

Figure 1: Conceptual model of transportation dynamics

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## Warning in st_point_on_surface.sfc(geometry): st_point_on_surface may not give  
## correct results for longitude/latitude data
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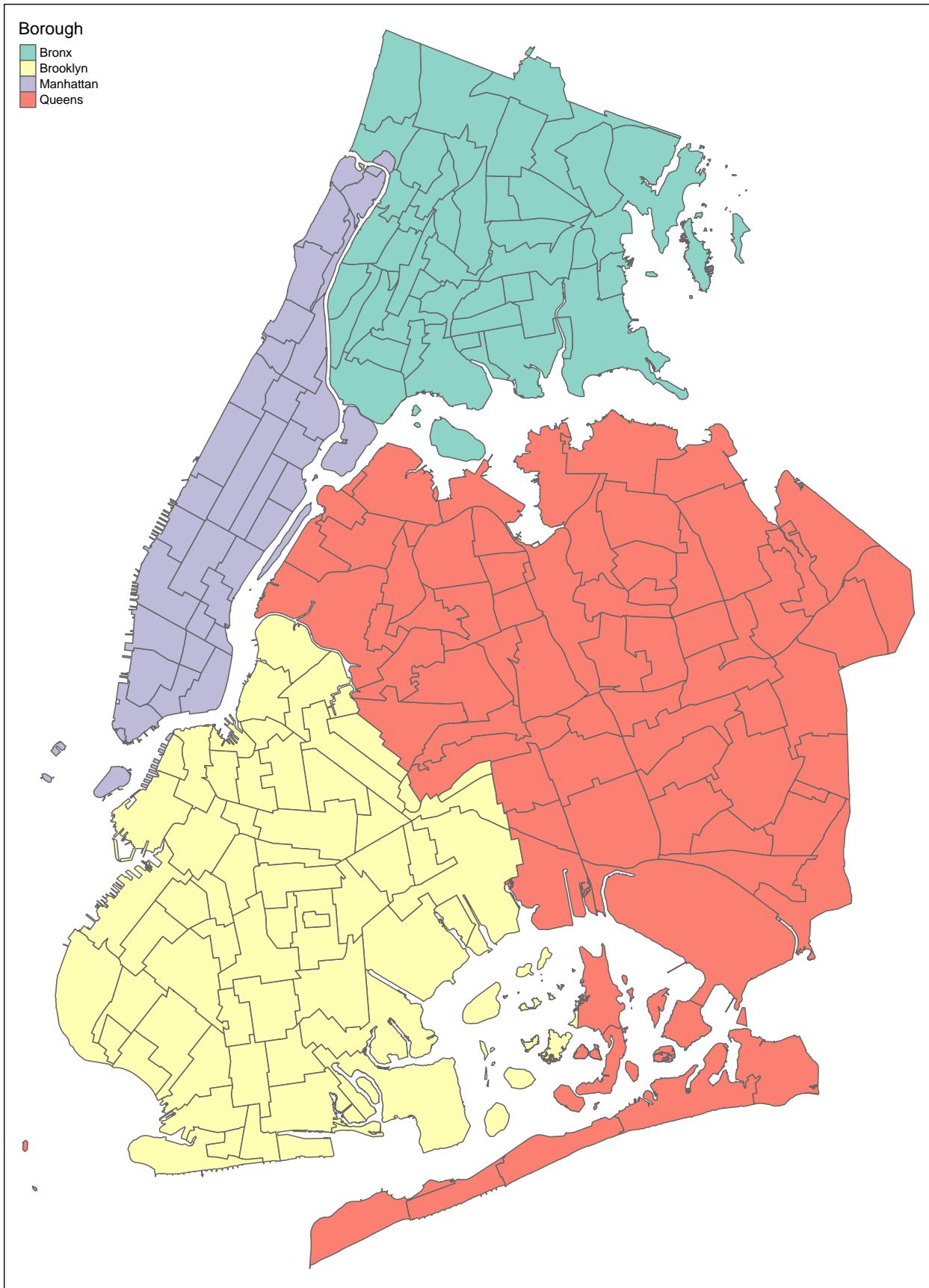


Figure 2: NYC Boroughs served by the MTA subway system  
2

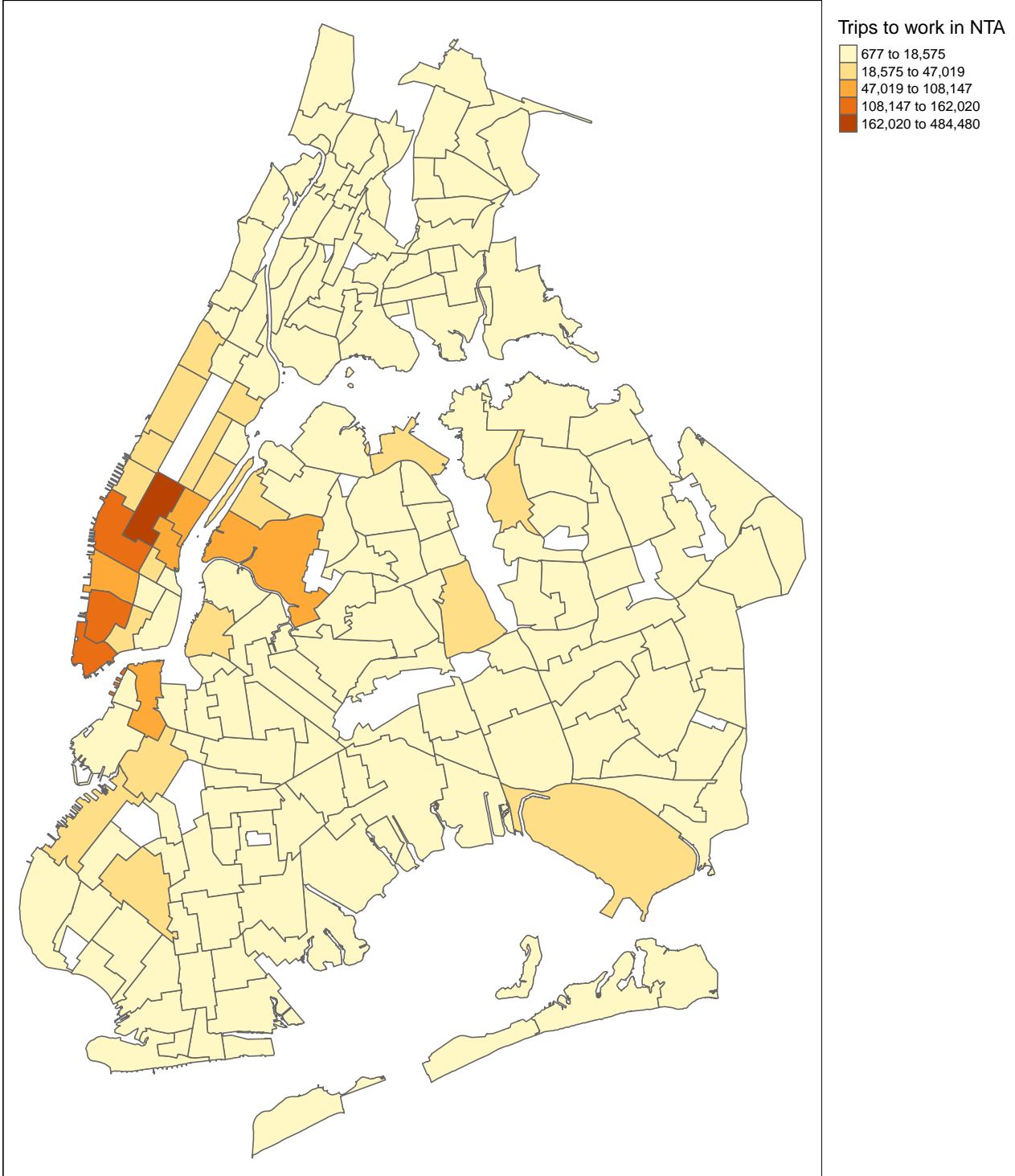


Figure 3: Number of jobs in each NTA across the Boroughs of Interest

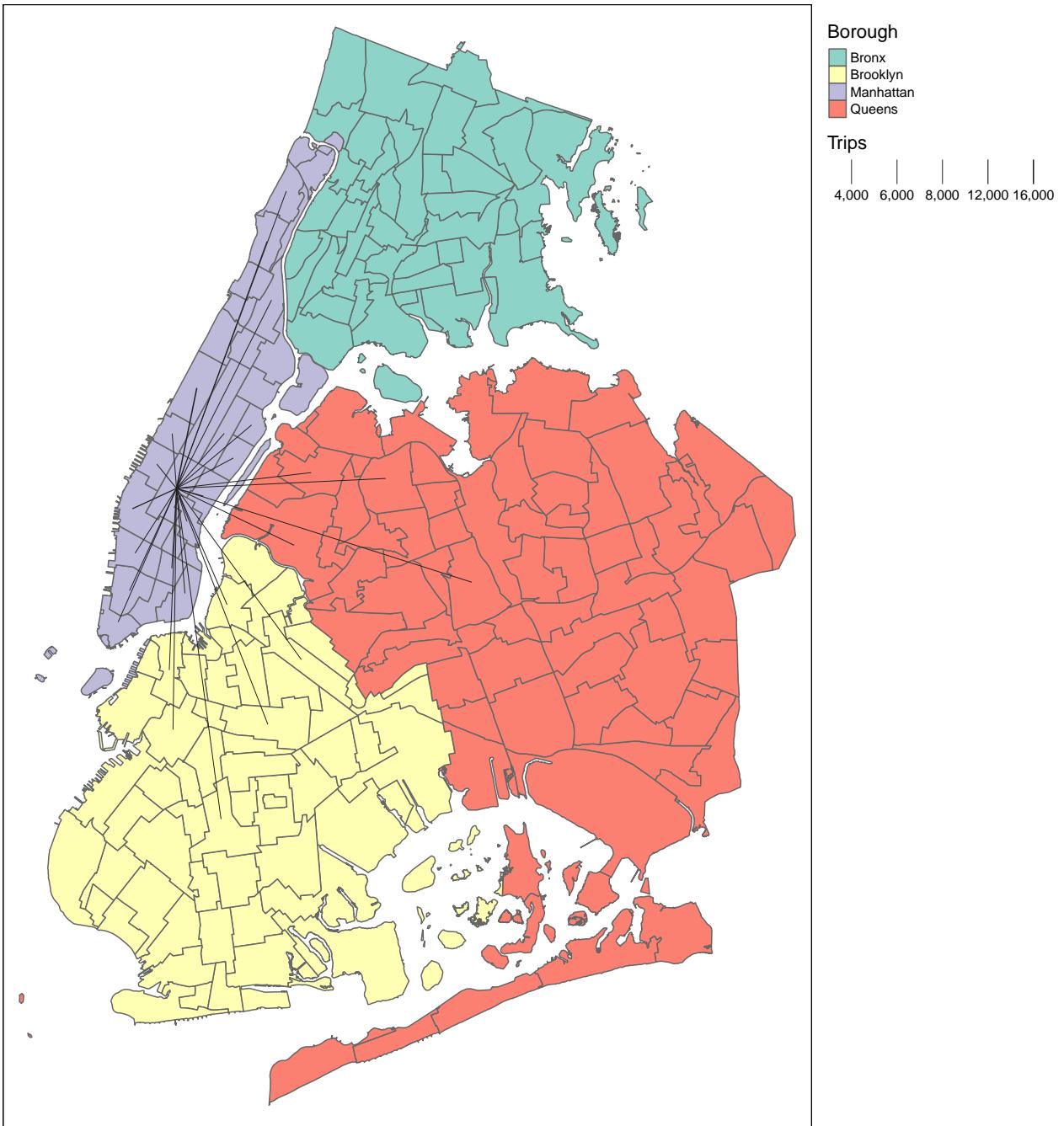


Figure 4: Desire lines for trips across the Boroughs of interest with at least 5000 trips are made

