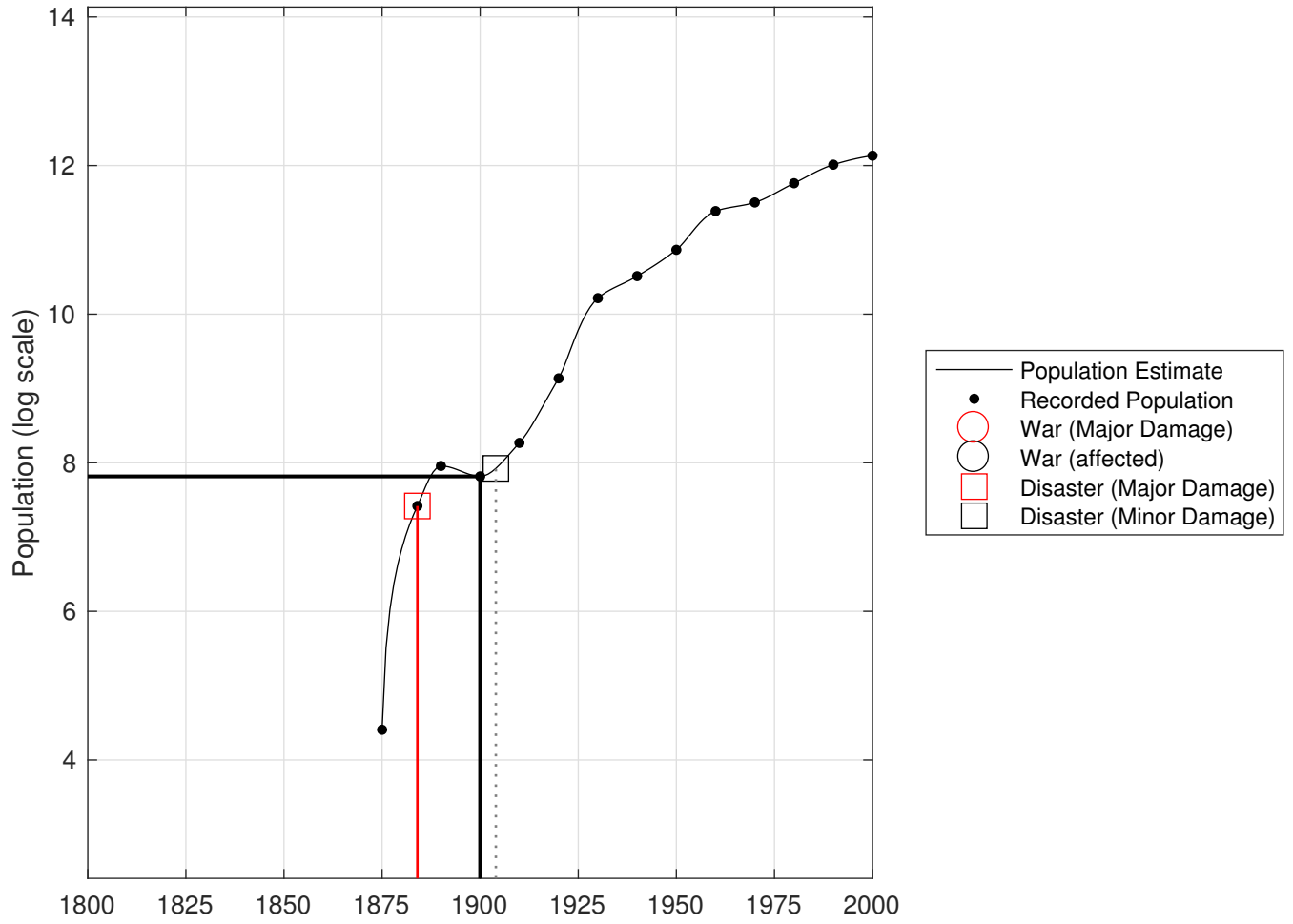
Table 150: Concentration Measures - Oerebro

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	0.70
Cumulative density of employment-weighted PP distances at 750 m	%	1.65
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-1.06
Weighted average distance from EWPPs to 1900 CH	in kilometres	0.45
Average from all prime locations to 1900 CH	in kilometres	0.44
Average distance from global prime locations to 1900 CH	in kilometres	0.31



A.73 Orlando

Figure 82: Orlando



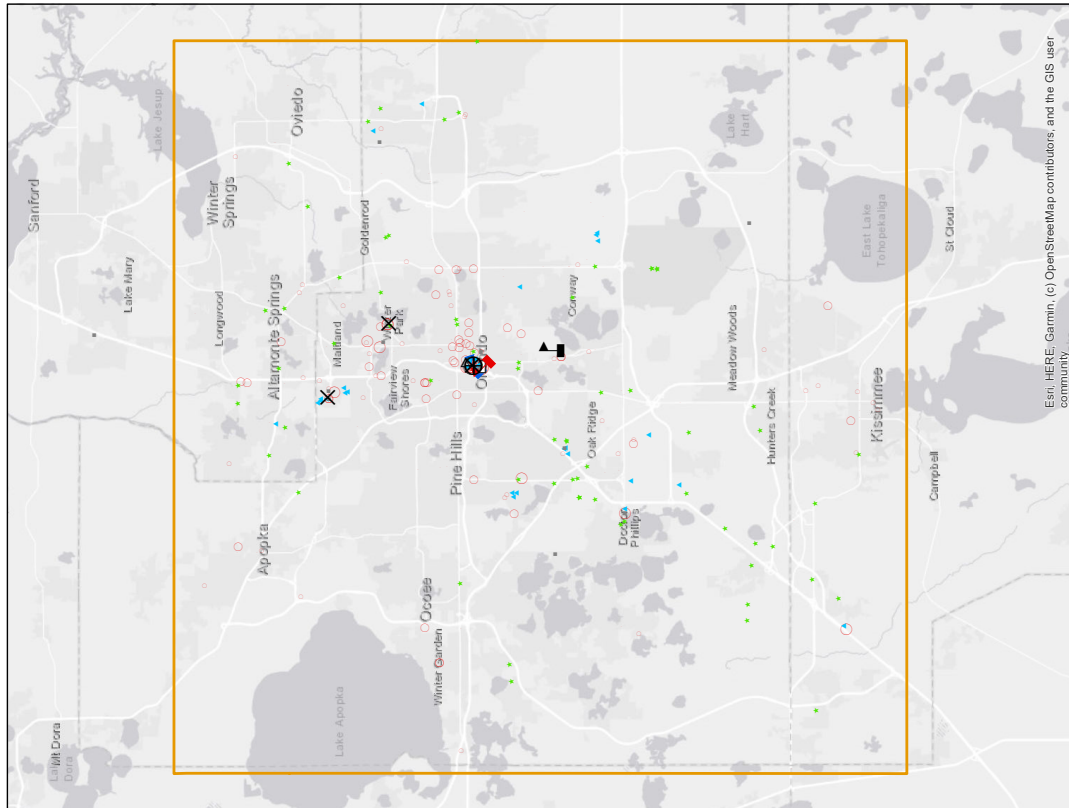
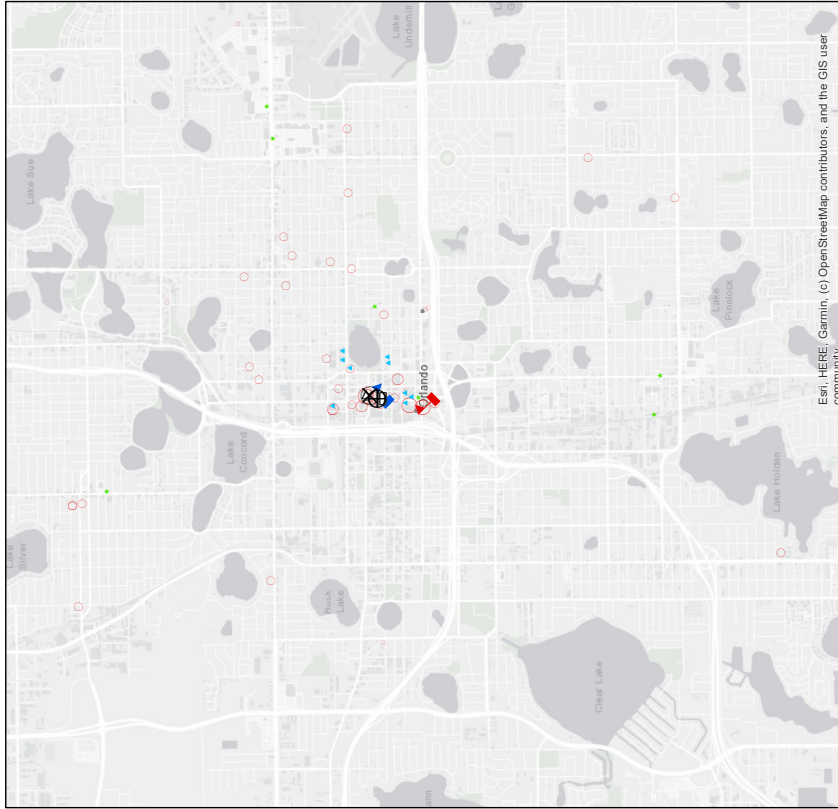


Table 151: Sources: Orlando ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1838	Rajtar (2006, p. 70), Antequino et al. (2012, p. 7)
First Political Institution <sup>b</sup>	1875	Ninth Judicial Circuit Court of Florida (2015), Fyotek (2009, p. 51)
City Hall	1900	City of Orlando (2015a, p. 2)
City Hall	2000	City of Orlando (2015a, p. 1)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>c</sup> , 1900 <sup>d</sup> , 1950, 2000	City of Orlando (2015a)
<i>Population Data (1800-2000)</i>		
City Population	1875, 1884, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	City of Orlando (2015a, p. 2), Gibson and Jung (2005a, p. 44), City of Orlando (2015b), United States Census Bureau (2015)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1884 <sup>e</sup>	City of Orlando (2015b)
Hurricane(s)	2004 <sup>f</sup>	Tribou (2013)
Flooding(s)	1904 <sup>g</sup>	Rajtar (2006, p. 43), Clark (2013, p. 51)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>Orlando's history starts with a fort (Antequino et al., 2012, p. 7) and this was where Fort Gatlin was stood (Rajtar, 2006, p. 70).

<sup>b</sup>This is where the first courthouse was built and the council met before the erection of the first proper city hall in 1885 (City of Orlando, 2015a, p. 2).

<sup>c</sup>Not yet a city.

<sup>d</sup>Incorporated in 1875

<sup>e</sup>"The fire destroyed a large portion of the Business District of Orlando" (City of Orlando, 2015b).

<sup>f</sup>No specific information given about Orlando and thus not coded as having caused major destruction.

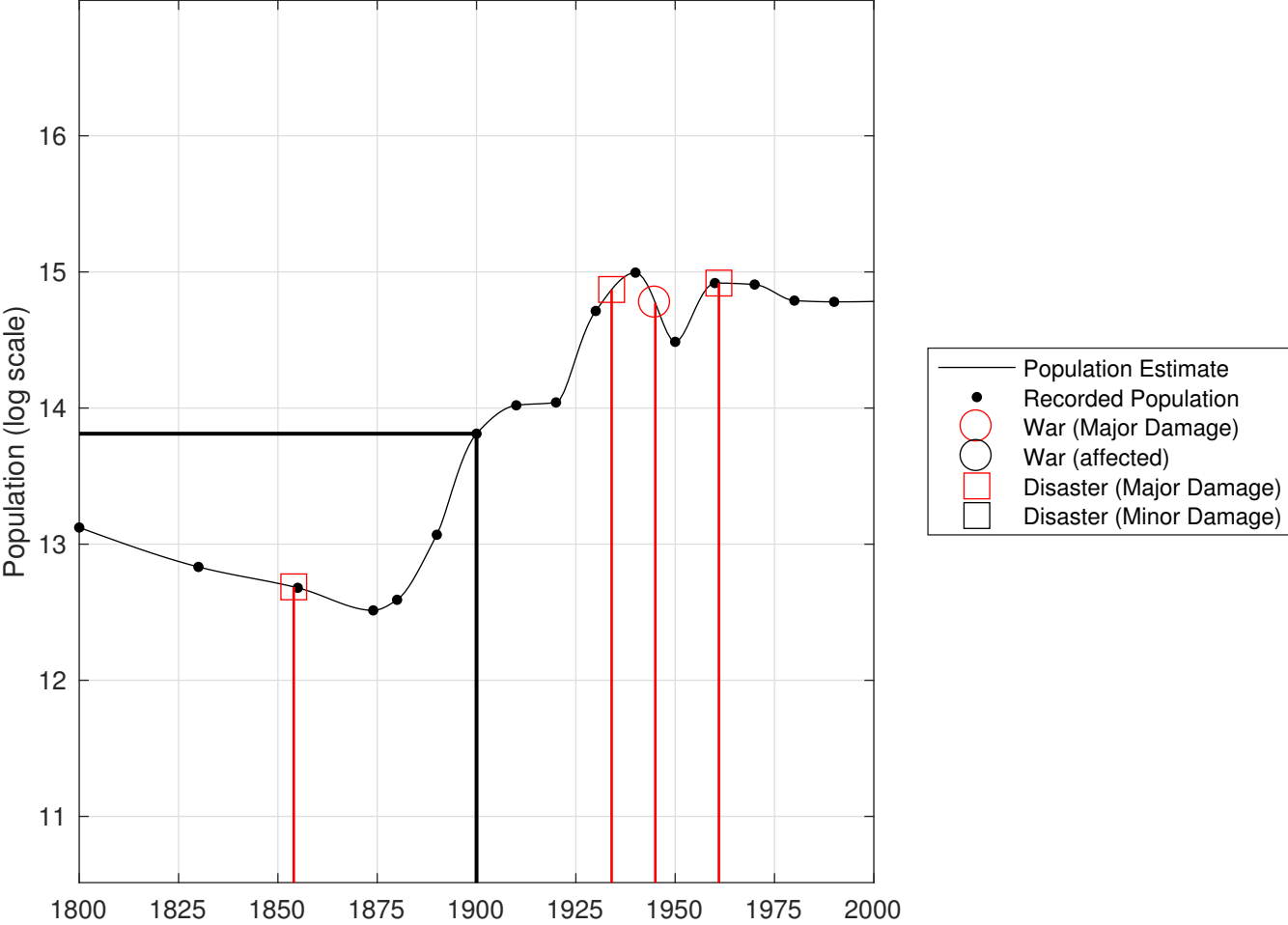
<sup>g</sup>It seemed to have been a heavy flood as the height reached the top of small houses (Clark, 2013, p. 51.), but Rajtar (2006, p. 43) does not describe the vast destruction, which is why we code as as minor.

Table 152: Concentration Measures - Orlando

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	12.86
Cumulative density of employment-weighted PP distances at 750 m	%	26.09
Average distance between all prime locations	in kilometres	4.76
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.69
Weighted average distance from EWPPs to 1900 CH	in kilometres	8.08
Average from all prime locations to 1900 CH	in kilometres	2.15
Average distance from global prime locations to 1900 CH	in kilometres	0.05

A.74 Osaka

Figure 83: Osaka



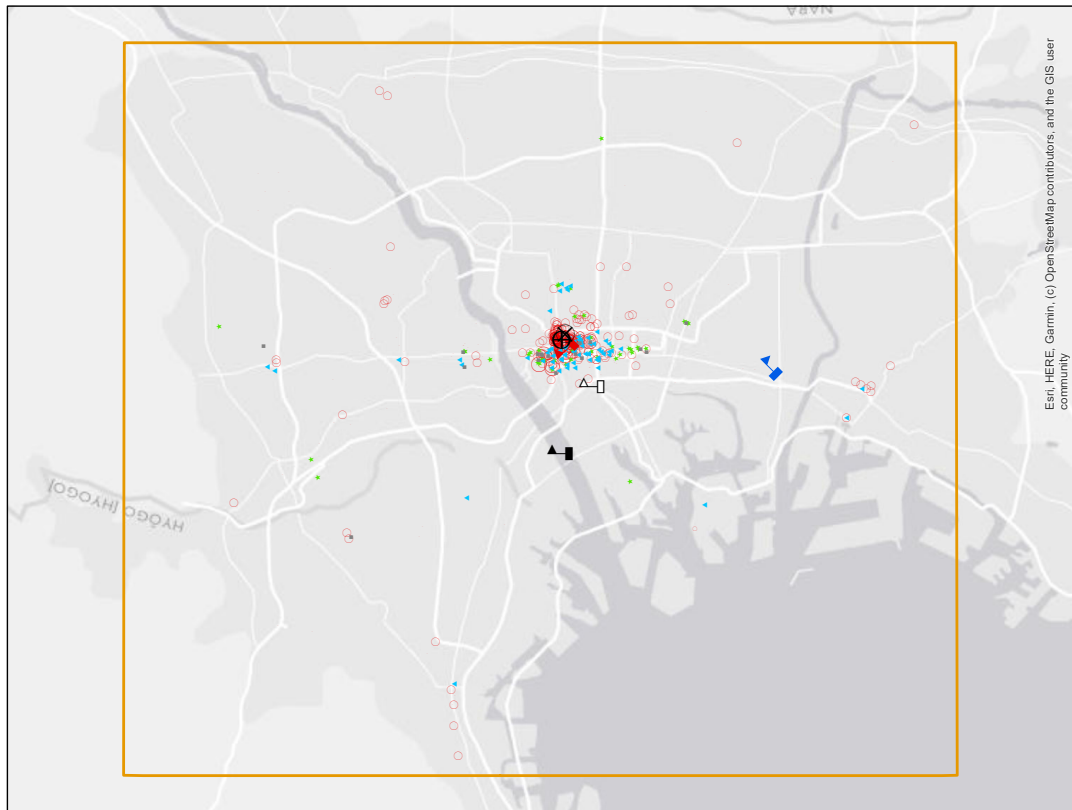
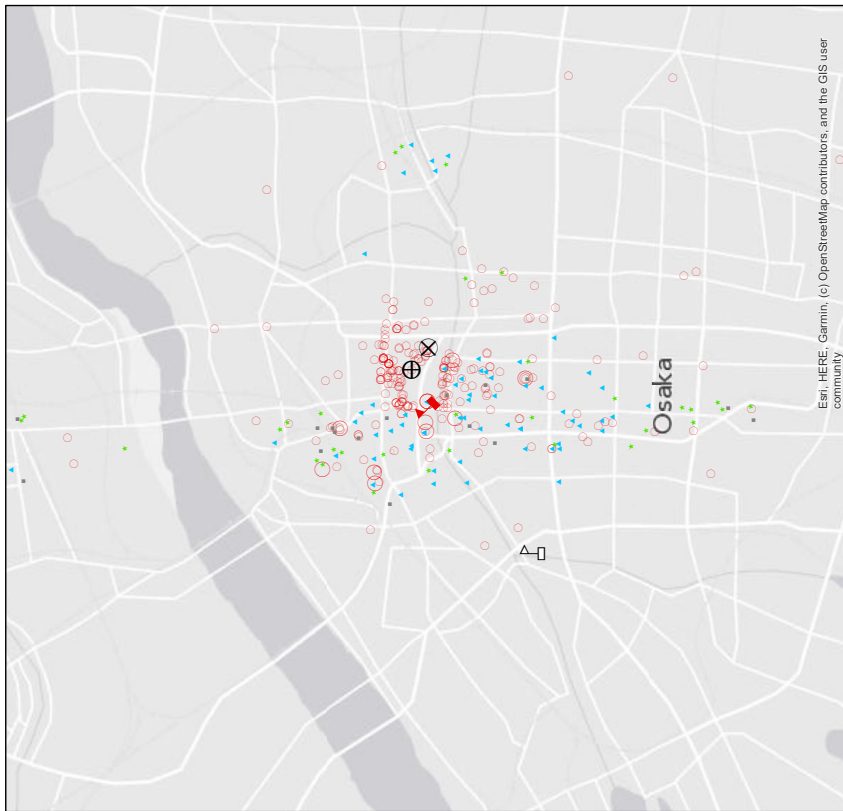


Table 153: Sources: Osaka ( Japan )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	-650	Ring et al. (1996, p. 648)
First Political Institution	350	Ring et al. (1996, p. 648)
City Hall <sup>b</sup>	1900	City of Osaka (2014)
City Hall	2000	Osaka Government Tourism Bureau (2014)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>c</sup> , 1900 <sup>d</sup> , 1950, 2000	Smitka (2012, p. 300), Röpke (1999)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1830, 1855, 1874, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2001	Prasad (2003, p. 31), Mosk (2007, p. 77), Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>e</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>f</sup>	1933	Zhao et al. (2000, 134)
Number of Stations	1910, 1940, 2010	Schwandl (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	1854	Gates and Ritchie (2009, p. 189)
Fire(s)	None recorded	
Hurricane(s)	1934 <sup>g</sup> , 1961	Longshore (2009, p. 383), Longshore (2009, p. 383), Encyclopaedia Britannica (2014g)
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1945 <sup>h</sup>	Röpke (1999, p. 5), Encyclopaedia Britannica (2014g)

<sup>a</sup>This is the first settlement according to a legend, so a large margin of error is involved. It is said the an emperor landed at the estuary of the Yodo river and settled there.

<sup>b</sup>Until 1898, there was no independent power at all. A city hall was only erected in the 1910. It seems that Osaka was still governed from the prefectural building in 1900.

<sup>c</sup>Though of high regional importance, government functions remained ( to our limited understanding of Japanese history) highly centralised in Edo during the Tokugawa period. Smitka (2012, p. 300) elaborates on this.

<sup>d</sup>It became prefectural government in 1868.

<sup>e</sup>Footnote from United Nations Population Division (2014): Major Metropolitan areas (M.M.A.) are defined by the Statistics Bureau of Japan. Census figures for 2005 and 2010 refer to the Kinki M.M.A.; figures from 1960 to 2000 are based on the Keihanshin M.M.A. These areas include Osaka, Kobe, Kyoto and Nara, among other cities.

<sup>f</sup>There seems to have been private electric railways of which some parts are building the metro loop of today and those were built around 1898 according to Wikipedia. However, no proper source could be found to back up the notion that this was basically a metro back then. Instead, it seems that those were rather suburban commuter trains (Hatate, 1983) that were later patched together to the “Osaka Loop.” We do the station count using Schwandl (2016) and take the opening date of the metro as the start of urban rapid transit.

<sup>g</sup>43000 buildings were destroyed in and around Osaka, which is why we consider this as a “heavy” disaster.

<sup>h</sup>First air raids in 1944, but major destruction caused in 1945.

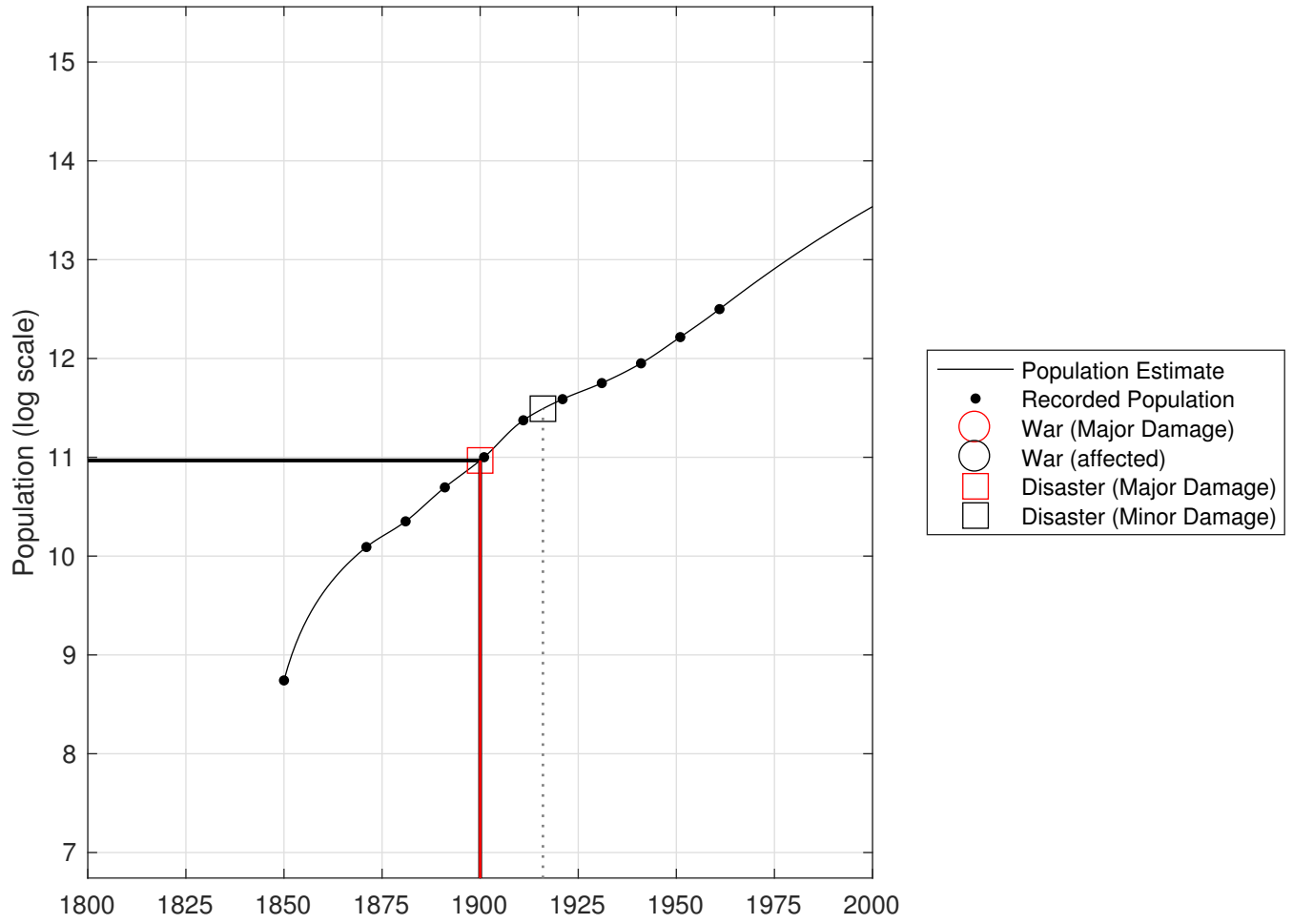
Table 154: Concentration Measures - Osaka

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	3.60
Cumulative density of employment-weighted PP distances at 750 m	%	3.51
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-1.06
Weighted average distance from EWPPs to 1900 CH	in kilometres	3.44
Average from all prime locations to 1900 CH	in kilometres	2.51
Average distance from global prime locations to 1900 CH	in kilometres	2.51



A.75 Ottawa

Figure 84: Ottawa



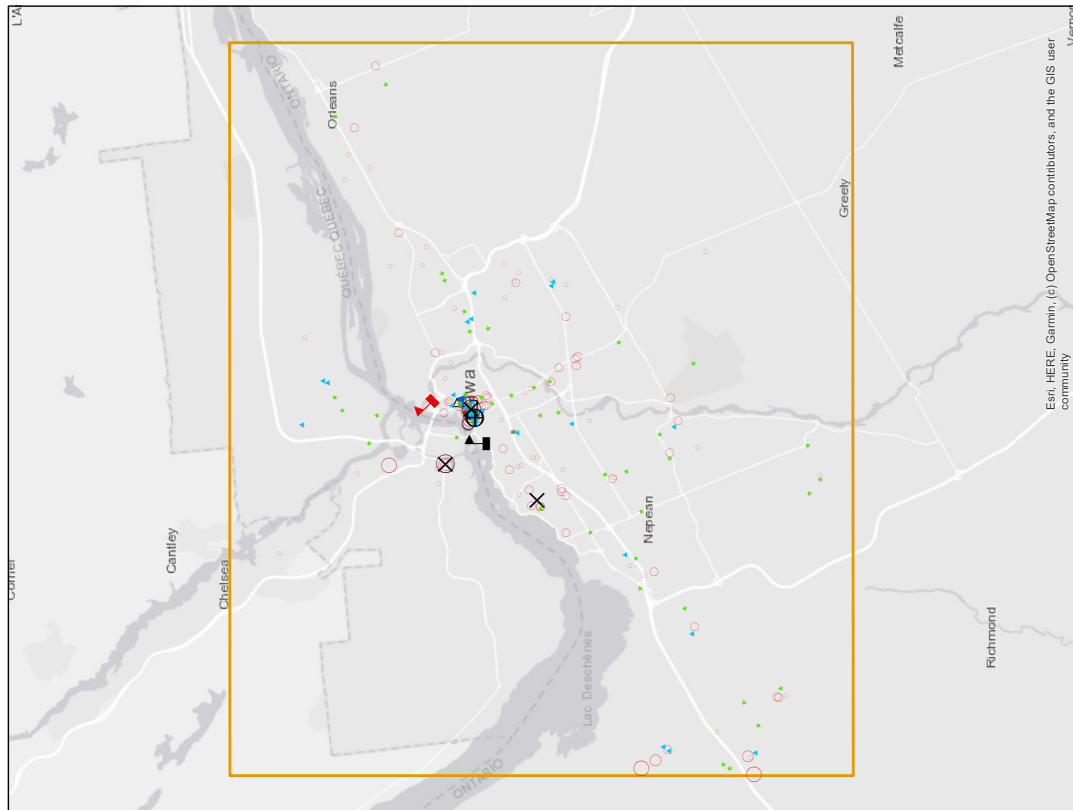
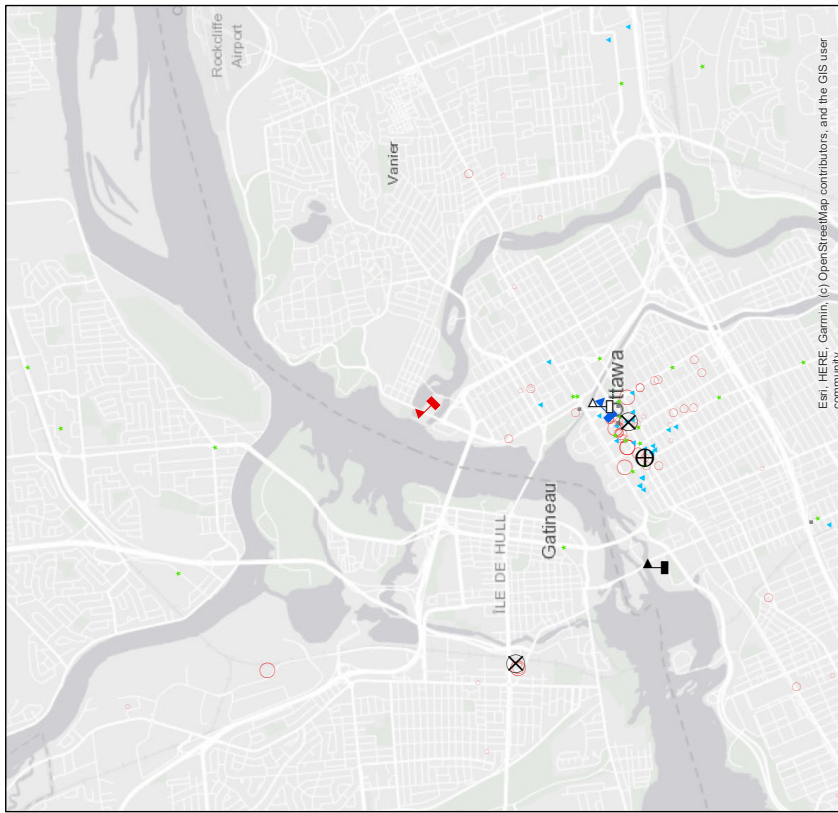


Table 155: Sources: Ottawa ( Canada )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1809	Nixon (2012, p. 5)
First Political Institution	1849	Carleton University (2015), Taylor (1986[2014], p. 99)
City Hall	1900	Taylor (1986[2014], p. 99)
City Hall	2000	Parks Canada (2015b)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Bytown Museum (2013)
<i>Population Data (1800-2000)</i>		
City Population	1850, 1871, 1881, 1891, 1901, 1911, 1921, 1931, 1941, 1951, 1961, 2001	Vineberg (2010, p. 17), Taylor (1986, p. 210), Statistics Canada (2015)
Metro Population <sup>b</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1900 <sup>c</sup> , 1916 <sup>d</sup>	Scott (2014, p. 76), Bytown Museum (2013), Scott (2014, p. 76)
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>We take the first settlement on the Ottawa side. Hull was settled 9 years before.

<sup>b</sup>Footnote from United Nations Population Division (2014): Refers to the Census Metropolitan Area. The capital is Ottawa.

<sup>c</sup>"A large portion of Ottawa was razed by a fire in 1900" (Encyclopaedia Britannica, 2015o).

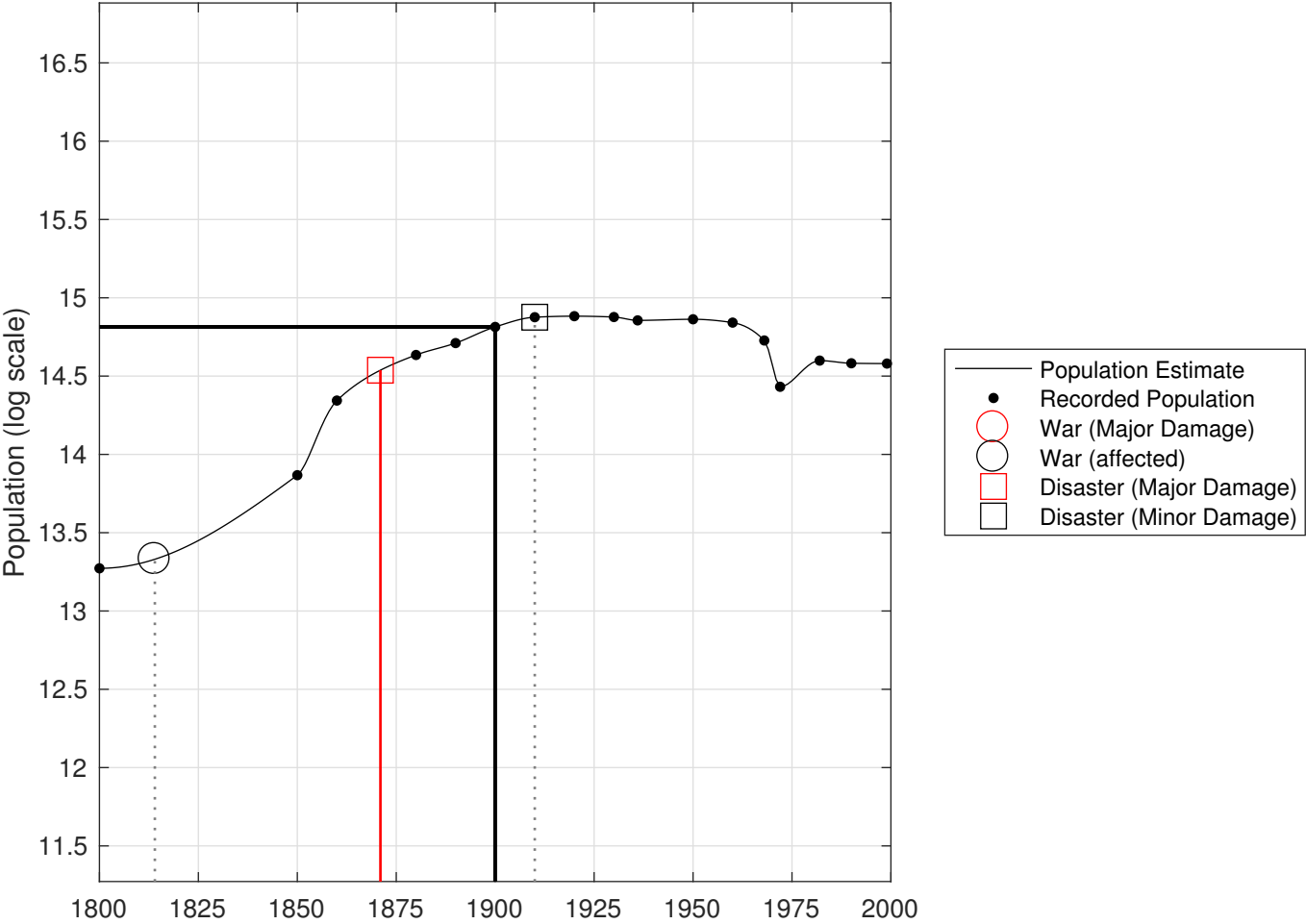
<sup>d</sup>This fire was limited to a small area around the parliament building and thus does not qualify as having caused major destruction.

Table 156: Concentration Measures - Ottawa

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	9.16
Cumulative density of employment-weighted PP distances at 750 m	%	14.21
Average distance between all prime locations	in kilometres	2.90
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.39
Weighted average distance from EWPPs to 1900 CH	in kilometres	6.02
Average from all prime locations to 1900 CH	in kilometres	1.03
Average distance from global prime locations to 1900 CH	in kilometres	0.66

A.76 Paris

Figure 85: Paris



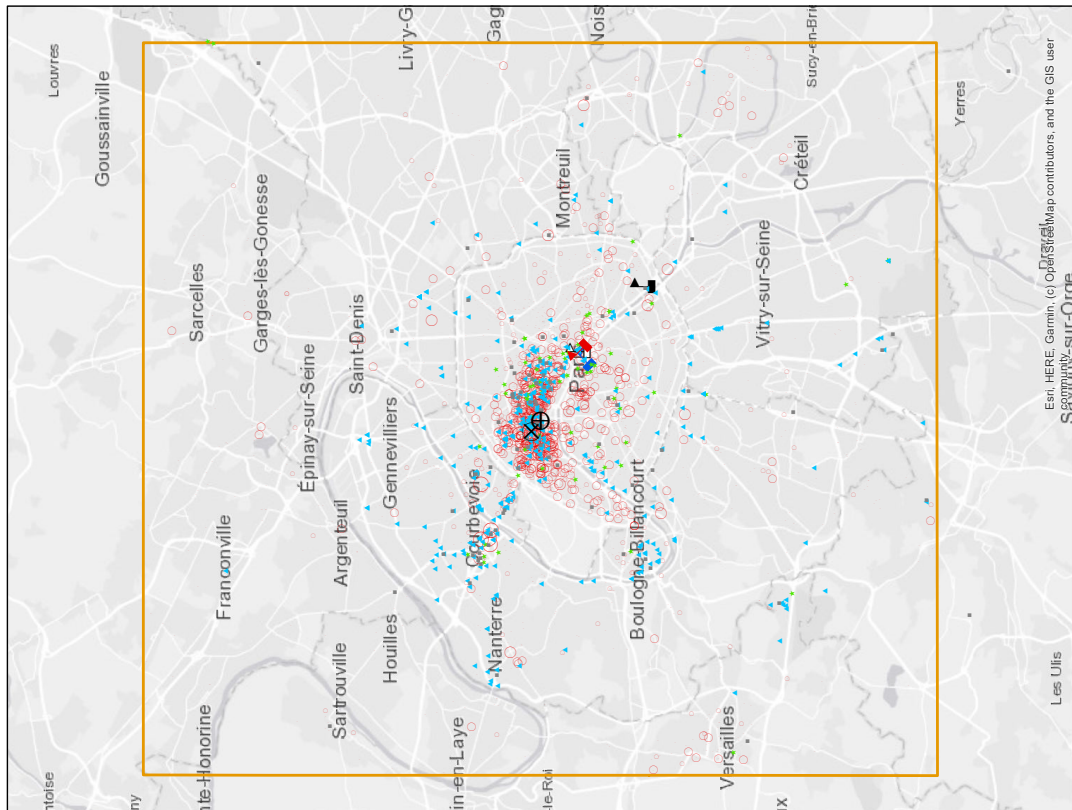
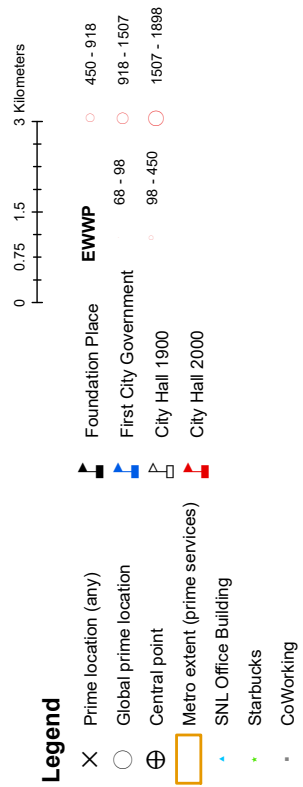
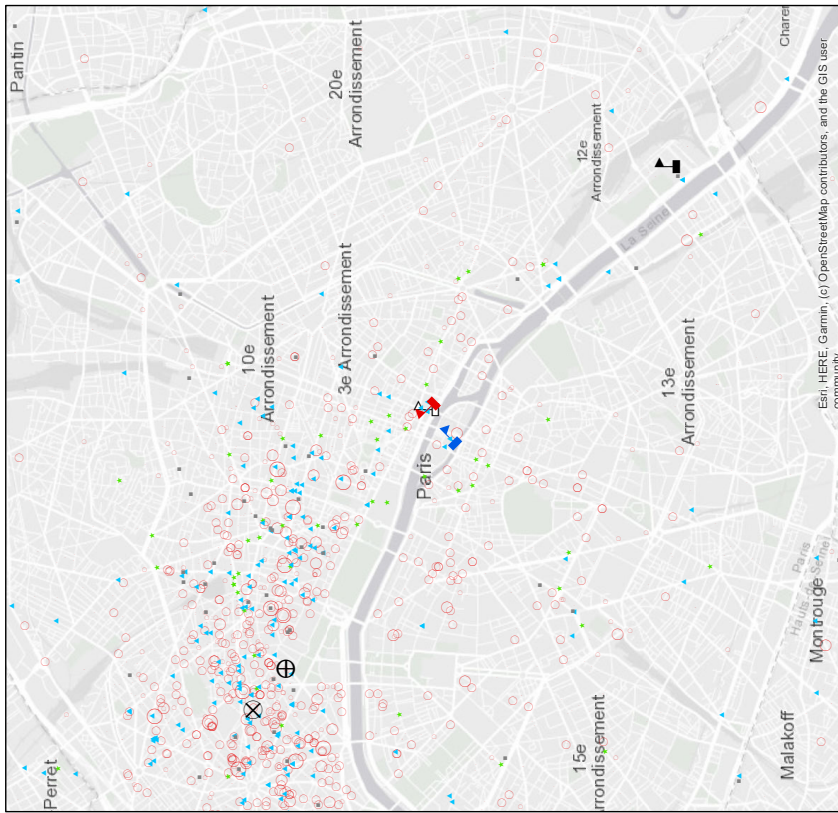


Table 157: Sources: Paris ( France )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	-4200	Fierro (1998, p. XV)
First Political Institution <sup>b</sup>	-52	Fierro (1998, p. 2)
City Hall	1900	Fierro (1998, p. 94)
City Hall	2000	Fierro (1998, p. 94)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>c</sup> , 1900, 1950, 2000	Fierro (1998, p. XV)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1860, 1972, 1880, 1890, 1900, 1910, 1920, 1930, 1936, 1950, 1960, 1968, 1982, 1990, 1999, 2006	Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1900	Osterhammel (2011, 446)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1871 <sup>d</sup>	Fierro (1998, p. 78)
Hurricane(s)	None recorded	
Flooding(s)	1910 <sup>e</sup>	Fierro (1998, p. 78)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1814 <sup>f</sup>	McNally (1958, p. 175)

<sup>a</sup>Neolithic settlement.

<sup>b</sup>The Romans won a decisive victory and Lutetia became a possession of the Roman Empire for 5 centuries. Maybe there was some type of government before, but the Romans were first to set up a proper administration, located on the Île de la Cité.

<sup>c</sup>Clvovis made Paris the capital. There were some changes thereafter, but non affecting 1850 onwards.

<sup>d</sup>Destroyed 200 buildings, also in the city center.

<sup>e</sup>While the damage was substantial, the houses could probably be repaired.

<sup>f</sup>Occupation of Paris.

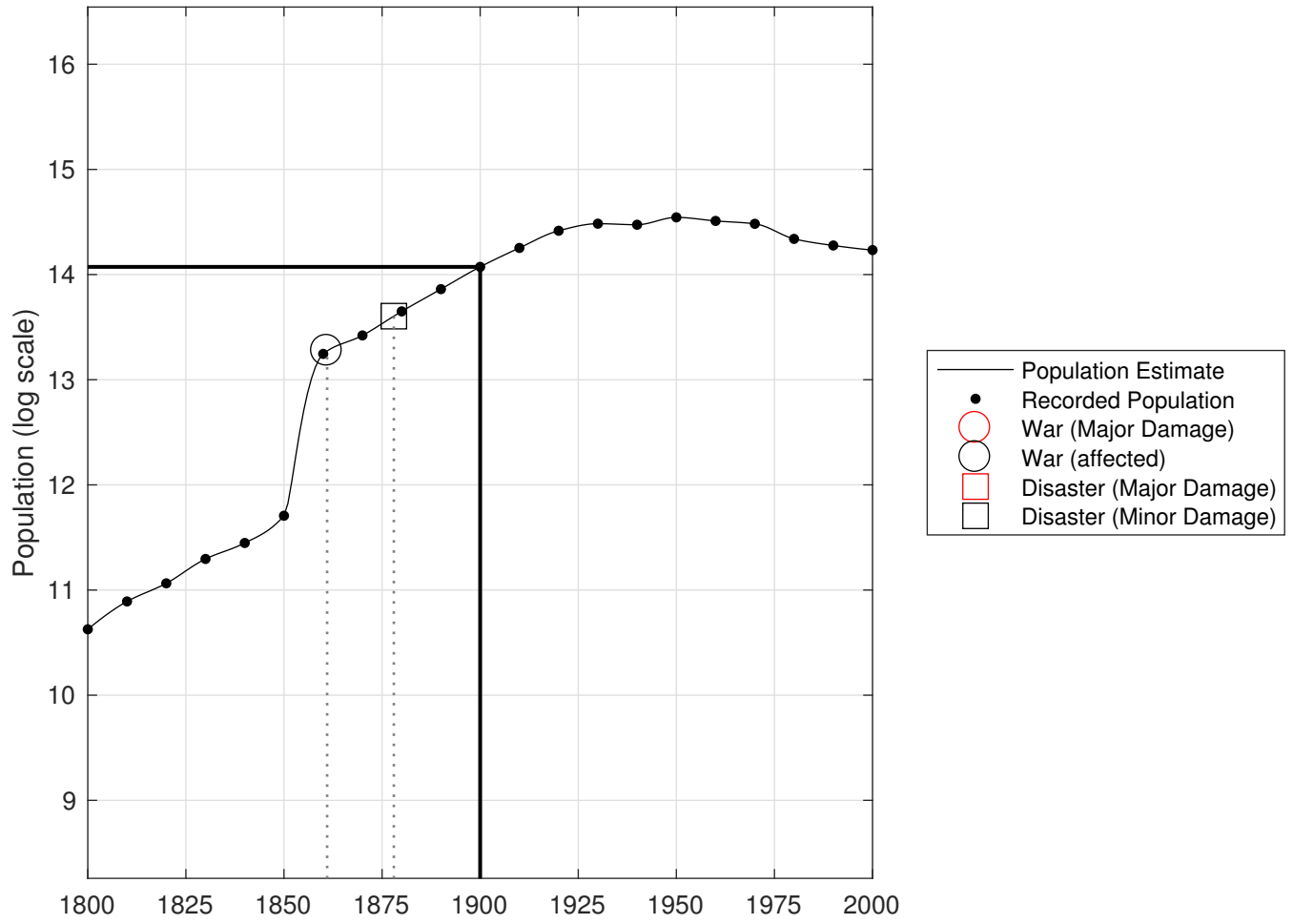
Table 158: Concentration Measures - Paris

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	5.85
Cumulative density of employment-weighted PP distances at 750 m	%	18.03
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.78
Weighted average distance from EWPPs to 1900 CH	in kilometres	4.90
Average from all prime locations to 1900 CH	in kilometres	3.80
Average distance from global prime locations to 1900 CH	in kilometres	3.80



# A.77 Philadelphia

Figure 86: Philadelphia



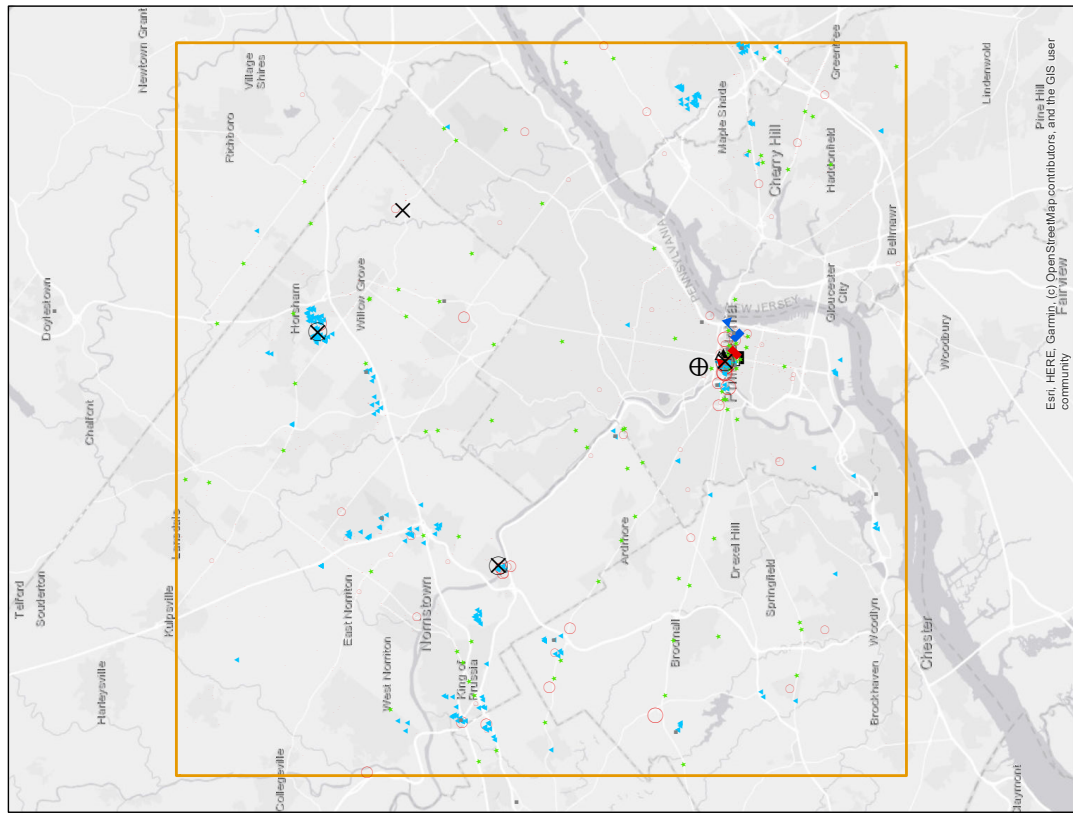
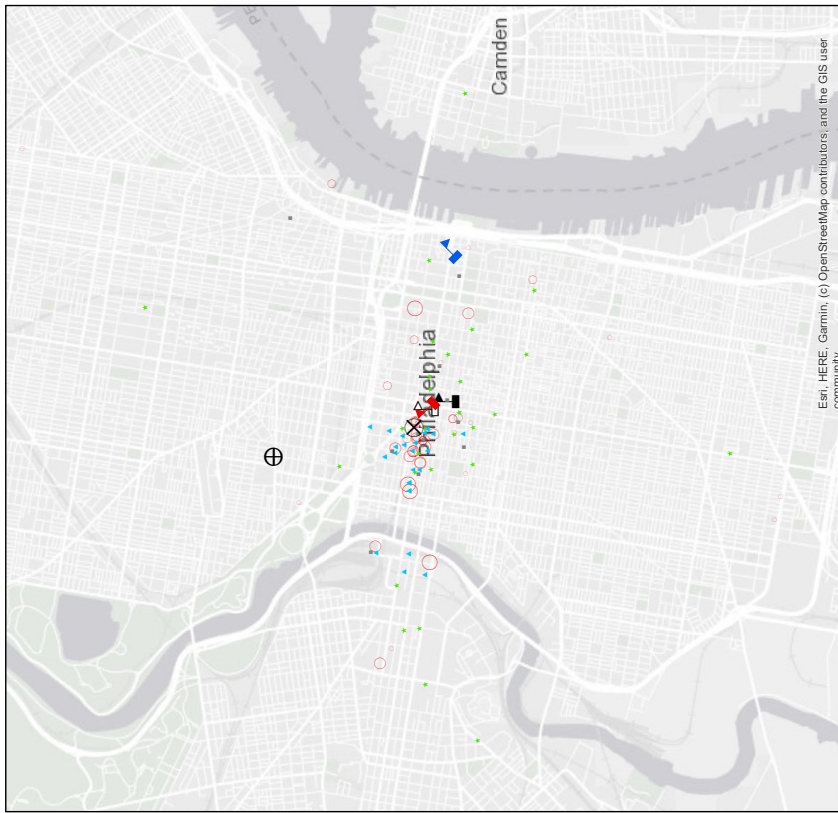


Table 159: Sources: Philadelphia ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1682	Pennsylvania Historical Commission (1937, p. 279)
First Political Institution <sup>b</sup>	1698	Scharf and Westcott (1884, p. 1769), Beiler (2011, p. 96)
City Hall <sup>c</sup>	1900	City of Philadelphia (2015)
City Hall	2000	City of Philadelphia (2015)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900, 1950, 2000	Scharf and Westcott (1884, p. 1769)
<i>Population Data (1800-2000)</i>		
City Population	1790, 1800, 1810, 1820, 1830, 1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Gibson and Jung (2005a, p. 94-95), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1907	Reis (2009, 103)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1861	New York Times (1861)
Hurricane(s)	1878	Healey and Woods (2012, p. 64)
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861	Gallman (2000)
International War(s)	None recorded	

<sup>a</sup>There had been some Swedish settlements in the area, but what became Philadelphia was “systematically planned before it was born” between the two rivers and South and Vie Street (Pennsylvania Historical Commission, 1937, p. 279) . We take the centroid of this settlement plan as the foundation place.

<sup>b</sup>After it’s incorporation in 1701, the first regular meeting place of the council seems to be the Court House, erected in 1707 and used by the council from 1710 onwards. High Street was re-named Market Street (Watson and Watson, 2009, 493). A first charter, “granted in 1691, had (...) fallen in abeyance, if indeed it was ever put in operation” (Young, 1895, p. 86)

<sup>c</sup>The city hall was built from 1871-1901.

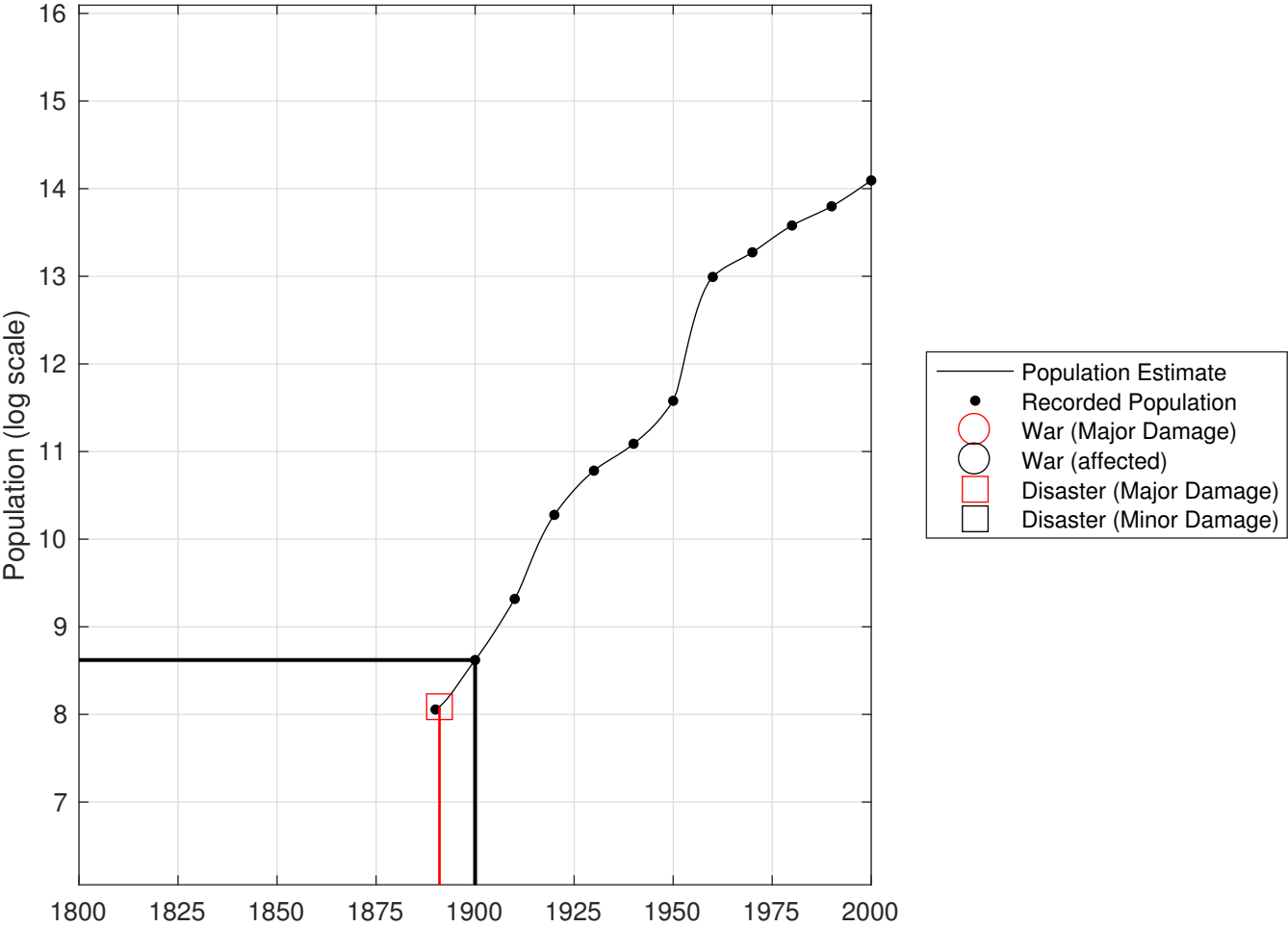
<sup>d</sup>It was the country’s capital 1790-1800, but never state capital. It was chartered as a city in 1701.

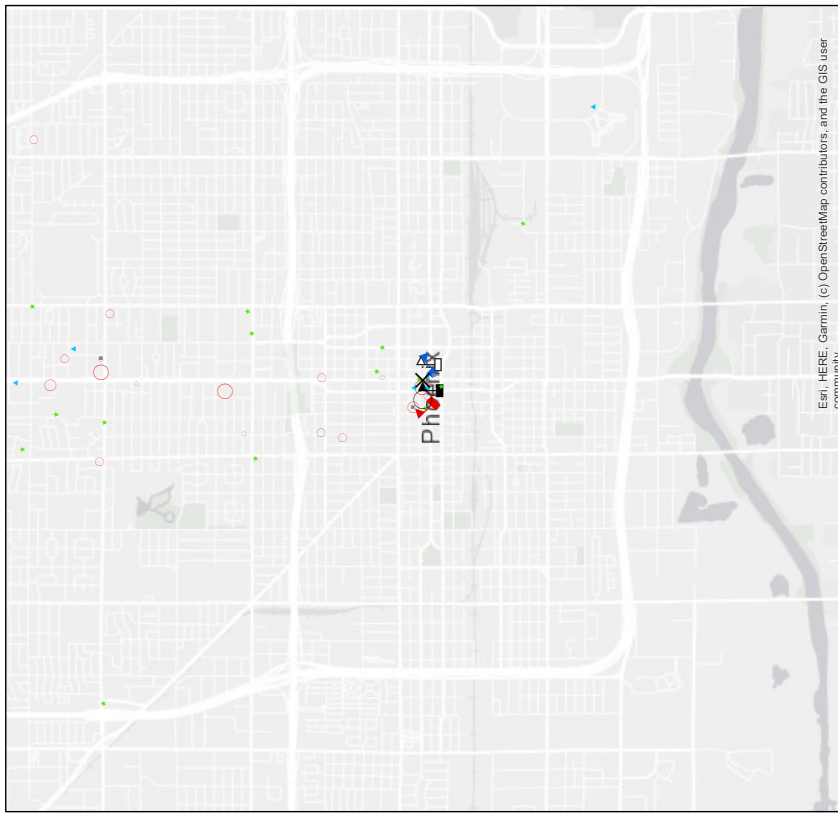
Table 160: Concentration Measures - Philadelphia

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	17.42
Cumulative density of employment-weighted PP distances at 750 m	%	30.81
Average distance between all prime locations	in kilometres	13.72
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.46
Weighted average distance from EWPPs to 1900 CH	in kilometres	12.53
Average from all prime locations to 1900 CH	in kilometres	5.09
Average distance from global prime locations to 1900 CH	in kilometres	4.42

A.78 Phoenix

Figure 87: Phoenix





- Legend**
- ✕ Prime location (any)
  - Global prime location
  - ⊕ Central point
  - ▭ Metro extent (prime services)
  - ▲ SNL Office Building
  - ▲ Starbucks
  - ▲ CoWorking
  - ▲ Foundation Place
  - ▲ First City Government
  - ▲ City Hall 1900
  - ▲ City Hall 2000
  - EWWP 450 - 918
  - EWWP 918 - 1507
  - EWWP 68 - 98
  - EWWP 98 - 450
  - EWWP 1507 - 1898

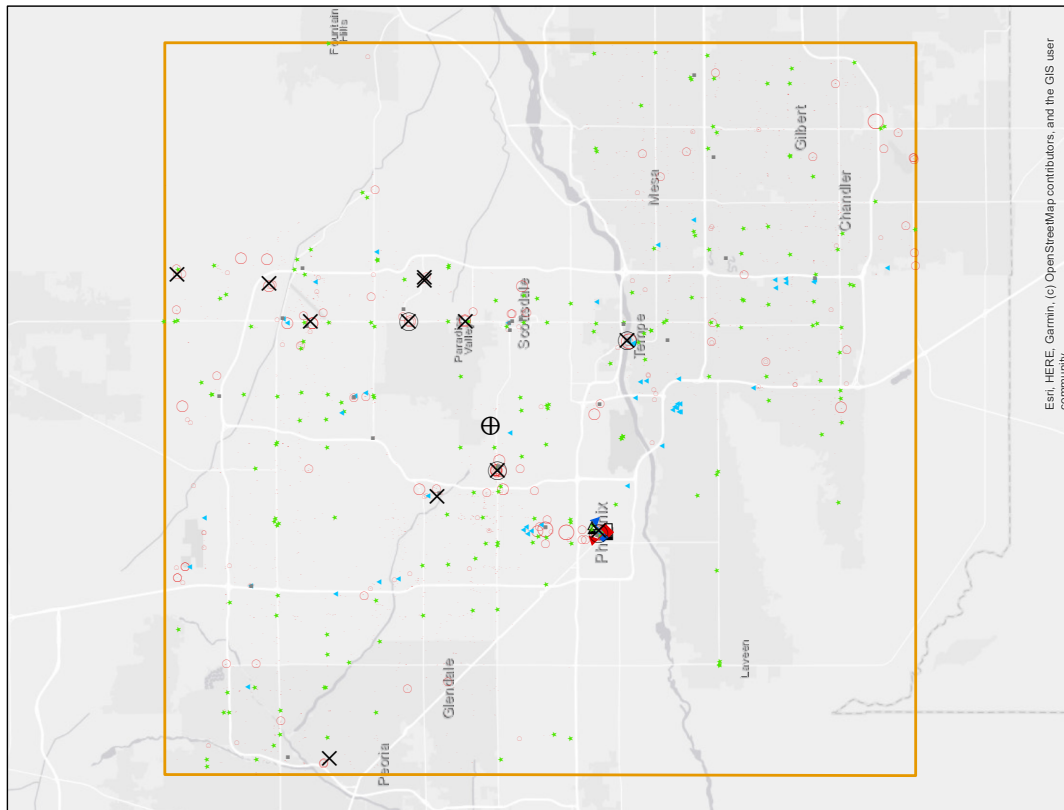


Table 161: Sources: Phoenix ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1870	City of Phoenix (2015)
First Political Institution <sup>b</sup>	1888	City of Phoenix (2015), Garcia (2008, p. 19)
City Hall	1900	City of Phoenix (2015), Garcia (2008, p. 19)
City Hall <sup>c</sup>	2000	Bailey and Scharff (2011, p. 11)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900 <sup>e</sup> , 1950, 2000	City of Phoenix (2015)
<i>Population Data (1800-2000)</i>		
City Population	1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Gibson and Jung (2005a, p. 28), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	1891	Honker (2000)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>This is the centroid of the initial rectangle on which the town was laid out. Before there was a settlement about four miles west, but due to the influx of pioneers this site was selected.

<sup>b</sup>The city was incorporated in 1871 (City of Phoenix, 2015) and a courthouse for the county government was established in 1884 (Garcia, 2008, p. 19). However, the city hall building as the first permanent seat of the city government. Location is specified in Garcia (2008, p. 19).

<sup>c</sup>Erected in 1994.

<sup>d</sup>No settlement in 1850.

<sup>e</sup>Became territorial capital in 1889 and later state capital.

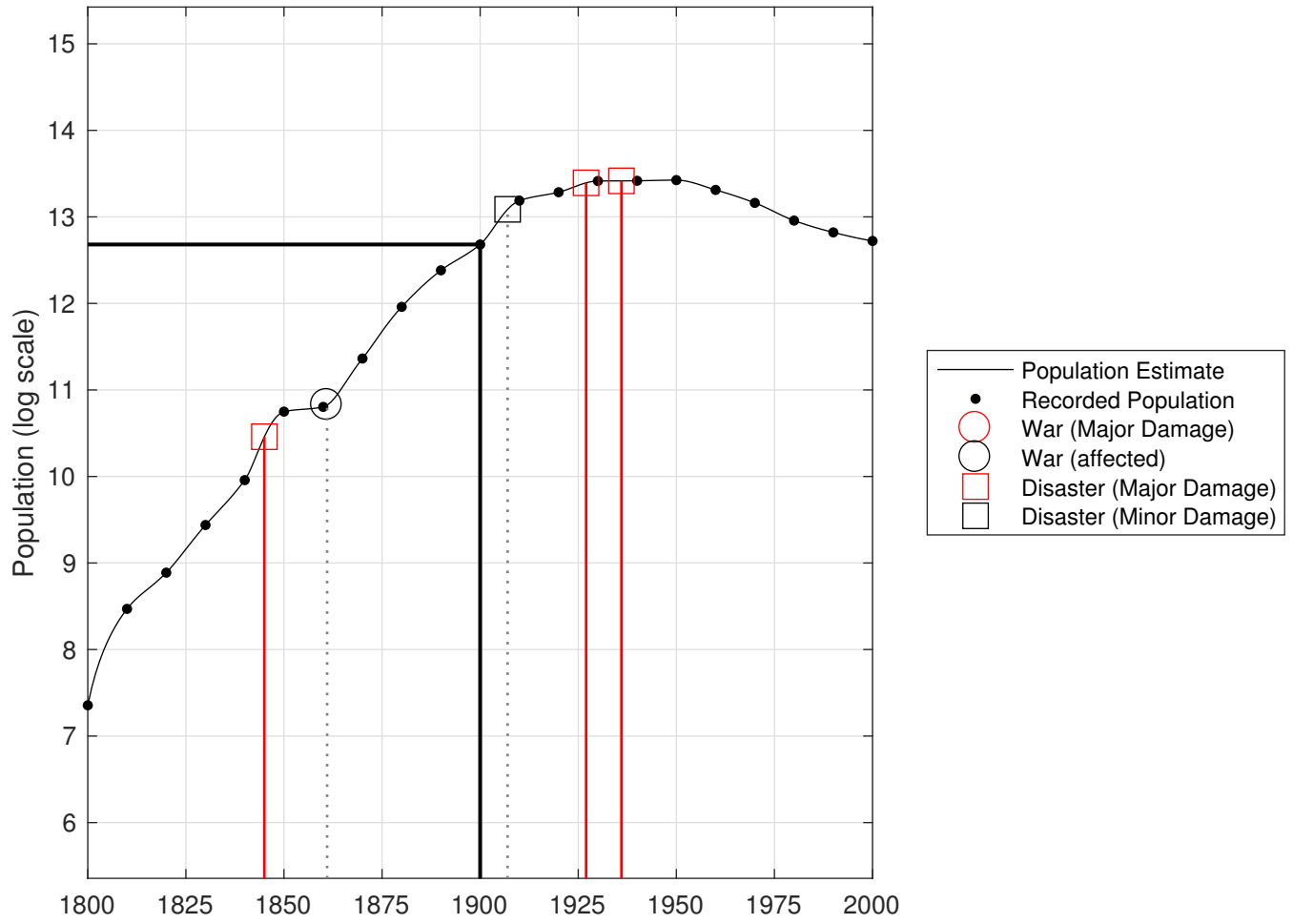
Table 162: Concentration Measures - Phoenix

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	21.87
Cumulative density of employment-weighted PP distances at 750 m	%	148.46
Average distance between all prime locations	in kilometres	15.30
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.29
Weighted average distance from EWPPs to 1900 CH	in kilometres	18.77
Average from all prime locations to 1900 CH	in kilometres	14.92
Average distance from global prime locations to 1900 CH	in kilometres	7.97



# A.79 Pittsburgh

Figure 88: Pittsburgh



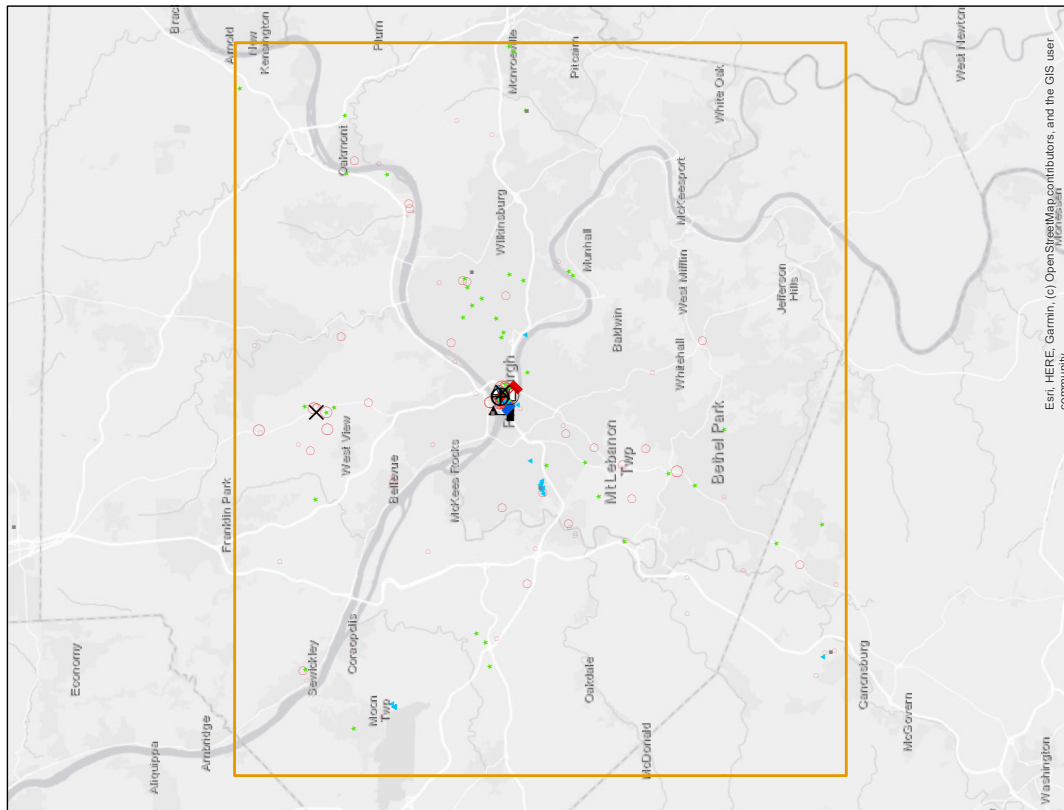
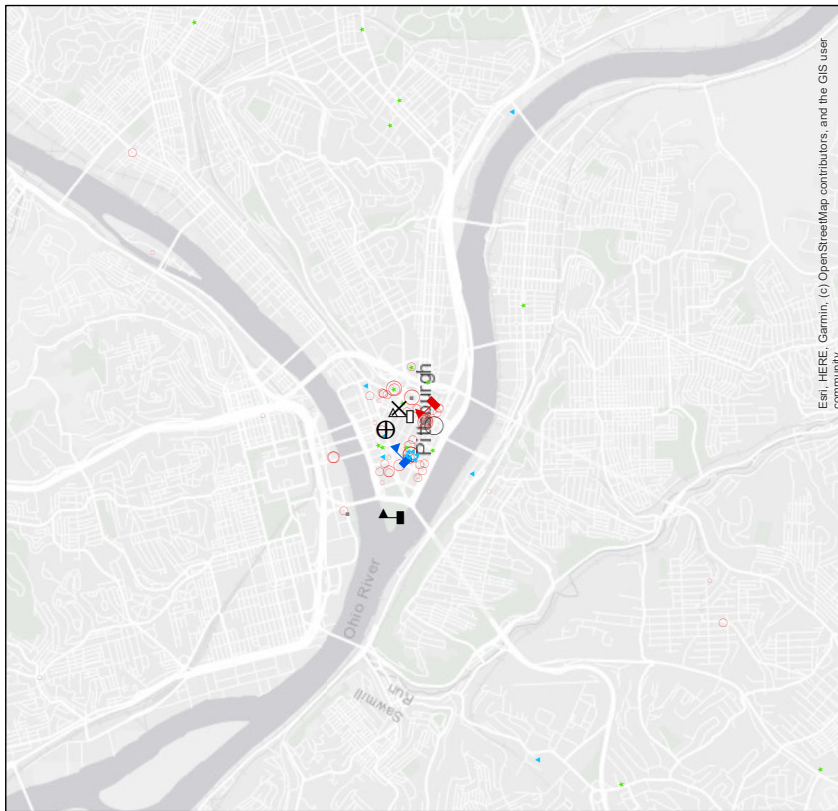


Table 163: Sources: Pittsburgh ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1754	University of Pittsburgh (2015a), Fort Pitt Society (2013, p. 16)
First Political Institution <sup>b</sup>	1799	Baldwin (1937, p. 109), Carnegie Library of Pittsburgh (2015)
City Hall <sup>c</sup>	1900	University of Pittsburgh (2015c), Killikelly (1906, p.xv-xvi)
City Hall	2000	City of Pittsburgh (2015)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Killikelly (1906, p. ix-xi)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1810, 1820, 1830, 1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Gibson and Jung (2005a), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>d</sup>	1985	Springirth (2006, 121)
Number of Stations	1910, 1940, 2010	Schwandl (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1845 <sup>e</sup> , 1927 <sup>f</sup>	Brotzman (1927, p. 500), Chicago Daily Tribune (1927), University of Pittsburgh (2015b), Encyclopaedia Britannica (2015p)
Hurricane(s)	None recorded	
Flooding(s)	1907 <sup>g</sup> , 1936 <sup>h</sup>	Parker (1999, p. 108), Peterson (2013, P. 168), University of Pittsburgh (2015d)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861	Huntington (2007, p. 137)
International War(s)	None recorded	

<sup>a</sup>Trent's fort was built here.

