Urbana Grocery Store Sustainable Development

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Milestone #3

ENVS 492- Sustainability Capstone Project Based Learning

Urbana Grocery Store Development

Executive Summary

The purpose of this paper is to propose a development plan for a 570,192 square foot area on the corner of Bradley Ave. and Lincoln Ave. in north Urbana, IL. With this proposal, we aim to provide the City of Urbana with a plan that will benefit its community members while remaining appealing to the developer. To the north and south of this area are the ONE Illinois North & South Student Apartments, west of the area there are single-family homes, and adjacent to area is a small gas station.

Figure 1. Development site and surrounding area.

A major commercial area, which includes a Walmart, Aldi, and Meijer, located off of Prospect Ave. in Champaign is a 10-minute drive, an hour and a half walk, and about an hour on public transport away from this development site. The closest grocery store to this area is County Market which is a 7-minute drive, 35-minute walk, and 20-minute ride on public transport. Most grocery stores average about an 8-10 minute drive from the site. While a 10-minute drive does not seem very far it is important to note the residents that surround the area. ONE Illinois Student Apartments mainly target university students of the University of Illinois, many of whom do not have personal vehicles. An article by the News-Gazette looked at the steady decrease of student parking permits sold since 2010, fewer and fewer students have a car on campus (Des Garennes, 2014). For this reason, we want to propose a grocery store be developed in this area.

We are also proposing three mid-rise apartment buildings, 2 to 3 storefronts, two green spaces, and four townhouses be developed in this space. The proposed design for the development places the grocery store near the largest avenue, Lincoln Ave. This will be the highest density point. It is most visible from the larger avenue and where most people will be located. From there density will gradually decrease. This is done so that the development matches the existing neighborhood layout. Mid-rise Apartment #3 larger will include storefronts on the ground floor and be located on the south end near ONE Illinois South apartments. Density will continue to decrease with the incorporation of Green Space #1 and residential use only buildings on the north end. Finally, the lowest density will be on the west side of the site near Goodwin Ave. Single-family townhouses are recommended for this area because they will most closely resemble the single-family homes in the neighborhood.

Aside from recommending the location and types of buildings that we believe would be beneficial to both the community and developer we are recommending sustainable designs for the site. We recommend different lane structures be implemented inside the development and on the surrounding street. The lanes will consider all types of visitors, those walking, biking, those using MTD, and personal vehicles. We also recommend pervious concrete and rain gardens be implemented to better stormwater management.

Introduction

Problem/opportunity

The City of Urbana is looking to develop a new walkable, bikeable, and transit-served grocery store/residential and commercial development that is located in an underserved and low-income area. The City recognizes that this area is an underserved grocery market. In fact, the USDA has classified this census tract as a food desert, a low-income area, and a low-vehicle access area. A food desert within an urban setting is defined by the USDA as an area where the nearest grocery store is over a mile away. The issue with this area being a food desert is that people living in a food desert do not have access to fresh, healthy food which is linked to health problems like obesity. According to the USDA, low-income tracts have a poverty rate of 20% or higher and have a median family income of less than 80% of the median family income for the state. More specifically, the median household income of this area is $19,643. The USDA also classified this area as having “low vehicle access.” This means that more than 100 families within the census tract have no access to a vehicle. The census tract of this area has 2,420 households (Rhone, 2019). Unfortunately, the USDA does not provide a more detailed number of households in this census tract that do not have access to a vehicle, but we can guess that the number is higher since there is a large student population in this area. Upon interviewing Juan Cepeda, a UIUC student and former resident of the ONE Illinois Student apartments, he was able to confirm not many residents had access to cars. Cepeda stated, “It was a rough time as a student without a car. I heavily relied on friends,” when asked about how he managed to purchase groceries. Therefore, the goal of this project is to make this development as walkable, bikeable, and transit-served as possible to serve the needs of the surrounding community. An additional goal is to incorporate as many sustainable designs as possible into this new development.

Past Development Projects

In the past, there have been a few residential developments in the area, but the issue with the developments is that there are little to no other services or amenities within these developments that can be beneficial to the public (grocery stores, shops, parks, etc.) This means people who live in this area

are being forced to travel to those resources and dependent on vehicles. Not only is this bad for the environment but also human health. By improving sidewalks, bike lanes, transit-stops and making this area a mixed-use development, we can add the resources that are currently lacking and make them accessible. This will promote healthier eating habits, a cleaner environment, and exercising. Massachusetts Housing Investment Corp discusses how including sustainable practices can encourage "Healthy Neighborhoods" (Church, 2019). The residential developments around this area that do not have any stores, cafes, or restaurants inside the development or within reasonable walking distance.

