Flexible Urbanism

by

Anahita Anandam

M.ARCH
University of Michigan, 2000

SUBMITTED TO THE DEPARTMENT OF ARCHITECTURE IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE IN ARCHITECTURAL STUDIES
AT THE
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SEPTEMBER 2006

© 2006 Anahita Anandam. All rights reserved.

The author hereby grants to MIT permission to reproduce and to distribute publicly paper and electronic copies of this thesis document in whole or in part in any medium now known or hereafter created.

Signature of Author.................................................................................................................. Department of Architecture
August 3rd, 2006

Certified by ................................................................................................................................. Julian Beinart
Professor of Architecture
Thesis Supervisor

Certified by ................................................................................................................................. John P. de Monchaux
Professor of Architecture and Planning
Thesis Supervisor

Approved by ............................................................................................................................... Julian Beinart
Professor of Architecture
Chairman, Committee for Graduate Students
Flexible Urbanism

by

Anahita Anandam

Submitted to the Department of Architecture
on August 3rd, 2006 in Partial Fulfillment of the
Requirements for the Degree of Master of Science in
Architectural Studies

ABSTRACT

This thesis seeks to find a new approach/method towards urbanization in existing low density neighborhoods in major metropolitan cities in the United States. The near South side of the city of Chicago (a city that carries a history as the most modern city in the world in the late nineteenth and early twentieth century) will be taken as a site for development. The site of the Illinois Institute of Technology has an associated history dating back to the nineteenth century as well as an extensive housing development built as a post world war two response to a lack of housing in major metropolitan cities. Today, the area stands deserted, with a few housing tower blocks that remain occupied.

The idea of flexible urbanism that would benefit the Chicago neighborhood can be traced back in history to the eighteenth century, a period during which rationality created a new type of society. Rationality is fundamental to this thesis, taken to its hilt with the idea that extreme rationality could lead to a sense of madness and diversity in options and ways of living in order to organize society today. The idea of extreme rationality can be seen through history with the development of the prisons and asylums in the eighteenth and nineteenth century, and later in the design of the microration, the unit of neighborhood development in the Constructivist period of the Soviet Planning process. During that period the garden city movement grew in the United Kingdom propagating the return of nature in the design of cities. A comparison to the garden city would be another new Town in England: Milton Keynes, a city where land was distinguished as separately zoned areas. These ideas of rationality and rule based zoning systems are fundamental to this thesis, and taken to its extreme to understand the city parametrically, in three dimensions.

Finally, the application of this new approach towards densification shows that this strategy is one that can be used universally to revitalize, reinvigorate, and re-emphasize the use of extreme rationality in order to create vitality in cities, and diversity in use.

Thesis Supervisor: Julian Beinart
Title: Professor of Architecture

Thesis Supervisor: John P. de Monchaux
Title: Professor of Architecture and Planning
Thesis Reader: Yung Ho Chang
Title: Professor of Architecture

Thesis Reader: Arindam Dutta
Title: Associate Professor of Architecture
Acknowledgements

I thank my thesis committee members, Julian Beinart and Yung Ho Chang for providing invaluable guidance in tracing the lineage of modern urban design and planning in history and subsequently its effect on design. I especially want to thank Julian Beinart for providing inspiration through his classes and for the reading material he provided that introduced me to the subject of Urbanism. I thank John de Monchaux for introducing me to the plan of Milton Keynes, which is a New Town designed in the late sixties in the United Kingdom and which forms the premise of this thesis and Arindam Dutta for introducing me to the lineage of modern thought in history and theory since the eighteenth century.

And finally, I thank my family: Parvez Anandam and Sudeshna Sen, and, Victor and Bhickoo Anandam.
# Table of Contents

**Chapter 1: Introduction**  
1.1 Global Cities: A History Appended ................................................................. 6

**Chapter 2: Chicago**  
2.1 A history ........................................................................................................... 9  
2.2 Armour Mission .............................................................................................. 10  
2.3 Mies and the Bauhaus ..................................................................................... 11  
2.4 Neighborhood revival ....................................................................................... 12  
2.5 Crown Hall ....................................................................................................... 12  
2.6 Rem Koolhaas’ new Student Center at IIT ....................................................... 14

**Chapter 3: Russian Constructivism**  
3.1 Introduction ...................................................................................................... 15  
3.2 The Panopticon ............................................................................................... 16  
3.3 English Reformed Prisons .............................................................................. 18  
3.4 Cook County Juvenile Detention Center ......................................................... 20  
3.5 Microraion planning-Soviet Housing ............................................................... 22  
3.6 Jose Luis Sert- 4 projects .................................................................................. 35

**Chapter 4: Team 10 and its anti-rationalist project**  
4.1 Introduction ...................................................................................................... 39  
4.2 Team 10 and the CIAM grid, 1948 .................................................................. 40  
4.3 Urban Infrastructure: Cluster City ................................................................. 43  
4.4 Tel Aviv-Yafo Central Area Project ................................................................. 45  
4.5 Central Beheer corporate office, Apeldoorn, 1968-72 .................................... 48

**Chapter 5: Experiments in England: New Towns and Archigram**  
5.1 The city as organism: Ebenezer Howard’s Garden City ............................... 51  
5.2 Milton Keynes ................................................................................................. 55  
5.3 Commonalities between Milton Keynes and the Garden City ....................... 65  
5.4 Archigram ...................................................................................................... 67

**Chapter 6: Urban Design Methods**  
6.1 Introduction ...................................................................................................... 75  
6.2 Urban Hybridization Project .......................................................................... 76

**Chapter 7: Flexible Urbanism Project**  
7.1 Mixing Horizontal Layers ............................................................................... 78  
7.2 Mixing Vertical Layers ..................................................................................... 81  
7.3 Application of Flexible Urbanism on Chicago’s IIT neighborhood ............... 89

**Chapter 8: Conclusion**  
8.1 Conclusion ...................................................................................................... 94

Bibliography ......................................................................................................... 95
Chapter 1

Introduction

1.1 Global Cities, a History Appended

This thesis finds new ways of understanding the word “flexibility” or adaptability in urban design. The term, adaptability, used by Kevin Lynch in the class “Theory of City Form” at MIT in 1977, can be defined as follows:

Adaptability means the future cost, discounted to the present, of adapting the spatial system to possible new future functions. In the general form, it is an impossible measure, since we have not specified costs to whom, nor what functions, nor when, nor to what level of performance.

This term has ambivalent meanings, which range from manipulability in a spatial system, to reversibility or the cost of returning the site to some previous natural condition, resilience to earthquakes, fires, attacks, etc… or innovativeness, or the ability of a spatial system to generate, test, and facilitate new environmental and behavioral possibilities.

The last meaning, which is innovativeness or the ability of a spatial system to generate new environmental and behavioral possibilities, is what will be surveyed through history in this thesis. The varying degrees of innovativeness, quantified by rational systems of thought, will be utilized to analyze and study the works of Jeremy Bentham, the Russian Constructivists, Ebenezer Howard, Team 10, and Archigram and how they exerted their hegemony on contemporary thought on flexible urban systems. This analysis will lay the historical and theoretical foundations for a current topic of interest on “Global Cities”. The notion of a Global
City cannot be approached without an initial understanding of the physical and virtual networks created in the past. This history will foretell the future of our cities, in a day and age when wireless telecommunication may lead to new social norms. I will use the notion of flexibility as a recurrent tool to understand this new term “global city”, or a global networked city. Kevin Lynch, in his notes on Adaptability, specified various ways of achieving it, for example by excess capacity, or a loose fit excess, a network of communication and transportation, by reducing the interference between parts or by of the elements likely to change from those unlikely to change, the use of elements that are usable for diverse functions such as rectangular blocks, the use of standard dimensional frameworks or modular units or finally the conservation of re-usable resources.

Every forthcoming chapter in this thesis will be based on Kevin Lynch’s ways of achieving adaptability, relating to it through various means such as networked communications and transportation as in the case of Team 10 and Archigram, or the use of standard parts as in the work of the Russian Constructivists, or finally in the conservation of resources as in the case of the New Towns of England.

The second and final chapters of this thesis will focus on the application of this system on a specific site, which is the neighborhood of the Illinois Institute of Technology in Chicago, Illinois, with the Crown Hall, designed by Mies Van Der Rohe as its focal point. The second chapter will introduce the reader to the site and its specificities, while the last will explore the possibilities of application of this flexible urban system on the site.