<sup>b</sup>First government meetings convened at Andrew Watson tavern, but the first permanent seat was the courthouse erected in 1799. "Diamond" is the old name for the Market square.

<sup>c</sup>Built in 1872, it seemed to be in operation in 1900 (no new hall built).

<sup>d</sup>The Pittsburgh LRT is partly underground, but seems to have small parts than are running on street level, too. However, similar system such as in Los Angeles and San Jose are counted as metro systems and thus we count this one, too. We take the number of stations from Schwandl (2016).

<sup>e</sup>"Left one third of the city in ashes" (University of Pittsburgh, 2015b).

<sup>f</sup>Gas Explosion counted as fire. The damage seems extensive with houses in the radius of half a mile damaged and buildings in vicinity levelled.

<sup>g</sup>While many parts of downtown were flooded and workers were idle for a week, it does not seem that many structures (except for one bridge) were swept away.

<sup>h</sup>1000 homes were completely destroyed and 8000 damaged, which is why we code this flood as major.

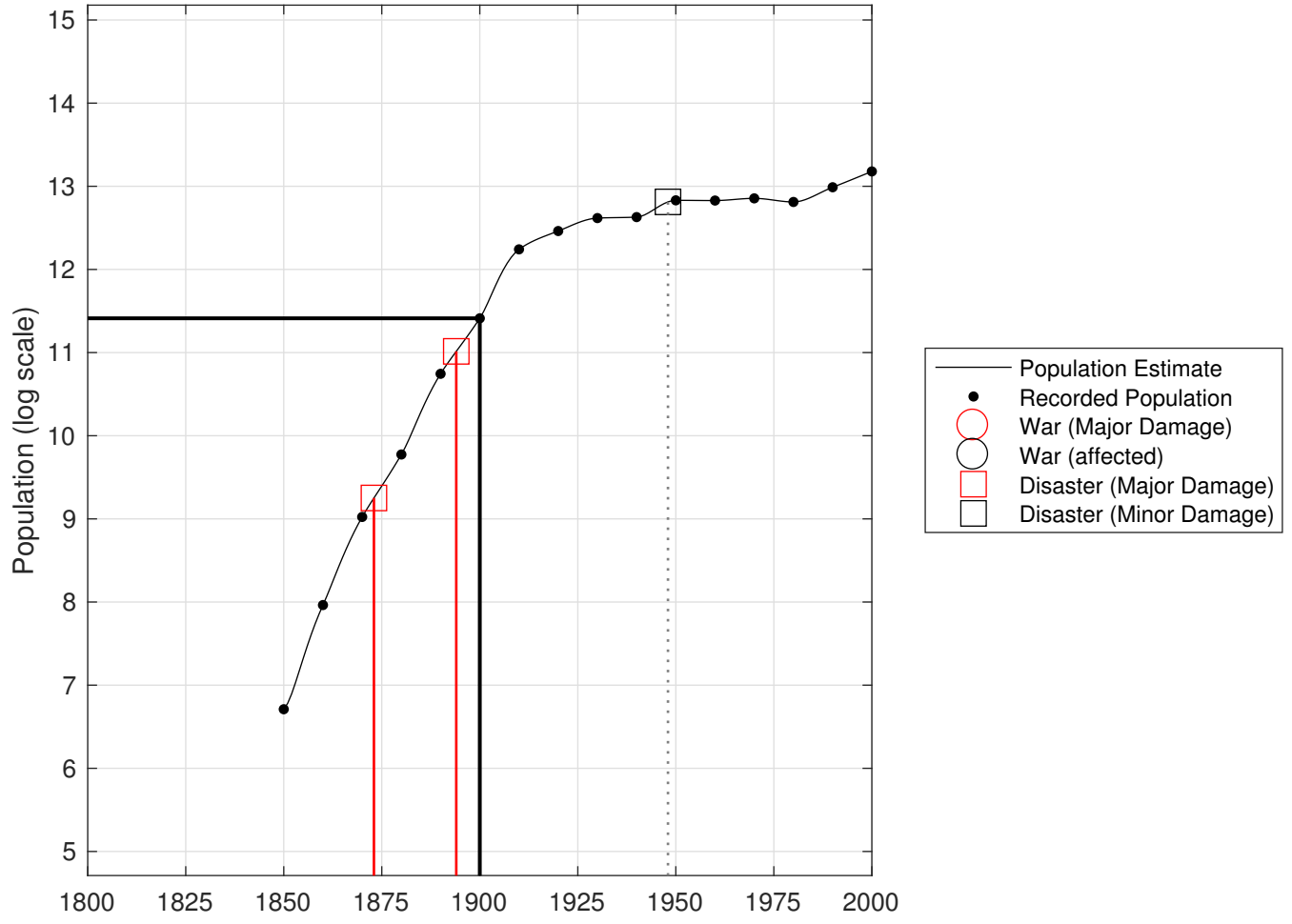


Table 164: Concentration Measures - Pittsburgh

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	9.18
Cumulative density of employment-weighted PP distances at 750 m	%	11.77
Average distance between all prime locations	in kilometres	9.45
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-1.09
Weighted average distance from EWPPs to 1900 CH	in kilometres	5.60
Average from all prime locations to 1900 CH	in kilometres	1.42
Average distance from global prime locations to 1900 CH	in kilometres	0.38

# A.80 Portland

Figure 89: Portland



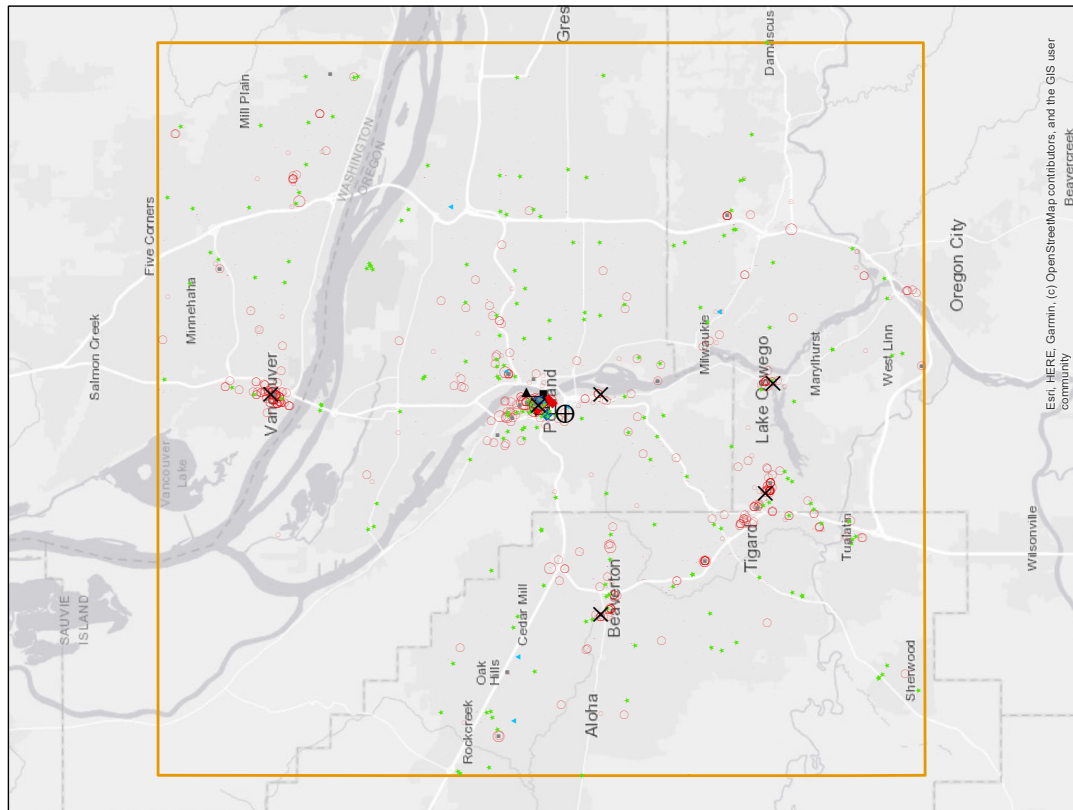
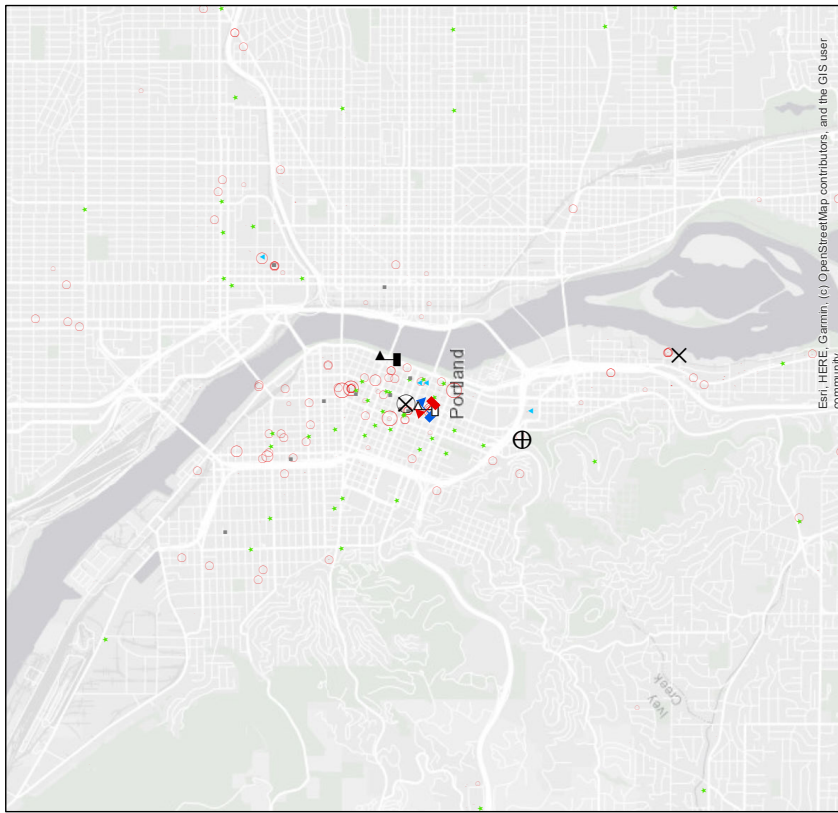


Table 165: Sources: Portland ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1844	Orloff (2015)
First Political Institution <sup>a</sup>	1895	City of Portland (2015a)
City Hall	1900	City of Portland (2015a)
City Hall	2000	City of Portland (2015a)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>b</sup> , 1900, 1950, 2000	City of Portland (2015a)
<i>Population Data (1800-2000)</i>		
City Population	1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Gibson and Jung (2005a, p. 93), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1873 <sup>c</sup>	City of Portland (2015a)
Hurricane(s)	None recorded	
Flooding(s)	1894 <sup>d</sup> , 1948 <sup>e</sup>	City of Portland (2015b), Fortner (2007, p. 125), City of Portland (2015a)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>There had been (a still standing) a court house, but no indication is given that it has been used for municipal government. This seems the first permanent seat of the Portland city council and has remained so until today.

<sup>b</sup>Incorporation in 1851.

<sup>c</sup>This fire destroyed approximately one third of the business district (City of Portland, 2015a). There was another fire in December 1972, which is not listed in this very detailed city chronicle and thus we do not record it either.

<sup>d</sup>Large parts of the city were innuated and apparently some structures were damaged. The actual extent is not entirely clear, it seems that a considerable number of structures was damaged such that businesses and residents had to move (see also Wong, 2004, p. 253).

<sup>e</sup>As Vanport was not technically a part of Portland and flood damage in the city proper was limited in a later flood in 1948, we code this as not having caused major destruction to the city of Portland.

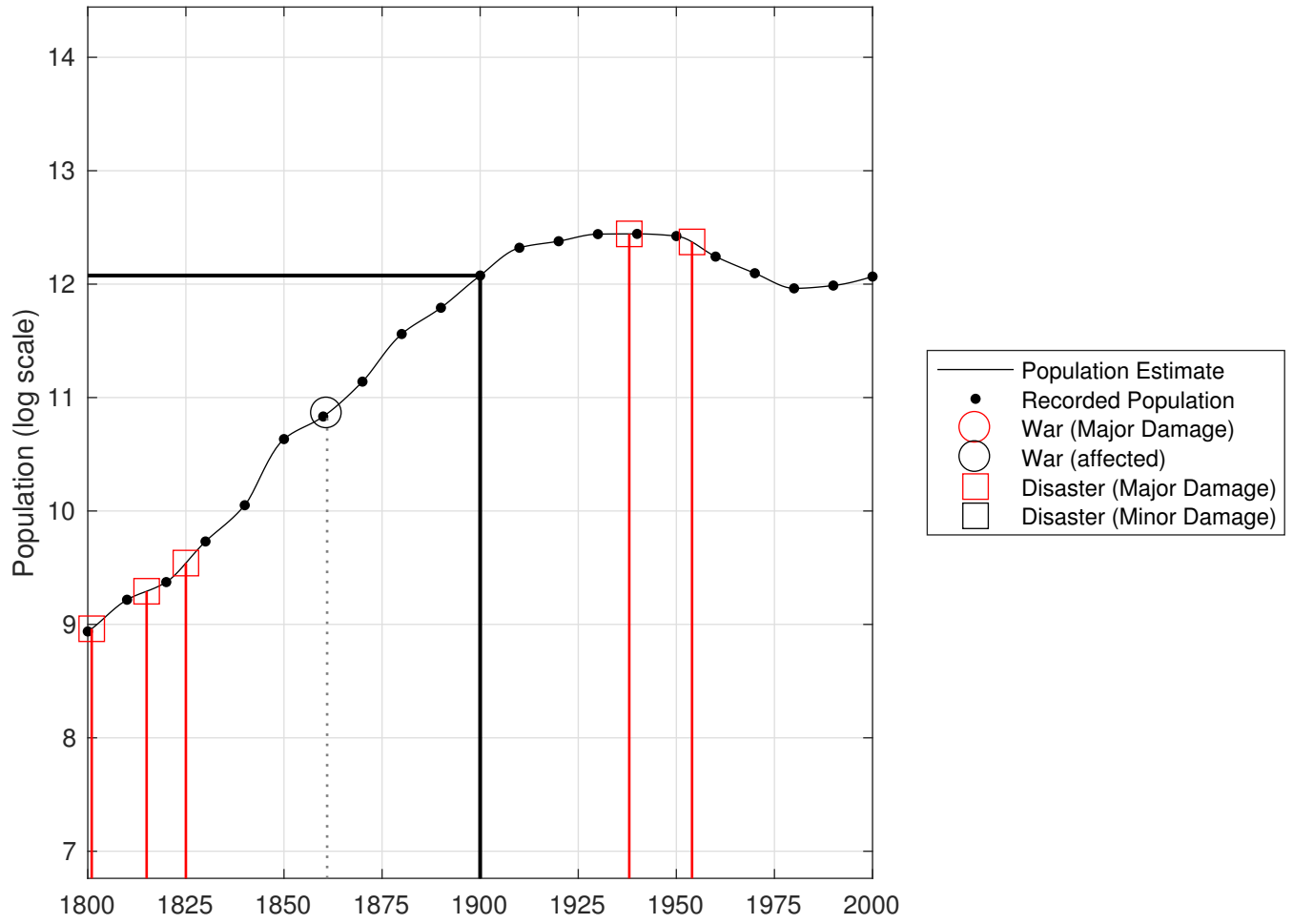


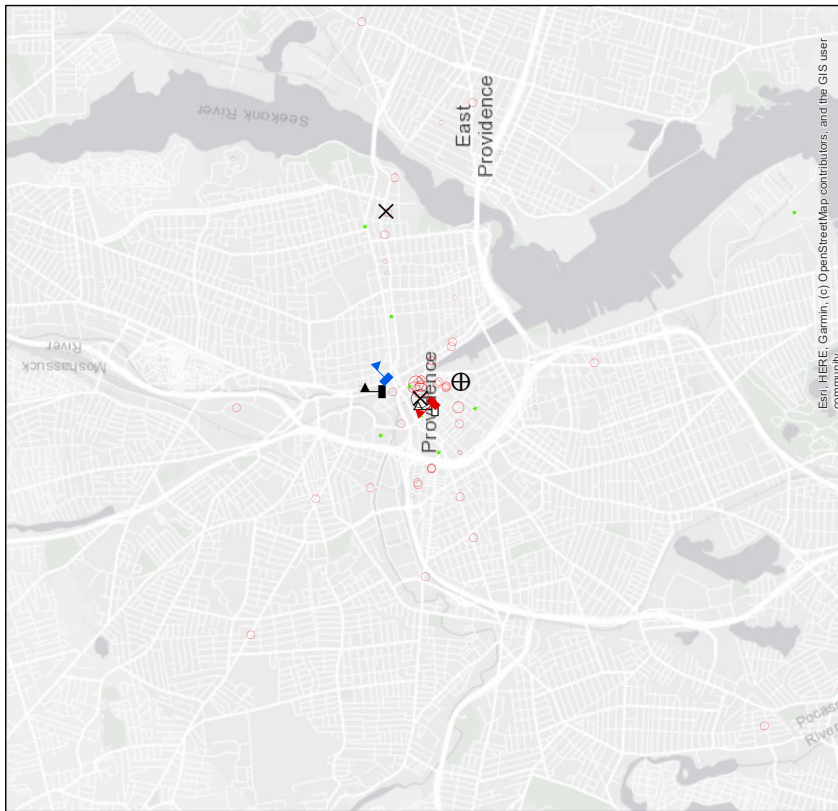
Table 166: Concentration Measures - Portland

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	13.43
Cumulative density of employment-weighted PP distances at 750 m	%	38.10
Average distance between all prime locations	in kilometres	10.52
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.52
Weighted average distance from EWPPs to 1900 CH	in kilometres	9.65
Average from all prime locations to 1900 CH	in kilometres	8.50
Average distance from global prime locations to 1900 CH	in kilometres	0.23

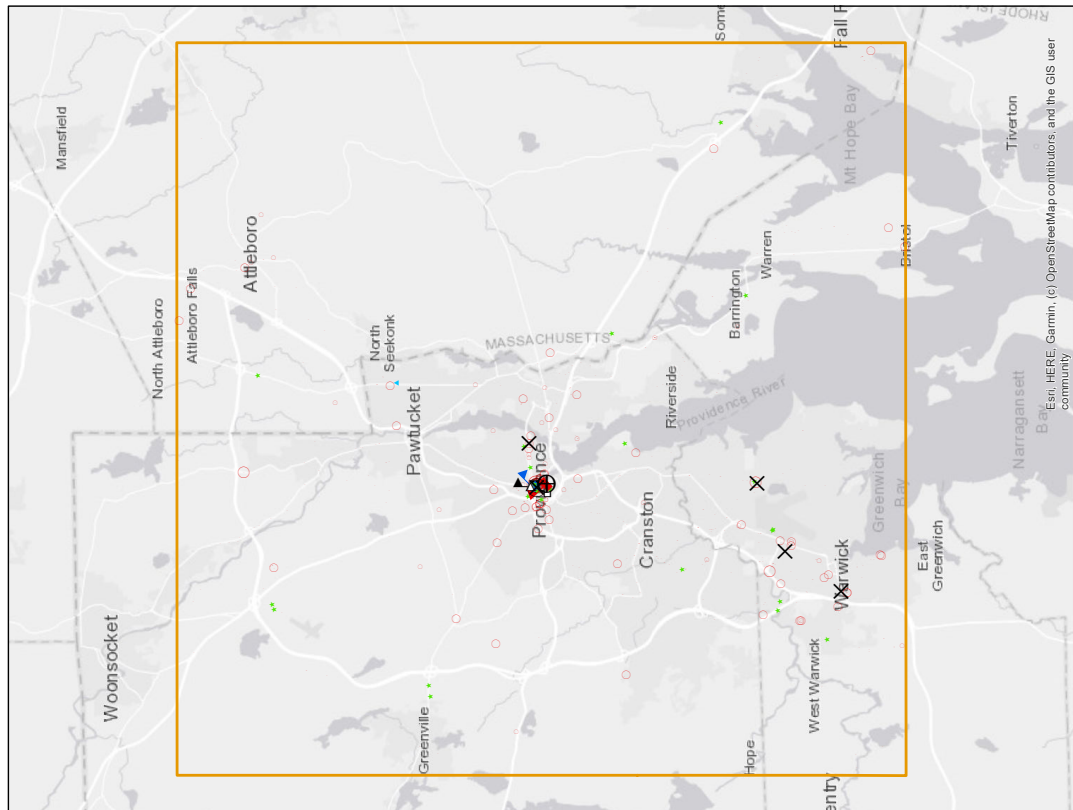
# A.81 Providence

Figure 90: Providence





- Legend**
- X Prime location (any)
  - Global prime location
  - ⊕ Central point
  - Metro extent (prime services)
  - ▲ SNL Office Building
  - ▲ Starbucks
  - ▲ CoWorking
  - Foundation Place EWWP
    - 450 - 918
    - 68 - 98
    - 98 - 450
  - First City Government
    - 918 - 1507
    - 1507 - 1898
  - City Hall 1900
  - City Hall 2000



- 0 3 6 12 Kilometers

Table 167: Sources: Providence ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1636	National Park Service (2015f)
First Political Institution <sup>a</sup>	1731	Campbell (2011)
City Hall	1900	Campbell (2011)
City Hall	2000	Campbell (2011)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>b</sup> , 1900, 1950, 2000	Montès (2014, p. 78)
<i>Population Data (1800-2000)</i>		
City Population	1790, 1800, 1810, 1820, 1830, 1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Gibson and Jung (2005a, p.96), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1801, 1825 <sup>c</sup>	Betts (1927, p. 320), Klyberg (2015)
Hurricane(s)	1815, 1938 <sup>d</sup> , 1954	United States of America Congress (2006, p. 7068), Conley and Campbell (2015), Klyberg (2015)
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861	Williams (2015)
International War(s)	None recorded	

<sup>a</sup>This was the first permanent seat. Beforehand, meetings took place near a tree at the corner of College street and Main street, the Quaker Meeting House or private homes.

<sup>b</sup>Before 1900, it shared the status of the state capital.

<sup>c</sup>The Universalist church and 11 other buildings were destroyed. Given the size of the city, this is coded as major destruction.

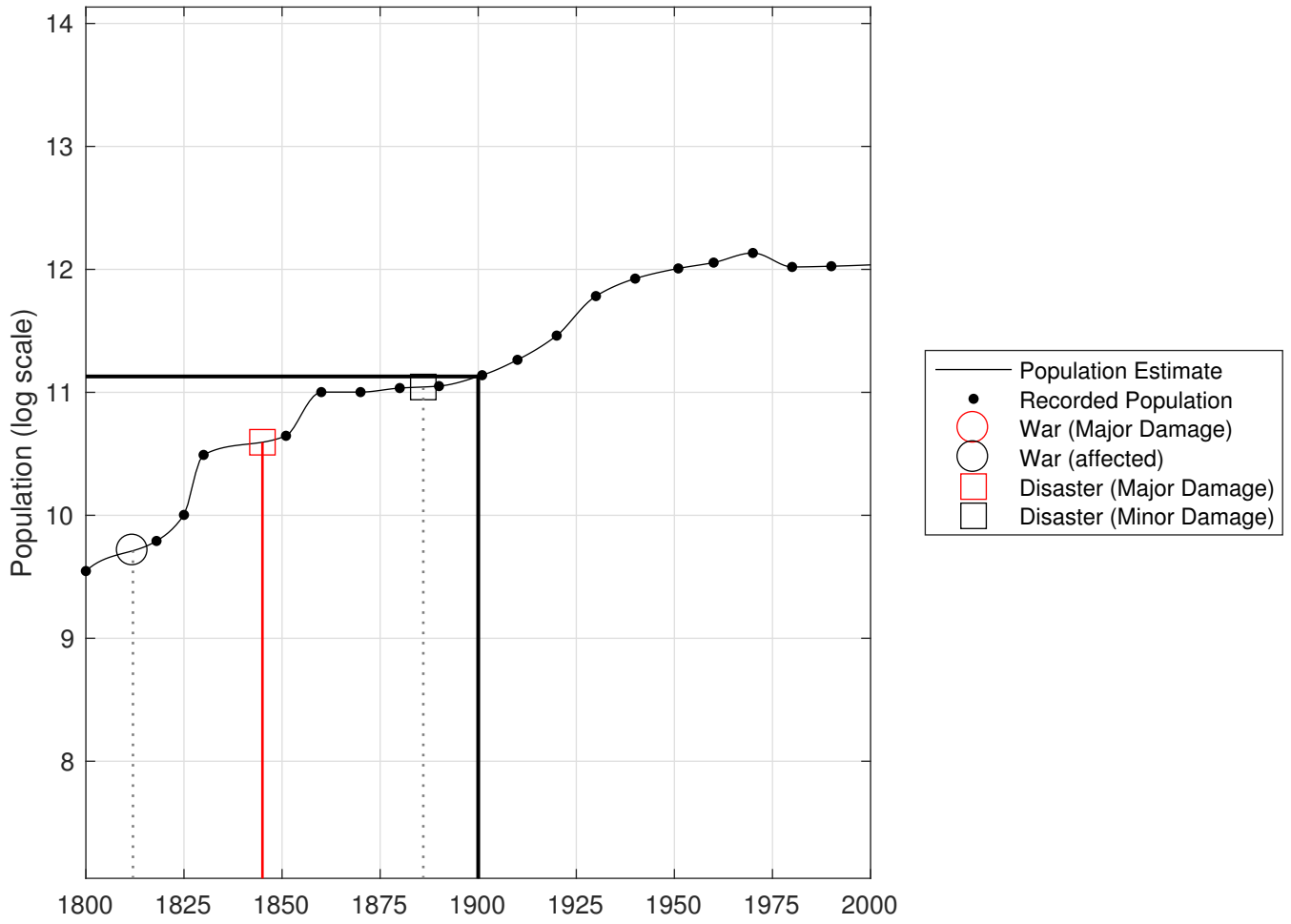
<sup>d</sup>Although mentioned on Encyclopaedia Britannica (2015q), the extent of the hurricane in our classification only warrants “having caused major destruction.”

Table 168: Concentration Measures - Providence

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	11.10
Cumulative density of employment-weighted PP distances at 750 m	%	20.73
Average distance between all prime locations	in kilometres	7.39
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.56
Weighted average distance from EWPPs to 1900 CH	in kilometres	7.35
Average from all prime locations to 1900 CH	in kilometres	2.92
Average distance from global prime locations to 1900 CH	in kilometres	0.12

A.82 Quebec City

Figure 91: Quebec City



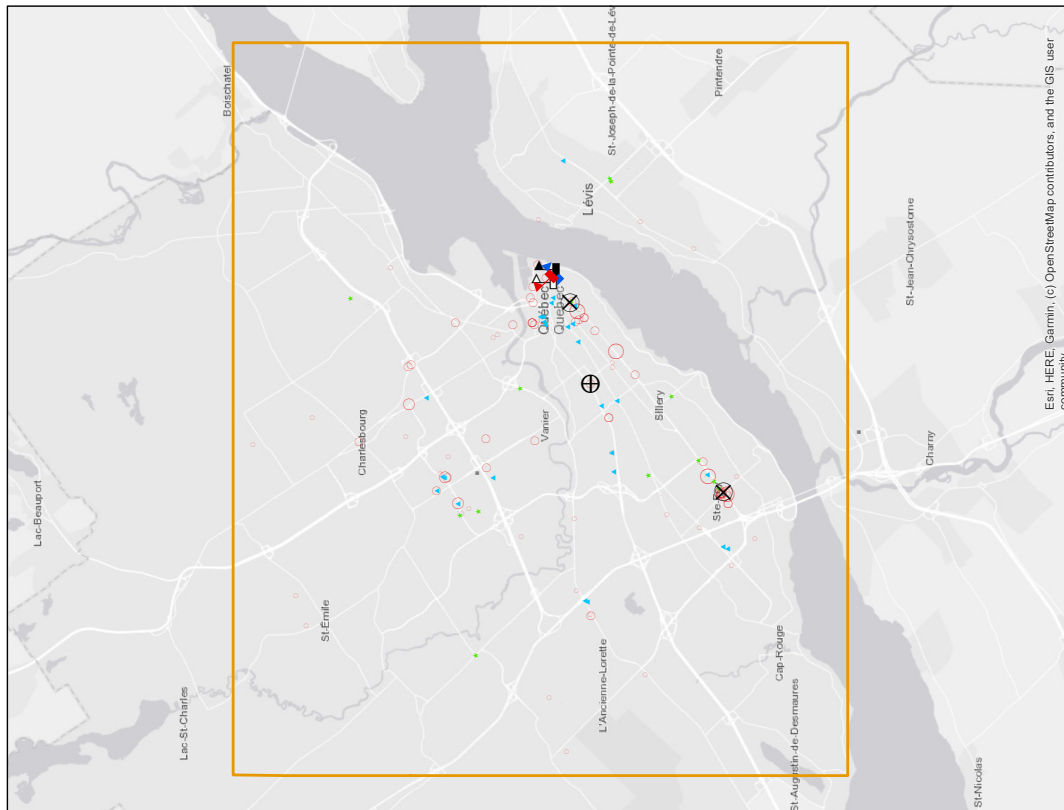
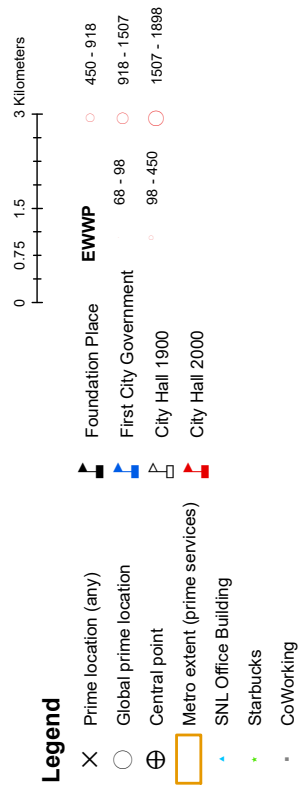
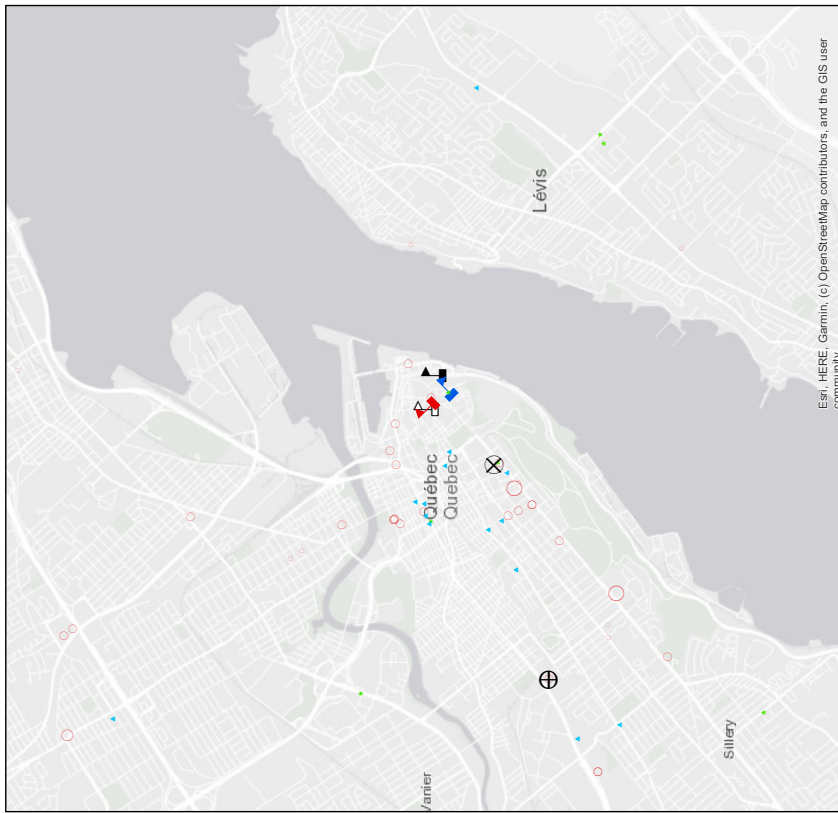


Table 169: Sources: Quebec City ( Canada )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1608	Ville de Quebec (2015)
First Political Institution <sup>a</sup>	1840	Ville de Quebec (2015)
City Hall	1900	Parks Canada (2015d)
City Hall	2000	Parks Canada (2015d)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>b</sup> , 1900, 1950, 2000	Gough (2010, p. 341f)
<i>Population Data (1800-2000)</i>		
City Population	1795, 1800, 1818, 1825, 1830, 1851, 1860, 1870, 1880, 1890, 1901, 1910, 1920, 1930, 1940, 1951, 1960, 1970, 1980, 1990, 2001	Ruddel and Lafrance (1985, p. 319), Pelletier et al. (1997, p. 93), Statistics Canada (1955), Mitchell and Palgrave Macmillan (2014), Cartier (2014)
Metro Population <sup>c</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1845 <sup>d</sup>	Buescher (2015)
Hurricane(s)	None recorded	
Flooding(s)	1886 <sup>e</sup>	Government of Canada (2015)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1812 <sup>f</sup>	Chartrand (2012, p. 43)

<sup>a</sup>Fort St. Louis seat of colonial government, no city hall until 1840 (Waymarking.com, 2012), but government like functions concerning the city were likely to be carried out from the fort. Four successive of the Saint Louis forts between 1620-1840.

<sup>b</sup>It was capital until the 1840 Union Act and has remained provincial capital ever since

<sup>c</sup>Footnote from United Nations Population Division (2014): Refers to the Census Metropolitan Area.

<sup>d</sup>There were two large fires in this year, both causing major destruction. As they lie only one month apart, we code them as one "major disaster."

<sup>e</sup>Center of damage was Montreal.

<sup>f</sup>Important fort in the War of 1812.

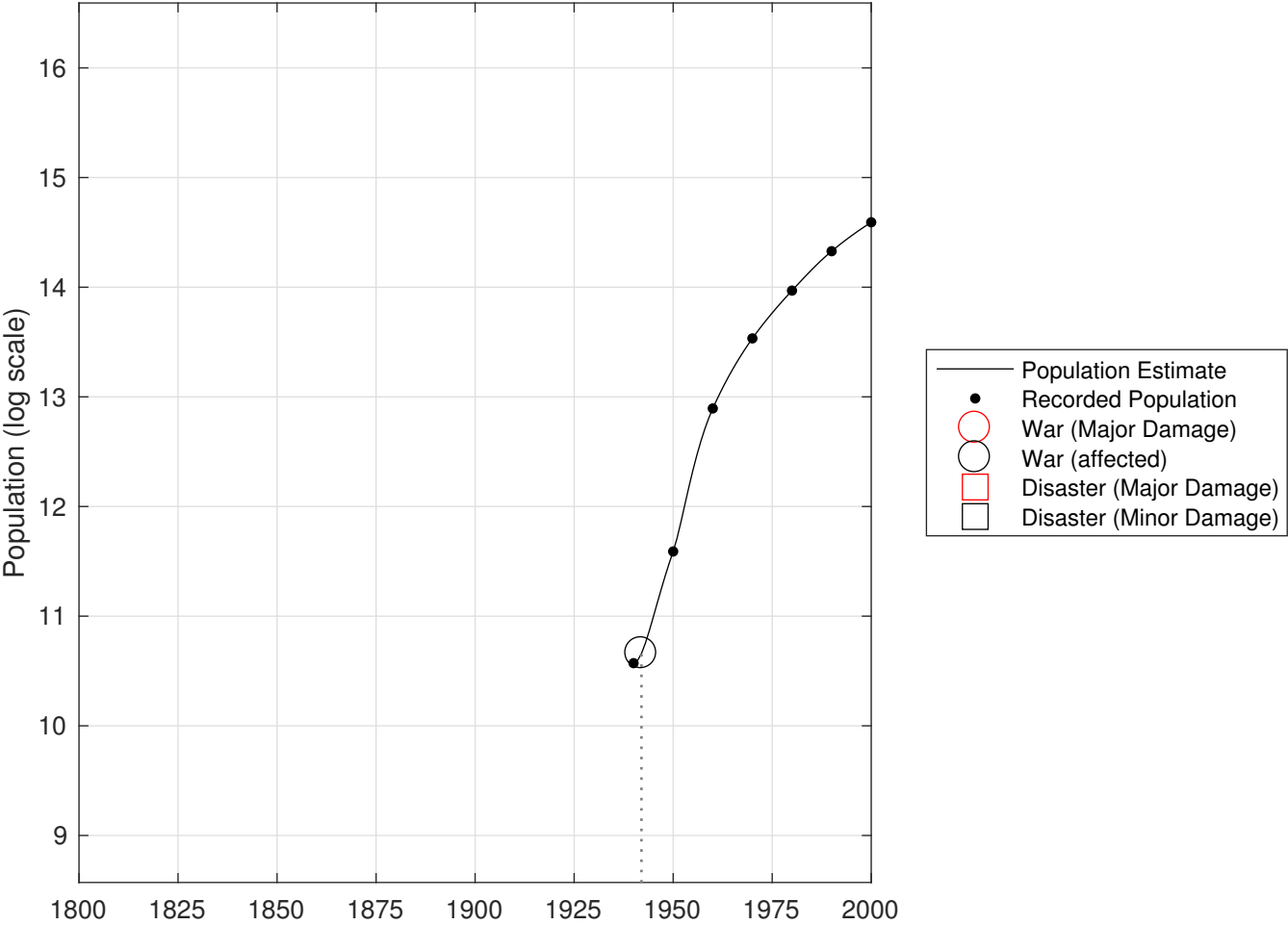


Table 170: Concentration Measures - Quebec City

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	5.84
Cumulative density of employment-weighted PP distances at 750 m	%	17.23
Average distance between all prime locations	in kilometres	3.54
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.39
Weighted average distance from EWPPs to 1900 CH	in kilometres	5.48
Average from all prime locations to 1900 CH	in kilometres	5.80
Average distance from global prime locations to 1900 CH	in kilometres	5.92

A.83 Quezon City

Figure 92: Quezon City



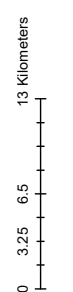
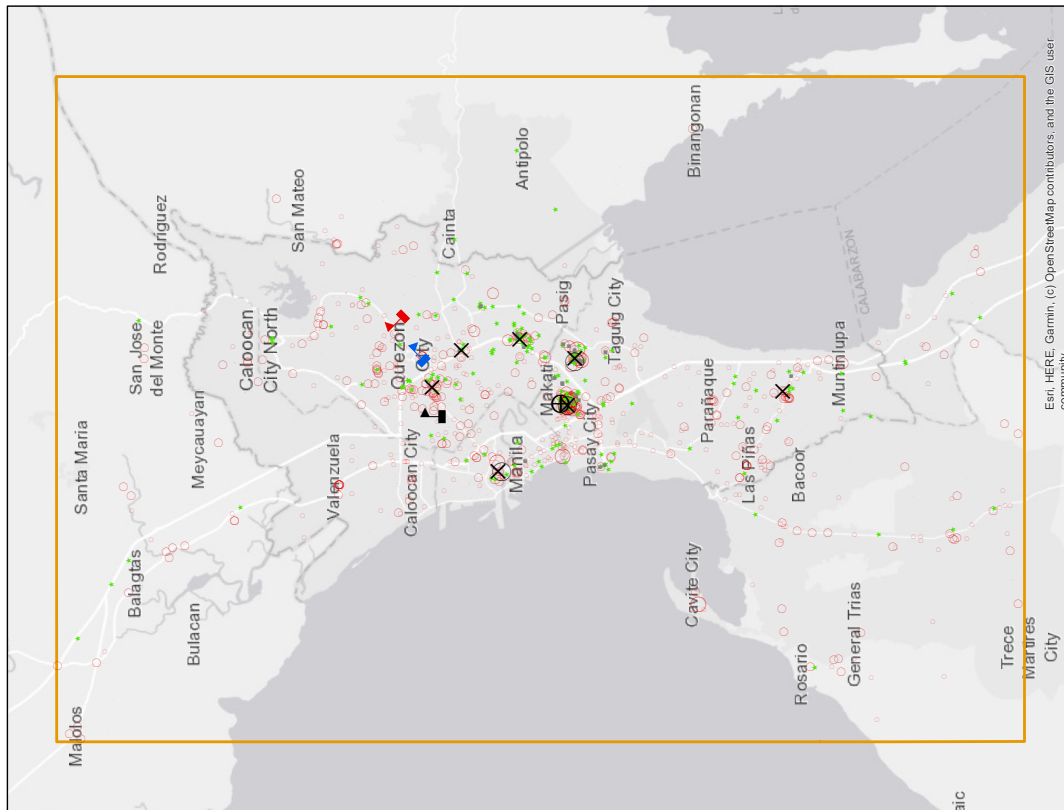
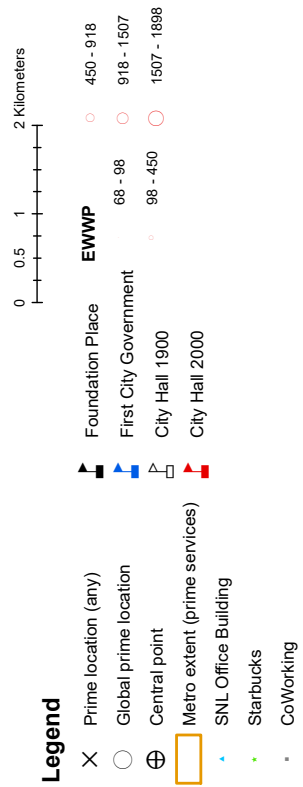
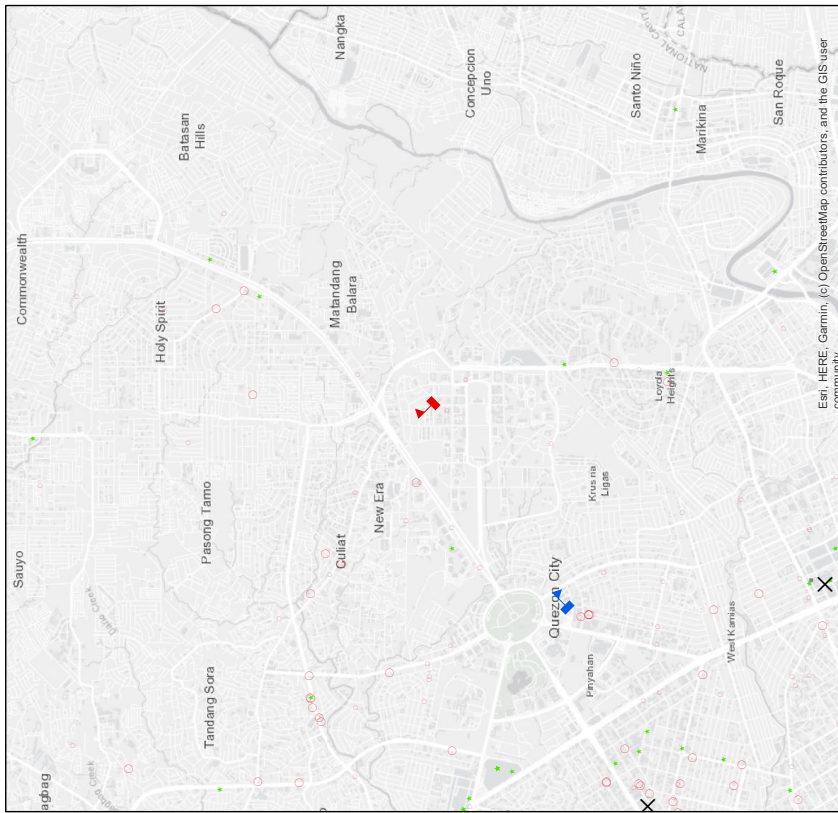


Table 171: Sources: Quezon City ( Phillipines )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1590	Government of Quezon City (2014a)
First Political Institution	1954	Government of Quezon City (2014b)
City Hall <sup>b</sup>	1900	Government of Quezon City (2014b)
City Hall	2000	Government of Quezon City (2014b)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>c</sup> , 1900, 1950, 2000	Government of Quezon City (2014b)
<i>Population Data (1800-2000)</i>		
City Population	1940, 1950, 1960, 1970, 1980, 1990, 2000	Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>d</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1984	Victor and Ponnuswamy (2012, 123)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1896 <sup>e</sup>	Quezon City Council (2014, p.3)
International War(s)	1942 <sup>f</sup>	Government of Quezon City (2014b)

<sup>a</sup>This was a church on today's area of Quezon city. One could think of it as the first European settlement in this region, but the information before the foundation of Quezon city before 1930 is very scarce.

<sup>b</sup>First city hall was built in 1954.

<sup>c</sup>Small settlement, city was only founded in 1938.

<sup>d</sup>Footnote from United Nations Population Division (2014): Refers to the National Capital Region.

<sup>e</sup>Revolution against Spanish Occupation.

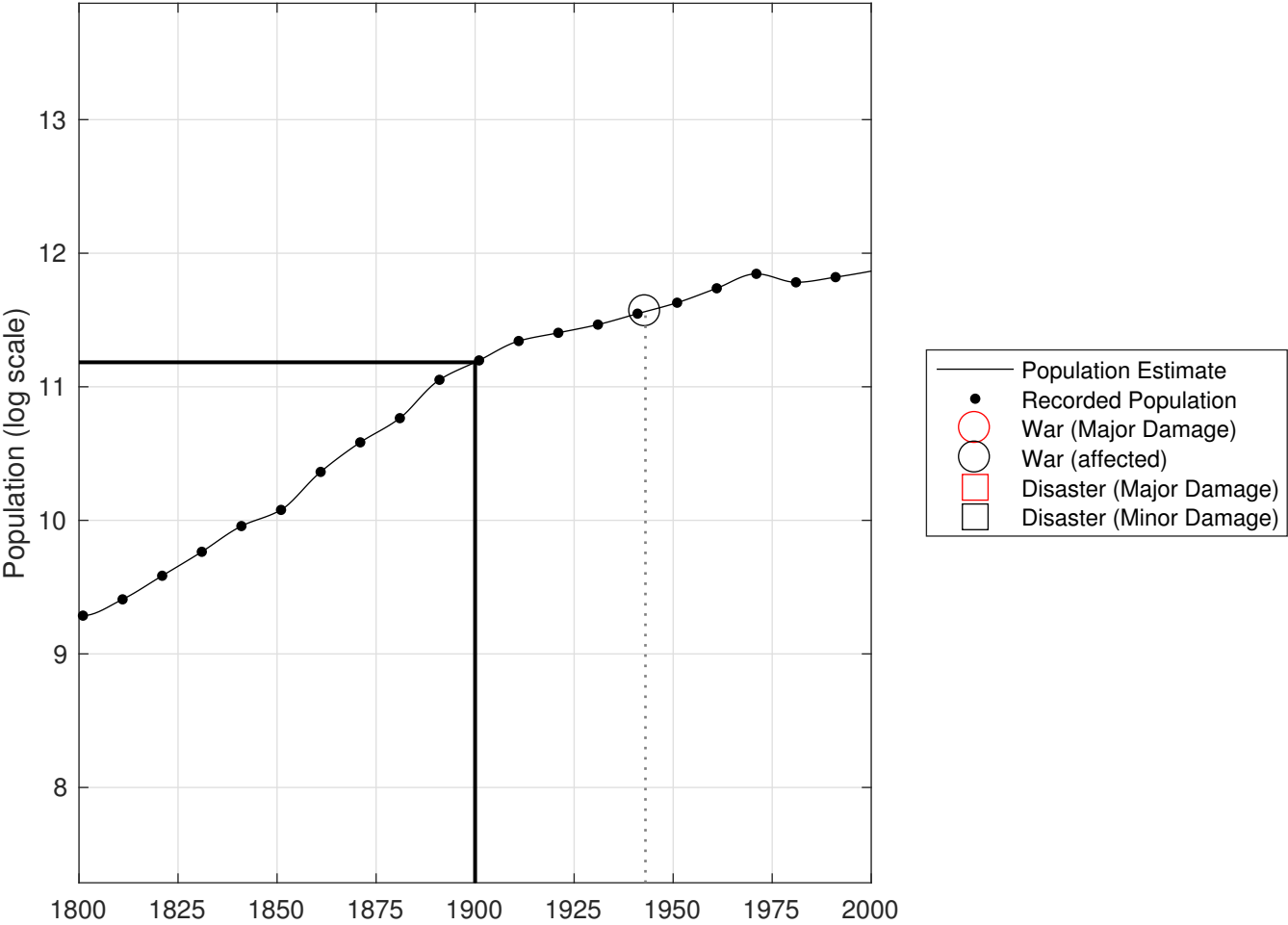
<sup>f</sup>Japanese Occupation.

Table 172: Concentration Measures - Quezon City

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	14.27
Cumulative density of employment-weighted PP distances at 750 m	%	40.96
Average distance between all prime locations	in kilometres	8.60
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.06
Weighted average distance from EWPPs to 1900 CH	in kilometres	12.72
Average from all prime locations to 1900 CH	in kilometres	9.98
Average distance from global prime locations to 1900 CH	in kilometres	10.40

A.84 Reading

Figure 93: Reading



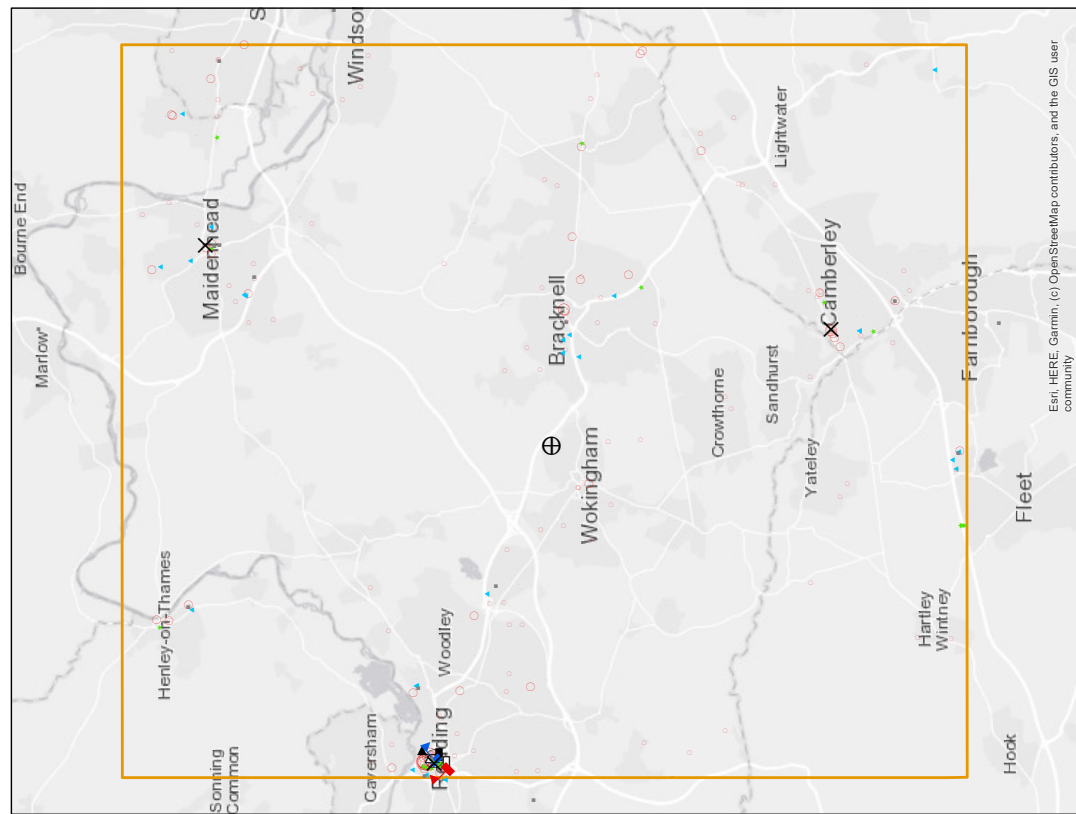
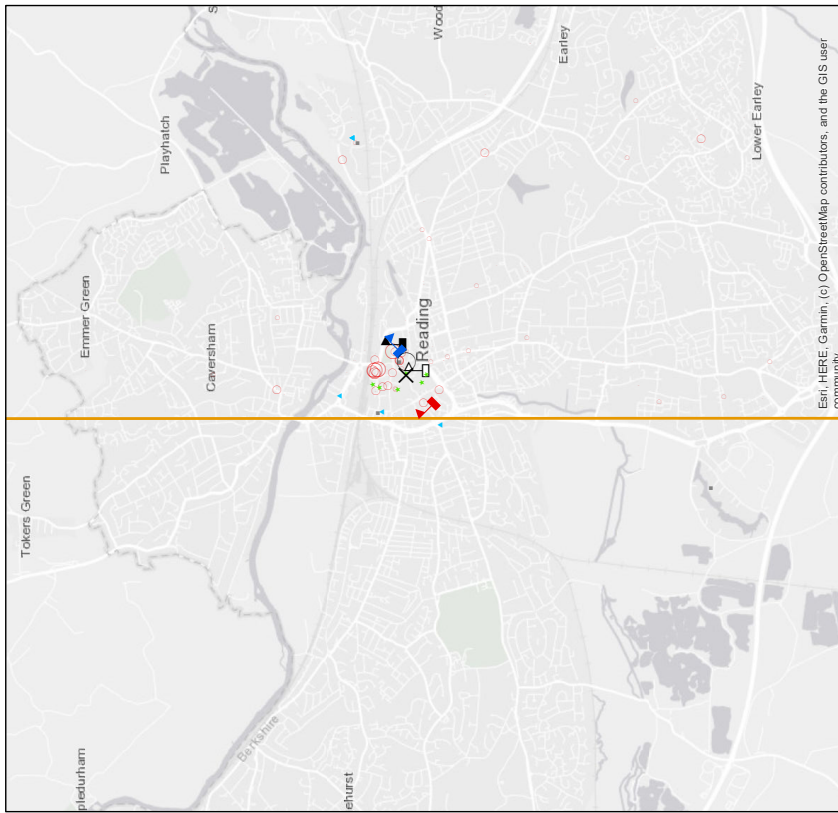


Table 173: Sources: Reading ( United Kingdom )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	871	Ditchfield and Page (1923, p. 232-234), John (1996, p. 75)
First Political Institution	1121	Doran (1835, p. 4), Ditchfield and Page (1923, p. 232-234)
City Hall <sup>b</sup>	1900	Guiling (1894), Reading Museum (2015)
City Hall <sup>c</sup>	2000	Reading Museum (2015), Reading Borough Council (2015)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Ditchfield and Page (1923)
<i>Population Data (1800-2000)</i>		
City Population	1790, 1801, 1811, 1821, 1831, 1841, 1851, 1861, 1871, 1881, 1891, 1901, 1911, 1921, 1931, 1941, 1951, 1961, 1971, 1981, 1991, 2001	Doran (1835, p. 264), University of Portsmouth (2015)
Metro Population <sup>d</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>e</sup>	None	
Number of Stations	1910, 1940, 2010	NaN
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1943 <sup>f</sup>	Arborfield Local History Society (2015)

<sup>a</sup>Reading is first mentioned in 871, when the Danes set up a fort where now is the north east part of the city (John, 1996, p. 75). The settlement - most likely - has existed for a while by then, but we are unable to locate any further information on when and where it was. Some speculation has been done that there was even a Roman settlement (Doran, 1835, p. 1), but this is uncertain. Reading enters a period of insignificance until 1121 (Doran, 1835, p. 4), when the abbey is founded, which we then take as the first “real government place” (Ditchfield and Page, 1923, p. 232-234).

<sup>b</sup>Opened in 1882. The second source suggests that the town hall was the seat of the city council.

<sup>c</sup>Location of the new city hall since 1976.

<sup>d</sup>Footnote from United Nations Population Division (2014): For Birmingham, Manchester, and Newcastle upon Tyne, data from 1951 to 1971 refer to Conurbation, while data from 1981 to 2011 refer to Urban area (including Greater Manchester). For Birmingham (West Midlands) the limits of the urban area have been modified in 2011. For Sunderland, data from 1951 to 1981 refer to Sunderland and Whitburn urban areas, while data from 1991 to 2011 refer to Sunderland, Whitburn, Washington, Chester-le-Street and 9 other sub-divisions of the urban agglomeration. The limits of the urban agglomerations of Newport and Reading-Wokingham have been modified between 1981 and 1991.

<sup>e</sup>There is no metro system matching the definition by Gonzalez-Navarro and Turner (2016).

<sup>f</sup>There was one bombing, but damage was limited to very few buildings in the center. 41 Casualties occurred. We could not locate other disasters for 1800-2000 on the timeline until the end of the 19th century (Guiling, 1894) and none for the 20th.





Table 174: Concentration Measures - Reading

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	13.71
Cumulative density of employment-weighted PP distances at 750 m	%	36.25
Average distance between all prime locations	in kilometres	13.27
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.44
Weighted average distance from EWPPs to 1900 CH	in kilometres	12.63
Average from all prime locations to 1900 CH	in kilometres	6.17
Average distance from global prime locations to 1900 CH	in kilometres	0.28

A.85 Rio de Janeiro

Figure 94: Rio de Janeiro

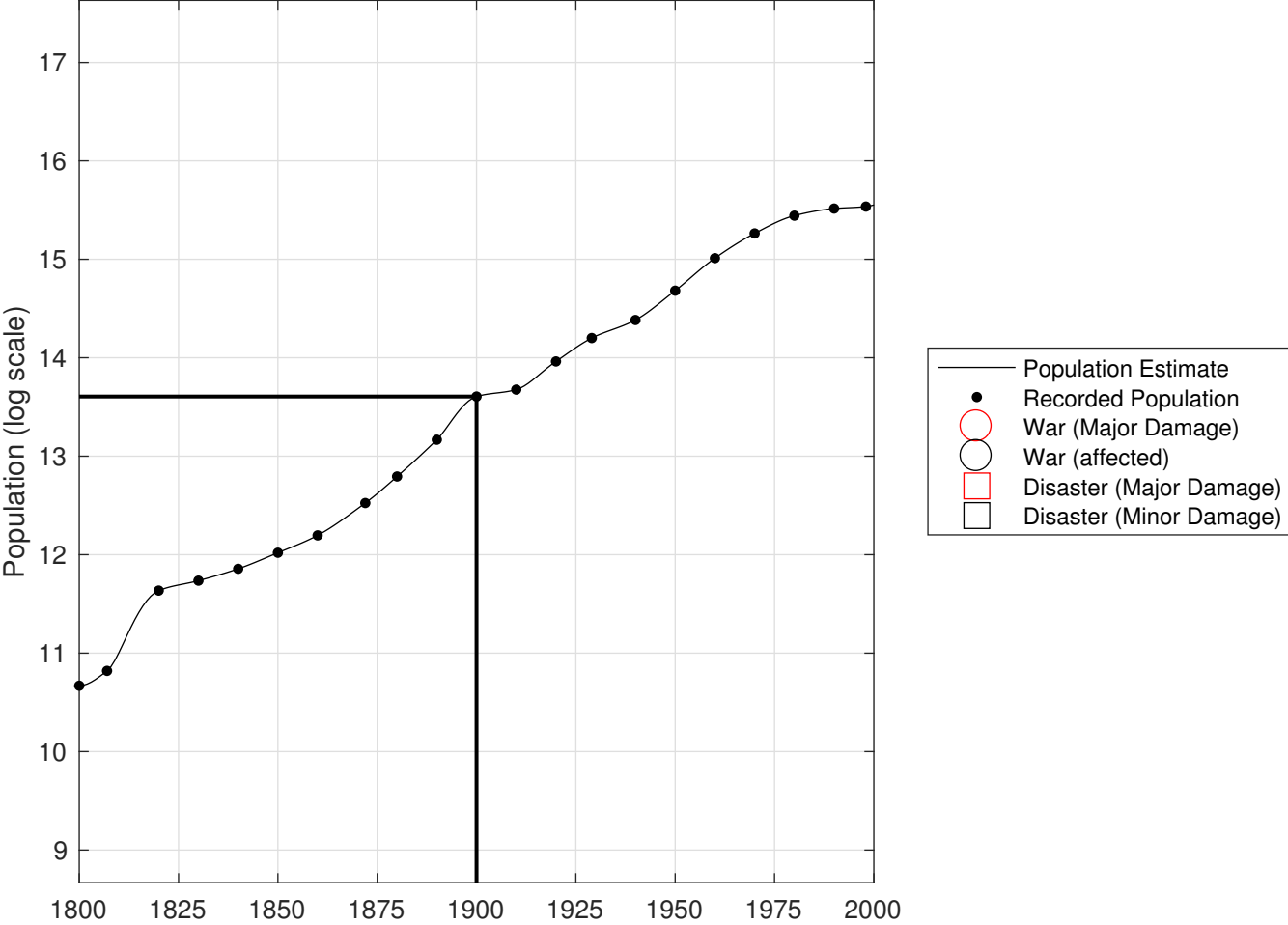




Table 175: Sources: Rio de Janeiro ( Brazil )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1555	Henderson (1821, p. 31)
First Political Institution <sup>b</sup>	1567	Câmara Municipal do Rio de Janeiro (2014a)
City Hall <sup>c</sup>	1900	Arquivo Geral da Cidade do Rio de Janeiro (2014)
City Hall <sup>d</sup>	2000	Câmara Municipal do Rio de Janeiro (2014b)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950 <sup>e</sup> , 2000	Cardoso and Araujo (1992, p. 271)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1807, 1820, 1830, 1840, 1850, 1860, 1872, 1880, 1890, 1900, 1910, 1920, 1929, 1940, 1950, 1960, 1970, 1980, 1990, 1998, 2005	Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1979	Morton (2015, 330)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>French built fort on Villegagnon, an island just before the coast

<sup>b</sup>The first town hall was built here, but the whole historic hill “Morro de Castelo” was demolished in 1922 due to urban redevelopment programmes. We used <http://www.riodejaneiroaqui.com/pt/morro-do-castelo-2c.html> to locate the spot of the town hall. Later the first ‘city hall’ was built in 1825 according to Arquivo Geral da Cidade do Rio de Janeiro (2014).

<sup>c</sup>Government moved here in 1897.

<sup>d</sup>Today’s seat of the mayor is somewhere else (see Centro de Arquitetura and Urbanismo do Rio de Janeiro (2001, p. 15)), but we take the seat of the Câmara Municipal - the local legislative body (Câmara Municipal do Rio de Janeiro, 2014b)

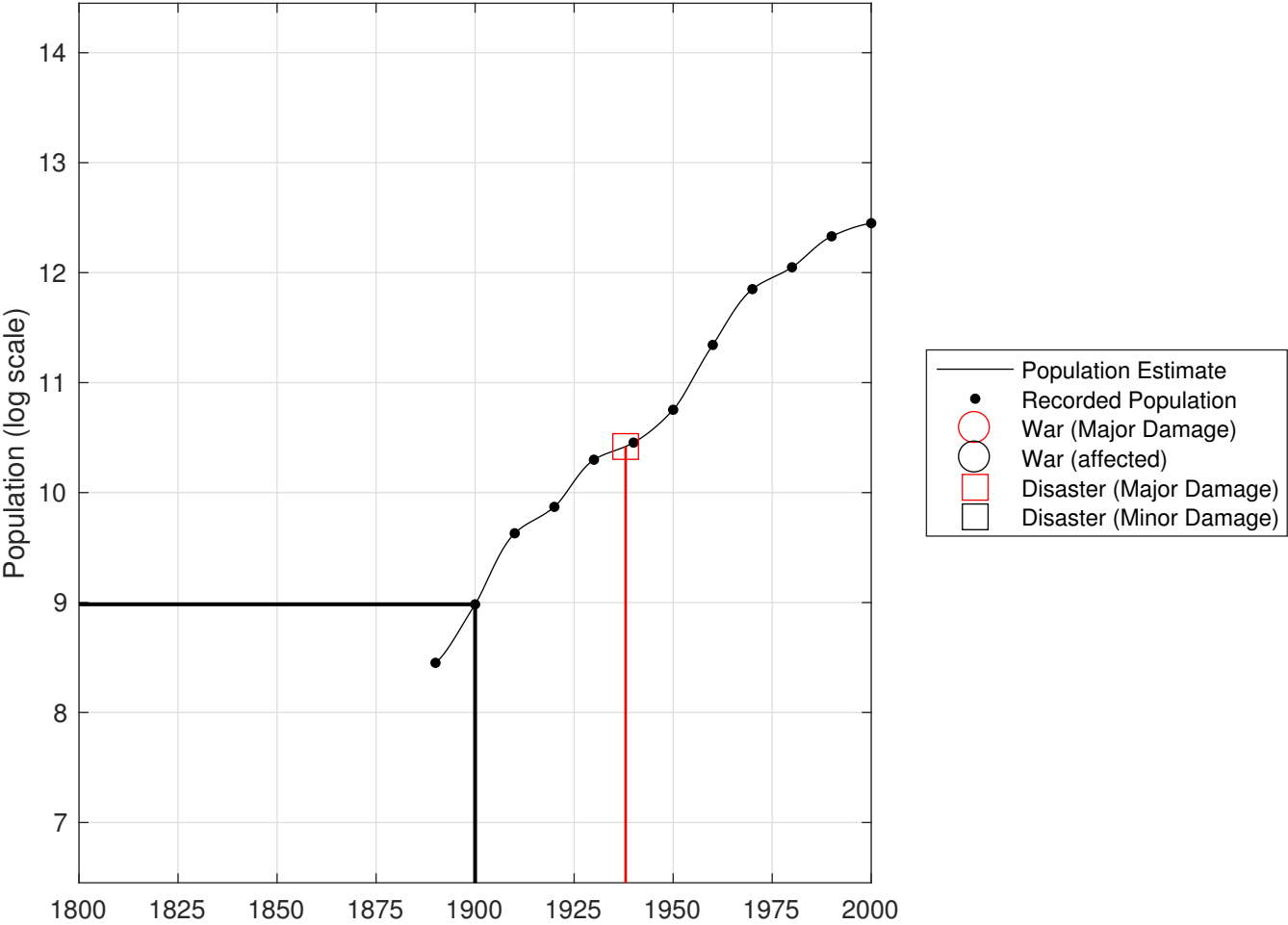
<sup>e</sup>Remained Capital until 1960.

