

ABSTRACT

Title of Thesis: OBSOLESCENCE AND RENEWAL:
TRANSFORMATION OF POST-WAR
CONCRETE BUILDINGS

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of Historic Preservation, 2016

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In this thesis I investigate issues of post-war concrete buildings and how we can both add value and make adaptable what we have traditionally defined as not valuable and not adaptable. 55% of United States' commercial building stock was built between the years of 1960 and 1980, leaving 36 billion square feet of building material to be adaptively reused or at the bottom of a landfill. Currently, our culture does not value many character defining features of these buildings making the preservation of these buildings difficult, especially at this 50 year critical moment of both the attribution of a "historic" status and time when major renovation of these buildings needs to occur. How can architects add value to a building type, sometimes called "brutalist", that building culture currently under values and thinks is "obsolete"? I tested this hypothesis using the James Forrestal Building in Washington D.C. After close study of the obsolescence, value, history and existing conditions, I propose a design that

adds value to Southwest Washington D.C. and may serve as an example for post-war planning renewal around the country.

OBSOLESCENCE AND RENEWAL: TRANSFORMATION OF POST-WAR
CONCRETE BUILDINGS.
CREATING THE DEPARTMENT OF ENERGY CENTER OF INNOVATION
AND SMITHSONIAN DC AT THE JAMES FORRESTAL BUILDING

by

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Preface

My interest in the topic began when concrete buildings around the Chicago, Baltimore and Washington D.C. area began to be torn down in the early 2010's. I was immediately interested in why people didn't value these buildings and would prefer to see these places become new places. I kept hearing the word "obsolete" and started off on a meandering path of exploration into the question of, "why?"; a question which Connie Ramirez, had always pushed me to pursue. After working in architecture and historic preservation, it was apparent to me that both cohorts speak different languages. This thesis is an attempt at both practicality and an academic pursuit in what we can do with buildings we don't value, especially those who are defined by the elements we don't value.

Dedication

To Michael, Family and Friends. Thank you.

Acknowledgements

Michele Lamprakos, thank you for going above and beyond for this project.

Mike Tomlin, thank you sharing your engineering expertise in working with these buildings.

Powell Draper, thank you for being a wonderful mentor.

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Table of Contents

Preface.....	ii
Dedication.....	iii
Acknowledgements.....	iv
Michele Lamprakos, thank you for going above and beyond for this project.	iv
Mike Tomlin, thank you sharing your engineering expertise in working with these buildings.....	iv
Powell Draper, thank you for being a wonderful mentor.	iv
Don Pousson, I truly learned so much from our HVAC meeting. I can't thank you enough for sharing your expertise about sustainable systems.	iv
Table of Contents.....	v
List of Figures.....	vii
Introduction.....	1
Theory: Obsolescence and Adaptive Reuse.....	2
Obsolescence.....	2
Origins.....	2
Commodity and Attempts to Quantify Obsolescence for Profit.....	6
Obsolescence Factors.....	9
American Building Sector favors Creative Destruction Over Old.....	10
Understanding Product Obsolescence.....	12
Developing a New Graph.....	14
Post War Building Analysis.....	17
Initial Study of Demolished Buildings.....	17
General Summary.....	18
Post war Building Analysis in Washington D.C.....	19
Methodology.....	19
General Summary of Washington D.C. Analysis.....	19
Renovations.....	21
Precedent Analysis.....	22
Alice Tully Center at Julliard.....	22
Design Goals.....	29
Urban and Program Principles.....	29
Architectural Principles.....	30
Social Principles.....	30
Adaptability Principles.....	31
How do we adapt these buildings?.....	31
Chapter 2: Post War Building.....	39
Post-War Building Problem.....	39
Concrete in DC.....	41
Height Act and Other Rationale.....	42
Concrete.....	43
Environment versus Exposed Concrete Structures.....	44
Chapter 3: Southwest Washington D.C. Beginnings.....	48

Early Years	48
Change in Post-War Washington D.C.	49
Redevelopment	53
The Smithsonian & Southwest	55
Forrestal Building Development.....	55
Chapter 4: Existing Conditions at The James Forrestal Building.....	62
Why the James Forrestal as the Case Study?	62
Site Layer: Existing Conditions.....	63
Structure Existing Conditions	69
Skin Existing Conditions	70
Service Existing Conditions	71
Space Existing Conditions.....	71
Chapter 5: Program and Work Culture	74
Engaged User Design.....	75
Chapter 6: Creating the Department of Energy Center for Innovation and the Smithsonian D.C. at the James Forrestal.	77
Time of Innovation at the DOE	77
Design on the Site Scale to add value and make more adaptable.....	80
Skin Proposal.....	89
Services Proposal	91
Space Proposal	93
The Gallery Space.....	94
Conclusion	97
Appendix I	98
Bibliography	99

This Table of Contents is automatically generated by MS Word, linked to the
Heading formats used within the Chapter tex

