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CONCEPTS FOR A POST-GLOBALIZED **URBAN AGRICULTURE** SYSTEM IN NEW YORK

DALE LUEBBERT | MENTOR: CHRIS FORD | GRADUATE DESIGN THESIS 2009

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The censorship never gives up. It always comes back in a disguise.
Brazilian Press Association.
100 Years Fighting for Freedom of speech.

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PROJECT STATEMENT

Current pressures in today's world caused me to investigate strategies of change in the organization of society to promote a more efficient existence. Globalization, a movement characterized by the dissemination of economies, ethnicities, media, ideas, technologies, and production; has become today's reality. The shift from imperialism to globalism has caused a decline in the power and importance of nation states and a rise in the power of multi-national corporations operating within this globalized society.

The investigation focuses on globalism's physicality and the fact that its existence is reliant upon access to inexpensive energies, which is not today's reality. This dependence on energy will cause the collapse of globalism in the physical sense. Corporations will no longer be able to use their worldwide networks of production and distribution because transportation costs will far outweigh the costs of production of their products. In an ever more globalized society the production of goods has become increasingly cost effective for multi-national corporations. As the intensity of globalized supply chains increases so does the demand for energy. This inefficient means of production and distribution has driven up the cost of energy and corporations have begun to reduce the distances that their goods must travel because of this increase. If one can assume that these two trends are proportionally related, then as the cost of energy continues to rise the collapse of the globalized supply chain will soon follow. This power structure, once localized, will become inherently dominant. Multi-national corporations that respond first to these global changes will be the ones that flourish in this environment. It is not in the pursuit of ideological sustainable living that these entities exist, but toward the pursuit of profits. The corporate powers that globalism as a process has allowed to flourish as the power structures within society will become the agents of change in pursuit of their own self-fulfilling desires, they have no desire to act socially but in the pursuit of profits they must sustain the consumer. ConAgra claims to be acting more sustainably by collapsing their supply chain and finding synergies, but the actual motivation of these strategic moves is to reduce costs and increase profits.

This premise, along with increasing urban populations and densities, make it economically-feasible and essential for companies to localize production and distribution in urban areas. Over the last 100 years populations in general and urban populations have skyrocketed and these trends are forecasted to continue. In 1900, the world's population was 1.65 billion, today it is 6.7 billion and the UN's conservative estimates put the global population at nine billion by 2050. In 1900, 10 percent of the world's population lived in urban areas, in 2007 that figure passed the midpoint at 50 percent, and by 2050 predictions put the world's population living in urban areas at a minimum of 75 percent. It is possible to reference how similar the tendency of humans to concentrate their numbers in a limited space is similar to the social behavior of ants and certain other insects. This observation suggests that the evolution of modern man could eventually prove a fatal one in that gradually all individuality will disappear and the ultimate human society will be that of a huge insestate robot state. I, of course, am not prepared to recognize the possibility that our density will take that shape, yet the tantalizing thought persists that a theory projecting such a bleak outlook may not be completely imaginary. The collapse is upon us, of that there is no doubt, with consequences we cannot yet measure.

In pursuing the investigation in the post-globalized context production of food takes precedent over any other type because its production is highly globalized and it is a fundamental need for life. The current industrial food system was studied to gain an in-depth understanding of the means by which food is produced and distributed. A Healthy Choice meal, a ConAgra product, was mapped from its beginnings on the industrial farm to my microwave. This research proved how inefficient and unsustainable the current system is, further justifying a localized food system. The American food industry burns nearly a fifth of all of the petroleum consumed, about as much as automobiles do. Today it takes between seven and 18 calories of fossil fuel energy to deliver one calorie of food energy to an American plate. (Pollan 183) Our current food system, including food processing and distribution, claims about 28% of total US fossil energy use, with about 1/3 of this total used at the farm level. We use about 10 kilocalories of fossil energy for every kilocalorie of food energy produced, not counting the energy use in final food preparation, and at the farm level, American agriculture uses about 3 kilocalories of fossil energy for every kilocalorie of food energy produced. (Ikerd 299) When humankind acquired the power to fix nitrogen, the basis of soil fertility shifted from a total reliance on energy from the sun to a new reliance on fossil fuel. When you add together the natural gas fertilizer to the fossil fuels it takes to make the pesticides, drive the tractors, and harvest, dry, and transport the corn, you find that every bushel of industrial corn requires the equivalent of between a third and a half of a gallon of oil to grow it-or around fifty gallons of oil per acre of corn. Before the advent of chemical fertilizer farms produced more than two calories of food energy for every calorie of energy invested. (Pollan 44)

Production of food in urban areas is not a new idea. According to the USDA, a third of America's agricultural output comes from urban or metropolitan areas. The US Government's Urban Gardening Program estimates that a $1 investment in food growing projects in cities yields $6 of produce. During the two World Wars, urban agriculture flourished in England and America. The threat of starvation posed by blockades and rationing of food prompted campaigns to increase indigenous food output, much of it from urban agriculture. During World War I, the number of allotments roughly tripled from around 450,000 to 1.5 million. At the outbreak of World War II, the UK's minister of agriculture launched the 'Dig for Victory'

campaign, as part of which more than half of all manual workers produced food from either an allotment or their gardens. Today, economic hardship is the main reason why urban agriculture is so common in cities in developing countries. Across Chinese cities, 85 percent of vegetables consumed by residents are produced within those cities, and Shanghai and Beijing are fully self-sufficient in vegetables. The environmental benefits of urban agriculture are as much an incentive for growing food in cities as the economic ones. The current global food economy is heavily reliant upon nonrenewable resources and generates a large amount of waste. Growing food in the city shortens the distance between producer and consumer, thus cutting energy consumption considerably. (Doron 53)

Traditional urban agriculture cannot make a significant impact upon the industrial food system in high-density cities with large populations, such as New York City, for many reasons. Extremely high land values within the city would make outputs from the system very expensive. Also, if all of the available vacant land and parks were converted to agricultural purposes, at the current rate of 1.24 acres of farmland needed per person each year (Pimentel 317), it would only be able to feed 40,266 people, hardly a significant impact in a city with a population over eight million.

Therefore, the proposed network engages the water for the production of food in order to have a scalable system capable of generating yields to supplement a high percentage of New Yorker's diets. This model avoids the problems of producing food on land that is more economically suited for office buildings. The architectural components of this system were explored, mainly, the production vessels, the interface on the waterfront, and retail components throughout the city. The interface facilitates the off-loading of goods from the water-based production facilities, as well as many other functions. The retail nodes enable the sale and distribution of fresh food to the citizens of New York in areas of high density and with a strong coloration to the subway system. The intention of the network is to raise an awareness of the benefits of a localized food system, while acting as a catalyst for change.

McDonald's™

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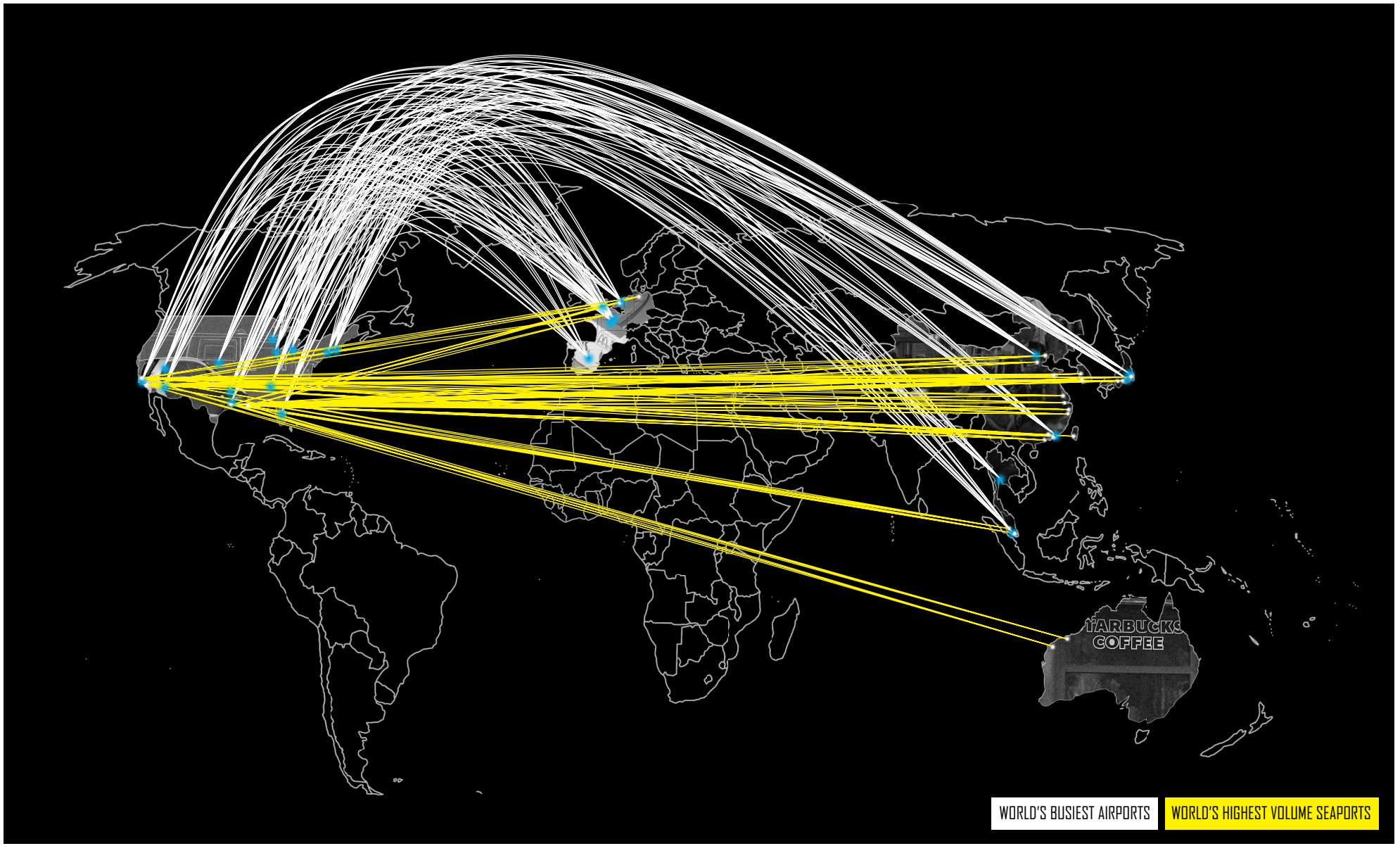
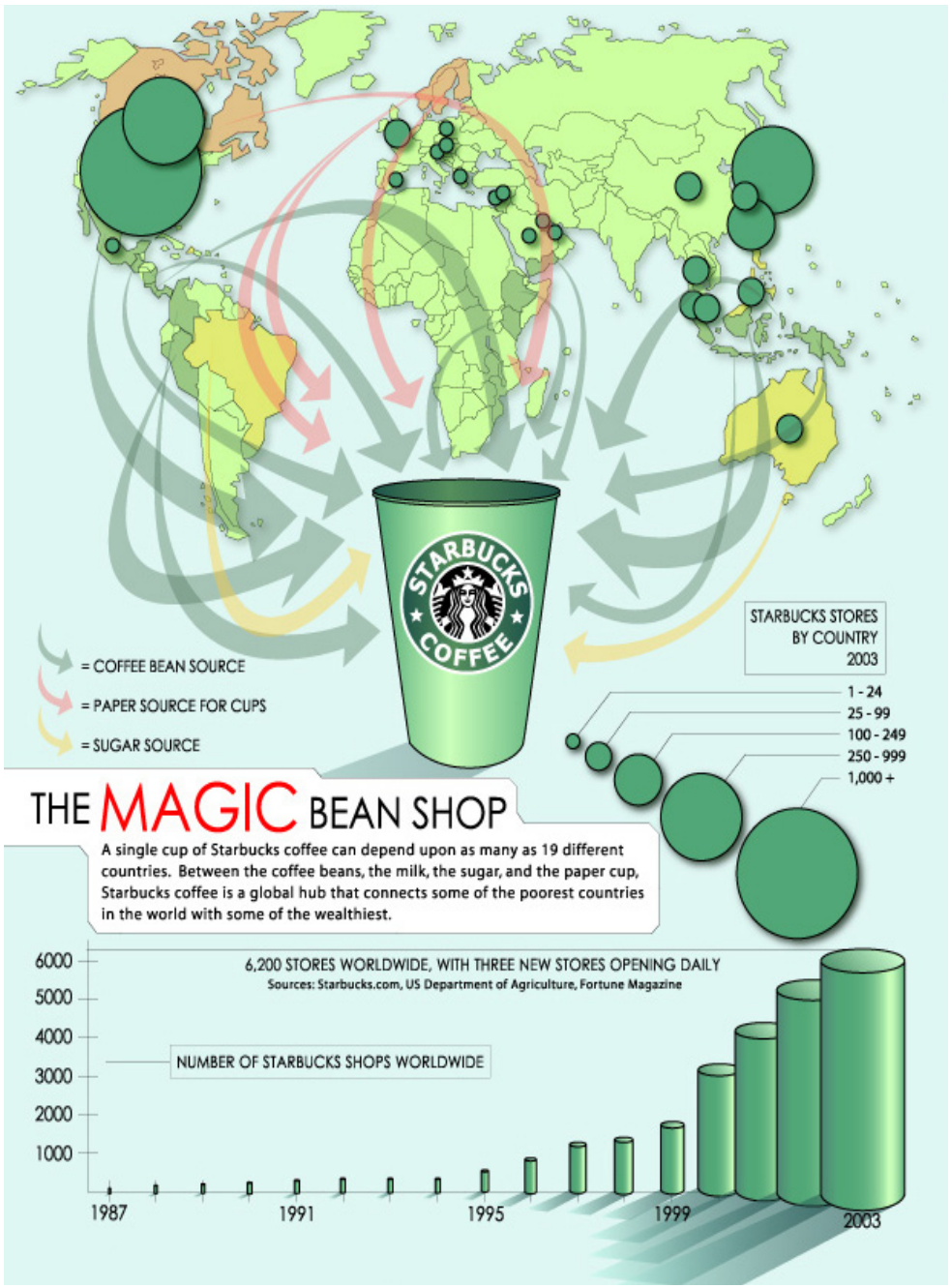
GLOBALIZATION (V.):

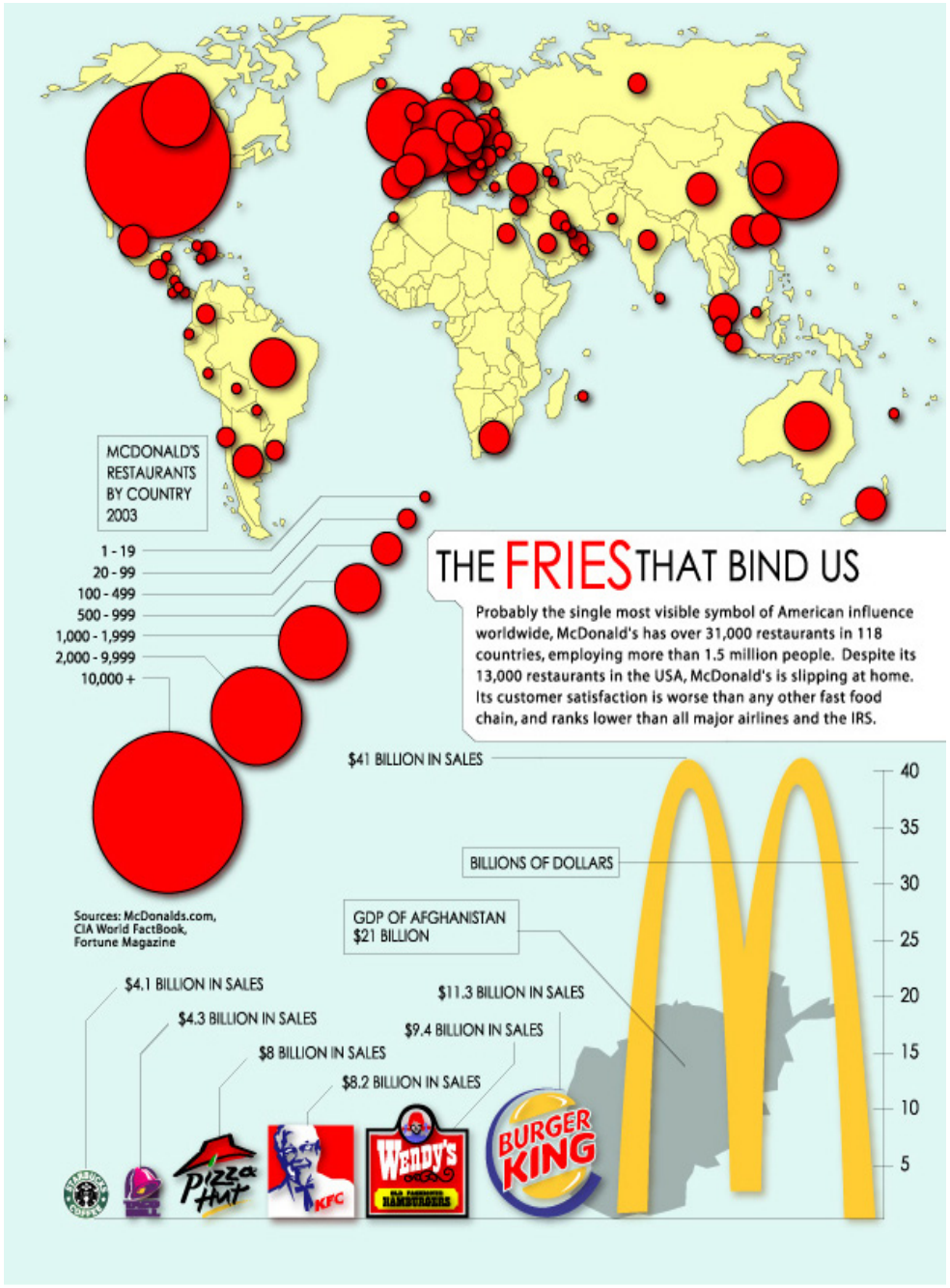
AN ORGANIZATION OF SOCIETY CHARACTERIZED BY THE PROLIFERATION OF IDEAS, CULTURES, TECHNOLOGIES, PEOPLE, ETHNICITIES AND PRODUCTION PROCESSES.



Globalization has been defined as a process in which the population of the world is increasingly bonded into a single society. This process is a combination of economic, technological, sociocultural and political forces. Globalization is often used to refer to economic globalization, that is, integration of national economies into the international economy through trade, foreign direct investment, and capital flows. This structure allows for a shift in the power structure of society where, in the past, nation states were the dominant force, but now multi-national corporations (MNC's) are heading to the top. As we have seen, MNC's have begun to leverage control over democracies by means of lobbyist and campaign contributions. As MNCs gain more power in this globalized society they become a potential vehicle for change.



"Starbucks has good quality stuff, but it is still a symbol of America's low-class food culture. It's maybe O.K. to have a Starbucks around the Forbidden City. But having one inside the City is inappropriate. This is not globalization, but an erosion of Chinese culture." Wrote Rui Chenggang on Jan. 12, 2007 a popular news anchor for the national television broadcaster, CCTV. Globalism has allowed MNCs to gain unpricedented levels of earnings, but at what cost? It does not just affect the economic structure of the world, its proliferation has led to the incredible expansion of production processes. The negative externalities of this expansion are unfortunately not part of the profitability accounting for these MNCs.



The above image shows two American tourists about to enter a Middle Eastern McDonalds for the most widely available meals in the world, as women walk buy in full Islamic head dress.

Not all aspects of globalism are detrimental. The spread of cultures and ideals has begun to alter the gluttonous ideals of many Americans. At the same time typical American ideals such as, a car for every person, have begun to spread to the East via the media. Dissemination of Western ideals may prove to be problematic as countries with 1.5 billion people continue to industrialize, establish, and expand their own middle class. Expansion of the global labor force, impregnated with Western ideals will continue to bolster this globalized society.

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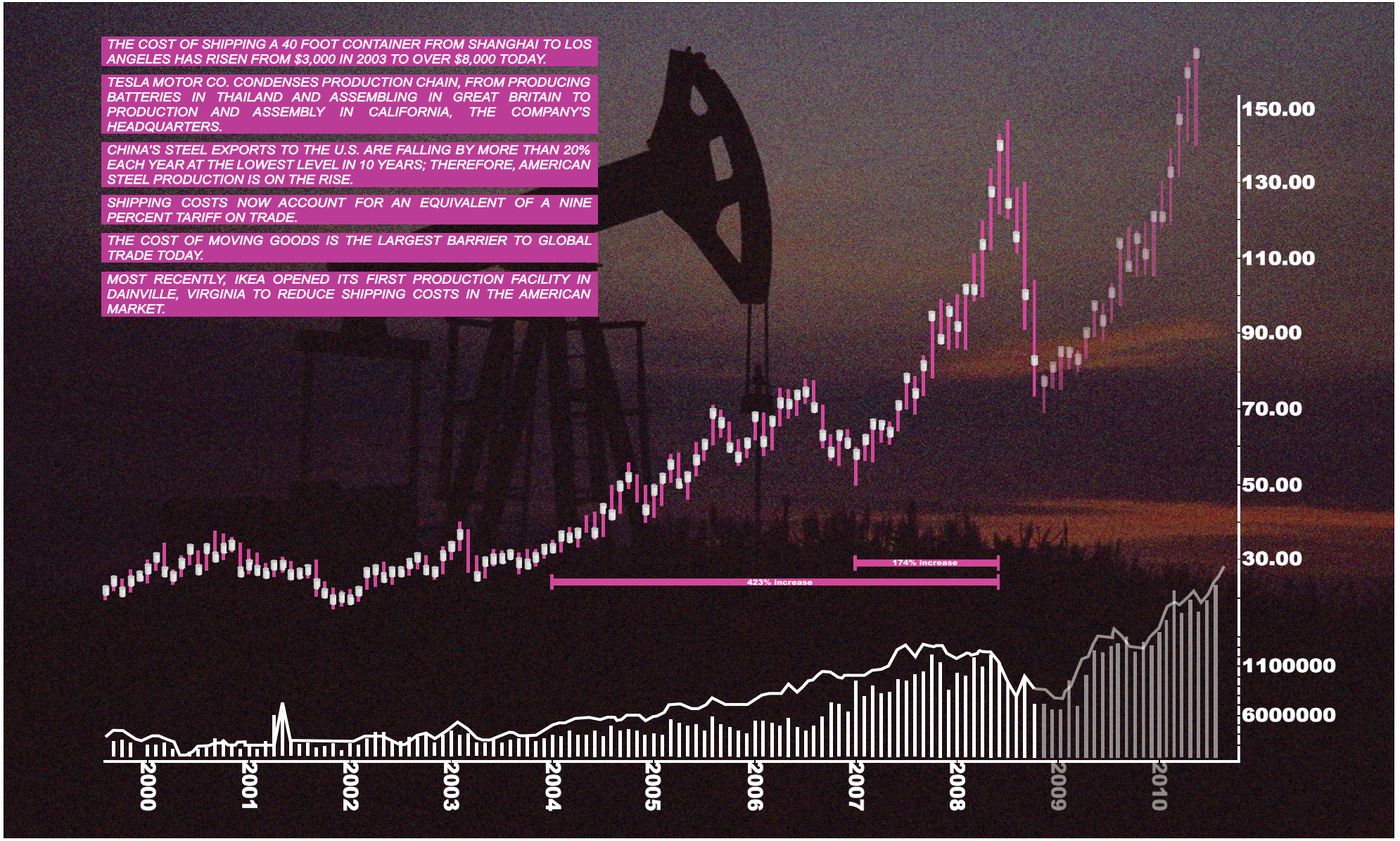
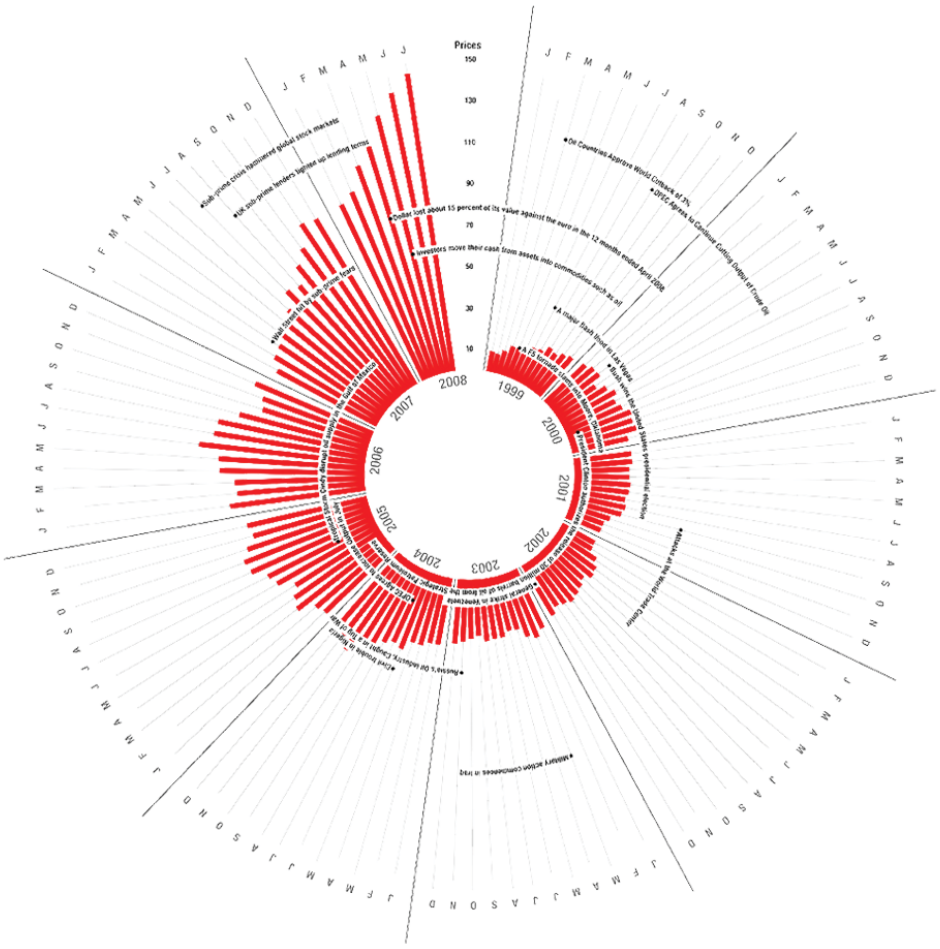
OIL VERSUS POPULATION

THE GLOBAL POPULATION BOOM HAS BEEN PREDICATED UPON ACCESS TO INEXPENSIVE FOSSIL FUELS. AS THESE RESOURCES DIMINISH SOCIETY WILL NEED TO FIND ALTERNATE METHODS TO SUSTAIN ITSELF.



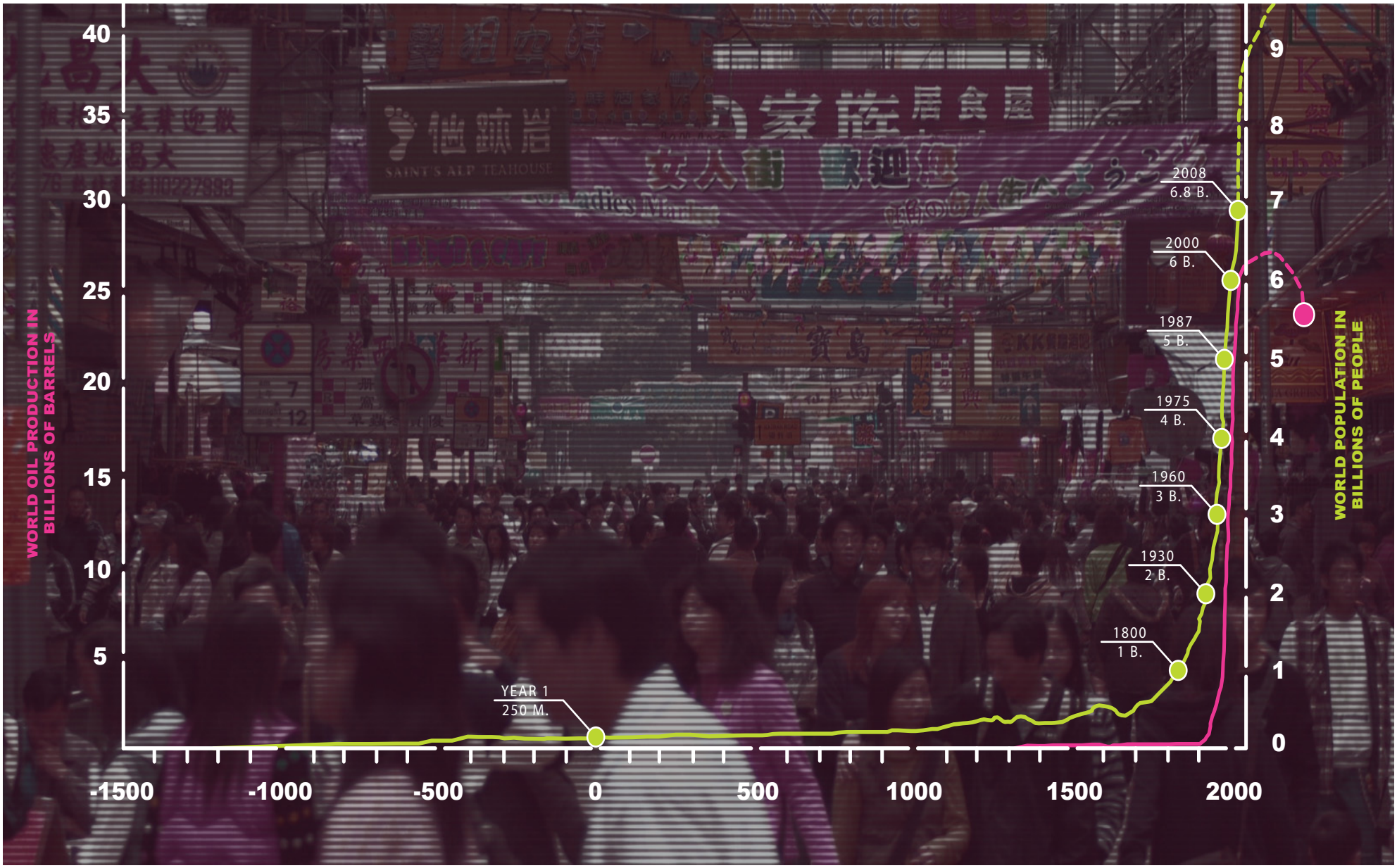
Will this expansion of a globalized consumer culture continue indefinitely? It is the primary contention of this project that as the cost of energy continues to rise the physical collapse of globalism is sure to follow. Examples of this collapse have already occurred and a few are referenced in the above graphic. The price of oil rose by 423% between 2004 and 2008 the effect if that substantial an increase on shipping costs is astronomical.



Recently, the costs of oil and most other commodities have plummeted, most of this deflation can be attributed to the global recession. This fluctuation in pricing has a strong correlation to recent history, the valuation has and will continue to trend up as volatility increases because of increasing demand. Each summer the price increases above the previous winter's low and the general trend will continue to escalate.

ENERGY CONSUMPTION PER CAPITA (GJ/YR)

This predicted escalation in energy costs when cross referenced with the above data should cause great alarm to Americans. Especially when one considers that the United States imported a record $453.3 billion worth of oil in 2008, a figure representing two-thirds of the total trade deficit of $677.1 billion, according to new statistics from the U.S. Census Bureau.

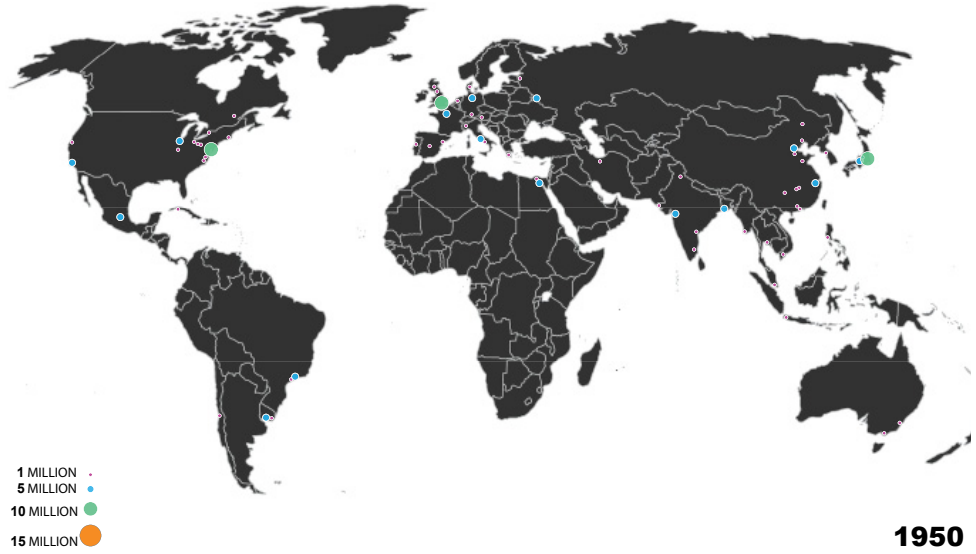


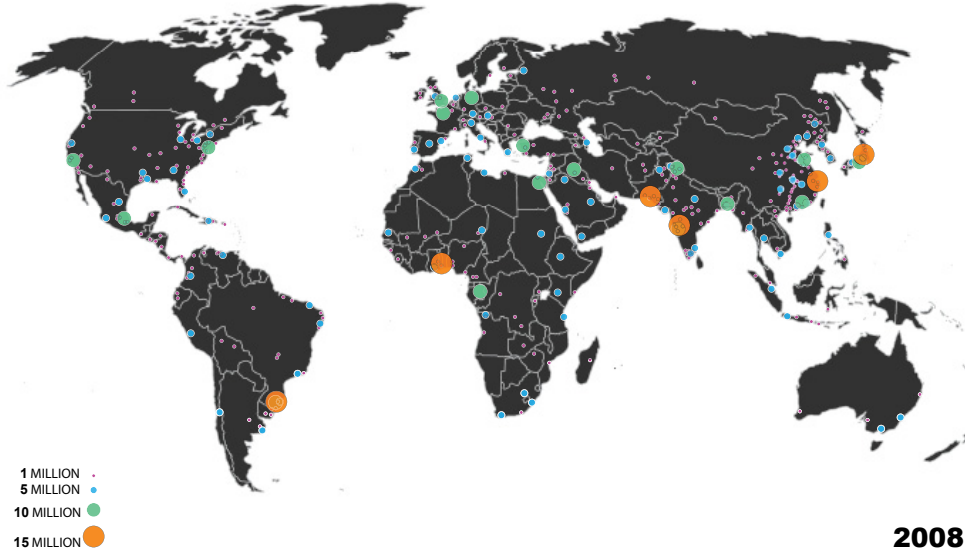
POPULATION VERSUS OIL PRODUCTION

It is this ability for humankind to access, transport, and consume stored energy that has led to the dramatic increase in global population since the Industrial Revolution. The chart on this page attempts to show how correlated population is to harnessing of fossil fuels. Forecasts show that population will continue to increase; however, oil production will dramatically decrease or end altogether. Conservative experts state that at the current rate of consumption all of the Earth's known oil deposits will have been pumped dry by 2075.

MOST RAPIDLY EXPANDING CITIES UNTIL 2015

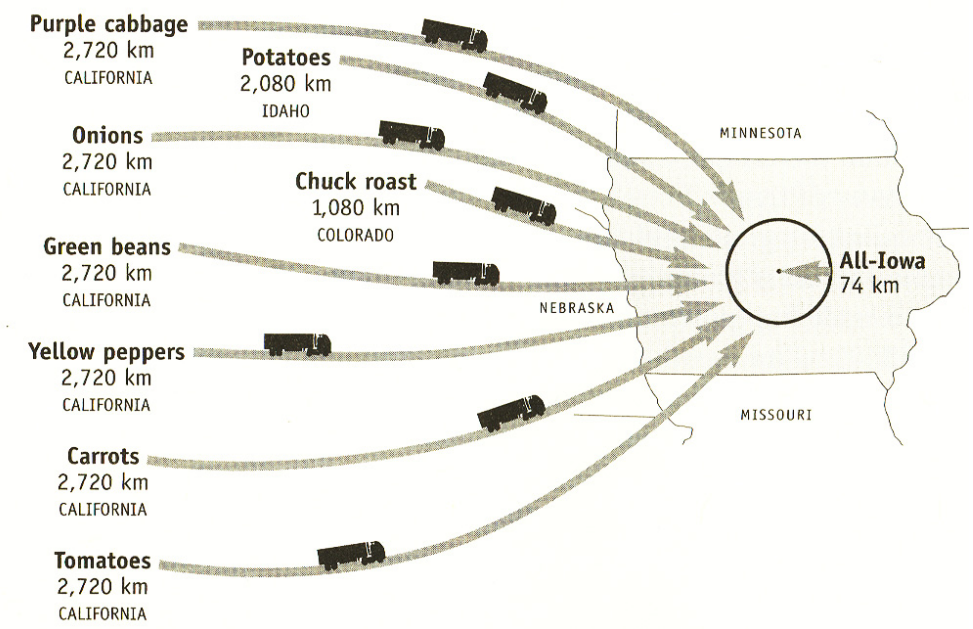
Attempting to move forward in a post-globalized context it was important to understand the dynamic nature of the global population. Over the last 100 years populations in general and urban populations have skyrocketed and these trends are forecasted to continue. In 1900, the world's population was 1.65 billion, today it is 6.7 billion and the UN's conservative estimates put the global population at nine billion by 2050. In 1900, 10 percent of the world's population lived in urban areas, in 2007 that figure passed the midpoint at 50 percent, and by 2050 predictions put the world's population living in urban areas at a minimum of 75 percent.



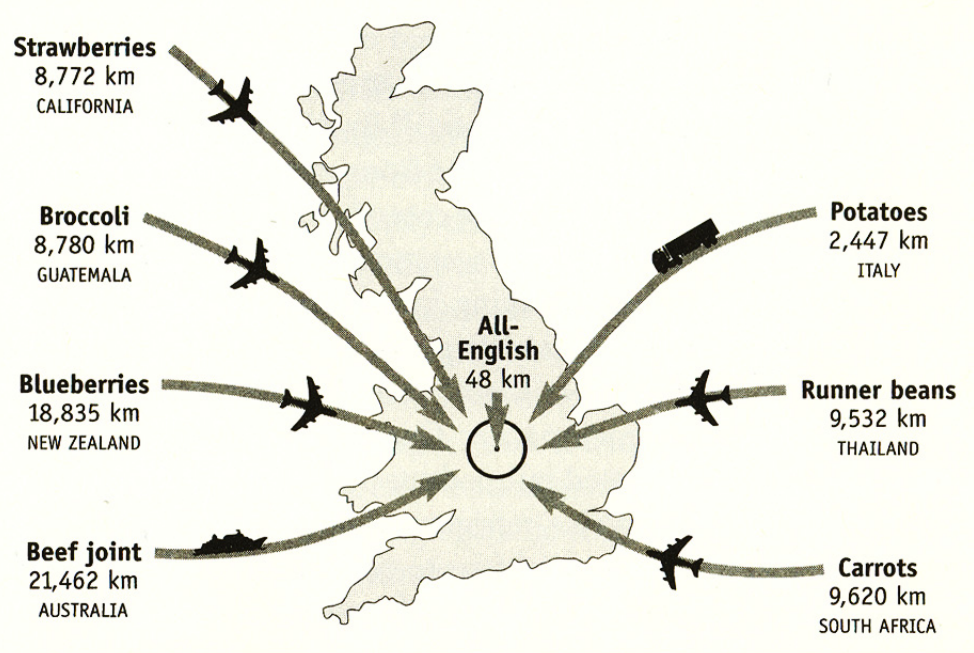


CITIES WITH MORE THAN 1 MILLION INHABITANTS SINCE 1850

With the global population continuing to urbanize it is possible for one to postulate about a localized production and consumption network that removes the energy expensive methods of production and distribution that has flourished with the abundance of inexpensive fossil fuels.