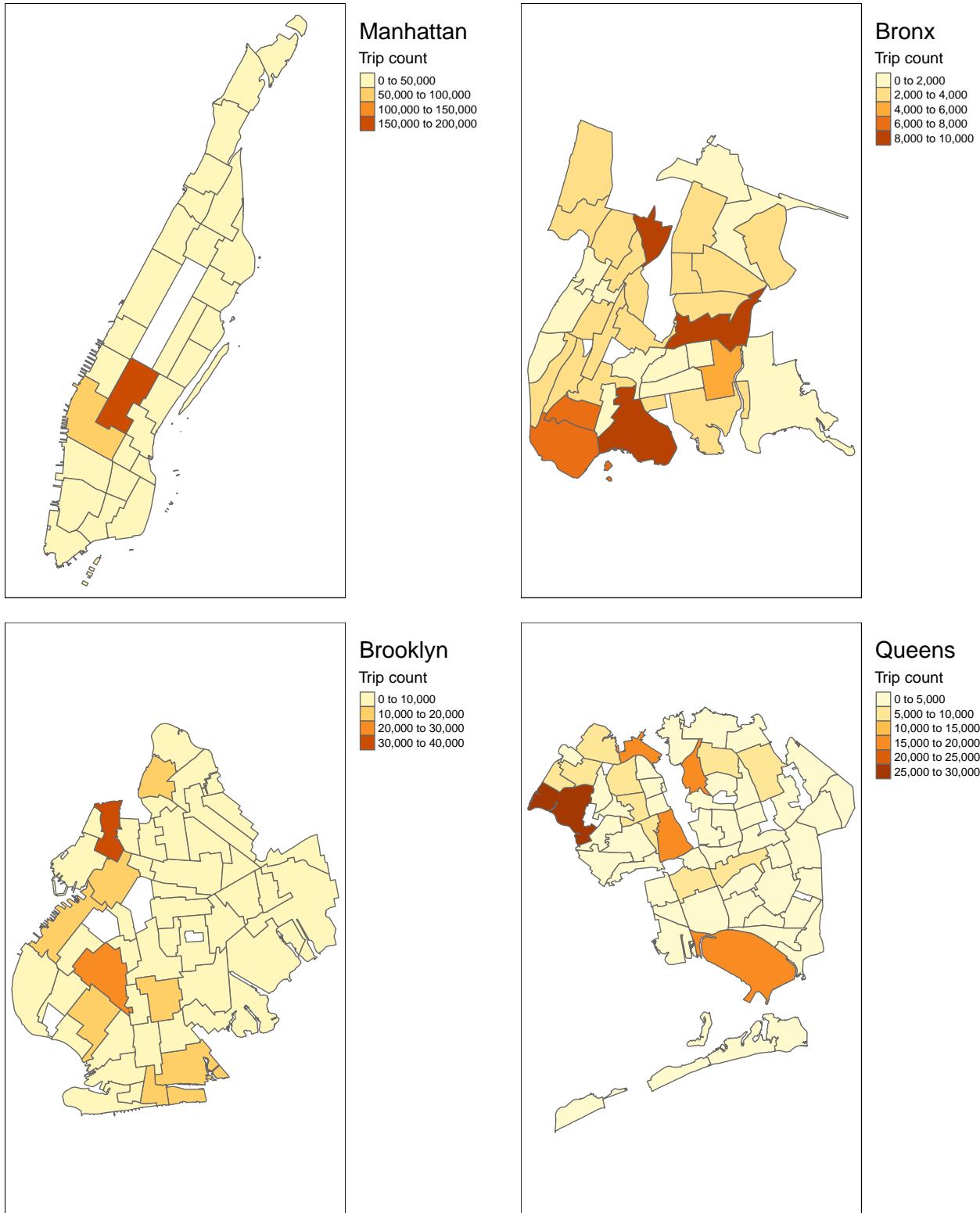


Figure 5: Number of jobs where the trip origin is within the same borough.

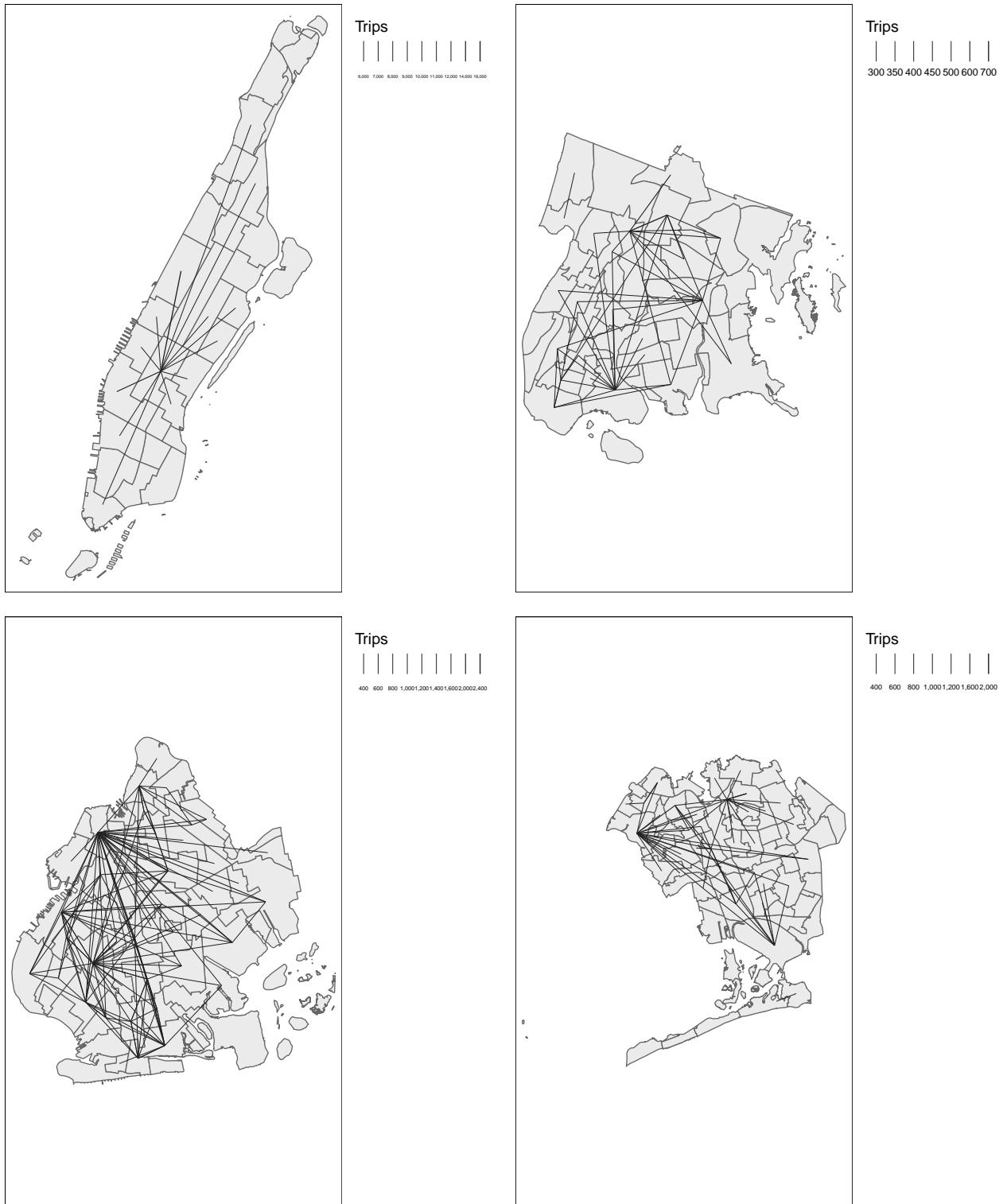
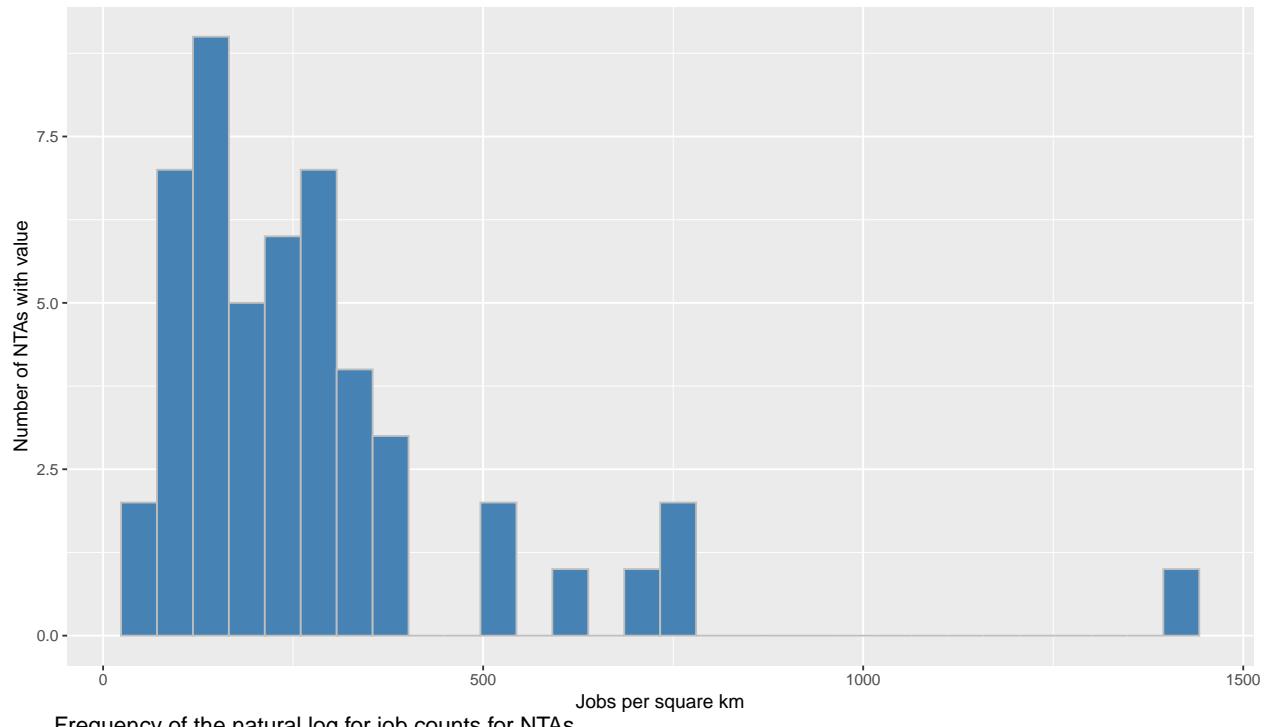
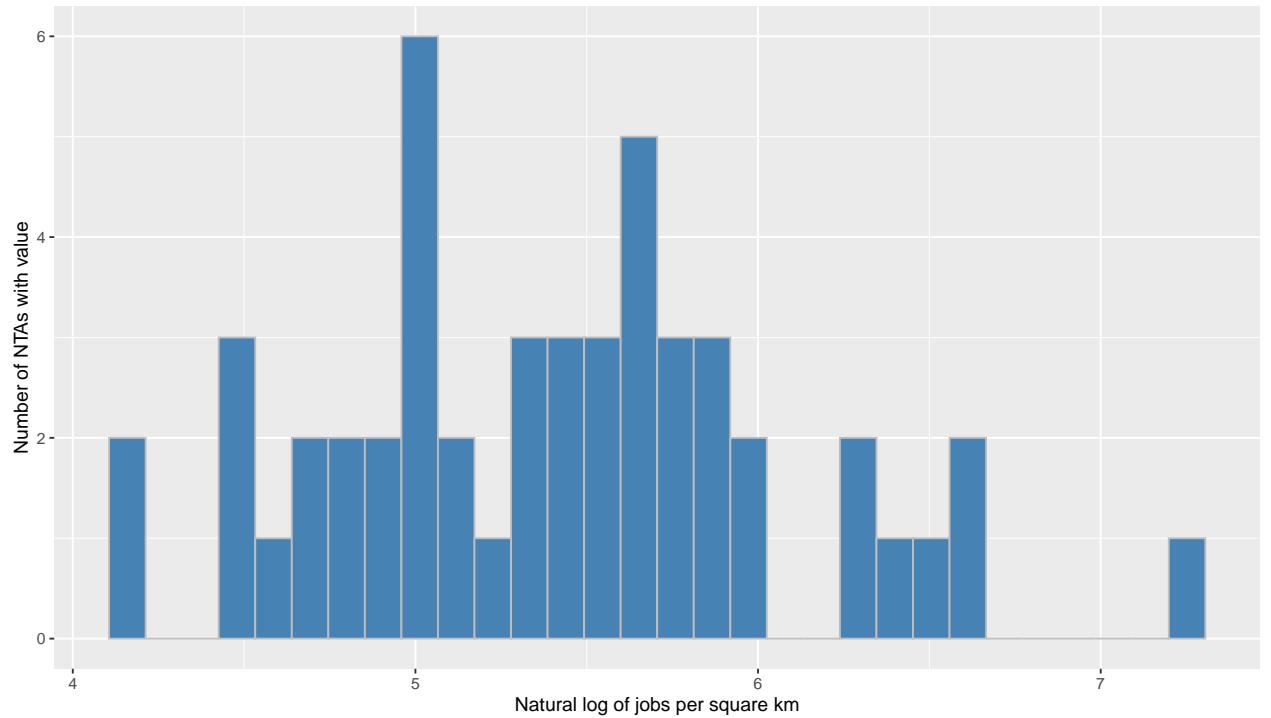


Figure 6: Desire lines for the most popular trips that start and end within the borough

