A Comparison of the Accessibility of Three Neighborhoods' Institutions and Amenities in Frederick, MD

Elizabeth Hampton
Christopher Johansson
Yana Demireva
Albert Engel

Table of Contents

EXECUTIVE SUMMARY

Frederick is a city of neighborhoods. We studied three neighborhoods in the southern part of the City: Downtown—the area of downtown Frederick, South—the area to the immediate south and west of downtown, and West—the area west of the Frederick Bypass anchored by the Golden Mile and US-40. We based our analysis on the institutions and amenities present in each neighborhood. Institutions were landmarks or structures of civic nature such as schools, banks, churches, and parks, while amenities were necessities or conveniences such as groceries, retail, or service areas. We determined the boundaries of the neighborhoods by mapping the locations of institutions and amenities within the City and observing how they were geographically organized, then using differences in the age of the buildings in those areas as well as physical barriers between them to designate borders.

We then studied selected social, demographic, and economic characteristics of the neighborhoods. These were age, income, race, and household size. We found that households tended to consist of fewer people closer to downtown Frederick, the youngest and most racially diverse areas were along the Golden Mile, the oldest and least diverse were in downtown Frederick and west of downtown, and income levels throughout the study area can be seen as having a bi-centric distribution.

We also administered a survey in person at three locations within the City. Survey questions explored how often respondents visited amenities and institutions, and what form of transportation they used to get to those places. Respondents indicated that convenience stores were the type of service they used the most often, most trips they took to such destinations were less than five miles, and the mode of transportation they chose depended on their destination. Large numbers of respondents indicated support for bike lanes, traffic abatement, and crosswalks.

Three recommendations result from this analysis:

- add bike lanes wherever possible
- improve walkability
- implement policies to encourage the opening of a grocery store within downtown Frederick.

In the future, appropriate areas of research to extend this study may include bicyclist and pedestrian counts at key locations to guide bicycle and pedestrian policy within the City, a thorough assessment of the City's public transportation system, and a review of neighborhood zoning to determine whether it reflects a desirable and functional land use pattern.

INTRODUCTION

A city that has a structure of neighborhoods is often a sign of a healthy, thriving place for citizens to live and work. A system of neighborhoods offers a set of social networks that can both promote a sense of inclusion and foster diversity within the greater city.

Frederick, Maryland is a city of neighborhoods. These neighborhoods are identifiable by various social and physical boundaries, and each interpretation of these supposed boundaries tell a different story about the authentic quality inherent within each area. Social boundaries such as age, race, and income levels do not necessarily coincide with the same areas bounded by any physical condition such as road networks, natural barriers, or topography, therefore neighborhood boundaries are not clear delineations. We analyzed a series of these boundary conditions to arrive at a layered reading of each identifiable area, and discovered that Frederick's neighborhoods are each very functional but also function very differently from each other.

RESEARCH QUESTIONS

One of the ways that Frederick's neighborhoods distinguish themselves from one another is in the spatial organization of institutions and amenities within each area. We were interested in analyzing the combination of institutions and amenities that exist within the framework of Frederick's established neighborhoods to determine the role these places of shared experience within the community play in defining the organization of Frederick's neighborhoods.

In our study we defined "institutions" as landmarks or structures of civic nature such as schools, banks, churches, and parks, and differentiated these locations from "amenities," which we considered to be necessities or conveniences such as groceries, retail, or service areas. We used a combination of ArcGIS for mapping and spatial assessments, a public survey administered in Frederick to gain qualitative feedback from community members, and additional technologies such as Flickr and Wordle that served to add a further layer of detail to our understanding of the City.

From this analysis we hoped to synthesize a new possible reading of neighborhood boundaries from a functional standpoint, understand how people operate within their city and their respective neighborhoods, and identify priorities within the community that could either serve to reinforce neighborhood ideals or assist in future improvements.

QUANTITATIVE METHODS

DEFINITION OF NEIGHBORHOODS

There were four components that led to our neighborhood definition: location of community institutions, age of structures, barriers to transportation, and the limitations of data.

The first stage of neighborhood definition consisted of mapping the locations of institutions within the community. As shown in Appendix 1, Map 1, these institutions were schools, libraries, grocery stores, banks, houses of worship, recreational facilities, parks, and transportation hubs. The locations of these institutions were gathered from Google Maps.

When mapped, these community institutions were observed to fall in clusters or corridors, as shown in Appendix 1, Map 2. We chose to focus on three southern clusters or corridors: Downtown, South—the mostly-residential neighborhood to the south of downtown Frederick, and West—the residential and commercial areas anchored by the Golden Mile west of US-15. The institutions within these neighborhoods are shown in Appendix 1, Map 3

The next task was to determine where to draw the boundaries of the neighborhoods these institutions served. Because the different areas were developed at different times, the neighborhoods matured in distinctly different eras. As shown in Appendix 1, Map 4, structures in downtown Frederick were mostly constructed between 1770 and 1929. The areas to the immediate south and west of downtown Frederick were developed between 1946 and 1970, while most development west of US-15 did not take place until after 1970. US-15, which was expanded into a limited-access highway in the 1950s, acts as a barrier to east-west transportation; within the study area, only West Patrick Street (US-40) and South Jefferson Street traverse it.

Based on these considerations, we looked for a geographic unit that would provide social and demographic data at a level of detail sufficient to show distinctions between the neighborhoods. Because such social and demographic data are not available at the individual address level or on the census block level, we settled on the block group level.

Like any geographic units greater than individual addresses, block groups have the drawback of using roads as dividing lines. As can be seen in Appendix 1, Map 4, the block groups to the immediate south and west of downtown Frederick contain structures built in the same era as those in Downtown, but because they are located on the south or west sides of the streets that serve as the block group boundaries, these structures are included in block groups along with primarily younger structures. This does not render the block group level inappropriate for analysis. However, it is important to keep in

mind that neighborhood boundaries are frequently fuzzy, not distinct, and that the block groups designated here as neighborhood boundaries are representative, not definitive.

This process of neighborhood definition led us to designate three neighborhoods, which we called "Downtown," "South," and "West." The boundaries of these neighborhoods are shown in Appendix 1, Map 5.

Table 1 shows the mean construction year of structures in each block group and in each neighborhood. This data was gathered from Maryland PropertyView. The neighborhoods contained in Downtown, as defined here, have mean construction years ranging from 1872 to 1919. The earliest mean construction year for a block group in the South neighborhood is 1934, or 25 years later. While the latest mean construction year for a block group in that neighborhood is 1970—a gap of just one year from the earliest mean construction year in the West neighborhood—we assigned that block group to the South neighborhood given its geographic proximity to the rest of the block groups and the fact that US-15 divides it from the block groups to its west.

The next step was to show statistically that these neighborhoods were distinct from each other. First, we performed a one-tailed t-test comparing the mean construction year of structures in Downtown with the mean construction year of structures in the South neighborhood. We performed the same test a second time to compare structures in the South neighborhood with structures in the West neighborhood. The purpose of these tests was to assess whether the age of structures in the South neighborhood differed significantly from those in Downtown, and whether the age of structures in the West neighborhood differed significantly from those in the South neighborhood. The results of these tests, shown in Table 2, supported our neighborhood definitions. Structures in the South neighborhood were significantly newer than those in Downtown, and structures in the West neighborhood were significantly newer than the South neighborhood.

To add rigor to the statistical analysis, the test was applied to two sets of pairs of similar block groups assigned to different neighborhoods. The first set of pairs were the Downtown block group with the most recent mean construction year (Group 2) paired with the block group in the South neighborhood with the earliest mean construction year (Group 1), and the South neighborhood block group with the most recent mean construction year (Group 17) paired with the block group in the West neighborhood with the earliest mean construction year (Group 25). Neither of these pairs consisted of adjacent block groups, but the difference in mean years between Groups 1 and 2 was 15.17 years while the difference in mean years between Groups 25 and 17 was just 1.13 years.

The results of the testing, shown in Table 2, indicated that the difference between Groups 1 and 2 was significant while the difference between Groups 25 and 17 was not. However, as can be seen in Appendix 1, Map 5, Group 25 is geographically isolated from Group 17 and the rest of the South neighborhood, so it cannot be said to be part of the same neighborhood.

The second set consisted of two pairs of block groups selected for having a narrow range of mean structure-construction years and that are adjacent to each other but assigned to different neighborhoods. The block groups compared the Downtown and South neighborhoods in Groups 7 and 11. The South and West neighborhoods were compared in Groups 17 and 19. The difference in mean years between Groups 7 and 11 was 54.8 years while the difference in mean years between Groups 17 and 19 was 9.42 years. The results of the testing, shown in Table 3, indicated that the differences in means between both pairs were significant.

The results of all three sets of tests support the neighborhood definition. The boundaries reflect differences in the ages of structures within the neighborhoods—which in all but one case were shown to be statistically significant—as well as geographic barriers such as US-15. Therefore, we felt confident enough with our defined neighborhoods to proceed with further analysis of social, demographic, and economic comparisons of the neighborhoods.

GIS NEIGHBORHOOD ANALYSIS

The next phase of our analysis was a GIS-based comparison of transit and pedestrian infrastructure in each of the three neighborhoods. Appendix 1, Map 6 shows bus stop locations gathered from General Transit Feed Specifications (GTFS, which allows analysis of transit service and systems), sidewalks within the City, and traffic volume data from SHA for selected roadways. To assess transit accessibility, we used GTFS data for TransIT, mapping the locations of stops within the City. We then created 1/8-mile buffers around those stops.[1] Table 4 shows the percentage of each neighborhood's institutions and amenities that fell within those buffers. Downtown and the South neighborhood had similar levels of accessibility, with about 81.58% and 80.00% of locations respectively falling within the buffers. In contrast, just 65.38% of locations in the West neighborhood are located within 1/8-mile of TransIT bus stops. This indicates that the West neighborhood has less transit accessibility than either Downtown or the South neighborhood.

