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Field Study of Potential Relocation Sites for the Adams County Farmers' Market

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Abstract

Farmers markets are an essential part of a community's culture and provide a vital service to all of its members. Currently, the Adam's County Farmers Market is at a crossroads, as the lease it has on its current location is up and they must consider where they will go next. The purpose of this study is to assist the market in finding the best location in Gettysburg by analyzing the potential sites and providing a numerical score to compare each site. Four potential locations were used in this study: Constitution Lot, Lutheran Seminary, Recreation Park and the Existing site location. Of these locations it was hypothesized that Recreation Park would be the best spot due to its many open fields and provided amenities. The study was conducted by identifying 12 criteria to consider for each site and weighting them against each other using an Analytical Hierarchy Process (AHP). Each site was given a score for each category and each weight was applied to the corresponding category. These scores were added up and each site received a score out of four measuring the quality of the site. The highest scoring site was Constitution Lot site benefited greatly from its vendor and parking space size while the Existing site location came in at a close second due to its many amenities. This study was conducted with the hope of improving the quality of the farmer's market and increasing its vendor capabilities so that it can better serve the community.

Keywords

Farmers market, Analytical Hierarchy Process, Site evaluation

Disciplines

Environmental Indicators and Impact Assessment | Environmental Studies | Food Studies

Comments

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Field Study of Potential Relocation Sites for the Adams County Farmers Market In Pennsylvania

By Michael Iodice and Patrick Canty Environmental Studies Department Gettysburg College 10-27-2021 ES 400

Abstract

Farmers markets are an essential part of a community's culture and provide a vital service to all of its members. Currently, the Adam's County Farmers Market is at a crossroads, as the lease it has on its current location is up and they must consider where they will go next. The purpose of this study is to assist the market in finding the best location in Gettysburg by analyzing the potential sites and providing a numerical score to compare each site. Four potential locations were used in this study: Constitution Lot, Lutheran Seminary, Recreation Park and the Existing site location. Of these locations it was hypothesized that Recreation Park would be the best spot due to its many open fields and provided amenities. The study was conducted by identifying 12 criteria to consider for each site and weighting them against each other using an Analytical Hierarchy Process (AHP). Each site was given a score for each category and each weight was applied to the corresponding category. These scores were added up and each site received a score out of four measuring the quality of the site. The highest scoring site was Constitution Lot followed by the Existing Site, Recreation Park, and Lutheran Seminary. The Constitution Lot site benefited greatly from its vendor and parking space size while the Existing site location came in at a close second due to its many amenities. This study was conducted with the hope of improving the quality of the farmers market and increasing its vendor capabilities so that it can better serve the community.

Introduction

Over 5000 years ago, the first Farmers markets were held in Ancient Egypt, in a desert of all places. While that may seem counterintuitive, it is not that far off from today, where we have farmers markets not only located in rural and fertile places, but also located in cities, which are practically deserts when it comes to the ability to grow produce or raise livestock (Nudi, 2014). The original farmers markets of ancient Egypt utilized a bartering system rather than a currency. This system allowed the craftsmen of Ancient Egypt to trade their goods for food to feed their families and by bringing all of the local farmers to a central location it allowed people to get these vital resources when their ability to travel was limited (Gallison, 2019). Across history, farmers markets have been essential to their communities because they arose out of a need to access vital resources, not out of convenience. In the United States, farmers markets date back to the early 1700s and they are not just an essential means of resource acquisition for their patrons. In the US, farmers' markets are also a public forum to share ideas, cultural traditions and differing perspectives with others (Neal, 2019).

The diet in the United States is rather unhealthy, one reason many Americans do not eat healthier foods is because they are much more expensive and easier to obtain than the less healthy alternatives. Fresh local produce is essential to a healthy diet and thankfully in the United States there are many government assistance programs that allow lower-income individuals to purchase these foods at places like farmers markets. However, for lower income individuals to utilize these programs and maintain a healthier diet, they must be able to access these farmers markets. When a farmers market is considering changing locations one of the most important factors to their success is the access to their site itself (Sadler, 2016). In a recent study involving numerous farmers market managers, it is shown that one of the greatest hindrances to a farmers market being able to provide SNAP benefits to its lower-income patrons, is the transportation to the market itself for those individuals (Gusto et al., 2020). Thus, it is incredibly important for a farmers market to be located as close to the commercial/downtown districts of their towns as possible, to provide greater ease of access to the citizens in need of the healthy food available at farmers markets.

