Cultivating Curriculum

How Investing in School Grounds, the Streetscape and Vacant Land as Urban Ecosystems can Address Food Security, the Community and Institutions of Public Education.

Karen Elizabeth McAllister, 2019
Virginia Polytechnic Institute and State University

Master of Science in Architecture, Urban Design Concentration

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ABSTRACT

The 2014 Agricultural Act (Economic Research Division) (aka: The Farm Bill) was an important limelight shone on the issue of access to healthy foods, food education and the correlation between an increasingly unhealthy population and proximity to fresh, healthy food. Further legislation such as the Urban Agricultural Production Act of 2017 has been introduced to leverage the Farm Bill's financial incentives to promote urban agricultural programs and transform vacant land into agricultural use. Specifically, this has become increasingly common in many lower income and disadvantaged communities affected by a lack of access to fresh food stores. Additionally, in response many public schools have pro-actively sought funds to transform their schoolyards into gardens and teaching classrooms (Gamson) in order to provide food literacy and education however, this practice remains the exception. Many children still face a lack of healthy food options or the availability of any fresh food outside of their school environment. What if the standard education facility could be used as a tool to confront not only the architecture of the learning space, but a school-as-ecosystem, representing a neighborhood catalyst to teach through action – addressing comprehensive global issues brought on by food desert environments and a child's perspective about their own health?

This thesis explores the possibility of casting the urban ecological net wide- envisioning a timescale for transforming public spaces and school grounds using green infrastructure practices, biological remediation, planning for changes in transportation technology and the expectations of a public education and child's perception about their environment.

Emphasizing a broad focus on all of the potential sites for food production in the city (including the school, schoolyard and what they represent to the community), surfaces a multi-functioning methodology encompassing community identity, amenity, ecology, infrastructure and beauty envisions what could become of urban areas in the future. The primary goal is to educate future generations in the value of the food network and to give them the kind of direct hands-on experience that educators emphasize while concurrently nourishing urban communities through development of a project carried out in common, one that has health benefits for the population, that engenders a sense of long-term pride, and that empowers people to make change in their environment, even in modest or temporary ways.

The idea that school design can encourage and facilitate, hinder and inhibit behaviors at school, and the architectural symbolism of schools can have a profoundly wider impact on children and their behaviors in and outside of school (Tucker). There is a significant psychological difference in learning about the environment, for the environment and in the environment (Malone).

Creating public space focused on individual learning and the physical and mental health of the individual aims to balance the scales of social economic injustices. It is going to take every effort from the hyper-localized to city-wide and even regional scales to make significant urban changes to create a taxonomy of spaces to support the growth of our cities while simultaneously educating young minds on the value of understanding our ecological relationship to the city and surrounding environment.

Citations

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GENERAL AUDIENCE ABSTRACT

The 2014 Agricultural Act (Economic Research Division) (aka: The Farm Bill) was an important limelight shone on the issue of access to healthy foods, food education and the correlation between an increasingly unhealthy population and proximity to fresh, healthy food. Further legislation such as the Urban Agricultural Production Act of 2017 has been introduced to leverage the Farm Bill's financial incentives to promote urban agricultural programs and transform vacant land into agricultural use. Specifically, this has become increasingly common in many lower income and disadvantaged communities affected by a lack of access to fresh food stores. Additionally, in response many public schools have pro-actively sought funds to transform their schoolyards into gardens and teaching classrooms (Gamson) in order to provide food literacy and education however, this practice remains the exception. Many children still face a lack of healthy food options or the availability of any fresh food outside of their school environment. What if the standard education facility could be used as a tool to confront not only the architecture of the learning space, but a school-as-ecosystem, representing a neighborhood catalyst to teach through action – addressing comprehensive global issues brought on by food desert environments and a child's perspective about their own health?

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To Quinn, Olivia and Charlotte,
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"Just Love"

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To the United States Navy Civil Engineer Corps.,
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To the faculty and staff at the WAAC,
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Thesis Defense
July 31, 2019

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INSPIRATION

I first began my research and thesis study with the opportunity to observe a city's challenge in lack of space in public schools due to rapid population growth and the potential consequence of isolating the city's rich diversity if additional schools were built in their demographically divided neighborhoods. I was then introduced to the study of sustainable urban infrastructure, increasingly intrigued by studying food flows, geography and the question of how we as a nation have such an abundance of available food and nutritional education yet still have staggering percentages of families with children who do not have access to sustainable food sources. With the known challenge of durability for public schools to support a growing population and what they represent to a community, led to my desire to explore the linkage between sustainable food, necessary urban infrastructural changes and on-going educational reform and educational environment of our children. Given that today's students will be tomorrow's citizens, leaders, workers, and parents(1) what could be done to positively influence the educational and community environment?

To leverage the below examples at multiple scale, this thesis explores the possibility of casting the urban ecological net wide- envisioning a timescale for transforming public spaces and school grounds using green infrastructure practices, biological remediation, planning for changes in transportation technology and the expectations of a public education and child's perspective about their own health and the environment in which they live.

I applied my research and studies from the coursework of Theory of Urban Form, Sustainable Infrastructure and Comparative Urbanism to prepare my final reflection essay for Urban Ecology as a culmination of my multidisciplinary studies for the urban design exploration of city food systems, investment in vacant land and how through standard education environments this could become a standardized expectation of a public education in the United States.

Food Systems as City Infrastructure: How and where will all the food grow?

[This opinion essay is intended for the audience of the website "The Nature of Cities", which is a platform to share multidisciplinary ideas creating a dialog of urban solutions towards cities that are harmonious ecosystems of people, nature and infrastructure. The dialog is for people interested in proposing policy changes and design influences to not only make our cities more sustainable for a growing population but also as sustainable ecosystems capable of supporting food systems, biodiversity and education for the next generation. This essay is intended to help reader's understanding that food systems are critical infrastructure for urban areas and that cities need to design and develop their food systems with the same level of attention and intention as transportation, energy and building systems. The essay will discuss multiple scales (local site, city-wide and global) and the networks which they encompass to address the criticality of how and where food will grow in the future.]

Underlying both matters of the world's expected population growth and the future of urban spaces is how and where will all the food grow necessary to sustain and perhaps positively impact the food system entirely? This leads into a complex discussion of the question: what kind of infrastructure would a city have to develop if it cultivated its own food? (1) The critical reality is then that food production and distribution are as essential to a city's planning as the need for necessary transportation, building and energy systems.

Meat and dairy are primary drivers of both global warming and ecological footprint consequences – with a direct relationship between their consumption and city wealth (2). Yet, the discussion of how urbanization has affected food systems is a somewhat hidden linkage between their

physical expansion and mass changes in population diets. The most likely major influence on the future of urban food systems is urban expansion on fertile agricultural area (3), which is prematurely being sought as a competing means in biofuel technologies in the modern world along with the relentless over-infrastructure of city expansions globally. The under recognized linkage of these events on the human spirit has untouched potential for discovering creative and innovative solutions to a harmonious ecology of people, cities and nature. Through research, it has been determined that the same socio-metabolic processes that human bodies produce necessitates different types of nature with a wide assortment of cultural meanings (4). The culture of which has created an immensely diverse and creative humankind, with a spirit of progress and determination to face the future's challenges. One of those challenges is the connection of future city growth to sustain and feed their future population which is now more apparent than it ever has been.

Global food systems are as much politically and commercially dominated as they are psychologically and socially networked links that bring all nationalities and backgrounds together. Major trade agreements that effect millions of people have the power to effect billions due to the rippling economy of public-private ventures and majority control over agriculturally prosperous land. For example, in Indonesia and Africa where malnutrition has plagued the populations for centuries – their agriculturally fertile land is being sold to support biofuel needs of Western Countries (5). As much as this is an injustice to food security and health of millions – it also shines light on the dysfunction of the primarily mono-culturally grown food that currently feeds the world and starts a conversation about urban food spaces and the potential for finding innovation in cultivating in the urban environment. Approaching this challenge and injustice from a planning perspective, possibly lies an opportunity to introduce small grassroots efforts of food cultivation to a larger scale. As cities have expanded, their inevitable "third landscapes" which encapsulate the unattended (roadsides, underpasses and railroad embankments), have become neglected reservoirs with robust potential for biodiversity and unexpectedly fertile land (6). Linking this possibility to the expected needs for population growth– it may introduce a supplementary source of agriculture as well as fundamental psychological progress of the human spirit by producing one's own food. Bringing food production closer begins the dialog of this psychological effect by a simple act of digging garden soil in preparation for spring planting, which triggers an emotionally strong sense of connection to the earth and to the regeneration of life. It is an act of nurturance and an expression of faith in renewal (7). Furthermore, urban areas effected greatly by soil contamination, there is a tremendous potential in considering urban agriculture through phytoremediation1 as the lead to future re-urbanization structural development; thus, the urban landscape would precede urban architecture (8), forming the framework for future urban growth and renewal. The ecology of the ground space and biodiversity of vertical grow and green spaces could be the cornerstone of sustainable urban environments. The benefits for the local biosphere of increased and dense vegetation could also greatly reduce detrimental ecological effects. This is by no means a replacement for large-scale farming cultivation and regionally distributed consumables, but a supplement and means to close the gap in sustainable food access while impacting the hyper-local environmental context of the urban community. Planning city growth through this projective landscape lens can establish the expectations of future growth periods as well the conditions of the city's infrastructure. The ecology of the ground space and biodiversity of vertical grow and green spaces could be the cornerstone of sustainable urban environments. This outdoor living space could be poised as public learning space, providing a hands-on comprehensive approach to environmental learning for all (9). At the earliest age possible, this could develop child's "knowing eye" (visual literacy) to start to 'read' the environment, introducing a deep perception capability and practice of critical analysis and thinking skills – thus, the visual literacy of the built environment and ground environment is used as pedagogical tool.(10)

As a case study example (see page 27), The University of Arkansas Community Design Center led a project team in 2015 to propose a Food City Scenario in Fayetteville, Arkansas. They presented a drastic change to the city's food production, distribution and food security for the entire region

to confront the reality that despite being the leading U.S. producer of rice and ranking high for poultry, eggs, sweet potatoes and pork, the state has one of the highest rates of childhood hunger nationally and food insecurities (11). This leads into a complex and multidisciplinary discussion of the question stated in the opening: what kind of infrastructure would a city have to develop if it cultivated its own food (1)? Their proposal led to the development of a taxonomy of urban spaces which consolidated the city's footprint to support sustainable food production and commerce within the context of existing built infrastructure. The program model included extensive research on potential ecological strategies that are specifically designed into the urban fabric to encourage both sustainable edible yields and maturation over time of increased population of plant and animal species. The model is a transition from their traditional mono-culture growing environment to a holistic and inclusive agroecology. For example, instead of using synthetic fertilizers, the local compost would offset the need to use synthetic pesticides. (1) This example deeply rooted in the ecology of the urban space calculatingly consolidates the built footprint. A footprint quite possibly adaptable to many global cities facing similar issues. Although only in a proposal state, Food City Scenario not only addressed the capability and potentially long-term sustainable urban agricultural environment but confronted the global issue of localized food sources and reduction in food shed for urban populations. A discussion of which, could potentially have a drastic influence on cities with continued exponential population growth. Sustainability for provisioning services is a recognized global issue and the implementation of constructed urban environments to support holistic ecosystems is inevitably forthcoming. When referring to "the how" this may be accomplished, an investigation of small-scale grassroots efforts may lead to transforming city growth through the previously discussed projective planning.

I've recently read the story of Emmanuel Pratt's Sweet Water Foundation in Chicago, which not only transformed vacant land into teaching and producing garden spaces in a disadvantaged community, its representation is also far-reaching to multiple leading higher-education outlets to support educational and experimental theories of urban ecology to pre-existing neglected urban environments. Although this is a small footprint and fraction of influence in a time of anthropocene2 (12), there seems a much greater ripple effect within a community's sociological, ecological and psychological connectivity from a seemingly small physical change to the land and the effort of a community leader as its catalyst. Converting once derelict land to an urban farm or community garden is not a new idea, but the study of its far-reaching grasp of influence on the local economy has considerably impacted the study of urban ecology and the future of our sustainability and the sustainability of our future. The local food or "slow food" movement surfaces a traditionally historic method of community allotment cultivation and has the power to affirm as a constant food flow, complementing modern practices of regionally distributed, mono-culturally produced food.

In a discussion towards creating the Sitopian world (13), or "food place" at the center of life, is a singular dimension Utopian concept only because it does not address permanent shelter to billions of disadvantage people and have the self-sustainable agricultural integration for a healthy population. However, what it does present is the network of local food and food as a part of all landscapes, addressing a community's "foodprint" (2) and a communal ideology that may be scalable to very dense urban populations. This concept, although not discussed by Steele, can also be rooted into the standardized education of all young students, alluding to a vast global concept already practiced by some communities celebrating their relationship with the landscape. Interestingly, in 2000 the UN presented eight Millennium Goals for improving the lives of the world's poorest people as a historic declaration with the participation of over 180 countries, surfaced a three-step process (12), which could be rooted in a new order of urban agriculturalism adopted by the majority of existing disadvantaged populations. Putting food at the center of life could have a profound and lasting psychological and physiological effect on future generations.

In the grassroots example of Pratt's Sweet Water Farm, the legacy that the urban farm is building not only addresses food deserts by bringing fresh, locally grown sustainable food to disadvantaged communities, it empowers the community to get involved, providing the funding and entrepreneurial skills to connect this small farms to others in the city. The project transformed a community's "third landscape" into thriving food production center and social networking platform on a hyper-localized scale. By reviving the environmental quality locally through the "greening" of the city it

provides a place of social interaction and encourages others to share art, teaching and experimental ideas, an important goal echoing Frederick Law Olmsted's visions of creating places of reunion where people come together. Through urban ecology we've learned that there is a fundamental link between the urban landscape and food cultivation, with the expectation of the earth's population growth, finding these alternative food spaces within cities is just as important and necessary to make common place as it is to ensure the technology will be in place to keep our cities moving. Defining the taxonomy of these alternative spaces and places will have a profound influence on how populations can adapt in urban environments either by necessity or transformation of our relationship with the city and the environment. With the aid of what we are learning through urban ecology, the metabolism of cities (13) will soon include those alternative food spaces – joining the measuring of stock of flows like housing, buildings, infrastructure and transportation and open public spaces.

Urban ecology as a platform provides extraordinary opportunity to study evolutionary and adaptive process affecting urban biota (16). Advantageously, due to the drastic variations of urban environments influenced by population growth, the study encourages a viewing of the human interaction with the environment, and vice versa, in a positive way. The focus on application of research strategies to reduce negative effects on humans and nature in urban environments can be the catalyst the world's cities need to bring the ideas of opportunity and improvement to our urban areas from a vision to reality.

As I am intrigued by Pratt's Sweet Water Farm, on a global scale I am influenced by the experimentation on a city-scale to drastically change how humans interact, influence and take part in the city's ecological health. The Nantucket Project captured snapshots of how some of the world's leading cities are approaching the expected boom in population. The comparison of Shenzhen, China, where 90% of the world's drones are designed and produced, the expectation of its population is so great, they are converting entire highway infrastructural systems to a spine of open public spaces and public housing then constructing an underground autonomous-vehicle-only highway system (17). The conversion of transportation infrastructure to public spaces has also been introduced in other cities like Shanghai and Singapore where the development and investment of public transportation is so crucial to the success of those cities as they continue to experience rapid population growth. However, The Project recognizes two primary concepts: 1) people move to cities and are attracted to cities because of the economic promise and social networking of meeting many people and 2) growth of the city to support increased population is not exponential (17). We've learned that making room matters (18) and how we as a population propose to create that space can set up the unknown future for success. The linkage between the proposing connected landscape arteries and expanding urban built environment could be a unified agroecology for sustainable food systems, which is an inevitable and necessary endeavor for the growing global population.

All these examples from the local to global scale, share the necessity of understanding their urban food demand or "foodprint", which result from the production, processing, distribution and waste generation of their location (2). When the agricultural footprint is compromised or converted, like in the example for Indonesian fertile land, the reliance on locally yielded food sources immediately becomes unstable. Behavioral changes, awareness campaigns and United Nation declarations are a step forward to addressing the future of our food systems and security of sustainable food sources for a growing population. All examples begin with the participation and buy-all from the populations themselves.

No matter what the future of cities will be what is certain is that it is going to take every effort from the hyper-localized efforts of Pratt's Sweet Water Farm to the city-wide scale like in Fayetteville to make significant global policy changes combating fertile land loss and utilizing the "third landscape" to initiate and create a taxonomy of spaces to support the growth of our cities as well as to educate on the value of understanding our ecological relationship to the city and surrounding environment. The irony of our existing food system is that it is devoid of actual relationship between humans and nature (13). It is challenging to consider how urban agricultural practices could be incorporated into the growing temporary cities, however is there an opportunity to provide basic needs through urban agricultural practices? Modern technologies, urban ecology, multidisciplinary proposals and the growing practice of urban agriculture provides a great foundation for understanding how the systems can used

and if they can successfully operate in urban environments.

Notes:
1. Phytoremediation: a low-cost solar energy driven cleanup technique over time of contaminated soils through the direct planting of vegetation, greenery, trees and flowering plants.
2. Anthropocene: the time of human activity as the dominating global influence on climate and the environment.

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The simple act of digging garden soil in preparation for spring planting triggers strong emotions; a sense of connection to the earth, to the regeneration of life. It is an act of nurturance and an expression of faith in renewal.

~ Anne Whiston-Spirn ~

The Granite Garden

To aid in my imagination for this thesis, I chose to write a short story depicting the evolving rendered skyline which is the visual inspiration for the research and produced work of this thesis.

A Short Story:

"THE ORCHARD"

The crisp autumn sun shone brightly through the apartment window as Anna was pulling her bread out of the toaster. She looked curiously at her mother who seemed to be daydreaming about something as she sipped on her coffee. Anna asked, "Mom, what are you thinking about?"
Her mom looked back at her refocusing her attention and pressed 'send' on her digital signature permission slip. "Oh, I was just thinking about the first field trip I went on when I was your age."

Anna's mom, Marissa, had grown up in this same neighborhood but thirty-five years is a fair span of time for the neighborhood to transform. "Can you tell me about it?" Anna said, taking a bite of her breakfast.

Marissa began… "Well, as you know grandma and grandpa lived four blocks north of here and I went to the same schools as you. My first field trip was in second grade and I distinctly remember it because it was this same time of year. Upstate had been know for decades as producing the best apples and our class was going to learn all about apple farming. I had never seen an apple tree before."

"Really?" Anna asked quite surprised. "Mom that's kinda funny… my class is going to visit the orchard down the street from school today. I don't really know why we need a permission slip anyways… we walk past the place every day to school!"

"I know that Anna – but it was just different back then. Our food grown wasn't so close as it is now. Let me actually tell you a story about those trees you see each day."

"It was my first day of kindergarten and I was so excited to be starting in a new school. My teacher had mentioned that we were going to be helping out the community in a big way that but I did not really understand what he had meant at the time. Turns out, the very next week, we were practicing our numbers by counting the apple seeds that the school had received from a few upstate orchards. Each student got small plastic bags and we separated the healthy seeds to prepare to grow them. We learned all about how apples trees start from just single seeds and can take many, many years to grown large enough to produce the apples that we would later go visit at the upstate orchard. Our school library had a lot of books donated to teach us about farming – urban agriculture I think it was – but I did not really know what that meant at first."

"Anyways – our class, turns out our whole school – cared for seeds through the germination process, and once it was time for me to go to first, second and then third grade, as a community we continued to grow those seedlings and eventually planted them in temporary containers."

“That’s really cool, mom! Why did you plant them in temporary containers? Why not just plant them in the ground as they are now?” Anna asked, finishing her breakfast looking very interested in her mom’s story.

“That’s a really good question. Well, back then – we couldn’t plant directly in the ground that was going to be consumed. This part of the city was used to support the manufacturing, transportation and industry of that large food distribution nearby. See – once some of the business left or consolidated, unfortunately most of the land they used to occupy was contaminated – simply because they used to fix motors and engines, and over time the fuels and lubricants soaked into the ground, contaminating the soil. Most trucks used to deliver goods and consumables ran on diesel fuel, not batteries or solar power like they do now – and the business that repaired those trucks were mostly located through our neighborhood. When that happened, anything planted in the ground would be toxic to consume.

The city decided to label the land as vacant until they could treat the ground and some other use could be allowed for that section of the city.”

“Is that what they mean by city zoning?” Anna asked.

“Exactly,” her mother answered. “So as the years went by and I continued through school, those trees grew bigger and bigger. Once they were about as tall as you, our middle school helped plan to move all of the trees into some of the vacant lots in these beautiful planters surrounded by wildflowers. They called it our ‘urban meadow’ project and made a big deal about in the news. Even the mayor came out to see the thriving land. We visited the meadows often and sometimes our whole class lesson would be in the meadow. I even remember taking one of my science tests there.”

“When I went away to college, your grandparents would send me updates on the orchard. Another big event the city planned was when they finally planted the trees where you are going to visit today. I was just so happy to hear about how this great city was changing and growing into what we have today. It feels really special to me to be able to share this story with you and that I even grew one of those trees that you are going to visit today.”

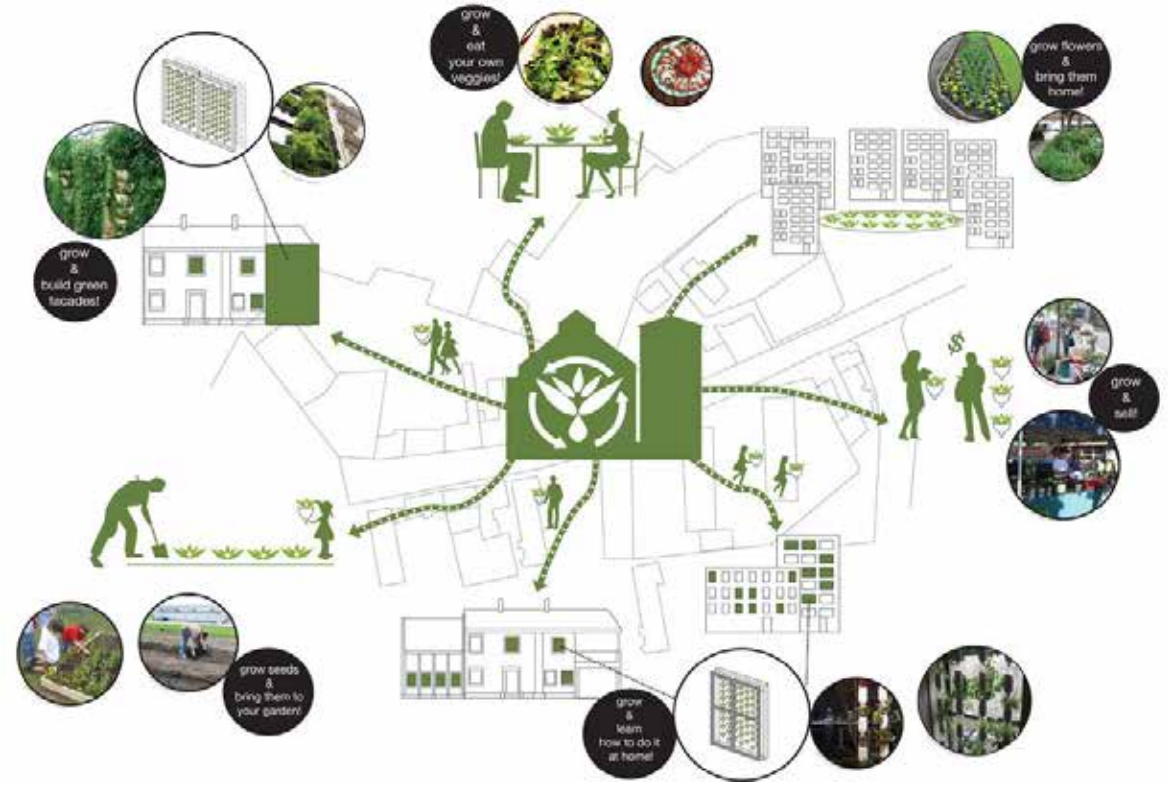
And with that, Anna finished her breakfast and left for school, thinking about all of the things her mother has just said and what she could do to continue to grow her community…

INTRODUCTION

"...Bringing food production closer, in addition to being *sustainable*, is *pedagogical*."