All the chapters in between the second and the last will provide the historical and theoretical knowledge that will inform the notion of the “global city”, or the physical and social interconnectivities that can exist in contemporary cities, societies and culture. The chapters will attempt to trace the historical lineage of global cities, define its meaning, and provide an overview of a possible theoretical framework that can be adopted by Global Cities, in response to the conference on Global Cities in Liverpool in June 2006.

If the notion of flexibility can be a parameter used in the understanding of Global cities, its lineage goes back to the Enlightenment, a period where rationality was taking to its hilt. With the idea that the parameter of flexibility has no definite fixed variable, the idea of extreme rigidity becoming a fluid and flexible design parameter can be seen in the work of Jeremy Bentham and the Russian Constructivists in a post second world war period.
In the Garden city movement in England, the idea of flexibility is one that is manipulated into an environmental ethics, where the idea of the sustainable land uses becomes an element of the networked city. Ideas during this period were still raw and restricted, but were later radically transformed in the work of Team 10 and Archigram, whose work embody the notion of flexibility and physical and social networks in cities to a maximum. It is primarily in their work that one can base a current thinking and a historical and theoretical basis for the notion of a Global City.
Chapter 2

Chicago

2.1 A history.

Chicago is a city where countless wild onions grew¹, and it got its name “Chi-ca-gou” as the Indian name for the “Place for wild onions”. The history of Chicago grew with the advent of two French people, Jacques Marquette and Louis Jolliet, who were traders, discoverers and seekers of copper.² Fort Dearborn built in 1803 denotes the beginning of the growth of the city of Chicago as it stood on the banks of the river and was enclosed and protected by a fenced gateway. During the 1930’s, Chicago transformed itself from a village to a city³.

In the areas adjoining the IIT campus, there was a lack of cultural resources in the community, such as social agencies, schools, children’s playgrounds, daycare centers, etc... Instead there was a large expansion of businesses, commerce and industry. Large warehouse buildings were designed and built while there were no centers of activity. The warehouses designed were ornamental with a base for storefront exhibit, a couple of floors of high ceiling storage spaces, topped with a large penthouse floor. At the site of the current Illinois Institute of Technology, the Armour Mission was founded by the Armour family to provide service to the youth of the neighborhood.

² Ibid, page 2
³ Ibid, page 11
2.2 Armour Mission.

The Armour mission embarked on December 5, 1886, to provide dedicated service to the young people of the neighborhood in a brick stone building. Classes were conducted in clay-modelling, woodworking and instructions in millinery, dress making and cooking. The Armour mission turned into the Armour Institute 20 years later.
Conversion of warehouse buildings into residential buildings.

The Chicago Convention Center

2.3 Mies and the Bauhaus.

In 1936, with the resignation of the director of the department of Architecture at the Armour Institute, a position was left open for a director, and recommendations were finally made to Mies Van Der Rohe. Mies had established the Bauhaus in 1919, a school for the arts, social issues and technology. The school moved from Weimar to Dessau in
1925, and in 1932 it was ordered to be closed. Mies closed the Bauhaus on July 20, 1933.

2.4 Neighborhood Revival.

The seven acre Armour campus needed to be expanded and new physical facilities needed to be added. This proved to be two decades of extensive expansion in the forties and fifties, a time of phenomenal growth. At the time after the First World War, the neighborhood was blighted. The area which was developed in the 1880’s had lost a lot of its residents as wealthier people chose to live further from the city with the advent of the car. Hence, those homes were taken over by moderate income groups of people. Overcrowding and deterioration continued. When New Orleans closed down Storyville in the late twenties, jazz came in to Chicago and found its home on State Street between 31st and 35th street. The jazz age glamour had pervaded the South Side. However, by the late thirties, there was a decline in the physical character of the neighborhood.

2.5 IIT Crown Hall.

The Armour Institute and Lewis Institute united to form the Illinois Institute of Technology. The decision for IIT to remain at its current location helped in preventing neighborhood blight. The resultant of their decision to remain resulted in the development of the South Side Planning Board. Their goal was to eradicate about 700 acres of slums, and buildings were coming down at a high rate. Before Mies joined the staff of IIT, Laszlo Moholy-Nagy came to Chicago and headed the department of design, which is now part of the school of Architecture and City and Regional Planning. After WWII, the campus expanded at almost two buildings per year for 30 years. IIT Crown Hall, which is the school for Architecture and City and Regional Planning, was dedicated in 1956, at a time when Mies was heading the department after the closing of the Bauhaus in Dessau. As Colin Rowe said: Crown hall is a symmetrical and probably mathematically regulated volume.4 Crown hall has no central area where one can view the building, and it is rather viewed from an angle. The idealization of the building is its relationship between façade and column, which was dealt with extreme precision.

---

Crown Hall's entrance is raised on a platform of two feet.

Crown Hall, view from the side.
2.6 Rem Koolhaas’ new Student Center at IIT.

The Mies’ master plan had suggested to build a façade on State Street, and Rem Koolhaas kept the essence of that plan in his design for IIT’s new Student Center. Rem Koolhaas tried to revitalize an area that had lost its vitality, and had half the population that it had during the 1970’s. The building, built in 2003 re-urbanizes the campus by ensuring that it occupied the least amount of space possible. The student flows in and out of the campus have been a consideration for design, and reverses the rectilinearities created by Mies’ campus design.

Student Center showing “the Tube”, IIT Campus.
Chapter 3

Russian Constructivism

3.1 Introduction.

This chapter traces the connections between geometry and design, and the use of extreme rationality to produce an art form. I will describe the relationship between Jeremy Bentham’s panopticon and the Soviet Planning Process which is finally reflected in the work of Sert who was a strong proponent of art, but who proclaimed to reject rule based design although his work continuously revealed the contrary.

The post world war two Soviet Planning process began with Nikita Khrushchev’s speech of December 7th, 1954 at a conference for architects and builders. In the speech, he laid out a manifesto for modernism that would revolutionize the planning and design process of housing in the Soviet Union, and a few years later in other Eastern Socialist states of Europe, and then finally in the United States. In his speech Khrushchev differentiated between beauty and the superfluous in architecture, and promulgated designs that eliminated useless things. Designs for housing were now to be based on a kit of parts as there was an obsessive search for an ideal rational building within an ideal rational town. A new vocabulary of design based on extreme rationality with a lack of flexibility and aesthetics had emerged, and began to transform the landscape of Socialist states.

The use of geometry as a tool to rigidly structure and control the social and physical movements of people is seen through this planning process. Various shapes and patterns of building types were used to merge planning principles with construction, thus
eliminating the entire process of design in between. The planning of Soviet housing can be paralleled to the Kantian principles of rejecting purpose in beauty or the superfluous.

Strict geometric rules used in the design of Jeremy Bentham's Panopticon and subsequently in the construction of prisons and juvenile detention centers to date can be compared to the design of the microraion. In both cases, behavior, correction and equality of all members living within the prison or the housing structure were laid out with strict mathematical rules that regulated the architecture and urban planning. In the case of the prison, the rules were distances between cells and bathrooms, or cells and social television spaces, while in the microraions, rules were based on an urban scale. In both cases, aesthetics and superfluous elements were eliminated from the designs, and the bland and monotonous exterior facades were used as a means to "correct" society's behavior. However, failures to improve behavior can be seen through a high rate of recidivism in the prisons and in the juvenile detention centers and a failure of the Communist regime in the Soviet Union.

3.2 The Panopticon.

Jeremy Bentham’s is known for being a leader in a school of thought known as utilitarianism. He devised the Panopticon or the Inspection House in 1787, which is now associated with prison architecture, but Bentham had thought it to be for schools, hospitals, orphanages, nurseries and institutions for the blind. The idea had originated from a structure that was designed by his brother Samuel, who was reorganizing the estates in Kritchev, Russia. Jeremy had joined his brother and it was from there that he laid out the design of the Panopticon.

The Panopticon was designed as a cylindrical sheath lined with 4 to 6 stories of cells or rooms. The cells faced a covered shaft of space within which there was a smaller kiosk. The occupants of the cells are backlit, separated from one another by walls (lighting came in from the windows in the outer cylinder). In order to counteract the light emanating from behind, Bentham designed a series of Venetian blinds that would prevent the prisoner from seeing the observer, as they were subjected to scrutiny from the observer in the tower. The project below is that of an improved 1791 prison drawn by
Willey Reveley. It contained 460 prisoners, in a rotunda of 120 feet diameter. The internal fixtures of the cell were made of iron.

