

Brooklyn Park Foreclosure and Transit Proximity: Relationship Between Transit Locations and Foreclosure Rates



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Resilient Communities Project

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Resilient Communities Project

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Abstract

The city of Brooklyn Park faced a large foreclosure crisis within the past decade and responded with large investments from a variety of sources in order to stabilize housing and neighborhoods. The city wanted to better understand the best ways to use resources for the future and see if there were correlations between transit and housing values. Data about foreclosures and transit was collected to analyze this relationship. A network analysis was done to determine resident's ability to access local transportation. It was discovered that almost all of Brooklyn Park was within a 15-minute walk of a transit stop. A large majority of foreclosed homes were within this distance to transit. There were some homes that were outside the network and not accessible directly to transit by walking. On average these homes were resold from foreclosure for \$100,000 more than transit accessible houses. Further analysis can be conducted to look at demographics and access to transit or if transit accessible homes were more or less likely to undergo foreclosure than non-transit accessible homes.

Keywords: Brooklyn Park, foreclosure crisis, foreclosures, transit, bus stops.

Background

Brooklyn Park is the 6th largest city in Minnesota. Of the population of 80,000, half of the people are of color and one fourth speak a language other than English at home.¹ The city's population has grown at a higher rate than the rest of Hennepin County since 1980.² Brooklyn Park is a northern suburb of Minneapolis and has a large collection of single family homes. The housing stock has a wide variety of prices, and within and nearby Brooklyn Park there are

¹ "Resilient Communities Project: City of Brooklyn Park - Foreclosure Recovery Impact in Brooklyn Park" Erika Boyd

² 2010 U.S. Census Demographic Report City of Brooklyn Park, MN - Community Development Department

several commercial centers with large concentrations of jobs. The city does not directly touch the city of Minneapolis but faces many of the same problems that first-ring suburbs currently face.

During the housing foreclosure crisis from 2006-2013, approximately one fifth of single family homes in Brooklyn Park faced foreclosure. The city responded to the crisis and used funds from local, state, and federal organizations to assist 230 homes within the city. To tackle the issue, Brooklyn Park has the following foreclosure program strategies: prevent foreclosures, secure foreclosed homes and foreclosed homes rehabilitation. Currently, a total of 185 homes have been purchased, rehabilitated and sold by the city.³ The level of investment has been immense and has totaled \$9 million from the Local, State, and Federal sources which pulled in an additional \$15 million from other sources to aid in the recovery.

Despite not being a core city or first-ring suburb, Brooklyn Park has a large collection of local and express bus routes that serve the city. Most of the developed portions of Brooklyn Park are served by at least a bus route that travels to downtown Minneapolis during rush hours. In the future, Brooklyn Park will have five light rail stops for the Blue Line extension which will terminate within the city. An estimated 27,000 rides will be taken daily along the Blue Line extension when it is expected to open in 2021. The light rail stations and surrounding areas are undergoing significant planning and there will likely be large amounts of redevelopment in those areas.⁴ While light rail stations will have a greater impact on local land use, bus routes can also impact land uses and values. The bus stops associated with the bus routes can help increase the distance residents are able to travel for work or other essential trips.

³ Resilient Communities Project: Proposal 2016. Submission from the City of Brooklyn Park

⁴ <http://www.brooklynpark.org/light-rail/>
<https://metro council.org/Transportation/Projects/Current-Projects/METRO-Blue-Line-Extension.aspx>

It is important to understand how well the large investment in foreclosure recovery programs have worked within the city since direct investments such as those undergone during the foreclosure crisis can help stabilize neighborhoods. What's more, access to reliable transit may also play a part in the ability of neighborhoods to recover from a housing crisis. Therefore, this project is related to transit accessibility since it is an important factor in how residents can find and travel to jobs. The first objective is to visually explore the possible association amount transit accessibility and foreclosures. This includes answering important questions to help define transit accessibility. This includes: What data is important and should be included? What modes of transportation should be used and what is a maximum walking distance to those modes of transportation? Is there a spatial relationship between foreclosure locations and transit? Secondly, the project aims to examine the relationship between transit accessibility and rebound values. That is, identify if there was an impact between transit proximity and investment in the resale value of the foreclosed homes.