List of Figures

Figure 1 Usage of Word "Obsolescence" Over Time	2
Figure 2 <i>Bolton attempts find average life of building</i>	5
Figure 3 Bolton Attempts to Classify Years of Life by Building Type.....	5
Figure 4 Usage tied to Economic Downturns	8
Figure 5 Range of Factors Determining Culturally Defined Obsolescence	9
Figure 6 Inherent issues in the way we assign value to older buildings	11
Figure 7 Levitt's Product Life Cycle Theory	13
Figure 8 Levitt's Product Lifecycle Extension for Nylon.....	14
Figure 9 Critical Moment at 50 years for Postwar Buildings	15
Figure 10 Range of Values in determining Value of Buildings.....	16
Figure 11 Initial Demolition Study	18
Figure 12 Lincoln Center Campus & Alice Tully Building in New York City.....	23
Figure 13 Dense Urban Fabric Before the Lincoln Center Development and After ..	24
Figure 14 Proposed Design Changes for Adaptive Reuse of Alice Tully Hall	25
Figure 15 Original Alice Tully Hall.....	26
Figure 16 Image showing the Elimination of Exterior Staircase and Readjusting the Ground Plane to meet the Street	26
Figure 17 Image showing the Extension of the Building to Hold the Street Edge.....	27
Figure 18 showing the clip of the new extension to match street edge and the glass to reflect the Hall's new sense of openness to the pedestrian and NYC.....	27
Figure 19 Alice Tully's Final Design by Diller, Scifidio Renfro from the Corner	28
Figure 20 Newly added Program and Greenspace in Plaza.....	29
Figure 21 Architects Initial Design Approach Considering Obsolescence	32
Figure 22 Stewart Brand's Theory on How Buildings Learn which Incorporates Rates of Change	33
Figure 23 Washington D.C. Post War Building Layers and Rates of Change	34
Figure 24 Structure Layer may also operate at the Skin Layer in Post-war Buildings	35
Figure 25 Service Layer Embedded in Structure Layer Making it Difficult to Adapt Service.....	36
Figure 26 How we can make Post-war Buildings more Adaptable	37
Figure 27 Six Elements of Post-war Buildings currently not valued.....	37
Figure 28 Adding Value to Post War Buildings	38
Figure 29 High Number of Commercial Buildings were Built in the Post-war Period	39
Figure 30 Amount of Building Material to End up in Landfills if We Don't Adapt Post-war Buildings.....	40
Figure 31 Example of Concrete Construction Types.....	44
Figure 32 Number of Freeze-Thaw Cycles in Regions of the United States.....	45
Figure 33 Post war Office Building Growth in Washington D.C. Downtown Core ..	47
Figure 34 Early Land Tracts of Washington D.C.	48
Figure 35 Southwest from Above	50
Figure 36 African American Women in bedroom with photo of FDR probably in hopes of something better for her community	50

Figure 37 Picture depicting the importance of Southwest to look admirable in the backdrop of the Capitol Building also shown cut off from the rest of the city by the National Mall	51
Figure 38 1960 Sanborn with James Forrestal Overlay and red showing already demolished buildings	52
Figure 39 Washington Post Image Depicting the Areas of Southwest Redevelopment	53
Figure 40 Commission of Fine Arts Transition from Traditionalists to Modernist after the Assassination of JFK.....	57
Figure 41 The design of the 10th Street mall approved by city planners in 1961. FOB 5 was shown as four distinct buildings.	58
Figure 42 Early Model of FOB5	59
Figure 43 Proposed Water Elements Passing Under the Elevated Block of FOB 5... 59	59
Figure 44 Proposed North Elevation in 1963 depicting a Pyramidal Glass and Steel Façade	60
Figure 45 Proposed model with two adjacent flanking buildings	60
Figure 46 Proposed Pyramidal Glass Façade Glowing at Night	61
Figure 47 Final Proposed Deign Model	61
Figure 48 Red Depicting the Current Location of the Forrestal Building in the NCPC Plan to the left and the Smithsonian Plan to the right.....	62
Figure 49 Aerial view of Forrestal Complex	63
Figure 50 Figure Ground of Surrounding Context with Forrestal Highlighted in Red	64
Figure 51 Figure Ground of Southwest compared to a neighboring Capitol Hill Community	65
Figure 52 Diagram of Current issues on Site.....	66
Figure 53 Forrestal has 4 of the 6 Value Issues on the Site Scale	66
Figure 54 Author Photo Looking South from Independence Avenue. Shows Forrestal creating a wall and blocking the view up 10th street.....	67
Figure 55 Author Photo of Desolate and unused space under Piloti	67
Figure 56 Author Photo shows space looking south down 10th Street with no greenspace and just hardscape. Additionally shows few pedestrians but rows of cars	68
Figure 57 Author Photo shows 10th Street looking back to blocked view of Smithsonian Castle.....	68
Figure 58 Showing Existing structural Condition of Forrestal Building.....	69
Figure 59 Structural Plan Showing Opportunity to Capitalize on Expansion Joints over 10th street.....	70
Figure 60 Existing North Elevation	70
Figure 61 Existing Penthouse Core is entirely dedicated to Mechanical Equipment. 71	71
Figure 62 Example Floor Plan of Cubicles and long Corridors.....	72
Figure 63 Typical office and Hallway Condition at the DOE	72
Figure 64 Proposed User engaged Tool to promote work place space diversity	76
Figure 65 Time for DOE to be Innovative at the Forrestal.....	78
Figure 66 Single Use Office Space transformed into the DOE Center for Innovation and the Smithsonian D.C.	79