Frequency of job counts for NTAs



Frequency of the natural log for job counts for NTAs



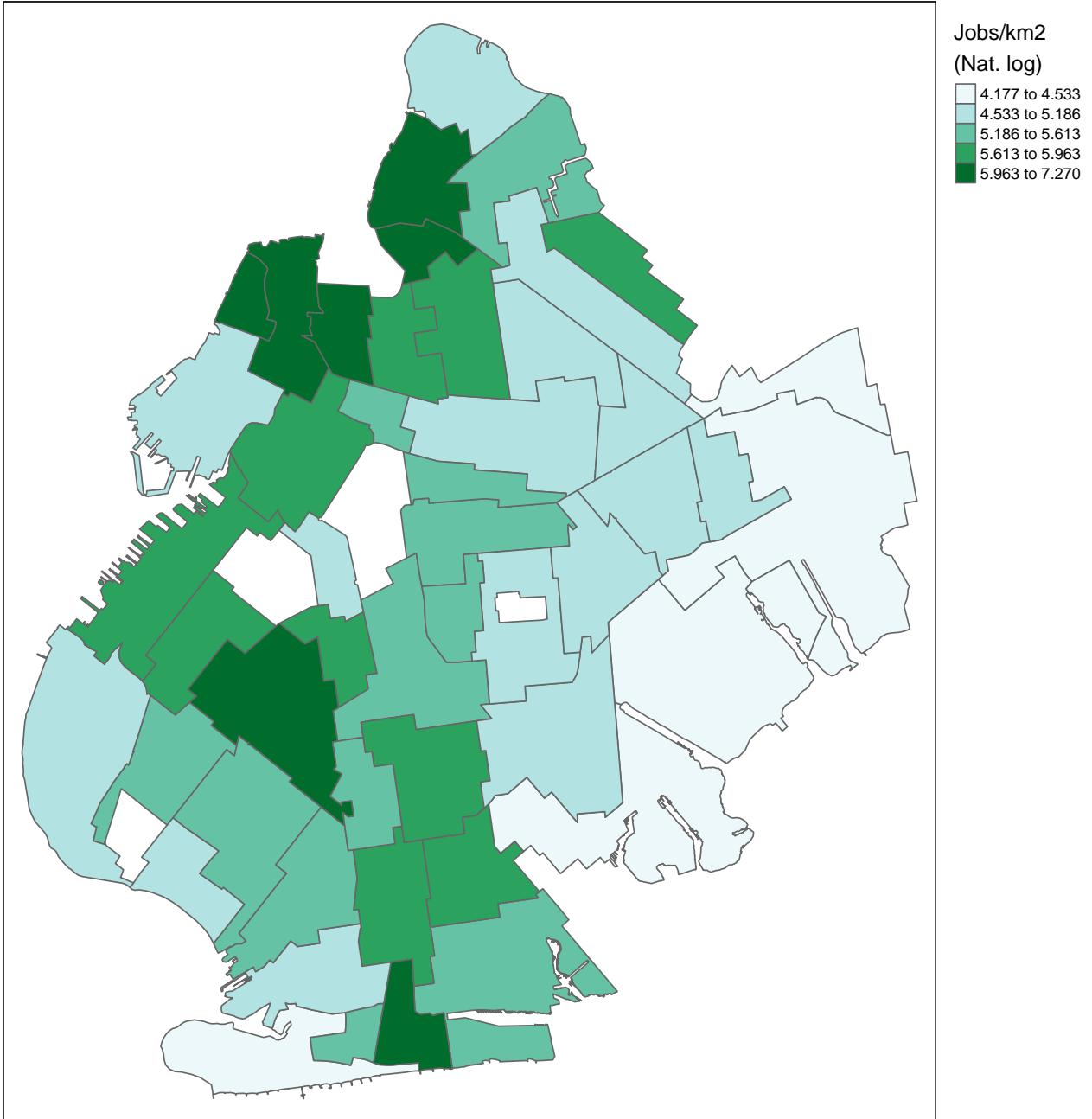


Figure 7: Number of jobs in each NTA tract. Job count is calculated from the sum of all trips which end in that NTA. It is standardized by the total area of the NTA. It is also transformed with a natural log.

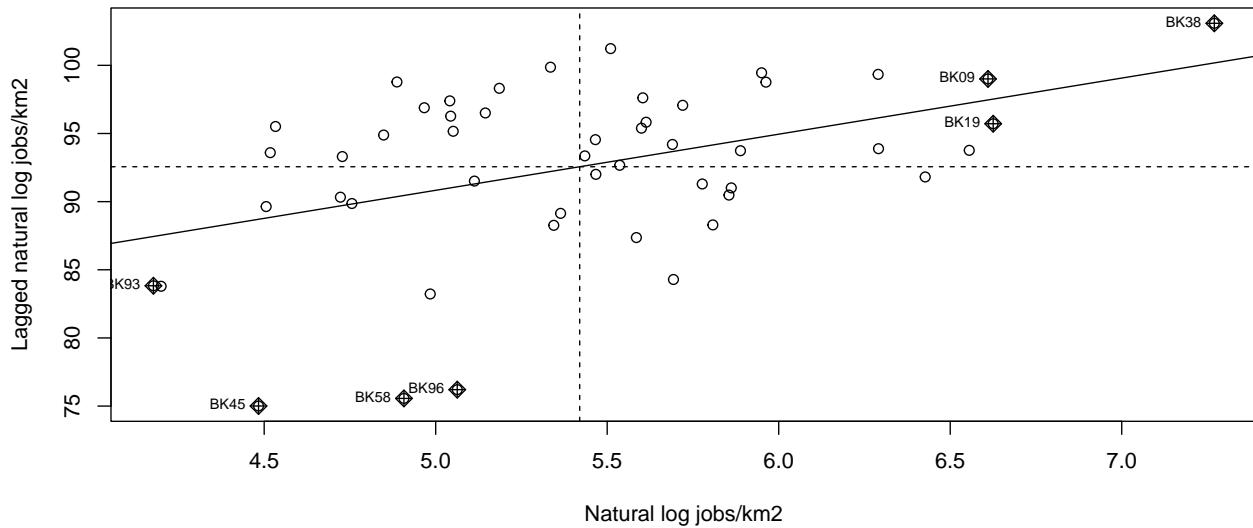


Figure 8: Global auto-correlation of job count using subway transit time for neighborhood wieghts

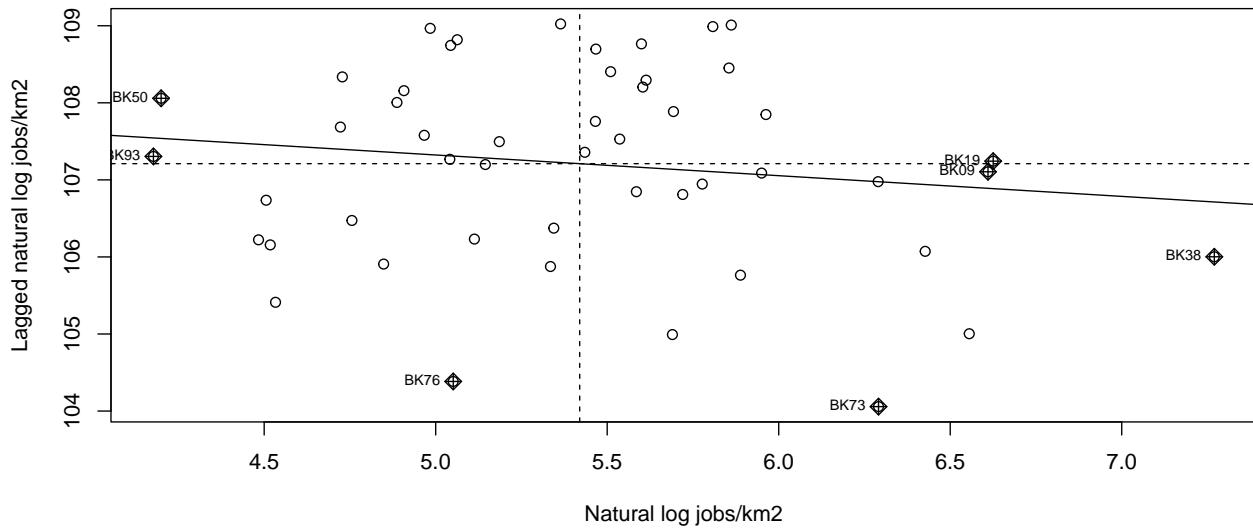


Figure 9: Global auto-correlation of job count using driving time for neighborhood wieghts

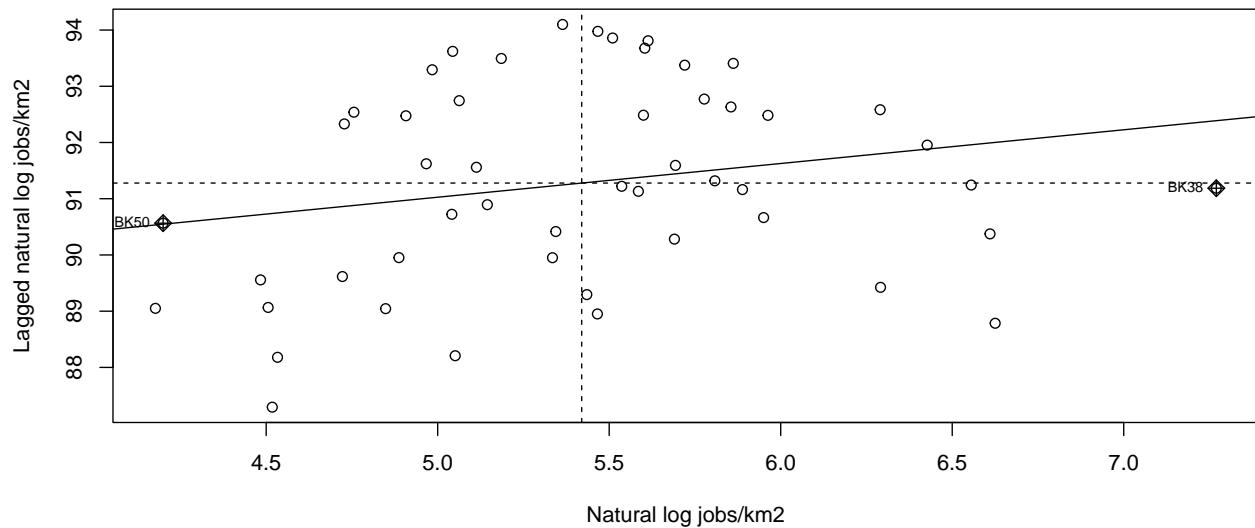


Figure 10: Global auto-correlation of job count using walking time for neighborhood weights

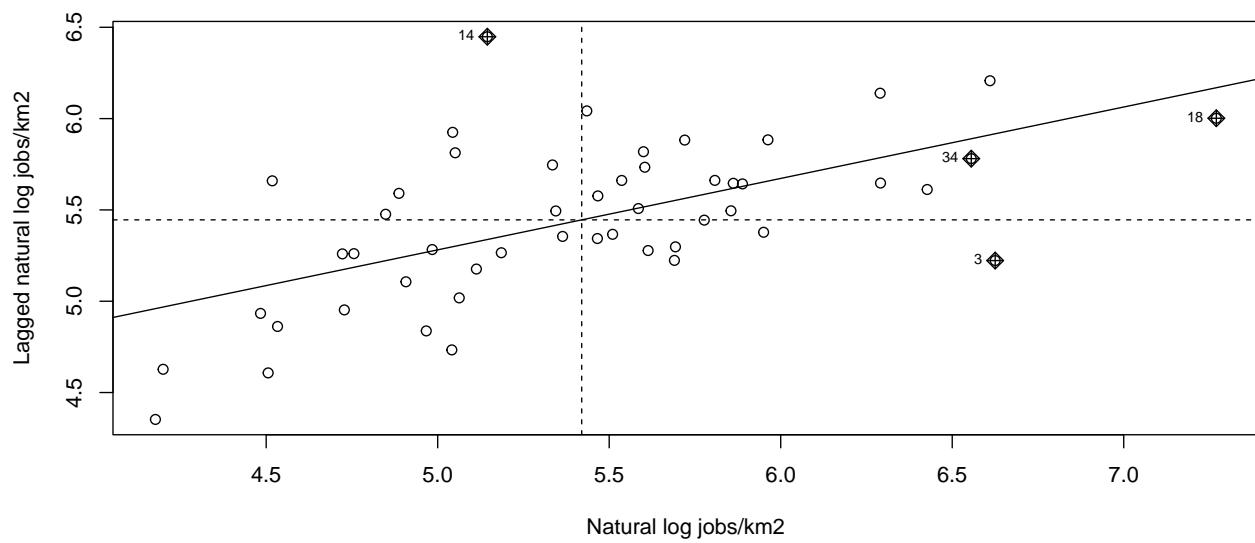


Figure 11: Global auto-correlation of job count using queens contiguity for neighborhood weights

