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No Parking but Parks: Sustainable Urban Planning of Open Space in New York City

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ABSTRACT

Parks are keys to create a sustainable urban living environment. They are particularly important today as they ameliorate of one of the most urgent problem—global climate change. Parks has been New Yorkers' most cherished public infrastructure. This thesis takes a close look on New York City and examines how open space planning affect the development of a metropolis. To investigate the topic, I applied three disciplines in environmental policy: environmental planning and design, history, and politics. These disciplines are intertwined. This thesis first digs in to the history of how the city's iconic Central Park is created and evaluates how Robert Moses shaped New York with parks and parkways. Then, it identifies the environmental urban problems and approaches them with Jane Jacob's idea and other new theories. It also includes other park examples such as the Highline Park, the Lowline, and Paley Park to demonstrate their sociological, recreation, ecology, and aesthetic value. Finally, it discusses the politics and dive into *PlaNYC* and its aim to ensure all New Yorkers live within a 10-minute walk of a park. This is a timeline of New York City's park planning and I wish to prove for a sustainable future of metropolis with wise development decisions.

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INTRODUCTION

Today, more than 3.3 billion people lives in urban settlements. It is estimated that in 2030 60% of world's population will live in cities[1]. Thus, in the 21st century, sustainable development is crucial for the city to be livable and accommodates such growth. Parks are an integral part to create a well-developed urban living environment. Ever since cities have been established, open space provides foundation for dwellers of all classes to interact. Plazas and squares are marketplaces that characterized medieval cities. They are platforms for people to exchange goods and services, and to enjoy social lives. Public spaces were typically used for social purposes, land uses redefined and reallocated as cities continue to develop. After the birth of automobile and intense motorization, urban landscape has drastically changed, with roads and parking spaces dominating. This triggers a series of problems such as intensifying climate change, creating nature deficit disorder, damaging public health and promoting environmental injustice. Sustainability focused movements like new urbanism and smart growth started to flourish in response to the troubles. Parks and public space are fundamental elements in these concepts because they play indispensable roles in our neighborhoods. Parks are not only safe and beautiful settings for recreation. They act as cohesive community forums and provide identity for citizens. They provide places for health and wellbeing that are accessible by persons of all ages and abilities, especially for those with disabilities. Parks and recreational services are a major factor in the perception of quality of life in a given community. They also generate money for the local economy as well as improving the tax base and increasing property value.

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[1] "Urban Population Growth" World Health Organization, Accessed April, 2014, http://www.who.int/gho/urban_health/situation_trends/urban_population_growth_text

Parks has been New Yorkers' most cherished public infrastructure. Central Park is the city's icon and it is the most visited place on Earth. Our city boasts more than 52,000 acres of City, state and federal parkland, representing 25% of the city's area[2]. It has the greatest percentage of parkland of any large city in the country[3]. New York City Parks are green spaces that not only provide our residents with a sanctuary from the stresses of city life, but also have long defined the character of our city and its neighborhoods[4].

Therefore, New York City has been focusing on sustainable park development; in particular, our parks and streetscapes will have to meet the needs of over 9.1 million residents in the future. To fully address how to develop the city's open space, several aspects should be studied. Quantitative natural and social science data provides background information for the problem of climate change, how does it affect New York, and the urge to soothe it via soft infrastructure. Three intertwining disciplines: environmental history, urban planning and city politics are applied to best approach the issue. First, digging into New York City's history enables us to get an overview on how the city is shaped and changed overtime. It demonstrates the traditional American way of using open space as parking lots. Then, in order to reduce the harmfulness created by this practice, new urban planning and design concepts should be considered. It helps to understand what options can be used for the city to be more resilient. Last but not least, policy is required for actual applications of the ecological designs and to encourage widespread sustainability. It also shows progressive development of the city planning and envisions us a bright future for our metropolis.

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[2] "PlaNYC 2030." New York City Government, Web, Accessed April, 2014
[3] "High Performance Landscape guidelines." City of New York Parks and Recreation, Web, Accessed April, 2014
[4] ibid

BACKGROUND: Climate Change and 21ˢᵗ Century Parks

"*Parks are a crucial component of the urban infrastructure that will help our city address the challenges of the twenty-first century*"

—Michael Bloomberg, Mayor of New York City, 2010

Plant trees, lots of trees[5]. This is the fundamental solution to tackle climate change. Prince Charles declared that climate change is the greatest threat to mankind. After showing all these alarming documentary films like *An Inconvenience Truth*, *The day After Tomorrow*, *6° could Change the World*, global warming is no longer an interior phrase that environmentalists use and concern, but a common awareness that it could totally destroy our world if we handle the problem without care. It is significantly pressuring the world to focus on environmental protection and to reduce carbon footprint. New York has the longest waterfront on Earth with 520 miles[6]. If the sea level continues to rise, large scale of land would be inundated.

New York 2100
(Source: "*Weather of the Future*" by Heidi Cullen, *Inhabitat*)

[5] Al Gore in election 2008
[6] "Vision 2020: New York City Comprehensive Water Plan" New York City Government Web. Accessed April, 2014

Intergovernmental Panel on Climate Change Report

The warming of the climate system is unequivocal, observable changes like increasing global surface temperature, rising sea level, widespread melting of snow and ice caps, changing in precipitation pattern are all evidence to the issue[7]. They are affected by regional changes, particularly temperature change. During the past 50 years, the global average temperature increased drastically, and it is extremely likely (95% confidence) due to the increased anthropogenic greenhouse gas (GHG) concentration (mainly Carbon Dioxide), especially after industrial revolution. Concentrations did not raise much above 280ppm before then, now it is at 400ppm. The GHG concentration is predicted to continue growing at a rate of 1.5 ppmv per year over the next few decades, in which induce further warming and more harmful environmental impacts[8]. Even if the GHG concentration is stabilized, the global surface temperature and sea level will keep rising for centuries because of climatic process and feedbacks. This global average temperature change triggers regional impacts that vary by extent of adaptation, social-economic pathway, in which they might be abrupt or irreversible, depending on the rate and magnitude of the change. Whereas, the probability that this is caused by natural climatic processes alone is less than 5%[9]. When the ice cap melts, more GHG would be released and exacerbate the situation. There are many options for reducing global GHG emissions through international cooperation like the Kyoto Protocol and UNFCCC; there are barriers, but mitigation is necessary.

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[7] "United Nation's Intergovernmental Panel on Climate Change (IPCC): 2007 Synthesis Report" Web, Accessed April, 2014
[8] ibid
[9] ibid

New York City's Rising Currents

Recent studies on climate change keep showing more disturbing figures. Rising seal level and more frequent and violent storms, the combined effects of global warming, are predicted to rise 2 feet in the harbor and estuaries of New York City by 2080 under normal conditions[10]; if there is a Rapid Ice Melt Scenario, it would be doubled. In a Category 1 Storm, it will create surges up to 30 feet, which put the city in danger of inundation[11]. Manhattan used to have marshy edges, but those have been gradually erased since 1600s, when Dutch colonists built docks to facilitate trade, fortifications to prevent attack, and seawalls to protect the growing city from its watery lifeline. To make matters worse, current seawalls will not be able to withstand predicted storm surges level.

Thus, the MOMA and P.S.1 contemporary art center collaboratively organized an exhibition called '*Rising Currents: Projects for a New York's Waterfront'* to address this urgent confront. Five multidisciplinary teams of architects, landscape architects, engineers, ecologists, and artists were challenged to re-envision areas of coastlines around the city. *New Urban Ground* is new paradigm for city infrastructure focused on lower Manhattan. Downtown is protected and greened through the introduction of absorptive wetlands and parklands. It is paved with a mesh of cast concrete and plants selected for their tolerance to pollution and saltwater. These porous green streets act as a sponge for rainwater in a new organic system designed to respond resiliently to daily tidal flows and occasional storm surges[12].

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[10] Bergdoll, Barry. *Rising Currents: Projects for New York's Waterfront.* MOMA, 2011. Print
[11] ibid, 13
[12] ibid, 60

New Urban Ground cuts into the island and created urban estuaries; including upland parks, freshwater wetlands and saltwater marshes, which make the shoreline a new, continuous ecosystem. The urban estuaries supporting saltwater and freshwater wetlands alternate with areas zoned for development, creating a balance between economic and ecological sustainability. Streets within the storm-surge flood zone are engineered for 3 different water-carrying capacities: absorption (Level 1), distribution (Level 2), and retention (Level 3)[13].
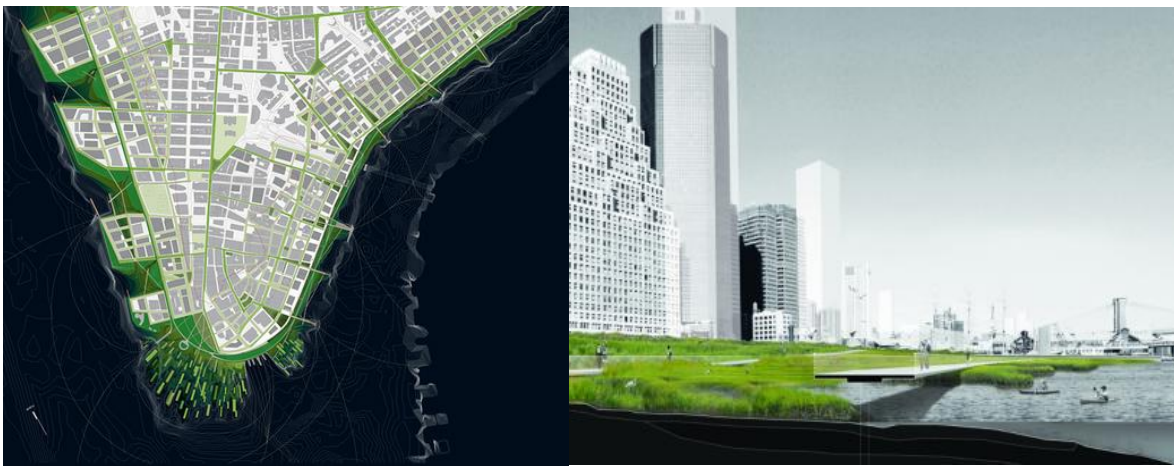
(Source: *Rising Currents: Projects for New York's Waterfront*)

In southernmost tip of Manhattan, there is the Battery Breakwater, a field of islands, constructed of sediment-filled geotextile tubes and designed to moderate the forces of storm surges, which is located in a shallow saltwater marsh. The East side of lower Manhattan is extended with landfill by one block to create an esker, or ridge, parallel to the shoreline, as well as a park and a saltwater marsh. A linear forest below street level runs along the East River to Brooklyn Bridge, providing a defense from storm surges[14].

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[13] Ibid, 62
[14] Ibid, 63

Considering the urban estuaries, saltwater marsh mitigates the force of incoming water in the event of a storm surge because it is designed to carry runoff and storm surge flooding off the land and out into the harbor. The Plants in these zones are selected for their capacity to withstand higher levels of salinity due to inundation from storm surges. A series of elevated walkways creates a platform for recreation, allowing people to occupy the estuary without disruption the natural habitat. The urban edge is raised according to the heights of tide. There are also features like Watershed parks, ferry stop, boat basin, and blue or green roofs that hold water and release it gradually into the streets[15]. Much of the area is transformed into a network of green space.