One previous development project used a zoning variation that allowed for a reduced number of parking spots. This development in Urbana, between West Oregon Street and West Nevada Street, was approved for a special permit that allowed the developers to reduce the number of required parking by 34 percent, allowing for fewer parking spaces than would ordinarily be required by city zoning regulations. The building would also include some aspects of sustainable design including a low-intensity green roof, a collection of stormwater for irrigation, and motion sensor lighting (Rodriguez, 2011). This specific zoning variation could be negotiated to help encourage a developer to include more sustainable designs that would reduce the need for parking. Reduced parking saves the developer money so those savings can be traded for other sustainable design features that may increase costs.

Currently, there is a residential development project under construction at Lincoln and University in Urbana that we have studied. The developer is focusing on tailoring the new development to the surrounding area through working closely with the city and studying the area in great detail. The development will have lower-density townhome buildings along the street adjacent to the older homes that are already in the neighborhood to make the development fit in with the surrounding area (Meadows 2019). This is a design choice that we will be incorporating into our proposal. We are proposing high-density buildings on the east side of the development at Lincoln Ave that will gradually decrease to low-density buildings on the west side at Goodwin.

Many other urban areas are implementing mixed-use projects into new developments. Washington, D.C., has several recent examples of large-scale mixed-use projects with grocery store anchors in a dense, walkable urban environment. One example is Cityvista. It opened in 2008 and includes a 55,000-square-foot "Urban Lifestyle Safeway" grocery store as part of a large mixed-use development with condominiums, apartments, and 75,000 square feet of additional retail, all on a 3.2-acre site. Parking was reduced by 40 percent versus a conventional suburban store, and the ratio is 2.9 spaces per 1,000 square feet of store space. (Newberg 2011). This type of mixed-use design is what inspired our motivations for making this area a mixed-use development.

We also researched development projects that incorporate sustainable design and subsidized housing. One residential development project in Bronx, NY called Via Verde includes a 66 kW building-integrated solar PV system, onsite cogeneration, green roof, community vegetable gardens, natural daylighting and cross-ventilation, green interior finishes, rainwater harvesting, and drought-tolerant vegetation. The building features one of the most innovative buildings integrated photovoltaic systems in New York City, with a dramatic cascading solar wall and lofted solar canopy (Via Verde 2018). Aside from having a great sustainability design, one of the major purposes for the Via Verde development was to provide affordable housing. Out of 222 residential units, 151 are available to low-income households earning between 30-90% of the average median income (Douglas, 2012). The remaining units are available to middle-income residents.

Proposed Solutions

Our proposed solutions will incorporate some aspects of past development projects as well as incorporate our own design ideas. We plan on incorporating more amenities for the community. We are proposing a multi-use commercial and residential development that will include a grocery store, green space, stormwater management, green energy, subsidized housing, and will be walkable, bikeable, and transit-served. We hope this will draw people to the area and provide the community with a place to come together.

Objectives

What We Are Doing

This project will develop a proposal for the development that includes a grocery store, three mid-rise apartments, four townhomes, two to three storefronts, and enhanced sustainable features such as green space, efficient stormwater management, and efficient transportation. This development will be at the Southwest corner of Bradley and Lincoln in Urbana. The community has emphasized the need for a grocery store in the area, but we want to propose more than that. We want to propose a sustainable multi-use development that will contain more amenities such as a previous/permeable pavement for efficient stormwater management, green space, more transit accessibility, and more commercial space. We want to also make this development accessible for people with low income since this area is defined by the USDA as a low-income area. We will accomplish this by having a percentage of the residential development be subsidized (2019).

Motivations/Benefits

We divided our motivations into three categories: economic, social, and environmental. The development proposal will be shared with the developer and the city of Urbana. Our economic motivation is to propose a plan that will be profitable and economically feasible to the developer. Our social motivation is to be able to provide a grocery store/commercial development for a low-income food desert. We also want to provide a percentage of subsidized low-income housing for this community through our residential development. Our environmental motivation is to make this development as sustainable as possible with sustainable design practices.