(Edward Souza)

Gardening and growing food in the urban environment - although presents some challenges to traditional agricultural production - highlights the beauty in cultivation in that "the garden" can take place in many unexpected places... An entrance courtyard to the school, the balconies on public housing, the top of the public library, a vertical green wall public art installation or a constructed storm-water daylighting pond for public park and recreation. We are only limited by the imagination of public policy, land use creativity and the limitations of public buy-in. With the challenges that disadvantaged areas of our country face not only with dependable food access but also sustainability and maintainability of the public structures - there is an opportunity of investment for the environment and education as the platform for return.



Source: ARCH Daily, Edward Souza; 18 May 2019.

COMMUNITY AS NEXUS

Just as any living being, a city is a constantly evolving stock of input and output – and is marked by its ability to adapt, thrive, overcome, withstand and rejuvenate. When certain complexities for a city are the reasoning for either an overabundance of vacant land or perhaps a shift in population concentration, it can be challenging for a neighborhood to renew and revitalized. Herein lies the opportunity to delve into research for the prospect of combining the inevitability with innovation and shared prosperity (both for human and nature) – to introduce the community with an opportunity to become something more sustainable. Its urban metabolism, which is a measurable data set of forms and flows – also recognizes that human activity alters the biophysical processes by analyzing the dynamic internal relationships between humans and nature (1). This "measurability" allows for assessment of the condition of places and spaces and a glimpse of the reality the community may be faced with in the near future. Specifically, if the community has a rapid and steady population growth – a near challenge will be physical health of its occupants and a sustainable vision for food for the population. This challenge can be embedded into the educational right of all children in the community – introducing a social agenda of widespread food and healthy literacy in urban environments. With the prediction of over 70% of the world's population living in cities over the next 30 years (2) the power of influence that urban community relations and education will have could be the denominator of a more sustainable future of nature in the city and its link to sustainable food systems. An attempt to highlight people's relationship to food – can be seen as an agricultural embedding into urban environments. This concept globally used at the earliest of settlements – now is almost completely devoid in cities. There are many contributors to why this relationship with food ended, but the irony of existing food systems and its contributing void of our relationship with nature is a motivating factor to this research. In Carolyn Steel's "How Food Shapes of Cities," (3) she describes the ability of looking at a pile of raw vegetables, recognizing them, knowing how to prepare them and then celebrating that accomplishment around a communal table could arguably be seen a form of Utopian principles. The idea that food is an expected part of the landscape – especially in urban environments – could be the missing link to food systems and a celebration of community and knowledge, regardless of demographics.

The unique and profound advantage that all cities have, is the influence of social interaction between city dwellers – in multiple occurrence or unplanned social interact – and how this influence carries into the relationship of infrastructure and use of public spaces. Leveraging this influence is the basis for this thesis.

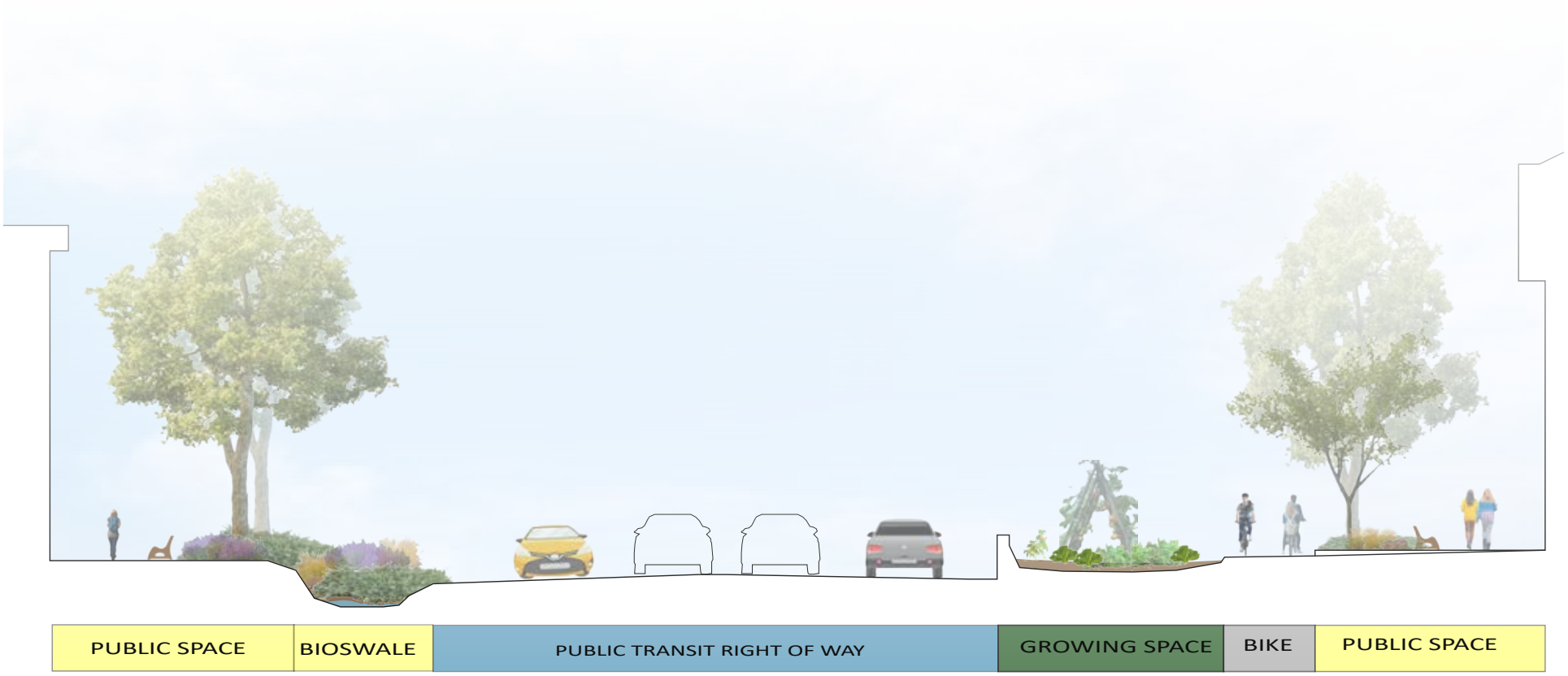
With such a wide net cast for the research, the information is organized by a matrix of precedence in order to then project the understanding of time. Then, aligned by how all of the activities could either be related or concurrent in investment of either the streetscape, the schoolyard, vacant land – or perhaps all three. Beginning initially with opportunity, which presented itself as the "need" for further research. The other priorities of research encompass infrastructure, policy, grow space and learn space.

Underlying all priorities, is community – which is the input and output of all five data points.

The opportunity to affect our relationship to the city is heavily influenced by the environment of the city. The data points of condition are not only the infrastructure of the public buildings and streetscape (to include schools, libraries, community centers and public housing), but is also heavily influenced by the sociological and psychological aspects of the urban environment. There is an unparalleled opportunity for face-to-face interaction, contact and communication (4), which is the nexus of the "re-naturing" of the city. A community's relationship health is just as influential on its prosperity as its land value and investment opportunities. This relationship can be addressed at the earliest age possible.

DEFINING THE INVESTMENT

For the purposes of this research, “investment” is not a financial endeavor for maximum return – but the measure of effort and outcome for a sustained ecological environment. In an urban environment full of beautiful trees and flowers, the placement, purpose and utilization of nature is the measure of the success of investment. What is being asked through this research is how nature can be used a restoration tool, a teaching method, and sustainable means for bringing food closer to a disadvantaged community.



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EDUCATIONAL INFRASTRUCTURE AND INVESTMENT: THE PHYSICAL PLACE AND MENTAL FRAMEWORK

Schools have unquestionably been the heartbeat of communities for centuries. What they represent physically often is a marker for stately architectural symbolism or showcase of engineering masterpieces that have a lasting influence on the neighboring citizens themselves but also on the children whom occupy the halls and classrooms throughout the years. The placement of the school represents a basic human right of education and is often used to the maximum extent to positively influence the community a catalyst for change and progress. These school structures have endured throughout the years and have the influence to project change on an acclimating urban metabolism. There has become a significant realization, however, in the attitude of environment.

A child's ability to learn can be expanded and influenced with improvements to the environmental setting of the learning atmosphere. Leading discussions of the environment removed from the actual environment is an educational shortfall that currently plagues many public schools. A student's attitude, skills, feelings and motivations can all be poised dimensionally should their educational environment be accessible through their schooling – a comprehensive approach to children's environmental learning and interpretation of the world. This is a conditioning of environmental consciousness at the earliest age (1). If the school location and ground itself is invested projectively (2) – further embedding nature in its landscape would be the initial move towards building the urban ecology. Then, expanding that landscape for further urban development and restoration.

The benefits of investing in educational environments go far beyond monetary gains for the local community – but can make people healthier, giving them more control over their lives (3). If a daily challenge to citizens is where their fresh food comes from, then educational facilities and public programs are the link between first providing necessary food, which many currently work tirelessly to close the food gap (see page 39), but also the basic human right to fresh food access. Presenting this to children at the earliest age possible, could have a profound and rippling influence on food desert environments and rapidly urbanizing areas. Schools can encourage and facilitate, hinder and inhibit behaviors, and the architectural symbolism of schools can have a profoundly wider impact on children and their behaviors in and outside of schools (4). Introducing children to an environmental behavior and food landscape attitude then becomes a pedagogical tool carried through life and standardized expectation. What could become of the future of cities when learning in the environment of urban ecological network is the standard educational right?

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RESEARCH AND ANALYSIS

The Quality of Urban Spaces
(Public Housing Project)

Case Study:
Square Des Bouleaux, Paris

Situated between two public housing building designed by Renzo Piano, the restricted size emphasizes the connection to nature by the close proximity planting of tall birch trees. Providing a shaded transitional space between the buildings, the design is suggestively projective and provides a enrichment area to the biodiversity of the city.

Architect: Renzo Piano
Landscape Architect:Michel Desvigne

Source: micheldesvignepaysagiste.com/en/square-des-bouleaux

The Quality of Urban Spaces
(Temporary Public Use on Private Land)

Case Study: Lafayette Greens, Detroit, MI

Demolition of a historic structure left the lot vacant in 2010. While the city is working with investors and developers, the vacant space was converted to a public-private venture with city residents as a public grow space, open to all who wish to learn about cultivation. Due to this use as a transitional space, planters were raised to provide easier access to gardens as well as annunciating the “temporary” use.
Because no consumable vegetables and herbs were planted in the existing soil, the temporary planters provide an “instant transformation” of the now public space.

Source: ASLA 2012 Awards

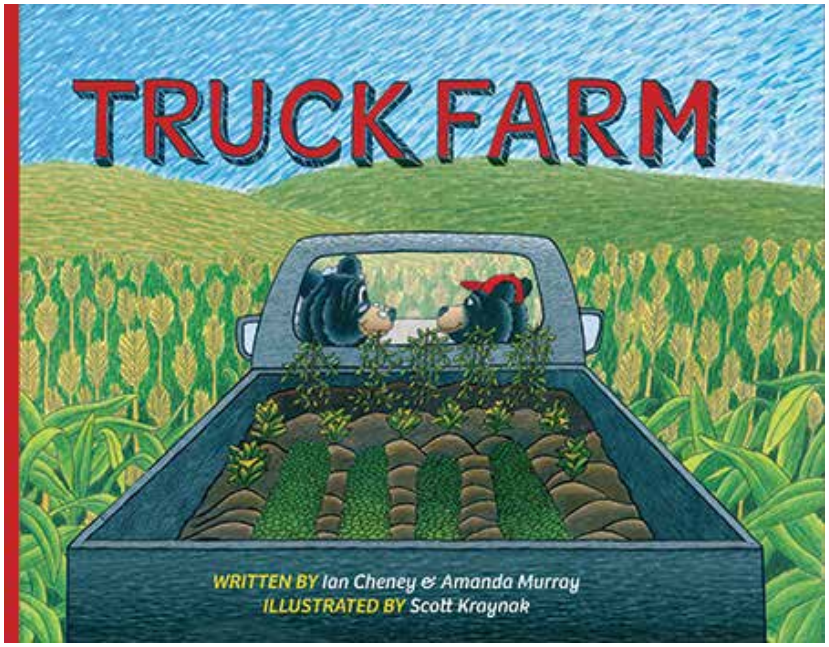
The Quality of Urban Spaces (Leftover Spaces)

Case Study:
Third Landscape, Gilles Clement (2004)

The Third Landscape - an undetermined fragment of the Plantary Garden -designates the sum of the space left over by man to landscape evolution - to nature alone. From this point of view, the Third Landscape can be considered as the genetic reservoir of the planet, the space of the future…..

Images: Clement, Gilles. L'île Derborence, Parc Henri Matisse, Lille, France.

Image: *Toit de la base sous-marine de Saint Nazaire, Gilles Clément; Estuaire 2009 et 2011/Le Voyage à Nantes.*



The Quality of Urban Spaces (Temporary Placemaking)

Case Study: Truck Farm Food Project

Nowadays it could be as simple as a social media post going viral to have a pop-up event made successful. The creativity brought to the urban fabric can lead to an almost instant transformation of a previous devoid or empty space.
The example of “Truckfarm” fleets is an innovative way to bring fresh picked vegetables directly to the consumer (also Farm on Wheels). Now a children’s book, its short film and fleet of trucks literally brings the farm to you - touring up and down the east coast.

Source: truckfarm.org

Quality of Urban Spaces (Timescale)

Case Study:
Time Landscape by Alan Sonfist, NYC 1978

Leftover spaces, or Third Landscapes" as described by Gilles Clement, have the potential to become powerful place-makers within their existing city fabric. Artist Alan Sonfist transformed a fenced off forgotten corner of NYU campus with native trees and plantings to represent an homage to the once open land of now Manhattan.
The small, undesirable development site has now enriched the biodiversity and landscape for over fifty years.

THE PROJECT:
Applying Research + Analysis

Monoculture

Commercial Agriculture

Polyculture

Aquaculture

Hydroculture

UNDERSTANDING OUR FOOD: AGRICULTURAL PRACTICES + THE HEALTH OF THE CITY

Understanding where our food comes from and how it goes from growth to consumer was a starting point in my research. In the United States, we have been in a state of rapid expansion of mono-culturally grown and harvested food- maintaining the need for widespread use of pesticides and the reliance on trucking industries to distribute the mass-produced food.

The geographic spread of urban environments has almost completely ended the relationship that humans had with food production. Additionally, advancements in technology and the monetary gain from long-haul transportation of consumables removed the street-selling atmosphere when agriculture was embedded into the bustle of urban every-day life. In recent years there have been successful examples of combined agricultural production as well as scaled-production in order to reduce or eliminate the need for harmful chemicals as well as the ability to bring food closer to the consumer. Having a removed relationship with food production for most people lies the opportunity to spread food literacy and education to the masses of an increasingly unhealthy population through urban agriculture and public education programs.

Additionally, with the most likely influence on the future of urban food systems resulting from urban expansion and farmland loss (1), there is undoubtedly a linkage between the physical expansion of cities and population diet. There is also the discussion of means to access - which has been a driver of an even more unhealthy population in disadvantaged communities affected by food desert environments. Approaching this challenge and injustice from a planning perspective, possibly lies an opportunity to introduce small grassroots efforts of food cultivation to a larger scale. As cities have expanded, there inevitably is land vacant due to unfavorable structure or economic instability. Using this as a platform for population growth needs – it may introduce a supplementary source of sustenance as well as a fundamental psychological progress of the human spirit by producing one's own food or having a primary food source as close as possible to daily life. Specifically, in urban areas affected greatly by soil contamination there is a tremendous potential in considering urban agriculture as the lead to future structural development; thus, the urban landscape would precede urban architecture (2), forming the framework for future urban growth and renewal. The ecology of the ground space and biodiversity of vertical grow and green spaces could be the future of sustainable urban environments.

Citations:
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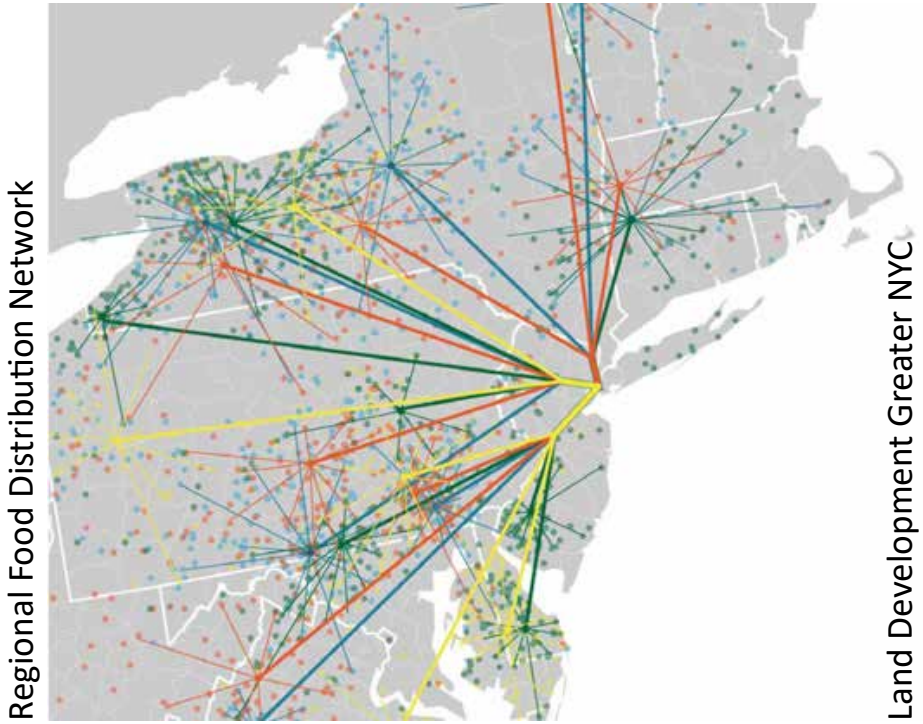
NYC Food Distribution : FOOD MILES

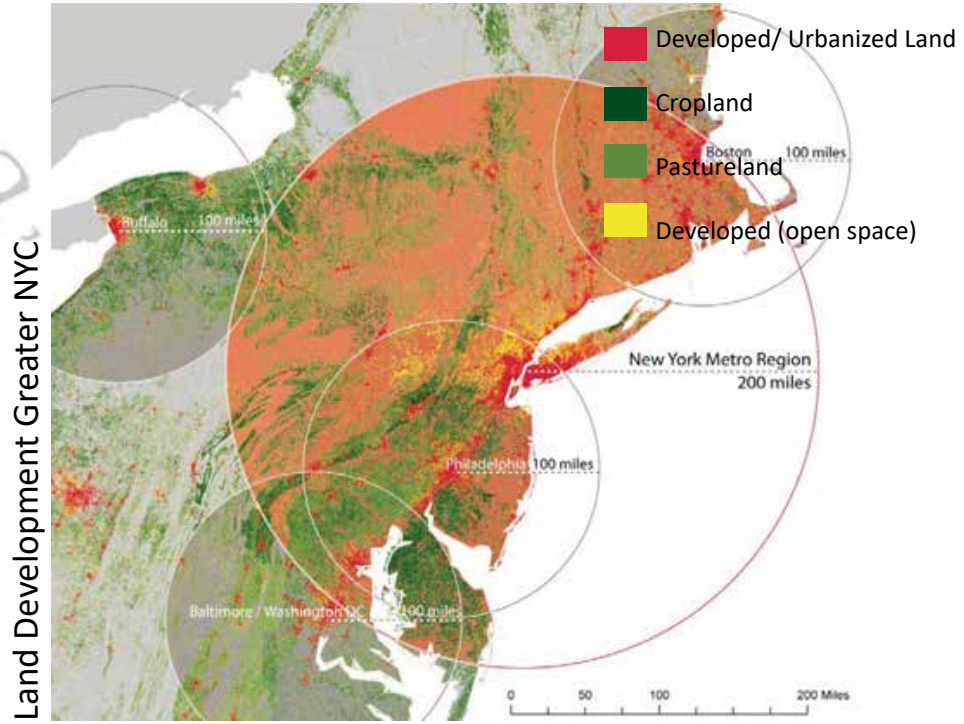
Columbia University's Urban Design Lab has launched a series of studies aimed at finding vulnerabilities in our food system as well as gaps and potential for improvement in how we distribute food. Understanding demographics in terms of food miles and food shed of urban areas, the Design Lab developed rigorous, quantitative data sets that can be used to propose policy interventions to provide foodshed sustainability and increase access to affordable, healthful food in all NY neighborhoods.

The data sets applicable to this thesis research is in terms of land usage and comprehension of the vast agricultural land mass it takes to feed NYC. By identifying existing vacant land conditions affected by soil contamination as well as the geographical representation of meal gaps in NYC families, the proposed neighborhoods aided in identifying a site for this research.

The Urban Design Lab's initiative incorporates localized land use, soil type, transportation infrastructure, and climatic conditions to assess production at several scales, as well as actual consumption data for New York City. Additionally, the Initiative allows for comparison of existing regional production and distribution with potential regional production and distribution to identify concrete possibilities for enhancing regional capacity.

The images below are maps of existing regional food distribution networks (left image) and the differentiation of land use (right image) throughout the greater NYC area. This information is being produced by Columbia University to identify existing food production in the NYC region, potential production capacity and regional food needs that could be met within NYC region, comparison between existing and potential production, and aims to develop steps to narrow the gap between existing and potential production.





Source: *Urban Design Lab, Columbia University*

The “Third Landscape” - an undetermined fragment of the Planetary Garden - designates the sum of the space left over by man to landscape evolution... from this point of view, the “Third Landscape” can be considered as the space of the future... a biological necessity to condition the future of things (1). Public vacant land, as unavoidable from a real estate position - has the potential to be the biological and ecological connection for the expansion of the urban garden. With a holistic city vision in place to grow and evolve over time - the evolution of restored environment can transform for nature in the city to the nature of the city.

The Urban Design Lab has done extensive data research over the past decade on NYC and its potential to feed the future.