The New Urban Ground is a great 21st century design that utilizes parks and protected public lands' green benefits and quantifiable ecosystem services[16] like they improve the water quality, prevent flooding, protect groundwater, filter and improve the quality of air we breathe, act as carbon storage, provide shading and vegetative buffers to development, produce habitat for wildlife and biotic connectivity to increase biodiversity.

21st Century Parks

According to a report by Columbia University Center for Climate Systems Research, planting along the streets, in open spaces, or on rooftops, has the greatest potential to reduce New York City's urban heat island effect. In fact, planting in these area already decreases adjacent air temperatures by up to 5 degrees.

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[15] Ibid, 62
[16] "High Performance Landscape guidelines." City of New York Parks and Recreation, Web, Accessed April, 2014

Urban heat island effect refers to the elevated temperature that exists in highly urbanized environments. The city is crowded with dark pavements and dense building materials, causing extensive absorption of solar radiation during the daytime and re-radiation of heat at nighttime. Presently, the urban heat island effect elevates nighttime temperatures in the summer by 7 degrees in New York City[17]. This additional heat load increases energy demand with more air-conditioning use, in turn leads to more GHG emissions. Moreover, air quality is reduced and risk to public health is increasing due to the temperature rise. Illness such as heat-related asthma and strokes would have more occurrences, creating more mortality.

Parks enriches public health and the city's own environmental health. People could relief from the stresses they encountered in the chaotic and crowded city streets and so regain their mental and physical health[18]. It provides a place for children and families to connect with nature and recreate outdoors together. It helps alleviate nature-deficit disorder[19] —the rises in obesity, attention disorders, and depression of children due to the lack of nature in the lives of today's world. Open space development nowadays should also be cautious of environmental injustice. While environmental protection has greatly expanded over the past several decades, there is still environmental inequality such that low-income neighborhoods are in extreme environmental degraded conditions and dwellers has limited access to parks. Thus, both quantity and quality of parks are important for park development.

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[17] Ibid P.12
[18] Larice, Michael and Elizabeth Macdonald. *The Urban Design Reader*. Routledge. 2012. Print
[19] Louv, Richard. Last Child in the Woods, Algonquin Books, 2008. Print

ENVIRONMENTAL HISTORY

When looking into environmental or urban problems, there are many approaches. History is the basic discipline in understanding the background of the issue. Environmental history shows the changes in human relationship with the natural world overtime. It gives a well-rounded view of a specific region on how it is shaped and development, naturally and anthropologically. Increasing population, advanced technology, and changing lifestyle patterns are key components that greatly alter the physical landscape with environmental consequences. The ways that people think about nature further influence the interaction. This section investigates how industrial revolution and suburbanization changed the cityscape, and turned our world to a consumer's society; then, it gives a brief history of New York with a focus on the Robert Moses Era, the way he shaped New York as a motorized city while improving parks; lastly, it analyses the history and characters of an individual example, Central Park.

Aerial photo of the busy New York harbor, 1920
(Source: http://www.panynj.gov/port/history.html)

Industrial Revolution and Suburbanization

It is pretty strange to think about how human history has 10,000 years and how our society has transformed drastically since Industrial Revolution. Not only the GHG emissions have significantly increased, population has been growing. Between 1821 and 1855, New York City nearly quadrupled in population. As the city expanded, people were drawn to the few existing open spaces, mainly cemeteries, to get away from the noise and chaotic life in the city[20]. This leads to the Greensward Plan and the development of Central Park, which is discussed later in this section.

Public space has been a basic part of cities and urban structure throughout history, human settlements would be unimaginable without it, and it is necessary in mediating between private territories. The nature and character of public spaces are closely related those of cities. Historically, primary open spaces of the city were the core of the urban society with relatively cohesive and homogeneous population, integrating political, economic, social, and cultural activities[21]. For example, the *Agora* in Greek cities, the *forum* in Roman cities, and market squares in medieval cities. Streets, intersections, minor squares are actually also public open space that is essential to everyday sociability and trade[22].

 Society has structural changes after industrialization. Cities have grown, and the population is too large and heterogeneous to facilitate the same complex ranges of functions that rely on proximity and close encounters. Public space that provides

[20] Scobey, David M. *Empire City: The Making and Meaning of the New York City Landscape.* Philadelphia: Temple UP, 2002. Print.
[21] Larice, Michael, and Elizabeth Macdonald. *The Urban Design Reader.* "The Changing Nature of public Space in City Centres" 447 London: Routledge, 2007. Print.
[22] Ibid, 448

public goods has been under pressure of the market-based paradigm[23]. At the same

time, large-scale public sector schemes in urban development are carried out. Urban

renewals, high-rise public housings, new towns and motorways are increasing

exponentially. Industrial expansions introduced the use of automobiles and

changed people's lifestyle entirely. Technological advancements enable people to do

less mechanical works and improve living quality. They started to move out from

the city for lower density and more greenery since transportation was made easier

for people to move around. Suburbanization and ideas like smart growth and garden

city movement were prevalent. In 2001, about half of all Americans live in low-

density suburbs, and half of the remainders live in very-low-density rural areas.

Only about a quarter live in relatively dense central cities[24].

There was an economic decline in the 1970s, which deprived the funds for

public sector; a lot of urban projects and development schemes are forced to

abandon. As the market slowly revived, privatization became the trend. Urban

developments were transferred from public to private sector[25]. However, in this

capitalist-based consumer's society, private companies are more interested in the

profit and their returns on its investments than the community as a whole. To make

matters worse, locally elected politicians would devote more on public goods in

their budget that have immediate political and economic returns[26]. This generated

the fear of a fragmented city, with loss of public space and the idea of city.

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[23] Ibid, 445
[24] O'Toole, Randal. "The Folly of "Smart Growth"." Thoreau Institute, Fall 2001. Web.
<http://object.cato.org/sites/cato.org/files/serials/files/regulation/2001/10/otoole.pdf>.
[25] Urban design Reader "The Changing Nature of public Space in City Centres" 446
[26] Ibid, 447

Robert Moses's New York City: Motorization and Parks

When Dutch and British first landed in the 17th century, Manhattan was a green paradise with abundant wildlife, magnificent park-like forests, and extensive marshlands[27]. New York grew in importance as a trading port under the British rule in the early 1700s. Streets and warehouses were built near the piers on the riverside for easy access to shipments. In 1811, the Commissioner's Plan has issued, and placed New York City on a grid system after all.

During that period while everyone walked, the rich lived in Bowing Green, a central location with proximity to the wharves[28]. One of the poorest parts of the city was now the southern end of 5th Avenue. It was an early African American district and cemetery. In 1826, the city brought a big plot of land in that area and it became the Washington Square[29]. This current archetypal urban space was a pronto-suburb back then. It grew because a faster form of transportation, an omnibus, New York's first public transit, enabled the rich to travel farther and buy bigger, greener homes[30]. Interestingly, Washington Square Park was the place that sparks Jane Jacobs and Robert Moses's fight. In the 1950s, Robert Moses proposed a road running though the park and it was Jane Jacob's neighborhood. She was fighting to save 19th century sprawl from 20th century sprawl[31].

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[27] Sanderson, Eric. *Mannahatta: An Ecological First Look at the Manhattan*. 2007
[28] Glaeser, Edward L. *Triumph of the City: How Our Greatest Invention Makes Us Richer, Smarter, Greener, Healthier, and Happier*. New York: Penguin, 2011. Print
[29] Ibid, 170
[30] Ibid, 170
[31] Ibid, 170

Under the influence of Robert Moses, New York used to be a city for automobiles, since he favors highways over public transit. Robert Moses was the most influential urban planner in the 20th century and the master builder of New York City. He created the culture of commuting, and changed the physical landscape entirely, more than anyone else, by building many parkways, bridges, and tunnels. With the support of New York City's governor Al Smith since 1920s, Robert Moses raised in power to control the city's urban development. He was the New York City Park Commissioner, Tri-borough Bridge and Tunnel Authority Chairman, sole member of the Bethpage State Park Authority, the Jones Beach State Park Authority, the Henry Hudson Parkway Authority, the Marine Parkway Authority, the Hayden Planetarium Authority, etc.[32].

(Moses' works; more shown in appendix)

E-19. Grand Central Parkway, January 3, 1938

E-20. Cross Island Parkway, July 10, 1940

E-21. Grand Central Parkway, with adjacent bike path, February 14, 1941

[32] Caro, Robert. *The City Shaper.* 1998 http://www.robertmosesnyc.com/NYer.html

Robert Moses lit the Era of Motorization and help created suburbs. Critics like Robert Caro often attack him by his lack of consideration for general publics as he displaced hundreds of thousands people when constructing his projects. His influence declined when urban planning started to focus more about the virtues of intimate neighborhoods.

(Bryant Park, 1935

Source: Fischer, Jan "*Models of Total Urbanism: Berlin and New York City*" IES Abroad Berlin Metropolitan Studies. Lecture. 8 April 2013)

Despite the dirty, dark, urban-heat emitting parkways, Robert Moses is credited with his park developments. Jonas Beach was part of the project of parkways on Long Island. It was swampy and low-lying. Sands were brought to raise 10 feet; bathhouses, a tower, and malls were built. Now the place was considered to be one of the most beautiful public parks on Earth, that are free from housing developers and private clubs. The Riverside Park was transformed in 1930s while constructing the Henry Hudson Parkway. Before, it was nothing more than a six-mile-long wasteland of mud and rapidly eroding landfill[33], with smog by the ferries near the shore. After the completion of the "Westside Improvement Project", he park and the parkway were done so skillfully that the public is generally unaware that the Freedom Tunnel rail tunnel now used by Amtrak is underneath.

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[33] Ibid

Even Moses promoted the use of automobiles; New York City is distinguished by its low ownership of personal automobiles and the highest rate of public transportation use in the United States. It is the only city in which over half of all households do not own a car, and in Manhattan this figure even reaches 77%[34]. The average Manhattanite consumes gasoline at a rate that the country as a whole hasn't matched since the mid-1920s. Arguably, New York City is the greenest community in the States. The life expectancy of New York City residents are 9 months longer than average American, daily walking might be part of reason. According to a study, every minute spent on walking extends life expectancy by 3 minutes[35]. If people utilize open spaces into more parks than parking lots, would definitely promote walking and then improve the environment and public health.

Case Study: Central Park

In 1859, New York City invited visionary designers Frederick Law Olmsted and Calvert Vaux to create Central Park, a man-made sylvan wonderland in the heart of extreme dense area. They produced an unprecedented public amenity and one of our city's most beloved open spaces. Roughly 1600 People lived in that area before, including Irish pig farmers and German Gardeners. The swampy landscape made it undesirable for private development, thus the city turn it to a park. Central Park is the first theme park, with nature as the theme. It is closer to Disneyland than Yosemite as only pieces of rocks are original from the former swampland[36].