Study Area and Data

Data for the project was collected from two main sources. The foreclosure locations and other associated data with foreclosures was collected from the city of Brooklyn Park. The rest of data was collected from the Minnesota Geospatial Commons. Data from the Minnesota Geospatial Commons was created by two organizations. The county shapefiles and roads shapefiles were created by the Minnesota Department of Transportation. The planned stations, transit stops, and transit routes were from the Metropolitan Council.

Although the data contained the information needed, further editing was needed before initial analysis could be completed. To ensure that the analysis included useful routes, bus routes were chosen based on if they were within the city limits, and went to a major hub where a large

number of jobs are located. After asking Brooklyn Park for suggestions on popular routes, there were two (Express - West River Rd and Express - Zane Ave) that were recommended as popular and that went to areas that were important hubs for work and other resources. There were 7 other routes that also crossed a portion of Brooklyn Park and were also included for analysis. The bus stops associated with those routes were extracted from the shapefile of all transit stops in the Hennepin County area. The data was clipped to get an extent of all the relevant shapefiles down to only the borders of Brooklyn Park. Then, each of the 9 routes and their associated bus stops were exported as a layer. In total, there were 18 separate files which contained the bus route and associated bus stops.

- **Counties and cities:**

ftp://ftp.gisdata.mn.gov/pub/gdrs/data/pub/us_mn_state_dot/bdry_mn_city_township_unorg/metadadata/metadadata.html County and city boundaries were acquired from MN Geospatial commons and clipped to Ramsey, Hennepin and Anoka County. These boundaries would allow us to focus our project just on the city of Brooklyn Park.

- **Roads:**

ftp://ftp.gisdata.mn.gov/pub/gdrs/data/pub/us_mn_state_dot/trans_roads_mndot_tis/metadadata/metadadata.html These are road data that were downloaded from MN Geospatial Commons and were clipped to the three counties. The road information was required in order to create a network analysis.

- **Planned Stations:**

ftp://ftp.gisdata.mn.gov/pub/gdrs/data/pub/us_mn_state_metc/trans_pland_transitway_station/metadadata/metadadata.html These are points where stations are planned for the metro. Downloaded from MN Geospatial Commons.

- **Transit Stops:**

ftp://ftp.gisdata.mn.gov/pub/gdrs/data/pub/us_mn_state_metc/trans_stop_boardings_alightings/metadadata/metadadata.html These data show all of the existing transit boardings and alightings. The data was downloaded as a DBF file, then, the XY points were shown to produce a useable shapefile. Downloaded from MN Geospatial Commons.

- **Transit Routes:**

ftp://ftp.gisdata.mn.gov/pub/gdrs/data/pub/us_mn_state_metc/trans_transit_routes/metadadata/metadadata.html These data show all of the transit routes in the three counties, and have a description of what type of route they are. The data was used to identify each route's service area. Downloaded from MN Geospatial Commons.

- **Foreclosures 2005 to 2016:**

Foreclosure data was acquired from the city of Brooklyn Park. The data included the addresses and geocoded locations of each foreclosed house as well as some housing price information.

Methodology

In order to begin to complete our objectives, our first idea was to perform a simple buffer analysis to get a radius around all the different transit stops in Brooklyn Park. Through research, we determined an average human walking speed is roughly 3 miles per hour. Extrapolating from this data, we estimated an average human would walk .75 miles in 15 minutes. Thus, our buffer distance was set to .75 of a mile surrounding the transit stops in Brooklyn Park. However, we were not satisfied with this as a result. Due to the belief that people would not be able to walk from their homes to the transit stops in a straight line; they would have to walk on roads or on sidewalks adjacent to the roads. To study this, a Network Analyst Dataset needed to be created.

