

Philadelphia Green Schools:
Building Sustainable Partnerships between Schools and Neighborhoods



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11.308 Ecological Urbanism
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The following paper documents my vision for a ‘Green School’ program that transforms neighborhoods within the broader context of programs suggested within the class. The paper is divided into three main sections: The first section explains the theoretical framework behind the concepts in the paper, namely: place-based education, environmental literacy, urban metabolism and industrial ecology. The second section of the paper then explains how the application of principles from urban metabolism can form sustainable partnerships between schools and their immediate neighborhoods, using Sulzberger School in West Philadelphia as a case study. The third and final section explains the limitations, further research directions and the possibilities that such a program may entail if successfully applied.

The results that I came across from testing this model have been unexpected and extremely promising. When a resource mapping exercise of the neighborhood surrounding Sulzberger School revealed an array of diverse resources and potential that is untapped, I knew that no community or neighborhood would need to look very much further than its own backyard in order to transform itself. This is the essence of my vision and one of the main themes that have emerged during this semester: a reaction to the direction that educational institutions have taken in the United States over the past decades. The industrialization of the education system has left students with little creativity, motivation or critical thinking skills which are necessary to succeed in the professional world. Furthermore, the schools have been completely disconnected from their immediate neighborhoods and offer little or no further benefits besides their prescribed official ‘roles’. However, even the most impoverished communities contain within them a wealth of resources that just need a simple reconfiguration and coordination in order to enrich the students’ education, build ties between the school and the neighborhood and empower the community.

Part One: Literary Background and Research

The first two main concepts that are central to my vision are place-based education and landscape literacy. My use and understanding of these terms are derived from the following authors and their work in helping shape and develop these terms: David Sobel, “Place-Based Education: Connecting Classroom and Communities” (2004), and Anne Whiston Spirn “The Nature of Mill Creek: Landscape Literacy and Design for Ecological Democracy” (2014). Place-based education is simple in its essence: “knowledge of the nearest things should be acquired first, then that of those farther and father off”¹. It is the process of using the local community and environment as a starting point to teach concepts in language, arts, mathematics, social studies, science and other subjects across the curriculum. Landscape literacy is the process by which the local community learn for ‘read’ their environment and the multi-layered processes which have formed the neighborhood as we know it today: “landscape literacy should be a cornerstone of community development and of urban planning and design. To plan prudently is to transform problems into opportunities and liabilities into resources, and to intervene at an appropriate scale”². Within each concept and the sources from which they come from, the authors’ offer case studies and examples to further explain these concepts and show their practical implementation. The most relevant and interesting case studies for my case are:

¹ Sobel, David. "Place-based education: Connecting classroom and community." *Nature and Listening* 4 (2004).

² Spirn, Anne Whiston. "Restoring Mill Creek: landscape literacy, environmental justice and city planning and design." *Landscape Research* 30.3 (2005): 395-413.

- Littleton High School, New Hampshire

In a novel collaboration between Chutter's General Store and the marketing program at the Littleton High School's vocational center, the town has been functioning as a classroom:

“When the well-established downtown candy store realized that its internet sales site was costing more than the revenues it generated, the owners looked to the school for a solution. The high school needed more space and the marketing class was seeking real-world projects. The school district and the town agreed to rehabilitate a space below the candy store to create a marketing classroom for less than it would cost to build new space at the high school. By having the marketing class take over Chutter's internet business, the students get economics experience and the candy store owners generate a bit of revenue as a result of the reduced labor costs. Through a balanced focus on economic development and environmental preservation, the community gets revitalized and the state curriculum standards are met.”³

- Caldwell Middle School, Louisiana

In Louisiana, getting out of the classroom often means getting into mosquitoes, so the 4H Club at Caldwell Middle School in Terrebonne Parish took on the real-world challenge of mosquito control:

“One parent, whose daughter has asthma, was interested in finding ways to control mosquitoes in residential areas without aerial spraying of pesticides. First, students and teachers started to experiment with raising guppies to see if they would eat mosquito larvae. But these students got a lesson in ecology when a professor from Nichols State University recommended native mosquito fish instead, because of the problems caused when nonnative species are introduced into local waters. Students bred the mosquito fish and then released them into stagnant ponds, ditches, and even swimming pools. Just a fun project? Melynda Rodrigue, 4H sponsor and Caldwell teacher, indicated that math teachers will chart the numbers of offspring and the time period needed to repopulate the tanks, science classes will study the fish's life cycle, and social studies classes will study the impact on the community's environment. Some students used their writing skills to create a brochure for distribution to the community, and other students got public speaking experience through presentations at other schools in the area.”⁴

- Martin Luther King Middle School, California

In Berkeley, California, a similar grassroots school-and-community effort has been transformed into a bioregional initiative. This case study offers the most strikingly obvious argument for why it doesn't make sense that food for a school would come from thousands of miles away. Furthermore, it provides a real world example of how a local initiative has led to the institutionalization of its program – a successfully integrated bottom-up approach:

³ Sobel, David. "Place-based education: Connecting classroom and community." *Nature and Listening* 4 (2004).

⁴ Sobel, David. "Place-based education: Connecting classroom and community." *Nature and Listening* 4 (2004).

“From one vegetable garden at the Martin Luther King Middle School came the idea to have a garden on every schoolyard in Berkeley, which spread to the idea of a garden on every schoolyard in California. And since you can’t realistically feed all the children in any one school with produce from one garden, why not create connections between local farmers and the school district? Instead of freeze-dried burritos trucked in from the Midwest, how about burritos with organic beans and cheese grown and produced by area farmers who are threatened by suburban sprawl? These ideas have led to the creation of the Food Systems Project, where the aim is to have all the food in the Berkeley school lunch program be organic and locally grown within the next decade. At the same time, food preparation and agriculture education become an integral part of each school’s curriculum.

The Food Systems Project is funded by the United States Department of Agriculture’s Linking Farms to Schools initiative, the California Department of Health, and the Center for Ecoliteracy, a broad coalition of funders trying to address the problems of child nutrition, school improvement, and sustainable agriculture in an integrated fashion. Project director Janet Brown has commented that by using food as an organizing principle for systemic change, the program addresses the root causes of poor academic performance, psychosocial behavior disorders, and escalating children’s health issues such as obesity, asthma and diabetes. At the same time the program connects the loss of farmland and farming as a way of life and the social problems facing school communities.”⁵

- Sulzberger Middle School, Pennsylvania

Despite extensive in-class discussions regarding this specific case study, a short excerpt is included here because the imagined pilot program I propose also uses the same school. While the West Philadelphia Landscape Project investigation was through the lens of landscape literacy, my envisioned program looks through the lens of resource identification and mapping – another form of reading the landscape:

“From 1994-2001, students in my classes at the University of Pennsylvania and at the Massachusetts Institute of Technology analyzed the urban watershed, demonstrated how storm water could be collected in landscape projects that are also stormwater detention facilities, and created designs for wetlands, water gardens, and environmental study areas on vacant land in the Mill Creek neighborhood. When the West Philadelphia Landscape Project website was launched in early 1996, it featured the database, reports, and projects built from 1987-1991.