Expected Deliverables

Our expected deliverable is a final development proposal for the area that will be shown to the City of Urbana. This proposal will have a visual of the area and a narrative. The visual will show where the buildings, streets, and amenities will be located on a map of the area. We will add a short description of each sustainable plan that will be included as well as an analysis of the costs and benefits of the sustainable design elements. The narrative will be a detailed proposal for the development of the site following the guidelines of a real development proposal.

Methodology

The major sections of this project included: researching past projects, looking at current characteristics of our site (including zoning information), determining community needs, proposing a layout for the development, and evaluating different sustainable practices. The purpose of these sections are to assist the City of Urbana in communicating their needs and wants to the developer.

Task 1: Research done on existing development proposals.

We divided this section into three categories of research. The first category was based on local examples of similar development projects that have been done in Urbana. We thought it would be most helpful to have some project examples that we know have worked in Urbana rather than other cities that do not have Urbana's unique characteristics and issues. The second category was development projects where there is commercial development on the bottom and residential development built on top of the commercial development. The third category focused on development projects that have incorporated low-income housing into their residential development.

Task 2: Defined current site characteristics.

This section included both visiting the site at the southwest corner of Lincoln and Bradley and extracting data about the site from GIS. The purpose of this section was to get a better visual idea of the development site and its surrounding area. We took note of traffic patterns, surrounding commercial spaces, bus stops, and sidewalk space. Another aspect of this section was extracting data about the site from GIS and satellite images such as square footage, census data, and specific dimensions and measurements.

Task 3: Community Outreach

Our goal with this task was to get some sort of input as to what the community would like to develop in their area of residency. Reaching out to the community was an important task since they are one of the greatest stakeholders in this project. Initially, a survey was proposed, however, after looking further into how to do this we found that it was too difficult to reach this many people. There was also a time constraint associated with this task. Instead we sought the input from two reliable community members, Scott Tess, our project sponsor, and Shirese Hursey, council member for this ward. We questioned them on what they believed were the major needs and concerns of the residents in this area. We also had a conversation about what practices and amenities they believe the community would benefit from.

Task 4: Determined where and how many commercial/residential units will be developed.

Using the data and knowledge gathered from tasks 1-3 we decided on the number of green spaces, apartment buildings, townhomes, and commercial buildings that will go into the development. A proposed to scale layout was drafted using SketchUp. Any measurements of the area used were obtained from GIS. Once, the layout of the development was determined we looked at what areas had room to incorporate better transportation and sustainable practices.

Task 5: Evaluated sustainable practices.

In this section, we looked at various sustainable practices such as transportation, green space use, and stormwater management. The goal of this section was to produce a development layout that encourages the surrounding residents to live more sustainably by changing their method of transportation. This included finding ways to make the development more welcoming and aesthetically pleasing by incorporating sidewalks, bike lanes, and green scenery to reduce the use of cars. We also looked at how lanes should be constructed or altered to accommodate for the increase of population and addition of bus routes.As far as stormwater management, the advantages of adding permeable pavement and rain gardens were looked at.

Task 6: Determined zone changes

Using the proposed development layout obtained in task 4 any zoning changes that would have to be done were determined. Once again information on zoning was obtained through the Urbana GIS website. Any zoning changes are discussed in the results section.

Results and Discussion

Sketch of the Development:

Figure 2 displays our layout proposal for the City of Urbana. We are recommending a grocery store, 3 mid-rise apartment buildings, 2-3 storefronts, 4 townhomes, and 2 green spaces. Our goal was to propose the development that not only served the residents living in it but also the surrounding community. For this reason, buildings were placed in a manner that complemented the surrounding area. A building with greater population density was placed where there is currently the greatest amount of traffic. Proposed buildings with smaller population densities were placed in an area that is more residential than commercial.

Figure 2. Proposed Layout of the Development

We are proposing a grocery store be placed on the Southeast corner of the development facing Lincoln Ave. This is the best location for the grocery store to be placed since Lincoln Ave has the largest foot traffic and that will bring in more business. This location also makes the grocery store most visible to the

public. 4,000 m^2 have been designated for the construction of the grocery store. This area is approximately the size of Country Market in Champaign, IL.