First, a new Network Dataset was created in ArcCatalog called BP_Network, and the prepared Brooklyn Park road data was added to it. The Brooklyn Park Road data is the major participating class based on earlier assumptions. The data would need turns modeled, so during setup this box was checked as well as making Brooklyn Park Roads the elevation field. Next, a new attribute needed to be created - called

Impeded Time, and its usage type would be a cost in seconds with the datatype set to being a double. The streets to-from and from-to sources would be based on the value seen in Figure 1.

This equation would determine how far along the roads a person can walk in a certain amount of

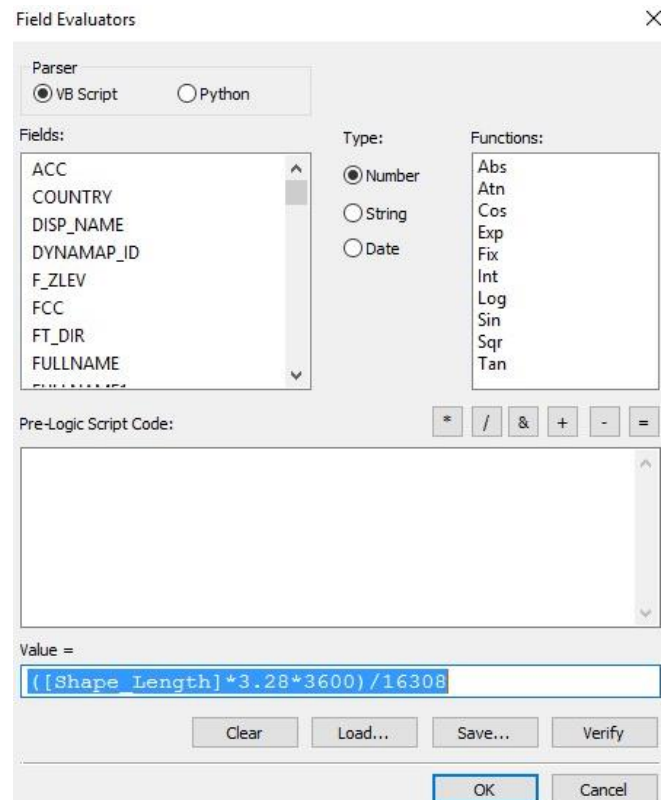


Figure 1. Field Evaluator for Impedance Times

time (seconds). After this was inputted into the dataset, the global turn delays were set as seen in Figure 2. This required some thought and eventually different second delay amounts were settled upon. The last step in building the Network Dataset would be setting the travel modeled as walking and the distance as meters. With the previous settings, the Network Dataset was complete and new service areas could be created from the transit stop points that were prepared earlier.

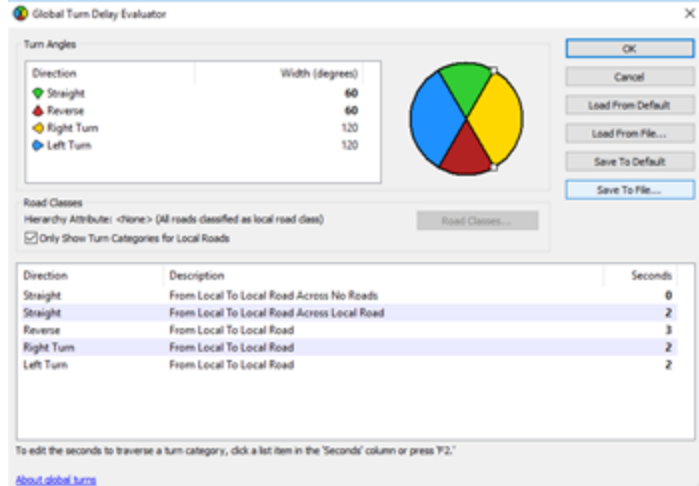


Figure 2. Global Turn Delays for Network Dataset

The 9 transit stops which have routes going to downtown Minneapolis were loaded individually into the Network Dataset, then solved to find the polygon which would represent a 15 minute walk to a particular transit station. The Analysis Settings, Polygon Generation, Line Generation, Accumulation and Network Locations were all changed to obtain the proper polygon output. The most important setting being the Analysis Settings (Figure 3); in which the default breaks were set to 900 seconds (15 minutes) and the direction would be towards the facilities. All the polygons were then merged into one final area representing a total area of coverage of transit stops in Brooklyn Park.