Figure 67 Monumental North and Experimental South with a split work-live scenario	80
Figure 68 Proposed Site Plan	81
Figure 69 Functional Greenspace Diagram	82
Figure 70 Community Anchor Diagram	82
Figure 71 Existing Site Section Cut Perpendicular through 10th street looking north	83
Figure 72 Proposed Park Section	83
Figure 73 Perspective of park with Green trellis and Smithsonian in the background	84
Figure 74 New Road kidneys in Shared Automobile and Pedestrian Space	84
Figure 75 Three Major moves structurally	85
Figure 76 At structural intervention steel will highlight places of adaptability	86
Figure 77 Structural insertion Diagram at 10th Street	87
Figure 78 Portal Frame leading toward new Southwest with hanging art installation	88
Figure 79 Proposed North and South Elevations	89
Figure 80 Wall Section of the North (left) and South (right) facades	90
Figure 81 Cross Section through Light Well	91
Figure 82 Proposed Services	92
Figure 83 Added Efficiency and more Sustainable Services	92
Figure 84 Diversity of Space at the DOE Center of Innovation. Typical Floor plan .	93
Figure 85 Rendering of DOE Center of Innovation	94
Figure 86 Smithsonian DC and New Ground Floor Condition	95
Figure 87 Rendering of Proposed Ground Floor Condition	96

Introduction

Why don't we like post-war or "brutalist" buildings? Built in a period of massive growth following the Second World War, these buildings have been called ugly, uninviting and obsolete. Obsolescence is defined in a range of ways depending on the user, making it culturally defined and also making it possibly redefined. By exploring, value, time, and rates of changes we can better understand why we define these buildings in a negative way and additionally how we can adapt them in the future.

I will begin a review of literature, theory, in regards to obsolescence and adaptive reuse. I will follow with an analysis of five brutalist buildings in Washington D.C. to discern elements of these buildings that are character defining features but also elements that current day society does not value. I will also discuss sites and buildings along the East coast that were subject to this type of planning and building style during the mid and later 20th century. I will then propose ways in which we can add value to these buildings and their associated site conditions. I will apply these principles to the James Forrestal Building in Washington D.C., a site which is due for demolition in the upcoming Southwest EcoDistrict Plan, in a series of design considerations that aim to prove that these buildings can have added value and can be adaptively reused. In these considerations, I will provide an overview of the history of Southwest Washington D.C. which helped me understand the context in which the James Forrestal Building was constructed and helped inform my design process.

Theory: Obsolescence and Adaptive Reuse

Obsolescence

Origins

The word obsolescence stems from its verb, obsolete, Latin *obsolescere*, meaning *fall into disuse*. Once used to describe function and use, the word obsolescence today has a variety of meanings, especially in architecture. Obsolescence in America is unique. No other country in the world has tried to quantify and promote obsolescence to the extent of United States. A culture founded on the Manifest Destiny ideal and affirmed by its consumer culture, has turned even architecture into a commodity.

Architecture as a Product: How American Consumerism Defined Obsolescence

Obsolescence as a word was hardly used until it was invented in the early twentieth century by creative American industry.

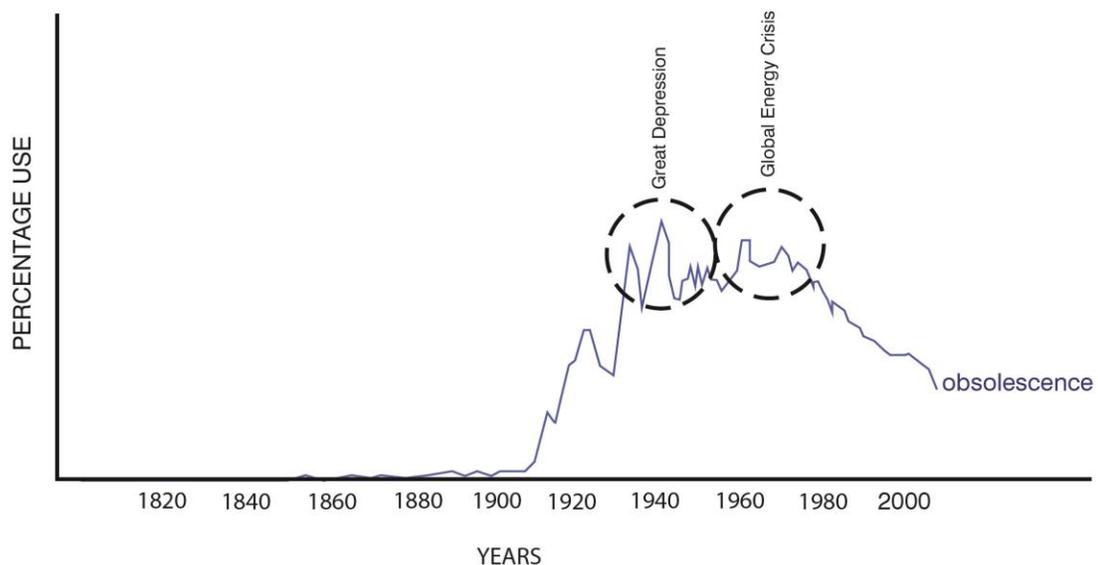


Figure 1 Usage of Word "Obsolescence" Over Time
Base data from Google, Image by Author