[1] While 1/4 of a mile is more commonly considered to be the distance most people will walk to bus stops, we were cognizant of the fact that the geocoded locations of our institutions and amenities were located along road segments, when in fact—especially along the Golden Mile—pedestrians have to walk a significant distance from the roadway to the actual location of the amenity or institution. Therefore, we chose to use a smaller buffer distance to better show variations in accessibility.

We assessed pedestrian infrastructure using the City-provided sidewalk data to calculate the ratio of total sidewalk length to total roadway length within each neighborhood. While not every roadway is suitable for sidewalks, those roadways tend to be in non-pedestrian-oriented areas. Therefore, this ratio is a useful proxy for the general pedestrian accessibility of streets in a given area. The results of the analysis, in Table 5, show that Downtown has the highest level of pedestrian accessibility—a ratio of 0.92—among the three neighborhoods, with the West neighborhood falling second with a ratio of 0.81. The South neighborhood had a ratio of 0.71. One possible explanation for this is that the I-70/US-15 interchange is located in the South neighborhood, adding a significant amount of roadway length that is not associated with any sidewalks. Indeed, the block group that contains the interchange (Group 17) has a sidewalk-to-roadway ratio of just 0.54. However, another block group within the neighborhood (Group 1) has an even lower sidewalk-to-roadway ratio of 0.36, and that block group does not include any limited-access highways.

The last component of the GIS analysis was an assessment of neighborhood social, demographic, and economic characteristics—specifically age, income, race, and household size. The three neighborhoods were compared using 2013 American Community Survey 5-year estimates at the block-group level. The details of this analysis and references to mapped findings are shown in Table 6.

A number of trends are worth noting. While there was no overall geographic gradient regarding age, income, or race, there was one for household size. Households tended to consist of fewer people closer to Downtown. The youngest and most racially diverse areas were in the West neighborhood, along the Golden Mile, while the oldest and least diverse were in Downtown and in the western sections of the South neighborhood just west of Downtown. Income levels have a bi-centric distribution; the two lowest incomes areas are the central part of the West neighborhood and in some parts of Downtown. Incomes tend to increase as distance from those areas increased (see Appendix 1, Map 10).

These social and demographic trends shed light on variations in accessibility within the study area. The age- and income-diverse residents of Downtown have many nearby institutions and amenities, as well as strong transit and pedestrian networks that allow them to reach those locations. The older, wealthier, and more racially diverse South neighborhood also has a strong transit network, but institutions and amenities in that neighborhood are more dispersed, and pedestrian accessibility is weaker. Finally, the West neighborhood can be seen as bifurcated; the younger and more racially diverse areas immediately around the institutions of the Golden Mile have stronger transit accessibility but weak pedestrian accessibility, while the wealthier neighborhoods farther from the Golden Mile have both weak transit and pedestrian accessibility.

QUALITATIVE METHODS

The qualitative methods portion of the research was a survey to City residents in three key geographic areas, identified using the neighborhood definition techniques described above. The purpose of the survey was to identify whether a) clusters of institutions and amenities correspond with actual neighborhoods, and b) whether these institutions and amenities are easily accessible to their communities. The survey format was chosen to provide a more nuanced understanding of quantitative GIS data. Limitations to this method include the small sample size, limited time available for fieldwork, and difficulty in identifying neighborhoods by name—respondents often had different names for the same locations.

METHODOLOGY

Two researchers conducted fieldwork separately, on Friday morning, December 12th and Sunday afternoon, December 14th. Surveys were administered using Google Forms on a smartphone and on paper. The weather both days was cold, windy, and partly sunny. Survey questions explored how often respondents visited amenities and institutions such as libraries, schools, grocery, convenience, and retail stores, and what form of transportation they used to get to those places (for full survey questionnaire, see Appendix 2).

RESULTS

Researchers conducted a total of 17 surveys. Respondents were between 20 and 70 years old. Fifty-nine percent of respondents were female and 41 percent male. Respondents were asked to self-identify their race and ethnicity, resulting in 65 percent White, 12 percent Latino, and 18 percent African-American.

Most respondents indicated that they visited convenience stores daily, while they took weekly trips to grocery stores, parks, libraries, and religious institutions. Medical facilities were frequented irregularly (see Appendix 3, Figure 1). Many responded that the places they visit daily are within five miles. Most respondents walk to the park (59 percent), and 29 percent walk to the convenience store; however, 65 percent of people drive to the grocery store, and 53 percent drive to retail stores. Most other institutions and amenities are also reached by car, despite their perceived proximity to respondents' homes (see Appendix 3, Figure 2). Public transportation was used rarely, if at all, and very few people biked to the places they visit daily. Nonetheless, 35 percent of respondents indicated that bike lanes would be an improvement to their neighborhoods. Fifty-eight percent of respondents also

suggested that traffic abatement and crosswalks would also be desirable additions to their neighborhoods, and would make it easier to walk to amenities from their homes (see Appendix 3, Figure 2).

OTHER PLANNING TECHNOLOGIES

To broaden understanding of the unique details that make up the various Frederick neighborhoods, we incorporated additional technologies in the study. Flicker (Flickr.com) and Wordle (Wordle.net) help visualize the neighborhoods and re-present the City in new ways.

Flickr is an online photo sharing application that allows users to catalog their experience of discovering each neighborhood through photography, and will be a convenient way to keep the conversation going with the community and connect with others who are also interested in sharing their views of Frederick. Photos from field trips to the City are collected in a Flickr group titled "Frederick Neighborhoods," which is publicly searchable and can be joined by anyone who wishes to view the compilation of others' photos or add to the collection (see Appendix 4).

Wordle is a Word association application that allows users to input an assortment of text that is then generated into a visual text display—a "word cloud." An algorithm is applied to the text that forms a hierarchy with the most frequently used words appearing the largest. Frederick's Neighborhood Advisory Council (NAC) meetings are set up to discuss neighborhood values, concerns, and priorities, and so we were interested in visualizing a collection of NAC meeting minutes on the City of Frederick's website to discern any shifts in priorities between NAC groups. The resulting word clouds allowed us to visualize the different concerns and interests in each neighborhood, and reinforced some of the research findings (see Appendix 4).

CONCLUSIONS and RECOMMENDATIONS

Neighborhoods identified by survey respondents seem to match up with clusters identified on our GIS maps. Residents of the City of Frederick seem satisfied with the number of parks and opportunities for recreation, and most do not find that their neighborhoods are lacking any particular institution or amenity. The short distance that people travel between their place of residence and amenities visited on a daily or weekly basis indicates that residents live close to the amenities that they most need, such as grocery and retail stores. However, despite this short distance, most people choose to drive, rather than walk, bike, or use public transit. Encouraging these alternative modes of transport

is important, as they can alleviate traffic congestion and promote healthy behaviors that can benefit citizens. To foster these behaviors, we recommend instituting or, at the very least, exploring the following options:

- Adding bike lanes – It is possible that people do not bike because the infrastructure is lacking or inhospitable for bicyclists. We recommend adding bike lanes in residential neighborhoods and along main thoroughfares, or performing a needs assessment in key neighborhoods such as the Golden Mile and downtown Frederick to determine if this is a viable option.
- Improving walkability – Close to 60 percent of respondents indicated that their neighborhoods would benefit from traffic abatement strategies that improve residents' ability to walk to amenities. Crosswalks and speed bumps are two strategies that can encourage walking and increase the accessibility of places such as grocery and retail stores. Walking can also encourage interactions between residents, strengthening neighborhoods' sense of community.
- Opening a grocery store in downtown – Several respondents indicated that the only amenity lacking in downtown was a grocery store. Ensuring that residents have access to fresh food in their neighborhood is key in creating strong, sustainable communities. Paired with the high walkability of downtown Frederick, a grocery store could only reinforce the neighborhood's strengths.

FUTURE RESEARCH

Although it was beyond the scope of this study, there are several avenues for future research on the ways in which clusters of amenities and institutions can indicate the character and needs of neighborhoods.

One way to explore the connection between amenities and their surrounding neighborhoods would be to perform pedestrian and cyclist counts to assess the accessibility of amenities. Additionally, research on neighborhoods' zoning would contribute valuable information regarding whether the mix of uses, such as residential, commercial, etc., is appropriate for a given area, and whether this mix (or lack thereof) reflects what residents want and need.

Finally, few of our survey respondents used the public transit system in Frederick. While our sample size was small, this may indicate a mismatch between the current needs of residents and the current transit options. A more thorough assessment of public transit opinions and needs may reveal potential improvements that could galvanize more transit usage.