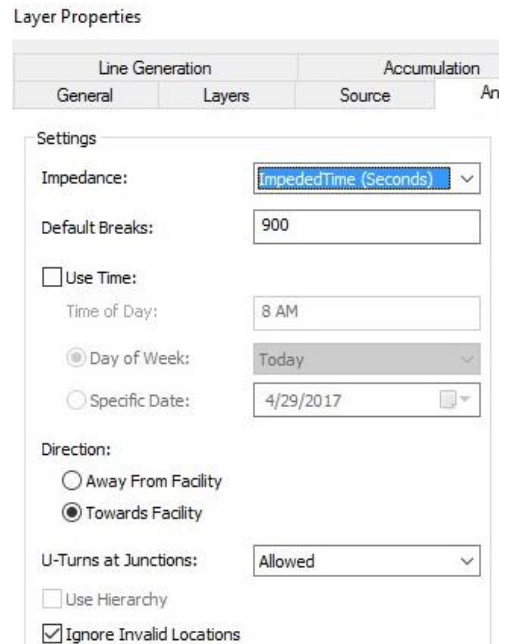


Figure 3. Break Time for the Network Polygon

The points inside the polygon were then studied by selecting all the foreclosed homes inside the final polygon areas and dividing them by the total number of foreclosed homes to obtain a percentage of foreclosed homes within our transit facilities area. In addition, we studied the resale value of foreclosed homes inside the transit coverage area vs the resale value of homes outside the transit coverage area. To accomplish this, the resale attribute was summarized in ArcMap for each of the two established categories. The output of an average resale value of the foreclosed homes inside and outside the transit coverage areas.

Results

Since there was only 3 distinct parts of our analysis we had 3 main results. Early in our analysis we performed a .5 mile buffer around all transit stops in Brooklyn Park, inside the buffer zone were 89% of the foreclosed homes we were studying. In addition to the simple buffer analysis a Network Dataset was built in order to calculate the amount of foreclosed homes within a 15 minute

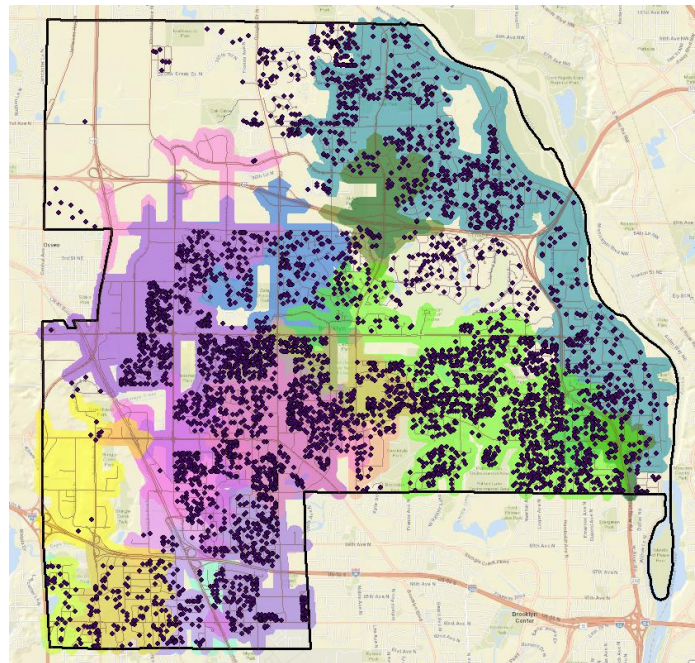


Figure 4. Final 9 Network Polygons and the Foreclosed Homes Contained Within

walk and the amount of homes beyond that time frame. In total, we found 5067 out of 5426 (93%) foreclosed homes fell inside the 15-minute break we had set for the polygon output. Statistically it seemed there is no correlation between the amounts of reasonably distanced transit to the locations of foreclosed homes. Our last calculation was obtaining an average resale value of the foreclosed homes inside our 15 minute Network Polygon versus the average resale value