**Well serviced cells**
Mechanical systems were installed to service the cells, in order to avoid numerous servants frequenting the prison. The cell included a water closet with a cast iron seat, and the effluents of which were to be discharged into a closed sewer. For drinking and washing, cold water was to be pumped manually. The beds within each cell were made to fold as the space within them was very tight. The heating arrangements made use of convection currents and were fully integrated with ventilation. The air entered the building through an inlet duct, and passed through a heated chamber. A ring of stacks were located in the circumference and passed hot air through the building. The heated air was even to be re-circulated for economy and this principle was a novelty in the late eighteenth century.

*Jeremy Bentham’s panopticon, drawn by Willey Reveley.*

---

3.3 English Reformed Prisons

The English prisons were reformed between 1800 and 1832 as there was a continuous increase in the number of prisoners and the capacity of the prisons were getting maximized. In the same period the average prison population doubled from 7,000 to 14,000.\(^6\) The early nineteenth century prisons were organs of a persistent ideology; their design was less a tentative search for the points of contact between architecture, conduct and morality.\(^7\) By 1833, the prisons built were entirely transformed into new types of prisons, and all the old low rise buildings were brought down.

There were three types of prisons constructed during that time based on design (geometry), discipline, and society. The three types are as follows:

1. **Radial prison**

   ![Radial prison plan, drawn by George Thomas Bullar](image)

---


\(^7\) Ibid, page 237.
In this type of prison, prisoners were put into groups and the groups were separated from each other. The radial wings were attached to a central observer’s rotunda.

2. **Polygonal prison without wings:**

![Polygonal Prison Diagram](image)

Fisherton Anger County Gaol, Richard Ingleman, 1817, ground plan.

The polygonal prisons separated the observer from the prison by a large distance, and proved to be an ineffective type of prison. A series of courtyard separated the observer from the prisons and this prison proved difficult to ventilate.
Polygonal prison with wings:

Wakefield House of corrections, architect unknown, 1821.

In this case, the observer was allowed privacy when entering and exiting the prisons, as there were a series of workrooms that separated the observer from the prison, although the distance remained the same in this case. The prisons were low in height, and this type of prison was an amelioration of the polygonal plan without wings.

3.4 Cook County Juvenile Detention Center

The Juvenile Temporary Detention center provides temporary secure housing for youth from the ages of ten through sixteen years, who are awaiting adjudication of their cases by the Juvenile Division of the Cook Country court. The Juvenile temporary detention’s goal is to provide the children with a safe and secure environment, although they are incarcerated in cells. The strict rules used in prisons are documented through this project, and interrelationships between the location of the supervisor’s desk and cells, corridors and cells, bathrooms and cells are elucidated. (photographs of the interior of prisons are not permitted to be taken).
Thoughts on correction have been directly transformed into the layout of the cells and their relationships to one another. The juveniles with the highest crime record or those who have been incarcerated several times are located in cells closest to the shower stalls which are positioned at the extremity of the group of cells. Supervisors’ desks are located closest to the entry/exit, and in a position for surveillance. Within the cells the positioning of the furniture limits variety and diversity in layout as they are anchored to the floor. The furniture which includes a bed and a desk are made out of molded plastic with rounded corners. Color in furniture is the only means of differentiation between cells that have been used. The amount of day-lighting within the cells is limited, while all the openings face the interior courtyard alone. Thoughts between the lack of daylight and the methods of correction are interlaced although the results here again do not seem beneficial in the long term. Walls are made of two layers of concrete block, and fenestration is located above the height of the juvenile, to ensure filtered light into the cells.

**Results**

This form of incarceration has been proven to be ineffective, with a high rate of recidivism of 30 percent. Some juveniles return to the juvenile detention center up to three times, till they are transferred to the adult prison. In this case, punishment as a means to correct society’s behavior has been proven to be highly ineffective. However in other countries techniques/strategy that have proven to be far more effective are incarcerating juvenile
delinquents/children in dorms. Inmates, who are referred to as “clients” or “pupils” live in dormitory-style rooms, and address guards by their first names and get generous home leaves. The belief system underlying the dormitory style prisons is one where the loss of freedom in itself is a punishment, and that the punishment needs to be made as nice as possible. As a result, Finland imprisons the smallest fraction of its population in comparison to any European country, (52 prisoners per 100,000 people). About three decades ago, Finland had a penal system model that was similar to that of the United States, but they decided to rethink the model.

Pre-detention, Detention, Post Detention:
The conditions that lead to the incarceration of juveniles are usually high risk and high crime environment. Socio-economic conditions of these neighborhoods are poor while the law enforcement is very high. During detention the juvenile is placed in the juvenile detention center while he/she awaits trial at the court. The juvenile detention center has primary and secondary school systems that are usually located in the basement of the center, and groups of cells arranged around internal courtyards for high security.

3.4 Microraion planning- Soviet housing.

Housing “microraiions”
The microraion had been associated with high rise housing blocks. They were mass housing schemes that were deployed in the outskirts of cities in Russia and Eastern Europe, and as low income housing towers in many cities such as New York, St Louis, Chicago and Boston. They were designed as a post war strategy to house the masses, keeping them off the streets and contained in geometric, standardized forms. The microraion designed in Russia, unlike its counterpart in the United States was designed for the everyday person, and is even to this date maintained in a condition that is superior to the American low income housing. The belief for a utopian perfection, where a utopian life was reflected as a manifestation of a perfect building and urban plan is reflected in the design of the Krushchevka.
A complex of three planned microrions.

Microrion and a group of 3 microrions which form a residential complex.

Housing now turned into rigid geometric form, and was grouped together in "microrions" (small neighborhoods) with central locations for schools or community centers that formed the heart of the neighborhoods. Strict geometric rules, akin to the design of Jeremy Bentham's Panopticon were used in the design of the microrion neighborhoods such as distances between different programmatic elements, size of apartments and fenestrations, etc.
Diagram shows how distance to services affects the design of the microraión.

**Labor productivity**

Increasing the productivity of labor that would create a supply of qualified builders was one of the principle goals of the Constructivist period. One has to agree with the statement as it is absolutely necessary to enhance the productivity of the construction worker, if one is striving to create a society with more even division of income between members.

The Soviet society was based on the creation of a society with an even division of income between its members. In order to increase the productivity of the labor, diversity in tasks were removed and rationality and efficiency became the method of work used in the construction industry.
Mapping of roads, landscape and building footprint in a typical microraion. Drawing by Author.
The diagram shows the various layers of design which are separated from one another for efficiency in construction. This demonstrates that design transitioned from the planning process directly into construction with the elimination of the architectural design process in between. The layers, seen as individual such as landscape, roads, buildings do not intersect to produce a cohesive whole.

8 Microraiion forming a neighborhood unit, with a central civic center. Drawing by Author.

Microraiion, Kyiv, Ukraine, East Bank.
Each microraiion, (which formed the unit of a conglomeration of housing units, in combination with schools, stores, recreation areas, and outdoor sports facilities) was designed with the above planning rules which were used to guide the design. A group of microraiions, along with a common Civic Space at the center forms a neighborhood unit.
Each neighborhood unit has been delineated in the map, with the civic cores that are located at the center.

Plan shows network of paths. Drawing by Author.

The plan shows the network of paths that connected the individual buildings together. The paths are the only means of internal transportation within each neighborhood unit, and there are no paved roads. Parking is situated randomly on the side of the paths with no parking structures.
The plan shows the location of the schools which are at a distance of 500 meters at the maximum from any individual residential buildings. Schools were divided into kindergarten, primary and secondary schools, with well delineated architectural forms.

Building Types:
There were rules for general sameness in the building industry, when an efficient building industry is hinged on standardization. The goal was to have as few building types as possible and to compile them as catalogue of their parts. The catalogue of parts is then used as a cookbook, and design components are relegated to interchangeable parts. The
production of art in this case is negligible, and rules are created for the interchangeability of the building parts.

The ideal city and its skyline

“We are not against Beauty, but against useless things”. This was the beginning of Khrushchev’s criticism of the chief architect of the city of Moscow, who drew attention to the adornments on the spires of buildings. Nostalgia and adornments were removed from the buildings as they were laid bare. The ideal city life was reflected in the design of the skyline, and the period of Constructivism followed a style that mandated Soviet architecture and planning to be transformed into a process of rules and regulations.

Decoration on tall tower blocks:

Balconies form a design element in the otherwise monotonous tower blocks.
The monument

The re-introduction of new monuments on the East bank of Kyiv compliment the ones on the other side of the river. New Monuments were designed with facilities including parking. The monument formed an intrinsic part of the history of Kyiv dating back to the thirteenth century and continues to play an important role in the cultural development of the city.

The monument is seen at the end of the image. Construction of new housing can also be seen.