Food has a production cycle that has become increasingly globalized and energy intensive. The above diagram is currently the best representation of the extremely dispersed nature of the industrial food system. Form the Liepold Center for Sustainable Agriculture at Iowa State, it demonstrates this complexity by portraying the movement of goods in food miles. The graphic depicts an average meal consumed in Iowa, the distance that meal travels to get to the plate, and the very short radius that the meal could have been sourced from if the sources were all local.



The European model for food delivery is much more energy intensive, with most of the products being sourced form other continents. This inefficiency is staggering especially considering the oil versus population data that was already discussed and the fact that our current food system, including food processing and distribution, claims about 28% of total US fossil energy use, with about 1/3 of this total used at the farm level. (Ikerd 299) Hoping to make a more detailed representation of the complexity and contradiction in the current industrial food system, I studied a specific MNC's supply and distribution chain.

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CONAGRA FOODS; THE ENABLER

CONAGRA IS THE NATIONS SECOND LARGEST FOOD PRODUCER. ITS PRODUCTS ARE IN 98% OF AMERICAS HOMES.

ConAgra Foods is a leading branded foods company and it is the trusted name behind several brands. Headquartered in Omaha, ConAgra is the nations second largest food producer. ConAgra is a $12 billion company with two main divisions, business to business $4 billion and business to consumer $8 billion. Their over 4,500 products can be found in 98% of American households. ConAgra becomes the MNC that acts as a forward thinking client that is interested in sustaining their profits in a post-globalized world.

After meeting with Greg Smith, ConAgra's Executive Vice-President, head of supply chain, the complexity of the cooperation's business dealings, specifically how they source, produce, and distribute their products, could not be overstated. Greg stated that he considered my premise to be valid and the issues are ones that they are well aware of and are working to ensure the economic sustainability of the cooperation as it navigates the future. The main criticism that Greg had for my ideas was, "People and companies are burdened by what they have. In a perfect world, if ConAgra were to have nothing and were going out to create a production network we would not make anything close to what we have." There previous investments do not allow them to seek efficiencies and alternate methods of operation.

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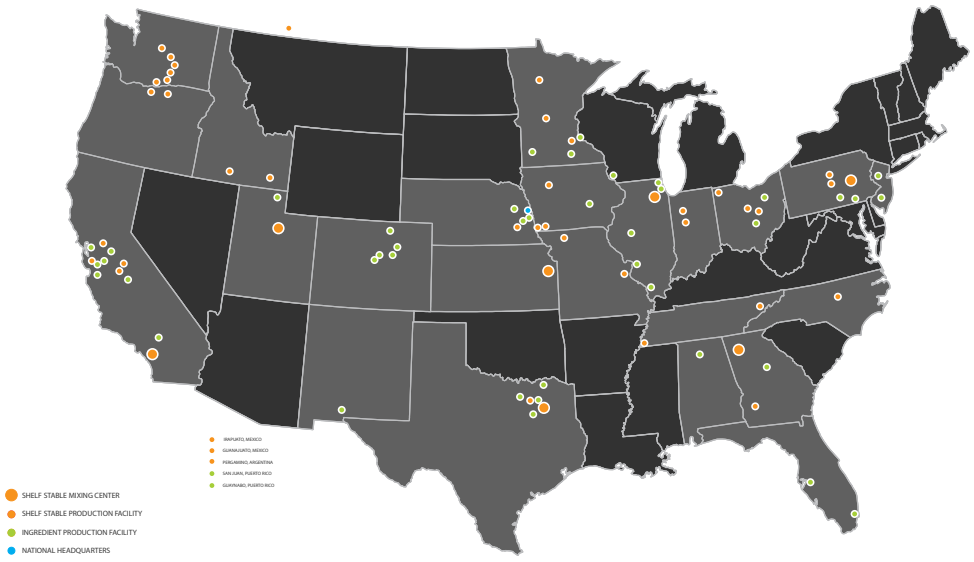
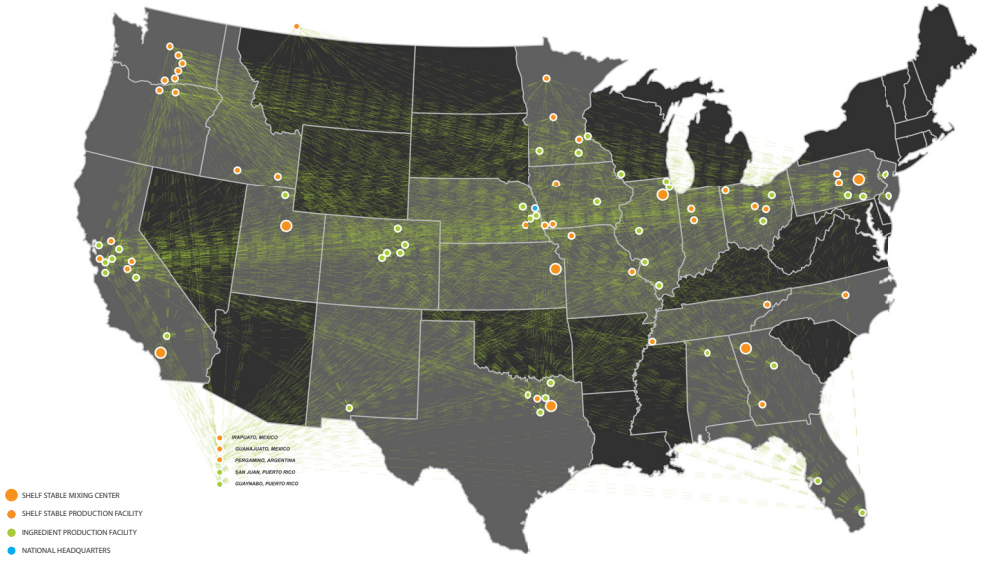
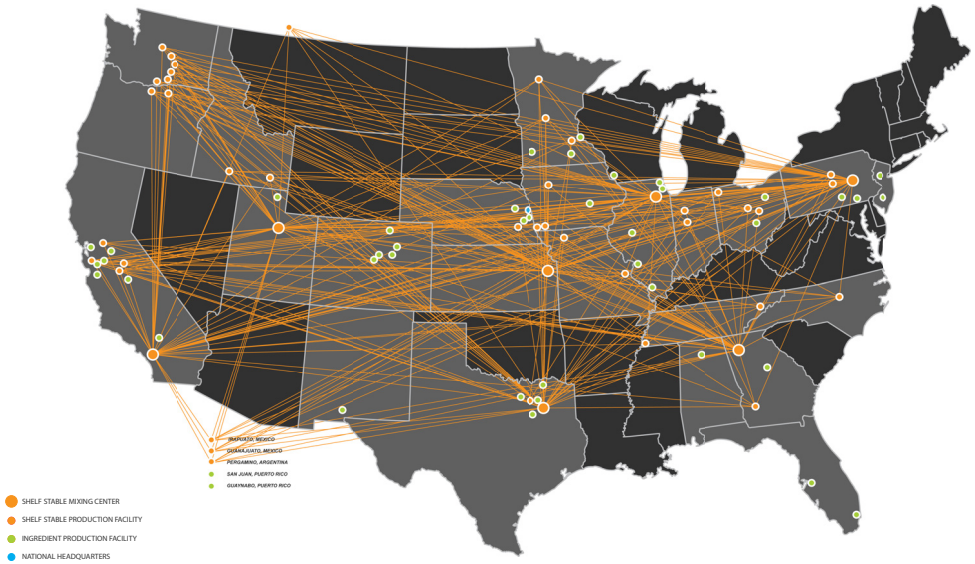
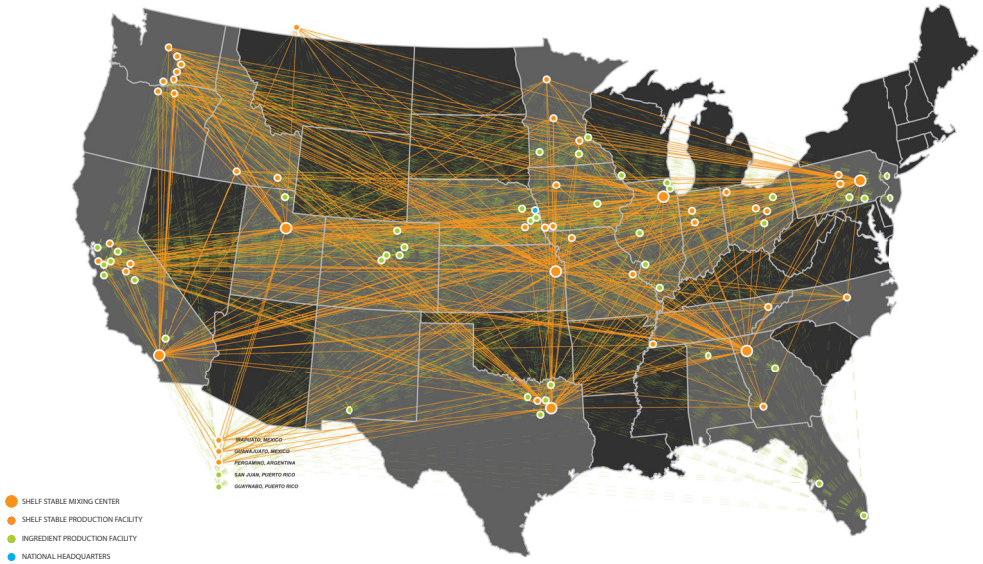
CONAGRA SUPPLY CHAIN

THE TWO EXTREMELY COMPLEX SUPPLY NETWORKS WERE MAPPED TO GAIN A BETTER UNDERSTANDING OF HOW WASTEFUL THE CURRENT FOOD SYSTEM IS.

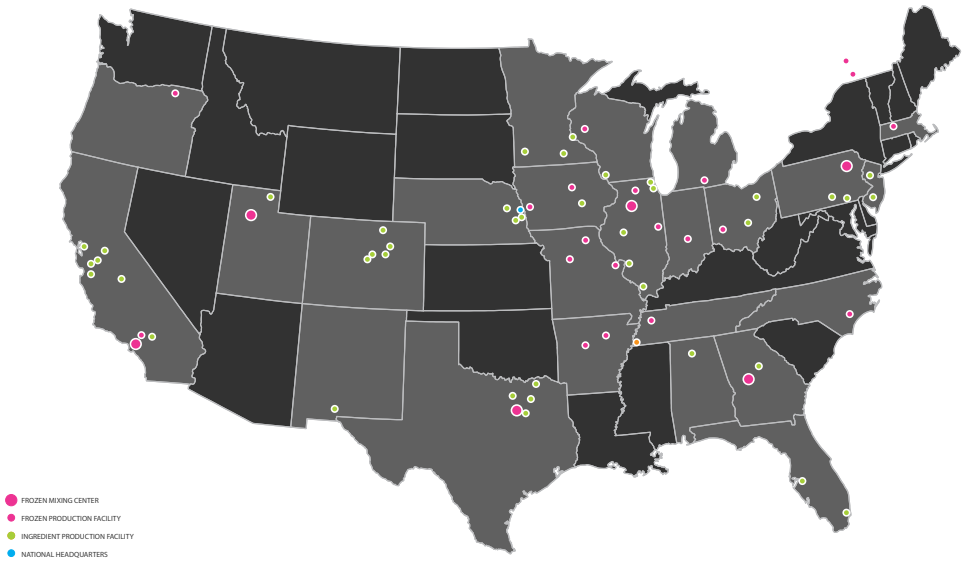


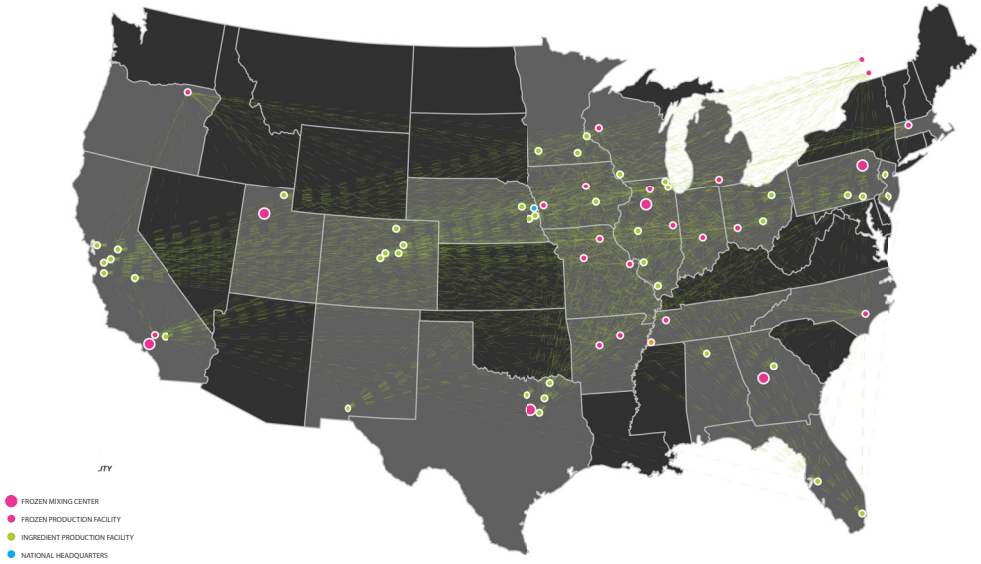


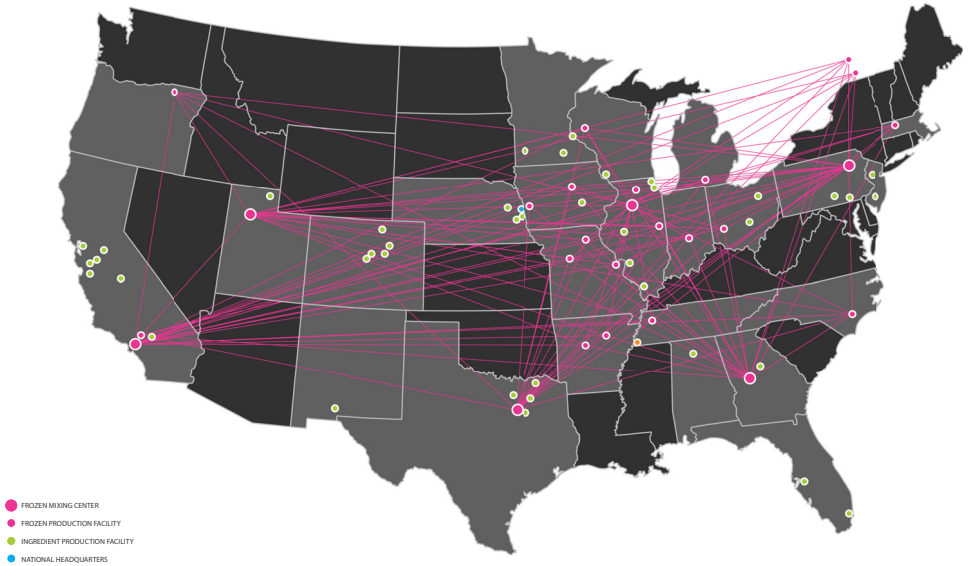


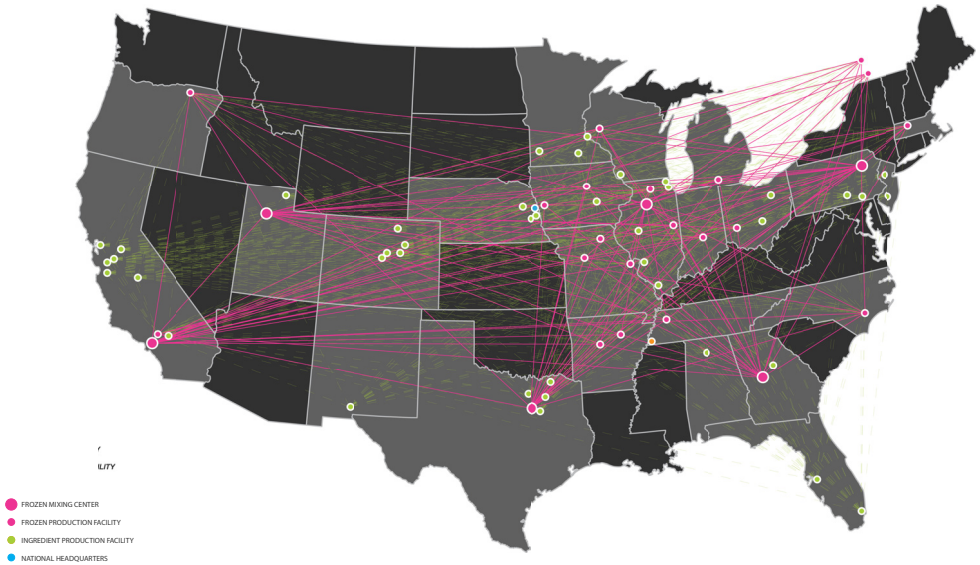


ConAgra's 42 manufacturing facilities and 13 distribution centers are divided into two distinct production and distribution networks. The shelf stable network, shown above, is the larger of the two having seven distribution centers. The products in this network do not need to be climate controlled at any point in the process. The product sources, depicted in green above, only show products that are sourced from company owned industrial farms. These farms only provide about 7% of the total raw products that are included in ConAgra's products. Therefore, if the sourcing of products form other companies were referenced in the above maps the complexity of the network would increase by ten fold.

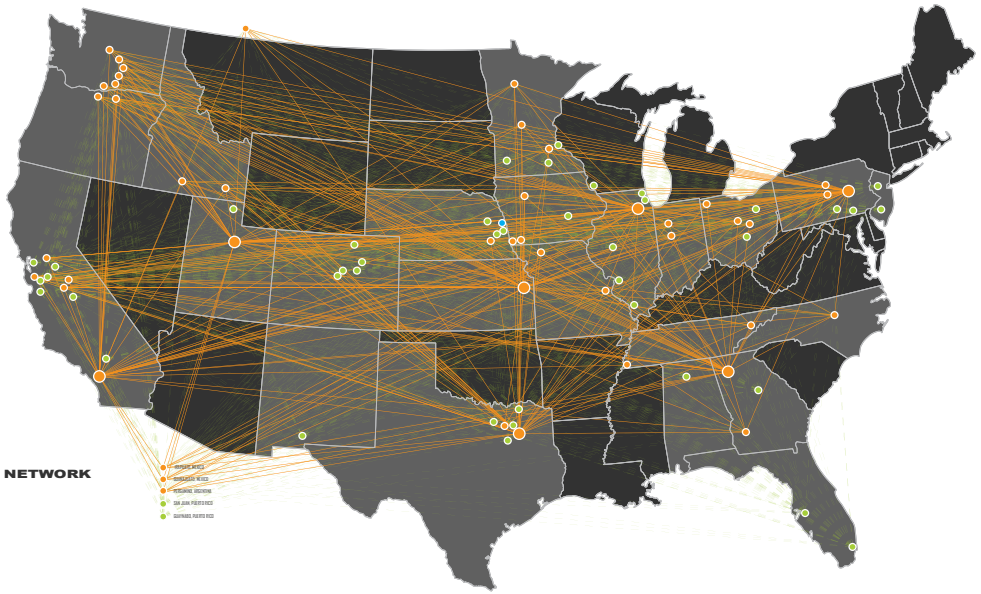


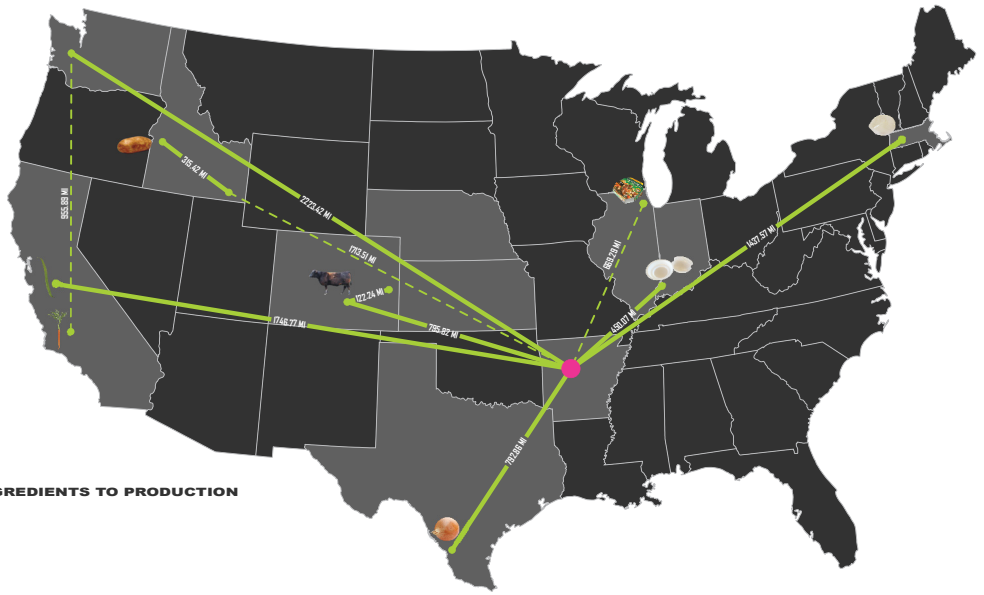






The frozen production and distribution network is shown above. With its six distribution centers it is the smaller of the two networks. The complexity and distance that some ingredients may travel to be included in a meal is staggering. Greg Smith stated, "ConAgra is burdened by the large number of products that they produce and the complex industrial processes that these products undergo makes it impossible to breakup these processes to many locations because the economies of scale will not work."





.00276 GAL = 96.73 KCAL
.22448 KWH = 193.02 KCAL
.053 GAL
TOTAL: 320.8 KCAL

OUTER PACKAGING

METHOD: TRAIN
CHICAGO IL-RUSSELLVILLE AR
669.29 MI = 1077.12 KM
.000008 SEC = .000003 KCAL
.000069 GAL = 2.399 KCAL
TOTAL: 2.76 KCAL

.000468 GAL = 16.37 KCAL
.0141 KWH = 12.14 KCAL
.0099 GAL
TOTAL: 29.17 KCAL

CELLOPHANE SEAL

METHOD: TRUCK
LUDLOW MA-RUSSELLVILLE AR
1437.57 MI = 2313.54 KM
.000009 SEC = .00001 KCAL
.00006 GAL = 2.13 KCAL
TOTAL: 2.78 KCAL

.017 GAL = 593.46 KCAL
.5084 KWH = 437.17 KCAL
.36 GAL
TOTAL: 1050.1 KCAL

INNER STEAMER TRAYS

METHOD: TRUCK
HARWOOD IN-RUSSELLVILLE AR
450.07 MI = 2313.54 KM
.0041 SEC = .005 KCAL
.00082 GAL = 28.79 KCAL
TOTAL: 31.29 KCAL

.00002 SEC = .0000028 KCAL
.53778 KWH = 462.41 KCAL
.23 GAL
TOTAL: 83.49 KCAL

PRODUCTION FACILITY

METHOD: TRAIN
RUSSELLVILLE AR-JOLIET IL
624.56 MI = 1005.13 KM
.0000003 SEC = .000008 KCAL
.00286 GAL = 98.35 KCAL
TOTAL: 105.82 KCAL

.000001 SEC = .00000081 KCAL
.0539 KWH = 46.31 KCAL
TOTAL: 49.40 KCAL

CONAGRA MIXING CENTER

METHOD: TRUCK
JOLIET IL-OTTAWA KS
527.58 MI = 849.05 KM
.0081 SEC = .022 KCAL
.0090 8 GAL = 317.46 KCAL
TOTAL: 335.21 KCAL

.000002 SEC = .0000013 KCAL
.0760 KWH = 65.379 KCAL
TOTAL: 69.75 KCAL

WALMART WAREHOUSE

METHOD: TRUCK
OTTAWA KS-LINCOLN NE
213.81 MI = 344.09 KM
.0007 SEC = .008 KCAL
.00368 GAL = 128.55 KCAL
TOTAL: 135.85 KCAL

17.42 SEC = 4.82 KCAL
.11088 KWH = 95.3448 KCAL
TOTAL: 123.71 KCAL

WALMART

METHOD: CAR
STORE - HOME
5.1 MI = 7.8 KM
47.92 SEC = 6.19 KCAL
.0041 GAL = 128.09 KCAL
TOTAL: 141.53 KCA

.24 SEC = .0332 KCAL
.084 KWH = 72.31 KCAL
2.73 GAL
TOTAL: 83.49 KCAL

.27 SEC = .038 KCAL
.00052 GAL = 5.31 KCAL
.00024423 KWH = .21 KCAL
8.90 GAL
TOTAL: 11.06 KCAL

CARROTS

METHOD: TRAIN
BAKERSFIELD CA-GATE WA
555.89 MI = 1538.36 KM
.000009 SEC = .0001 KCAL
.00057 GAL = 19.78 KCAL
TOTAL: 22.64 KCAL

CARROT PROCESSING

METHOD: TRUCK
GATE WA-RUSSELLVILLE AR
2223.42 MI = 3578.25 KM
.0215 SEC = .0224 KCAL
.00533 GAL = 186.37 KCAL
TOTAL: 197.52 KCAL

.18 SEC = .0249 KCAL
.07731 KWH = 66.471 KCAL
1.97 GAL
TOTAL: 72.48 KCAL

.20 SEC = .026 KCAL
.000179 GAL = 6.26 KCAL
.00025586 KWH = .22 KCAL
10.82 GAL
TOTAL: 27.93 KCAL

POTATOES

METHOD: TRUCK
EAGLE ID-PRESTON ID
315.42 MI = 507.62 KM
.0038 SEC = .004 KCAL
.00138 GAL = 48.23 KCAL
TOTAL: 52.39 KCAL

POTATO PROCESSING

METHOD: TRAIN
BOISE ID-RUSSELLVILLE AR
1713.51 MI = 2757.6 KM
.000018 SEC = .00002 KCAL
.00147 GAL = 51.42 KCAL
TOTAL: 57.36 KCAL

3.82 SEC = .495 KCAL
.00013 GAL = 7.54 KCAL
.002256 KWH = 1.94 KCAL
7.22 GAL
TOTAL: 31.74 KCAL

GREEN BEANS

METHOD: TRUCK
MENDOTA CA-RUSSELLVILLE AR
1746.77 MI = 2811.15 KM
.0098 SEC = .012 KCAL
.0033 GAL = 114.08 KCAL
TOTAL: 124.82 KCAL

.26 SEC = .028 KCAL
.000431 GAL = 15.06 KCAL
.00017445 KWH = .15 KCAL
4.95 GAL
TOTAL: 22.28 KCAL

ONIONS

METHOD: TRUCK
LAREDO TX-RUSSELLVILLE AR
792.86 MI = 1275.98 KM
.0077 SEC = .008 KCAL
.00058 GAL = 20.13 KCAL
TOTAL: 22.97 KCAL

3.97 SEC = .6241 KCAL
.2095 KWH = 180.17 KCAL
3.23 GAL
TOTAL: 207.09 KCAL

10.1 SEC = 1.29 KCAL
.1452 GAL = 5076 KCAL
.005024 KWH = 4.32 KCAL
.1359 GAL
TOTAL: 5840 KCAL

BEEF

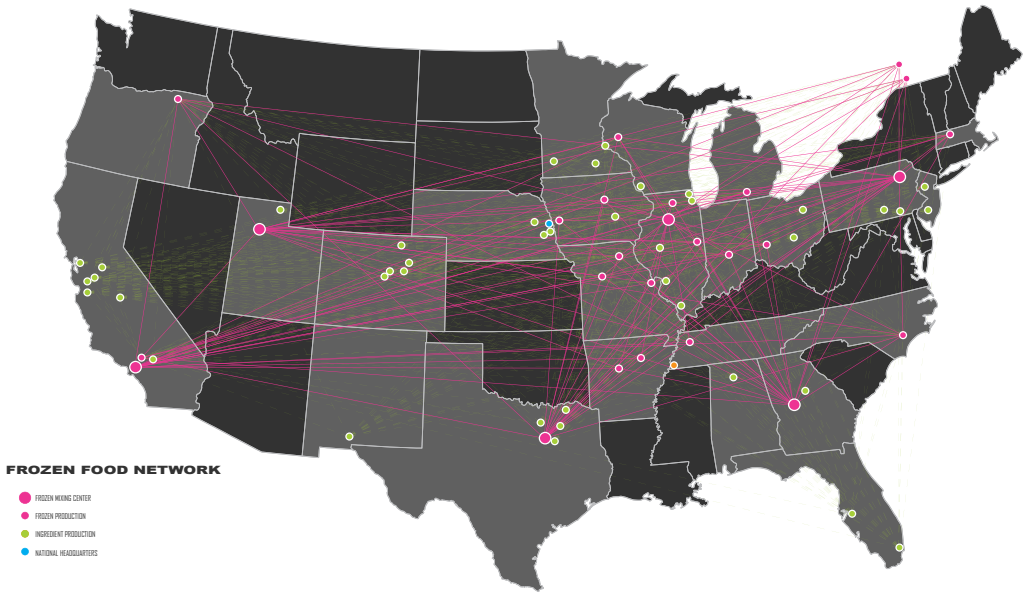
METHOD: TRUCK
LAMAR CO-PUEBLO CO
122.24 MI = 196.73 KM
.00004 SEC = .0002 KCAL
.000691 GAL = 24.02 KCAL
TOTAL: 22.91 KCAL

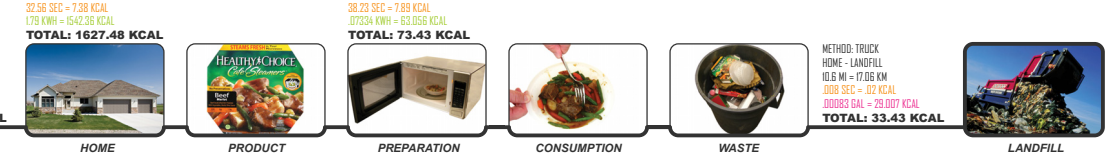
BEEF PROCESSING

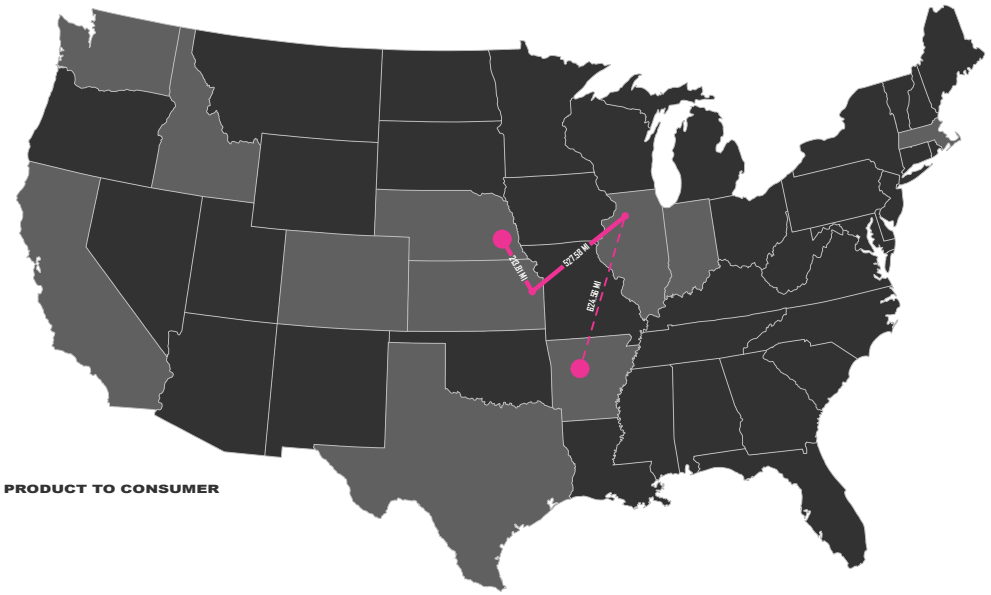
METHOD: TRUCK
PUEBLO CO-RUSSELLVILLE AR
795.82 MI = 1280.74 KM
.0077 SEC = .008 KCAL
.0039 GAL = 137.43 KCAL
TOTAL: 149.08 KCAL

CONAGRA SUPPLY CHAIN

BOTH OF CONAGRA'S PRODUCTION NETWORKS, CLIMATE CONTROLLED AND SHELF STABLE, ARE DEMONSTRATED. THE EXTREME PHYSICAL DISPERSAL AND THE NECESSARY TRANSPORTATION OF GOODS BETWEEN THE NODES OF THE NETWORK RESULTS IN A INEFFICIENT, ENERGY INTENSIVE PRODUCTION CHAIN. A HEALTHY CHOICE CAFE STEAMER, BEEF MERLOT, IS DIAGRAMMED FROM INITIAL INPUTS ON THE FARM TO WASTE IN THE FORM OF PACKAGING IN A LANDFILL. RELEVANT INPUTS ARE GIVEN FOR EACH STEP IN THE CHAIN. EACH FIGURE IS BASED UPON THE PROPORTION OF EACH INGREDIENT IN THE MEAL. IN THE END, THE TOTAL FIGURES ARE STAGGERING, THE CONSUMPTION OF THE PACKAGED FOOD PRODUCT REQUIRES 61 UNITS OF FOSSIL FUEL ENERGY EQUIVALENT INPUT FOR 1 UNIT ENERGY OUTPUT IN THE FORM OF FOOD.







TOTALS:

GALLONS OF FUEL = .20495 GAL = 7149.97 KCAL

KWH OF ELECTRICITY = 3.77 KWH = 3242.98 KCAL

SECONDS OF LABOR = 156.24 SEC = 28.95 KCAL

MILES OF TRANSPORT = 12588.81 = 20259.42 KM

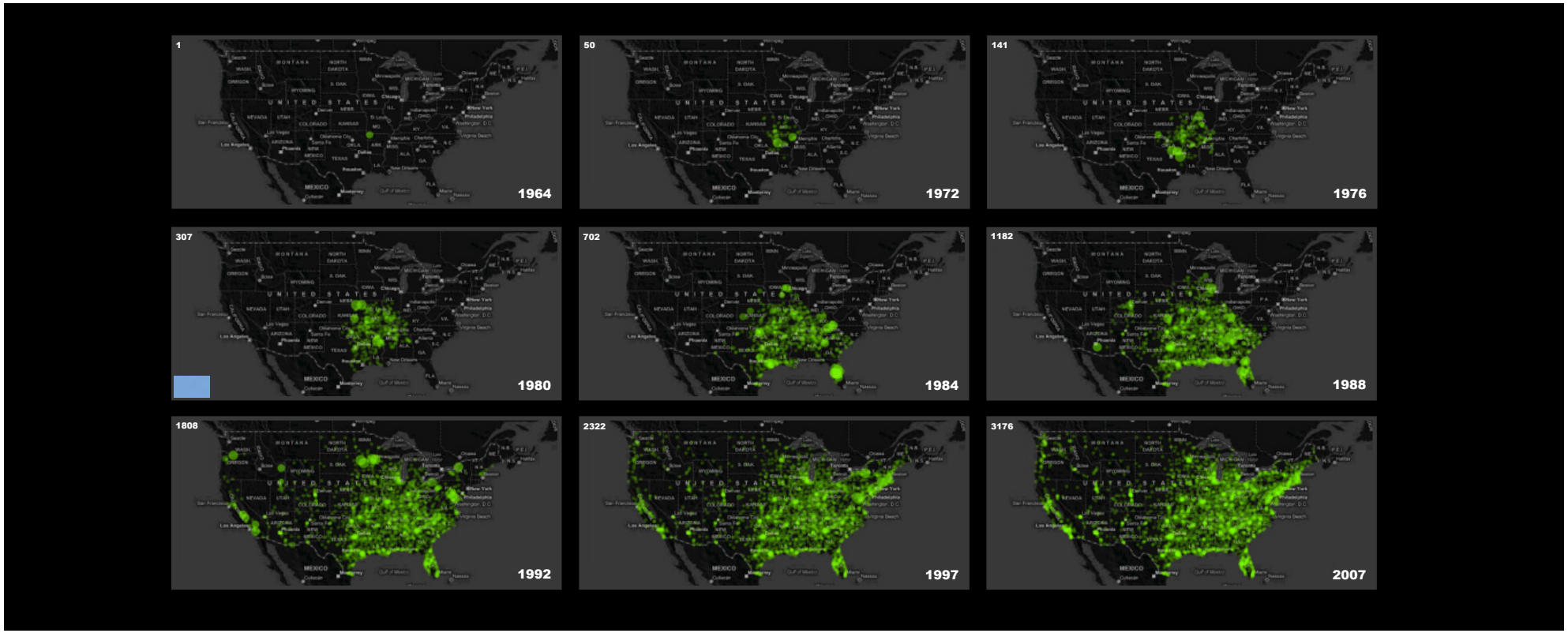
GALLONS OF WATER = 11399.47 GAL

13429.85 KCAL IN : 220.00 KCAL OUT

61 : 1
IN OUT

13429.85 KCAL = .385 GAL OF GAS

=



ConAgra's largest customer is WalMart, over 45% of their products are sold directly to the retailing giant. The above graphic shows the virus like spread of WalMart across the United States. Greg Smith mentioned that he meets regularly with the WalMart executives to organize and seek out synergies in the way they move the products. He said that both companies are concerned by the logistics of moving products at the cost of fuel continues to rise. Especially when it is very unlikely that rail will be able to expand when on average one mile of track costs $1.8 million, infrastructure and highways in America are deteriorating and an alarming rate, and large cities have begun to pass referendums banning eighteen wheelers during the busiest times of the day, this will hurt lead times and the ability for distributors to cycle shipments.

urban ConAgraculture

EVOLUTION OF INDUSTRIAL AGRICULTURE

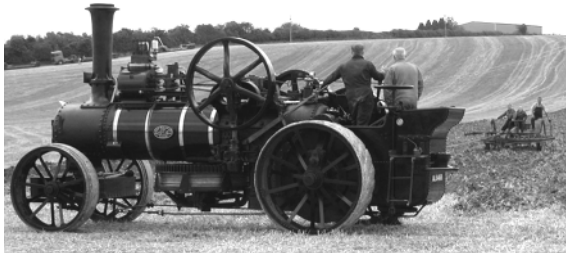
AN ORGANIZATION OF SOCIETY CHARACTERIZED BY THE PROLIFERATION OF IDEAS, CULTURES, TECHNOLOGIES, PEOPLE, ETHNICITIES AND PRODUCTION PROCESSES.

PRE-INDUSTRIAL

The fundamental purpose of agriculture is to collect solar energy and to transform it into forms that can be used to support human life. People simply cannot eat sunlight. Solar energy must be collected, converted, concentrated, and stored by green plants before it can be useful to humans. Agriculture is quite capable of meeting the food needs of the global population of today, and possibly feeding twice or even three times as many people in the future, even while reducing its reliance on fossil energy. However, achieving this objective will require a fundamentally different kind of agriculture. The industrial agriculture of today is not sustainable. (Ikerd 299) The major principle missing from modern industrial farming is that to the greatest extent possible farmers should rely on contemporary energy from the sun, as captured everyday by photosynthesis, instead of the fossilized sun energy contained in petroleum. (Pollan 188)

J. W. FAWKES STEAM PLOW 1858

The first successful steam powered tractor; initiated the shift from animal powered to mechanized agriculture. It took a long period for the industrial revolution to take a firm hold on agriculture. In 1920 there were only 225 tractors in all of America. (Pollan 38) This change to mechanized agriculture that relies upon abundant fossil fuels allowed for increased yields and greater efficiencies for the average farmer.