TABLES

TABLE 1 Mean Construction Year by Neighborhood and Block Group

Neighborhood	Block Group	GeoID	Number of Parcels	Mean Construction Year	Neighborhood Mean Construction Year
Downtown	Group 2	240217501001	305	1919	**1902**
	Group 3	240217501002	337	1910	
	Group 4	240217502001	295	1893	
	Group 5	240217502002	518	1899	
	Group 6	240217503001	335	1898	
	Group 7	240217503002	233	1894	
South	Group 1	240217722001	315	1934	**1954**
	Group 8	240217506003	350	1949	
	Group 11	240217651003	373	1949	
	Group 15	240217651002	450	1955	
	Group 17	240217651001	630	1970	
West	Group 9	240217505043	619	1996	**1988**
	Group 10	240217505035	476	1988	
	Group 12	240217505063	341	1982	
	Group 13	240217505061	378	1993	
	Group 14	240217505033	022	1976	
	Group 16	240217505052	525	1993	
	Group 18	240217505053	574	1983	
	Group 19	240217505042	217	1979	
	Group 20	240217505041	324	1998	
	Group 21	240217505051	772	1986	
	Group 22	240217505062	406	1982	
	Group 23	240217505031	348	1981	
	Group 24	240217505032	186	1982	
	Group 25	240217505034	017	1971	

Table 2 Structure Age Comparisons—Most Recent Construction Year

Descriptive Statistics			*Hypothesis Testing*	
Downtown (D)	*Mean:*	1902.742	**Downtown vs. South** $H_O: \mu_S \leq \mu_D$ $H_A: \mu_S > \mu_D$	t: -44.4272 P: 0
	Variance:	1642.426		
	Parcels:	2023		
South (S)	*Mean:*	1954.646		
	Variance:	1192.401		
	Parcels:	2118	**South vs. West** $H_O: \mu_W \leq \mu_S$ $H_A: \mu_W > \mu_S$	t: -60.3031 P: 0
West (W)	*Mean:*	1988.051		
	Variance:	164.8269		
	Parcels:	5205		

Table 3 Structure Age Comparisons—Narrow Range of Construction Years

Descriptive Statistics			*Hypothesis Testing*	
Group 2	*Mean:*	1919.138	**Group 2 vs. Group 1** $H_O: \mu_2 \leq \mu_1$ $H_A: \mu_2 > \mu_1$	t: -4.03669 P: 0.0000305
	Variance:	1659.540		
	Parcels:	305		
Group 1	*Mean:*	1934.311		
	Variance:	2702.470		
	Parcels:	315		
Group 17	*Mean:*	1970.405	**Group 17 vs. Group 25** $H_O: \mu_4 \leq \mu_{17}$ $H_A: \mu_4 > \mu_{17}$	t: -0.190364 P: 0.425
	Variance:	564.210		
	Parcels:	630		
Group 25	*Mean:*	1971.529		
	Variance:	1110.390		
	Parcels:	17		

Table 4 Percent of Amenities and Institutions within 1/8 mile radius of transit stops

Neighborhood	Block Group	GeoID	Locations Within 1/8-mi of a Stop	All Locations	Percent of Locations Within 1/8-mi of a Stop
Downtown	Group 2	240217501001	1	1	**81.58%**
	Group 3	240217501002	1	1	
	Group 4	240217502001	17	17	
	Group 5	240217502002	10	17	
	Group 6	240217503001	2	2	
	Group 7	240217503002	0	0	
South	Group 1	240217722001	2	2	**80.00%**
	Group 8	240217506003	6	7	
	Group 11	240217651003	1	2	
	Group 15	240217651002	1	1	
	Group 17	240217651001	2	3	
West	Group 9	240217505043	0	0	**65.38%**
	Group 10	240217505035	1	2	
	Group 12	240217505063	1	2	
	Group 13	240217505061	0	0	
	Group 14	240217505033	2	2	
	Group 16	240217505052	0	1	
	Group 18	240217505053	0	0	
	Group 19	240217505042	1	4	
	Group 20	240217505041	3	3	
	Group 21	240217505051	3	4	
	Group 22	240217505062	0	0	
	Group 23	240217505031	0	1	
	Group 24	240217505032	0	1	
	Group 25	240217505034	6	6	

Table 5 Pedestrian Accessibility

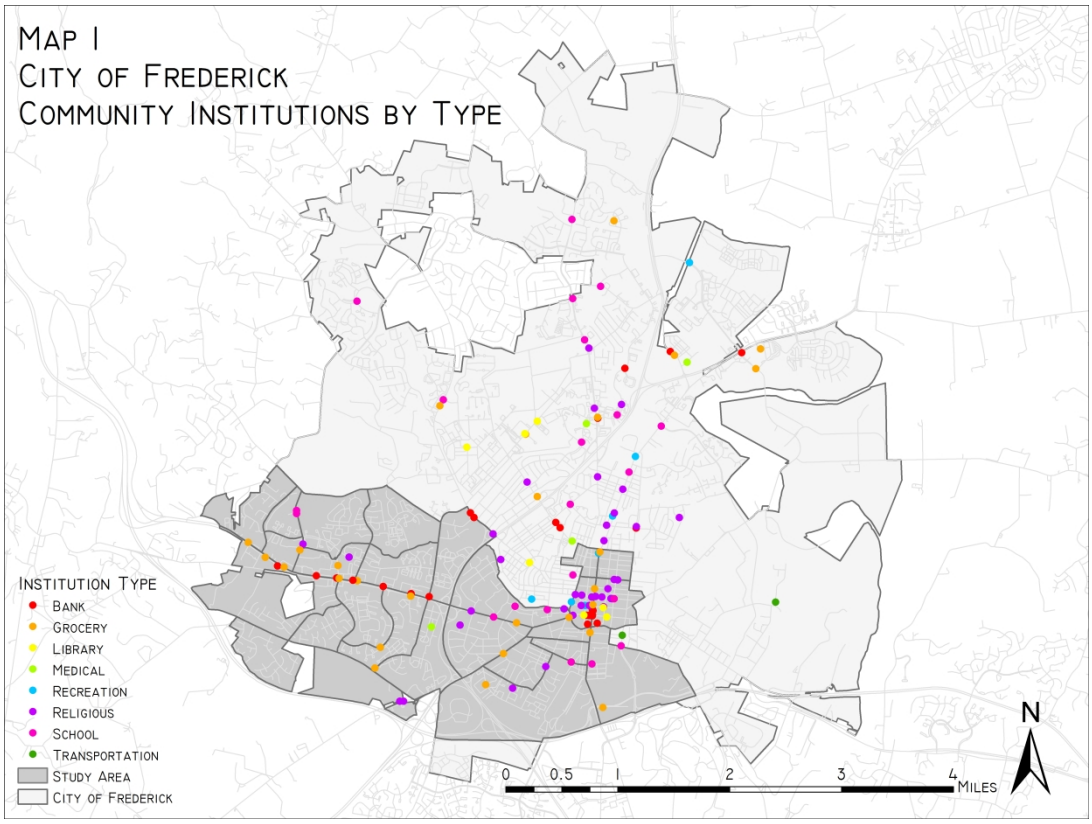
Neighborhood	Block Group	GeoID	Total Sidewalk Length (S)	Total Roadway Length (R)	Block Group S to R Ratio	Neighborhood S to R Ratio
Downtown	Group 2	240217501001	11212.17	16581.21	0.68	**0.92**
	Group 3	240217501002	12573.00	20198.74	0.62	
	Group 4	240217502001	17656.56	12596.16	1.40	
	Group 5	240217502002	28824.40	28690.92	1.00	
	Group 6	240217503001	14319.38	11877.80	1.21	
	Group 7	240217503002	12973.67	16253.50	0.80	
South	Group 1	240217722001	18452.48	51442.56	0.36	**0.71**
	Group 8	240217506003	35635.43	34963.51	1.02	
	Group 11	240217651003	31065.66	30580.73	1.02	
	Group 15	240217651002	43156.38	43501.02	0.99	
	Group 17	240217651001	48824.01	89950.51	0.54	
West	Group 9	240217505043	34490.39	38209.11	0.90	**0.81**
	Group 10	240217505035	35905.40	37940.31	0.95	
	Group 12	240217505063	31420.55	49656.81	0.63	
	Group 13	240217505061	36482.91	36244.62	1.01	
	Group 14	240217505033	5290.90	12338.61	0.43	
	Group 16	240217505052	29126.69	47253.75	0.62	
	Group 18	240217505053	28502.04	33045.26	0.86	
	Group 19	240217505042	18120.90	36963.62	0.49	
	Group 20	240217505041	23365.01	26489.12	0.88	
	Group 21	240217505051	30887.35	36504.36	0.85	
	Group 22	240217505062	31187.99	22677.55	1.38	
	Group 23	240217505031	26657.26	26029.79	1.02	
	Group 24	240217505032	13358.97	20788.59	0.64	
	Group 25	240217505034	10441.51	13375.88	0.78	

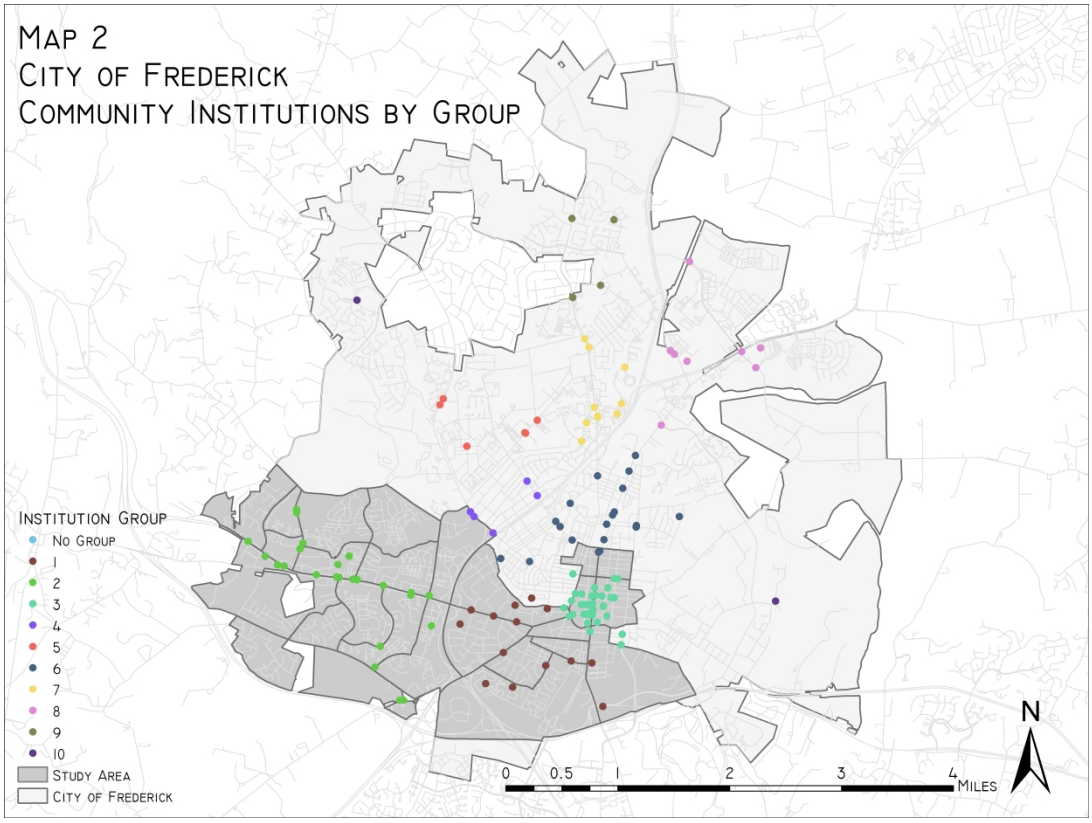
Table 6 Neighborhood Social, Demographic, and Economic Characteristics