The early twentieth century was a time of war and extreme economic strife. Factories were full of products to sell but with no market buy. This, as Giles Slade discusses¹, was when it all changed. Manufacturers had to manage both demand and distribution carefully in order to bring repeat customers back. Factories were filled with product with no consumer to consume and repeat customers were saving and reusing instead of buying. The “throwaway ethic” of the United States was a result to insure repeat customers by supplying cheaply made, disposable products. Technology in the production industry allowed for cheaper materials, faster turnaround and a one-time, instant gratification. Americans invented the disposable. Giles argues that there are three stages of history in how product obsolescence in America came to be: technological, progressive, and eventually, the invented by the adulteration of materials.

Technological obsolescence has driven the world. From a wheel to the car, innovation has always paired with obsolescence. Every innovation has rendered the previous invention less functional than the current invention, leaving it obsolete; the adze replaced the reciprocal saw, and cell phone replaced the home phone. Progress and destruction hand in hand. However, in the early twentieth century innovation was not happening quickly enough and anti-thrift campaigns were not strong enough to stop people from reusing their old stuffs thus not consuming new goods. Giles attributes the American “trade up” culture to the American car industry. Ford consistently released new model cars, with new colors, that put consumers in a cycle of consumption in attempt to grasp at social and status hierarchy. Giles explains, “In a

¹ Slade, Giles. *Made to Break: Technology and Obsolescence in America* p.50

consumer culture, people size one another up continually to establish status hierarchies based on disposable income and taste...²” The newest model must be had. After the Great Depression hit, manufacturers struggled to have any consumers let alone repeat consumers, resulting in adulteration. Manufacturers began to use lower quality materials to purposely shorten lifespans to force customers to buy replacements.³ Manufactures began to see if they could quantify the life span of their products and possibly shorten them to both produce more and make more money. Manufactures looked to designers, “After the depression, the direction of American Industry passed from the hands of engineers into the hands of the designers”. Leaving the design of products inherently tied to consumerism. Daniel Abramson argues that society comes to terms with the creative destruction of capitalism through the built environment. After the Gilleder building was demolished in 1910, just 14 years of constructions Engineers like Reginald Pelham Bolton began to theorize why some buildings began to fall into sudden loss. Bolton argued that sudden loss of value in real estate was beyond the building itself and was driven by technological innovation, shifts in land use, building ownership, population, traffic change, injury to character of neighborhood, adherence to a new uniformity and stylistic preference⁴. Bolton further classified his research by building type, declaring life cycles of certain buildings to be longer or shorter on what category they fell into. Banks and institutional buildings had a 45-60 year lifespan, while hotels only had

²Slade, Giles. *Made to Break: Technology and Obsolescence in America* p.50

³ Ibid p. 5

⁴Bolton, Reginald Pelham. *Building for Profit; Principles Governing the Economic Improvement, 1856-1942.* p70

14-18 years lifespan. He also classified lifecycle by type and material of building construction (Figure 2).

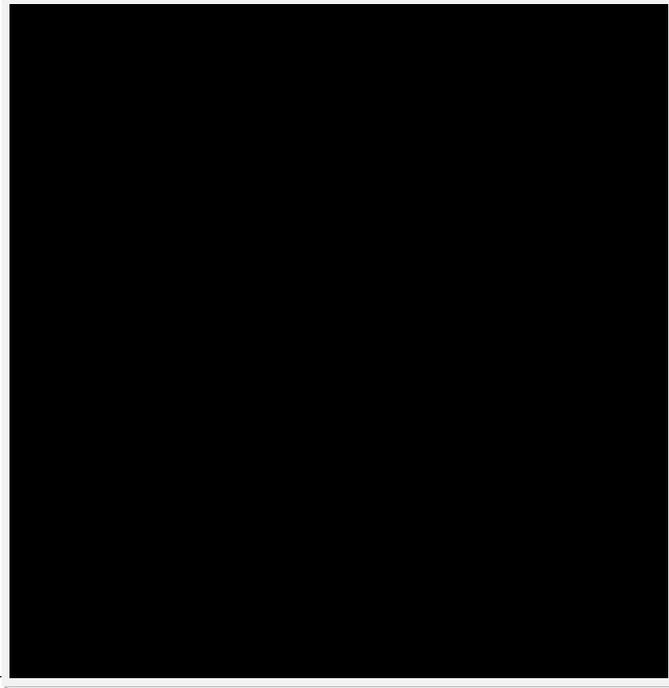


Figure 2 *Bolton attempts find average life of building*



Figure 3 **Bolton Attempts to Classify Years of Life by Building Type**

Commodity and Attempts to Quantify Obsolescence for Profit

1920's real estate groups were interested in better understanding how their investments represented obsolescence because of early twentieth century tax law, specifically Regulation 77 of the Revenue Act of 1932. Abramson argues that this tax law depoliticized obsolescence and created short life buildings—with favorable tax benefits—became a part of American culture. According to Abramson, Quantifying Obsolescence has been an almost uniquely American endeavor. Only one other deep study has been conducted on obsolescence and it was completed by the Bartlett School in London and only suffered from using American data.⁵ Burton argues that the equation land assessors in the 1930's were using had two unknowns (obsolescence and market value) which were riddled with personal judgement calls.