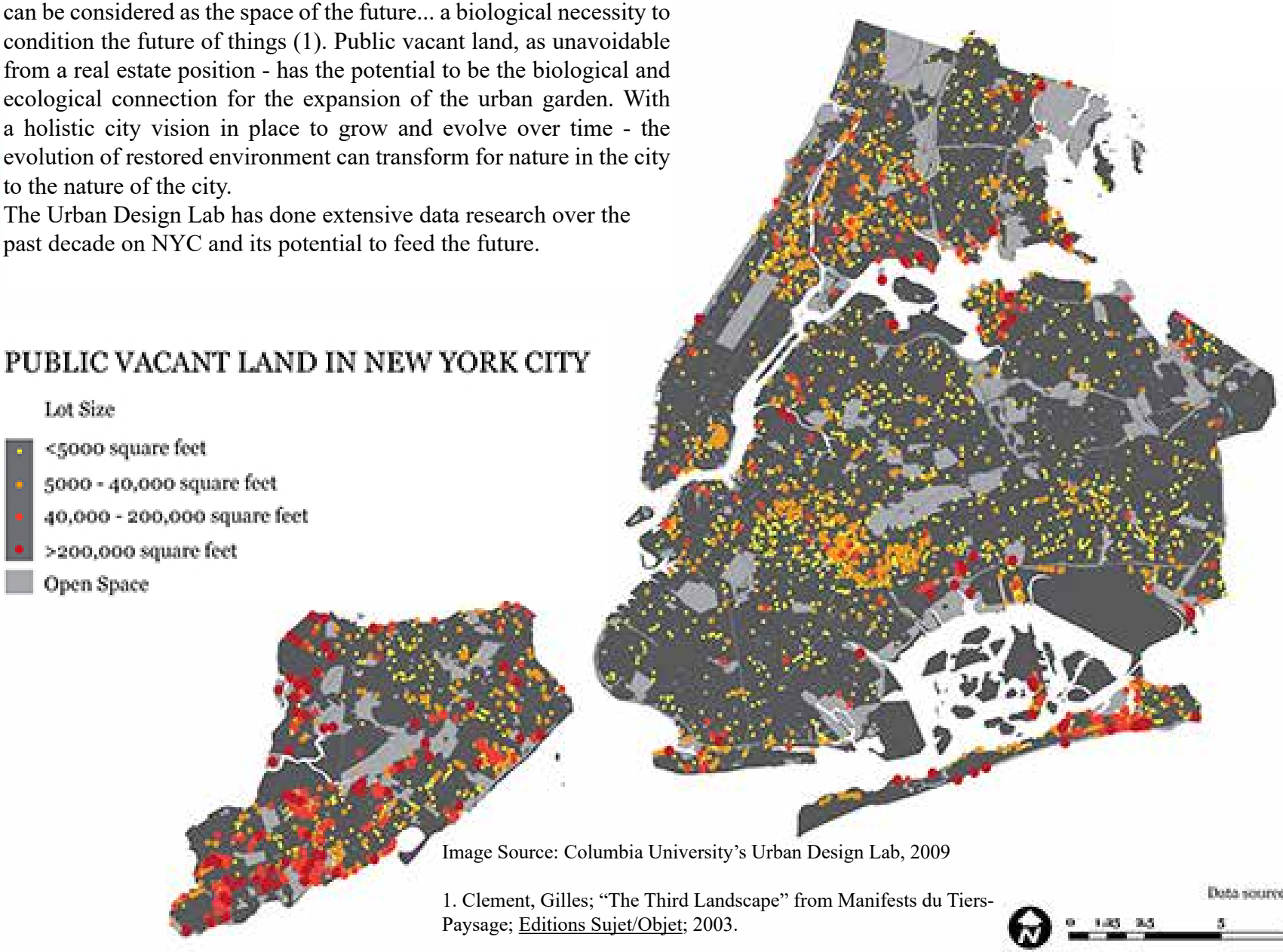
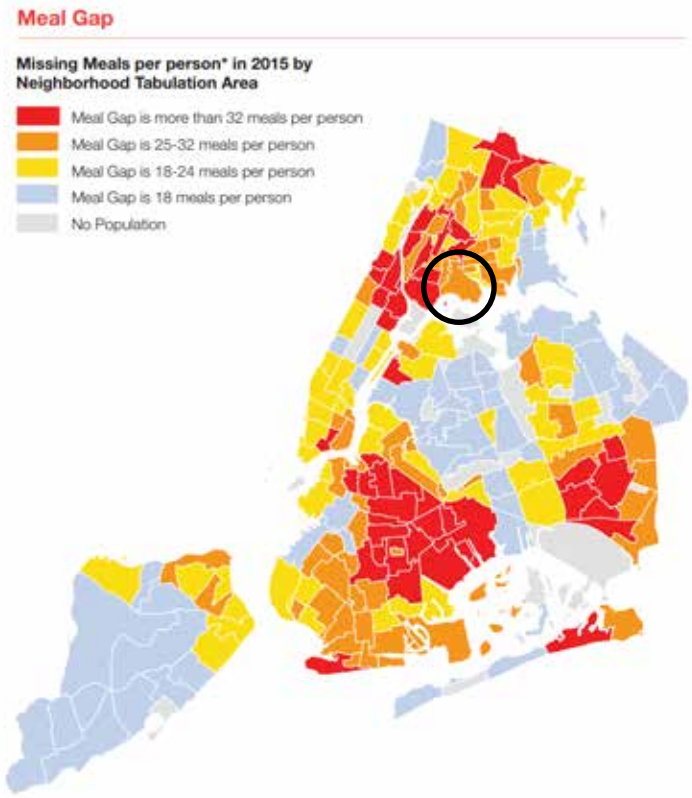


Image Source: Columbia University’s Urban Design Lab, 2009

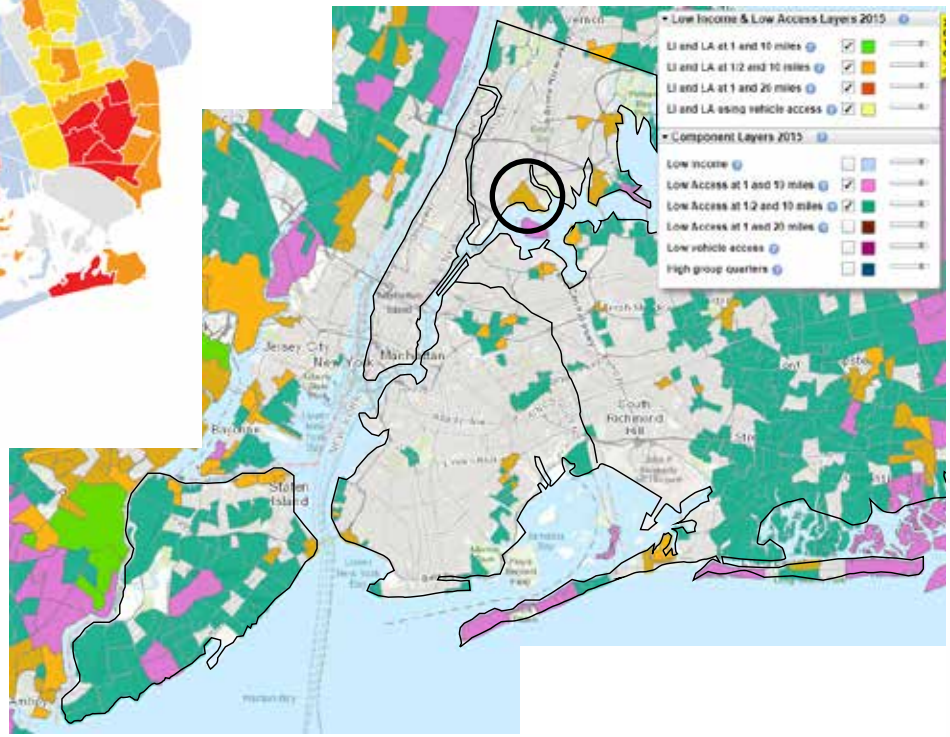
1. Clement, Gilles; “The Third Landscape” from Manifests du Tiers-Paysage; Editions Sujet/Objet; 2003.



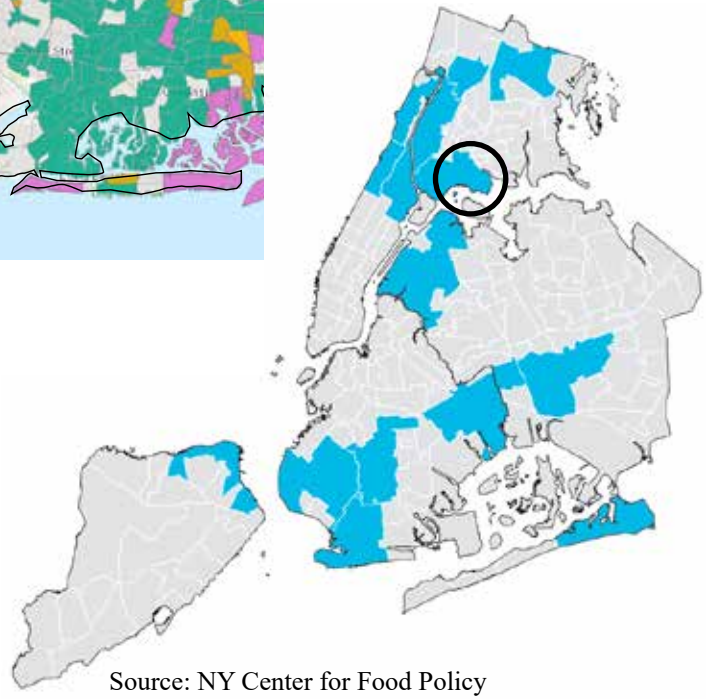
Source: NY Center for Food Policy

Food access is not a localized issue. Much research has been done on understanding the challenges that communities face at multiple scales to ensure fresh food is available to the masses as well as combating hunger and closing the "meal gap," specifically in disadvantaged communities. Although this thesis is not about regional food distribution and market for placement of grocery stores - it is clear that there is strong correlation between missed meals, demographics and lack of access to fresh food stores.

Hunts Point, Bronx - which is the site selected for this thesis demonstration (and will be expanded upon in a later section) is circled on the map for reference.

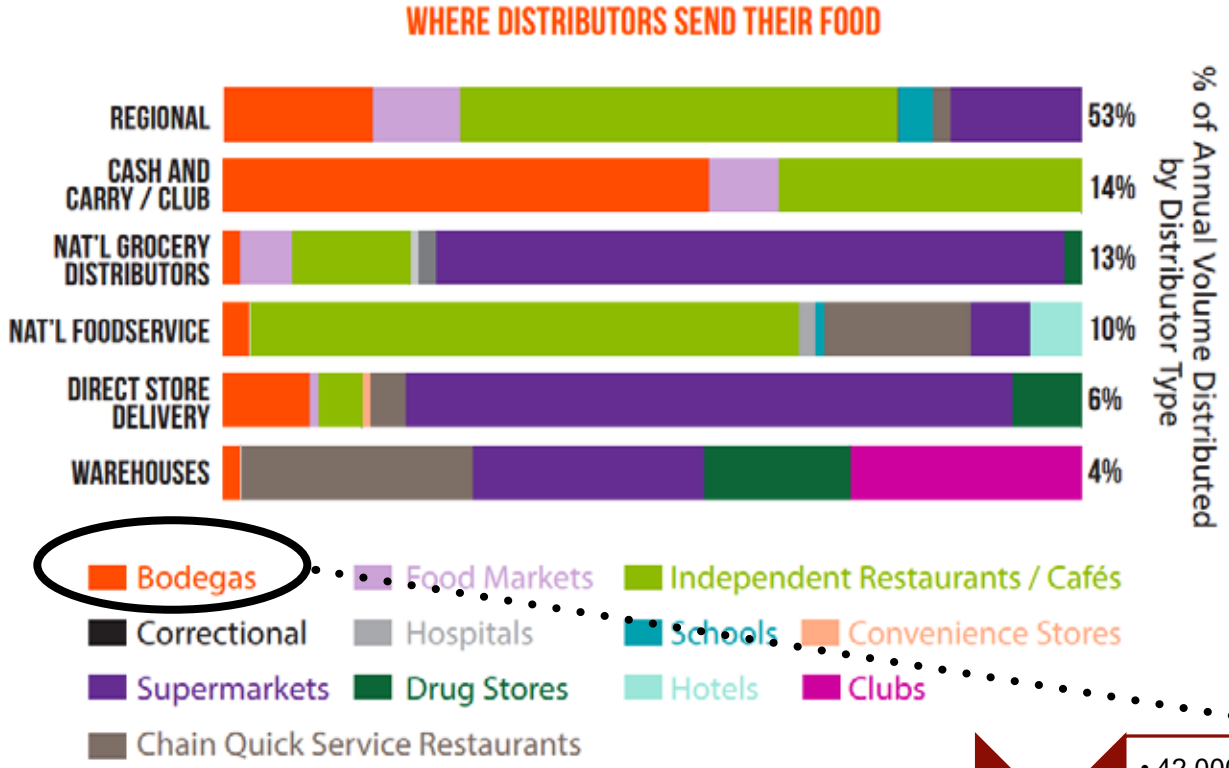


Source: USDA Food Access Research Atlas



Source: NY Center for Food Policy

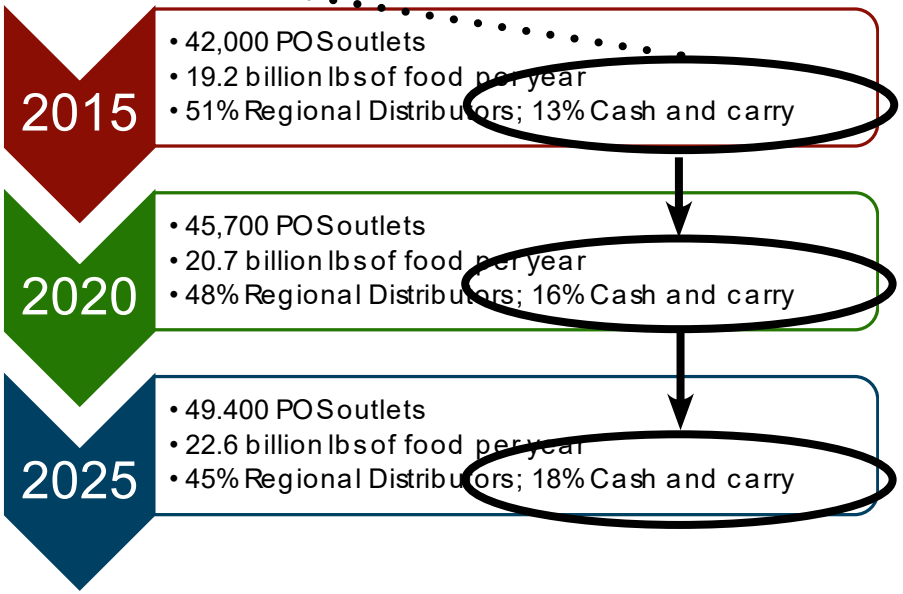
New York City's food supply chain is a dynamic system comprised of numerous food distributors and a variety of point-of-sale (POS) outlets.



Source:

Understanding Food Distribution
(Food Distribution in New York City, NYC Economic Corporation, Mayor's Office of Recovery and Resiliency, 11/29/2016)

Demand for food in New York City is growing at 1.6% per year (double the national average of 0.7%). Additionally, on-line grocery is expected to capture 6% of the point-of-sale market by 2025.



TWOFOLD: WHEN LACK OF ACCESS AND FOOD HEALTH EDUCATION ARE COMBINED

What do we mean by healthy food system?
A food system refers to the whole system that involves all aspects of food production, processing, distribution, retail, preparation, consumption, and disposal/waste. A healthy food system ensures that everyone has access to healthy and nutritious diet. It also supports a robust, diversified economy and a sustainable and resilient community that treats the environment, workers, and consumers fairly.

• *Access: A major principle of a healthy food system is to ensure that communities are food secure—and food access is a major component of food security. Access refers to people having easy physical and economical access to healthy food that meets their dietary needs. Physical access is dependent on the geographic proximity of a healthy food store, and economic access relates to afford-ability. Furthermore, the concept of access is*
not restricted to access to healthy food but also includes access to unhealthy food (e.g. fast food) because it a combination of both these factors that determine food environment.

• *Production: The food production component of food systems planning is not limited to growing food on farms but also includes urban food production. Urban food production takes place at a smaller scale and usually involves urban agriculture and gardening. It is sustainable, helps increase access to healthy food, and has other social benefits. Urban food production can build a sense of community around active living and a healthy lifestyle.*

Source: Ricklin, AICP, A.; "American Planning Association Metrics for Planning Healthy Communities"; May 2017.

Food access is a leading proponent of an unhealthy population as well as missed meals and affordable, healthy fresh foods. Additionally, this plays a leading role in the food education for young minds who are exposed to the lack of access within their community.

Addressing the issue from an urban design and landscape perspective - much can be done regarding the balance of urban density, urban farming and agricultural practices, and widespread availability of food education within the community.

The Five Borough Farm Project has been a leader in identifying and consolidating data for the benefits of urban farming as well as the measurable impact it has on the community (1). In partnership with NYC Parks and Recreation, the promote three main goals:

1- build a coalition of urban agriculture stakeholders
2- Promote innovative land-use solutions to support urban agricultural activities
3- Measure and communicate the impact of urban agriculture citywide

Source: *Altman, L. et al. Five Borough Farm II, Growing Benefits of Urban Agriculture in New York City; Design For Public Trust; NYC; 2014.*

CASE STUDY: FAYETTEVILLE, AK 2030: FOOD CITY SCENARIO

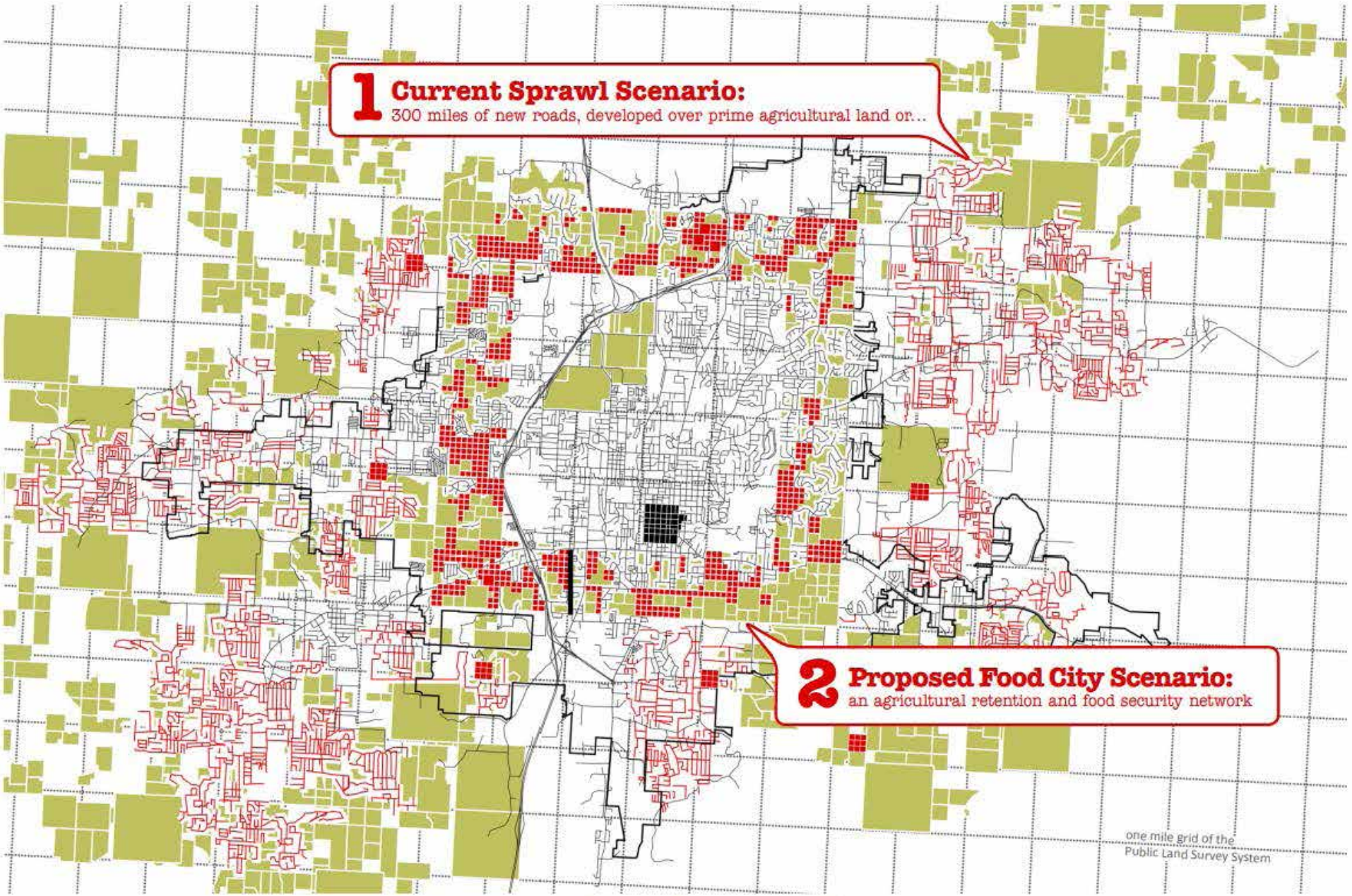


Image Credit:
https://s3.amazonaws.com/uacdc/Fayetteville_2030-Food-City-Scenario-Plan.pdf

What kind of infrastructure would a city have to develop if it cultivated its own food? (1). In 2015, The University of Arkansas Community Design Center led a project team funded by the Clinton Global Initiative for the City of Fayetteville, Arkansas to propose a Food City Scenario as a drastic change to the city's food production, distribution and food security for the entire region. "At present, Arkansas is the U.S. leading producer of rice and ranks in the top ten for poultry, eggs, sweet potatoes and pork. However, the state has one of the highest rates of childhood hunger nationally and over 14% of its population are food insecure." (2). The proposal of a Food City devises a model transition in order to create a sustainable foodshed for the city combining ecological municipal utility, green infrastructure, public grow space, and reorganization of agriculturally used land. With projections of both infrastructural expansion of the city as well as an increase to its population over the next 10 years, the project envisions a future based upon greater food security with accompanying forms of resilient urbanism that link food production and place-making (1). In addition, the project includes a vision for the next 50 years and predicts the consequences and outcomes of the resiliency of the urban environment. The proposal is a robust 35,000 acres servicing 75,000 residents and encompasses both the denser city center as well as its surrounding commercial farmland. The reorganization of the urban agricultural framework is based on the scenario's Five Urban Grow Guilds (3) (Image 1) associated with specific and interdependent functions: 1) permaculture/foraging landscapes, 2) farming and gardening requiring intensive management or annual landscapes, 3) GROW™ Streets (Gardening-Right-of-Way) (Image 3). 4) pollution remediation landscapes that support safe urban growing and 5) waste-to-energy districts that up-cycle concentrated agriculture and urban waste streams (IMAGE 2) (1). The project closely examines sustainable food production practices by proposing a highly networked urban fabric that exploit advanced principles of landscape infrastructure fundamentals of water cycle management, nutrient and energy cycle management, and community dynamics. Food City includes extensive research on potential ecological strategies that are specifically designed into the urban fabric to encourage both sustainable edible yields and maturation over time of increased population of plant and animal species. The model is a transition from the traditional monoculture growing environment to a holistic and inclusive agroecology. This proposal relies heavily on modification to current urban agricultural real estate practices and public lifestyle adaptation resulting in eventual networked ecosystem services.