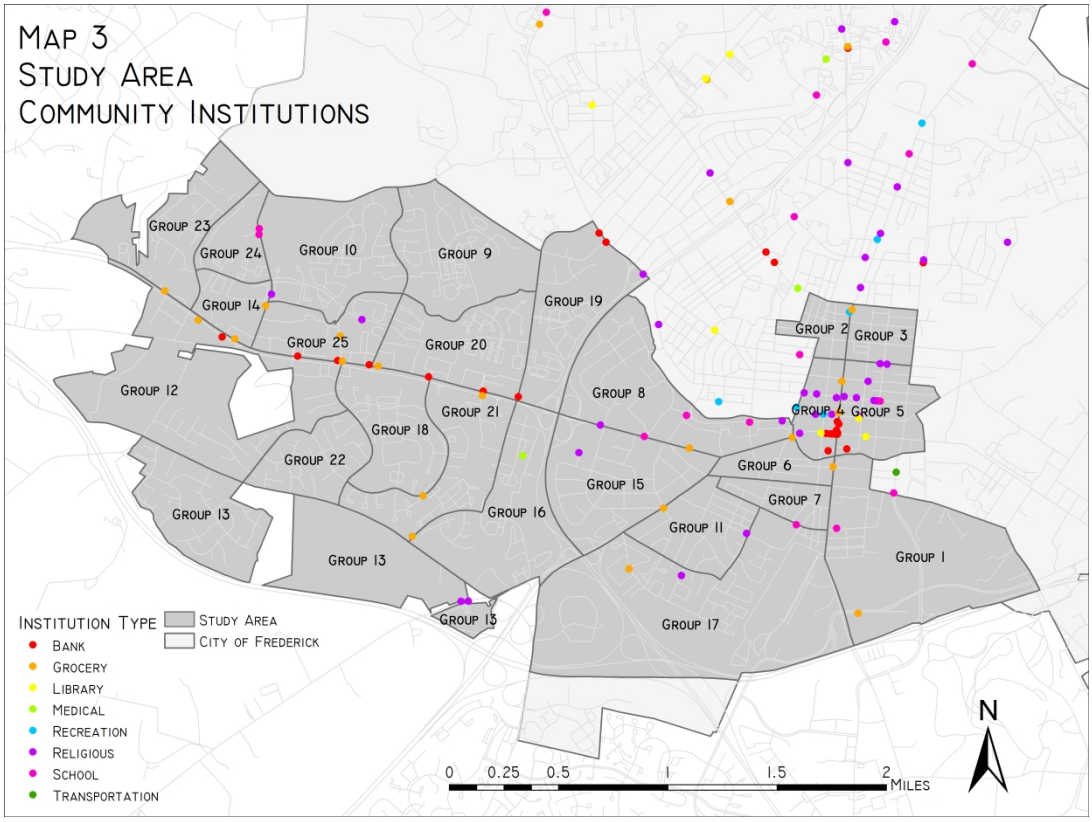
			Map 9		*Map 10*		*Map 11*		*Map 12*	
Neighborhood	**Block Group**	**GeoID**	**Median Age**	**Neighborhood Average Median Age**	**Median Income**	**Neighborhood Average Median Income**	**Block Group Percent Nonwhite**	**Neighborhood Percent Nonwhite**	**Block Group Average Household Size**	**Neighborhood Average Household Size**
Downtown	Group 2	240217501001	39.4	**37.2**	$43,750	**$56,771**	26.0%	**22.3%**	1.82	**1.88**
	Group 3	240217501002	33.5		$66,042		13.8%		2.15	
	Group 4	240217502001	38.9		$76,359		6.1%		1.74	
	Group 5	240217502002	39.8		$72,045		13.6%		1.79	
	Group 6	240217503001	31.6		$51,700		23.2%		2.04	
	Group 7	240217503002	40.1		$30,729		55.7%		1.69	
South	Group 1	240217722001	36.2	**43.8**	$54,875	**$61,177**	25.3%	**32.8%**	2.29	**2.41**
	Group 8	240217506003	56.0		$81,791		5.2%		1.89	
	Group 11	240217651003	38.7		$54,688		25.8%		2.55	
	Group 15	240217651002	52.9		$53,125		15.2%		1.99	
	Group 17	240217651001	35.3		$61,406		51.2%		2.85	
West	Group 9	240217505043	36.3	**32.9**	$66,111	**$65,879**	43.1%	**45.5%**	2.63	**2.76**
	Group 10	240217505035	31.1		$49,591		39.1%		2.12	
	Group 12	240217505063	41.4		$94,423		33.8%		2.75	
	Group 13	240217505061	38.6		$130,515		30.5%		3.38	
	Group 14	240217505033	32.4		$51,782		45.5%		3.12	
	Group 16	240217505052	30.1		$58,871		26.8%		2.49	
	Group 18	240217505053	29.3		$48,250		73.6%		2.99	
	Group 19	240217505042	32.1		$81,042		26.1%		1.97	
	Group 20	240217505041	29.6		$67,550		78.8%		3.10	
	Group 21	240217505051	29.4		$48,661		19.4%		3.12	
	Group 22	240217505062	28.6		$62,396		39.8%		3.86	
	Group 23	240217505031	45.7		$77,039		40.3%		2.99	
	Group 24	240217505032	27.1		$41,328		51.0%		2.43	
	Group 25	240217505034	29.0		$44,746		75.4%		2.24	