To reach a broad spectrum of the Mill Creek population, my students and I launched a program with a public school in the Mill Creek neighborhood. What began as a community-based, environmental education program organized around the urban watershed grew into a program on landscape literacy and community development. From 1996-2001, hundreds of children at Sulzberger and students at the University of Pennsylvania, learned to read the neighborhood’s landscape; they traced its past, deciphered its stories, and told their stories about its future, some of which were built. The tools they used were their own eyes and imagination, the place itself, and historical documents such as maps, photographs, newspaper articles, census tables, and redevelopment plans. The program had four parts:

⁵ Sobel, David. "Place-based education: Connecting classroom and community." *Nature and Listening* 4 (2004).

reading landscape, proposing landscape change, building landscape improvements, and documenting these proposals and accomplishments. The first two parts were incorporated into university and middle-school curriculum during the academic year; all four were integrated in a four-week summer program.”⁶

Both authors make compelling arguments for their concepts. Sobel’s place-based education model emphasizes hands-on, real-world learning experiences. According to the author, this approach to education increases academic achievement, helps students develop stronger ties to their community, enhances students’ appreciation for the natural world, and creates a heightened commitment to serving as active, contributing citizens. Moreover, community vitality and environmental quality are improved through the active engagement of local citizens, community organizations, and environmental resources in the life of the school.⁷ In regards to landscape literacy, Spirn warns us that when those who plan and build the city disregard the significance of these patterns or fail to see them at all, they waste resources, produce dangerous, expensive mistakes, and inflict grave injustice on all who live there.⁸ In other words, what they are proposing are not alternatives to the status quo – it is a much-needed revolution to the failed systems in place.

The second two main concepts central to my program are urban metabolism and industrial ecology. In “The Changing Metabolism of Cities” (2007), authors Christopher Kennedy, John Cuddihy, and Joshua Engel-Yan set out a clearly defined framework for what the term Urban Metabolism accompanies. It is a model to facilitate the description and analysis of the flows of the materials and energy within cities, providing researchers with a metaphorical framework to study the interactions of natural and human systems in specific regions.⁹

One of the core uses of Urban Metabolism is to track and record measures of sustainability in cities and regions around the world. The model collects information regarding energy-efficiency, material cycling, waste management and infrastructure in urban environments, among others. Furthermore, it records and analyzes environmental conditions and trends that are easily understood for policy makers and consequently comparable over time, making it easier to find unhealthy patterns and develop a plan of action to improve present conditions. By tracing flows of energy, materials and waste through urban systems as a whole, changes and alterations can be made to close the loops to create circular metabolisms where resources are recycled and (almost) no waste is produced. Such initiatives are already being made for the purpose of making ‘green’ building easier and more accessible. According to the authors, uses of the model are not restricted to strictly functional analysis, as it has been adapted to examine the relational aspects of urban relationships between infrastructure and citizens.

This model is closely related, or built off of, an industrial ecology model – which looks at maximizing efficiency and reducing waste at a production level (smaller scale). Industrial Ecology is an analytical method to quantify flows and stocks of materials or substances in a well-defined system and is an important tool to study the bio-physical aspects of human activities on

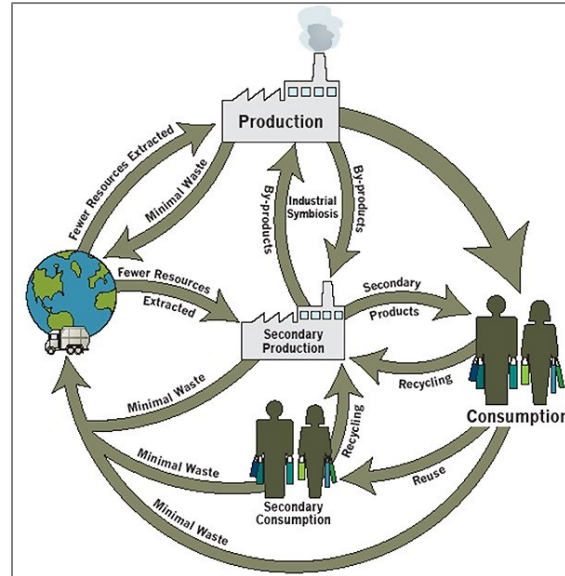
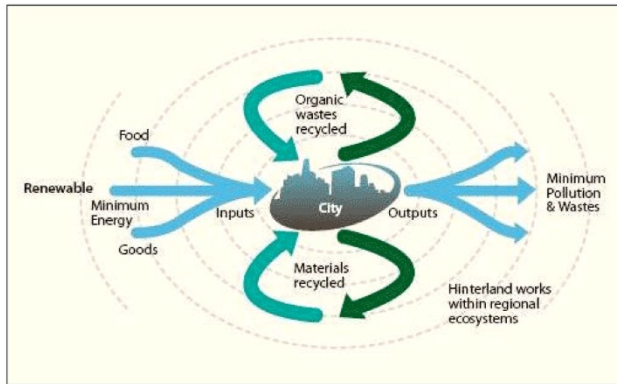
⁶ Whiston Spirn, Anne. "Restoring Mill Creek: landscape literacy, environmental justice and city planning and design." *Landscape Research* 30.3 (2005): 395-413.

⁷ Sobel, David. "Place-based education: Connecting classroom and community." *Nature and Listening* 4 (2004).

⁸ Spirn, Anne Whiston. "Restoring Mill Creek: landscape literacy, environmental justice and city planning and design." *Landscape Research* 30.3 (2005): 395-413. ⁹

Kennedy, C., S. Pincetl, and P. Bunje. "The study of urban metabolism and its applications to urban planning and design." *Environmental pollution* 159.8 (2011): 1965-1973.

different spatial and temporal scales.¹⁰ While these two models presented here seem unrelated to the two themes before (place-based education and landscape literacy), I believe that a marriage between the two could produce unexpectedly stimulating results and experiments. The next section will explain this marriage and detail my vision for a model program in Philadelphia.



Figures 1 and 2: Diagrams depicting Urban Metabolism (above) and Industrial Ecology (right).

Part Two: Creating a Model Program

My vision for a model program for Philadelphia is one that applies the principles of the urban metabolism model to form sustainable partnerships with the surrounding community and neighborhood. Specifically, I am looking at the concept of industrial ecology to structure the partnerships and exploit all available resources in the community (both physical and non-physical) in order to greatly reduce or eliminate any waste of available, valuable resources.

A model for partnerships, which uses the resources of the community for the school in such a way, could prove prospectively stimulating when combined with the themes of place-based education and landscape literacy. Imagine a neighborhood where the school used a nearby urban garden to learn biology, but also used the produce in the cafeteria for food. Imagine a local restaurant that allows the school to use their kitchen to cook the school's lunch but also gave culinary lessons to students. Imagine a nearby clinic that offers its medical services in school but invites students to come learn and experience first-hand medical knowledge. A local library, tailor, college, tech company, etc... are all valuable resources that could form partnerships and offer resources to the school. At the same time, the school is offering their valuable resources (young, highly capable brains) back to the community. The school theatre could be used for local events. The playground, built and designed by the neighborhood, is open after hours for everyone to enjoy. The possibilities are endless and diverse depending on location, but each community has a lot to offer. Both the tangible and non-tangible resources hold a massive untapped potential.