To achieve the network of ecosystem services, the project identifies real estate as "third places" in order to predict the capacity of the city to support and maintain its local food needs. The design solutions to address municipal-scaled nutrient management include composting networks, integrated waste management utilities, deep litter farming, and aquaculture (1). Healthy soil levels to sustain food and livestock production is expected to take many years and its stated as a limitation to the project's vision. For the scenario to become reality, the progressive design approach consolidates the existing greenbelt by infilling the urban core which eventually produces a mat agricultural environment (1) – allowing for the adjacencies needs for ecosystem sustainment to take place. Soil restoration and infrastructure placement is projected to take place over the next 40 years, but the scenario aims to institutionalize and provide the framework for the city's consolidation, infill and eventual expansion.

Ecosystem Services

The ecosystem services proposed are framed by the real estate actions of twenty-two different but networked agricultural land-uses that holistically maintain and thrive the urban ecosystem. Three ecosystem service examples from the twenty-two included in the proposal are composting services, provisioning and aquaculture. The composting network gathers organic waste of local livestock (poultry and pigs) and up-cycles the byproduct into the nearby food production soils to recover nitrogen, potassium and phosphorous macronutrients (1).

Instead of using synthetic fertilizers, the local compost would offset the need to use synthetic or pesticides. Constructed wind-breaks (Image 3) around the composting areas would not only protect the population from undesirable odors but could support wildlife habitat for large native animal species such as deer, turkey, bobwhites and other small mammals (4). The campus design organizes the states of decomposition into advantageous adjacent management which include anaerobic and aerobic composting, vermicomposting and deep litter farm which are protected by the windbreaks and shelterbelts to control odor and support natural wildlife habitats (1).

GROW™ Streets are designed to provide public rights of way in residential areas that identify food production for urban orchards, fruit boulevards, flowers, vegetable gardens and tree lawns (1). The gardens are protected from localized stormwater runoff through bioswale and filter strips along roadways to prevent contaminants from harming vegetable gardens. GROW™ streets could provide a wildlife sanctuary hosting local bird, insect and small animals. Residents would have the opportunity to grow their own yields of fruits and vegetables in semi-public community environments.

Of the many proposed scenarios, the complexity of multi-loop aquaponics for urban wetland reclamation for fish farming is the most challenging. The ideas presented combine polyculture food production in reclaimed floodplain soils, irrigation channels from stormwater runoff and mound farms – while restoring public land for nature preserve and an open space park. Assisted by migratory bird towers designed in shallow pond areas to provide enriched nutrients needs to support fish hatcheries, the proposal speaks to the limitations of how scalable such urban productions could produce, especially since Fayetteville is not a lake region.

Although aquaculture has been practiced for a century or more, the construction of multi-looped systems in restored habitat environments using natural flow and native plants is a complex and somewhat modern situation. However, utilization of the existing reservoirs into constructed hatchery farm environments with naturally-filtering wetland grasses and integrated holdings of fish production, the region could potentially provide the city with a large-scale public park while simultaneously yielding locally farmed fish such as trout and catfish (5).

Aquaculture as Public Park Land

This challenge is presented as a multi-looped system, which separates itself both in complexity and reliance on multiple constructed components. Traditionally, single system techniques for aquaculture rely on “rules of thumb” administration and are drastically less complex (6). However, large-scale aquaculture productivity in wetland areas could allow for a new market of local fish to the land-locked city. The design of consolidation to the agricultural blocks within the city would need to address the 45+ inches of rain annually, and could use that stormwater runoff, to provide natural and continuous flow to a containment area. Additionally, with extensive research currently on constructed wetland systems for improvements to aquaculture practices, the low requirements for space, fresh water, and energy enable the establishment of such a system almost anywhere (7). Challenges to this scenario would include control of the turbidity in the soil surface of the containment area as well limitations to what type of fish that could be farmed. Potentially, trout could be used as they are a robust fish, and although grow more slowly than a comparable traditionally farmed fish such as Tilapia, trout are native to the area, thrive in cold-water and remain productive in all seasons (8).

Food City Scenario not only addresses the capability and potentially fully sustainable urban agricultural environment but confronts the global issue of localized food sources and reduction in food shed for urban populations. Sustainability for provisioning services is a global issue and the implementation of constructed environments to support holistic ecosystems is inevitably forthcoming. Although only in a proposal state, Food City includes extensive and award-winning (9) research data that envisions as duplicating urban context that should be highly considered as cities plan for re-urbanization and increase to urban populations in the next 50 years.

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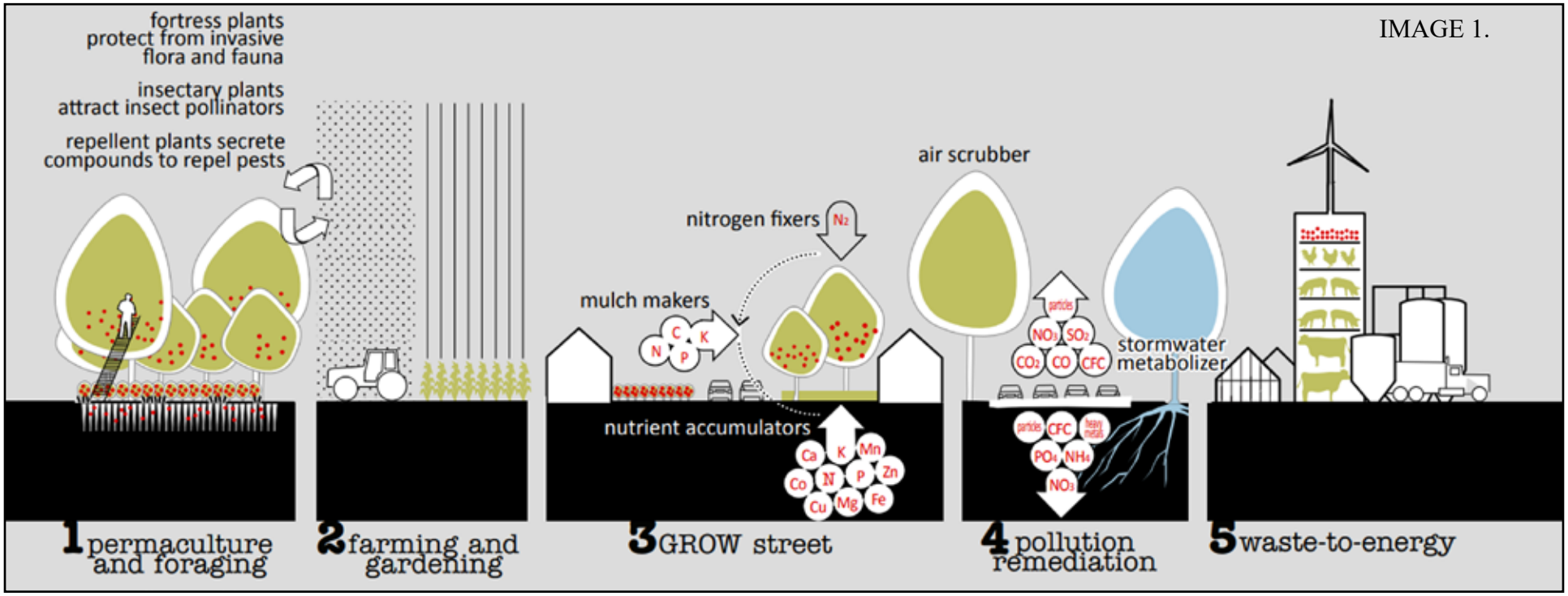
IMAGE 1.



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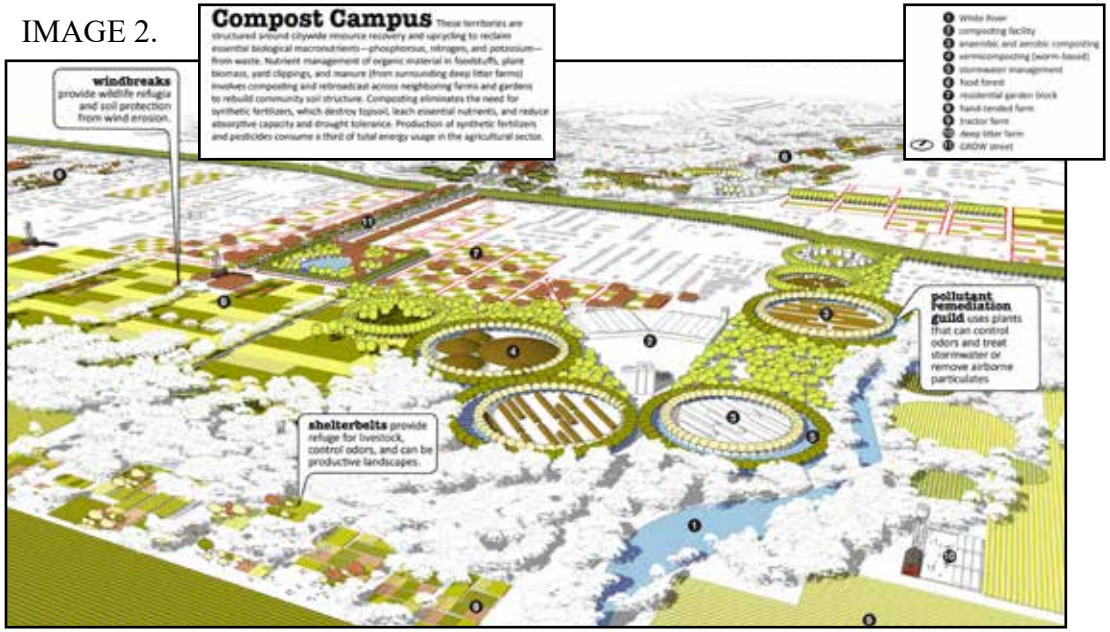


IMAGE 3.

Image Credits
https://s3.amazonaws.com/uacdc/Fayetteville_2030-Food-City-Scenario-Plan.pdf

PROJECT: SITE SELECTION

Although this project is not addressing regional food distribution, understanding where the food comes from and how it gets to the consumer is highly influential in the opportunity to address the proximity of fresh food. Bringing food closer on a smaller scale does not replace greater food distribution to the masses, but it can enhance the security of fresh food availability in the long term as well as adding to food literacy to all residents.

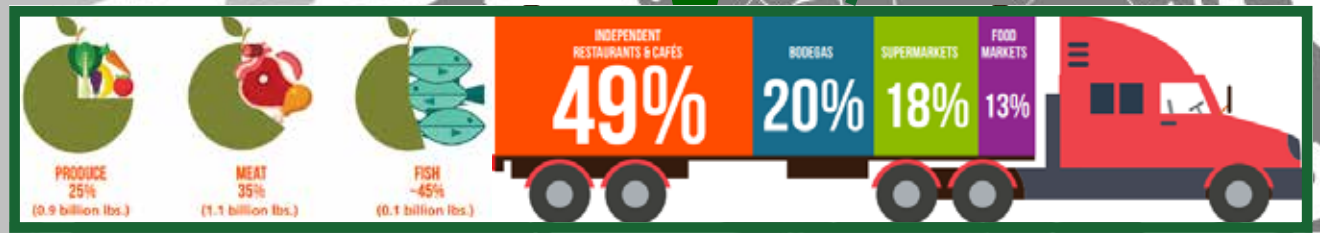
Food Desert Demographics

Food Distribution Centers
(Sized by volume output of food flow)

Urban Farming / Agriculture

Hunts Point, Bronx is the largest regional food distribution center in the greater NYC area. It provides approximately 22% of the fresh vegetable, meat and seafood consumption to the population.

(Food Distribution in New York City, NYC Economic Corporation, Mayor's Office of Recovery and Resiliency Briefing, 11/29/2016)

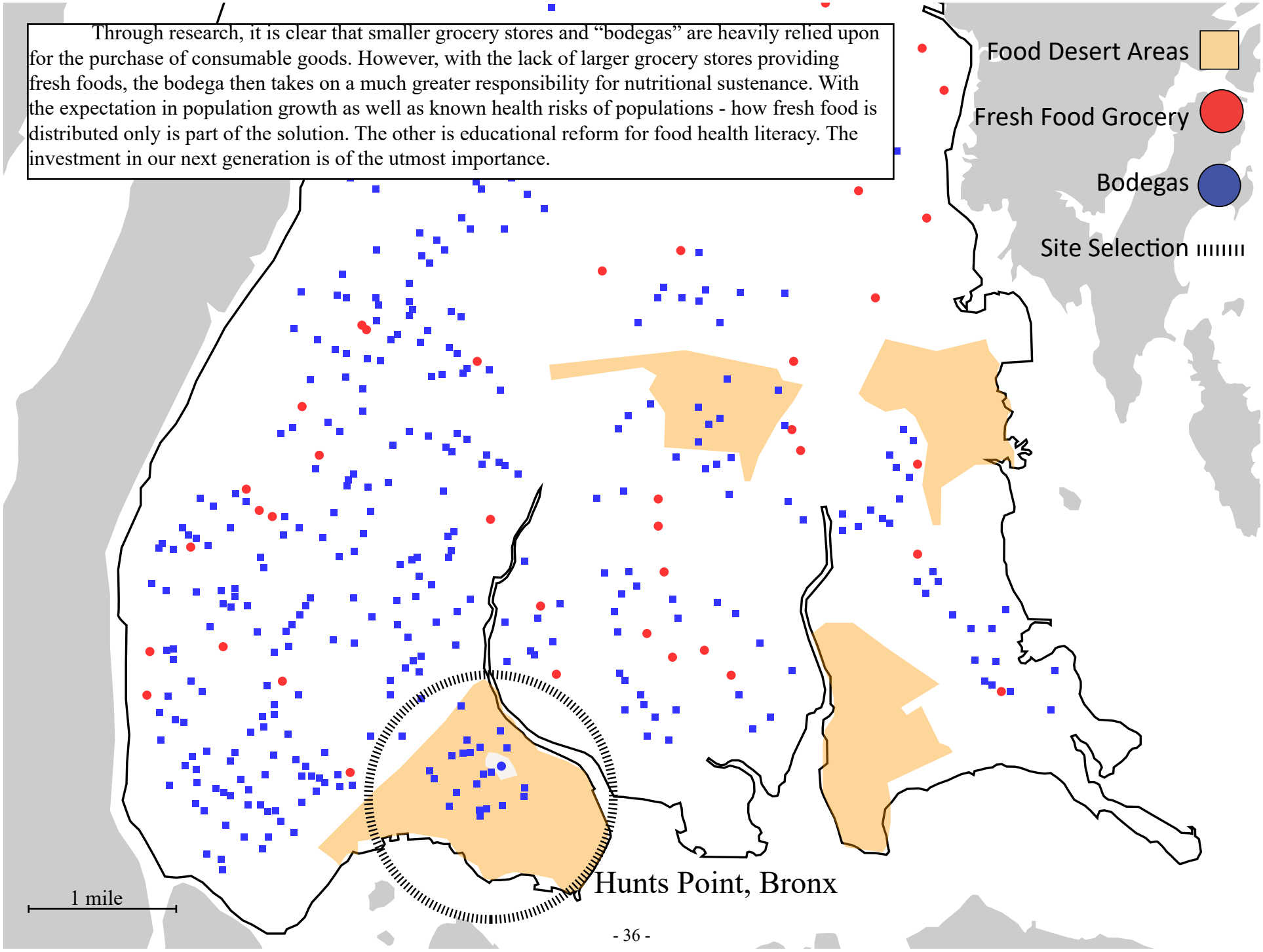


Hunts Point, Bronx

Source: www1.nyc.gov/site/doitt/initiatives/3d-building.page


Area of Study
N
1/8 mile
Vacant Lots and Structures
(Residential Core outline, refer to maps on pages 52 - 54)
Monastery
Community Playing Fields
Spofford Juvenile Center (vacant)
Recreation Center
Community Preschool
The Hunts Point School
Longwood Preparatory Academy
Longwood Avenue
Bruckner Expressway
Spofford Avenue
P.S. 046 Joseph Drake
Neighborhood Preschool

Through research, it is clear that smaller grocery stores and "bodegas" are heavily relied upon for the purchase of consumable goods. However, with the lack of larger grocery stores providing fresh foods, the bodega then takes on a much greater responsibility for nutritional sustenance. With the expectation in population growth as well as known health risks of populations - how fresh food is distributed only is part of the solution. The other is educational reform for food health literacy. The investment in our next generation is of the utmost importance.



SITE SELECTION: HISTORY

The NYC subway expansion in 1904 enabled affordable housing within proximity to Manhattan - which attracted many new populations of Jews, Italians, Armenians and Yugoslavians. Throughout the 20th century, the industry of food distribution became increasingly concentrated in the southern and eastern end of the peninsula, as it offered ease of offload from water transportation. The expansion of the railroad lines enabled fast radial distribution to the greater NYC area in addition to traditional truck transportation - much of which remains the primary mode of food transportation. The Hunts Point Food Distribution provides for approximately 22% of the fresh meat, fish and vegetables distribution to the greater NYC area (1). The center also provides jobs to the local community of Hunts Point. However, the residential area of the peninsula remains a food desert environment. The irony of so much available fresh food only to the commercial market as well as the connection of the existing public schools along the corridor of Spofford Avenue was the challenge for the site selection.

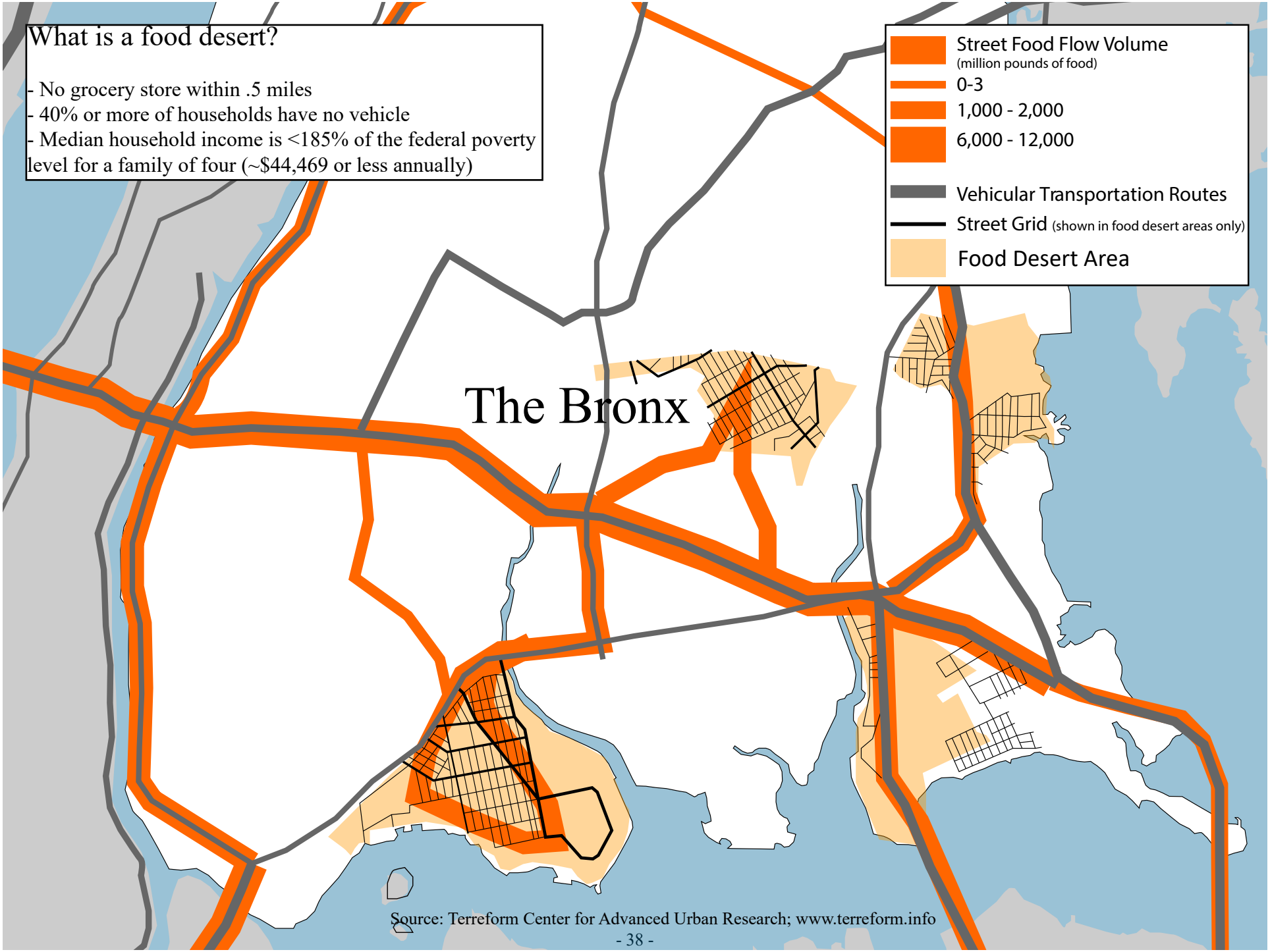
Demographics (2)

The Bronx, NY
Population: 1,332,650 (2010 census)
(Fastest growing county in NY since 2010)

40% of families with children living below poverty

"The contemporary landscape plays a structural role in public health outcomes. While the causes of chronic diseases are complex, one key factor is the food environment, particularly in certain urban neighborhoods that are served almost exclusively by convenience stores. These convenience stores offer processed food, alcohol, tobacco, and lottery tickets, but few if any choices for fresh produce. In regard to food systems, the consolidation and expansion in the size of grocery stores, and the policy environment that allowed private corporations to determine location of grocery stores (largely justified by size) has had a huge impact on the landscape of health in American cities." (3)

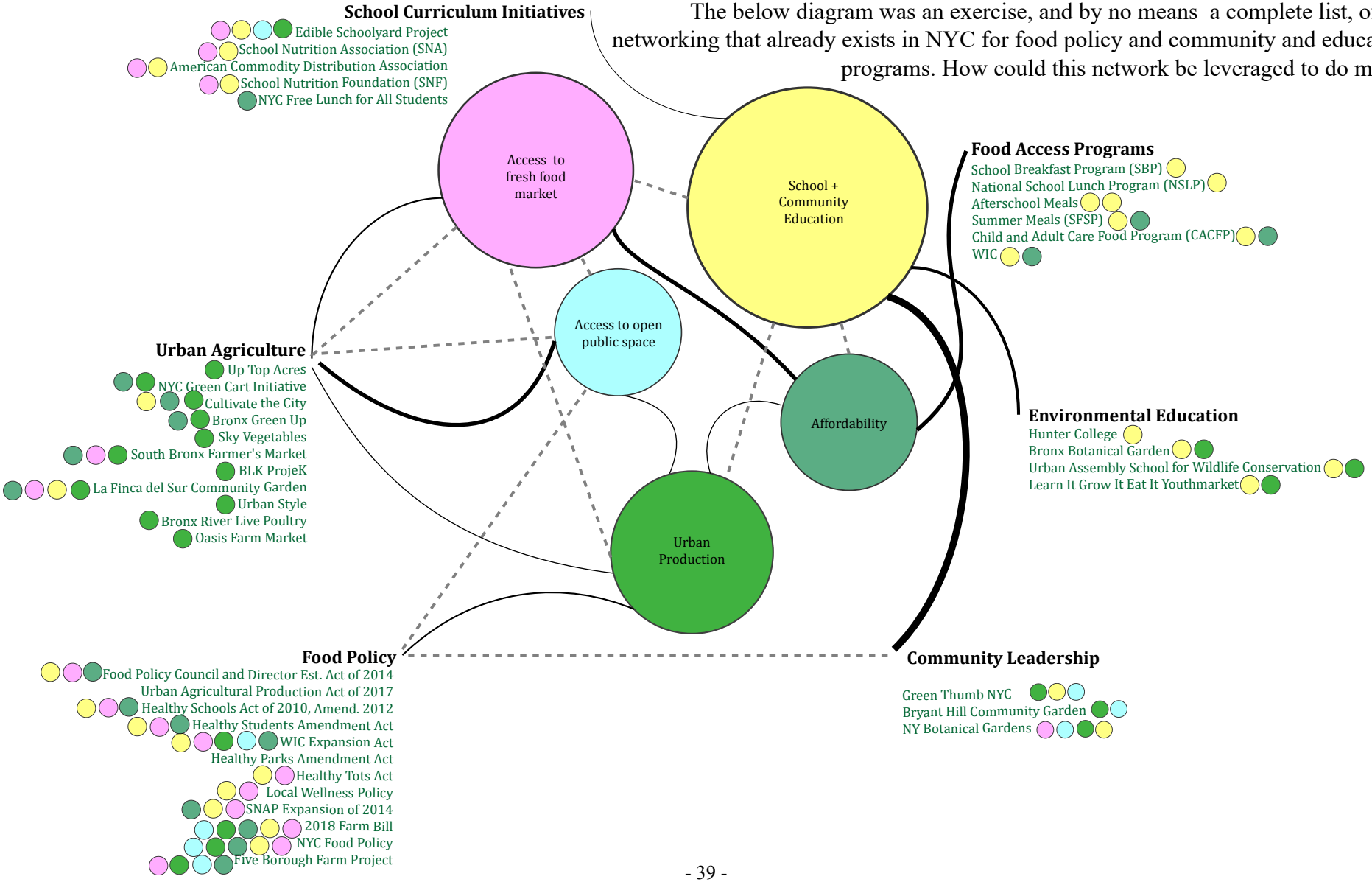
Source:
1. www.thepoint.org
2. U.S. Census
3. Potteiger, M.; Landscape Journal 32:2, pg 265


What is a food desert?
- No grocery store within .5 miles
- 40% or more of households have no vehicle
- Median household income is <185% of the federal poverty level for a family of four (~$44,469 or less annually)
Street Food Flow Volume
(million pounds of food)
0-3
1,000 - 2,000
6,000 - 12,000
Vehicular Transportation Routes
Street Grid (shown in food desert areas only)
Food Desert Area
The Bronx
Source: Terreform Center for Advanced Urban Research; www.terreform.info

NYC Initiatives Closing the Food G a p

Understanding where food access limitations exist as well as policies in place for closing the gap on those limitations is included in this research to understand the possibility to leverage existing investment opportunities to business in disadvantaged communities. A great amount of effort, time and commitment to the people of New York is already in place. Further investing in derelict public land as well as existing school grounds could close the food gap even further.