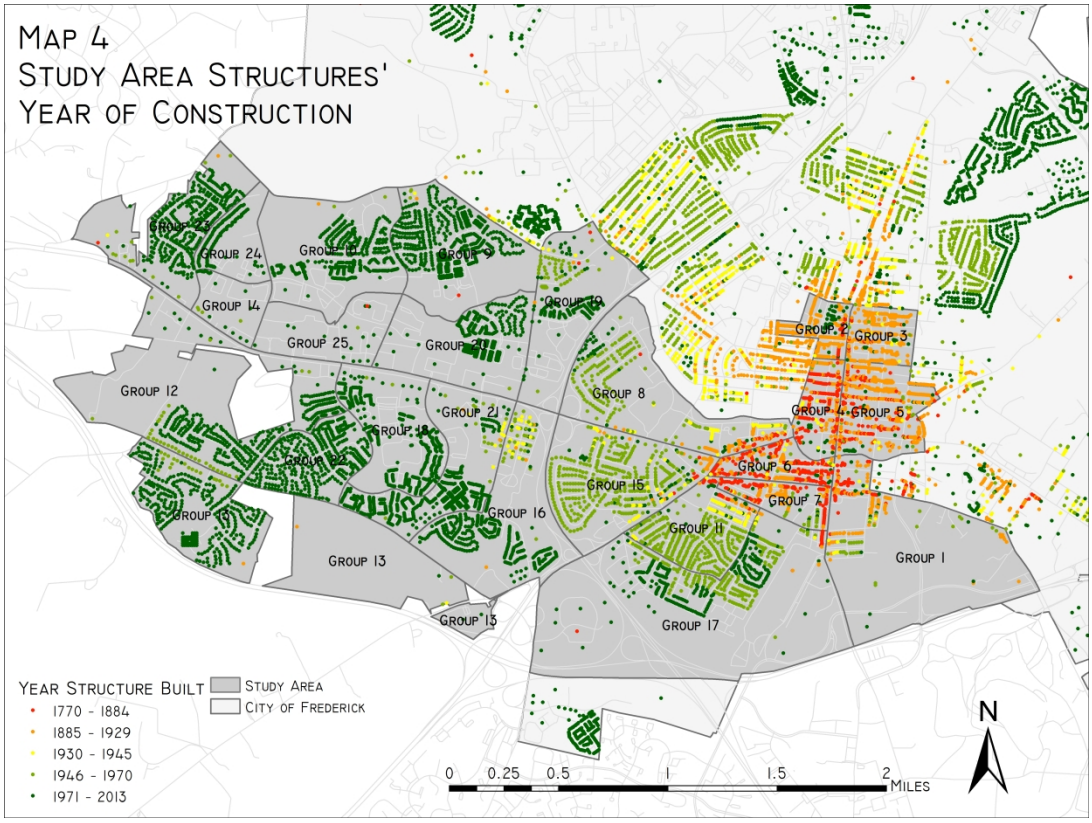
APPENDIX

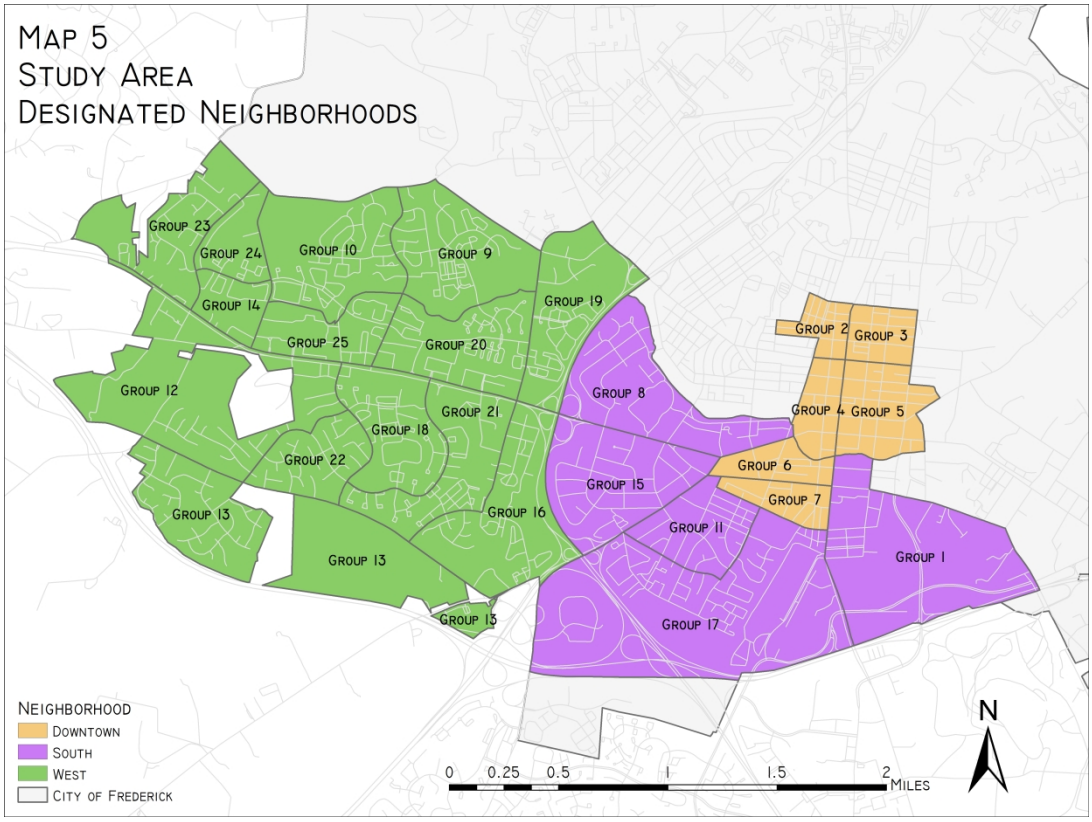
APPENDIX 1 – MAPS

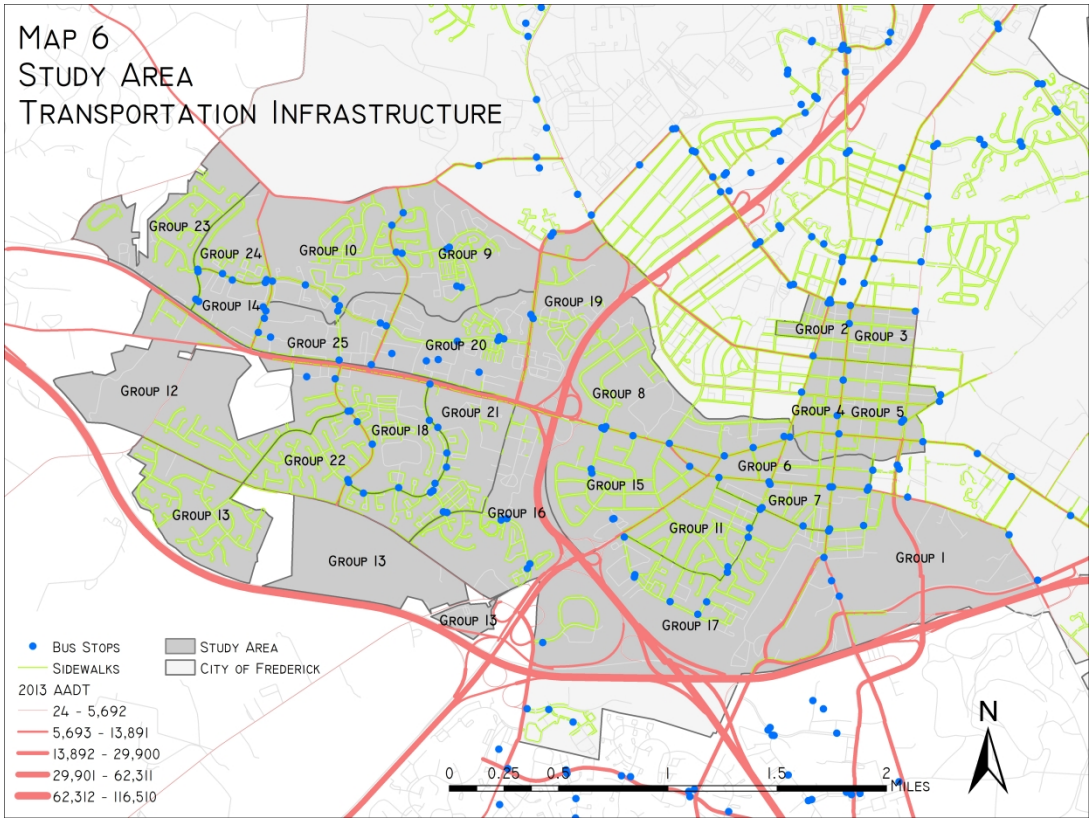


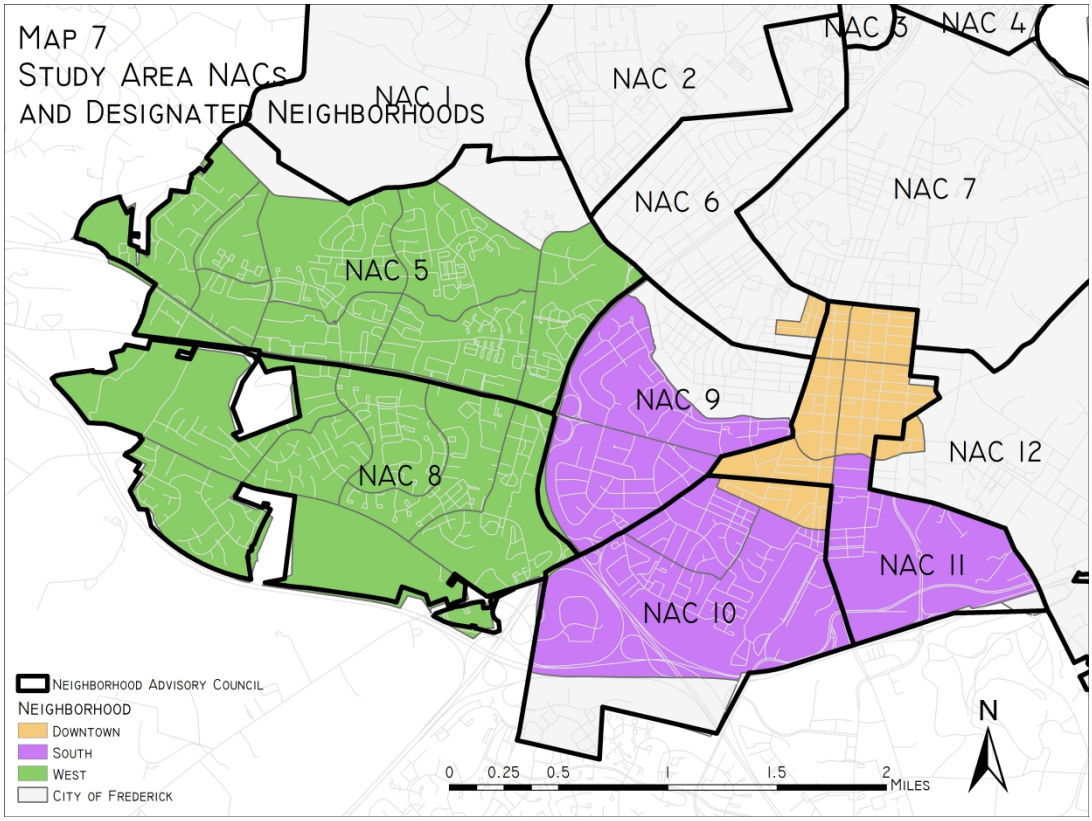

MAP 2
CITY OF FREDERICK
COMMUNITY INSTITUTIONS BY GROUP
INSTITUTION GROUP
NO GROUP
1
2
3
4
5
6
7
8
9
10
STUDY AREA
CITY OF FREDERICK
0 0.5 1 2 3 4 MILES
N