Early on, I had a vision of the program having an organizational structure that is dynamic and evolving – showing the different partnerships, what they do, and how someone from the community could intersect and join. It would be a combination of Evergreen's model (national

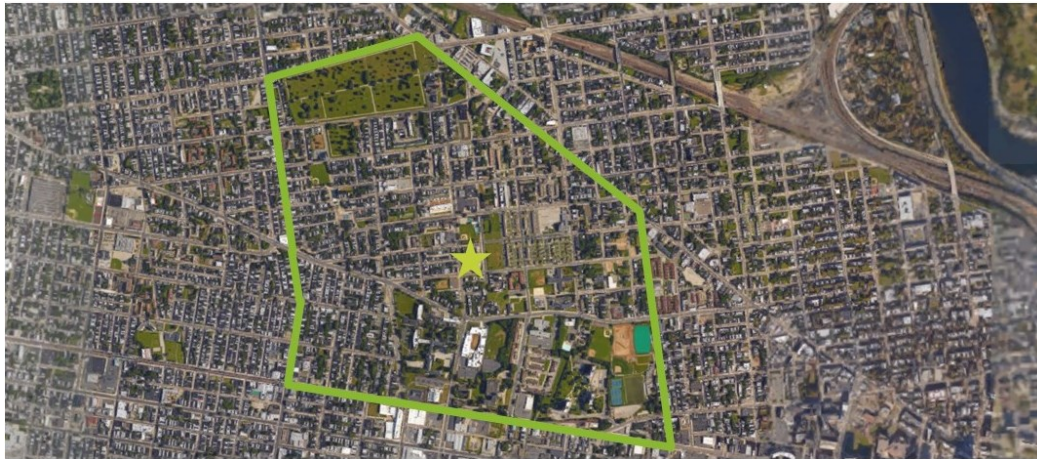
¹⁰ Allenby, Brad. "The ontologies of industrial ecology?." *Progress in Industrial Ecology, An International Journal* 3.1-2 (2006): 28-40.

scale) and the typical community school (small / neighborhood scale). The school would naturally be at the center of this organizational structure (a hub, or center for the community) and the links around it to the community would be established through long-term partnerships. The aim is that the flow of resources would come from the community to the school and from the school back to the community (through the same or different avenues and to different people, potentially). The resources can quantitatively be tracked and traced as in any urban metabolism model, but the input and outputs will also have measures of success that are indirect and not as easy to quantify (knowledge, stewardship, ecological justice, etc...).

Before working out the details and implementation of the model, I decided to test it. The first step was to map the resources for a community and see how many of these links or partnerships could be formed and what kind of resources and opportunities would be most useful to achieving our goals and the overall vision. I decided to choose Sulzberger Junior High School as the ‘pilot’ school to launch and test the program. Since we had visited the school and its surrounding neighborhood and were familiar with many aspects of the school through the teachings of the course – it seemed to provide for the ideal subject.

The map below became my starting point. Like any system, I first had to set clearly defined boundaries – which I began to draw with the guidance of Prof. Spirm who is an expert on the community. Once these boundaries were marked, I started the task of identifying and mapping all the resources in that defined neighborhood.





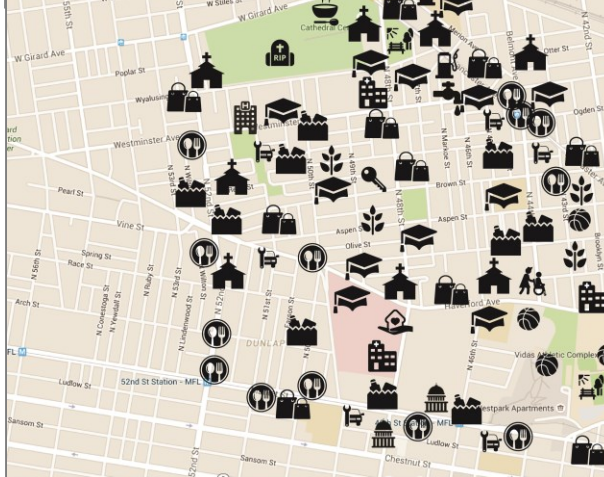
Figures 3, 4 and 5: Map showing the different scales and defined boundaries of the community with Sulzberger School in the middle.

While I was tempted at the beginning to look for a GIS map (available online) of the community, I decided to wear the shoes of the students who would be conducting such a project and took a walk down the streets on Google Maps (Street View). As I started my journey, I began to jot down the name and addresses of all the businesses and organizations that I was coming across and building a database on an excel spreadsheet. What slowly began to unravel, unexpectedly, was that the community contained within it much, much more than I had previously estimated. The resource mapping exercise re-affirmed my hypothesis but astounded me – as I had not expected a neighborhood like Mill Creek, which appeared to me as a lower-income, low-medium density residential area, to contain a rich and diverse set of resources, businesses and organizations. It gave me further hope – if a seemingly ‘impoverished’ community like Mill Creek contained within it such a vast reserve of untapped potential, then no neighborhood is too ill-equipped for this type of school-neighborhood partnerships.

	A	B	C	D
1	Name	Address	Phone Number	Description
2	Lombard Central Prespeterian	4201 Powelton Ave, Philadelphia	(215) 222-3044	House of worship
3	Aldi Philadelphia	4421 Market Street	(855) 955-2934	Standby for Disco
4	Vidas Athletic Complex	300 Powelton Ave, Philadelphia	215-895-2864	The Vidas Athletic
5	Lee cultural center	4328 Haverford Ave, Philadelphia	685-7655	Sitting on 9.4 acre
6	Alain Locke School	4550 Haverford Ave, Philadelphia	(215) 823-8202	Public elementary
7	Lee Park	Lee Park, Haverford Ave, Philadelphia, PA	19104	Public Park
8	CVS pharmacy – photo	4849 Market St, Philadelphia, P	(215) 474-4801	Grocery store
9	CHOP Karabots Pediatric Care Cent	4865 Market St, Philadelphia, P	(267) 425-9800	Children's hospita
10	Travelers Aid Family Services Phila	111 N 49th St, Philadelphia, PA	(215) 240-4800	Homeless shelter
11	Jeonah Jireh Baptist Church	19131, 4807 Haverford Ave, Phi	(215) 473-0895	Church
12	The mill Creek School	111 N 49th St, Philadelphia, PA	(215) 471-4900	Private therapeut
13	Checkers	4322 Market St	(215) 662-0400	Fast food chain ee
14	Sunday Best	41 N 52nd St, Philadelphia, PA	(215) 476-2660	Jamaican Restaur
15	Family Dollar	29 N 52nd St, Philadelphia, PA	(215) 748-4058	Dollar Store
16	Pete's Pizza	5158 Haverford Ave, Philadelphia	(215) 747-5555	Greek Restaurant
17	Refuge Apostolic Church--Our Lord	201 N 52nd St, Philadelphia, PA	(215) 474-4888	Church
18	One Door Mission True Light	401 N 52nd St, Philadelphia, PA	(215) 477-4412	Church
19	Number One Chinese food store	4251 Walnut St, Philadelphia, P	(215) 387-3000	Chinese Restaura
20	James Rhoads Elementary School	4901 Parrish St, Philadelphia, P	(215) 581-5504	Elementary Schoo
21	J&R Express	897 N 50th St, Philadelphia, PA	(215) 452-5490	Grocery store
22	Blue Moon	5105 Westminster Ave, Philad	(215) 877-9923	Hotel