The below diagram was an exercise, and by no means a complete list, of the networking that already exists in NYC for food policy and community and education programs. How could this network be leveraged to do more?



SCHOOL TRANSFORMATIONS
LEARNING ABOUT THE ENVIRONMENT, FOR THE ENVIRONMENT, IN THE ENVIRONMENT

1. Early school houses were single rooms that taught all grade levels and were the anchor of the community.

2. Once more children were being educated, the school building was usually the largest in the community and was designed as a prominent civic building that represented authority, achievement and the center of good order and discipline. The school had a strong relationship with the church within the community.

3+4. Earlier school furniture was ergonomically superior and although coursework was taught with all desks facing the instructor; classes were generally smaller and enabled the instructor to give more attention to the individual student. The classrooms were independently controlled for heating and the windows were of maximum size and placement in order to allow as much natural lighting as possible for each classroom space.

1. 

2. 

3. 

5. Post WWII, the need for public schools became an incredible endeavor and so began the era of cheap, brick buildings designed to educate as many children as possible. Many of these structures still stand today. From 1960 to 1980, the minimum required air flow was reduced by half, allowing darker, stuffy and sterile classrooms environments.

6. Following World War II the required amount of fresh air introduced into schools by standard building codes was reduced every few years. By 1981 ASHRAE 62, the standard building code for fresh air exchange, had literally been cut in half (1).

4.

5.

6.

7. Due to flux in populations, many public schools are forced to allow more students in smaller classrooms. This creates a congested and possibly detrimental learning environment. Additionally, schools HVAC systems are typically centrally controlled and don't adjust for solar exposure and additionally capacity of students.

8. During the late 20th century, classroom reform underwent a transformation into the construction of open and modular classroom spaces. Although in theory may maximize the flexibility for the instructor and promote interdisciplinary coursework, too much open space and independence can be distracting for students and detrimental to achievement of students.

9. An easy solution to defining the territory of the school grounds as well as keeping students safe from the public, schools are completely surrounded by chain link fences; over-controlling access, approach and use of the grass or landscaped areas.

7. 

8. 

9. 

10.Even in urban environments, public schools are often surrounded in a sea of asphalt, placed for the convenience of teacher and staff commuting, and in high grades, for students to drive their own cars.
These vast non-porous surfaces are often vacant after hours and on weekends- and sometimes are located in valuable land areas.

11. PS26 in Brooklyn, NY transformed its asphalt exterior to a naturally landscaped learning and recreational environment for the elementary students (2).

12. In partnership with the Edible Schoolyard Project, PS 216 in Brooklyn, NY has opted to place a large school garden and outdoor classroom where an asphalt parking lot used to be. The school teaches multiple subjects through cultivation and gardening and serves the fresh vegetables and fruits in the school's cafeteria as they are yielded and harvested.

10.

11.

12.

Sources:
1. Bomier, B.; Renaissance of the American School Building. Anoka, MN: Environmental Resource Council; 2014.
2. Edibleschoolyardnyc.org

- pro-environmental education plan
- social and community cohesion
- access to healthy, fresh food
- life skills = the next generation's skills
- sustainable food source
- enrich food education in the individual and in the community

living classrooms and recreational spaces

future generations leading the way

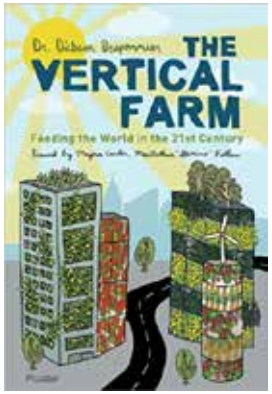
The school is a community, the community is a school

replant seeds

grows here, stays here

community outreach and land preservation

family participation and education



investment and sustainment (financial and sustenance)

- CO^2
- stormwater runoff
- vacant land
- transportation cost
- childhood obesity

SCHOOL AS THE CORNERSTONE

With the assistance from the Edible Schoolyard Project, PS 216 in Brooklyn transformed its degraded asphalt parking lot into a vegetable garden, outdoor classroom and funded an expansion to the school's kitchen for demonstration classes, community events and classroom instruction.

This example of rooting the young student's education into garden learning is inspiration for influencing a child's perspective about their own health.

The influence on school community spirit that sharing a meal with a classmate that was planted, cultivated and prepared together has approaches social interactions, youth well-being and psychological health.

What if this is the standard in all public school environments?

Source:
Edible Schoolyard Project
Edible Schoolyard NYC

P.S. 048 Joseph Drake Elementary School, Bronx

The New York Times
Published: April 12, 1914

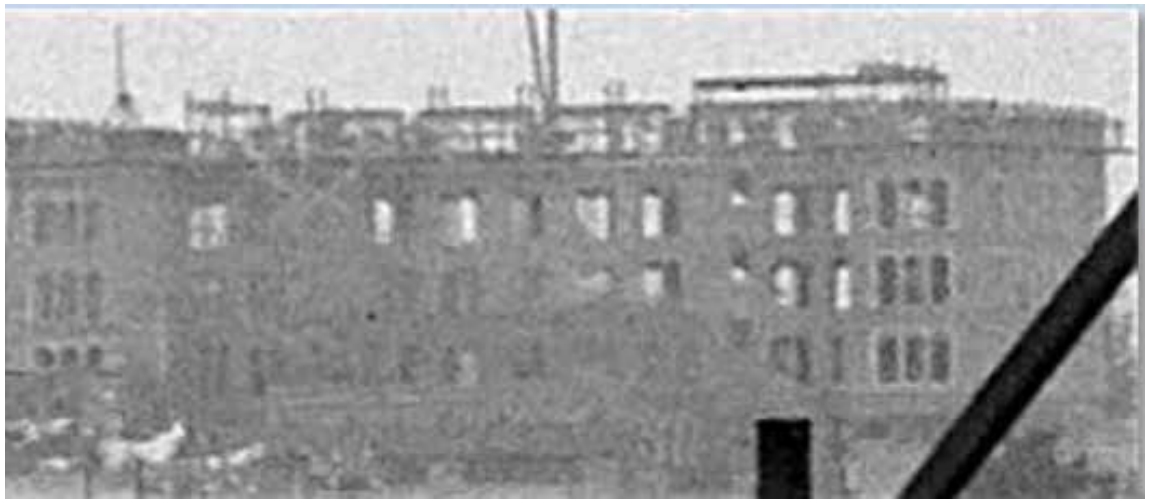
HUNTS POINT ACTIVITY.

Many Large Sales in That Part of the Bronx—Terminal Work Begun.

Many sales of apartment houses and lots have been made recently west of the Boulevard around the Hunts Point and Community buildings. The Johnson - Billings - Brady syndicate have begun work on their terminal development at the foot of Hunts Point. The city has voted $432,000 for a school on Spofford Avenue. The contract for the Subway has been let, and work will be commenced within a few days.

Some of the sales lately made in that locality include a plot of six lots on the north side of Seneca Avenue, twenty-five feet east of Longfellow Avenue to Emil Rothman; the northeast corner of Longfellow and Seneca Avenues, 25 by 100 feet, to Bernard De Passe; northwest corner of Longfellow and Lafayette Avenues, 150 by 100 feet, to the Prospect Holding Company, which resold the plot 50 by 100 feet, at the northwest corner, to E. Mayer, and the balance to the Riedt Realty Company; a plot 100 by 100 feet on the west side of Longfellow Avenue, 250 feet north of Lafayette Avenue, to the Prospect Holding Company, which resold it to Abraham Rieser and E. Mayer; the southeast corner of Edgewater Avenue and Seneca Avenue, running through to the Bronx River, and the block front on Seneca Avenue, running from Edgewater Road to the Bronx River, to R. Goldberg for the Hunts Point Realty Company, and seventeen lots on the west side of Edgewater Road, 100 feet south of Garrison Avenue, for the Hunts Point Realty Company, to Ray Bernstein and A. Mears, and a plot 100 by 100 on the east side of Bryant Avenue, 225 feet north of Lafayette Avenue, to the Kitchen Realty Company.

1914.



2016.

2019. P.S. 048 Joseph Drake Elementary School, Bronx

Just as the school established presence for the main street of 1914 Hunts Point for its newly immigrated residents - the built environment has completely transformed over the past 100+ years - but the location of the school and profound architectural symbolism of the structure and what it represents for the community is still present today.

CURRICULUM BUILDING

The most important aspect of the developed curriculum is for students to be exposed to as much of their community as possible within the boundaries and limitations of a public school program. There are multiple subjects at all levels of education that are appropriate for young students to take part in and to lead. The idea that kindergartens can sprout apple seedlings and then plants juvenile trees when they enter 7th or 8th grade presents students, families and residents with the opportunity to have ownership and self pride in their community.

Additionally, short term modifications to curriculum could connect the schools with programs already in place such as Five Borough Farm Project, which collects data from urban gardeners as well as community composting programs and street tree care. (See Urban Habitat Timescale for further details, page 64).

As a student grows through the grade levels in school - their education would include a base in the garden - and be just as acceptable as foundations in multi-language programs. Further research could guide specific curriculum programs for each grade level.

out of the computer

hands-on learning

On-site composting for full-cycle understanding of growing fruits and vegetables.

Contamination identification + temporary school gardens

Grow and harvest

Elementary School Activities

Elementary + Middle School

Rain garden and importance of supporting ecosystem for sustainability

Pop-up farmers markets and summer employment opportunities

Preparation and handling

Cooking skills

Soil preparation and treatment

Application of technology-based production and potential for future careers

High School

THE PROJECT:
Vacant Spaces + Streetscape

City designated vacant land and buildings are leading reasons for deteriorating community blocks and are related to crime-ridden areas, derelict streets and making it difficult for zones to prosper. With many years as designated land for transportation, manufacturing related to shipping industries and lots for commercial truck repairs, the city has been forced to label these lots as brown fields; contaminated land that must be remediated in order to re-zone or develop on the existing vacant lot.

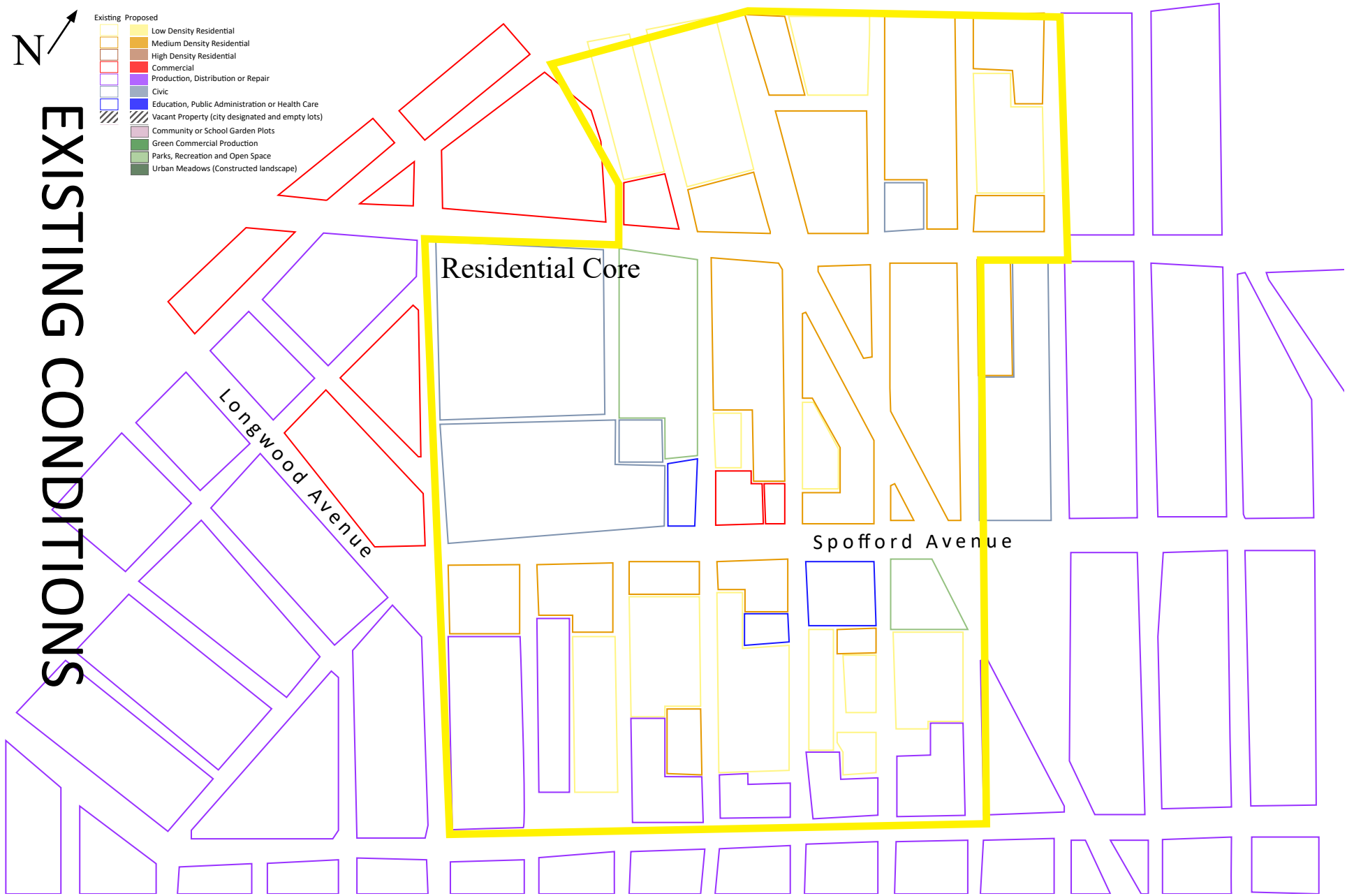
By imagining these contaminated lots re-zoned to allow "green infrastructure" for commercial agriculture - the cleaning of the sites can take place over use methods of biological remediation techniques.

IDENTIFYING POTENTIAL FOR RE-ZONING IN "BUFFER AREA"

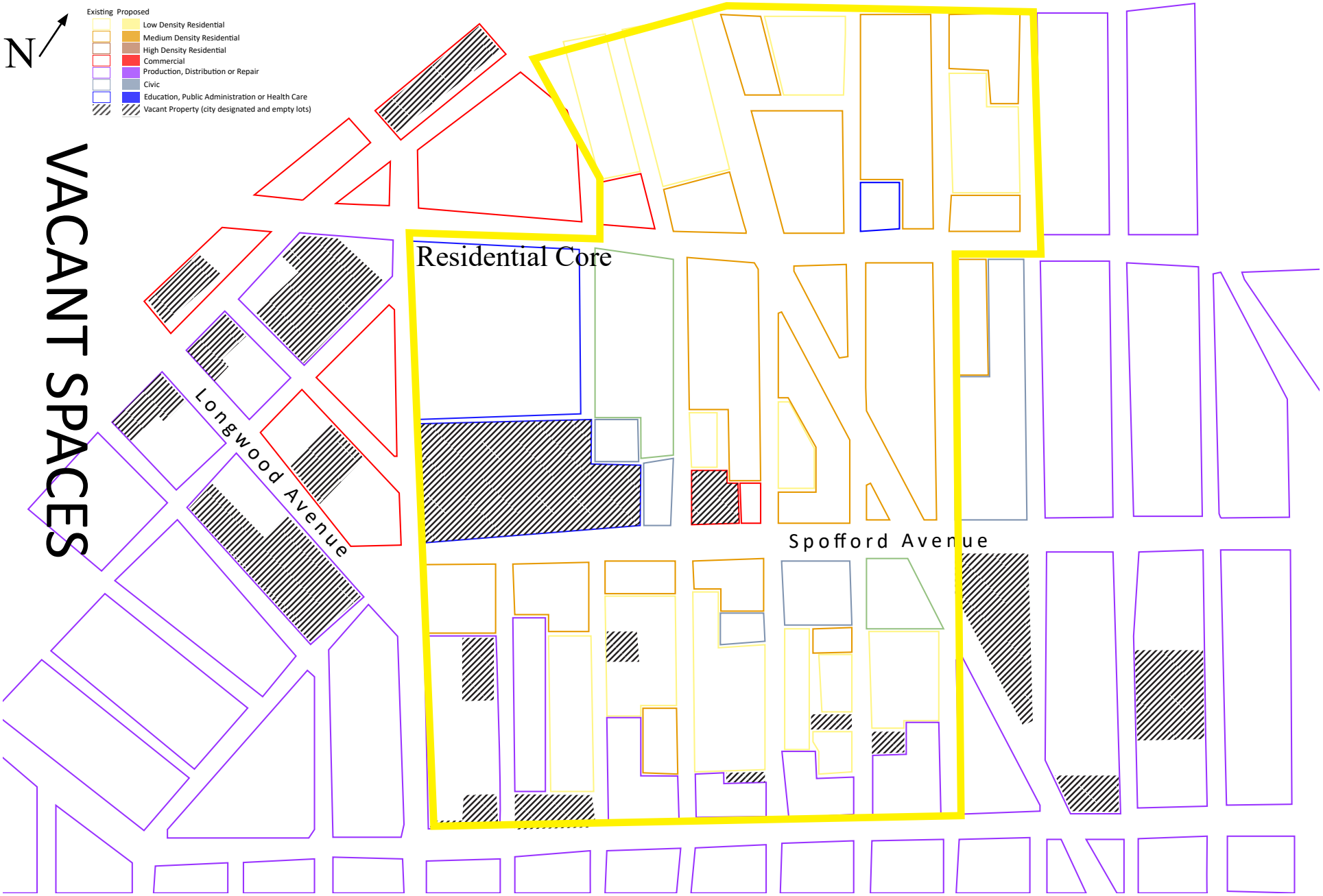
One of the challenges that the neighborhood of Hunts Point is faced with is the extent of the manufacturing and distribution areas in relation to the residential areas - with no "buffer zone." Leveraging city-allowed rezoning of the edge areas that 1) faced with many vacancies and 2) can serve as a separation zone between residential and industrial can allow for green protection of newly developed areas from heavy truck transportation routes and commercial bustle.

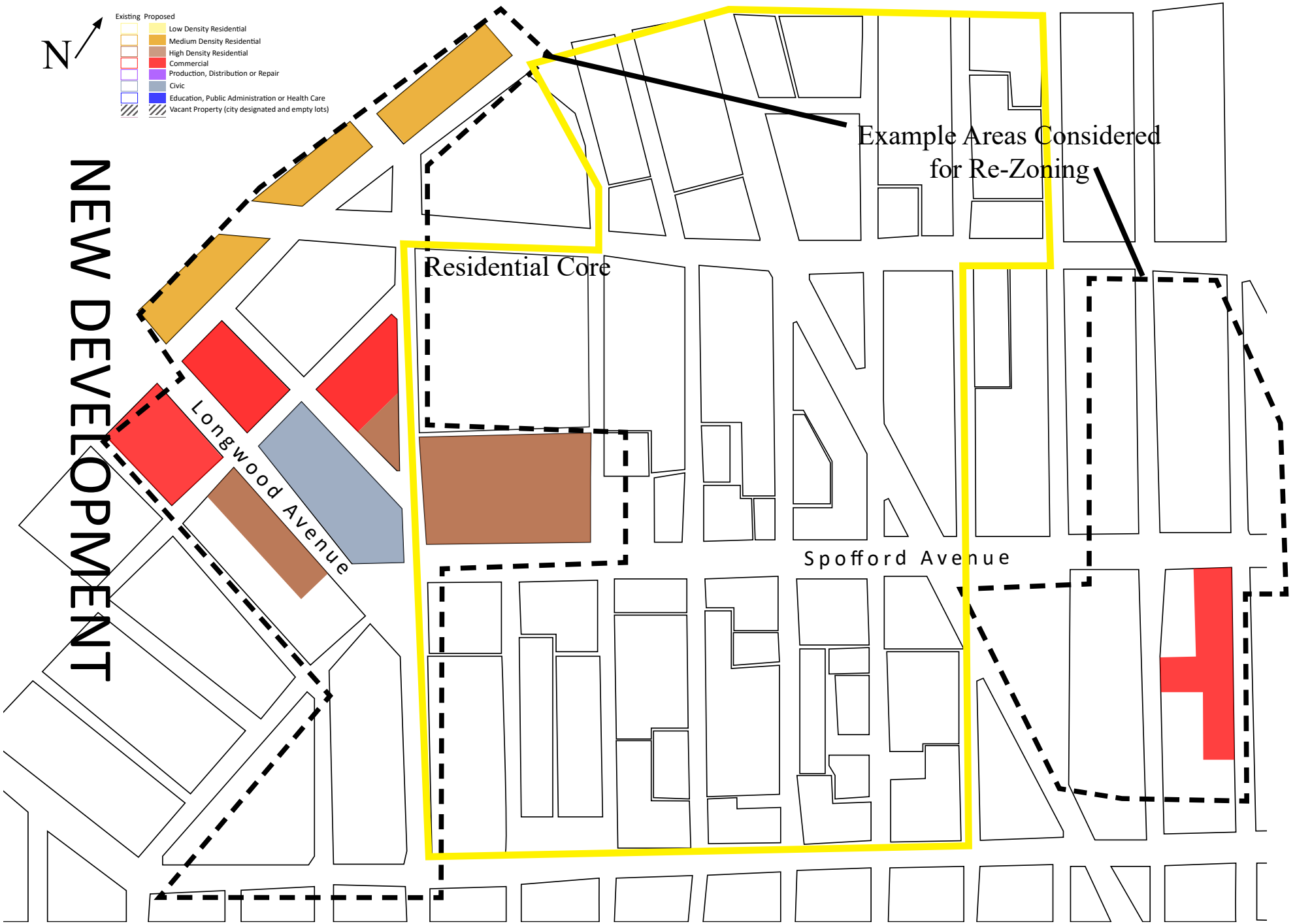
With the expectation of autonomous vehicles and efficiencies in commercial transportation methods, re-zoning previously commercial or industrial areas to allow for new development of medium density residential, commercial, educational and agricultural areas - the imagined corridor of the community can be transformed.

