

Using GIS mapping system for the investigation of elderly data, and promotion and support projects

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The purpose of the presentation

This presentation is designed for officers who work in the development of municipal services for senior citizens.

In this presentation, I would like to share some test cases which I developed by GIS mapping system to building innovative information or to promote projects for senior citizens.

The presentation displays geographic tools which are common in other urban areas, such as education or engineering.

The examples presented here have been prepared during my work in Holon, Israel. All the maps have been prepared with the generous help of the GIS department staff of the Municipality of Holon.

My role as social geographer and social services planner was to know to ask the right questions and ask for the right maps.

I would be happy to receive any comments or questions

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Using urban maps to promote programs for senior citizens services

One of the challenges in developing senior citizens services is the need to create databases and information that will allow us to know them and their needs.

This paper presents a geographical method for locating and identifying the distribution of senior citizens in the city and secondary data resulting from the geographic dispersal.

Using GIS maps as a tool for urban planning is common. Many municipal systems have a GIS department that creates maps for a variety of needs: urban and regional zoning planning, drawing school registration areas, placing physical infrastructure, identifying drainage problems, and more.

The purpose of this presentation is to present some potential uses of GIS for the development of services for senior citizens.

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GIS mapping system

The GIS system is composed of layers of city maps; to make innovative information one should add geographic information dealing with senior citizens.

Geographic information is any information that has MR or a precise address, for example: location of car accidents involving the elderly or public gardens and shopping centers in which the elderly gather.

The following examples will demonstrate the way in which the maps were constructed. Each map will be attached to a "Recipe": What you should ask from your local GIS office to produce similar maps.

Ethics and confidentiality. There is no need to use personal information such as names since the goal is to create a general count and general characteristics of places.

Map No. 1: Senior citizens distribution by residential address

This map is the basis for planning and locating different public services for senior citizens. It provides a static picture of where the elderly live today!

The map was designed by dividing the city into squares of 200 square meters (an easy walking range for people over 70 years old, as a range of walking to do shopping, the public park, or a social and cultural center).

In each square were counted the number of residents over 70 years old for whom their home address is within the square.

Coloring of the squares is by number of elderly addresses. The color scale is determined by your decision or the mapping system auto scale. It varies according to the quantities of people, as well as the number of people you are looking for. Over 100? Under 50? Consult the GIS expert.

Beware! There are neighborhoods with low single-story houses, and also residential buildings housing many people.

In Map No. 1, it clearly shows that in 2015, the senior citizen population is concentrated in three areas. Two are veteran neighborhoods while the third is old and inhabited by a community of immigrants from the Soviet Union, characterized by a high proportion of elderly.

Possible uses of the Basic Map

- **To know where senior citizens live in and where are their main residential areas**
- **Increased maintenance of sidewalks, for maximum comfort of senior citizens.**
- **Designing public parks and commercial centers convenient to the needs of senior citizens.**
- **Placing toilet facilities, water, and comfortable seating.**
- **Design and placement of benches**
- **Checking the status of traffic lights and the pedestrian crossings**
- **Placing billboards aiming for Senior Citizens.**

Map No.2: A layer of senior citizens locations and a layer of road accidents with casualties over the age of 65

This map is built on the base map, with an extra layer of road accidents in which there were casualties of pedestrians over 65.

To add a layer of road accidents it is necessary to create an Excel table with accident data. This statistic is available at the Ministry of Transport, CBS, or organizations that handle road accidents.