In Gettysburg, Pennsylvania, USA, there is currently a relatively small farmers market, called the Adams County Farmers Market, which is very likely to relocate to a new location in town. The Adams County Farmers Market is currently in a great location that is central to downtown Gettysburg however; it has very limited space and other shortcomings that limit the ability for the Market itself to grow by adding more vendors and accommodating more patrons. The Adams County Farmers Market's lease on their current location is set to expire after the end of the 2021 farmers market season, in November. At this juncture, the ACFM can either sign a new lease with their current location or find a new location that is better able to suit their needs. However, there are talks of a new development being created on the current market site, so relocation may be a necessity (Stangor 2021). As a result of this opportunity, the ACFM management has begun the task of searching for a potential new location. Recently, the ACFM management has been probing patrons and vendors about what they would like out of a new site (A.C.F.M.A. Accomplishments). From this information, the ACFM site development committee has been able to determine what factors are most important to them and their customers, in a new site. The ACFM has also found several potential sites they could relocate to, but they have not specifically analyzed how well these different

sites meet the criteria which are most important to them. Our study aims to assist the ACFM site development committee with this analysis process.

The central purpose of our study is to identify the optimal location for the Farmers Market based on criteria collected from the manager and vendors (A.C.F.M.A. *Adams County Farmers'*), and our own research on the topic. We will answer this central question in our study:

Which of the potential locations best meet the specified criteria which is important to the Farmers' Market Manager and Site Development Committee to provide the most suitable location for the market?

By answering this question we will assist the Adams County Farmers Market in finding and creating the best environment for itself so that the patrons have the best shopping experience possible. We will find the factors that are important to the viability of a potential site and are testable. With the help of GIS software and the Analytical Hierarchy Process, we will find the theoretical best potential site for the Adams County Farmers Market because of an established precedent of these tools and their importance in urban planning.

The market is a central part of Gettysburg and Adams County culture, so improving the market can further serve the community financially and culturally. Due to our conversations with the Farmers Market Manager, Reza Djalal, the vendor space and parking space will likely be the most important factors that influence the viability of a potential site since they are the limiting factors of the Adams County Farmers Market's current location. Based on this preliminary information, we wrote our **hypothesis**:

It is likely that the Gettysburg Recreation Park Site will be the most viable site for the Adams County Farmers Market because it offers many amenities that other potential

sites do not, and this site has a large area to expand to should the Market increase in size.

While the Adams County Farmers Market is relatively small compared to other farmers markets, it is still vital to the Adams County population that it serves. Just this past year, in 2020, the farmers markets in Pennsylvania were considered by the Governor as essential businesses and the Adams County Farmers Market was able to operate, not only safely but effectively helping locals having hunger-related issues amidst the pandemic. Since its inception in the early 2000s, the Adams County Farmers Market has had a history of innovation and adapting to the problems it faces to better serve its community (A.C.F.M.A. Accomplishments). Finding the optimal location for the farmers market is one of these problems. It is not just crucial for the market, but for the town of Gettysburg as a whole. Farmers markets provide so many obvious and subtle benefits to a town's culture and to the people in it. Generally speaking, farmers markets are known to bring communities together, promote small business shopping, and in many places raise property values for the surrounding homes (Collins 2020). The Adams County Farmers Market in particular provides fresh, affordable produce to the more than 1,200 lower income shoppers (L.I.S.) that it serves annually (A.C.F.M.A. Accomplishments). This fresh produce can be purchased by using the \$900 provided to L.I.S. via WIC, SFMNP, and SNAP vouchers (Local Food Directories 2019). This greatly helps lower income families provide healthy meals for their families. So, by helping the farmers market find its optimal location, we hope to not only increase their popularity and profits, but to contribute to the community as a whole.

Methods & Research Design

First, the potential sites for our study were determined. Initially, we were provided with eight potential sites to analyze, but ultimately this was narrowed down to four potential sites based on a survey conducted by the Adams County Farmers Market Association and based on the report completed by the current site manager (A.C.F.M.A. (n.d.). *Public Survey* 2021). These sites were located at the Constitution parking lot at Gettysburg College (called Constitution), in the parking lot of the Gettysburg United Lutheran Seminary (called Lutheran Seminary or Seminary), at Gettysburg Recreation Park (called Rec Park), and at the existing site next to the Rabbit Transit in downtown Gettysburg (called Existing site) (Djala 2021). These locations were identified in Figure 1.