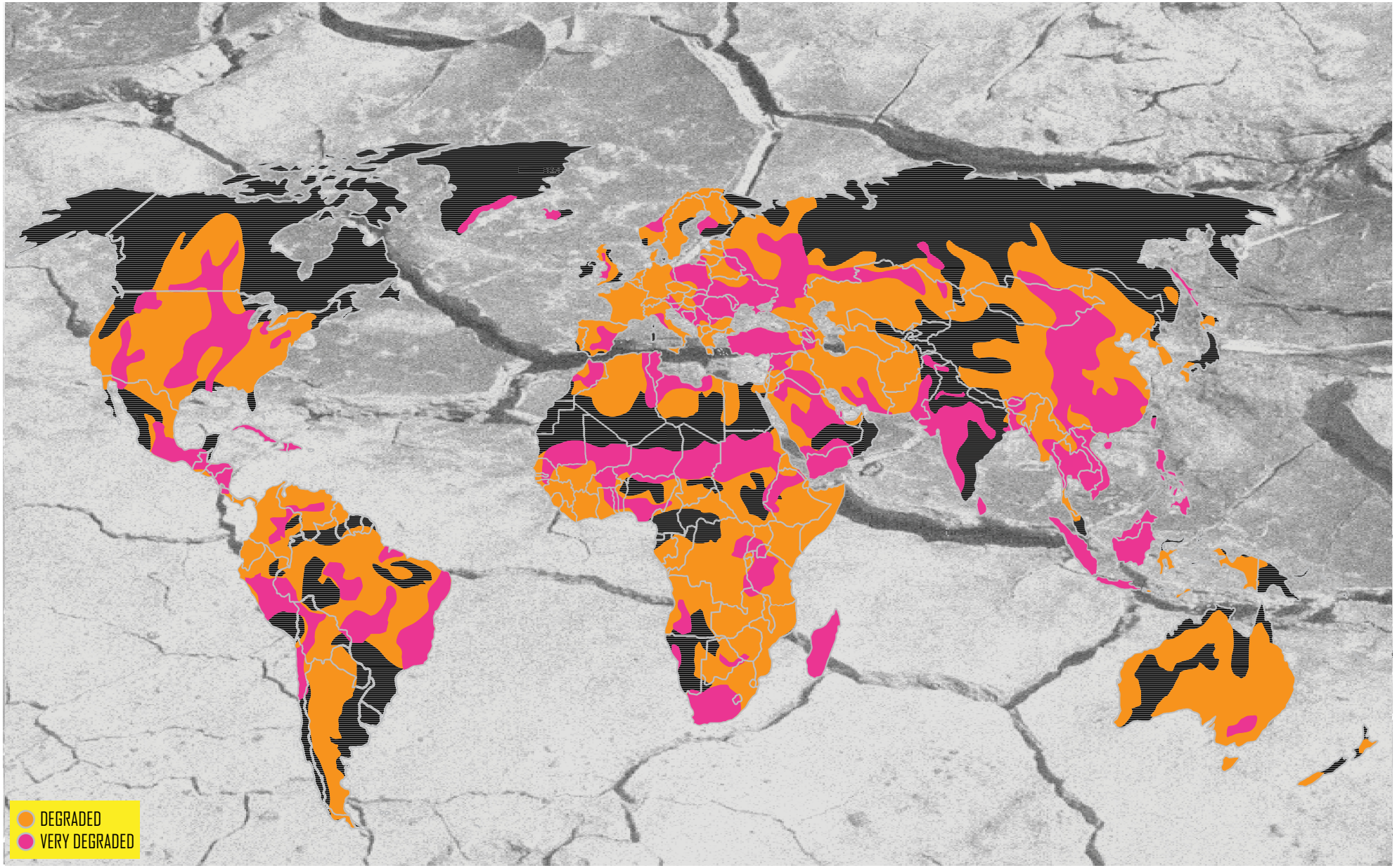


JOHN DEERE MODEL A 1934

Adjustable axle width allowed farmers to pull equipment along rows without damaging crops. Another mid-century agriculture innovation, nitrogen fixing, allowed for much greater yields, Without the Harber-Bosch nitrogen fixing process two out of every five humans alive today would not have been born. When humankind acquired the power to fix nitrogen, the basis of soil fertility shifted from a total reliance on energy from the sun to a new reliance on fossil fuel. (Pollan 43)

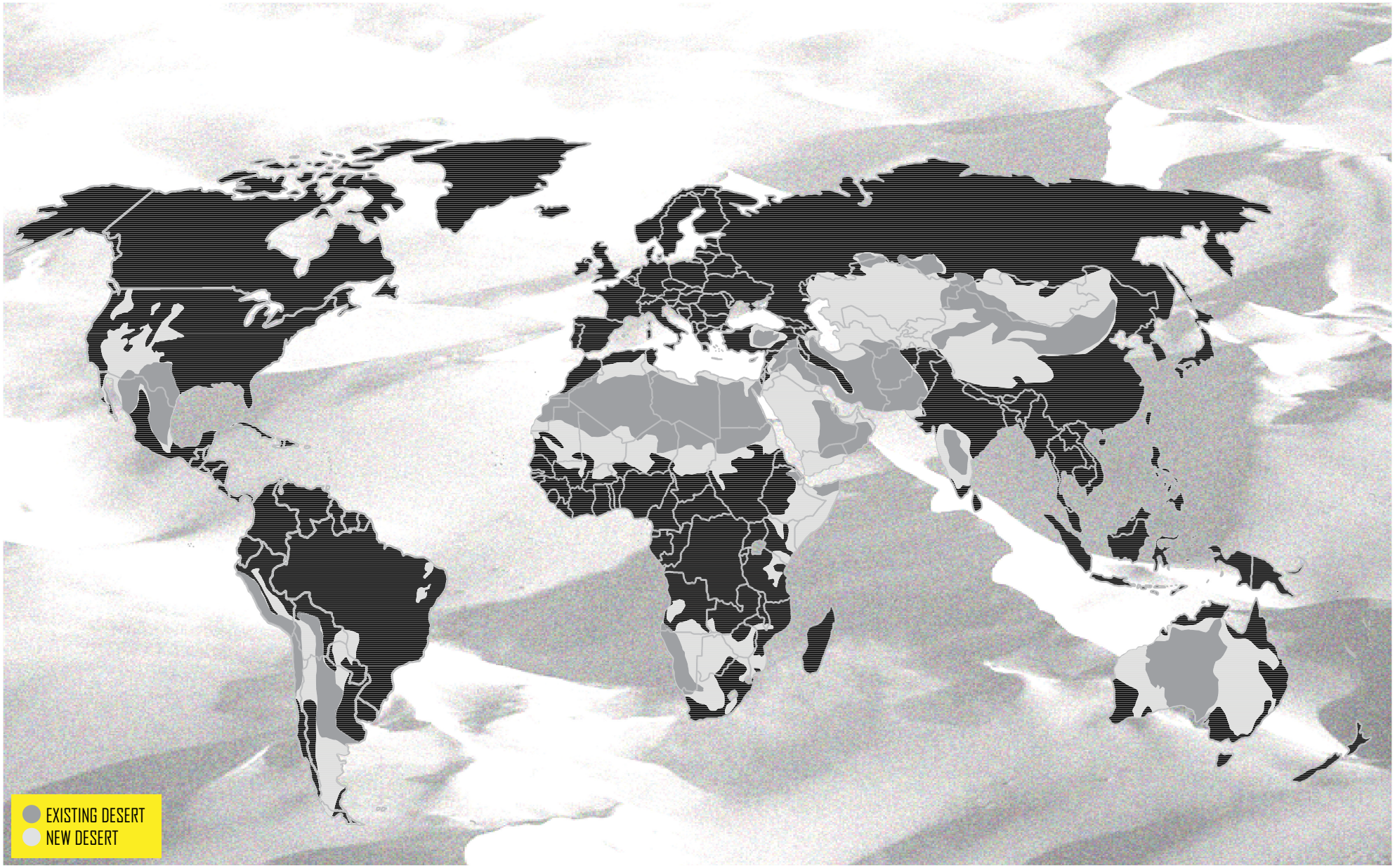
JOHN DEERE 9030 SERIES 2008

This tractor offers up to 530 hp and GPS for faster, more efficient planting with minimal overlap. These very large scale tractors increase productivity and yields while reducing the amount of time a farmer must spend on a given acre of land.



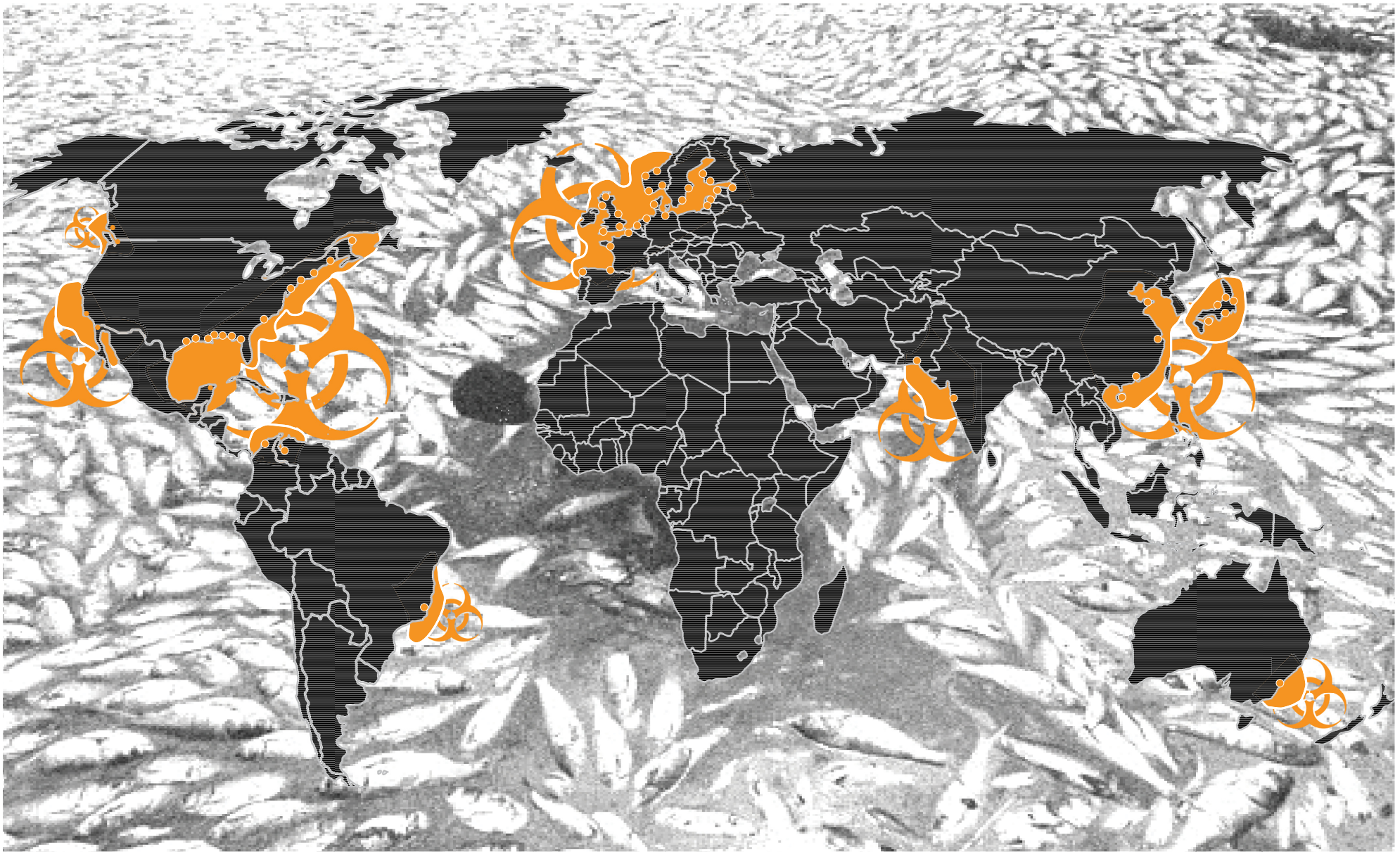
SOIL DEGRADATION

Industrial Agriculture results in extreme erosion of fertile topsoil. For instance, Iowa has lost over half of its fertile topsoil since the dawn of the industrial agriculture movement. Topsoil takes centuries to form, but it can be degraded in just a few production cycles. Human activities, such as over cultivation and improper irrigation, compined with climate change are rapidly changing fertile soils into barren patches of land.



DESERTIFICATION

Deserts are dry regions with limited plant and animal life and very little rain. As a direct result of the industrial food system, deserts are growing by .17% annually. Desert now accounts for a quarter of China's landmass ans is advancing by 3,000 square kilometers yearly. Currently, deserts cover about 25% of the Earth's land area, by 2100 it is projected to cover over 50%.



OCEAN DEADZONES

Chemical runoff from industrial farming is the largest contributor to ocean deadzones. The fertilizers in the water increase algae populations, which in turn depletes the oxygen levels causing a deadzone. The map above shows the areas of the ocean that are devoid of aquatic life.

BEHIND EVERY GOOD MAN IS A GREAT TRACTOR.

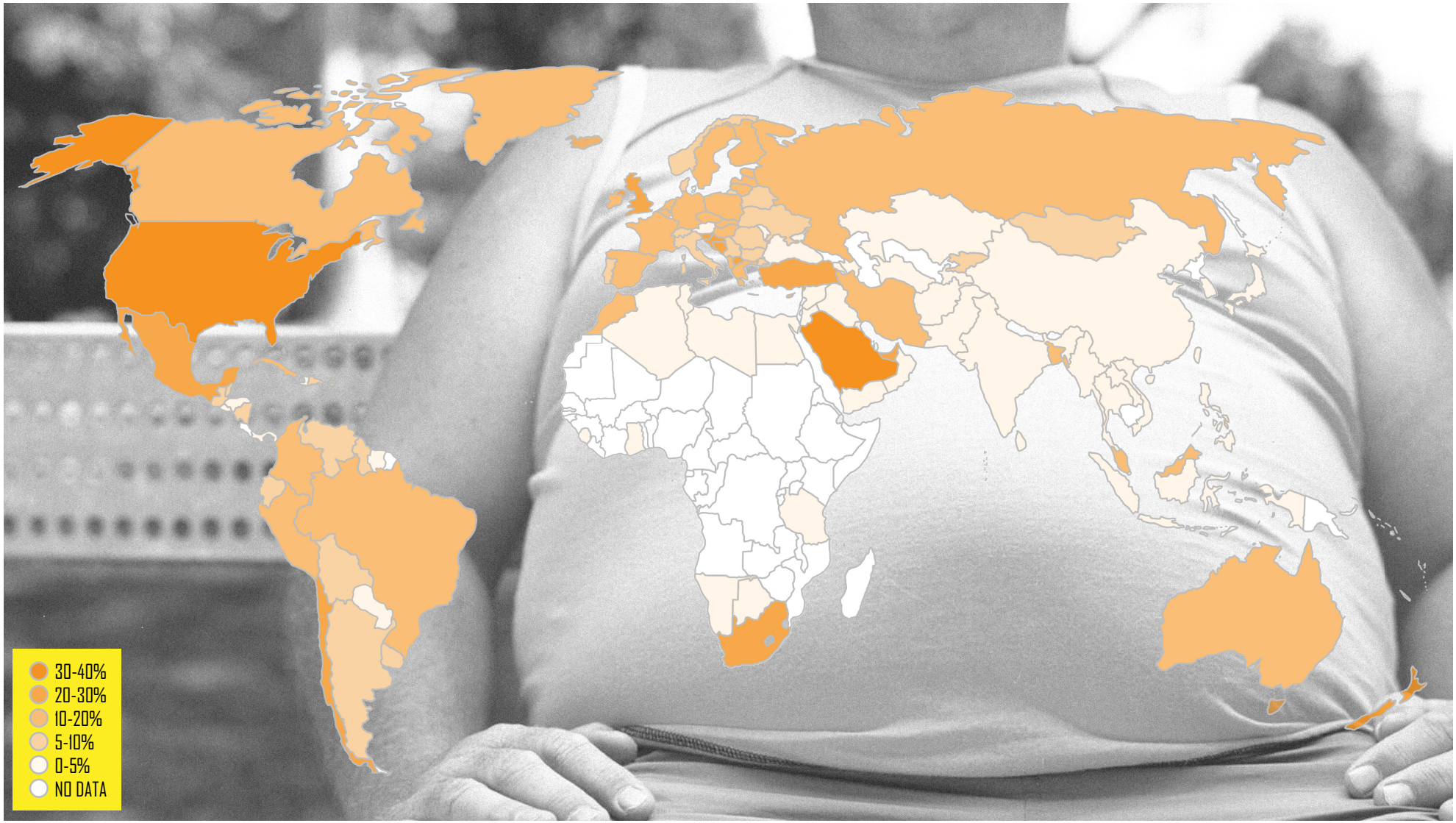
JOHN DEERE

(AND A SMART WIFE WHO BOUGHT IT FOR HIM.)

urban ConAgra**culture**

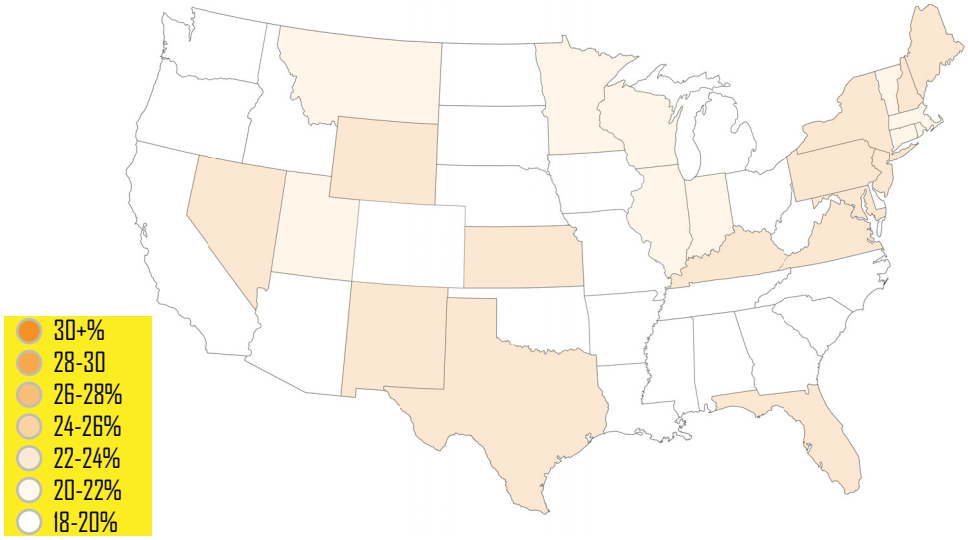
DIET RELATED HEALTH EPIDEMICS

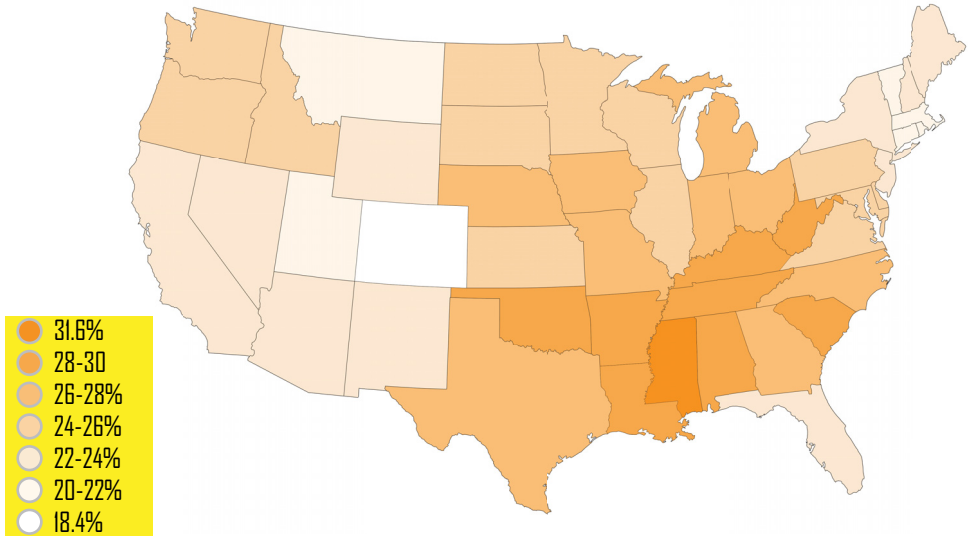
OBESITY AND DIABETES ARE EPIDEMICS THAT HAVE BEEN INCREASING IN RECENT YEARS DUE TO THE PROLIFERATION OF LOW QUALITY FOODS FROM THE INDUSTRIAL FOOD SYSTEM

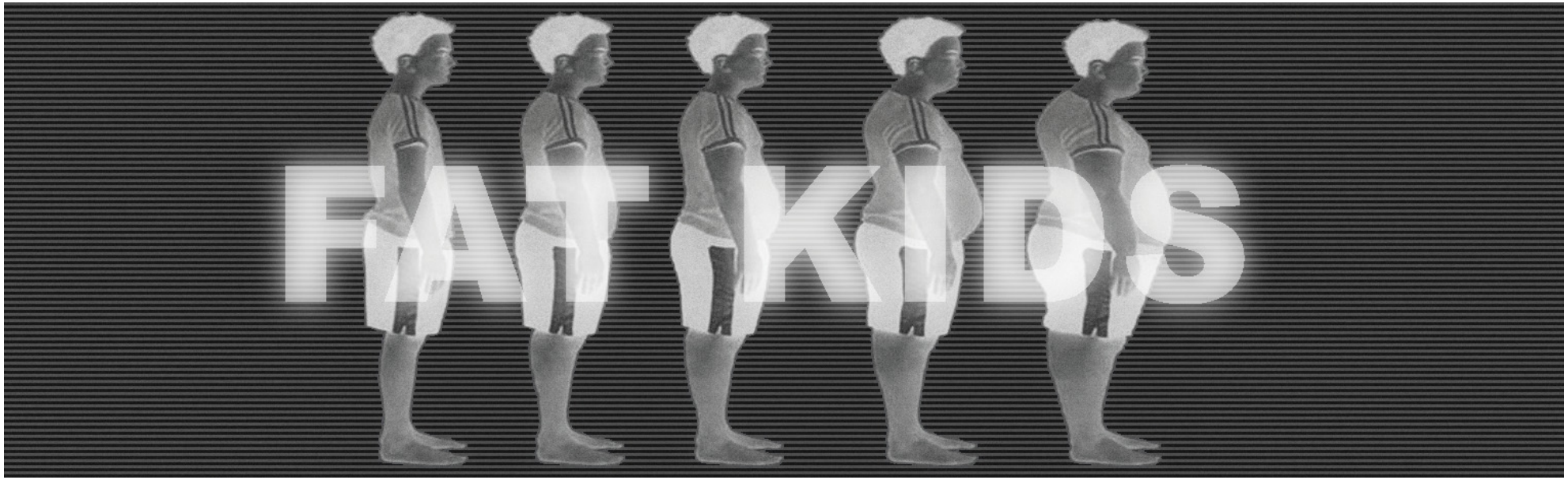


OBESITY

After all the industrial food system does to the environment should we not expect that these food goods be nutritious for us to consume? Obesity is a diet related health epidemic that has been increasing at an alarming rate. Most nutritionist agree that the obesity epidemic is due to the amount of "empty calories" that the average American consumes. Most of these calories come from high fructose corn syrup. A product of industrial agriculture's promotion of the monoculture, corn.





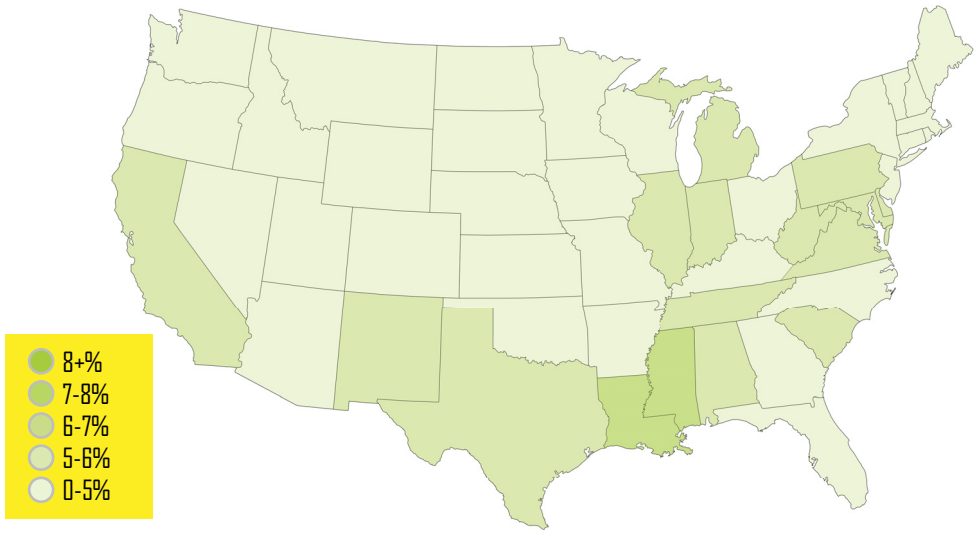


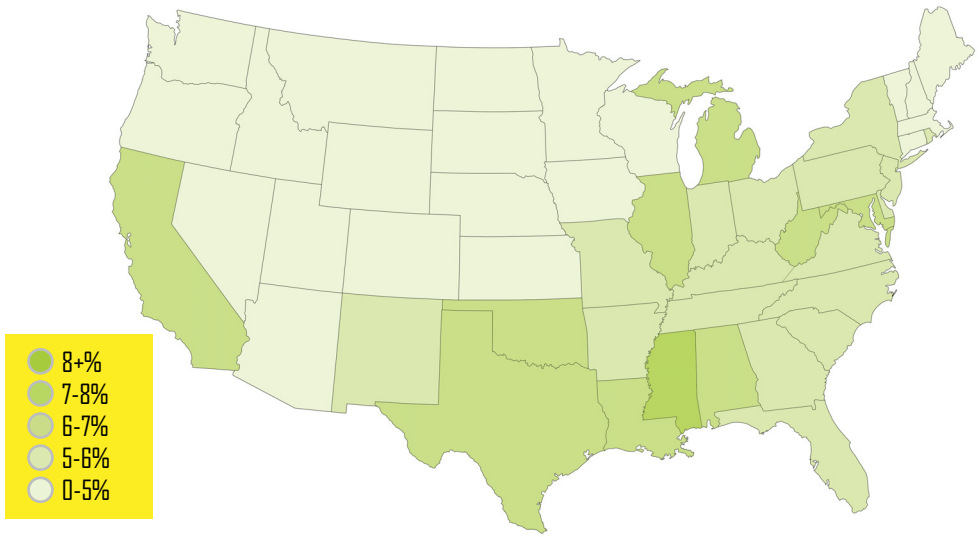
It is clear that obesity is a major issue in America, it has more obese adults than any other country. Shown above, the prevalence of obesity in the American population has increased rapidly from 1995 until 2008. According to the Surgeon General obesity today is officially an epidemic. It is arguably the most pressing public health problem we face, costing the health care system an estimated 90 billion dollars a year. Three of every five Americans are overweight. One of every five is obese. (Pollan 102)

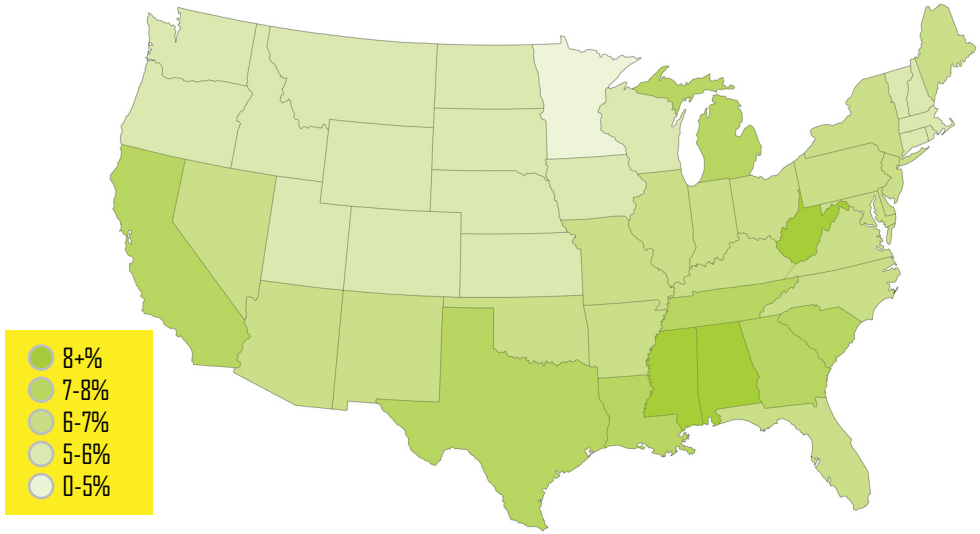
DIABETES

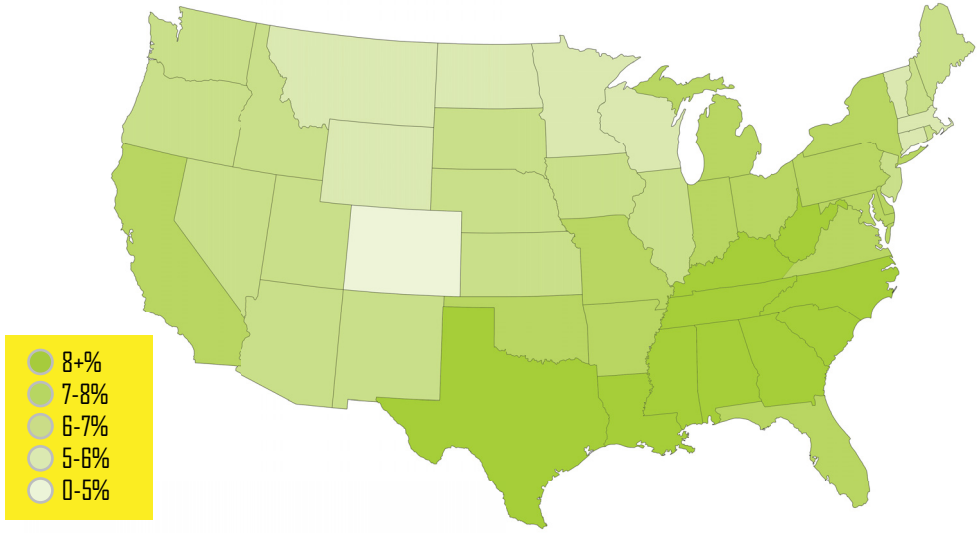
Diabetes is another diet related health epidemic. Above the prevalence of diabetes in 2007 is shown. There is a high correlation between obesity and diabetes because both are liked to the non-nutritious foods we consume.

A recent study in the Journal of American Medical Association predicts that a child born in 2000 has a one in three chance in developing diabetes. Because of these health problems today's children may turn out to be the first generation of Americans whose life expectancy will actually be shorter than their parents. (Pollan 102) There are 530 million bushels of corn annually is turned into 17.5 billion pounds of HFCS (high fructose corn syrup) in the US. Became popular in the 1980's, it is the leading source of sweetness in our diet. (Pollan 103)









Diabetes will continue to be an epidemic that will particularly plague the economically disadvantaged within our society because of the larger proportion that processed foods make up of their diets. Above, the rise in prevalence of diabetes in the population is shown from 1998 through 2004.

ENJOY OUR BROADEST MENU EVER.
i'm lovin' it®

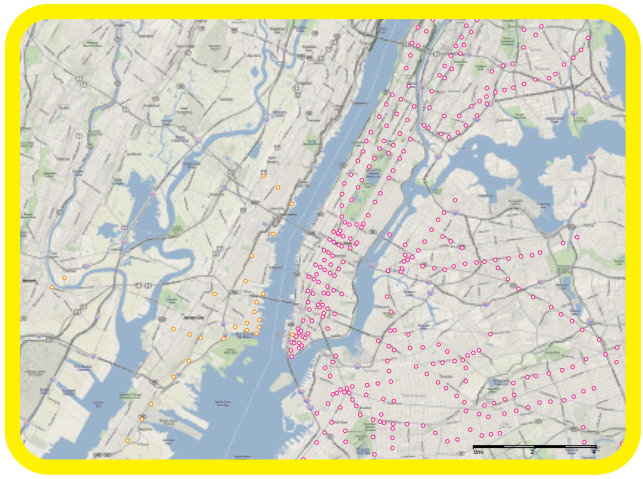
ENJOY OUR BROADEST MENU EVER.
i'm lovin' it®

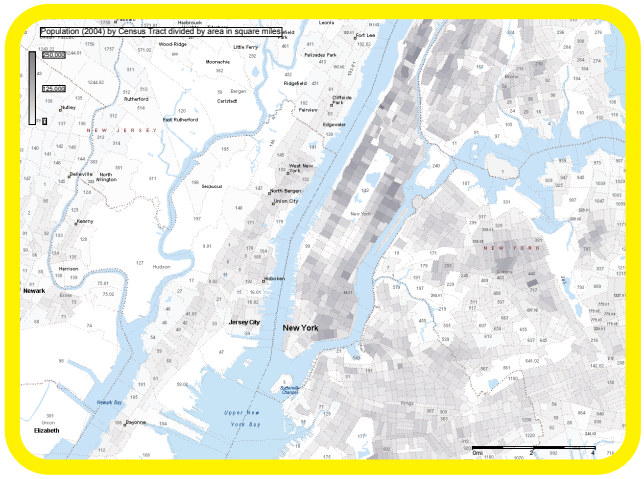
COMPARATIVE ANALYSIS

UNITED STATES CENSUS DATA WAS ORGANIZED AND OUTPUT USING A GIS SOFTWARE. THE COMPARISON BETWEEN OMAHA AND NEW YORK WAS MADE TO DETERMINE WHICH URBAN MODEL WOULD BE MORE SUCCESSFUL AT DEMONSTRATING THE IDEOLOGY OF URBAN FOOD PRODUCTION AND DISTRIBUTION FOR AN ARCHITECTURAL THESIS. OMAHA WAS STUDIED BECAUSE IT IS A STEREOTYPICAL MIDSIZED AMERICAN CITY WITH A RELATIVELY DENSE CENTER AND INCREASING DISPERSAL AS ONE MOVES OUT. NEW YORK WAS CHOSEN AS THE STUDY'S ANTITHESIS BECAUSE IT HAS THE LARGEST POPULATION WITH THE HIGHEST DENSITY IN THE UNITED STATES.

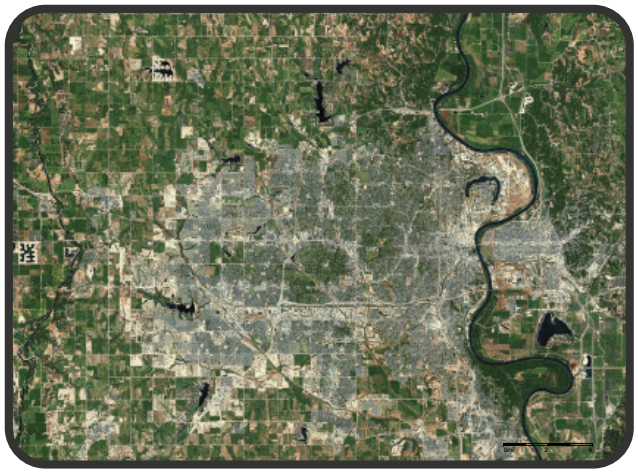
NYC

OMAHA

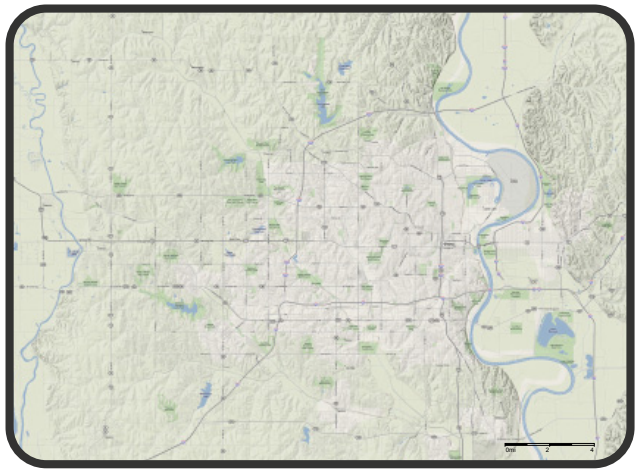




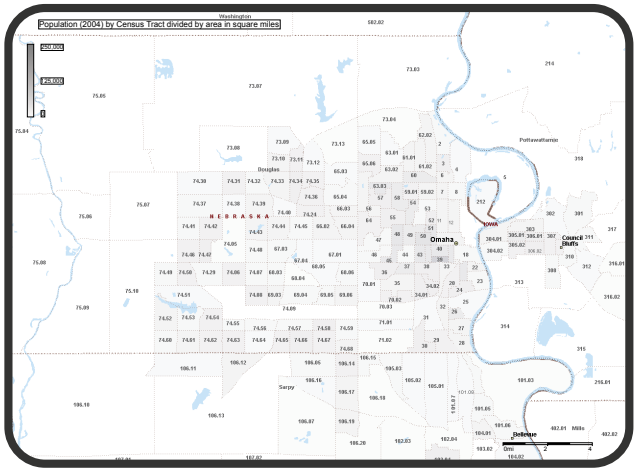
AERIAL IMAGERY



TRANSIT NETWORKS



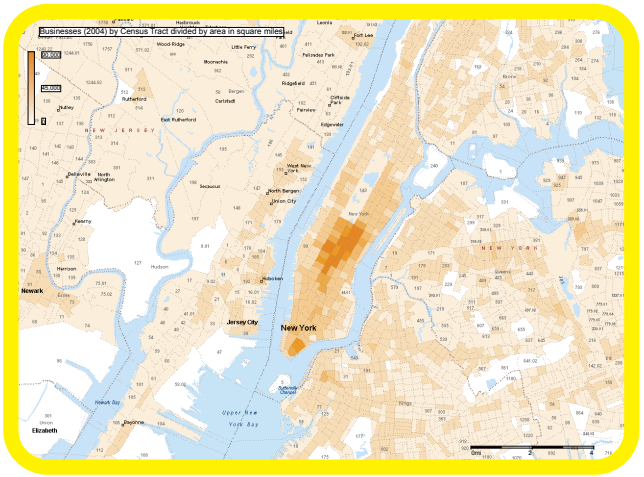
RESIDENTIAL DENSITY



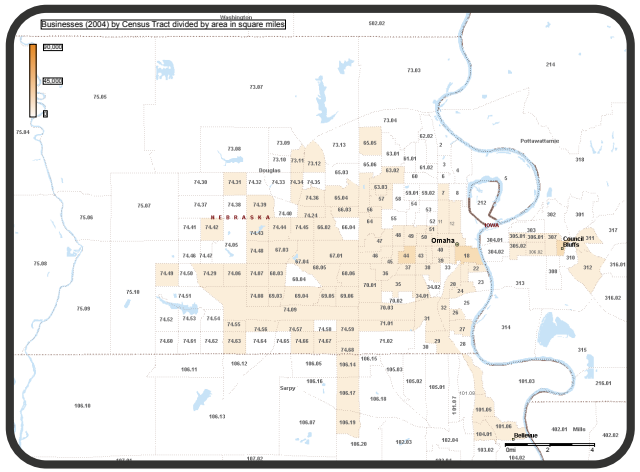
THE AERIAL PHOTOGRAPHS SHOW THAT OMAHA IS SURROUNDED BY TRADITIONAL FARMLAND, WHILE NEW YORK HAS NO ADJACENT FARMLAND. THE IMAGES ALSO SHOW AN ABUNDANCE OF SCRAP GREEN SPACE IN AND AROUND THE OMAHA AREA, WHILE THESE ASSETS ARE ALMOST NON-EXISTENT IN NEW YORK. ANOTHER PROMINENT FEATURE IS THE ABUNDANCE OF WATERWAYS AROUND THE NEW YORK AREA.