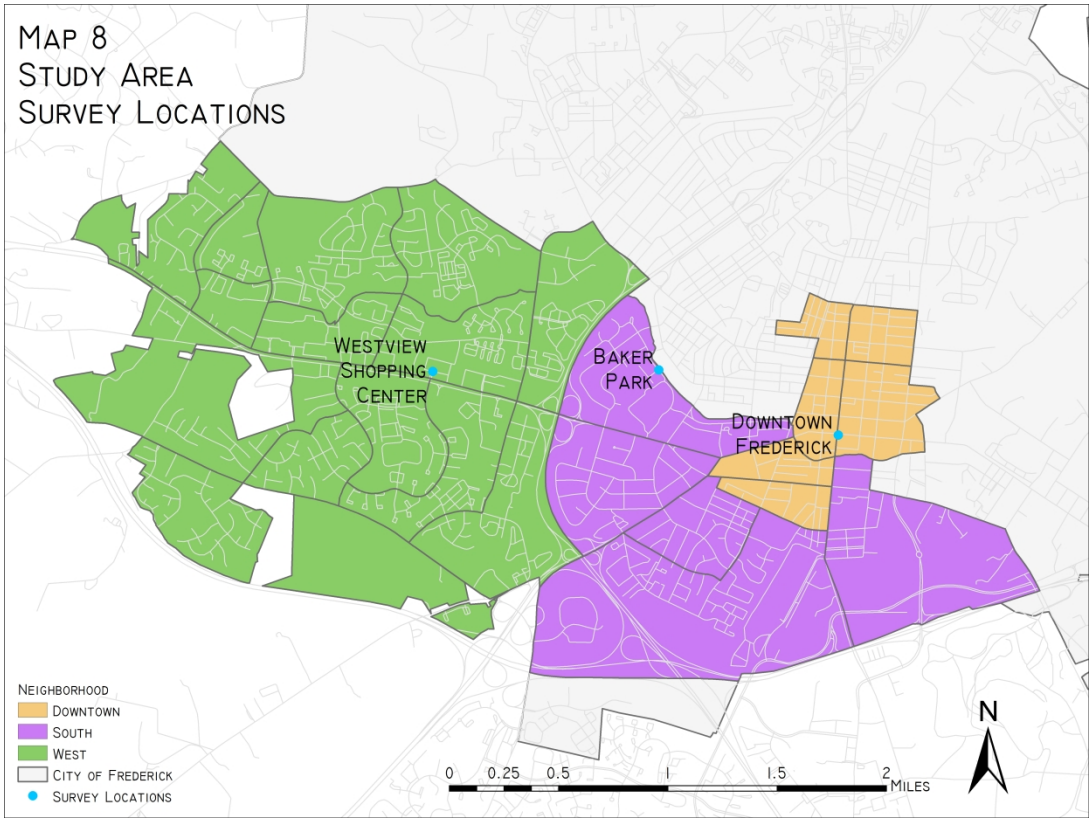

MAP 3
STUDY AREA
COMMUNITY INSTITUTIONS
GROUP 23
GROUP 24
GROUP 10
GROUP 9
GROUP 19
GROUP 14
GROUP 25
GROUP 20
GROUP 12
GROUP 8
GROUP 21
GROUP 18
GROUP 22
GROUP 15
GROUP 16
GROUP 13
GROUP 11
GROUP 13
GROUP 1
GROUP 13
GROUP 17
GROUP 2
GROUP 3
GROUP 4
GROUP 5
GROUP 6
GROUP 7
INSTITUTION TYPE
BANK
GROCERY
LIBRARY
MEDICAL
RECREATION
RELIGIOUS
SCHOOL
TRANSPORTATION
STUDY AREA
CITY OF FREDERICK
0 0.25 0.5 1 1.5 2 MILES
N

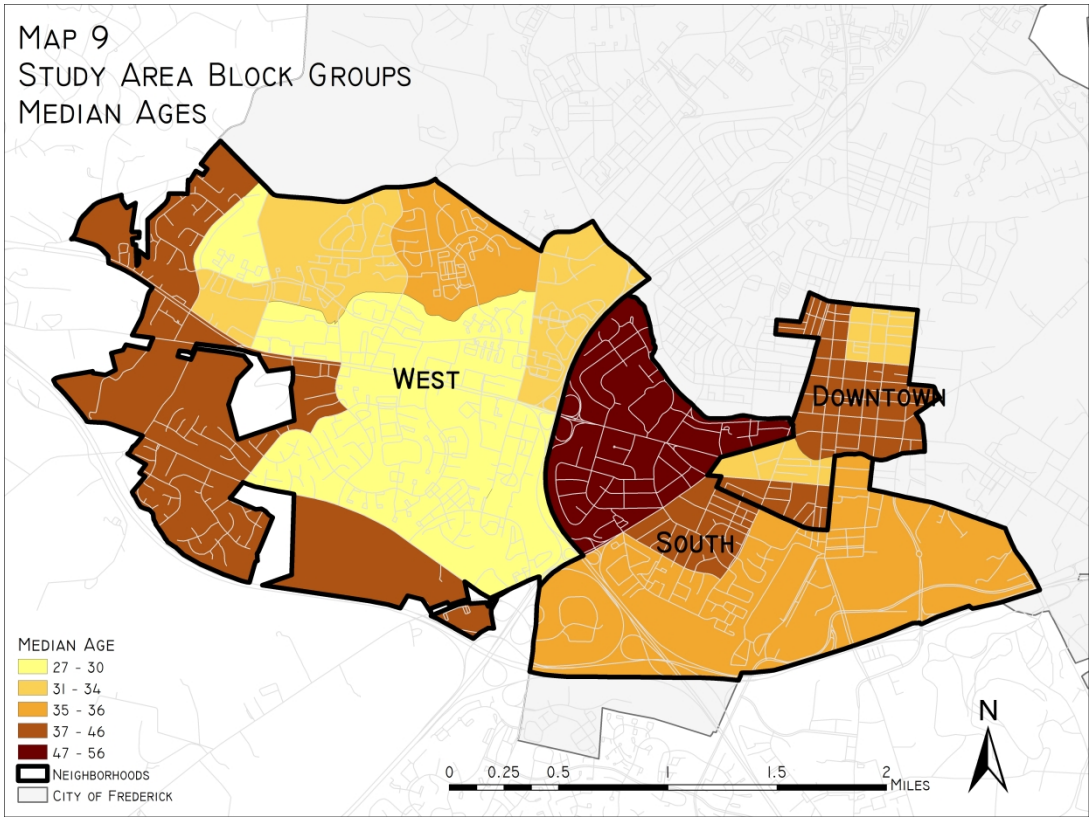

MAP 4
STUDY AREA STRUCTURES'
YEAR OF CONSTRUCTION
GROUP 23
GROUP 24
GROUP 10
GROUP 9
GROUP 14
GROUP 19
GROUP 25
GROUP 20
GROUP 12
GROUP 8
GROUP 21
GROUP 2
GROUP 3
GROUP 4
GROUP 5
GROUP 18
GROUP 22
GROUP 6
GROUP 15
GROUP 7
GROUP 16
GROUP 11
GROUP 13
GROUP 1
GROUP 17
YEAR STRUCTURE BUILT
1770 - 1884
1885 - 1929
1930 - 1945
1946 - 1970
1971 - 2013
STUDY AREA
CITY OF FREDERICK
0 0.25 0.5 1 1.5 2 MILES
N

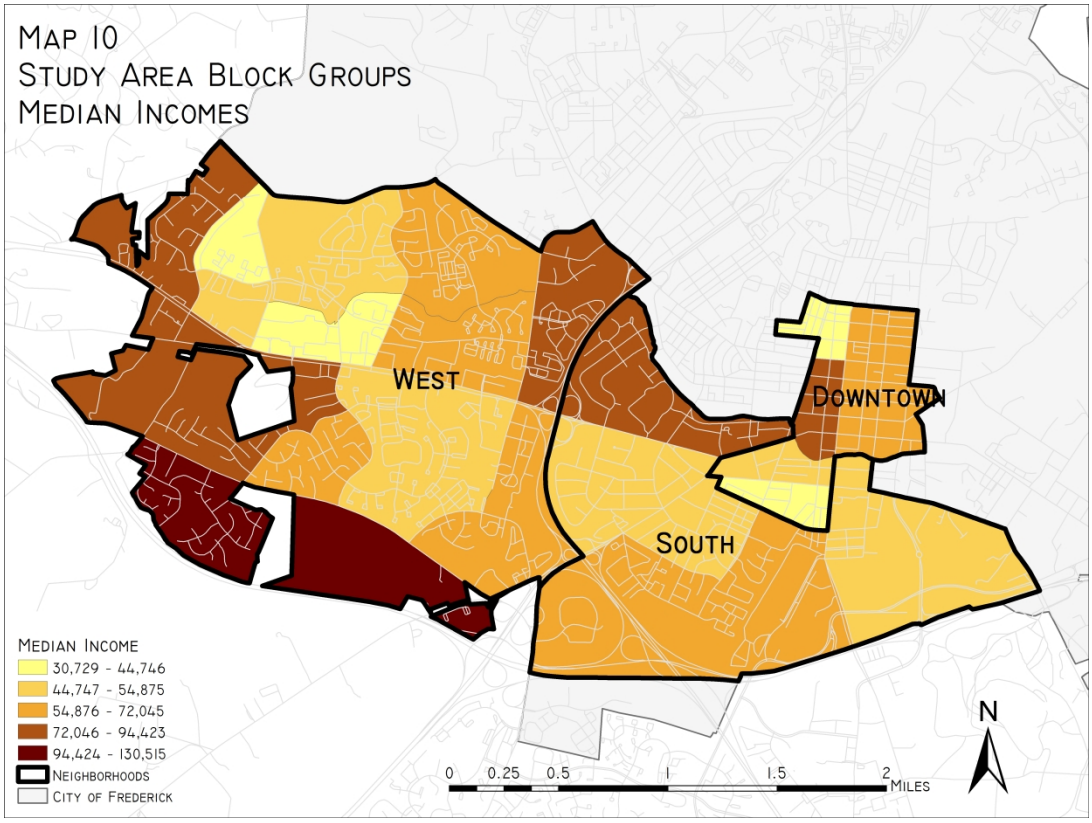

MAP 5
STUDY AREA
DESIGNATED NEIGHBORHOODS
GROUP 23
GROUP 24
GROUP 10
GROUP 9
GROUP 14
GROUP 19
GROUP 25
GROUP 20
GROUP 12
GROUP 8
GROUP 21
GROUP 2
GROUP 3
GROUP 4
GROUP 5
GROUP 18
GROUP 22
GROUP 6
GROUP 15
GROUP 7
GROUP 16
GROUP 11
GROUP 13
GROUP 1
GROUP 17
NEIGHBORHOOD
DOWNTOWN
SOUTH
WEST
CITY OF FREDERICK
0 0.25 0.5 1 1.5 2 MILES
N