Table 176: Concentration Measures - Rio de Janeiro

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	6.28
Cumulative density of employment-weighted PP distances at 750 m	%	3.61
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-1.19
Weighted average distance from EWPPs to 1900 CH	in kilometres	3.78
Average from all prime locations to 1900 CH	in kilometres	0.52
Average distance from global prime locations to 1900 CH	in kilometres	0.52

A.86 Riverside

Figure 95: Riverside



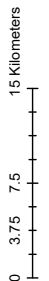
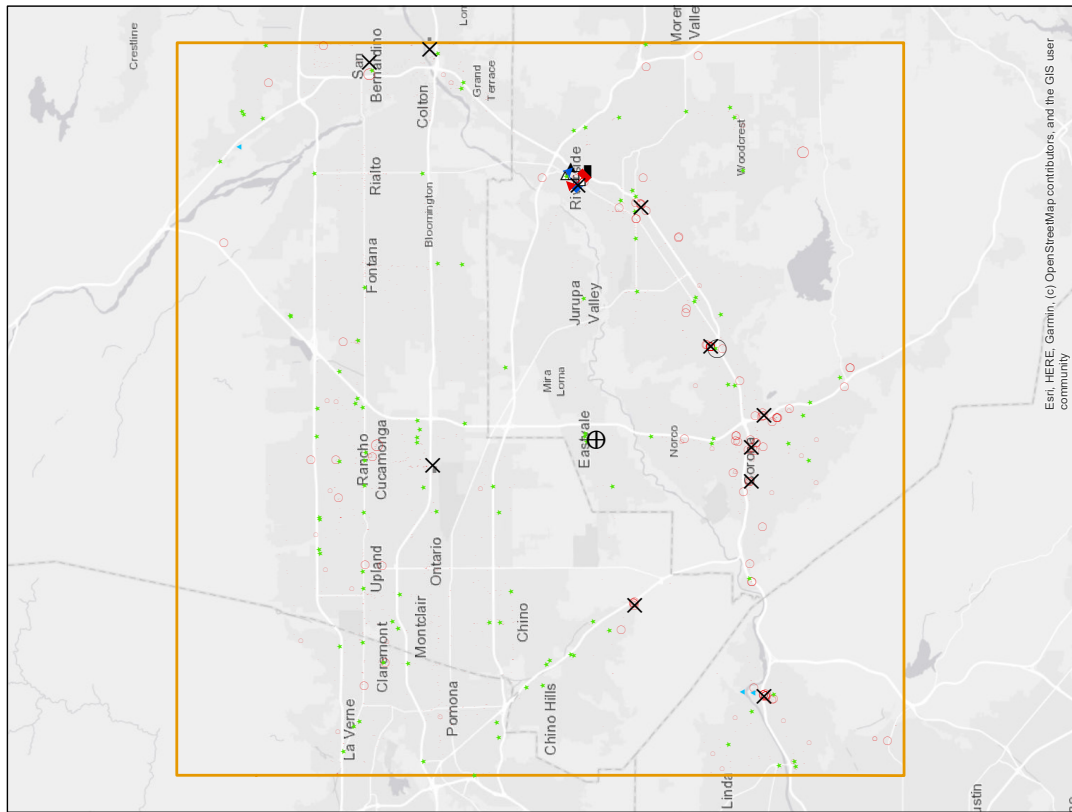
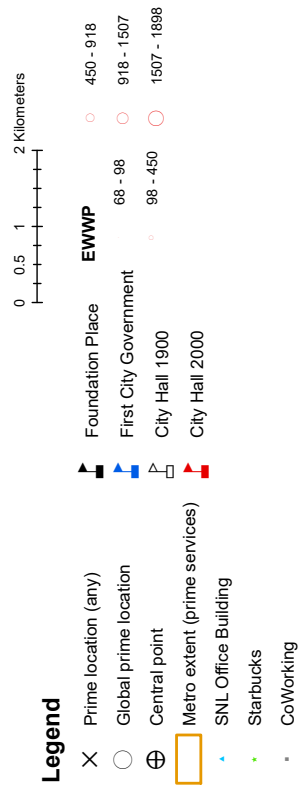
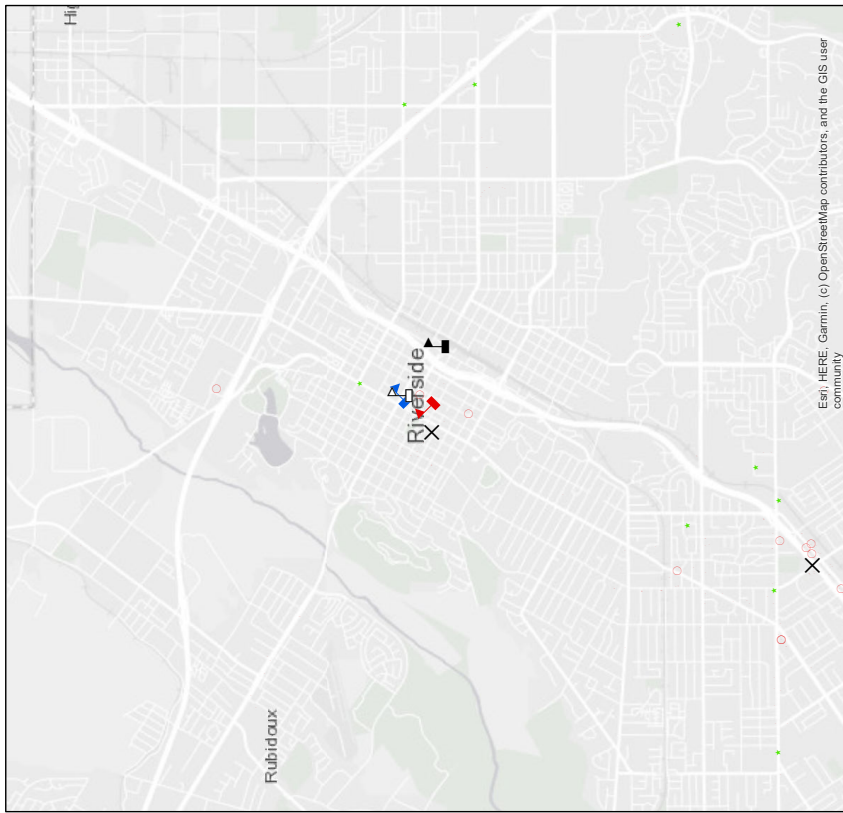




Table 177: Sources: Riverside ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1870	City of Riverside (2015b)
First Political Institution <sup>a</sup>	1890	City of Riverside (2015a, p. 3)
City Hall <sup>b</sup>	1900	City of Riverside (2015a, p. 3)
City Hall	2000	Freeman (2009, p. 25)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>c</sup> , 1900, 1950, 2000	City of Riverside (2011)
<i>Population Data (1800-2000)</i>		
City Population	1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Gibson and Jung (2005a, p. 34), United States Census Bureau (2015)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>d</sup>	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1888 <sup>e</sup>	City of Riverside Fire Department (2015)
Hurricane(s)	None recorded	
Flooding(s)	1938 <sup>f</sup>	Lech (2007, p. 50)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>This seems to be the first permanent meeting place for the city council (incorporated in 1878) until the city hall in 3612 Mission Avenue was opened in 1923.

<sup>b</sup>This was the city hall in 1890 and there is no indication it had been moved until 1900.

<sup>c</sup>Not yet settled.

<sup>d</sup>One could count metrolink as a commuter rail or metro.

<sup>e</sup>We code this as a non-major fire, because the extent in the source is not clear. While it “engulfed a whole block”, the fire department “saved a large portion of the business district (City of Riverside Fire Department, 2015).

<sup>f</sup>A number of earthquakes have been recorded, but none of it caused severe damage according to the historical record. In contrast, this flood swept many structures away.

Table 178: Concentration Measures - Riverside

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	22.00
Cumulative density of employment-weighted PP distances at 750 m	%	100.52
Average distance between all prime locations	in kilometres	19.39
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.23
Weighted average distance from EWPPs to 1900 CH	in kilometres	21.16
Average from all prime locations to 1900 CH	in kilometres	19.24
Average distance from global prime locations to 1900 CH	in kilometres	14.70

# A.87 Riyadh

Figure 96: Riyadh

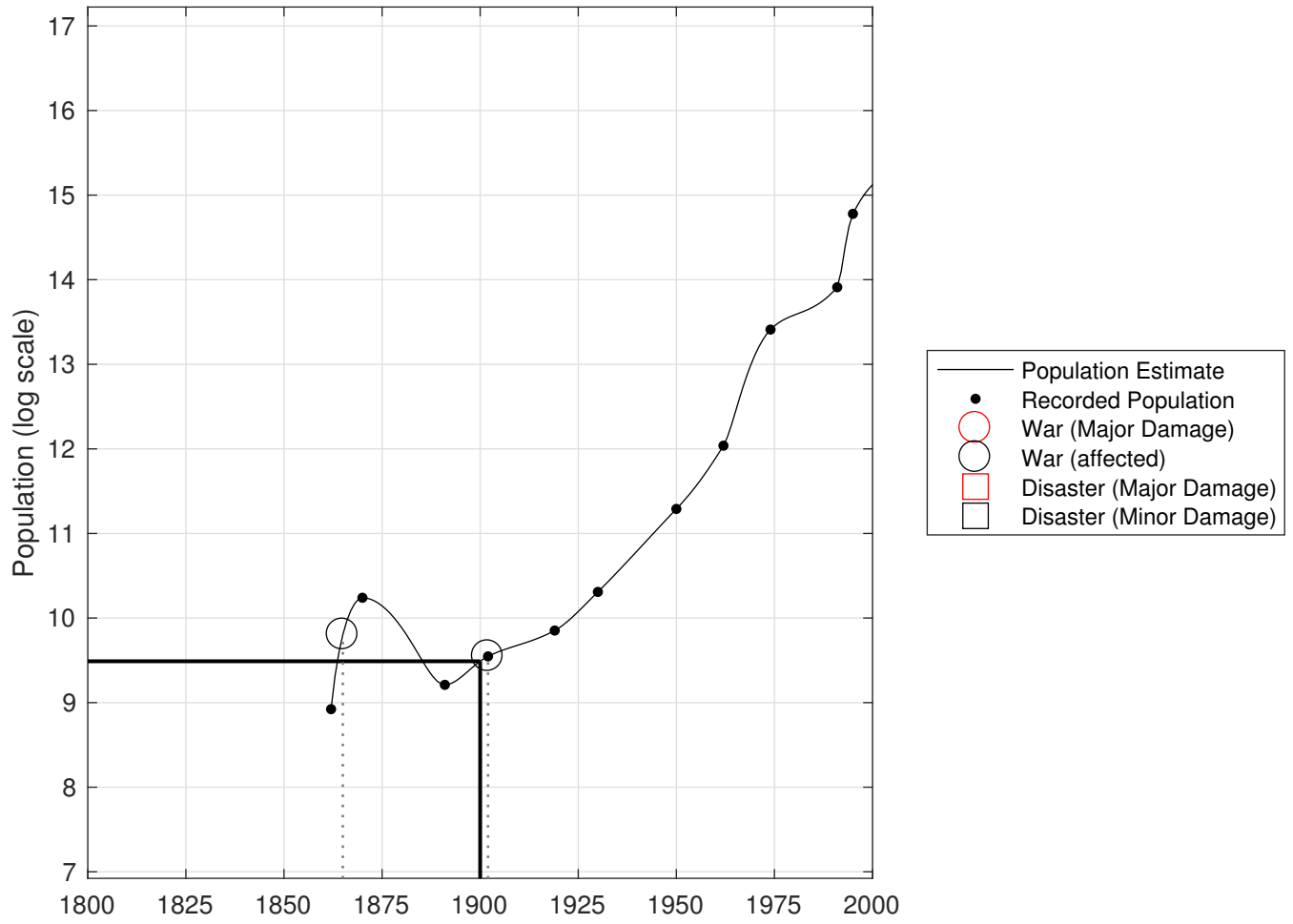




Table 179: Sources: Riyadh ( Saudi Arabia )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	-300	Cybriwsky (2013, p.258)
First Political Institution <sup>b</sup>	1737	Musa and al Asad (2003, Figure 2), Cybriwsky (2013, p. 258)
City Hall <sup>c</sup>	1900	for Tourism & Antiquities (2014)
City Hall <sup>d</sup>	2000	ArRiyadh Development Authority (2015)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>e</sup> , 1900, 1950, 2000	Clark and Aramco (2006, p. 9), Cybriwsky (2013, p.258)
<i>Population Data (1800-2000)</i>		
City Population	1862, 1870, 1891, 1902, 1919, 1930, 1950, 1962, 1974, 1991, 1995, 2004	Al-Hathloul (2004, p. 113), Mitchell (2007, p. 45), Mubarak (2004, p. 569), al Rasheed and Vitalis (2004, p. 79), Al-Hemaidi (2001, p.183), Kim (2015)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1865 <sup>f</sup>	Clark and Aramco (2006, p. 129)
International War(s)	1902 <sup>g</sup>	Clark and Aramco (2006, p. 132)

<sup>a</sup>Old city quarter called Al- Batha.

<sup>b</sup>City became encircled with walls in 1737 (1 sqkm). We take the centroid here, as it is not recorded where exactly Deham Dawwas was based. First source shows where wall was, second when it was built.

<sup>c</sup>Masmak Fort.

<sup>d</sup>This is the seat of the Riyadh principality, which is to our understanding the government body for Greater Riyadh.

<sup>e</sup>Riyadh became capital in 1824.

<sup>f</sup>10 years Civil war after Faysal's death, which reduced the city's influence, but no destruction is recorded.

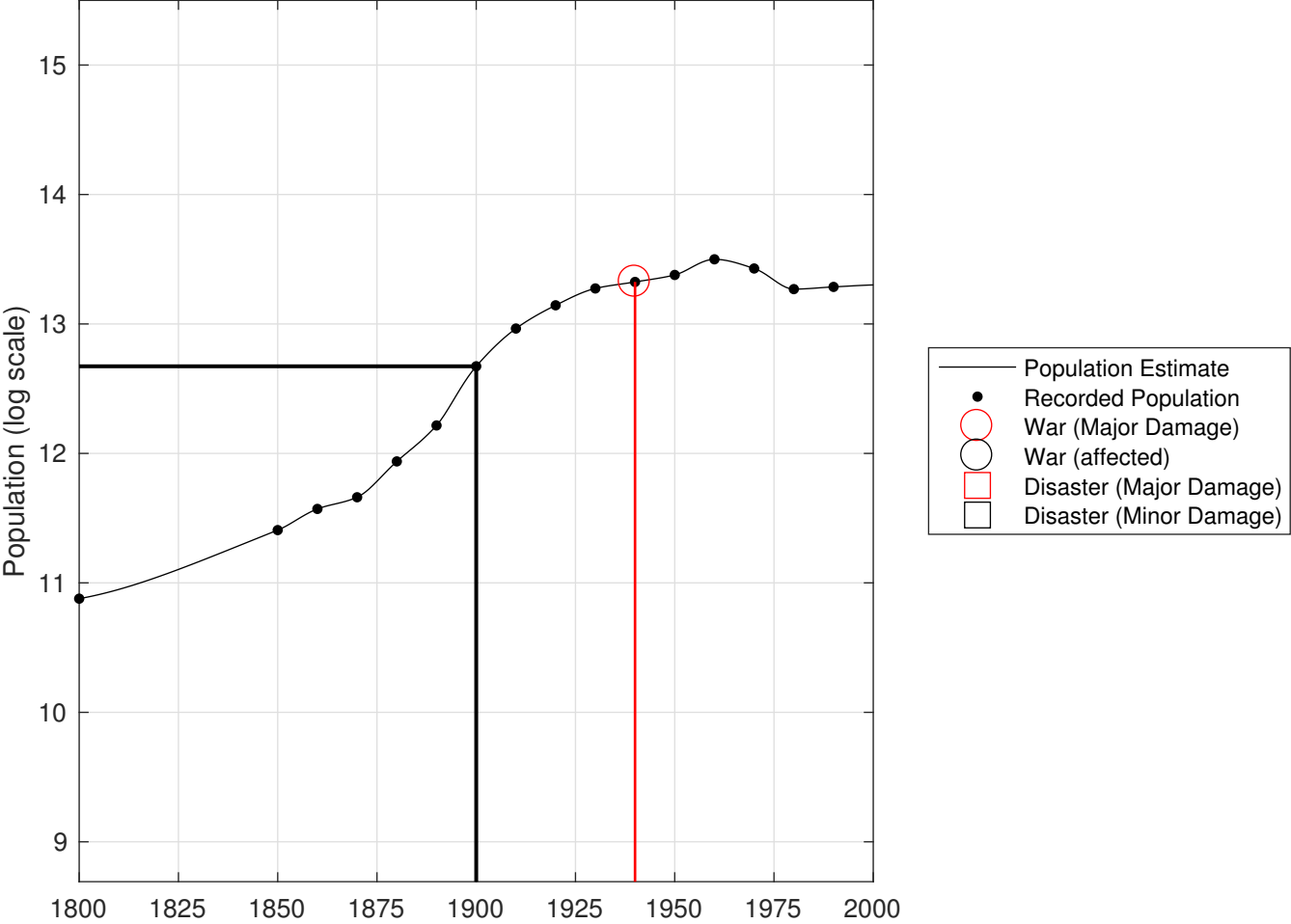
<sup>g</sup>The Saudis gain control above Riyadh again, but no severe destruction mentioned. We cannot locate any other major disasters in sources specific to Riyadh such as Philby (1959), which is surprising. This might be due to the lack of English writing on Riyadh's history or simply because it only became an important city in the beginning of the 20th century. There has been some acts of terrorism, but the damage was limited to few buildings while the death toll was high.

Table 180: Concentration Measures - Riyadh

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	8.38
Cumulative density of employment-weighted PP distances at 750 m	%	35.81
Average distance between all prime locations	in kilometres	2.55
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	1.19
Weighted average distance from EWPPs to 1900 CH	in kilometres	11.75
Average from all prime locations to 1900 CH	in kilometres	8.10
Average distance from global prime locations to 1900 CH	in kilometres	8.10

A.88 Rotterdam

Figure 97: Rotterdam



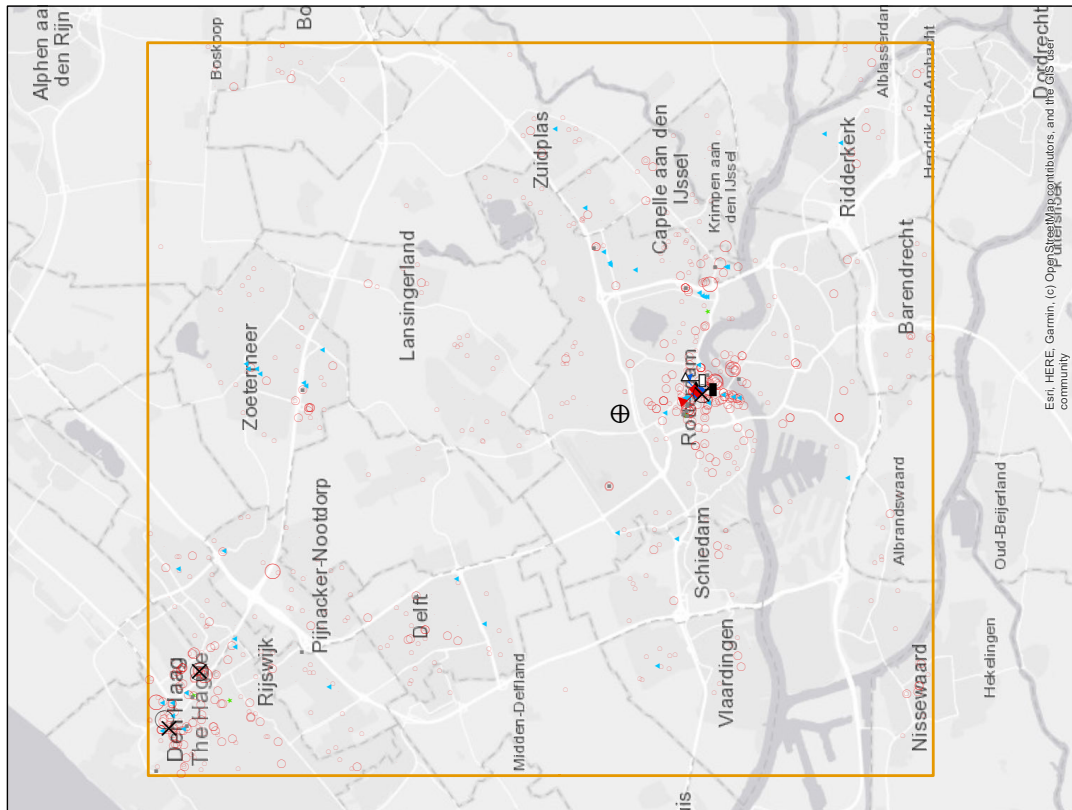
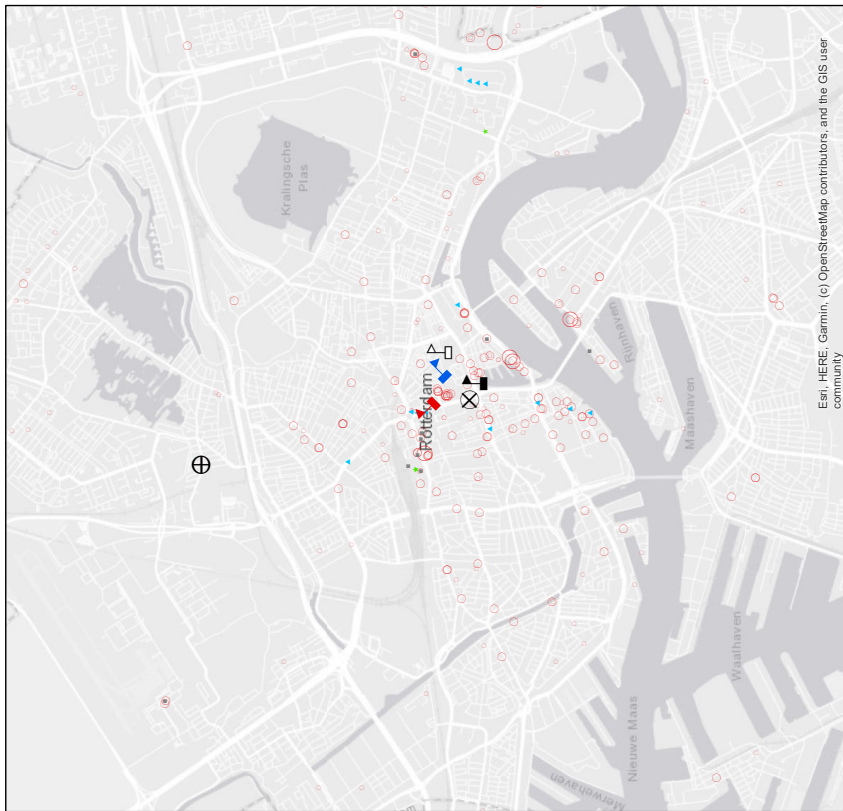




Table 181: Sources: Rotterdam ( Netherlands )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	800	van der Schoor (2010, p. 10)
First Political Institution <sup>b</sup>	1340	Corinne Boeijinga-Hubers (2014), Citymarketing Rotterdam (2014a)
City Hall	1900	Baedeker (1861, p. 221), Stadsarchief Rotterdam (2015)
City Hall	2000	Nederlands Bureau voor Toerisme & Congressen (2014)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Citymarketing Rotterdam (2014a)
<i>Population Data (1800-2000)</i>		
City Population	1750, 1800, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2003, 2010	Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1968	Edwards (2015, 279)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1795 <sup>c</sup> , 1940 <sup>d</sup>	Citymarketing Rotterdam (2014b), Encyclopaedia Britannica (2014h), Encyclopaedia Britannica (2014h)

<sup>a</sup>There was a small settlement where the Rotte meets the Maas. Location is not very exact as the rivers might have been changed over time.

<sup>b</sup>Town charter is given to Rotterdam and a form government must have existed. This article cites Laurenskerk as the center of the settlement, which we take as the location. We tried hard to find better sources and among other things contacted the city council (Corinne Boeijinga-Hubers, 2014).

<sup>c</sup>French occupation until the fall of Napoleon in 1795-1815.

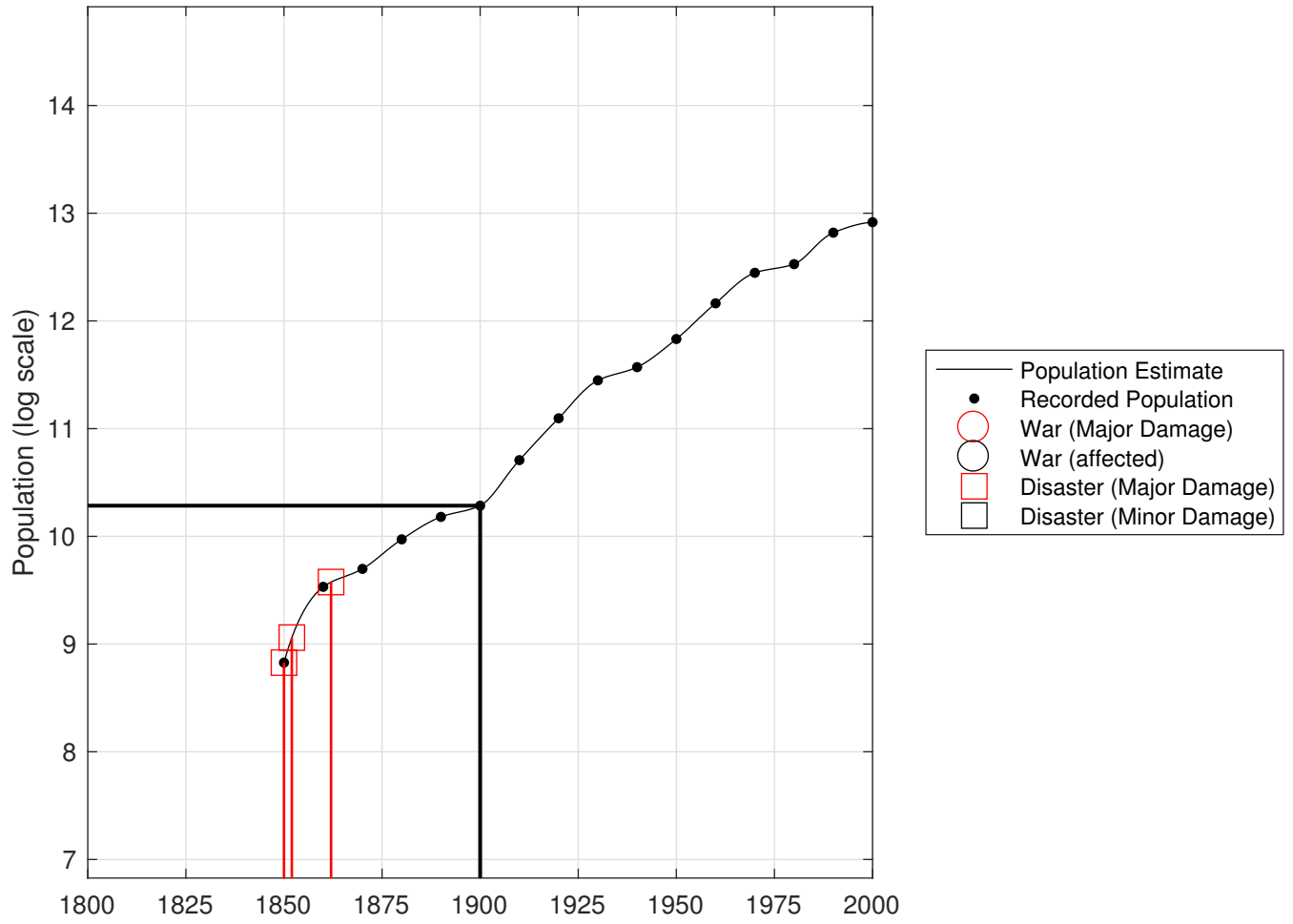
<sup>d</sup>Rotterdam was hard hit by German bombings destroying large parts of the city and a third of the port facilities (Encyclopaedia Britannica, 2015r).

Table 182: Concentration Measures - Rotterdam

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	12.93
Cumulative density of employment-weighted PP distances at 750 m	%	31.72
Average distance between all prime locations	in kilometres	10.03
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.28
Weighted average distance from EWPPs to 1900 CH	in kilometres	9.95
Average from all prime locations to 1900 CH	in kilometres	10.43
Average distance from global prime locations to 1900 CH	in kilometres	10.25

# A.89 Sacramento

Figure 98: Sacramento



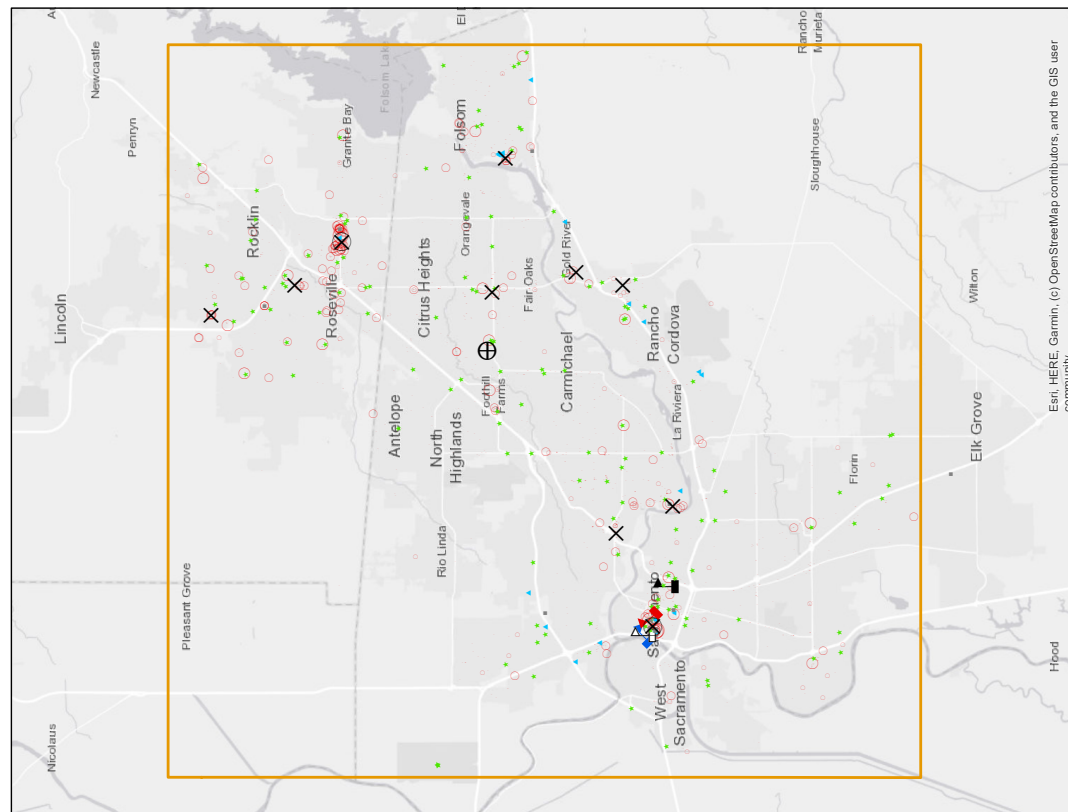
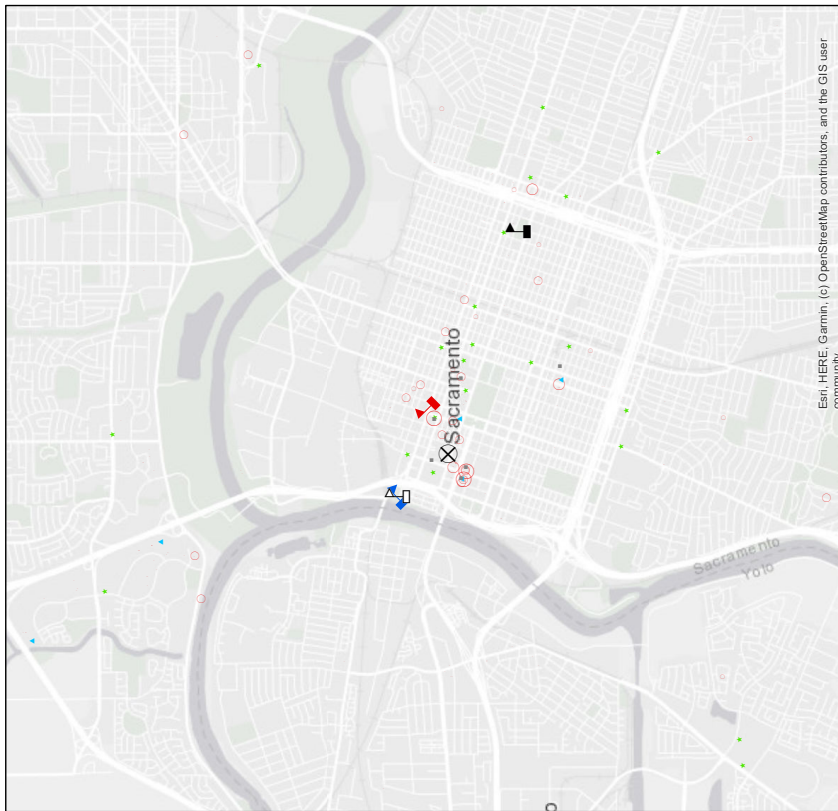


Table 183: Sources: Sacramento ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1839	Hoover and Kyle (1990, p. 286f)
First Political Institution <sup>a</sup>	1854	Center for Sacramento History (2015)
City Hall	1900	Center for Sacramento History (2015)
City Hall	2000	Center for Sacramento History (2015)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Center for Sacramento History (2015)
<i>Population Data (1800-2000)</i>		
City Population	1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Gibson and Jung (2005a, p. 34), United States Census Bureau (2015)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>b</sup>	None	
Number of Stations	1910, 1940, 2010	schwandl2016urbanrail
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1852 <sup>c</sup>	Center for Sacramento History (2015)
Hurricane(s)	None recorded	
Flooding(s)	1850 <sup>d</sup> , 1862 <sup>e</sup>	Center for Sacramento History (2015)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>There was a courthouse, which was used before this, but we take the location of the city hall as Sacramento was very small before this.

<sup>b</sup>There is a LRT system in place, but it does not satisfy the criteria as it runs partly on street level and thus we change the count of stations accordingly (Schwandl, 2016).

<sup>c</sup>This fire destroyed 85 % of the city and led to a complete rebuilding of the city with brick instead of wood (Center for Sacramento History, 2015). The fire though without date is also mentioned on Encyclopaedia Britannica (2015s)

<sup>d</sup>Two major floods in the same year, coded as one. Most of the city was destroyed. Encyclopaedia Britannica (2015s) also mentions the heavy flooding.

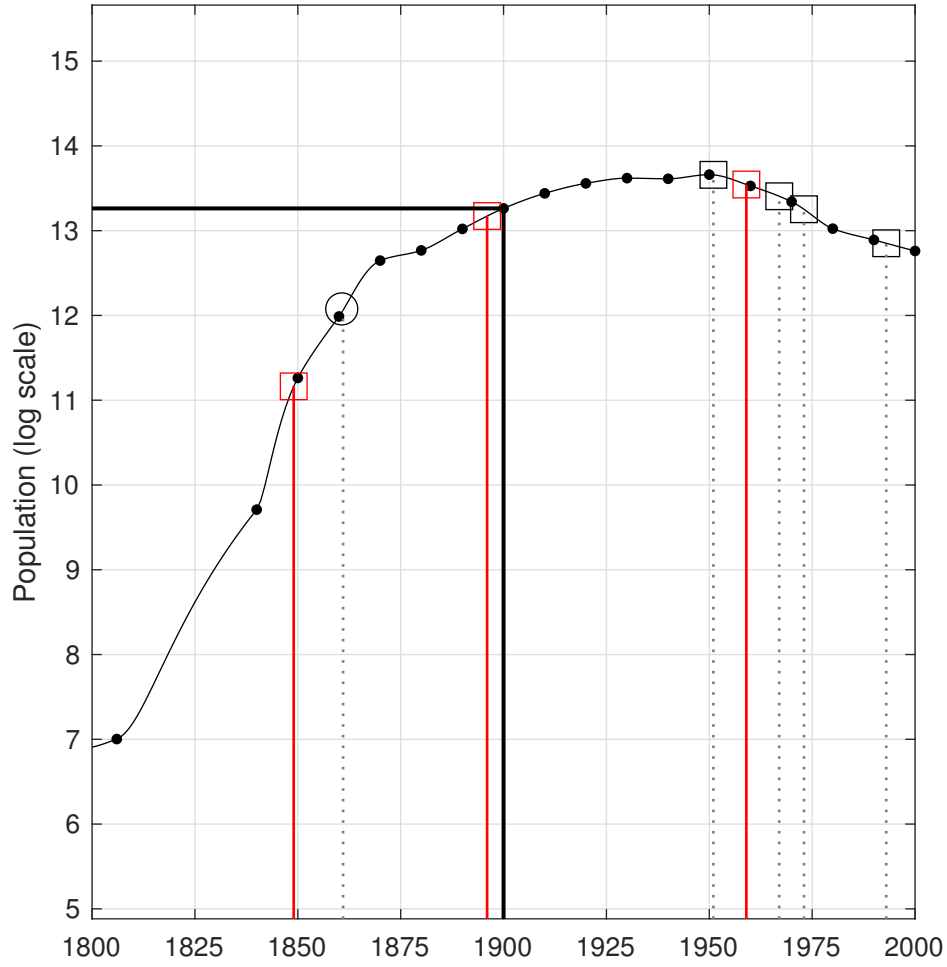
<sup>e</sup>Sacramento has been frequently flooded throughout the second half of the 20th century (Sacramento Area Flood Control Agency, 2015). The damage, however, seems more limited when compared to the early floods due to flood protection plans. The flood of 1862, for example led to a raise of the downtown area by 15 feet in the aftermath. Encyclopaedia Britannica (2015s) also mentions the heavy flooding in the 19th century.

Table 184: Concentration Measures - Sacramento

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	16.84
Cumulative density of employment-weighted PP distances at 750 m	%	59.07
Average distance between all prime locations	in kilometres	14.79
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.19
Weighted average distance from EWPPs to 1900 CH	in kilometres	18.90
Average from all prime locations to 1900 CH	in kilometres	19.64
Average distance from global prime locations to 1900 CH	in kilometres	18.98

# A.90 Saint Louis

Figure 99: Saint Louis



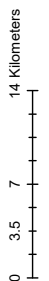
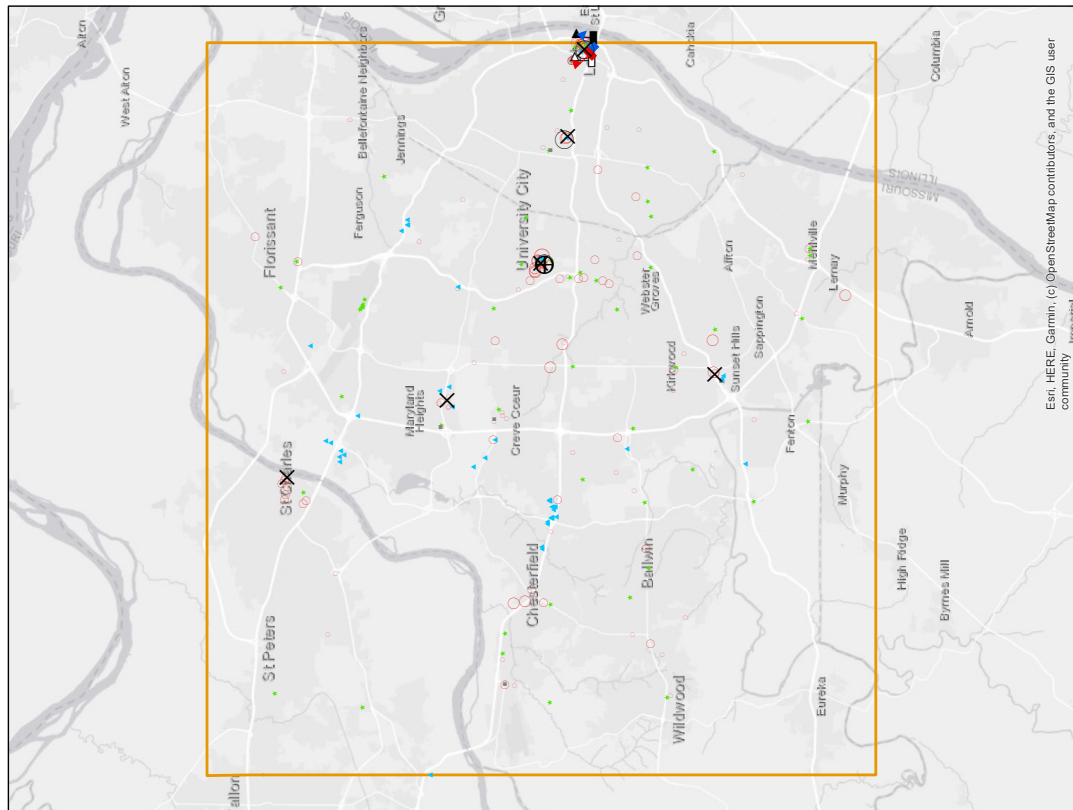
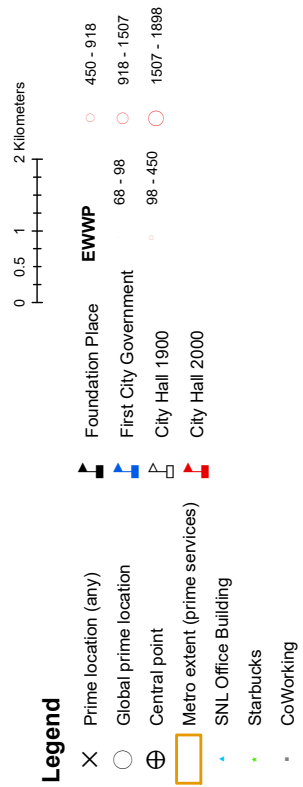
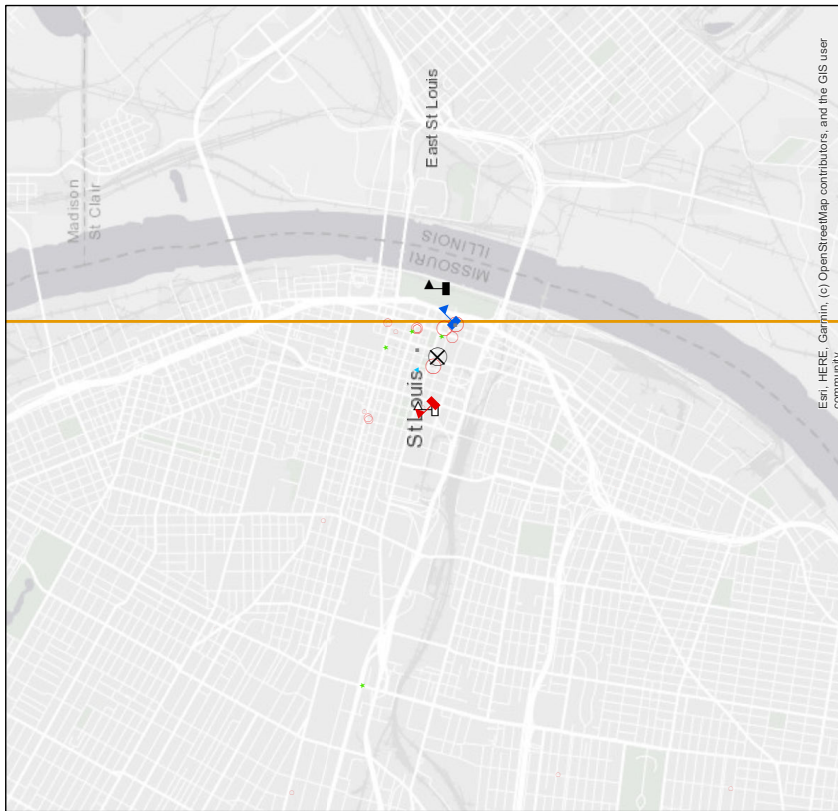




Table 185: Sources: Saint Louis ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1763	Van Ravenswaay and O'Connor (1991, p. 20), Saint Louis University Libraries Digitization Center (2009)
First Political Institution	1827	City of St. Louis (2015b)
City Hall	1900	City of St. Louis (2015b)
City Hall	2000	City of St. Louis (2015b)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	City of St. Louis (2015a)
<i>Population Data (1800-2000)</i>		
City Population	1796, 1806, 1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Van Ravenswaay and O'Connor (1991, p. 63), Gibson and Jung (2005a, p. 71), United States Census Bureau (2015), St. Louis City Plan Commission (1969)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1993	Gass et al. (2005, 174)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1849 <sup>a</sup>	O'Neil (2011), City of St. Louis (2015b)
Hurricane(s)	1896, 1959, 1967 <sup>b</sup>	Vincent (1910, p. 855), St. Louis City Plan Commission (1969), O'Neil (2009), Bandle (2011)
Flooding(s)	1951 <sup>c</sup> , 1973 <sup>d</sup> , 1993	McEntire (2007, p. 40), Klein and Zellmer (2014, p. 93)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861	St. Louis City Plan Commission (1969)
International War(s)	None recorded	

<sup>a</sup>Given its small size and that Encyclopaedia Britannica (2015t) mentions it, we code this disaster as "heavy."

<sup>b</sup>The extent of damage is unclear. Also O'Neil (2009) says concerning the 1959 tornado that it was the last devastating one.

<sup>c</sup>While Klein and Zellmer (2014, p. 93) mentions large destruction, this seems to not directly relate to Saint Louis as it's not even recorded in the detailed timeline by St. Louis City Plan Commission (1969). We thus code it as not having caused major destruction.

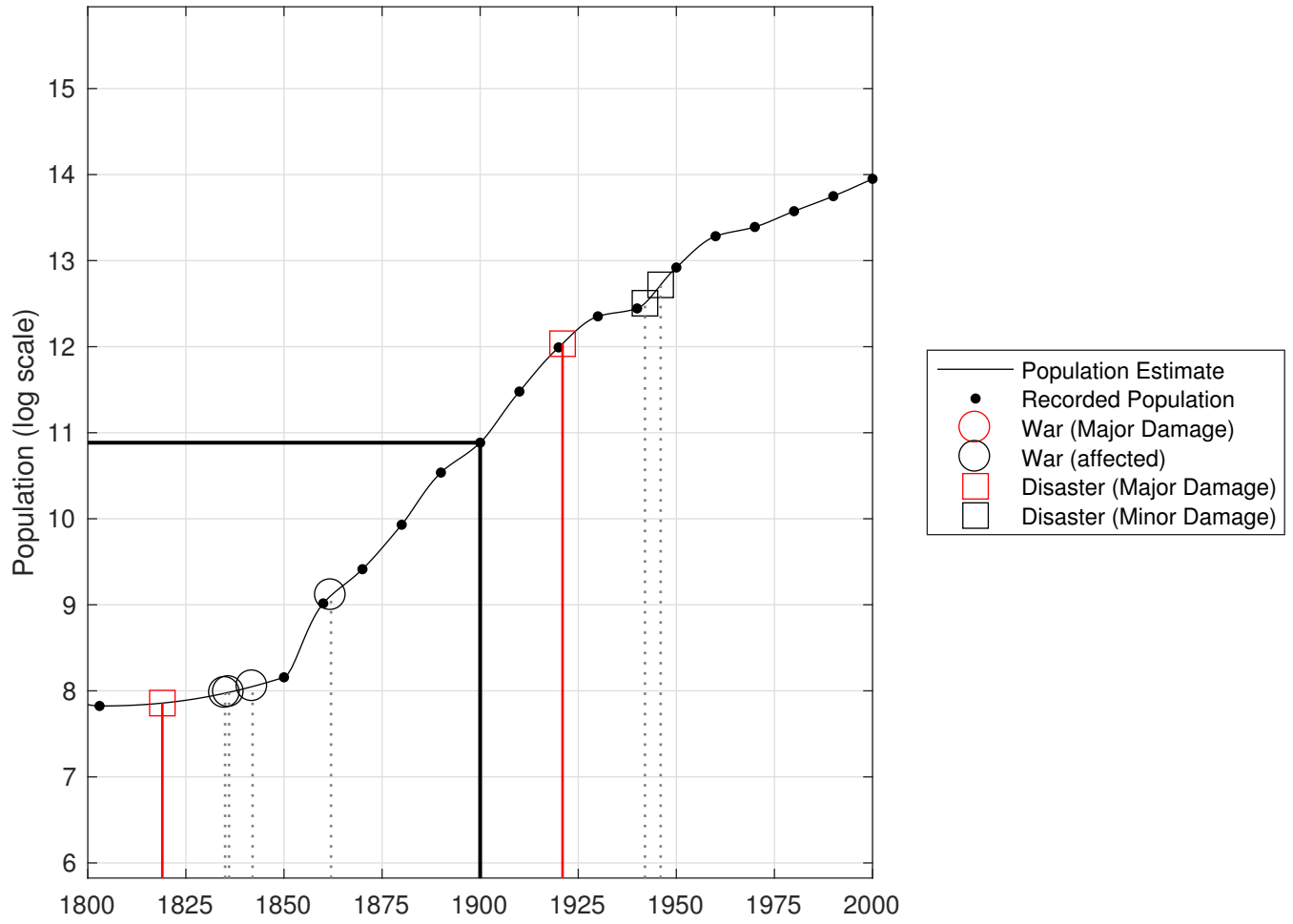
<sup>d</sup>1973 and 1993 floods hit other cities rather than St. Louis due to their flood protection measures.

Table 186: Concentration Measures - Saint Louis

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	15.32
Cumulative density of employment-weighted PP distances at 750 m	%	47.81
Average distance between all prime locations	in kilometres	13.86
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.45
Weighted average distance from EWPPs to 1900 CH	in kilometres	16.28
Average from all prime locations to 1900 CH	in kilometres	10.45
Average distance from global prime locations to 1900 CH	in kilometres	6.63

# A.91 San Antonio

Figure 100: San Antonio



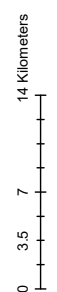
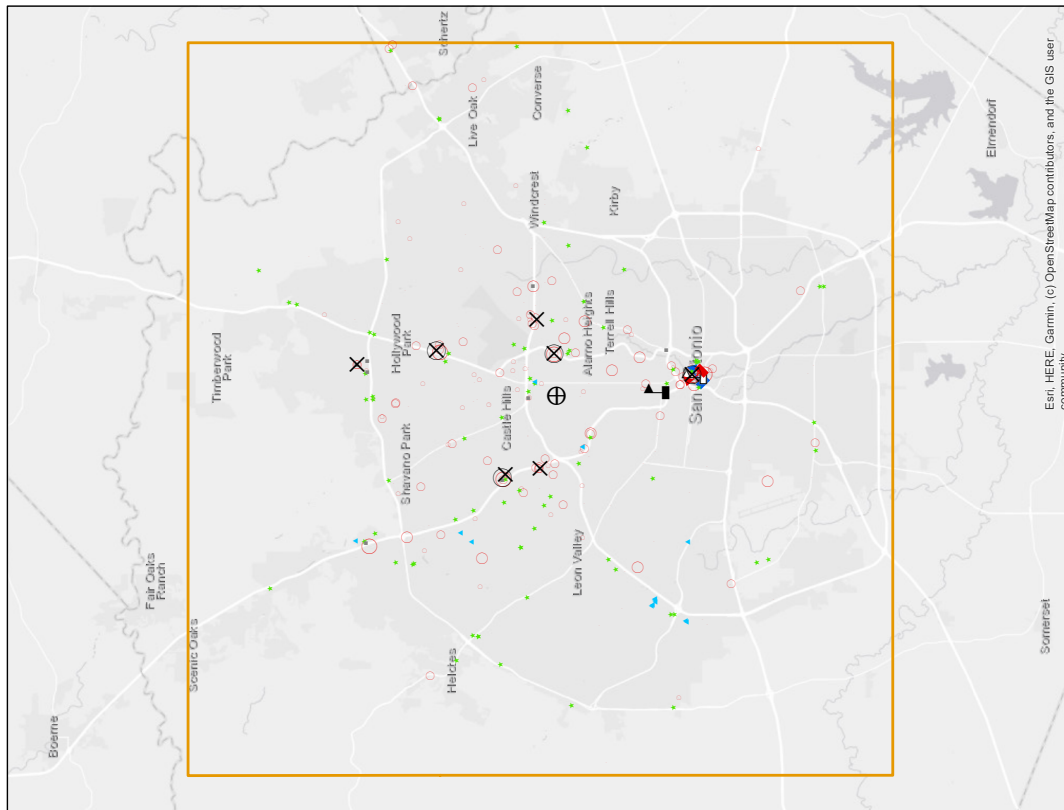
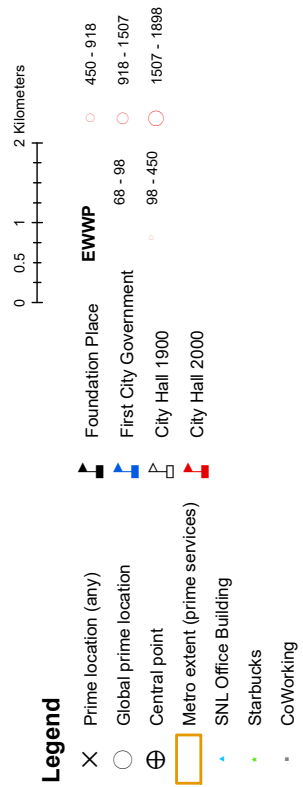
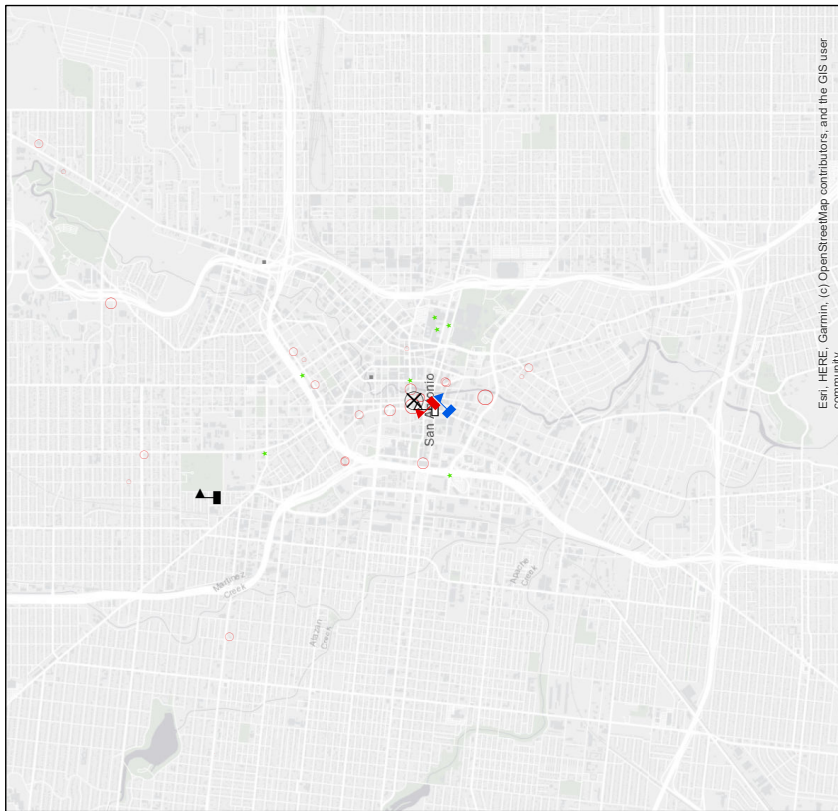


Table 187: Sources: San Antonio ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1718	Schoelwer (2010)
First Political Institution <sup>a</sup>	1731	Canary Islands Descendants Association (2015), Awbrey and Dooley (2005, p. 453)
City Hall	1900	Osborne (City of San Antonio, p. 1)
City Hall	2000	Osborne (City of San Antonio, p. 1)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	City of San Antonio (2015)
<i>Population Data (1800-2000)</i>		
City Population	1790, 1803, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Anderson (1999, p. 103), Gibson and Jung (2005a, p. 105), Porter (2011, p. 80), United States Census Bureau (2015)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	1942 <sup>b</sup>	National Oceanic and Atmospheric Administration (2015a), Roth (2010, p. 45)
Flooding(s)	1819 <sup>c</sup> , 1921, 1946 <sup>d</sup>	San Antonio River Authority (2015), Weber (2008, p. 161), San Antonio River Authority (2015), Torget (2015, p. 21), San Antonio River Authority (2015), Breeding (1948)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1862	Fehrenbach (2010)
International War(s)	1835 <sup>e</sup> , 1836 <sup>f</sup> , 1842 <sup>g</sup>	Hardin (2010), Gunn (2010b), Barr (2010)

<sup>a</sup>Even though this settlement was very small, the colonisers established a government building (Casa Real) and elected a Mayor.

<sup>b</sup>It caused damage to trees and considerable damage to some properties, but it does not seem to have caused “major destruction” to the building stock as such.

<sup>c</sup>In some parts of the city, hardly any structure survived (Torget, 2015, p. 21).

<sup>d</sup>This flood seems to have swept away only a few old buildings (Breeding, 1948, p. 11), although inundating large parts of the city.

<sup>e</sup>Siege of Bexar, where some buildings were destroyed (the number, however, remains unclear, which is why we code the siege as minor).

<sup>f</sup>Battle of Alamo. No severe property damage occurred.

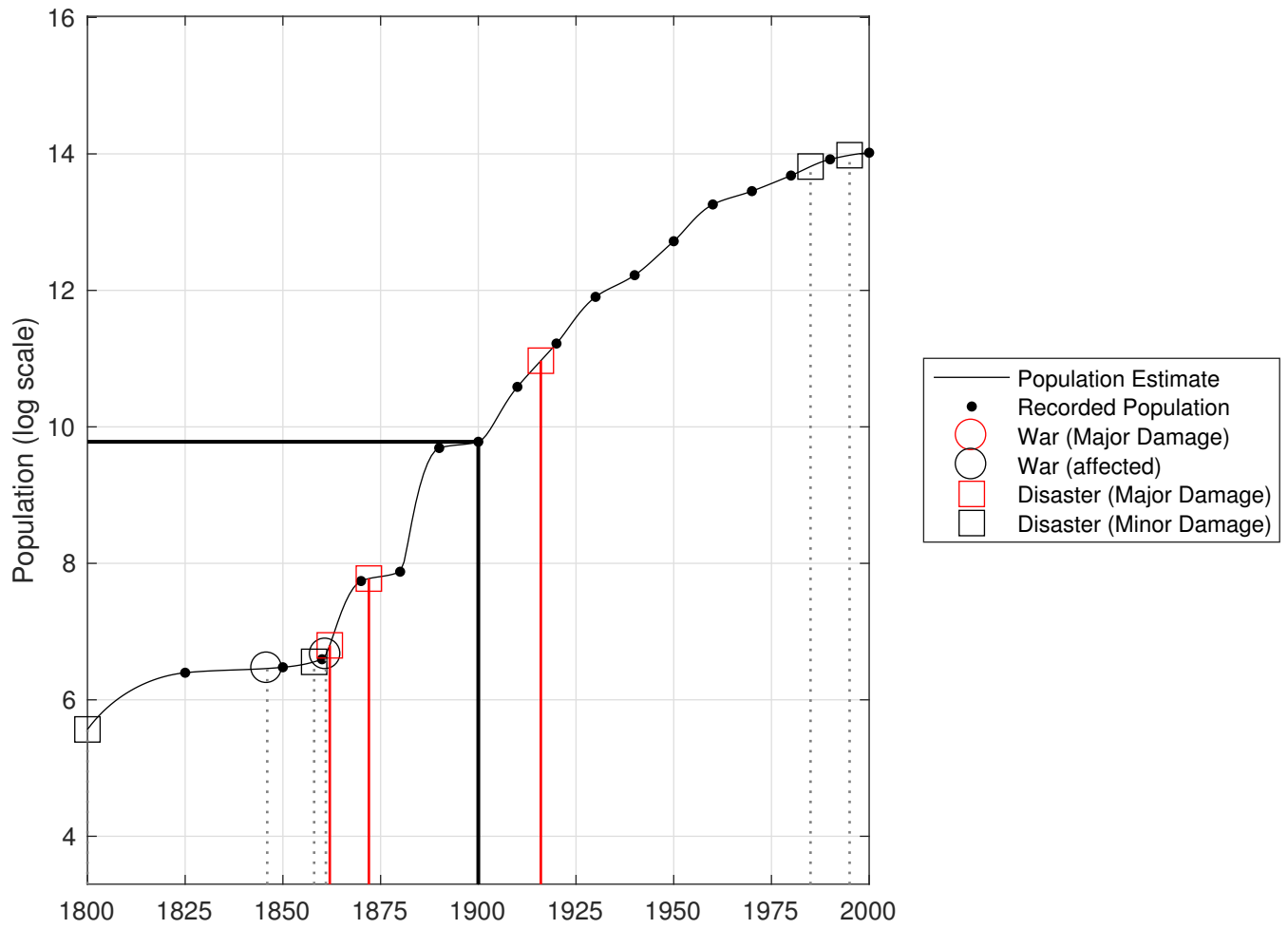
<sup>g</sup>Mexican invasion. Large loss in population but no damage to property recorded.

Table 188: Concentration Measures - San Antonio

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	12.20
Cumulative density of employment-weighted PP distances at 750 m	%	51.07
Average distance between all prime locations	in kilometres	8.49
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.37
Weighted average distance from EWPPs to 1900 CH	in kilometres	11.32
Average from all prime locations to 1900 CH	in kilometres	8.42
Average distance from global prime locations to 1900 CH	in kilometres	6.19

# A.92 San Diego

Figure 101: San Diego



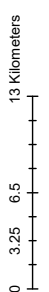
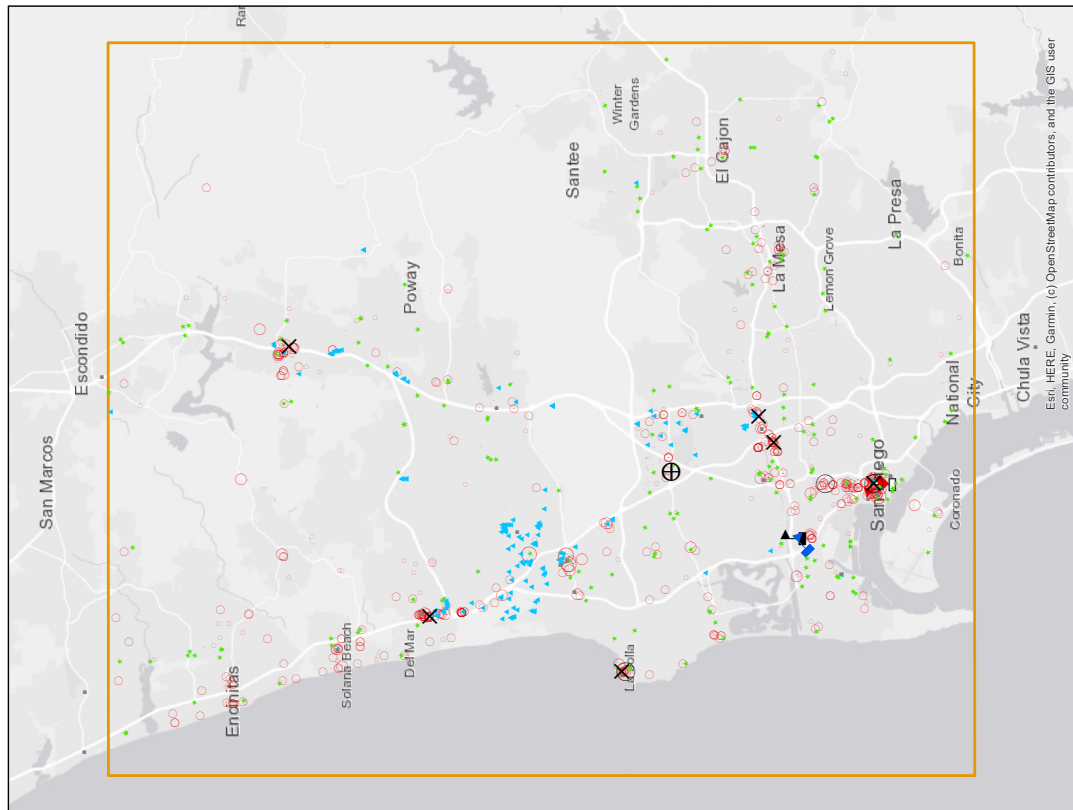
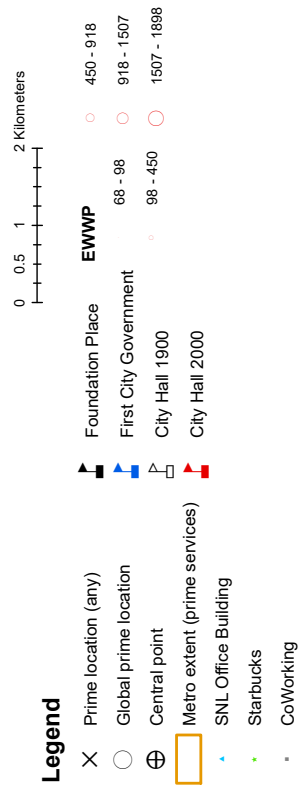
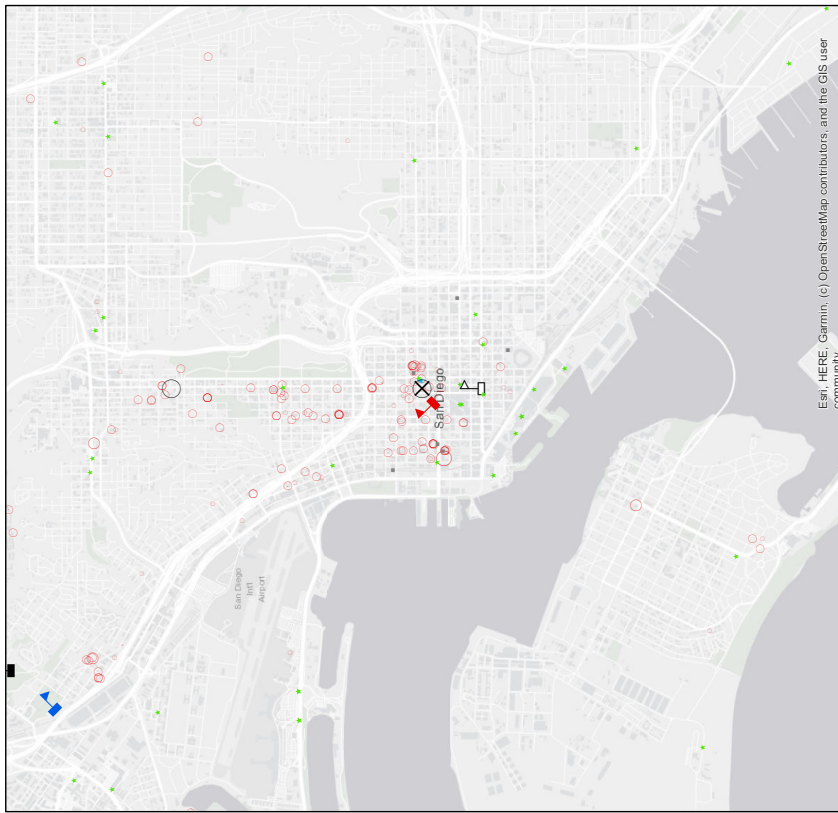




Table 189: Sources: San Diego ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1769	National Park Service (2015g)
First Political Institution	1847	San Diego History Center (2015a)
City Hall	1900	Showley (2012)
City Hall	2000	City of San Diego (2015)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	San Diego History Center (2015b)
<i>Population Data (1800-2000)</i>		
City Population	1797, 1825, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Gibson and Jung (2005a, p.35), City of San Diego (2014), United States Census Bureau (2015), San Diego History Center (2015b)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	1800 <sup>a</sup> , 1862 <sup>b</sup>	San Diego History Center (2015b), Shearer et al. (2009, p. 45), San Diego History Center (2015b), Roquemore (1997, p. 8)
Fire(s)	1872 <sup>c</sup> , 1985 <sup>d</sup> , 1995 <sup>e</sup>	San Diego History Center (2015b), San Diego History Center (2015b), Engstrand (2005, p. 262)
Hurricane(s)	1858 <sup>f</sup>	San Diego History Center (2015b)
Flooding(s)	1862 <sup>g</sup> , 1916 <sup>h</sup>	San Diego History Center (2015b), San Diego History Center (2015b), Brunn (2011, p. 1149)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861	San Diego History Center (2015b)
International War(s)	1846 <sup>i</sup>	San Diego History Center (2015b)

<sup>a</sup>While there was probably some damaged to buildings (Roquemore, 1997, p. 8), the accounts do not indicate strong destruction.

<sup>b</sup>Shearer et al. (2009, p. 45) reports that it “damaged” buildings, which is we infer that it did not destroy many buildings. It is hard to find more detailed sources for this earthquake.

<sup>c</sup>According to Engstrand (2005, p. 262) this fire destroyed much of the old town.

<sup>d</sup>67 homes were destroyed, but given the size of the city we code it not as major.

<sup>e</sup>54 homes were destroyed, but given the size of the city we code it not as major.

<sup>f</sup>Only “some” homes collapsed (San Diego History Center, 2015b).

<sup>g</sup>“Many of the houses of the original (Old Town) settlement were swept into the sea” (Brunn, 2011, p. 1149).

<sup>h</sup>As this flood was “washing out all but two of the city’s 112 bridges and breaking the Lower Otay Dam,” it is coded as major although the number of buildings destroyed is not given in the source.

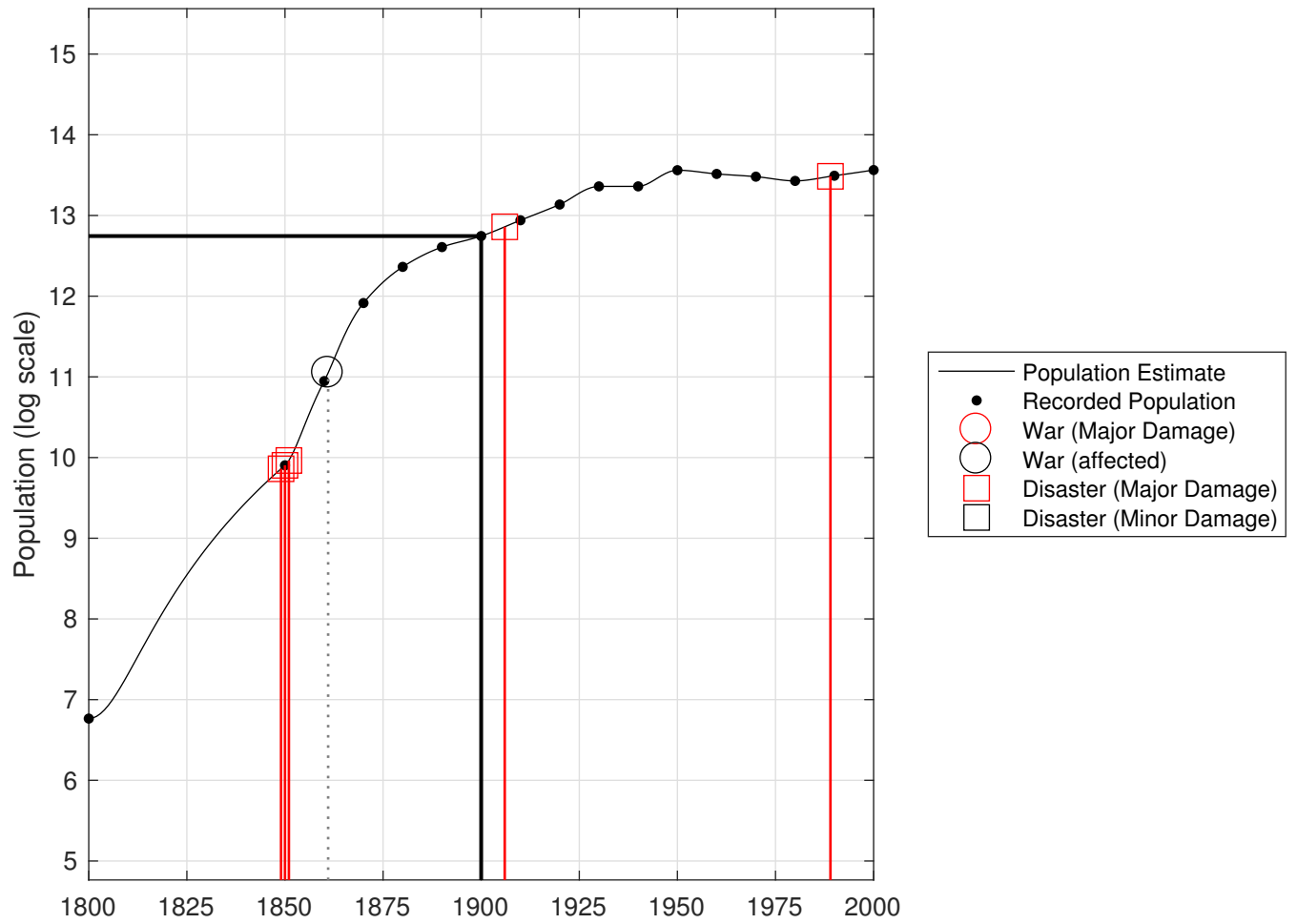
<sup>i</sup>No destruction of the city apparent in the source.