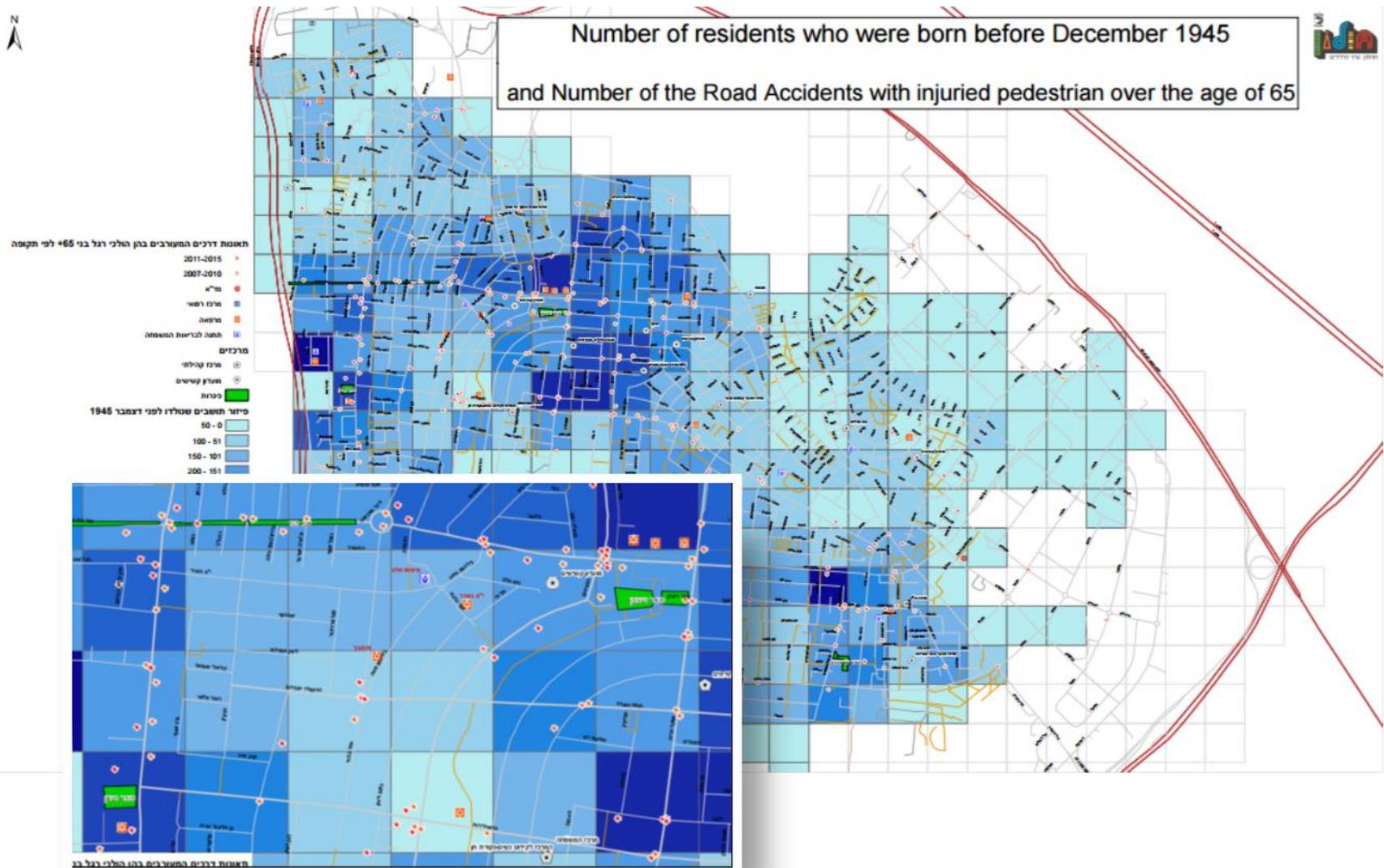
It can include properties such as type of accident, number and type of casualty, and of course location (map reference or an exact address). The GIS system creates a new layer of points of road accidents that have the properties that are attached to the map reference point.

It is possible to see where there are concentrations of traffic accidents, color the accidents' symbol by number of casualties or the type of accident. It is also possible to count the number of accidents in certain places. For example, the number of road accidents in the city center. Or examine the relationship between the number of road accidents and the existence or non-existence of pedestrian crossings. (Pedestrian crossings could be another information layer).

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In addition you can see the main traffic line in which there are many accidents. These indicate a greater

Map No.2: A layer of senior citizens distribution and a layer of road accidents with casualties over the age of 65



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Possible uses for the map of accidents with injured persons over the age of 65

This map has multiple uses to prevent accidents by identifying places with multiple accidents and researching the reasons for it.