Industrial Districts

The industrial districts that are located closer to towns have been designed with a set of rules that were similar to the rules set in the Garden City, with the location of the industrial belt at its utmost extremity. Depending on how harmful the industrial belt is, its location is either separated by a roadway from the main city, or located at its periphery such as in the case of the Garden City, or located in the centre of the city (coinciding with the core of the Garden City). This method of zoning allowed for the development of the environment health zone. All industries were classified as either II, III, IV degree of harmfulness. The location of the industrial belt is parallel to the residential area, thus allowing for expansion in a sideways direction (similar to the diagram of the Garden City).

---

8 Principles of Town Planning in the Soviet Union, Central Research and Design Institute of Town Planning, Moscow 1967.
1. Industrial district with extensive environmental pollution, 2. Industrial district with minor environmental pollution 3. Industrial enterprise with no environmental pollution.

Industrial areas were designed with minimum standards for functioning. Comparison with possible rational uses of the site was continuously developed. Graphs were made to study the interdependence of industrial enterprises (physical development), with the growth of its operational personnel (social development). Cooperation of enterprises were fostered to have more efficient use of the site area, and designs were based on areas, lengths of roadways, lengths of railways, and number of factories buildings depending on whether the cooperation between enterprises were successful.
Industrial area utilization balance A. Present use of the territory, B possible rational use of the territory.

The idea of future expansion (see diagram above) was integral to the design and layout of factories. Some of these ideas were new to town planning, and were based solely on the use of rationality as a method and mode of planning. Methods of expansion of industries were either sideways, or in front of the industry, while taking into account adjoining industries. Non harmful industrial buildings were sometimes situated near residential buildings and had external appearances that were close to those of public buildings. In most Soviet planned towns, the design of the industrial area was usually located adjacent to a residential area, to ensure that travel time did not exceed 30 minutes. Efficiency and speed of travel, and adjacencies to services were the guiding factors in neighborhood designs.

**Town centers**

The town centers were planned as civic centers that included administrative offices, post and telegraph offices, cinemas, educational buildings, serving each microraion, but separated from it.
In a particular case, which is at the Novosibirsk Scientific Town, there were administrative and other public offices, a palace of culture, a shopping center and a hotel included in the civic centers adjoining the microraiion. The civic center also included a University campus that was adjoining the stores, hotels, and shopping centers.

Scheme for civic center, showing administrative buildings, commercial enterprises, cultural and educational buildings, hotel and stadium.
Town center of Novosibirsk Scientific Town that included administrative and other public offices, a palace of culture, a shopping center and a hotel. Included in the center are a University and a Palace of Science of Engineering.

This leads to the introduction of the work of Jose Luis Sert, whose interest was in designing civic centers and modernist housing for people, primarily in Spain, and later in the United States, where he was the Dean of the Graduate School of Design at Harvard University. His designs were based on a combination of principles of art, and of rationality in planning and architecture. In the following pages, I have redrawn 4 projects, to demonstrate the bridge created between art, rationality, urban design and architecture. His work has influenced the urban design method on Flexible Urbanism.
3.4 Jose Luis Sert - 4 projects.

Peabody Terrace: Harvard University.
This project is compared with the microraiion neighborhoods in the Soviet Union. In Sert’s work, one can trace the principles of rules, and delineation of individual layers of housing, parking, paths, and green space in the master plan of his projects, along with consideration for the human scale in projects.

Peabody Terrace: Harvard University. Drawing by Author.
New York Housing Project
The New York Housing project was projected to be a non-rational project, with only a few rational aspirations such as separating pedestrians from cars, but in reality, was highly rational, and repetitive. The housing plans were repetitive, and the external features such as the continuous bay windows were artistic and yet highly geometrical and equally spaced.

New York Housing Project. Drawing by Author.
Boston University
The Campus of Boston University had to be designed with multiple facilities, such as a Student Union, a law library, the law department. They were designed as a combination of quadrangles, with a high slab and low-slab towers which formed the rules of the complex. (rules and art form were generated together in this case).
Bogota
The master plan for Bogota was developed as an addition to the existing plan, which was founded in 1539. Town Planning Associates developed this plan along with Le Corbusier. The master plan takes the Pilot plan designed by Le Corbusier as its point of departure.

A classified Road System: The roads were divided into several types, V1, V larger regional roads, V2 the main traffic ways within the city, V3 linking the V1 and V2 roads, V4 the local main streets, V5 branch off V4, V6 local service streets, and V7 are park strips.

A network of parks: Main parks are linked with the V7 green strips forming a continuous network. These parks are of many different sizes, characters and shapes. Some follow the directions of small streams. The core of the city: The main core of the city, planned as an extension of the existing one, is divided into three areas or subcenters:

1. Government and religious center
2. The commercial and business sectors
3. The cultural and entertainment centers.

Bogota. Drawing by Author.
Chapter 4

Team 10, and its “anti-rationalist project”

4.1 Introduction.

Team 10 grew out of a response against the rational thinking of modernist architects and urban planners such as Le Corbusier, Gropius, Mies, Giedion, etc… as they based their thinking on the enhancement of individuality within a collective society, with more emphasis on the enhancement of individual relationships to life so that men and women could define space as their personal opinion to life.

The reason behind the study of the work of Team 10, as they separated from CIAM in the last two conferences, lies in the notion that the development of their ideas were based on flexibility and contextualism in urban design, and the need for architects and urban designers to meet society’s plural demands. If society is believed to have no form, the quest for urban designers as they saw it would be to build the counter form. Team 10’s notion of flexible designs grew from the tenets of Modern Architecture and Urbanism, and the proliferation of the industrialization of buildings. The need to multiply and exponentially expand the boundaries of projects was an important design focus in the late modernist projects, and the notion of flexibility in design can be seen as a reintroduction of a function of play of volumes as a part of social life. Flexibility grew out of systems of mobility, variability and elasticity in the organization of town planning principles. Mobility is related to the intensity of use of a region, of which the process of increasing and decreasing the uses could in turn increase or decrease the possibilities of communication and movement. Mobility and grouping of densities are both important parameters of the flexible urban project, with the idea that a community can be formed around well defined densities. The liberal
aspect of projects can be seen as an extension of flexible networks, with the activities of flow, speed, stopping, starting as a manifestation of human occupation, leading to an “aesthetic of change”. This chapter will try to document this “aesthetic of change”, through the writings and the projects of the members of Team 10 as a reaction against CIAM.

For an attempt at a history of Team 10, the core group of Team 10, which included Jaap Bakema, Georges Candilis, Giancarlo De Carlo, Aldo van Eyck, Alison and Peter Smithson and Shadrach Woods, instigated the changes in CIAM (a group formed and dominated by Le Corbusier and Sigfried Giedion in 1928). After the eight congress of CIAM in Hoddesdon, the group which was set up by younger architects worked on bringing down CIAM, which finally began to falter at the tenth congress in Otterlo in 1959. Team 10 sprang as a younger group of modern architects, who between the period of 1953 and 1981 represented a core group of participants interested in writing and setting the rules for design for a late modernist project. Team 10’s projects were utopian in nature, as they were in search for a Utopia for the present.

Alison and Peter Smithson, ideogram of a net of human relations, a constellation with different values of different parts in an immensely complicated web crossing and recrossing.

4.2 Team 10 and the CIAM grid, 1948:

The CIAM grid was designed as a response to the problems faced by modern society in urbanism. The grid was conceived as an urban planning tool for analysis, synthesis, presentation and interpretation which offered a double ended framework for thought. The framework forms an

The CIAM Grid appeared as a rigorous method for exploring the vast field of questions facing urbanism and freely addressing those by setting up a work plan that could address the plurality of questions, and creating a framework to handle the various parameters used to define the city.

