Optimal New School Location in San Gabriel Area
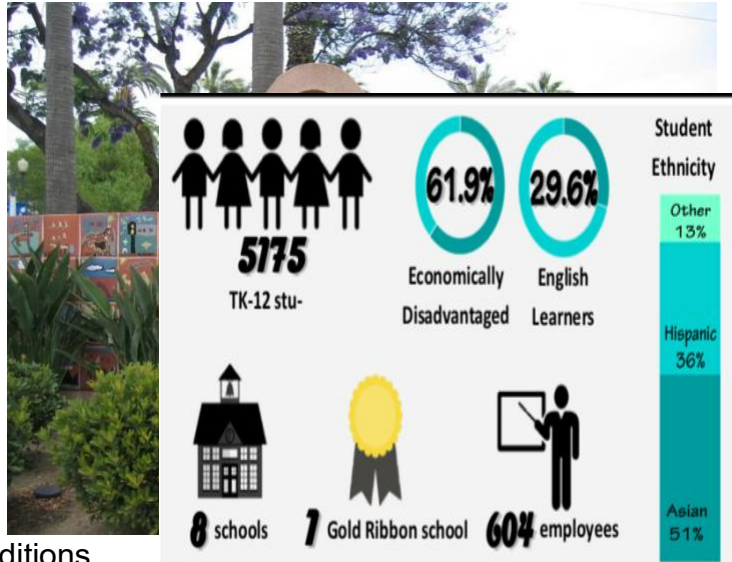

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Introduction

The City of San Gabriel is a general law city in Los Angeles County. The city has a population of 41,225 residents with diverse ethnic groups. In looking at San Gabriel's education conditions,

it's not hard to find that San Gabriel Unified School District is in partnership with the San Gabriel Community to bring necessary knowledge and skillsets to students. The school district consists of five elementary schools, one middle school, one traditional high school, and one continuation high school. 51% of students are Asians, 29.6% of students are English learners. In that case, involving English learners in class and helping them maximize their achievement are urgent affairs. Meanwhile, 61.9% of students are economically disadvantaged.

San Gabriel Unified School District is dedicated in providing benefits for schools and students. There are many programs that aim to offer services, education resources, financial aids to different groups of people. For English learners, it offers English Language Programs; for instructional personnel, it invests in the professional growth by Education Protection Account Fund and other resources; for financial disadvantaged students, it provides the scholarship opportunities.
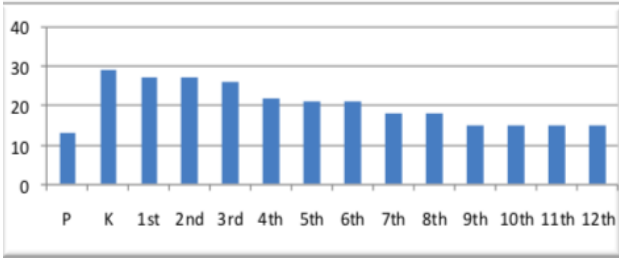
According to the data from Education Data Partnership, the enrollment of students in San Gabriel Unified School District (SGUSD) increased from 6,369 to 7,244 during 2013~2017. Meanwhile, the average class size in SGUSD is 28.4, which is higher than that in Los Angeles County--25.7 and California State--25.4. However, most states set class-size limitations, of which the range varies from 14 to 27 (see the graph below). The average class size of SGUSD has exceeded the limitation. Furthermore, data shows that the student-teacher ratio in SGUSD is 21 at the year 2017~18, which is higher than tha in Los Angeles County where the number of students for each teacher is 20.4.
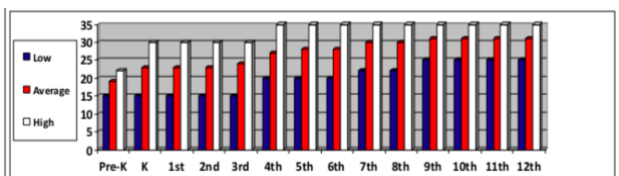
For different states, policy makers have different preferences regarding class-size. There are low, average and high class-size preferences in various states as the graph on the left shows. In the United States, classes that have less than 20 students are defined as small classes. According to the article "long-term effects of class size", small-size class has noticeable positive impacts on students. The impacts include higher a

rate of taking college exams and improvements on cognitive and noncognitive test scores.