- 1. Repair and adjust the infrastructure** to the senior citizens' needs. For example to check whether the traffic light time is too short, crosswalks are not marked well, or there is no pedestrian crossings where old people need it. Offer an annual plan for painting pedestrian crossings where many elderly are staying.
- 2. Promote a public campaign** to prevent older adult accidents, and distribute educational materials, especially in areas prone to accidents. Place warning signs to drivers in these places.
- 3.** In addition, use the road accidents as an indicator **marking the walking routes** used by many senior citizens. For example, placing more benches and shade facilities on these routes. Adding benches at the traffic lights and near pedestrian crossings could encourage senior citizens to go there, and not be tempted to cross the road without a crosswalk or crossing at a red light because they have no strength to stand and wait for the green light.

Analysis of future changes in the geographic layout of senior citizens' residence in city

The following three maps present the distribution of seniors citizens in the city of Holon, by Age Group.

The purpose of this group of maps is to assess the future changes in the senior citizens' residence located in the city.

The recipe

- set three levels of age: 60-66, 67-74, and over 75, to create one map for each age group.
- The city map was divided into squares of 400 square meters counting the number of elderly residents whose address is in the square by age.
- The red and orange squares are marked where there are more than 200 people, yellow 100 to 150, and the greens less than 100 people.

The main conclusion is that the "comfortable" situation in which there are few dense areas of elderly neighborhoods is fading, as the younger senior citizens are living all over the city.

While in Map 3 there are areas painted red, which indicates high density of senior citizens, in the two "younger" maps there are almost no such dense areas.

These data have an impact on the division of the city into senior citizen services, such as construction of senior citizens clubs, placing health clinics, or geographical distribution of service areas of social workers.

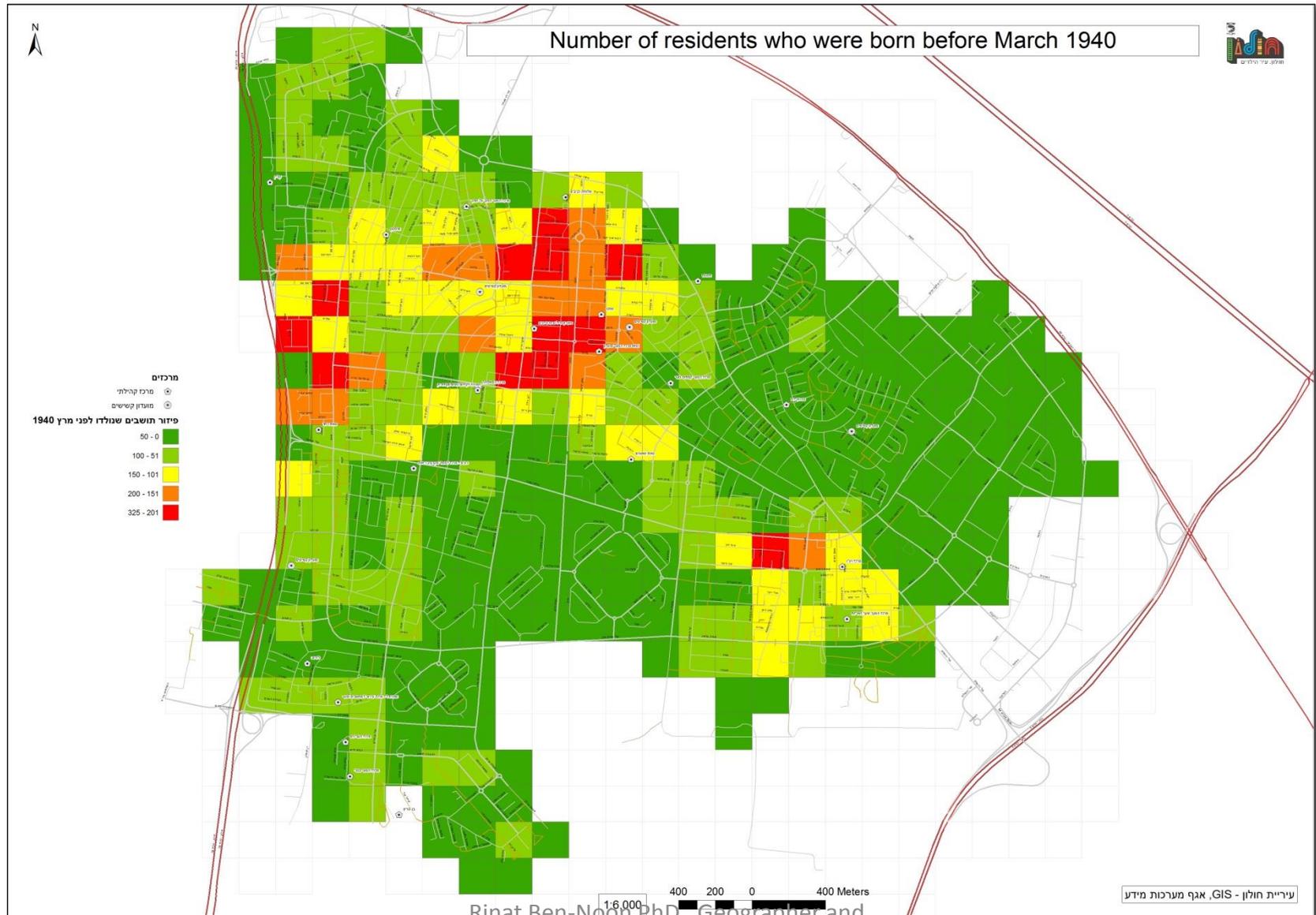
Possible uses of maps that show the future changes in the distribution of senior citizens