Next, we identified the important factors for a potential farmers market location. We based these factors on interviews we conducted with the market manager as well as the survey conducted by the farmers market prior to our study (A.C.F.M.A. (n.d.). *Public Survey* 2021). The factors we determined, in order of relative importance, were Vendor Space, Parking Space, Public Restroom access/quality (called Public restroom), Proximity to Downtown, On-site Storage, Foot Traffic, Car Traffic, Electrical Outlet Access, Visibility from the street, Shade Quality, Water Source Access, and Wifi Accessibility (A.C.F.M.A. (n.d.). *Adams County* 2021). The method for data collection is described later in this section.

Once the factors were established, data was collected from the potential sites to use in our analysis. We separated the data into three different groups: Potential Customer data, Amenities, and Spatial data. The Potential Customer data included Foot Traffic, Car Traffic, and Visibility from the street. Foot traffic data was collected by

standing at the entrance to the site between 8 am and 12 pm on a Saturday (the time period the farmers market operated) and over a 15 minute period, the number of pedestrians that walked past the entrance was recorded (Table 1). Then, the collected data was scaled to represent the total number of estimated pedestrians that pass the entrance (over the 4 hour period). One caveat to this is that the current location was tested on the following Sunday, because it was believed that the presence of the farmers market would skew the data as additional people would be there for the market. An identical method was used to calculate car traffic. This collection was repeated three times for each site.

The next group of data was the Amenities, which included On-site storage, Electrical outlets, Public Restrooms, Water Sources, and Wifi. First, it was determined if there were any Electrical outlets, Public Restrooms, or Water Sources within the perimeter of the site. Next, the potential for on-site storage was determined. After discussing with the site manager, it was established that they would be utilizing portable storage units, so we only needed to identify if there was proper space for these units. Lastly, the wifi was tested using our mobile phones to see if there is access to free Wifi. If there was access, then the quality of the Wifi was determined by the signal strength. Additionally, the quality of these categories was also discussed with the market manager and determined using information produced by the farmers market as well as the judgment of the researchers. For the sake of time, more in-depth methods were not used and these categories were left up to the interpretation of the researchers and the Site Development Committee. Generally speaking, the quality of the public restrooms was based on the overall size, accessibility, and cleanliness. For water sources we generally looked how clean they were and how good the water pressure was. Overall, in any

instances where the data was not simply producing a number, the researchers used their discretion and confirmed this with the farmers market.

The last category was the Spatial data. This included Parking Space, Vendor Space, Proximity to downtown and Shade. This data was constructed using Google Earth. The parking lot size and vendor space for each location were determined by creating clips of the sites from the Gettysburg using the "polygon" tool and calculating the areas using the "measure" tool (Figure 2). The distance from the center of town was determined using the ruler tool to measure the distance from the center of town to each location. The shade coverage was determined by creating a 50 foot buffer around the perimeter of the site and counting each tree within the buffer.

The next step was to establish a consistent way to scale our criteria in order to test our hypothesis and compare the sites. We collected data for each category and these results were given a score from 1-4, with 1 being the lowest score and 4 being the highest score. Then we used an Analytical Hierarchy Process (AHP) to determine the weights for our categories (Manoj 2018). This is a method of creating criteria weights based on the importance of each criterion relative to the other criterion. It utilizes a pairwise matrix with the categories on both the *x* and *y* axis. Each category is then compared to every other category and assigned a value based on its relative importance. The values range from a value of 1 meaning two categories have equal importance to a value of 9 which means a category has extreme importance compared to another category (Manoj 2018). Using these comparisons, we were able to create weighted values for each category. Exact values can be found in Table 2. We chose this method because there is an established precedent of using GIS in conjunction with the Analytical Hierarchy Process in the site evaluation phase of urban planning (Dai et al., 2001). Additionally, there are

relevant studies to our research using both GIS and AHP to evaluate the best potential landfill site (Moeinaddini et al., 2010) and model studies that establish the credibility of using both GIS and AHP together for site evaluation in environmentally-friendly urban planning for ecotowns, (Bunruamkaew & Murayam, 2011) as well as eco-tourism (Wabineno-Oryema & Omondi, 2018).