	A	B	C	D
82	Loretta's Flower Shop	437 N 52nd St, Philadelphia, PA	(215) 477-6654	Florist
83	Directions Beauty Salon	5159 Wyalusing Ave, Philadelphi	(215) 879-7723	Beauty Salon
84	Robinson Chapel Church	675 N 52nd St, Philadelphia, PA	(215) 477-5251	Church
85	Alaska King Crab House	4834 Lancaster Ave, Philadelphia	(215) 877-3421	Seafood Restaura
86	Brightside Academy	4829 Lancaster Ave, Philadelphia	(215) 879-0162	Day Care Center
87	Quba Institute	4637 Lancaster Ave, Philadelphia	(215) 473-8589	Private School
88	Skyblue	910 N Markoe St, Philadelphia, (215) 238-0922	Women's Clothing
89	Penn Steaks	4530 Lancaster Ave, Philadelphia	(215) 877-1760	Steak House
90	Mikail's Halal Steak-out	4617 Lancaster Ave, Philadelphia	(215) 473-1221	Mediterranean R
91	Amos Healing Missionary Baptist C	4553 Lancaster Ave, Philadelphia	(267) 266-9176	Church
92	Penske Truck Rental	4511 Lancaster Ave, Philadelphia	(215) 879-0967	Truck Rental Agen
93	U-Haul	4501-4511 Lancaster Ave, Philad	(215) 764-6429	Truck Rental Agen
94	D 8 Brothers Food Market & Deli	4500 Westminister Ave, Philade	(215) 397-4783	Grocery Store
95	Destiny Worship Center	4500 Westminister Ave, Philade	(215) 879-5400	Church
96	We Care Printing Shop	888 Lex St, Philadelphia, PA	191 (215) 477-3996	Screen Printer
97	AAA Body Repair Shop	873 N 45th St, Philadelphia, PA	(215) 477-1500	Auto Repair Shop
98	MJR Enterprise	4518 Ogden St, Philadelphia, P	(610) 316-5049	Home Improve
99	Parrish Supermarket	4529 Parrish St, Philadelphia, P	(215) 222-1299	Grocery Store
100	Eagle Jewelry & Loan	4216 Lancaster Ave, Philadelphia	(215) 386-3570	Pawn Shop
101	Fatiregun Christiana	4400 Haverford Ave, Philadelphia	(215) 685-7626	Pharmacy
102	All for You Limousine	5155 Ogden St, Philadelphia, P	(267) 269-2866	Limousine Servic
103	The Enterprise Center	4548 Market St, Philadelphia, P	(215) 895-4000	The Enterprise Ce

After building the database of businesses and organizations (see full spreadsheet in appendix A) with very simple information: name, address, phone number and short description, I began to categorize the resources under general headings and gave each an icon or symbol to represent it on a map. In total, I found that there were 103 resources in the immediate community.

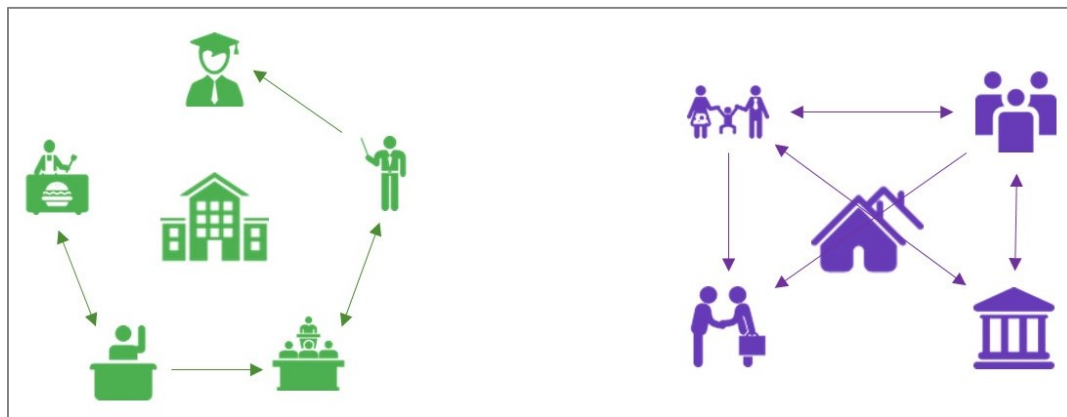
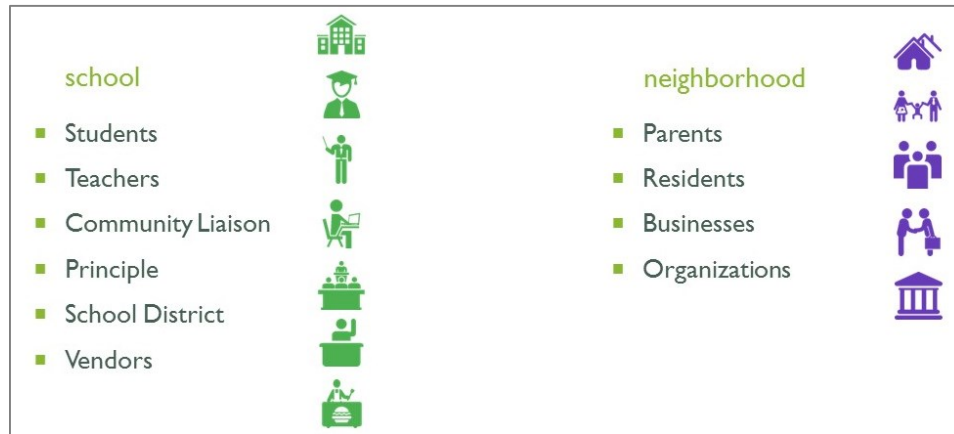


Restaurants	18	
Retail	15	
Groceries	12	
Educational	11	
Religious	10	
Garages/Auto Dealers	10	
Sport Facilities	4	
Urban Farms	4	
Health Centers	3	
Gas Stations	2	
Parks	2	
Hotel	1	
Misc. / Others	9	
Total	103	

Figures 6-9: Diagrams depicting the build up of business and organizations. The final one is a composite.

Table 1: Table showing the categories in the neighborhood and the number of each. Icons for each category also shown.

After completing the community mapping and database, the natural second step was to map the stakeholders in order to make it clear from the beginning to make sure all necessary parties are involved at all levels. I started by creating a diagram of the current situation and then reworking it to include the imagined connections that would be created through the introduction of the program.



Figures 10 and 11: Diagrams showing the stakeholders in the school and the neighborhood and how they currently relate to each other

At present, the diagram shows a disconnected, one way relationship structure that currently links the stakeholders at school. Some links don't even exist, such as the one between the students and the vendors. It struck me as odd that something as important as what food students were consuming on a daily basis was completely out of their reach. While at the neighborhood level more connections were present due to the work some organizations and businesses have with the residents, some critical links are also missing. For example, residents and businesses have a one-way consumer/seller relationship at present. This has created some tensions in the community, as business owners are perceived as outsiders who are not invested in the community's interest aside from commercial, monetary gain.