These maps are designed to aid future planning, for example:

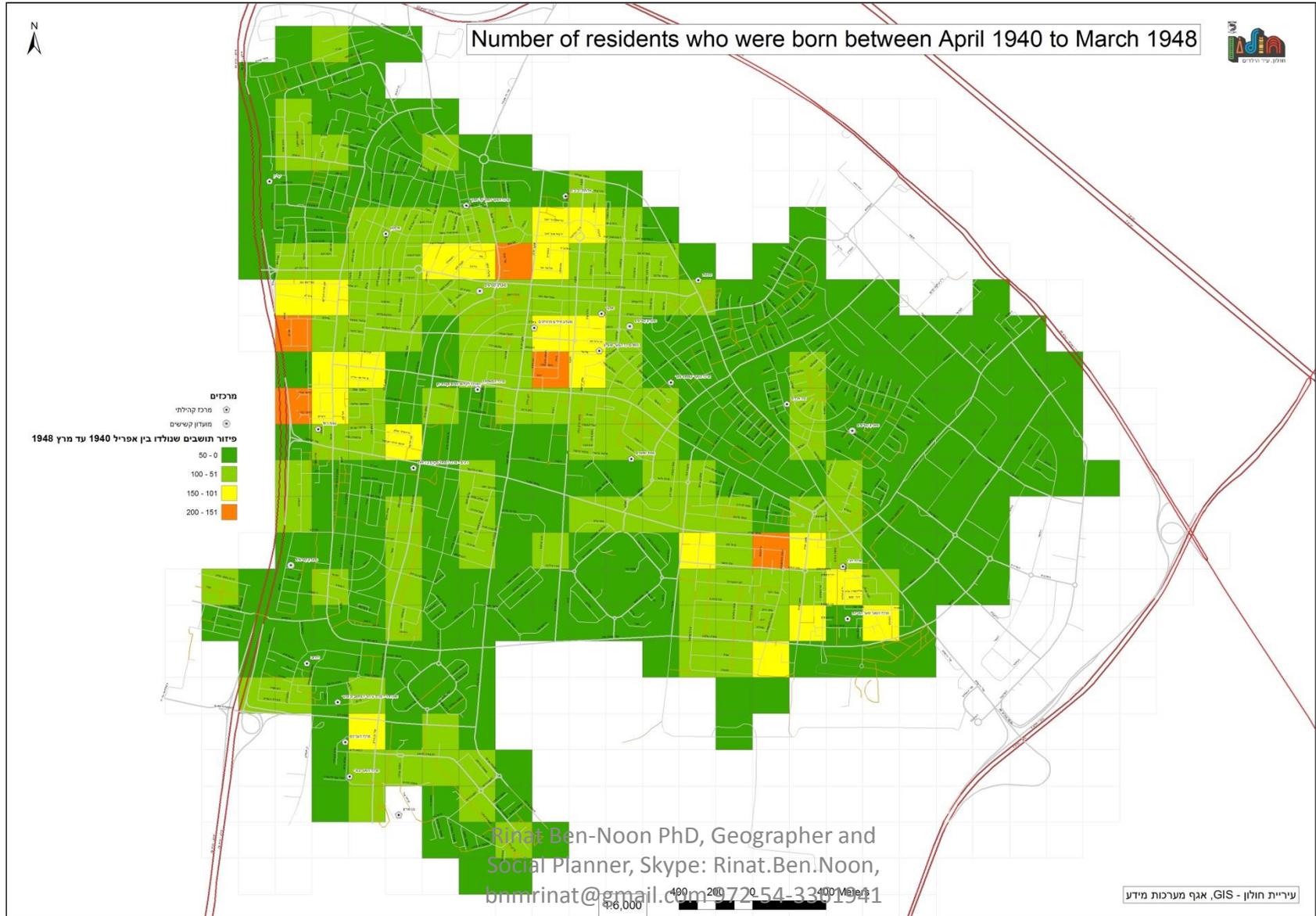
- Future planning **of service areas** for senior citizens, such as the geographical service areas of social workers.
- Providing important information for the **community health clinics** regarding the future number of elderly they will have to serve.
- Identification of locations for **construction of service centers** for the elderly, or conversion of the education system for the use of senior citizens.
- Planning **car parking areas** with a section for handicapped people.
- Planning **public transportation lines** for destinations popular with the elderly.