Table 190: Concentration Measures - San Diego

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	18.12
Cumulative density of employment-weighted PP distances at 750 m	%	58.16
Average distance between all prime locations	in kilometres	15.55
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.41
Weighted average distance from EWPPs to 1900 CH	in kilometres	17.16
Average from all prime locations to 1900 CH	in kilometres	15.07
Average distance from global prime locations to 1900 CH	in kilometres	4.83

## A.93 San Francisco

Figure 102: San Francisco



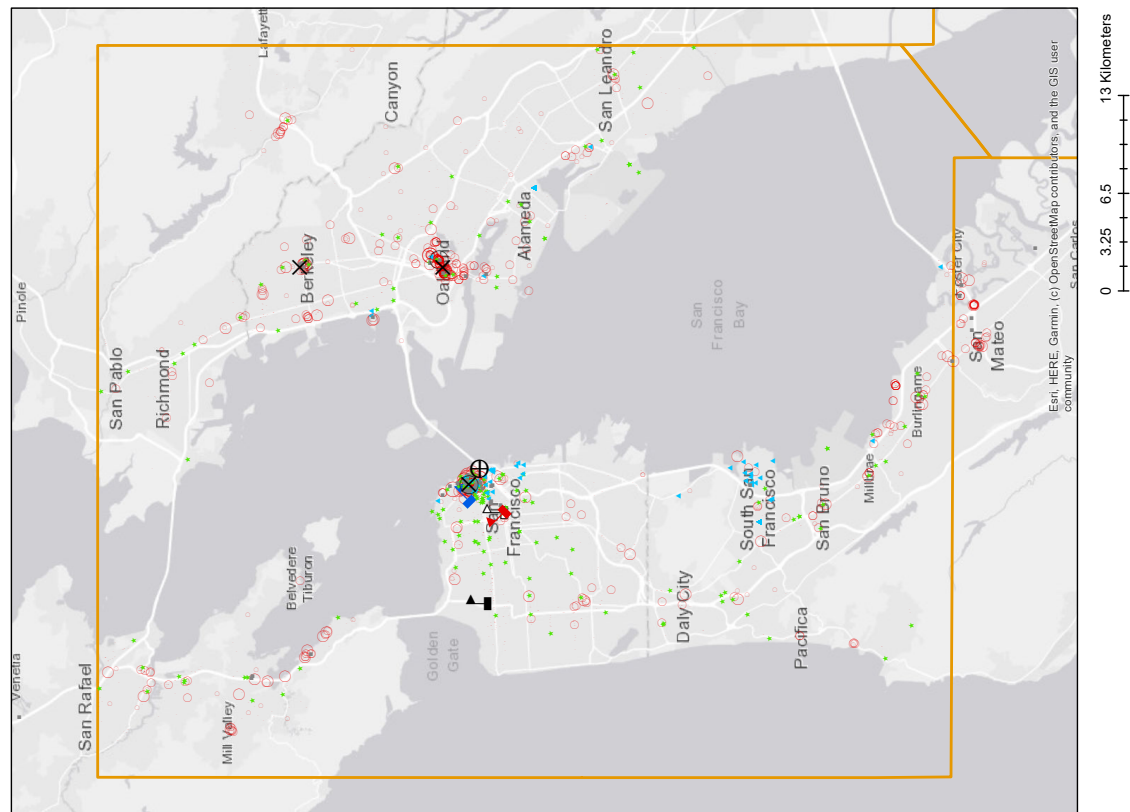
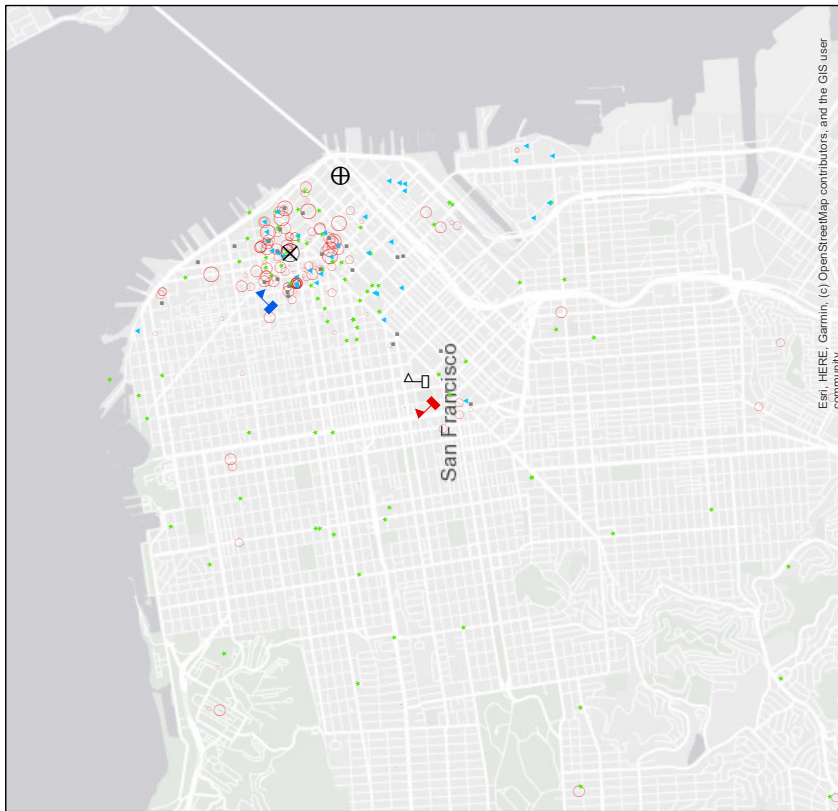


Table 191: Sources: San Francisco ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1776	Hanrahan (2011, p. 8), Dwinelle (2011[1863], p. 25)
First Political Institution <sup>b</sup>	1844	Richards (2002, p. 334)
City Hall	1900	Bernal (1992, 5337), Prentice (2006, p. 14)
City Hall <sup>c</sup>	2000	Bernal (1992, 5339)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	The Virtual Museum of the City of San Francisco (2015)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Dwinelle (2011[1863], p. 110), Gibson and Jung (2005a, p. 35), Chandler (1987, p. 53), United States Census Bureau (2015)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1972	Vuchic (2007, 86)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	1906 <sup>d</sup> , 1989 <sup>e</sup>	Duke (1910), Lamott (2015), Wiley (2000), Lamott (2015)
Fire(s)	1849 <sup>f</sup> , 1850, 1851, 1851	City and County of San Francisco (1925)
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861 <sup>g</sup>	Turril (1925)
International War(s)	None recorded	

<sup>a</sup>Site of the first Spanish settlement.

<sup>b</sup>This was the seat of the Alcade (Spanish magistrate) in 1944 under Mexican rule and “the town’s first seat of government.”

<sup>c</sup>Built in 1915 and apparently no change of location afterwards.

<sup>d</sup>Also led to a major fire and basically levelled the city.

<sup>e</sup>We code this as a major earthquake as a neighbourhood was severely damaged and infrastructure was affected heavily.

<sup>f</sup>This was a series of fires, which all caused heavy destruction due to the wooden structures of the buildings.

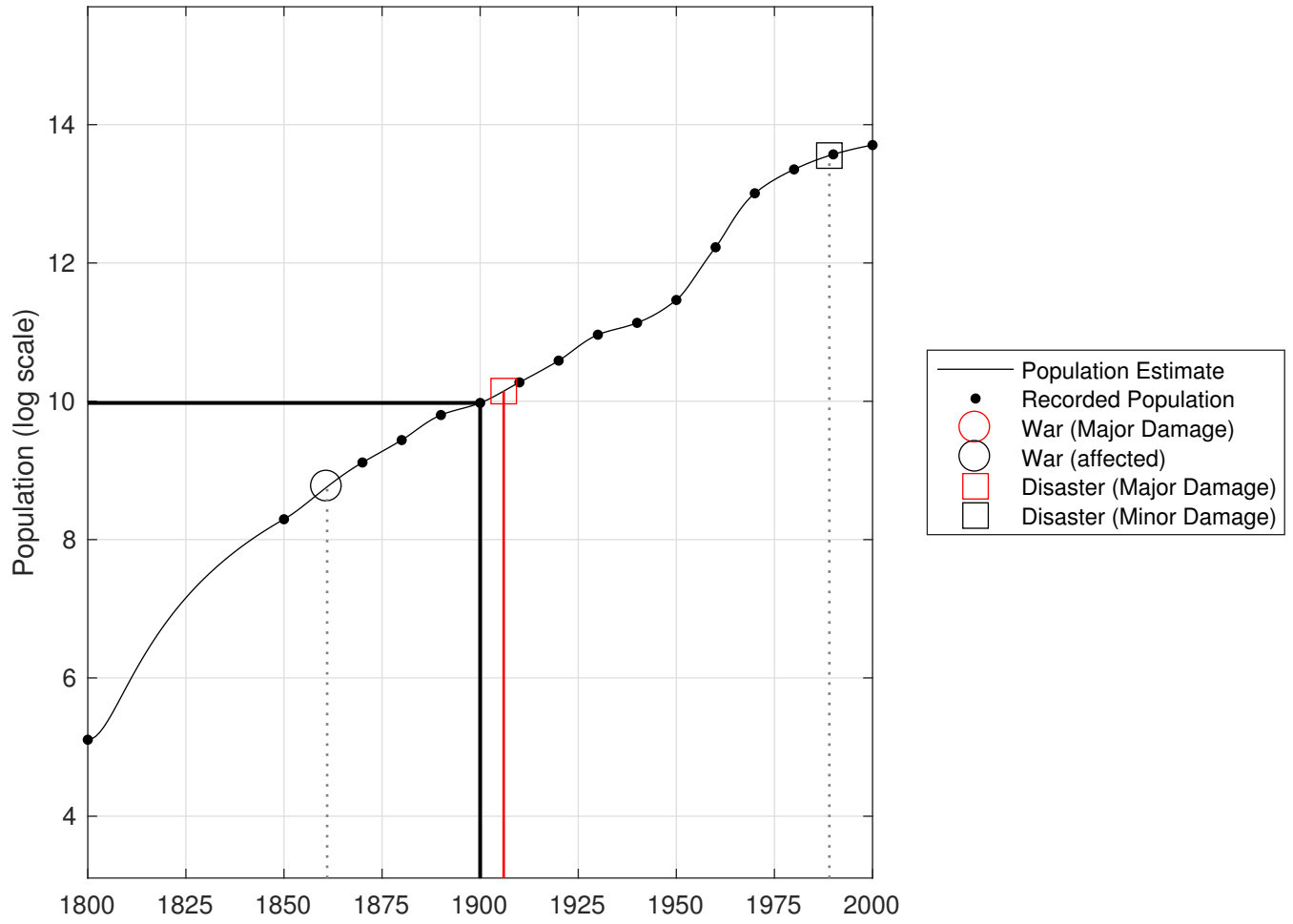
<sup>g</sup>No references to destruction, but it was a military base. San Francisco was also under Mexican rule in the beginning to mid-19th century but no destruction reported.

Table 192: Concentration Measures - San Francisco

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	16.30
Cumulative density of employment-weighted PP distances at 750 m	%	22.51
Average distance between all prime locations	in kilometres	7.47
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.38
Weighted average distance from EWPPs to 1900 CH	in kilometres	11.56
Average from all prime locations to 1900 CH	in kilometres	7.21
Average distance from global prime locations to 1900 CH	in kilometres	6.46

# A.94 San Jose

Figure 103: San Jose



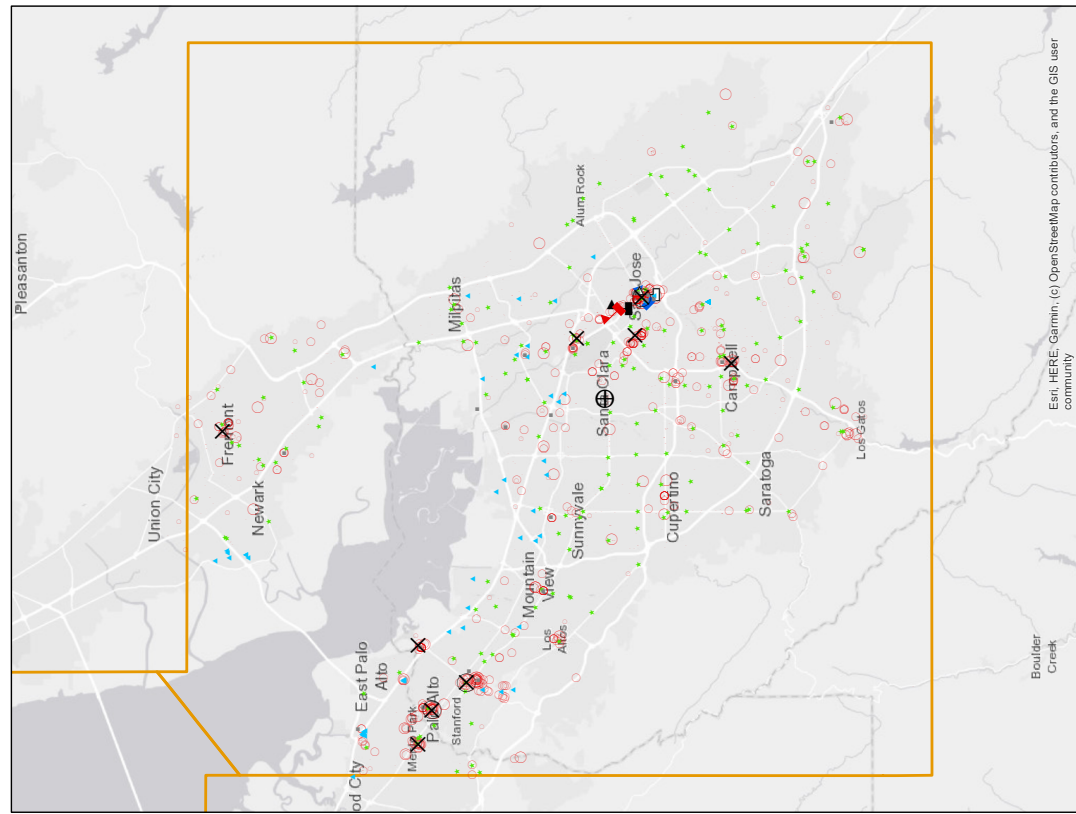
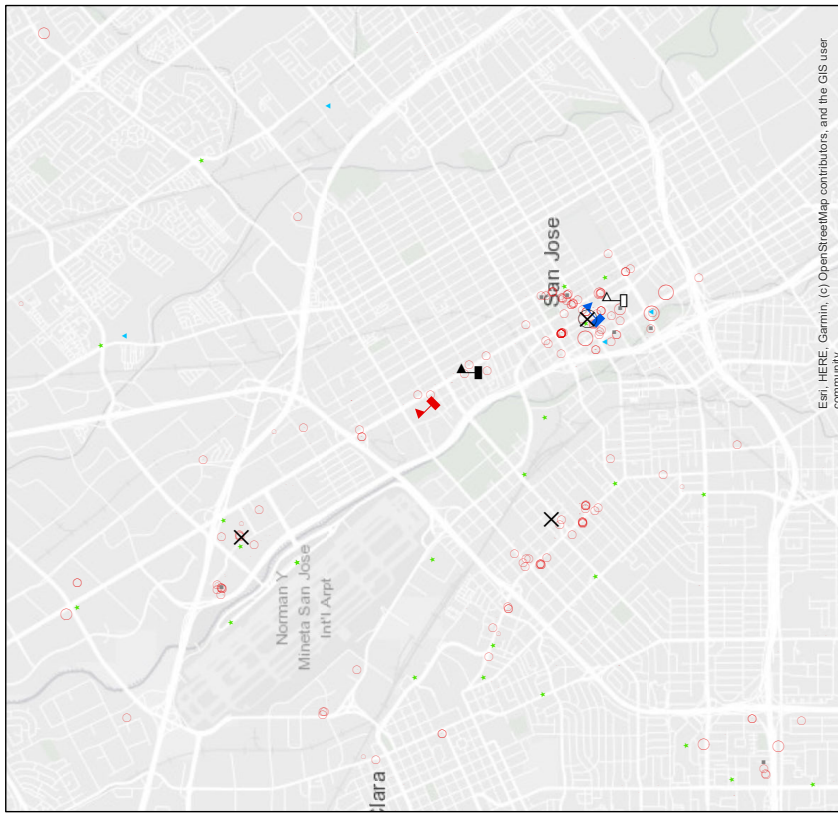




Table 193: Sources: San Jose ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1777	Renge et al. (1966, p. 427)
First Political Institution <sup>a</sup>	1798	City of San Jose (2007, p. 10)
City Hall	1900	Shueh and Wyman (2009, p. 114)
City Hall	2000	Johnson (2010, p. 68)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>b</sup> , 1900, 1950, 2000	Encyclopaedia Britannica (2015u)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Pitti (2003, p. 12), Gibson and Jung (2005a), Mitchell and Palgrave Macmillan (2014), United States Census Bureau (2015)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>c</sup>	1987	Stilgoe (2007, 243)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	1906, 1989	Klett et al. (2006, p. 82), Schmitt (1989)
Fire(s)	2002 <sup>d</sup>	Woolfolk (2012)
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861 <sup>e</sup>	Hart (2009)
International War(s)	None recorded	

<sup>a</sup>Although they had a council from 1783 on, this Juzgado (courthouse) seems to be the first permanent government building.

<sup>b</sup>For a brief period and until 1852, San Jose was state capital of California.

<sup>c</sup>This is an LRT system, but it is not a clear cut off-street to the best of our knowledge. However, most of it is on separated tracks.

<sup>d</sup>The damage was estimated a \$ 100 m. A shopping center and around 30 apartments were destroyed, but given the size of the city, this seems small.

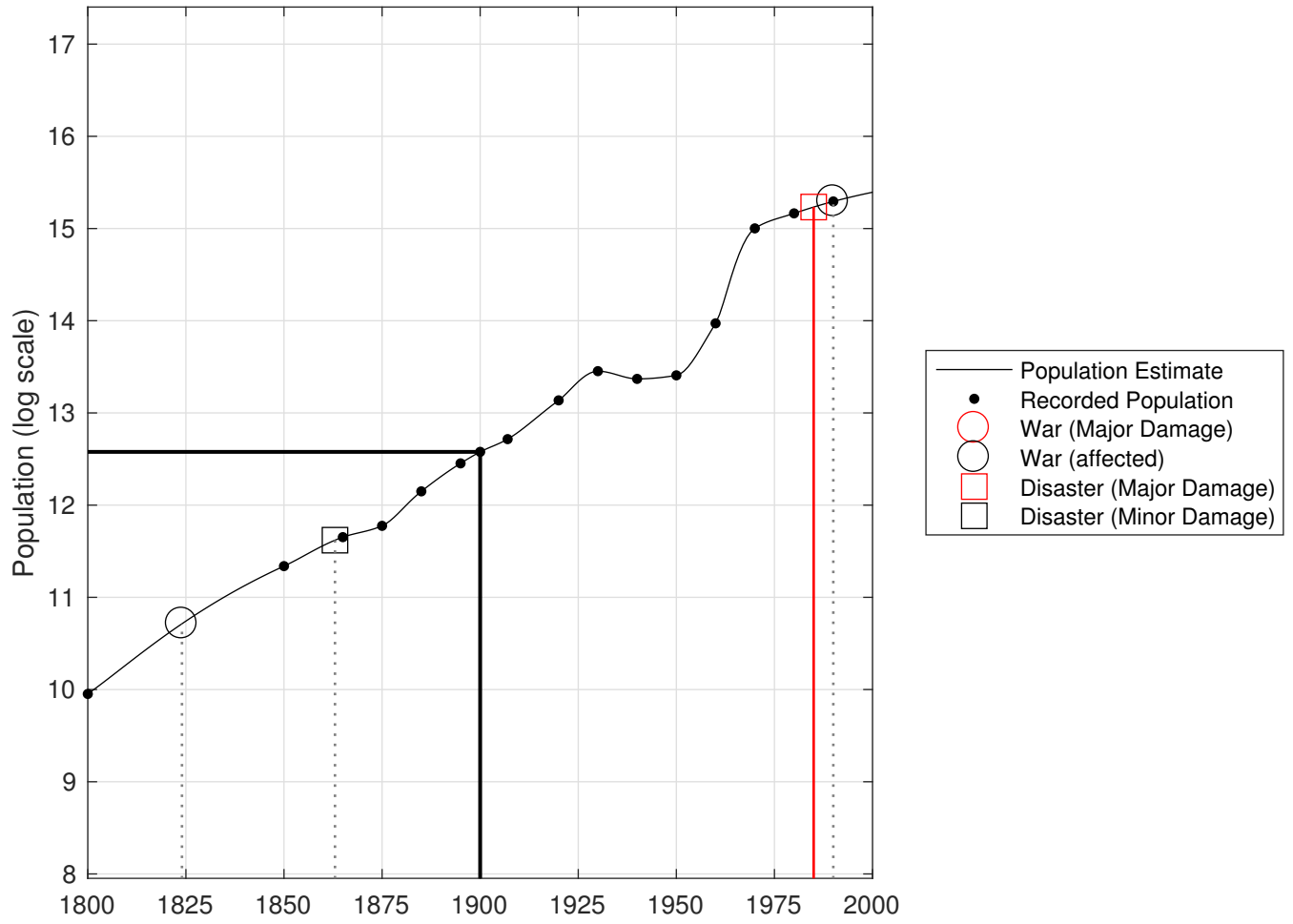
<sup>e</sup>No destruction recorded, but a military post was there.

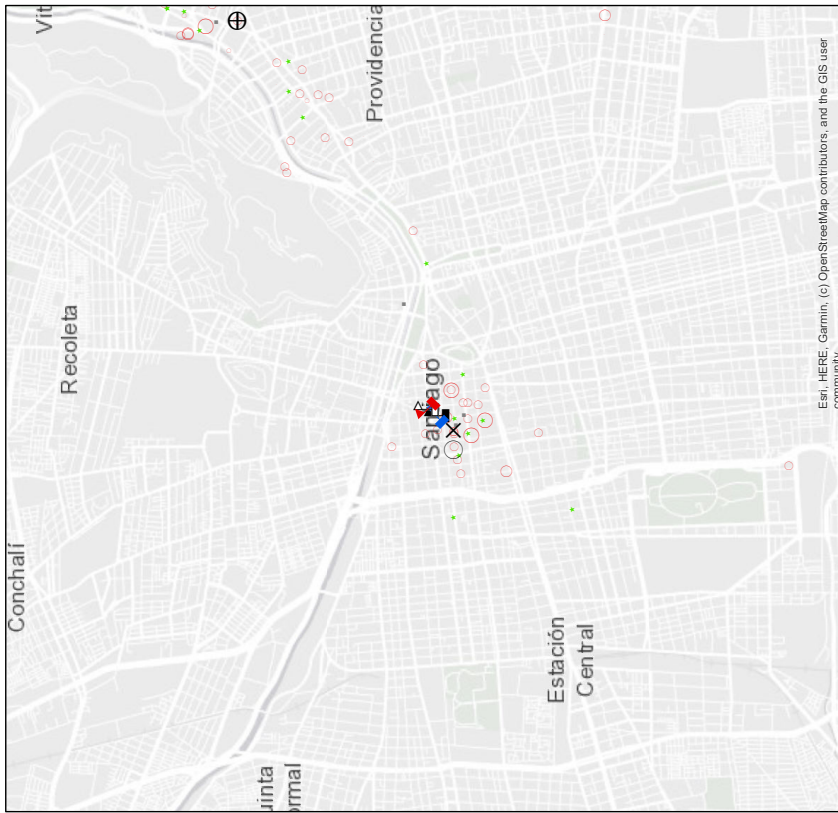
Table 194: Concentration Measures - San Jose

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	16.01
Cumulative density of employment-weighted PP distances at 750 m	%	49.26
Average distance between all prime locations	in kilometres	15.45
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.51
Weighted average distance from EWPPs to 1900 CH	in kilometres	13.25
Average from all prime locations to 1900 CH	in kilometres	12.70
Average distance from global prime locations to 1900 CH	in kilometres	11.54

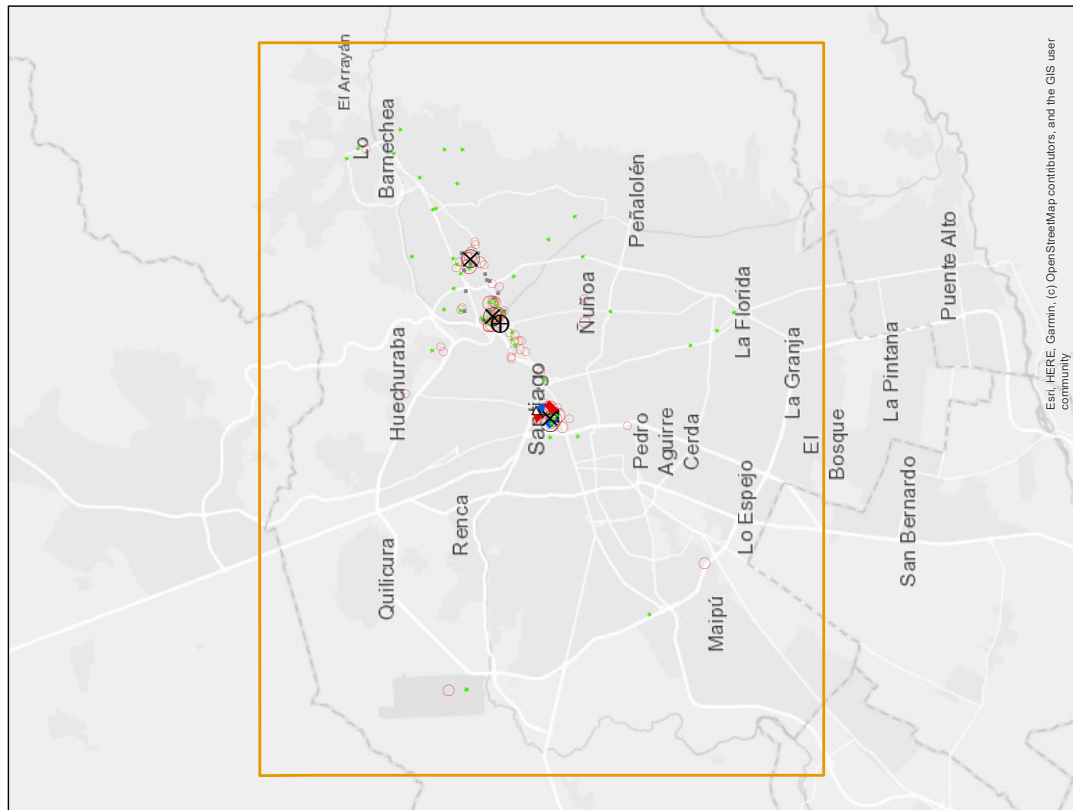
# A.95 Santiago de Chile

Figure 104: Santiago de Chile





- Legend**
- X Prime location (any)
  - Global prime location
  - ⊕ Central point
  - Metro extent (prime services)
  - SNL Office Building
  - Starbucks
  - CoWorking
  - ▲ Foundation Place
  - ▲ EWWP
  - 450 - 918
  - 918 - 1507
  - 68 - 98
  - 98 - 450
  - 1507 - 1898
  - First City Government
  - City Hall 1900
  - City Hall 2000



- Prime location (any)
- Global prime location
- 450 - 918
- 918 - 1507
- 68 - 98
- 98 - 450
- 1507 - 1898

Table 195: Sources: Santiago de Chile ( Chile )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1541	Villalobos (2005, p. 37f)
First Political Institution <sup>b</sup>	1541	Villalobos (2005, p. 37f)
City Hall	1900	Walter (2005, p. 15)
City Hall	2000	Walter (2005, p. 15)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Municipalidad de Santiago de Chile (2014)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1865, 1875, 1885, 1895, 1900, 1907, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2001	Chandler (1987, p. 261), Chandler (1987, p. 262), Chandler (1987, p. 493), Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>c</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1975	Onursal and Gautam (1997, 110)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	1985 <sup>d</sup> , 2010 <sup>e</sup>	Organisation for Economic Co-operation and Development (2013, p. 106), Kovach (2004, p. 139f), United States Geological Survey (2015a)
Fire(s)	1863 <sup>f</sup>	Eastlake (2013, p. 20)
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1824 <sup>g</sup> , 1990 <sup>h</sup>	Municipalidad de Santiago de Chile (2014)
International War(s)	None recorded	

<sup>a</sup>This is the central place in the city plan of Santiago.

<sup>b</sup>A Cabildo (Spanish Municipal government) was established and we take the Plaza Mayor as the meeting place.

<sup>c</sup>Footnote from United Nations Population Division (2014): Data from 1952 to 1992 refer to Gran Santiago. Data for 2002 and 2012 refer to the urban population of Santiago Metropolitan Area Region.

<sup>d</sup>We code this as major, although it is not entirely clear to what extent newer buildings were affected.

<sup>e</sup>Ten percent of the housing stock were either damaged or destroyed.

<sup>f</sup>This fire killed approximately 2500 people, which was by the time a significant part of Santiago's population. However, only one building was affected which is why we code it as not causing major destruction.

<sup>g</sup>It is not mentioned, whether any buildings were destroyed and we thus assume no major damage was done to the city. In the war War of Independence (1810-1818), the damage done to the city was small (Britannica, 2014b).

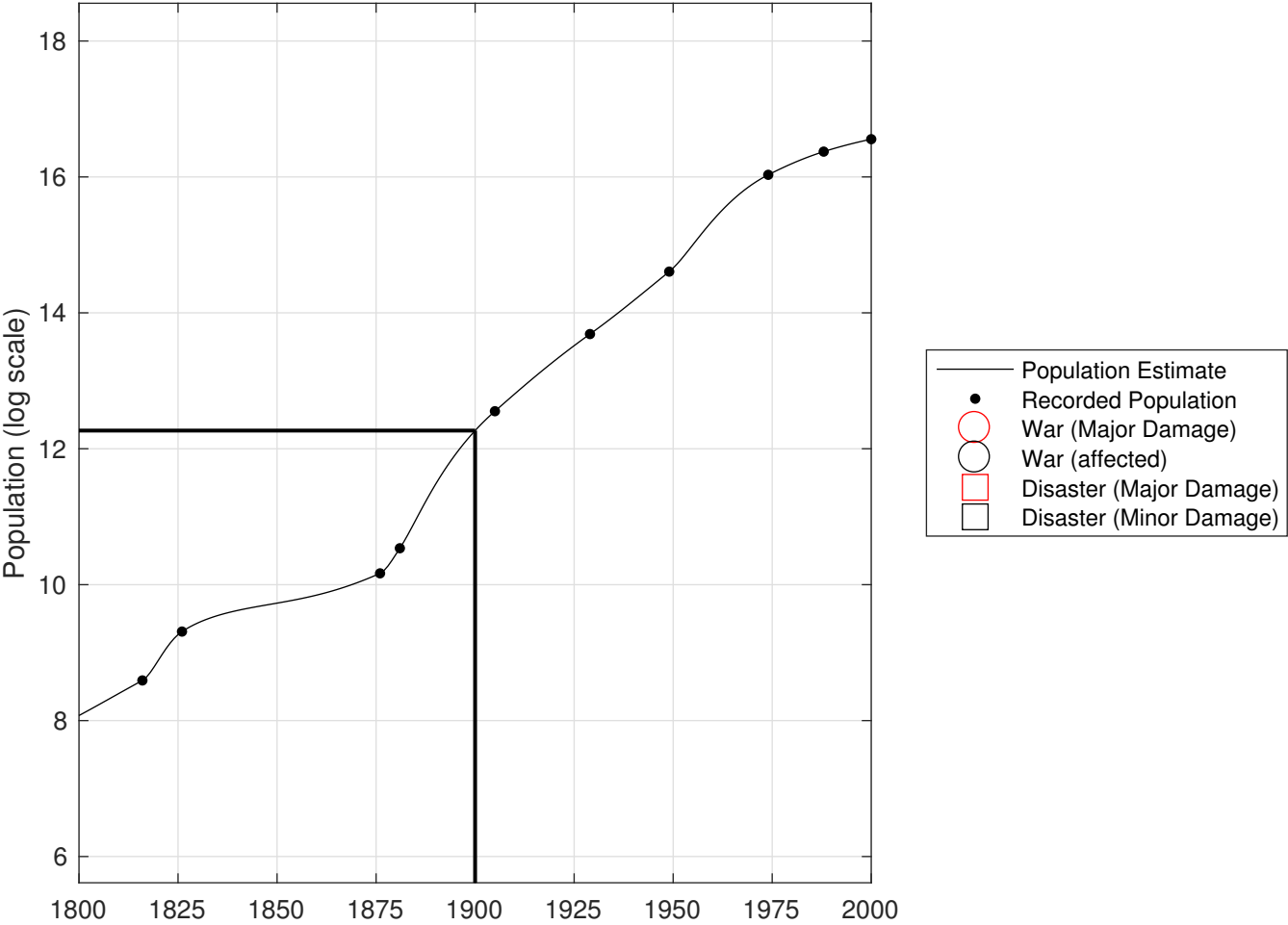
<sup>h</sup>Revolution against Pinochet.

Table 196: Concentration Measures - Santiago de Chile

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	4.92
Cumulative density of employment-weighted PP distances at 750 m	%	8.88
Average distance between all prime locations	in kilometres	3.74
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.17
Weighted average distance from EWPPs to 1900 CH	in kilometres	4.64
Average from all prime locations to 1900 CH	in kilometres	3.94
Average distance from global prime locations to 1900 CH	in kilometres	3.94

A.96 Sao Paulo

Figure 105: Sao Paulo



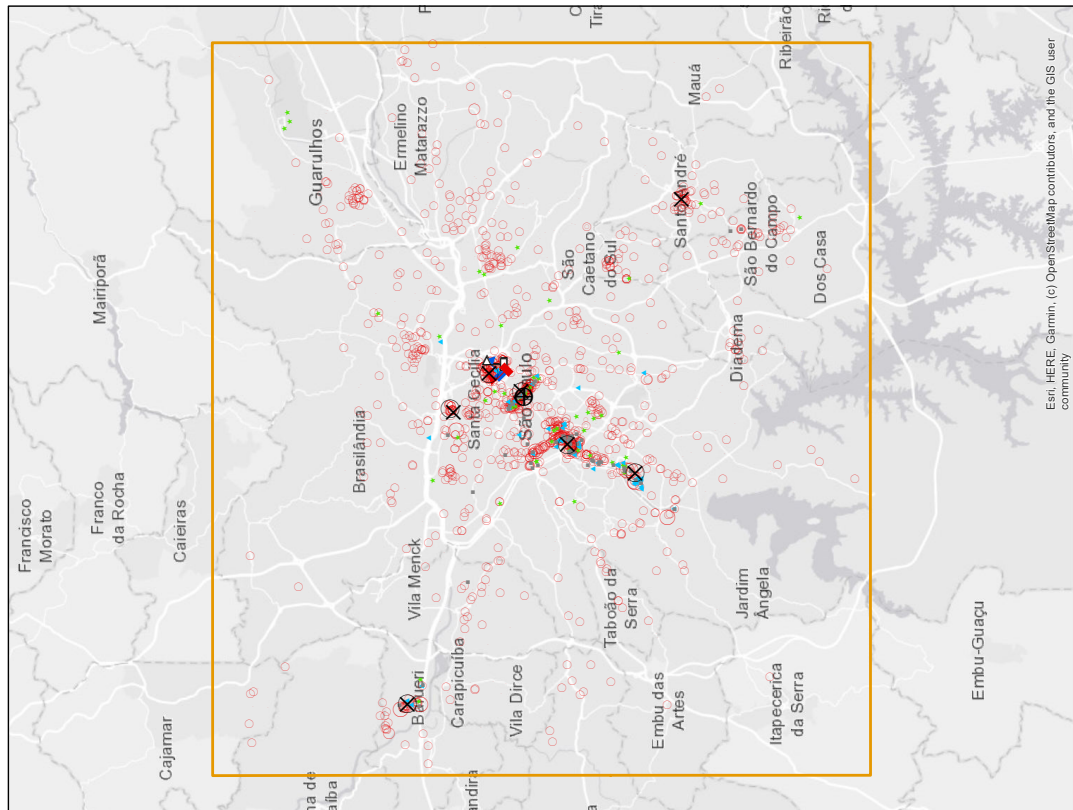
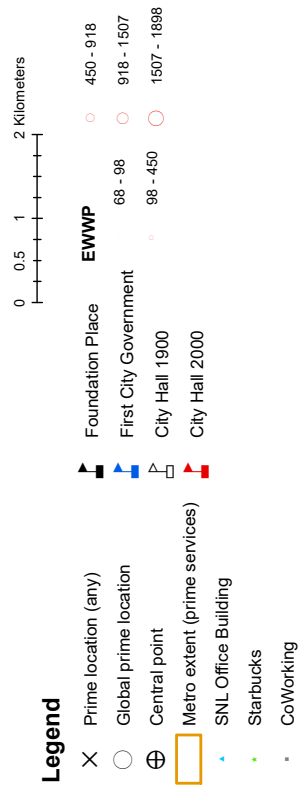
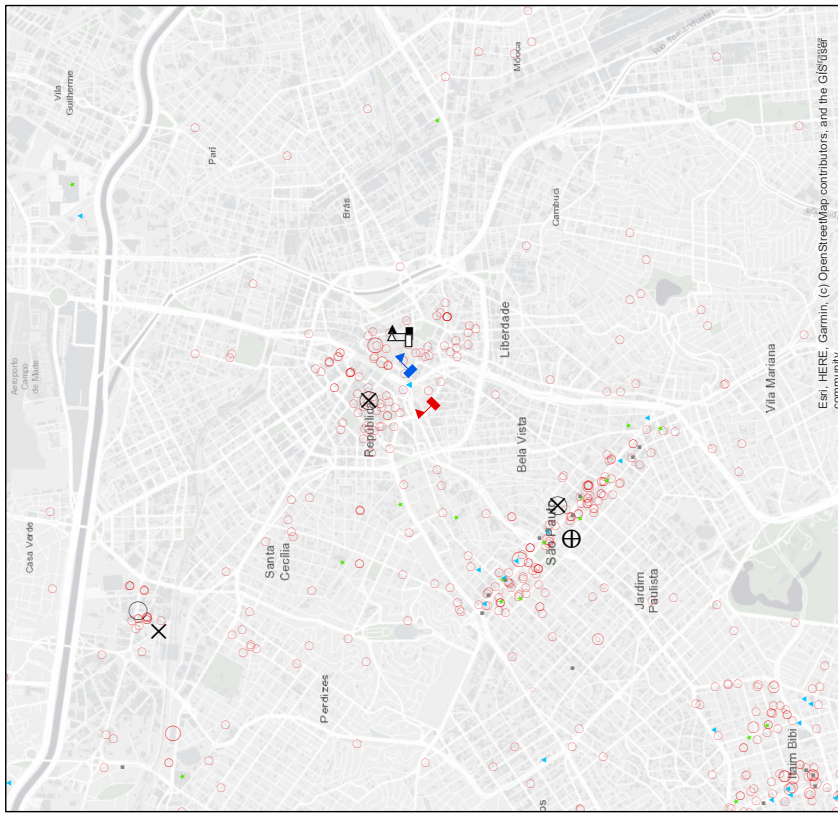




Table 197: Sources: Sao Paulo ( Brazil )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1554	Reis (2004, . 9)
First Political Institution <sup>b</sup>	1619	Reis (2004, p. 16), Sao Paulo City Council (2012)
City Hall	1900	Sao Paulo City Council (2012)
City Hall	2000	Sao Paulo City Council (2012)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>c</sup> , 1900, 1950, 2000	Reis (2004, p. 20)
<i>Population Data (1800-2000)</i>		
City Population	1776, 1816, 1826, 1876, 1881, 1905, 1929, 1949, 1974, 1988, 2000	Angel et al. (2012, p. 307), Reis (2004, p.. 86)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1974	Onursal and Gautam (1997, 110)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>there seems to be some disagreement on when exactly the city was founded, but the quoted book marks the 450th anniversary of the city

<sup>b</sup>Sao Paulo gained "city status" in 1711, but there was a townhall beforehand

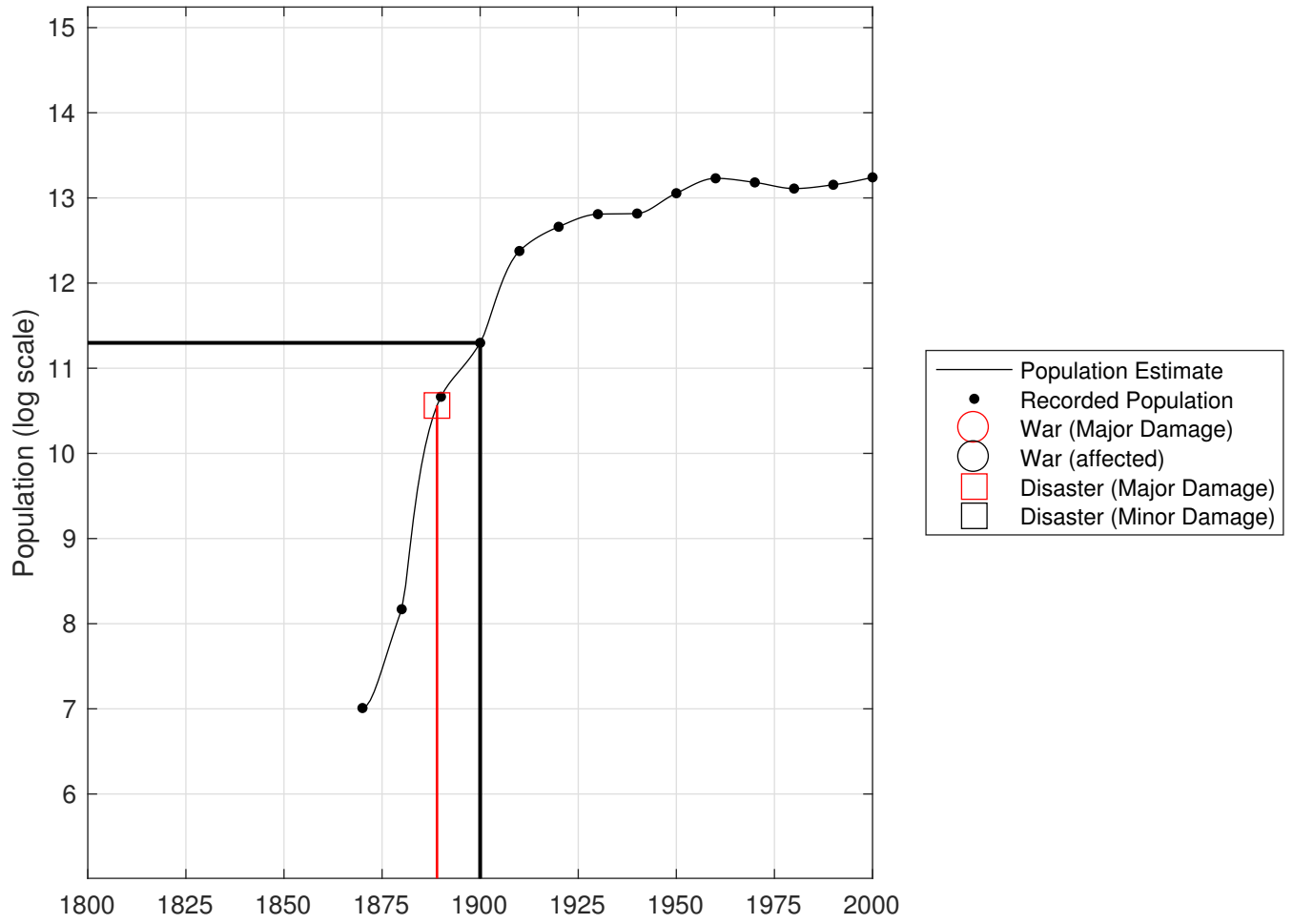
<sup>c</sup>became head of captaincy in 1682, no information that this changed at some point

Table 198: Concentration Measures - Sao Paulo

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	12.24
Cumulative density of employment-weighted PP distances at 750 m	%	48.61
Average distance between all prime locations	in kilometres	12.09
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.64
Weighted average distance from EWPPs to 1900 CH	in kilometres	8.83
Average from all prime locations to 1900 CH	in kilometres	6.53
Average distance from global prime locations to 1900 CH	in kilometres	5.69

A.97 Seattle

Figure 106: Seattle



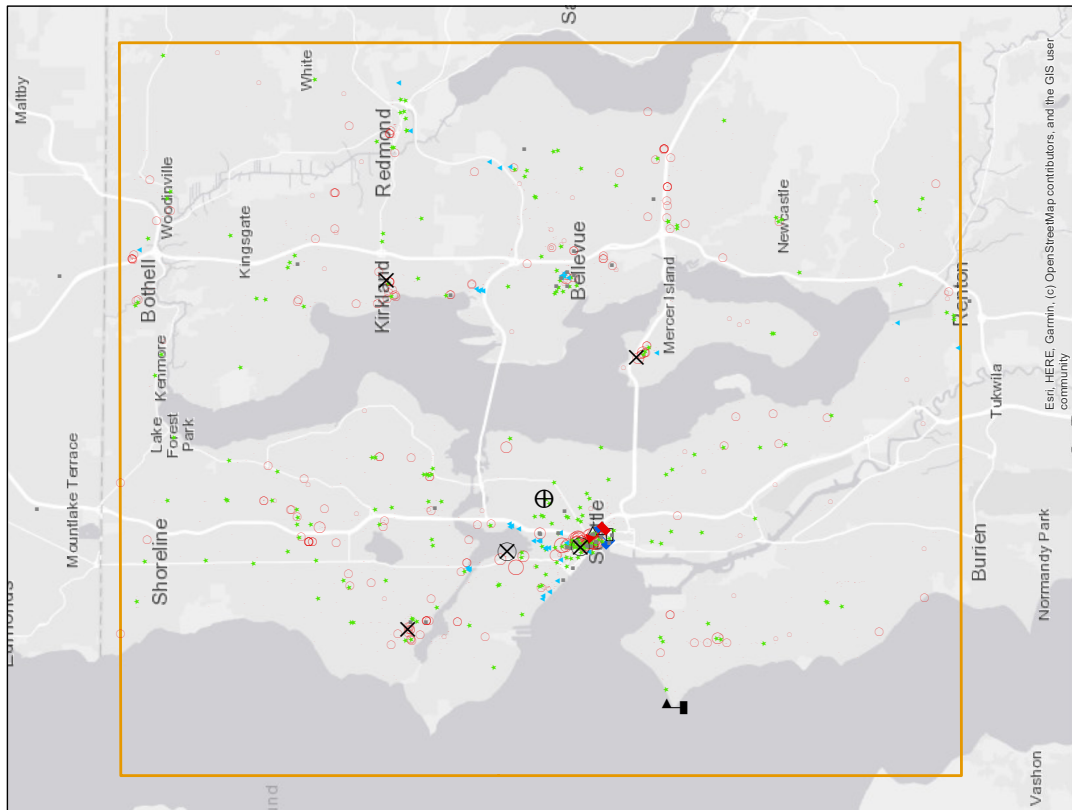
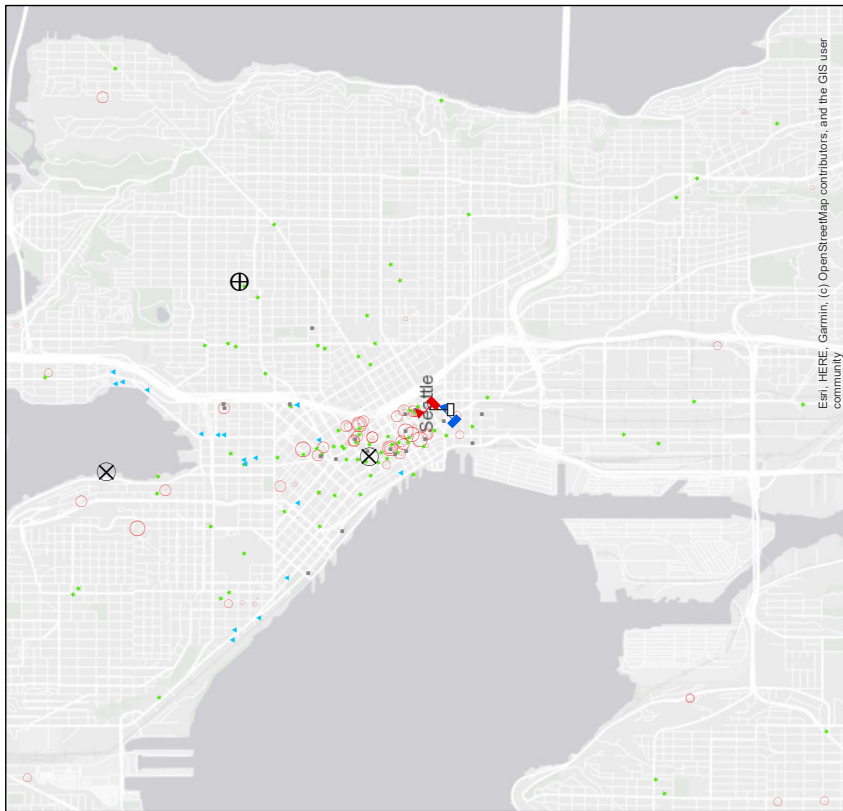


Table 199: Sources: Seattle ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1851	Keniston-Longrie (2014, p. 7)
First Political Institution <sup>a</sup>	1882	City of Seattle (2015)
City Hall	1900	City of Seattle (2015)
City Hall	2000	City of Seattle (2015)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	City of Seattle (2015)
<i>Population Data (1800-2000)</i>		
City Population	1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Gibson and Jung (2005a, p. 111), United States Census Bureau (2015)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1889 <sup>b</sup>	Keniston-Longrie (2014, p. 9)
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>First permanent city hall after incorporation in 1869.

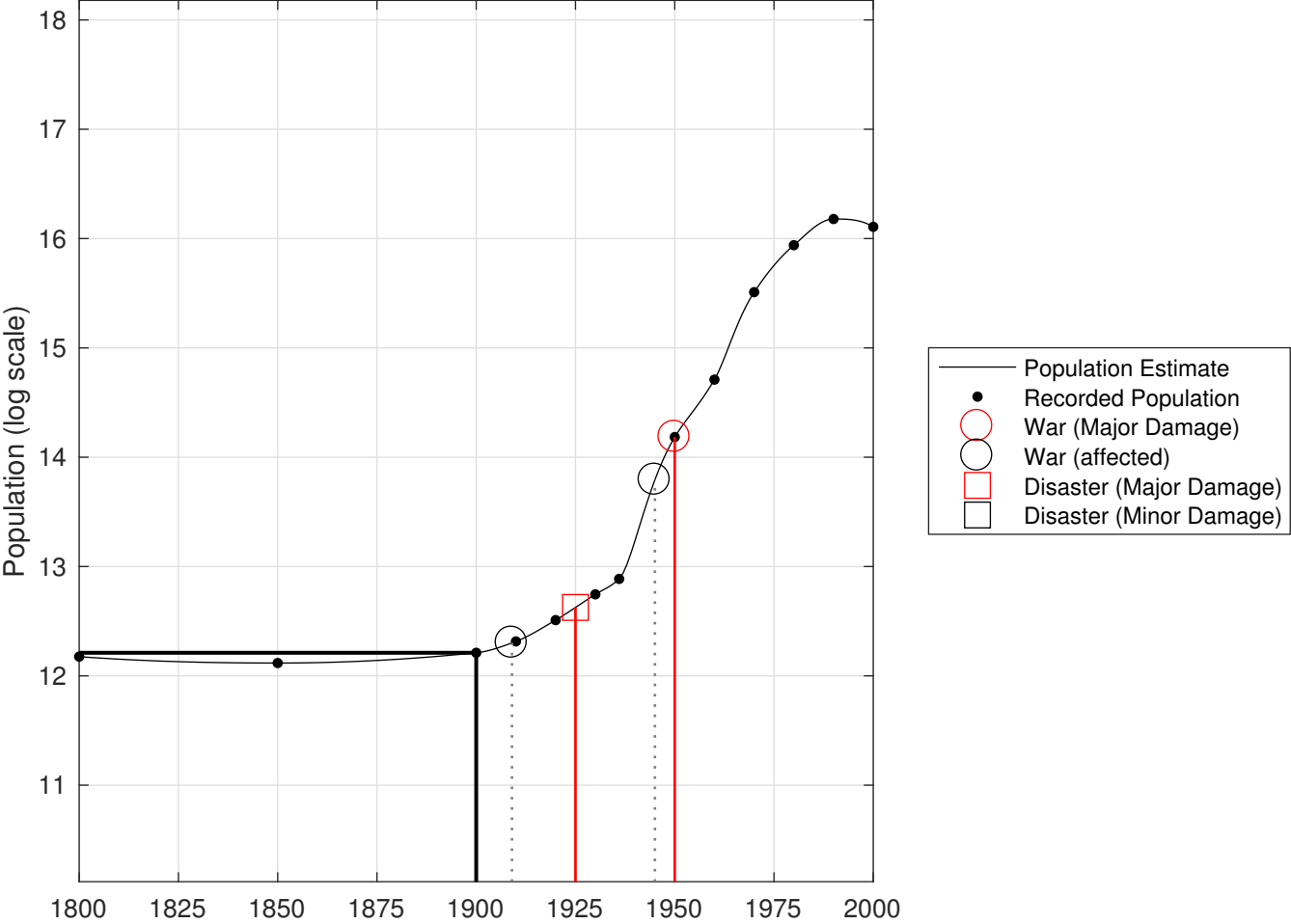
<sup>b</sup>According to McNamee (2015), this fire consumed 30 square blocks, including the entire business district. We find no evidence of other major disasters. There were floods in 1948 and 1990, but the damage caused appears limited. Even though Seattle's location makes it earthquake prone, none of the historical earthquakes as described by the United States Geological Survey (2015b) would qualify for major destruction.

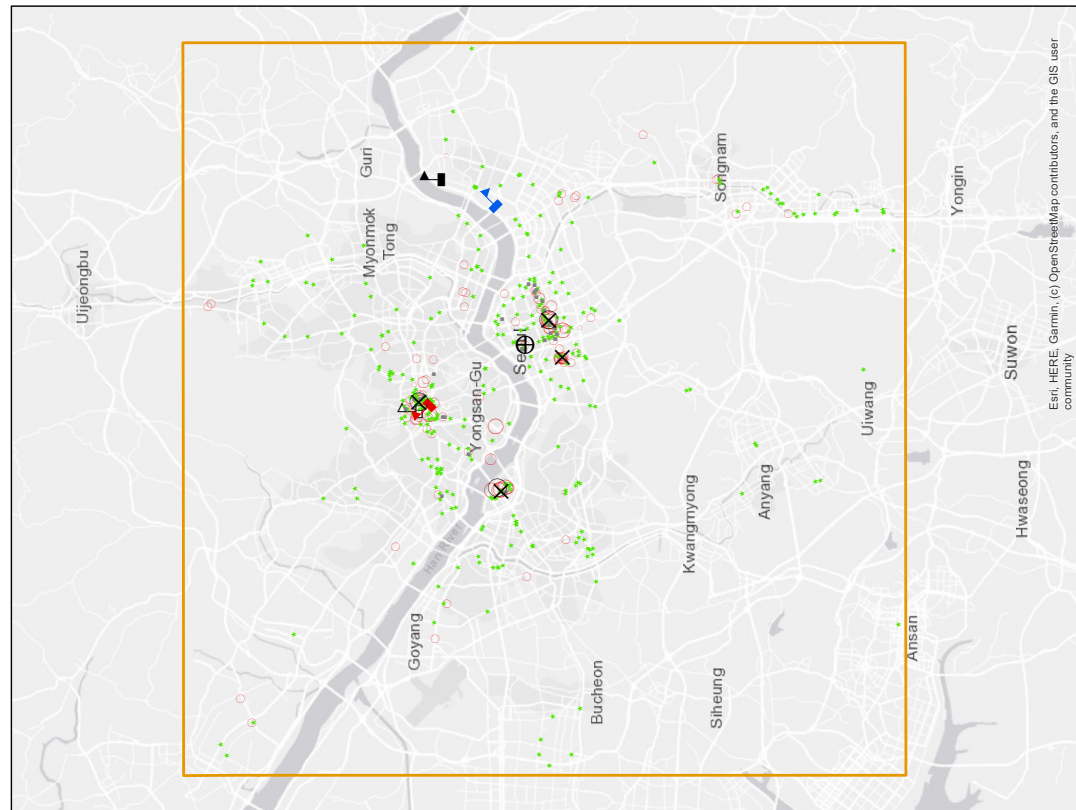
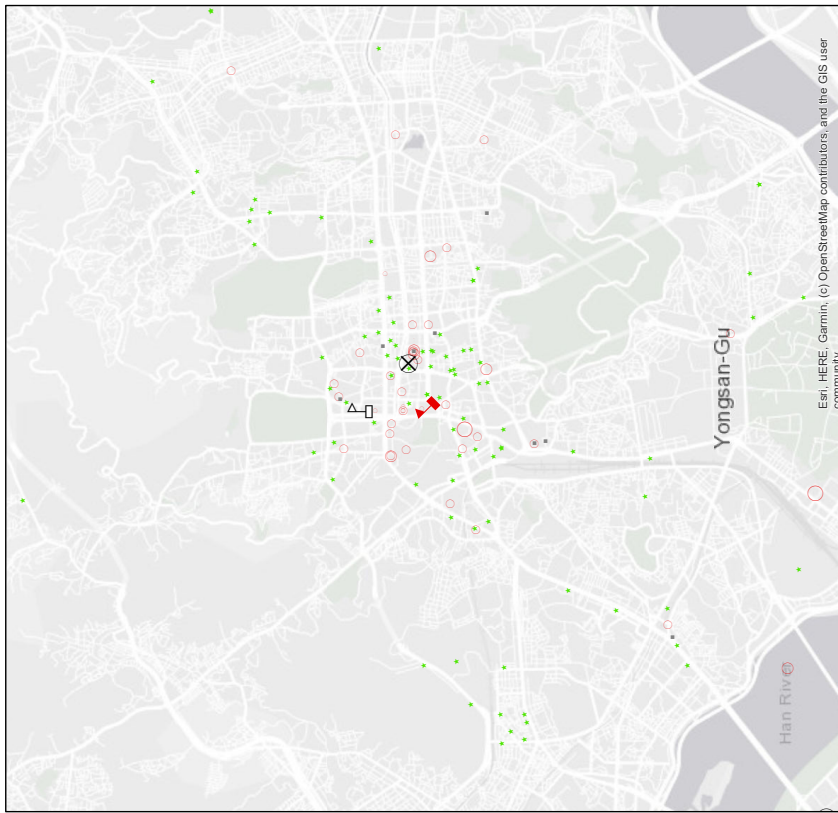
Table 200: Concentration Measures - Seattle

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	11.44
Cumulative density of employment-weighted PP distances at 750 m	%	28.87
Average distance between all prime locations	in kilometres	7.47
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.20
Weighted average distance from EWPPs to 1900 CH	in kilometres	8.78
Average from all prime locations to 1900 CH	in kilometres	3.86
Average distance from global prime locations to 1900 CH	in kilometres	1.23

A.98 Seoul

Figure 107: Seoul





- Legend**
- ✕ Prime location (any)
  - Global prime location
  - ⊕ Central point
  - ▭ Metro extent (prime services)
  - ▲ SNL Office Building
  - ★ Starbucks
  - CoWorking
  - ▲ Foundation Place
  - ▲ First City Government
  - ▲ City Hall 1900
  - ▲ City Hall 2000
  - EWWP 450 - 918
  - 918 - 1507
  - 68 - 98
  - 98 - 450
  - 1507 - 1898



Table 201: Sources: Seoul ( South Korea )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	-5000	Seoul Metropolitan Government (2014)
First Political Institution <sup>b</sup>	250	Seoul Metropolitan Government (2014)
City Hall <sup>c</sup>	1900	Jong-woo (2013, p. 217), Government Buildings Management Service (2014)
City Hall	2000	Chattopadhyay and White (2014, p. 278)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900, 1950, 2000	Seoul Metropolitan Government (2014)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1900, 1910, 1920, 1930, 1936, 1950, 1960, 1970, 1980, 1990, 2000	Chandler (1987, p. 416), Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>e</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>f</sup>	1974	Institute (2014, 72)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	Seoul Metropolitan Government (2014)
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	1925	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1950 <sup>g</sup>	Kim and Choe (1997, p. 10)
International War(s)	1909 <sup>h</sup> , 1945 <sup>i</sup>	Kim and Choe (1997, p. 36)

<sup>a</sup>We take the Amsa Dong settlement as the first, although some evidence of earlier settlements exists (Myeongmok-dong, Yeoksam-dong and Garak-dong), but it is not clear to us to what extent and what kind.

<sup>b</sup>This marks the Pungnaposeong Fortress, which could be interpreted as the first administrative unit on the today's city grounds. The Baejke tribe built it, which settled from 18 BC in the area.

<sup>c</sup>According to Jong-woo (2013, p. 217), this was where the city hall (Ministry for the capital city) was located prior to the Japanese occupation (starting in 1910); the other reference points to the exact location.

<sup>d</sup>Apparently, no change in the capital status in 19th and 20th century.

<sup>e</sup>Footnote from United Nations Population Division (2014): Refers to Seoul Special City. Data refer to the urban population of the city.

<sup>f</sup>There have been rail lines with stops in Seoul such as the Seoul-Incheon line as early as 1899 (Hwang, 2010). Some of those were later converted into metro lines, but it seems inconsistent to classify these as metros, which is why we take the official opening date of the subway (1974) and change the number of stations in 1910 and 1940 to 0.

<sup>g</sup>47 percent of the buildings were destroyed during the Korean War (see also Yu, 2015b).

<sup>h</sup>Beginning of colonial occupation.

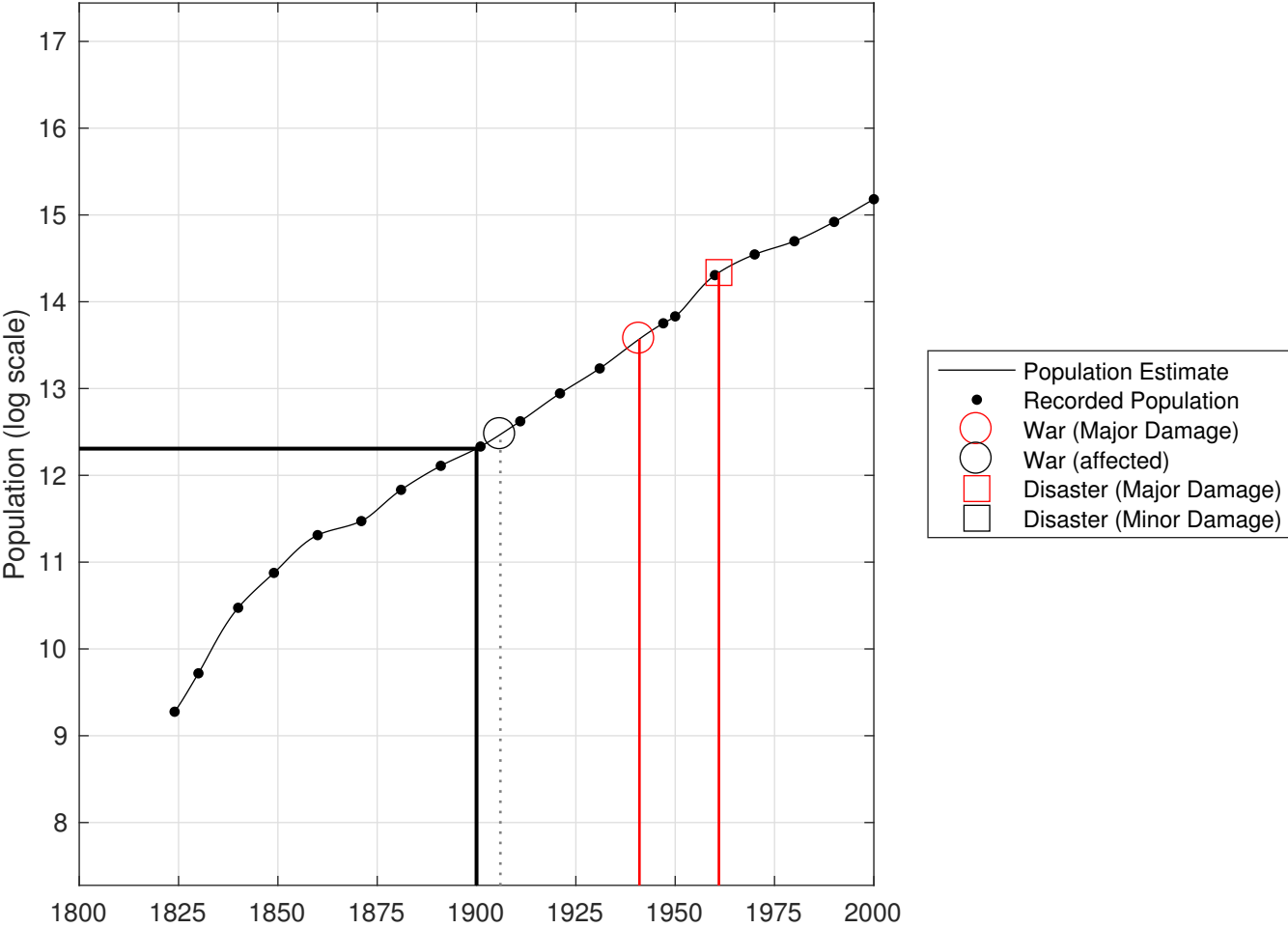
<sup>i</sup>End of occupation; independence.

Table 202: Concentration Measures - Seoul

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	8.39
Cumulative density of employment-weighted PP distances at 750 m	%	17.14
Average distance between all prime locations	in kilometres	5.61
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.82
Weighted average distance from EWPPs to 1900 CH	in kilometres	7.40
Average from all prime locations to 1900 CH	in kilometres	6.67
Average distance from global prime locations to 1900 CH	in kilometres	5.82

A.99 Singapore

Figure 108: Singapore



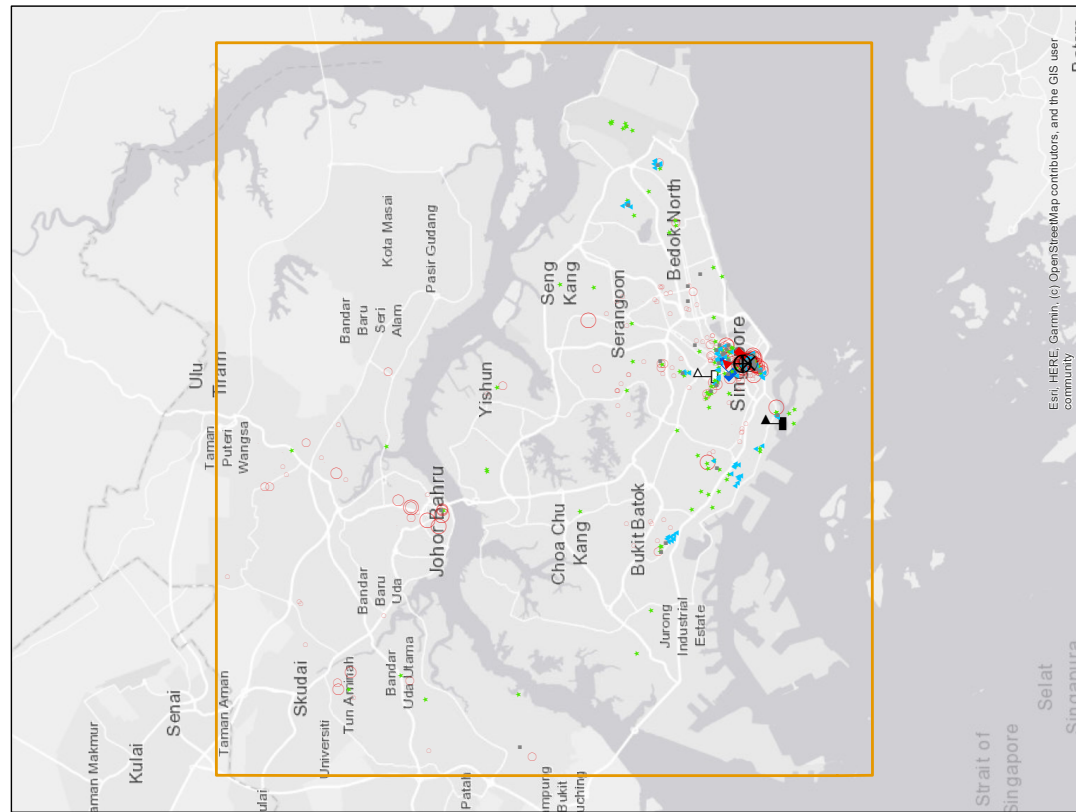
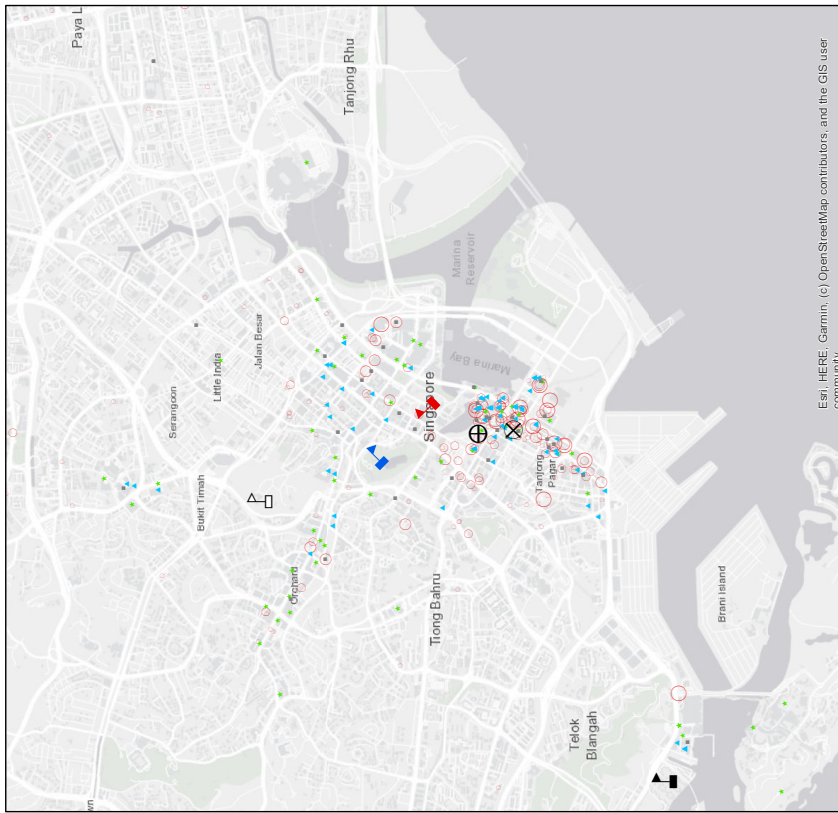


Table 203: Sources: Singapore ( Singapore )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1250	Turnbull (1989, p. 4), Mulliner et al. (1991, xxi)
First Political Institution <sup>b</sup>	1819	Liu (2001, p. 22), Turnbull (2009, p. 96)
City Hall <sup>c</sup>	1900	Liu (2001, p. 46)
City Hall	2000	Liu (2001, p. 192)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900, 1950, 2000	Quah (2010, p. 27)
<i>Population Data (1800-2000)</i>		
City Population	1824, 1830, 1840, 1849, 1860, 1871, 1881, 1891, 1901, 1911, 1921, 1931, 1947, 1950, 1960, 1970, 1980, 1990, 2000, 2010	Swee-Hock (2012, p.9), Department of Economic and Social Affairs, Population Division (2011)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1987	D and D (2016, 184)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	Loh (2013)
Fire(s)	1961 <sup>e</sup>	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1906 <sup>f</sup>	Liu and Wong (2004, p. 31), Mulliner et al. (1991, xxv)
International War(s)	1941 <sup>g</sup>	Parliament of Singapore (2014), Abshire (2011, p. xiv)

<sup>a</sup>Mulliner et al. (1991, xxi) dates the settlement back to the 1200s, which is why we assume 1250. The location is given by Turnbull (1989, p. 4). The city was abandoned, when the British came (Turnbull, 1989, p. 7f).