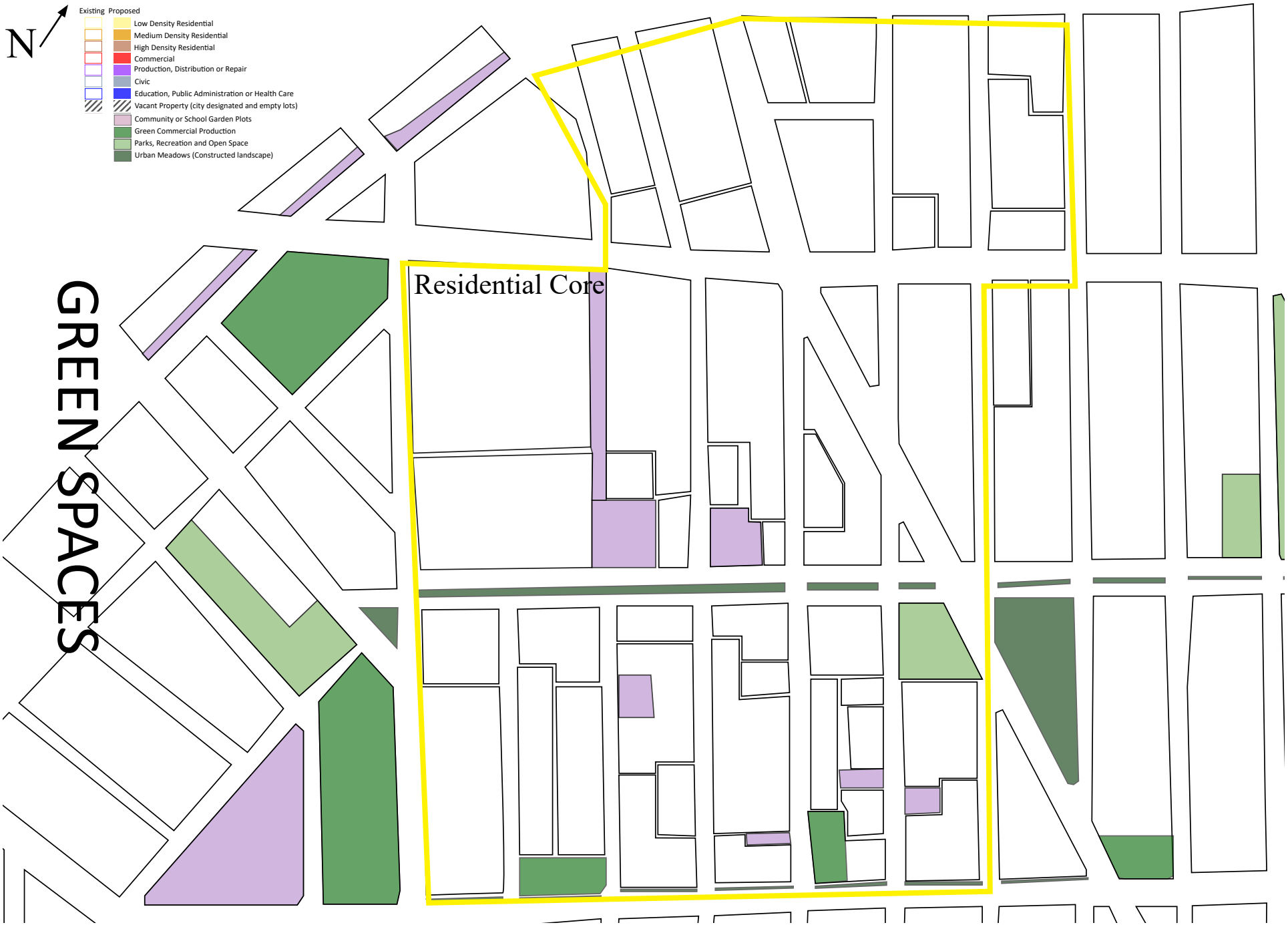
Source: The Hunter Urban Studio, Hunts Point Study, 2016

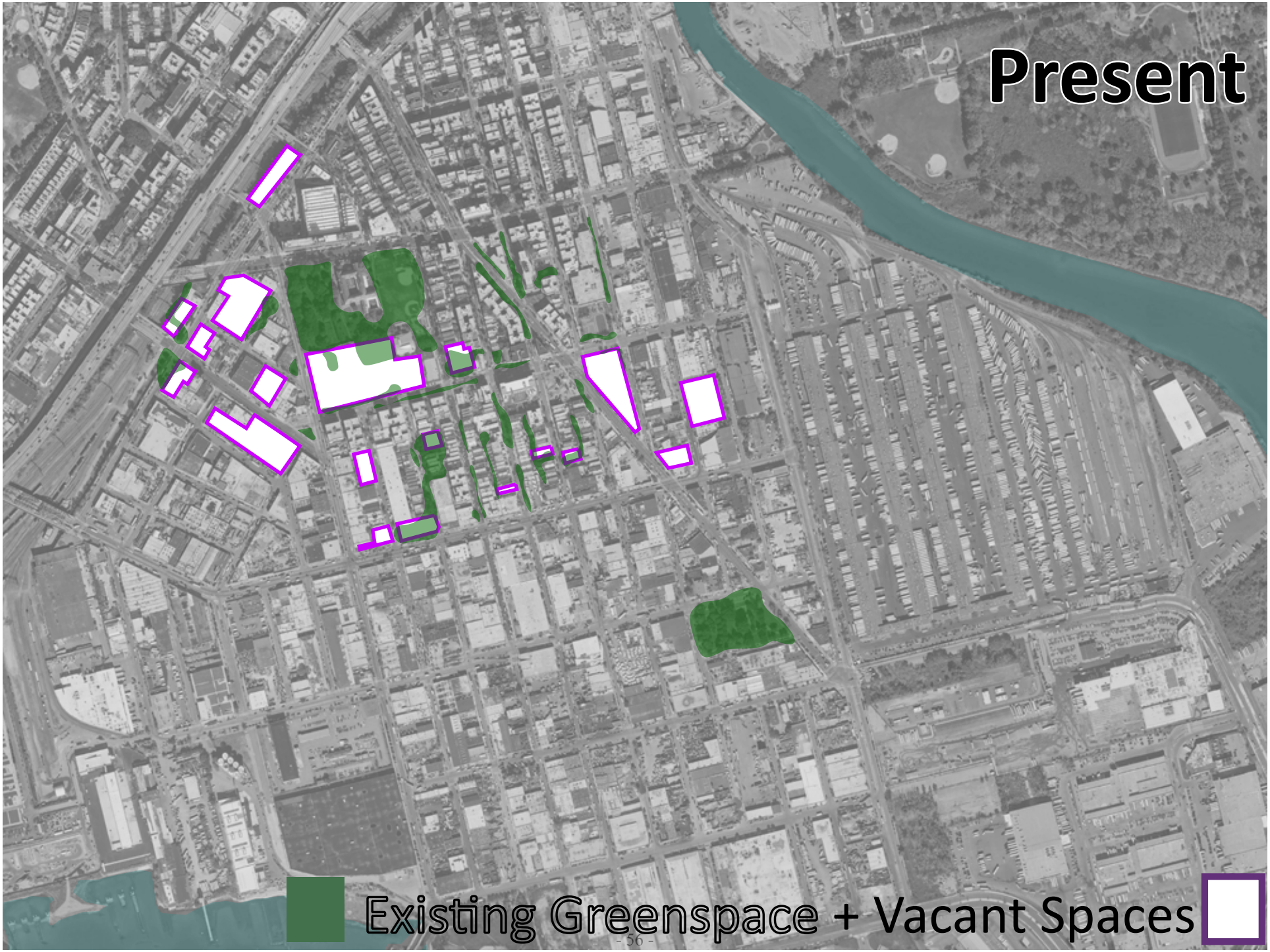


(Map diagram referenced in aerial project site outline, see page 35)

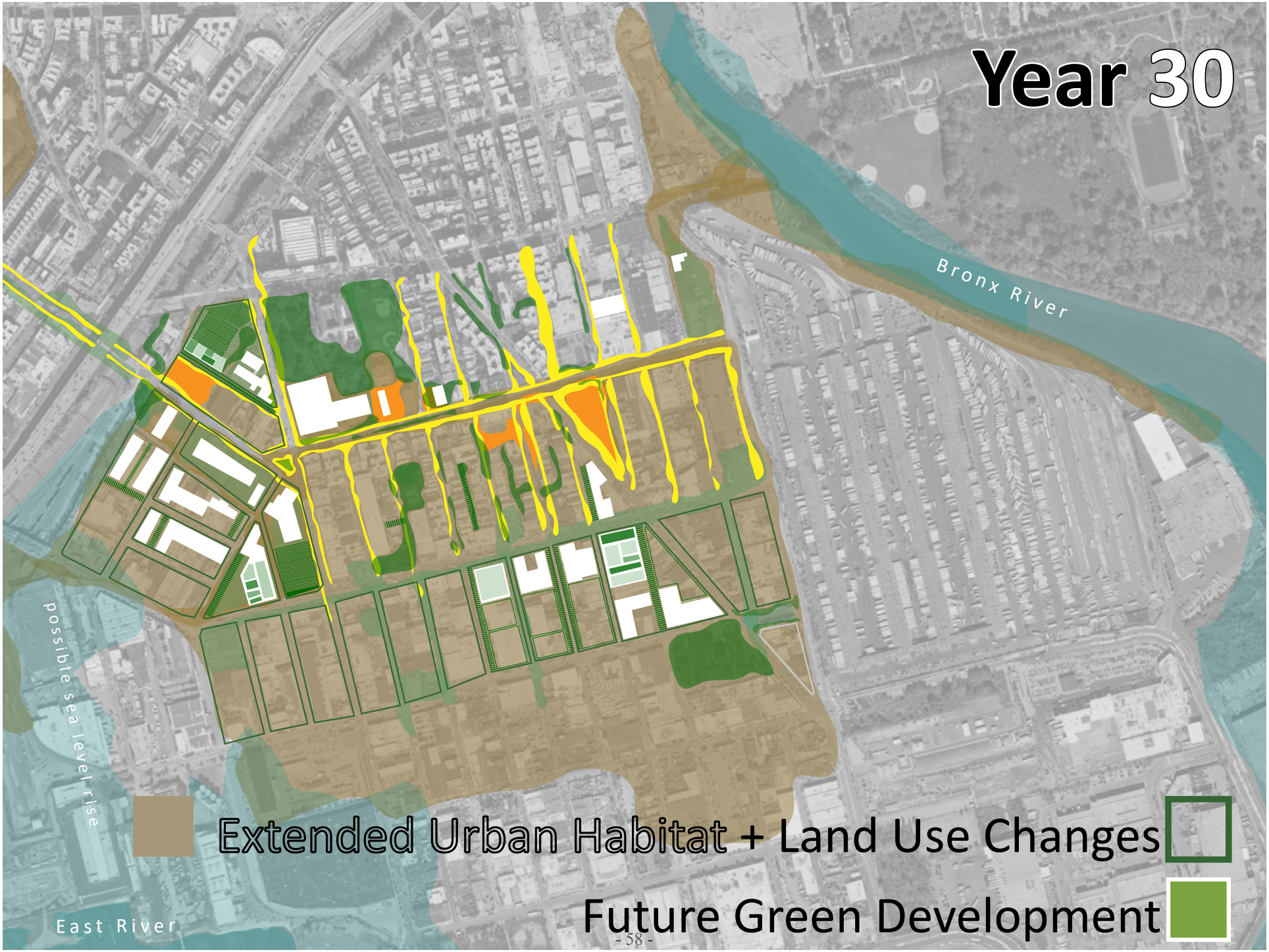

N
Existing Proposed
Low Density Residential
Medium Density Residential
High Density Residential
Commercial
Production, Distribution or Repair
Civic
Education, Public Administration or Health Care
Vacant Property (city designated and empty lots)
VACANT SPACES
Residential Core
Longwood Avenue
Spofford Avenue


N
Existing Proposed
Low Density Residential
Medium Density Residential
High Density Residential
Commercial
Production, Distribution or Repair
Civic
Education, Public Administration or Health Care
Vacant Property (city designated and empty lots)
NEW DEVELOPMENT
Example Areas Considered for Re-Zoning
Residential Core
Longwood Avenue
Spofford Avenue


N
Existing Proposed
Low Density Residential
Medium Density Residential
High Density Residential
Commercial
Production, Distribution or Repair
Civic
Education, Public Administration or Health Care
Vacant Property (city designated and empty lots)
Community or School Garden Plots
Green Commercial Production
Parks, Recreation and Open Space
Urban Meadows (Constructed landscape)
Residential Core
GREEN SPACES


Present
Existing Greenspace + Vacant Spaces


Year 10
Bronx River
East River
Streetscape Investment + Initial Remediation


Year 30
Bronx River
possible sea level rise
East River
Extended Urban Habitat + Land Use Changes
Future Green Development

THE PROJECT:
Urban Habitat Time Scale

Delving into the history and demographics of a chosen site is the initial and straightforward scientific approach to building the program of cultivating curriculum. However, the next process is more synergistic and cyclical – imagined ebbing and flowing to accommodate and invigorate fluidity, flexibility and a world in motion (1). This principle is grounded through urban ecology in the development of the process due largely in part to the dependent relationship of the community occupants and how they experience their surroundings. The time scale demonstrates the necessary duration of appropriate remediation for soil restoration but also is a continually phasing progression of landscape infrastructure that builds upon itself, framing the community development through a projective (2) approach. Additionally, it gives visualization of concurrent activities and efforts – some led by the greater metropolis and some national policy waiting for adoption within the local area. Recognizing these efforts is a composition of vitality and optimism for ecological and ethical standardization that should be available to all children in the living and learning environments.

Urban ecology, which is the scientific study of the urban system comprised of the built environment, biophysical characteristics and human and nature social interaction (3) , as a platform provides unprecedented opportunity to study evolutionary and adaptive process affecting urban biota (4). Advantageously, due to the drastic variations of urban environments- the study encourages a viewing of the human interaction with the environment, and vice versa, in a positive way. Having a preconceived expectation of flexibility within the program implantation over time – opens the process to exploration of human factors having unexpected influence on the urban environment. The focus on application of research strategies to reduce negative effects on humans and nature in urban environments can be the catalyst the world's cities need to bring the ideas of opportunity and improvement to our urban areas from a vision to reality. In the previous discussion of Sitopia (5), singular solutions most likely will not satisfy multiple, complex predicaments of proper housing for a rapidly growing urban (and most often) disadvantaged population and having the self-sustainable agricultural integration for a healthy population. Using the timescale allows for the visualization of multiple and complex predicaments to further explore potentials for efficiency in policy, leverage available funding as well the physical space of grounding the learning environment of the public schools. This organization strategy is the effort for building towards the project's priority of "the community is a school, the school is a community."

Beginning with opportunity, the project's program models is framed around the priorities of infrastructure, policy, grow space and learn space. It is a generational epoch, drafted to respond to particular social and ecological concerns, continuing evolving with each generation's engagement (6).

1. Wasserman, Judith. "A World in Motion: The Creative Synergy of Lawrence and Anna Halprin"; Landscape Journal, Vol. 31, No. 1/1; pages 33-52; 2012.
2. Imbert, Dorothee; Aux Fermes, Citoyens!; Ecological Urbanism; pp. 256-267; 2010.
3. Mcphearson, T. et al. "Advancing Urban Ecology Towards a Science of Cities"; BioScience, Vol. 66 No. 3; March 2016.
4. McDonnell, Mark et al. 2016. The Ecological Future of Cities; Science 352 (936-938).
5. Steel, Carolyn. TED Talk "How Food Shapes our Cities;" 5 October 2009.
6. Wasserman, Judith. "A World in Motion: The Creative Synergy of Lawrence and Anna Halprin"; Landscape Journal, Vol. 31, No. 1/1; pages 33-52; 2012.

PRECEDENCE

LAWRENCE HALPRIN:
A World in Motion

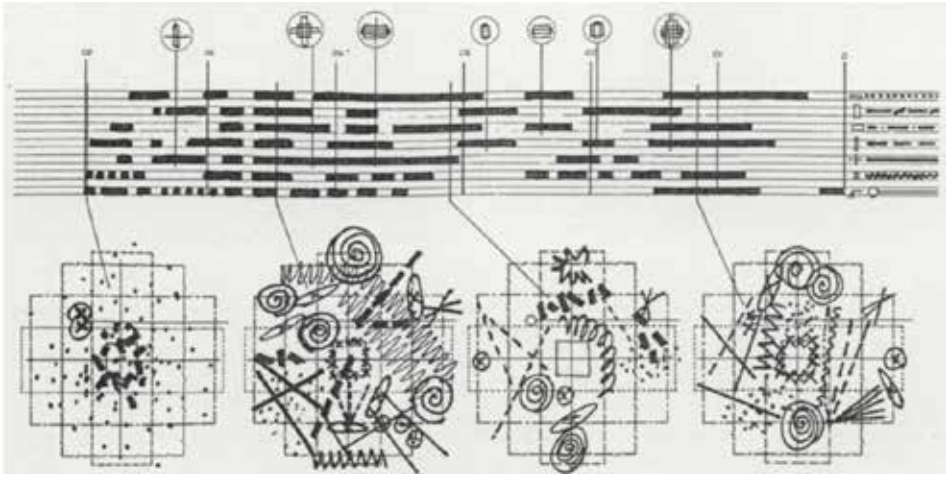


Image: Lawrence Halprin's scoring pattern for the Overhoff-Halprin 1962 World's Fair (Creative Processes in the Human Environment; reprinted by permission George Braziller, Inc., New York

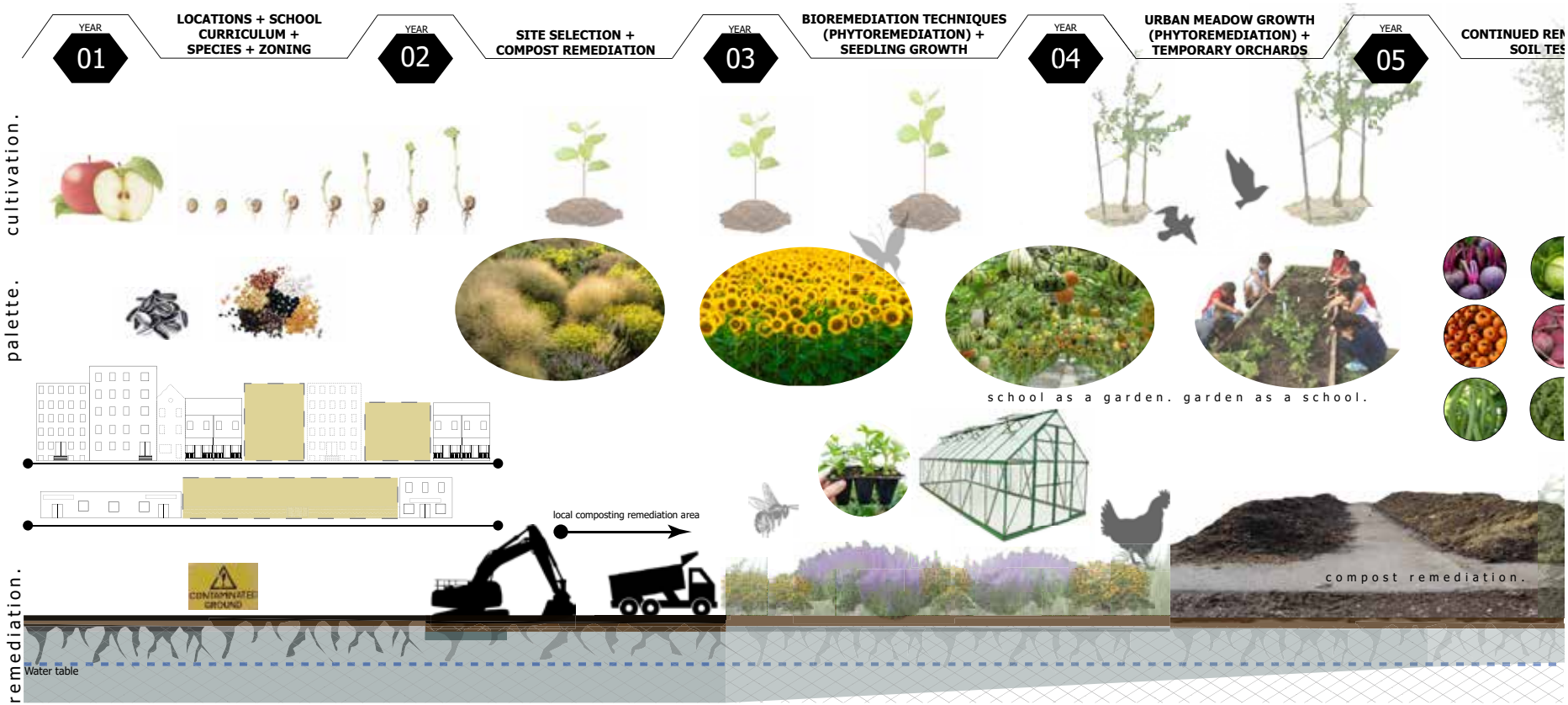
FRESH KILLS LANDFILL PARK: Lifescape by James Corner Studio

Fresh Kills Landfill, previously one of the largest landfill areas in the United States, was closed, capped and in the process of undergoing a multi-year, multi-effort transformation into a 2,000+ acre recreational park in Staten Island. With inspiration from its program of "Lifescape," is a vast ecological process of reclamation and renewal to recover biodiversity of ecosystems; an adaptation of management and stewardship of new forms of interaction among people, nature, technology and the passage of time (1).

