

Know Your Stop: Is Violent Crime Higher Near Portland Transit Stops?

National Studies Show an Increase in Crime at Transit Stops, but Does This Hold True in Portland?

Hypothesis

"Portland transit stops have higher rates of violent crime in their immediate vicinity than are present in surrounding areas."

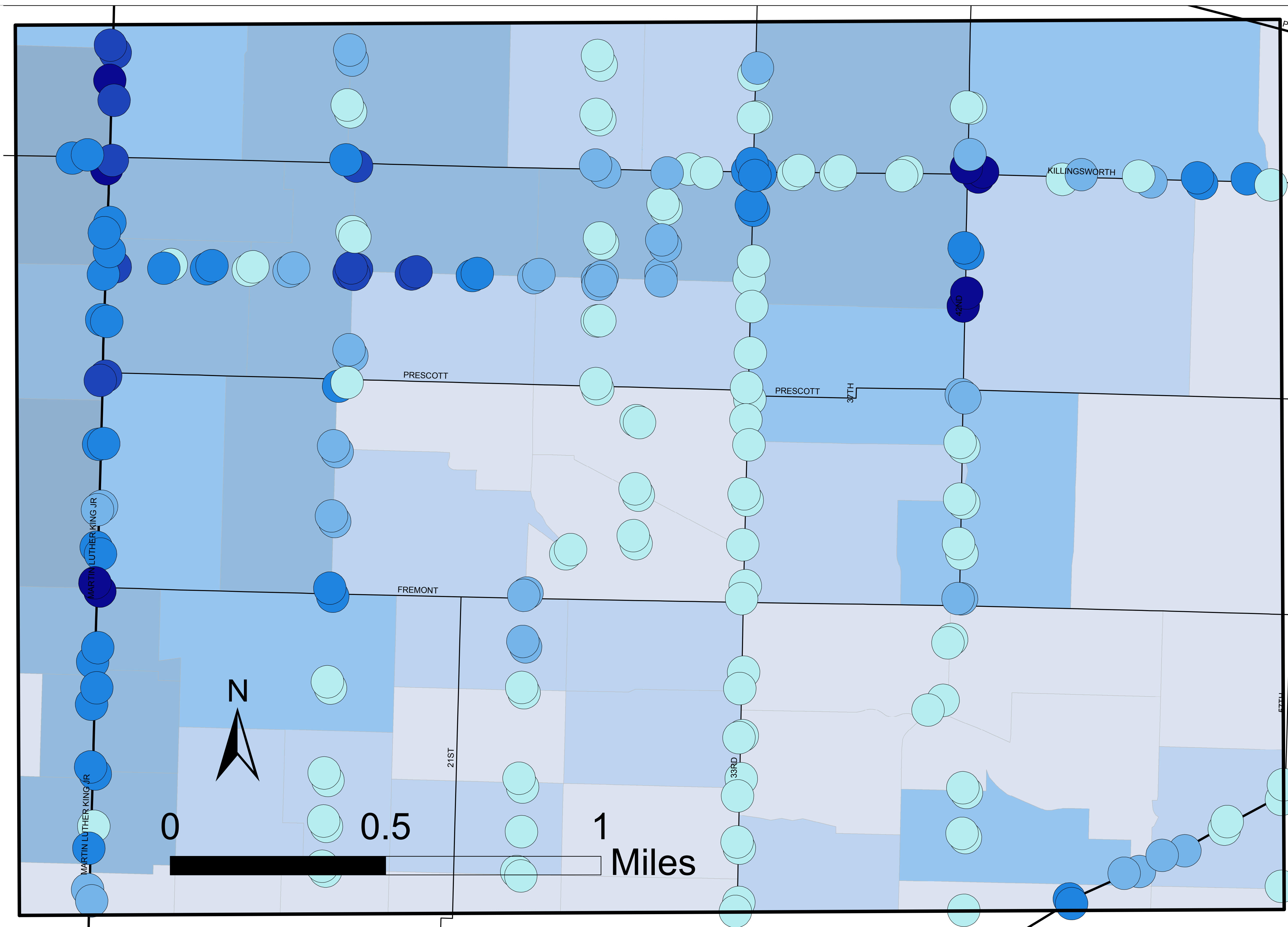
Studies of crime at transit stops conducted nationally, such as "Analysis of Technologies and Methodologies Adopted by US Transit Agencies..." by Shen, et al., show an increase in crime rates at transit stops. This is thought to be an example of criminology's "watering hole theory", that criminals find victim-rich locales and wait for a likely victim to show up.