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[34] Owen, David. *Green Metropolis: Why Living Smaller, Living Closer, and Driving Less Are Keys to Sustainability*. New York: Riverhead, 2009. Print.
[35] Ibid, 165, 166
[36] Miller, Sara C. "*Transforming Central Park.*" Lecture.

Central Park covers 843 acres. It is designed like an open museum[37], walking along the circulated trails and pedestrian paths could see breathtaking views on various sightseeing spots created intentionally. It contains many appealing features such as a children's zoo, two ice skating rinks, a reservoir surrounded by a running track, an outdoor theater, playgrounds and fields, tennis courts, museums etc[38].

(Drawing by John Bachmann, part of a campaign to advertise the new park)

Being the city's treasure, the park certainly has important functions. It provides large outdoor area for all types of recreational and aesthetic purposes, creates various habitats that increase biodiversity and brings other environmental benefits, and represents the city's image on a big scale.

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[37] Ibid
[38] Owen, David. *Green Metropolis,* 170

However, the most heavily used features in the park are those situated along the park's outermost edge. They are next to the surrounding streets, and not really beneficial by locating in a large plot of ground or being isolated from one and other by banks of vegetation[39]. The human flow would be grater without these vegetation barriers if it were situated in other places in the city. Large urban park, especially for the classic pieces of 19th century urban landscaping, have many of the drawbacks that sprawling suburbs do, such as they insert too much space between individuals and uses that they actually inhibit many of the activities they are intended to encourage[40]. Spaces are then wasted since the area can be used in other ways.

When observing the pedestrian flow around central park, you can see that there is not much traffic. People travelling to a destination are far less likely to walk across a park or any large open space area than they are to walk the same distance along a lively city street[41]. Central Park has very clear-cut borders and this appoints to the death of this issue. In the *Death and Life of Great American Cities*, Jane Jacobs explained this perception in the chapter on " The Curse of Border Vacuums". Borders are formed when the perimeter of a single massive or stretched-out use of territory creates an edge of the area[42]. Railroad tracks, huge single-use buildings, wide streets, big parking lots, leafy, spacious parks can all be barriers. The root trouble of borders is that they are apt to form dead ends for most users of city streets. They represent for most people, most of the time, as barriers[43].

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[39] Ibid, 170
[40] Ibid, 169
[41] Ibid, 168
[42] Jacobs, Jane. *The Death and Life of Great American Cities*. Vintage, 1992. Print. 257
[43] Ibid, 259

When considering streets in connection to the border streets, their human flow is small as well, because few people are using the immediate border street. They fail to get a so-called by-the-way circulation of people going in the direction of border[44]. Consequently, Borders tend to form vacuums of use adjoining them. Vacuums are dangerous, as consistent man flow keeps the place safe[45]. It also fractures the city and inducing environmental injustice by isolating neighborhood.

30 years ago, New York City was in its Dark Age. The entire park became a vacuum area and people have to stay out for the sake of safety. In 1980, Central Park Conservancy did park-wide studies and decided to rebuild Central Park and plan for the park's future. Central Park Conservancy is a non-profit, private organization that manages the park under a contract with the city of New York. They are responsible for the park maintenance, which is a huge expense. Central Park is only funded 25% of their expenses by the city of New York, the rest of 75% are from individual and corporate donations[46]. According to an independent study, the park is responsible for more than $1 billion in annual economic activity and revenue for New York, $390+ million is from economic activity, $650+ million from real estate and other tax revenues[47]. This demonstrates how private sectors control and benefit from public space. The following section elaborates on how to design and manage open space better.

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[44] Ibid, 259
[45] Ibid, 259
[46] Miller, Sara C. "*Transforming Central Park.*" Lecture.
[47] Ibid

URBAN DESIGN AND PLANNING

"Sustainability is a condition of existence which enables the present generation of humans and other species to enjoy social wellbeing, a vibrant economy, and a healthy environment, and to experience fulfillment, beauty and joy, without compromising the ability of future generations of humans and other species to enjoy the same."

-Guy Dauncey

Sustainable urban planning is the ultimate emphasis of this thesis, and it is crucial for the city with an expanding population. Sustainability in a general sense is the capacity to support, maintain or endure. There is no universally accepted concept of sustainability, and it has undergone various interpretations. At the 2005 World Summit on Social Development[48], the United Nation defined the 3 pillars for sustainable development, which are environmental performance, economic development and social inclusions.

The Three Pillars of Sustainable Development
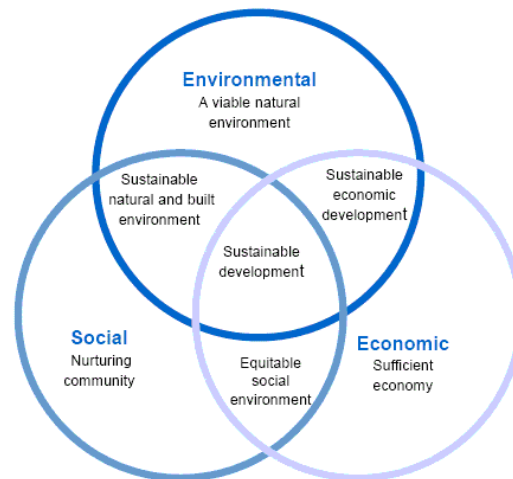
Urban planning, in brief, is the design of city environments concerning the use of land, whereas many elements have been mentioned previously. This discipline takes a deeper insight on various pioneering and foundation urban theories. It also includes case studies on interesting park designs of now and tomorrow like the Highline Park and the Lowline.

[48] http://www.un.org/womenwatch/ods/A-RES-60-1-E.pdf

Historical Precedents: Frederick Law Olmsted and Ebenezer Howard

Frederick Law Olmsted, the designer of Central Park planned to create a park in the style of European public grounds, with an uncorrupted countryside appearance. He believed that such naturalistically design parks serve as an antidote to urban life and preserves people's mental and physical health by providing open spaces filled with trees, sunlight, and fresh air[49]. These provisions are conductive to calm contemplation and they would give mental recuperation to park visitors. Social inclusion is another concept that is important in open space planning. Public parks should be places where the many disparate groups in American society, like the working people, the wealthy people, the poor, the immigrants, the descendants of early colonists, all come together and develop a basis for creating community though shared aesthetic experience[50].

In terms of leisure activities in the park, he addresses that there are two types of recreation: exertive and receptive. Exertive recreational activities required physical or mental exertion, such as sports game or chess. Receptive recreational activities were those people engaged without conscious effort, such as music or art[51]. He only deemed the latter recreation type appropriate for large city parks because if recreations requiring large spaces to be given up to the use of a comparatively small number, should not be considered essential[52]. Recreations should be gregarious and neighborly.

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[49] *"Public Parks and the Enlargement of Towns"* The Urban Design Reader, 37-44
[50] Ibid
[51] Ibid
[52] Ibid

Parks should be in proximity of everyone and made interesting with plantings and decoration, so that in necessarily passing through them, whether in going to or from the park, or to and from business, some substantial recreative advantage may be incidentally gained[53]. According to this concept, more small urban parks are to be produced instead of a large park with bucolic vistas in the heart of a dense city. It is true that Central Park seems proximate in all directions. Yet, it is difficult to provide adequate entertainment throughout the area. As discussed, people might even avoid going into it because of the border vacuums. A wise solution is to split up into smaller open space scattered around the area like Washington Square Park, which draws steady flow of pedestrians into itself.

Ebenezer Howard's garden city vision was one of the most captivating planning and design ideas of the late 19th century. It greatly inspired the creation of new towns and garden suburbs in England and America, resulting in the Garden City Movement. The garden city was a place where people live in harmony with nature. Howard created a "three magnet diagram" demonstrating the ideology of "town and country must be married" and "out of this joyous union will spring new hope, a new life, a new civilization"[54]. He pointed that overcrowding in the city is the source of urban illness. People were traditionally attracted to the cities because of higher wages and greater social opportunities in spite of hardship of city life. Whereas, rural life is less compelling despite the beauty and fresh air available in the countryside. The garden city will eliminate the down sides of urban and rural lives. His ideas were not only utopian visionaries but in practice, in a compromised form.

[53] Ibid
[54] *"Garden Cities of To-morrow"* The Urban Design Reader, 53-61

Foundations: New Urbanism and Jane Jacobs

19th and 20th century is the age of motorization and suburbanization. Both Olmstead and Howard were promoting suburban living with their designs. However, this created sprawls. "*Eighty percent of everything ever built in America has been built in the last fifty years, and most of it is depressing, brutal, ugly, unhealthy, and spiritually degrading*", written by James Howard Kunstler in his book *The Geography of Nowhere*. In his account, Suburban residents live in places where nothing relates to anything else, as daily activities are pulled apart into large-scale segregated developments accessible only by automobiles[55].

People started to criticize this modern "anti-urban" development and seek for a return for healthy urban living with interactions instead of isolations. New Urbanism emerged in the 1960s and arose in early 1980s. New Urbanism is founded on the belief of that a combination of land use changes, urban design, and architecture can revive a sense of community and make the urban environment more livable[56]. There are 10 major principles in new urbanism: walkability, connectivity, mixed-use and diversity, mixed housing, quality architecture and urban design, traditional neighborhood structure, increased density, green transportation, sustainability, and quality of life[57]. It promotes a diverse neighborhood with a range of housing and job types.

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[55] Judd, Dennis R., and Todd Swanstrom. *City Politics: The Political Economy of Urban America*. New York: Pearson Longman, 2008. Print. 309
[56] Judd, Dennis R., and Todd Swanstrom. *City Politics: The Political Economy of Urban America*. New York: Pearson Longman, 2008. Print. 309
[57] NewUrbanism.org. "NewUrbanism Principles." *Urbanism Principles*. Web.

New Urbanism promoters hope to design neighborhoods that nurture community, transportation systems that get people out of their cars, and urban environments built to human scale[58]. They support regional planning for open space, context-appropriate architecture and planning. They believe their strategies can reduce traffic congestion, increase the supply of affordable housing, and rein in suburban sprawl, and even crimes.

Although New Urbanism as an organized movement happened later, Jane Jacobs shared similar visions. Jane Jacobs' legacy and her influence are deeply rooted and felt widely by urbanists, planners and elected officials, it sets as groundwork for modern thinking about urban design. She was not an urban planner by occupation, but a journalist and author. Understanding and appreciating the integral character of diverse neighborhoods has to be a primary requirement for any planning initiative. Jane Jacobs was an activist, in her infamous book "*The death and Life of Great American Cities*", She set forth principles about sidewalks, parks and slums. She embraces the importance of the relationship of people and the public realm; the appreciation of networks created by diverse uses; the understanding that blocks are the basic unit of the city; and the primacy of the street as the glue of neighborhood life[59].

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[58] Ibid
[59] Burden, Amanda. "Jane Jacobs, Robert Moses And City Planning Today." *Gotham Gazette: The Place for New York Policy and Politics*. Gotham Gazette, 6 Nov. 2006.