of a home outside our polygon. The average resale value of a home within our polygon is \$185,218 and outside \$289,218 a difference of over \$100,000. We were informed by Brooklyn

1	OBJECTID	FIRSTBIDAM	Cnt_FIRSTBIDAM	1	OBJECTID	FIRSTBIDAM	Cnt_FIRSTBIDAM
4482	4481	610962.22	1	324	323	468448.31	1
4483	4482	618003.01	1	325	324	468898.47	1
4484	4483	621067.11	1	326	325	474365.48	1
4485	4484	629619.96	1	327	326	475155	1
4486	4485	635548.94	1	328	327	492312.63	1
4487	4486	654645.65	1	329	328	493685.13	1
4488	4487	677686.7	1	330	329	495312.32	1
4489	4488	700000	1	331	330	497205.23	1
4490	4489	715000	1	332	331	499000	1
4491	4490	739324.77	1	333	332	501582.73	1
4492	4491	828125.53	1	334	333	503966.29	1
4493	4492	869045.97	1	335	334	505134.43	1
4494	4493	936929.27	1	336	335	506205.41	1
4495	4494	974665.39	1	337	336	516629	1
4496	4495	1366410	1	338	337	518500	1
4497	4496	1524891.68	1	339	338	533513.07	1
4498	4497	1845891.46	1	340	339	589036.73	1
4499	4498	1881088.39	1	341	340	653328.32	1
4500	4499	4250000	1	342	341	657888.23	1
4501	4500	4606157.21	1	343	342	769245.24	1
4502	4501	6500000	1	344	343	1356000	1
4503	4502	21106483.79	1	345	344	4215370.78	1
4504	4503	21271111.11	1	346	345	5123331.07	8
4505		185218.218		347		289633.4941	

Figures 5 & 6. Average Resale Value of Foreclosed Homes Inside and Outside a 15 Minute Walk to a Transit Stop

Park staff the homes outside our polygon area were newer and had not yet had any transit stops planned near them yet. These neighborhoods were also a bit nicer than the rest of Brooklyn Park, leading the results to be higher.

Conclusions

Our study did not find any surprising results regarding foreclosures and accessible transit in Brooklyn Park. A very large majority of Brooklyn Park was within a 15 minute walk of a bus route which heads to downtown Minneapolis (one of the main job areas in the state). However, this is one of the main limitations of this study; it only analyzed foreclosures in correlation to routes going to one city. Additionally, the time of day needs to be taken into account as well, some buses only have service in the morning, or go to a severely limited schedule after the morning hours. It would be interesting for further work do delve into whether there are any routes which go to other major job areas in the Twin Cities (St. Paul, etc.) and the correlation between those routes and foreclosed homes. Our other analysis regarding the resale value turned up what we thought were surprising results, but not to the Brooklyn Park staff. A \$100,000 difference exists between the two areas we defined and this seemed significant. However, the

majority of homes which resold for more money are much newer and in nicer neighborhoods than the rest of Brooklyn Park. Overall there were no extraordinary results from our study, but just a confirmation of information the city of Brooklyn Park staff likely already knew.

Final Map Product

Data Link:

<https://drive.google.com/drive/folders/0B0Th3wbpu1K6SEnrSGIScFJHMmM?usp=sharing>

Foreclosures and Transit Service Areas in Brooklyn Park

By: Nicole Helgeson, Patrick Haney and Arie Peterson