Growing student population and the scarcity of middle schools are appealing to building a new middle school in San Gabriel area. Meanwhile, San Gabriel District doesn't have enough dual language teachers to meet the needs of its diverse demographics and immigrants. A new middle school will be beneficial to education quality, student academic development, and the populace's cultivation in long-term.

Project objectives

The project is focusing on a new middle school site selection in San Gabriel Unified School District. The school site selection should take many factors into consideration, including the number of potential enrollments of middle school students, the proximity to existing schools , the natural environment, the school size and the school's financial capacity. Therefore, the areas that are accessible to green space and public transportation are considered to be potential school sites. Geographic information systems like ArcMap can visualize data by showing the gradient of student population, the distribution of public transportation and the park and recreation area, etc. Also, ArcMap can help with adding layers of data and map superposition to produce the intersection that indicates the area with best conditions. Furthermore, a base map of San Gabriel can indicate the names and addresses of streets in the real world.

By determining the optimal new school location, the students and teachers in San Gabriel area may be having a more productive environment to study and

work. It will promote local community development in the future.

Methodology

This **applied research** aims to select a new middle school site in San Gabriel area. The collected data will be analyzed by the mix of qualitative and quantitative methods.

The data of population of 6~11 years old tells us the number of 6~11 years old people in each block group, and shows the gradient of 6~11 year-old distribution. Since I am selecting a new middle school site for future use, the students analyzed should be those who are going to middle school in future rather than current students. The data of metro stations and existing schools shows the location of metro stations and existing schools in San Gabriel area. And I use the "buffer" tool to indicate areas that are not suitable to build a new school. Meanwhile, I find the area with good environmental conditions by looking at 0.25- mile buffer of park and recreation space. Besides, the base map displays names of streets of selected area.

Factors that will influence the school site selection are as follow:

●The grades to be served.

●The predicted student enrollment.

●The distance to park or recreational area.

●The distance to Metro Station

●The distance to existing middle school

●School district financial capacity

●Minimum middle school size in California

●Environment surrounding school

All factors will be described in following analysis. The intersection area is the area with optimal conditions. However, some factors will indicate the disadvantages of the optimal new school site.

Sources:

U.S Census Bureau serves as a good source of data by offering California Block Group shapefile and California School Districts shapefile. The Los Angeles County Department of Regional Planning provided with shapefile of park and recreation space, as well as the data of existing public schools.

Simplyanalytics enabled me to find data about the population of 6~11years old of each block group in San Gabriel Unified School District. The data of metro was provided by Simplyanalytics as well.

Arc map gives a "streets" base map of San Gabriel area. It relates layers of data to the real-world streets.

Map Analysis:

The map created is based on block groups in San Gabriel area. The population of the predicted students is a vital factor for school site selection.

Figure 1 shows the population of 6~11 years old and displays the population of 6~11 years old in each block group in gradient scale.

The gradient color scheme changes from green to red. It is assumed that "green" is used for the least populous block group and "red" is used for the most populous group, with the linear gradient in between.