In the chapter "the Uses of Neighborhood Parks", Jane Jacobs particularly discussed the idea of parks and features of a successful park. First, it is important to acknowledge that open space is not the more the merrier like in orthodox city planning. "*People do not use city space just because it is there.*"[60] Poor managed open space would only be bleak vacuums between buildings that destruct the cityscape and provide grounds for muggings and vandalism; people would stay away from it.

"*In cities, liveliness and variety attract more liveliness; deadness and monotony repel life."*[61] Parks acts in the same way. Therefore, it is important to keep parks lively and active like the neighborhood. To achieve this goal, there should be effective diversity of use. A successful park cannot be occupied with mothers alone, mono functioning would cause void for a significant park of the day[62]. The park should attract as many different kinds of people, with as many different schedules, interests, and purposes as possible for intense use. Such parks usually possess four common characteristics: intricacy, centering, sun, and enclosure. Intricacy is the variety of reasons people use parks, among them centering or the fact that parks have a place known as their centers. Sun, shaded in the summer, should be present in parks, as well as building to enclose parks[63], which are of diverse types.

To sum up, "*the more successfully a city mingles everyday diversity of uses and users in its everyday streets, the more successfully, casually (and economically) its people thereby enliven and support well-located parks that can thus give back grace and delight to their neighborhoods instead of vacuity.*"

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[60] Jacobs, Jane. *The Death and Life of Great American Cities*. Vintage, 1992. Print. 90
[61] Ibid, 96
[62] Ibid, 99
[63] Ibid, 103

Modern Concepts: William H. Whyte and Jan Gehl

Wiiliam H. Whyte began to ponder the design effectiveness of the city's plaza and playground while working on an update of New York City's comprehensive plan in 1969 with the Planning Commission. Due to developer's growing desire for taller skyscrapers, the city had begun to grant density and height bonuses in exchange for public space amenities at the base of new buildings. He started the Street Life Project researching the effectiveness and use of these public spaces over a multiyear period[64]. He observed and analyzed the interactions and behaviors of people at this and other plazas, and explores why some urban plazas were successful as public spaces while others were not. Some of the key findings suggested the importance of seating supply and the adaptability of space for personal needs.

He addressed that "*a good plaza starts at the street corner. If it's a busy corner, it has a brisk social life of its own. People will not just be waiting there for the light to change. Some will be fixed in conversation; others in some phase of a prolonged goodbye. If there's a vendor at the corner, people will cluster around him, and there will be considerable two-way traffic back and forth between plaza and corner*".[65] There are a number of main factors that identify plazas as popular gathering points. First, an abundance of inviting places to sit and relax. "People tend to sit most where there are places to sit." Benches, movable chairs, ledges and steps could all provide hospitable seating. Good public spaces should not have strict borders, it should allow as much people flowing as possible. Tree canopies, water features, sculptures and food vendors all played a role in attracting people to urban plazas and parks.

[64] "The Social Life of Small Urban Spaces" The Urban Design Reader, 198-213
[65] Ibid

He produce a film "The Social Life of Small Urban Spaces", it featured Paley Park, a small vest pocket park in midtown Manhattan. I took a field trip there on my urban design class and the park was really successful. It acts as a little oasis in the center of the city. Nonetheless, it is located directly on the street so that people are attracted to look in and enter. When stepping in, people can see moveable chairs and tables that let people be comfortable and have some control over where they sit. There is a waterfall that provides a dramatic focal point and a reason to enter the park; its noise blocks out the sounds of the city and creates a sense of quiet and privacy. There's adequate shade in the summer from the trees, though they allow a beautiful dappled light to pass through their leaves[66]. Moreover, there is a tiny food corner where people can grab a bite for lunch.

Also systematically documenting urban spaces, Jan Gehl published several influencing books that changed cities around the world, such as "*Public Spaces, Public Life", "Life between Buildings", and "New City Spaces".* They present a method for evaluating city quality, discuss how our sensory abilities affect our use of space, and make recommendations for how design techniques can encourage active use of outdoor space. The public life is changing. Other than necessary activities like working, people have more leisure time and people starts to devote more optional activities, which are urban recreations. Jan Gehl believes that re-orienting city design towards the pedestrian and cyclist would improve the quality of urban life.

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[66] http://www.pps.org/great_public_spaces/one?public_place_id=69

Ideal Open Space

Integrating all of the positive elements for successful, sustainable open space design, the ideal open space focuses on several aspects. First, accessibility is fundamental. Open spaces are places for public interactions; it should attract as much human flow as possible and then fulfill its functions and provide services. Large parks are like suburbs and sprawls, isolated and discourages human activities as it insert too much space between individuals and uses. Thus, smaller pocket public spaces scattered around are easier to access and manage. Parks are created for recreation and aesthetics, therefore greenery is important and it brings ecological benefit. Diversity is another key. The use of parks should be diverse to create a lively environment. It should be inviting with water, tree shades, movable chairs and benches, art pieces, and other recreational grounds. Open spaces are for the public; they ought to be in human scale in context with the neighborhood, which presents the characters and image of the space, the neighborhood, and the city.

Case Studies: The Highline Park and The Lowline

The Highline is one of the most innovative and inviting contemporary parks. It is a miracle oasis in Manhattan and set forth examples for new concepts of recycling open space. The High Line is a public park built on a historic freight rail line elevated 30 feet above the streets on Chelsea. Trains stopped running since 1980 and the tracks were under threat of demolition. Friends of the High Line, a community-based non-profit group, formed in 1999 to protect the area.

Construction on the park began in 2006, with design team of landscape architects *James Corner Field Operations*, with architects Diller Scofidio + Renfro. *Friends of the High Line* now works in partnership with the City of New York to preserve and maintain the structure as an elevated public park.

As mentioned, railroad tracks are the classic examples of borders[67]. However, the Highline tracks conversely immerse into the neighborhood, providing a unique experience of life between buildings. The Highline is located on a lively neighborhood, very accessible by foot with stairs and elevators, public transportations and automobiles. It offers spectacular views of the Hudson River and Midtown New York, including interesting architectures produced by aspiring architects like Frank Gehry. It provides spaces for tourists, families and friends to relax. There are a variety of types of benches and chairs. The path is also adorned with colorful flora and fauna. There are a number of public art installations. Food trucks were available. In warmer months, many activities are held, like summer concerts, and star gazing.

(Source: National Geographic)

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[67] Jacobs, Jane. *The Death and Life of Great American Cities*. Vintage, 1992. Print. 257

In contrast, the Lowline Park is a glimpse of the future underground. Currently, we live in concrete jungles with all the skyscrapers competing like plants that strive for sunlight. I always picture an opposing underworld with trees and buildings heading towards the core. Pipes underground and abandoned train stations are always fantasies where adventures start. We have green roofs on the upper edge of our skyline and the Highline, so why not have green parks underneath the towering buildings?

The Lowline is a proposed project for the world's first underground park. It would be located in a historic trolley terminal under the eastbound roadway of Delancey Street on the Lower East Side, adjacent to the Essex Street station. It makes use of light technology that can naturally illuminate the park. Attached to the roof is a parabolic sun collector that enables sunlight to travel through a fiber-optic

heliotube[68]. A canopy distributor, providing ample sunlight below ground, then disperses the light. Beneath the canopy, there is a small park with grass, plants, and a tree installed to show that photosynthesis is able to occur underground with this exciting new technology[69]. Two years ago, there was a kickstarter exhibition and it successfully raised raised over $150,000. The project is now negotiating with the MTA and the City to build and operate the underground park. It is estimated to open in 2018[70].

The recycling of old railways into urban parks has become a trend. The barren abandoned vacant ground were also open space, with no use. These projects are well designed and managed that allows open space to fully perform their potentials. Sustainable planning should take into consideration of open space renewal. This would revitalize this city, and provide environmental, economic, and social benefits.

(The Lowline Exhibition, 2012 Source: Jenny Kun)

[68] http://www.thelowline.org/
[69] Ibid
[70] Ibid

CITY POLITICS

Applications of urban theories are mainly carried out by city policies. When proposing and carrying out a policy, laws and politics are main concerns; the policy might not benefit everyone, but should be just to all. The basic idea underlying all notions of justice is equity or fairness. Politics and government is impartible, political thought is fundamentally concerned with the justification of the power of government. Various investigations and contemplations on numerous aspects are required, such as considerations on history, social conditions, empirical data, conflicting interests of affected parties, and the political institutions and methods used to develop a solution. This section mainly discusses how New York City is dealing with the situation. It comprehends city policies: *PlaNYC 2030*, development plans: *High Performance Landscape Guidelines*, and Community-based Organizations.

PLANYC 2030

New York City has its problems of their consumer's habits, segregations, pollutions etc. However, multiple schemes have been carried out to make a brighter future with citizen's mutual consensus. In 2008, Mayor Bloomberg proposed *PlaNYC*, a long-term comprehensive sustainability plan to create a greener, greater New York City. That city can accommodate more residents, renew and add green infrastructure, retains its competitiveness in an increasingly global economy, and tackle challenges from climate change[71]. One of the biggest ambitions is to reduce the greenhouse gas emission by 30%.

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[71] PLANYC 2030." *PLANYC 2030*. Web. Jan. 2014
 <www.nyc.gov/planyc>

PlaNYC established 10 goals to achieve a sustainable city. They include: housing and neighborhood, parks and public space, brownfields, waterways, water supply, transportation, energy, air quality, solid waste, and climate change. These goals are interrelated and the city aims to expand and create new pathways to advance environmental and infrastructure initiatives continuously. In terms of parks and public space, the plan hopes to ensure all New Yorkers lives within a 10-minute walk of a park. It targets high impact projects in neighborhoods underserved by parks, creates destination-level space for all types of recreation, promotes and protects nature, ensures the long term health of parks and public space, and re-imagines the public realm[72].

The plan suggested that we are now in the third great era of park building. The first era began in the second half of the 19th century, when Frederick Law Olmsted and Calvert Vaux designed over 1,900 acres of city parkland including our most iconic open space, Central Park. The second great era began with the appointment of Robert Moses as City Parks Commissioner in 1934. Taking advantage of New Deal funding, he more than doubled park acreage in the city[73]. However, before the plan established, over 2 million New Yorkers still live more than a 10-minute walk from a park.