$$Ob = (R - P) - Mb$$

Ob = obsolescence, R = Present day cost of reproduction, P = physical depreciation dependent upon the life of the building in years, Mb = present market or income value of the building.

Land assessors around the country were struggling with how to assign a value to obsolescence in the early twentieth century. A 1933 Journal of Land & Public Utility Economics article, written by John E. Burton, discusses some of the differences between depreciation and obsolescence. Burton recalls Horace F. Clark's—who wrote *Appraising the Home*—definition: depreciation as physical deterioration and

⁵ Abramson, Daniel. On Architecture and Capitalism: Obsolescence, History, and the Present Crisis from CAUI Princeton Fall 2011.

obsolescence as the social deterioration⁶. This would mean that obsolescence would be something felt but not necessarily quantifiable. Burton also recalls that obsolescence could be the “action of those factors which restrict the usefulness of buildings to a period shorter than that allowed by its physical existence”. Failure to meet a bar set by a building’s original intention would be obsolescence. However Burton concludes that obsolescence in land and building is really a twofold issue—one from within the building and one from issues quite separate from it and was almost always a combination of the two. Burton declares change in land use districts to be “most extraordinary type of obsolescence.”⁷ He argues that cities have tried to create zoning use districts to protect character of place in order to slow down obsolescence. Land-use obsolescence is an adjacency problem, death by comparison happens and then death lower value because of lack of adaptability. He also argues that “art of building” also falls into consideration which includes materials, construction type, layout, efficiency and style. He continues that if detriment to necessary human needs like light and air or justice such as racial prejudices should exist, that they might also contribute to obsolescence. Burton ends that obsolescence is a scale of time, never knowing when its cycle begins, one year or 30 years and a it exists because a range of factors—not just one.

Ideas of American defined obsolescence began to creep from buildings to neighborhood and even cities in the 1930s. Abramson describes this as a time when blight and obsolescence were synonymous. The American Public Health Association (APHA) , “designed a survey method to quantify urban obsolescence, with forms

⁶ Burton, John E., Building Obsolescence and the Assessor. *Journal of Land & Public Utility Economics*,. Volume 9. No.2. May 1933 pp. 109-120.

⁷ *Ibid* p. 112

used by assessors sent to neighborhoods to measure physical, environmental and social deficiencies. The more penalty points, the more obsolete.⁸” The solution to blight? Demolition. Cities around the county dealt with issues of massive loss of place including Baltimore and Boston. Scars of the slum clearance were seen and then repeated during the 1970’s urban renewal period. Abramson argues that this helped accelerate the process of capitalist reinvestment. Each major demolition and period of defining obsolescence has come after national economic downturn(Figure 4). Now after the Global Economy crisis of 2008 has America started to deal with this again? Abramson argues that sustainability is America’s “new way” to deal with change.