Various projects fitted into the grid, and one such example is Team 10’s idea of the stem, initiated by Candilis, Josic and Woods. In their project, they rethought the idea of the street, liberating it from its traditional urban characteristics, and approaching it from two angles: one, as a social condenser and two, as a figure that structures the urban form. According to Candilis, the work of CIAM and the Athens Charter destroyed the idea of a street by replacing it by passages and routes. But the idea of the street remains a primordial element in the design of cities. Candilis wanted to rediscover the idea of the street as a linear city centre street which formed the basis of a city plan. He first used the idea of the stem in a competition for the town of Caen-Herouville, in France, in 1961, and shortly thereafter it was applied in a more diversified way in the plan of Bilbao, in Spain. The structure of the stem included all the elements of commercial, cultural, educational, and leisure activities, as well as roads, walkways and services. In the case of Bilbao, the idea of the stem shows a sound understanding of the relation between the size of the residential zone and the nature of the collective functions and infrastructure. Topographical characteristics of the site decide the course or contour of the site, as in the case of Bilbao where the stem takes the form of an irregular figure that develops at the highest points of the valley. Public functions which include shops, theaters, offices, are matched in character and numbers to the size of the residential area at any point in time, and are planned in phases. The result is an expandable stem for pedestrians, which at the same time forms both the social and physical infrastructure of the new housing area, as the buildings erected along the stem introduce the public facilities needed by the residential areas. Simultaneously, the intervals at which public functions are spaced along the stem determine the rhythm and the structure of further urban development. Fourteen storey apartment blocks fan out from this intervening space over the
whole site. The only problem with this expansion process is the number of parking places that can be reached from the ring road that skirts the perimeter of the site. However, between the pedestrian traffic system (the stem) and the vehicle system (the ring road and parking places), the new town can develop in freedom. In this example, the flexibility of the system lies in the multiple expansions of the stem, and the ability for the ring road to reach into each one of the housing tower blocks. However, the downfall of this system is reflected in the bifurcation of pedestrian and vehicular traffic.

Bilbao, view of the model delineating traffic patterns.

Bilbao, building plan showing the idea of the "stem".
4.3 Urban Infrastructure, Cluster City

Mobility is the key both socially and organizationally to town planning, as roads create social divisions due to their largeness. Laying down a road is an important matter as it changes the structure of a community. In the Cluster city, the roads and communication systems were the only urban infrastructure that were laid down as a fixed thing, and unlike most of the English New Towns, flexibility was a important parameter of the design process. The process of recreating density patterns and location of functions were linked with mobility, and the idea of using a means of communication as a basis for city design. The notion of the “aesthetic of change” is one that relates to the control of physical communications, by throwing out traditional aesthetic values which were mostly concerned with fixed relationships. The idea of the “aesthetic of change” also rejected the Carthesian aesthetics because of its inability to relate to the culture of then current times.

With a few fixed programmatic elements, the transient, which includes housing, drug stores, advertising, shops and finally people and of course people are based on a short term cycle for renewal. The long term cycles would include certain historical buildings and a road system (cycle up to 75 years). The road system is therefore seen as a fix that connects, and this makes it different from the historical fixes.

The non-building environment which includes posters, sky signs and shop windows are the most transient. The establishment for an aesthetic of change is in fact as important as maintaining the security of the road system. Thus the “aesthetic of change” can provide a feeling of stability and security because of our ability to recognize the pattern of related cycles.
Traffic patterns by Kahn. The architect can control systems of physical communication and offer new concepts.

### 4.4 Tel Aviv- Yafo Central Area Project
Van den Broek and Bakema.

In this project, the idea of flexibility is seen through the period of investment that the built component has. Buildings with long periods of investment form the backbone building of the project, while the smaller buildings, such as the prestige rooms, convention rooms in the project can be inserted into the foot of the long term investment buildings. These can be changed after a short period of investment. This project, just like most of the projects of Team 10 depicts an actual formal transformation of the idea of flexibility. This method is a proposed direct transformation of the idea of flexibility into a built form limiting the actual random movements of pedestrians and vehicular traffic.
The brief for the project stated that the aim was to produce a visual coherence between a permanent core, and an ever-increasing scale of administration and traffic, and harmonizing the relationship between the two of them. The traffic movement in this project is seen as a fix, and so is the core, which consists of non replicable programs such as theaters, town hall, convention centers, etc... The current site conditions for the project necessitate two roads to be built, one situated along the sea (as the project is adjacent to water), and the other along the land lying behind the coast. The physical intersection of these two road systems is an important, relating to the connection between land and water, and forming the core of the project. The backbone building, which is a wall like building that forms the core of the project lies at the intersection of the two road systems.

**City Gate buildings:** In the south and north east, there are curved buildings that are raised on levels to define points of intersection of road systems. These city gates are points of choice and signs of reverence for movement, change and permanency.9

---

Site Plan.

View of Bakema and Van den Broek's Tel Aviv Project 1.
This project is a part of Dutch Structuralism, which is about making open-ended building structures by the repeated use of basic elements. All the elements themselves, and the way they are linked, are conceived to facilitate multiple uses, and future growth and change. Hertzberger offered the users of the building a basic structure which they can appropriate and adapt to the needs of everyday practices such as living, working, education, etc… The Centraal Beheer building, a workspace for around 1,000 people is located outside of Apeldoorn, a town in the middle of the Netherlands. The design of the office building follows a democratic style of government with designs that are open and non-monumental. The complex consisted of 58 small towers, each up to four storeys in height, plus a tower for technical facilities on top of an underground, multi-storey car park. The towers are separated by passages which make up a labyrinthine, non-hierarchical grid illuminated from the above skylights. The towers are grouped into four quadrants, and the main internal streets that separate the quadrants link the entrances to the center of the building. The center of the building is where the building is visualized as a city, which its central space operating as the public space of the building. The design has working spaces which could be laid out and modified internally in a varied fashion. In this project, the idea of flexibility is directly transformed into an expandable form.
Plan of Entrance Level.

Plan of Top Level.
Aerial view.
Chapter 5

Experiments in England: New Towns and Archigram

5.1 The city as organism: Ebenezer Howard’s Garden City

The Garden Cities of Tomorrow has led the modern town planning movement by altering its path. The importance of the garden city movement cannot be underestimated, and according to Lewis Mumford\textsuperscript{10}, the beginning of the twentieth century saw two great inventions which are the aeroplane, and the Garden city.

The new Towns Act of 1946 in Great Britain brought about new planning methods that were to be used for removing congestion in cities. The Garden city by Ebenezer Howard laid the foundation for the design of twenty new towns that were designed and built, and surrounded by a green belt that segregated them from the city. These new towns were the first to be designed as completely new towns. Zoning of areas within each town became important, as there were separate areas that delineated various uses, such as industry, housing, green belt, etc…

Town and Country Magnet

Howard took on the problem of the city’s development as a relationship of not just its physical growth, but the relationship between community functions and physical structure, thus turning rural life into urban life through intellectual and social growth. The country was impoverished, because of the extensive growth in the cities and the garden city formed the antithesis of a suburb, not a more rural retreat but a more integrated

\textsuperscript{10}Ebenezer Howard, Garden Cities of To-morrow, MIT Press 1965.
foundation for an effective urban life.¹¹ The Garden city offers a combination of environmental benefits alongside an urban setting. In this case, town and country were mixed together.

The garden city movement advocated for the decentralization of industries, and there was more concern during this period with the processes that produced communities and provided for environmental benefits. Howard believed that the cities could actually multiply themselves, and form clusters of cities which can depend on each other. This led to the idea of “town clusters”.¹² It is at this point in time that Howard decided to bring Letchworth and couple it with another city called Welwyn. The importance of the Garden city lies in the importance in planning, on a horizontal level. There was “decentralization” of industry in the period and the interest dealt more with the processes that could produce communities and not necessarily the physical aspects of the city.

In 1944, the government of Britain had accepted to decongest the cities, and decided to form green belts around towns, for replacing and relocating people. In the second town at Letchworth, there was a faithful fulfillment of Howard’s essential ideas. It has a wide range of industries, a community of homes with gardens and a spirited life, where all people can find employment locally. It is surrounded by an agricultural belt, with the principles of single ownership of land, with any surplus revenue that will benefit the town.

¹² Ibid.
The three magnets.

Correct Principle of a city's growth.

Plan of Welwyn.
Centre of Garden City.

Diagrams of the Garden City movement, with the rural belt surrounding it.
5.2 Milton Keynes

At the beginning of the New town program in 1945, a committee was briefed to suggest guiding principles for the establishment and development of “self contained and balanced communities for work and living”. This included the importance of voluntary organizations for the youth, and in creating new social relations. Housing was to be provided in sufficient variety by design, location and cost to satisfy a wide spectrum of residents by income and preference, and secondly, that the range and location of facilities in relation to residential areas, particularly the activity centers, was such that single social groups would not develop in ways that would represent an inequitable distribution of opportunities.

The plan can be laid out in 3 phases:

1. Economic development: The growth and development of the city will by definition involve the building of a local economy interdependent with the regional and national economy, and a main determining factor in the capacity of Milton Keynes to attain its goals will be the pattern and rate of development of this local economy. The local economy of the region will have a direct relationship with the commercial, industrial and domestic rents in Milton Keynes, and thus upon the Corporation’s own capacity to finance the many facilities which it is determined itself to provide, ranging from roads to rent rebates.