In addition, these maps have important implications for future planning of the entire city and understanding the life cycle of the residential areas and the construction of multi-generational service systems.

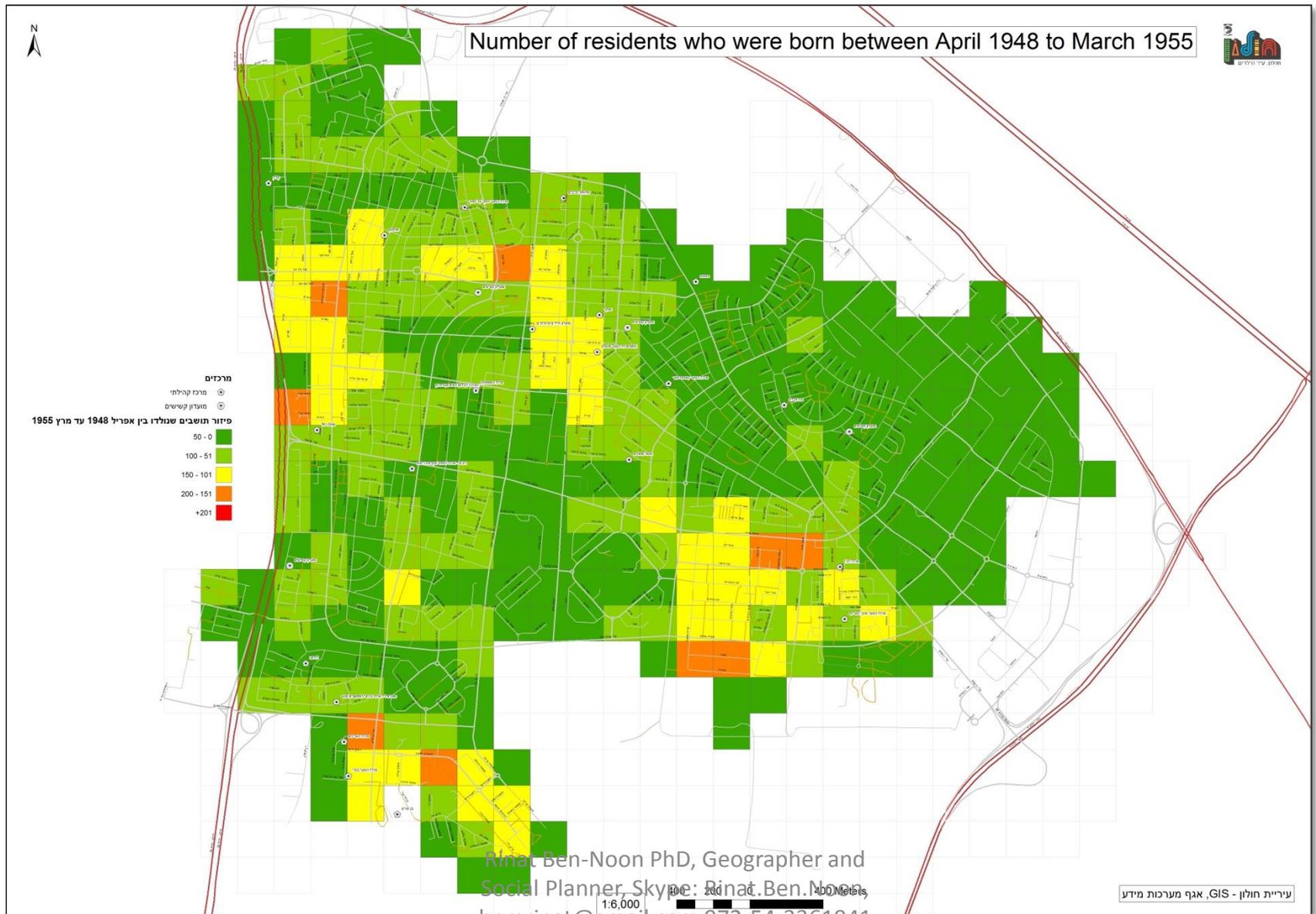
Map 3. Distribution of residents over age 75 in Holon