The first step to re-mapping the stakeholders had to involve the addition of a community liaison in the school. This would require the hiring of one expert, preferably from within the community, to help facilitate and manage the partnerships while creating some format for formalizing them. The community liaison will work with the students and the teachers in helping to choose which

resources they'd like to partner with based on best match. The model program will allow the students to be involved stakeholders in the school, firstly, and in the neighborhood thereafter.

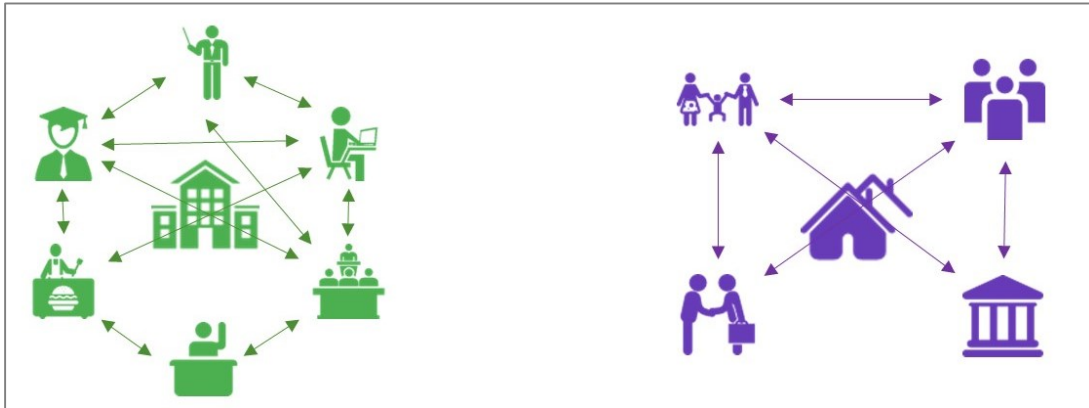


Figure 12: Stakeholder relationships under model program.

Once the internal structure of the school has been adjusted accordingly, it will now make for connecting to the neighborhood and partnering up with the stakeholders there much smoother and more inviting.

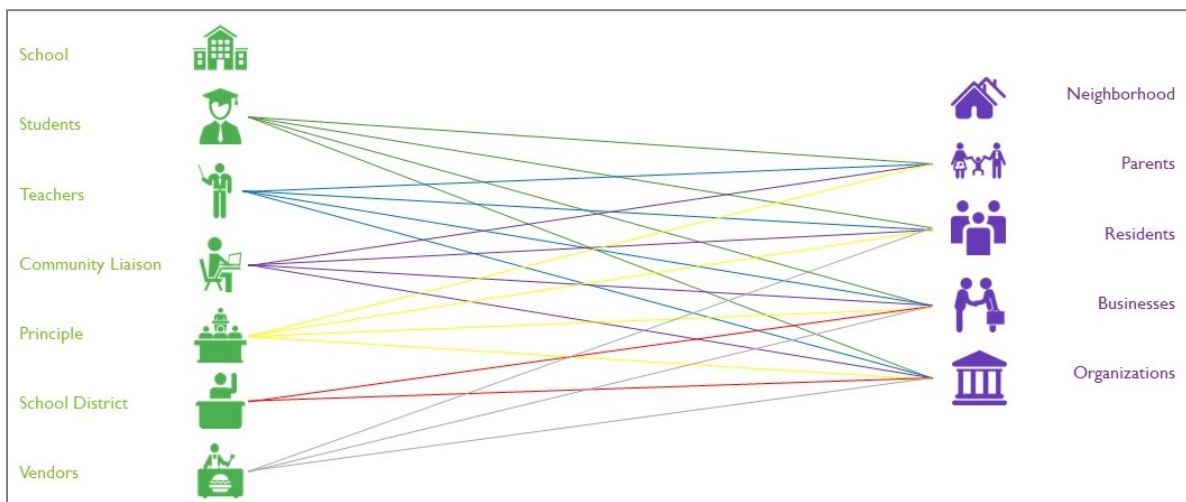


Figure 13: New connections and links between the school and the neighborhood.

A web of links begin to form between the school and the neighborhood at almost all levels. The school is no longer an island in the community but a center that connects different aspects of it in the form of formal partnerships (with the local organizations) and informal ones (with parents and residents).

With the initial community resource mapping, database building, and stakeholder analysis complete – the third step involved laying out an implementation and phasing plan. It was clear that such a program involved different exercises at different levels, which made for building up the model program a game of building skills and knowledge. Furthermore, I was sure that I wanted the partnerships between the school and the neighborhood resources over a long-term period,

stretching over several years. This was important for several reasons: building trust between the neighborhood and the businesses, in-depth studies, and finally a chance to learn about a certain organization's nuts and bolts rather than skimming the surface of several entities. In addition, I was certain that through the study of the resources in the community, the students would begin to question the flow chart of resources (and waste) for their own school. Lastly, the information collected through the partnerships and any projects or proposals would have to be available online through the school's website in order to share the knowledge and initiatives taken by each class and how the partnerships are furthering the students' academics and reveal the diverse projects or proposals that will come out.

With the above notions forming the framework for implementation, filling in the rest of the structure came naturally. Between the 6th and 8th grades, students will perform several exercises in order to map the resources in their community. Rather than using Google Maps, as I did, the students are the experts in their own neighborhoods and would be able to map it with more expertise than anyone. Mapping the resources would then lead to activities in which the students gather information regarding their businesses, initiate contact with them, and build a database with all collected information.