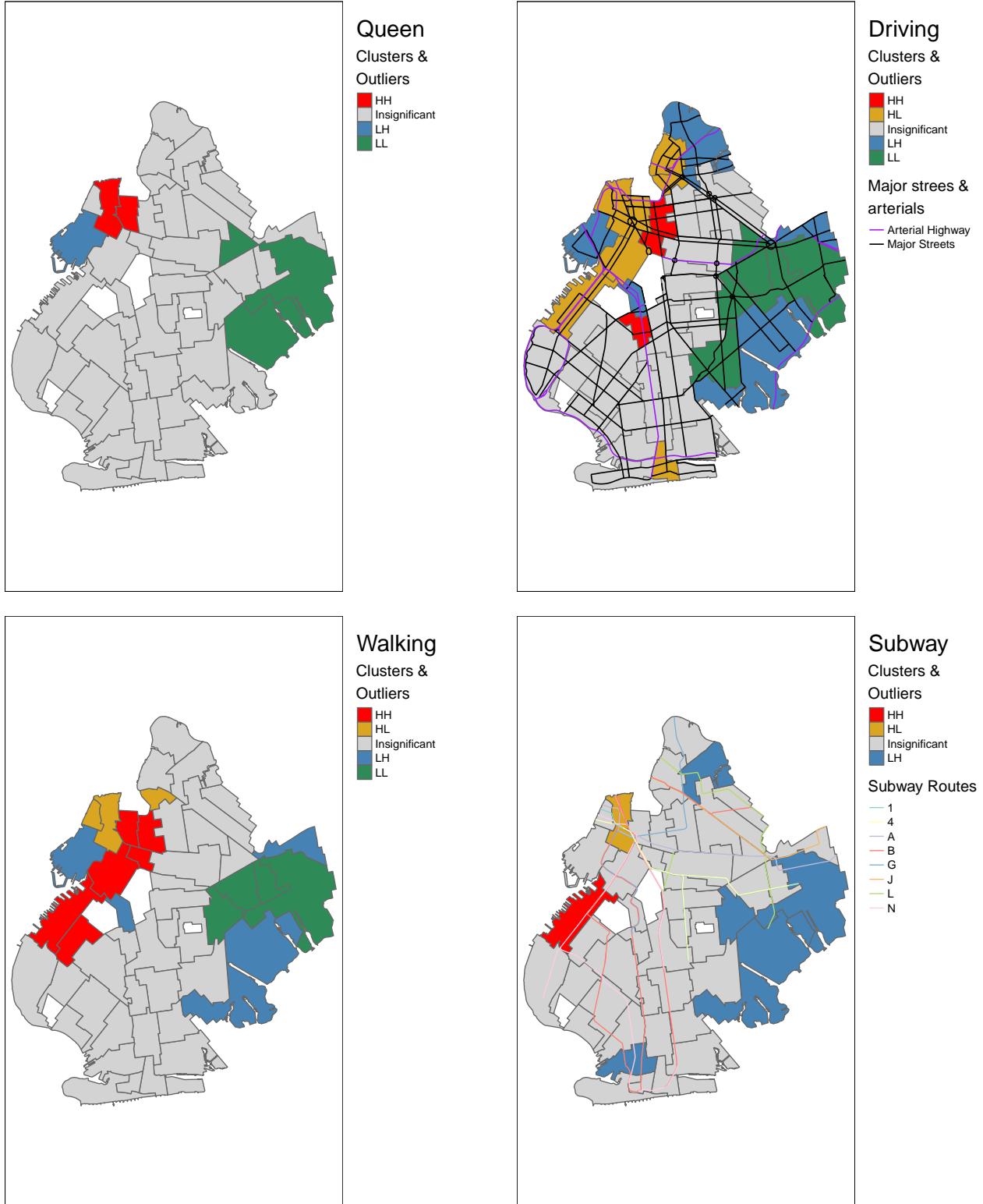


Figure 12: Local auto-correlation for job count of NTAs. Each map utilizes a unique neighborhood weighting. Top left uses queen contiguity. Top right uses driving time in traffic and is overlayed with major roads. Bottom left uses walking time. Bottom right uses transit time on the subway and is overlayed with the subway network.

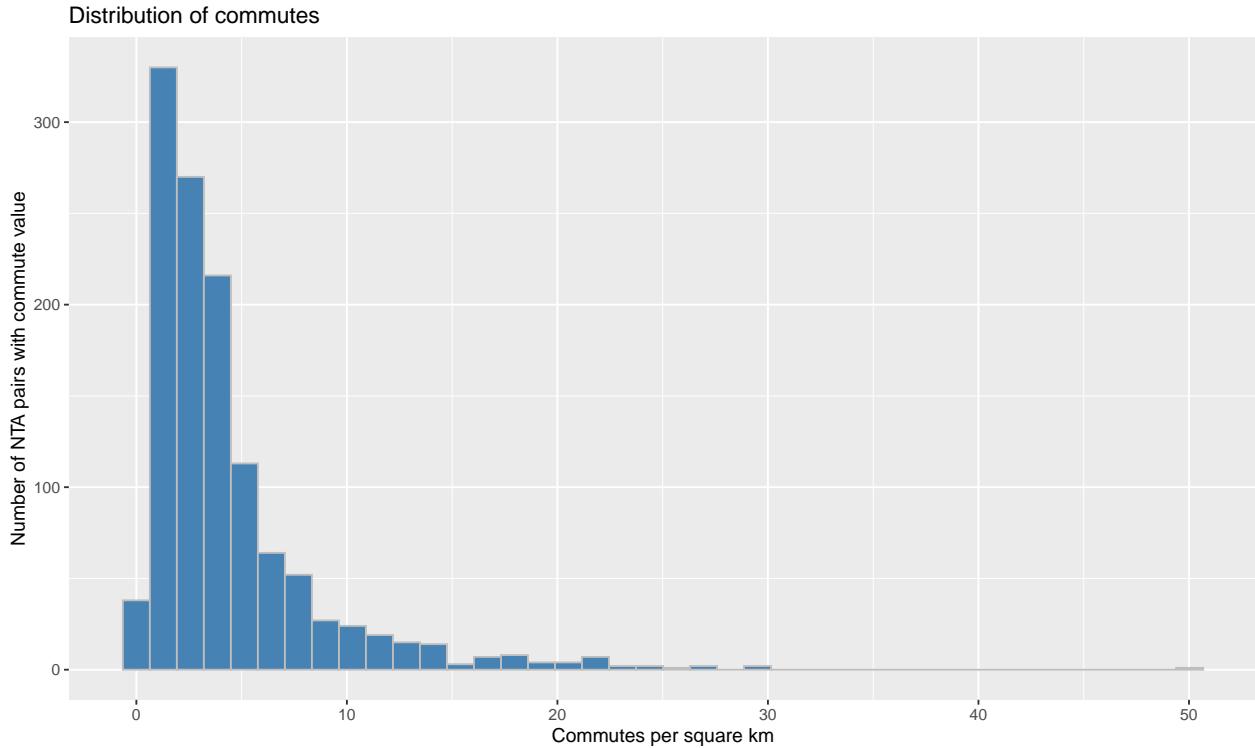


Figure 13: Frequency of commute counts, standardized by the sum of the areas of the commute's origin and destination NTAs

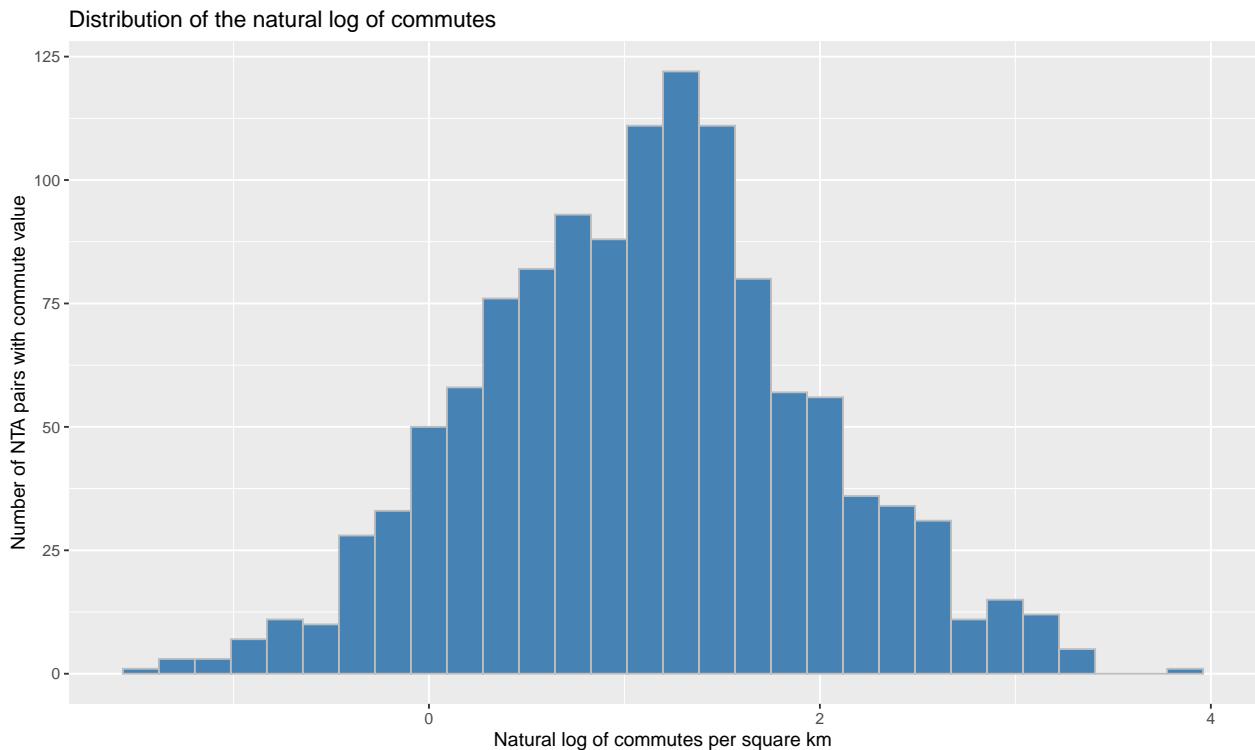


Figure 14: Frequency of the natural log of commute counts, standardized by the sum of the areas of the commute's origin and destination NTAs

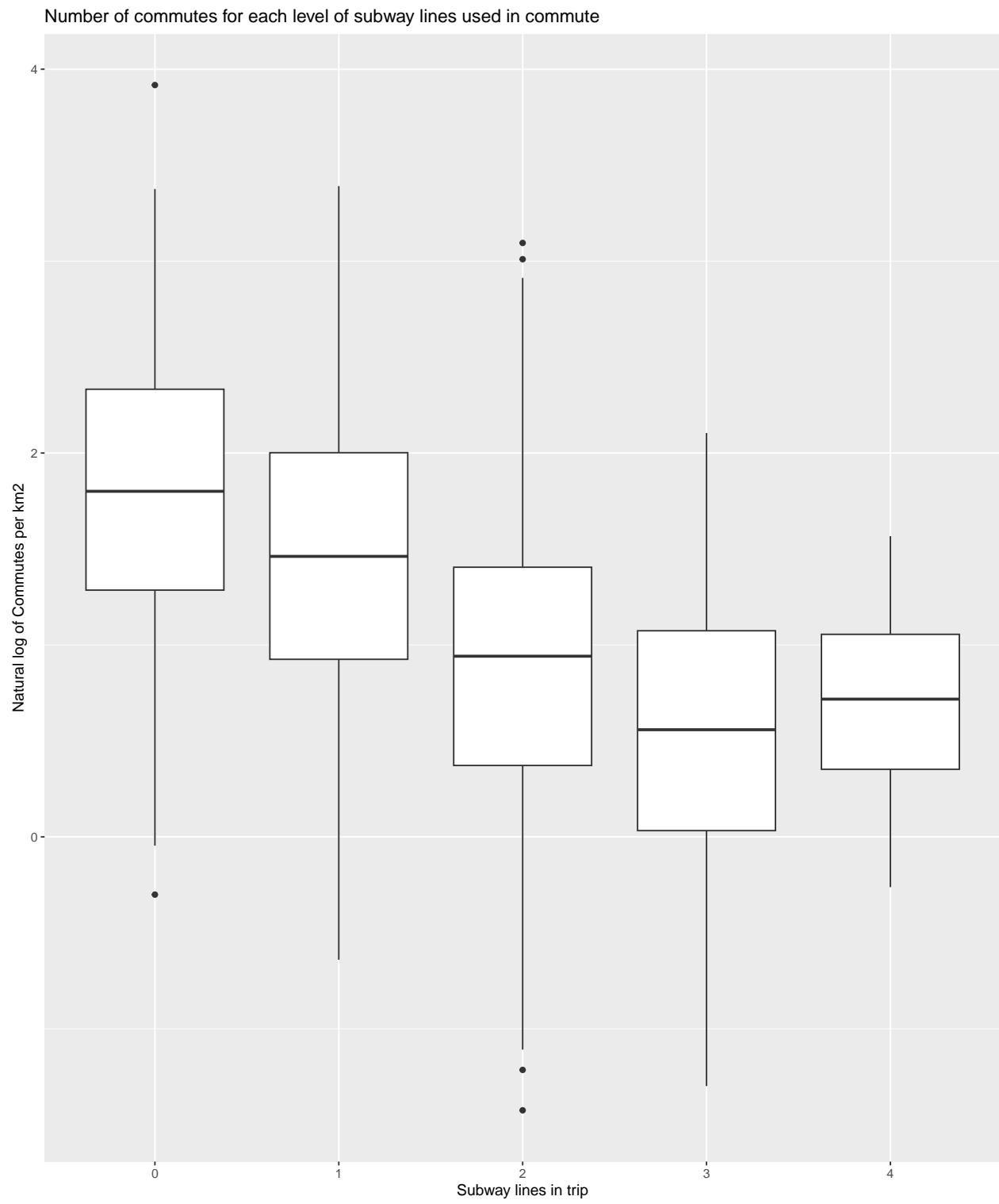


Figure 15: Boxplot for the number of commutes, factored by the number of subway lines used during the commute. Commutes are transformed by a natural log and standardized by area