THE TRANSIT MAPS SHOW AN ADEQUATE ROAD NETWORK IN OMAHA, BUT AS THE PREVIOUS RESEARCH HAS SHOWN THIS METHOD OF TRANSIT MAY BECOME UNFEASIBLE IN THE RELATIVELY NEAR FUTURE. NEW YORK ALSO HAS AN ADEQUATE ROAD SYSTEM, BUT THIS SYSTEM IS SUPPLEMENTED BY MANY OTHER MASS TRANSIT SYSTEMS. SUBWAY STATIONS ARE SHOWN, AS WELL AS SOPHISTICATED BUS AND FERRY SYSTEMS.

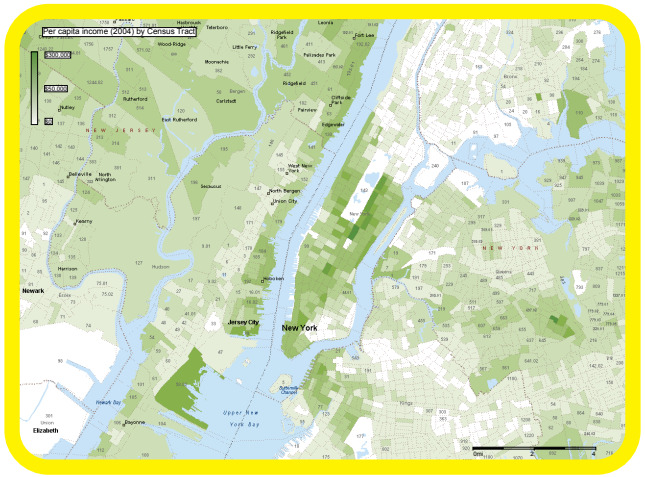
RESIDENTIAL DENSITY IS OBVIOUSLY MUCH GREATER IN NEW YORK THAN IN OMAHA. THE CONTRAST IS VERY APPARENT WHEN LOOKING AT THE MOST DENSE TRACT IN OMAHA AND HOW THAT RELATIVE DENSITY COMPARES WITH TRACTS IN MANHATTAN. WHERE THE SAME VALUE IS CONSIDERED RELATIVELY LOW RESIDENTIAL DENSITY. OMAHA HAS A MORE EVEN DISPERSAL OF DENSITY, WHERE NEW YORK HAS MANY DEFINED AREAS OF LOCALIZED DENSITY.



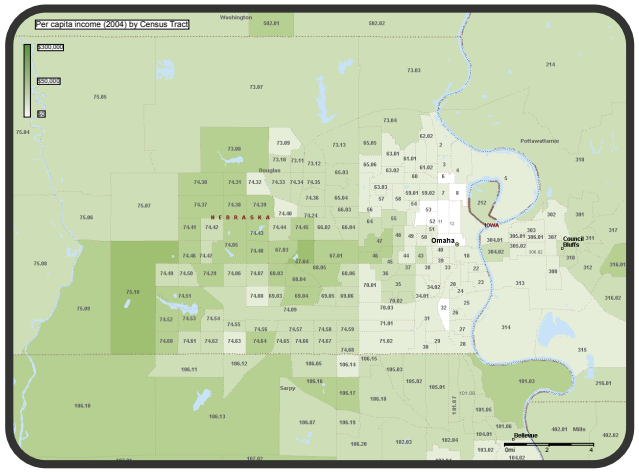
COMMERCIAL DENSITY



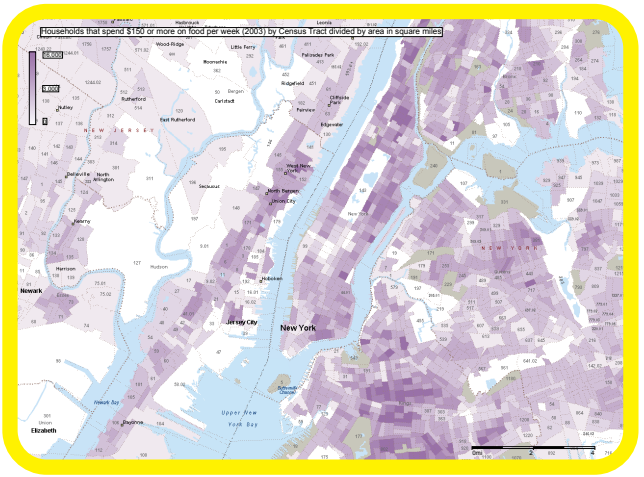
COMMERCIAL ZONES ARE QUANTIFIED BY THE NUMBER OF BUSINESSES IN A GIVEN AREA. OMAHA HAS A CENTRAL BUSINESS DISTRICT DOWNTOWN AND ANOTHER AT MIDTOWN; HOWEVER, THESE AREAS ARE LOW DENSITY WHEN COMPARED TO NEW YORK. FOR EXAMPLE, IN NEW YORK AREAS WITH VERY FEW BUSINESSES EQUATE TO THE CENTRAL BUSINESS DISTRICT IN OMAHA. IN MANHATTAN, THERE ARE TWO VERY DENSE COMMERCIAL ZONES. THE AREA SOUTH OF CENTRAL PARK AND THE FINANCIAL DISTRICT AT THE SOUTHERN MOST END OF THE ISLAND.



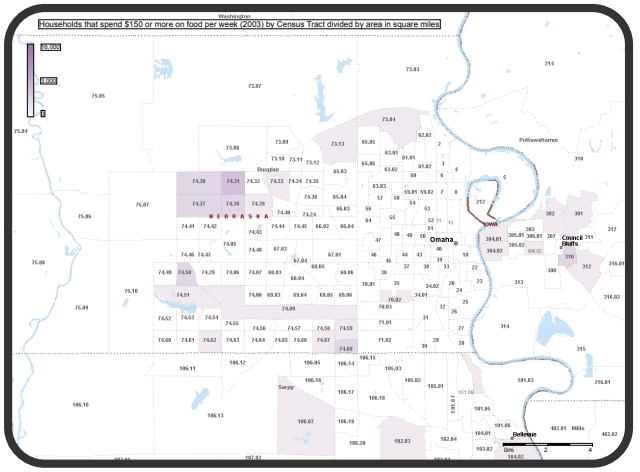
ANNUAL INCOME



THE INCOME DATA IS VERY EMBLEMATIC OF THE DEMOGRAPHIC DIFFERENCES BETWEEN THE TWO CITIES. IN OMAHA, AS WELL AS MOST OTHER AMERICAN CITIES, THE WEALTHY PEOPLE LIVE IN THE PERIPHERY OF THE CITY, WHILE IN NEW YORK THE MOST AFFLUENT RESIDENTS LIVE VERY CLOSE TO THE CITY CENTER. ALSO, OMAHA HAS A MORE SMOOTH GRADATION BETWEEN THE WEALTHY AND THE POOR AREAS AND IN NEW YORK THE LINE BETWEEN THESE TWO EXTREMES IS MORE DEFINED GEOGRAPHICALLY.



FOOD EXPENSES



MORE MONEY IS SPENT WEEKLY ON FOOD IN NEW YORK; HOWEVER, IN THE AREAS OF OMAHA THAT SPEND THE MOST WEEKLY THERE IS VERY LOW DENSITY. THIS ALLOWS ONE TO ASSUME THAT THESE PEOPLE MUST TRAVEL LONGER DISTANCES, BY CAR, TO PURCHASE THIS FOOD. WHEN THE INCOME DATA IS COMPARED WITH THE FOOD EXPENSE DATA AN IMPORTANT TREND IS REALIZED. THE AREAS IN OMAHA THAT SPEND THE MOST ON FOOD ARE AREAS WITH HIGH INCOME RATES, WHILE IN NEW YORK THE OPPOSITE SEEMS TO BE TRUE. THE AREAS OF NEW YORK THAT SPEND THE MOST ON FOOD ARE AMONG THE POOREST IN THE CITY.

CONCLUSIONS

THE ANALYSIS SHOWS THAT IMPLEMENTING THE IDEOLOGY OF URBAN PRODUCTION AND DISTRIBUTION OF FOOD WOULD NECESSITATE TWO UNIQUE STRATEGIES IN THESE VERY DIFFERENT CITIES. IN OMAHA, A STEREOTYPICAL AMERICAN CITY, THE IMPLEMENTATION OF THIS IDEAL COULD BE, IN THE MOST SIMPLE TERMS, A LEGISLATIVE MOVE THAT WOULD ALLOW THE RESIDENTS TO TAKE FULL ADVANTAGE OF THE ASSETS THAT ARE ALREADY A PART OF THE CITIES DISPERSED FORM. MAINLY, THE ABUNDANCE OF SCRAP AND UNUSED OPEN SPACES. FOR EXAMPLE, THE AREAS AROUND THE PRIMARY RESIDENTIAL MODEL, THE DETACHED SINGLE-FAMILY HOME, COULD BE USED TO PRODUCE FOOD. OTHER COMMON SPACES THAT COULD BE FARMED ARE THE AREAS THAT MAKE UP THE EASEMENTS ALONG AND BETWEEN ROADWAYS. IN ADDITION TO SPACES WITHIN THE CITY THE AERIAL PHOTO SHOWS THAT THERE IS AN ABUNDANCE OF TRADITIONAL FARMLAND IMMEDIATELY SURROUNDING THE CITY. THE VAST MAJORITY OF THIS LAND IS USED TO PRODUCE THE TWO LARGEST CASH CROPS IN AMERICA, CORN AND SOYBEANS, THAT DO NOT DIRECTLY TRANSLATE TO HUMAN FOOD. IF THESE FIELDS WERE USED TO PRODUCE FOOD INSTEAD OF CASH CROPS A LARGE AMOUNT OF OMAHA'S FOOD NEEDS COULD BE SUPPLEMENTED BY LOCAL FOOD PRODUCTION. OMAHA HAS A MUCH SMALLER, LESS DENSE POPULATION THAT SPENDS LESS MONEY ON FOOD THAN NEW YORK. NEW YORK WITH ITS LARGE POPULATION AND HIGH DENSITY WOULD REQUIRE A LARGER SCALE, MORE ORGANIZED MODEL TO ALLOW THE URBAN PRODUCTION OF FOOD TO HAVE A SIGNIFICANT IMPACT UPON THE NEEDS OF THE CITY. THE NEW YORK SYSTEM WOULD REQUIRE AN ARCHITECTURAL COMPONENT, WHILE IN OMAHA ARCHITECTURE MAY NOT BE REQUIRED TO ORGANIZE OR FACILITATE THIS IDEOLOGY.

REAL FRIES IN A FAKE WORLD.

Our fries start each day as whole, premium potatoes. They're fresh cut and cooked in sunflower oil with no preservatives or coatings. What you get is real goodness and great taste. At New York Fries you really can indulge wisely.

REAL. FRESH. FRIES.

REAL FRIES IN A FAKE WORLD.

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REAL. FRESH. FRIES.

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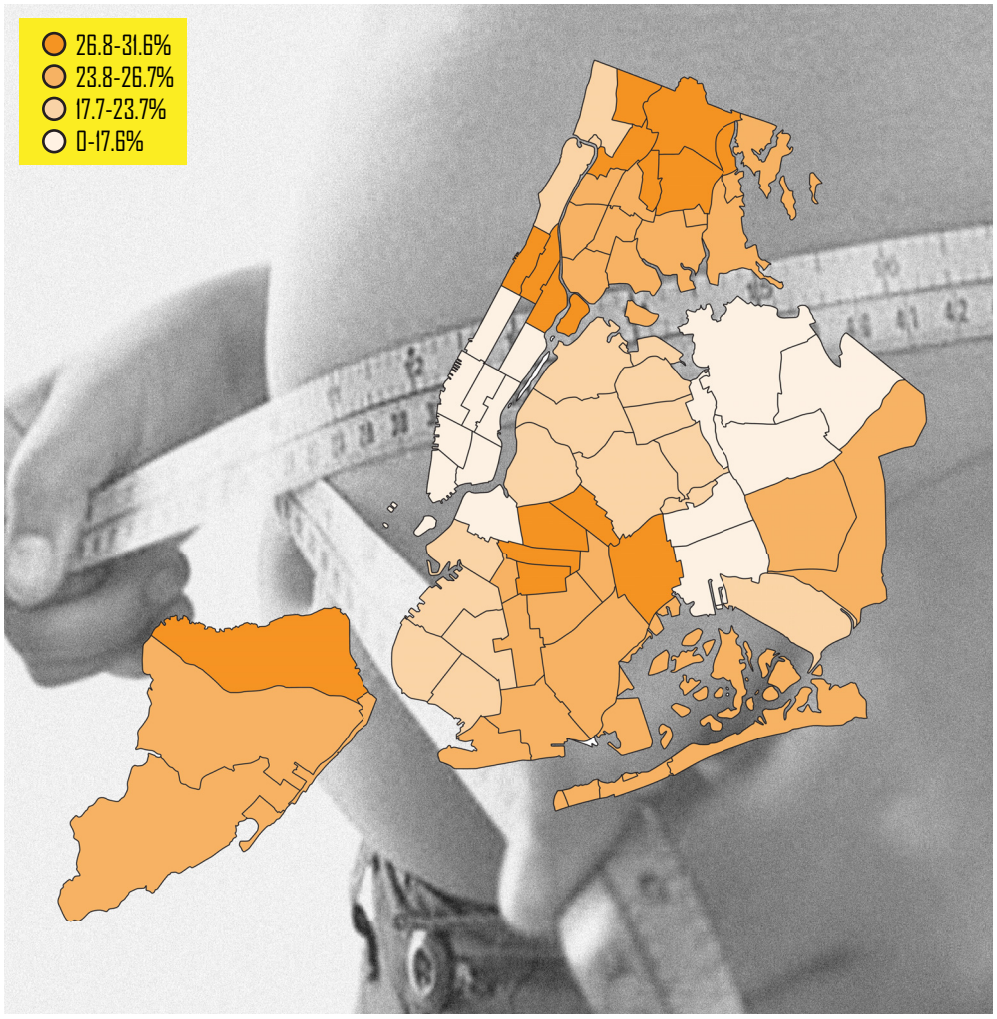
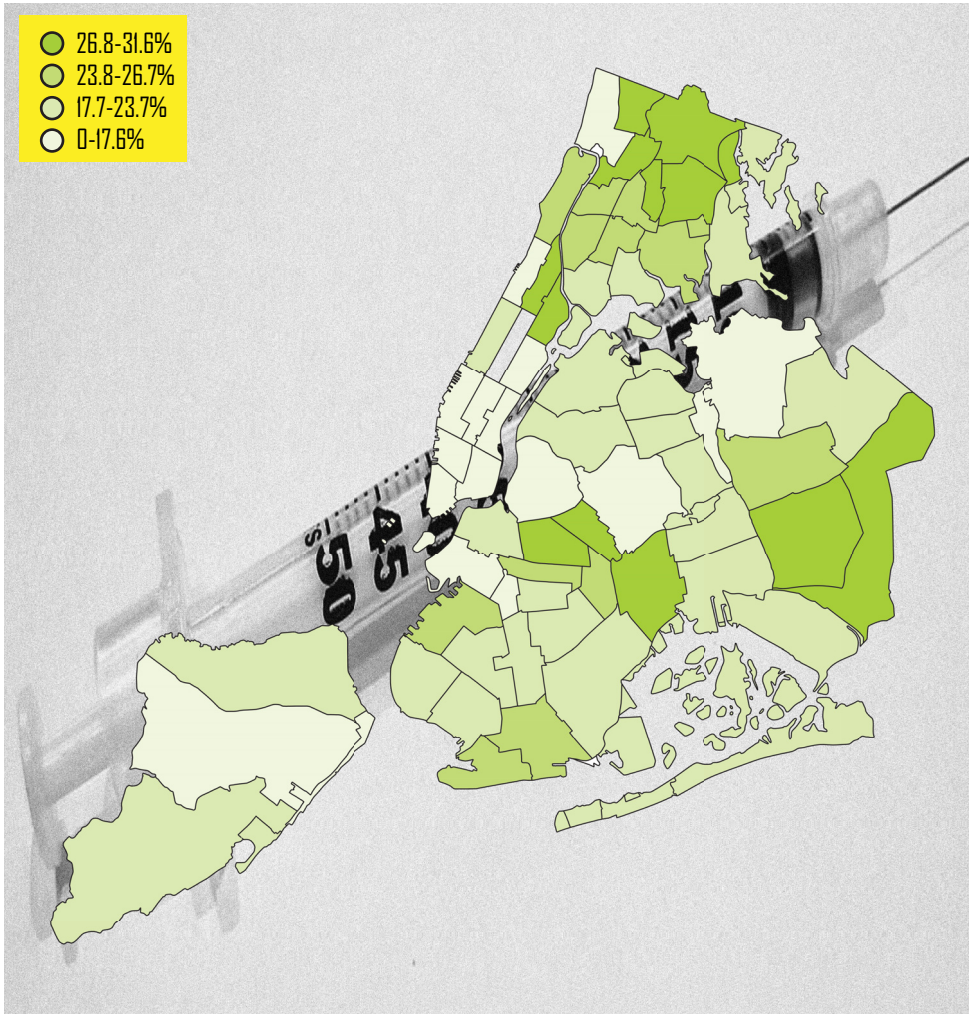
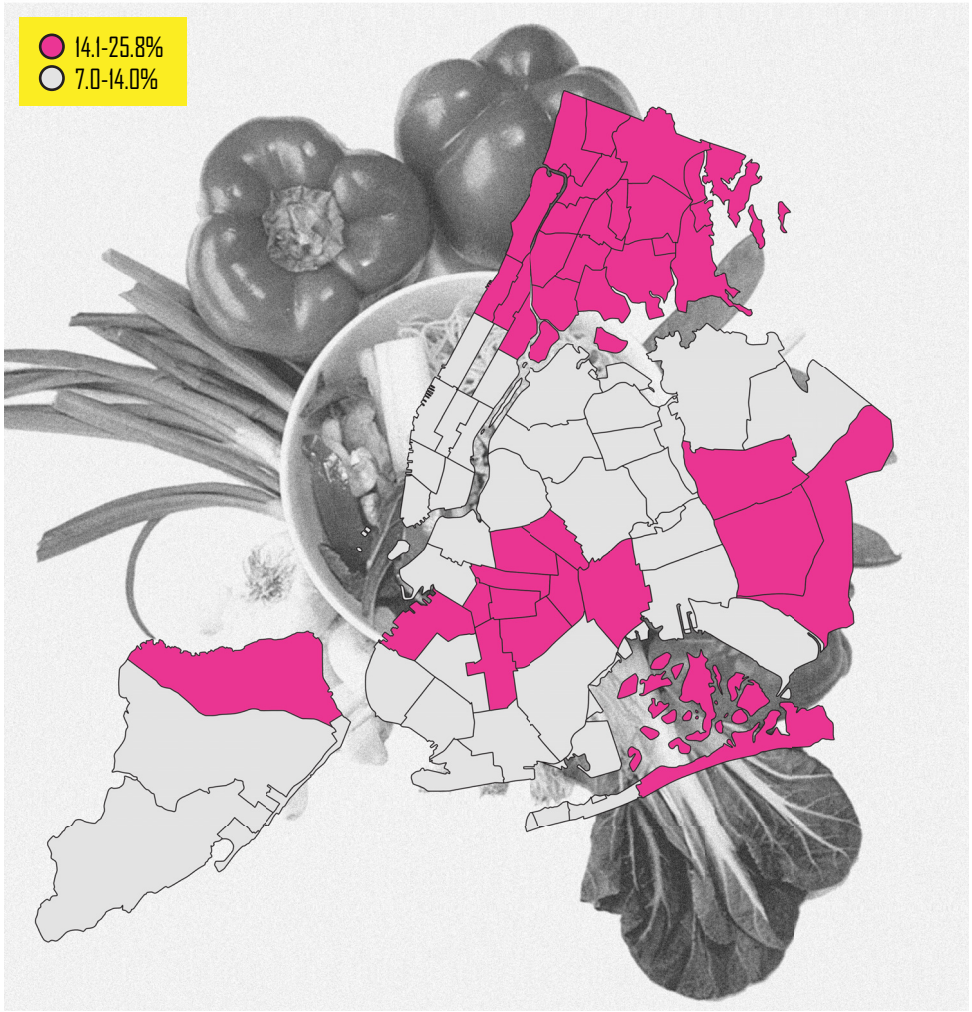
DIET RELATED HEALTH EPIDEMICS IN NYC

THESE EPIDEMICS WERE DIAGRAMMED AT THE CITY SCALE TO VERIFY THAT THE GLOBAL AND NATIONAL TRENDS ARE TRUE IN NYC

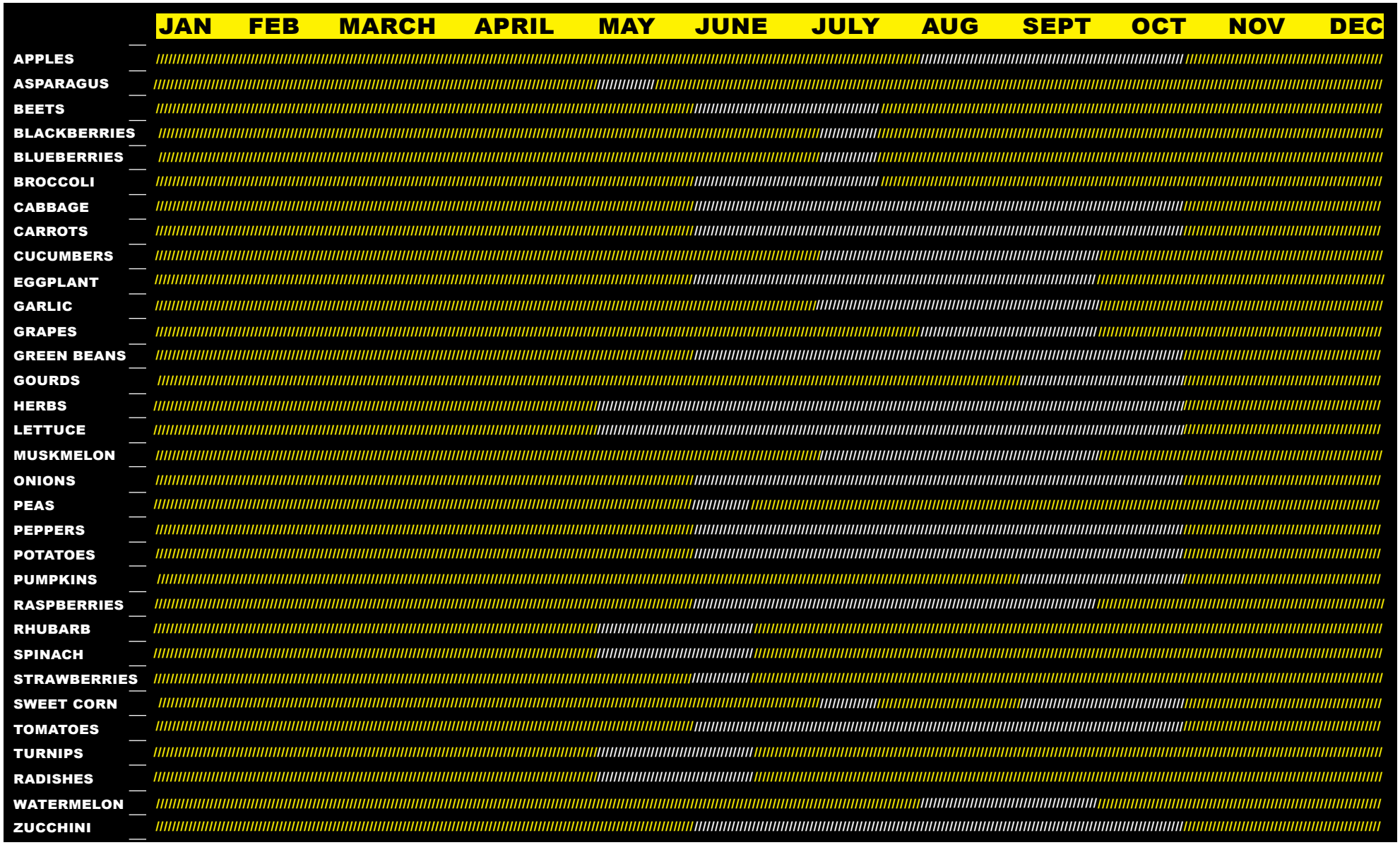




This case study shows that the correlation between the incidence of obesity and diabetes to economic status is observable on the scale of neibhorhoods. For example the rate of obesity and diabetes in the Upper West Side is very low while the neighborhood that is immediately adjacent, Harlem, the rates are much higher.



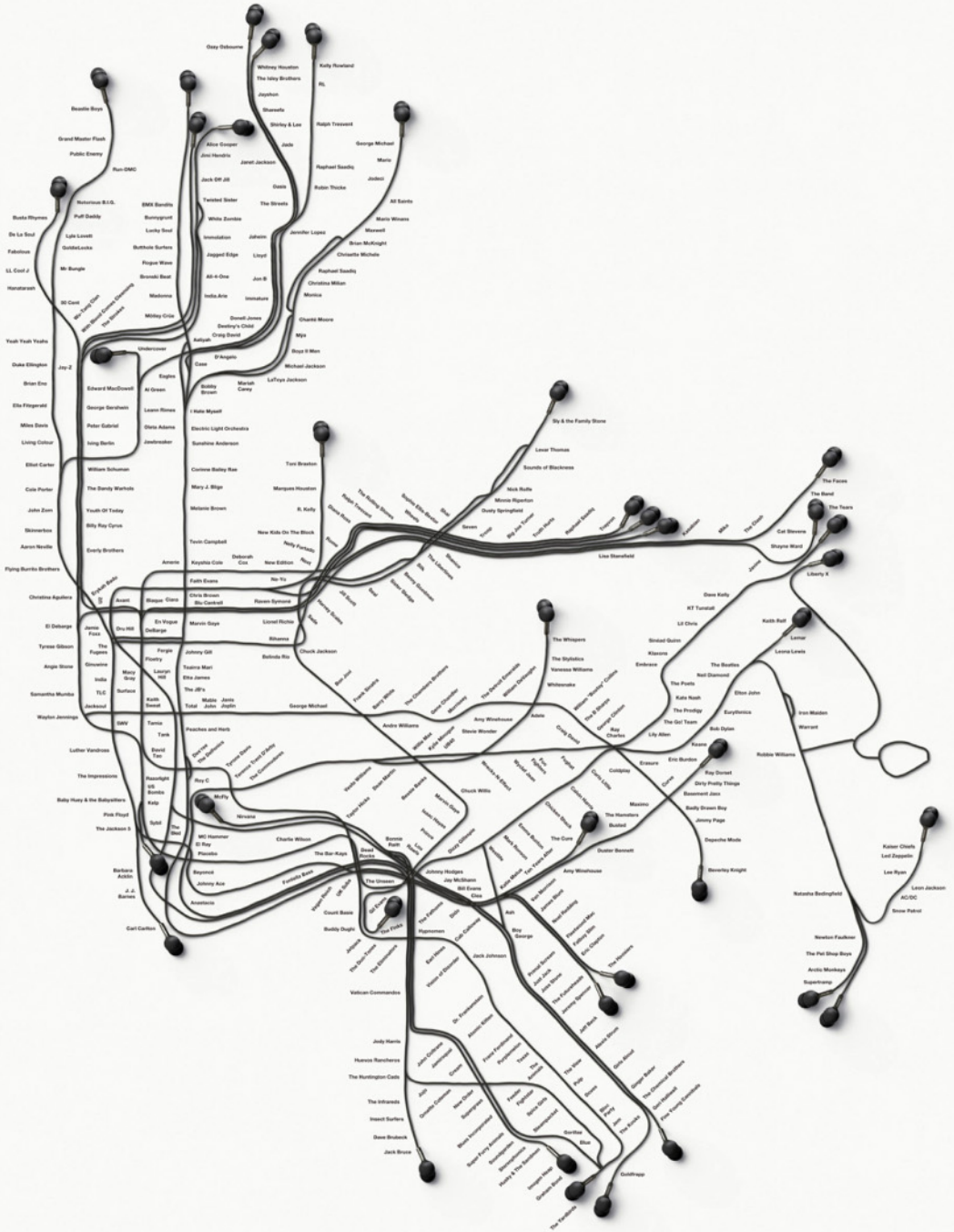
This economic disadvantage affects these people's diets in a significant way, above the percent of people reporting that they had consumed no fresh fruit or vegetables in the previous day shown. This data begins to tell us that the best way to deal with these health epidemics is to provide an increased amount of fresh produce and make this product to be available to the disadvantaged. Additionally, the ratio of supermarkets to population by community district is given along with the location of supermarkets. The areas with increased incidents of obesity and diabetes are under represented by supermarkets.



The current availability of locally grown fresh produce is shown above in white along with projected expectations for the performance of a environmentally controlled food production network that allows for an abundance of fresh produce to deal with the diet related health epidemics.

NEW YORK by Walkman

SONY


Ozzy Osbourne
Whitney Houston
The Isley Brothers
Jayshon
Shanette
Shirley & Lee
Jade
Kelly Rowland
RL
Ralph Tresvant
Raphael Saadiq
Ruben Thicke
George Michael
Mario
Jodeci
All Saints
Mario Winans
Maxwell
Brian McKnight
Chrisette Michele
Raphael Saadiq
Christina Milian
Monica
Chanté Moore
Mya
Boyz II Men
Michael Jackson
LaToya Jackson
Mariah Carey
Bobby Brown
Keyshia Cole
Deborah Cox
New Edition
Ne-Yo
Faith Evans
Chris Brown
Rihanna
Lionel Richie
Marvin Gaye
Johnny Gill
Toshiro Mari
Etta James
The JB's
Mable John
Janis Joplin
George Michael
Peaches and Herb
Roy C
McFly
Nirvana
MC Hammer
El Ray
Placebo
Beyonce
Johnny Ace
Anastacia
Charlie Wilson
The Bar-Kays
Count Basie
Buddy Dugh
Vatican Commandos
Judy Harris
Huevos Rancheros
The Huntington Cads
The Infrareds
Insect Surfers
Dave Brubeck
Jack Bruce
Sly & the Family Stone
Lavar Thomas
Sounds of Blackness
Nick Rolfe
Minnie Riperton
Dusty Springfield
Seven
Wilson Pickett
Big Joe Turner
Todd Rundgren
Traffic
Hendrix
Mike
The Chain
Lisa Stansfield
The Faces
The Band
The Tears
Cat Stevens
Shayne Ward
Liberty X
Dave Kelly
KT Tunstall
Lil Chris
Sinéad Quinn
Klaxons
Embrace
The Whispers
The Stylistics
Vanessa Williams
Whitesnake
The Beatles
Neil Diamond
The Poets
Kate Nash
The Prodigy
The Go! Team
Lily Allen
Eurythmics
Elton John
Bob Dylan
Keith Ruel
Lamar
Leona Lewis
Iron Maiden
Warrant
Robbie Williams
Kaiser Chiefs
Led Zeppelin
Lee Ryan
Leon Jackson
AC/DC
Natasha Bedingfield
Snow Patrol
Newton-Faulkner
The Pet Shop Boys
Arctic Monkeys
Supertramp
Kool & The Gang
Eric Burdon
Ray Donet
Dirty Pretty Things
Basement Jaxx
Badly Drawn Boy
Jimmy Page
Depeche Mode
Beverley Knight
Erasure
Cutting Crew
Culcipine
Maximo
The Hamsters
Busted
Duster Bennett
The Cure
Amy Winehouse
Johnny Hodges
Jay McShann
Bill Evans
Cleo
Ash
Boy George
Toy Dolls
Jack Johnson
Dr. Feelgood
Steve Ellis
Faces Extended
Rod Stewart
Ronnie Lane
Ronnie Wood
Small Faces
Jeff Beck
Steve Howe
Yes
Asia
Geordie
Nazareth
Gary Moore
Thin Lizzy
Budgie
Nine Days
Nine Inch Nails
Ministry
Gun
Wolf
Goldfrapp
The Young Knives
The Chemical Brothers
Tom Rolland
Ginger Baker
Cream
Jimi Hendrix
Alice Cooper
Janet Jackson
Jack Off Jill
Twisted Sister
White Zombie
Immolation
Jagged Edge
All-4-One
India.Arie
Donell Jones
Destiny's Child
Craig David
Kelly Price
Case
D'Angelo
Undercover
Eagles
Al Green
Leann Rimes
Gloria Adams
Jewelwaker
Edward MacDowell
George Gershwin
Peter Gabriel
Irving Berlin
William Schuman
The Dandy Warhols
Youth Of Today
Billy Ray Cyrus
Everly Brothers
Avant
Blaque
Ciara
En Vogue
DeBarge
Dru Hill
Fergie
Pleasty
Laura Izibor
Mary Gray
Surface
Keith Sweat
Tamia
Tank
David Tao
Rasselglit
Kelp
Solid
The Used
Barbara Acklin
J.J. Barnes
Carl Carlton
Beastie Boys
Grand Master Flash
Public Enemy
Run-DMC
Notorious B.I.G.
Puff Daddy
Lyle Lovett
Outkast
Mr Bungle
50 Cent
Wu-Tang Clan
Rage Against The Machine
The Streets
Madonna
Mötley Crüe
EMX Bandits
Bunnygrund
Lucky Soul
Butthole Surfers
Rogue Wave
Bromski Beat
Busta Rhymes
De La Soul
Fabolous
LL Cool J
Hanatarash
Yeah Yeah Yeahs
Duke Ellington
Jay-Z
Brian Eno
Ella Fitzgerald
Miles Davis
Living Colour
Elliot Carter
Cole Porter
John Zorn
Skinnerbox
Aaron Neville
Flying Burrito Brothers
Christina Aguilera
El Debarge
Tyrese Gibson
Angie Stone
Samantha Mumba
Waylon Jennings
Luther Vandross
The Impressions
Baby Huey & the Babysitters
Pink Floyd
The Jackson 5
Jacksoul
Tevin Campbell
Corinne Bailey Rae
Mary J. Blige
Melanie Brown
Sunshine Anderson
Electric Light Orchestra
I Hate Myself
Toni Braxton
Marques Houston
R. Kelly
New Kids On The Block
Nelly Furtado
Roven Symone
Belinda Ria
Chuck Jackson
Johnny Kemp
Bon Jovi
Peter Beere
Barry White
The Chemical Brothers
Jamie Chandler
Basement
Andre Williams
Miles Davis
Kate Bush
Stevie Wonder
Amy Winehouse
Adele
The Whispers
Wilson Pickett
Otis Redding
Ray Charles
Sam & Dave
Booker T. & The MG's
Wilson "Boogie" Cotton
Aretha Franklin
Chuck Willis
Ricky Williams
Steve Marion
Ronnie Bond
Marc Bolan
Tyrannosaurus Rex
Tyrone Ford
The Commodores
Nirvana
Kurt Cobain
Dave Grohl
Krist Novoselic
Queens of the Stone Age
Josh Homme
Nick Oliveri
Dave Catching
Hed PE
Incubus
Brandon Boyd
Mike Einziger
Jose Pasillas
Chris Kilmore
Alex Katunich
Ben Kenney
Jon Brion
Fiona Apple
Paul Thomas Anderson
Aimee Mann
Michael Penn
Jon Brion
Fiona Apple
Paul Thomas Anderson
Aimee Mann
Michael Penn
Jeff Buckley
Eric Matthews
Fred Eaglesmith
Jason Molina
Songs: Ohia
Will Oldham
Bonnie 'Prince' Billy
Palace
Slint
Tortoise
Chicago Underground
Rob Mazurek
Chad Taylor
Jeff Parker
Ken Vandermark
Exploding Star Orchestra

COMMERCIAL - 1,300 ACRES, 12% OF MANHATTAN

COMMERCIAL - 1,131 ACRES, 10.4% OF BOROUGH

PARKING FACILITIES - 169 ACRES, 1.6% OF BOROUGH

INDUSTRIAL - 965 ACRES, 8.9% OF MANHATTAN

INDUSTRIAL / MANUFACTURING - 237 ACRES, 2.2% OF BOROUGH

TRANSPORTATION / UTILITY - 728 ACRES, 6.7% OF BOROUGH

OPEN SPACE - 3,974 ACRES, 36.5% OF MANHATTAN

OPEN SPACE / RECREATION - 2,708 ACRES, 24.9% OF BOROUGH

PUBLIC FACILITIES / INSTITUTIONS - 1,266 ACRES, 11.6% OF BOROUGH

RESIDENTIAL - 4,083 ACRES, 37.4% OF MANHATTAN

ONE AND TWO FAMILY - 146 ACRES, 1.3% OF BOROUGH

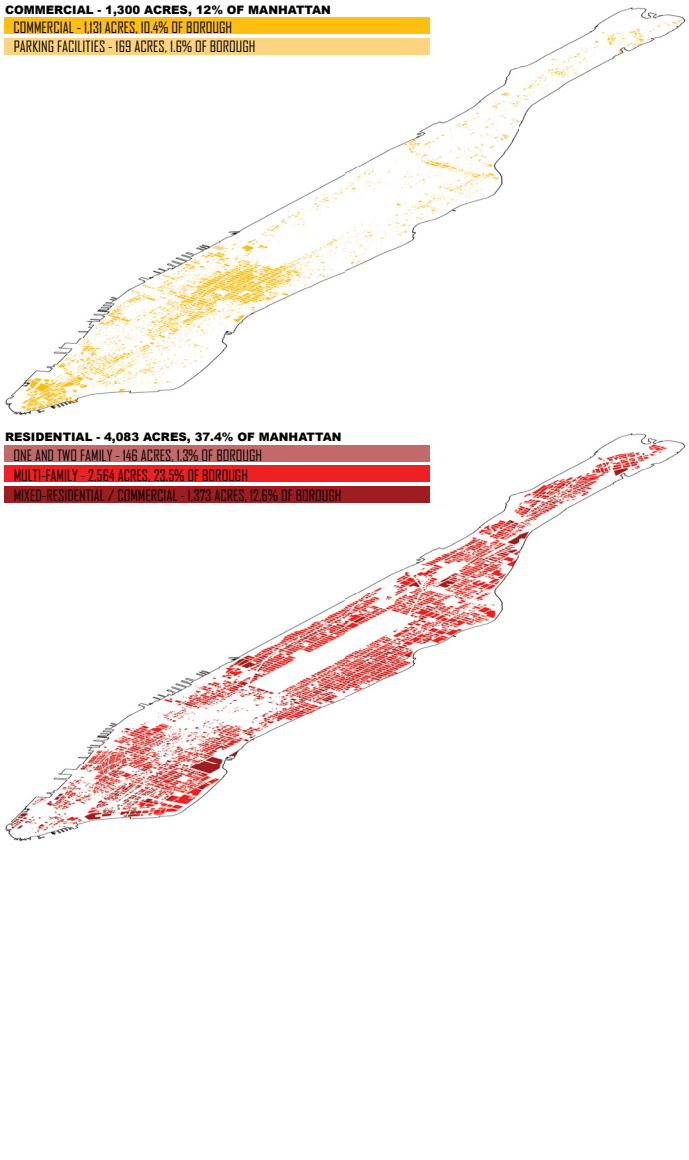
MULTI-FAMILY - 2,564 ACRES, 23.5% OF BOROUGH

MIXED-RESIDENTIAL / COMMERCIAL - 1,373 ACRES, 12.6% OF BOROUGH

VACANT LANDS - 567 ACRES, 5.2% OF MANHATTAN

VACANT LAND - 359 ACRES, 3.3% OF BOROUGH

MISCELLANEOUS - 208 ACRES, 1.9% OF BOROUGH



A New York City land use analysis was completed in order to better understand what proportion of the total land area would have to be alloted to urban agriculture in order to have a network that is large enough to have a significant impact on the current industrial food system.