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[72] Ibid, 32
[73] Ibid, 34

(Source: http://nytelecom.vo.llnwd.net/o15/agencies/planyc2030/pdf/
planyc_2011_planyc_full_report.pdf)

Our plan for parks and public space:

Target high impact projects in neighborhoods underserved by parks
1 Create tools to identify parks and public space priority areas
2 Open underutilized spaces as playgrounds or part-time public spaces
3 Facilitate urban agriculture and community gardening
4 Continue to expand usable hours at existing sites

Create destination-level spaces for all types of recreation
5 Create and upgrade flagship parks
6 Convert former landfills into public space and parkland
7 Increase opportunities for water-based recreation

Re-imagine the public realm
8 Activate the streetscape
9 Improve collaboration between City, state, and federal partners
10 Create a network of green corridors

Promote and protect nature
11 Plant one million trees
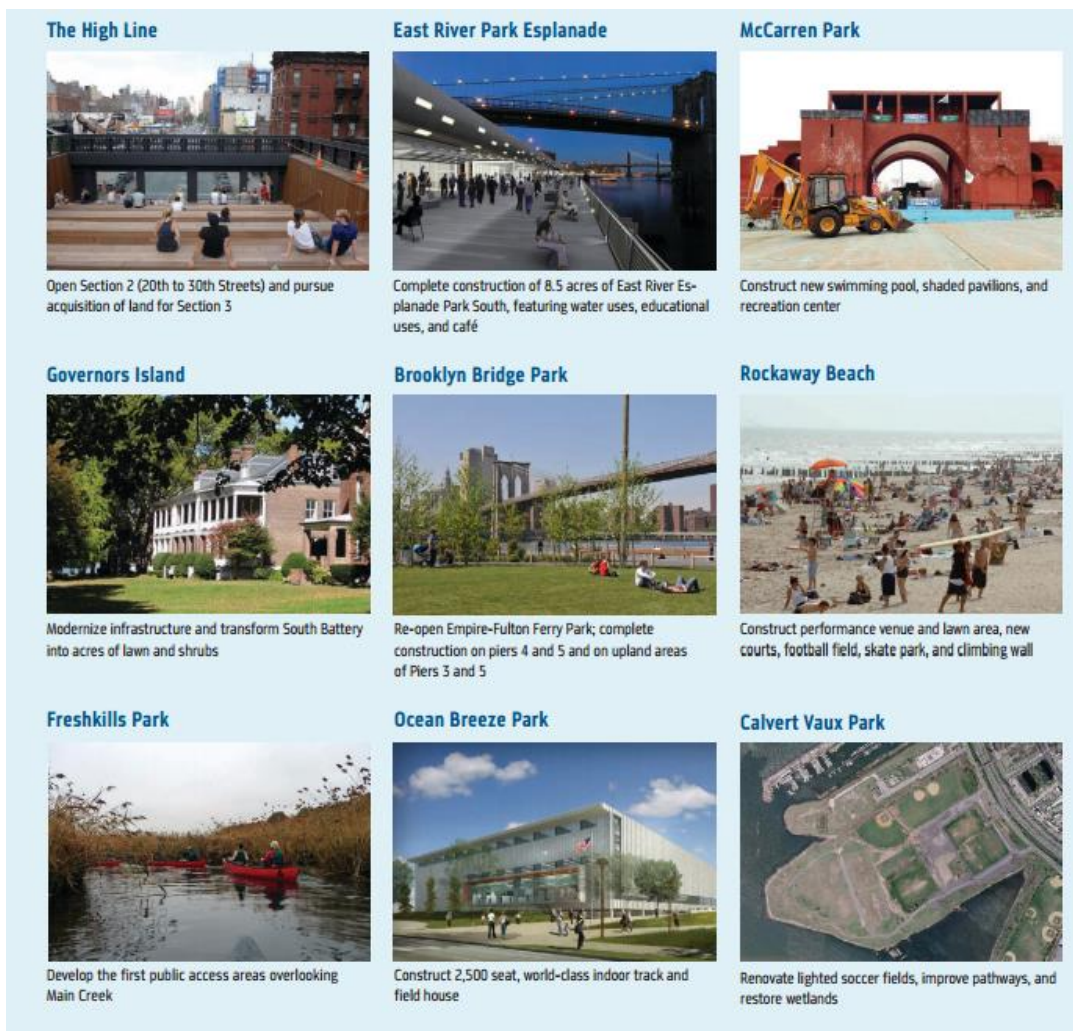12 Conserve natural areas
13 Support ecological connectivity

Ensure the long-term health of parks and public space
14 Support and encourage stewardship
15 Incorporate sustainability through the design and maintenance of all public space

The figure above shows the initiatives of the plan. High impact projects are those with greatest open space need. It includes community gardens and urban agriculture opportunities. It will enrich many of the city's neighborhood least served by parks. The city will continue to create and renovate parks to attract people from all over the city.

Many public spaces like schoolyards, vacant lots, athletics fields, and lightly trafficked streets, have not fully realized their potentials. Through targeted investments that use existing land better, these spaces cam become valuable community resources[74]. Since the supply of vacant land and capital are finite, the city should make the most out of the funding for projects, and new strategies are used to create parks like the Highline. The Plan estimates that by 2030, we will acquire or upgrade more than 4,700 acres of parkland and public spaces throughout the 5 boroughs.

The High Line
Open Section 2 (20th to 30th Streets) and pursue acquisition of land for Section 3

East River Park Esplanade
Complete construction of 8.5 acres of East River Esplanade Park South, featuring water uses, educational uses, and café

McCarren Park
Construct new swimming pool, shaded pavilions, and recreation center

Governors Island
Modernize infrastructure and transform South Battery into acres of lawn and shrubs

Brooklyn Bridge Park
Re-open Empire-Fulton Ferry Park; complete construction on piers 4 and 5 and on upland areas of Piers 3 and 5

Rockaway Beach
Construct performance venue and lawn area, new courts, football field, skate park, and climbing wall

Freshkills Park
Develop the first public access areas overlooking Main Creek

Ocean Breeze Park
Construct 2,500 seat, world-class indoor track and field house

Calvert Vaux Park
Renovate lighted soccer fields, improve pathways, and restore wetlands

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[74] Ibid, 35

According to the *PlaNYC Progress Report* update 2014, New York City's Department of Parks and Recreation (DPR) now manages almost 30, 000 acres of parks and natural area, including 27 percent of the city's shoreline[75]. DPR completed 7 *PlaNYC* milestones and added 109 acres of new parklands to New York City's park system in 2013[76]. In particular, the phase one of Highline Park is completed in which enhances park for use by the public as well as improving its value as habitat and ecological resource. The *MillionTreesNYC* program is 27% ahead of schedule, have planted over 830,000 trees[77]. Many green events event were held and New Yorkers are learning how to care for our city.

Much of 2013 was spent recovering from Hurricane Sandy. Up to 3 million cubic yards of sand were displaced from city beaches during Sandy[78]. Parkway landscapes that suffered are helped restored, and the city is also researching how to better utilize parkland for storm water management. The city's park system not only continues to provide open spaces for recreation and public gather for a growing number of people, it also serves to protect and buffer communities and habitats from the impacts of severe weather event and climate change[79]. By adapting the measures, New York will be stronger and more resilient for all residents in the future.

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[75] *PlaNYC* Progress Report 2014
http://www.nyc.gov/html/planyc2030/downloads/pdf/140422_PlaNYCP-Report_FINAL_Web.pdf
[76] Ibid, 9
[77] Ibid, 9
[78] Ibid, 73
[79] Ibid, 72

High Performance Landscape Guidelines

The High Performance Landscape a comprehensive manual for the design and construction of sustainable parks and open space. Assisting the *PlaNYC* initiative, the Fellows of the Design Trust for Public Space, the landscape architects and specialists of the Parks Department has worked together to prepare for these guidelines. It will change the way all of New York City's parks are designed, built, and maintained, improving the quality of life for all New Yorkers while reducing the city's impact on the Earth.

Parks are not only beautiful places; they are healthy ecologies. Facing serious potential climate danger, the Parks Department now expects each one of New York City's parks to perform numerous ecological and social functions at the highest possible levels. These new expectations will require changes in attitude as well as practices[80]. The full range of open spaces is targeted, from planted traffic islands to urban forests, from pocket plazas to Central Parks. They are not simply "natural landscapes, but high performance land that are precisely engineered and planned to get the most out of a limited parcel of land that requires careful maintenance and skilled, ongoing evaluation. There are detailed guides for assessment practice on soil, the water, and the vegetation.

Park design should engage all users, creating delight in any forms. It strives to integrate uses for benefits, not conflicts while determining and addressing the cultural and age preference of neighborhood users. Adjacent source of users are paid with particular attention. It should engage nature, revealing a range of

[80] The High Performance Landscape Guidelines, 17
http://www.nycgovparks.org/sub_about/go_greener/design_guidelines.pdf

landscape types. It should not harm the ecology the place but offer a diversity of ways to engage with the natural environment. The design should also respond to site context. It needs to understand the historic design intent of the site and respect it, understand the natural and historical importance and interpret it, and understand existing microclimate while creating new one to accommodate site uses, season extension, and mediate climate change. Ecologically, the function is supported, it should maximize the benefit of ecosystem services by preserving existing environmental features, and restore and regenerate lost or damaged ecosystem services. The diversity and interconnectivity should increase by understanding and preserving the complex relationships between soil, water, vegetation and fauna in each ecosystem; strengthening the city's ecological functioning through increasing the diversity of park vegetation and habitat; creating linkages between individual parks and natural areas that enhance larger-scale ecological functioning.

Economic principles are also important for high performance landscapes. Resiliency and performance is the core for economic considerations. Planners ought to work to maximize the economic efficiency and productivity of all design, construction and maintenance; and include maintenance considerations in all designs to assure that projects will thrive without extensive repair and modifications. Also, it is important to consider the long term-impact of material selection, including source and production methods; and work with maintenance staff to learn from past problems and increase serviceability.

Socially, collaboration and participation is crucial for the development of community stewardship. People are encouraged to have direct communications and collaboration within and throughout the Parks Department and with other city agencies. There should be a consultative process that engages the public, so that their knowledge of the site and recreational preferences are incorporated into the design. Public health, education and long-term thinking should be promoted with the design. Parks that encourage active recreation improve the health and well being of city residents. It should design to inform the public about the critical ecological benefits of parks; teach future generations about the importance of park the cities well being; and effect a transformation of social priorities about ecological objectives. Last but not least, Parks should provide future generations with a sustainable environmental supported by regenerative systems, and avoid consumption of resources that contribute to habitat destruction and global warming.

<u>Other Programs</u>

Despite *PlaNYC* and *the High Performance Landscape Guidelines*, the city also implemented a lot of related development schemes to fully transform New York into a sustainable role model. Such *as GreeNYC, Million Trees, the Comprehensive Waterfront Plan, Sustainable Stormwater Management Plan, Greener, Greater Buildings Plan* etc. In 2008, Mayor Bloomberg introduced a program called summer streets[81]. It banned motor vehicles on three Saturdays from about 7 miles of streets in Manhattan, including Park Avenue below 72nd Street. It is a new, interesting way to use street, more as a park than as a thoroughfare; and send a powerful message that the tide is turning to pedestrians.

Mayor De Blasio recently has proposed an increase on taxes of vacant land throughout the city. De Blasio's plan calls for a hike in yearly tax rates on vacant land by an average of $15,300, following a five-year phase-in period. These taxes would generate revenue for the city and it can be used for other meaningful purposes like constructing public housing. Estimates shows that the plan would eventually generate around $162 million annually, funding nearly 4,000 units of affordable housing[82]. This would also stir up the recycling of abandoned lots.