<sup>b</sup>This is the first seat of the governor of Singapore on where today stands Fort Canning.

<sup>c</sup>This is Government house, which was finished in 1868 and from where the colony was ruled. There was a “town hall,” but it seems to have been used as a theatre and occasional meeting place. As Singapore was a colony and a municipal council was only founded much later in the 20th century, de facto power remained with the colonial government.

<sup>d</sup>Became capital of the Straits settlement in 1932.

<sup>e</sup>16000 people were homeless because of this fire, which is why we code it as causing major destruction.

<sup>f</sup>There have been many riots such as the one in 1906 between the Hokkiens and Teochews in 1906, but as with these riots, we do not code them as having caused mayor destruction. There is too little evidence for severe damage to shops and structures. Neither in the timeline of Abshire (2011, p. xiii-xvi) nor in the more detailed one by Mulliner et al. (1991, xxv), we find any other disasters that would qualify as major.

<sup>g</sup>Bombing of Singapore and Japanese occupation. The destruction is not mentioned in Encyclopaedia Britannica (2015v) and thus only coded as “major.”

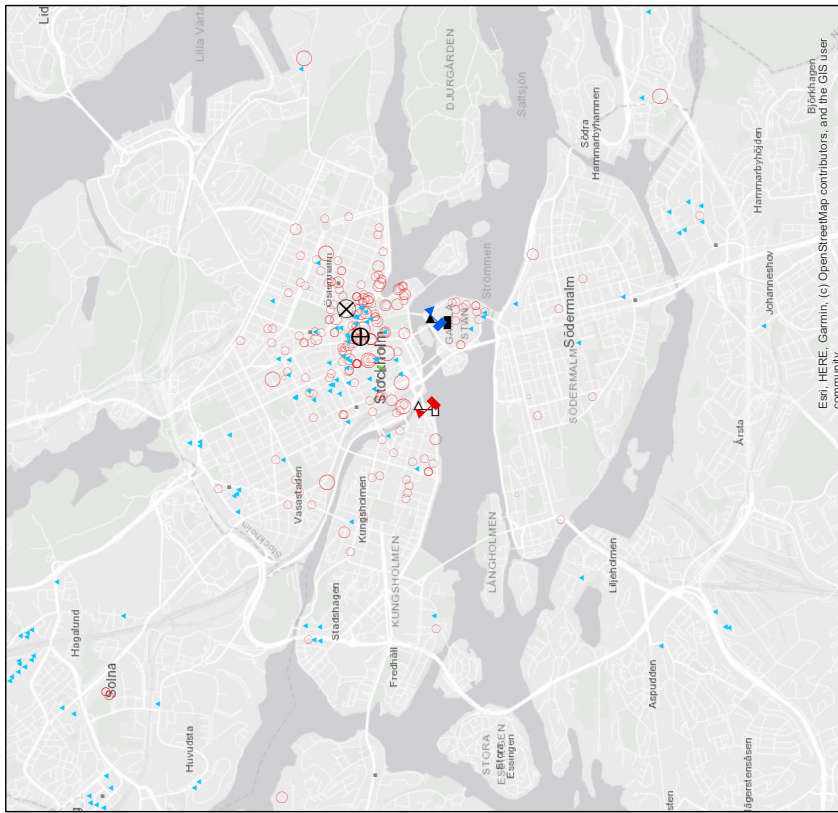
Table 204: Concentration Measures - Singapore

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	9.71
Cumulative density of employment-weighted PP distances at 750 m	%	6.72
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.16
Weighted average distance from EWPPs to 1900 CH	in kilometres	6.65
Average from all prime locations to 1900 CH	in kilometres	2.88
Average distance from global prime locations to 1900 CH	in kilometres	2.88

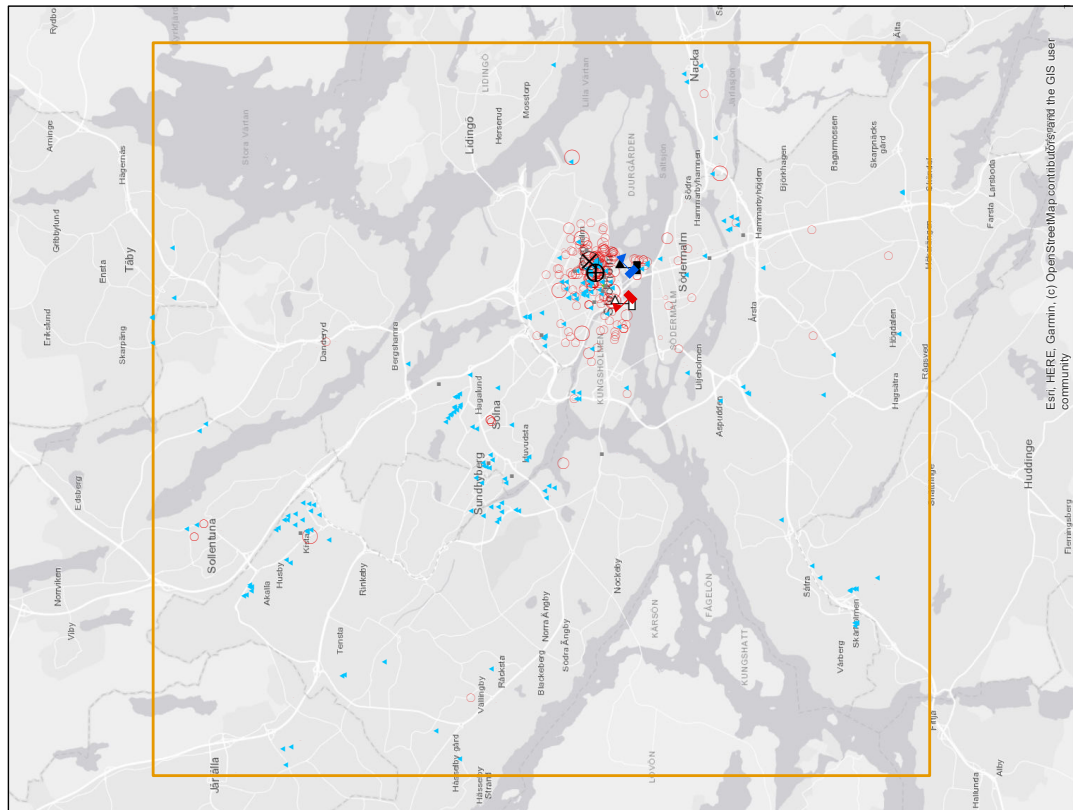
A.100 Stockholm

Figure 109: Stockholm





- Legend**
- ✕ Prime location (any)
  - Global prime location
  - ⊕ Central point
  - Metro extent (prime services)
  - ▲ SNL Office Building
  - Starbucks
  - CoWorking
  - ▲ Foundation Place
  - ▲ First City Government
  - ▲ City Hall 1900
  - ▲ City Hall 2000
  - EWWP 450 - 918
  - EWWP 68 - 98
  - EWWP 98 - 450
  - EWWP 1507 - 1898



- 0 2.5 5 10 Kilometers



Table 205: Sources: Stockholm ( Sweden )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	990	Swedish Royal Court (2014)
First Political Institution <sup>b</sup>	1252	Swedish Royal Court (2014), Streiffert (2012, p. 15), Cybriwsky (2013, p.288)
City Hall <sup>c</sup>	1900	Maunder and Hansen (2013, p.178)
City Hall	2000	Knoller (2013, p.613)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900, 1950, 2000	Cybriwsky (2013, p.288)
<i>Population Data (1800-2000)</i>		
City Population	1750, 1800, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2003	Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>e</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>f</sup>	1933	Elgán and Scobbie (2015, 277)
Number of Stations	1910, 1940, 2010	Schwandl (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>The Vikings built a wooden blockade on the spot where the royal palace stands today.

<sup>b</sup>Birger Jarl officially founded the city in 1252 and his fortress stood where today's palace is. We take this as the first point of government.

<sup>c</sup>This city hall was built in 1897.

<sup>d</sup>Stockholm has been capital since 1634.

<sup>e</sup>Footnote from United Nations Population Division (2014): Refers to "ttort" (According to the administrative divisions of 2005).

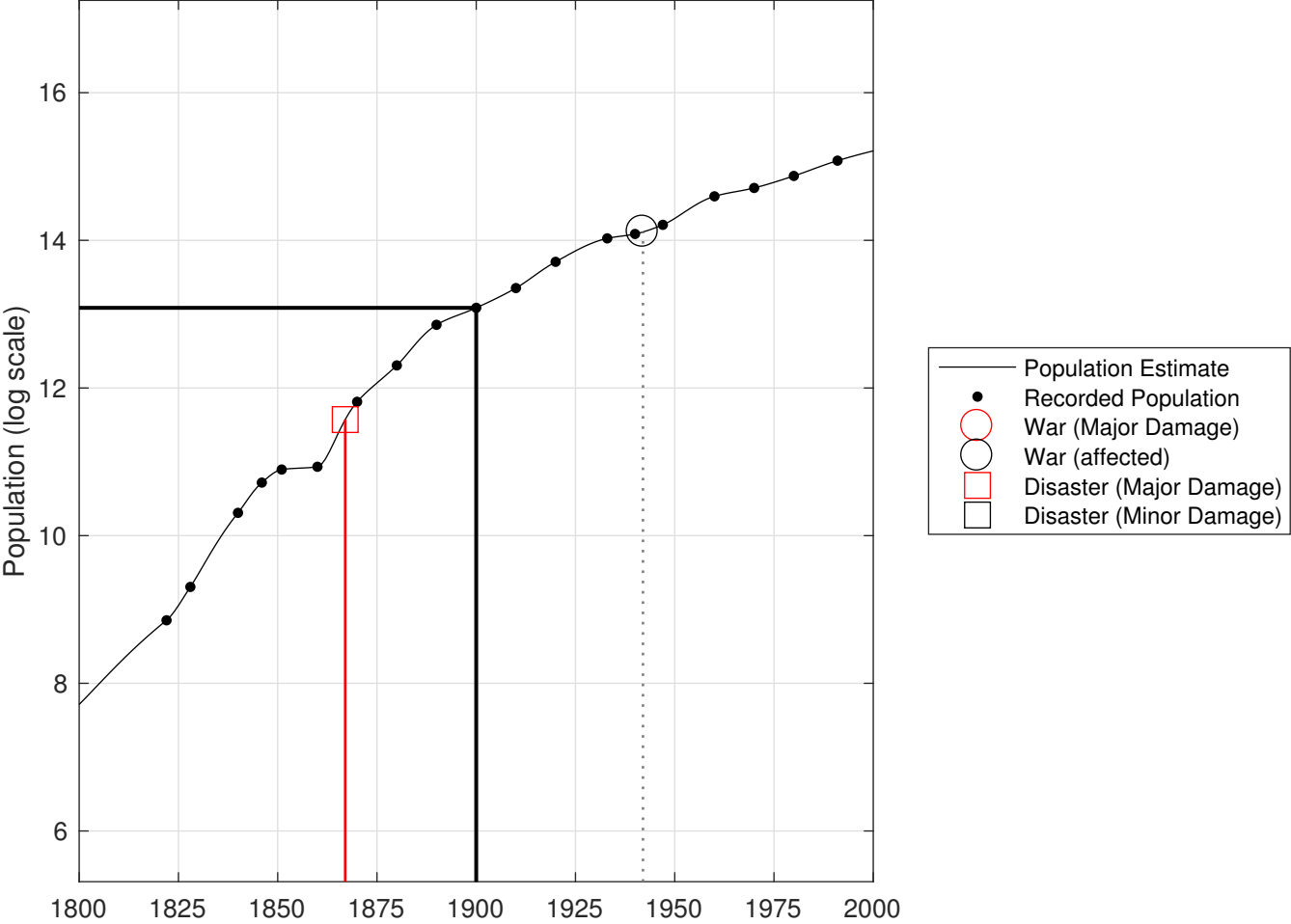
<sup>f</sup>In 1933, a "premetro" was opened, meaning that underground trams were operating with the goal to later convert them into a proper subway. We count this as a metro system and change the number of stations for 1940 to 2 accordingly.

Table 206: Concentration Measures - Stockholm

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	2.39
Cumulative density of employment-weighted PP distances at 750 m	%	3.50
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-1.26
Weighted average distance from EWPPs to 1900 CH	in kilometres	1.88
Average from all prime locations to 1900 CH	in kilometres	1.40
Average distance from global prime locations to 1900 CH	in kilometres	1.40

A.101 Sydney

Figure 110: Sydney



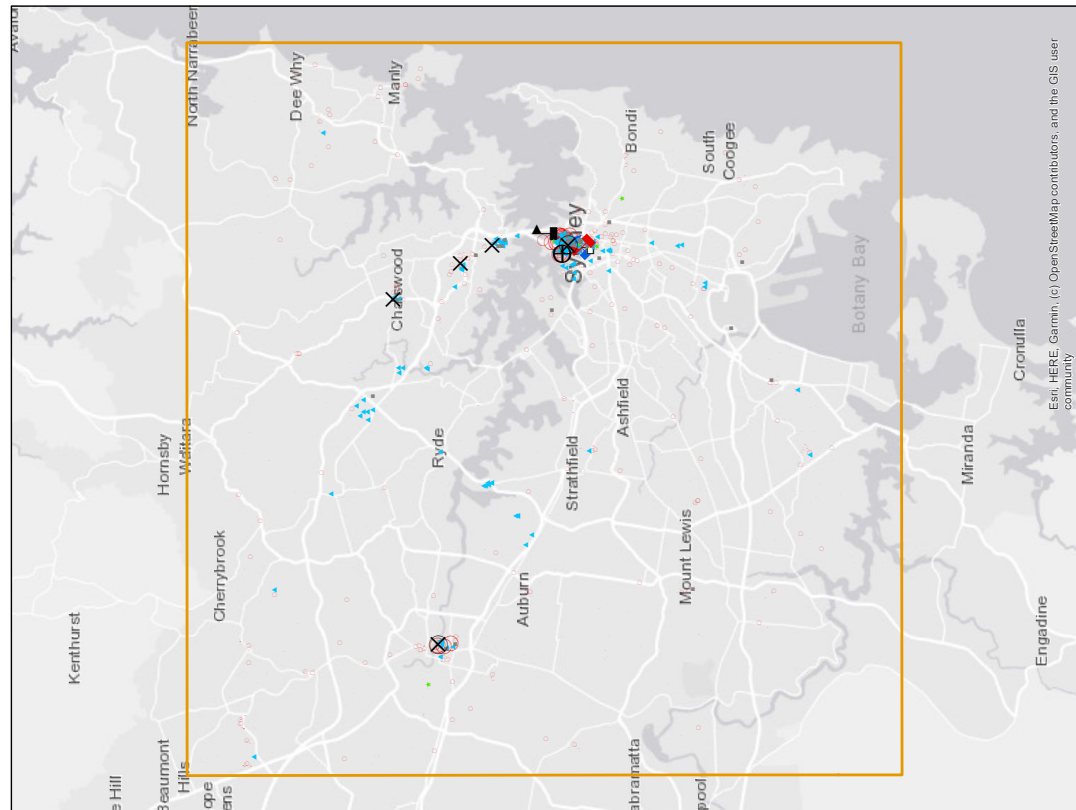
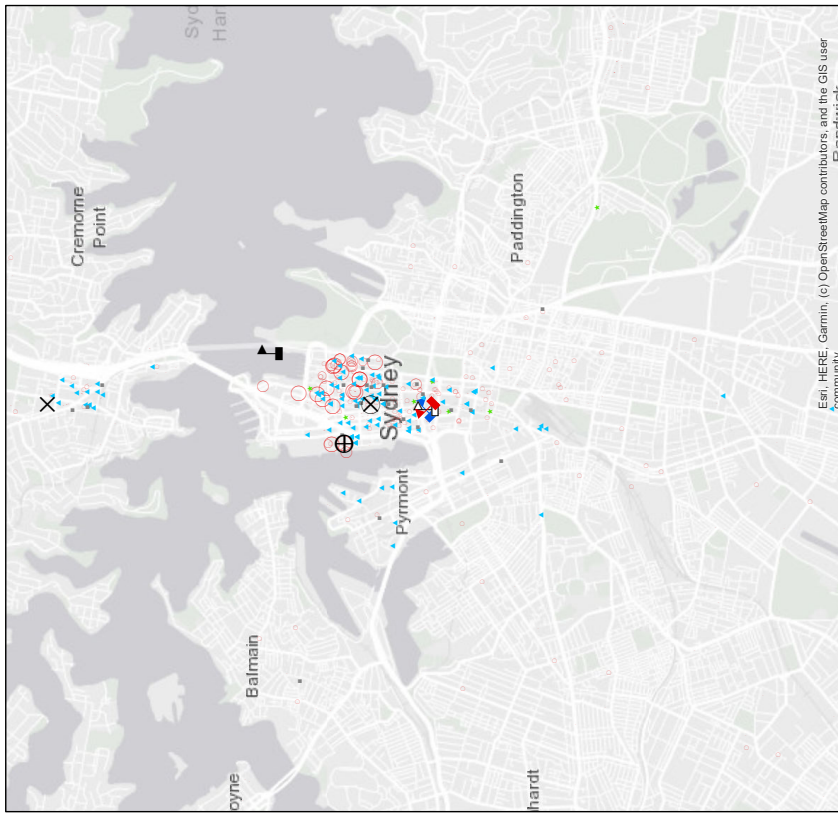


Table 207: Sources: Sydney ( Australia )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1788	Turnbull (1999, p. 58)
First Political Institution <sup>a</sup>	1868	New South Wales Government (2014)
City Hall	1900	New South Wales Government (2014)
City Hall	2000	New South Wales Government (2014)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>b</sup> , 1900, 1950, 2000	Turnbull (1999, p. 91)
<i>Population Data (1800-2000)</i>		
City Population	1788, 1822, 1828, 1840, 1846, 1851, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1933, 1940, 1947, 1960, 1970, 1980, 1991, 2003	Mitchell (2007, p. 47), Connell (2000, p. 58)
Metro Population <sup>c</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	1867 <sup>d</sup>	Ring et al. (1996, p. 863)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1942	Archives (2014)

<sup>a</sup>There were some temporary offices before, but this was the first actual townhall.

<sup>b</sup>The reference refers to the mentioning of the government house from which NSW was governed; technically it became a state capital only in 1901, because before New South Wales was a colony and not part of the Australian confederation; it was the colony's capital though.

<sup>c</sup>Footnote from United Nations Population Division (2014): Refers to Greater Sydney.

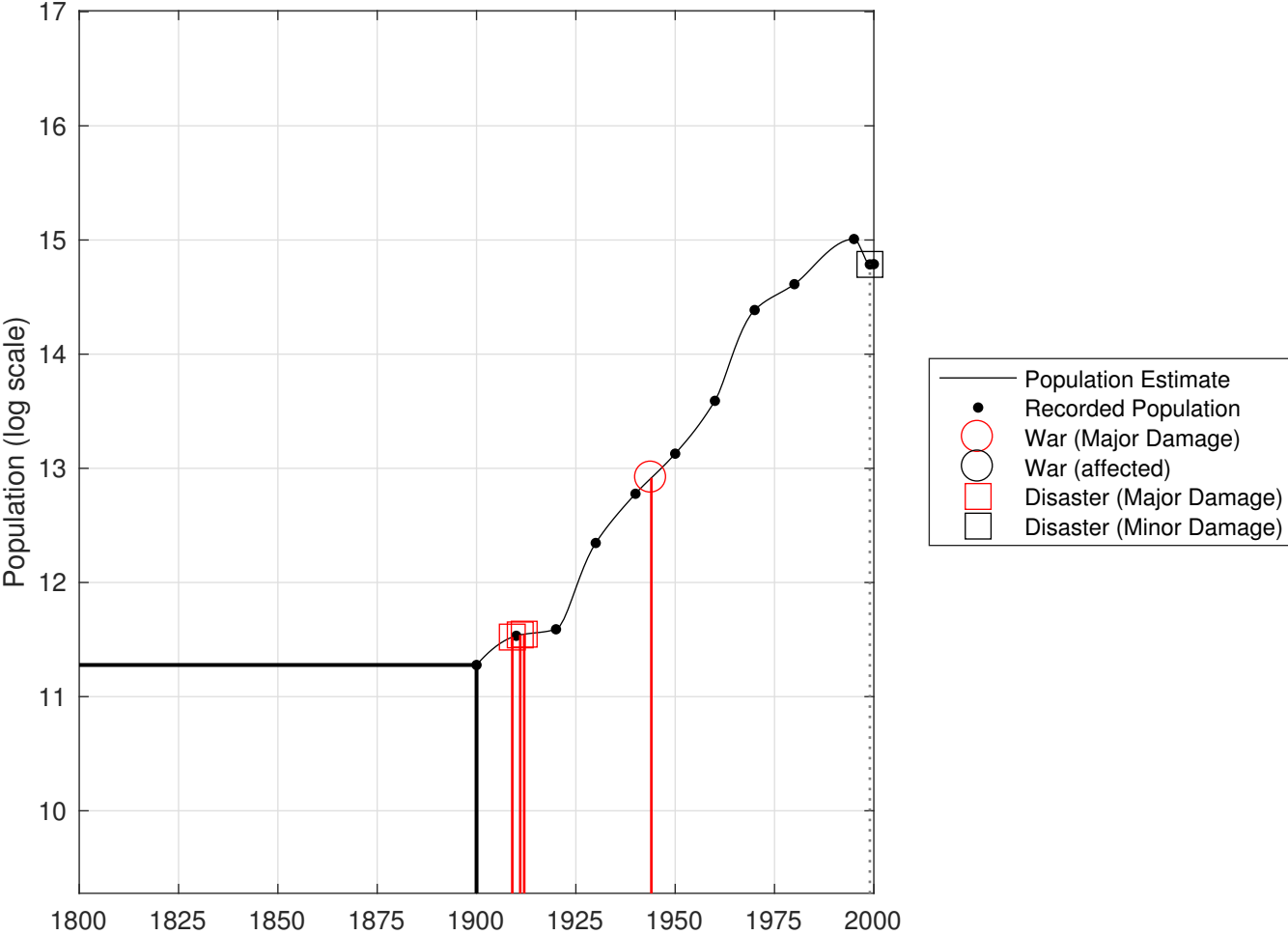
<sup>d</sup>The flood "submerged" the city.

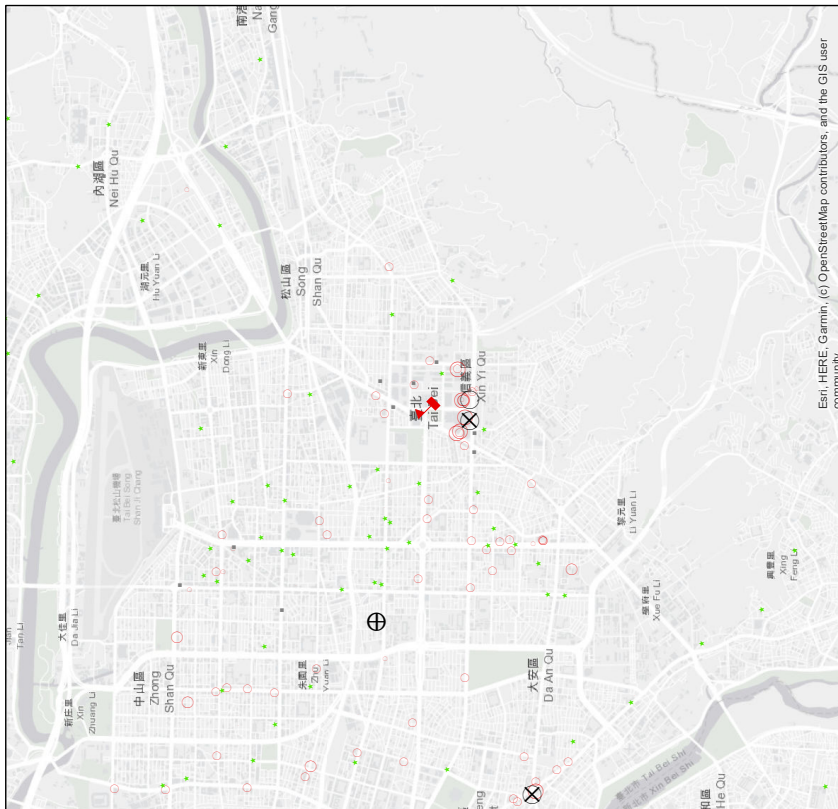
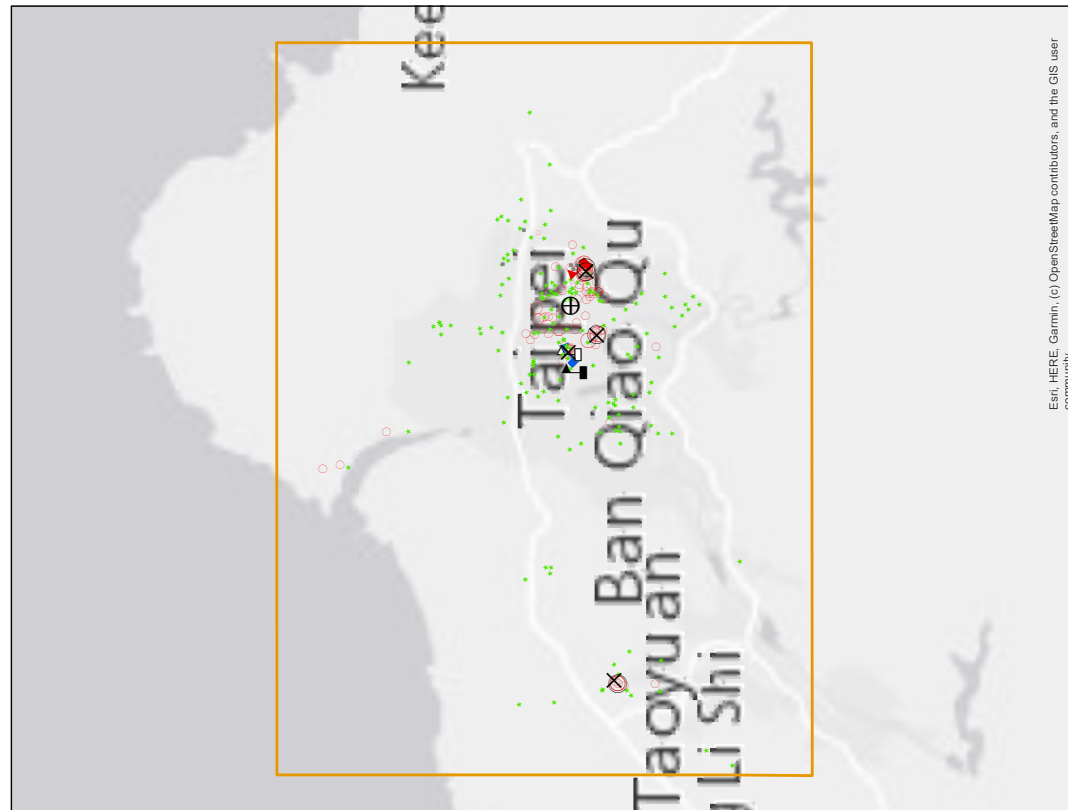
Table 208: Concentration Measures - Sydney

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	11.87
Cumulative density of employment-weighted PP distances at 750 m	%	13.69
Average distance between all prime locations	in kilometres	7.91
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.60
Weighted average distance from EWPPs to 1900 CH	in kilometres	8.25
Average from all prime locations to 1900 CH	in kilometres	4.19
Average distance from global prime locations to 1900 CH	in kilometres	3.80

A.102 Taipei

Figure 111: Taipei





**Legend**

- ✕ Prime location (any)
- Global prime location
- ⊕ Central point
- ▭ Metro extent (prime services)
- SNL Office Building
- Starbucks
- CoWorking
- ▲ Foundation Place
- ▲ First City Government
- ▲ City Hall 1900
- ▲ City Hall 2000
- EWWP 450 - 918
- 68 - 98
- 98 - 450
- 918 - 1507
- 1507 - 1898



Table 209: Sources: Taipei ( Taiwan )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1709	Taipei City Government (2014), Foreign Ministry of the Republic of China (1995 (23, June) Tzeng (2009), Allen (2012b, p. 42)
First Political Institution <sup>b</sup>	1884	
City Hall <sup>c</sup>	1900	Allen (2012b, p. 42)
City Hall <sup>d</sup>	2000	Taipei City Government (2014)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>e</sup> , 1900 <sup>f</sup> , 1950 <sup>g</sup> , 2000	Taipei City Government (2014),
<i>Population Data (1800-2000)</i>		
City Population	1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1995, 1999, 2000	Mitchell (2007, p. 46), Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1996	D and D (2016, 301)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	1867 <sup>h</sup> , 1909 <sup>i</sup> , 1999 <sup>j</sup>	Wang (2008, p.218), Taipei Times (2004)
Fire(s)	None recorded	
Hurricane(s)	2001 <sup>k</sup>	Sui et al. (2002, p. 265)
Flooding(s)	1898, 1911, 1912	Hu et al. (2013)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1895, 1944 <sup>l</sup>	Allen (2012b, p. 39), Taipei City Government (2014)

<sup>a</sup>This was the first street of taipeh and is were most of the chinese started to settle. There is a pre-colonial history, but hardly any written records (except for a dutch map of 1654) exist and the settlement was mainly in manka

<sup>b</sup>It seems there was no real government until 1884, when taipei was made a city. Beforehand it seems to have been governed by business associations (Tzeng, 2009, p.2). This Qing Yamen (local admin) was built somewhen in between 1875 and 1895, we take 1884 this is when taipeh was granted city status

<sup>c</sup>Real city government structures only established in the 1920s. However, this was the seat of the provincial (and thereby de facto municipal) government until the Japanese occupation in 1895. The Japanese used this building for colonial administration.

<sup>d</sup>Current Location taken from the impressum of the history page, though the new building was finished in 2002.

<sup>e</sup>No status.

<sup>f</sup>Seat of the japanese governor general, de facto province governance.

<sup>g</sup>Became provisional capital in 1949.

<sup>h</sup>Historical records report "tsunami, surface rupture, death."

<sup>i</sup>1200 houses were damaged or destroyed.

<sup>j</sup>Only one building collapsed in Taipei.

<sup>k</sup>5000 buildings flooded. However, destruction as such does not seem major. Moreover, flooding is very frequent.

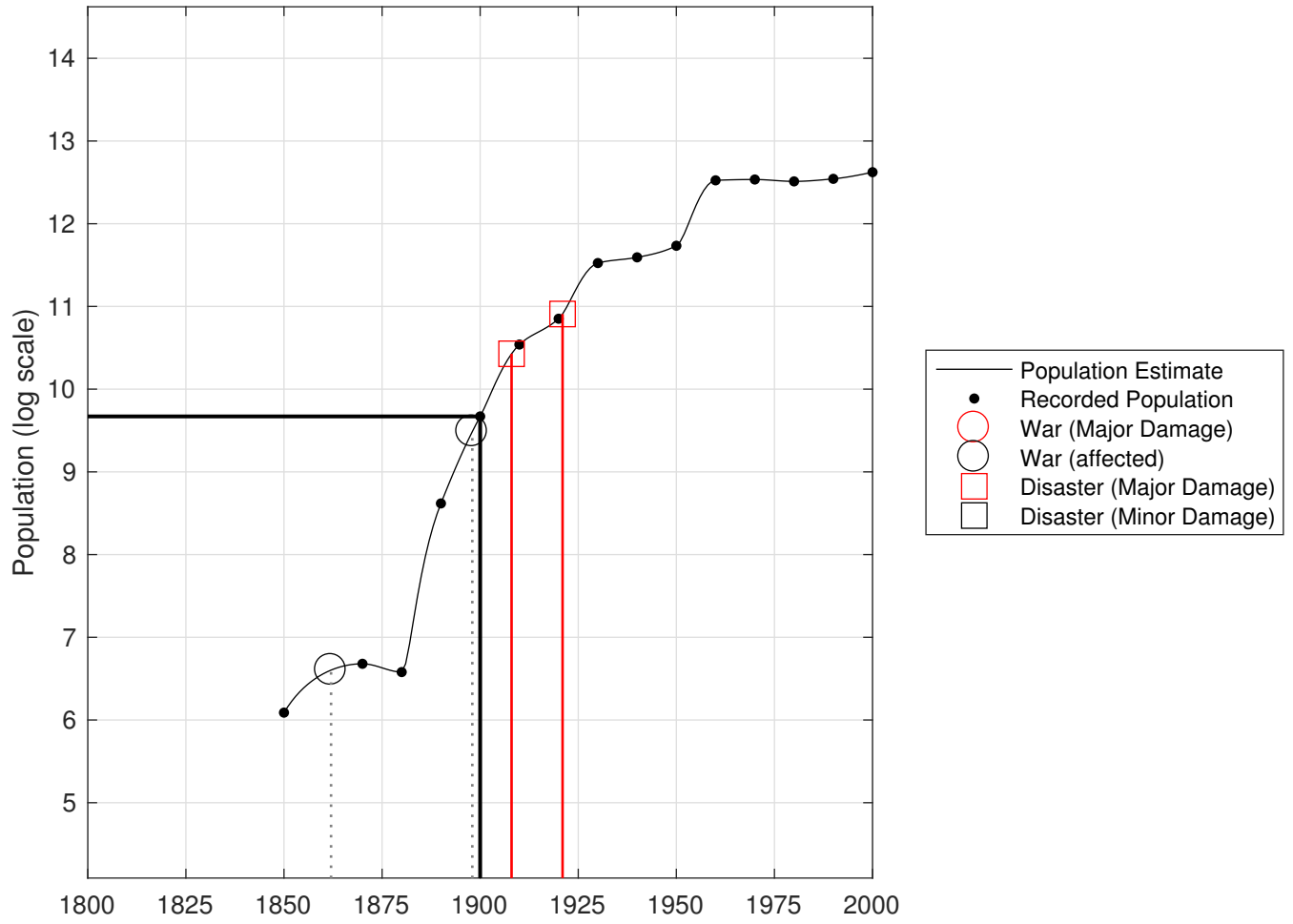
<sup>l</sup>None of the mentioned disasters is recorded in the Encyclopedia Britannica.

Table 210: Concentration Measures - Taipei

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	7.18
Cumulative density of employment-weighted PP distances at 750 m	%	11.67
Average distance between all prime locations	in kilometres	10.37
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.04
Weighted average distance from EWPPs to 1900 CH	in kilometres	5.45
Average from all prime locations to 1900 CH	in kilometres	6.09
Average distance from global prime locations to 1900 CH	in kilometres	7.51

# A.103 Tampa

Figure 112: Tampa



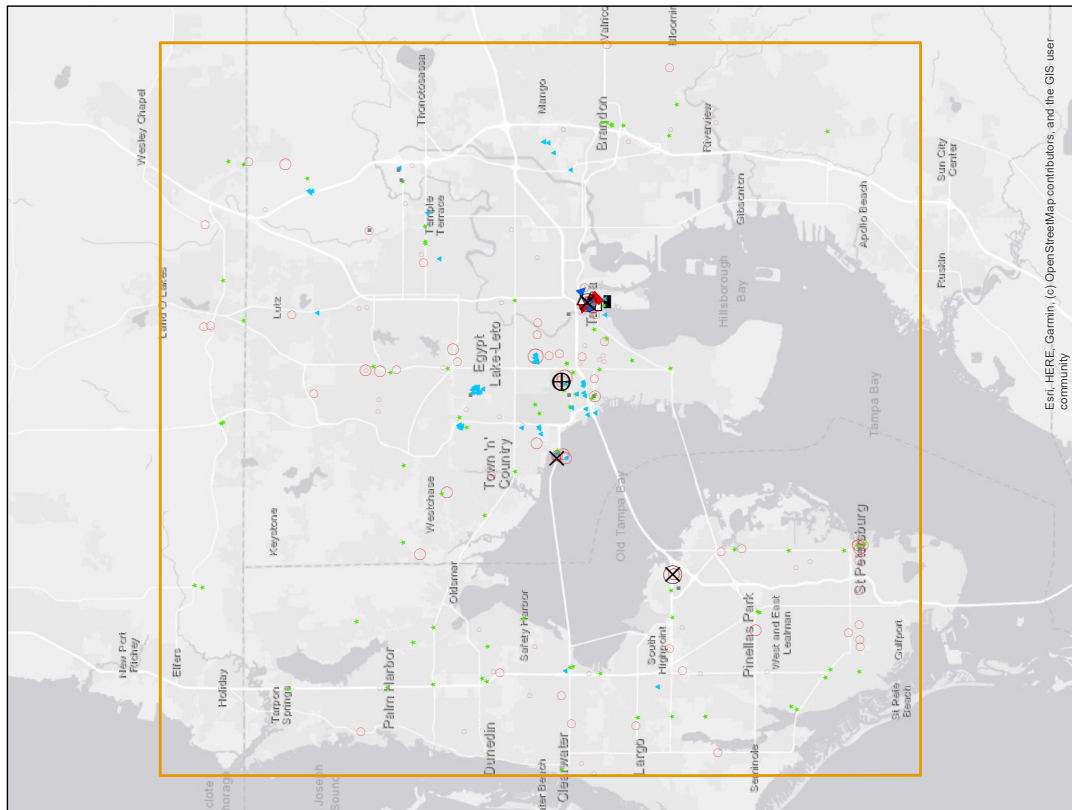
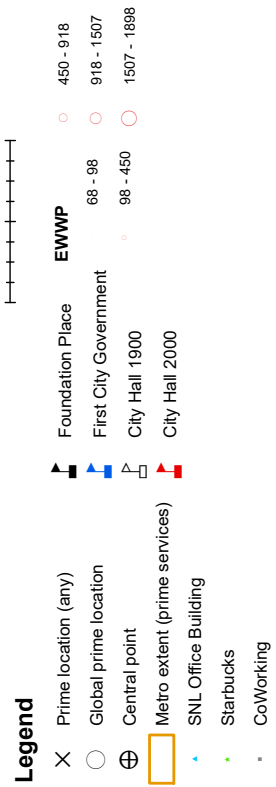
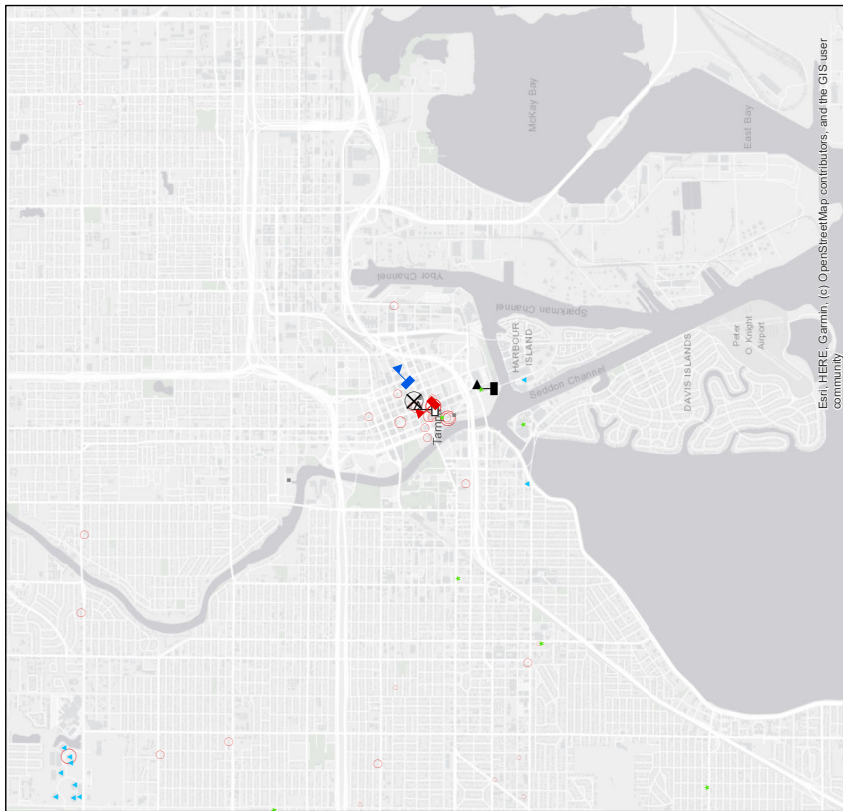


Table 211: Sources: Tampa ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1824	The Tampa Tribune (2013), City of Tampa (2013, p. 1)
First Political Institution <sup>a</sup>	1854	City of Tampa (2013, p. 2)
City Hall	1900	Bailey (1981, p. 2)
City Hall <sup>b</sup>	2000	Bailey (1981, p. 2)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>c</sup> , 1900, 1950, 2000	Florida Department of State (2015)
<i>Population Data (1800-2000)</i>		
City Population	1850, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Blakey (1990, p. 106), Gibson and Jung (2005a, p. 44-45), United States Census Bureau (2015)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>d</sup>	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1908 <sup>e</sup>	City of Tampa (2015)
Hurricane(s)	1848, 1921	Blakey (1990, p. 106), McClure (2010), McMorrow-Hernandez and Yost (2013, p. 27)
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1862 <sup>f</sup>	City of Tampa (2013, p. 3), Tucker (2013a, p. 663)
International War(s)	1898 <sup>g</sup>	Florida Division of Library & Information Services (2015)

<sup>a</sup>This courthouse was used for meetings by the mayor and council. The first proper city hall was only built in 1890 (City of Tampa, 2013, p. 3).

<sup>b</sup>No apparent change in location.

<sup>c</sup>Tampa was legally created in 1848

<sup>d</sup>There was a people mover earlier, but it only had two stops. It does not qualify as an MRT according to Gonzalez-Navarro and Turner (2016)

<sup>e</sup>Over 17 city blocks were consumed by the fire (City of Tampa, 2015), which constituted a large part of the city (Encyclopaedia Britannica, 2015w).

<sup>f</sup>It served as a fort and there was also a small battle, but destruction seemed limited.

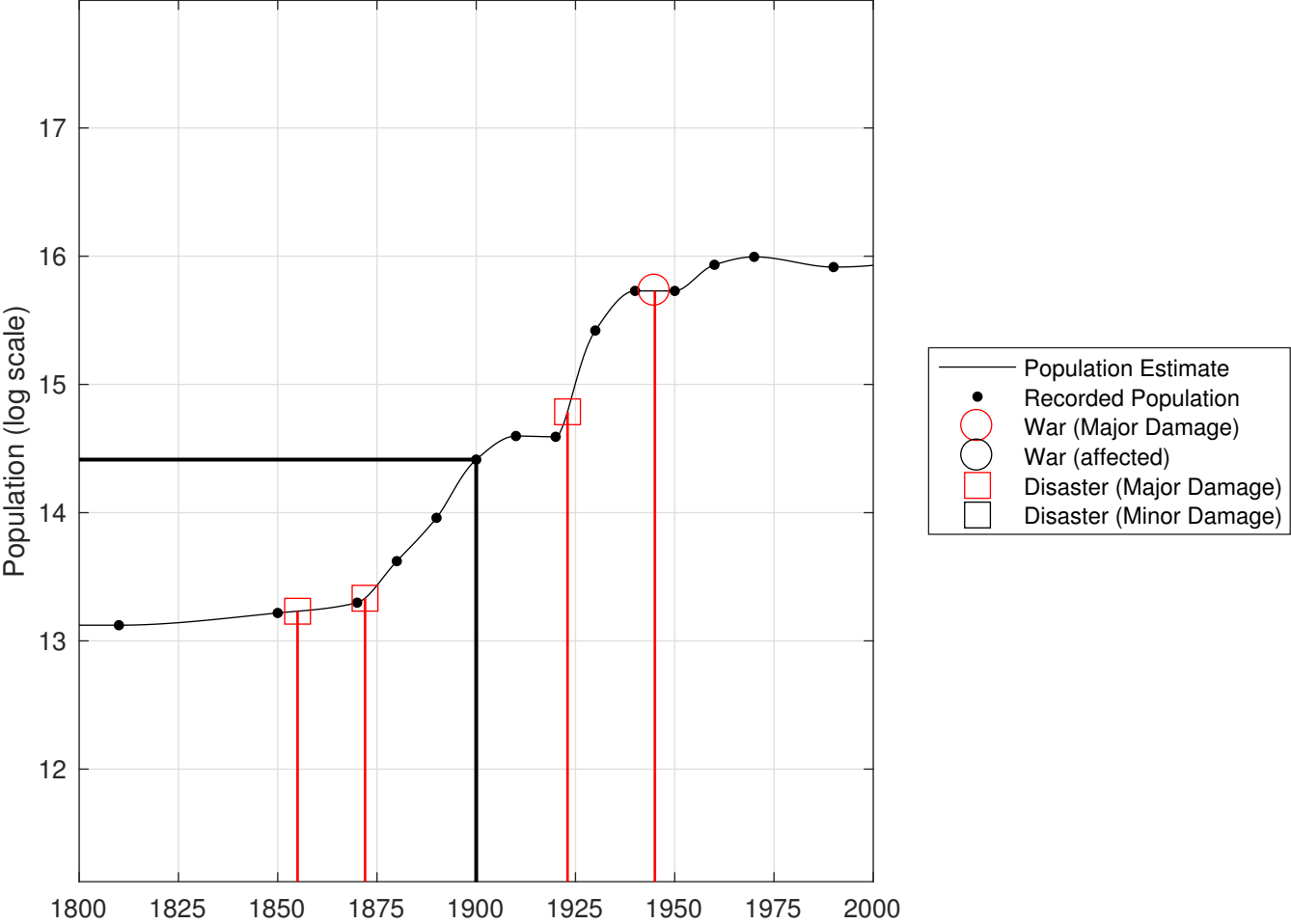
<sup>g</sup>Important military post, but no destruction (Spanish-American War).

Table 212: Concentration Measures - Tampa

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	19.91
Cumulative density of employment-weighted PP distances at 750 m	%	58.20
Average distance between all prime locations	in kilometres	11.01
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.86
Weighted average distance from EWPPs to 1900 CH	in kilometres	14.98
Average from all prime locations to 1900 CH	in kilometres	5.34
Average distance from global prime locations to 1900 CH	in kilometres	3.08

A.104 Tokyo

Figure 113: Tokyo



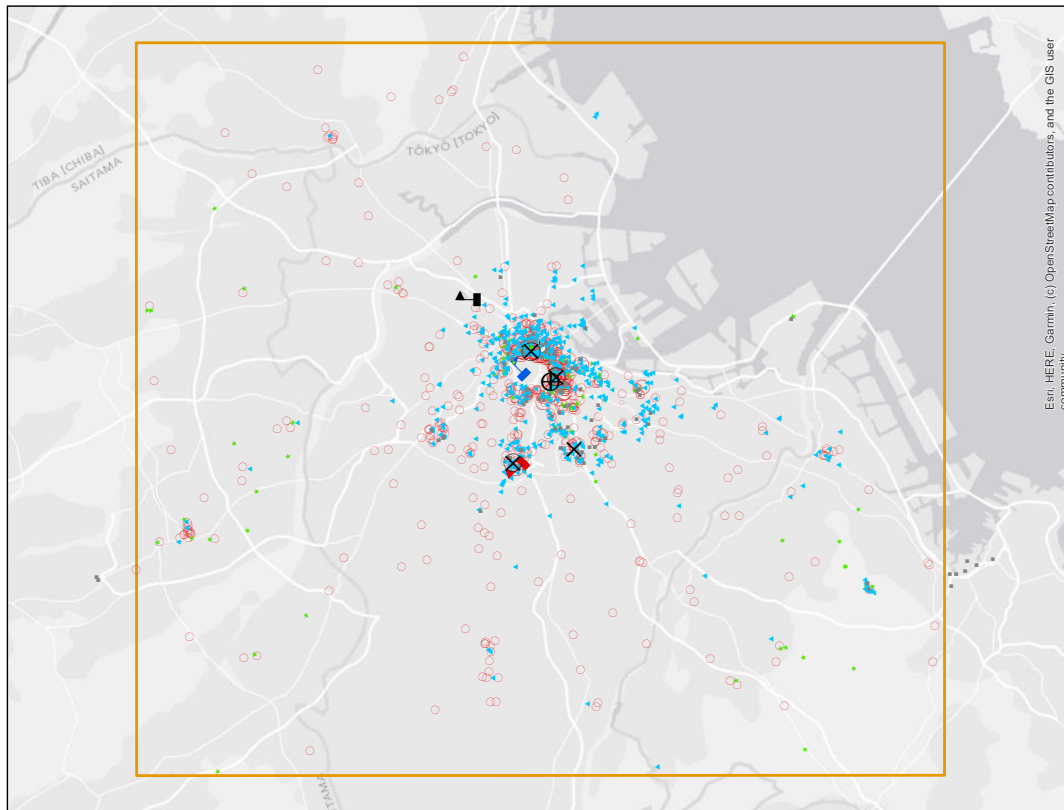
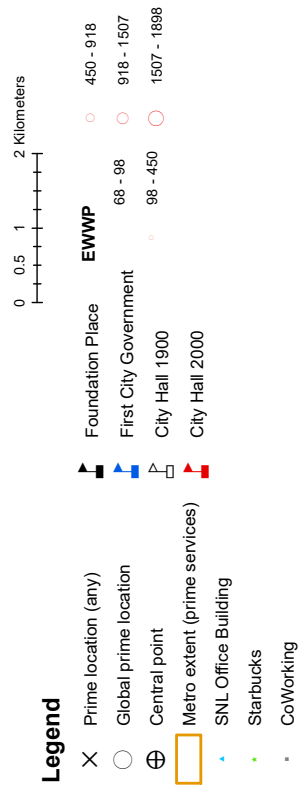
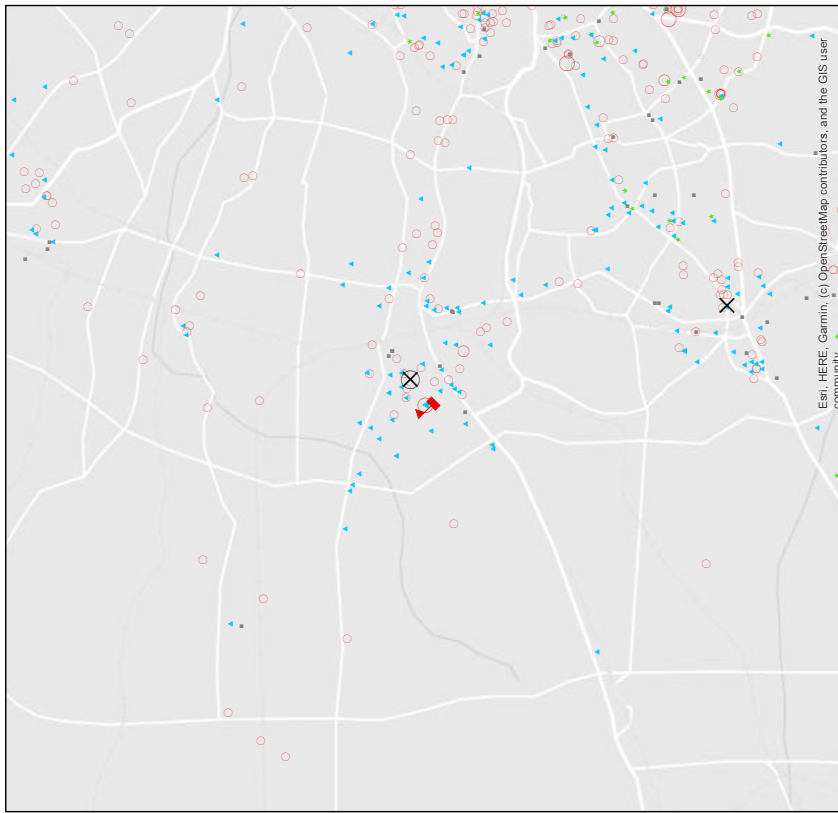




Table 213: Sources: Tokyo ( Japan )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	628	Cybriwsky (1997, p. 125)
First Political Institution <sup>b</sup>	1457	Cybriwsky (1997, p. 4)
City Hall <sup>c</sup>	1900	Seidensticker (1983, p. X-XI)
City Hall	2000	Tokyo Metropolitan Government (2014)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900 <sup>e</sup> , 1950, 2000	Cybriwsky (1997, p. 5)
<i>Population Data (1800-2000)</i>		
City Population	1747, 1810, 1850, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1990, 2004	White (2011, p. 14), Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>f</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>g</sup>	1885	Henshall (2013, 349)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	1855, 1923 <sup>h</sup>	Cybriwsky (1997, p. 84), Cybriwsky (1997, p. XIX)
Fire(s)	1872 <sup>i</sup>	Cybriwsky (1997, p. 80)
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1945 <sup>j</sup>	Cybriwsky (1997, p. XX), Seidensticker (2015)

<sup>a</sup>There was a settlement and a temple was granted to this location by the provincial government.

<sup>b</sup>"Development of Tokyo as an urban settlement is traced to 1457 when a warrior leader named Ota chose a site near a small village in Kanto plain name edo to build a castle."

<sup>c</sup>Apparently, the governor of Tokyo prefecture was in charge in executive terms until 1898, but remained in power until 1943 (Cybriwsky, 1997, p. 153). I therefore take the location of the prefectural office from a historical map of 1903 (Seidensticker, 1983, p. X-XI).

<sup>d</sup>Seat of the shogunate, who were a military government who ruled Japan. Nevertheless the emperor was still in Kyoto.

<sup>e</sup>Emperor changed the name of Edo to Tokyo in 1868 and moved his seat to Tokyo; thus it can be considered the de facto capital.

<sup>f</sup>Footnote from United Nations Population Division (2014): Major Metropolitan areas (M.M.A.) are defined by the Statistics Bureau of Japan. Census figures for 2005 and 2010 refer to the Kanto M.M.A.; figures from 1990 to 2000 are based on the Keihinyo M.M.A., and figures from 1960 to 1985 are based on the Keihin M.M.A. As a reference, the population of Tokyo-to was estimated at 12.1 million persons and of the Tokyo Ku-area at 8.1 million in 2000.

<sup>g</sup>This refers to the opening of the first stations of the city loop (the elevated Yamanote Line). The number of stations in the data by Gonzalez-Navarro and Turner (2016) is most likely wrong.

<sup>h</sup>This earthquake destroyed 63 % of Tokyo's homes and is also mentioned in Seidensticker (2015).

<sup>i</sup>This fire "destroyed approximately 3000 buildings, which had housed 50000 people (...)" (Sorensen, 2005, p. 61). This means it affected 10 % of the population, mainly in the Ginza neighbourhood. We code it as "major."

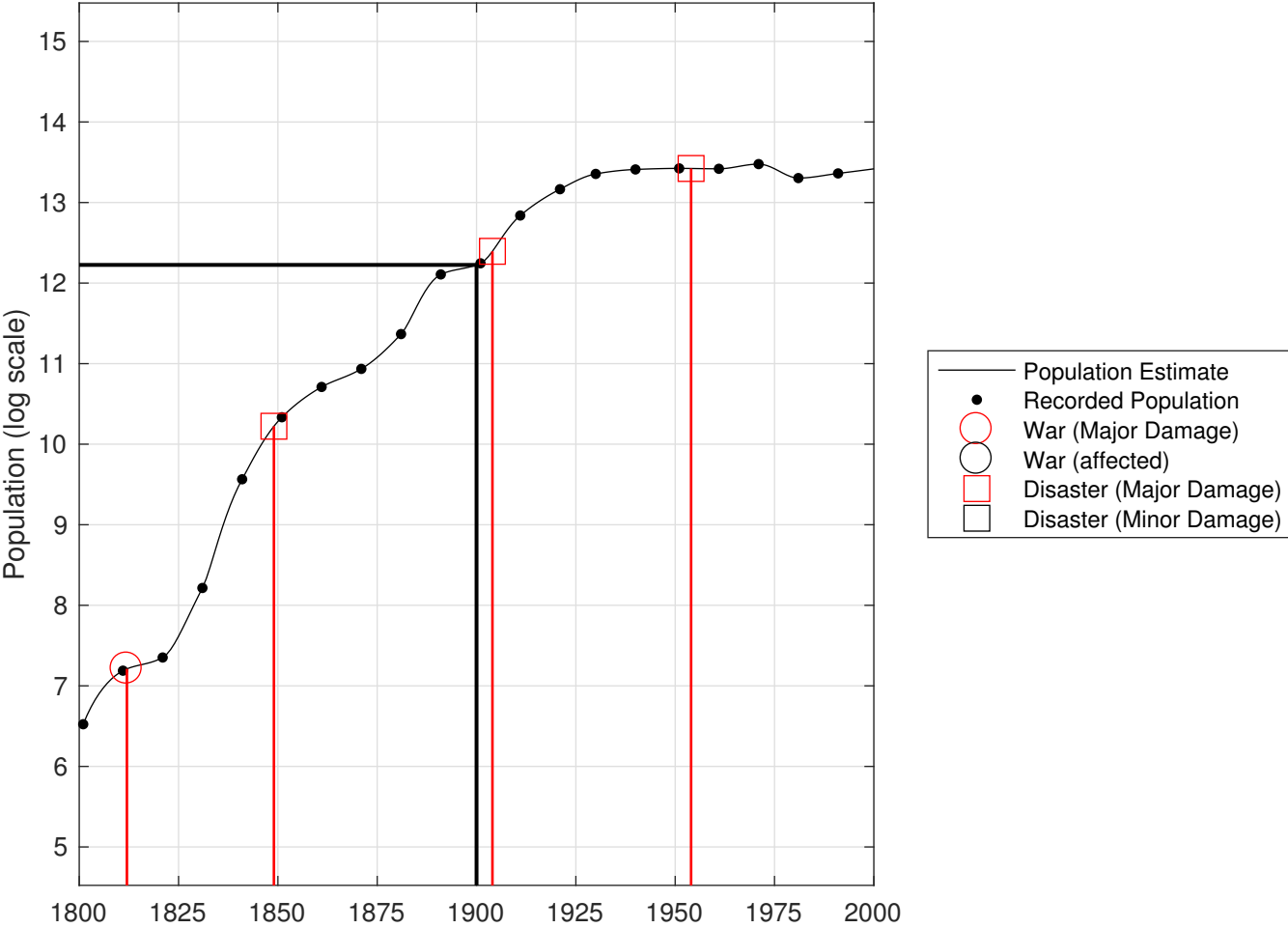
<sup>j</sup>World War II air raids.

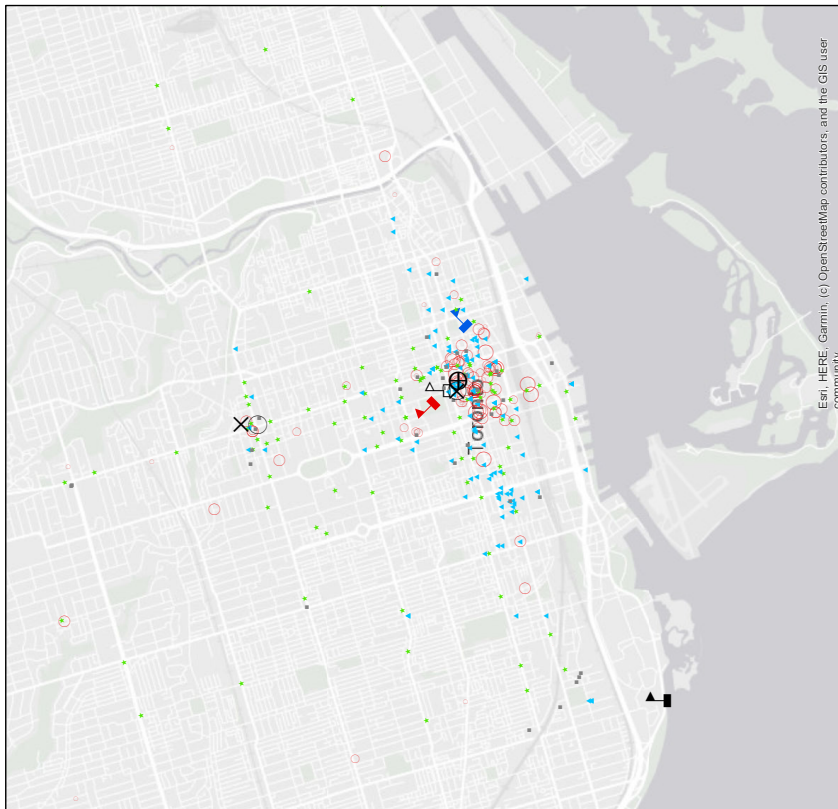
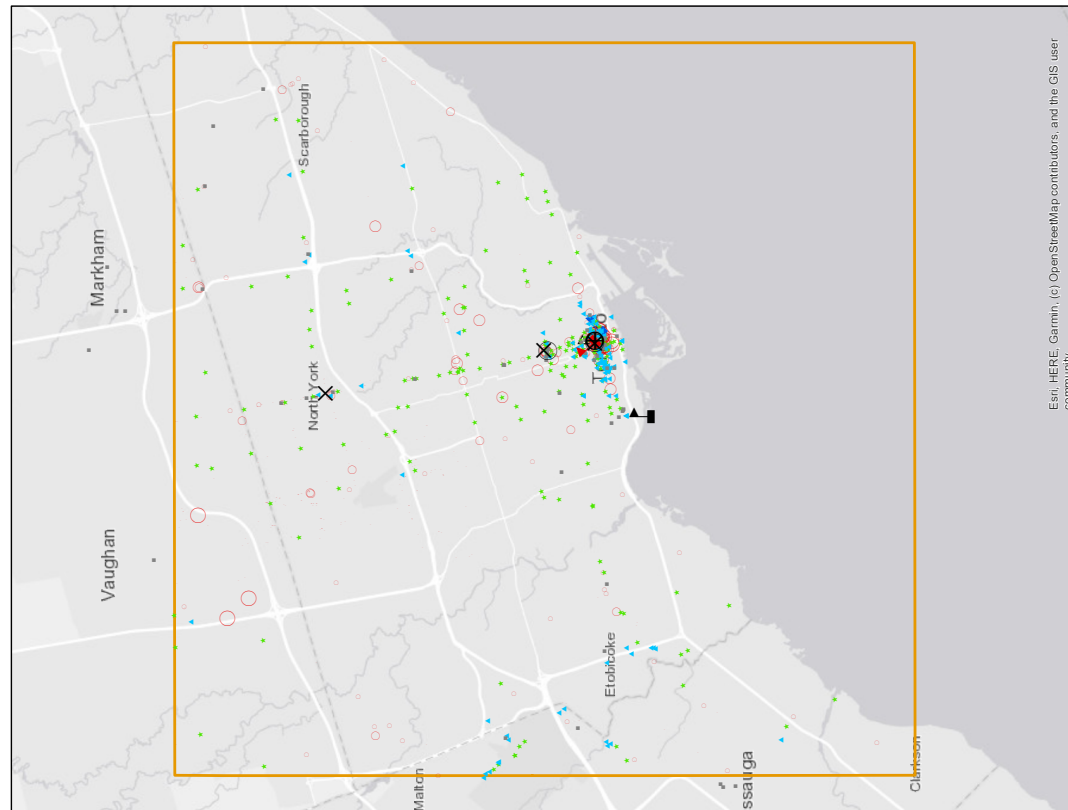
Table 214: Concentration Measures - Tokyo

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	8.74
Cumulative density of employment-weighted PP distances at 750 m	%	22.28
Average distance between all prime locations	in kilometres	3.45
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-1.14
Weighted average distance from EWPPs to 1900 CH	in kilometres	6.05
Average from all prime locations to 1900 CH	in kilometres	2.28
Average distance from global prime locations to 1900 CH	in kilometres	1.87

A.105 Toronto

Figure 114: Toronto





**Legend**

- X Prime location (any)
- Global prime location
- ⊕ Central point
- Metro extent (prime services)
- ▲ SNL Office Building
- Starbucks
- CoWorking
- ▲ Foundation Place
- ▲ First City Government
- ▲ City Hall 1900
- ▲ City Hall 2000
- EWWP 450 - 918
- EWWP 918 - 1507
- EWWP 68 - 98
- EWWP 98 - 450
- EWWP 1507 - 1898

Table 215: Sources: Toronto ( Canada )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1750	Perkins (1989, p. 282)
First Political Institution <sup>a</sup>	1845	Goddard (2014, p. 123)
City Hall	1900	Goddard (2014, p. 124)
City Hall	2000	Mangione (2014)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Goddard (2014, p. 122)
<i>Population Data (1800-2000)</i>		
City Population	1801, 1811, 1821, 1831, 1841, 1851, 1861, 1871, 1881, 1891, 1901, 1911, 1921, 1930, 1940, 1951, 1961, 1971, 1981, 1991, 2001	Careless (2002, Table V), Relph (2013, p. 124), Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>b</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1954	Scott (2013, 219)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1849 <sup>c</sup> , 1904 <sup>d</sup>	Encyclopaedia Britannica (2015x), Mangione (2014)
Hurricane(s)	1954	Mangione (2014), Environment Canada (2015)
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1812	City of Toronto (2015)

<sup>a</sup>First permanent city hall after the incorporation as Toronto in 1834.

<sup>b</sup>Footnote from United Nations Population Division (2014): Refers to the Census Metropolitan Area.

<sup>c</sup>This fire “destroyed some 15 acres (6 hectares) of the downtown area” (Encyclopaedia Britannica, 2015x).

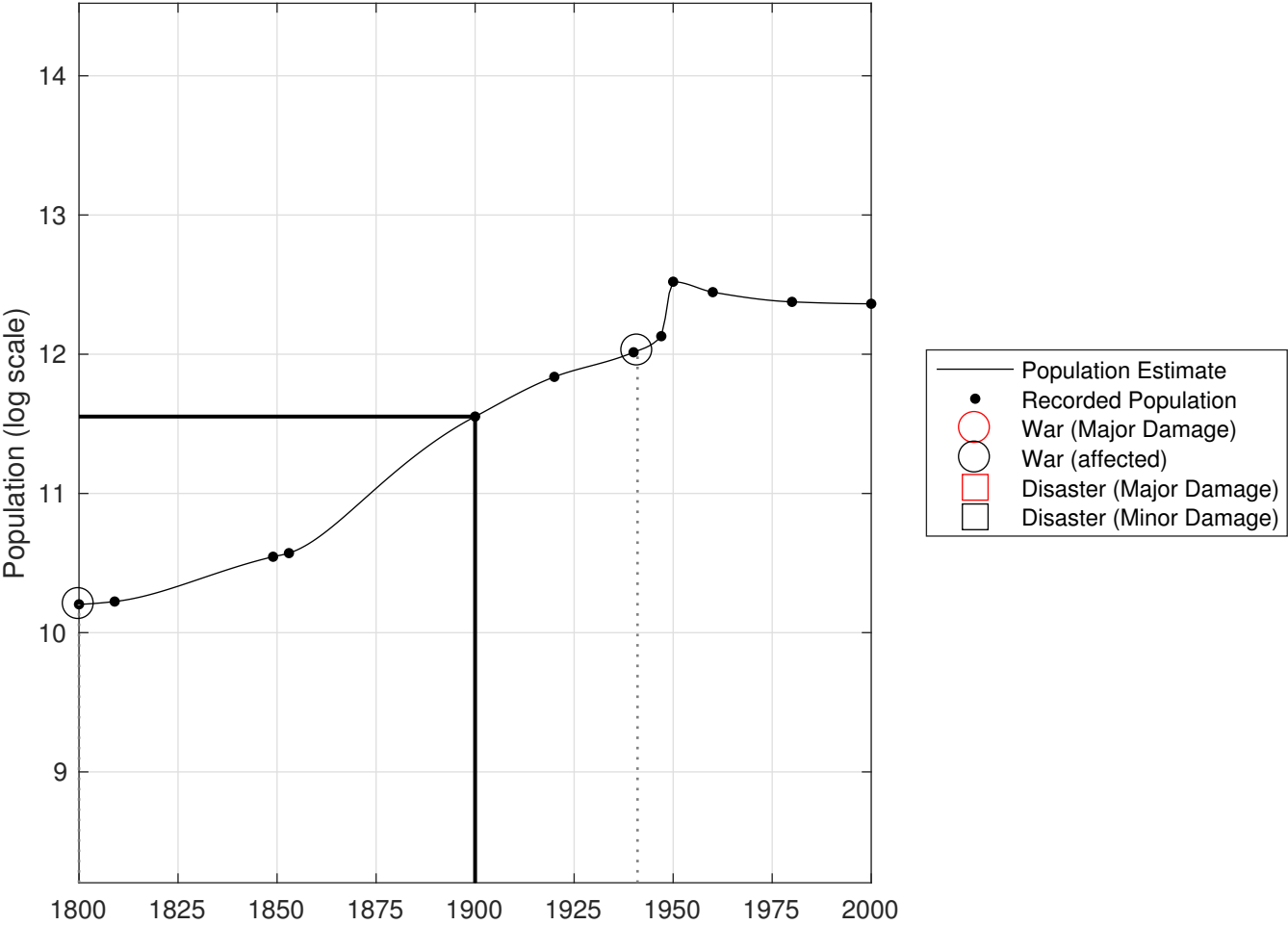
<sup>d</sup>This fire destroyed 104 buildings in downtown Toronto.