Adjacent to the grocery store we are proposing Mid-rise Apartment #3 be added. In this building we are proposing 2 to 3 storefronts be added on the ground floor. With these storefronts we envision a service that will improve residents' experience. The storefronts could be a number of things including a bank, coffee shop, ice cream shop, and bakery. We believe this is the perfect location for the storefronts since a large park would be located directly in front making the area a nice place for leisure. Two additional mid-rise apartment buildings are proposed next to and across from Mid-rise Apartment #3. Following the three mid-rise apartment buildings is Green Space #1. This space is the largest green space being proposed within the development. It will serve the residents from the development as well as the surrounding area. This area also serves as a buffer between the higher population density areas and lower density areas. On the west corner of the development we are proposing a set of 4 townhouses be added. Compared to the apartment buildings the population of people residing in this area will be much lower. This was done in order to match the single-family homes that are located across N. Goodwin Ave. A second green space, Green Space #2, is proposed in the middle of the townhouses. This green space compared to the other one will be more exclusive to the residents of the townhouses. The area could include a small area designated for resident's pets and a few benches.

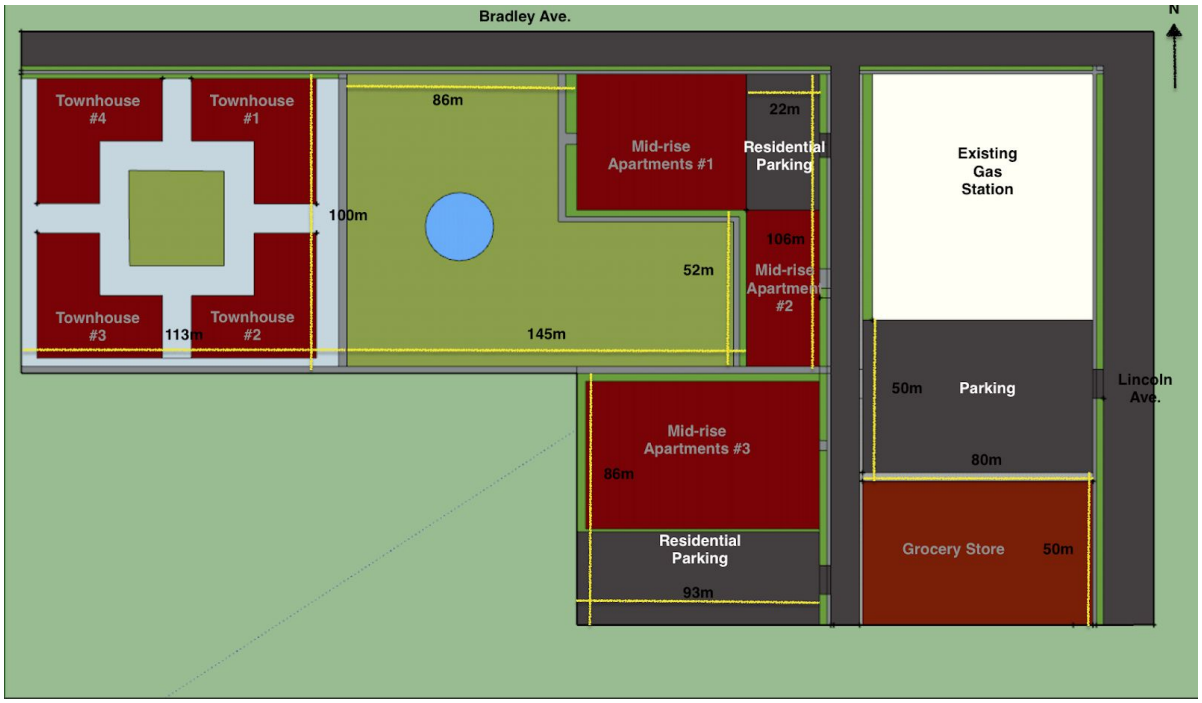

Figure 3. Proposed Layout of the Development Top View

In addition, lanes and parking was also modeled for this development. Figure 3 displays the top view of the development proposal. In this image where parking and the lanes are located is more clear. A few of the measurements for the development are also displayed in this image.