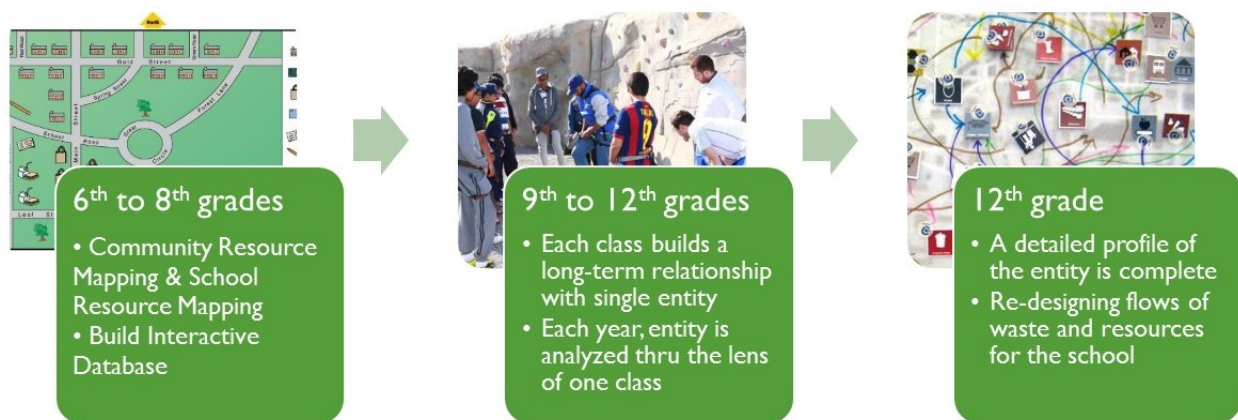


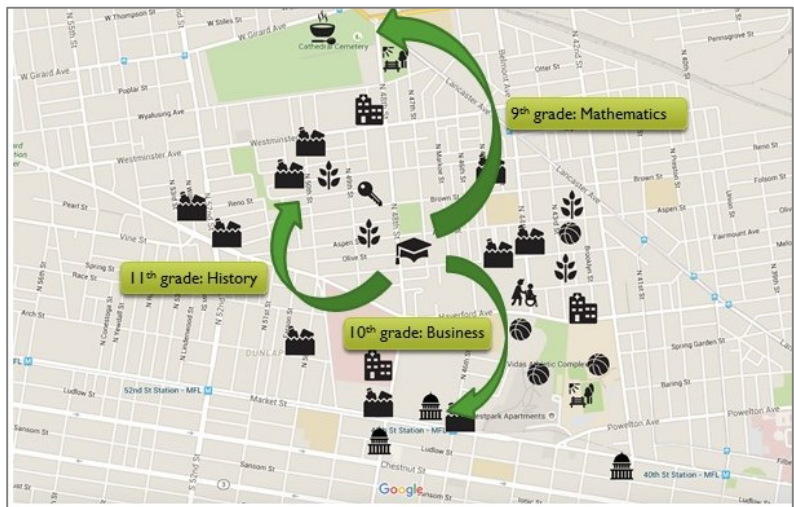
Figure 14: Diagram showing the stages of implementation as they build-up.

At the beginning of the 9th grade, students – along with their teachers – will choose a business or organization to partner with for the next three years. The students would already be familiar with the entities in the neighborhood and the teachers, with the community liaison, would have formed contacts with entities most suitable for partnerships. Once the partnerships have been formalized, each year the students will analyze the entity thru the lens of a different class. The example below shows a hypothetical structure for a class in Sulzberger that has partnered up with an actual business in the area.

Each year, the students, teachers and community liaison will negotiate a partnership plan and model with a certain business in the area and study one different aspect of the business each year. The advantage of this model is that based on the students' interests and the needs of the resources, each partnership model will look different and produce different results. By the 12th grade, the students of the class would have a rich, deep company (resource) profile that contains within it a wealth of information, interviews, video, projects and proposals (implemented or imagined). That resource profile would be developed slowly over the year and be available online. As part of their end of high school project, students will also create a resource flow map for the business they have been working with and their own school. The idea is that these flows could somehow be diverted or combined in order to create a more closed (and perhaps interrelated) loop.

Partnership with <i>Loretta's Flower Shop</i>	
9 th grade	Biology class project: local fauna, soil, ecological cycles, study of species in shop.
10 th grade	Art class project: study of artists whom use flowers as subject, mural project for the shop.
11 th grade	Business class project: design of a long-term business plan, marketing proposal.
12 th grade	ICT project: create a smartphone app for flower deliveries to expand reach of business.

The map on the right shows Sulzberger school in the middle and begins to imagine the endless arrays of links and partnerships possible under this model. At one point, you could imagine that the school could be a hub that manages all these partnerships but also gives back to the community. One day perhaps, it would create a closed loop where all resources are produced in the community and also consumed there and wastefulness is vastly reduced – this would certainly be on track with achieving the three legged stool of sustainability: ecology, economy and equity. Every year, the students will analyze the resource flows in and out of the school – moving up the scale from neighborhood (9th grade), city scale (10th grade), regional scale (11th grade) and finally national scale (12th grade). This gradual increase in scale and reach to track the resources will then



create a map of food shed chains which the students can progressively follow and track back to their original sources. In a similar way that students at Martin Luther King Middle School in Berkley, California were able to mobilize and partner with the School District and Department of Agriculture to divert the path of where their food was coming from, students in Sulzberger, after such an exercise, may begin to demand the same. A map, such as the one above, along with the resource flow charts of the entities partnered with may be synchronized and combined and creative internal diversions to form closed loops in the neighborhood might ensue. The third and final section of this paper will present the limitations, future possibilities and further research in order to fully develop this model and being to imagine its reach and effects if implemented on a larger scale to include more schools and neighborhoods.

Part Three: Future Possibilities and Further Research

In the previous section, I wanted to avoid the trap of choosing which entities or businesses would be the most suitable for partnerships, since I truly believe the students and the community should form the initiative and choice in order to truly be invested in it. However, I would like to use this section of the paper to explain which partnerships I believe could form truly beneficial outcomes and along with the other possibilities for future growth and gaps that I would like to research further.

Future Possibilities:

- Based on the literary research and my findings through studying the neighborhood's resources, I find that Sulzberger School would benefit from creating a partnership with local urban farms in order to emulate a food chain network similar to the one developed in Berkeley, California. This project will involve analyzing the contract systems, food shed scales and flows and looking at the cost of waste management.
- A rethinking of what waste is could form another project in which students look at the waste produced and either reuse or recycle it internally. Waste could potentially be transformed to a useful resource for the community in a certain shape or form.
- The students, through their partnerships with local entities can mobilize them and advocate for businesses to become bid ready and perhaps provide what is needed for the school. Although issues of scale and qualifications have to be considered, students may have a helping hand in developing the businesses to qualify.
- Since the students would of accumulated a vast and deep profile with a wealth of information regarding local resources, the students might form an initiative with the Philadelphia Planning Department (GIS section) in order to fill in the attribute details for them. Students will develop key skills while the planning department will gain the valuable information.
- Most of all flows in the future could be re-directed so that the community is self-sustained and waste is minimized or eliminated.
- Based on the program's success – which can be measured through the tracking of flows (similar to an industrial ecology model which analyzes material flows) and looking at how much energy and waste has been reduced, more schools can begin to follow the model. Schools in impoverished neighborhoods are targeted first because they would benefit, and need it, the most.

Every neighborhood has its own unique character, resources and dynamics which makes the application of this model in different communities exciting – as results, interactions and possibilities will diverge greatly. The flexibility and adaptability of this model allows it to then be customized based on local needs and wants in order to maximize the gains formed from the partnerships for the students first, neighborhood second and entities third. The ‘think local, act global’ theme of the program will help students develop the necessary life-long skills that will allow them to be actively engaged and contributing citizens. A new sense of appreciation for what is near - more investment in their own neighborhood, community pride – and of what is further away will be deep-rooted in the education system which will further build students’ appreciation and care for the rest of the globe.

Finally, some limitations and gaps exist which are listed here below for consideration and further research. They are meant to acknowledge that there are still areas which need to be investigated in order to complete the model or develop it further.

Further Research:

- Information regarding where schools get their resources from is not readily available. This becomes troubling when something as important as nutrition, and where food comes from, is hard to find. More research should be dedicated to find the resources and map these food shed chains and networks.
- Incorporating and altering the syllabi for the courses that use the partnership model needs further study. The teachers could work with the community liaison, who will also have educational expertise, to create new syllabi. Its creation and the incorporation of partnerships into them is an area that needs more development.
- The tracking and measuring of flows and resources is one measure of success. Many other measures are perhaps harder to quantify. However, setting clearly defined targets and parameters of success are extremely important and necessary to ensure that the program is achieving its goals. While the comparison of measures between schools is not encouraged (since each comes with its own unique context and some measures are hard to quantify) – this will form a level playing field in which one could measure *some* aspects in a comparable way between schools and neighborhoods.