NEW YORK CITY TOTALS

COMMERCIAL - 8,083 ACRES, 5.2% OF CITY LAND USE

COMMERCIAL - 6,041 ACRES, 3.9% OF CITY LAND USE

PARKING FACILITIES - 2,042 ACRES, 1.3% OF CITY LAND USE

INDUSTRIAL - 17,069 ACRES, 11% OF CITY LAND USE

INDUSTRIAL / MANUFACTURING - 5,592 ACRES, 3.6% OF CITY LAND USE

TRANSPORTATION / UTILITY - 11,477 ACRES, 7.4% OF CITY LAND USE

OPEN SPACE - 50,239 ACRES, 32.5% OF CITY LAND USE

OPEN SPACE / RECREATION - 38,966 ACRES, 25.2% OF CITY LAND USE

PUBLIC FACILITIES / INSTITUTIONS - 11,273 ACRES, 7.3% OF CITY LAND USE

RESIDENTIAL - 65,070 ACRES, 42.2% OF CITY LAND USE

ONE AND TWO FAMILY - 42,090 ACRES, 27.3% OF CITY LAND USE

MULTI-FAMILY - 18,701 ACRES, 12.1% OF CITY LAND USE

MIXED-RESIDENTIAL / COMMERCIAL - 4,279 ACRES, 2.8% OF CITY LAND USE

VACANT LANDS - 13,870 ACRES, 9% OF CITY LAND USE

VACANT LAND - 10,964 ACRES, 7.1% OF CITY LAND USE

MISCELLANEOUS - 2,906 ACRES, 1.9% OF CITY LAND USE

IF...

1.24 ACRES OF FARMLAND IS NEEDED TO FEED ONE PERSON.

THEN...

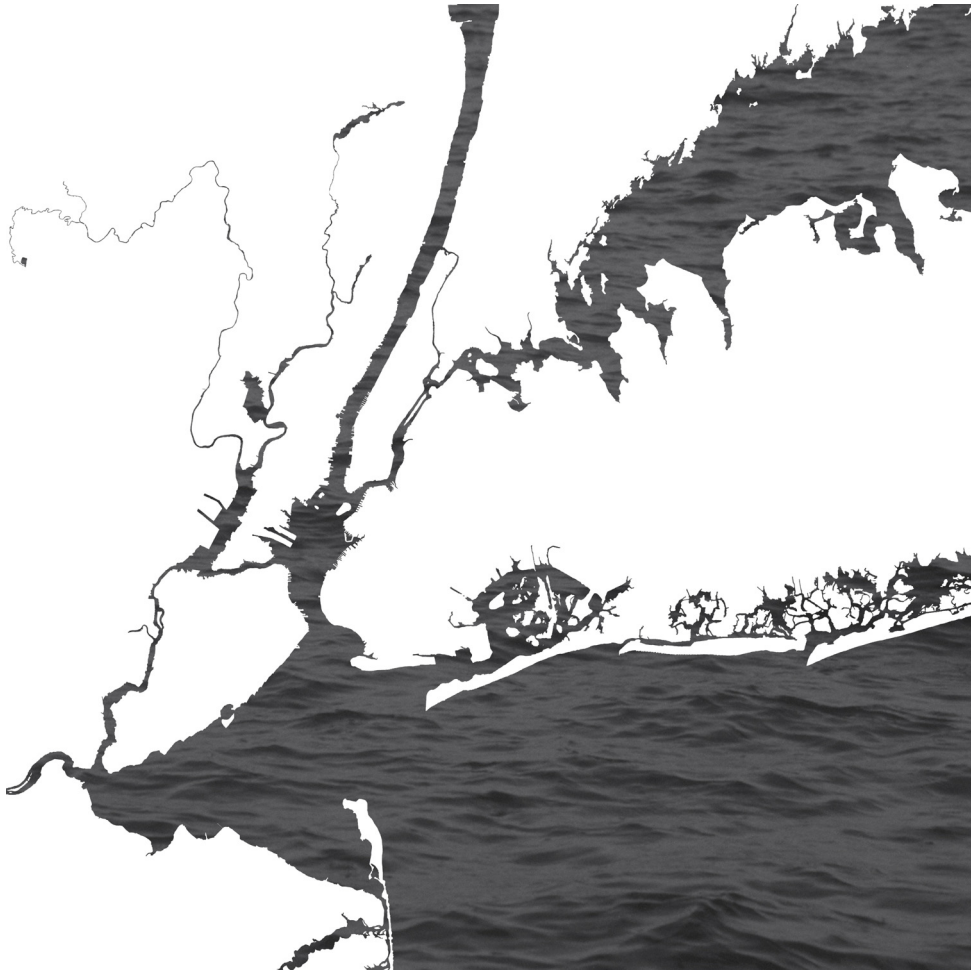
THE 49,930 ACRES OF TOTAL OPEN SPACE AND VACANT LAND IN NEW YORK WOULD FEED ONLY 40,266 PEOPLE.

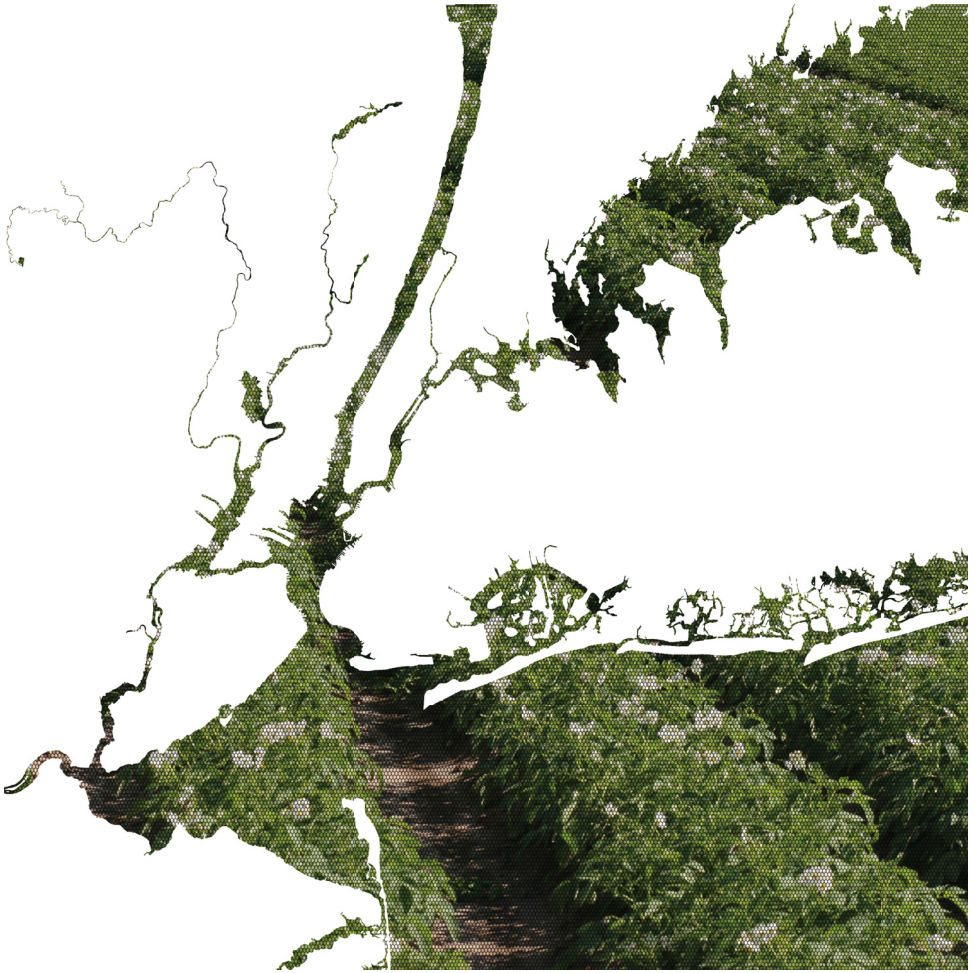
OR...

THE 154,330 TOTAL ACRES OF NEW YORK CITY HAS THE POTENTIAL TO FEED ONLY 124,460 PEOPLE.

NEW YORK CITY LAND USE ANALYSIS CONCLUSIONS

The extremely dense land use combined with high land values causes one to consider new, creative methods for developing a local food network. If the goal is to create a network that is large enough to have a significant impact on the way New Yorker's feed themselves, it is clear that a solution that relies upon conventional urban agriculture will never be enough. If all of New York was to be converted to industrialized agricultural lands the area of NYC would only be able to feed 125,000 people. If the amount of land area required to feed one person is adjusted to the lowest value that was available in the research, from 1.24 acres for industrial agriculture to .6 acres for high yield urban farming, the number of people who's needs could be met by converting NYC to productive farm land would still only be 257,000 people. A larger, scalable solution is required.





A figure ground analysis of New York's land area generated the creative possibility of producing food on the water surface. This approach allows the network to avoid producing food on land that is better suited for office buildings.

THE BEST WAY TO DRINK IS RESPONSIBLY. 10 CANE® IMPORTED RUM, 40% ALC./VOL. ©2008 IMPORTED BY MOËT HENNESSY U.S.A., INC., NEW YORK, N.Y.

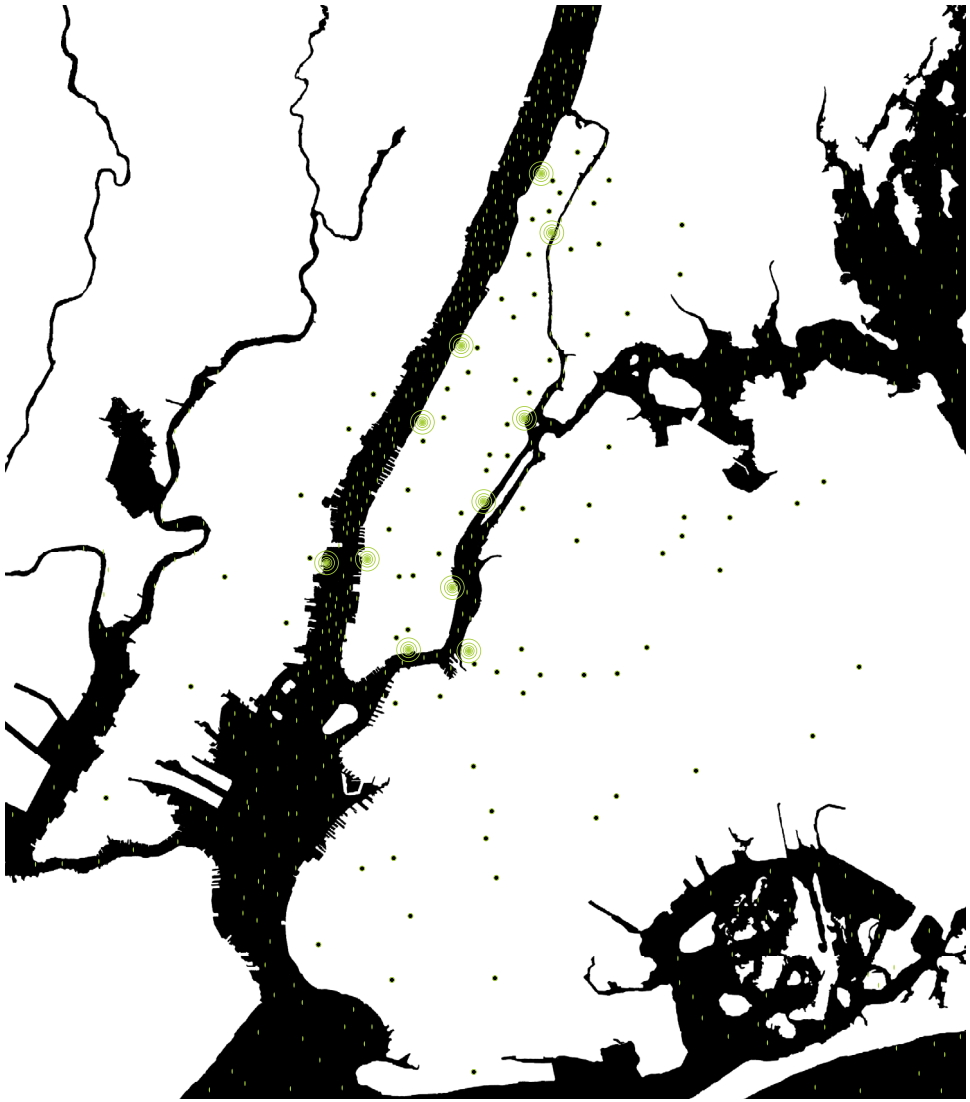
NOTHING BEATS A PROPER AIRPLANE MEAL.

urban ConAgraculture

PRELIMINARY DESIGN ALTERNATIVES

THREE DIFFERENT MODELS WERE DIAGRAMMED AND EVALUATED BASED UPON THEIR ABILITY TO AFFECT CHANGE WITHIN THE CITY

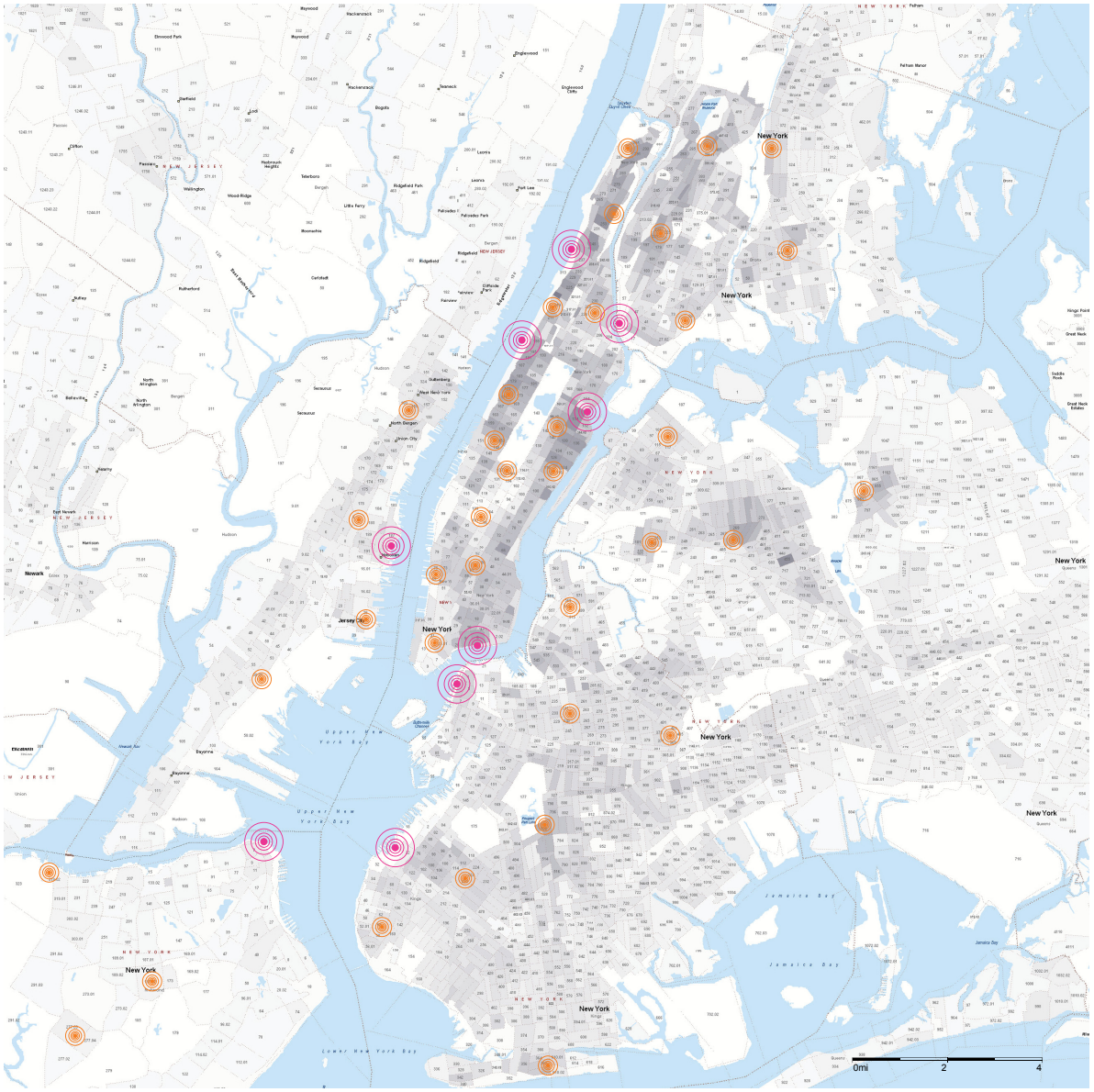
The Centralized Model, shown above, incorporates all necessary functions within a single structure, including production, offices, and retail. The singular nature of this model, extremely high land value, and its relatively small scale limit its capabilities to create change. Also show above is the Decentralized Model, this scalable solution allows for much higher yields than the centralized model. The issue of land value is jettisoned by engaging the water for the production of food. However, this model relies upon the retailing of food on the waterfront, often times a great distance from the nearest subway station. This makes it inconvenient for consumers to access the product and could potentially lead to the failure of the network.



PRELIMINARY DESIGN CONCLUSIONS

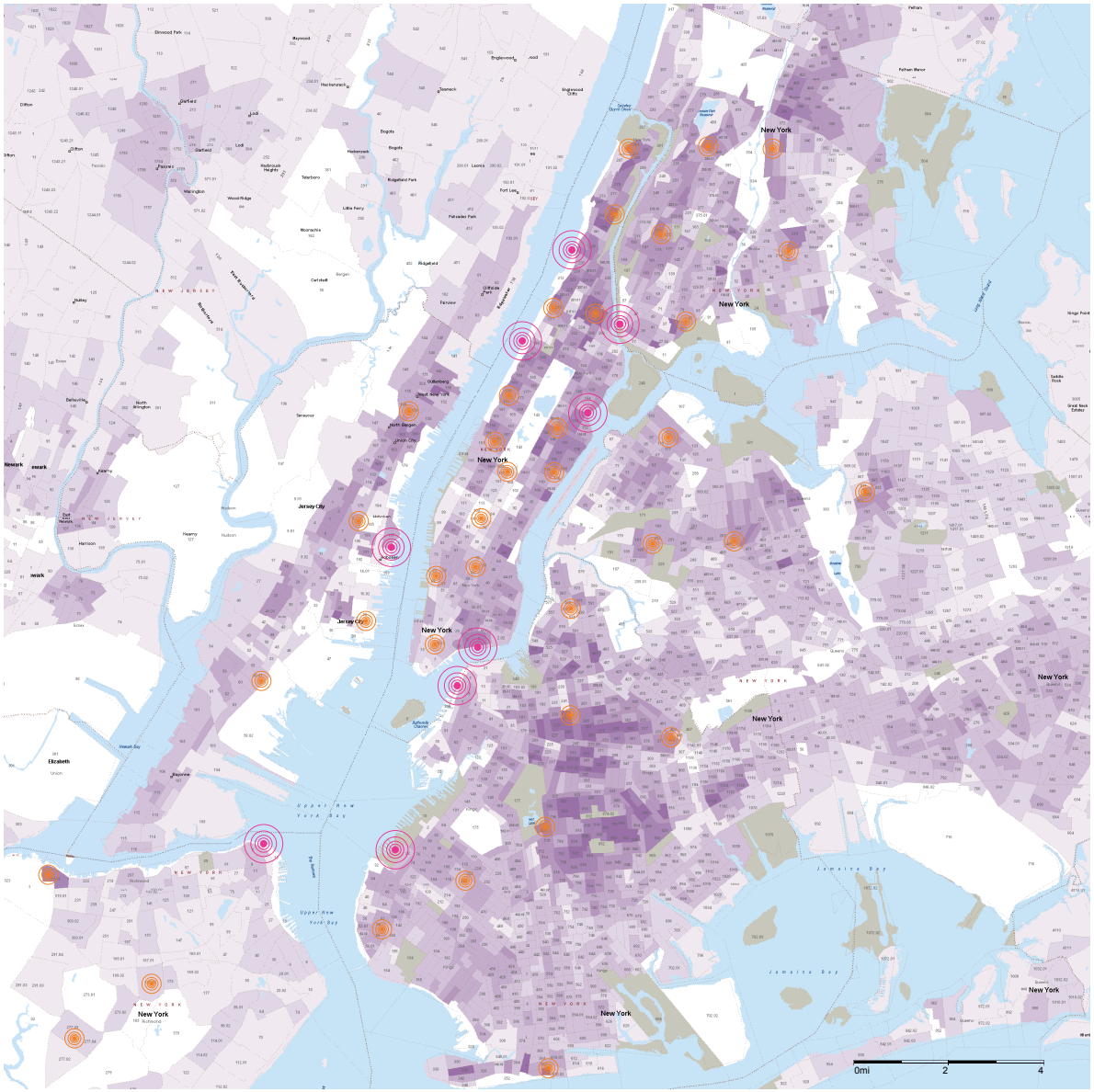
The hybrid model is the schematic system that has the most advantages when compared with the others. The Centralized Model may have resulted in a more definite architectural solution, but its lack of scalability and inability to exist in many locations throughout the city made it an illogical choice. The Decentralized Model allows for a scalable solution but the lack of proliferation of goods into the city could present a serious long term detriment to the success of the network.

The Hybrid Model, shown above, like the Decentralized Model is scaleable and has the potential for higher yields. However, this model offers dispersed retail nodes located near mass transit stations and in areas of high density. These nodes allow for the proliferation of goods throughout the city.



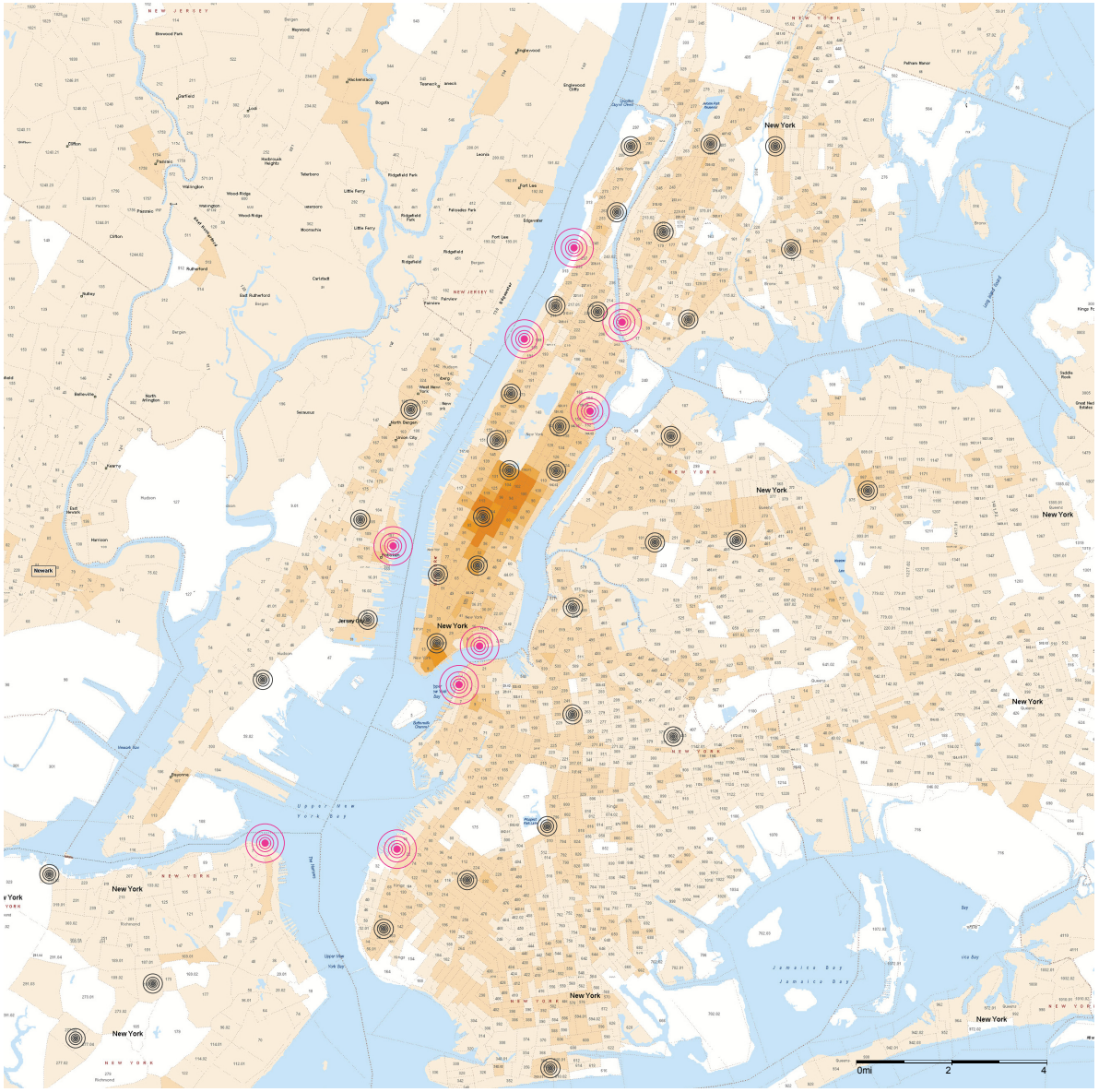
RESIDENTIAL DENSITY

Providing food close to where people live is essential for the economic sustainability of any food system. Therefore, the components of the hybrid network are located within areas of high residential density.



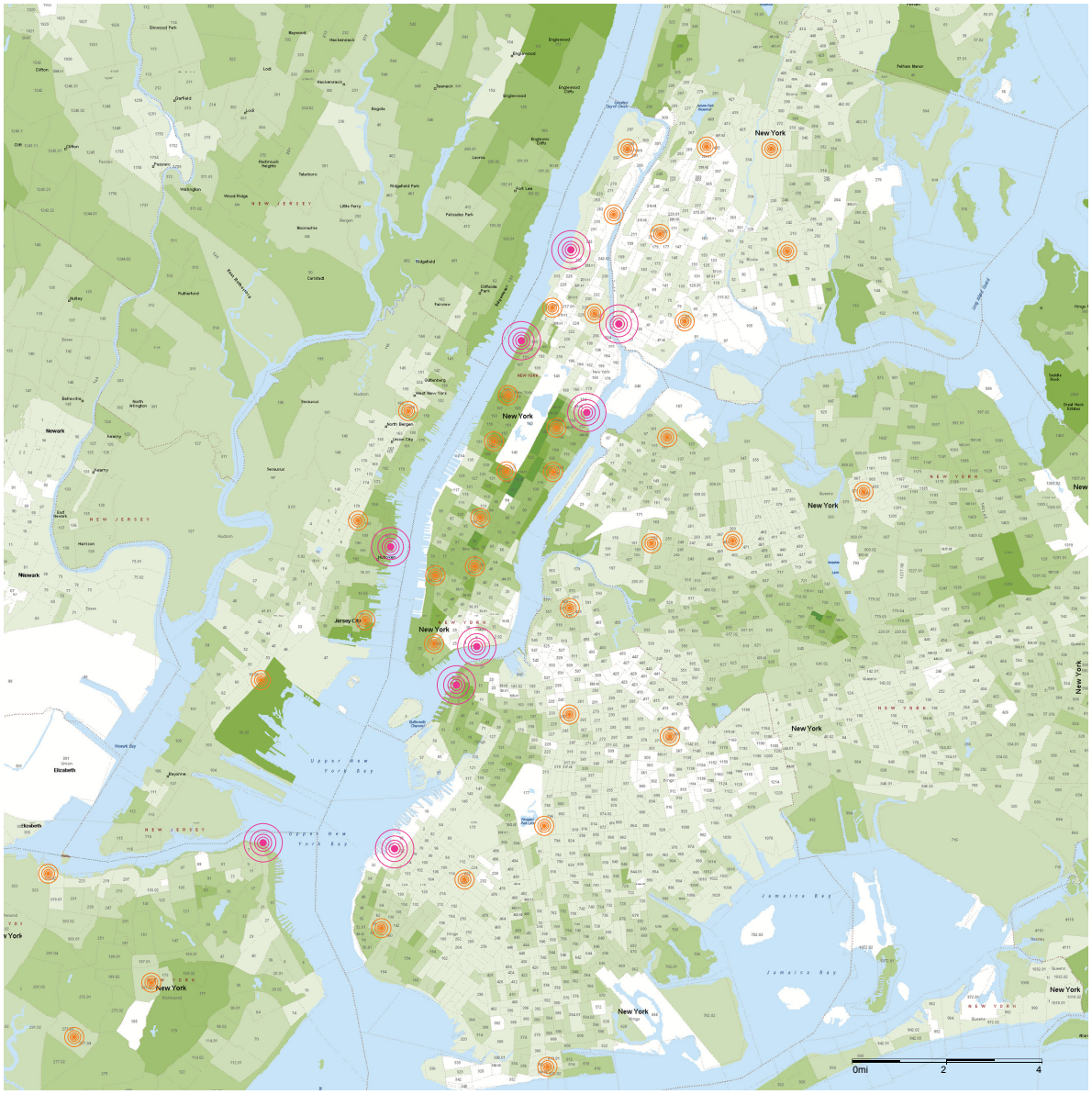
WEEKLY FOOD EXPENSES (NUMBER OF HOUSEHOLDS SPENDING MORE THAN $150 PER WEEK ON FOOD)

Retail nodes have been located at areas within the city that have been identified as having intensities of food spending.



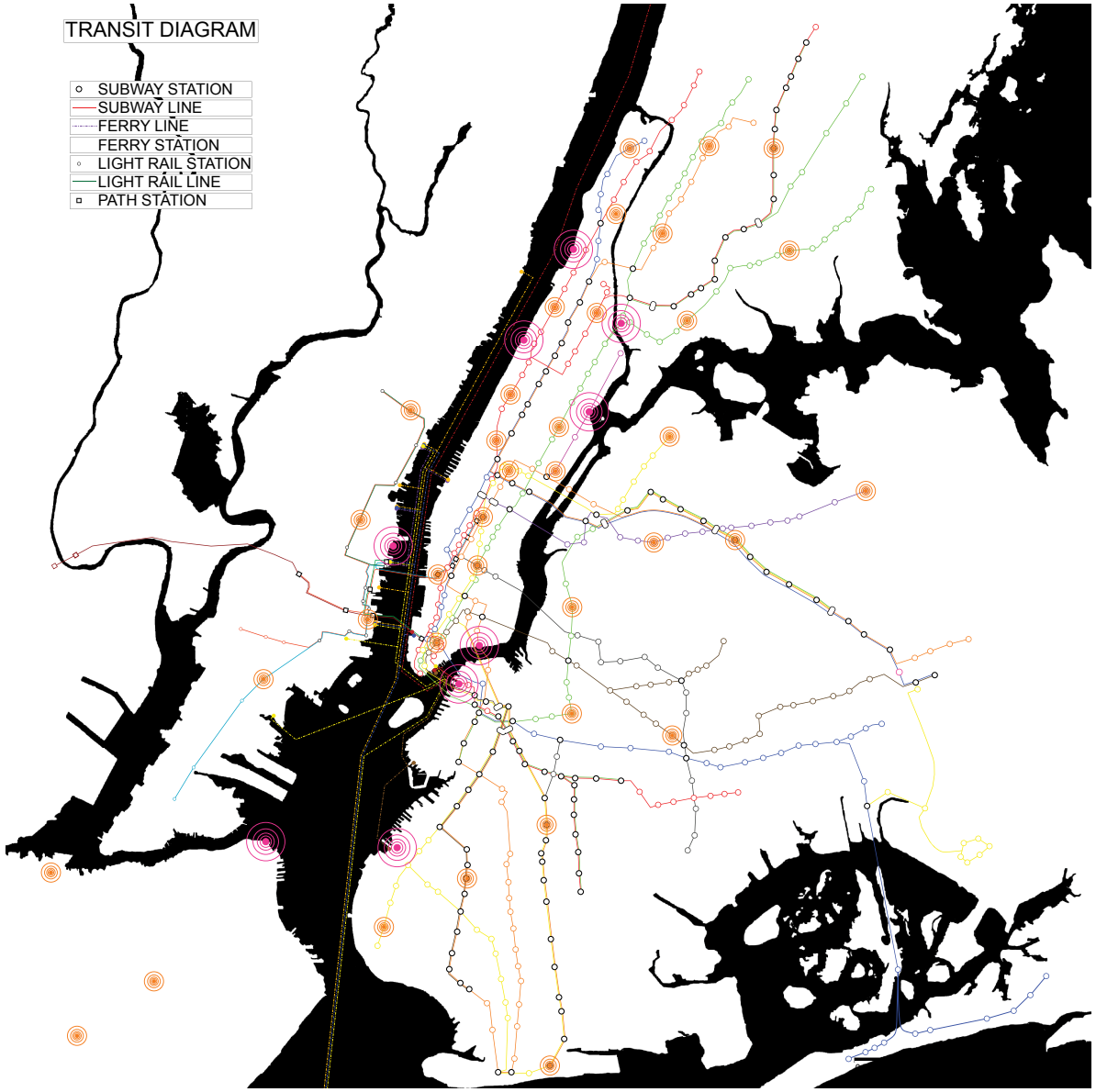
COMMERCIAL DENSITY

Retail nodes have been located at the two business districts of Manhattan to take advantage of the large influx of commuters each business day.



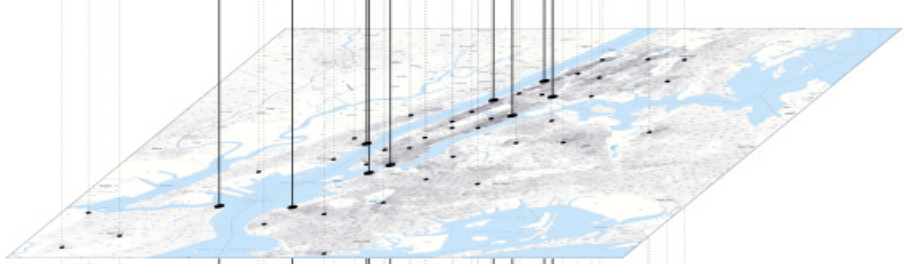
INCOME PER CAPITA

There is a very prominent divide between income levels at the north edge of Central Park, but when this data set is compared with the food expense data it is clear the less economically fortunate spend as much on food.



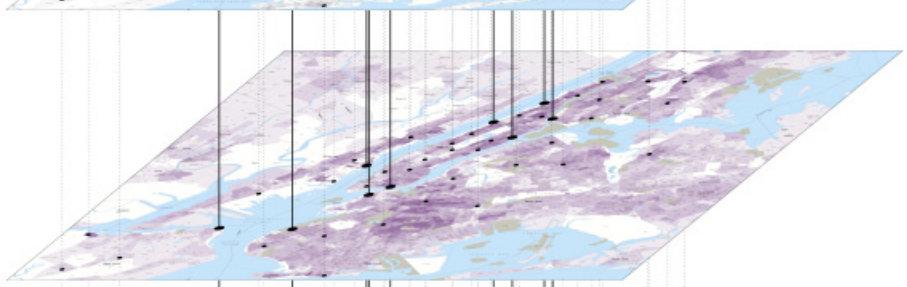
TRANSIT NETWORK

All components of the network are located as close as possible to nodes of the existing mass transit system. This stratgey allows the food network to engage a higher number of people on a daily basis.



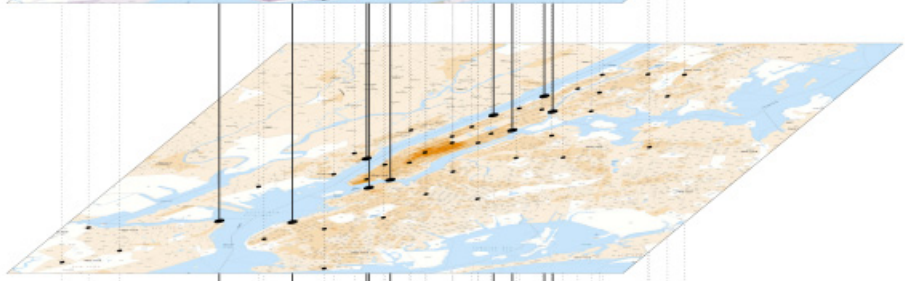
RESIDENTIAL DENSITY

PROVIDING FOOD CLOSE TO WHERE PEOPLE LIVE IS ESSENTIAL FOR THE ECONOMIC SUSTAINABILITY OF ANY FOOD SYSTEM. THEREFORE, THE COMPONENTS OF THE HYBRID NETWORK ARE LOCATED WITHIN AREAS OF HIGH RESIDENTIAL DENSITY.



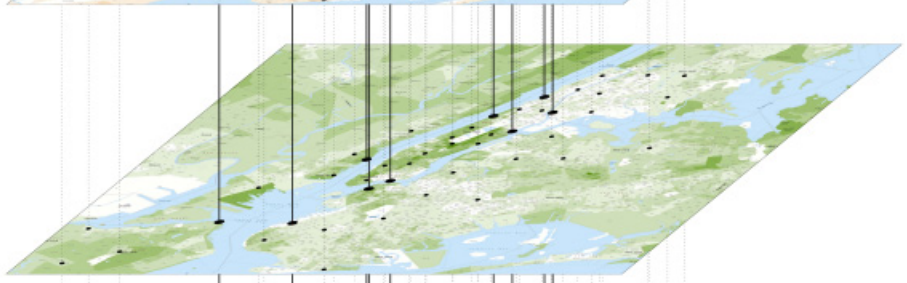
WEEKLY FOOD EXPENSES

RETAIL NODES HAVE BEEN LOCATED AT AREAS WITHIN THE CITY THAT HAVE BEEN IDENTIFIED AS HAVING INTESITIES OF FOOD SPENDING.



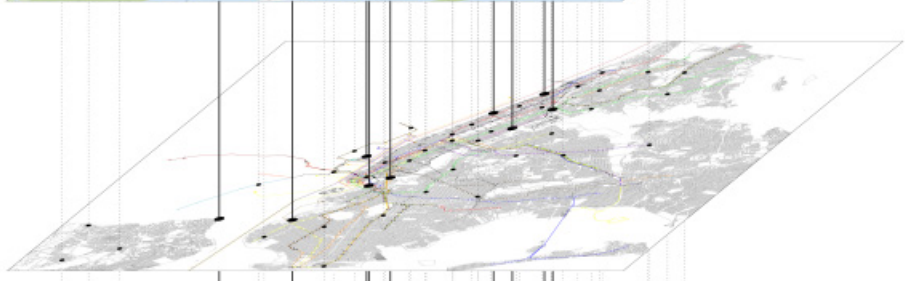
COMMERCIAL DENSITY

RETAIL NODES HAVE BEEN LOCATED AT THE TWO BUSINESS DISTRICTS OF MANHATTAN TO TAKE ADVANTAGE OF THE LARGE INFLUX OF COMMUTERS EACH DAY.



