

School Attendance Areas and GIS

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(1) Introduction : Like other Iranian cities, school boards have not created official attendance areas for schools at any education level of Rasht City to spatially allocate students to schools within their local areas. In the absence of guidance from education authorities, parents are the main decision makers in choosing schools for their children. This is also the case for the selection of public female junior high or PFJH schools in Rasht City. Although this might invoke images of freedom under the current system, many female students go to school outside their local areas. In the case of the Iranian city of Rasht, this parental choice based system of school selection has resulted in commutes that are longer than necessary for the PFJH students who journey on foot or on the public buses, city taxis, and shared rental taxis and mini-buses that comprise the city's public and private transport.

Despite the relative ease of getting to school in developed countries, a daily journey to the city in Iran is a heavy burden on students and their families. Without the convenience of a free school bus or carpooling, most students have to travel longer distances than necessary on foot from their homes to catch a taxi or rented private vehicles along main routes. Not only are such means of conveyance adding to the considerable cost families of sending their children to the schools in Rasht, they are also less safe. Daily travel in taxis or rented buses also means higher exposure to the risk of injury or even death. Another consequence of lengthy journeys to city schools on foot and rented vehicles included decreased time and energy for homework or other activities at home.

(2) Purpose : In order to reduce the problems that students face daily in their commutes to schools in Iran, replacement the parental choice of school selection with student enrolment within a certain school attendance area was the aim of this research. It proposed this can be accomplished by introduction of attendance areas that reduce both the time and distance of commutes to schools and allocate students to the nearest schools on foot as much as possible.

(3) Methodology : Multiplicatively weighted Voronoi diagram (MWVD) was the method for the construction of attendance areas given its utility in demarcating spaces so that all journeys within them

are closest to a chosen school. A GIS-based specialist packaged called WVD18 (Mu Lan, 2004) was applied for the construction of diagrams that would represent the attendance areas for each school. Each diagram was then constructed in relation to the number of students to represent the weighted factor. Following this approach, larger schools tended to have larger enrolment areas and vice versa for smaller schools. Once the attendance areas were completed, they were analyzed spatially using Arc/Info, software of the Geographical Information System (GIS). In order to examine if the delimited boundaries minimized travel times and distances for students at schools, five studied PFJH schools were analyzed for more detailed study.

(4) Conclusion : The research concluded that the projected school attendance areas can result in shorter and more convenient commutes on foot. This can also nearly eliminate the need to travel by vehicle for the overwhelming majority of students and make their journeys more convenient.

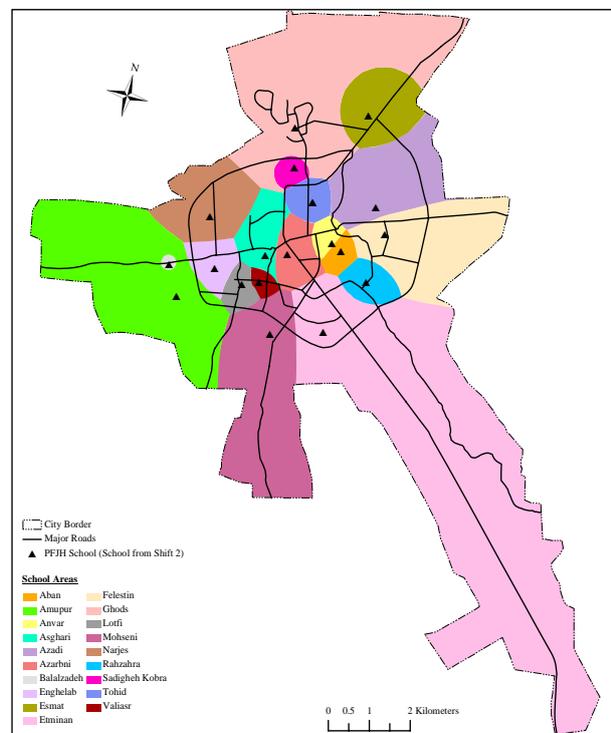


Figure 1: Proposed attendance areas for Rasht's PFJHschools of Shift 2.