Methodology

Using violent crime data, transit stop data, and census data, we created a 200ft buffer (distance derived from criminology studies) around each stop, and established the number of crimes that occurred within both the buffer, and in surrounding neighborhoods over the past 6 years, and normalized it for area. We then ran a student t-test to assess whether there was statistical significance to the differences.

Conclusion

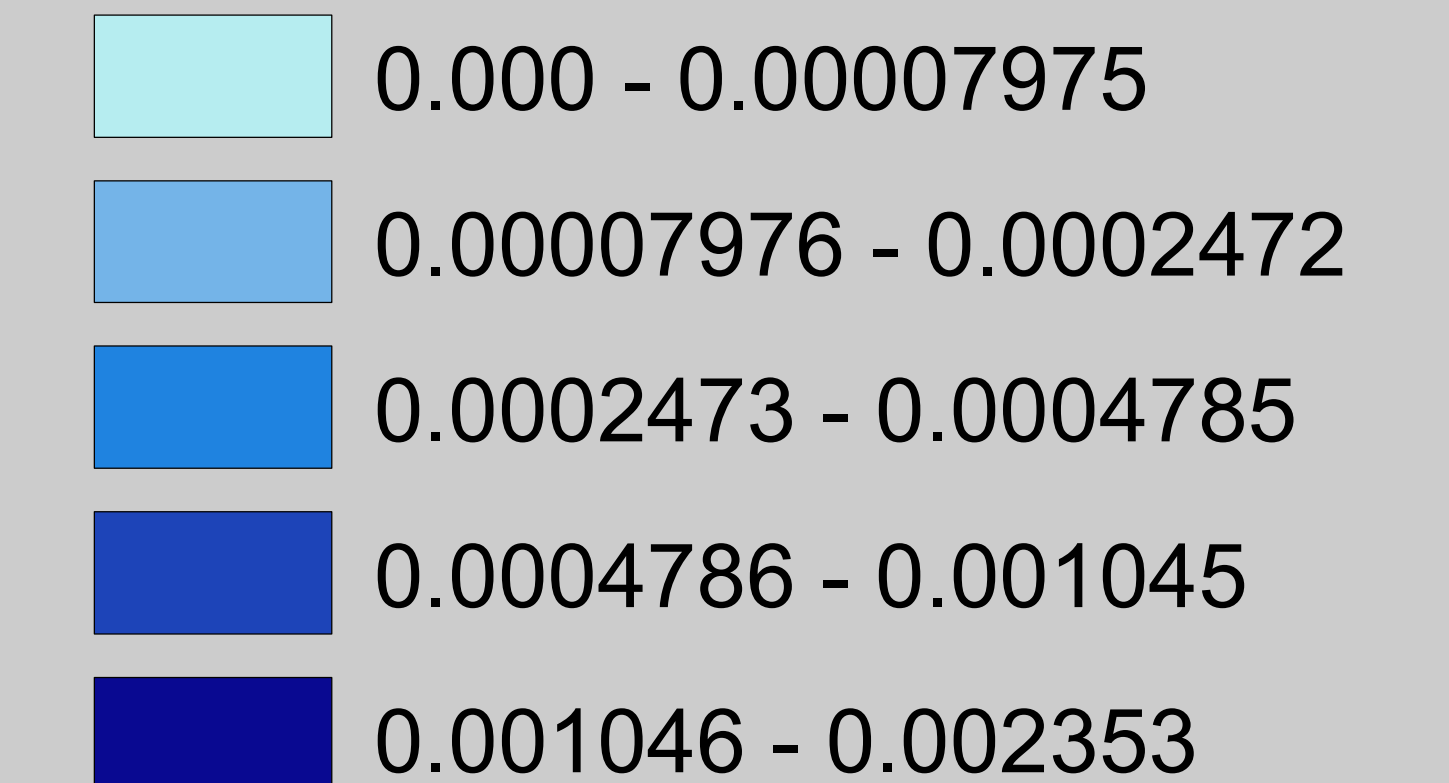
To our understanding of the t-test results, there does appear to be a statistically significant difference between the violent crime level within 200 feet of transit stops in our selected study area.