Table 216: Concentration Measures - Toronto

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	8.72
Cumulative density of employment-weighted PP distances at 750 m	%	6.48
Average distance between all prime locations	in kilometres	5.65
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.34
Weighted average distance from EWPPs to 1900 CH	in kilometres	5.63
Average from all prime locations to 1900 CH	in kilometres	0.90
Average distance from global prime locations to 1900 CH	in kilometres	0.35

A.106 Utrecht

Figure 115: Utrecht



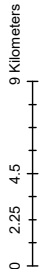
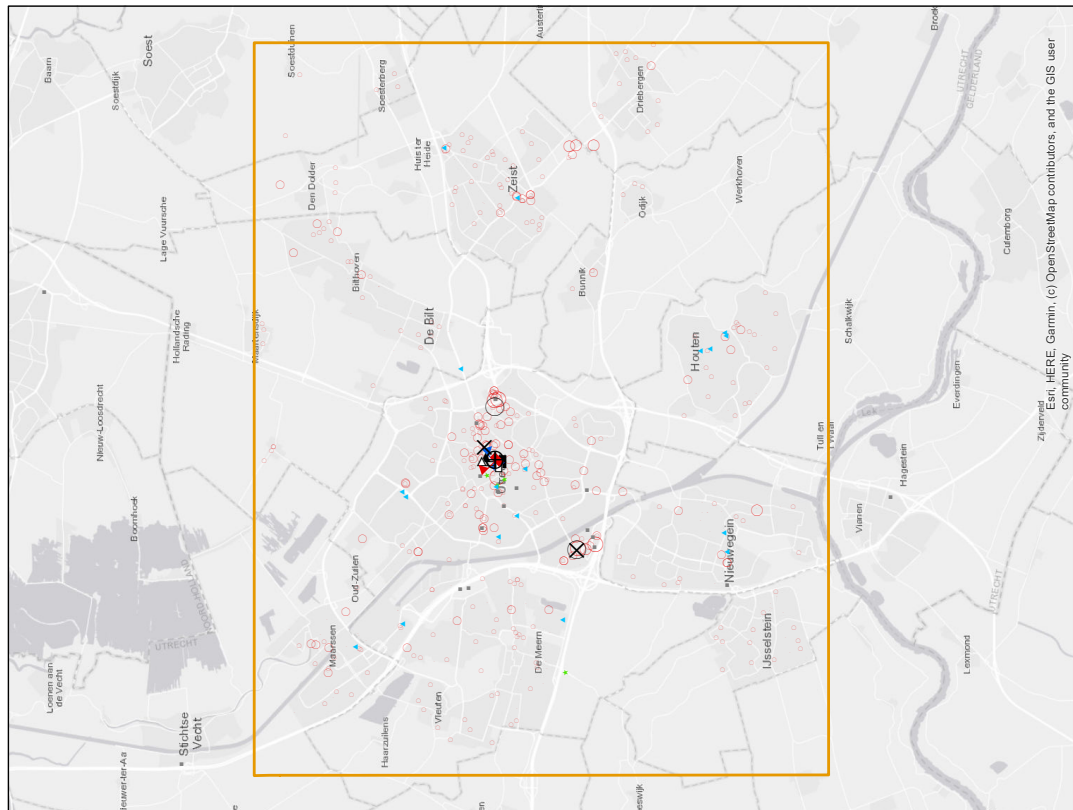
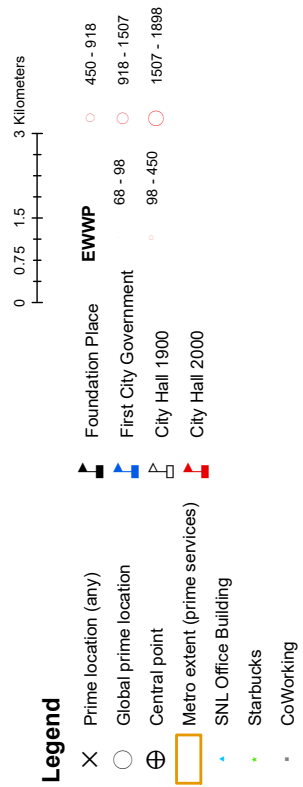
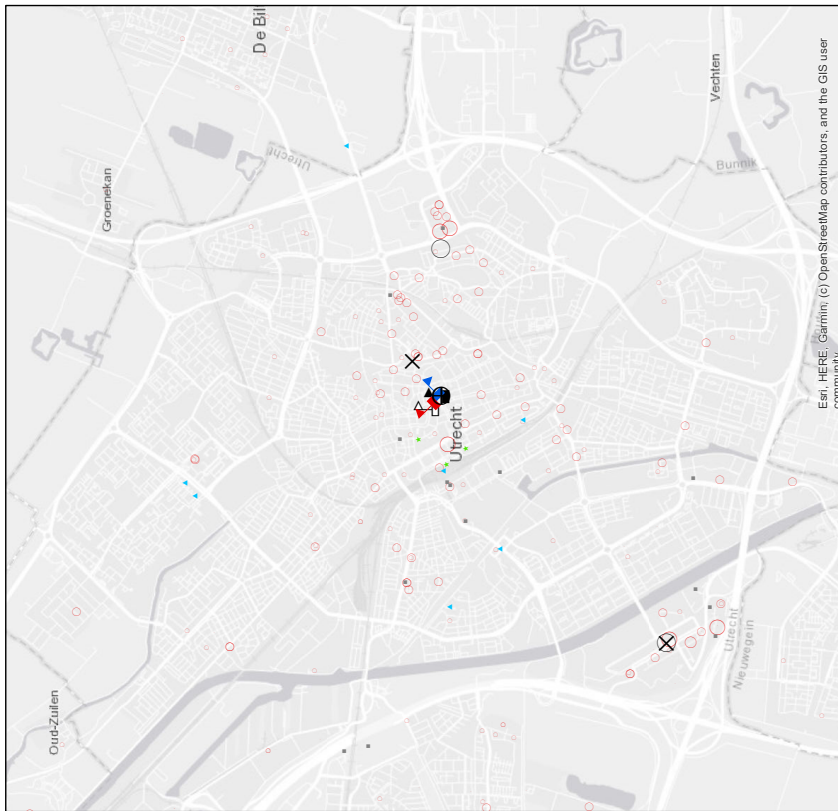




Table 217: Sources: Utrecht ( Netherlands )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	47	Domkerk Utrecht (2015), Iniatief Domplein (2013)
First Political Institution <sup>b</sup>	696	Domkerk Utrecht (2015), Iniatief Domplein (2013), Breval (1726, p. 79f)
City Hall	1900	Utrecht Info Center (2015)
City Hall	2000	Utrecht Info Center (2015)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>c</sup> , 1900, 1950, 2000	Hand (2013, p. 90)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1809, 1849, 1853, 1900, 1920, 1940, 1947, 1950, 1960, 1980, 2000	Chandler (1987, p. 180), Chandler (1987, p. 494), Chandler (1987, p. 509), International Urban Research (1959, p. 57), Het Utrechts Archief (2015)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>d</sup>	None	
Number of Stations	1910, 1940, 2010	NaN
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1800 <sup>e</sup> , 1941 <sup>f</sup>	Encyclopaedia Britannica (2015y), Amsterdam Tourist Information (2014)

<sup>a</sup>Romans set up outposts here and quickly began settling in this area. We take the location of the Roman fort also as the location of the first political center.

<sup>b</sup>With becoming a bishopric, this was the first time Utrecht became independent from the Frisian rulers (Breval, 1726, p. 79f). The articles describe the place of the church which was the seat of the Bishop of Utrecht.

<sup>c</sup>The bishopric of Utrecht was established in 695 and since then Utrecht would govern the province Utrecht, not only the city itself.

<sup>d</sup>There is no metro system matching the definition by Gonzalez-Navarro and Turner (2016).

<sup>e</sup>Occupation by Napoleon from 1795 to 1813, but no substantial damage mentioned. We can find no references to post-1800 floods or fires in German and English sources.

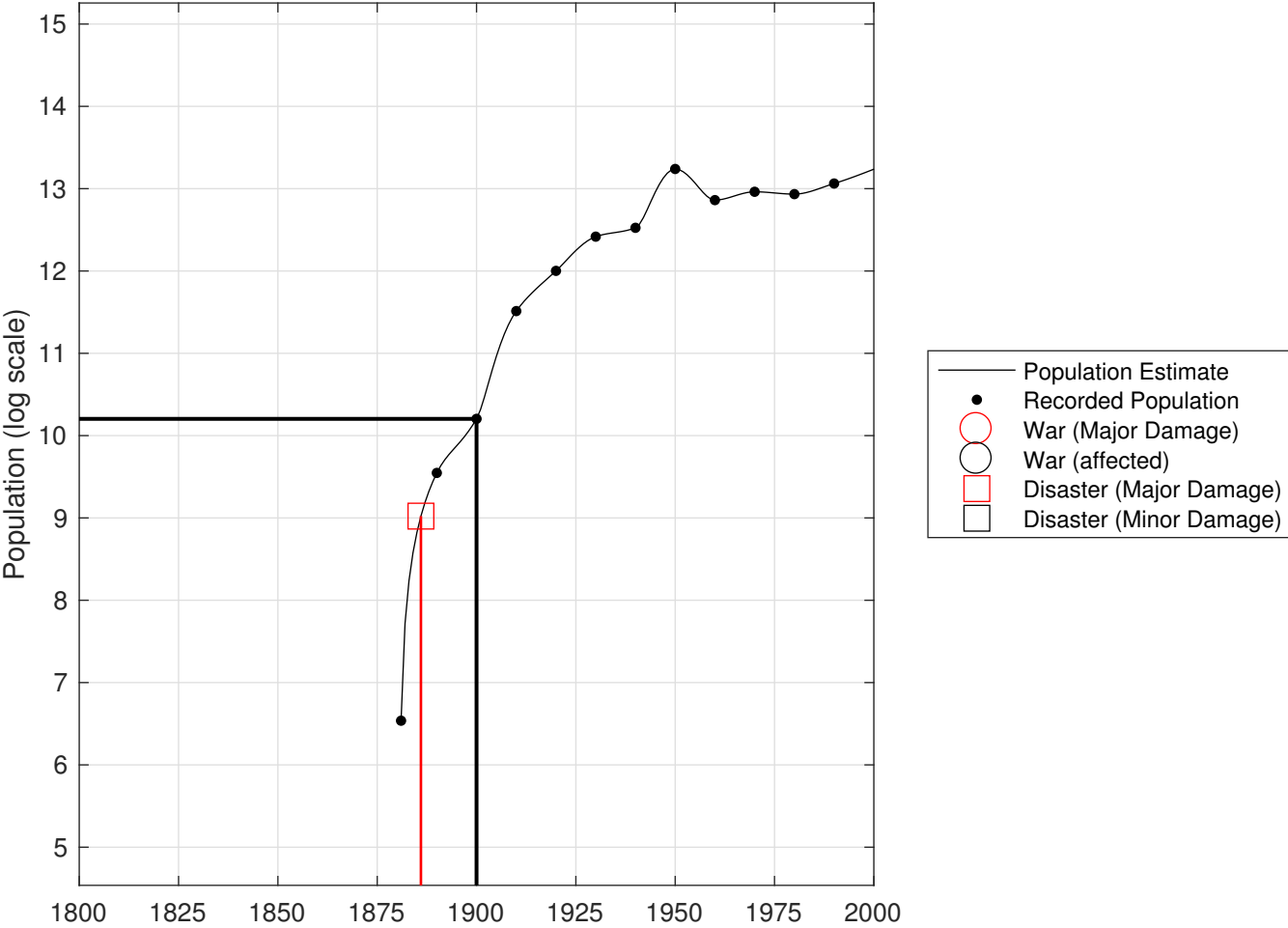
<sup>f</sup>World War II occupation, but no substantial damage to the city mentioned. Apparently, the Netherlands surrendered after the announcement of that Utrecht will be bombed (Zabecki, 2014, p. 1114). In World War I, the Netherlands remained neutral.

Table 218: Concentration Measures - Utrecht

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	7.68
Cumulative density of employment-weighted PP distances at 750 m	%	30.57
Average distance between all prime locations	in kilometres	2.07
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.10
Weighted average distance from EWPPs to 1900 CH	in kilometres	5.36
Average from all prime locations to 1900 CH	in kilometres	1.81
Average distance from global prime locations to 1900 CH	in kilometres	2.54

A.107 Vancouver

Figure 116: Vancouver



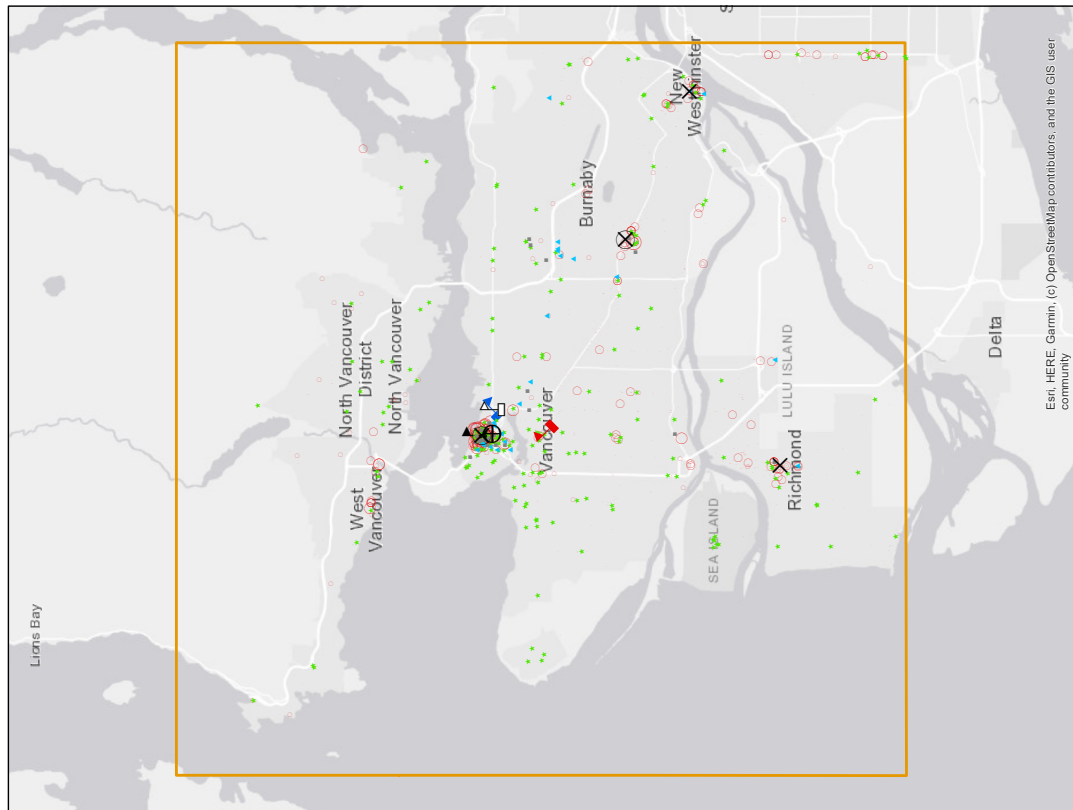
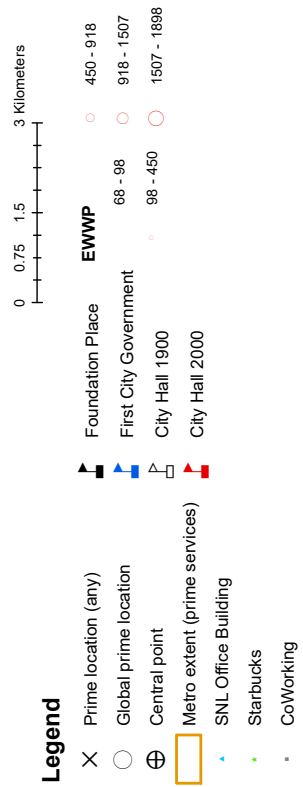
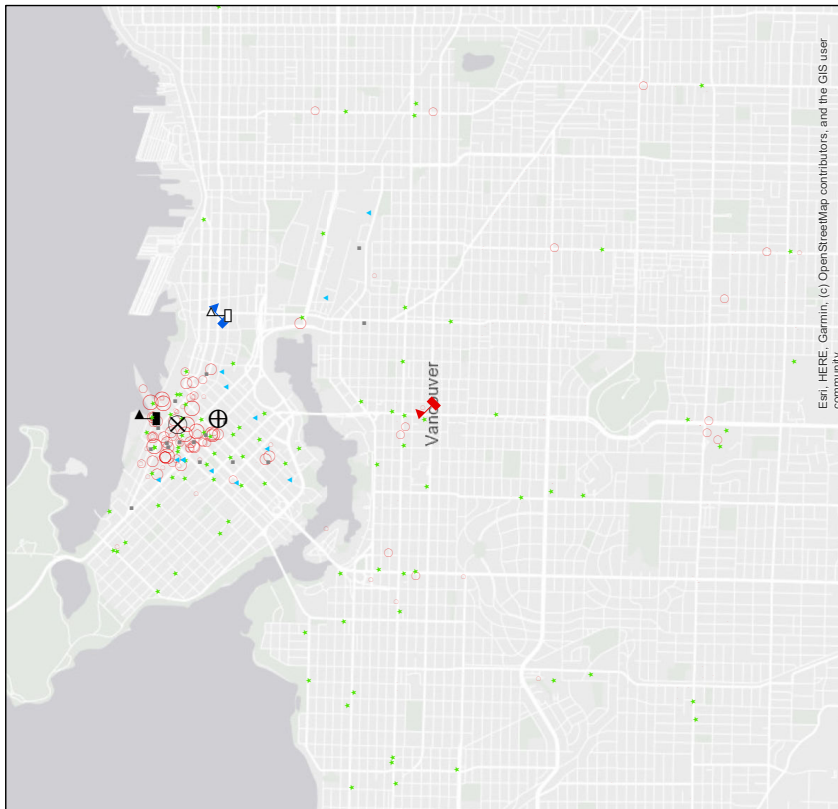


Table 219: Sources: Vancouver ( Canada )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1862	Kalman et al. (2012, p. 160), Vancouver Historical Society (2015)
First Political Institution <sup>b</sup>	1886	Canada (2015), Morgan (1983, p. 99), Parks Canada (2014)
City Hall	1900	Morgan (1983, p. 99), Parks Canada (2014)
City Hall	2000	Davis (2015a)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>c</sup> , 1900, 1950, 2000	McDonald and Barman (1986, p. 97)
<i>Population Data (1800-2000)</i>		
City Population	1881, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2001	McDonald (2011, p. 13), Mitchell and Palgrave Macmillan (2014), British Columbia Statistics (2015)
Metro Population <sup>d</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1986	Newman and Kenworthy (1999, 174)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	Al-Kodmany and Ali (2013, p. 369)
Fire(s)	1886 <sup>e</sup>	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>This is where the cabin of the first settlers was. In the same year (but later) another village was settled in what now is South Vancouver.

<sup>b</sup>No permanent structure was chosen after the fire in 1886. First the council met in a tent and then in the Oppenheimer building, because Oppenheimer was Mayor (Canada, 2015). Therefore we chose the following as the first city hall, built in 1898.

<sup>c</sup>Incorporated in 1886.

<sup>d</sup>Footnote from United Nations Population Division (2014): Refers to the Census Metropolitan Area.

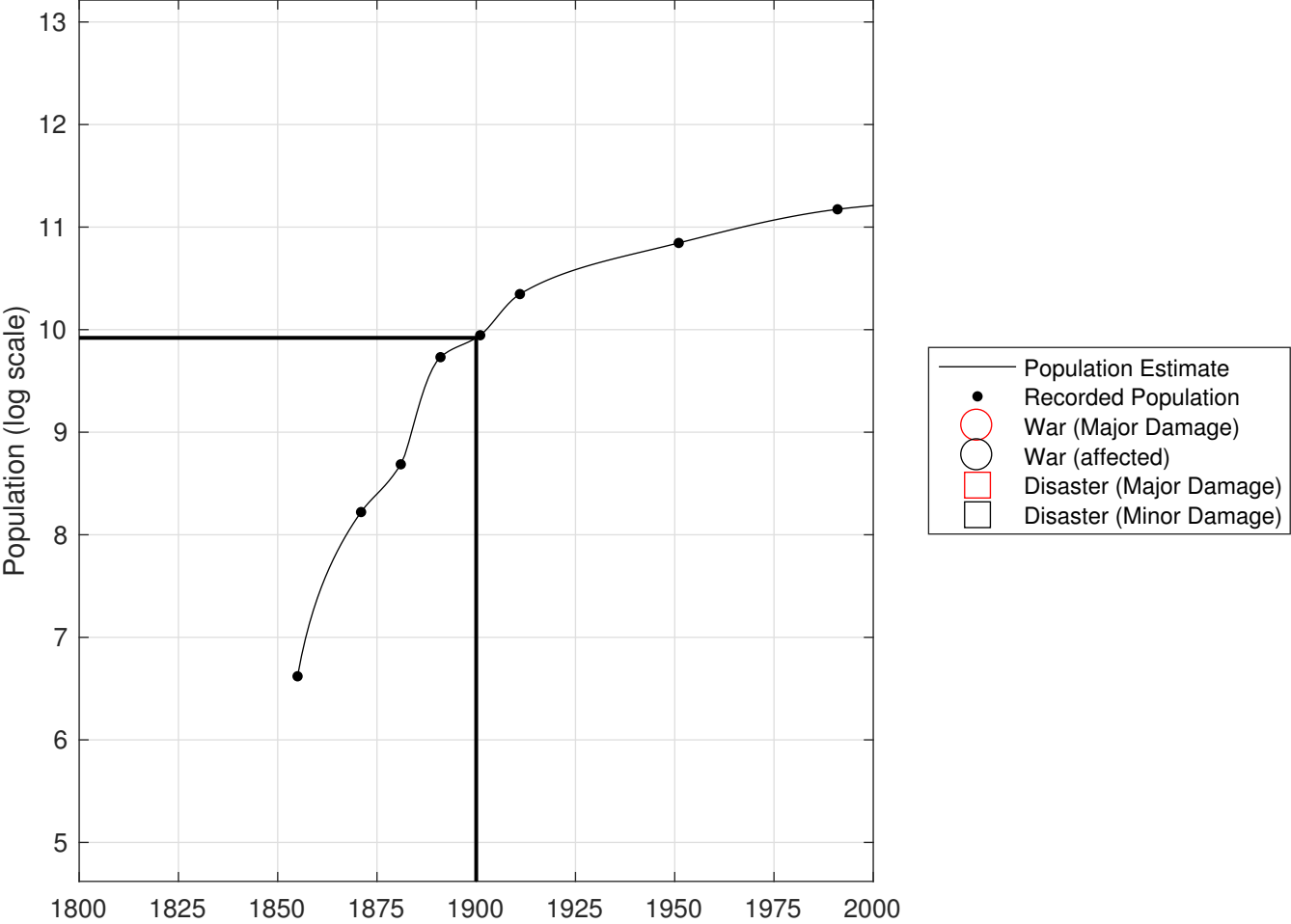
<sup>e</sup>This fire destroyed the city (Davis, 2015b).

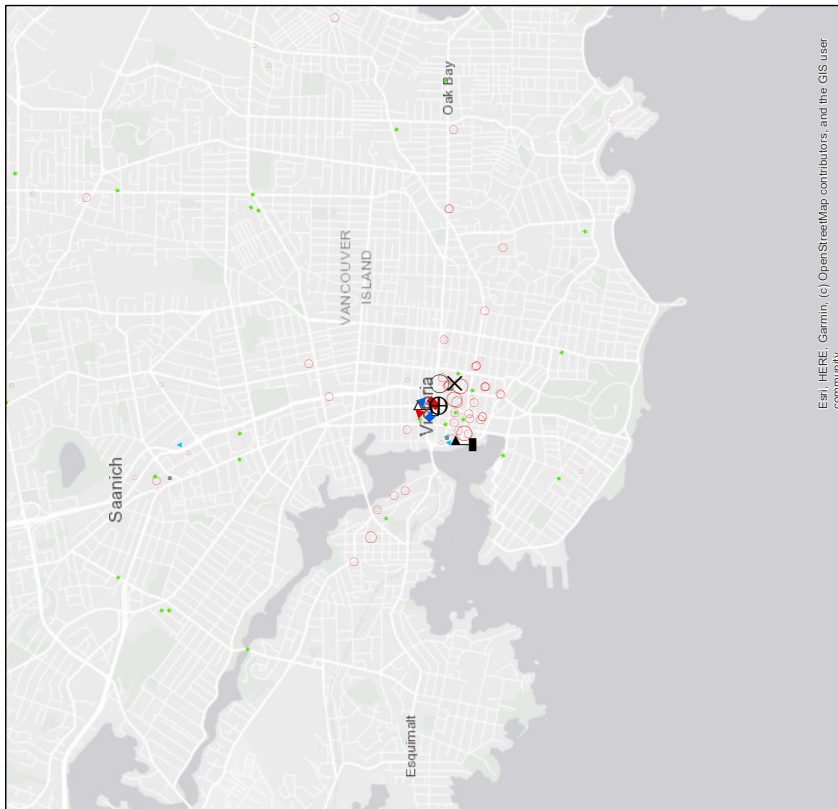
Table 220: Concentration Measures - Vancouver

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	9.94
Cumulative density of employment-weighted PP distances at 750 m	%	13.17
Average distance between all prime locations	in kilometres	9.56
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.38
Weighted average distance from EWPPs to 1900 CH	in kilometres	7.17
Average from all prime locations to 1900 CH	in kilometres	4.51
Average distance from global prime locations to 1900 CH	in kilometres	2.30

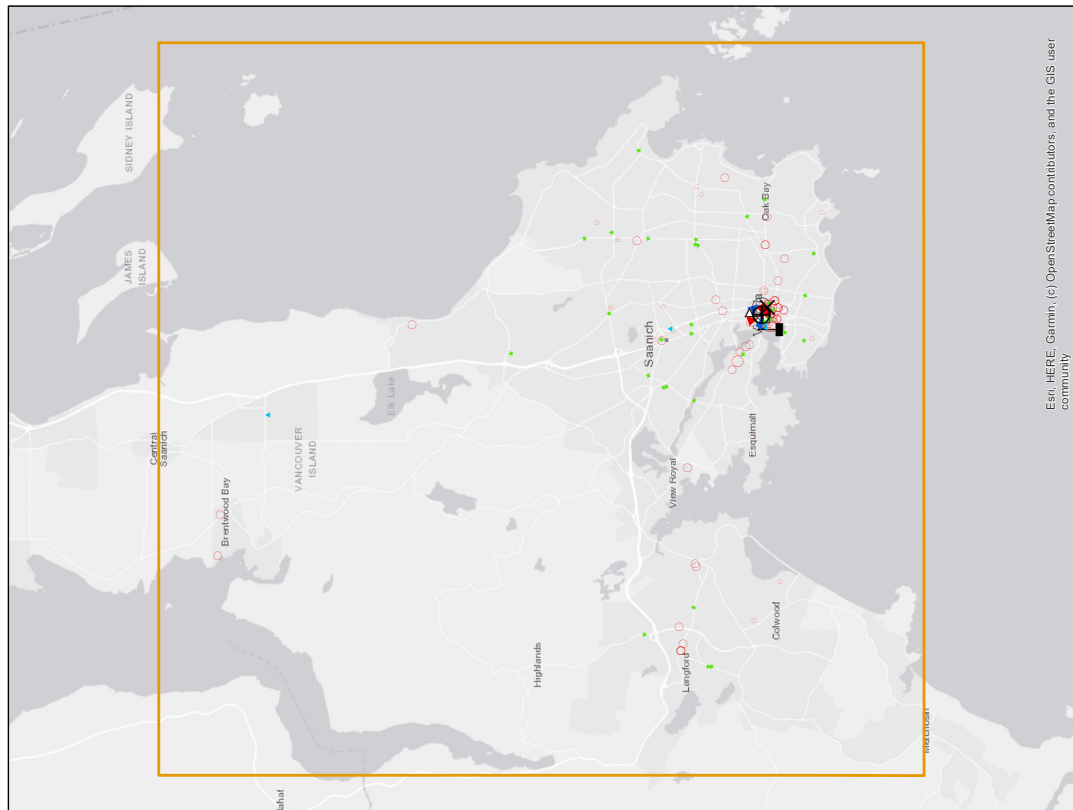
A.108 Victoria

Figure 117: Victoria





- Legend**
- X Prime location (any)
  - Global prime location
  - ⊕ Central point
  - Metro extent (prime services)
  - ▲ SNL Office Building
  - ▲ Starbucks
  - ▲ CoWorking
  - ▲ Foundation Place
  - ▲ First City Government
  - ▲ City Hall 1900
  - ▲ City Hall 2000
  - EWWP 450 - 918
  - 68 - 98
  - 98 - 450
  - 918 - 1507
  - 1507 - 1898



- 0 2.25 4.5 9 Kilometers



Table 221: Sources: Victoria ( Canada )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement	1843	Parks Canada (2015c)
First Political Institution <sup>a</sup>	1890	History (2015)
City Hall <sup>b</sup>	1900	History (2015)
City Hall	2000	History (2015)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	City of Victoria (2015)
<i>Population Data (1800-2000)</i>		
City Population	1855, 1871, 1881, 1891, 1901, 1911, 1951, 1991, 2001	Belshaw (2009, p. 195), Belshaw (2009, p. 196), City of Victoria (2009, p. 1), Belshaw (2009, p. 64), McLaren et al. (2002, p. 69)
Metro Population <sup>c</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>d</sup>	None	
Number of Stations	1910, 1940, 2010	NaN
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>Construction started as early as 1878 and this became the first permanent seat. There were several temporal seats, of which the locations are detailed in Mindenhall (2012, p. 15).

<sup>b</sup>No change ever since the first city hall was built.

<sup>c</sup>Footnote from United Nations Population Division (2014): Refers to the Census Metropolitan Area.

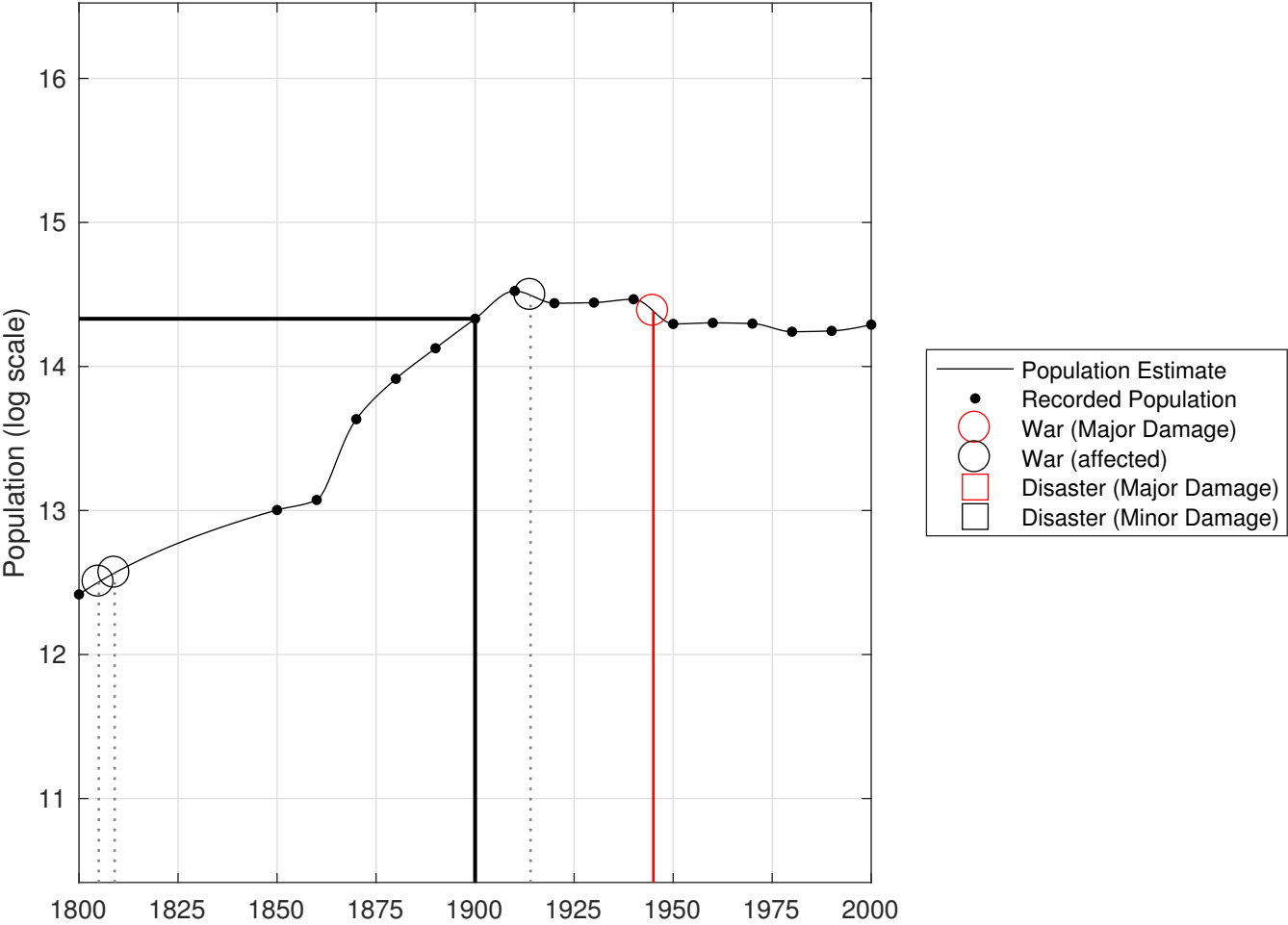
<sup>d</sup>There is no metro system matching the definition by Gonzalez-Navarro and Turner (2016).

Table 222: Concentration Measures - Victoria

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	4.91
Cumulative density of employment-weighted PP distances at 750 m	%	5.70
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.12
Weighted average distance from EWPPs to 1900 CH	in kilometres	3.09
Average from all prime locations to 1900 CH	in kilometres	0.31
Average distance from global prime locations to 1900 CH	in kilometres	0.42

A.109 Vienna

Figure 118: Vienna



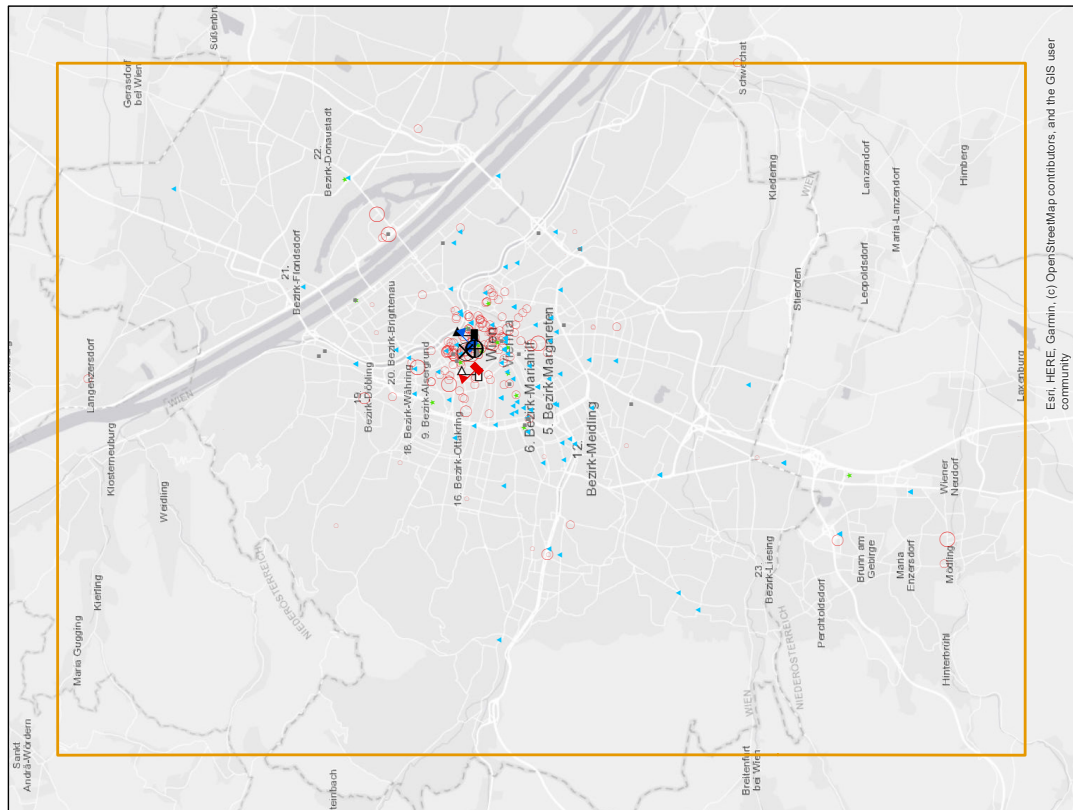
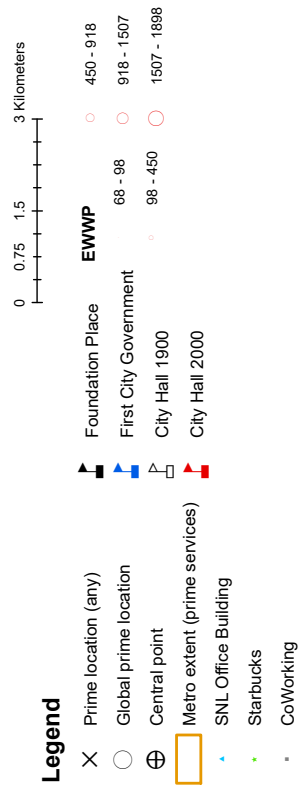
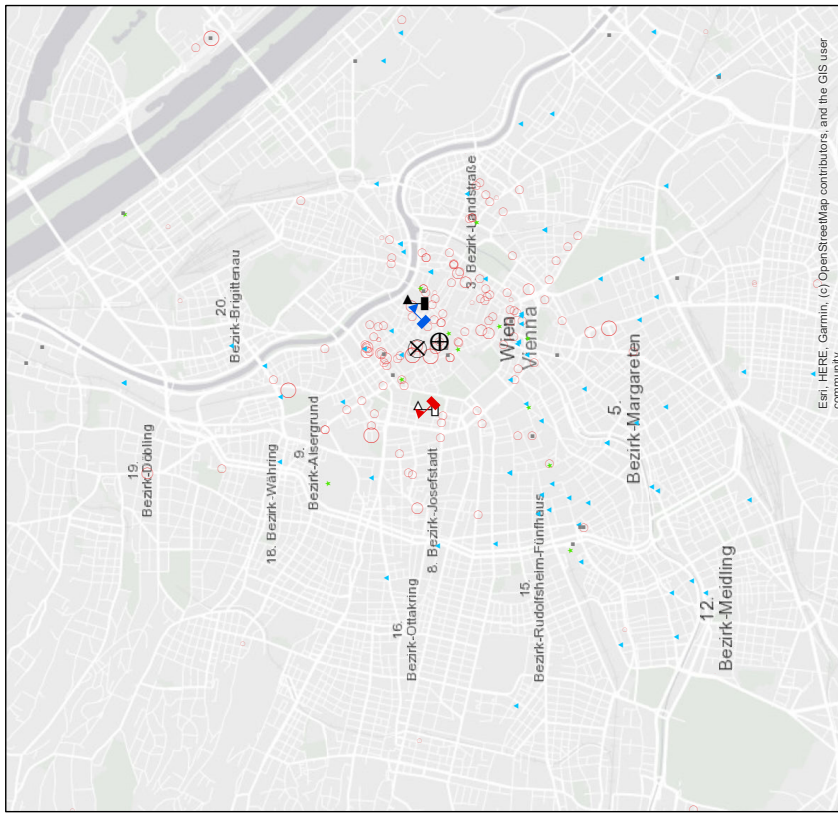


Table 223: Sources: Vienna ( Austria )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	50	Weiss (1882, p. 28)
First Political Institution <sup>b</sup>	1316	Weiss (1882, p. 300)
City Hall <sup>c</sup>	1900	Stadt Wien (2014a)
City Hall	2000	Stadt Wien (2014a)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900, 1950, 2000	Weiss (1882, p. 75)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>e</sup>	1898	Helml (2011, 32)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016), Helml (2011, p. 32)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1805 <sup>f</sup> , 1809 <sup>g</sup> , 1914 <sup>h</sup> , 1945 <sup>i</sup>	Stadt Wien (2014b), Wien Kulturgut (2014), Stadt Wien (2014c)

<sup>a</sup>There were some celtic settlements (Winkler and Hengl, 2007, p. 20,21), but it is not entirely clear if those were a proper city or just scattered settlements. Roman settlements came a bit later.

<sup>b</sup>This is the first city hall ("Rathaus"). Governing bodies such as the church had existed already in 850. However, after that Vienna was not really settled for a few centuries.

<sup>c</sup>Built in 1872-1883.

<sup>d</sup>Babenbergers become independent in 1155 and thus Vienna becomes a capital, which has apparently not changed ever since

<sup>e</sup>This is the Stadtbahn, which is - to the best of our understanding - an elevated rapid transit. Gonzalez-Navarro and Turner (2016) seem to have overseen it as it qualifies in their definition. We therefore add the number of stations (33) as in the sketch of Oelwein (Helml, 2011, p. 32) for 1910. The Stadtbahn was electrified in 1925 and later converted to the U-Bahn. For 1940, we take the same number of stations as for 1910 and for 2010, we follow Gonzalez-Navarro and Turner (2016).

<sup>f</sup>Napoleonic War.

<sup>g</sup>Second occupation during the Napoleonic wars.

<sup>h</sup>In World War I, Vienna served as the center of Austria-Hungary. While no direct destruction to the building stock occurred, the city was also affected by famine.

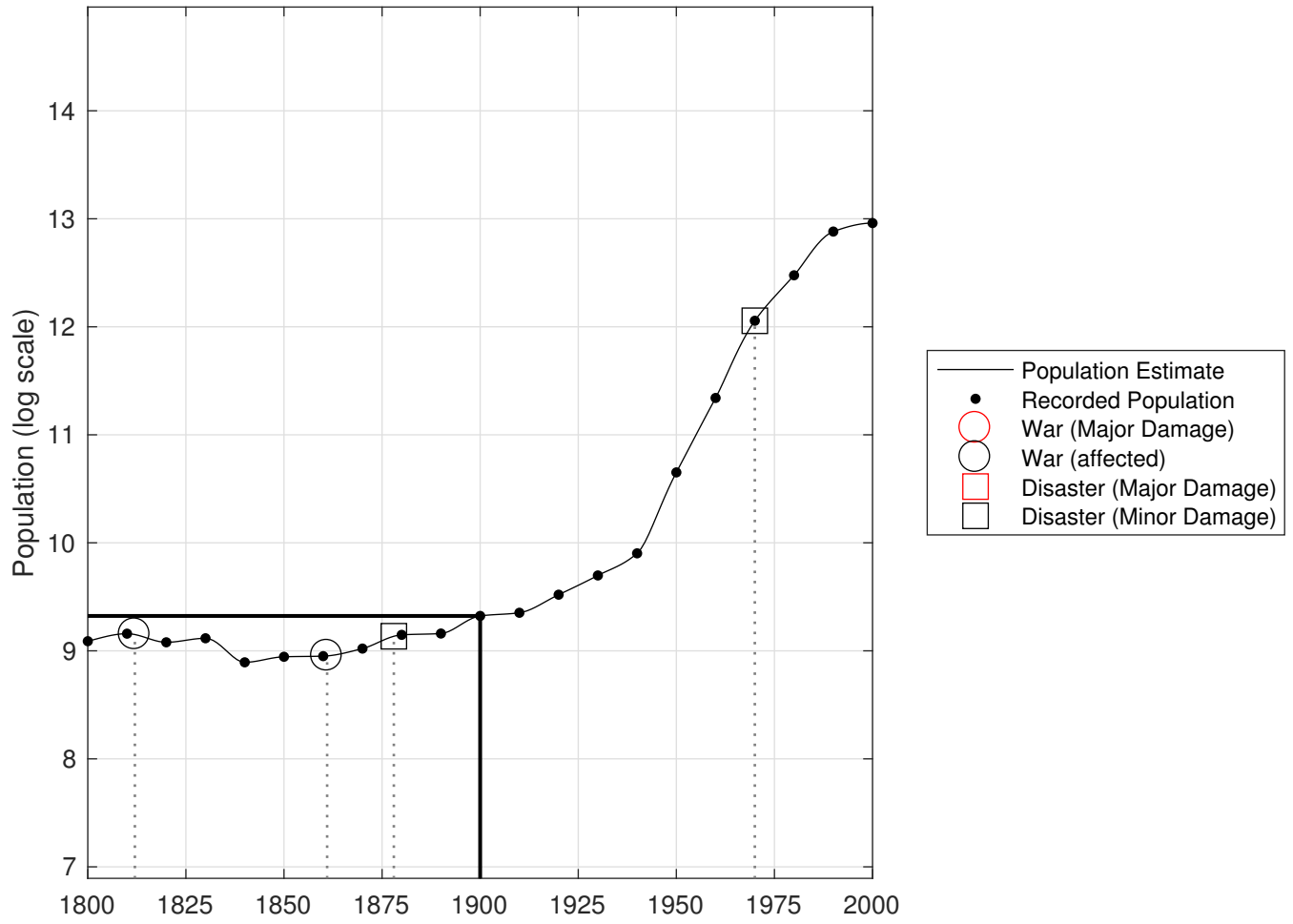
<sup>i</sup>First raids in 1944, but more destructive ones in 1945. Heavy damages occurred also according to Ehrlich (2015b).

Table 224: Concentration Measures - Vienna

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	3.18
Cumulative density of employment-weighted PP distances at 750 m	%	5.53
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-1.04
Weighted average distance from EWPPs to 1900 CH	in kilometres	2.22
Average from all prime locations to 1900 CH	in kilometres	0.66
Average distance from global prime locations to 1900 CH	in kilometres	0.66

# A.110 Virginia Beach

Figure 119: Virginia Beach



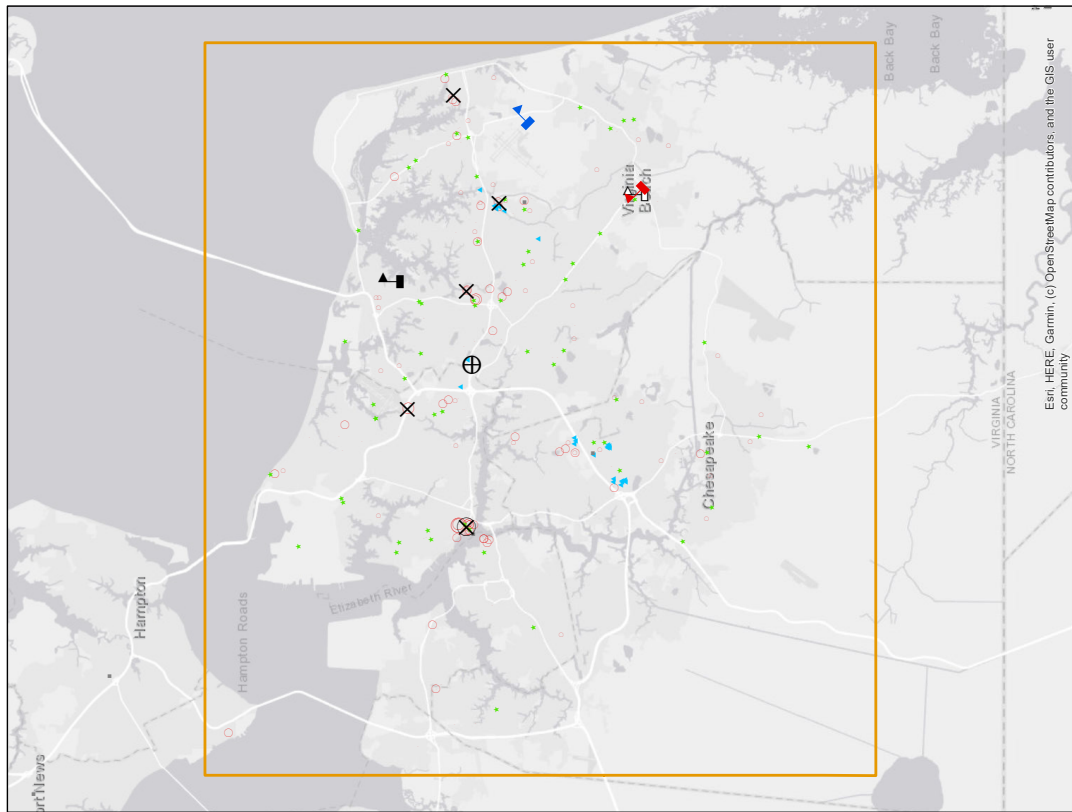
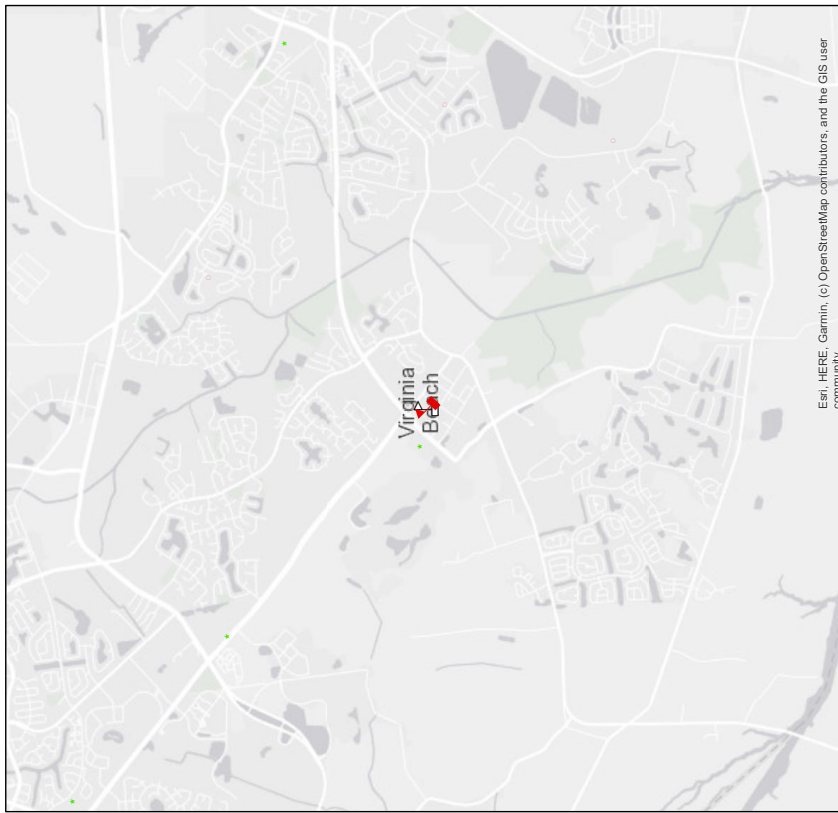




Table 225: Sources: Virginia Beach ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1621	Yarsinske (2002, p. 27), National Park Service (2008, p. 5)
First Political Institution <sup>b</sup>	1689	Woodruff and Moore (2000), Salmon and of Historic Resources (1994, p. 88), Norfolk Public Library (1950)
City Hall <sup>c</sup>	1900	Society (2001)
City Hall	2000	Society (2001)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900, 1950, 2000	Government of Virginia (2007)
<i>Population Data (1800-2000)</i>		
City Population	1790, 1800, 1810, 1820, 1830, 1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Forstall (1996, p. 172f), United States Census Bureau (2015)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	1970	National Oceanic and Atmospheric Administration (2015b)
Flooding(s)	1878 <sup>e</sup>	National Oceanic and Atmospheric Administration (2015b)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861	City of Virginia Beach (2006, p. 66)
International War(s)	1812	City of Virginia Beach (2006, p. 67)

<sup>a</sup>In 1607, explorers reached Cape Henry but they established a settlement in Jamestown. The first actual settlement in today's city limits was established in 1621 and we take the first settlers house as the location.

<sup>b</sup>First courthouse of Princess Anne County.

<sup>c</sup>The courthouse was in this location since 1821, later the municipal center would be erected.

<sup>d</sup>Today's Virginia Beach was formed of Virginia Beach and St. Anne County in 1963. St. Anne County is much older, which is why we take it as the origin of Virginia Beach.

<sup>e</sup>Hurricanes are not severe enough to be coded as having caused extensive damage.

Table 226: Concentration Measures - Virginia Beach

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	13.48
Cumulative density of employment-weighted PP distances at 750 m	%	45.72
Average distance between all prime locations	in kilometres	8.77
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-3.15
Weighted average distance from EWPPs to 1900 CH	in kilometres	16.67
Average from all prime locations to 1900 CH	in kilometres	18.60
Average distance from global prime locations to 1900 CH	in kilometres	22.60

A.111 Washington

Figure 120: Washington



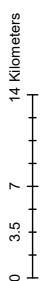
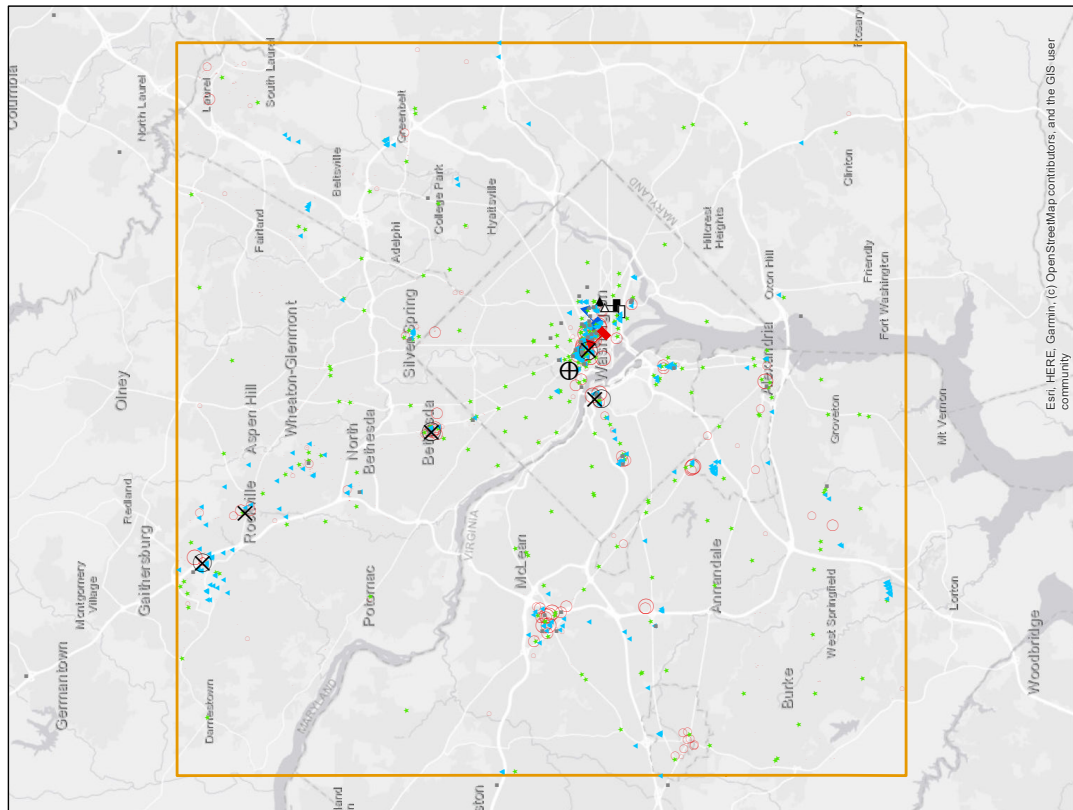
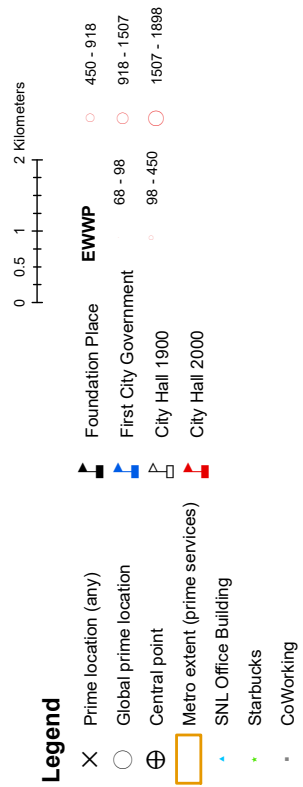
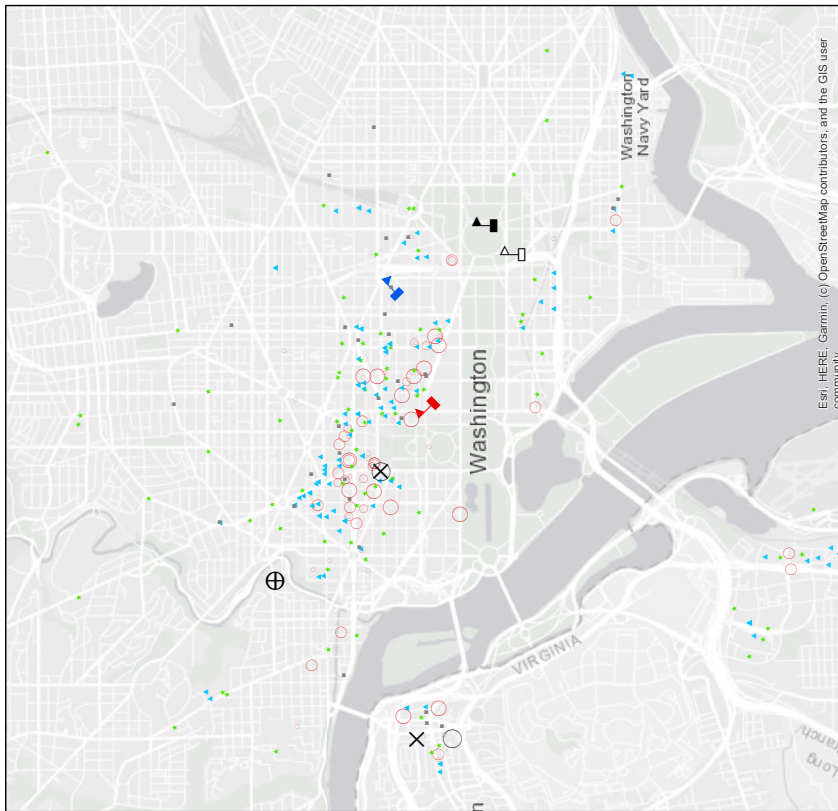


Table 227: Sources: Washington ( US )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1790	Bowling (1991, p. 13)
First Political Institution	1821	Green (1962, p. 90, p. 106), Lessoff (1994, p. 141)
City Hall <sup>b</sup>	1900	Lessoff (1994, p. 142)
City Hall <sup>c</sup>	2000	Lessoff (1994, p. 142)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>d</sup> , 1900, 1950, 2000	Lessoff (see e.g. 1994)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1810, 1820, 1830, 1840, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	U.S. Census Bureau (2012b, p. 2), Gibson and Jung (2005b, p. 42), Gibson (1998)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1976	Grass (1992, 139)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1814 <sup>e</sup>	Pitch (2000)

<sup>a</sup>DC was "founded" by a decision of congress in 1790. Before that Georgetown had already existed. Foundation place and city hall are marked as the capitol.

<sup>b</sup>Refurbished lumber warehouse, moved in in 1887, moved out in 1902.

<sup>c</sup>Built in 1903.

<sup>d</sup>Washington was founded "as the capital"

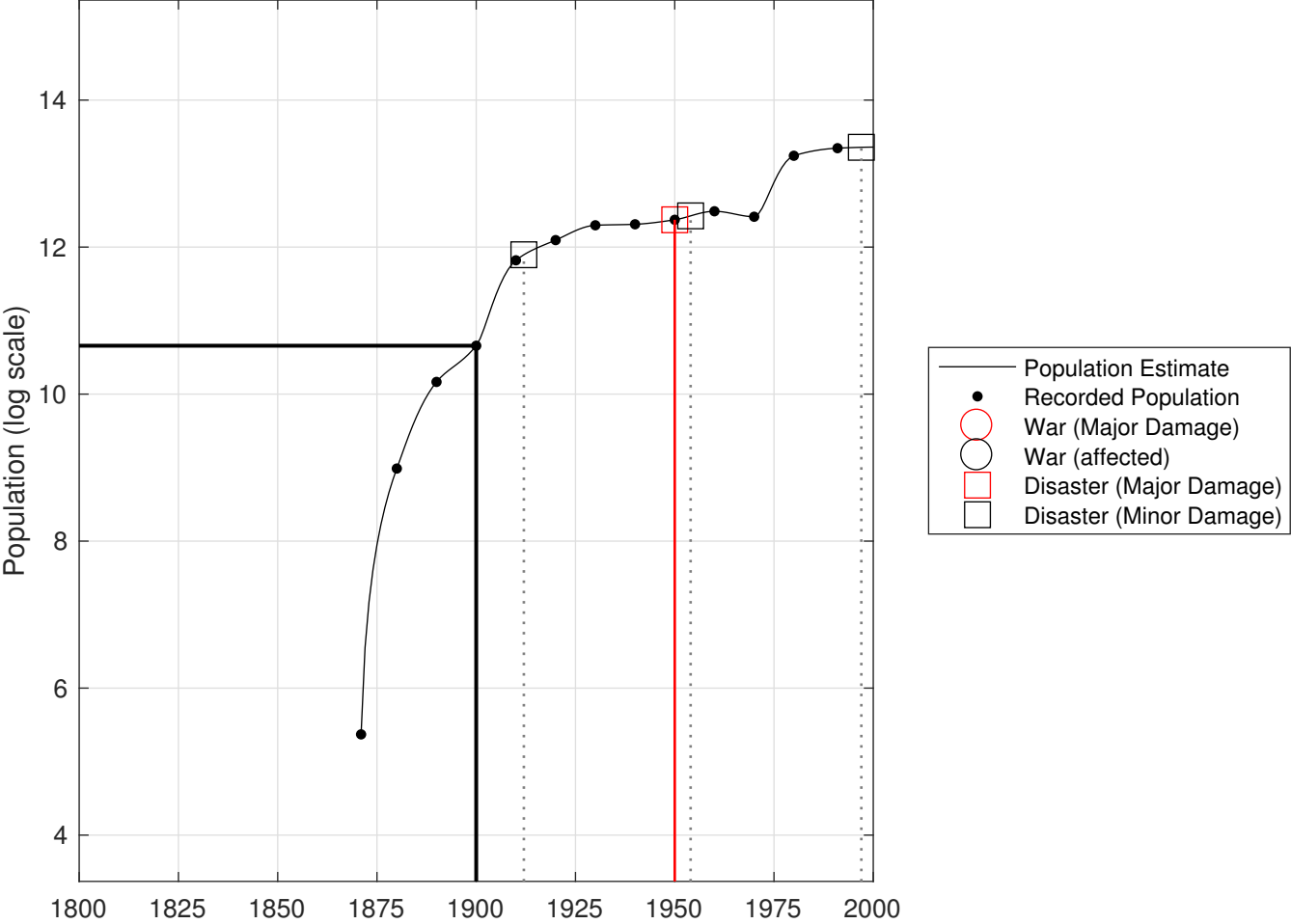
<sup>e</sup>The British mainly set federal buildings in fire such that we code this event as major but not "heavy" destruction.

Table 228: Concentration Measures - Washington

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	15.80
Cumulative density of employment-weighted PP distances at 750 m	%	32.28
Average distance between all prime locations	in kilometres	12.15
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.45
Weighted average distance from EWPPs to 1900 CH	in kilometres	13.15
Average from all prime locations to 1900 CH	in kilometres	9.25
Average distance from global prime locations to 1900 CH	in kilometres	7.85

A.112 Winnipeg

Figure 121: Winnipeg



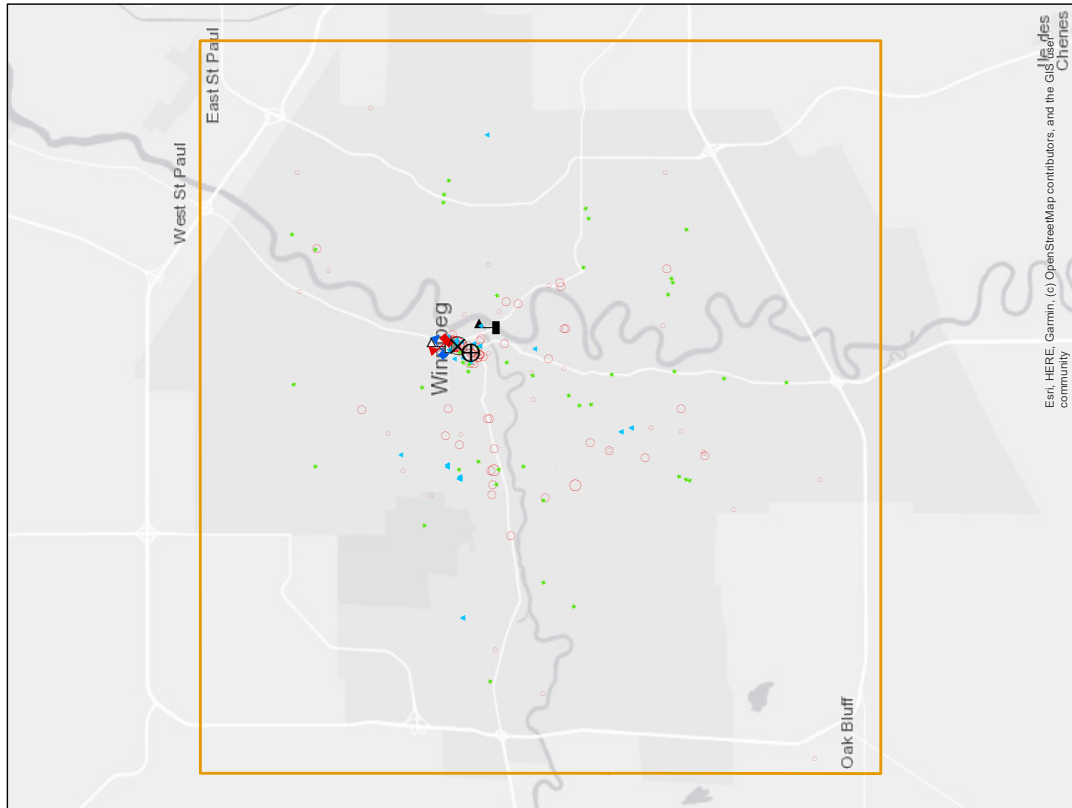
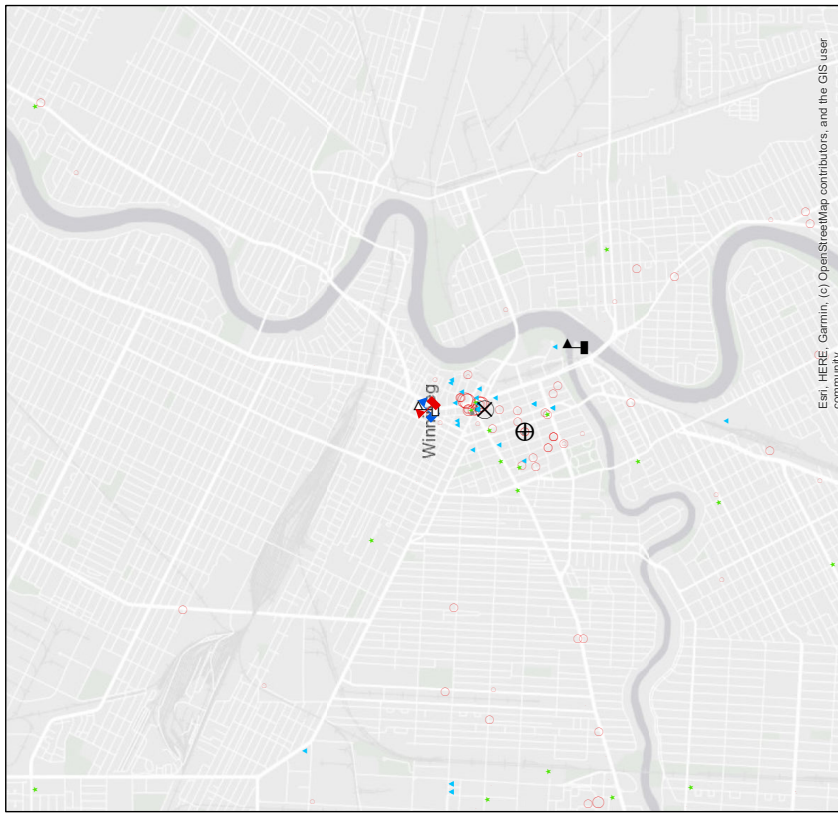




Table 229: Sources: Winnipeg ( Canada )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	1738	Jaenen (1992), Guinn (1980, p. 33)
First Political Institution	1877	Merrett (2001, p. 14), City of Winnipeg (2015)
City Hall	1900	City of Winnipeg (2015)
City Hall	2000	City of Winnipeg (2015)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>b</sup> , 1900, 1950, 2000	Artibise (1975, p. 11), Merrett (2001, p. 13)
<i>Population Data (1800-2000)</i>		
City Population	1871, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1991, 2001	Artibise (1975, p. 10), Artibise (1975, p. 130), City of Winnipeg (2014), Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>c</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>d</sup>	None	
Number of Stations	1910, 1940, 2010	NaN
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1912 <sup>e</sup> , 1954 <sup>f</sup>	Fire Fighter's Historical Society of Winnipeg (2015)
Hurricane(s)	None recorded	
Flooding(s)	1950 <sup>g</sup> , 1997 <sup>h</sup>	Manitoba Government (2015)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	None recorded	

<sup>a</sup>Fort Rouge found at the forks in the river. The settlement was abandoned later on, but it was used long enough to consider it the first permanent settlement on what today is Winnipeg.

<sup>b</sup>Incorporated in 1872. Winnipeg has apparently been the capital of Manitoba from its foundation onwards.

<sup>c</sup>Footnote from United Nations Population Division (2014): Refers to the Census Metropolitan Area.

<sup>d</sup>There is no metro system matching the definition by Gonzalez-Navarro and Turner (2016).

<sup>e</sup>This fire, while "in the history books" seems to have affected only one building.

<sup>f</sup>"Most memorable fire", yet limited to one building.

<sup>g</sup>10,000 homes were destroyed and 5,000 buildings were damaged in Manitoba. While it is also mentioned in Encyclopaedia Britannica (2015z), many bridges had to be rebuilt and large parts of the city were flooded, it seems that not many houses were swept away. We thus record it as only "major."