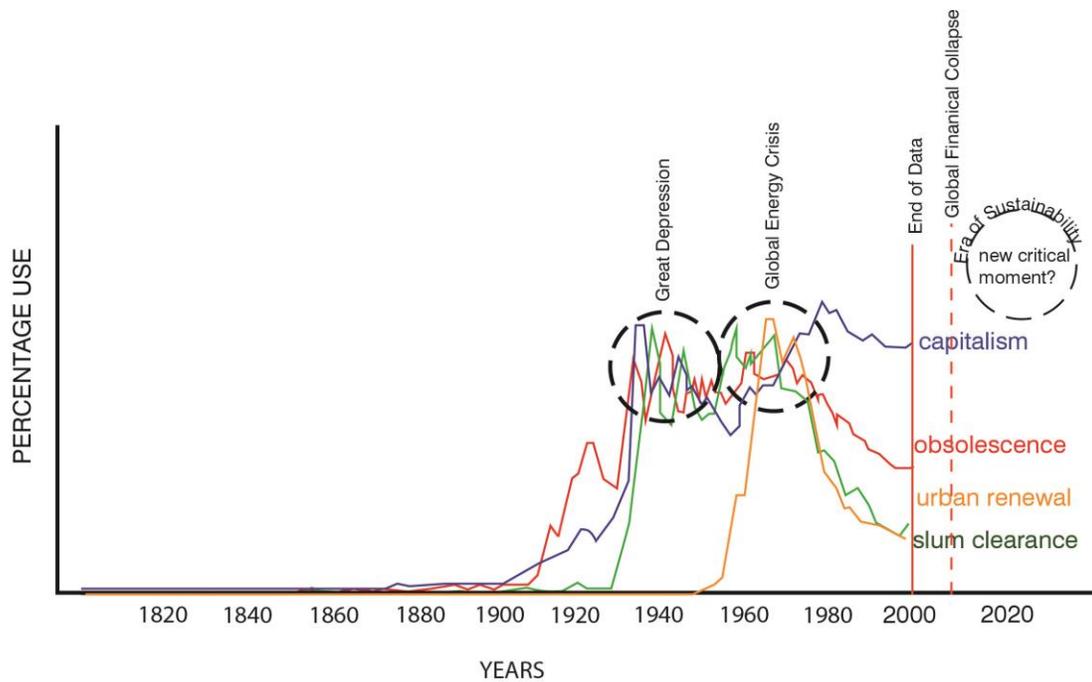


Figure 4 Usage tied to Economic Downturns
Base data from Google, Image by Author

⁸ Tischleder, Babette Bärbel, and Sarah L. Wasserman. Cultures of Obsolescence: History, Materiality, and the Digital Age.

Obsolescence Factors

Abramson, Giles, Bolton, Burton and Levitt have all attempted to develop a better understanding of obsolescence. In summary there are both the direct and indirect influences on a obsolescence as it relates to buildings. Direct seems to be easily quantifiable elements such as materials but most of obsolescence lies within indirect causes, confirming its difficulty to define (Figure 5)

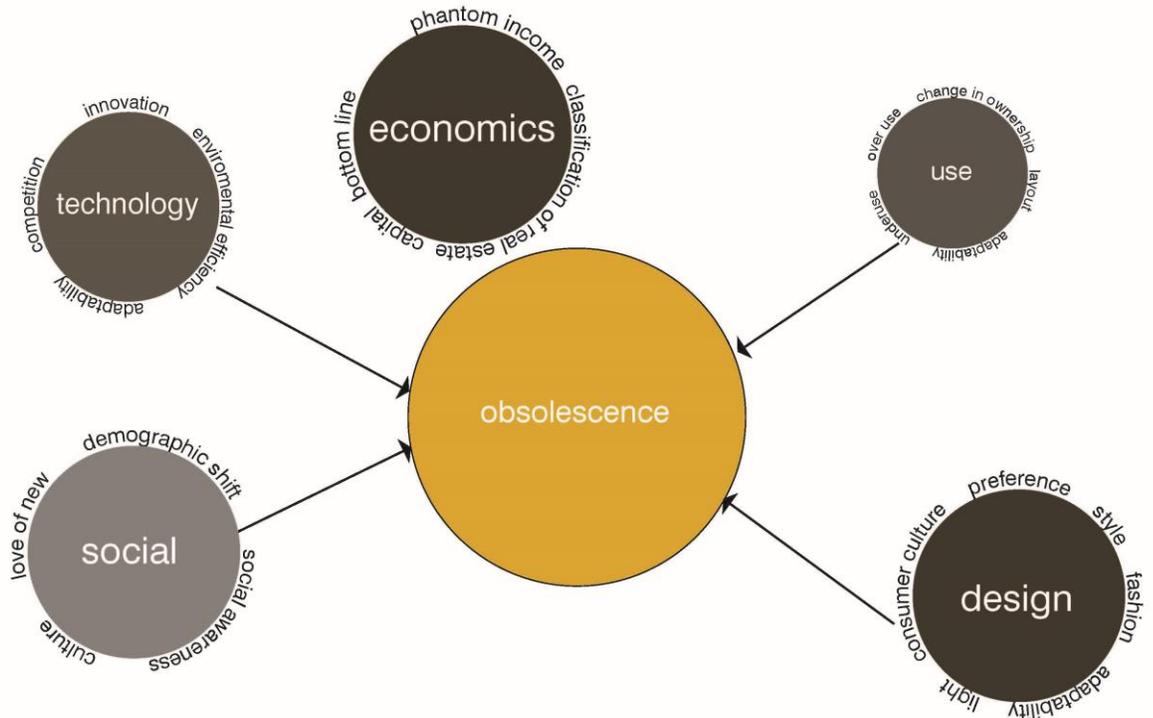


Figure 5 Range of Factors Determining Culturally Defined Obsolescence
Image by Author

American Building Sector favors Creative Destruction Over Old

Giles, Abramson and Burton all argue that obsolescence is more acute in American than anywhere else around the world. Giles states, “Deliberate obsolescence in all forms—technological, psychological or planned—is a uniquely American invention⁹.” Burton writes, “Actual wear and tear has been a minor factor in bringing the useful life of American buildings to an end; it has contributed toward that end, but the usual final cause is found in obsolescence”¹⁰ The real estate industry for years has been turning architectural obsolescence into something else. From real estate hosting most of investor wealth, to naturally biased market analyses dominating architectural moves, the American building industry has always favored new over old. In fact just looking at some development proformas and their Reserve for replacements is indication that from day one of construction they rarely think about updating buildings. Moreover, building developers are often out of the investment when the tax benefits run out and cash flow goes away. Tom Moretti, real estate specialist in historic preservation, clarified this idea in 2014 lecture revealing that is nearly impossible for a Class A building to be historic building and referenced only the new TRUMP renovation of the Washington D.C. Post office headquarters as one of the only examples he knew. Although the Building Owners and Manager (BOMA) have produced basic formulas for classes of Office buildings, a Washington D.C office real estate company has posted a more telling definition of these classes (Figure 6)

⁹ Slade p.3

¹⁰ Burton p. 112

Clearly indicating that value lays in the newest and state-of-the-art the real estate industry is putting an emphasis on consumerism. Class A buildings even have the most “prestigious clients” giving some sort of class hierarchy to these new building. Anything more than ten years old is immediately relegated to Class B. Notice that function has not been a factor in any of these designations and all these building remain functional.