Once all of the sites received their scores in each category, the weights were applied to each category and the new weighted scores were summed. It had a potential maximum score of 4. Finally, our findings were reported to the ACFMA and our study was evaluated with any changes in our method reported, and ways to improve the study examined.

<u>Results</u>

Final scores were determined for the four sites and these scores were represented in their raw form with a maximum score of 4 (Table 2). These scores were added up and the resulting order for our site score from greatest to least was Constitution Lot with 3.062, the Existing Site with 2.949, Rec Park with 2.318, and Lutheran Seminary with 2.186 (Figure 3).

When looking at the three criteria categories, the sites tended to excel in one area but were lacking in the other two categories. First looking at the Potential Customer data including Foot Traffic, Car Traffic, and Visibility from the street, the winner in this group of criteria was the Existing site. The Existing site had significantly more foot and car traffic than all of the sites (Table 1). This resulted in the site receiving a perfect score for all three criteria (Table 2). Rec park also performed well in these categories,

receiving a score of 3 across the board, followed by Constitution lot with scores of 2 and Seminary with scores of 1 (Table 2).

Next, looking at the amenity criteria, the clear leader was Rec Park. It received the highest score possible in each category, scoring 4 in Restrooms, Onsite storage, Water Source, Wifi and Electrical Outlets (Table 2). The Existing site also scored well in this section, receiving a score of 3 in Restrooms, and Wifi (Figure 2). Constitution lot and Seminary did not perform well in this section, as Constitution scored in the lower half for all criteria (excluding onsite storage which was consistent across the board) and Seminary performed above average in only Electrical Outlets with a score of 3.

Lastly, looking at the Spatial criteria, with Vendor Space, Parking Space, Proximity to downtown, and Shade, the overall leader in this group of criteria was Constitution lot. It had the largest vendor space and the largest parking space by a large margin, as well as the second best proximity to town (Figure 2; Figure 1). The Existing site and Seminary also performed relatively well in this category, the Existing site having the best proximity and the second best parking space, and Seminary having the second best Vendor space and the best shade coverage (Figure 2; Figure 1). Rec park scored the lowest in this group, despite having the second best shade score with 3, because it had the worst Vendor and Parking space, as well as the second worst proximity to downtown (Table 2).

Discussion

The first thing noted with the results was that the difference between the best two sites and the worst two sites was quite large. Constitution Lot and the Existing Site both scored over near 3 out of 4 points while neither Rec Park or Seminary received above 2.5

out of 4 points (Table 2). These two sites were clearly the best options but they reached these high scores in different ways. Constitution Lot had the highest areas for both vendor space and parking space, but scored in the lower half in almost every other category with the exception of On-site storage, which was consistent across all sites, and proximity to downtown (Table 2 and Figure 3). The Existing site on the other hand scored most of its points in the middle weighted categories, receiving the highest score in Proximity, On-site storage, Foot Traffic, Car Traffic, and Visibility, while only having decent parking and vendor spaces (Table 2 and Figure 3). This starts an interesting debate as to which site is subjectively better and how this plays into the goals of the farmers market going forward. If the goals of the ACFM are to grow the site and expand its number of vendors and patrons, the obvious choice is the Constitution lot. However, if the ACFM is more interested in maintaining their current level of on-site quality and traffic than they are expanding the size of their market, the Existing Site may be the better spot for them, despite the numbers. This also would bring Rec Park back into the conversation, since it scored the best on average for its amenities of any site.

There has been some recent press about the ACFM being close to a decision and leaning towards the Gettysburg Rec Park site (Stengor, 2021). It is true that the Farmers Market is close to deciding where they will relocate to, however no final decision has been made at this time. It is important to consider that this article from 'Gettysburg Connection' was written prior to the findings from this study being shared with the site development committee. According to that committee, the results of our study have greatly helped inform their decision, as well as having potentially swayed their decision towards looking into the feasibility of relocating to our higher ranked Constitution Lot

Site much more than they were prior. With this in mind, let's now consider our more lower ranked sites, one of which was highlighted in the article in question.