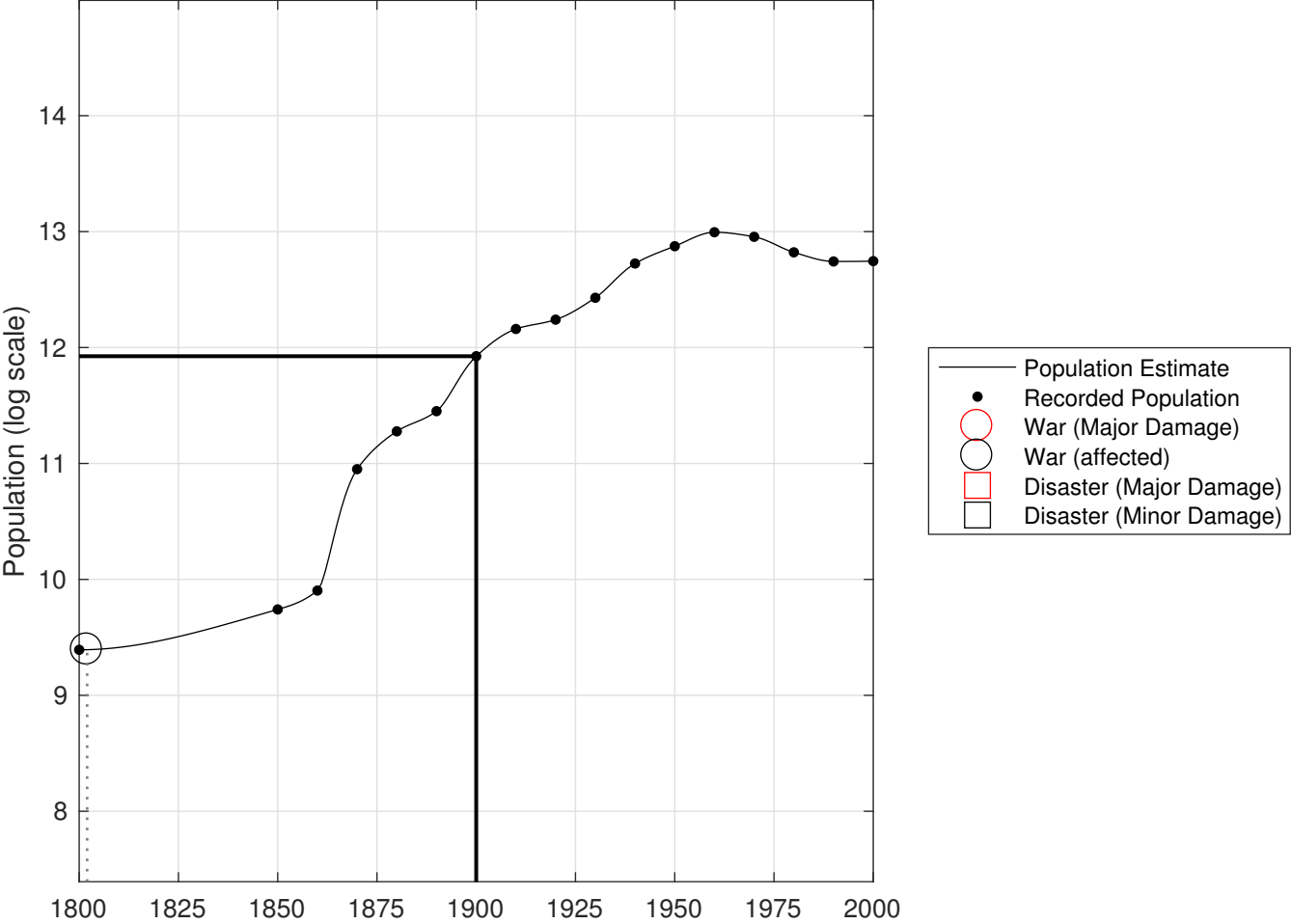
<sup>h</sup>1000 homes were damaged. Thus not coded as "major."

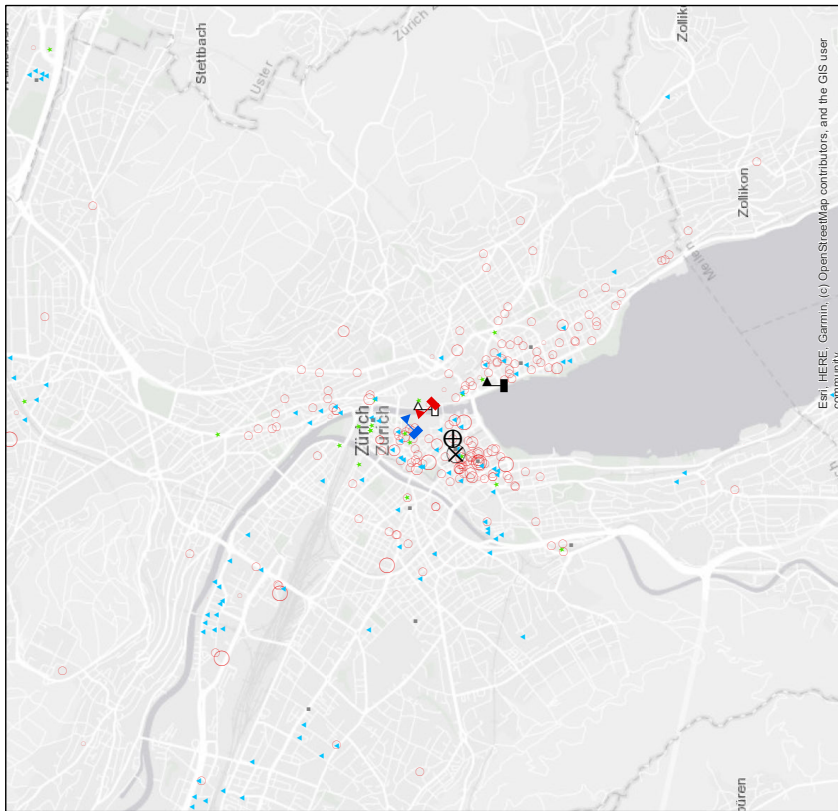
Table 230: Concentration Measures - Winnipeg

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	5.05
Cumulative density of employment-weighted PP distances at 750 m	%	8.14
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.38
Weighted average distance from EWPPs to 1900 CH	in kilometres	3.64
Average from all prime locations to 1900 CH	in kilometres	0.64
Average distance from global prime locations to 1900 CH	in kilometres	0.64

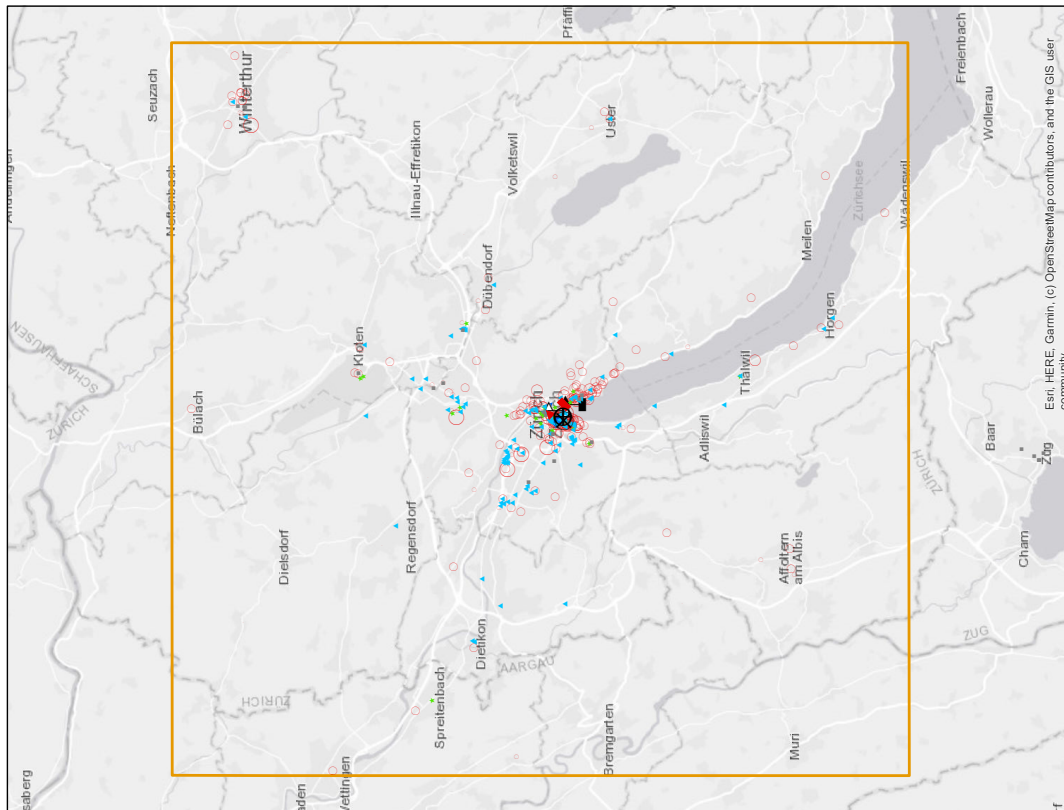
A.113 Zurich

Figure 122: Zurich





- Legend**
- ✕ Prime location (any)
  - Global prime location
  - ⊕ Central point
  - ▭ Metro extent (prime services)
  - ▲ SNL Office Building
  - ▲ Starbucks
  - CoWorking
  - ▭ Foundation Place
  - ▭ First City Government
  - ▭ City Hall 1900
  - ▭ City Hall 2000
  - EWWP 450 - 918
  - EWWP 68 - 98
  - EWWP 98 - 450
  - EWWP 918 - 1507
  - EWWP 1507 - 1898



- 0 3.25 6.5 13 Kilometers

Table 231: Sources: Zurich ( Switzerland )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>a</sup>	-450	Stadt Zürich (2015)
First Political Institution <sup>b</sup>	370	Stadt Zürich (2015)
City Hall	1900	Maissen (2006, p. 383),Brown et al. (2006, p. 88)
City Hall	2000	Maissen (2006, p. 383),Brown et al. (2006, p. 88)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>c</sup> , 1900, 1950, 2000	Encyclopaedia Britannica (2013c)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1860, 1870, 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 2000	Mitchell and Palgrave Macmillan (2014)
Metro Population	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	None	
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1802 <sup>d</sup>	Largiadèr (1945, p. 54-74)
International War(s)	None recorded	

<sup>a</sup>Prehistoric settlements. The dating is a rough approximation. Potentially, the settlement was much older.

<sup>b</sup>The roman castle was built here. The date is only approximate. A military camp was established as early as 15 BC on the same spot. However, we assume that only the castle involved greater political functions.

<sup>c</sup>Capital of the Kanton (state).

<sup>d</sup>During the Helvetic Republic a number of turbulent years for Zürich passed by. While Zürich was under fire in the “Stecklikrieg” in 1802, no extensive damage is reported (Stüssi-Lauterburg, 2012). In Largiadèr (1945, Volumes 1 and 2), no other disasters such as fires or floodings could be found in the index between 1800-2000.

Table 232: Concentration Measures - Zurich

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	5.64
Cumulative density of employment-weighted PP distances at 750 m	%	6.46
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.48
Weighted average distance from EWPPs to 1900 CH	in kilometres	3.41
Average from all prime locations to 1900 CH	in kilometres	0.59
Average distance from global prime locations to 1900 CH	in kilometres	0.59

## **B City Sheets (China mainland)**

The sources for Chinese cities alongside their bibliography are given in this part of the appendix. In particular, we want to thank Tiantong Song for excellent research for the collection of the Chinese historical data and modern data relating to the urban biographies.

B.1 Beijing

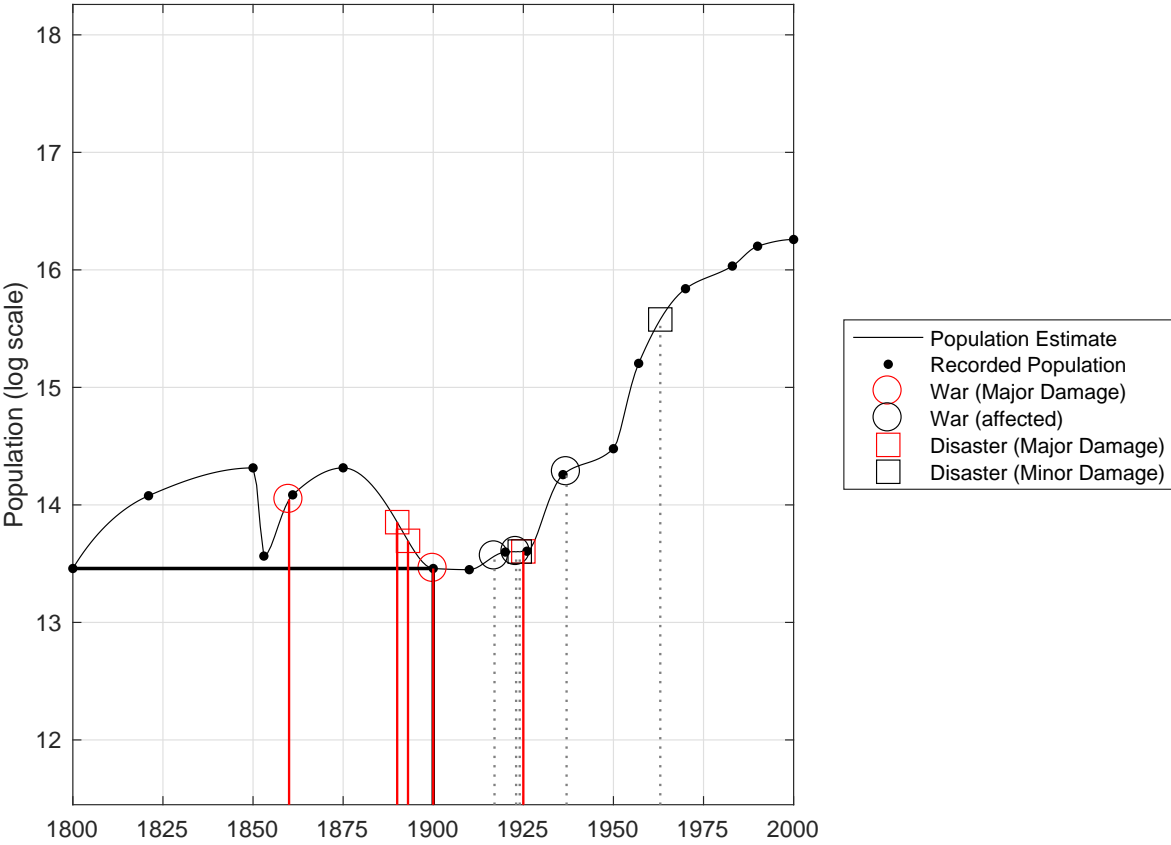


Figure 1: Beijing



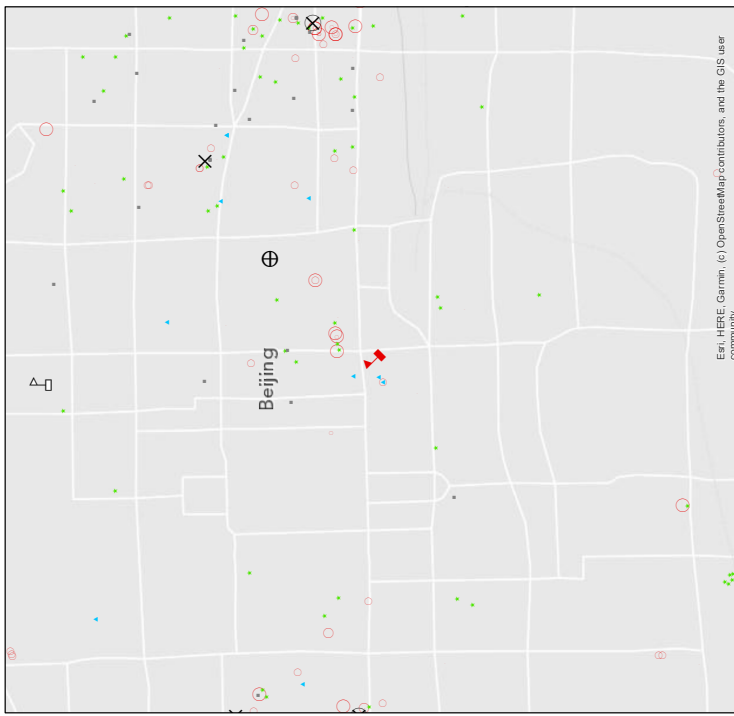
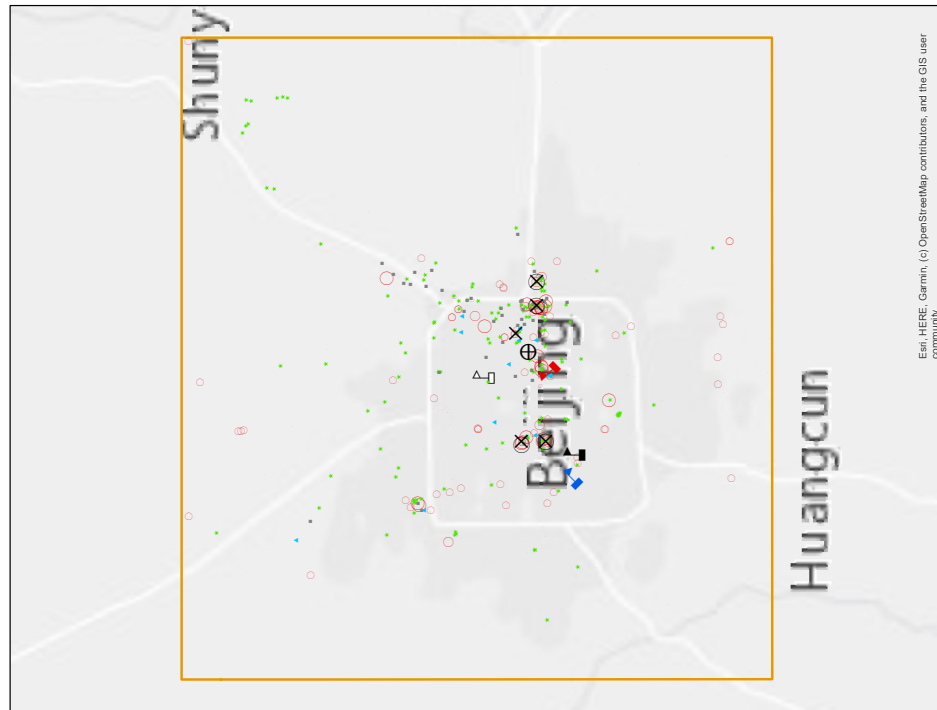


Table 1: Sources: Beijing ( China )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>1</sup>	-1300	韩 (1998)
First Political Institution <sup>2</sup>	-1045	侯 (1990, p. 42-43)
City Hall <sup>3</sup>	1900	北京市东城区人民政府 (2014)
City Hall <sup>4</sup>	2000	北京市东城区人民政府 (2011)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>5</sup> , 1900, 1950, 2000	Bonavia (2013)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1821, 1850, 1853, 1861, 1875, 1900, 1910, 1920, 1926, 1936, 1950, 1957, 1970, 1983, 1990, 2000	Mitchell (2007, 42), 周 (2011, p. 17), Angel et al. (2012, p. 267), Chandler (1987b, p. 440), Chandler (1987b, p. 80)
Metro Population <sup>6</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1969	D and D (2016, 36)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	1890 <sup>7</sup> , 1893 <sup>8</sup> , 1924 <sup>9</sup> , 1925 <sup>10</sup> , 1963	何 (2013, p. 199-200), 尹 (1996, p. 49), 中国人民政治协商会议湖南省委员会 (2012)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1917 <sup>11</sup> , 1923 <sup>12</sup>	Fairbank and Twitchett (1978, p. 282), Fairbank and Twitchett (1978, p. 309)
International War(s)	1860 <sup>13</sup> , 1900 <sup>14</sup> , 1937 <sup>15</sup>	Crozier (1977, p. 198), Tanner (2009, p. 394), Tanner (2009, p. 404-406)

<sup>1</sup>Small city already had already existed before it became a capital.

<sup>2</sup>King Wu of Zhou established principality Ji according to Chinese records.

<sup>3</sup>Shuntian Government is in charge of the capital city and its environs in both Ming and Qing Dynasty (clearly this is not the location of the Chinese government, which was located in the forbidden city 5 kilometres south from here).

<sup>4</sup>location of 2014: CPC Beijing Committee leads the whole Beijing development.

<sup>5</sup>Beijing has remained the capital of China since the third Ming emperor, except for a brief period (1928-49).

<sup>6</sup>Footnote from United Nations Population Division (2014): For the 1982 and 1990 censuses, the data reflect all residents of urban areas of the city. For the 2000 and 2010 censuses, the population of the city is composed of population in all urban areas of 14 city districts (Dongcheng, Xicheng, Chaoyang, Fengtai, Shijingshan, Haidian, Mentougou,

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Fangshan, Tongzhou, Shunyi, Changping, Daxing, Huairou, and Pinggu) meeting the criteria such as contiguous built-up areas, being the location of the local government, being a Street or Having a Resident Committee.

<sup>7</sup>City was entirely flooded. People lived in boats for a while.

<sup>8</sup>In the inner city, at least 210 houses collapsed totally.

<sup>9</sup>Main streets in inner Beijing were all completely flooded.

<sup>10</sup>Great Disaster. Countless buildings collapsed and the main streets were like the sea.

<sup>11</sup>Chang Hsun marched into the capital and then was defeated by Tuan Ch'i-jui.

<sup>12</sup>During the Warlord Period, Beijing Government changed very frequently through military coups.

<sup>13</sup>In the Second Opium War(Arrow War), the British and French Troops occupied Beijing. They stole a fortune and looting and burning of the Summer palace took place

<sup>14</sup>Eight-Nation Army's Invasion: However, while mentioned in Bonavia (2015), it does not match our definition of "heavy" disaster (the same is true for the destruction during the Opium Wars). Looting and rape took place.

<sup>15</sup>The Japanese entered and occupied Beijing.

Table 2: Concentration Measures - Beijing

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	9.22
Cumulative density of employment-weighted PP distances at 750 m	%	22.80
Average distance between all prime locations	in kilometres	4.86
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.51
Weighted average distance from EWPPs to 1900 CH	in kilometres	7.04
Average from all prime locations to 1900 CH	in kilometres	5.45
Average distance from global prime locations to 1900 CH	in kilometres	5.63

B.2 Chengdu

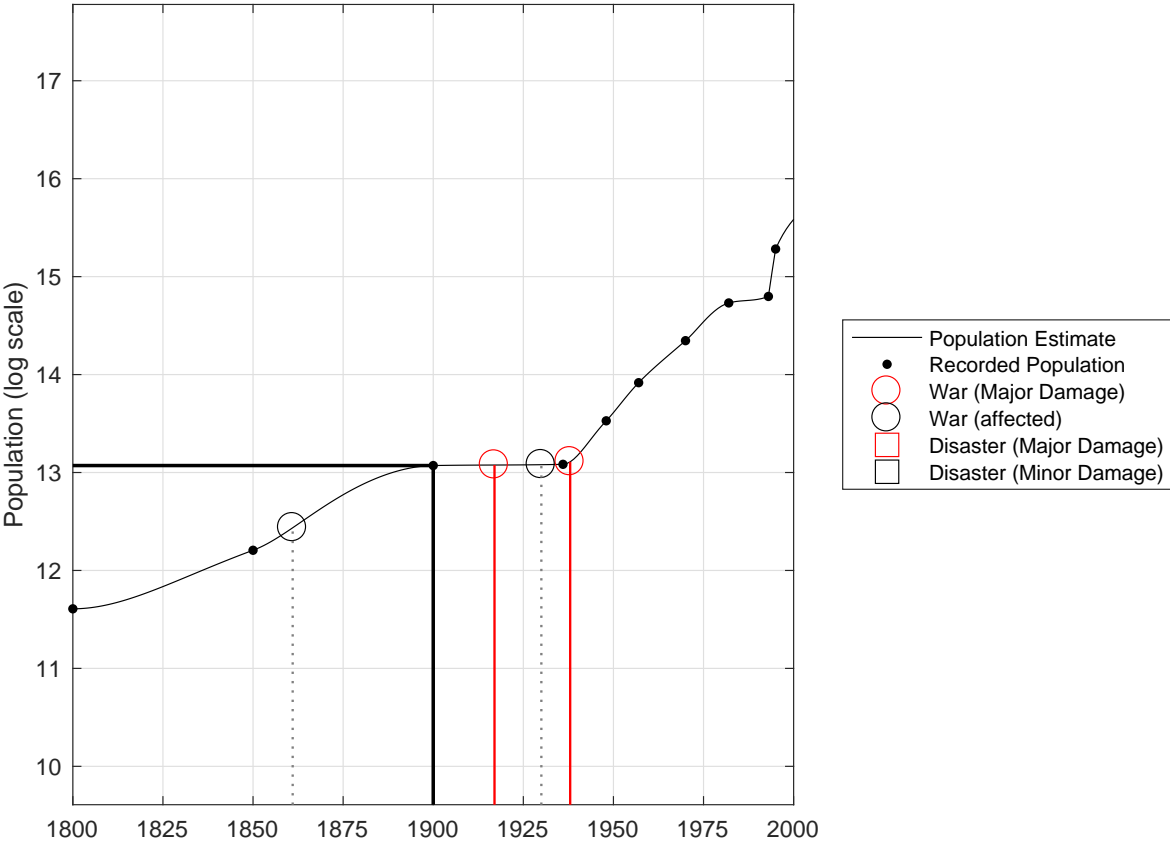
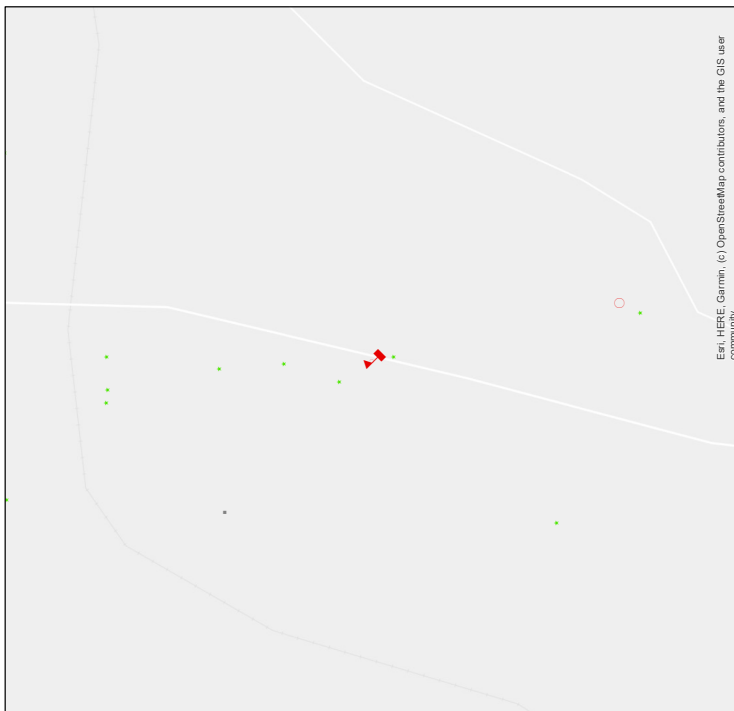
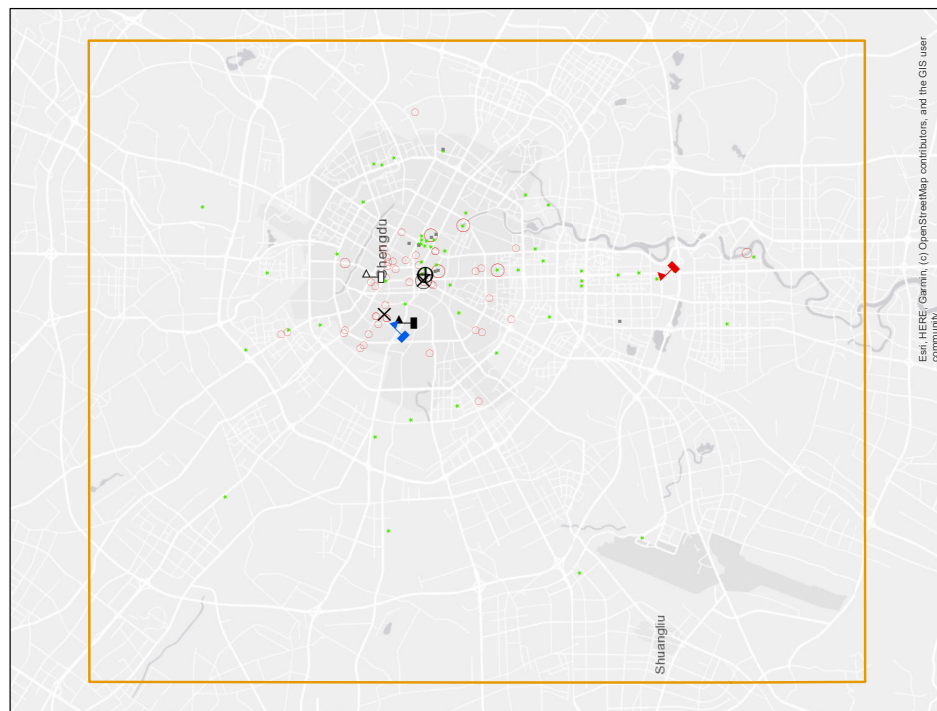


Figure 2: Chengdu



**Legend**

- X Prime location (any)
  - Global prime location
  - ⊕ Central point
  - Metro extent (prime services)
  - SNL Office Building
  - Starbucks
  - CoWorking
- 
- ▲ Foundation Place
  - ▲ First City Government
  - ▲ City Hall 1900
  - ▲ City Hall 2000
- 
- EWWP 450 - 918
  - 68 - 98
  - 98 - 450
  - 918 - 1507
  - 1507 - 1898

Table 3: Sources: Chengdu ( China )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>16</sup>	-1001	譚 (1999, p. 7-11)
First Political Institution <sup>17</sup>	-311	譚 (1999, p. 7-11), Wang (2008, p. 4-5)
City Hall <sup>18</sup>	1900	田 (2012, p. 105), 王 (1997, p. 29)
City Hall <sup>19</sup>	2000	成都市人民政府 (2010)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>20</sup> , 1900, 1950, 2000	Encyclopaedia Britannica (2014a)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1900, 1936, 1948, 1957, 1970, 1982, 1993, 1995, 2010	Satterthwaite (2007, p. 75), Chandler (1987a, p. 80), Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>21</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	2010	of Subway Construction on Housing Premium: A Micro-data Analysis in chengdu's Housing Market (2013, 447)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861 <sup>22</sup> , 1917 <sup>23</sup> , 1930 <sup>24</sup>	Wang (2008, p. 231), 杨 and 潘 (2012, p. 327), Gordon and Watson (2011, p. 65)
International War(s)	1938 <sup>25</sup>	Alvarez (2013, p. 206), Wang (2008, p. 316)

<sup>16</sup>People began to settle down near Twelve Bridge.

<sup>17</sup>Zhangyi set Chengdu City with walls and regulations. Not sure about the exact location but can be deduced from the information about the settlement given in the reference. We take the centroid of this, which is as close as we can get.

<sup>18</sup>The Qing Government reconstructed the Chengdu City Hall based on the Ming City Hall, which was located at Wudan Mountain.

<sup>19</sup>2014 location: CPC Chengdu Committee leads the whole Chengdu development and it has the same location with the Chengdu Government.

<sup>20</sup>It has been the capital of Sichuan since 1368 except for several years around 1646.

<sup>21</sup>Footnote from United Nations Population Division (2014): For the 1982 and 1990 censuses, the data reflect all residents of urban areas of the city. For the 2000 and 2010 censuses, the population of the city is composed of population

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in all urban areas of nine city districts (Mianjing, Qingyang, Jinniu, Wuhou, chenghua, Longquanyi, Qingbaijiang, Xindu, and Wenjiang) meeting the criteria such as contiguous built-up areas, being the location of the local government, being a Street or Having a Resident Committee.

<sup>22</sup>Dakai Shi, one of the generals of the Taiping Kingdom conquered Chengdu.

<sup>23</sup>Sichuan Army battled Yunnan Army and Guizhou Army on the streets of Chengdu.

<sup>24</sup>Two warlords, Xiang Liu and Wenhui Liu, fought against each other in Sichuan. One set up airforce at Chengdu until the other was ousted.

<sup>25</sup>Anti-Japanese War: multiple heavy air raids during that period.



Table 4: Concentration Measures - Chengdu

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	4.45
Cumulative density of employment-weighted PP distances at 750 m	%	13.65
Average distance between all prime locations	in kilometres	1.07
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.72
Weighted average distance from EWPPs to 1900 CH	in kilometres	3.36
Average from all prime locations to 1900 CH	in kilometres	1.86
Average distance from global prime locations to 1900 CH	in kilometres	1.94

B.3 Chongqing

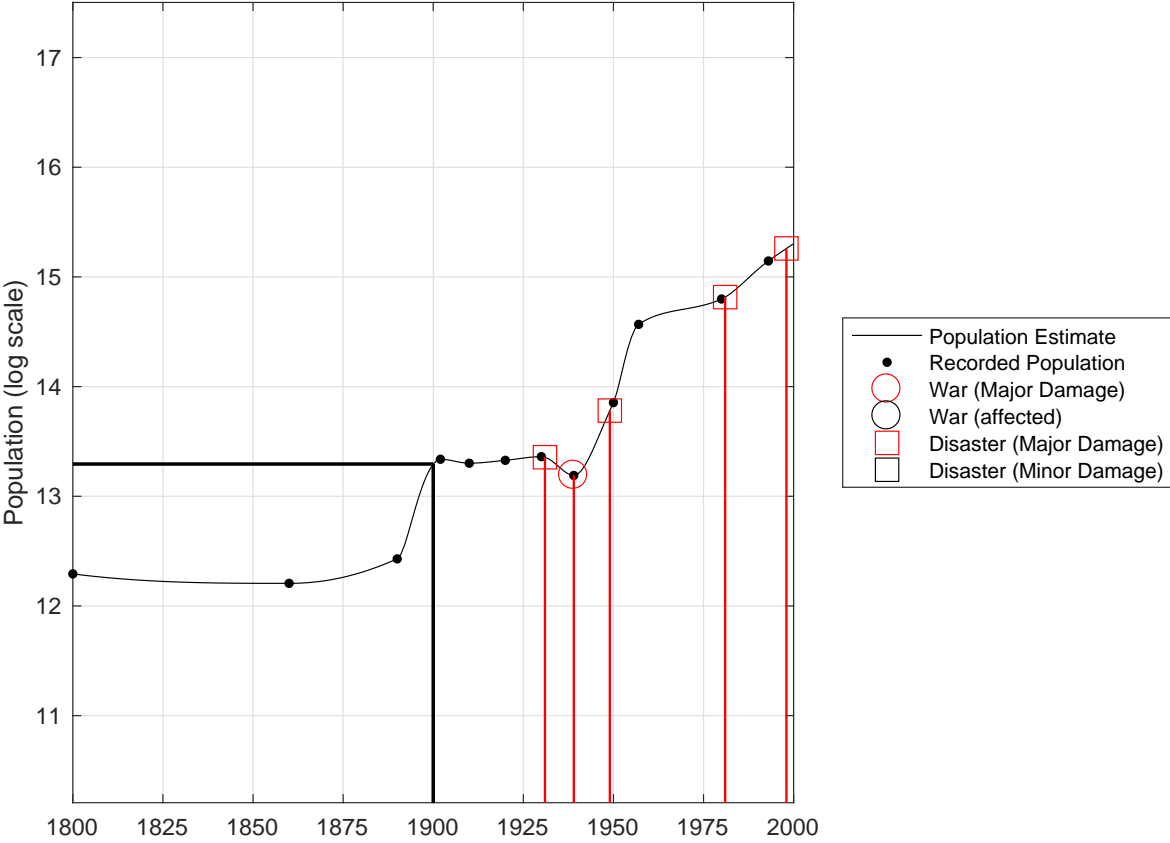


Figure 3: Chongqing

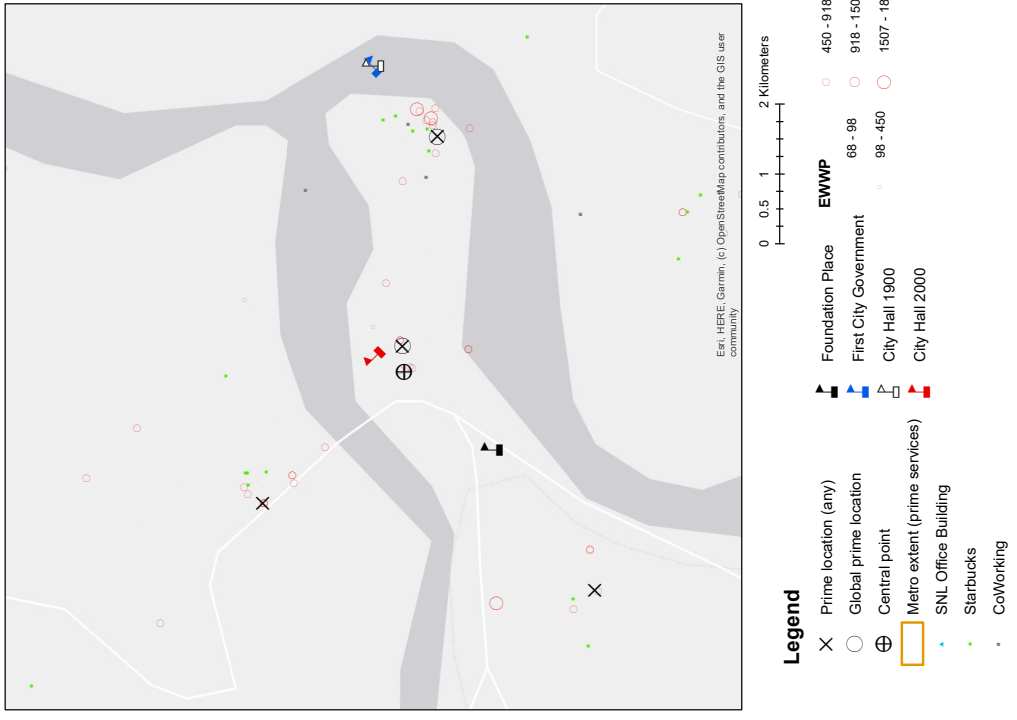
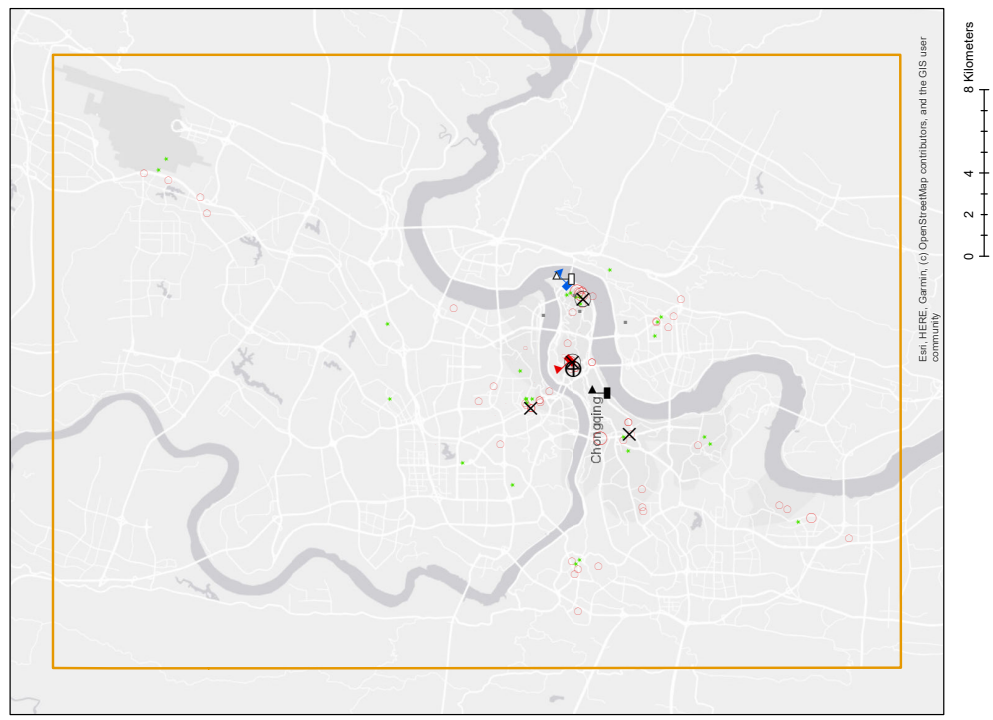


Table 5: Sources: Chongqing ( China )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>26</sup>	-475	琦 (1982)
First Political Institution <sup>27</sup>	-314	琦 (1982)
City Hall <sup>28</sup>	1900	琦 (1982)
City Hall <sup>29</sup>	2000	重庆市政府网 (2013)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>30</sup> , 1900, 1950 <sup>31</sup> , 2000	Wang (2014)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1860, 1890, 1902, 1910, 1920, 1930, 1939, 1950, 1957, 1980, 1993, 2010	Mitchell (2007, p. 42), Satterthwaite (2007, p. 74), Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>32</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>33</sup>	2005	Pletcher (2010, 242)
Number of Stations	1910, 1940, 2010	Schwandl (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1949 <sup>34</sup>	Time Magazine (2004, p. 217)
Hurricane(s)	None recorded	
Flooding(s)	1931 <sup>35</sup> , 1981 <sup>36</sup> , 1998	Penna and Rivers (2013, p. 140), Walker et al. (1993, p. 34), Huang and Shen (2013, p. 448)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	None recorded	
International War(s)	1939 <sup>37</sup>	Howard (2004, p. 128), Lary (2010, p. 88)

<sup>26</sup>Ba settled here. The center of the settlement had been near the Eling Park.

<sup>27</sup>Qin Zhanyi set city system here with walls and regulations. The cityhall is in the center of the Xiaoshizi, Chaotianmen, Wanglongmen and Qiansimen.

<sup>28</sup>The cityhall is in the center of the Xiaoshizi, Chaotianmen, Wanglongmen and Qiansimen and has seldom changed.

<sup>29</sup>2014 location: CPC Chongqing Committee leads the whole Chongqing development.

<sup>30</sup>The city became an integral part of the unified Chinese empire first under the Ming dynasty (1368-1644) and then under the Qing, or Manchu, dynasty (1644-191112).

<sup>31</sup>Chongqing had been an independent municipality during the Nationalist period, but from 1954 to 1996 it was a city under the administration of Sichuan province. In 1997 it was separated from the province to become a provincial-level municipality directly under the central government.

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<sup>32</sup>Footnote from United Nations Population Division (2014):For the 1990 census, the data reflect all residents of urban areas of the city. For the 2000 and 2010 censuses, the population of the city is composed of population in all urban areas of city districts meeting the criteria such as contiguous built-up areas, being the location of the local government, being a Street or Having a Resident Committee. Data after 1990 reflect urban population in the latest administrative city districts that include Jiangjin, Hechuan, Nanchuan, Yongchuan, Dazu, and Qijiang districts.

<sup>33</sup>Line 2 to opened in 2005, Line 1 in 2011. We change the number of stations according to Schwandl (2016).

<sup>34</sup>On 2nd Sep 1949, the great fire in Chongqing destroyed more than half of the inner city.

<sup>35</sup>Floodwater inundated and destroyed parts of Chongqing.

<sup>36</sup>Chongqing suffered its worst flood in the 20th century.

<sup>37</sup>Numerous air raids led to massive destruction of the city as also suggested in Kuo (2015).

Table 6: Concentration Measures - Chongqing

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	7.46
Cumulative density of employment-weighted PP distances at 750 m	%	19.21
Average distance between all prime locations	in kilometres	3.08
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.68
Weighted average distance from EWPPs to 1900 CH	in kilometres	6.37
Average from all prime locations to 1900 CH	in kilometres	3.44
Average distance from global prime locations to 1900 CH	in kilometres	1.97

B.4 Guangzhou

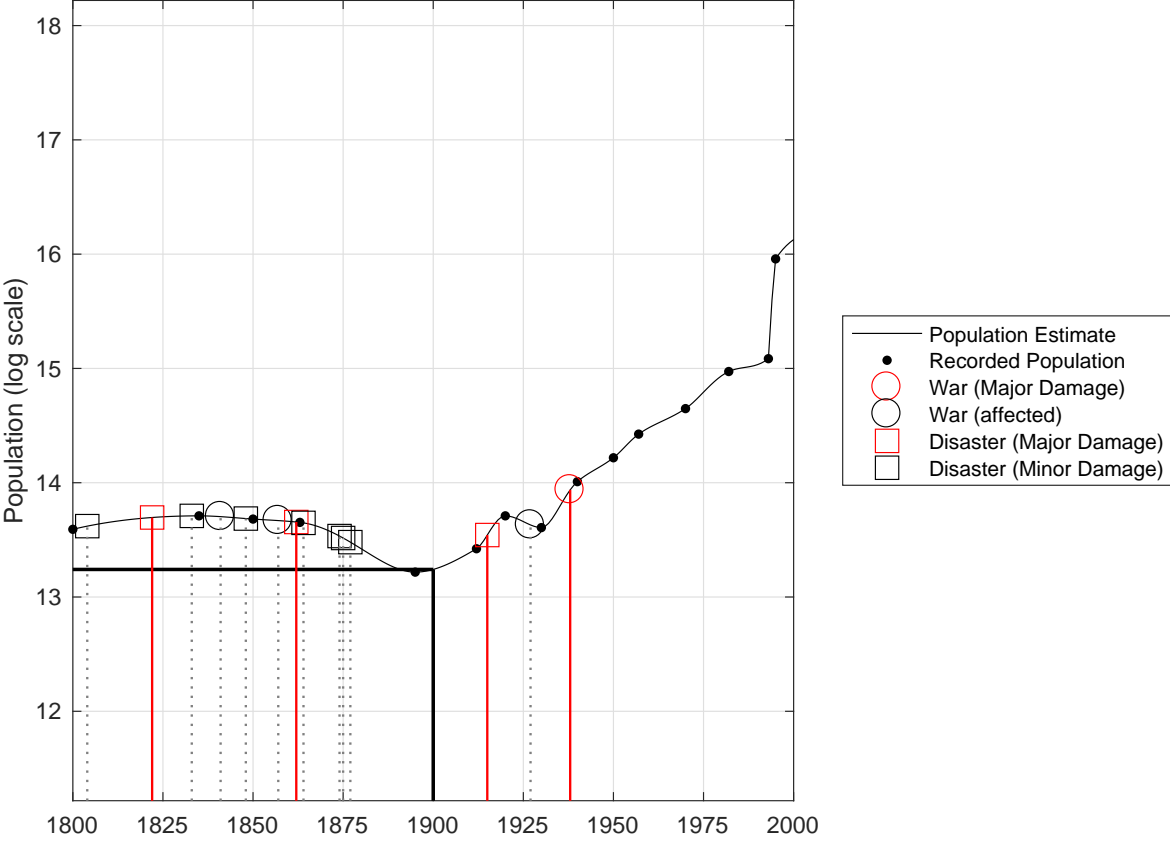
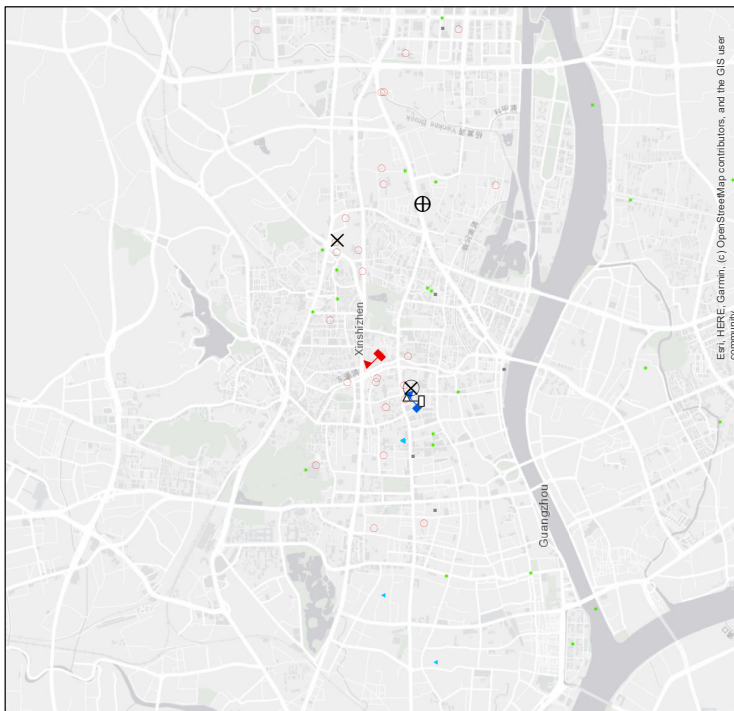
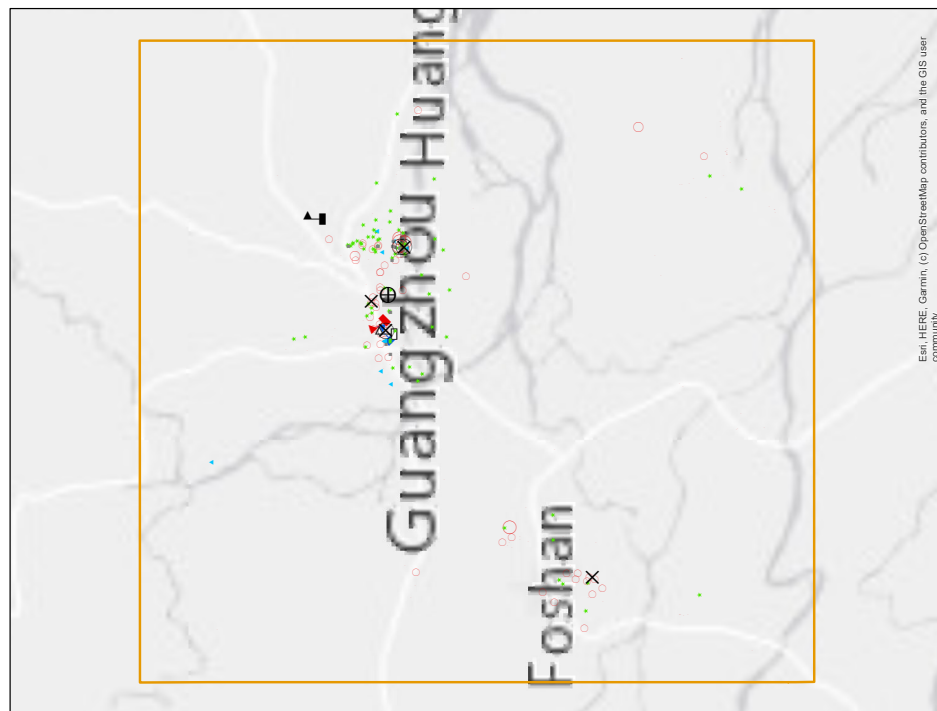


Figure 4: Guangzhou



**Legend**

- X Prime location (any)
  - Global prime location
  - ⊕ Central point
  - Metro extent (prime services)
  - SNL Office Building
  - Starbucks
  - CoWorking
- 
- ▲ Foundation Place
  - ▲ First City Government
  - ▲ City Hall 1900
  - ▲ City Hall 2000
- 
- EWWP 450 - 918
  - 68 - 98
  - 98 - 450
  - 918 - 1507
  - 1507 - 1898



Table 7: Sources: Guangzhou ( China )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>38</sup>	-1146	陈 (2007, p. 116),Kuo (2013)
First Political Institution <sup>39</sup>	-214	吕 (1984, p. 42), Schinz (1996, p. 264f)
City Hall <sup>40</sup>	1900	citet[p. 111]Nanyuelocation
City Hall <sup>41</sup>	2000	citetGuangzhouCPC
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>42</sup> , 1900, 1950, 2000	Kuo (2013)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1835, 1850, 1863, 1895, 1912, 1920, 1930, 1940, 1950, 1957, 1970, 1982, 1993, 1995, 2010	Chandler (1987b, p. 419), Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>43</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1999	UN Habitat (2013, 46)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1822 <sup>44</sup> , 1875 <sup>45</sup>	张 and 刘 (2014)
Hurricane(s)	1848 <sup>46</sup> , 1862 <sup>47</sup> , 1874 <sup>48</sup>	钱 (1995, p. 6), 钱 (1995, p. 7)
Flooding(s)	1804, 1833, 1864, 1877 <sup>49</sup> , 1915 <sup>50</sup>	林 (2011, p. 7), 劳 (1982)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1927 <sup>51</sup>	Jaques (2007a, p. 416)
International War(s)	1841 <sup>52</sup> , 1857 <sup>53</sup> , 1938 <sup>54</sup>	Jaques (2007a, p. 416), Jaques (2007a, p. 416), Best (2009, p. 107), Gong-fu (2015)

<sup>38</sup>It was built in the Zhou dynasty, which is why we assume 1146 BC. Britannica claims that there was a walled city, but we are not sure about this based on other sources, which is why we take 214 BC as the first government (see below).

<sup>39</sup>The First Emperor of Qin assigned Zhao Tuo to establish city and rules in Fanyu, Nanyue, which is Guangzhou now. The Nanyue Palace, which regulated the whole Fanyu City, is in the center of Yuehua Road, Huifu Road, Jiucangxiang and Jixiang Road.

<sup>40</sup>The city hall has been located at the site of Nanyue Palace since Qin.

<sup>41</sup>2014. The Guangzhou CPC leads the development of Guangzhou.

<sup>42</sup>Guangzhou is the capital city of Guangdong Sheng, and it has long been one of China's main commercial and trading centres.

<sup>43</sup>Footnote from United Nations Population Division (2014): For the 1982 and 1990 censuses, the data reflect all residents of urban areas of the city. For the 2000 and 2010 censuses, the population of the city is composed of population

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in all urban areas of ten city districts (Liwan, Yuexiu, Hanzhu, Tianhe, Baiyun, Huangpu, Panyu, Huadu, Nansha, Luogang) meeting the criteria such as contiguous built-up areas, being the location of the local government, being a Street or Having a Resident Committee.

<sup>44</sup>The Thirteen-hong of Canton was destroyed and the commerce was badly influenced by the fire.

<sup>45</sup>Not sure about whether the business district was destroyed, but hundreds of buildings were damaged.

<sup>46</sup>Thousands of boats and ships were destroyed.

<sup>47</sup>A great number of boats and ships were destroyed and more than 80000 dead bodies were found in the river

<sup>48</sup>Great hurricane began from the southeastern sea.

<sup>49</sup>The first four floods that we recorded were serious, but we are unsure about their actual destruction within the city.

Thus we code them as not having caused major destruction.

<sup>50</sup>Areas were submerged. Hundreds of dead bodies floated on the river.

<sup>51</sup>The Second Chinese Revolutionary Civil War

<sup>52</sup>The first Opium War

<sup>53</sup>The Second Opium War

<sup>54</sup>Air raids by the Japanese bombed the city to “rubble” (Best, 2009, p. 107).

Table 8: Concentration Measures - Guangzhou

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	12.78
Cumulative density of employment-weighted PP distances at 750 m	%	18.84
Average distance between all prime locations	in kilometres	11.10
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.20
Weighted average distance from EWPPs to 1900 CH	in kilometres	9.04
Average from all prime locations to 1900 CH	in kilometres	5.55
Average distance from global prime locations to 1900 CH	in kilometres	3.52

B.5 Hangzhou

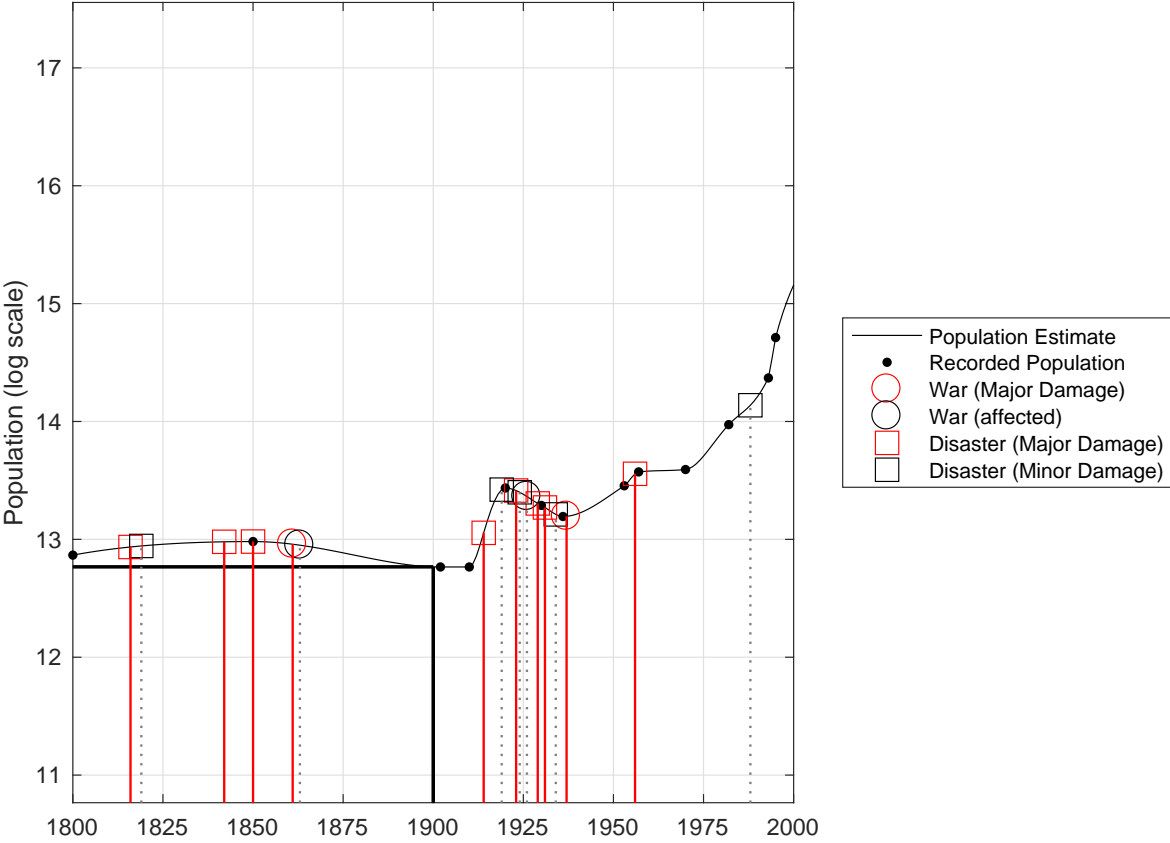


Figure 5: Hangzhou

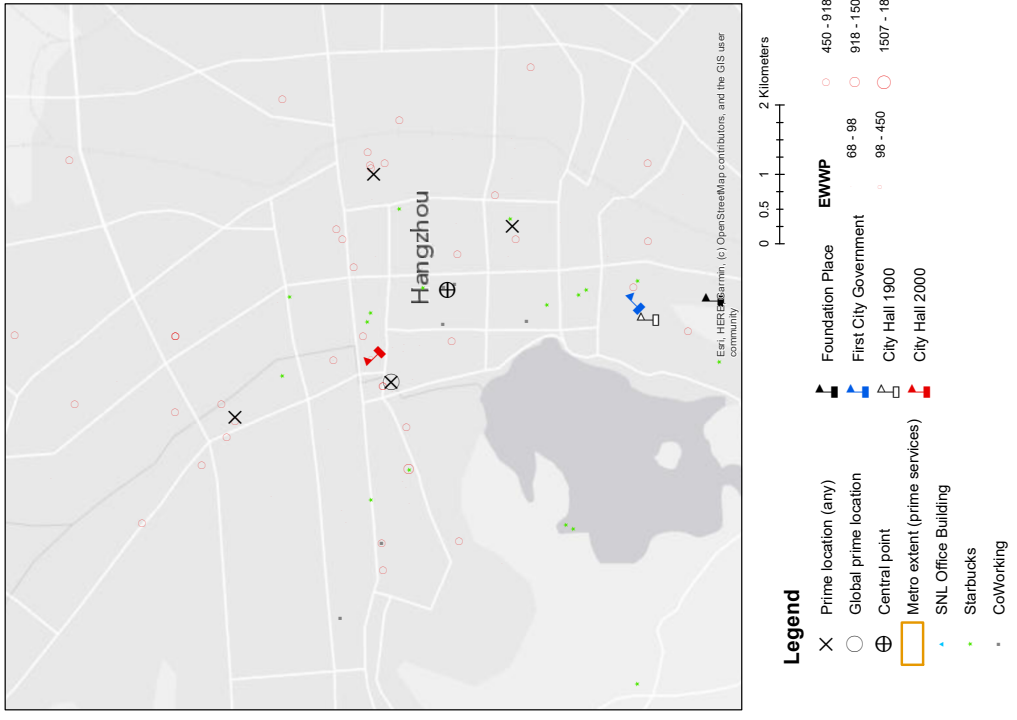
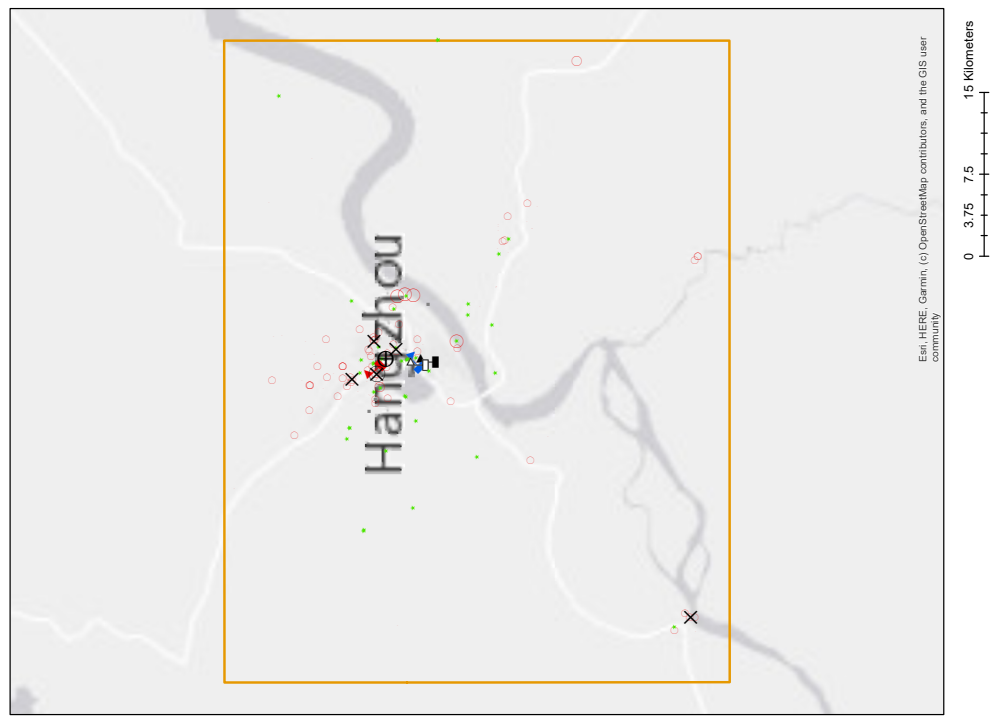


Table 9: Sources: Hangzhou ( China )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>55</sup>	-210	Schinz (1996, p. 238), Schinz (1989, p. 202)
First Political Institution <sup>56</sup>	150	Schinz (1996, p. 238), Schinz (1989, p. 202)
City Hall <sup>57</sup>	1900	蔡 (2012, p. 60)
City Hall <sup>58</sup>	2000	杭州日报 (2014), 都市快报 (1999)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>59</sup> , 1900, 1950 <sup>60</sup> , 2000	Encyclopaedia Britannica (2014b)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1902, 1910, 1920, 1930, 1936, 1953, 1957, 1970, 1982, 1993, 1995, 2010	Chandler (1987b, p. 426), Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>61</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	2012	UN Habitat (2013, 45)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1816 <sup>62</sup> , 1819 <sup>63</sup> , 1842 <sup>64</sup> , 1850 <sup>65</sup> , 1914 <sup>66</sup> , 1919 <sup>67</sup> , 1923 <sup>68</sup> , 1924 <sup>69</sup> , 1926 <sup>70</sup> , 1929 <sup>71</sup> , 1929 <sup>72</sup> , 1934 <sup>73</sup>	林 (1994, p. 36), 蒋 and 林 (1995, p. 41), 蒋 and 林 (1995, p. 42)
Hurricane(s)	1956 <sup>74</sup> , 1988	Stoltman et al. (2007, p. 184), 周 and 刘 (1995, p. 58)
Flooding(s)	1919, 1931	Penna and Rivers (2013, p. 140), 刘 (2010, p. 157)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1861 <sup>75</sup> , 1863 <sup>76</sup> , 1926 <sup>77</sup>	Deng (2012, p. 39), Ring et al. (1996, p. 328), Encyclopaedia Britannica (2014b), Jaques (2007a, p. 432)
International War(s)	1937 <sup>78</sup>	章 (2007, p. 111)

<sup>55</sup>We take this small settlement of the “hill culture as the first settlement (see Schinz, 1996, p. 238 on the location). We infer the date of settlement from Schinz (1989, p. 202), which says that there have been settlements from the late 3rd century BC onwards.

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<sup>56</sup>We take the location of the first dike settlement from Schinz (1996, p. 238) as this needs some form government in terms of providing a public good. Schinz (1996, p. 237) speculates that this settlement dates back to the 2nd century AD. Both the location and the time here have some margin of error.

<sup>57</sup>The political center in Qing is located between the Yongjin Gate and Qingbo Gate.

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<sup>58</sup>Hangzhou CPC and People's Government are located at the same site and the government has already been located at this site since 1999.

<sup>59</sup>Under the Ming and Qing dynasties, Hangzhou is the provincial capital of Zhejiang Province.

<sup>60</sup>Hangzhou has been the capital of Zhejiang Sheng since the establishment of PRC.

<sup>61</sup>Footnote from United Nations Population Division (2014): For the 1982 and 1990 censuses, the data reflect all residents of urban areas of the city. For the 2000 and 2010 censuses, the population of the city is composed of population in all urban areas of eight city districts (Shangcheng, Xiacheng, Jianggan, Gongshu, Xihu, Binjiang, Xiaoshan, and Yuhang) meeting the criteria such as contiguous built-up areas, being the location of the local government, being a Street or Having a Resident Committee.

<sup>62</sup>Thousands of residential houses were destroyed.

<sup>63</sup>Great fire. No more details given in the source and thus coded as not having caused major damage.

<sup>64</sup>The fire lasted two days and ruined more than 1000 houses.

<sup>65</sup>Great fire began from Zhenhai Building and destroyed about 3000 residential houses.

<sup>66</sup>Lasted 4 hours; more than 280 houses were destroyed.

<sup>67</sup>Lots of loss due to destruction of 30 stores and 80 buildings.

<sup>68</sup>More than 300 buildings were destroyed.

<sup>69</sup>More than 60 clothing stores were destroyed, but given the size of the city this does not appear to be a major disaster.

<sup>70</sup>About 275 buildings in the city were destroyed.

<sup>71</sup>88 stores and 113 houses were ruined.

<sup>72</sup>Several fires in this year, causing death and homelessness.

<sup>73</sup>38 stores and 50 houses were destroyed, but given the size of the city we do not code this as major

<sup>74</sup>Wanda typhoon went through Hangzhou.

<sup>75</sup>Taiping slaughtered more than 10000 people. "Severe battles waged during the city's (...) destroyed the city itself" (Ring et al., 1996, p. 328).

<sup>76</sup>Zuo Zongtang laid siege in Hangzhou to fight against Taiping.

<sup>77</sup>The 1st Chinese Revolutionary Civil War.

<sup>78</sup>From 1937 to 1945, Hangzhou was occupied by the Japanese. There have been air raids (see e.g. Earhart, 2015, p. 73). The extend is not entirely clear, but we code it as "major."