Image: ARCH Daily, courtesy of NYC Parks and Recreation Draft Master Plan

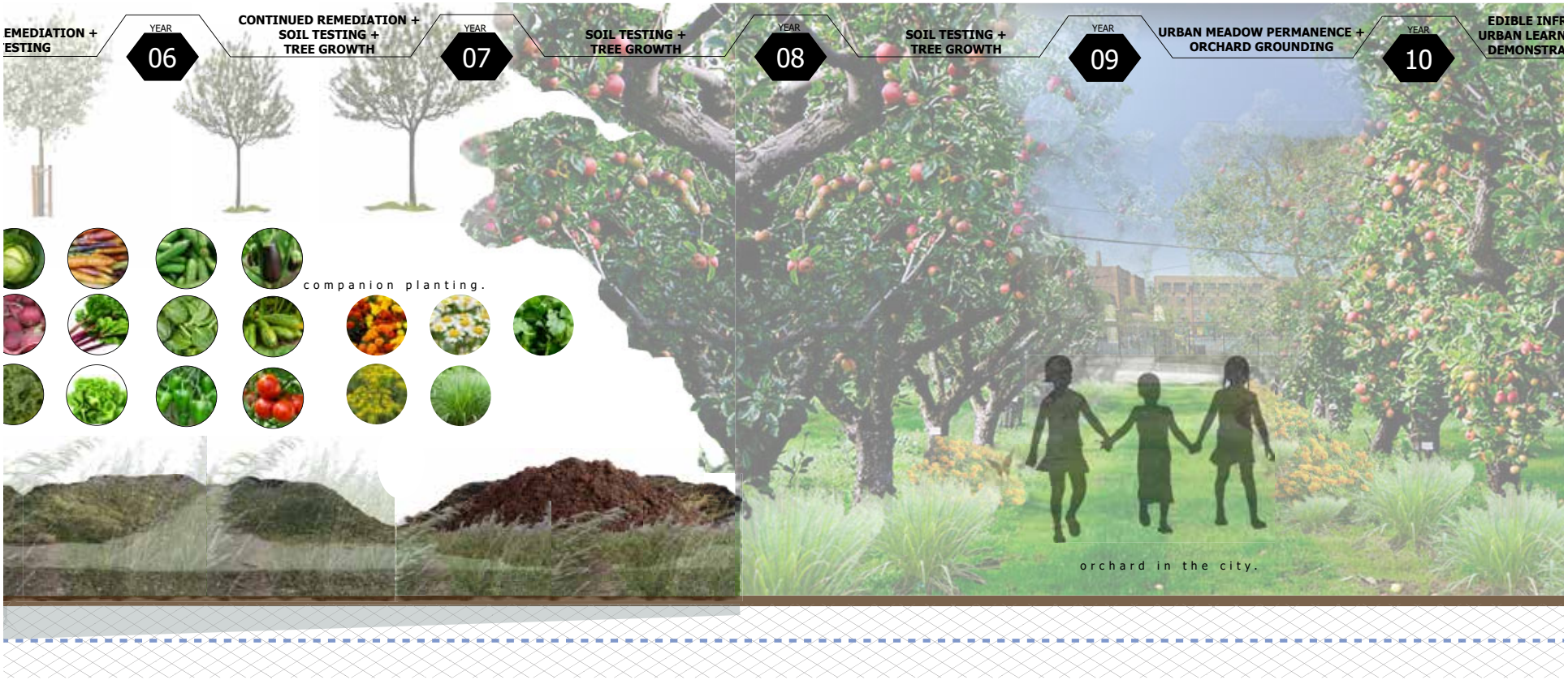
1. "Lifescape"; Freshkillspark.org/draft-master-plan

Early diagram for remediation, temporary grow spaces and permanent demonstration orchard vision.



Initially gaining inspiration from the fruition of a single apple seed to fruit-yielding mature tree lead me to researching the possibility of biological restoration over time to allow for such growth in urban contaminated soil. At the same time, the discussion of the temporary and the permanent for community place-making perpetuated this program for streetscape and learning space development.

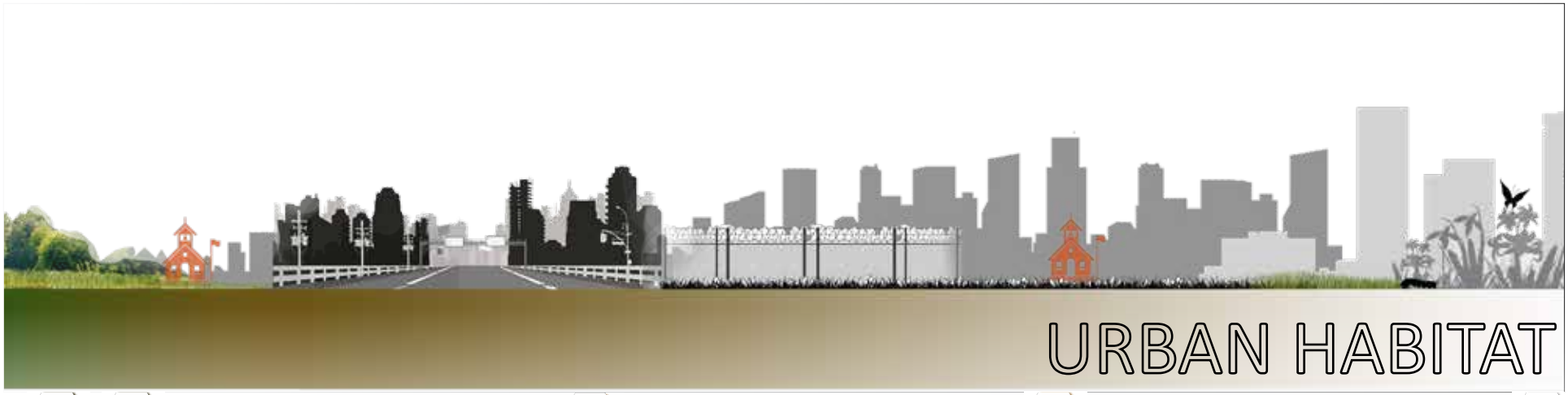
Temporary is the opportunity for a site to be used for the public good or remediation demonstration, such as in the case study example of Lafayette Greens in Detroit, MI (see page 16) which can almost transform a derelict site overnight, while the city passes a change in land use. Permanent installations, such as constructed bioswale along an entire street corridor, is not only an investment for localized stormwater control, but can seen as a daylighting of water to encourage biological restoration in the groundscape, supporting localized ecological connections throughout the community. The following pages depict the possibly leveraging of separate but related projects that uphold the intention of temporary and permanent place-making within the urban fabric.



Possibilities of Vacant Land: Phytoremediation and Design of both Temporary and Permanent Public Spaces (Learning Space and Grow Space)

Much research has been done over the past 40 years on biological remediation techniques to rid forgotten landscapes of contaminates in the soil. There are many benefits associated with the reuse of these sites to enhance the quality of life in the surrounding neighborhood, including to decrease crime, improved local environmental quality and increased property value (1). For the purpose of this research, phytoremediation techniques for vacant lots is twofold: 1) decontaminate soils using appropriate plants and vegetation and 2) provide temporary and permanent public usage for the sites. The planning of these sites is of utmost importance to not only aim to restore localized ecology, but also to connect the city landscape together – as a much larger installation and recognition of the importance of nature in the city. Studies have shown that people in a community prefer vegetated landscape to vacant land, and the benefits on the mental and behavioral outcomes have been demonstrated (2,3). Additionally, this thesis explores the psychological effect and potential outcome for young children exposed to the process, implementation, and education – offering them active participation in the progress of ecosystem restoration. The simple act of digging garden soil in preparation for spring planting triggers

(continues on page 69)



URBAN HABITAT

YEAR 01 05 10 15

NYC Initiatives

- Half of all NYC Public Schools have gardens
- 1,000 permits NYC Green Carts
- Public vote + policy approvals
- Truck Traffic Re-routing Masterplan
- Bike Lane Expansion
- Land Re-zoning
- **ALL** NYC Public Schools have gardens
- One million more street trees NYC
- NYC Pedestrian Street Initiative
- Hunts Point Fo… Construction Co…

- Condition of public housing + schools
- Expectancy for population growth
- Financial incentives for businesses
- Lack of access to healthy food choices

Population growth

Opportunity

where







Remediation Investment

- Vacant land recapitalization
- Soil sampling for contamination extent
- Soil compaction assessment
- Storm water contamination sources
- Biological remediation strategies presented
- Analysis of appropriate vegetation palette

- Decisions for *place-making* and *development*

Street Investment

Short term biological remediation

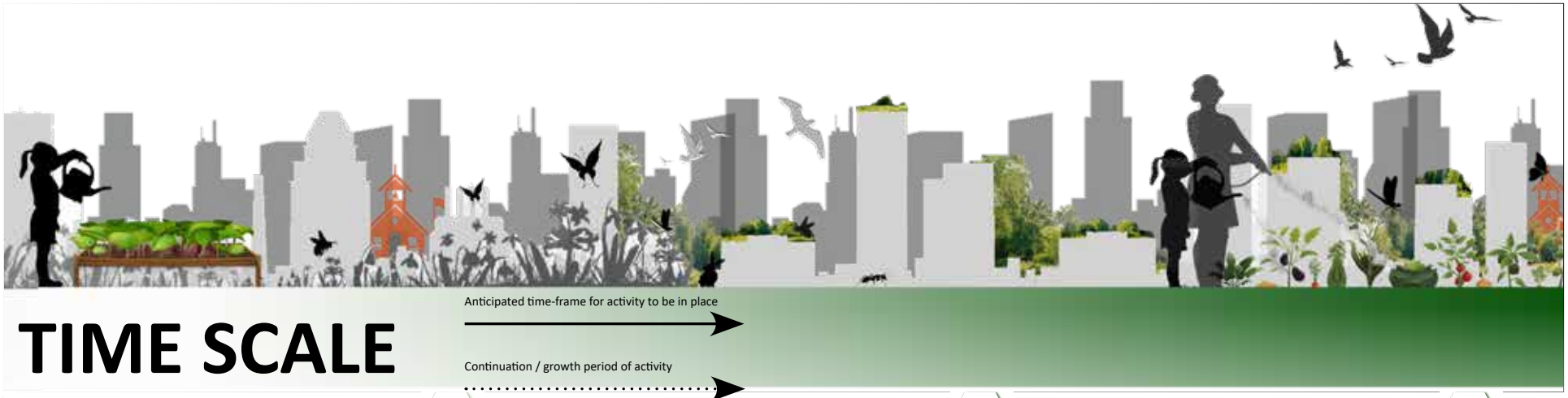
Long term biological remediation

Political Goals and Initiatives

Land Use Changes + Implementation

Existing Street Tree Palette

Street tree health +assessment



TIME SCALE

Anticipated time-frame for activity to be in place

Continuation / growth period of activity

20 25 30

od Hub
omplete

Significant Biological Remediation Complete

NYC Public Schools Rooftop Grow Space

Public vote + policy approvals

One million more street trees NYC

Car- Free NYC

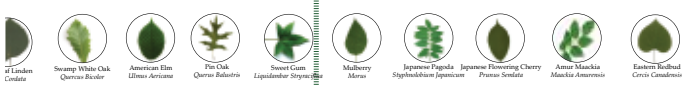
does our food come from??

Source: Edible Schoolyard project, Google Images

Imagined school rooftop garden, standard design specifics for all new school construction projects and retrofitting of suitable existing structure.

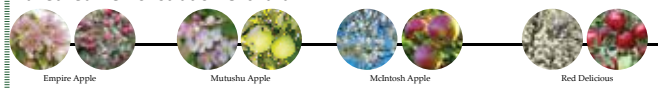
Imagined relationship between the school and its relationship to the community as a place of learning and part of the greater urban ecosystem.

Imagined orchard in the city



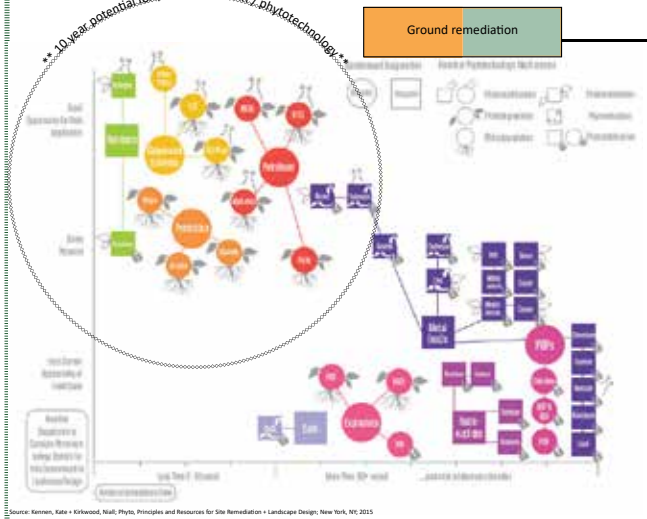
- Community Masterplan
- Street traffic patterns and planned transportation route improvement/ changes
- Bike lane improvements
- Soil compaction and testing
- Street parking needs
- Lane narrowing for recaptured public space

Palletized Demonstration Orchard



Street Tree Planting

Storm water mitigation + green infrastructure investments

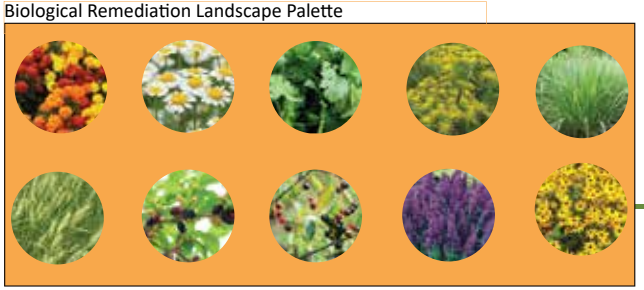


Source: Kennen, Kate + Kirkwood, Niall; Phyto, Principles and Resources for Site Remediation + Landscape Design; New York, NY; 2015

Ground remediation

Public utility upgrades + investments

Biological Remediation Landscape Palette

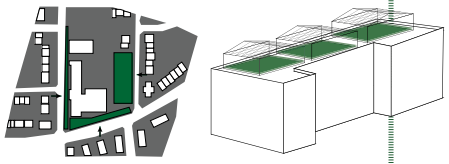


Source: Kennen, Kate + Kirkwood, Niall; Phyto, Principles and Resources for Site Remediation + Landscape Design; New York, NY; 2015

Edible Landscape I

School Infrastructure Assessment

School property assessment (ground and landscape infrastructure, pre-existing)



Suitability and Infrastructure Exploration

Roof re-structurin

Real Estate / Land investments

Public grounds mapping (Where and what will be invested)

Funding + investment strategies

- Leveraging existing public school infrastructure assessments to plan and project appropriate modification, investments, and applications for short term remediation, long term remediation and future school project sites.

Curriculum Building

- Evolution of learning <u>about</u> the environment, <u>for</u> the environment to <u>in</u> the environment.

- Determining appropriate grade level agricultural and subject specific activities for each age group.

School age children will e exposed to the appropriate level of gardening and agricultural skills as they advance in school. The thought is to apply as much hands-on learning as possible - and away from just simply reading about plants, nutrition, etc. Utilization of the entire city as their classroom, student would then be able to gain applicable understanding of their environment and the influence they have on their city at the earliest age possible.
The lasting psychological impact of learning in the environment can influence their entire adult life. Gaining the knowledge and confidence to grow something themselves, children have shown to develop a bond with nature and have a more pro-environmental attitude towards the world they live in (Tucker).

On-site composting for full-cycle understanding of growing fruits and vegetables.

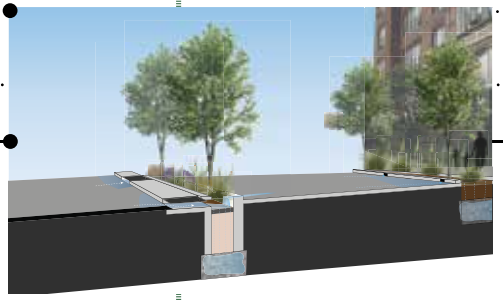
Contamination identification + temporary school gardens

Grow and harvest

Rain ga of supp

Permanent Transplant of Demonstration Orchard

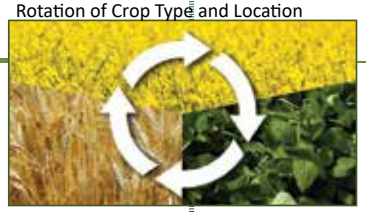
Orchard Producing Edible Fruit



Source: Tanner Springs Park, Portland, Oregon

Palette

Rotation of Crop Type and Location



Companion Planting Strategies

All soil remediated

g implementation

Restoration Cycles Begin

Agricultural land use

Hydroponics

rden and importance porting ecosystem for sustainability

Preparation and handling

Soil preparation and treatment

Aquaponics

Cooking skills

Pop-up farmers markets and summer employment opportunities

Application of technology-based production and potential for future careers

Husbandry

EDIBLE INFRASTRUCTURE + URBAN AGRICULTURAL PRACTICES

INVESTMENT:
Biological Remediation of Vacant Land

(continued from page 64)
strong emotions; a sense of connection to the earth, to the regeneration of life. It is an act of nurturance and an expression of faith in renewal (4).

It is an assumption for the location of Hunts Point, Bronx that the soils of vacant lots previously used for industrial purposes will most likely contain contaminates with properties other than lead , which through the coordination with phytoremediation specialist and landscape architects, these temporary and permanent public spaces would, over time, self-remediate with vegetation and could be leveraged as multi-functioning for environmental ecosystem restoration as well as for public and educational use within the time frame of a generation or less. Current knowledge of urban nature and remediation techniques permit more comprehensive solutions (4). The suggestion presented by Cultivating Curriculum is to establish a set of remediation guidelines, that through the expertise of multi-discipline, the research and implementation strategies would be applicable to many other cities and urban school grounds (1). Much testing of actual sites would have to be completed with the involvement of government, school and expertise to appropriately select species for specific geographic regions and contaminants. Choosing plant species that live in contaminated soil is the first crucial selection criterion. Plants that are hardy perennials, adapt to the local climate and will aggressively out-compete weeds and other plants are preferred. Once appropriate characteristics are met for the species, then evaluation, extraction degradation or stabilization capabilities can be further discussed (5). More specific technical research as well as the implications of compacted soils is beyond the scope of this thesis.

The intention for this thesis is to start the conversation. Phytoremediation techniques for vacant lots is possible over time and can involve the school curriculum from conception. Designing the system and programs to take place within the community space is just as important to this concept as the technical information and design of temporary and permanent spaces. This project is intentionally evolving and depends on time as a function of its success to become a hyper-localized environmental establishment as a part of a much larger evolution and conversation of the tripodal relationship of people, nature and the city. The ecosystem strategy analyses the interrelatedness of the different components of natural systems, as well as the human impact on their functioning and relies heavily on the understanding of natural resources management and urban forestry (6). This urban ecosystem is more than the sum of its parts – identifying the links in the network and their relative importance yields new insights and inspires more efficient deployment of activities, resources and space. Individual parts can be designed, over time, that serve more than one purpose in the ecosystem (4).

1. Hollander, J., Kirkwood, N., Gold, J; Principles of Brownfield Regeneration. Cleanup, Design and Reuse of Derelict Land; Island Press; Washington D.C.; 2010.
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6. Bradley, G.; Urban Forest Landscapes, Integrating Multidisciplinary Perspectives; University of Washington; Seattle and London; 1995.

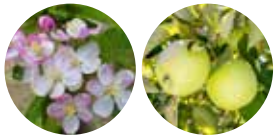
Vacant Lot: Temporary Orchard + Phytoremediation

Biological Remediation
Landscape Palette


200+ apple tree seedlings, temp. containers
Community Center
Neighborhood Preschool #2
Current abandoned lot/ building planned for neighborhood development (housing and retail)
Year 05
Elementary School (1 block east)

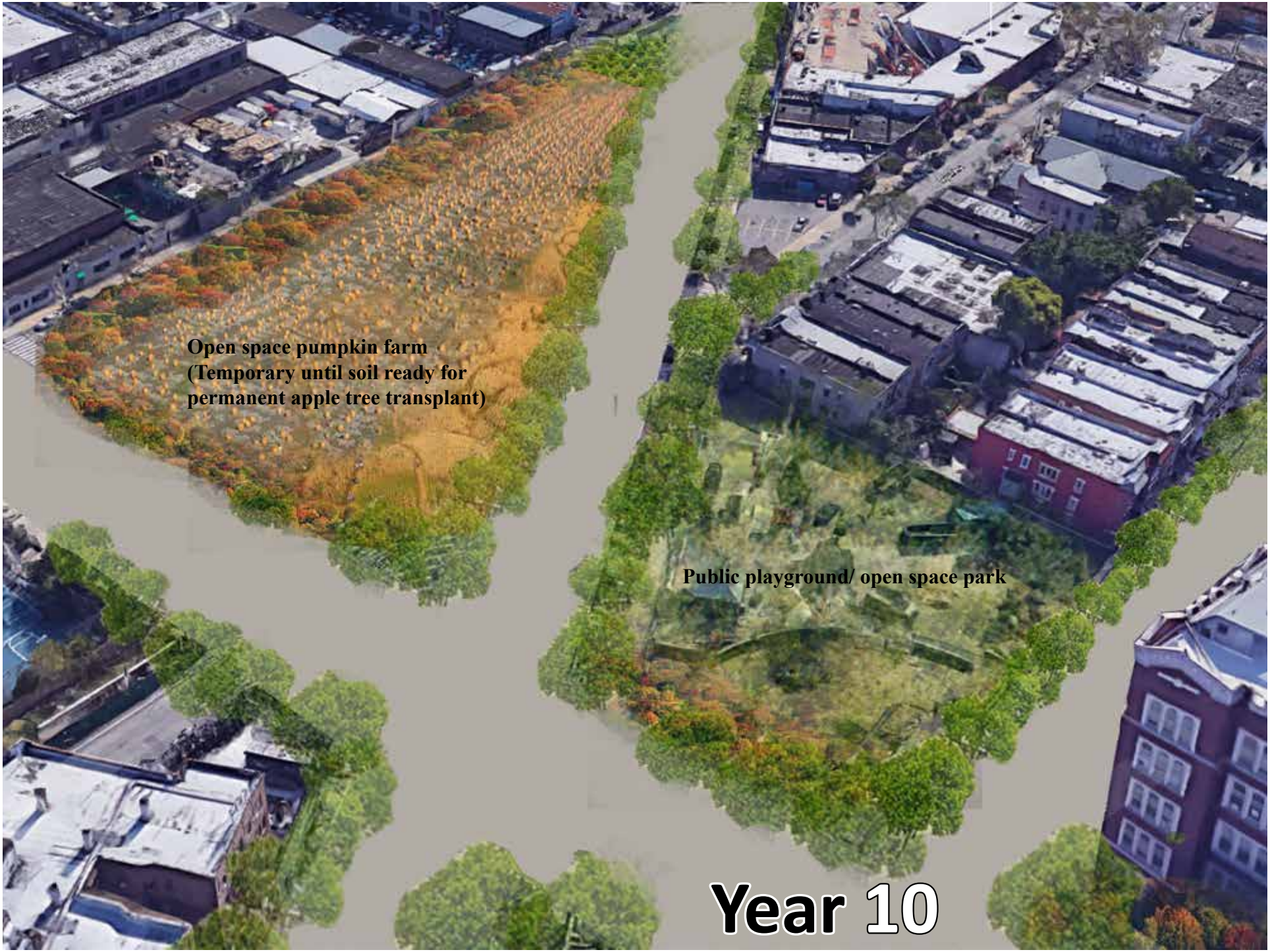
Long Term Remediation: Demonstration Orchard