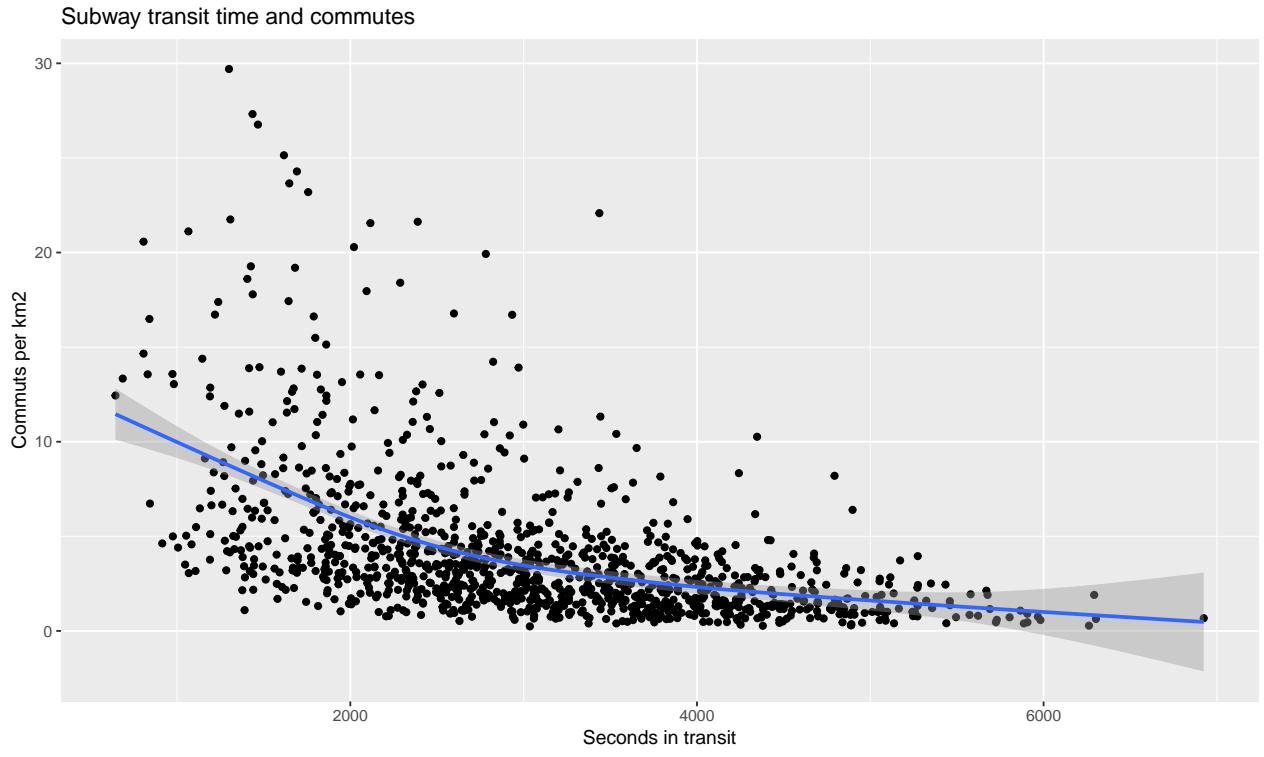


Figure 16: Time in transit on the subway plotted against the number of commutes standardized by area. A smoother line is overlayed in blue.

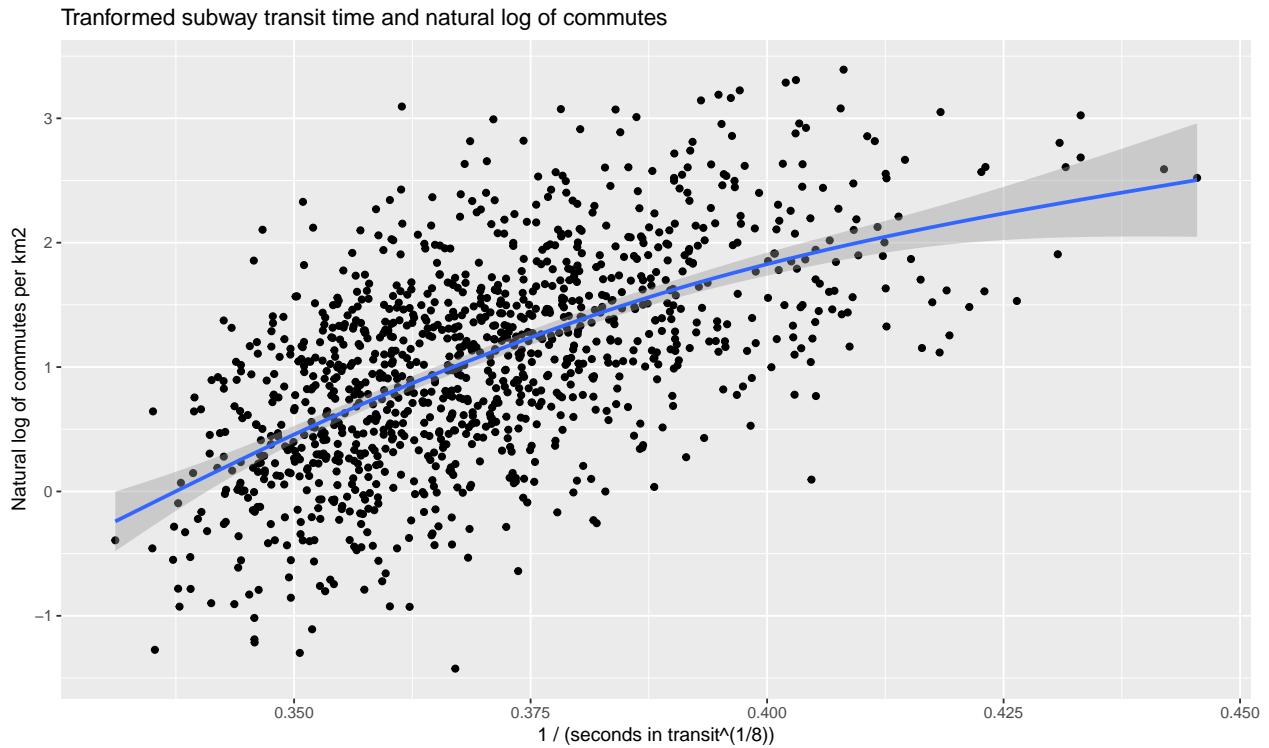


Figure 17: Time in subway transit is transformed by raising it to the power of one-eighth and taking the inverse. Commute count is transformed with the natural log. The values are plotted against each other. A smoother line is overlayed in blue.

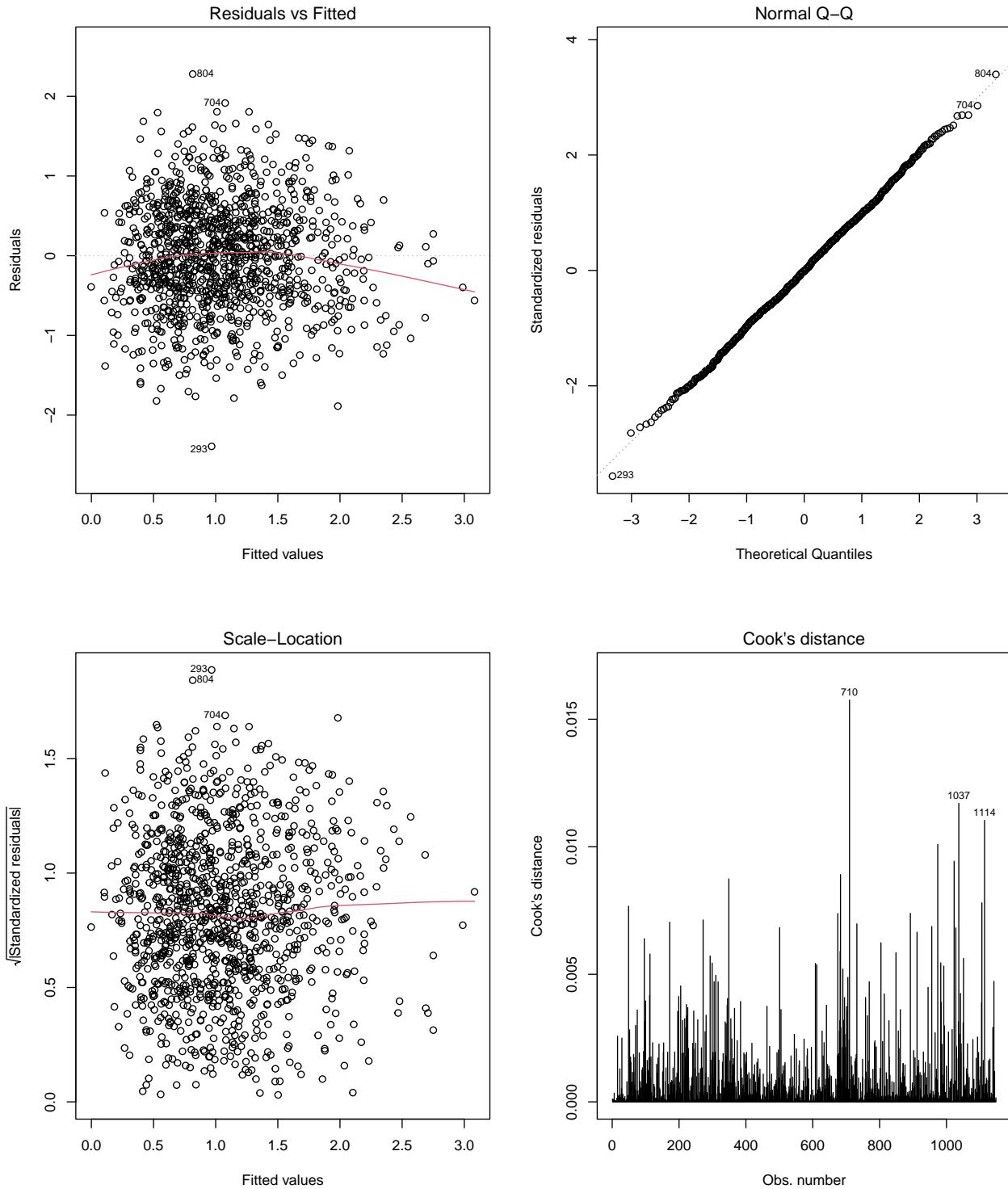


Figure 18: Diagnostic plots for the model of transformed subway transit time

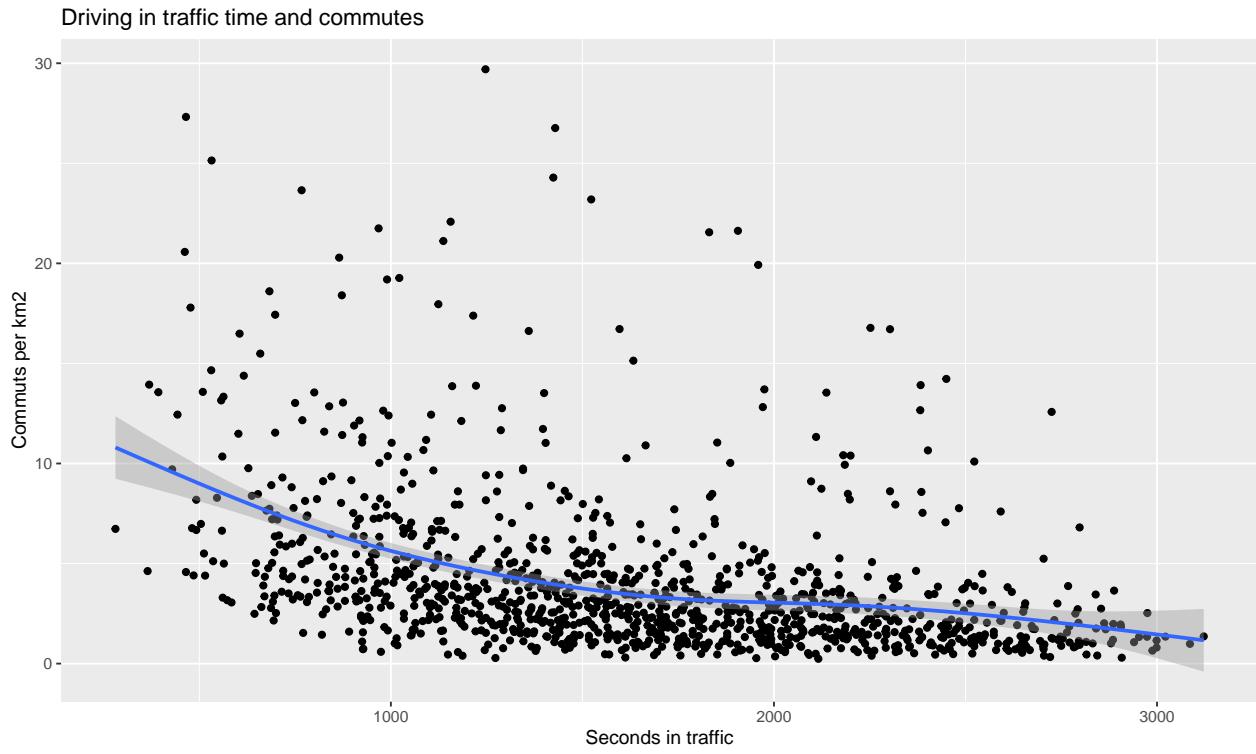


Figure 19: Time driving in traffic plotted against the number of commutes standardized by area. A smoother line is overlayed in blue.