Table 10: Concentration Measures - Hangzhou

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	11.77
Cumulative density of employment-weighted PP distances at 750 m	%	25.71
Average distance between all prime locations	in kilometres	11.63
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.88
Weighted average distance from EWPPs to 1900 CH	in kilometres	8.08
Average from all prime locations to 1900 CH	in kilometres	7.61
Average distance from global prime locations to 1900 CH	in kilometres	3.30

B.6 Nanjing

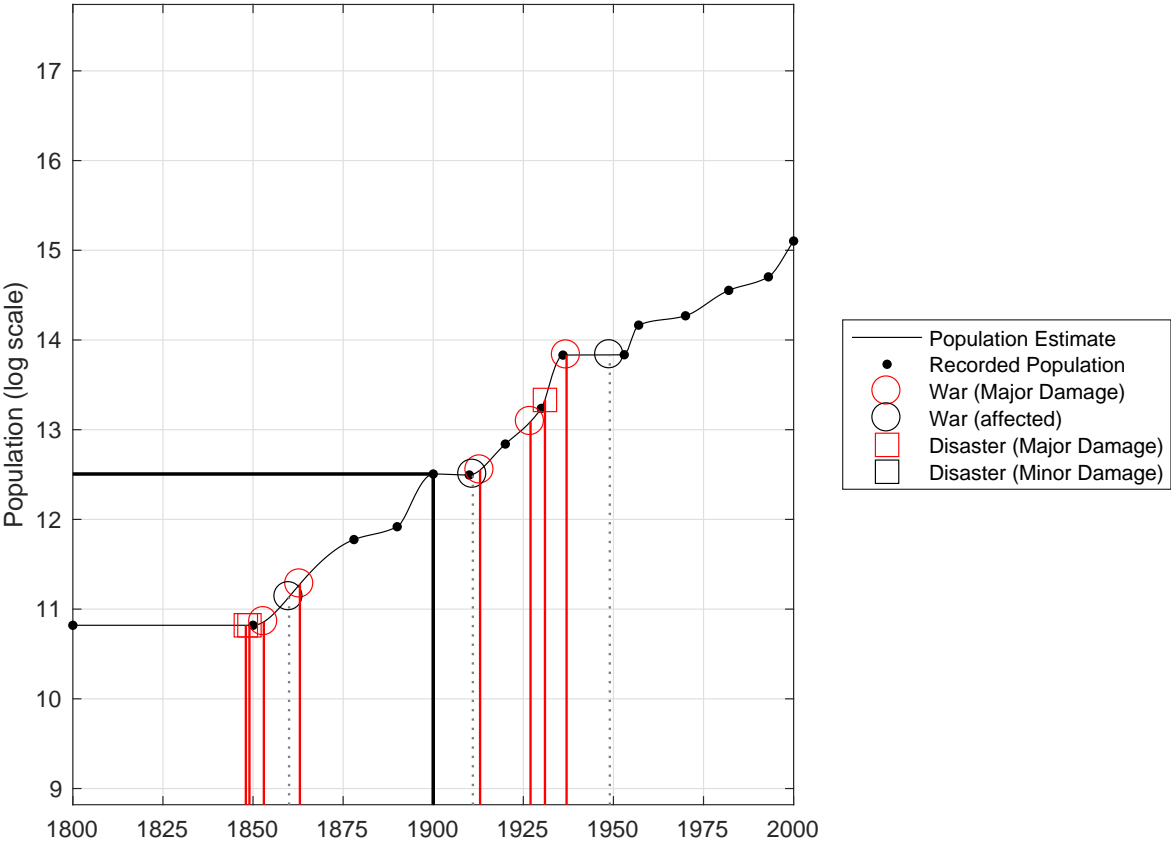


Figure 6: Nanjing

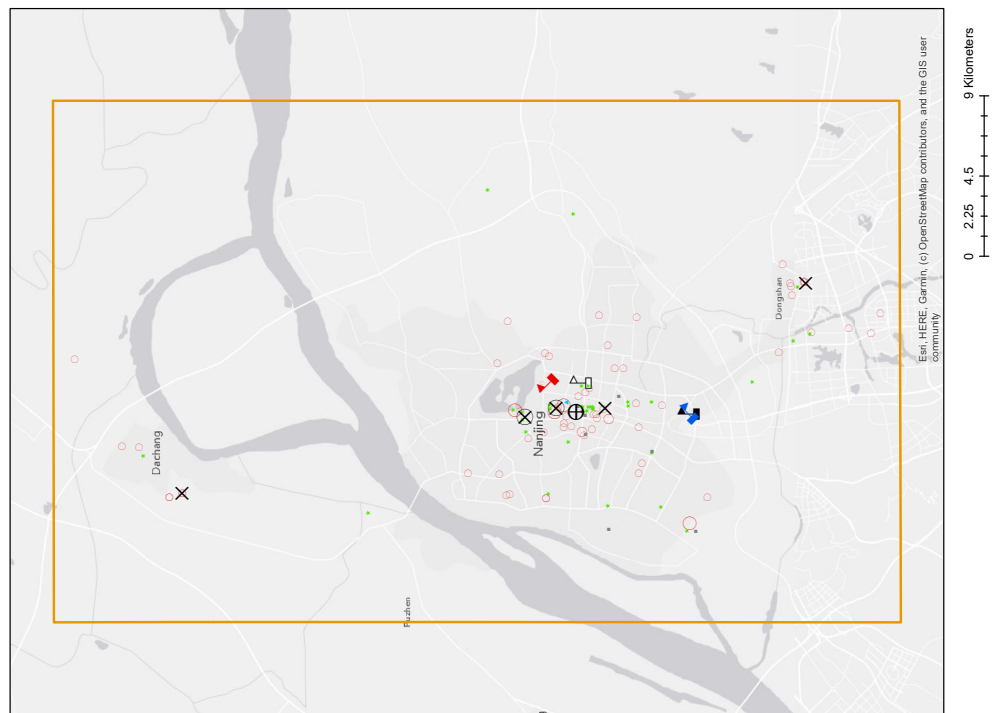
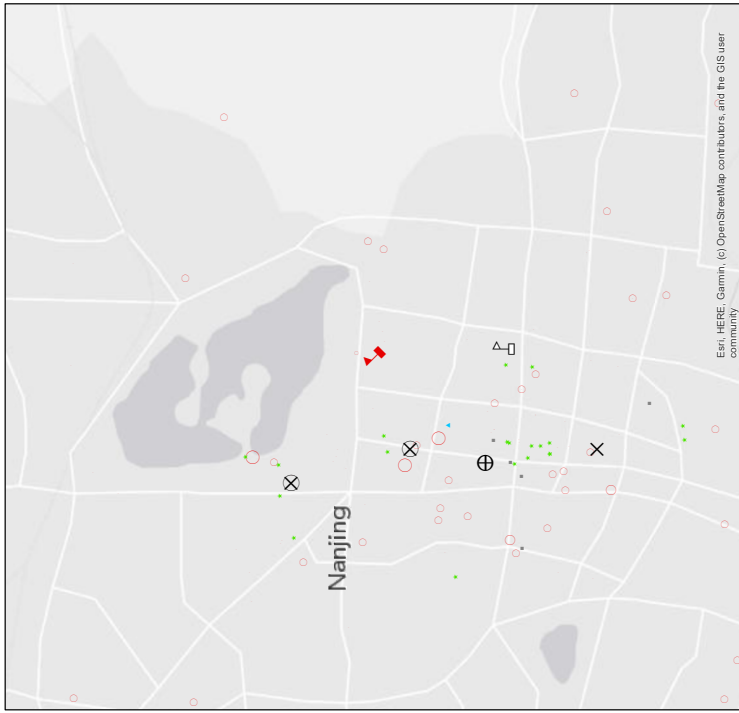


Table 11: Sources: Nanjing ( China )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>79</sup>	-472	Zeng (2014)
First Political Institution	-472	Zeng (2014)
City Hall <sup>80</sup>	1900	Nanjing Tourism Committee (2016), Schinz (1996, p. 301)
City Hall <sup>81</sup>	2000	中国共产党南京市委员会 (2014)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Zeng (2014)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1878, 1890, 1900, 1910, 1920, 1930, 1936, 1953, 1957, 1970, 1982, 1993, 2000, 2010	Chandler (1987b, p. 436), Chandler (1987b, p. 493), Satterthwaite (2007, p. 75), Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>82</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	2005	Matilla (2011, 13)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	1848 <sup>83</sup> , 1849 <sup>84</sup> , 1931 <sup>85</sup>	经 (2014, p. 41), 经 (2014, p. 42), 经 (2014, p. 44)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1853 <sup>86</sup> , 1860 <sup>87</sup> , 1863 <sup>88</sup> , 1911 <sup>89</sup> , 1913 <sup>90</sup> , 1927 <sup>91</sup> , 1949 <sup>92</sup>	Deng (2012, p. 39), Jaques (2007a, p. 711), Jaques (2007a, p. 711), Zeng (2014)
International War(s)	1937 <sup>93</sup>	Jaques (2007a, p. 711), Zeng (2014)

<sup>79</sup>In 472 BC, Yue State was constructed here, which was the earliest city in Nanjing area. Apparently, settlements in the wider area date back as far as 7000 BC (Ring et al., 1996, p. 616).

<sup>80</sup>We take the seat of the provincial governor, the Liang Jiang Viceroy. It was in the so called presidential palace, of which the location is inferred from Schinz (1996, p. 301).

<sup>81</sup>2014: location is confirmed by Nanjing CPC website.

<sup>82</sup>Footnote from United Nations Population Division (2014): For the 1982 census, the data reflect all residents of urban areas of the city. For the 1990, 2000 and 2010 censuses, the population of the city is composed of population in all urban areas of eleven city districts (Xuanwu, Qihuai, Jianye, Gulou, Pukou, Xixia, Yuhuatai, Jiangning, Luhe, Lishui and Gaochun), meeting the criteria such as contiguous built-up areas, being the location of the local government, being

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<sup>a</sup> Street or Having a Resident Committee.

<sup>83</sup> Nanjing suffered a lot. Half buildings were in the water. Boats were used in the streets.

<sup>84</sup> Heavier flood in Nanjing than 1848. Almost the total city was in the water.

<sup>85</sup> The heaviest flood in Nanjing.

<sup>86</sup> Taiping slaughtered 12000 people whose blood turned the river red.

<sup>87</sup> Taiping fought with Southern Imperial Barracks, the Taiping won.

<sup>88</sup> Qing General Zeng Guofan led the war and won. The war last to 1864

<sup>89</sup> The 1st Chinese Revolution

<sup>90</sup> The 2nd Chinese Revolution. Nanjing was sacked.

<sup>91</sup> The 1st Chinese Revolutionary Civil War. Zhangqian attacked and stormed Nanjing.

<sup>92</sup> The 3rd Chinese Revolutionary Civil War.

<sup>93</sup> Sino-Japanese War: More than 300 thousand Chinese died and damage to the building stock was extensive (Forsythe, 2009, p. 31).

Table 12: Concentration Measures - Nanjing

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	9.47
Cumulative density of employment-weighted PP distances at 750 m	%	19.52
Average distance between all prime locations	in kilometres	10.72
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.14
Weighted average distance from EWPPs to 1900 CH	in kilometres	6.27
Average from all prime locations to 1900 CH	in kilometres	6.42
Average distance from global prime locations to 1900 CH	in kilometres	2.25

## B.7 Ningbo

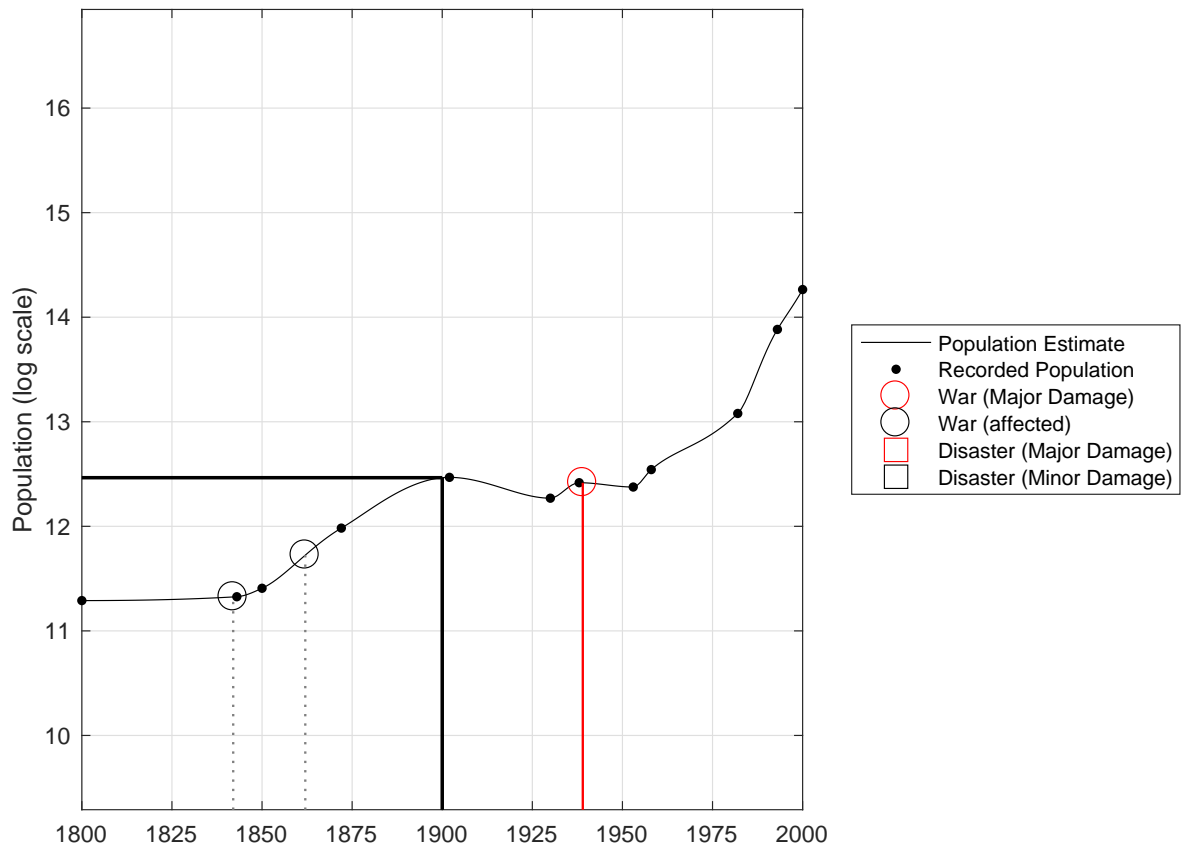


Figure 7: Ningbo

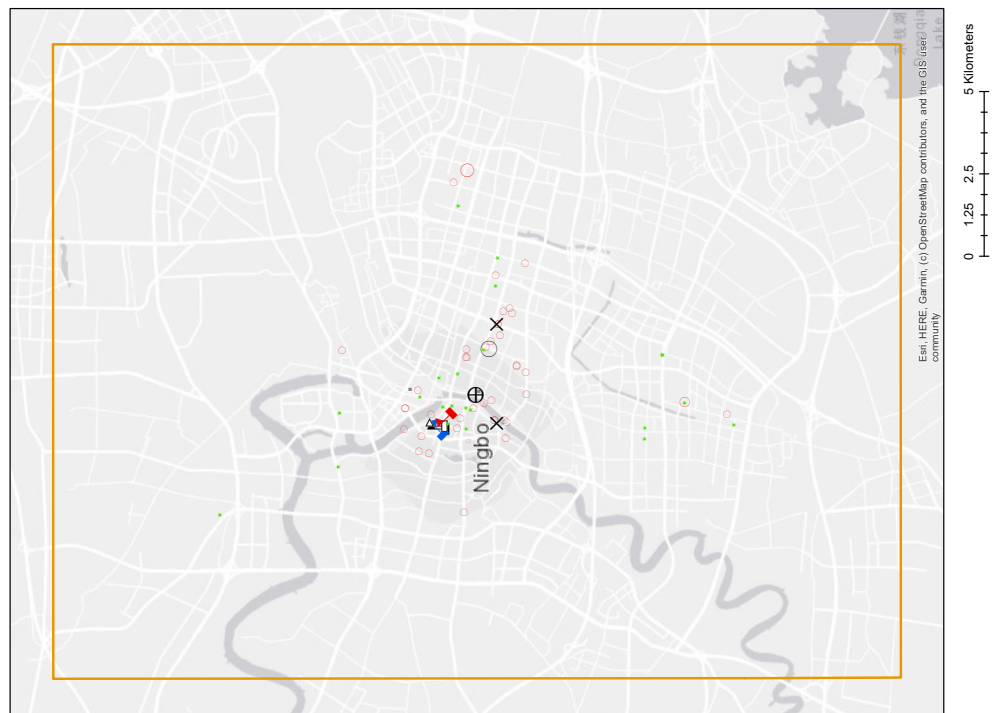
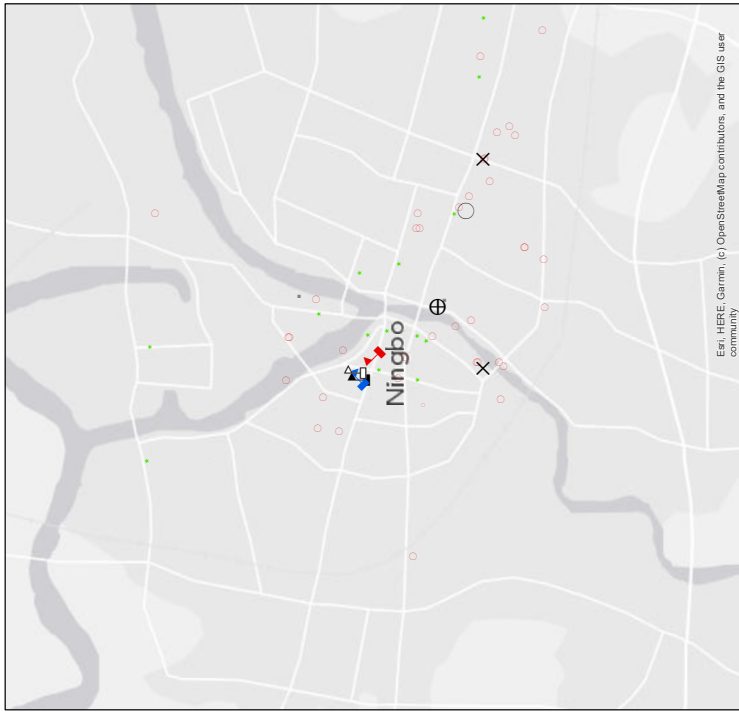




Table 13: Sources: Ningbo ( China )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>94</sup>	738	Schinz (1996, p. 206 & 210)
First Political Institution <sup>95</sup>	738	Schinz (1996, p. 206 & 210), Schinz (1989, p. 217)
City Hall <sup>96</sup>	1900	Schinz (1989, p. 219)
City Hall	2000	中共宁波市委办公厅 (2005)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950, 2000	Encyclopedia Britannica (2014)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1843, 1850, 1872, 1902, 1930, 1938, 1953, 1958, 1982, 1993, 2000, 2010	Chandler (1987b, p. 438), Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>97</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	2014	Railway Gazette (2014a, 1)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1862 <sup>98</sup>	Jaques (2007b, p. 732)
International War(s)	1842 <sup>99</sup> , 1939 <sup>100</sup>	中共宁波市党史研究室业务一处 (2005, p. 26), Jaques (2007b, p. 732)

<sup>94</sup>There has been a settlement ca 20 kilometers from Ningbo's current location (宁波网, 2010), which was moved in 738 to the current location of Ningbo. As this move constitutes a form of a foundation of a new city, we date the foundation accordingly to this move in 738 AD. Schinz (1996, p. 210) provides the layout of the city with the approximate location of the administrative offices and the notion that the layout survived almost 1200 years without change.

<sup>95</sup>The city was walled on ly in 907, but was chosen as an administrative center beforehand (Schinz, 1989, p. 217), which is why we take its foundation date as the date of the first city hall. The location is only approximate and follows the foundation approximation.

<sup>96</sup>The location is based on a mid-19th century data point (Schinz, 1989, p. 218-219), but we found no indication that the location changed.

<sup>97</sup>Footnote from United Nations Population Division (2014): For the 1982 and 1990 censuses, the data reflect all residents of urban areas of the city. For the 2000 and 2010 censuses, the population of the city is composed of population in all urban areas of six districts of the city (Haishu, Jiangdong, Jiangbei, Beilun, Zhenhai, and Yinzhou) meeting the

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criteria such as contiguous built-up areas, being the location of the local government, being a Street or Having a Resident Committee.

<sup>98</sup>Taiping Rebellion: the city was occupied and there might have been some destruction, but the extent is unclear which is why we code it as not a major disaster. For example, Schinz (1989, p. 218) says that merchants from Ningbo would do business in other cities, which were severely devastated. This makes us believe that destruction was at most modest in Ningbo.

<sup>99</sup>The first Opium War. It does not seem like there occurred any major damage in the city itself although 400 soldiers got killed in the siege.

<sup>100</sup>The Japanese bombing: However, as this event is not mentioned in Encyclopedia Britannica (2014), it is only coded as “major.”

Table 14: Concentration Measures - Ningbo

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	3.29
Cumulative density of employment-weighted PP distances at 750 m	%	9.45
Average distance between all prime locations	in kilometres	1.30
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	1.15
Weighted average distance from EWPPs to 1900 CH	in kilometres	2.76
Average from all prime locations to 1900 CH	in kilometres	2.37
Average distance from global prime locations to 1900 CH	in kilometres	2.61

B.8 Shanghai

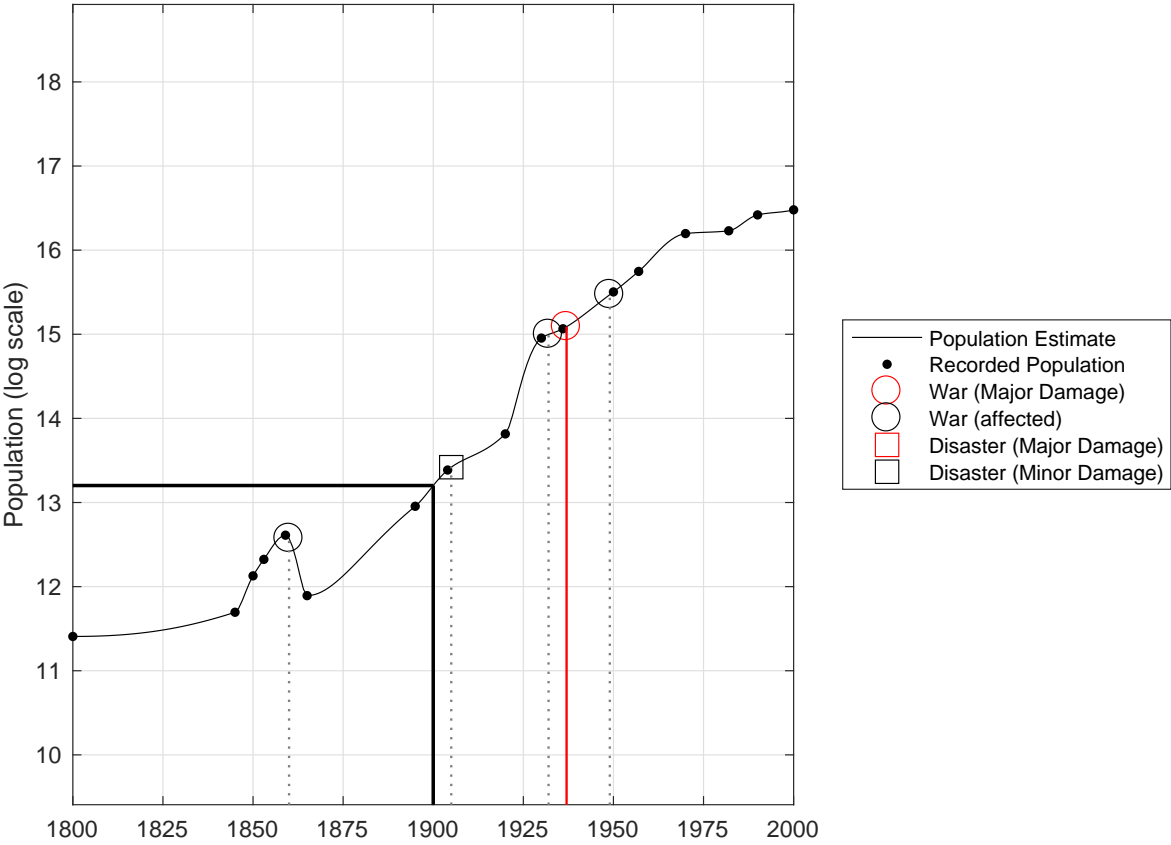
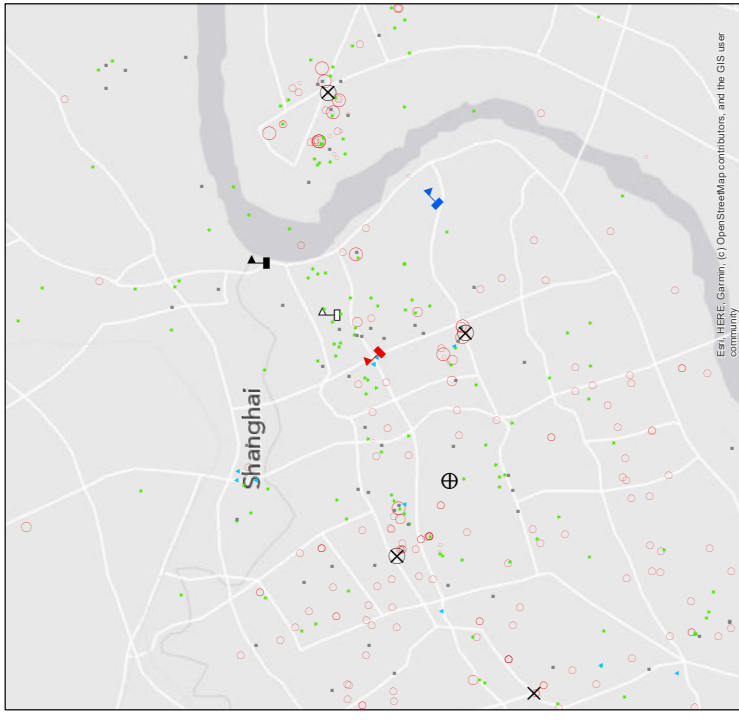
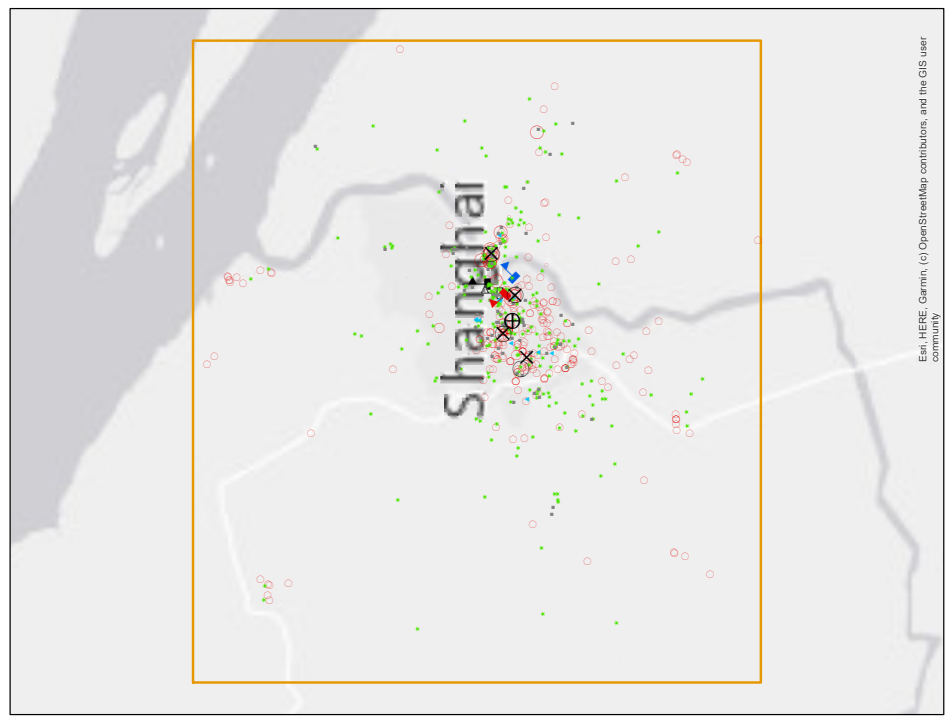


Figure 8: Shanghai



- Legend**
- X Prime location (any)
  - Global prime location
  - ⊕ Central point
  - Metro extent (prime services)
  - SNL Office Building
  - Starbucks
  - CoWorking
- Foundation Place**
- ▲ Foundation Place
  - ▲ First City Government
  - ▲ City Hall 1900
  - ▲ City Hall 2000
- EWWP**
- 450 - 918
  - 918 - 1507
  - 68 - 98
  - 98 - 450
  - 1507 - 1898



- Map of Shanghai showing various prime locations and historical markers. The map includes a scale bar from 0 to 14 Kilometers and a legend with categories like Prime location, Global prime location, Central point, Metro extent, and various historical markers.

Table 15: Sources: Shanghai ( China )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>101</sup>	317	Denison and Ren (2013, p. 13 & 19)
First Political Institution <sup>102</sup>	1292	Schinz (1996, p. 234 & p. 235)
City Hall <sup>103</sup>	1900	Denison and Ren (2013, p. 74)
City Hall	2000	Denison and Ren (2013, p. 13 & 222-224), 中共上海市委 (2014)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>104</sup> , 1900, 1950, 2000	牛 (1990, p. 134), Baruch (2014)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1845, 1850, 1853, 1859, 1865, 1895, 1904, 1920, 1930, 1936, 1950, 1957, 1970, 1982, 1990, 2000, 2010	Chandler (1987b, p. 441)
Metro Population <sup>105</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening <sup>106</sup>	1995	Low (2012, 143)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	Gettysburg Times (1931, p. 2)
Fire(s)	None recorded	
Hurricane(s)	1905 <sup>107</sup>	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1860 <sup>108</sup> , 1949 <sup>109</sup>	张 (2010, p. 56), Ring et al. (1996, p. 735)
International War(s)	1932 <sup>110</sup> , 1937 <sup>111</sup>	蔡 (2004, p. 117), Boxer (2014a), 张 (2010, p. 58)

<sup>101</sup>There have been settlements in the wider area before, but we take the first that is very to modern day Shanghai and was probably the most important one for the later settlement (Denison and Ren, 2013, p. 19). The source says it was close to the site of the later British consulate, but at the banks of the Woosong river, which is why we choose a position slightly north-west from the consulate based on the maps given in Denison and Ren (2013, p. 13).

<sup>102</sup>This is the approximate location according to Schinz (1996, p. 234 & p. 235).

<sup>103</sup>We take the center of Nanjing road for the town hall built in 1892 because the exact location on the road is unknown to the authors.

<sup>104</sup>In Qing, Shanghai is in Jiangsu Province. Shanghai became a province-level municipality in 1949, which is similar to the rank of a province.

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<sup>105</sup>Footnote from United Nations Population Division (2014): For the 1982 and 1990 censuses, the data reflect all residents of urban areas of the city. For the 2000 and 2010 censuses, the population of the city is composed of population in all urban areas of sixteen districts of the city as in 2013 (Baoshan, Changning, Fengxian, Hongkou, Huangpu, Jiading, Jing'an, Jinshan, Minghang, Pudong, Putuo, Qingpu, Songjiang, Xunhui, Yangpu, and Zhabei) meeting the criteria such as contiguous built-up areas, being the location of the local government, being a Street or Having a Resident Committee.

<sup>106</sup>This is the metro of Shanghai.

<sup>107</sup>There was one a typhoon striking Shanghai and flooding the city in 1905 and 1931 (Gettysburg Times, 1931). However, neither Denison and Ren (2013) nor Ring et al. (1996, p. 732f) record these in their city histories.

<sup>108</sup>Shanghai was an important base during the Taiping rebellion.

<sup>109</sup>One of the wars of Liberation.

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<sup>110</sup>In 1932, the Japanese Army bombed Zhabei District, Shanghai

<sup>111</sup>The city suffered great loss of life and heavy destruction (Ring et al., 1994, p. 737).



Table 16: Concentration Measures - Shanghai

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	9.01
Cumulative density of employment-weighted PP distances at 750 m	%	26.78
Average distance between all prime locations	in kilometres	3.32
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.74
Weighted average distance from EWPPs to 1900 CH	in kilometres	6.49
Average from all prime locations to 1900 CH	in kilometres	2.95
Average distance from global prime locations to 1900 CH	in kilometres	2.92

B.9 Suzhou

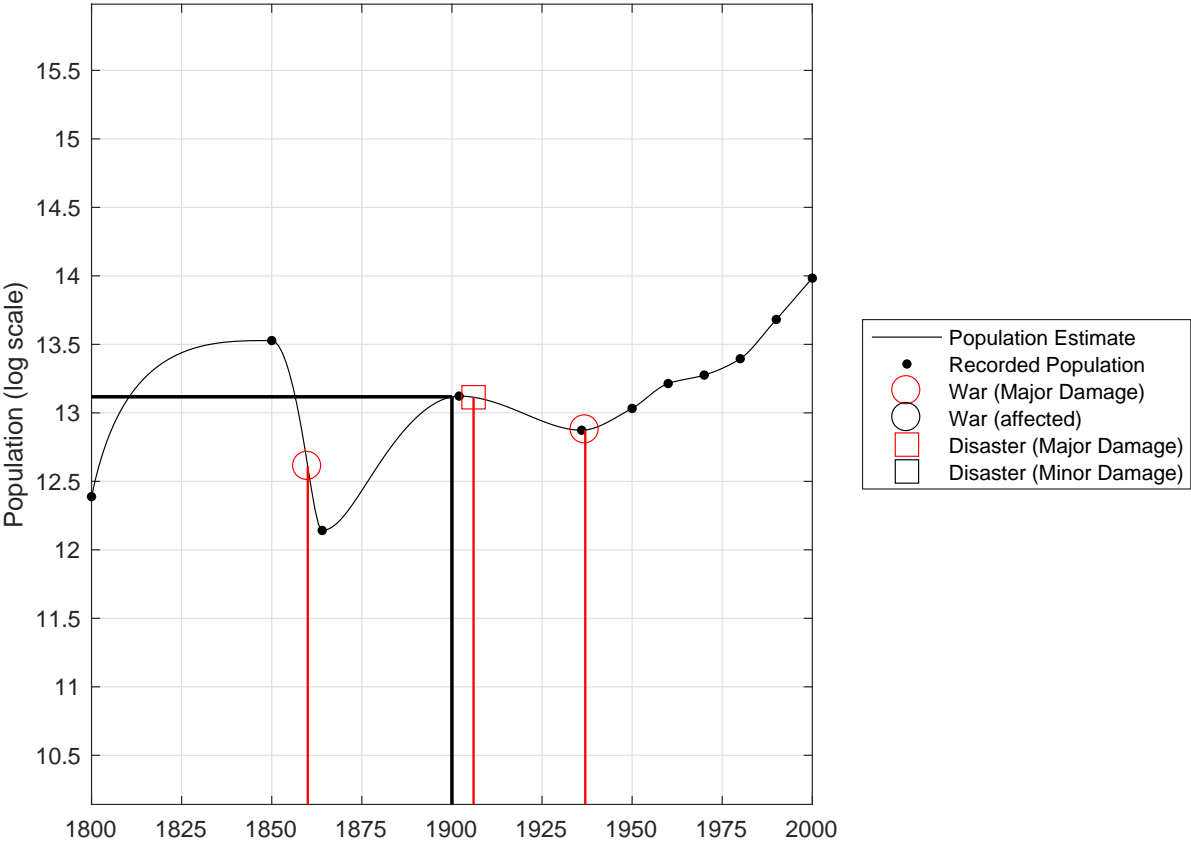
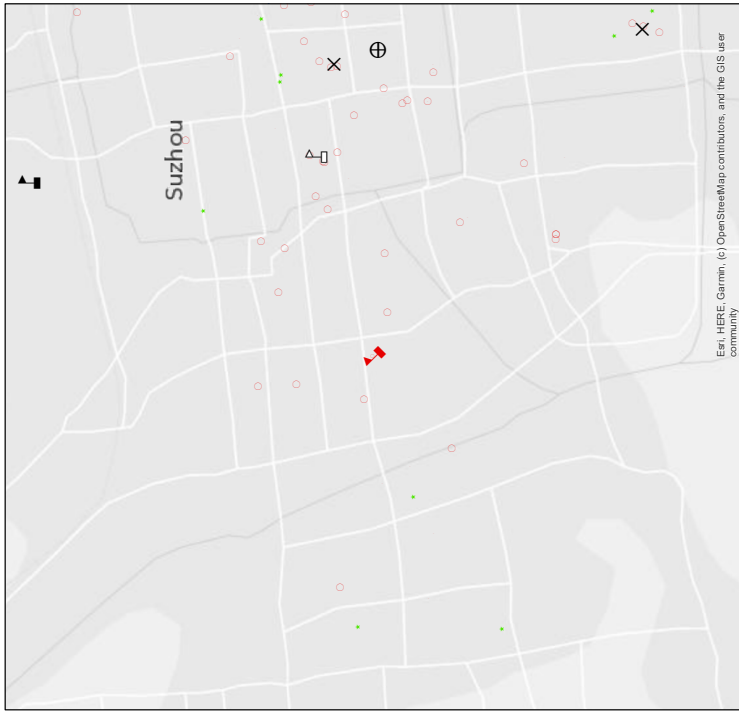


Figure 9: Suzhou



- Legend**
- X Prime location (any)
  - Global prime location
  - ⊕ Central point
  - Metro extent (prime services)
  - SNL Office Building
  - Starbucks
  - CoWorking
- Foundation Place    EWWP    450 - 918  
 First City Government    68 - 98    918 - 1507  
 City Hall 1900    98 - 450    1507 - 1898  
 City Hall 2000

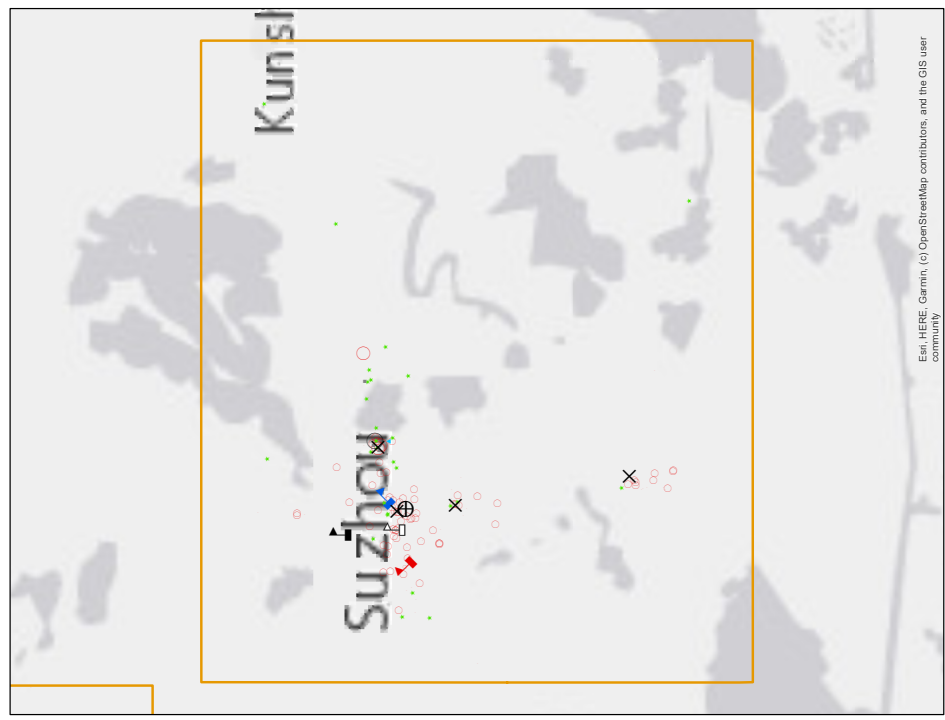


Table 17: Sources: Suzhou ( China )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>112</sup>	-560	苏州市人民政府 (2014a), Schinz (1996, p. 252), Ring et al. (1996, p. 778)
First Political Institution <sup>113</sup>	-514	苏州市人民政府 (2014b), Ring et al. (1996, p. 776)
City Hall <sup>114</sup>	1900	Academica Sinica (2012)
City Hall <sup>115</sup>	2000	中共苏州市委组织部 (2014)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>116</sup> , 1900, 1950, 2000	牛 (1990, p. 133), Encyclopaedia Britannica (2013a)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1864, 1902, 1936, 1950, 1960, 1970, 1980, 1990, 2000	Schinz (1989, p. 192), UN Habitat (1999, p. 213), Clark (2013, p. 391), Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>117</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	2012	UN Habitat (2013, 45)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	1906 <sup>118</sup>	张 (2010, p. 167)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1860 <sup>119</sup>	蔡 (2004, p. 209), Encyclopaedia Britannica (2013a)
International War(s)	1937 <sup>120</sup>	蔡 (2004, p. 210)

<sup>112</sup>We know that there was a settlement at Tiger hill not far North-West of the place where the city would be eventually be set up (Schinz, 1996, p. 252). However, it is unclear in what period this area was settled. Schinz (1996, p. 94) argues that there was some urban activity as early as 560 BC. However, this is not the city Suzhou would grow from. Nevertheless it constitutes the first (close by) settlement.

<sup>113</sup>In 514BC, Suzhou was made the capital city of Wu State by Wuzixu. The inner city, the Royal Palace of Wu, had not changed until much later

<sup>114</sup>This is where the general prefectural officecourt was in 1883. An alternative location would be 500 metres eastwards.

<sup>115</sup>2014: The location is confirmed by Chineseepc news website.

<sup>116</sup>In Qing, Suzhou and Nanjing are both capital cities of Jiangsu.

<sup>117</sup>Footnote from United Nations Population Division (2014): For the 1982 and 1990 censuses, the data reflect all residents of urban areas of the city. For the 2000 and 2010 censuses, the population of the city is composed of population

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in all urban areas of five city districts (Gusu, Huqiu, Wuzhong, Xiangcheng, Wujiang) meeting the criteria such as contiguous built-up areas, being the location of the local government, being a Street or Having a Resident Committee.

<sup>118</sup>Unsure about the destruction. Great flood.

<sup>119</sup>1860-1863: Taiping seized Suzhou. Before leaving, Qing Army set fire everywhere in Suzhou.

<sup>120</sup>After Suzhou fell, the Japanese Army set fire everywhere.

Table 18: Concentration Measures - Suzhou

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	7.44
Cumulative density of employment-weighted PP distances at 750 m	%	17.90
Average distance between all prime locations	in kilometres	6.60
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.78
Weighted average distance from EWPPs to 1900 CH	in kilometres	5.19
Average from all prime locations to 1900 CH	in kilometres	5.70
Average distance from global prime locations to 1900 CH	in kilometres	5.49

B.10 Tianjin

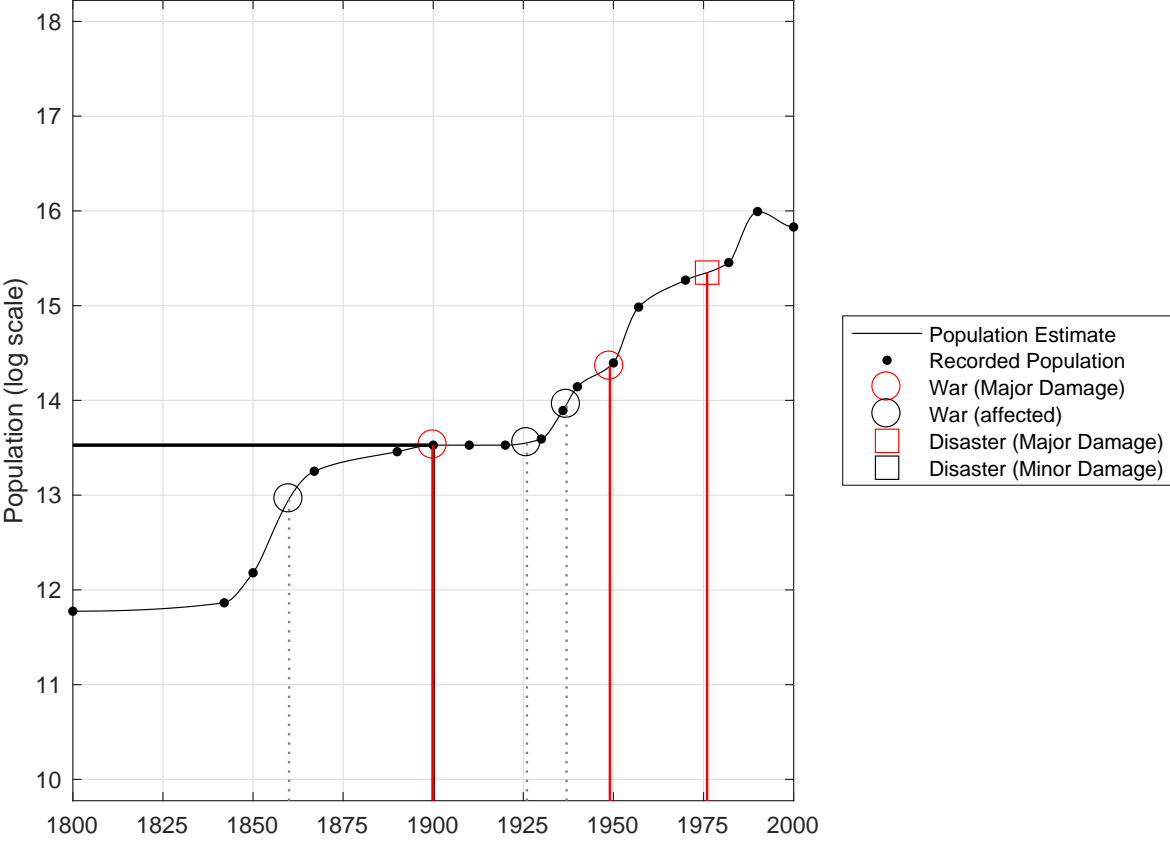


Figure 10: Tianjin

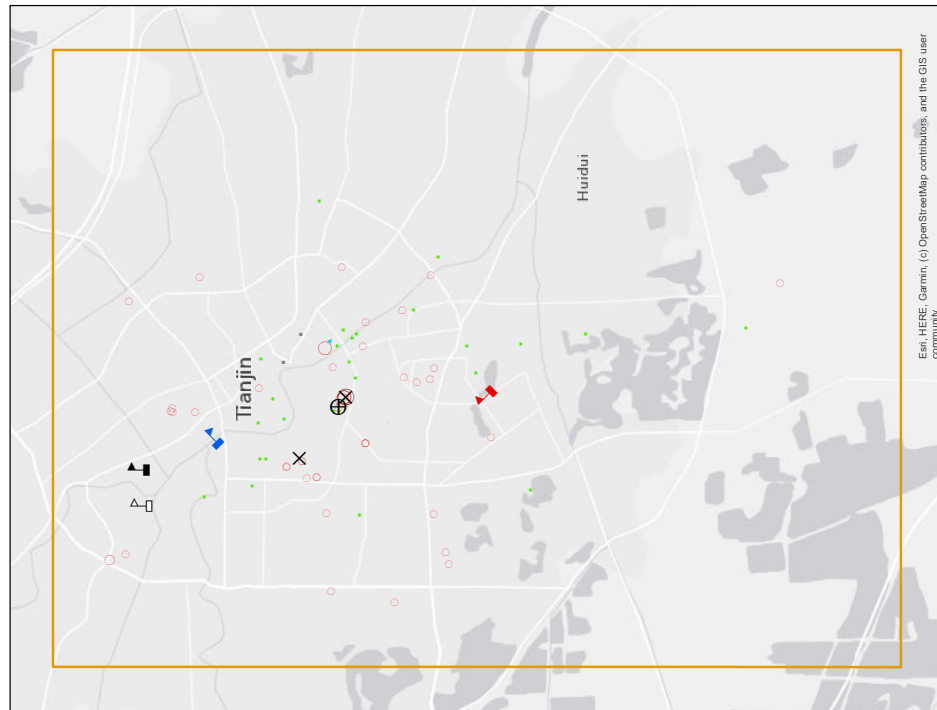
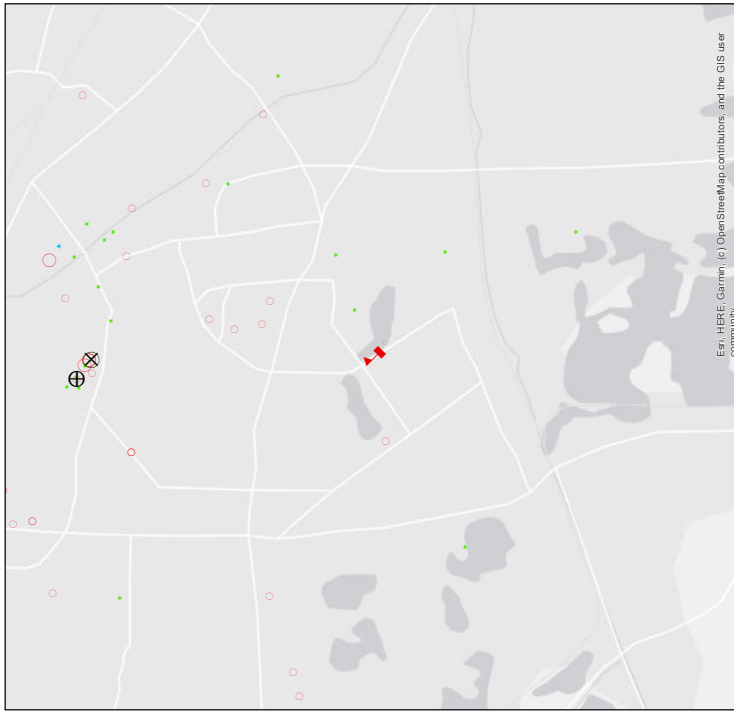




Table 19: Sources: Tianjin ( China )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>121</sup>	1214	天津市地方志 (2014)
First Political Institution <sup>122</sup>	1404	王 (2004, p. 10), Tianjin Planning Bureau (2009)
City Hall <sup>123</sup>	1900	University of Bristol (2012)
City Hall	2000	中共天津市委组织部 (2014)
<i>Government Types (1850-2000)</i>		
Government Type	1850, 1900, 1950 <sup>124</sup> , 2000	牛 (1990, p. 15), Boxer (2014b)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1842, 1850, 1867, 1890, 1900, 1910, 1920, 1930, 1940, 1936, 1950, 1957, 1970, 1982, 1990, 2000, 2010	Chandler (1987b, p. 446), Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>125</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	1984	Matilla (2011, 13)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	1976 <sup>126</sup>	Perkins (2013, p. 525), Boxer (2014b)
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	None recorded	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1926 <sup>127</sup> , 1949 <sup>128</sup>	Jaques (2007a, p. 1016), Brown and Pierce (2013, p. 134)
International War(s)	1860 <sup>129</sup> , 1937 <sup>131</sup> , 1900 <sup>130</sup>	Jaques (2007a, p. 1016), Ring et al. (1994), Bickers and Tiedemann (2007, p. 133), Boxer (2014b)

<sup>121</sup>In 1214, Jin Dynasty set up Zhigu, a stockaded village in this area. Tianjin developed from the water transportation of goods and army. From plenty of literature, it firstly functioned as a wharf, which is located at the intersection of three rivers: canal river and branches of Haihe.

<sup>122</sup>In 1404, Ming established Tianjin. The cityhall was located at Nanmen Inner Street and Zhenshudaqiang Hutong, which is in the old city and to the west of the drum-tower.

<sup>123</sup>Approximate location.

<sup>124</sup>Province-level city.

<sup>125</sup>Footnote from United Nations Population Division (2014): For the 1982 and 1990 censuses, the data reflect all residents of urban areas of the city. For the 2000 and 2010 censuses, the population of the city is composed of population

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in all urban areas of thirteen districts of the city (Heping, Hedong, Hexi, Nankai, Hebei, Hongqiao, Dongli, Xiqing, Jinnan, Beichen, Wuqing, Baodi, and Binhai) meeting the criteria such as contiguous built-up areas, being the location of the local government, being a Street or Having a Resident Committee.

<sup>126</sup>In 1976, Tangshan Earthquake devastated Tianjin: thousands of people died.

<sup>127</sup>War in Tianjin area between 1926 to 1928 and they needed a lot of donation.

<sup>128</sup>3rd Chinese Revolutionary Civil War

<sup>129</sup>“City was shelled by the British and French” (Boxer, 2014b). However as the extent of destruction is unclear, it is coded as “minor.”

<sup>130</sup>In 1900, Tianjin was occupied by allied troops for 25 months. They destroyed the city walls (Boxer, 2014b).

<sup>131</sup>Occupation by the Japanese: however, Tianjin “was spared the destruction the latter [Japanese] wrought on other cities” (Ring et al., 1994, p. 816).

Table 20: Concentration Measures - Tianjin

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	4.15
Cumulative density of employment-weighted PP distances at 750 m	%	12.81
Average distance between all prime locations	in kilometres	0.97
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.33
Weighted average distance from EWPPs to 1900 CH	in kilometres	5.81
Average from all prime locations to 1900 CH	in kilometres	5.17
Average distance from global prime locations to 1900 CH	in kilometres	5.82

B.11 Wuhan

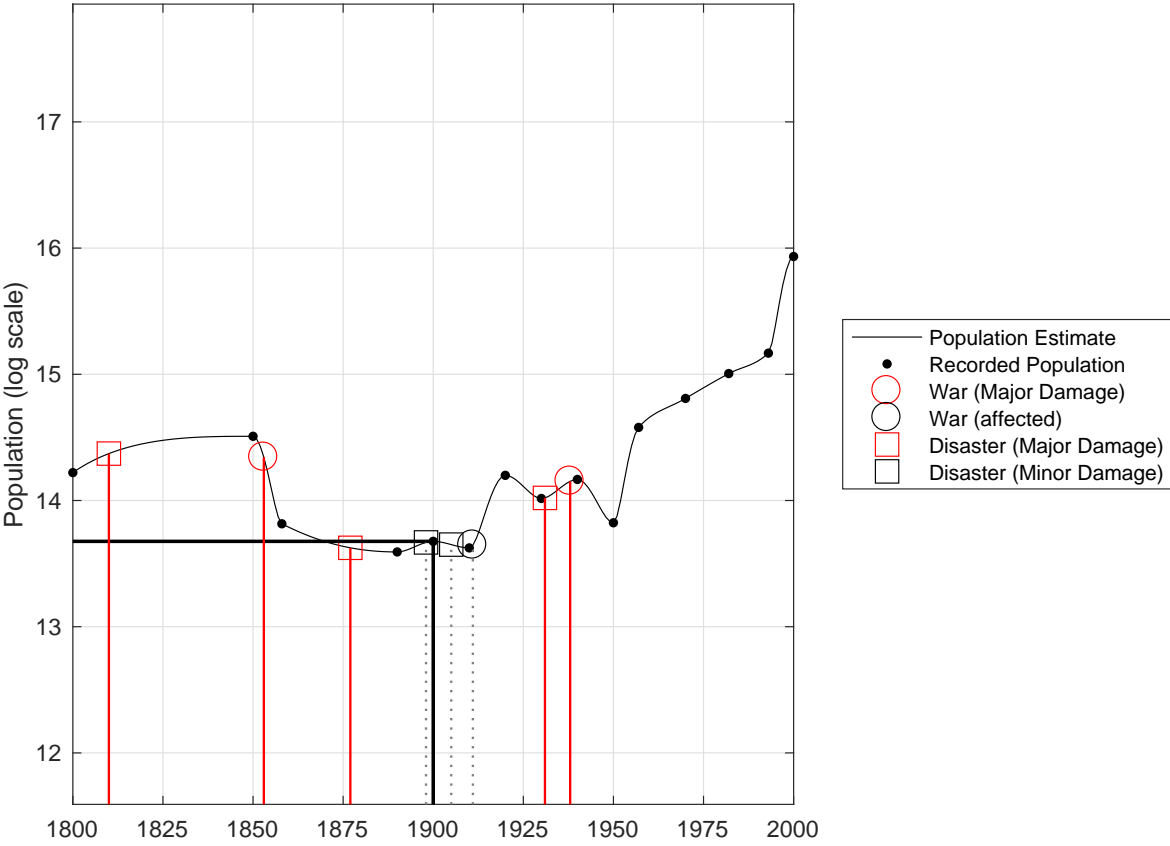


Figure 11: Wuhan

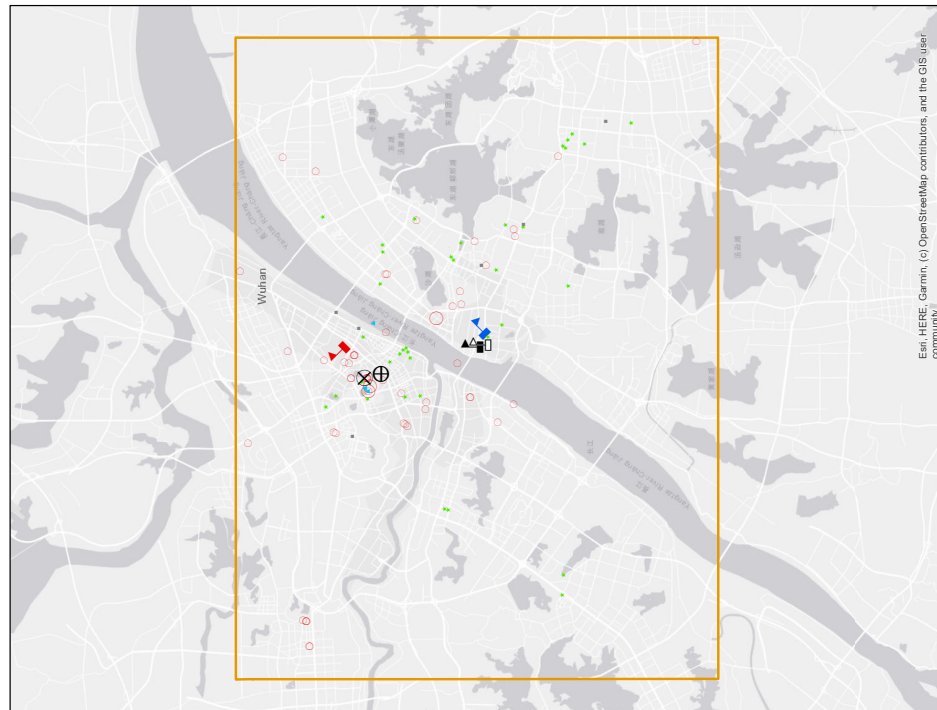
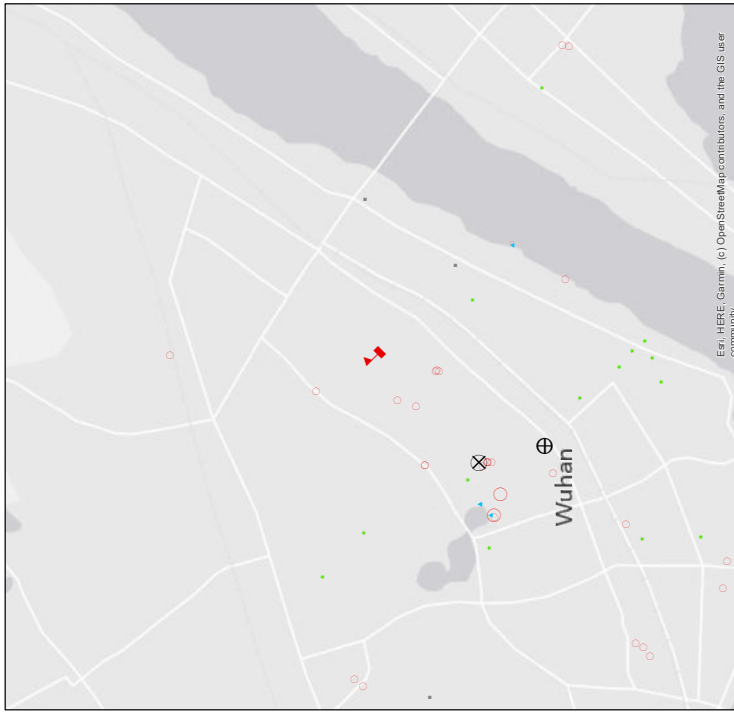


Table 21: Sources: Wuhan ( China )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>132</sup>	-5	Ring et al. (1996, p. 866), Schinz (1996, p. 244).
First Political Institution <sup>133</sup>	220	Ring et al. (1996, p. 866)
City Hall <sup>134</sup>	1900	Schinz (1989, p. 245)
City Hall <sup>135</sup>	2000	中共武汉市委宣传部 (2014, p. 234)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>136</sup> , 1900, 1950, 2000	牛 (1990, p. 234), Encyclopaedia Britannica (2013b)
<i>Population Data (1800-2000)</i>		
City Population	1800, 1850, 1858, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1957, 1970, 1982, 1993, 2000, 2010	Rowe (1984, p. 40), Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>137</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	2004	Matilla (2011, 13)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	
Fire(s)	1810 <sup>138</sup> , 1877 <sup>139</sup> , 1898 <sup>140</sup> , 1905 <sup>141</sup>	王 (2010, p. 87), 王 (2010, p. 89), 王 (2010, p. 90)
Hurricane(s)	None recorded	
Flooding(s)	1931 <sup>142</sup>	Penna and Rivers (2013, p. 140)
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1853 <sup>143</sup> , 1911 <sup>144</sup>	Jaques (2007a, p. 434), Jaques (2007a, p. 709)
International War(s)	1938 <sup>145</sup>	MacKinnon (2008, p. 120-122)

<sup>132</sup>About 3500 years ago, an old city, named Panlong, was constructed in Wuhan area. However, this neolithic settlement does not seem to be the origin of Wuhan, which was first referenced around 2020 years ago (Ring et al., 1996, p. 866). It proved impossible to find the exact location, but it is fair to assume that it was at the river banks not far from where the palace would be built in 223.

<sup>133</sup>Wuchang is the oldest part of Wuhan. It became capital of the state of Wu here for a brief period of time. A castle was built on snake hill in 223 AD, which we take as the geo-reference (Ring et al., 1996, p. 866).

<sup>134</sup>We take the map of the imperial city here, which probably refers to the mid-19th century (Schinz, 1989, p. 245). The location is the one of the office of the prefect of Wuchang

<sup>135</sup>The location is confirmed by the publicity department of Wuhanpc.

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<sup>136</sup>Wuhan consisted formerly of three towns in Qing: Wuchang, Hanyang and Hankou (governed by Hanyang). Wuchang was the capital city of Hubei Province in Qing.

<sup>137</sup>Footnote from United Nations Population Division (2014): For the 1982 and 1990 censuses, the data reflect all residents of urban areas of the city. For the 2000 and 2010 censuses, the population of the city is composed of population in all urban areas of thirteen districts of the city (Jiang'an, Jianghan, Qiaokou, Hangyan, Wuchang, Qingshan, Hongshan, Dongxihu, Hannan, Caidian, Jiangxia, Huangpo, and Xinzhou) meeting the criteria such as contiguous built-up areas, being the location of the local government, being a Street or Having a Resident Committee.

<sup>138</sup>The great fire in Hankou lasted for 3 days, burning more than 80,000 stores and houses.

<sup>139</sup>The great fire went through the Luxi Street and finally stopped due to the river.

<sup>140</sup>More than 5000 buildings were destroyed and more than 1000 people died.

<sup>141</sup>The gangster set fire, burning more than 40 houses.

<sup>142</sup>Floodwater inundated and destroyed Wuhan

<sup>143</sup>Taiping Rebellion: Taiping seized Wuhan area. Hankow lost half of its population, which is why we consider it a major event. The Taipings "razed the town completely" (Rowe, 1984, p. 41)

<sup>144</sup>Chinese revolution began in Wuchang, a part of Wuhan.

<sup>145</sup>Large boomings, air battles and blood. Then Wuhanfell.

Table 22: Concentration Measures - Wuhan

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	8.12
Cumulative density of employment-weighted PP distances at 750 m	%	19.79
Average distance between all prime locations	in kilometres	0.00
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	0.51
Weighted average distance from EWPPs to 1900 CH	in kilometres	7.19
Average from all prime locations to 1900 CH	in kilometres	6.03
Average distance from global prime locations to 1900 CH	in kilometres	6.03



B.12 Wuxi

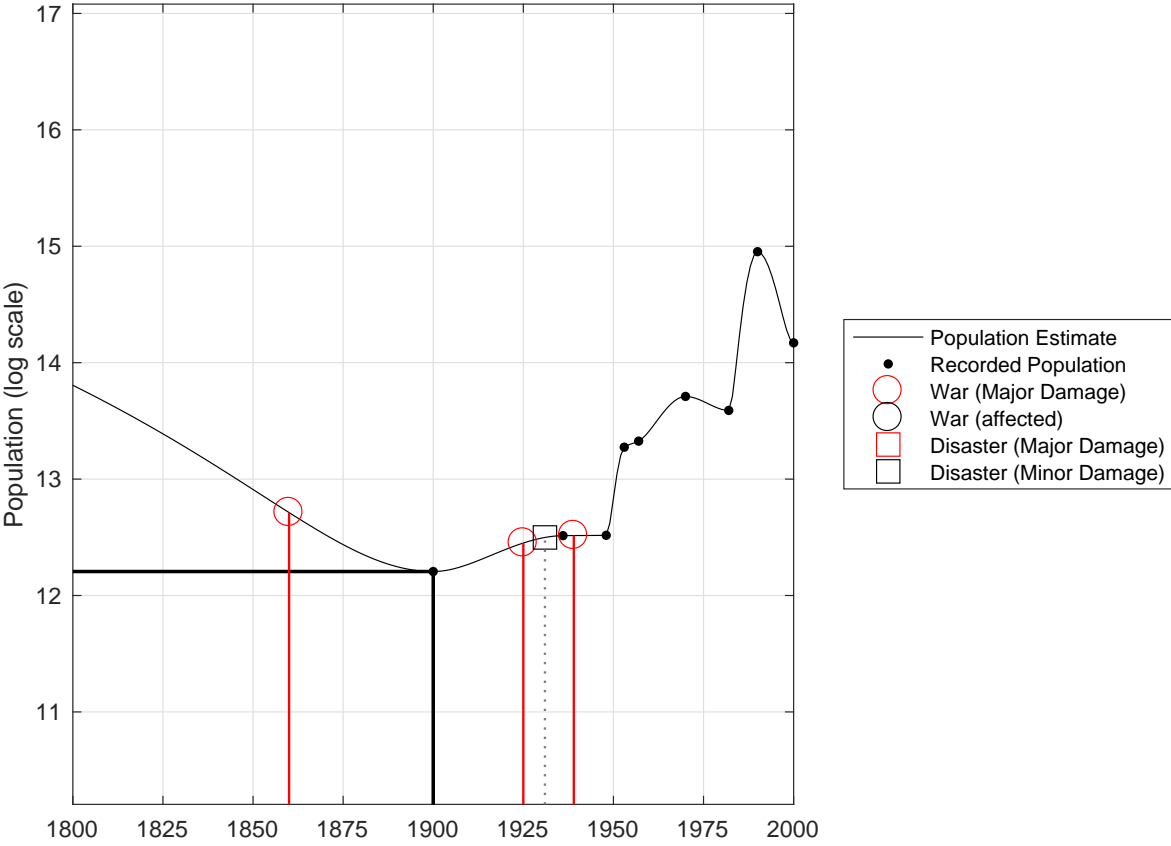


Figure 12: Wuxi

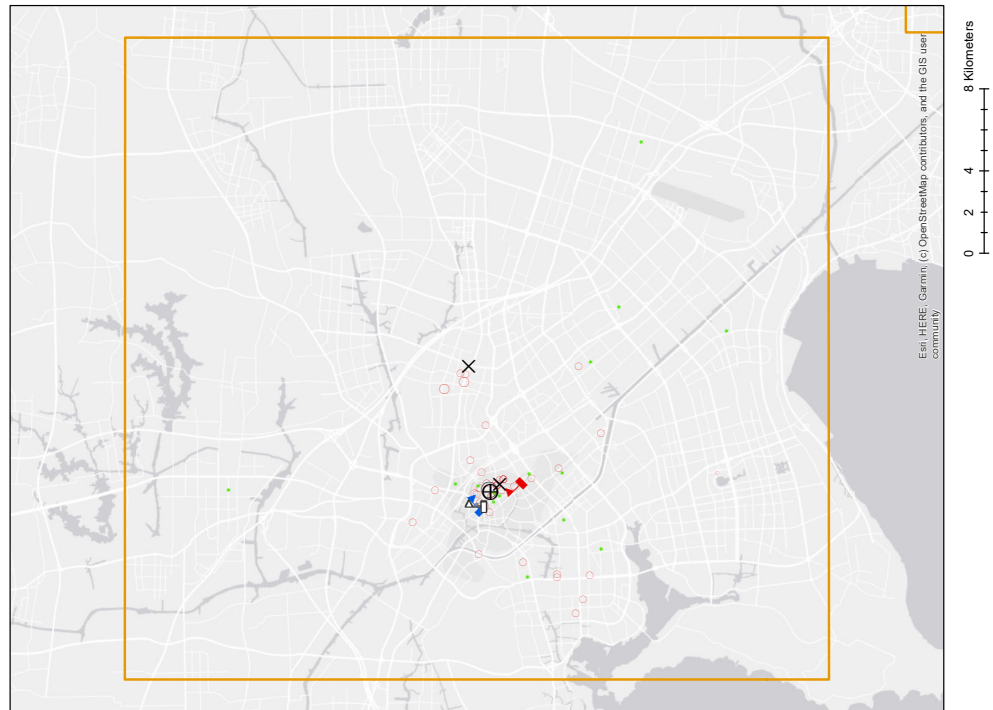
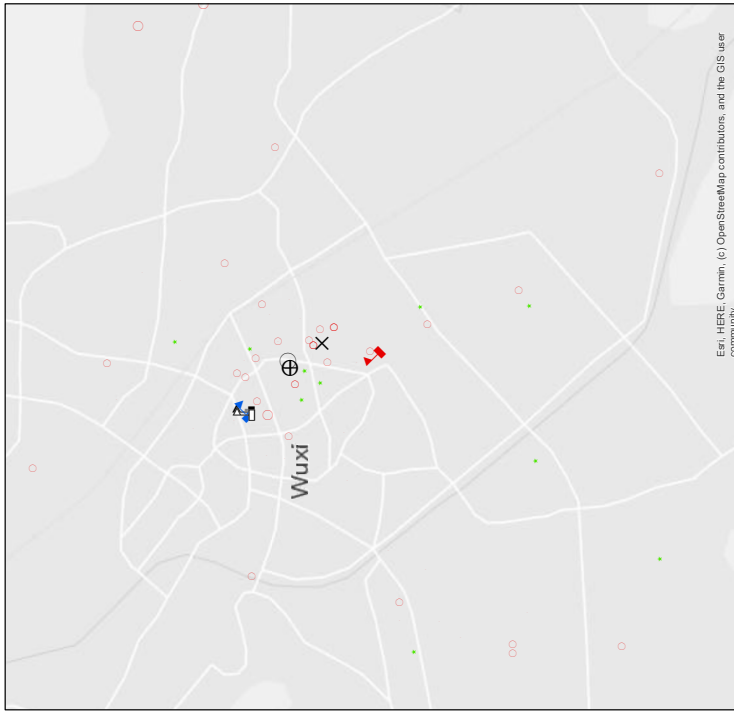


Table 23: Sources: Wuxi ( China )

Variable	Year(s)	Sources
<i>Foundation Place and City Halls</i>		
First Settlement <sup>146</sup>	-1100	无锡市史志办 (2013), Schinz (1989, p. 223 & 226)
First Political Institution <sup>147</sup>	-202	无锡市史志办 (2013), Schinz (1989, p. 223 & 226)
City Hall <sup>148</sup>	1900	Schinz (1989, p. 223 & 226)
City Hall <sup>149</sup>	2000	Schinz (1989, p. 227)
<i>Government Types (1850-2000)</i>		
Government Type	1850 <sup>150</sup> , 1900, 1950, 2000	Encyclopædia Britannica (2013)
<i>Population Data (1800-2000)</i>		
City Population	1795, 1900, 1936, 1948, 1953, 1957, 1970, 1982, 1990, 2000, 2010	Rawski and Li (1992, p. 212), Schinz (1989, p. 224), Schinz (1989, p. 225), Mitchell and Palgrave Macmillan (2014)
Metro Population <sup>151</sup>	1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015	United Nations Population Division (2014)
<i>Rapid Transit System</i>		
System Opening	2014	Railway Gazette (2014b, 1)
Number of Stations	1910, 1940, 2010	Gonzalez-Navarro and Turner (2016)
<i>Disasters (1800-2000)</i>		
Earthquake(s)	None recorded	譙 (2007, p. 137)
Fire(s)	None recorded	
Hurricane(s)	None recorded	
Flooding(s)	1931 <sup>152</sup>	
<i>Wars (1800-2000)</i>		
Civil Wars(s)	1860 <sup>153</sup> , 1925 <sup>154</sup>	蔡 (2004, p. 154), 蔡 (2004, p. 178)
International War(s)	1939 <sup>155</sup>	蔡 (2004, p. 157)

<sup>146</sup>We are unsure about the exact timing. In the end of 11th century BC, Taibo, a son of Zhou King, settled in Meili, Wuxi and set the earliest city (无锡市史志办, 2013). See also Schinz (1989, p. 223) for a discription of the different legends.

<sup>147</sup>In 202 BC, Emperor Gaozu of Han set Wuxi county (无锡市史志办, 2013). Very approximate location: We take a later sketch of the city for determining the location (Schinz, 1996, p. 250). This is reasonable as there seems to have been little growth. Only in 1022 the city was actually walled.

<sup>148</sup>We take the mid 19th century location from Schinz (1989, p. 223 & 226) as there seems to have been no change until 1900.

<sup>149</sup>This is the 1982 location of Wuxi Municipality. It has been moved later as today it's not in the same place anymore

<sup>150</sup>A city of Jiangsu Province

<sup>151</sup>Footnote from United Nations Population Division (2014): For the 1982 and 1990 censuses, the data reflect all residents of urban areas of the city. For the 2000 and 2010 censuses, the population of the city is composed of population in all urban areas of six districts of the city (Chong'an Nanchang, Beitang, Xishan, Huishan, and Binhu) meeting the criteria such as contiguous built-up areas, being the location of the local government, being a Street or Having a Resident

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Committee.

<sup>152</sup>The 1931 flood directly affected the silk industry in Wuxi.

<sup>153</sup>Taiping Battle almost ruined the city.

<sup>154</sup>Warlords expanded in Jiangsu, ruining the commerce and market of Wuxi.

<sup>155</sup>Japan fired, killed and grabbed between 1939 and 1942.

Table 24: Concentration Measures - Wuxi

<b>Variable</b>	<b>Unit</b>	<b>Values</b>
<i>Measures of concentration irrespective of old center</i>		
Employment-weighted distance between PPs	in kilometres	4.23
Cumulative density of employment-weighted PP distances at 750 m	%	8.69
Average distance between all prime locations	in kilometres	2.38
<i>Measures of concentration relative to old center</i>		
1900 town hall distance density gradient	elasticity	-0.13
Weighted average distance from EWPPs to 1900 CH	in kilometres	3.01
Average from all prime locations to 1900 CH	in kilometres	2.19
Average distance from global prime locations to 1900 CH	in kilometres	0.86

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