Zoning:

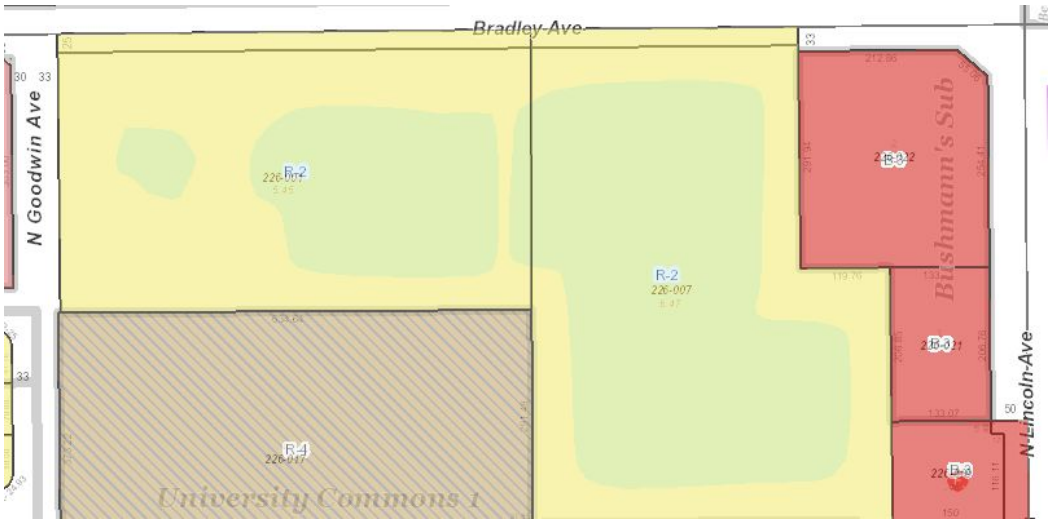

Figure 4. Current Zoning

Figure 3 displays the breakdown of the zoning for the development site. The zoning consists of R-2 and B-3. The R-2 Single-Family Residential District is intended to provide areas for single-family detached dwellings at a low density, on lots smaller than the minimum for the R-1 District. The R-2 District is also intended to provide for a limited proportion of two-family dwellings. R-2 provides desirable settings for residential uses within several density ranges described in Urbana's Comprehensive Plan, and for various types of dwelling units, with appropriate regulations regarding physical development. As appropriate, the districts also allow other uses compatible with residential areas, either as permitted or as conditional or special uses. Basic urban services and utilities, including adequate access and utilities, are necessary for these districts. We are recommending that this zoning stay the same for the townhomes on the East side of the development. We are recommending that this zoning changed to R-6 B for the center of the development where we are proposing mid-rise apartments.

ZONE	MIN LOT SIZE (square feet)	MIN AVERAGE WIDTH (in feet)	MAX HEIGHT (in feet)	MAX FAR	MIN OSR	MIN FRONT YARD (in feet)	MIN SIDE YARD (in feet)	MIN REAR YARD (in feet)
R-2	6,000[13]	60[13]	35[17]	0.40	0.40	15[9]	5	10

Figure 5. Development Regulations in the R-2 District

R-6B is High Density Multi-family Residential-Restricted Business District. It is intended to provide areas for a compatible mixture of limited business uses and residential development at densities ranging up to high. Both the uses permitted and the regulations on physical development make this district suitable as a buffer between more intensive commercial districts and lower density residential districts.

ZONE	MIN LOT SIZE (square feet)	MIN AVERAGE WIDTH (in feet)	MAX HEIGHT (in feet)	MAX FAR	MIN OSR	MIN FRONT YARD (in feet)	MIN SIDE YARD (in feet)	MIN REAR YARD (in feet)
R-6B	6,000	60	See Note[15]	1.50[16]	None	15	5	10

Figure 6. Development Regulations in the R-6B District

The B-3 General Business District is intended to provide areas for a range of commercial uses wider than that of Neighborhood Business but at a lower intensity than Central Business, meeting the general business needs of the City. The Business districts generally are intended to provide areas for commercial uses in districts accommodating the range of types, intensity, and physical forms of trade, commercial services, and offices (Champaign County GIS Consortium 2019). We are recommending that this zoning stay the same for the grocery store.

ZONE	MIN LOT SIZE (square feet)	MIN AVERAGE WIDTH (in feet)	MAX HEIGHT (in feet)	MAX FAR	MIN OSR	MIN FRONT YARD (in feet)	MIN SIDE YARD (in feet)	MIN REAR YARD (in feet)
B-3	6,000	60	None[3]	4.00	None	15	5	10

Figure 7. Development Regulations in the B-3 District

Nearby Grocery Stores:

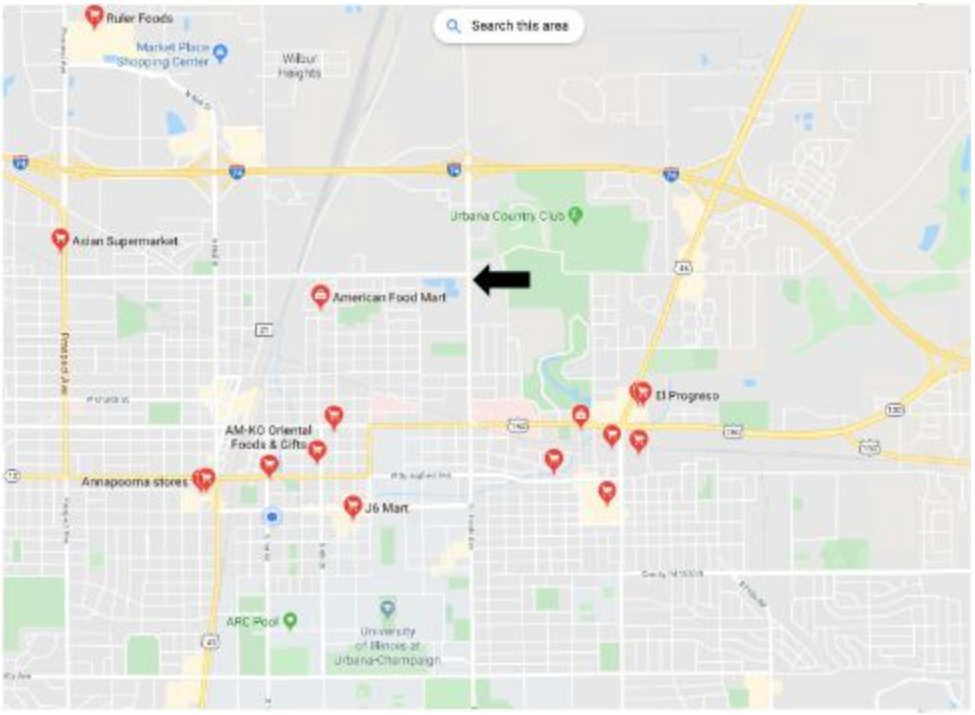

Figure 8. Map displaying grocery stores in the area

This map, **Figure 7**, shows all the nearby grocery stores to our development site. The nearest place to buy food in this area is the American Food Mart which is a 20-minute walk away. However this simply a convenience store and not a full-service grocery store in which one could buy all of the necessary food. Additionally, since this is only a convenience store the food sold there would be more expensive than a grocery store. After the American Food Mart, the nearest grocery store is County Market, which is a 35-minute walk away and 20 minutes on the bus. Considering that the surrounding community of the development site consists of many people who do not have access to cars, getting to County Market is difficult. Right now by going to other grocery stores, the area produces 294.75 tons of CO2 emissions per year. This is equivalent to the weight of 42 elephants. Additionally, the area spends $51,909 on gas per year by going to other grocery stores. By putting grocery stores in this area, we can reduce the amount of car emissions this area produces and save the area money in the long run.

The table below shows the nearby grocery store and how many miles they are away. The table also shows how long it takes to walk to the store.

Table 1. Nearby Grocery Stores and Distances

Name	Miles	Mins walking
County Market	1.7	34 mins
Save A Lot	1.6	31 mins
Common Ground Food Co-operative	1.8	36 mins

Schnucks Urbana	1.8	36 mins
Average distance/min	1.725	34.25 mins

Walkable, bikeable, and transit-served:

Figure 9. Lane structure by development

Figure 8 is a diagram of all the possible lanes on a given street. We are using this in order to make this development walkable, bikeable, and transit-served. The width of the street will most likely have to be expanded into our development area in order for us to fit in all the lines. Furthermore, we propose that the lanes be on Bradley, Ave because it has less traffic it than Lincoln. In fact, a traffic report near the area states that Lincoln has 15,100 cars passing through, while Bradley has 6,400 cars passing through on a given day (Illinois Department of Transportation). By putting the lanes on Bradley Ave, we are hoping to better control traffic flow, while making this area more transit-served because people will not have to get off the bus and cross a busy street. We also propose that the sidewalk has trees and small plants that will separate the streets from the people who are walking. The trees, small plants, and green space will make the walk aesthetically pleasing and motivate the people living in the townhomes to walk to the grocery store. Next, we took a look at the bus route. As shown in **Figure 9** below, the 22-bus stops on Lincoln at our development. In order to make the area more transit-served, we are suggesting that the 7-bus route be moved so that it passes through the area. Instead of the 7-bus turning down Fairview, we suggested it continues down Goodwin and turn on Bradley, then keep straight and turn down Lincoln then turn back on Fairview.