Each color shade represents a range of numbers, from the number range "27~46"
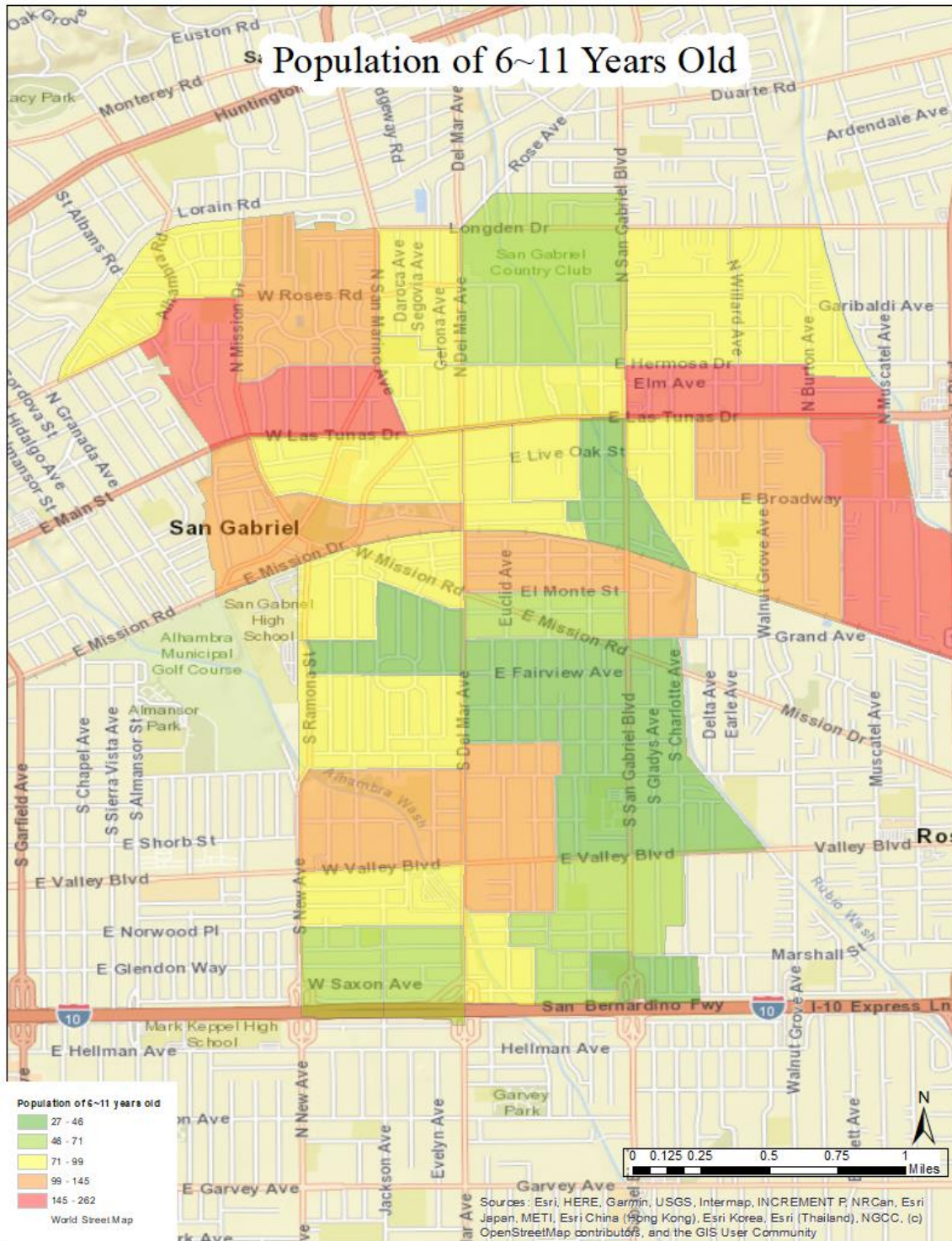
to the number range "145~262".

Figure 1: Population of 6~11 years old

Besides population, high priority should be given to green space conditions. Green

space is conducive to public health in that it is beneficial to stress reduction, mental health improvement, brain function restoration and positive mood. Green space has shown a significant impact on childhood autism in California elementary school districts. Meanwhile, green space become "outdoor classroom" for students in more and more countries.

Figure 2 shows the park and recreation space in San Gabriel Unified School District. It has broken the park and recreation space into pink grid. The 0.25-mile buffer indicates areas where within 0.25- mile distance to the park and recreation space. As we all know, park and recreation space are green infrastructure providing recreation and aesthetic amenities to communities and also create green environment. Therefore, the new middle school should be built within 0.25-mile buffer of park and recreation space.