	Class A	Class B	Class C
BOMA DEFINITION	<p>-Most prestigious buildings</p> <ul style="list-style-type: none"> -rents above average for the area. -high quality standard finishes -state of the art systems -exceptional accessibility <p>-definite market presence.</p>	<ul style="list-style-type: none"> --Competing for a wide range of users with rents in the average range for the area. --finishes are fair to good for the area. -- systems are adequate, but the building does not compete with Class A at the same price. 	<ul style="list-style-type: none"> --Competing for tenants requiring functional space at rents below the average for the area..
WASHINGTON D.C. OFFICE SPACE PROVIDER	<ul style="list-style-type: none"> --prestigious location --significant square footage in comparison to other area buildings. --They commonly feature the newest and most attractive construction --maintained by a professional property management company. --combination of premier amenities, --Class A buildings attract the highest quality tenants. --High-visibility location --Convenient access --Modern design features --Large central lobby --High ceilings --State-of-the-art elevator, HVAC and wireless technology --On-site parking 	<ul style="list-style-type: none"> --average to above-average space with quality management and full functionality, -- located in the suburbs or on the outskirts of important business districts. --generally built more than 10 years ago, --rent for the average price for the area --may show signs of age-related wear and tear. T --Does not offer the same high-quality fixtures and finishes as Class A space. 	<ul style="list-style-type: none"> --Functional space at a rental rate below the average for the area. --Typically older than 20 years --Located in less desirable areas --Need of renovation. --Building architecture, infrastructure and technology are outdated.

Figure 6 Inherent issues in the way we assign value to older buildings
Image by Author

One of the only ways the American economic sector has chosen to favor extending life cycle instead of ending and beginning anew is through the 1976 Federal Historic Tax Credit Program. Within the time of the Global Energy crisis in the 1970's Americans sought for a way to deal with change and to make financial incentives to keep buildings from being torn down. Providing an opposition to the early twentieth century incentive for shortening life cycles, the tax credit now gave dollar for dollar on money owed to the government for taxes leading the building industry to pursue projects that involved historic buildings they would have otherwise dismissed. Leveraging over \$73 billion in private investment so far, the program has proved valuable in extending the lifecycle of important building in the United States¹¹. Local municipalities are now adopting incentives but these solutions remain minimal. Preservationists have struggled and continue to struggle in a consumerist culture that is all about the bottom line. Well respected preservationists such as Donald Rypkema have founded economic institutions called PlaceEconomics in attempt prove that keeping buildings from falling into obsolescence. With an increasing demand for hard numbers, why shouldn't architects play by the rules to better define obsolescence.

Understanding Product Obsolescence

Studying architecture for what the American society has rendered it is a critical exercise. Theodore Levitt has developed a way to "Exploit the Product Lifecycle" to

¹¹ National Park Service. "National Park Service Reports Historic Investments in 2014 Federal Historic Preservation Tax Incentives Program." News release, September 15, 2015. About Us. <https://www.nps.gov/aboutus/news/release.htm?id=1740>

achieve a successful product life¹². Architecture is not a product to be sold like other goods but when the market continues to treat it like it is, it becomes important to understand these subjectivities. Obsolescence is the last part of the life cycle. Levitt describes product life cycle in 4 stages: market development, growth, maturity and decline (Figure 7). Can architecture be applied to this? Yes, but what causes the decline?



Figure 7 Levitt's Product Life Cycle Theory

Levitt's most applicable ideas to architecture are those that include "life cycle extension" and "market stretching". In order to remain a viable product the product has to extend to other markets, use design and innovation to extend its life cycle and defer obsolescence.¹³

¹² Levitt, Theodore. Exploit the Product Lifecycle. Harvard Business Review. November 1962

¹³ Ibid 11



Figure 8 Levitt's Product Lifecycle Extension for Nylon

Essentially every adaptive reuse project aims to have “subsequent extension of life cycle”. These extensions are where architectural creative comes into play. By using architectural creativity value is added to the building and it survives. How do architects add value? The next chapter will focus on the how architects have dealt with obsolescence in the past and how architects can begin to understand postwar buildings and thus the ways to extend their life cycle. This graph will serve as basis for the continued study and case study of post war buildings in the proceeding chapters.