Community based organizations plays a significant role in city politics and public space planning. They manage the local neighborhoods. Sometimes they are in partnership with the city, but when alteration plans are made, they represents the opinion of residents.

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[81] Green Metropolis, 189
[82]http://ny.curbed.com/archives/2013/11/24/new_tax_could_force_vacant_lot_owners_to_sell_or_build.php

CONCLUSION: Go Green!

"*We do not inherit the earth from our ancestors; we borrow it from our children.*"

-Native American Proverb

Urban life is often thought of as devoid of the natural, but cities may hold the potential to create true environmental sustainability if managed correctly. A great city should be durable, resilient, and adaptive. Open space should be adjusted accodingly. There is a carrying capacity of natural system on Earth. The capacity is shared by all generations. With human exploitations, the capacity will soon be saturated as there is a limit. After the industrial revolution, the rate of exploitation has drastically increased. Under the influence of Robert Moses, the American urban model of a commuting society dominated by automobiles has been spread throughout the world. However, as people are realizing the importance of environmental protection, the new paradigm for a globalizing world became how to enhance the quality of human life while reaching equilibrium of each aspect on sustainable development. It matters more about creating awareness and understanding of the connections between the everyday lives of urban citizens and their natural world than where the city is physically located, because then people are able work towards the problem and make future cities better for next generations.

New York City is renowned for its towering skyscrapers, bustling streets, flashing digital signs and billboards in Time Square as an international metropolis. At the same time, it is the greenest city in terms of greenhouse gas emissions due to the compact density. When considering the future, parks are crucial for a city's growth and prosperity. High performance park and open space not only provide aesthetic and recreational services, it also act as soft infrastructure that shapes the city, buffers when storm strikes, habitats that fosters biodiversity, and platforms for social gatherings, innovative city movements, and civilization hub. When staring at city maps, there are always blanks —open space to fill in. Adding more parking lots or parks? It is your choice.

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APPENDIX

1) Global Temperature Rise
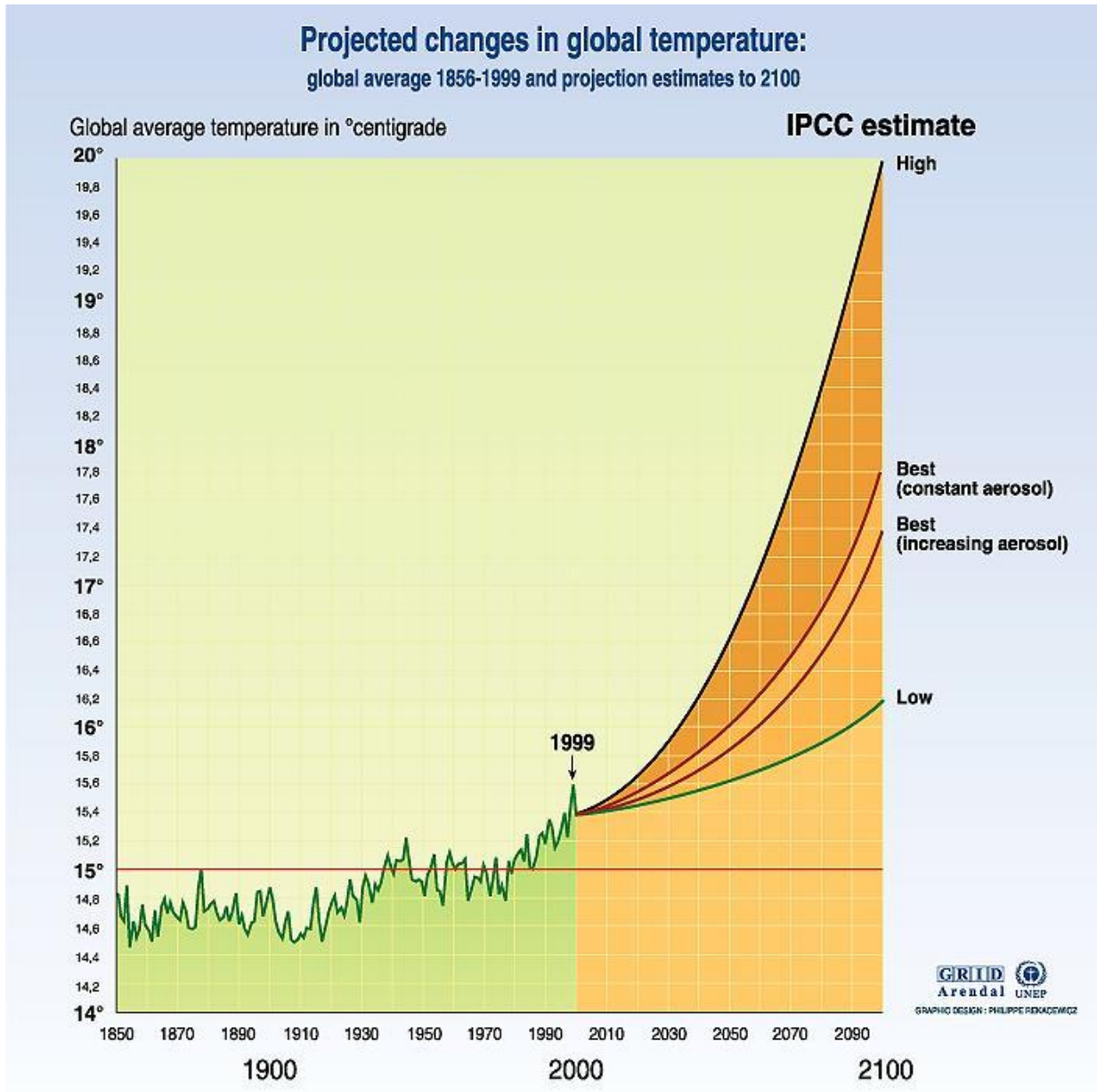
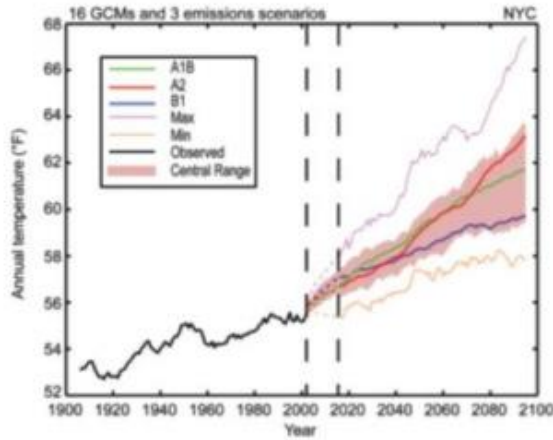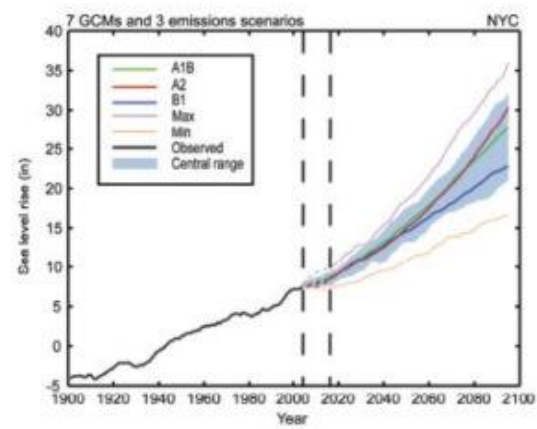(Image: http://www.grida.no/publications/vg/climate/page/3076.aspx)

2) New York City's Projected Future

NYC Projected Mean Annual Temperature

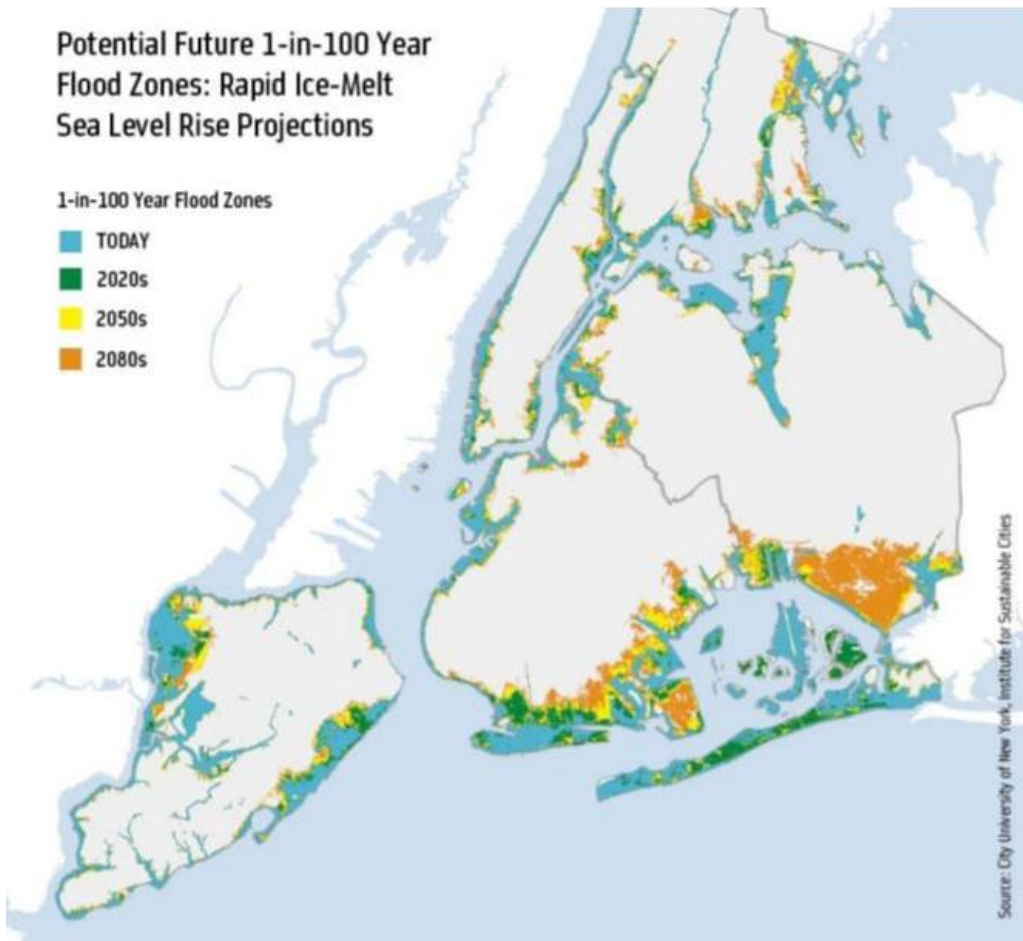**NYC Projected Sea Levels**

Source: NYC Panel on Climate Change

Potential Future 1-in-100 Year Flood Zones: Rapid Ice-Melt Sea Level Rise Projections

1-in-100 Year Flood Zones

TODAY
2020s
2050s
2080s

Source: City University of New York, Institute for Sustainable Cities

3)

Table 1. Selected 17th-century descriptions of Manhattan Island from Dutch, French, and English sources. Translations are reprinted from Jameson (1909). Notes in brackets are provided by the authors. Year = year described.