Empire Apple


Mutushu Apple


McIntosh Apple

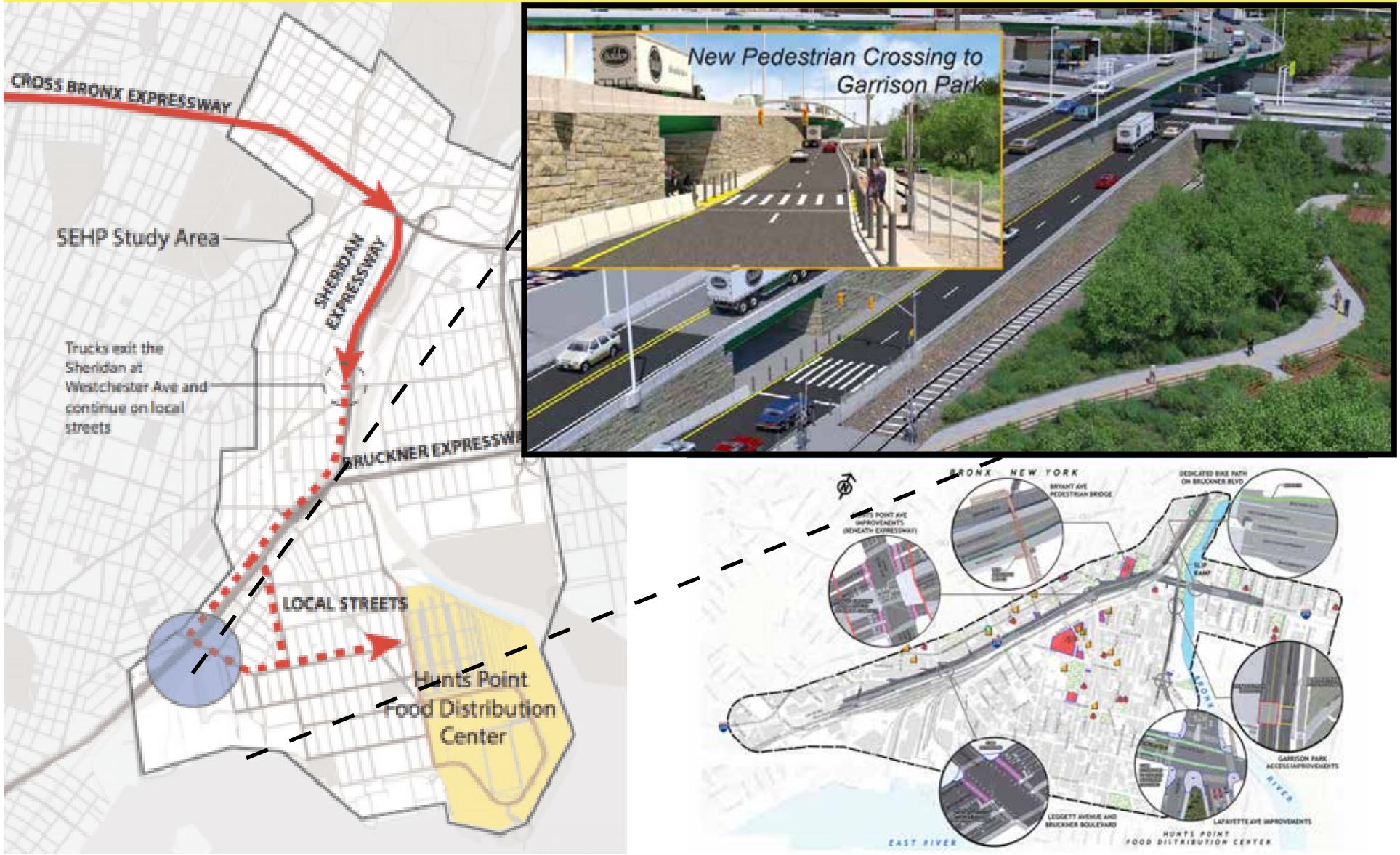

Red Delicious


Open space pumpkin farm
(Temporary until soil ready for
permanent apple tree transplant)
Public playground/ open space park
Year 10


Demonstration Orchard
~ 60,000 apples
produced annually
Year 30

INVESTMENT:
Streetscape + “Gained” Extension of Public Space

Streetscape: Remediation + Revitalization



Proposed truck route to keep congestion out of residential area (Spofford Avenue Corridor)
Source: www.dot.ny.gov

Street investment would transform not only the surfaces within the community, but also lead to multi-functioning constructed landscapes that encourage diverse and sustainable ecology and would reduce stormwater runoff. By controlling the stormwater where it falls, it allows infiltration and controlled ground water recharge with selected vegetation, trees and (eventually) edible landscaping. With the expectation of advancements to transportation and projected investment and construction of mass transportation, narrowing of streets and consolidation of street parking, and the eventual elimination the need for on-street parking entirely, allows for the possibly insertion and investment of the streetscape itself as a sustainable and thriving ecosystem within existing city grid.

Specifically in Hunts Point, the city is exploring the re-routing of heavy truck traffic for more direct on/off access from the highway to the Hunts Point Distribution Center. With the removal of heavy truck traffic from the residential corridor entirely, the streetscape can be transformed into pedestrian-friendly, safe and environmentally sustainable connections between the neighborhoods.

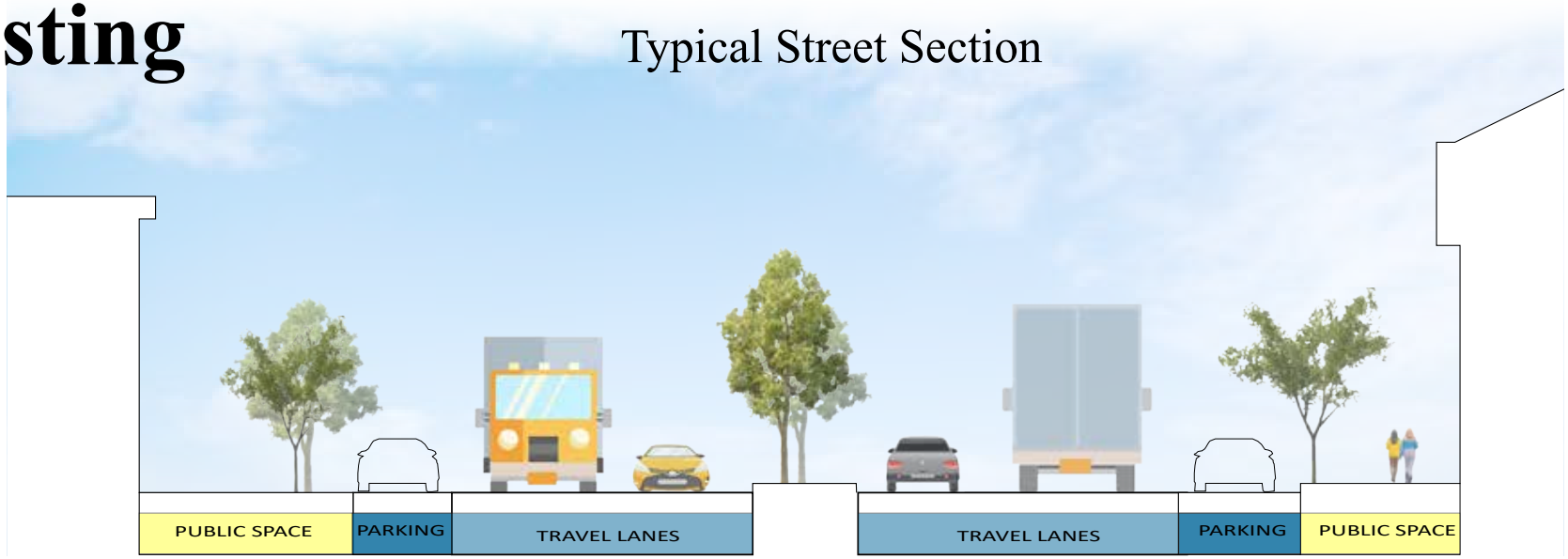
Precedence:

Thought holistically, street revitalization and investment encompasses multiple environmental needs, specifically in cities. Street investment now includes considerations for stormwater run-off, rain gardens, pedestrian-only and expanded public space- all of these green infrastructural changes encourage a transformation for how we use our streets in the city and what impact that may have on social interaction, the psychological effect on the resident of the city as well as the opportunity for learning spaces- literally right outside the front door of the school.

Example: SRF Consulting, 4th Street Stormwater

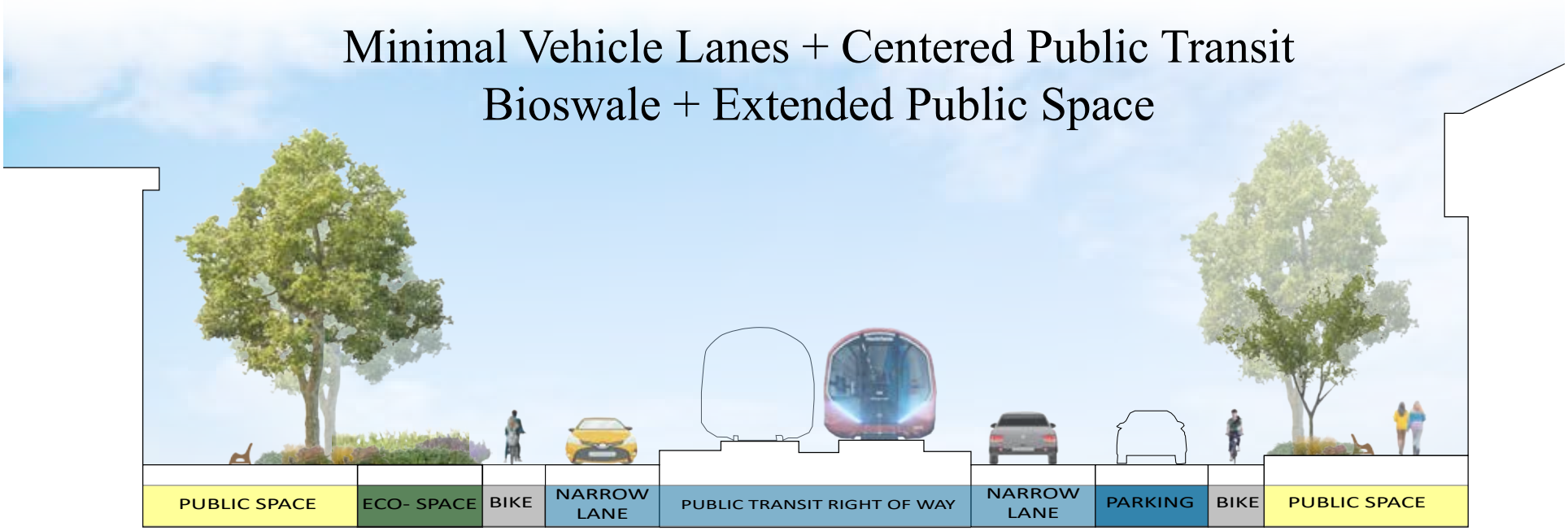
Example: SRF Consulting, 4th Street Stormwater

Existing



Year 10

Year 20+



Transportation technologies are exciting and advancing every year with the possibility of a future of autonomous vehicles and mass transit. With that in mind specifically in urban environments, there is the possibility of reducing the needed roadway space due to autonomous capabilities and gaining public space on both sides of the transportation corridor. The exploration of this thesis is in the possibilities of what that space would be and how it would function in the greater city network. By presenting multi-purpose solutions for example, a bioswale for stormwater control could naturally provide groundwater recharge for "grow space" along the public sidewalk.

Streetscape: Place-making

When the street is activated by place-making and temporary events, the street becomes an important opportunity for community interaction - social with each other, physical interaction with the nature and activity that is happen surrounding them and gives the sense of the importance on human well-being. When cities provide environments that people want to be in - there is a profound emphasis on pedestrian culture (1).

1. Speck, J. Walkable City: How Downtown Can Save America, One Step at a Time; North Point Press; 2013.


Source: NYC Summer Streets

INVESTMENT:
School Grounds

"When the school introduces and trains each child of society into membership within such a little community, saturating him with the spirit of service, and providing him with the instruments of effective self-direction, we shall have the deepest and best guarantee of a larger society which is worthy, lovely, and harmonious."

~John Dewey~

Educators have long been defending of the value of hands-on learning for centuries, such as the teaching methods of John Dewey (1), whose theoretical concepts included the benefits of service-learning. Which lends an interesting and important concept of "citizenship" development to a young child in their education environment. Derived from this concept, school aged children would be exposed to the appropriate level of gardening and agricultural skills as they advance in school. The thought is to apply as much hands-on learning as possible - and away from just simply reading about plants, nutrition, etc. Utilization of the entire city as their classroom, student would then be able to gain applicable understanding of their environment and the influence they have on their city at the earliest age possible.

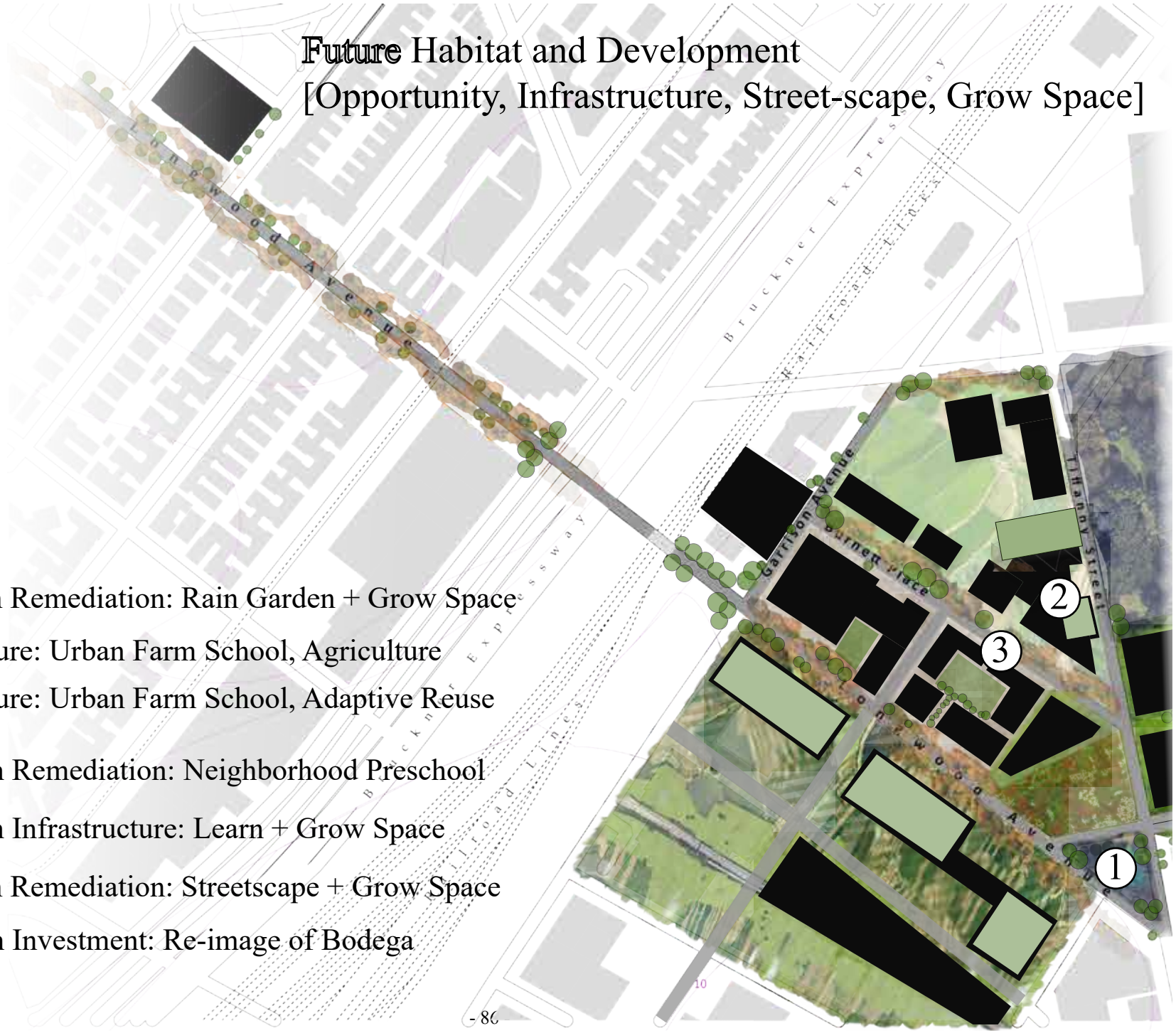
The lasting psychological impact of learning in the environment can influence their entire adult life. Gaining the knowledge and confidence to grow something themselves, children have shown to develop a bond with nature and have a more pro-environmental attitude towards the world they live in (2).

1. Giles, Jr., D. and Eyler, J.; "The Theoretical Roots of Service-Learning in John Dewey: Toward a Theory of Service-Learning"; Michigan Journal of Community Service Learning; Fall 1994.
2. Tucker, PhD, Richard and Izadpanahi, PhD, Parisa; "Live Green, Think Green: Sustainable School Architecture and Children's Environmental Attitudes and Behaviors;" Journal of Environmental Psychology 51 (2017) 209-216.

Short Term Investment: Teaching + Grow Space

INVESTMENT:
Short + Long Term Master Planning

Future Habitat and Development
[Opportunity, Infrastructure, Street-scape, Grow Space]



① Long Term Remediation: Rain Garden + Grow Space

② Infrastructure: Urban Farm School, Agriculture

③ Infrastructure: Urban Farm School, Adaptive Reuse (entrance)

④ Short Term Remediation: Neighborhood Preschool

⑤ Short Term Infrastructure: Learn + Grow Space

⑥ Long Term Remediation: Streetscape + Grow Space

⑦ Long Term Investment: Re-image of Bodega


Hunts Point Avenue
Spofford Avenue
Spofford Avenue
7
4
5
6

Existing

① Greenspace: Rain Garden + Grow Space

As a low point in topography, this intersection is a great example of a long-term street investment of designed sustainable infrastructure for stormwater management and expanded public learning space. The future rendering on the follow depicts the possibilities for an urban rain garden and outdoor classroom that could be associated with the school network and community.

Future

Existing

② Infrastructure: Urban Farm School, Agriculture

Utilizing existing structures previously used as mechanic garages, could become an new site for a secondary school, should the population increase as expected. The vision for the school would be a demonstration of phytoremediation over time and the possibility for it to house the teaching and practicing of husbandry in an urban environment, along with more advanced agricultural teaching methods appropriate for advanced grade levels.

Future

Existing

③ Infrastructure: Urban Farm School, Adaptive Reuse (entrance)


NEW YORK

Infrastructure: Urban Farm School, Adaptive Reuse (entrance)


BRONX URBAN
FARM SCHOOL

④ Greenspace: Short Term Remediation at Neighborhood Pre-K

⑤ Short Term Investment: Grow + Learn Spaces

P.S. 048 Joseph Drake Elementary School

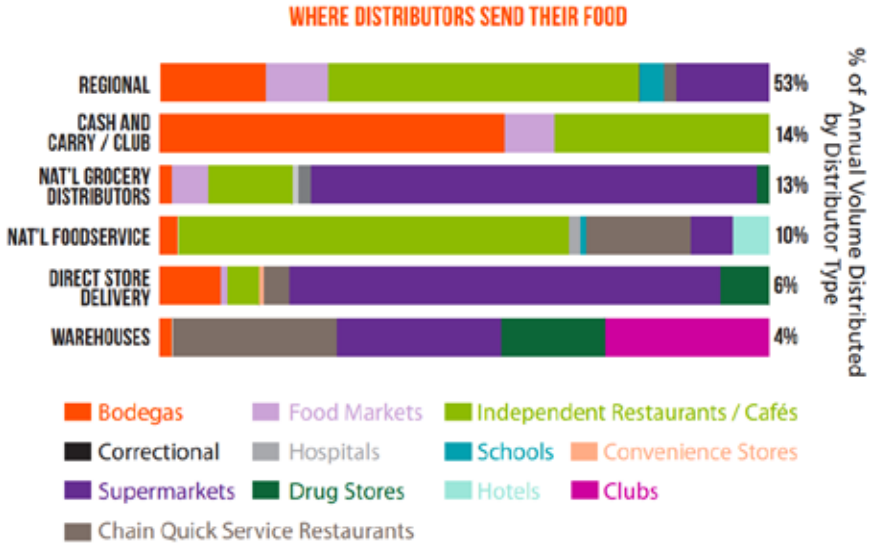
⑥Greenspace: Long Term Investment of Street (Spofford Ave)


FRESH
PRODUCE
SELF-DRIVING SHUTTLE
ST Kinetics
navya

Source: (Food Distribution in New York City, NYC Economic Corporation, Mayor's Office of Recovery and Resiliency, 11/29/2016)

⑦Long Term Investment: Re-image of Bodega

With the expectation that reliance on smaller grocers in the NYC area will only increase over the next few decades, it is that much important to leverage that access to the population with widespread availability of fresh, preferably locally grown food. This does not replace regionally distributed food or mono-culturally produced consumables, but it does address the food gap for many in disadvantaged communities.




Nelly's Grocer
Fresh Food Daily – Grown on Site
Order Here

DISCUSSION + REFLECTION

Cultivating Curriculum has presented itself as an on-going and cyclical process - it is not devoid of a conclusion, but rather thought of dimensionally: a rhombus of continued environmental adaptation. The imagined 30-year urban landscape from now not only will not appear as I have imagined it 30 years previously, but the imagination 30 years beyond that will also be a different transformation as I have pictured for this thesis discussion.

The list of occupations and specialized skills it would take to bring this imagined world into fruition is by no means exhausted – but the relating topics and extension researching of commonalities can be bring light to efficiencies and common goals.

It is a safe statement that education reform will always be reinventing itself out of necessity – finding new teaching methods and harnessing new technologies to prepare our youth to lead the us into the future. However, viewing this education holistically from an urban ecology and environmental landscape lens, allows addressing of global issues like sustainable access to fresh food to become a human right by inclusion into the public urban landscape and public education. So much effort has been put forth to frame the education setting to guide children to success – and Cultivating Curriculum interjects program and policy around inevitable maintenance to leverage sustainable infrastructure to address a multitude of urban challenges that stall disadvantaged communities through vitality.

I am excited, inspired, humbled, motivated, determined and empathetic for the future of our cities, education and the world for our children. This project has gone through a few evolutions during the research phase, but the outcome is a glimpse of the possible and what I strive for in my profession and education.

If you were to close your eyes, where does your imagination take you in the framework of Cultivating Curriculum?

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IMAGE CREDITS

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ARCH Daily, Edward Souza; 18 May 2019.

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ASLA 2012 Awards, Lafayette Greens, Detroit, Michigan

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The Third Landscape, Gilles Clement, 2004

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Greater NYC map; Source: www1.nyc.gov/site/doitt/initiatives/3d-building.page

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Edible Schoolyard Project + Edible Schoolyard NYC

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The Hunter Urban Studio, Hunts Point Study, 2016

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Lawrence Halprin's scoring pattern for the Overhoff-Halprin 1962 World's Fair (Creative Processes in the Human Environment; reprinted by permission George Braziller, Inc., New York
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