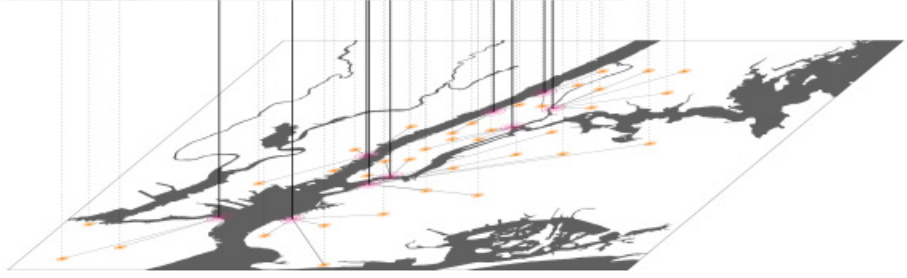
INCOME PER CAPITA

THERE IS A VERY PROMINENT DIVIDE BETWEEN INCOME LEVELS AT THE NORTH EDGE OF CENTRAL PARK, BUT WHEN THIS IS COMPARED WITH THE FOOD EXPENSE DATA IT IS CLEAR THAT THE LESS FORTUNATE SPEND AS MUCH ON FOOD.



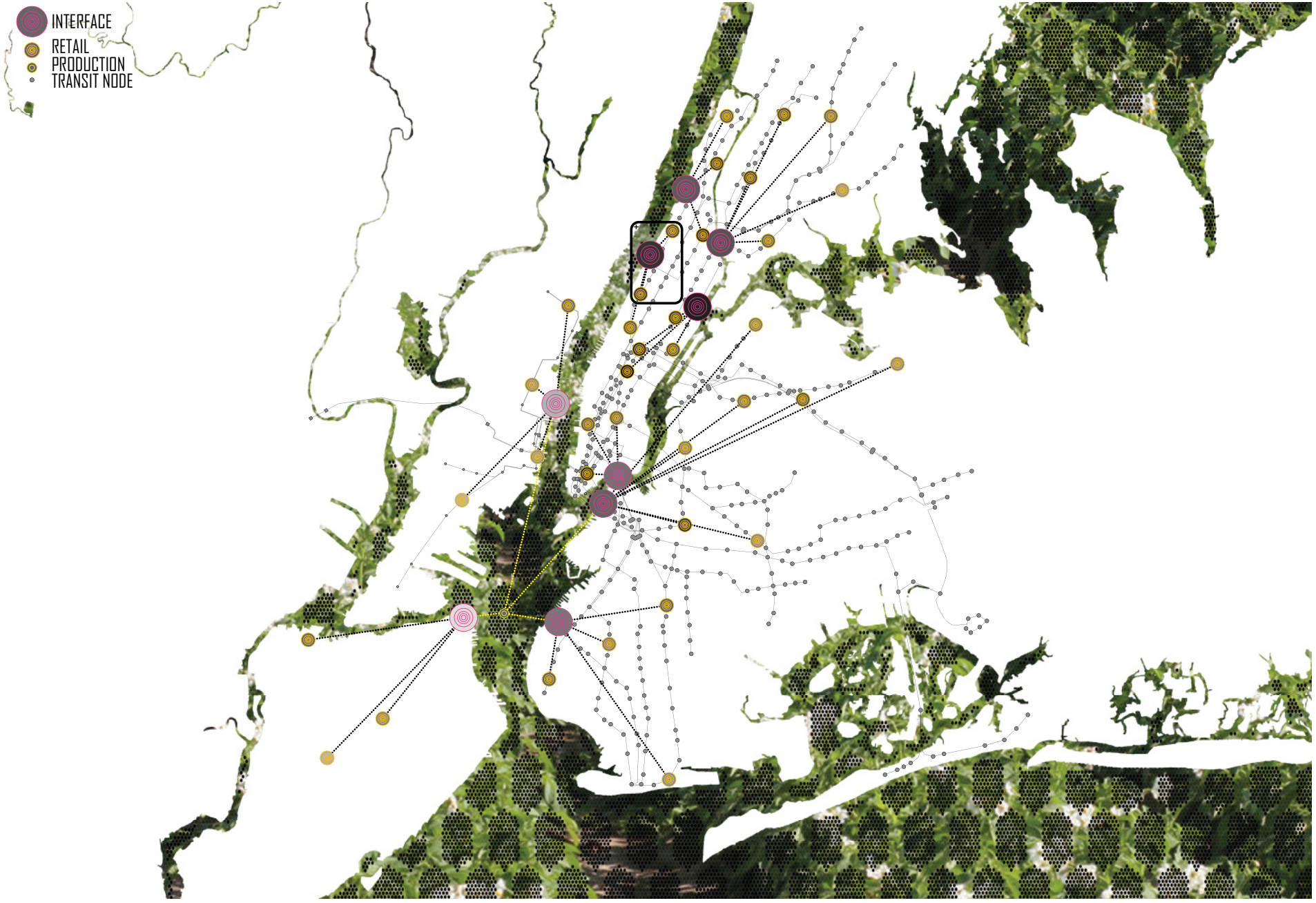
TRANSIT NETWORK

ALL COMPONENTS OF THE NETWORK ARE LOCATED AS CLOSE AS POSSIBLE TO MASS TRANSIT NODES. THIS STRATEGY ALLOWS THE NETWORK TO ENGAGE A HIGHER NUMBER OF PEOPLE ON A DAILY BASIS.



SITE SELECTION

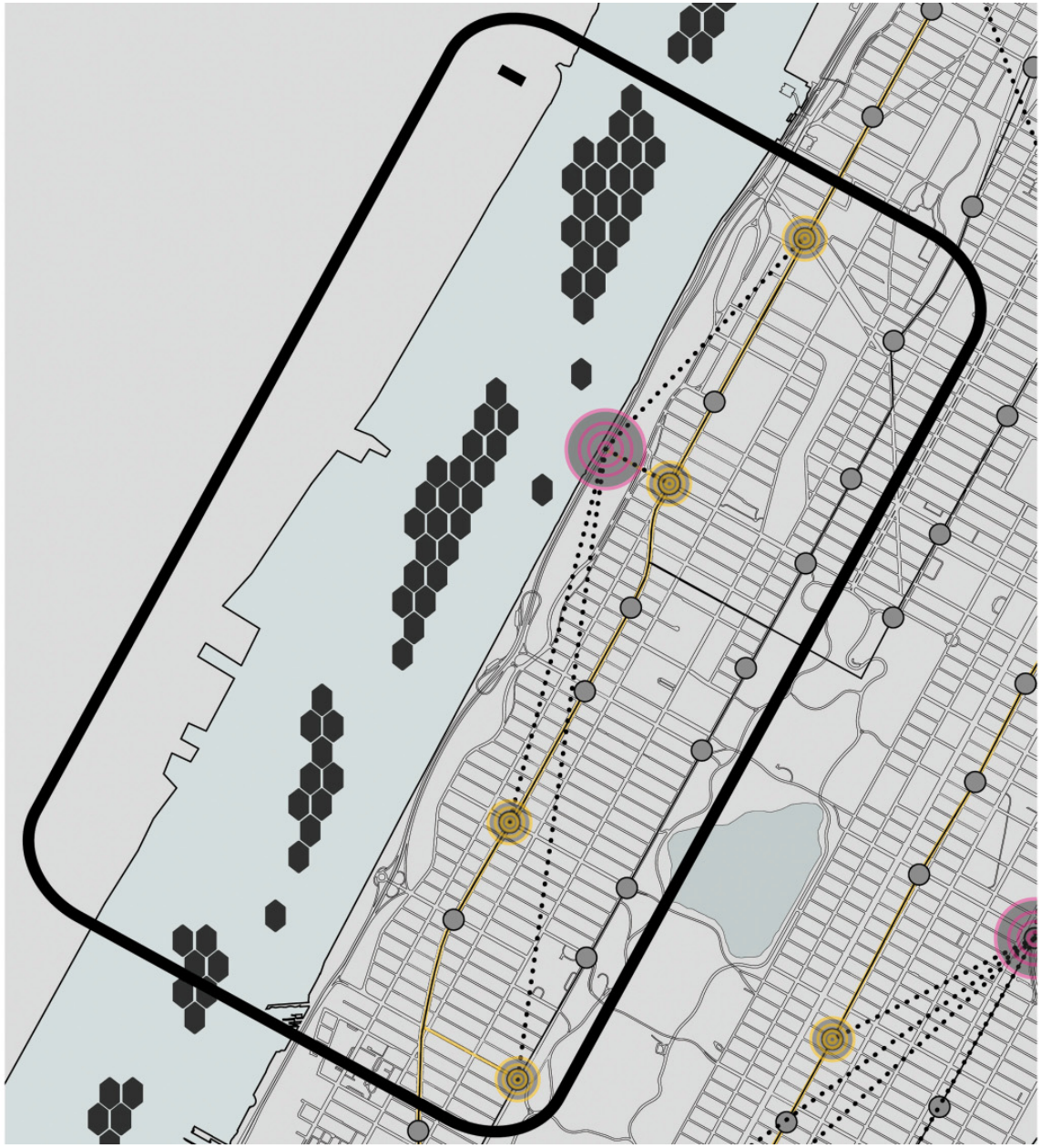
THE ABOVE DATA WAS REFERENCED IN THE SITING OF NODES FOR THE HYBRID NETWORK.



FINAL NETWORK DIAGRAM

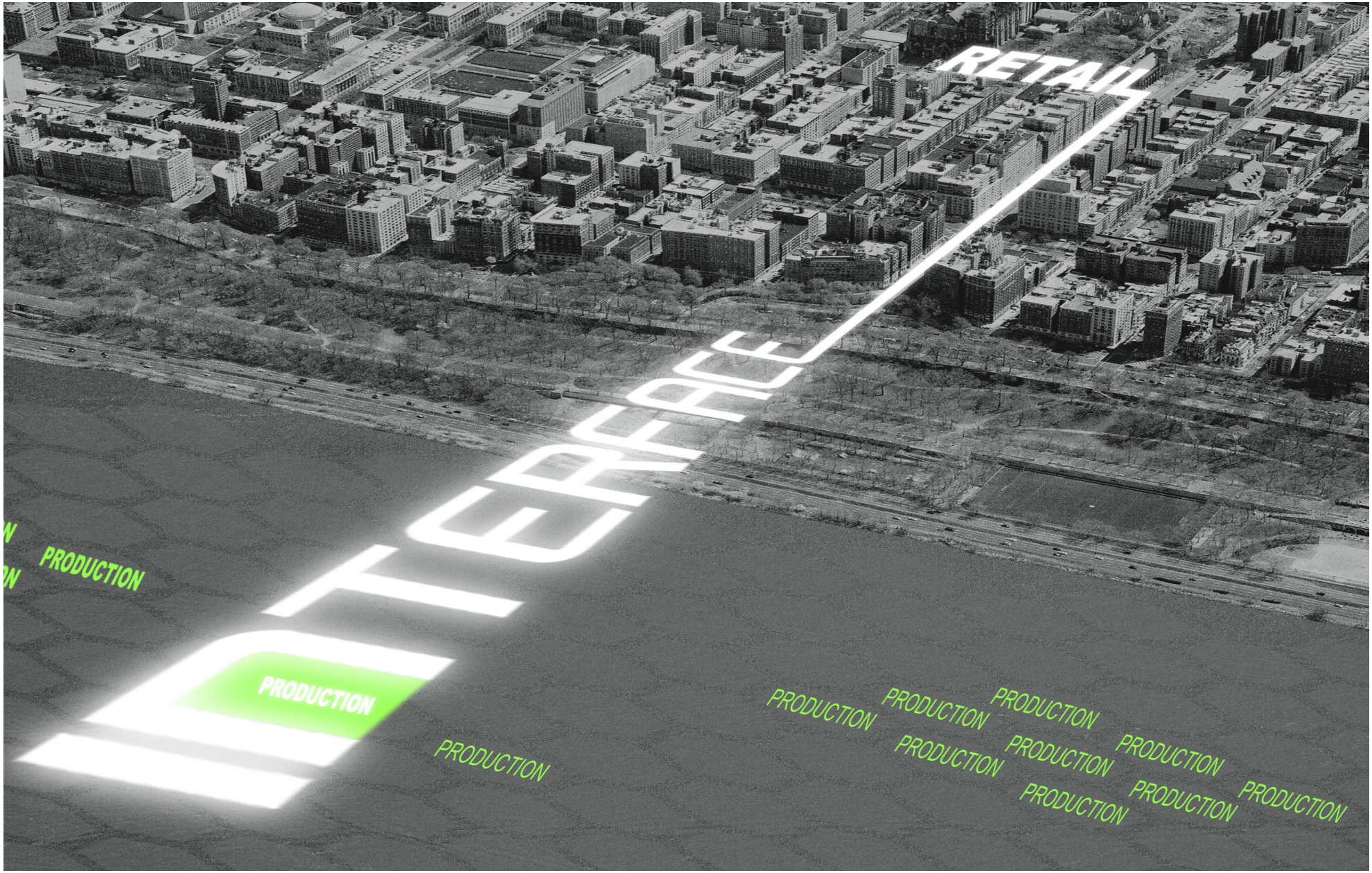
Food is produced on the water, processed on the waterfront, and distributed to various retail nodes within the city.

NEVER LET THEIR TOYS DIE
THE WORLD'S LONGEST LASTING BATTERY
Energizer



AREA OF EMPHASIS

The interface at 110th street and its adjoining retail hubs were chosen to be the units that were to be designed as the project is refined into an architectural solution. This location was choosen for many reasons, including, the socioeconomic variety that this interface serves, as well as, the proximity to Columbia, the Upper West Side, and Harlem.



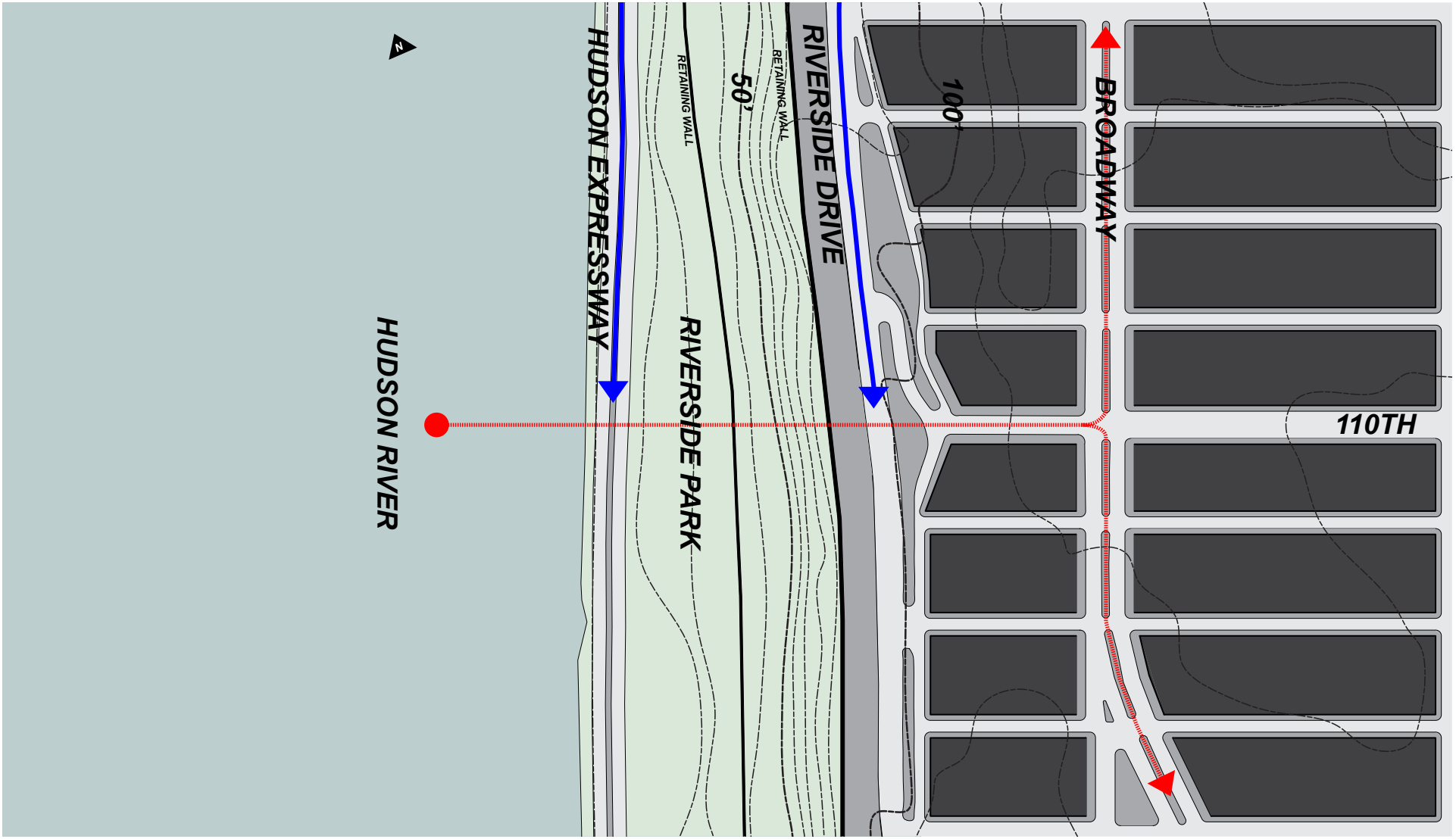
DIAGRAMMATIC STUDY

The initial design of the specific architectural componentry began with this text diagram showing the various components of the network, their relation to each other, and their relation to the city.

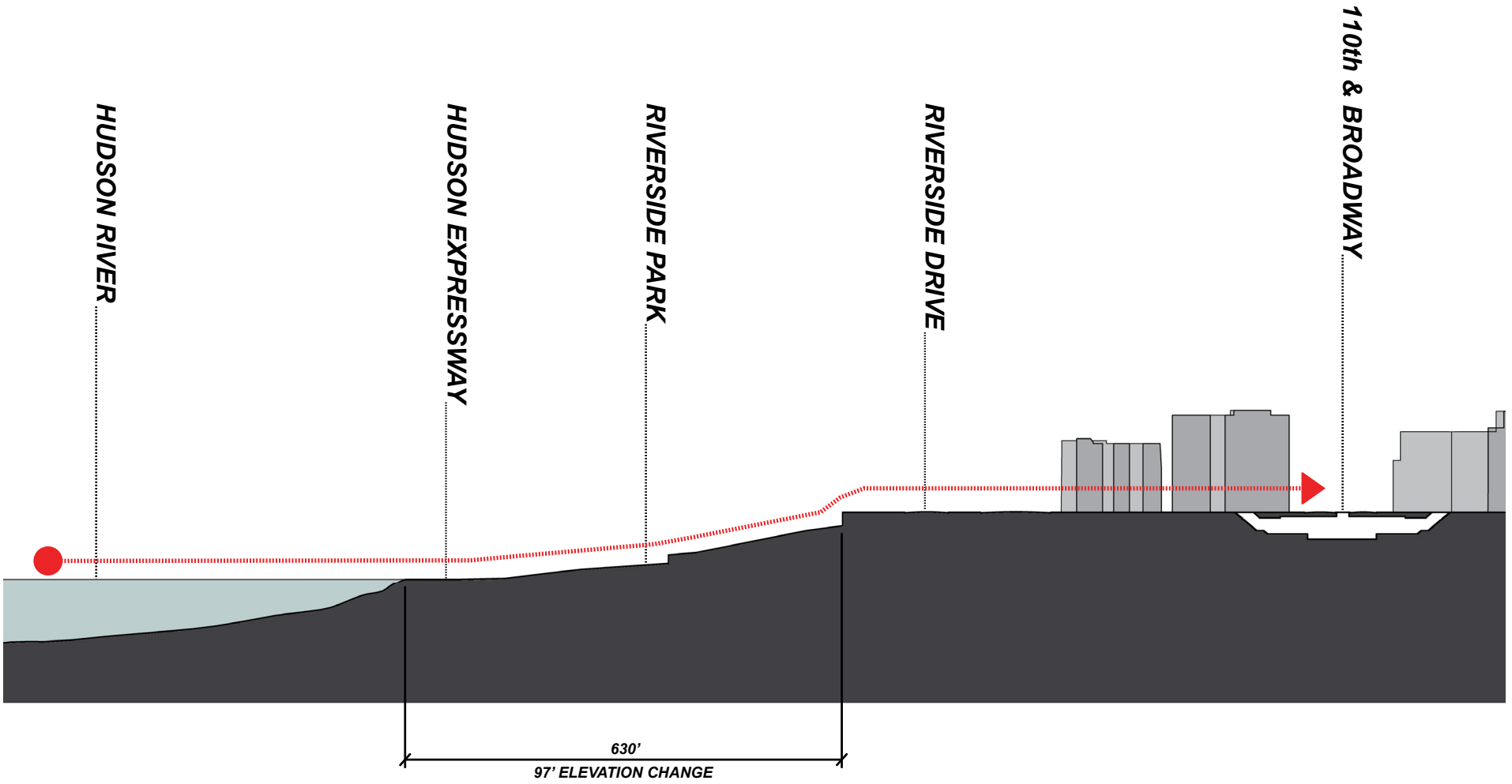
urban ConAgra**culture**

SITE ANALYSIS

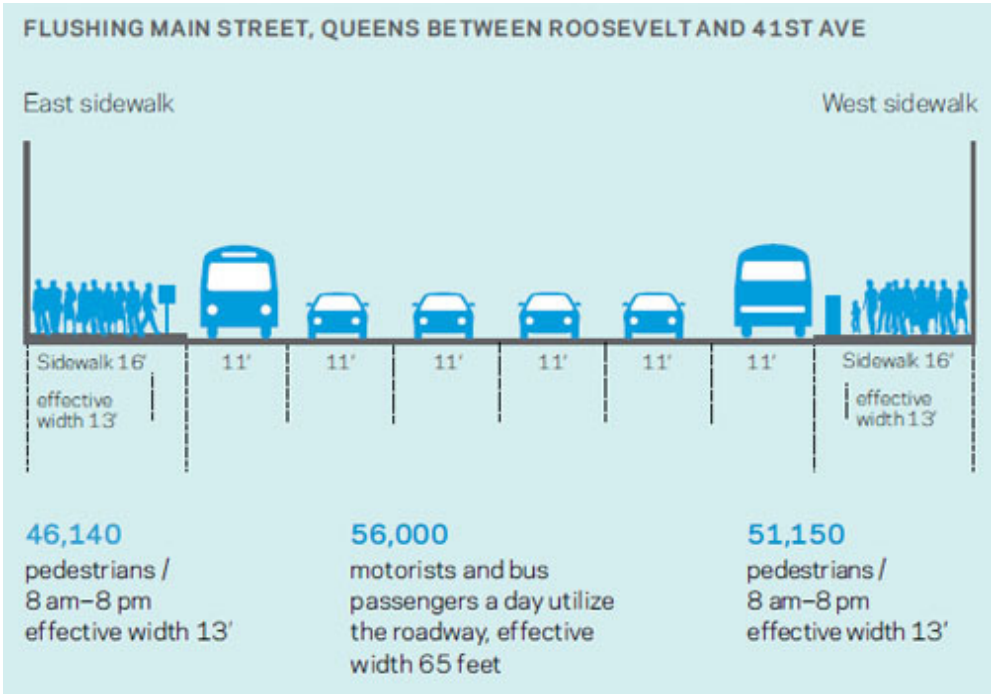
THE SITE AT 110TH AND RIVERSIDE PARK PRESENTS A FEW DIFFICULT SITUATIONS THAT HAVE THE POSSIBILITY OF DEVELOPING INTO CREATIVE DESIGN SOLUTIONS.

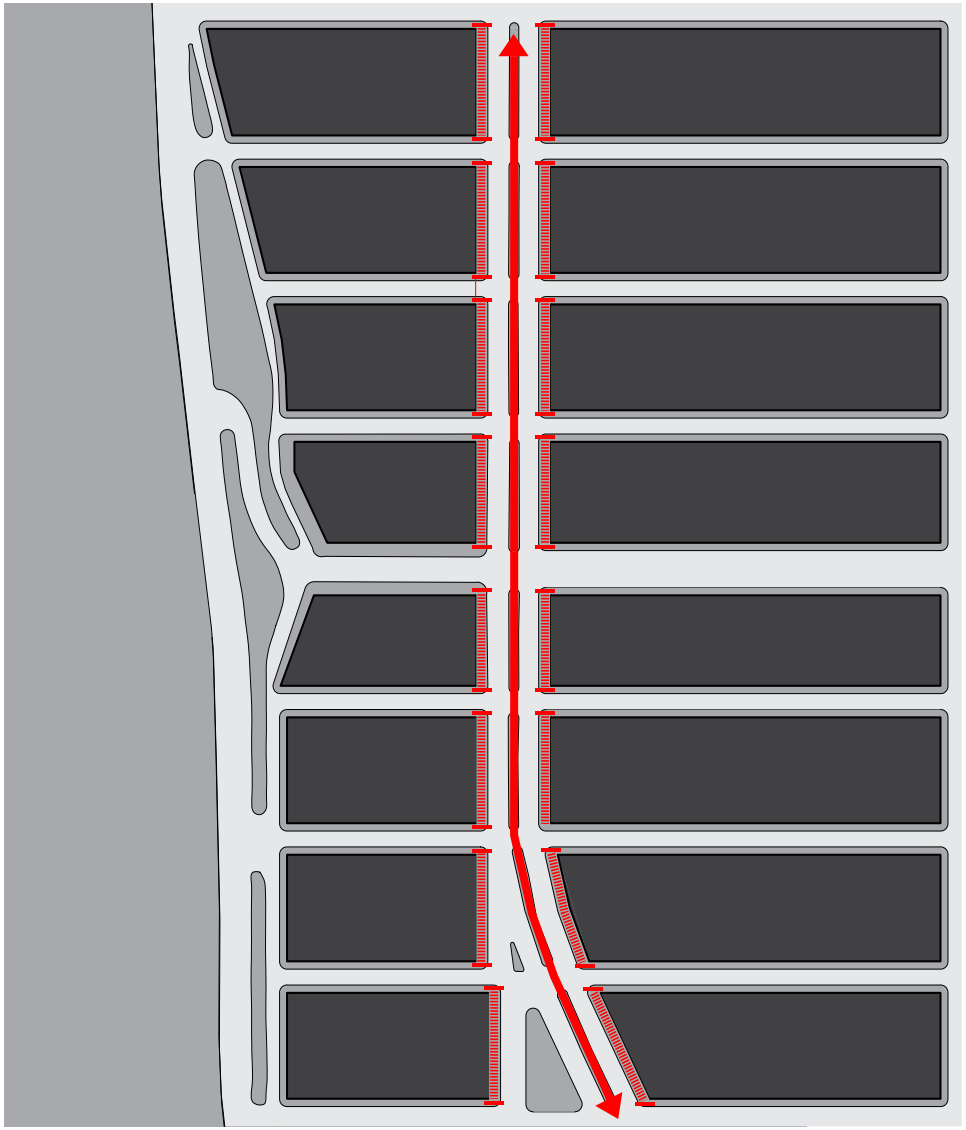


The site is characterized by a steep slope and several busy thoroughfares that must be avoided in order to have the network installed in the existing city with minimal detriment to the existing organizational structures.



This section shows the 97' grade change that occurs between the water level of the Hudson River and the plateau that is Manhattan. The section also shows the subway station at 110th and Broadway streets. The location of this station was highly influential in the siting of the components of the food network.





STREET USE ANALYSIS

The sidewalks in NYC are utilized by twice the number of people than are moved on the street in an eight hour peroid. This is very interesting when one considers to what extent the vehicle dominates the movement of pedestrians in the city grid. The design utilizes this necessity to allow for the movement of both food products and pedestrians in a straightforward manner.

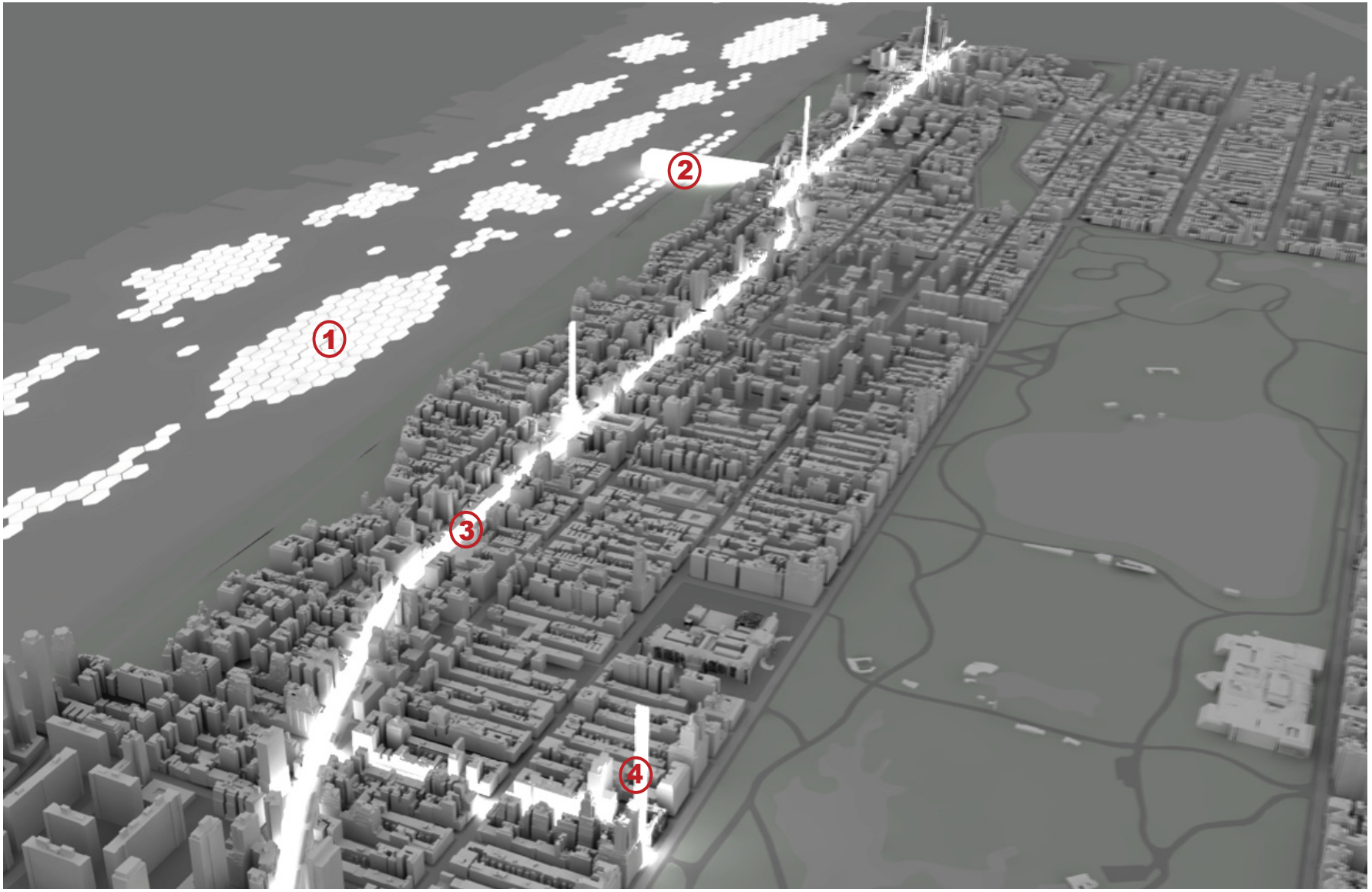
We Deliver the World

NATIONAL AIR CARGO

PROGRAM ANALYSIS

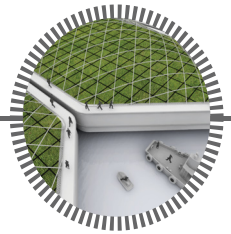
THE PROGRAM WAS DEVELOPED THROUGH MULTIPLE ITERATIONS AND WAS DOCUMENTED IN VARIOUS WAYS.

The programs for the various components of the network were defined in the above diagram. As these definitions were developed further a massing diagram was created, shown on the right.



1. PRODUCTION VESSEL

GROWTH
PUBLIC ACCESS
DESALINATION
WATER COLLECTION / STORAGE
SOLAR ENERGY COLLECTION
ENERGY STORAGE

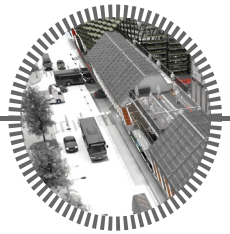


2. INTERFACE

HARVEST
PLANTING
PUBLIC ACCESS
EDUCATION
DISTRIBUTION
PROCESSING
RESEARCH
MAINTENENCE

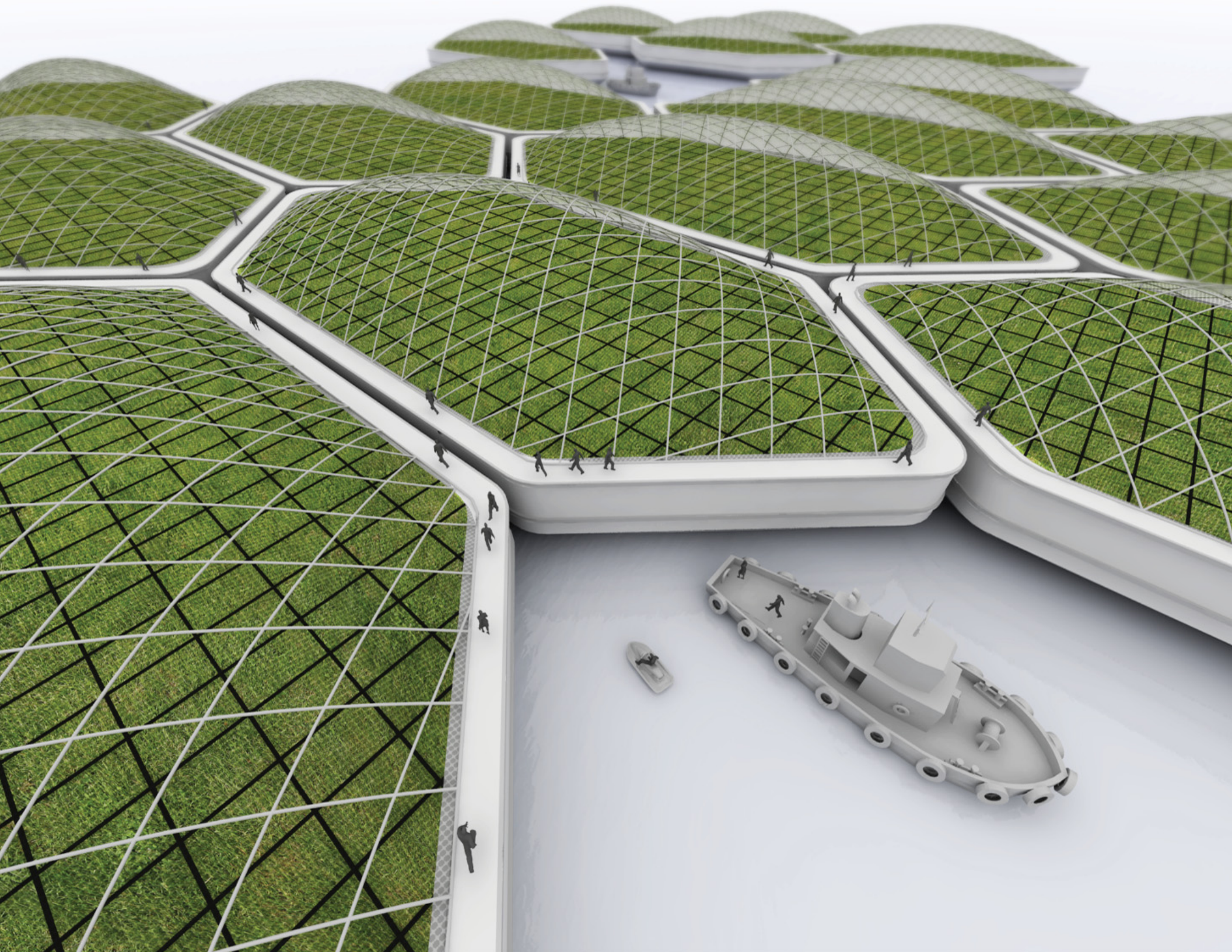
3. CONDUIT

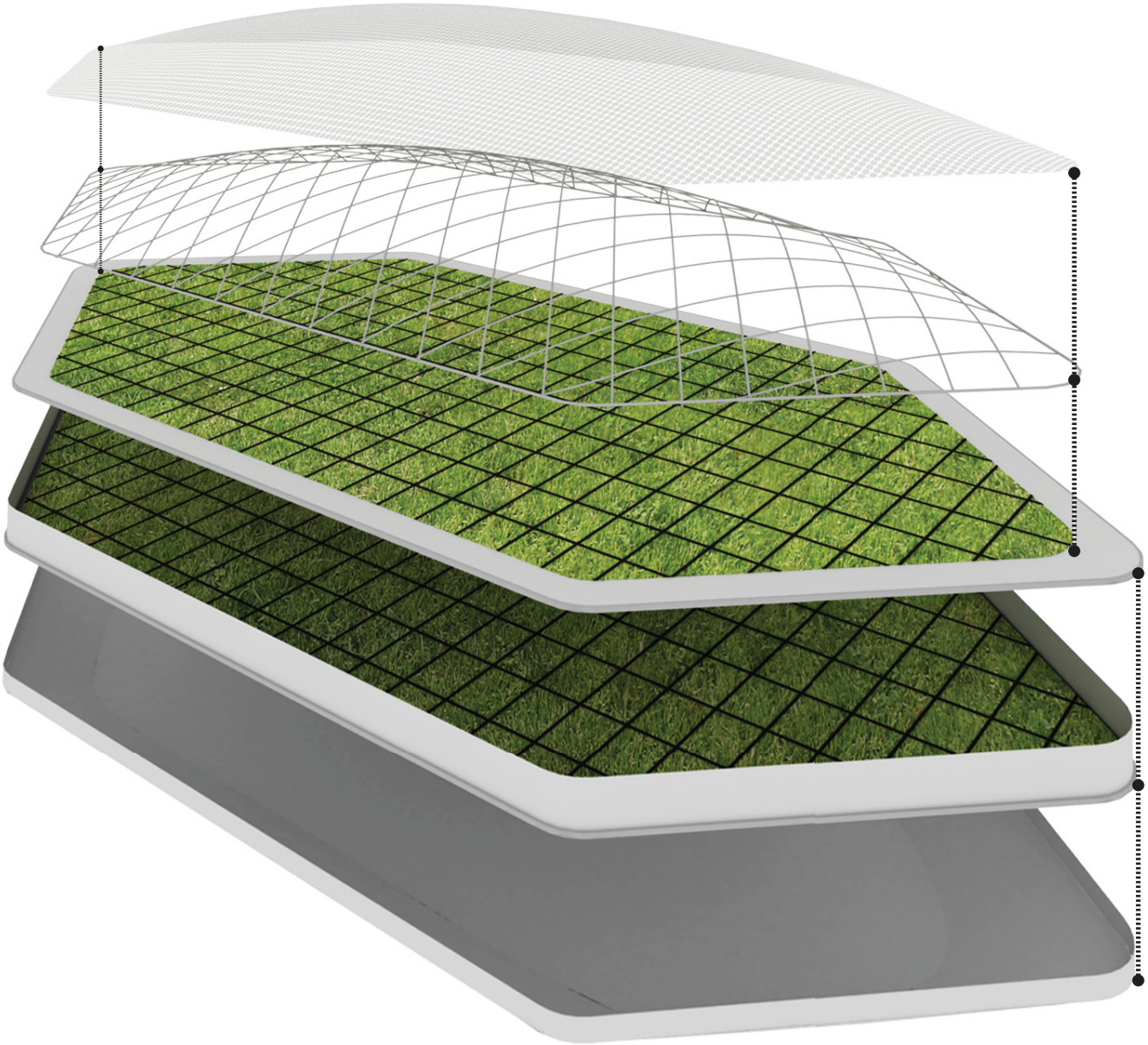
PRODUCT MOVEMENT
GROWTH
PEDESTRIAN NETWORK
PUBLIC AWARENESS
EDUCATION
PUBLIC ACCESS