The corporation will be concerned first of all with creating conditions- in terms of space, labor availability, services, access, environment and communications- in which firms can flourish and with the productive processes carried on by the firms and other enterprises already in the area as it expects to attract in future years.

In relation to its own development and in order to attract developers, the Corporation should be directly interested in the incomes generated. The resulting state of the local economy will have a material effect upon the levels of commercial, industrial and domestic rents in Milton Keynes and thus upon the corporation’s own capacity to finance

---

13 Peter Waterman, in Social Development in Action.
14 Suzanne Beauchamp de Monchaux, in The Best Laid Plans.
15 Milton Keynes Development Corporation, The plan for Milton Keynes, page 118.
16 Ibid, page 117.
the many facilities which it is determined itself to provide, ranging from roads to rent debates.\textsuperscript{17}

2. \textbf{Social Development:} The plan called for larger number of social goals than in typical master plans, and called for as many social goals as physical ones. In order to have greater social development, the corporation has recognized that the satisfactory social growth of the city is as much dependent on conscious planning as is its physical growth.\textsuperscript{18}

1. The idea of city of Learning was a new idea that Milton Keynes adopted as a goal for social development.
2. Housing management must change from being a function for allocating of rents and housing and turn into social indicators that monitor satisfaction.
3. Throughout the following sections considerable use has necessarily been made of the word “institution”. The reference towards institution is with health, education, and wellbeing of the community.
4. The institution needs to not only meet social needs, but needs to meet the goals of the Corporation
5. Community development: The community development program allows for transitory formation of groups to complain about certain activities such as construction traffic, or developing a playground to take up a particular recreation or leisure activity, and to recognize social value in potential leaders.
6. Promotion of Social Facilities: Promotion of social activities such as the building of multi-purpose halls, or the use of schools. It will be the function of the Corporation to ensure that the social facilities are provided and should act as a catalyst in ensuring that these facilities are provided.
7. Recreation and leisure provision: Recreation and leisure activities are encouraged, such as golf facilities,
8. Identification of and provision for special needs: Identification of special needs such as the needs of handicapped people, and the provision of services and opportunities related to community development.
9. Links with research: Along with the physical and social goals, there should be monitoring and evaluation of activities that are linked with research, to enhance the interests of all the people.

\textsuperscript{17} Milton Keynes Development Corporation, \textit{The plan for Milton Keynes}, page 119.
\textsuperscript{18} Ibid, page 119.
10. Public participation in planning: The idea of public participation in planning started with the planning of Milton Keynes. It is here that the activities involved with social development are important.

11. Links with employers: It is in the pursuit of the city’s social goals, in housing, and in advisory and information services, that the employers will involve themselves with.

12. Social Balance: A rich mix of age groups, class and occupation in uniformity, has been associated with the development of Milton Keynes.

13. Efficient use of resources: such as dwellings, of different types and sizes, to avoid irregularities in population such as middle aged, and old people.

3. Monitoring and Evaluation

1. The idea of monitoring and evaluation comes from testing the value of an activity, by looking at its “performance”, and by measuring its success and failure.

2. Applying resources by measuring inputs instead of outputs, for example in recording housing by numbers of dwellings built, rather than the way the houses meet the demands of the various families and lifestyles.

3. To monitor the problems and dissatisfactions of the residents, so that the indicators of social and economic life in the city can vary.

4. Monitoring is a selective process by which statistics and information are directly related to policy decisions and the assessment of the relative success or failure of plans in action.

5. Evaluation is the comparison of the effects or implications of plans with original objectives, intentions and expectations. Evaluations can occur before plans are implemented, as a method of selecting a best alternative, or after implementing an assessment of results.

6. A number of studies are conducted to evaluate public services, such as child development project and community development projects.

7. Social indicators need to be developed such as crime and welfare indicators.
**Principles of New Development**

The City Road Network: The intertwining of the road network and the land uses creates a strongly dependent relationship between the two parameters. The goals of the Master Plan consisted of adding a variety of housing typologies, the creation of easy movement and access with multiple choices in transportation, and an efficient use of resources.

**Strategic Plan: Land use zoning and road transport system in Milton Keynes.**

**City Road Reservations.**

The city roads needed to accommodate main services, landscape and planting to protect adjacent development from noise, and to be able to accommodate for alternative forms of transportation if required. To ease heavy north south traffic, a new trunk road was designed to distribute major traffic movement onto the city road system. The city roads were designed to carry buses, with smaller buses routed only along the main local routes within the gridsquares.
District Plan, showing hierarchy of routes.

**Land Uses**: (see strategic plan).

The Master Plan had a balance of housing and employment to ensure that the city could be self contained without heavy commuter traffic in and out. To ensure that balance, the ultimate population of Milton Keynes was set out to as 200,000. The plan incorporated existing settlements and ancient monuments to preserve the identity of the town, which has been incorporated into the open space.

The layout of the streets was not rigid (but was laid out in a grid) and patterns of development were allowed to be random, and as a result of it there was a substantial variety in typologies. Unlike the case of Kyiv, the East and West sides were equally developed to ensure a good balance of housing. However, the flat land forms of the East side attracted larger industrial uses, while the undulating sites of the West attracted smaller buildings.

Overlapping catchment areas: Homes were not grouped as inward looking neighborhood units, but were part of overlapping catchment areas, and according to different functions and requirements of each area. In this way, maximum choice was provided to the residents for schools, shopping, recreation and business.
Central Milton Keynes

Central Milton Keynes was planned to serve the vitality of traditional cities, as well as easy accessibility in typical suburban town center. Both the East and the West are terminated with a railway station and Campbell Park respectively. The railway station on the East is connected to the main arterial road and serves the office and shopping areas. The centre of Milton Keynes has been zoned as the Civic space of the city, thus serving all the adjoining residential neighborhoods, while simultaneously being connected to the shopping areas, and business district.

Employment

The employment and housing were created as a balance between the two uses. During that period, there was also an increase in High Tech Industry, which was classified “business use”, and an increase in the labor pool, such that 46-49 percent of the resident population was economically active. Employment included businesses, retailing, health and education, general industrial, and storage and distribution.

Land for industrial uses followed large leveled sites with good access to motorways, etc… and the offices were located in Central Milton Keynes with few sites for Campus offices and Business Parks, on naturally landscaped areas. Employment near housing

---

had architectural features that resembled the housing type of that locality, by matching features such as heights, and colors.

Employment land-predominant uses.

The Redway System
A “redway” is the proper name for a length of the shared use highway for pedestrians and cyclists in Milton Keynes. The philosophy behind the Redway system is as follows: an affective coherent network of routes separate from the city road system providing an attractive, safe, direct, and convenient access for pedestrians and cyclists at a local, district and city scale.”

---

21 Ibid, page 222.
Community Services
The Corporation identified areas of community services with the plan. These community services, unlike the business areas, were sprinkled evenly across the master plan, to revitalize and reinvigorate the housing communities. These community services included a focal meeting place for the local community, which consisted of multi-use buildings that were free standing, or integrated with other facilities and provided by the Corporation. However, the management of the community services was to be handled by the local community.
Meeting Places or community centers in Milton Keynes.

Local Open spaces, Linear Parks, Landscape
The landscape is a unique feature that complements the built form throughout the city, and is one of the key considerations in the design of Milton Keynes. The landscape as defined by the city road network provides an interface and sound barrier between the roads and the developments. The planting has been designed to enhance the character of the city and provide identity by combining informal and formal planting strategies along with the combination of various plant species. Gridsquare entrances and points of connections have been highlighted with distinctive planting species, and special planting has been chosen to ensure visibility at subway stations, and at the Redway system.
The Linear Park systems form a continuous corridor of green space that intersects with gridsquares at random points. These corridors are leisure routes that contain horse riding trails with varying widths, and a "string" which is an established public path that ensures the continuity of the park system. The Beads are focal points for the strings, and includes such things as public parking or picnic areas. The Setting includes the parkland, woodland, agricultural land, or forestry depending on the natural landscape of the area. Larger district parks are provided for about 15,000 people and perform as a conventional town park. Reservoirs were used to control flooding in the valleys, and some of them were used by the corporation to construct permanent water bodies which served as water features for the park network.

Landscape structure of Milton Keynes.

23 Ibid, page 70.
24 Ibid, page 70.
25 Ibid, page 76.
Planning and Implementation Process till March 1992
Since the 1980’s development, development took place on a large scale in Milton Keynes. As a result, the Corporation had to lay out a medium term planning framework, to produce an Implementation Strategy for new development in the city. The main strategies which spanned over a 5-7 development period were: 1. Economic development, residential development, and the recreations/parks strategy.

