

A Survey of Hospital Density in Wisconsin

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The Importance of Test Locations

Medical device manufacturers need to test their products in the field

Initial testing typically takes place at nearby hospitals

- Saves money on traveling
- Allows issues to be addressed quickly

Test sites are chosen based on number nearby and their distance from the manufacturer

Acquiring Data

Foursquare API was used to locate hospitals near a manufacturing site in southwest Wisconsin. Latitude and longitude values were taken from this data and plotted on a heat map.

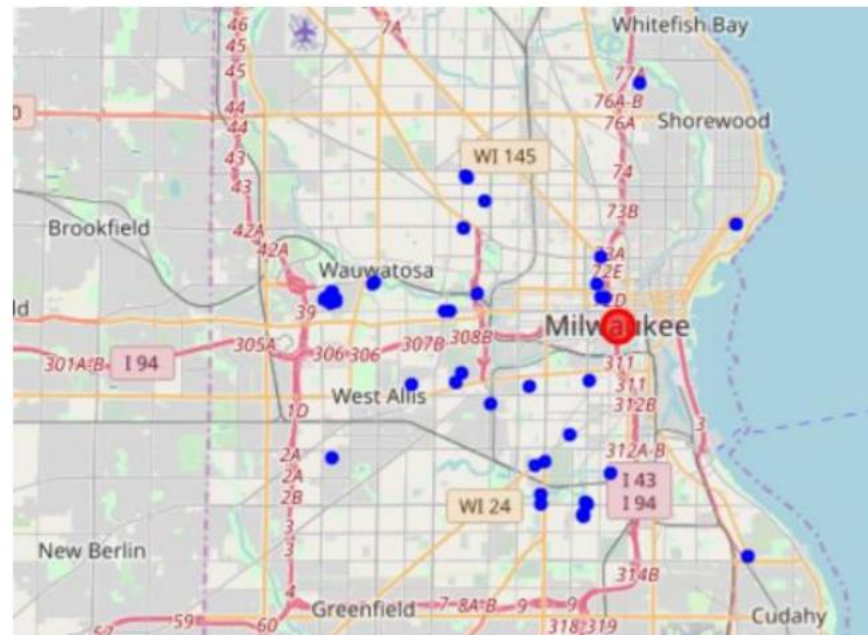


Figure 1: A heat map of hospitals in Milwaukee, WI in relation to the manufacturer location. The red circle represents the manufacturer's location. Blue circles represent hospital locations.

Data Analysis

K-mean clustering was used to group nearby hospitals together

The distance from the manufacturer to the centroid of each cluster was calculated using geopy

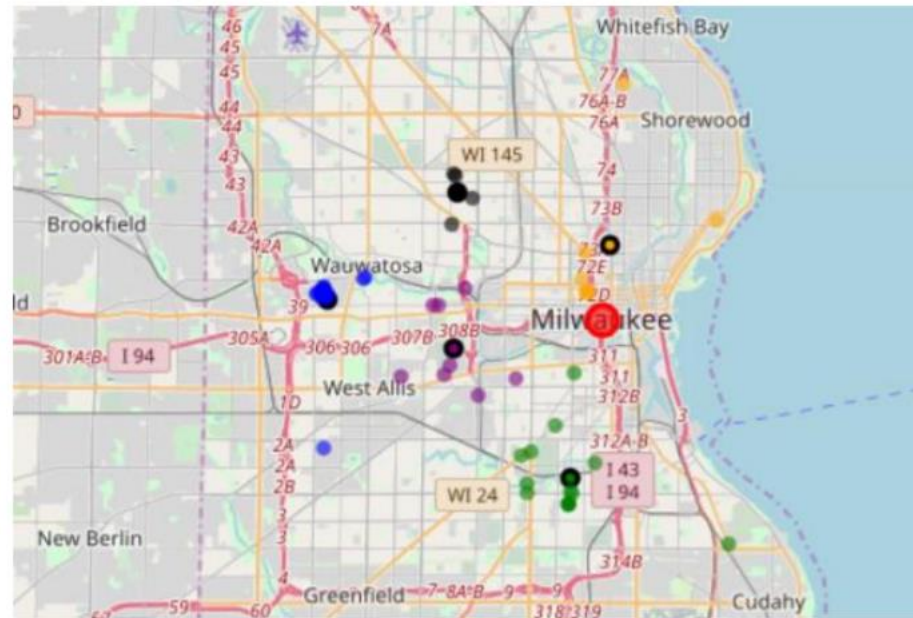


Figure 2: A heat map of Milwaukee hospitals when divided into five clusters. The red circle represents the manufacturer. Circles of other colors represent hospitals of a certain cluster. Circles with black outlines represent the centroid of their color's cluster.

Results

The Blue and Green clusters contain the most hospitals

The Orange, Purple, and Green clusters are the nearest to the manufacturer

The manufacturer should test at hospitals within the Green cluster

Group	Number of Hospitals	Distance from Manufacturer
Black	4	5.69 km
Blue	17	8.16 km
Green	14	4.80 km
Orange	7	2.23 km
Purple	8	4.50 km

Table 1: The number of hospitals in each cluster and the distance from the manufacturer to the cluster's centroid.

Conclusions

This process may be repeated for additional manufacturing sites

Future analysis should look only for hospitals which can meet all test requirements

- A hospital specialized in spinal surgery would not be the best place to test vision-analysis equipment