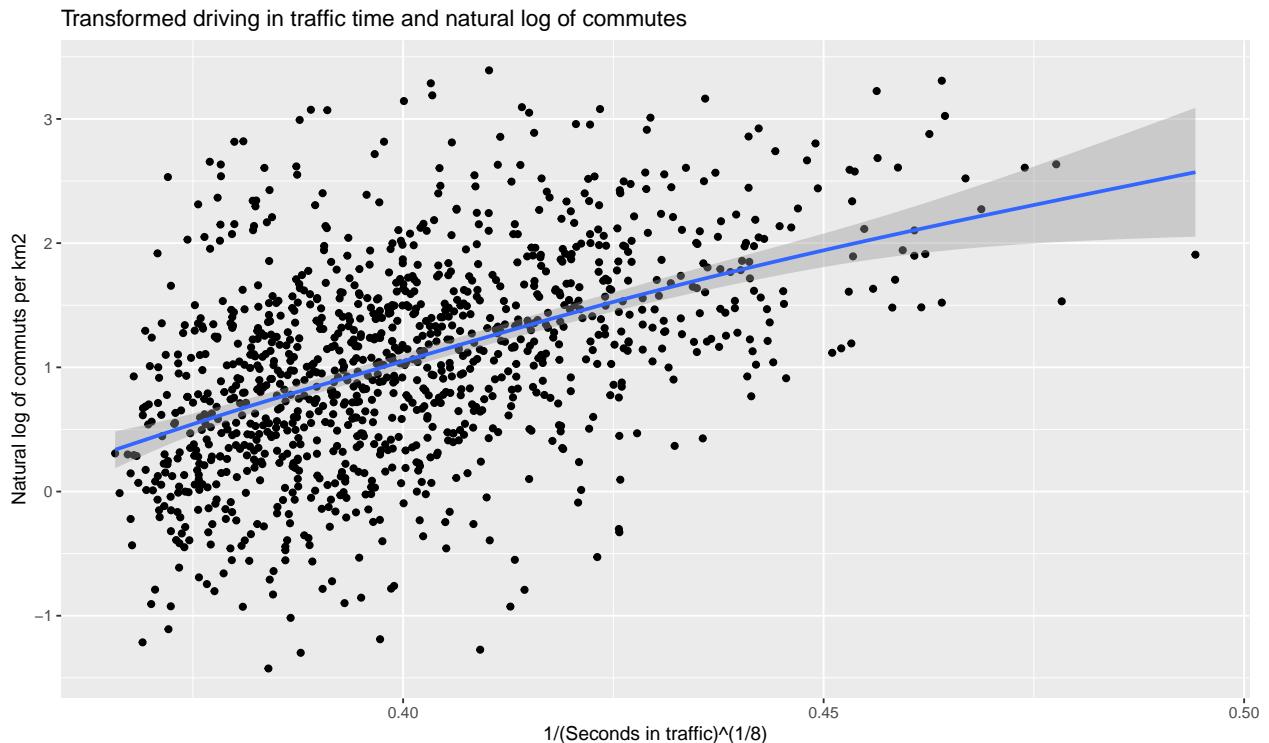


Figure 20: Time driving in traffic is transformed by raising it to the power of one-eighth and taking the inverse. Commute count is transformed with the natural log. The values are plotted against each other. A smoother line is overlayed in blue.

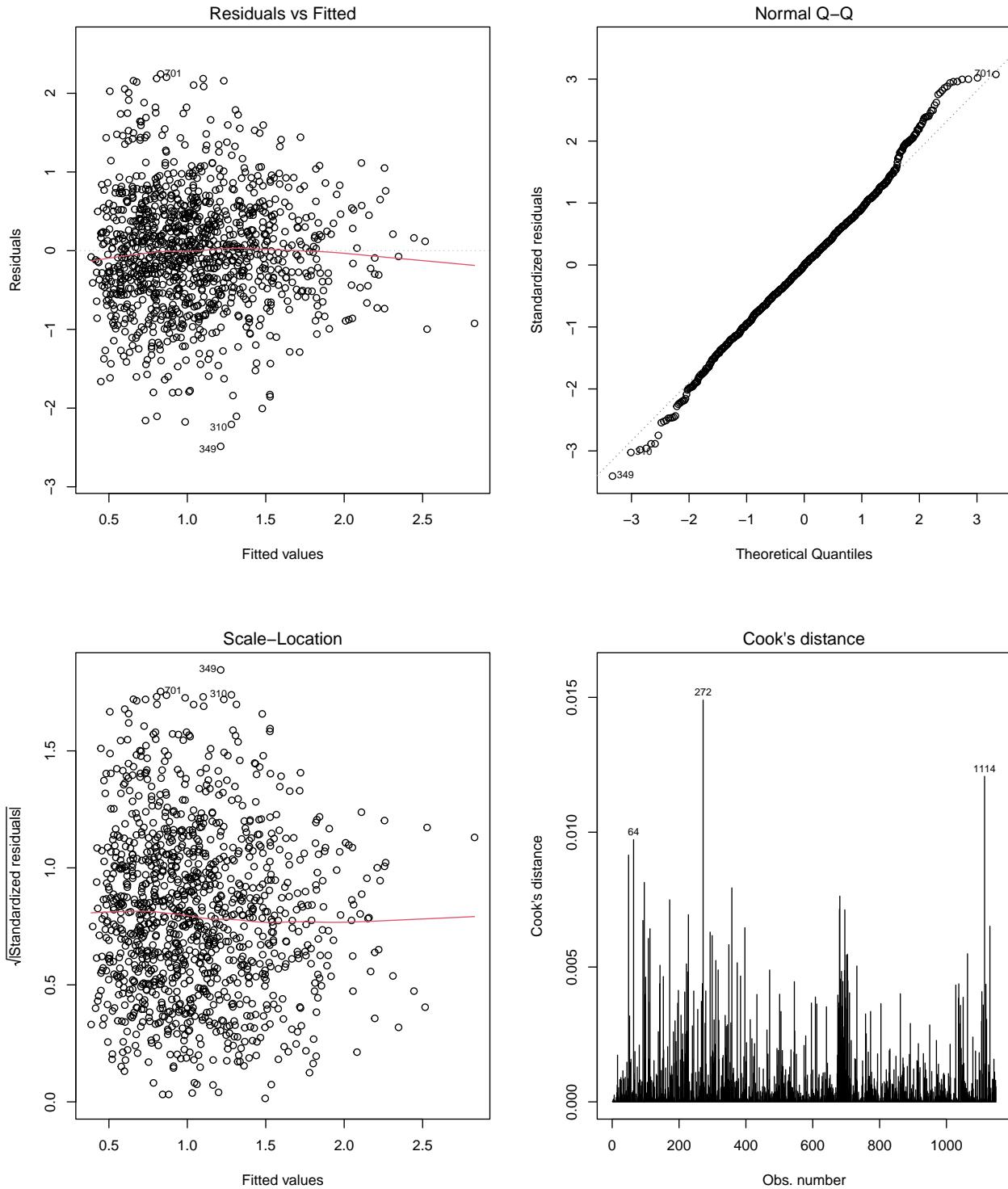


Figure 21: Diagnostic plots for the model of transformed driving time

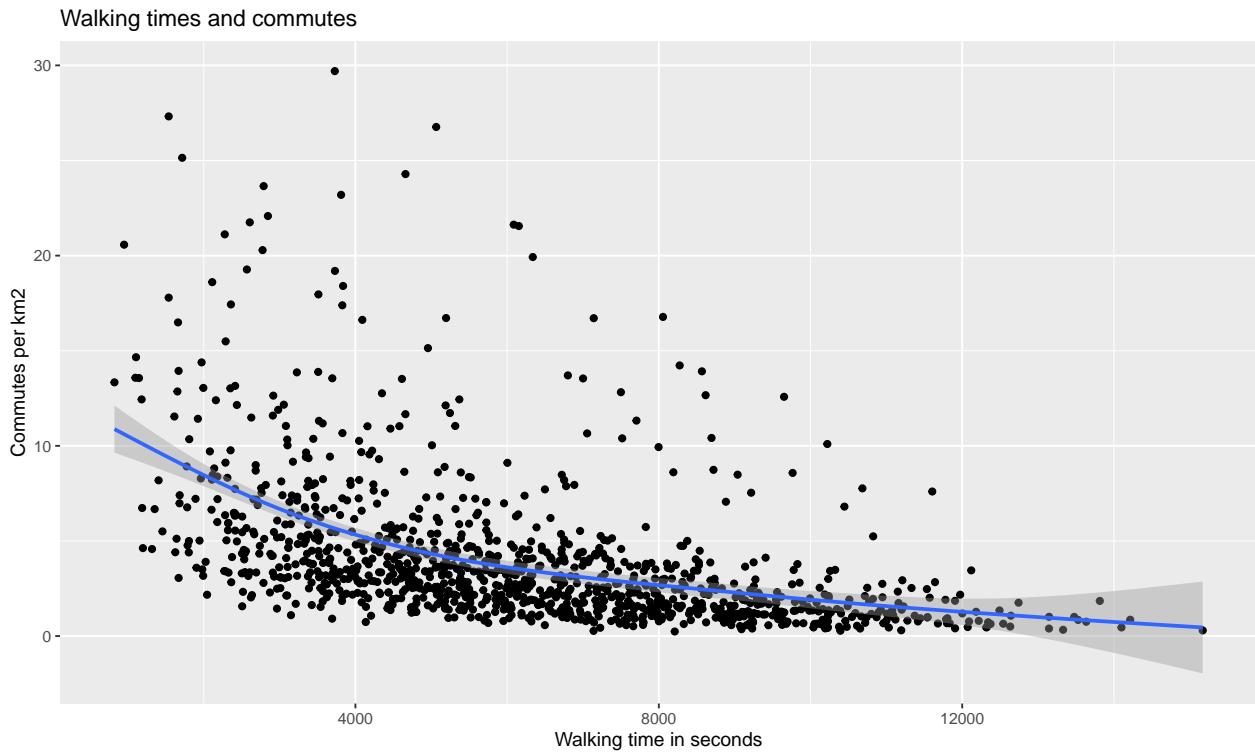


Figure 22: Time spent walking plotted against the number of commutes standardized by area. A smoother line is overlayed in blue.

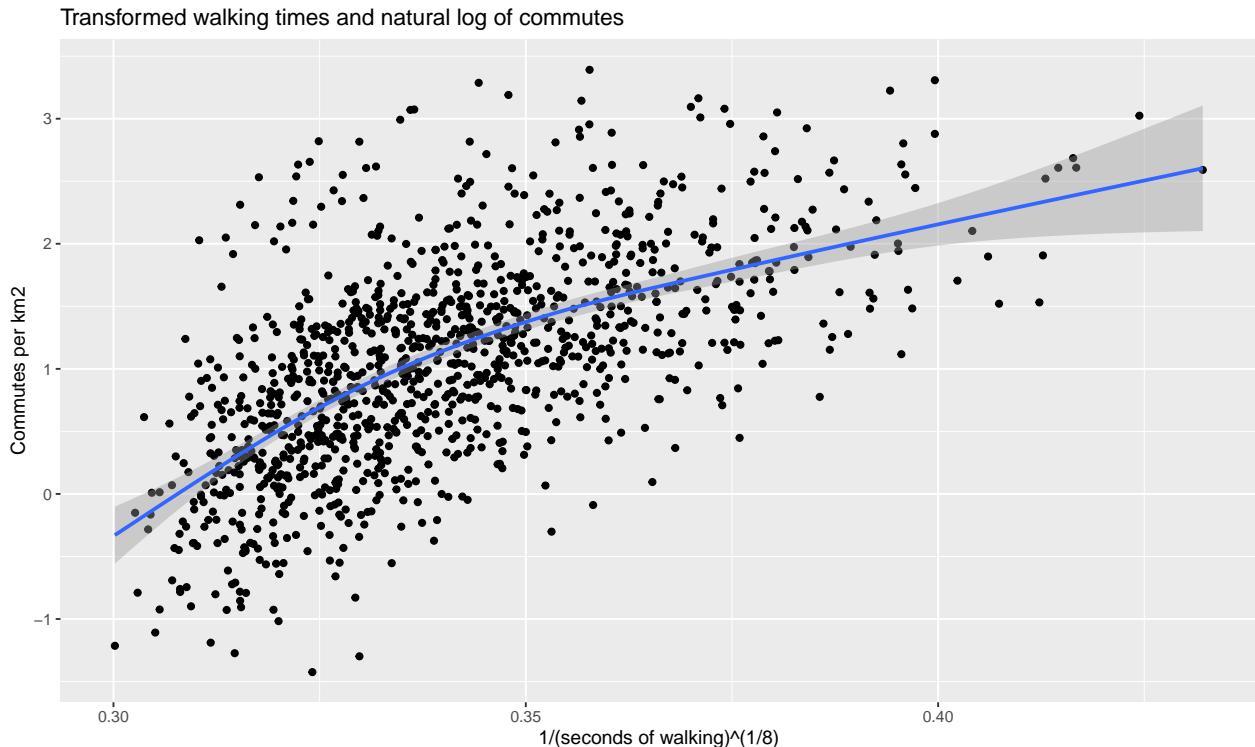


Figure 23: Time spent walking is transformed by raising it to the power of one-eighth and taking the inverse. Commute count is transformed with the natural log. The values are plotted against each other. A smoother line is overlayed in blue.