Legend

Trimet Stops

Weight / Area

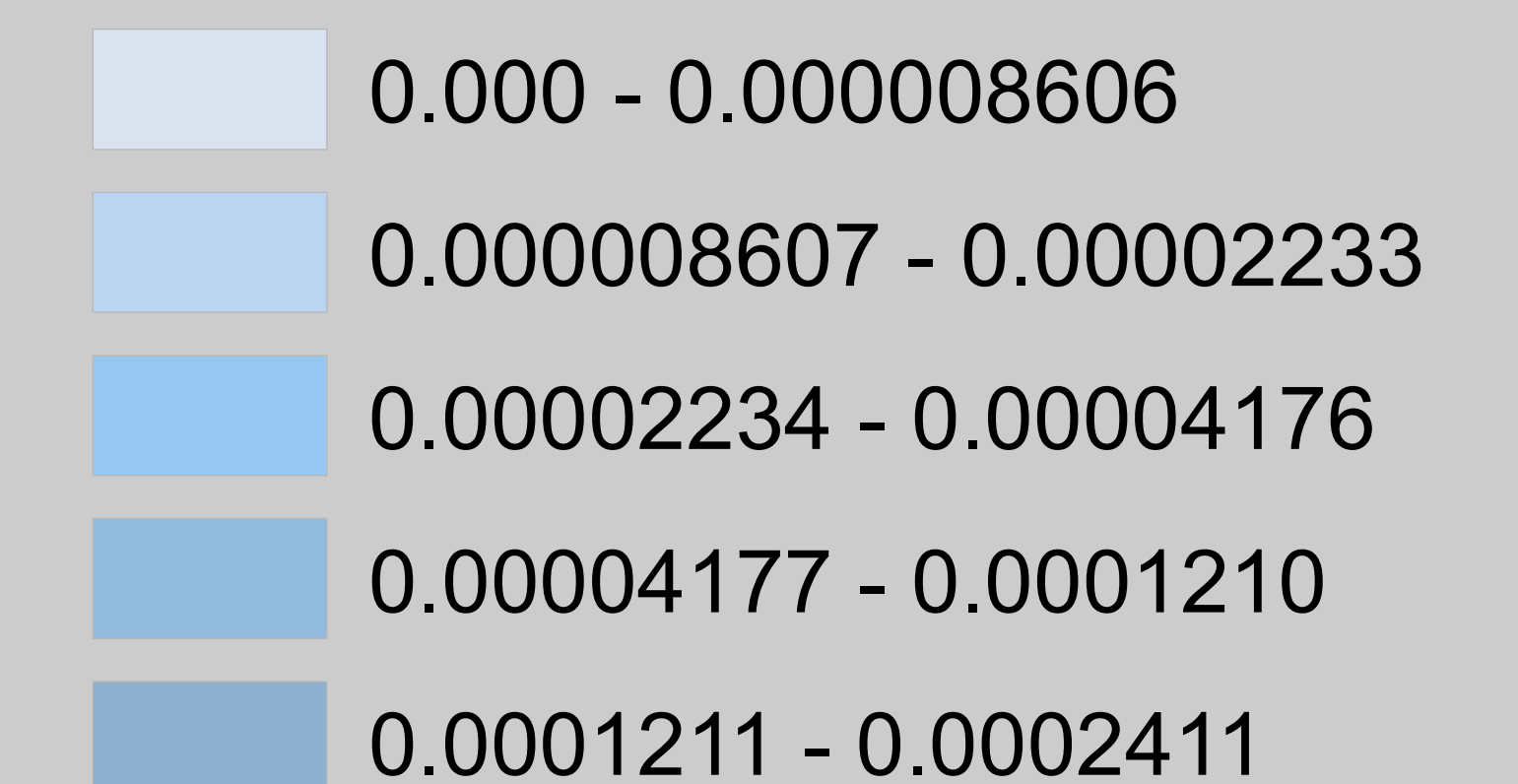


Major Streets

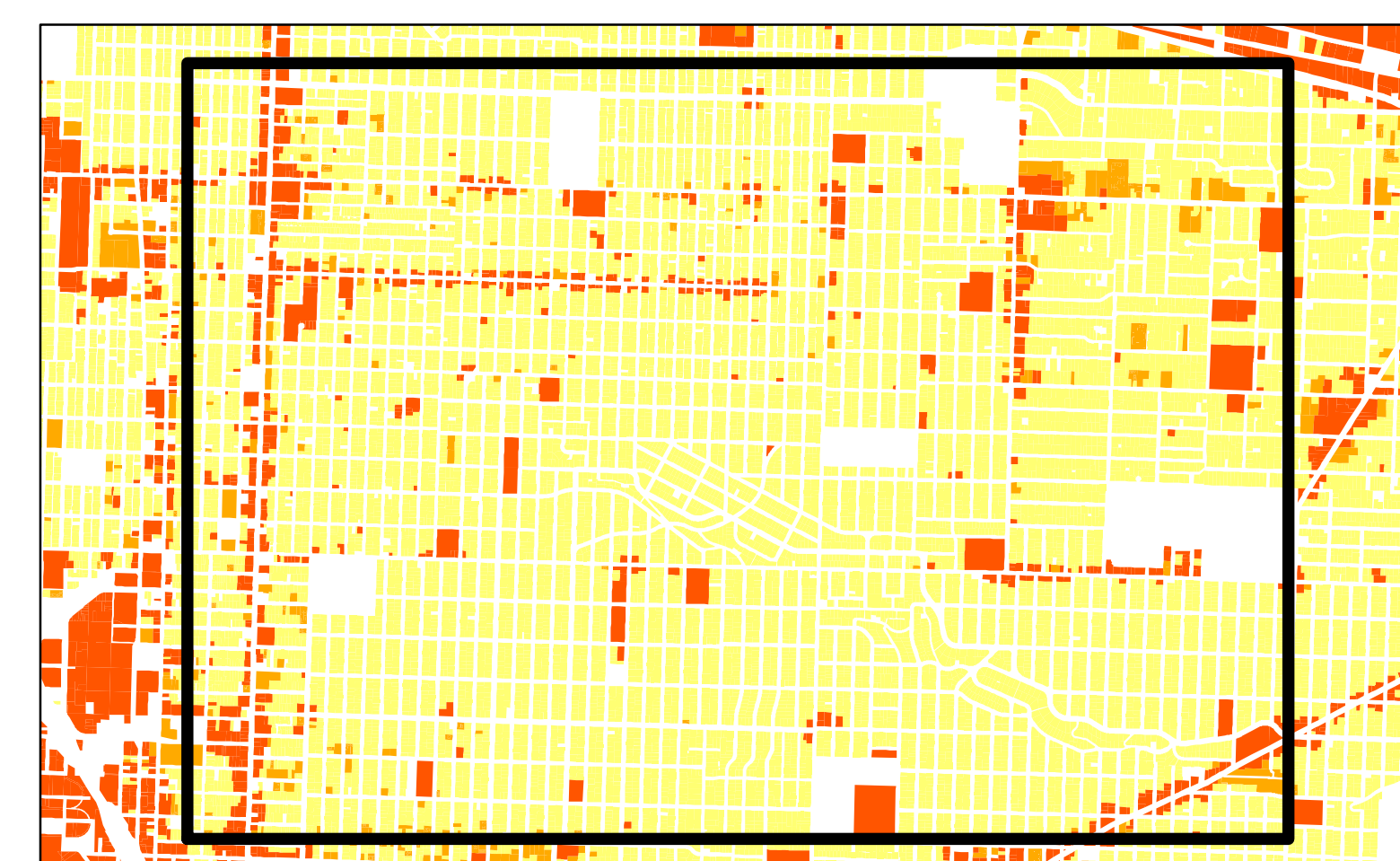
Arterial Streets

Neighborhood

Weight / Area

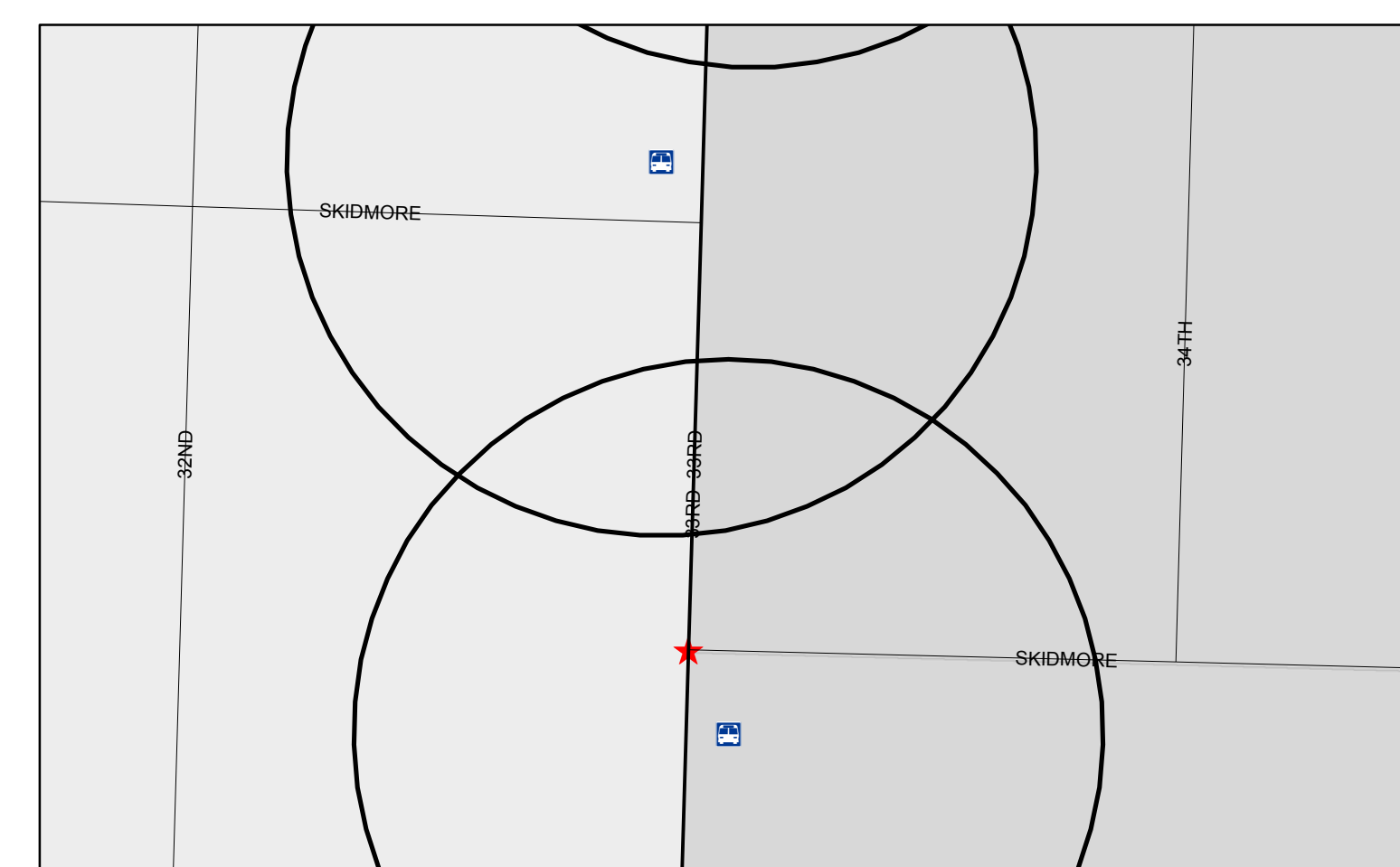


Our study area is in NE Portland, OR. The displayed circular areas are a 200 foot radius around each of the Trimet stops in the area. The surrounding neighborhood area is divided into US Census block groups. Violent crimes that were used in this study are: homicide, rape, robbery aggravated assault, simple assault, and sex offenses. All reported incidents of these crimes in the study area from 2008 to 2013, as reported to the FBI by the Portland Police Dept were used.