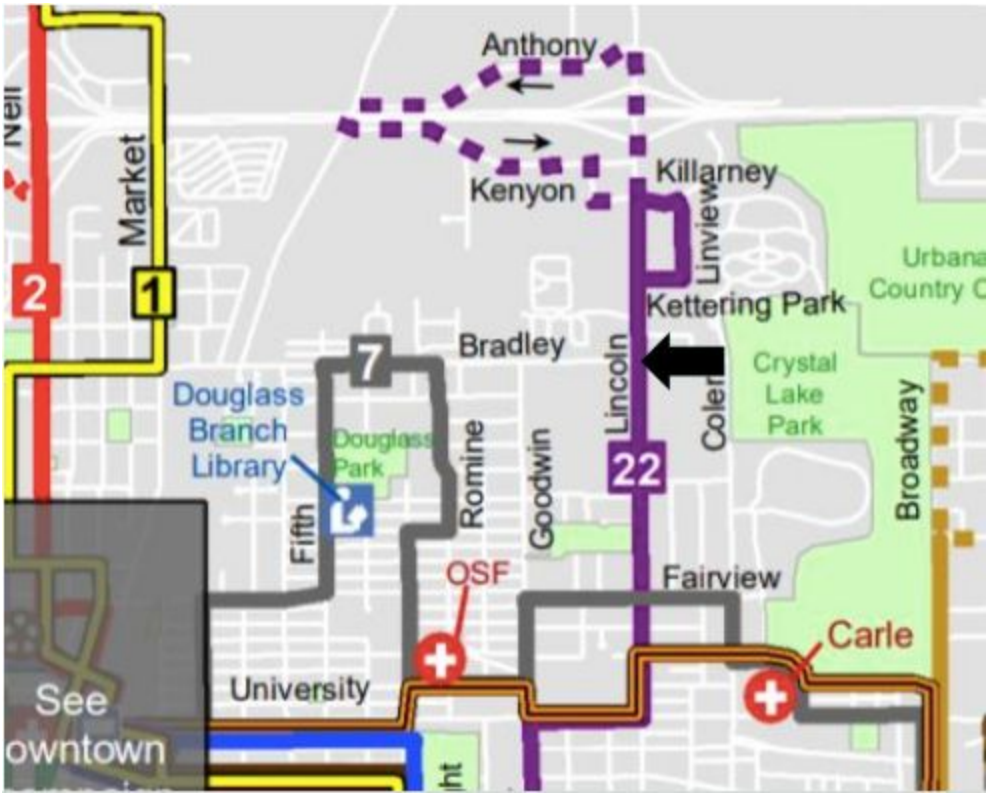

Figure 9. Bus routes by the development

Stormwater management:

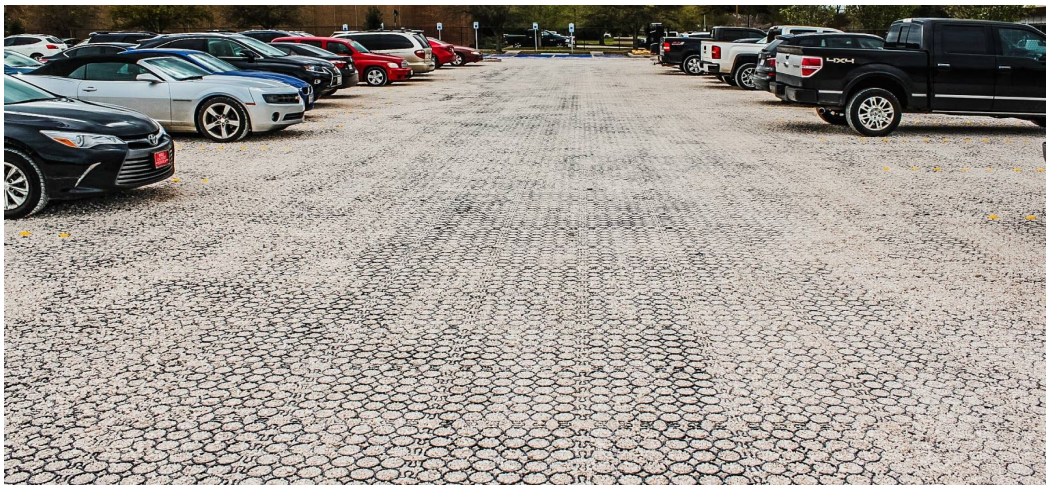

Figure 11. Pervious Concrete

To control stormwater and runoff, we propose pervious concrete and rain gardens as a sustainable design. Furthermore, pervious concrete and rain gardens work to reduce the amount of water in the area. Pervious concrete has low-impact on the environment and can be used for parking lots, sidewalks, and residential streets. The pervious concrete water to cement ratio is 15-25%. Low water means a high level of strength. Not only does pervious concrete manage water, but also oil from cars and other residues. In fact, pervious concrete can filter up to 70-80% of annual rainfall, and pervious concrete is still very effective during the cold seasons. Pervious pavement saves up to $64,649/year through its long life cycle and by avoiding the costs of other water retention systems and utility fees. Pervious pavement also has an Incentive of up to 25% of the total construction costs back. The lifetime of pervious concrete is 25 to 30 years and it is also recyclable. The average construction cost is $2.00 to $6.50/sq. ft. Rain gardens also reduce the amount of water in the area and are a good way to manage water in an urban setting. Not only do rain gardens control water runoff, but they will also make the walk more enjoyable. Furthermore, rain gardens can absorb up to 10 - 30% of annual rainfall. There is also an Incentive for rain gardens that can reimburse up to $250 of costs for a rain garden that has a minimum surface area of 100 square feet and has at least 500 square feet of the impervious area draining into it. By imputing rain gardens and pervious concrete we can manage the runoff in the area, save money in the long run, and make the area more beautiful.

Conclusions

Our proposal discusses the development plan for a 570,192 square foot area on the corner of Bradley Ave. and Lincoln Ave. in north Urbana, IL. The development plan consists of different sustainable practices and efficient transportation that will make this area walkable, bikeable and transit-served. We propose a mixed-use development that includes a grocery store, storefront apartments, condominiums sustainable elements (green space, efficient transportation, and stormwater management), subsidized housing, and efficient transportation. We hope to provide a place for the community to come together. We also believe putting a grocery store in this area can help reduce the amount of car CO_2 emissions this area produces by going to other grocery stores. Furthermore, mixed-use developments reduce car actives, by contributing to walkable and bikeable areas. This also lowers regional congestion, reduces greenhouse gas emissions, and Increases access to jobs or economic opportunities working for families. All in all, mixed-use developments promote healthier lifestyles for the people in this area. Our proposal will potentially be a solution to the food desert in this community.

Acknowledgments

We would like to give a big thanks to Dr. Lance Schideman and Vince Spagnola for their feedback and advice throughout this semester. We would also like to thank Scott Tess, our project sponsor from the City of Urbana, for attending our bi-weekly meetings and giving us the guidance and expertise necessary to complete this project. Finally, we would like to thank Councilor Shirese Hursey. Our development site is in her ward and she was able to provide us with information about the additionally needs and wishes of the community.

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Group Reflections-

Theresa Snarski: This class has taught me how to work on projects in the real world even if I do not have much relevant background about the project. Going into this project was intimidating at first because I have no knowledge of urban planning and development projects. I was able to learn more about urban planning as the project was carried out. I really enjoyed being able to put myself out of my comfort zone and learn in a hands-on experience. I also really enjoyed learning a lot more about the Urbana community and more about the history of the town I attend school in. Additionally, I believe that I have learned some relevant skills on professionalism. I was the main contact with our project sponsor and Councilor Shirese Hursey and was able to practice my professional communication skills which will make me more comfortable emailing professionals in my future.

Autumn Holmes: This was a very interesting project, although none of us had any experiences dealing with developing, we put our different backgrounds together in hope to come up with a solution that is beneficial to the area. We put our skills that we learn from other classes like GIS, Renewable & Alternative Energy, Etc to work and we also did research on things we didn't know. This project stood out to us because we care about environmental justice but we learn so much more. in fact, this was a great learning experience that will prepare us for our future careers.

Noemy Escamilla: This project was a learning experience. It taught us the importance of setting goals and narrowing down our scope. Having a structured timeline helped with achieving timelines. The biggest setback we had was our scope was too large. We struggled from the beginning understanding what was expected from us and because of it we tried to do too much. I think if I were to redo this project, I would want to focus on a single area instead of multiple. With such a broad scope teamwork and collaboration was important for our success.