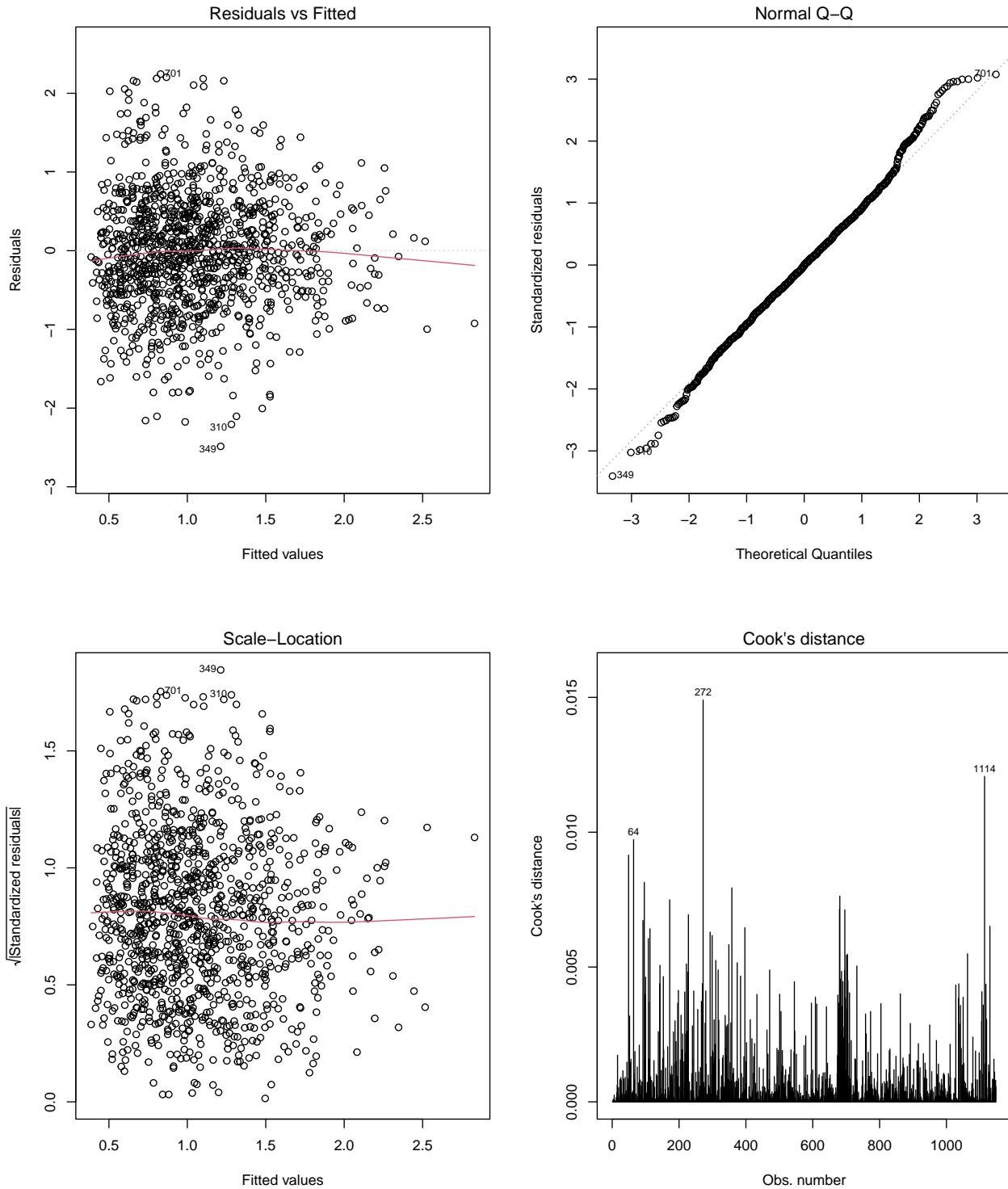


Figure 24: Diagnostic plots for the model of transformed walking time

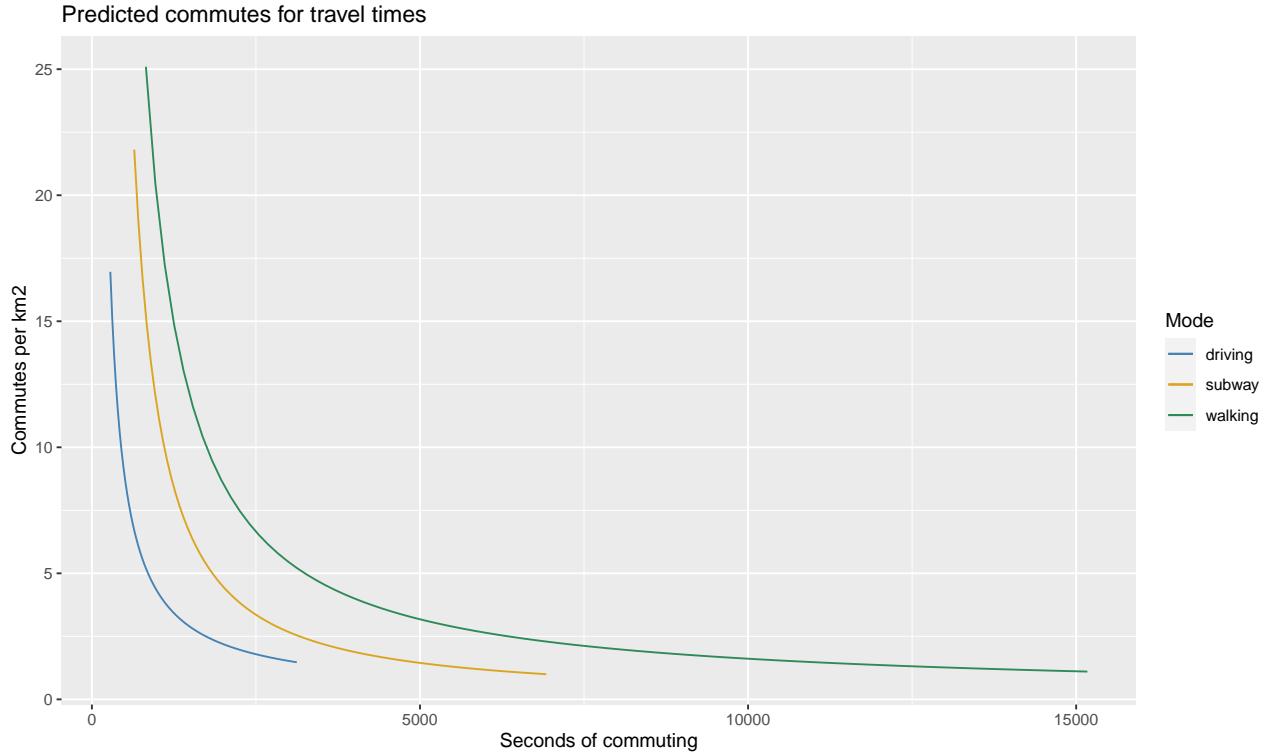


Figure 25: Models for transporation modes. Each model is only plotted from their minimum to maximum observed travel time.

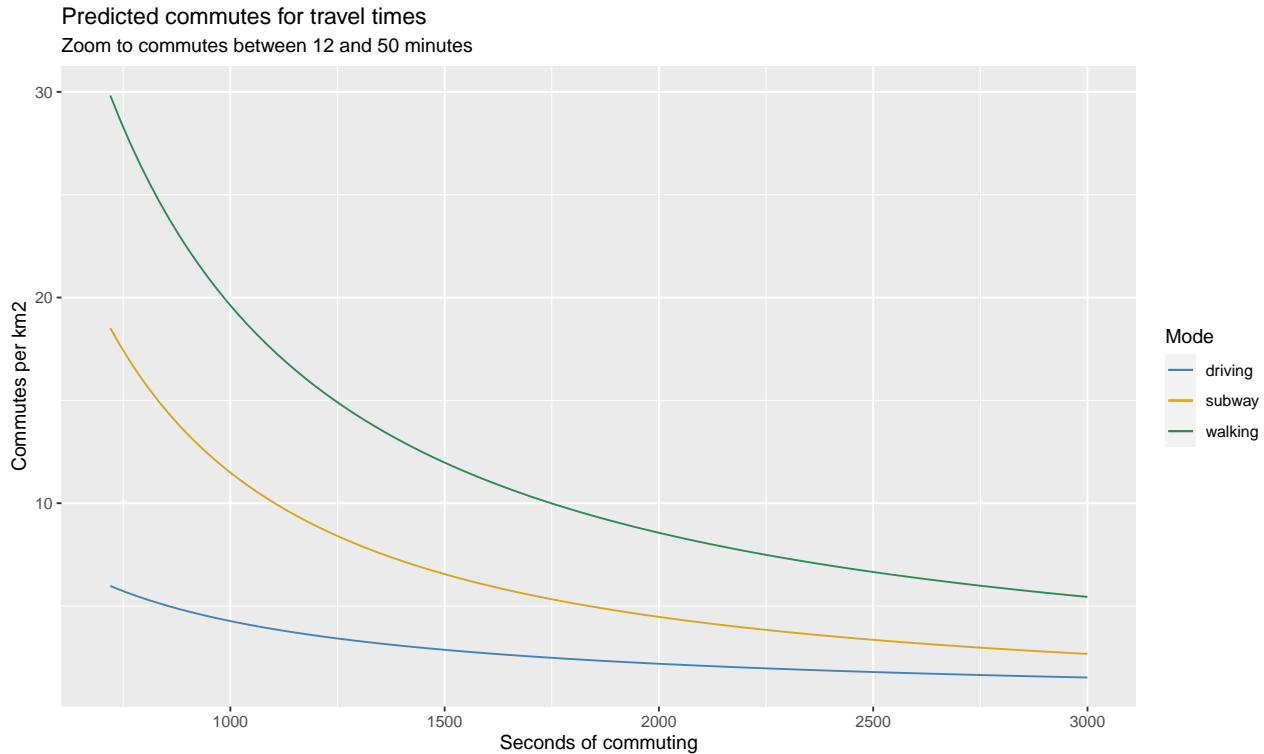


Figure 26: Models of transportation modes, zoomed on the range of 12min to 50mins. This range is seen in the travel time values for each transportation mode.