The strategic map used is the zoning map of Milton Keynes (as shown on page 40) to ensure that all changes are made based on a key map. This strategic map shows the basic land uses and road alignments. Further district plans detailed areas of development to visually demonstrate the location of bridges and underpasses, the location of local centers and health centers, and the boundary of parks. The Gridsquare Structure Plan zoomed in to the district maps, and to develop areas in details. This map was done with drawings and plans of 1:2500 scale\textsuperscript{26} to show the layout of the main roads, leisure facilities, and phasing proposals, with a financial statement of costs.

Planning and Implementation Process from April 1992
After April 1992, the responsibility for all aspects of the city shifted from the hand of the Corporation to a number of separate agencies. The Commission of the New Towns was the successor that inherited the Corporation’s land holdings and liabilities, and that finished all contract development that was already started.

City Roads: A large portion of the city roads at the center of Milton Keynes were dualled. The Commission had the responsibility of dualling all the city roads. A trust which was created in 1990 managed the Linear Parks and community development, while the Developers took over the development of the housing, at different price ranges. They also developed Health Facilities, education buildings, and retail.

5.3 Commonalities between the Garden city (Welwyn) and Milton Keynes.

The New Towns of England were designed as a result of the overcrowding in cities such as London, Birmingham, Manchester, and few other towns. The commonalities between the garden city and Milton Keynes lie in the idea that country (agricultural land) and city

(built surface), can coexist, and transform themselves into a new way of living, one where co-existence with nature can result in better sustainable communities. This idea which was nascent to the culture of the United Kingdom is fundamental to the design of sustainable buildings and cities even today, with a global expansion of know-how in garden city design to the Netherlands. The garden city had multiple common design elements with Milton Keynes, such as the enhancement of the idea of the town and country magnet. The center of both Welwyn and Milton Keynes was utilized as the core of the city, with the railways traversing the city in a North South direction. The core of the city was laid out in a green belt, and consisted of a railway station along with stores and shopping in the case of Milton Keynes. Howard’s idea of utilizing a green belt, or green expanse of land intermixed with buildings laid the foundations of Le Corbusier’s “tower in the park” concept, and the radiant city model, with vertical gardens instead of horizontal ones as in Howard’s case. The green belt, designed around the cities restrained and contained both cities to a certain limited size, although their difference was twofold. Milton Keynes was designed for a population of 40,000 while Welwyn Garden city was designed for 18,000 people.27

The roads and transportation networks lie within grand avenues in both the cases, and windy inner roads provide options for people to move from one point to another. The plot sizes are all consistent in the Garden city, with the average size of the building lot being 30x130 or at the least 30x100. In the case of Milton Keynes, there was variety and options in the typology of houses designed and built. In terms of the axis, both Welwyn and Milton Keynes ran North South, and were divided into two halves, with the railway crossing in the middle.

Both the cities represented a symbol of society, family, and living away from the city, The idea of municipal activity is common in both the cities, and both have measures to monitor the costs and working expenses of the town, the townhall, roads and their maintenance.

The larger social goals in the involvement of the town planning aspects show interest in public participation, in economic interest, in the development of schools, public facilities such as libraries, and townhalls etc…

One of the main differences lies in the flexibility of the road system that Milton Keynes had versus the Garden City. The ability to build larger roads set in green space, without traffic signals, gives the town of Milton Keynes more of a suburban feel to it versus the garden city’s industrial belts. Another difference is that Welwyn Garden City had a larger number of white collar workers than the average New Town28.

5.4 Archigram.

Archigram critiqued architects, government and planners on their inability to discard their mental impediments with two dimensional drawings, and to be unable to embrace newly developed technologies. Archigram’s drawings reflected life in an idealized England, at a time when there was a lot of talk on key words such as “flexibility”.29 Their attitudes came from a general state of discontent with social housing in England during the early 60’s. That period experienced much debate on the adaptation of buildings to changing user needs, and Archigram envisaged adaptation on a daily, if not hourly basis.30 It was at this time that building materials started to take on a much sophisticated role in the design of buildings, and materials such as translucent plastic sheeting were created. It was also at this time that buildings were designed in a much more fluid way, in order to create a non-inert object as a built form.

The buildings and cities created by Archigram responded to clients’ and users’ needs in a rapidly changing society of 1960’s England. Their designs responded to the excitement of creating a new world, and worked on solutions to responses to society’s everyday needs. According to Arata Isozaki, Archigram’s work was divorced from the patterned logic that modern architecture had created for itself during that time by establishing new values, a new syntax, and demonstrating the possibility of an independent subculture.31

Ideas by Archigram were manifold. They thought of issues such as pedestrian movements and the demarcation of space to channel such patterns of movements, interchangeable kit of parts to bridge the gap between the designer and the community,

housing as consumer product, etc… Culture in their times was developed as a byproduct of individuality, in a society that was consumer oriented. Housing in turn, had become a consumer product within this new culture, and is what had led to Archigram’s notion of the Plug-in Capsule Home, a home based on techniques of mass-production and automation. It is here that is important to note that the relationship that housing might have had with cars and refrigerators had become closer than with actual traditional housing.

Beyond the domain of architecture, there lies the intricacy of city life. Outside of architecture and the development of new building materials, the intensity of the metropolitan life created a new way of connecting style with sociology. 32 It is here that Archigram’s interest lied in.

From 1965 onwards, discussions were removed from their entrenchment with modern values, and the criteria for projects stopped responding to any architectural morality and began to gain more freedom and coolness. Designs were not based on a plan anymore, but on a three-dimensional sketch, showing the vitality present in cities. It is in this three dimensional representation that lies the rules for designs, and for their expandability. It is the first time here, that a new type of modernity was created, one that responded to the individual as a spectator of himself, with attitudes about the environment surrounding him. Rules were not based solely on the plan and its constituencies, but on an individual and its relationship to its constituencies. It is here that lies the difference between the work of Archigram and all the modernist work that preceded it.

The city is now seen as a subjective and objective materialization of culture. It is seen as temporary, and flashy33, and has more to do with vitality than with monument buildings34. The city is not seen as a two dimensional plan or section, but as a diagonal, which denotes a multi-level city. The emergence of the diagonal is not only a product of engineering experimental preference, but also an implication of a purpose of the structure that is new to buildings: to provide an umbrella within which growth and change can take place.35

33 Ibid, page 23.
34 Ibid, page 23.
Plug-in-City
The plug-in-city was a combination of a series of ideas that were worked on between 1962 and 1964. In the plug-in-city, the urban environment was programmed and structured for change, and designs of buildings inevitably turned into expandable forms. The link between city life and dynamism was as important as it was with an established form.

The notion of geometry in shaping the plan and the plug-in capsule is paramount in the understanding of the project, in both subjective and objective terms. 36 The axonometric below is seen as the classical image of the project. The project was based upon a drawn plan, which placed a structural grid on a square plan at 45 degrees to a monorail route that was to connect existing cities. 37 Alongside ran a routeway for a hovercraft, the idea being that it could connect some of the linked parts. However, beyond this functionalism and extreme geometric rules, there was variety in the heights and types of buildings.

In the Nottingham project, which was a proposal for shopping, one can see how the business of replacement and transportation are dominant features in the design. The idea of the plug-in proposition already existed in the section. The idea of the department store was broken down, and boundaries were blurred with a viaduct like structure against which the shops could lean. The scheme was only a short step towards the inculcation of the housing elements.
Nottingham Shopping Viaduct.

A specific application of the plug-in thinking can be seen in the rentable office floor. The axonometric shows a pylon that contains lifts and services with a tray hanging on each side. One tray would be the front office and the other the back office, and each could be exchangeable. Various ideas about automated shopping and diagonal movement are combined to produce the Plug-in-Office tower.

Housing project

The problems associated with the housing project were similar to any typical housing project designed, which are stacking, access, and illumination. The housing units were

---

regularly stacked and identical, and the structure neatly indicated with dotted lines. The indication of the fact that the plug-in city is open ended is untrue here. It is here that the real development of the plug-in city took place, where the housing, offices which were diagonal in the high intensity areas, and the electric city car which replaced the monorail all came together as an urban, architectural and human mechanism that were stirred together.  

Definition: The plug-in-city is set up by applying a large scale network-structure, containing access ways, and essential services to any terrain. Into this network are placed units which cater for all needs. These units are planned for obsolescence. The units are served and maneuvered by means of cranes operating from a railway at the apex of the structure. The interior contains several electronic and machine installations intended to replace present-day work operations.  