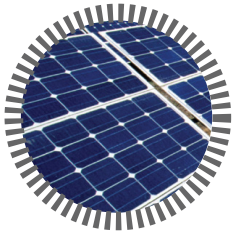


4. RETAIL

DISPLAY
EDUCATION
SALES
PRODUCTION







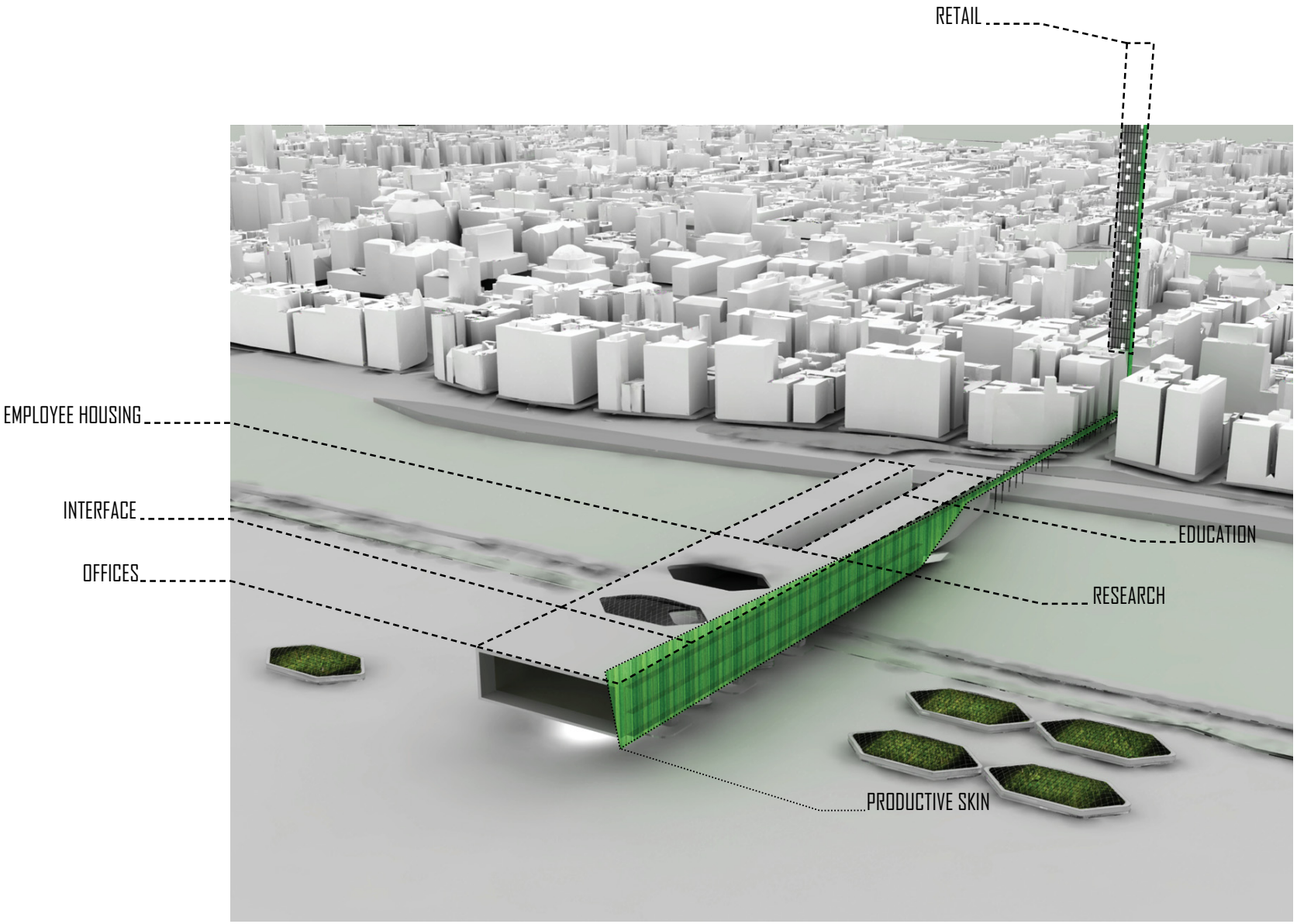
SEMI-TRANSPARENT, PHOTOVOLTAIC GLASS ENCLOSURE

TUBE STEEL TRELLIS STRUCTURE

NATURALLY-LIT, ENVIRONMENTALLY-CONTROLLED PRODUCTION

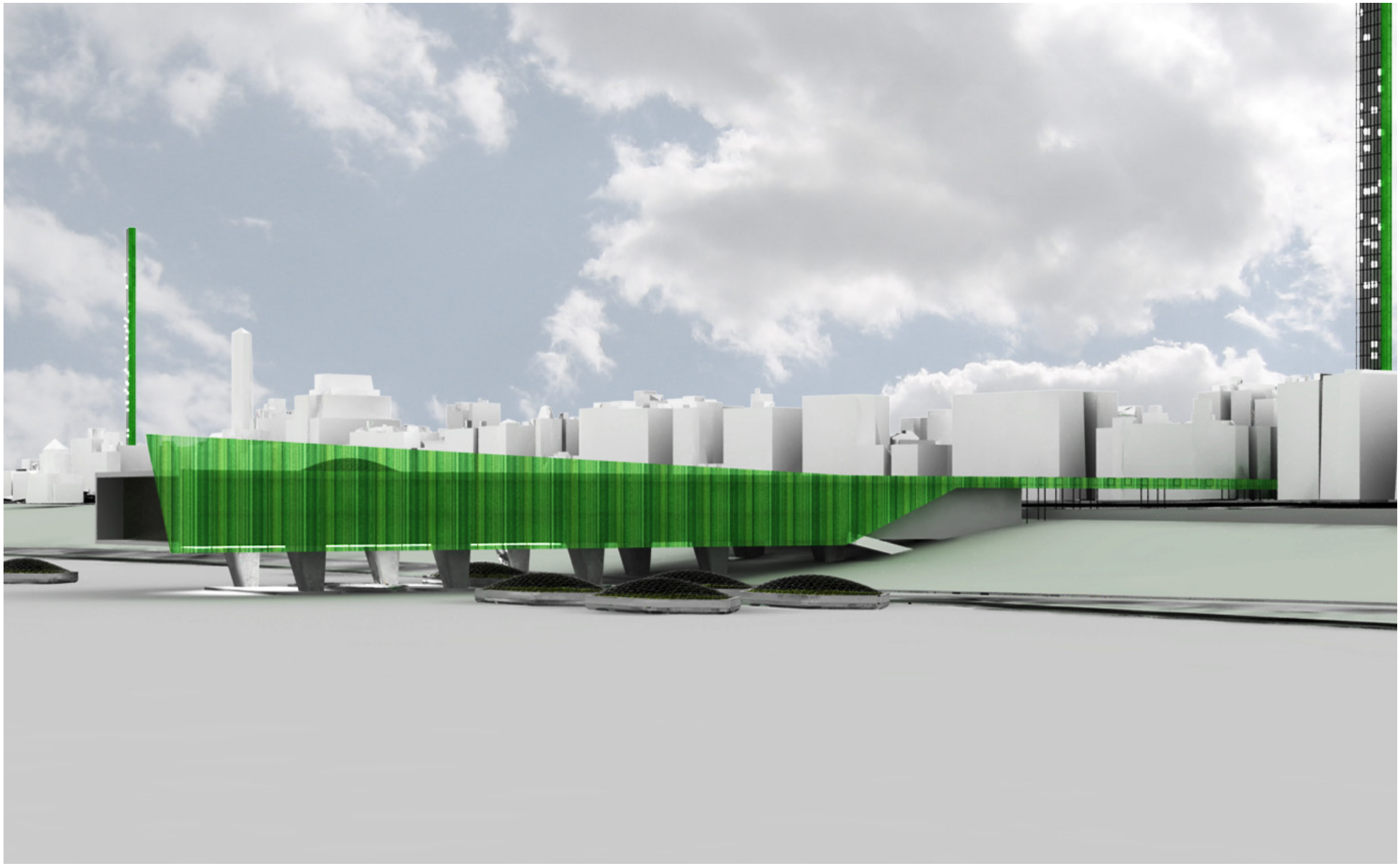
ARTIFICALLY-LIT, HIGH-YIELD PRODUCTION

DESALINATION, ENERGY CONVERSION AND WATER STORAGE EQUIPMENT



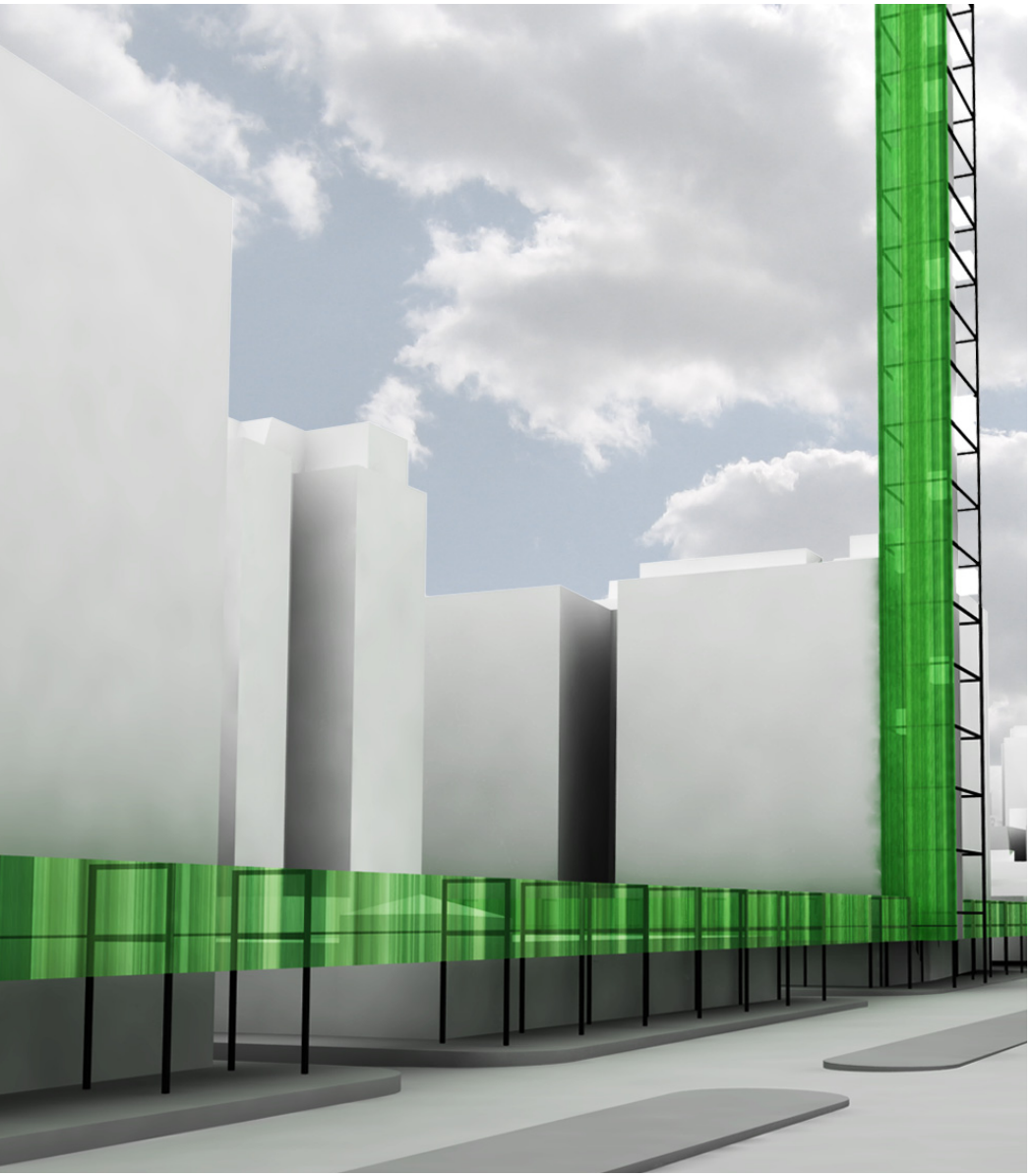
INTERFACE

The interface facilitates the harvesting, planting, and off loading of food products from the production vessels.



INTERFACE

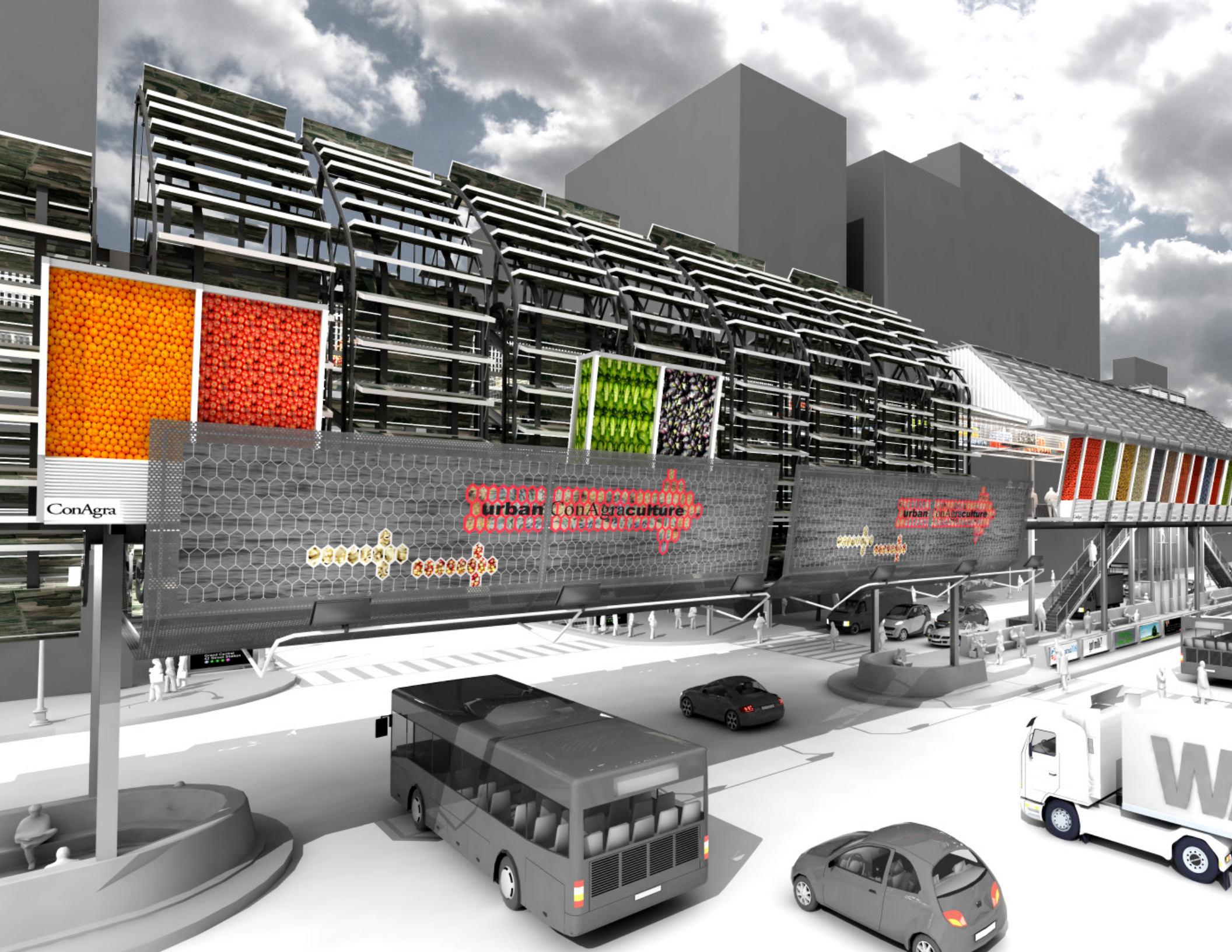
As the production vessels become ready for harvest they are navigated to the interface for offloading. The goods are then moved into the city via the conduit to be sold to consumers at the retail nodes.



SCHEMATIC DESIGN CONCLUSIONS

At this point the production vessel and interface were left to be developed further at a later time. The conduit and retail hubs were decided upon for further investigation because they are the omnipresent components of the food network. The schematic was critiqued because if the extreme limitations that would develop as the design for the retail continues to evolve. It was suggested that the conduit be moved to the median of Broadway to allow for further possibilities that would be impossible if it were to remain on above the sidewalk.

COURAGE. TAKE A TEST DRIVE.
MINI COOPER S.
MINI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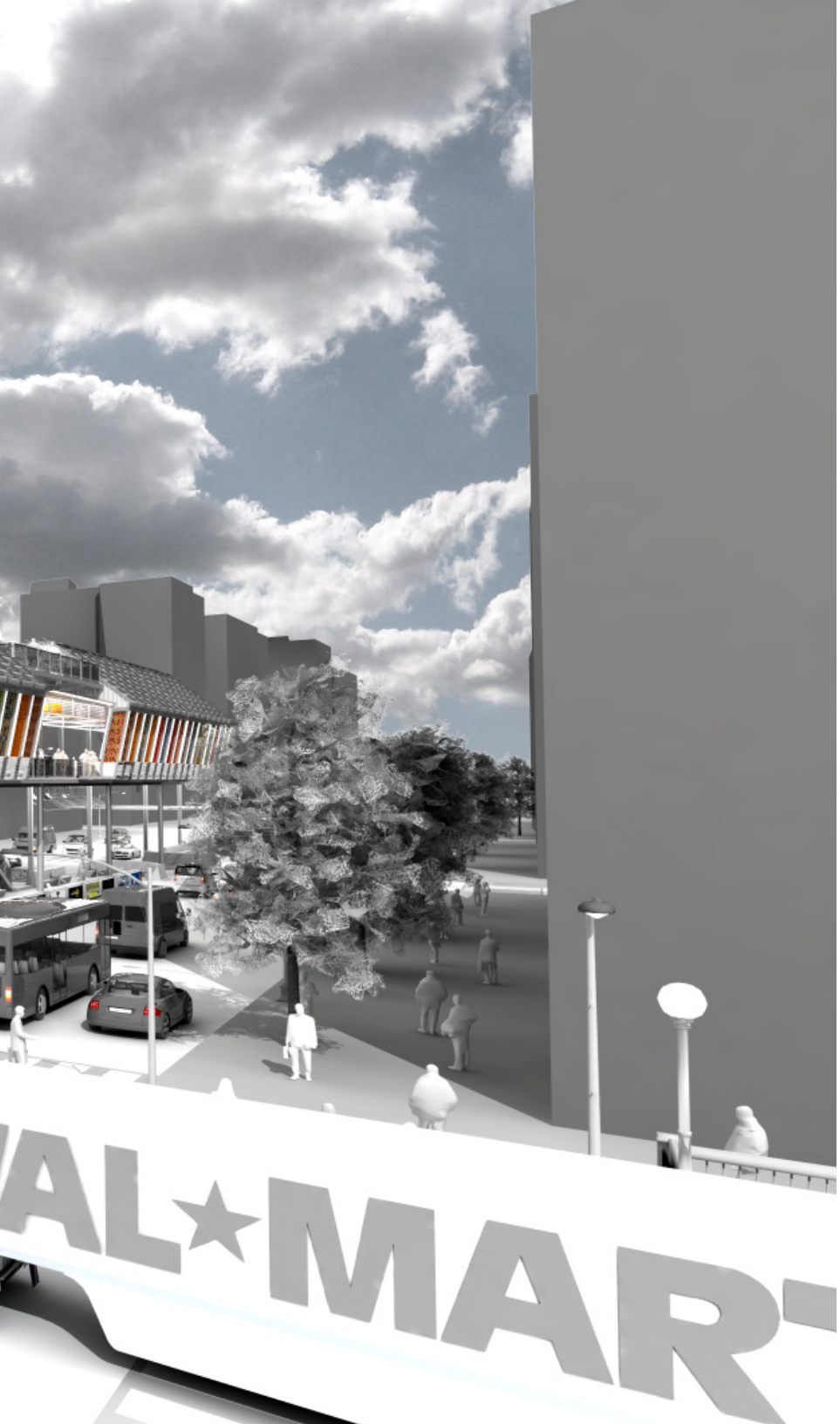
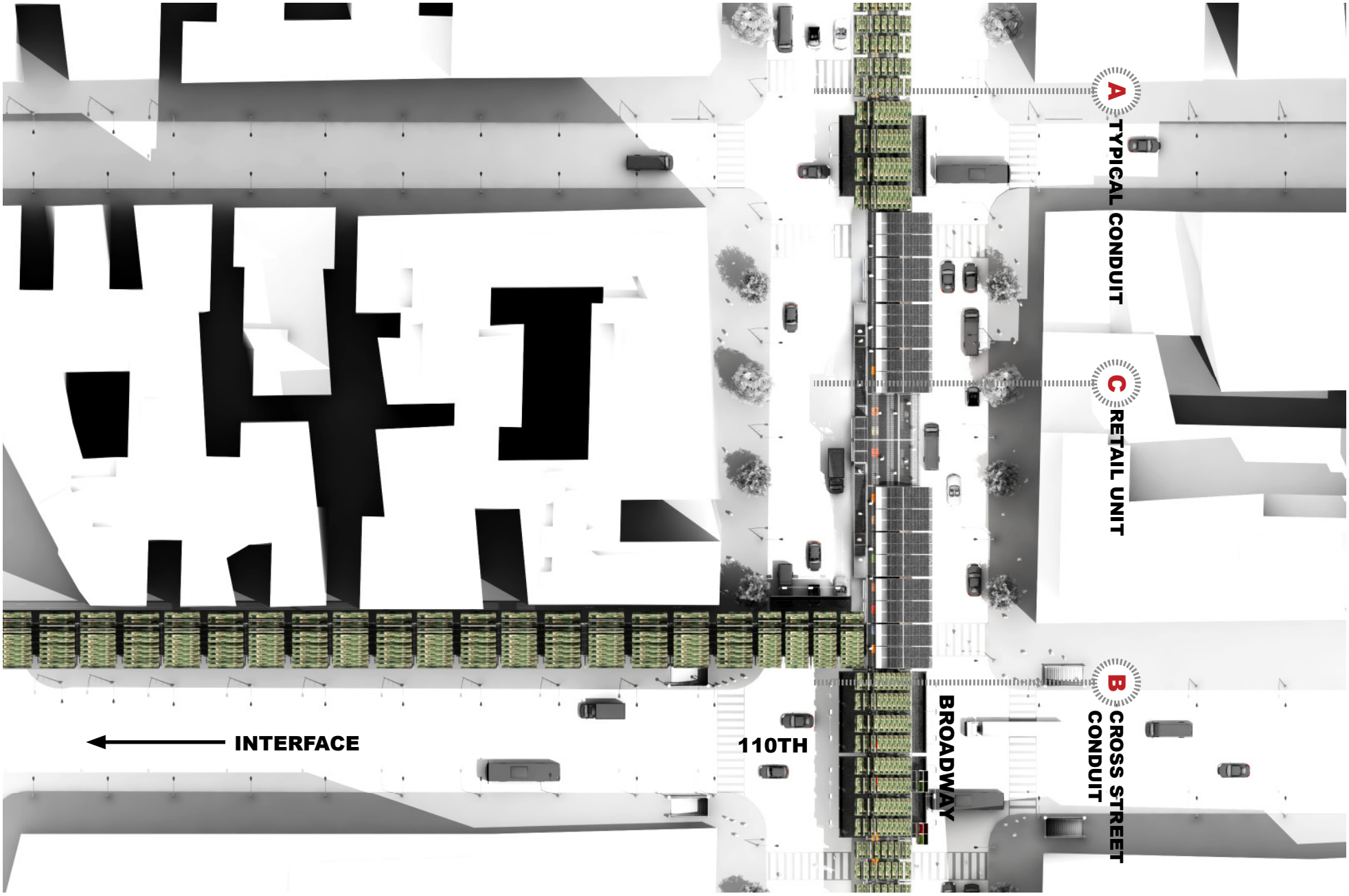


DESIGN DEVELOPMENT

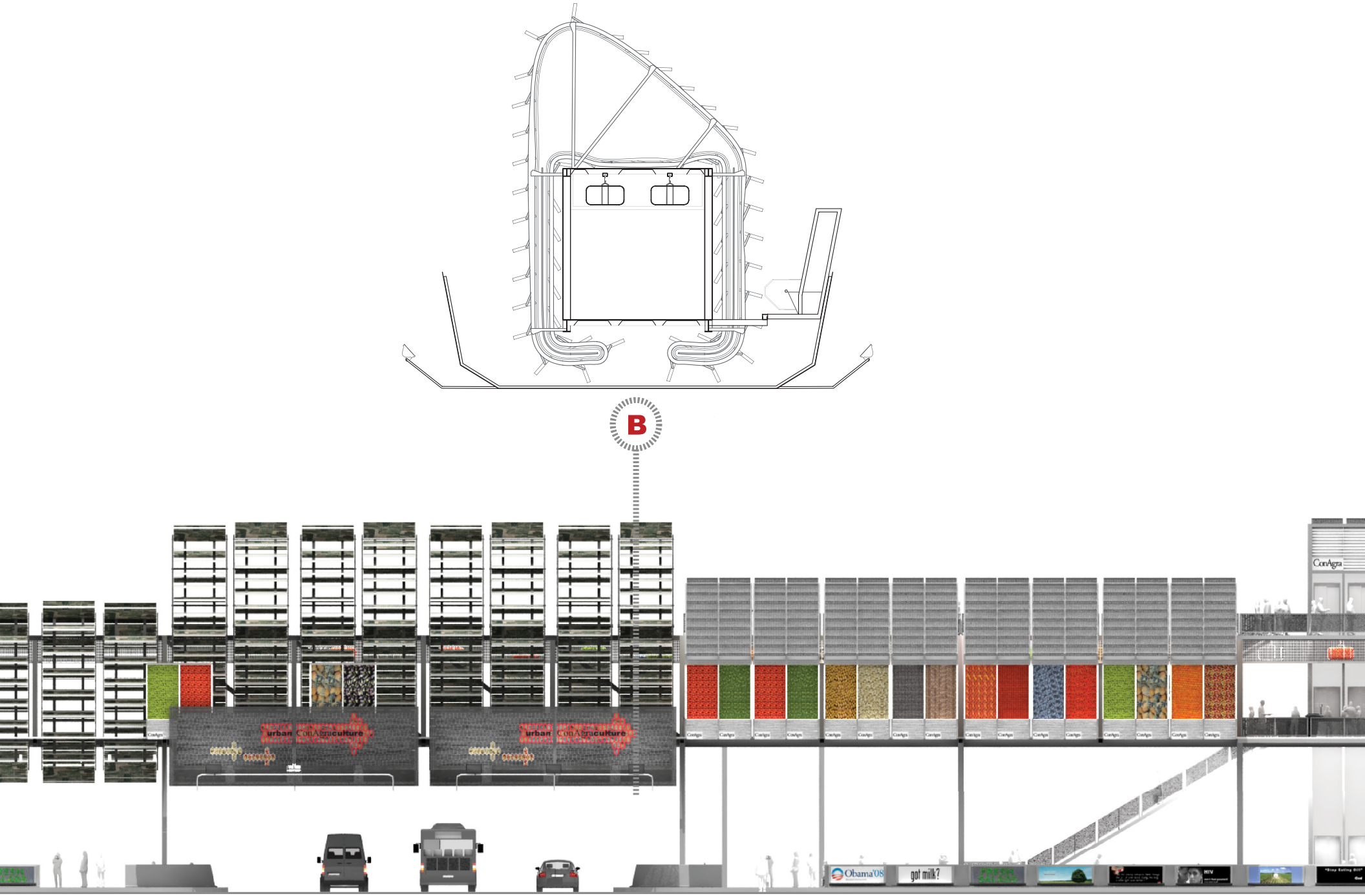
The conduit and Retail components of the network were designed to a much more tectonically resolved level. In addition to retailing the products of the network, these components move pedestrians, and produce food within the city where the food's growth can have the greatest affect on user's perceptions.



SITE PLAN

The components of the conduit and retail unit are shown and their relationship to the existing subway station is demonstrated.

All Day I Dream About Sneakers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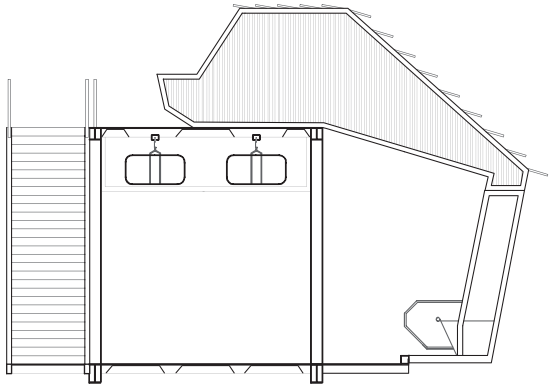
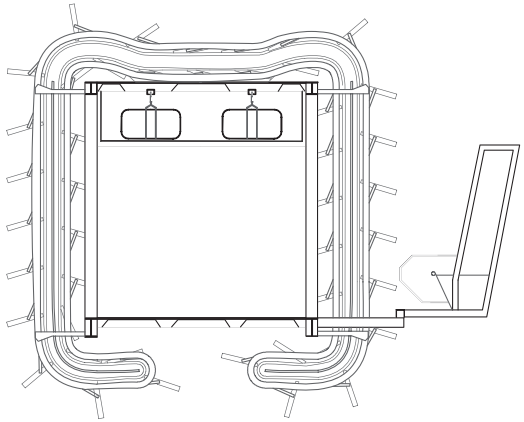
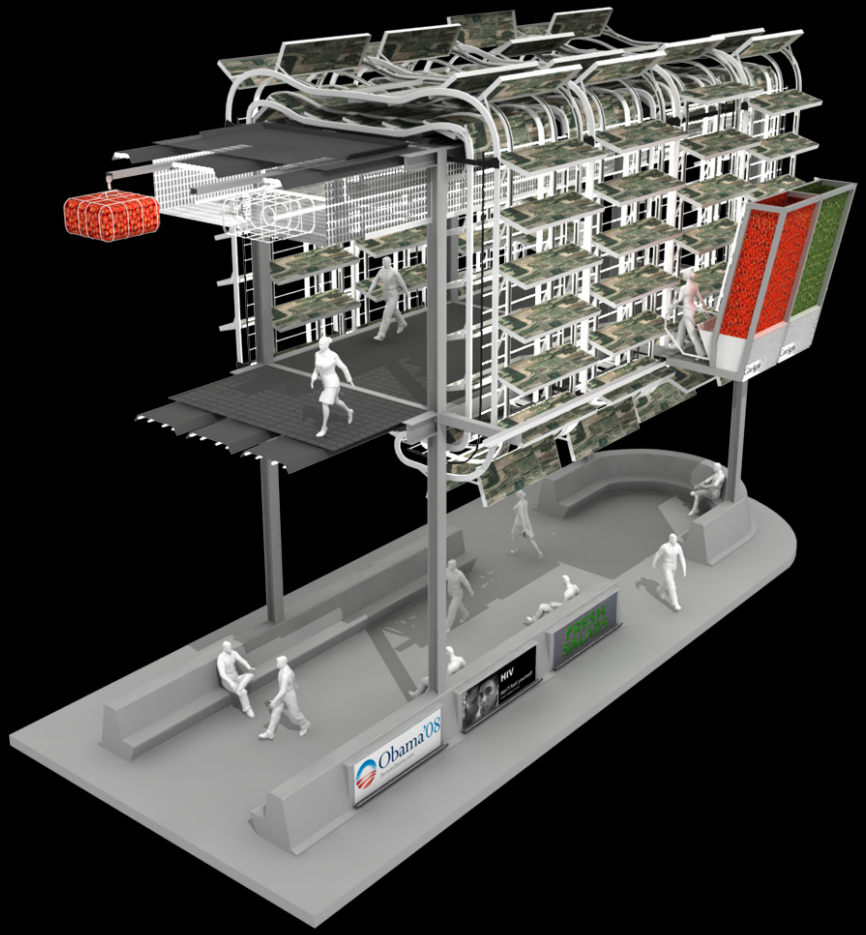




C
A
ConAgra
"Stop Eating Oil!"
-God
"Start Breathing Wind!"
-God
CHANEL

FRESH
SALADS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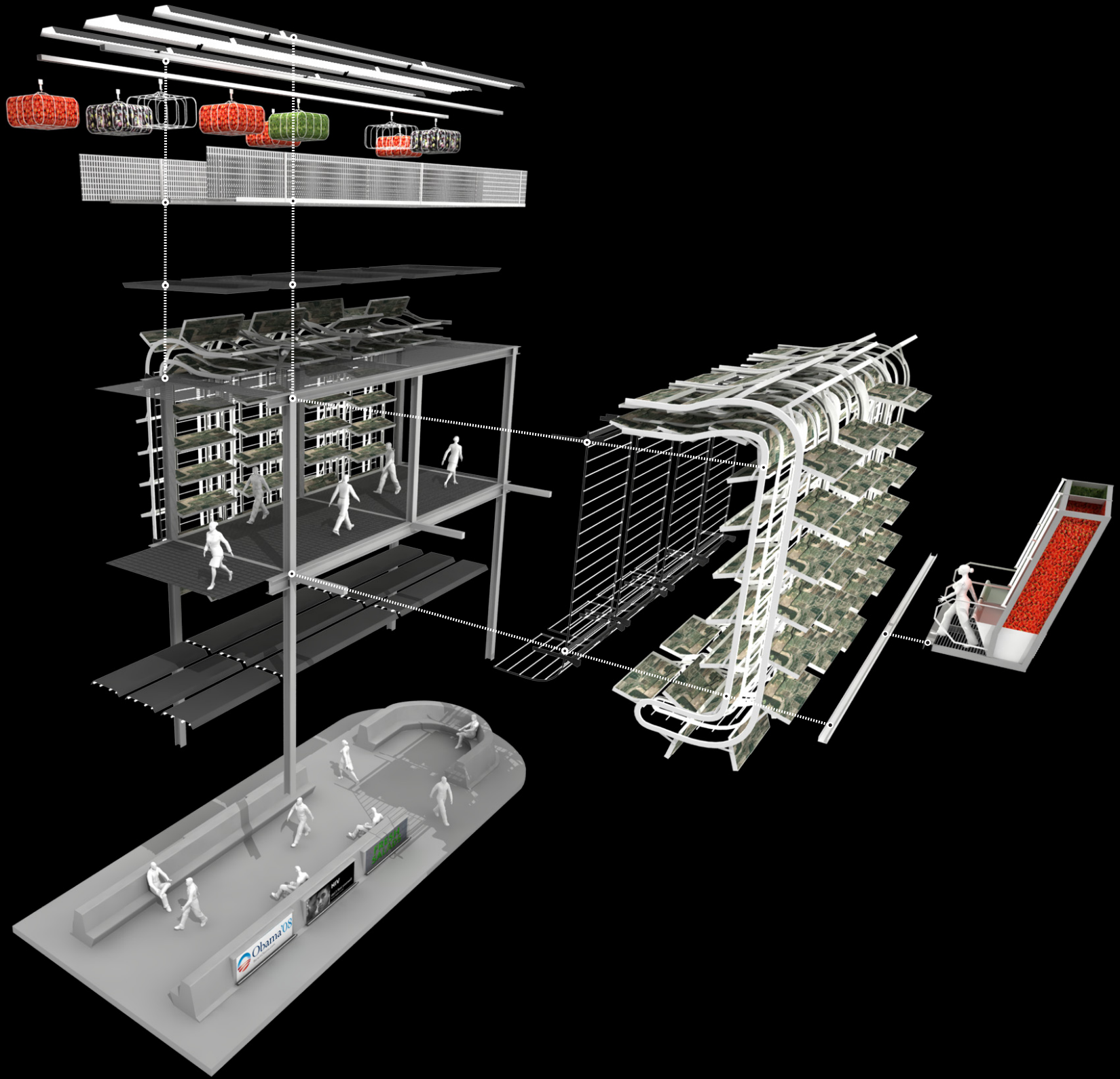
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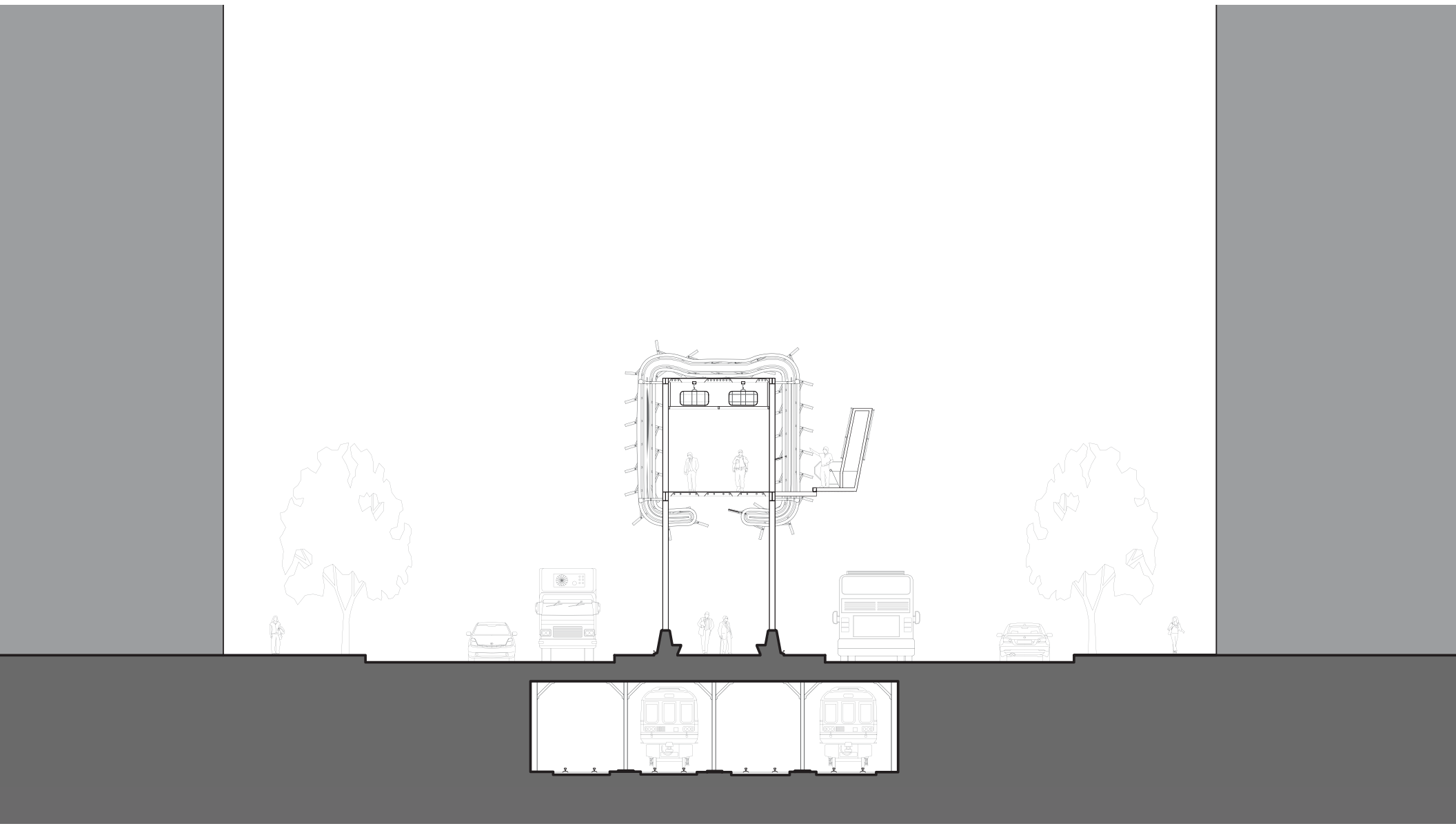