Study Area Selection

We used taxlot landuse data to select our study area, for its uniformity, while still including some major streets for contrast.



Buffer Size Selection

We selected our buffer size based on methodology from national criminology studies of transit systems.

t-Test: Two-Sample Assuming Equal Variances		
	ByAreaBuffers	ByAreaAmbient
Mean	0.000222694	3.61744E-05
Variance	1.19249E-07	2.3271E-09
Observations	210	62
Pooled Variance	9.28333E-08	
Hypothesized Mean Difference	0	
df	270	
t Stat	4.235386628	
P(T<=t) one-tail	1.56617E-05	
t Critical one-tail	1.650516748	
P(T<=t) two-tail	3.13234E-05	
t Critical two-tail	1.968789022	

Student t-test Validation

We ran a t-test to determine if there was significant difference between transit stops and their surroundings.

Sources: RLIS, Portland Metro CityData.com, Trimet Passenger Census 2013, U.S. Department of Justice Uniform Crime Reporting Handbook: FBI, "Transit Stops, Robbery, and Routine Activities: Newark, NJ" by E. Piza & Dr. Kennedy, "Addressing Women's Fear of Victimization in Transportation Settings" by A. Loukaitou-Sideris & C. Fink, "Forensic Criminology" by W. Petherick, et al., "Classics in Environmental Criminology" by M. Andersen, et al., and special thanks to Grant Humphries.