Description	Year	Source
"When I came on shore, the swarthy natives all stood and sang in their fashion. Their clothing consists of the skins of foxes and other animals, which they dress and make garments from skins of various sorts. Their food is Turkish wheat [maize], which they cook by baking, and is excellent eating…. It is as pleasant a land as one can tread upon, very abundant in all kinds of timber suitable for ship-building, and for making large casks."	1609	Henry Hudson, quoted by De Laet (1625)
"…and hard by it there was a Cliffe, that looked of the colour of a white greene, as though it were either Copper, or Silver myne: and I thinke it to be one of them, by the Trees that grow upon it. For they be all burned, and the other places are greene as grasse, it is on the side of the River that is called Manna-hata."	1609	Juet (1610)
"On this river there is a great traffick in the skins of beavers, otters, foxes, bears, minks, wild cats, and the like. The land is excellent and agreeable full of noble forest trees and grape vines, and nothing is wanting but the labor and industry of man to render it one of the finest and most fruitful lands in that part of the world."	1624	De Laet (1625)
"The island of Manhatas extends two leagues in length along the Mauritse River [Hudson River], from the point where the Fort "New Amsterdam" is building. It is about seven leagues in circumferance, full of trees, and in the middle rocky to the extent of two leagues in circuit. The north side has good land in two places, where two farmers, each with four horses, would have enough to do without much clearing at first. The grass is good in the forest and valleys, but when made into hay is not so nutritious for cattle as here [in Holland], in consequence of its wild state, but it yearly improves by cultivation. On the east side there rises a large level field, of from 70 to 80 morgens of land [140–160 acres], through which runs a very fine fresh stream; so that land can be ploughed without much clearing. It appears to be good…." (p. 104)	1626	De Rasieres (1628?)
"I began to make a plantation, a league and a half or two leagues above the fort [New Amsterdam, the plantation was probably in Harlem], as there was there a fine location, and full thirty-one morgens [62 acres] of maize-land, where there were no trees to remove; and hay-land lying all together, sufficient for two hundred cattle, which is a great commodity there. I went there to live, half on account of the pleasure of it, as it was all situated along the river."	1640	De Vries (1655)
"The first comers found lands fit for use, deserted by the savages, who formerly had fields here. Those who came later have cleared the woods, which are mostly oak. The soil is good. Deer hunting is abundant in the fall. There are some houses built of stone; lime they make of oyster shells, great heaps of which are found there, made formerly by the savages, who subsist in part by that fishery."	1643	Jogues (1646)

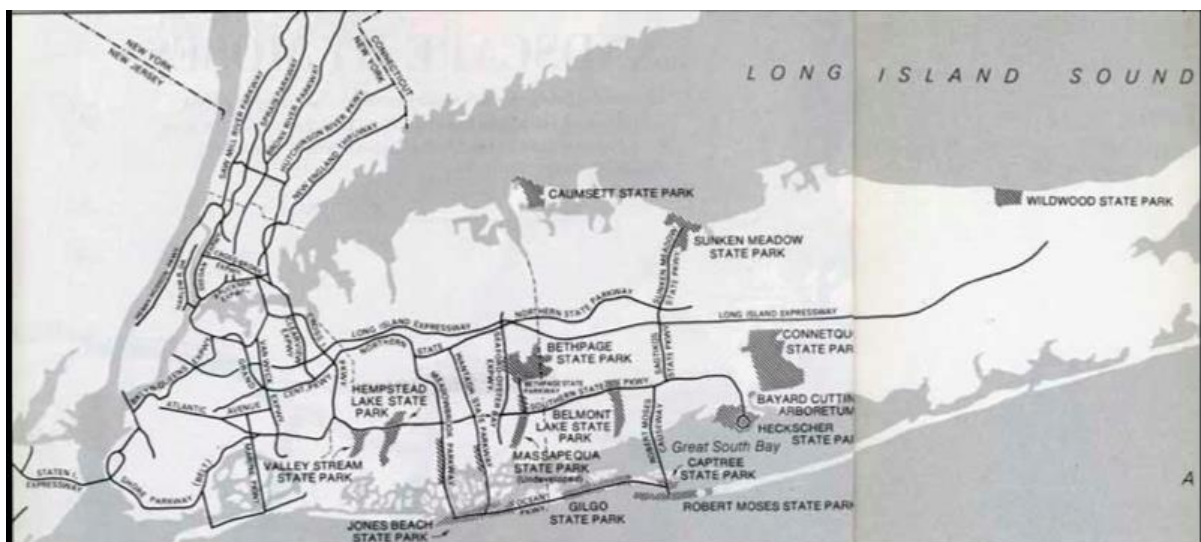(Source: Sanderson, Eric. Mannahatta: An Ecological First Look at the Manhattan. 2007

http://www.esf.edu/efb/gibbs/efb413/NortheasternNaturalist_SandersonBrown2007.pdf)

4) NYC alterations by Robert Moses between 1924-1968
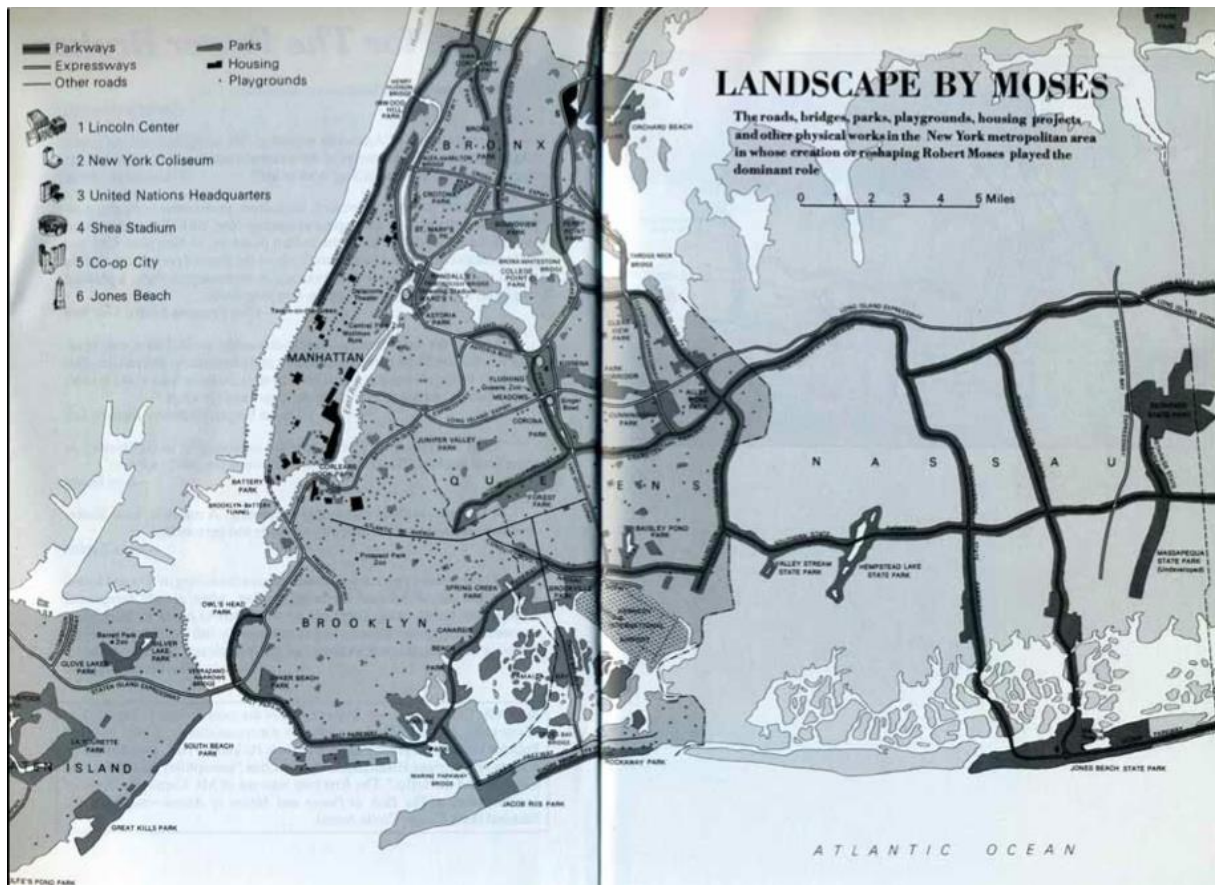
NYC and Long Island Highway system expanded by Robert Moses

(Source: Fischer, Jan "*Models of Total Urbanism: Berlin and New York City*" IES Abroad Berlin Metropolitan Studies. Lecture. 8 April 2013)
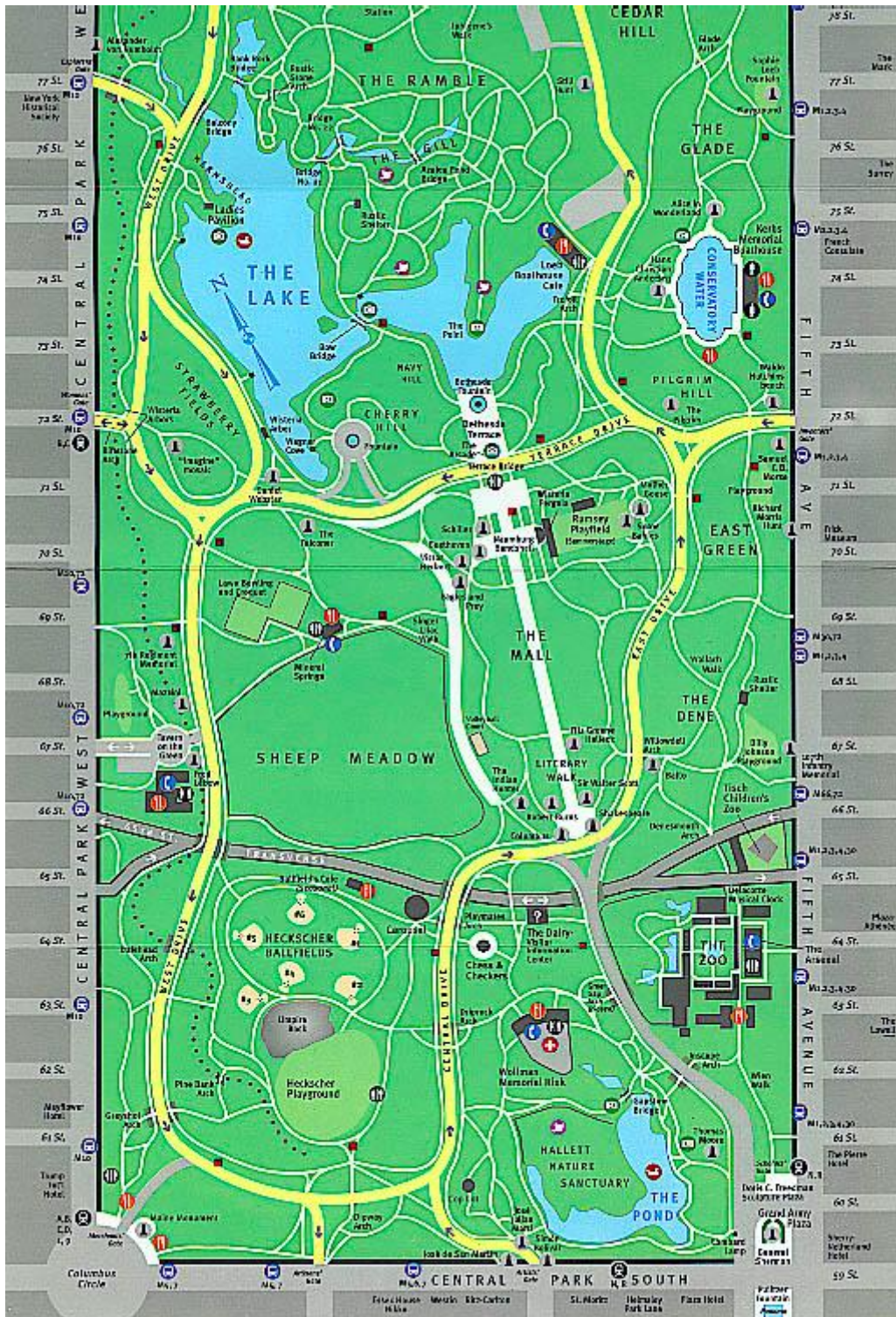
5) Robert Moses's Jones Beach Development with Central Mall and Tower, 1930