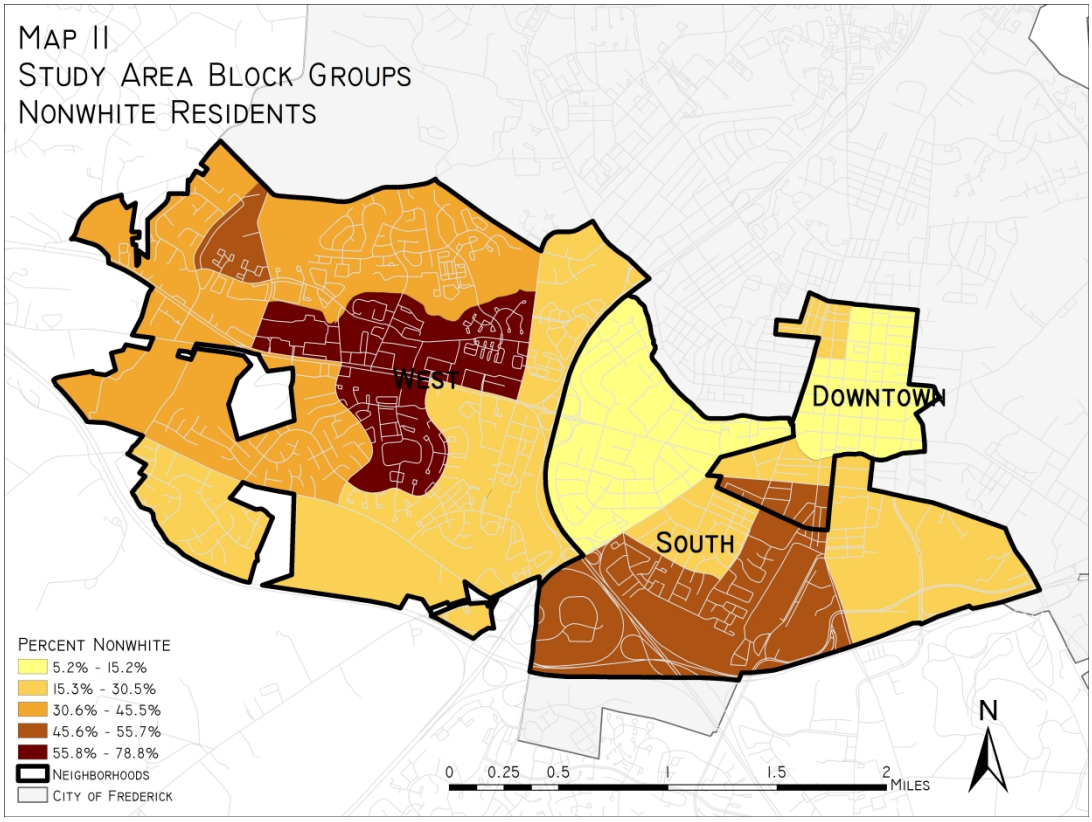

MAP 6
STUDY AREA
TRANSPORTATION INFRASTRUCTURE
GROUP 23
GROUP 24
GROUP 10
GROUP 9
GROUP 14
GROUP 19
GROUP 25
GROUP 20
GROUP 2
GROUP 3
GROUP 12
GROUP 8
GROUP 21
GROUP 4
GROUP 5
GROUP 18
GROUP 22
GROUP 6
GROUP 15
GROUP 7
GROUP 13
GROUP 16
GROUP 11
GROUP 1
GROUP 13
GROUP 17
BUS STOPS
SIDEWALKS
2013 AADT
24 - 5,692
5,693 - 13,891
13,892 - 29,900
29,901 - 62,311
62,312 - 116,510
STUDY AREA
CITY OF FREDERICK
0 0.25 0.5 1 1.5 2 MILES
N

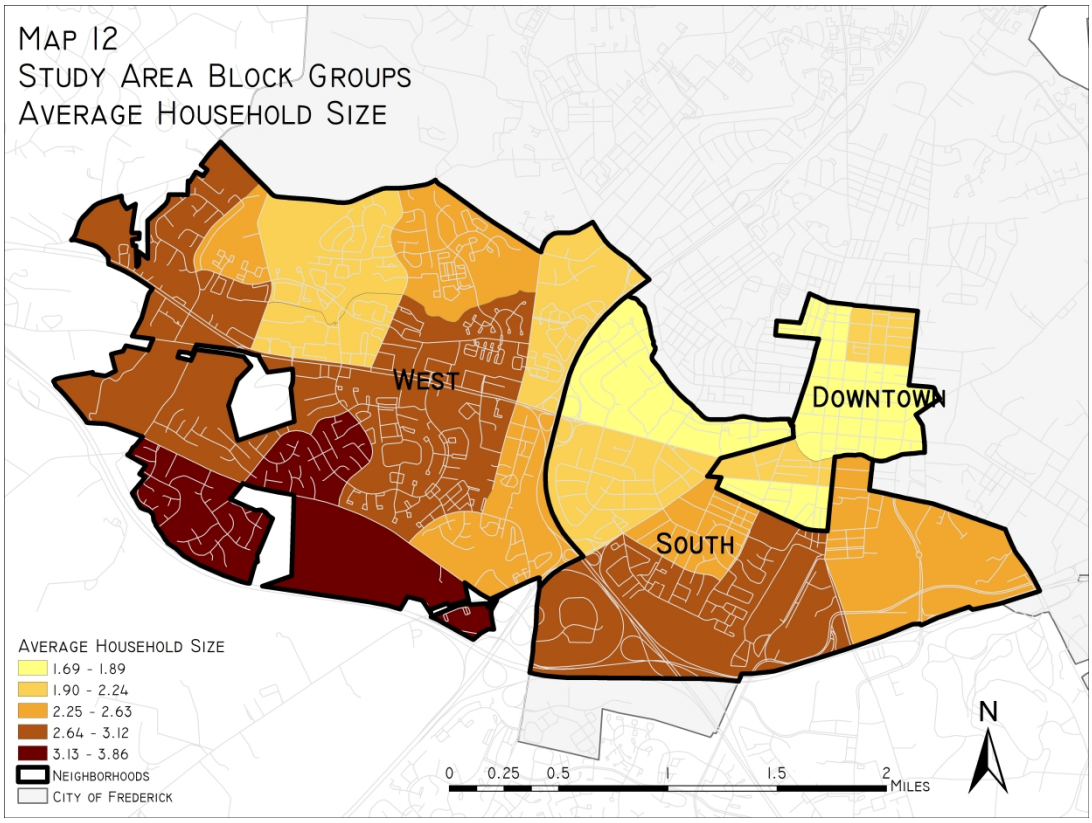

MAP 7
STUDY AREA NACS
AND DESIGNATED NEIGHBORHOODS
NAC 1
NAC 2
NAC 3
NAC 4
NAC 6
NAC 7
NAC 5
NAC 9
NAC 12
NAC 8
NAC 11
NAC 10
NEIGHBORHOOD ADVISORY COUNCIL
NEIGHBORHOOD
DOWNTOWN
SOUTH
WEST
CITY OF FREDERICK
0 0.25 0.5 1 1.5 2 MILES
N


MAP 8
STUDY AREA
SURVEY LOCATIONS
WESTVIEW SHOPPING CENTER
BAKER PARK
DOWNTOWN FREDERICK
NEIGHBORHOOD
DOWNTOWN
SOUTH
WEST
CITY OF FREDERICK
SURVEY LOCATIONS
0 0.25 0.5 1 1.5 2 MILES
N


MAP 9
STUDY AREA BLOCK GROUPS
MEDIAN AGES
WEST
DOWNTOWN
SOUTH
MEDIAN AGE
27 - 30
31 - 34
35 - 36
37 - 46
47 - 56
NEIGHBORHOODS
CITY OF FREDERICK
0 0.25 0.5 1 1.5 2 MILES
N


MAP 10
STUDY AREA BLOCK GROUPS
MEDIAN INCOMES
WEST
DOWNTOWN
SOUTH
MEDIAN INCOME
30,729 - 44,746
44,747 - 54,875
54,876 - 72,045
72,046 - 94,423
94,424 - 130,515
NEIGHBORHOODS
CITY OF FREDERICK
0 0.25 0.5 1 1.5 2 MILES
N


MAP 11
STUDY AREA BLOCK GROUPS
NONWHITE RESIDENTS
WEST
DOWNTOWN
SOUTH
PERCENT NONWHITE
5.2% - 15.2%
15.3% - 30.5%
30.6% - 45.5%
45.6% - 55.7%
55.8% - 78.8%
NEIGHBORHOODS
CITY OF FREDERICK
0 0.25 0.5 1 1.5 2 MILES
N


MAP 12
STUDY AREA BLOCK GROUPS
AVERAGE HOUSEHOLD SIZE
WEST
DOWNTOWN
SOUTH
AVERAGE HOUSEHOLD SIZE
1.69 - 1.89
1.90 - 2.24
2.25 - 2.63
2.64 - 3.12
3.13 - 3.86
NEIGHBORHOODS
CITY OF FREDERICK
0 0.25 0.5 1 1.5 2 MILES
N

APPENDIX 2 – SURVEY QUESTIONNAIRE

How often do you visit the following places (Select Daily, Weekly, Monthly, Don't Visit)?

- Library
- Grocery Store
- Park
- Convenience Store
- Retail
- Religious Institution
- Medical Facility
- School
- Restaurant/Bar/Coffeeshop

How far do you travel to get to the places you visit on a daily basis? (Write-in response)

How do you get to the following places (Select Walk, Bike, Drive, Public Transportation, Other)?