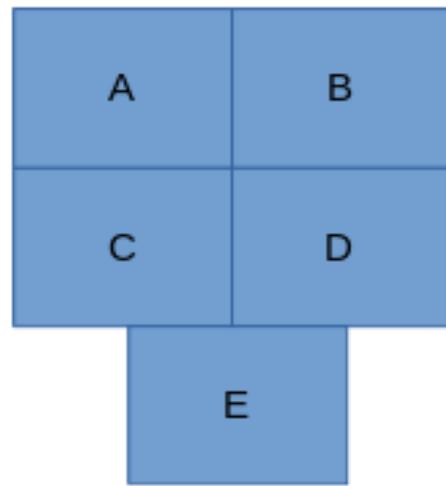


Figure 27: Hypothetical NTA layout

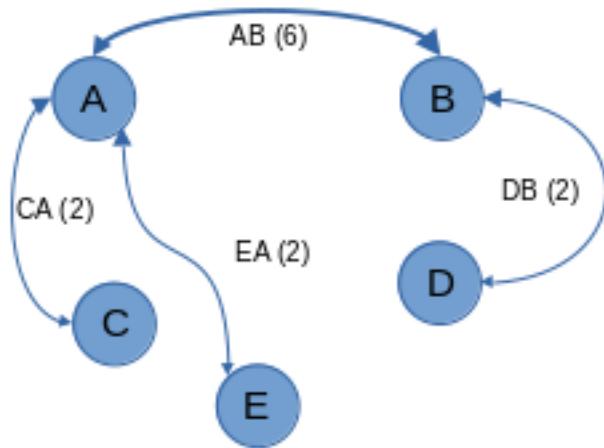


Figure 28: Hypothetical NTA network

	A	B	C	D	E
A	-	6	2	0	2
B	-	-	0	2	0
C	-	-	-	0	0
D	-	-	-	-	0
E	-	-	-	-	-

Figure 29: Matrix for hypothetical NTA network

	AB	AC	AE	BD
AB	-	1	1	1
AC	-	-	1	0
AE	-	-	-	0
BD	-	-	-	-

Figure 30: Complement for hypothetical NTA network

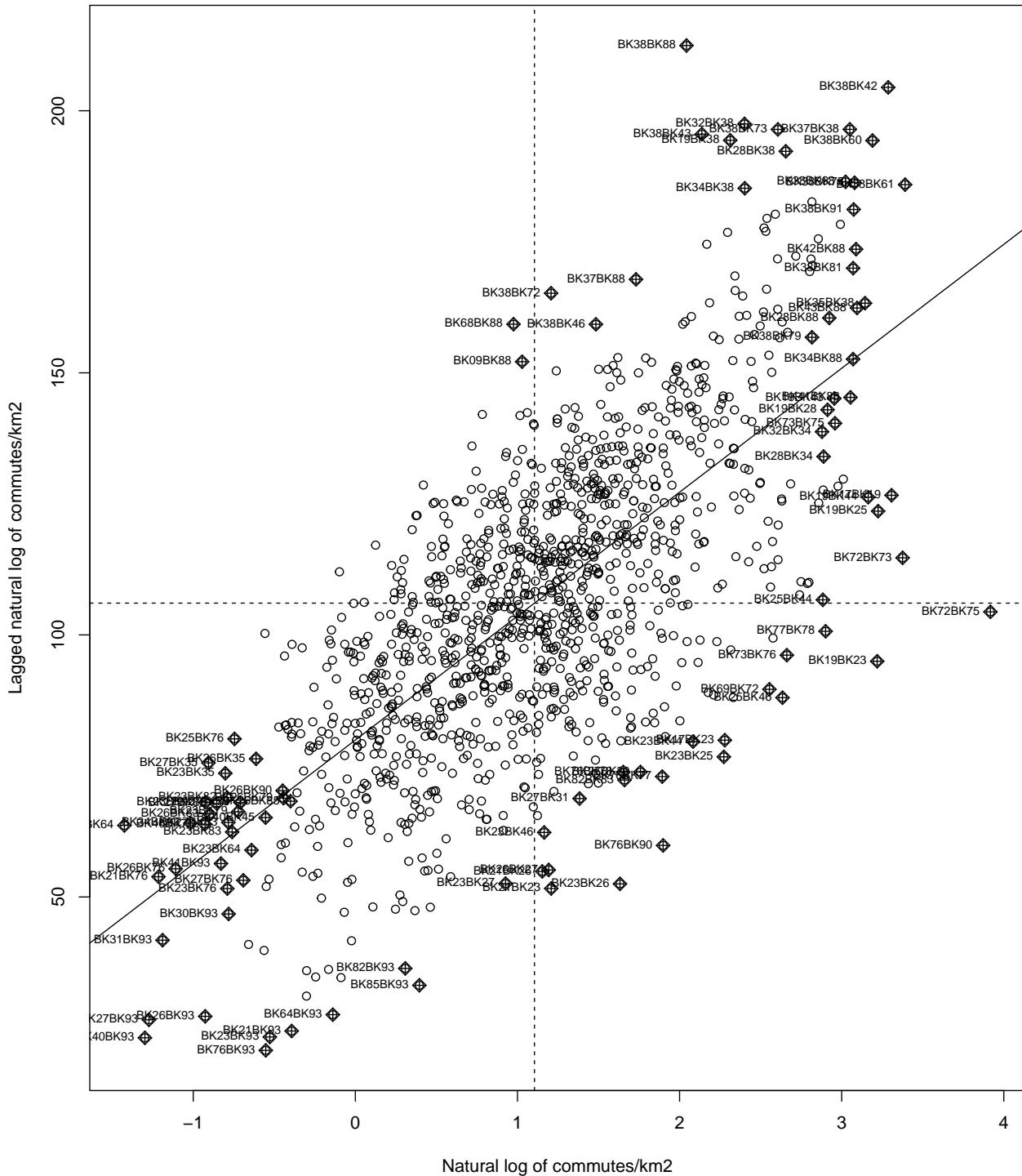


Figure 31: Global auto-correlation of commute network

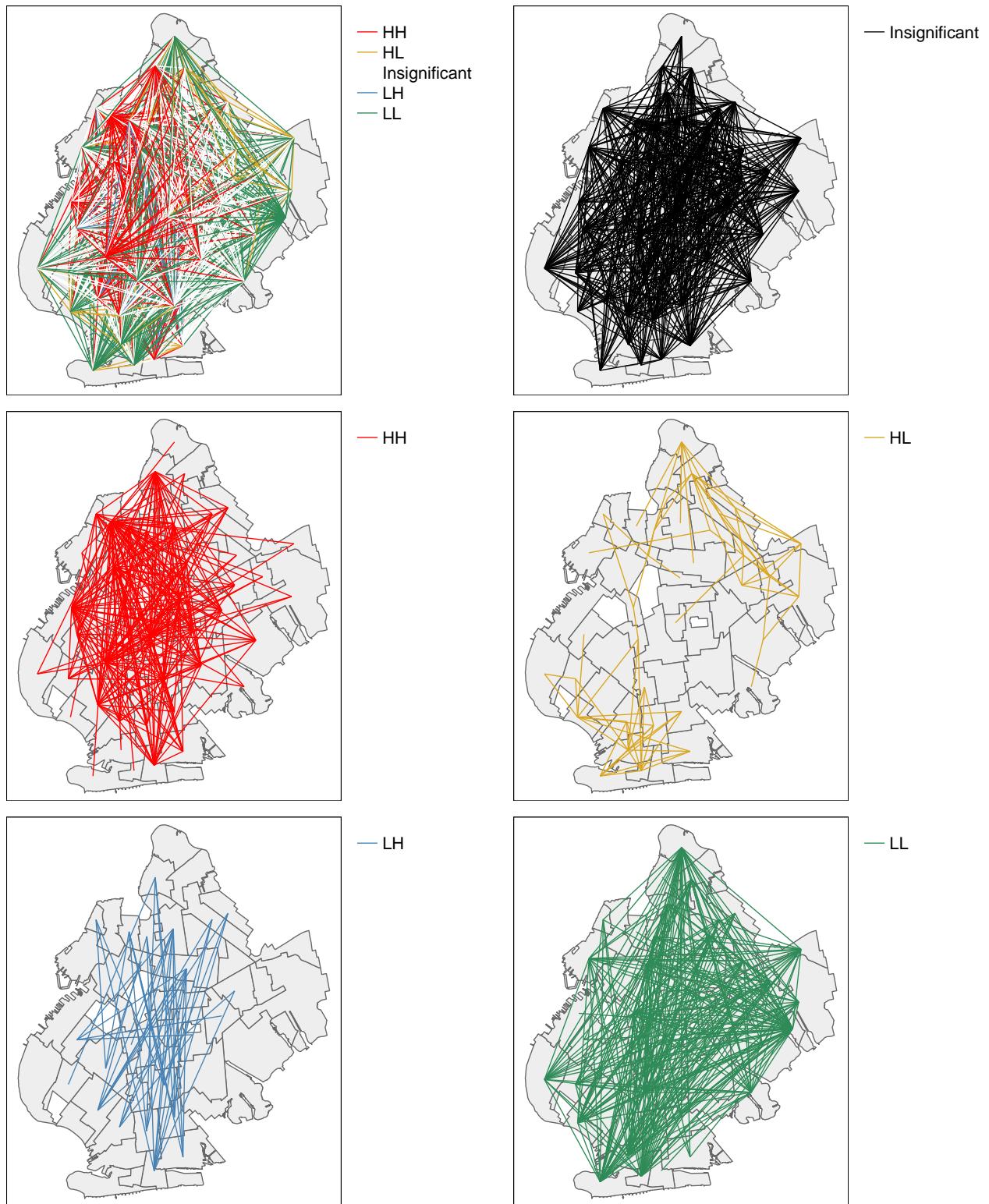


Figure 32: Local autocorrelation for commute network. Top left map shows all confidence types on one map. Top right shows Insignificant clusters. Middle left shows High High clusters. Middle right shows High Low clusters. Bottom left shows Low High clusters. Bottom right shows Low Low clusters

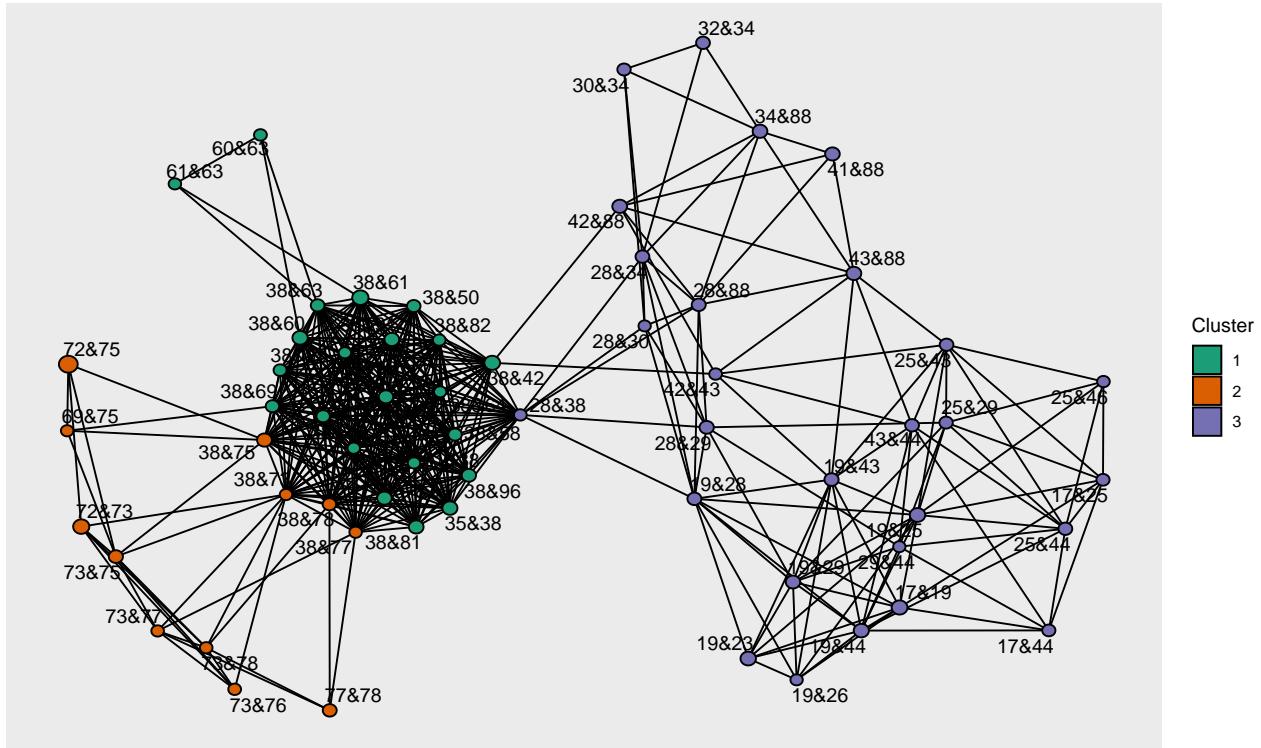


Figure 33: Graph of the top 5% most popular commutes through brooklyn and their interactions with each other. The color of the node reflects its membership in one of three clusters

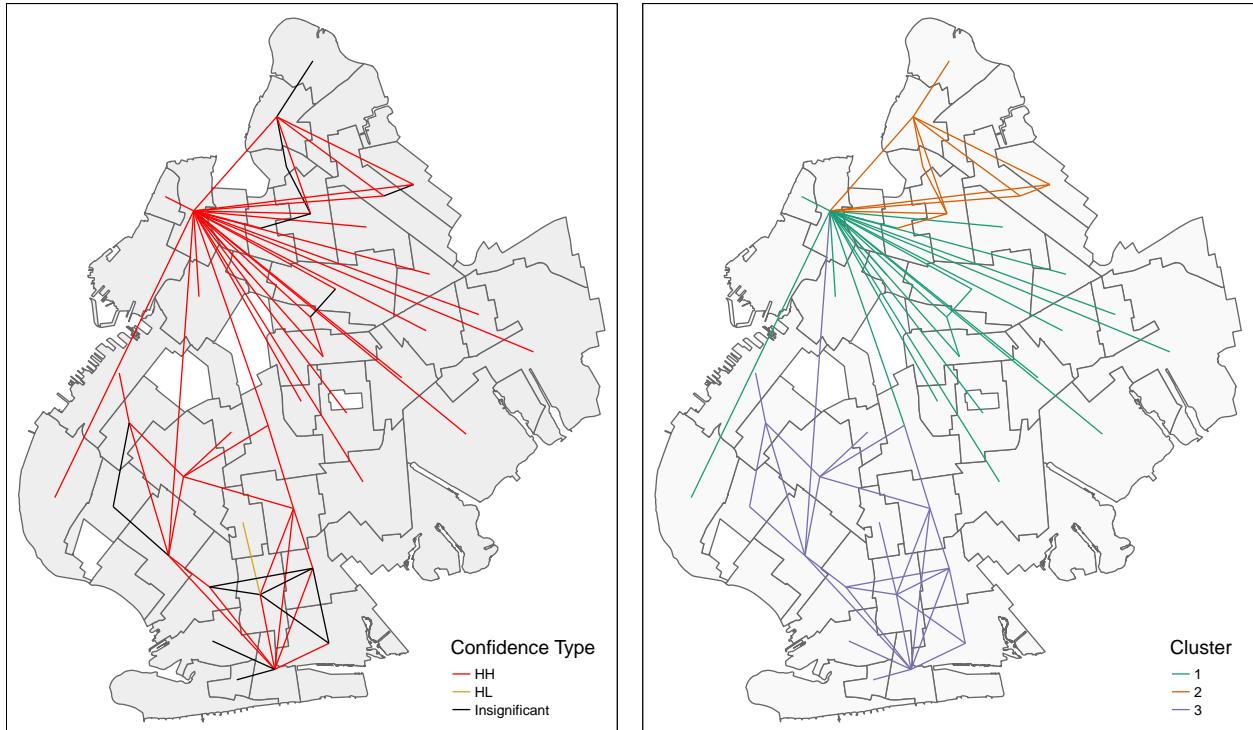


Figure 34: Geospatial distribution of the top 5% most popular commutes through Brooklyn. Left diagram is the confidence type of the commute. Right diagram is commute's membership in the network cluster