---

Typical permanence ratings range between a bathroom which is of three year obsolescence to a house unit which is of fifteen years, offices which are about four years to the main megastructure which is about forty years.

Thus there is hierarchy in the relative permanence of uses, but there is also hierarchy in the speed of operation of the elements within it as well. Therefore, the railways or parking roads tend to be at the periphery or down, and environmental sealed balloons and faster monorails are located at the top.

This high intensity area of the Plug-in- City is seen as a typical condition that could be superimposed on an overall map, for example that of London. The standard features that are superimposed are the diagonal framework of 9 foot diagonal tubes, intersecting at 144 foot intervals in an eight way joint. One in four of these tubes contains a high speed lift and an escape tube, while the remaining are for goods and servicing.

Plug-in-City network over London.

The work on the Plug-in City led to another project on the Paddington area in London that incorporated a cage like structure for dwelling. This research finally terminated in the project on “Control and Choice”. The determination of the environment in the Control and Choice project was not left in the hands of the designer, but rather, in the hands of the individual using the building, by turning on switches. In this project for housing, the dwelling cages formulated a notion of reserving space for a moment, thus, abandoning ideas, such as city or unit. The final design attempt led to the disintegration of the idea

of the "house" into an object that is not tied to its location, but that could even be worn on the back.

Application on Paddington Area of London, cage like structure for dwellings.
Chapter 6

Urban design methods

6.1 Introduction

The urban design process has not yet been formalized into a unique and distinctive methodology that can ensure that urban design becomes a professional field. There are various tools and methods available for studying cities, and these vary from mapping the city, as argued by Denise Scott Brown and Robert Venturi in "Learning from Las Vegas", or through sounds and visual cues as taught by Margaret Crawford at the Graduate School of Design. From the precedents that I have described earlier, namely the use of parameters in defining the extents and boundary conditions of a city, one can imagine a new urban design process that takes off from the case studies. This method takes the idea of the "City of Bits"\(^{42}\) with the “bit” as a unit of measurement, and assumes it to be transformed into a physical measure or parameter that can be used to measure the city. In a conventional planning process, the important parameters used would be the square footage of the various programmatic elements, density for population, and the Floor Space Index to calculate the height of the buildings designed within a specific zoned area.

6.2 Urban Housing Hybridization

This housing example which was designed by Eduardo Arroyo, Nerea Calvillo, and Sergio L. Pineiro is a method of occupying the landscape, in a randomly zoned manner. This process has been used to occupy the land by inserting a variety of programs, in various percentages, on the site. Various applications of replication, mutation, cohesion, transcription and hybridization have been applied to the mix to create results in a cookbook fashion. The process has been described below, and is perceived as an irrational method, although it is one that is highly rational and structured.

Urban Hybridization process
This is a process of occupying the land to relieve it from a monotonous zoning ordinance.

Replication
The first step is to create a percentile usage to be inserted within the area. This percentile usage can emanate from the developers, and is a key item in this example.

Mutation
What is unchangeable in terms of program remains that way.

Cohesion:
Once the balance is reached, the construction uses and the open spaces are defined and grouped, leading to the constructed hybrids.

Transcription:
One of the results of this mix of elements, superimposed in different ways, is a hybridization density of the territory.

Hybridization:
By this means, one can reach the first result of the process: the complete hybridization of the landscape, an organization that takes into account all planning elements with no formal planning goals, and that contains all the elements for a diversified morphology of the city. The territory is now hybridized by the multiplicity of programmatic functions.
Mix of program interjected in an open space.

Interaction of program with reality based vectors, which are the site constraints.
Chapter 7

Flexible Urbanism Project

7.1 Mixing Horizontal layers

Mixing Horizontal layers together, to form vitality in cities (using traditional architectural typologies).
Sites for development opportunity, creating diversity in use through mix of program.

Drawing by Author.
Layers in the city are seen as distinctive, but can interact with one another in a random non-linear way. Diagrams from top: Buildings, surrounding buildings, landscape, blocks, and pathways. Drawing by Author.
7.2 Mixing Vertical Layers

**Mixing Vertical Layers:** The cube which consists of multiples of 1mx1mx1m is the standard for defining space. Drawing by Author.
**Individual Points in space:** Points can denote program, individuals, resources, etc... Drawing by Author.
Points in Space are grouped: Points in space can be grouped together, and relationships formed are between various groups. Drawing by Author.
A network of points: Points in space form networks between themselves, and associations become non-linear, therefore, random encounters can occur, or random programming. Drawing by Author.

What I think of as urbanity is precisely making use of the density and differences in the city so that people find a more balanced sense of identification on the one hand with others who are like themselves but also a willingness to take risks with what is unlike, unknown.... It is the kinds of experiences that make people find out something about themselves that they didn't know before. That's what urbanity is at its best.... To me, how
to privilege the notion of difference that is what urbanity is all about, Richard Sennett, MIT.

Various programmatic elements: The cube can take on various programmatic types, and can transform itself from a housing unit to a retail unit and again to an office unit with the interchange of interior partitions and furniture. Drawing by Author.

Vertical programmatic elements, such as vertical green space, in front or behind, or intertwined between various programmatic elements such as housing, office, retail, etc... Drawing by Author.
The large cube forms an architectural object, and each small cube within the larger cube can take on various programmatic elements such as green space, housing, office, retail, communal services such as schools, daycare, etc... Drawing by Author.

Bar Code: showing various percentages of programmatic elements. Drawing by Author.
Parameters that guide various programmatic elements within a block on the site in Chicago, or a universal site; each programmatic element can change and can be controlled by external points. This allows for flexibility in the programmatic process, and in turn flexibility in defining and changing various programmatic elements instantaneously. Each programmatic element, other than parking which is situated in the middle of the block (shown in brown) can be plugged in to core, hence allowing for flexibility, universality in design, ease in construction, and ease of movement of people. The various programs for the spaces can be controlled digitally, and changes can be recorded instantaneously.

Digitally controlled space. Drawing by Author.
7.3 Application of Flexible Urbanism on Chicago’s IIT neighborhood

**Site (previous page, as example):** Chicago, between 35th Street and 31st street, on State Street. Location of IIT can be seen, (Crown Hall), and the Express Highway on the left. Housing in various blocks has been demolished, and new program needs to be added to revitalize the neighborhood, by adequately using resources available, and land.

**Master Plan Below:** From left: single family housing, express freeway, and IIT Campus. The percentage of program added can change parametrically and program is not associated with building type. Buildings thus become generic.
First Master Plan shows existing conditions in and around IIT Campus. Second Master Plan shows extent of additions of program as a source for revitalizing the neighborhood.
Existing master plan. Drawing by Author.
Proposed Master Plan. Drawing by Author.
Plans show various programmatic elements, in the First Floor Plan and Second Floor Plan. 
Drawing by Author.
GIS Data will now change parametrically to show what kind of program might be available in the city, or what available space can be used at any instant. Land use plans are thus non-existent now. The need to move away from zoning is imminent, and this project demonstrates ways in which one can understand the city parametrically.
Chapter 8

Conclusion

All the projects described in the thesis, starting from the Prisons of the eighteenth century to the nomadic nature of the Plug-in-City reflect a certain correlation between mathematics, and social and spatial structure within the city to form the basis of a Global City. This results in the final form of the global city, which I have named the Flexible City and which is a city where all social and physical interactions take place within a cube. The cube which is an expandable form, can transform itself into another by moving the exact same points that guide its extremities, to form structures that can be interlocked and interwoven together to generate a networked city. This networked city contains all physical, social and even virtual connections that can be formed to invigorate and revitalize the existing neighborhood of IIT. The creation of this network, not only finds its roots in modernism but also results in a normative and contextual solution for the urban plan of Chicago’s IIT neighborhood.

The Flexible city responds to issues of replicability, mutation and control and choice essential in creating vigor and intensity in cities. The method is also embedded in the history and cultural reality of the IIT campus, and its modernist design lineage. Replicability of usage and expandability of generic building types are two important cost control factors in the scheme. Finally, the scheme addresses the issue of parametric design in cities, by exponentially multiplying design solutions.
Bibliography


Llewelyn, Davis Weeks, Paper presented to the Milton Keynes development Development Corporation to the Minister of Housing and Local Government.

Suzanne Beauchamp de Monchaux, Paper Best Laid Plans.


Williams Stephanie, *The social impact of urban design, Eddie N. Williams*, The University of Chicago, 1990.