- Library
- Grocery Store
- Park
- Convenience Store
- Retail
- Religious Institution
- Medical Facility
- School
- Restaurant/Bar/Coffeeshop

Do you feel like your neighborhood lacks any of the places listed below? (Select multiple)

- Library
- Grocery Store
- Park
- Convenience Store
- Retail
- Religious Institution
- Medical Facility
- School
- Restaurant/Bar/Coffeeshop

What could be done to improve your experience of walking or biking in your neighborhood? (Select multiple)

- Improved sidewalks
- More trees
- Traffic abatement
- Bike lanes
- Crosswalks

Household Size (Write-in response)

Ethnicity (Write-in response)

Gender (Select Male/Female)

Age (Write-in response)

What neighborhood are we currently in? (Write-in response)
What neighborhood do you live in? (Write-in response)

APPENDIX 3 – SURVEY RESULTS

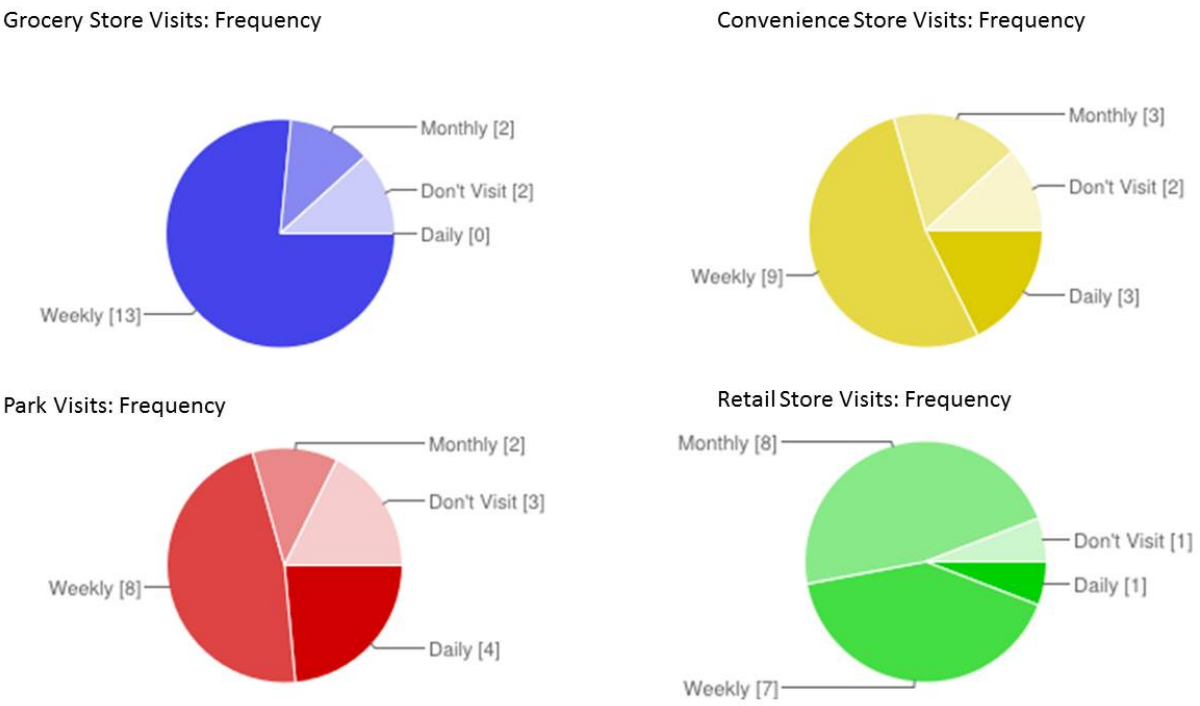


Figure 1 - Frequency of Visits to Selected Amenities

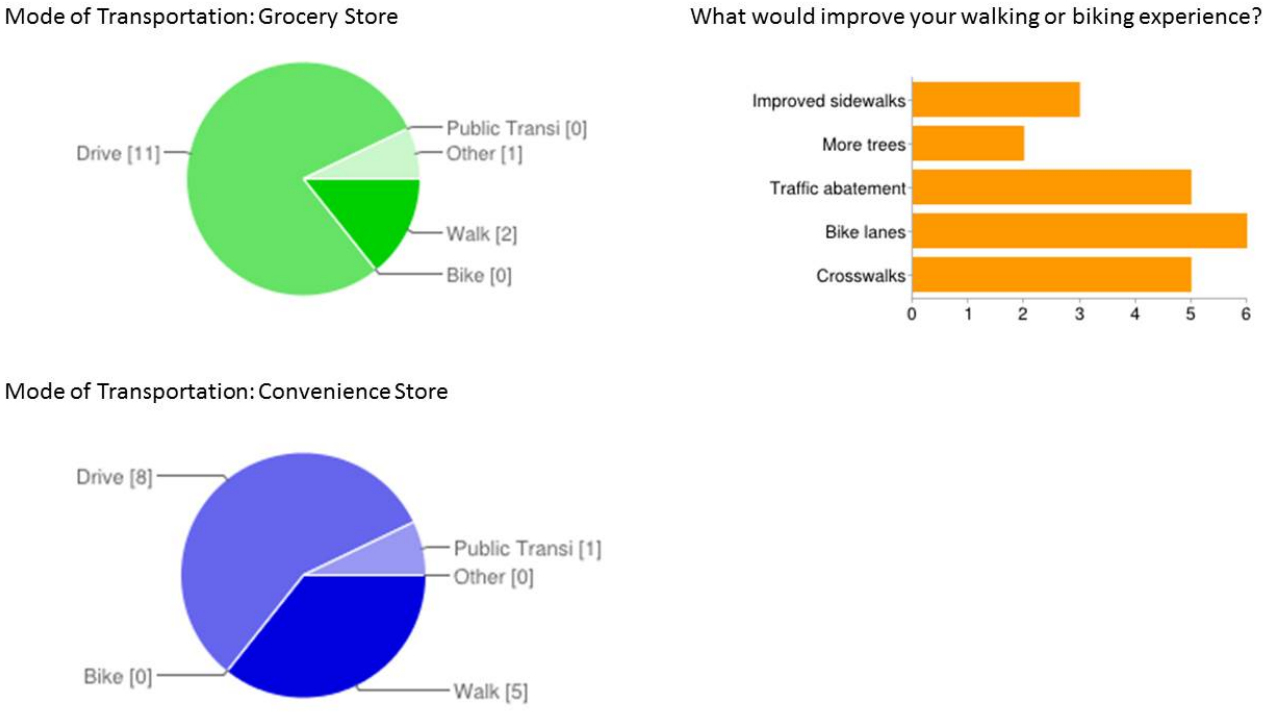
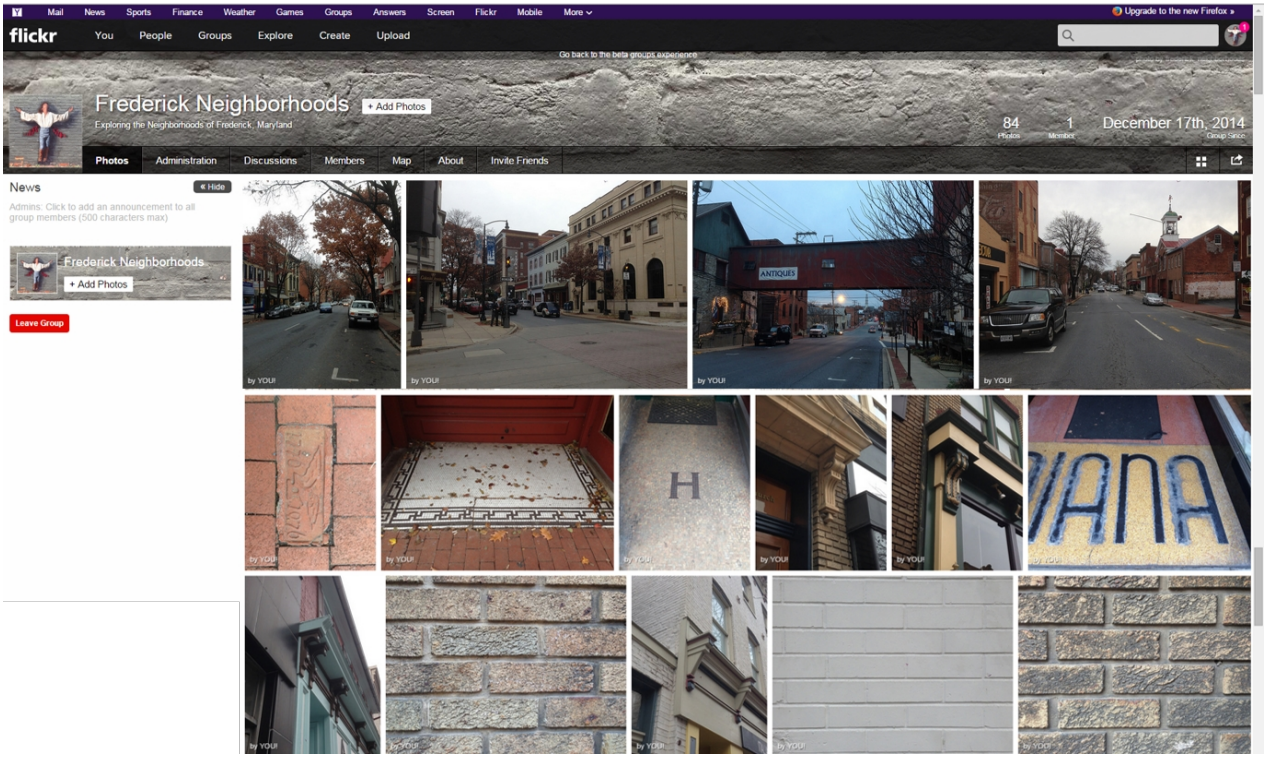


Figure 2 - Preferred Mode of Transportation to Selected Amenities & Walking Experience

Improvements

APPENDIX 4 – OTHER PLANNING TECHNOLOGIES



FLICKR SITE

DOWNTOWN

SOUTH

WEST

WORDLE WORD CLOUDS

APPENDIX 5 – FREDERICK PHOTOS

FIGURE 1 - DOWNTOWN FREDERICK

FIGURE 2 - WESTRIDGE SHOPPING CENTER, ROUTE 40

FIGURE 3 - PARKS IN FREDERICK

FIGURE 4 - PARKS IN FREDERICK

FIGURE 5 - SMALL BUSINESSES – CONVENIENCE STORES & RETAIL

FIGURE 6 - CIVIC INSTITUTIONS