Shadow Transit: Dollar Vans in New York City

**Background**

Dollar vans are a unique form of public transportation that operate as a shuttle service, serving communities that are underserved by traditional public transit. These vans, primarily owned and operated by the Chinese community, serve as a flexible and informal mode of transport for residents of various neighborhoods in New York City, including Sunset Park, Chinatown in Manhattan, and Chinatown in Flushing, Queens.

**Methodology**

To identify who has access to formal public transit, I used ArcGIS' Network Analyst tool to calculate walking times to the closest stops. In order to use Network Analyst, considerable time was spent setting up the network itself. This proved difficult given the number of streets in New York. In addition, once the network was set up I required filtering to eliminate private alleys, service roads, and other various non-routable segments. Once a working network was established, shapefiles of subway and bus stops were obtained from the MTA for use as facilities so that Network Analyst could generate polygons showing walking times.

Because subway service in the city is not as widespread as one might think, I used 7 minute walking times as the parameter for drawing service area polygons. For the bus data, I used a de-facto layer of 3 minute (in green) and 5 minute (in blue) walking times. I overlaid this data onto median income by census tract to illustrate correlations between income and transit access.

**Discussion & Conclusion**

After analysis of the data, the absolute necessity of the van routes was obvious. In looking at who has access to subway routes, I was expecting to see that access directly correlated with higher median income. However, it was not the case. In Manhattan, this held mostly true. In the outer boroughs, particularly Queens, there were multiple neighborhoods that had no access to subway service but had higher median incomes than their subway accessible counterparts.

In looking at bus service area, it is clear that the MTA has an extremely extensive bus network which, according to my analysis pales most of the city to within a 5 minute walking distance at most. This is misleading however, because it does not take into account the frequency with which the bus comes.

The bus frequency analysis was particularly difficult because the raw GTFS data provided by the MTA required a significant amount of processing before it was even remotely usable in anGIS. Additionally, because multiple times stop at the same bus stop, the counts seem somewhat higher than they would logically be. I had more time and experience in working with the data, I believe I could have eliminated this issue. Similarly, bus depots showed themselves as having 70 or 80 trips per hour because they dispatched so many busses for the morning commute, this is somewhat misleading because most of those busses do not load passengers at the depot.

These issues notwithstanding, the frequency analysis did an excellent job of showing which neighborhoods lack adequate or even existent morning rush hour bus service. While some of the neighborhoods affected, south and particularly Queens, have sufficient subway service, other areas such as eastern queens and south-central Brooklyn clearly rely on the existing van service to make up the gap. Another thing to keep in mind when viewing the frequency map is that many bus stops deep in the outer boroughs with significant services are those that service express busses to Manhattan. For commuters who must commute within the borough, the van again provide an invaluable service.

The Chinatown line serves a slightly different purpose in that it connects the three Chinatown communities of Sunset Park, Chinatown in Manhattan, and Chinatown in Flushing, Queens. Clearly, the dollar vans will not disappear any time soon. They serve too important and integral role in the transportation fabric of the city (they would actually probably rank as the 20th largest bus network in the US if counted). While the MTA may improve its service in the future, they will never be able to compete with the dynamic nature of the vans as they speak little to no English. In the case of the vans serving commuters between the Chinese neighborhood of Sunset Park and South Beach, the drivers serve as an alternative to newly arrived Chinese who would otherwise not have the language skills required to figure out the MTA's (Metropolitan Transportation Authority) system.

In addition, the dollar van service is vital. While more affluent neighborhoods might have had their transit woes eliminated by ride sharing apps, these communities do not have the disposable income to own a car and lift. It is, in addition to economic factors, the continued nature of the vans makes them dearer to immigrants who speak little or no English. In the case of the vans serving commuters to the upper west side (West Indian and Chinese populations), making the van the main route. While more efficient neighborhoods might have had their transit woes eliminated by ride sharing apps, these communities do not have the disposable income to own a car and lift. It is, in addition to economic factors, the continued nature of the vans makes them dearer to immigrants who speak little or no English.