The existing public schools are indicated in the map. The objective of adding existing school location is to avoid selecting same locations as existing schools, as **Figure 3** shows. The new middle school is outside of the 0.25-mile buffer of existing schools as the map indicates.
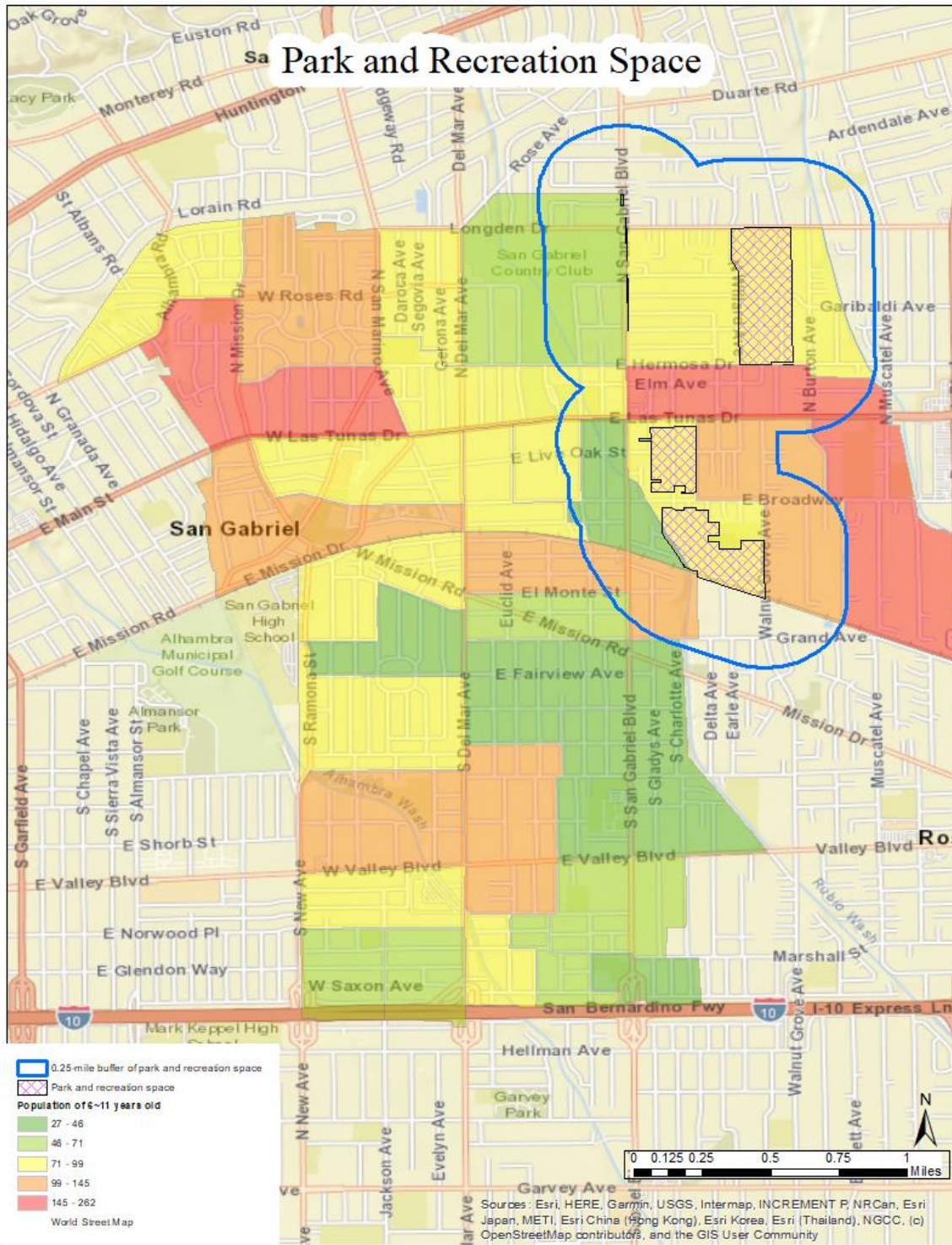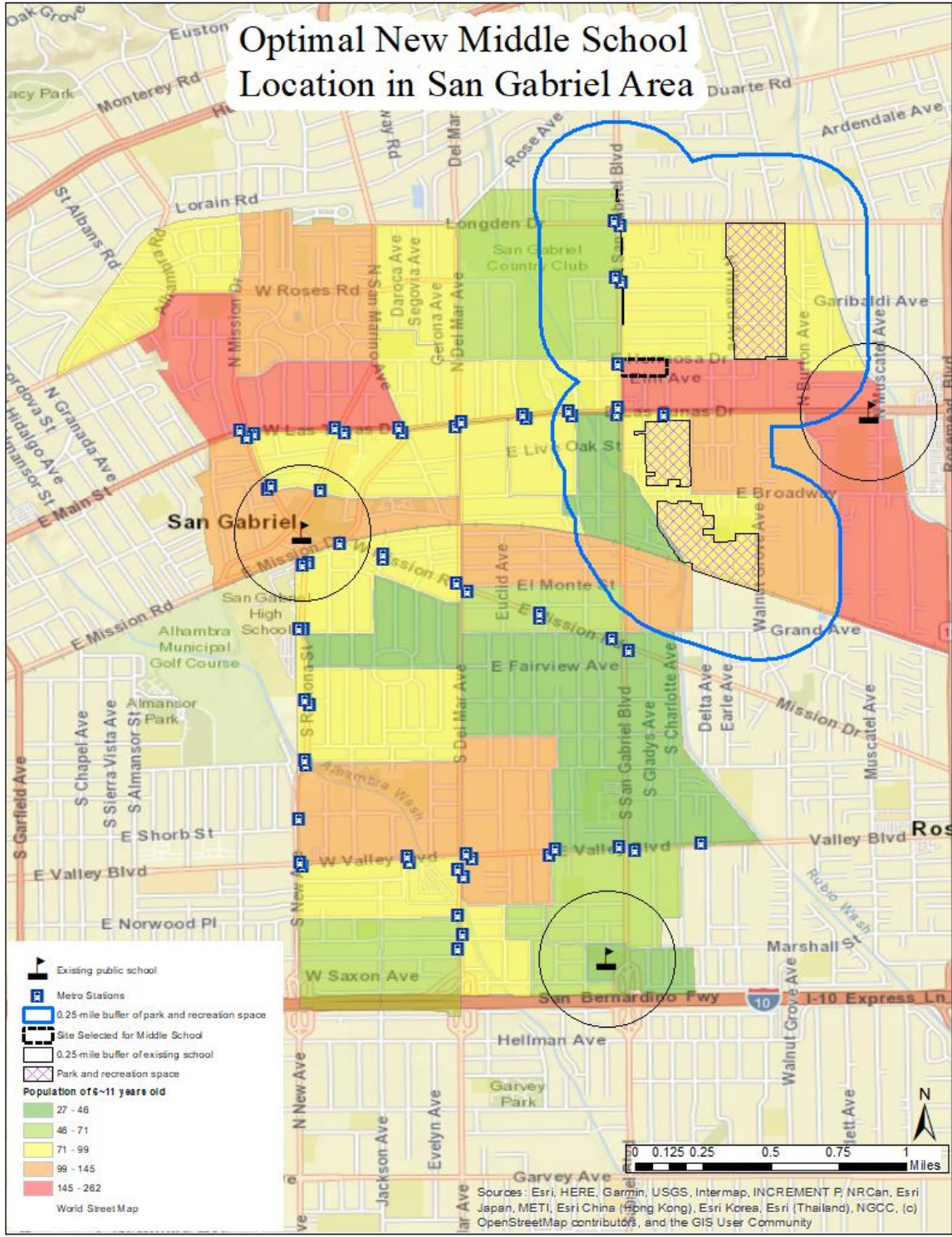
Figure 2: Park and Recreation Space

Figure 3: Optimal New Middle School Location in San Gabriel Area

Limitations

One of the limitations of this project lies in data. The data of population is from several years ago, which may not align with the current situation. There are some other factors that cannot be shown in the map includes land use policy, impacts the new school may have on the neighborhood, the financial capacity of SGUSD and migration mobility. Thus, map is not the only criteria for selecting a school site.

Conclusion

Based on the map and considerations above, the new middle school should be built in Wilson Elementary School area. Within this area, the block that is between **E Hermosa Drive** and **Elm Ave** is the optimal choice. The west end of this block is the main boulevard—N. San Gabriel Blvd where is adjacent to a green infrastructure called San Gabriel County Club; and the east end of this block is N. Charlotte Ave. The location of selected block is indicated on the map by black square. The chosen site is populated with 145~262 people who are 6~11 years old, which indicates greater needs than other area. At the same time, the selected block lies in a neighborhood that has a good safety record. However, the housing price of selected neighborhood is more expensive than the nearby area by 7.98%.

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