Similar to our higher ranked sites, the lower rated sites: Seminary and Rec Park, were bogged down by their shortcomings in different ways. Rec Park had the lowest score for both parking and vendor space which ended its chance of scoring the highest regardless of the fact that it received high scores in the middle and lower weights, specifically receiving perfect scores in all the amenities categories (Table 2 and Figure 3). For Seminary, its biggest downside is its isolation from the town. Religious schools are often built in more isolated areas and because of this Seminary scored last in Proximity, Foot traffic, Car traffic, and visibility (Table 2 and Figure 3). While these two sites did have some obvious strengths and were not simply poor across the board, they each had a major flaw which prevented them from scoring higher.

This study has a few areas where it could be improved, or areas where a potential error may have occurred. Firstly, in some of the categories, a more in depth analysis could have been performed to remove some potential researchers bias. Within each category, criteria could have been created to judge each site against one another. For example, for restrooms we could have performed a scored analysis based on cleanliness, number of toilets, proximity to the site, etc,. If there was more time to complete this study, certainly more in-depth measures like these could have been taken. Additionally, all of these categories have nuance so placing them in a 1-4 scoring system diminishes some of this nuance. For example, the constitution lot had the most parking by a large margin and this is lost in the rankings. Second, when selecting the categories and creating weights we inherently needed to use our own discretion, so these categories and weights may not be consistent across all farmers markets. Depending on the town, the

market, and the potential site locations, they both could look very different across studies. For instance, cost was not a category that we looked at but could be the driving factor for another market. Thirdly, we were only able to take measurements over a four week period in the fall when the market starts in early May. The seasonal effect on these categories is something that should be considered that the researchers did not have the time or resources to incorporate. Lastly, while measuring the pedestrian and vehicle traffic data for each site, it was decided that to remove bias from this data by allowing the additional traffic brought-in by the market itself during its usual hours. As a result, the traffic data from the existing site would be collected on Sundays (still during typical farmers market hours). Taking this precaution likely removed bias from our study towards the existing site in regards to its traffic data. However, considering the Existing Site's traffic data was collected on an entirely different day from the other sites, it is possible that outside factors could have influenced the results of the Existing Site's traffic data in a positive or negative way compared to the other sites which were theoretically subjected to more similar study conditions.

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Figures and Tables

Week 1 (10/9)		Constitution	L			
	Site	Lot		Seminary	Rec Park	Existing Site
	Foot Traffic		10	4	48	NA
	Car Traffic		5	9	48	NA
	Time (AM)	9:35-9:50		10:03-10:18	10:27-10:42	NA
Week 2 (10/16-17)						
	Foot Traffic			3	12	49
	Car Traffic		4	1	32	115
	Time (AM)	8:30-8:45		9:00-9:15	9:24-9:39	11:10-11:25
Week 3 (10/23-24)						
	Foot Traffic		45	13	72	145
	Car Traffic		47	10	48	148
	Time (AM)	10:58-11:13		11:20-11:35	11:43-11:58	11:43-11:58
Week 4 (10/31)						
	Foot Traffic	NA		NA	NA	95
	Car Traffic	NA		NA	NA	143
	Time	NA		NA	NA	11:45-12:00

Table 1: Traffic Data collected at the sites

Rank (4=best)	Criteria Weight	Constitution Lot	Seminary Site	Rec Park Site	Existing Site
Vendor					
Space	21.70%	4	3	1	2
Parking					
Space	21.70%	4	2	1	3
Restrooms	15.54%	2	2	4	3
Proximity to					
Downtown	11.38%	3	1	2	4
On-site					
storage	7.59%	4	4	4	4
Foot Traffic	5.15%	2	1	3	4
Car traffic	5.07%	2	1	3	4
Electrical					
Outlets	3.80%	1	3	4	1
Visibility					
from street	2.70%	2	1	3	4
Shade	2.04%	2	4	3	1
Water					
Source	1.70%	1	1	4	1
Wifi	1.55%	1	2	4	3
Weighted Scores		3.062	2.949	2.318	2.186

Table 2: Each site's rank from 1-4 in every category along with the criteria weights and each site's final score.



Figure 1: Map of the potential sites reviewed in this research study with their relative distance to downtown Gettysburg.



Figure 2: Map Identifying Sites and using Google Earth Pro software. Green areas are identified as vendor space at each site where blue areas are the parking space.



Figure 3: Stacked bar chart of each site's final score after the weights have been applied to their score, in each criteria. The colors in each bar indicate what proportion of the bar is from a given criteria. The total score for each site is displayed above their bar.