(Source: Fischer, Jan "*Models of Total Urbanism: Berlin and New York City*" IES Abroad Berlin
Metropolitan Studies. Lecture. 8 April 2013)

6) Map of Central Park till 78th street, showing the facilities

(Source: Barnes & Noble Visitors' Map to Central Park
http://berensondesign.com/cpmap.html)

7) Garden City and the "Town-Country Magnet"

(Source:
GARDEN CITIES OF
TO-MORROW
http://urbanplanning.lib
rary.cornell.edu/DOCS/h
oward.htm)

8) Paley Park

(Source: pps.org)

9) The Highline Park

(Source: http://www.inhabitat.com/)

10) The Lowline: Before and After

(Source: http://thelowline.org/)

10) PlaNYC 2030: Parks and Public Space
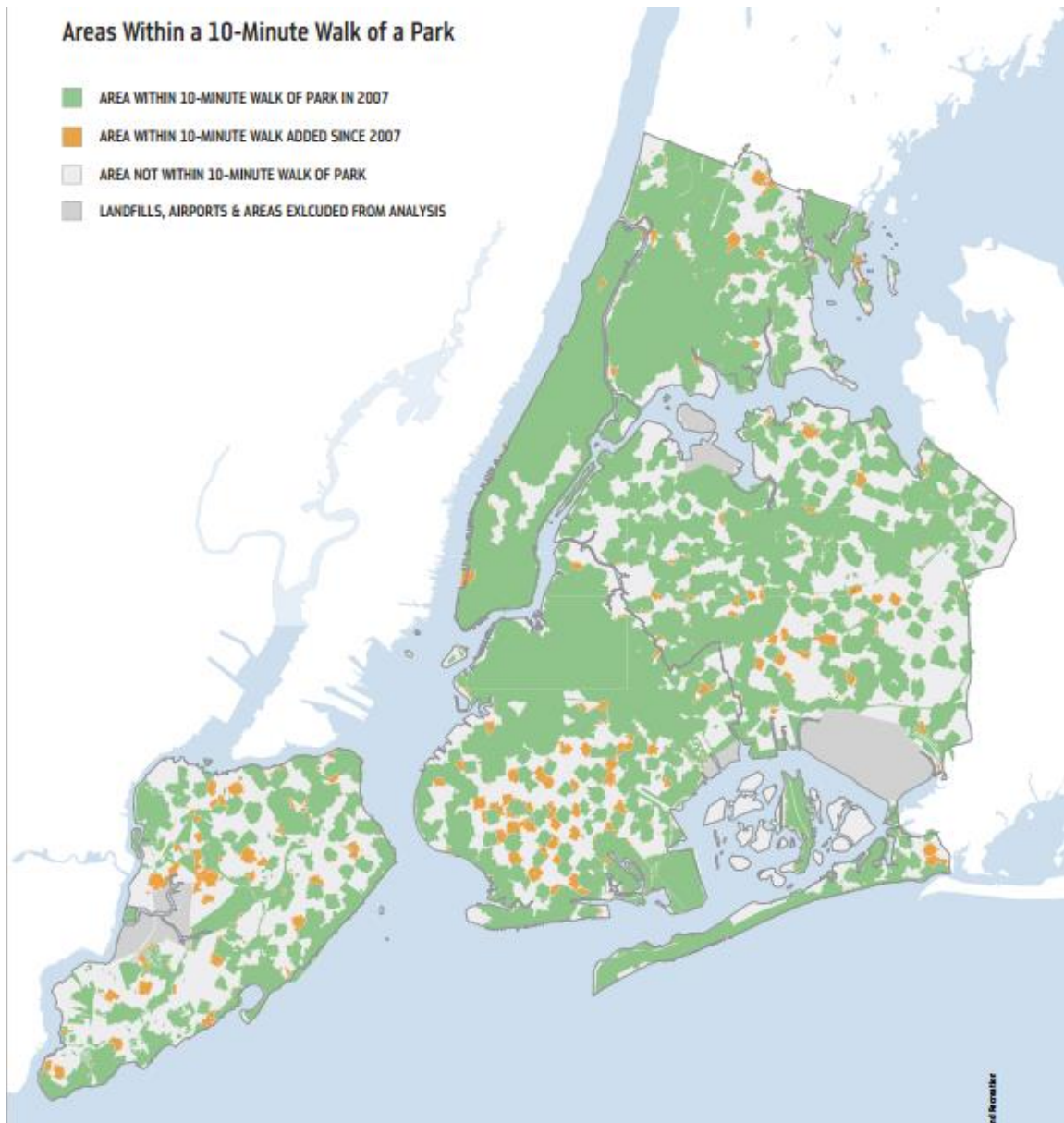
Areas Within a 10-Minute Walk of a Park

- AREA WITHIN 10-MINUTE WALK OF PARK IN 2007
- AREA WITHIN 10-MINUTE WALK ADDED SINCE 2007
- AREA NOT WITHIN 10-MINUTE WALK OF PARK
- LANDFILLS, AIRPORTS & AREAS EXLCUDED FROM ANALYSIS

(Source: PlaNYC 2030

http://www.nyc.gov/html/planyc2030/downloads/pdf/140422_PlaNYCP-Report_FINAL_Web.pdf)

11)
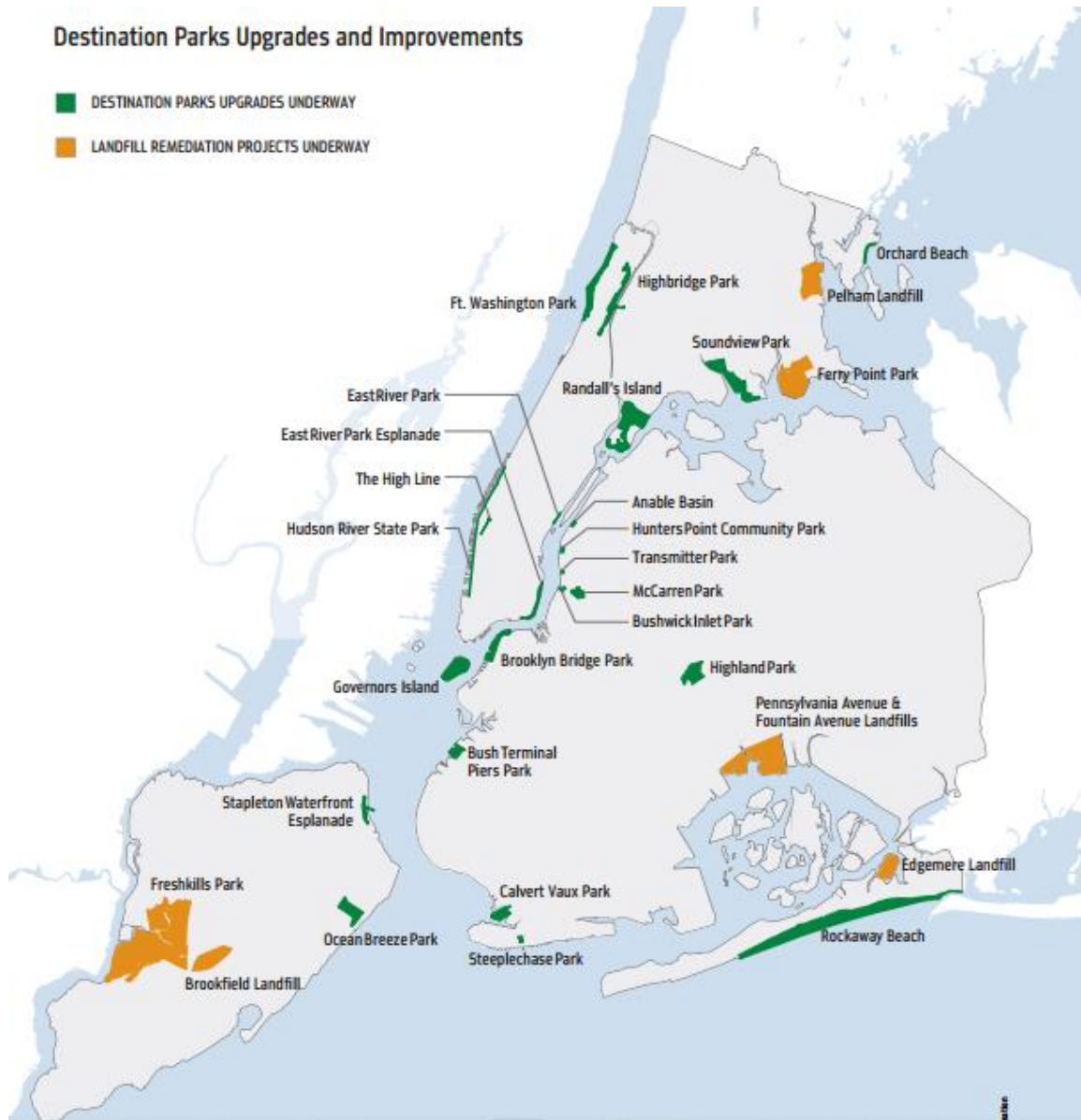
(Source: PlaNYC 2030

http://www.nyc.gov/html/planyc2030/downloads/pdf/140422_PlaNYCP-Report_FINAL_Web.pdf)

12) Future New York City: Green or Apocalypse

(East River Blueway Plan proposed by WXY Studios provides a natural waterfront along the existing and vulnerable FDR in NYC's Lower East Side
Source: Archdaily.com)