Before ending this paper, I would like to thank and acknowledge the work and discussions with my peers and instructors. Many of the ideas presented here are a direct result from interactions and discussions during class or through reading the journals.

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Figures

Cover page image: <http://philadelphiaift.org/wp-content/uploads/2015/01/philadelphia-skyline-background-image2-1800vp.jpg>

Figure 1: <http://www.hazwastehelp.org/BHW/industrial-ecology.aspx>

Figure 2: http://www.mdpi.com/sustainability/sustainability-05-05289/article_deploy/html/images/sustainability-05-05289-g009-1024.png

Figures 3 to 9: Images from Google Maps, overlaid by author.

Figures 10 to 14: By author.

Figures 15 and 16: Images from Google Maps, overlaid by author.

<u>Name</u>	<u>Address</u>	<u>Phone Number</u>
Lombard Central Prespeterian	4201 Powelton Ave, Philadelphia, PA	(215) 222-3044
Aldi Philadelphia	4421 Market Street	(855) 955-2534
Vidas Athletic Complex	300 Powelton Ave, Philadelphia, PA	215-895-2864
Lee cultural center	4328 Haverford Ave, Philadelphia, PA	(215) 685-7655
Alain Locke School	4550 Haverford Ave, Philadelphia, PA	(215) 823-8202
Lee Park	Lee Park, Haverford Ave, Philadelphia, PA	19104
CVS pharmacy – photo	4849 Market St, Philadelphia, PA	1 (215) 474-4801
CHOP Karabots Pediatric Care Center	4865 Market St, Philadelphia, PA	1 (267) 425-9800
Travelers Aid Family Services Philadelphia	111 N 49th St, Philadelphia, PA	19104 (215) 240-4800
Jevonah Jireh Baptist Church	19131, 4807 Haverford Ave, Philadelphia, PA	(215) 473-0895
The mill Creek School	111 N 49th St, Philadelphia, PA	19104 (215) 471-4900
Checkers	4322 Market St	(215) 662-0400
Sunday Best	41 N 52nd St, Philadelphia, PA	19104 (215) 476-2660
Family Dollar	29 N 52nd St, Philadelphia, PA	19104 (215) 748-4058
Pete’s Pizza	5158 Haverford Ave, Philadelphia, PA	(215) 747-5555
Refuge Apostolic Church-Our Lord	201 N 52nd St, Philadelphia, PA	19104 (215) 474-4888
One Door Mission True Light	401 N 52nd St, Philadelphia, PA	19104 (215) 477-4412
Number One Chinese food store	4251 Walnut St, Philadelphia, PA	1 (215) 387-3000
James Rhoads Elementary School	4901 Parrish St, Philadelphia, PA	19104 (215) 581-5504
J&R Express	897 N 50th St, Philadelphia, PA	19104 (215) 452-5490
Blue Moon	5105 Westminster Ave, Philadelphia, PA	19104 (215) 877-9923
Cathedral Cemetery	1032 N 48th St, Philadelphia, PA	19104 (215) 477-8918
Our Mother of Sorrows Church	1030 N 48th St, Philadelphia, PA	19104 (215) 878-0875
Our Mother of Sorrows School	1008 N 48th St, Philadelphia, PA	19104 (215) 473-5828
Clara Muhammad Sqaure	1000 N 47th St, Philadelphia, PA	19131
Sister Clara Muhammad School	4700 Wyalusing Ave, Philadelphia, PA	(215) 877-9020
Citgo	4626 Lancaster Ave, Philadelphia, PA	(215) 473-2538
Weinstein Supply	4612 Lancaster Ave, Philadelphia, PA	(215) 473-7000
BP	4708 W Girard Ave, Philadelphia, PA	(215) 473-9369
Christian Stronghold Baptist	4701 Lancaster Ave, Philadelphia, PA	(215) 877-1530
Blankenburg Elementary School	4600 W Girard Ave, Philadelphia, PA	(215) 581-5505
El Toro Lounge	898 Belmont Ave, Philadelphia, PA	(800) 627-3999
Thorton’s Soul Food Restaurant	4401 Lancaster Ave, Philadelphia, PA	(215) 452-5146
Dwight’s Southern Bar-B-Que	4345 Lancaster Ave, Philadelphia, PA	(215) 879-2497
44th st used tires & rims	4344 Lancaster Ave, Philadelphia, PA	(215) 222-0550
wolf cycles	4311 Lancaster Ave, Philadelphia, PA	(215) 222-2171
James Shuler Boxing Gym	750 Brooklyn St, Philadelphia, PA	1 (215) 416-1282
Martha Washington School	Philadelphia, PA 19104	(215) 823-8203
St. Ignatius Nursing Home	4401 Haverford Ave, Philadelphia, PA	(215) 349-8800
West Philadelphia Seventh Day	4527 Haverford Ave, Philadelphia, PA	(215) 222-5707
Dollar General	801 N 48th St, Philadelphia, PA	19104 (215) 452-0460
West Village	800 N 48th St, Philadelphia, PA	19104 (215) 310-6888
Mill Creek Farm	4901 Brown Street, Philadelphia, PA	(215) 805-2215
Reno Produce	43rd Street, Philadelphia, PA	19139
Aspen Farm	4837-59 Aspen Street, Philadelphia, PA	19139
Spiritual Harvest Garden	5400 Lindbergh Blvd. Philadelphia, PA	(215) 729-5281
43rd Street Community Garden	43rd Street, Philadelphia, PA	19139
Sulzberger Junior High School	4725 Fairmount Ave, Philadelphia, PA	(215) 581-5510
52nd & Haveford Farmers Market	52nd & Haveford St. Philadelphia, PA	