Map 4. Distribution of residents age 67-74



Map 5. Distribution of residents age 60-66



Combining of layer of senior citizens to layers of other services in the city

The following map was produced for the purpose of creating unique project contacts between senior citizens clubs and schools.

The map illustrates the possibility of cross-referencing two different data sets in order to obtain new information.

The recipe

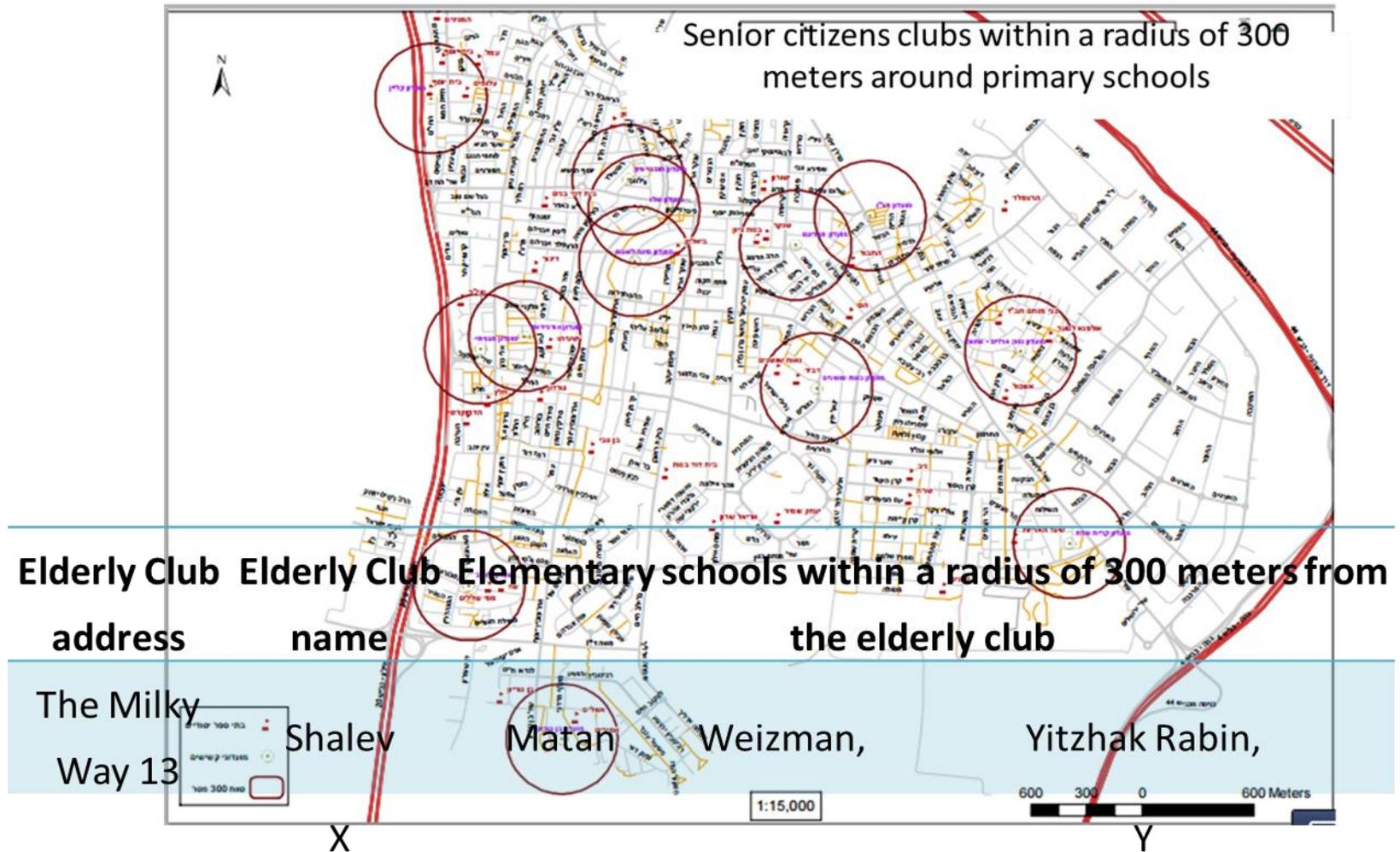
The map compose of two layers: a layer of primary schools and a layer of senior citizens clubs.