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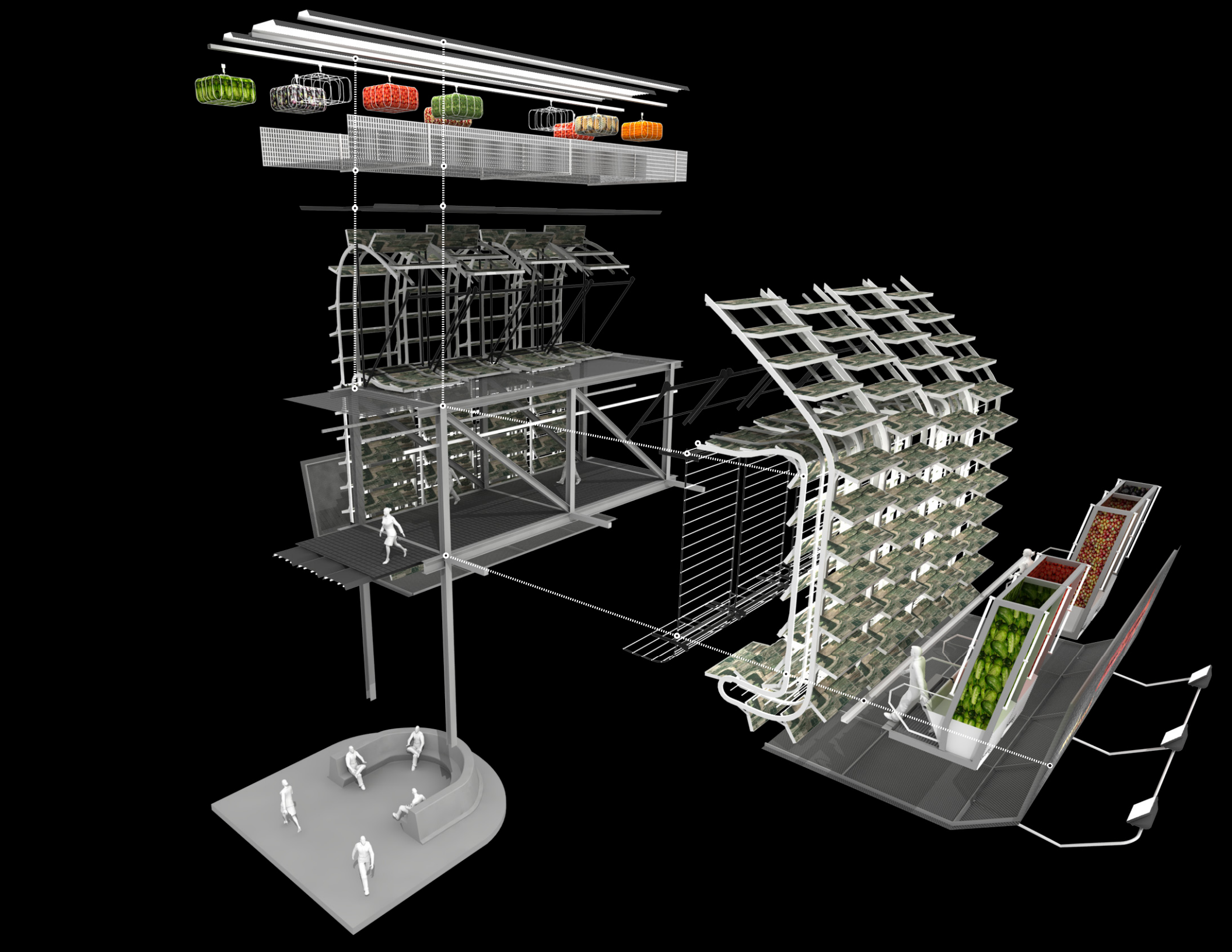

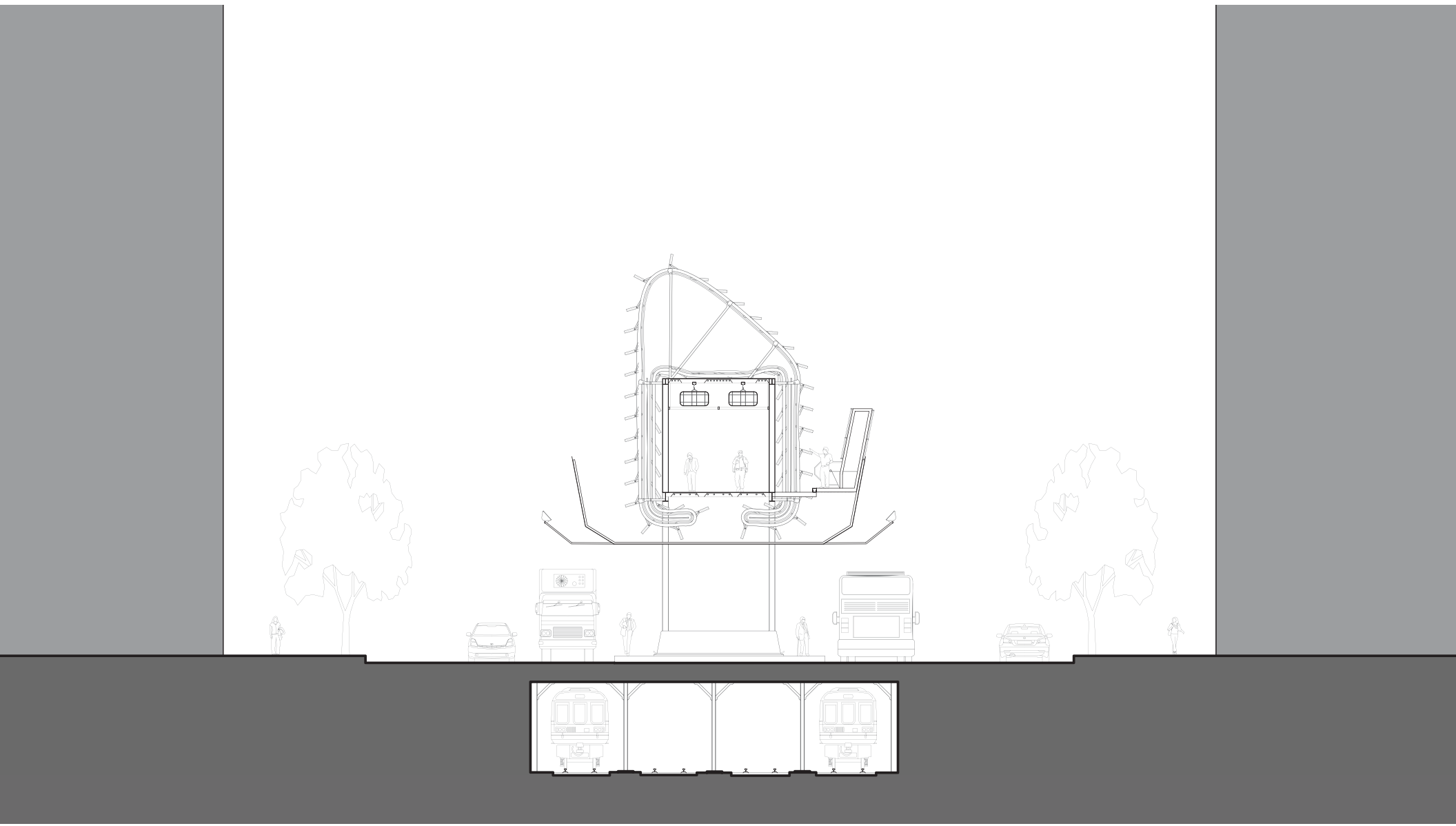

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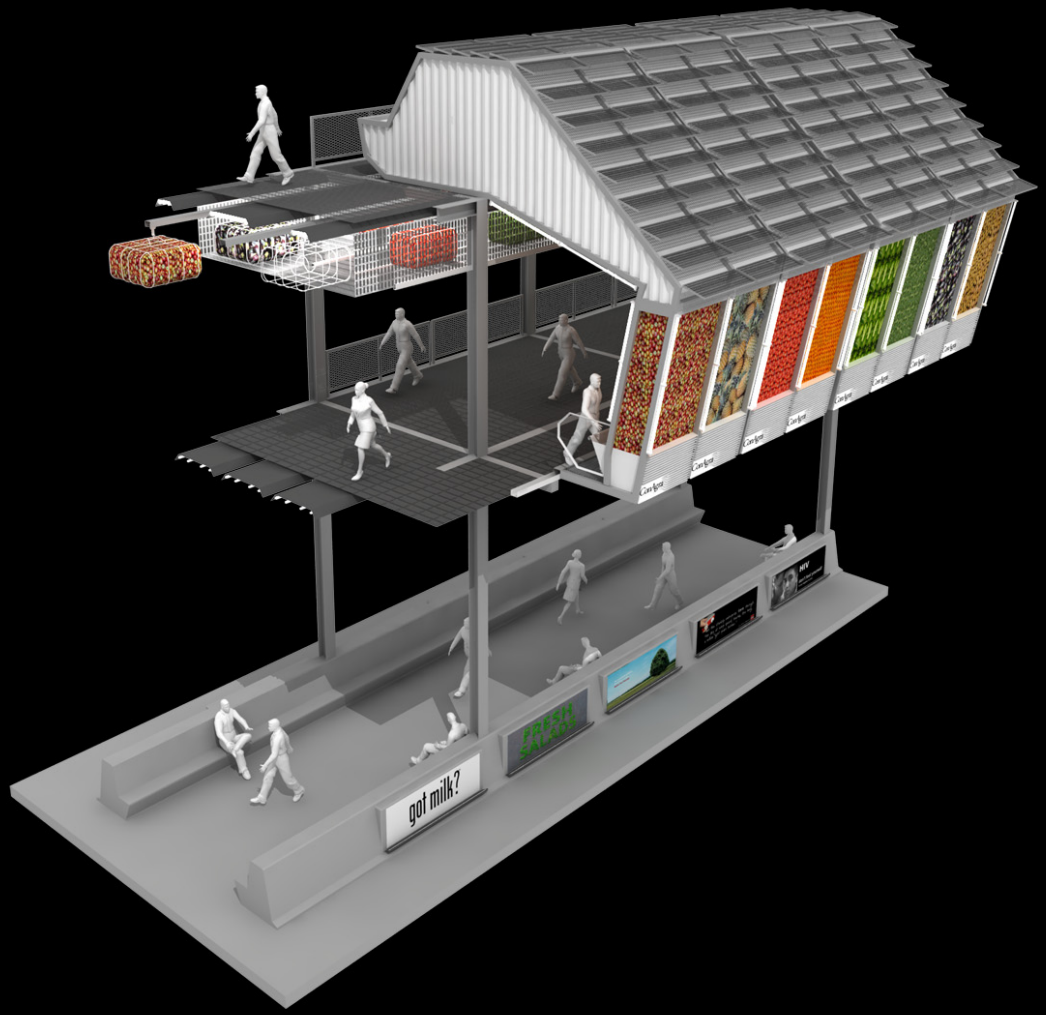
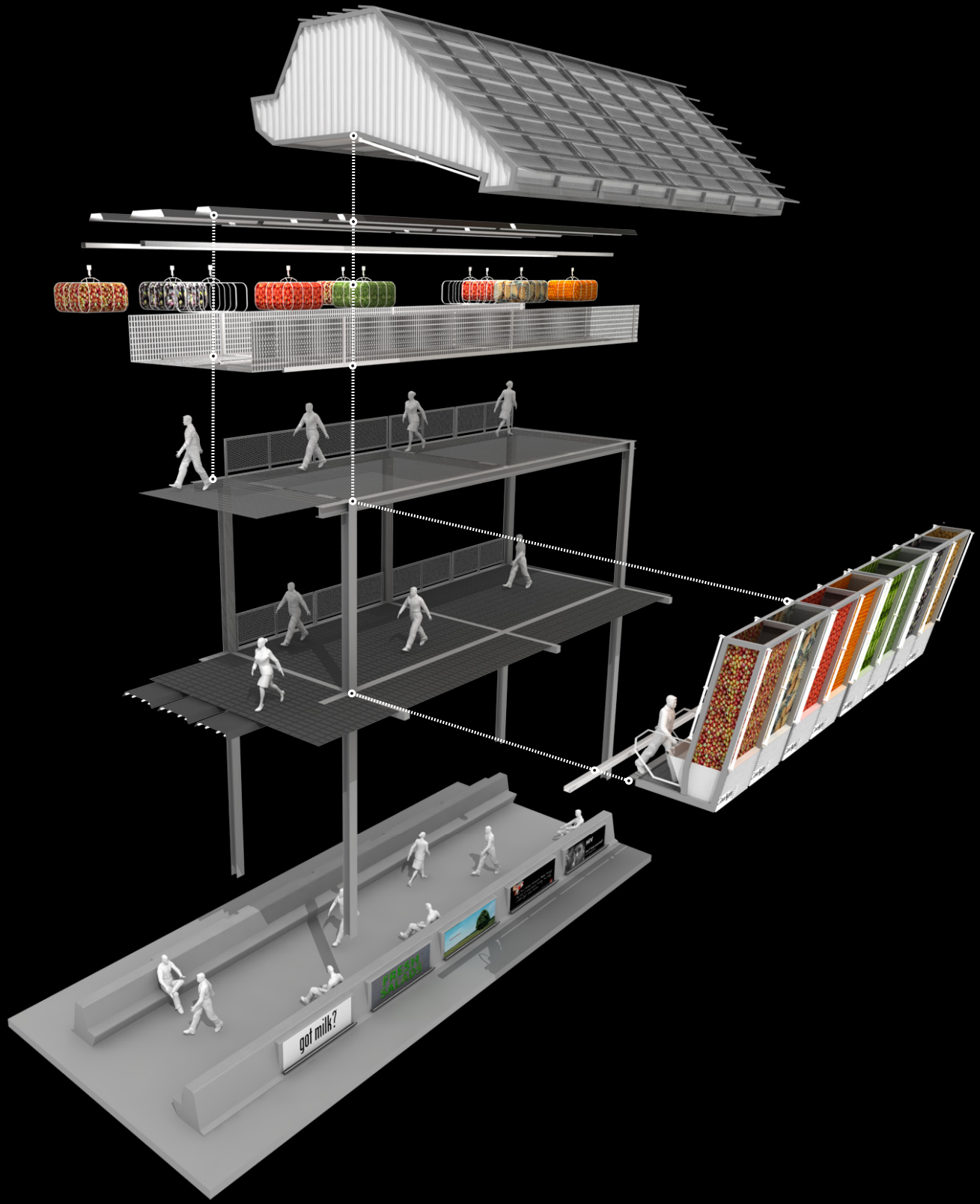

got milk?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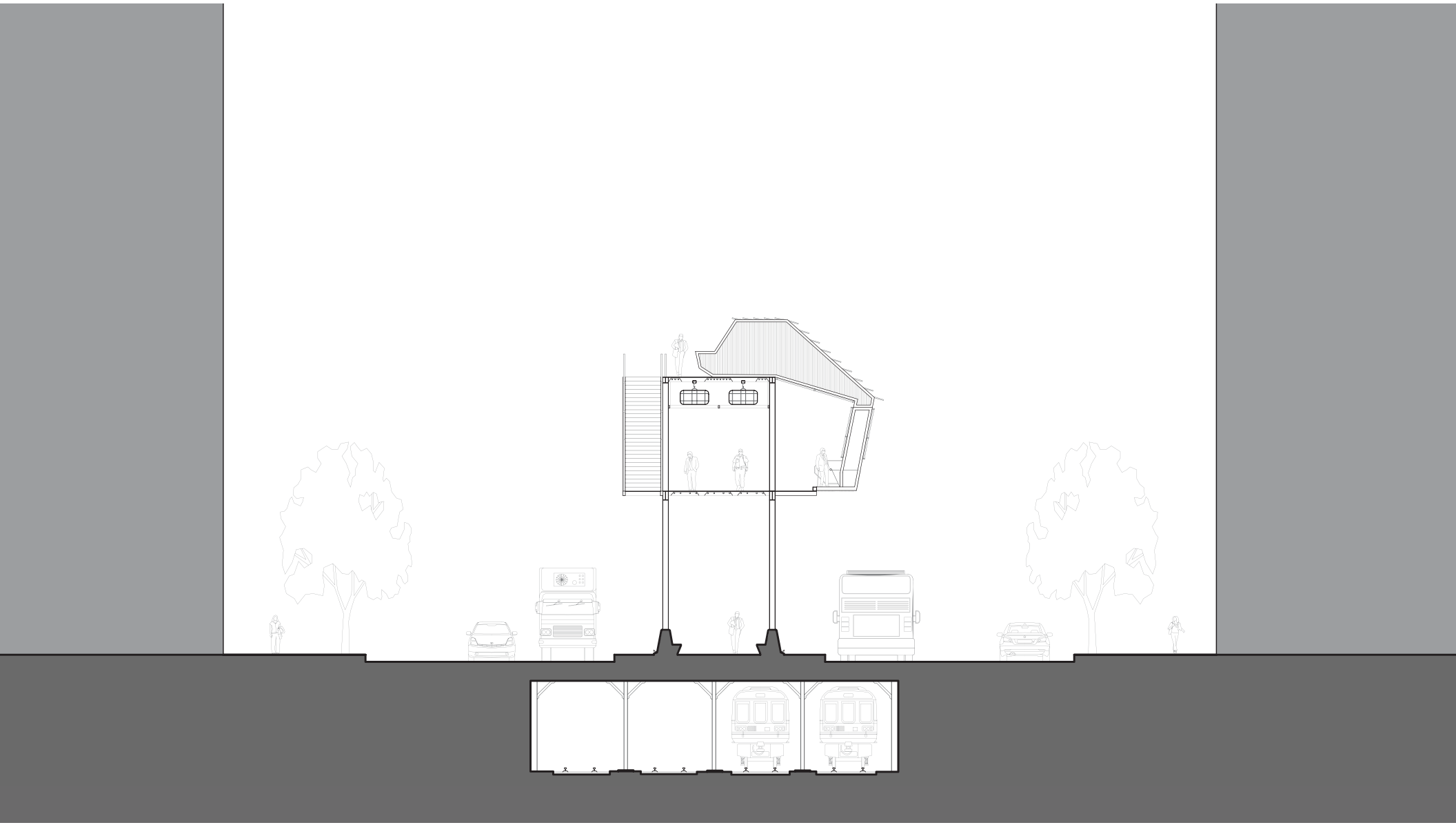
FRESH SALSA



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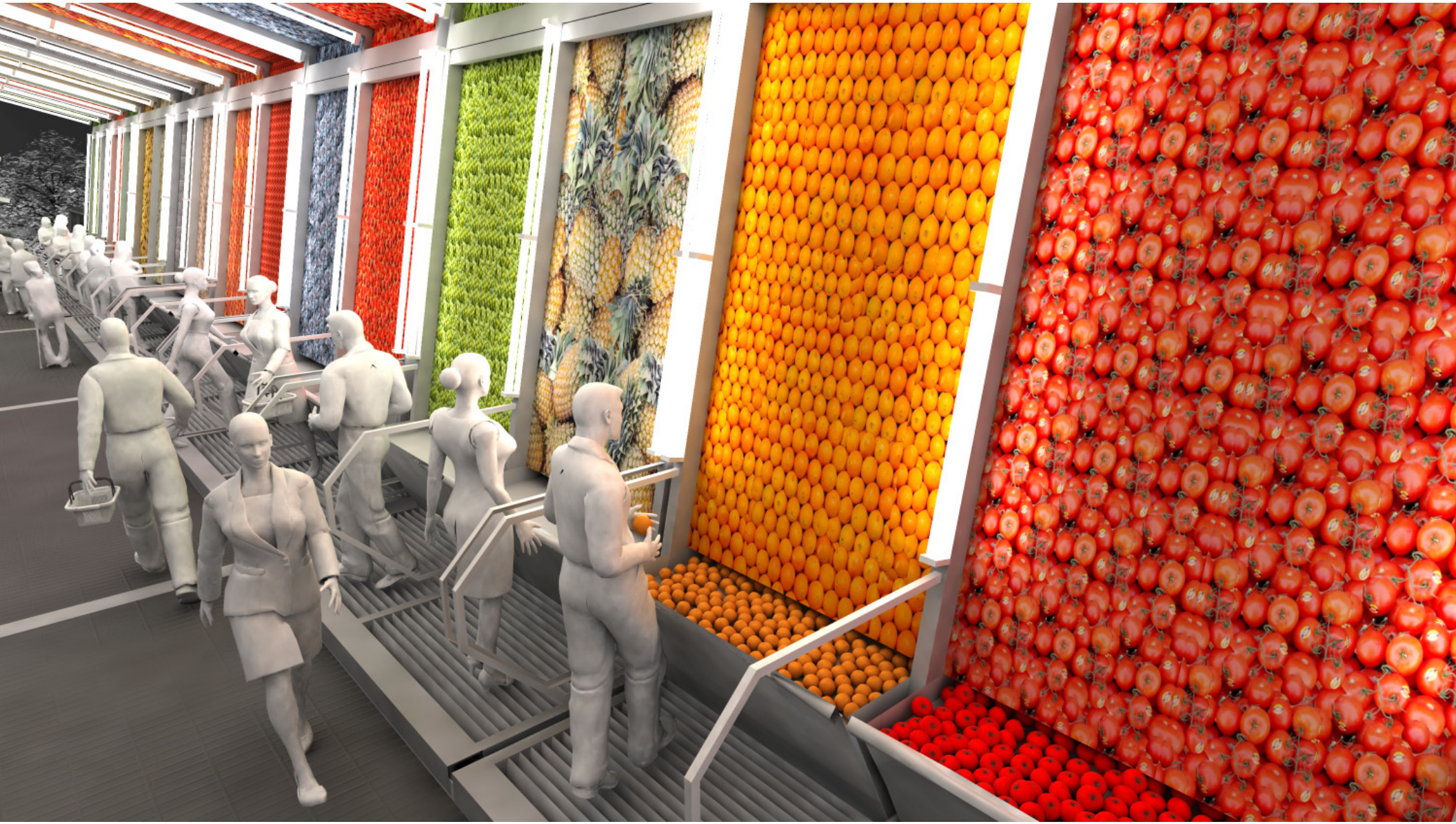
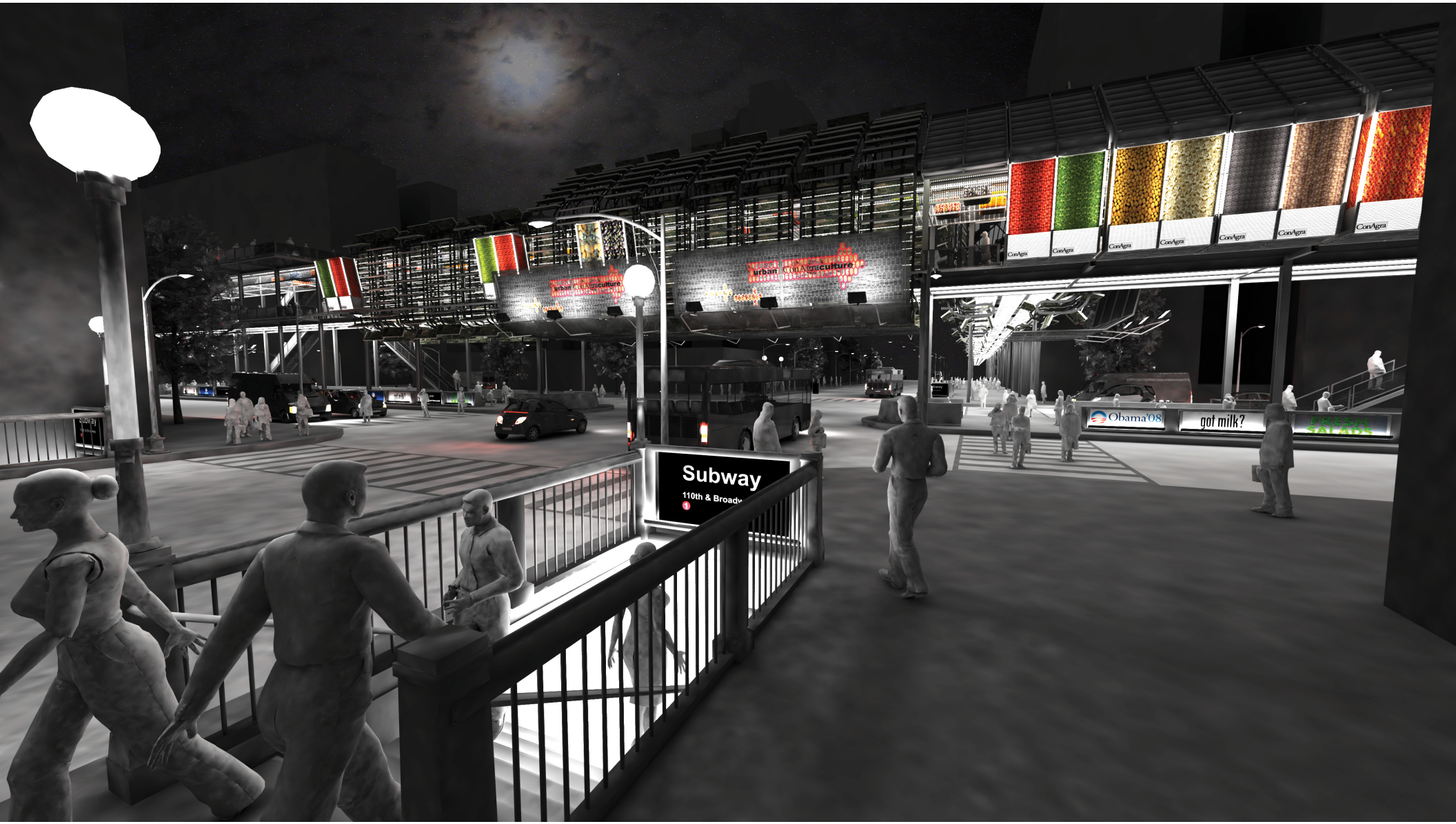


"Stop Eating Oil!"
-God
"Start Breathing Wind!"
-God
Agriculture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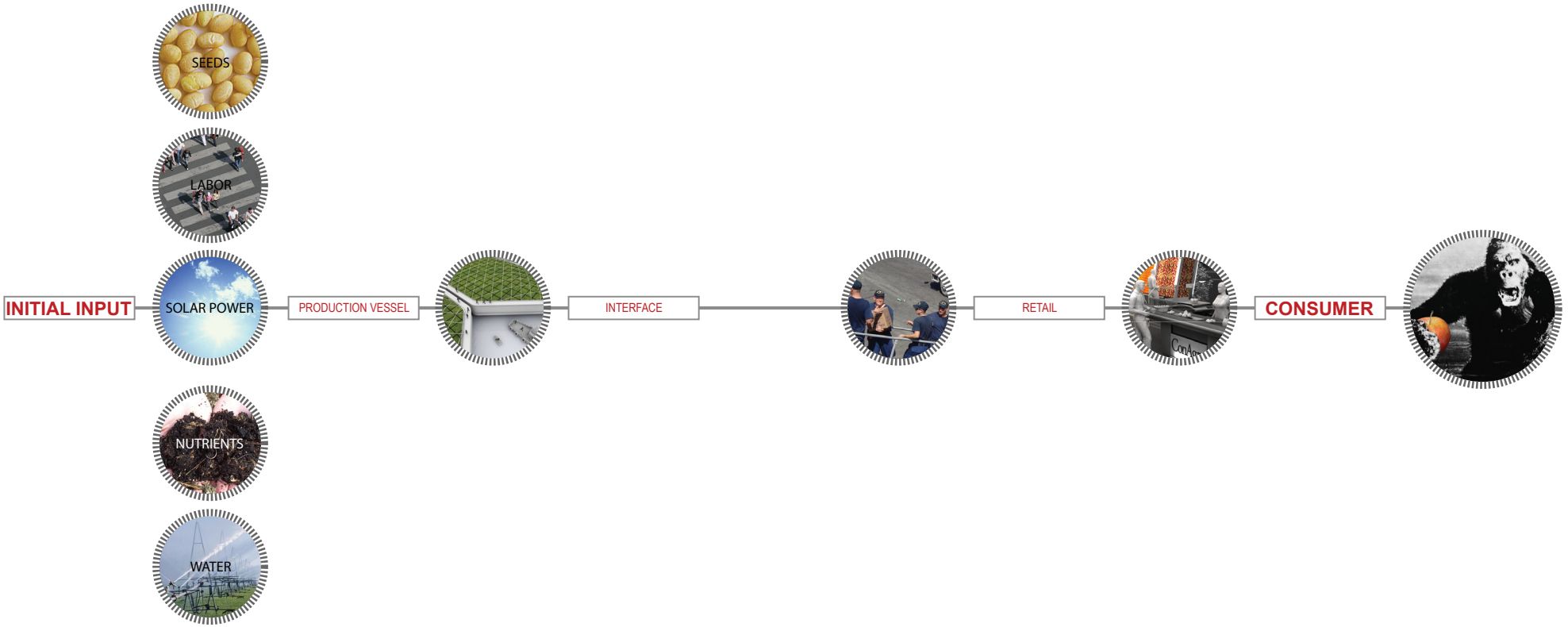

NEW SUPPLY CHAIN

On average, food will travel 7.25 miles from growth to consumer compared to the 1,150 miles that it travles today.

DONATE TO BNPI BANK, ACHRAFIE – ACCOUNT NO. 301 152 382 003.
HELP HER FEEL
HUMAN AGAIN
Dar Al Amal
SHELTER FOR ABUSED WOMEN
WWW.DAR-AL-AMAL.ORG

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ICONCLUSIONSICRITICAL ASSESSMENT : CHRIS FORDI ARCHITECTURE FACULTY

To Dale's credit, I have not yet known a Design Thesis student to immerse themselves into preparatory research with the same enthusiasm or intensity demonstrated this academic year. He owned it. This research was not directed towards familiar disciplinary issues such as Program, Building Types, or Historic Preservation, but rather squarely tackled the larger non-architectural issues of Globalism, Agriculture, and Energy. Each of these disciplines are monumental and it was both educational and entertaining to watch Dale navigate through these disciplines strategically, extracting helpful information in a precise way, so as to establish certain parameters and define an architectural problem space – Although his investigation explored disciplines other than Architecture, they provided a premise necessary for an architectural response to solve a particular problem.

I am finding a pronounced stigma related to "problem solving" these days, and it manifests itself in knee-jerk reactions at the mere mention of the term. I believe this is due to a desire to distance oneself from this term first championed by design methodologists of the 1950s and 1960s. Back in the day, the act of Design was equated with Problem Solving. Today, a more objective consideration of the act of Design would certainly include problem solving, but no longer regards it as its highest utilization. Instead, we understand that good Design transcends problem solving towards fulfilling higher expectations on behalf of both author and audience. In fact, this underscores a fundamental difference between artists and designers -- If artists are interested in solving problems of their own making, then designers are interested in solving problems outside of themselves. As stewards of the built environment, it is important that architects recognize this difference.

While his final solution is both provocative and novel, its value does not hinge upon these qualities. The value of this "Urban ConAgra-culture" design thesis lays in its ability to propose a technologically-intensive architectural solution for a very difficult design problem defined by both physical and non-physical aspects -- Architects have historically served as technological innovators, and Dale has certainly embraced this role.

While this design thesis fulfills curricular requirements, my best hope for Dale is to disseminate this proposal publically outside of our academic environment and allow the scope of this proposal to affect the thinking of corporate executives, farmers, and city officials. While it is unlikely that an academic investigation would have a significant public impact, it is completely reasonable to assume an influence in the future decision-making of relevant stakeholders.

Chris Ford

21 April 2009

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ICONCLUSIONSICRITICAL ASSESSMENT : THOMAS LAGINGI ARCHITECTURE FACULTY

The thesis statement while general is timely, culturally relevant and clearly stated.

The extensive investigation establishes that globalization has produced an economy that is energy intensive and dependent just to deliver the simplest agricultural products to consumers. It also asserts that as transportation costs soar past the economies of cheap labor; food production will have to return to more local solutions to be sustainable. This analysis and tracking of the food chain is very engaging and insightful particularly as it engages the author's personal inquiry into the origins and destinations of a common corporate agro-product.

Given this premise and an assertion that regions in intensely populate urban areas such as New York City are unable to sustain a food supply locally provide the beginnings of an architectural projection into a parallel agro-world of speculation about ways to make fresh urban food, mostly fruits and vegetables assessable to urbanites.

The analysis of NYC region in my view is problematic in that it doesn't appear to view the hinterland of the city as a potentially more intensely cultivated zone and nor is size based on a carefully determination of land needs. The productivity per acre is a terribly important assumption and must have some carefully substantiated basis in fact. It should be measured against the worlds most intensely cultivated urban regions with tightly managed agricultural production. I would guess that the Dutch and the Chinese examples would be highly informative and sustainable in face of very intense urban zones. This figure as the proposal suggests, generates the surface area of production required for both land or sea production and is area, which clearly requires further careful quantitative research.

Given that the thesis required an architectural investigation, the second major problem is the choice of strategies for resolution of the problem that was posed. I sense that "a favorite idea" was the source of the conceptual formation rather than an investigation of alternative approaches and a selection of the most promising. The result is a highly mechanistic system that could well be equally energy intensive as the one it replaces, kind of a industrial farming head transplant for NYC.

The interesting quality of the proposal is its technical mechanistic view of the future. It's place qualities are aligned more with the infrastructure systems, than with the neighborhood Italian green grocer or the earthy-ness of farming. People are existentially divorced from any ground where something might possibly take root and grow. The figures in the renderings interact only with machines. The public space of the conduit is a vending machine like contraption that constantly confronts you with product. The one check out personnel seems like a management mistake; a human factor in the machine that could have been avoided by better engineering and plastic credit transfers.

This is a dark architectural view of the future boarding on dystopian that is well worked out and carefully detailed.

The promises of modernism and the machine esthetic of the twentieth century are lost in the grit of the cityscape. The battle for hygiene, light, air and the garden in the city is given up or lost. The corporate dominion over community space is intensified where the public right of way is invaded by a retail machine that will ultimately achieve its optimum efficiency and privatize the system. The food chain is devoid of human handling the street space must now meet the improbable sanitary standards guaranteed only by the ethics of the corporation. These people don't need street trees just inject food into the real estate equation.

This is not friendly architecture. It is not based on sensory delight nor is it a machine for living the examined life. Conversely this is an up dated "Metropolis" where the machine rules the man and plant. The Blackwater police are now a wholly owned subsidiary of ConAgra. Somewhere the corporate captain is wandering through his mansion in the gated Hamptons thinking these damn boats are not profitable enough maybe we could market kelp.

The design is an engaging exploration and hyper rendered look into an unlikely future set in the context of the present. While it projects a compelling set of images that can spark a lively cultural and political debate befitting a good thesis inquiry I personally don't care to inhabit it.

God save the plants and animals, to hell with Captain ConAgra and his techno-culture minions.

Tom Laging, FAIA

Earthday 2009

urban ConAgraculture

|CONCLUSIONS|CRITICAL ASSESSMENT : CHAD KRUSE|THESIS COLLEAGUE

For an architecture thesis to be successful, it of course must recognize and establish its importance within the profession, but it must also push the boundary and have merit beyond the architectural realm to be truly significant. Dale's project presents a thorough investigation of the current methodologies and ideologies which surround our entire agricultural process from the field to our plates and the wealth of data presented helps him set up his position challenging the sustainability of our current system and in turn creates a solid premise which creates a need for intervention.

It is interesting that if one pauses to examine the project at this point, it is very possible that this intervention need not occur architecturally. This is where the project succeeds in having significance beyond architecture because the problem which Dale has recognized and is intervening with could attempt to be solved through a variety of highly different strategies. That is because the project is more about changing our attitudes and approach to the food system which we currently have in place and how we interact with it. As Dale has shown, in America we have developed very strong ideals for how and what we eat and creating a shift in our culture's expectations regarding food is a difficult undertaking. So although there are many strategies which one could develop for implementation, what is consistent among them all must be their ability to address that shift in our expectations. One viable method is an architectural intervention, which is the focus of this project. The bigger-picture question then becomes, how can architectural design generate a shift in our expectations of food and agriculture which challenges our current system in order to create positive change?

Overall, I feel that there are many things this project does well. But I would be interested to know if Dale feels that this project succeeds in answering the aforementioned question. In and of itself, I feel that the project is successful in dealing with the concerns of food such as growth, storage and public access. I would question, however, whether one stand-alone architectural endeavor can truly begin to shift our cultural ideals and I would be curious to know if Dale feels that the project can succeed on its own in this manner or if it needs to be about something greater. This project provides a good starting point, nevertheless, and if the architecture could be distributed across a network system throughout New York, as Dale has alluded to, then as a holistic strategy the project would be much stronger. So I think that showing the development or "spread" across Manhattan as this system itself takes root and grows would be one approach which would have created a stronger project addressing the premise at a larger scale.

Also of particular interest for me is the site which Dale chose for the project. The approach method is perfectly valid for the particular site, but I am wondering how this project might manifest itself within Omaha (as Dale researched as one potential site) or an urban area with a fraction of the population density as Manhattan. I think it would be very challenging to create a successful project with respect to the question in a smaller urban area and would almost certainly evolve into something far different than the proposed solution. Since Dale chose New York over Omaha, in partial response to data concerning population, economics and so forth, I would ask how he thinks cultural change through architecture might have to occur in a small urban area? Does this project have validity beyond the proposed site? If yes, how, and if not, how does this project attain relevance to outsiders of the site looking in?

Chad Kruse

21 April 2009

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Dale's initial investigation probes the global supply chain that has allowed the exponential growth of our global economy for the past few decades. I appreciated the fact that Dale postulates such a scientific and detailed opponent to the current supply chain despite the fact that it's roots are digging deeper and deeper into everyone's lives worldwide. An idea this big could not be captured with much less research and depth that accompanies his final solution at such a detailed area.

I believe that Dale's final solution presents a disconnect between the proposed production facilities + marketplace that unnecessarily complicates his final solution. Dale's solution requires the design, construction + operation of two or three linked modules that weave and compete on New York's already complicated landscape. I wonder why his original dilemma with the supply chain was solved with a much smaller supply chain. I would ask Dale if he investigated compiling every node of the supply chain to officially eliminate the supply chain. It seems as if the marketplace and production docks could have been centralized near the shore where both entities could become one.

In terms of compassion and dedication for the project, - from his initial investigation to an overall complete alternative to a complex network - I consider his thesis successful. He successfully presented and expounded upon [to great depth] a contemporary issue that has no foreseeable demise, and constructed a worthy argument and final solution that provokes the ideology of our current matrix. I think as an architectural solution, his project is conceptually, programmatically, and tectonically strong with - just enough, left to ones imagination to ponder the possibilities of a completed network.

Matt Peterson

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