Creative World Christian Academy	Philadelphia, PA 19131
Drexel Field	300 Powelton Ave, Philadelphia, PA 19104 (215) 215-895-2864
Stacy's Pizza	4201 Market St, Philadelphia, PA 19104 (215) 662-0998
Fresenius Medical Care Philadelphia	4216 Market St, Philadelphia, PA 19104 (866) 434-2597
Philadelphia Fire House	Philadelphia Fire House Pipeline (215) 686-1300
Upbeat Deli	4256 Market St, Philadelphia, PA 19104 (215) 387-6261
Social Security Administration District	4240 Market St, Philadelphia, PA 19104
Dunkin Donuts	4302 Market St, Philadelphia, PA 19104 (215) 876-7334
Notary Public	4302 Market St, Philadelphia, PA 19104 (215) 876-7334
Best Value Auto Center	4312 Market St, Philadelphia, PA 19104 (215) 207-1222
Camsa Auto Sales	4318 Market St, Philadelphia, PA 19104 (215) 382-4138
Subway	4301 Market St, Philadelphia, PA 19104 (215) 222-7800
Stan's Tires	4420 Market St, Philadelphia, PA 19104 (215) 222-6993
Hertz Rent a Car	4422 Market St, Philadelphia, PA 19104 (215) 222-7251
Keenan Auto Body	4436 Market St, Philadelphia, PA 19104 (215) 386-6450
D Thos Accessories	4548 Market St, Philadelphia, PA 19104 (215) 895-4068
Forman Mills	4806 Market St, Philadelphia, PA 19104 (215) 474-0877
Caprice Villa	5000 Market St, Philadelphia, PA 19104 (215) 748-4499
Care to Learn	5044-46 Market St, Philadelphia, PA 19104 (215) 476-6752
Station Food Market	5142 Market St, Philadelphia, PA 19104 (215) 748-1299
Carribbean Sould Food	5126 Market St, Philadelphia, PA 19104 (215) 921-9779
The Seafood Factory & Bar	5209 Market St, Philadelphia, PA 19104 (267) 292-4477
City Blue	15 N 52nd St, Philadelphia, PA 19104 (215) 748-3010
52nd Beauty Supply	14 N 52nd St, Philadelphia, PA 19104 (215) 748-1025
Grace House Convenience Store	134 N 52nd St, Philadelphia, PA 19104 (215) 240-7779
Race Supermarket	156 N 52nd St, Philadelphia, PA 19104 (215) 474-1818
Opio Accessories & Beyond	204 N 52nd St, Philadelphia, PA 19104 (215) 472-5857
Wallie's Groceries Food Market	3119 Spring Garden St, Philadelphia, PA 19104
Nancy's Nails Salon	5148 Haverford Ave, Philadelphia, PA 19104 (215) 748-9999
China Garden	5143 Haverford Ave, Philadelphia, PA 19104 (215) 747-8882
51 Brown Mini Market	5100 Brown St, Philadelphia, PA 19104 (215) 476-1077
Loretta's Flower Shop	437 N 52nd St, Philadelphia, PA 19104 (215) 477-6654
Directions Beauty Salon	5159 Wyalusing Ave, Philadelphia, PA 19104 (215) 879-7723
Robinson Chapel Church	675 N 52nd St, Philadelphia, PA 19104 (215) 477-5251
Alaska King Crab House	4834 Lancaster Ave, Philadelphia, PA 19104 (215) 877-3421
Brightside Academy	4829 Lancaster Ave, Philadelphia, PA 19104 (215) 879-0162
Quba Institute	4637 Lancaster Ave, Philadelphia, PA 19104 (215) 473-8589
Skyblue	910 N Markoe St, Philadelphia, PA 19104 (215) 238-0922
Penn Steaks	4530 Lancaster Ave, Philadelphia, PA 19104 (215) 877-1760
Mikail's Halal Steak-out	4617 Lancaster Ave, Philadelphia, PA 19104 (215) 473-1221
Amos Healing Missionary Baptist Church	4553 Lancaster Ave, Philadelphia, PA 19104 (267) 266-9176
Penske Truck Rental	4511 Lancaster Ave, Philadelphia, PA 19104 (215) 879-0967
U-Haul	4501-4511 Lancaster Ave, Philadelphia, PA 19104 (215) 764-6429
D 8 Brothers Food Market & Deli	4500 Lancaster Ave, Philadelphia, PA 19104 (215) 397-4783
Destiny Worship Center	4500 Westminster Ave, Philadelphia, PA 19104 (215) 879-5400
We Care Printing Shop	888 Lex St, Philadelphia, PA 19104 (215) 477-3996
AAA Body Repair Shop	873 N 45th St, Philadelphia, PA 19104 (215) 477-1500
MJR Enterprise	4518 Ogden St, Philadelphia, PA 19104 (610) 316-5049
Parrish Supermarket	4529 Parrish St, Philadelphia, PA 19104 (215) 222-1299
Eagle Jewelry & Loan	4216 Lancaster Ave, Philadelphia, PA 19104 (215) 386-3570

Fatiregun Christiana
All for You Limousine
The Enterprise Center

4400 Haverford Ave, Philadelphia, (215) 685-7626
5155 Ogden St, Philadelphia, PA 19104 (267) 269-2866
4548 Market St, Philadelphia, PA 19104 (215) 895-4000

Description

House of worship. Soup Kitchen.

Standby for Discount Groceries

The Vidas Athletic Complex is the home of outdoor varsity athletics at Drexel University. The comple:

Sitting on 9.4 acres, this recreation facility has a pool, a sports field, two ballfields, and five basketbal

Public elementary school

Public Park

Grocery store

Children's hospital with community center

Homeless shelter

Church

Private therapeutic day school

Fast food chain eatery

Jamaican Restaurant

Dollar Store

Greek Restaurant

Church

Church

Chinese Restaurant

Elementary School

Grocery store

Hotel

Cemetery

Church

School

Park

Private School

Gas station

Plumbing supplies

Gas station

Baptist Church

Elementary School

Mexican Restaurant

Restaurant

Restaurant

Used Tire Shop

Skateboard Shop

Gym

School

Nursing Home (non-profit organization)

Church

Dollar Store

Real Estate Office

Educational Urban Farm

Community Garden

Community Garden

Community Garden

Community Garden

High School

Food (non-profit organization)

School
Sports facilities
Pizza Delivery
Dialysis Center
Fire Station
Deli
Federal Government Office
Donut Shop
Notary Public
Used Tire Shop
Used Car Dealer
Restaurant
Tire Shop
Car Rental Agency
Auto Body Shop
Hat Shop
Warehouse-style chain selling clothing & shoes for men, women & kids at discounted prices
Lounge
Preschool
Restaurant
Restaurant
Restaurant
Sporting Goods
Cosmetics Store
Convenience Store
Grocery Store
Store
Store
Nail Salon
Chinese Restaurant
Grocery Store
Florist
Beauty Salon
Church
Seafood Restaurant
Day Care Center
Private School
Women's Clothing Store
Steak House
Mediterranean Restaurant
Church
Truck Rental Agency
Truck Rental Agency
Grocery Store
Church
Screen Printer
Auto Repair Shop
Home Improvement Store
Grocery Store
Pawn Shop

Restaurants	Retail	Groceries	Educational	Religious	Cars
Pete's Pizza	Family Dollar	Philadelphia	School	Central	tires & rims
Sunday Best	wolf cycles	- photo	School	Baptist Church	Auto Center
Checkers	Dollar General	Chinese food	Elementary	Apostolic	Sales
Food	Accessories	J&R Express	Sorrows	Mission True	Stan's Tires
El Toro Lounge	Supply	Reno Produce	Muhammad	Sorrows	Car
Southern Bar-B	City Blue	Haveford	Elementary	Stronghold	Body
Stacy's Pizza	Accessories &	Convenience	Washington	Philadelphia	Limousine
Upbeat Deli	Salon	Supermarket	Junior High	Worship	Repair Shop
Dunkin Donuts	Flower Shop	Groceries Food	Care to Learn	Missionary	Rental
Subway	Beauty Salon	Market	Academy	Chapel Church	U-Haul
Caprice Villa	Skyblue	Food Market &	Quba Institute		
Market	MJR Enterprise	Supermarket			
Sould Food	& Loan				
Factory & Bar	Printing Shop				
China Garden	Forman Mills				
Crab House					
Penn Steaks					
Steak-out					