Around every school marked a radius of 300 meters to identify the clubs near each school.

In addition, the GIS system produces a data table. Counting clubs all around the school

Locating elementary schools near to elderly social clubs to form a collaboration.

The GIS system produces a map and displays the data in the tables.



Calculation and display of population distribution around service centers

One of the challenges in promoting age-friendly cities is to motivate services-center managers to address senior citizens as an integral part of their target audience.

Community centers, learning and enrichment centers, sports clubs, and others, all of these are unaware of the number of elderly who are in their service area.

- Using GIS can reflect to them the number of elderly relative to other age groups near to their services.
- For this purpose you can count the number of people in a radius around the service, or the number of people who are within the boundaries of the service area.

Using GIS system to create an age distribution within a radius of 300 meters around service centers

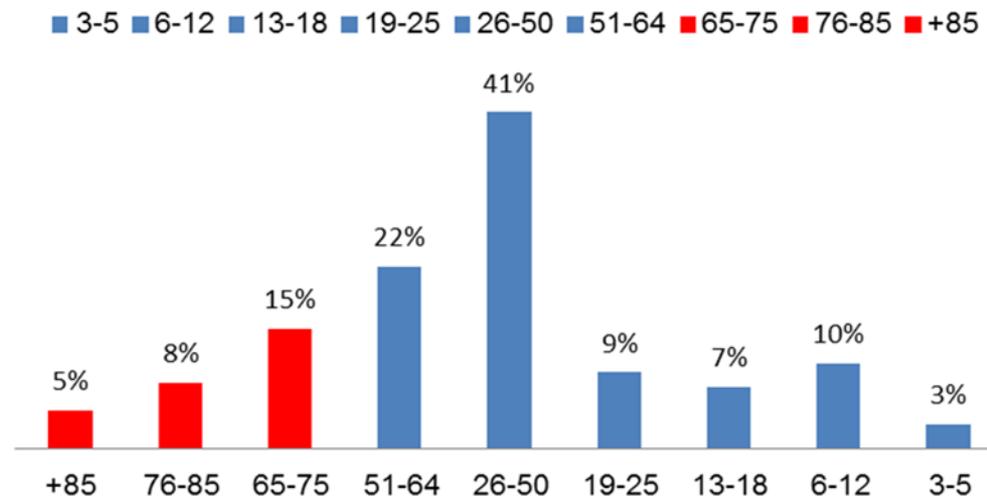
Step 1: drawing a radius around the point of service



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Step 2: Calculate the age distribution in any radius around service center

The purpose is to highlight the presence of the elderly living in close proximity to the service center, relative to other age groups who receive services, such as children and adolescents, or young people



Total	85+	76-85	65-75	51-64	26-50	19-25	13-18	6-12	3-5	Age
5972	229	398	722	1100	2035	460	369	514	145	N