Developing a New Graph

Using Levitt’s Method of Life Cycle as a base, we can develop a way to better understand as both architects and preservationists, why this is such a critical moment for these buildings. By mapping time and value, but considering value in larger

sense—beyond just economic value—we can begin to understand how value plays a role in the lifecycle of buildings. By using the Class A to B transition of office Space as the moment of Growth and generational benchmarks at every 25 years, we can begin to layout the lifecycle of these types of commercial buildings. As you can see, there is a critical moment that happens at 50 years. Currently, right now, is that critical moment of when both the definition of “historic” get attributed¹⁴ and when these buildings are coming to the end of their useful life, this need¹⁵ major renovation. This makes for a situation in which we are both attempting to assess the historic value of these buildings in a stage when we have to making a major investment in which invest in them (Figure 9).

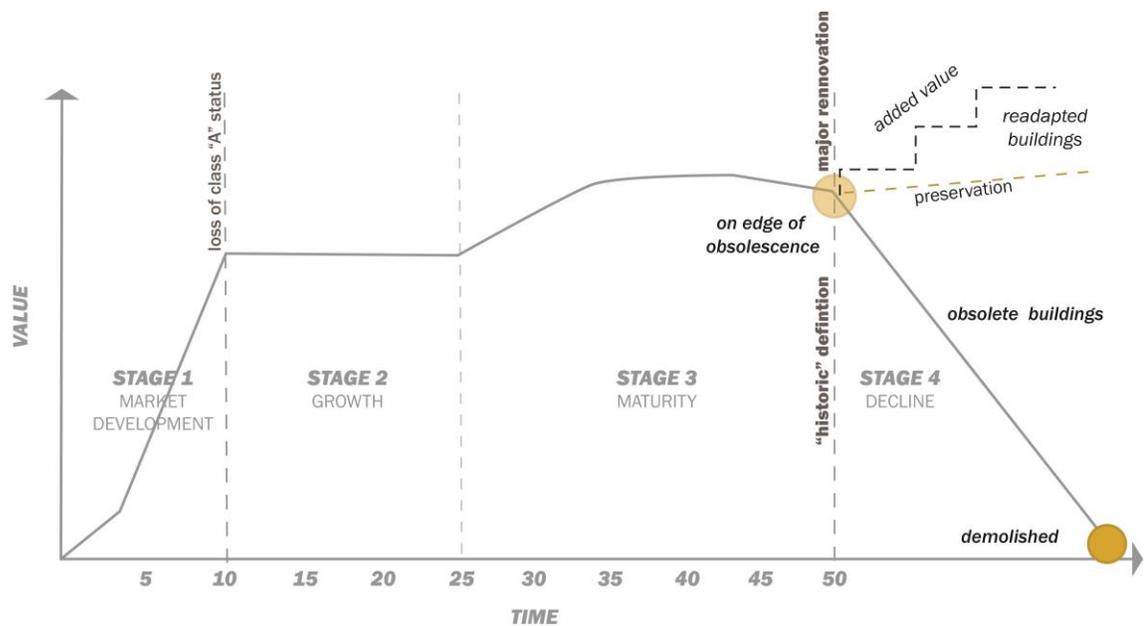


Figure 9 Critical Moment at 50 years for Postwar Buildings
Image by Author

¹⁴The Public Historian, Vol. 29 No. 2, Spring 2007; (pp. 81-103)

¹⁵ O'Connor, Jennifer. "Survey on Actual Service Lives for North American Buildings." Durability Service. October 2004. Accessed January 2016.
http://cwc.ca/wpcontent/uploads/2013/12/DurabilityService_Life_E.pdf

Looking at ways to add value, we can adapt buildings by adding value. I will introduce ways to add value in the proceeding chapters. We can preserve them, which would mean value would already to high enough to sustain not adding any additional value at the current moment but high value would endure to allow the building more years. And finally, we could choose to not add value in which the building would fall into obsolescence and would eventually be demolished. Adaptive reuse allows us to add value in order to ensure these buildings have an extended lifecycle. Post war buildings currently do not have enough value for us to preserve them thus we, as architects, need to be creative in the ways we adapt them by adding value. Value, much like obsolescence has a range of meanings. As human beings, we have a range of values (Figure 10).

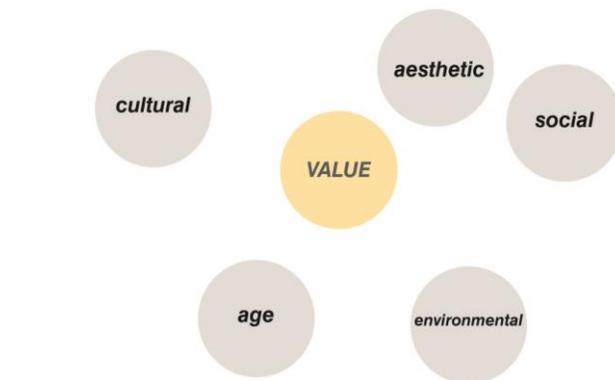


Figure 10 Range of Values in determining Value of Buildings
Image by Author

These values may be the principles in which we decide to base our lives on but they also may be something of worth, in which we decide is important. How to we add value to buildings in this critical moment of 50 years? We must first better understand what is not of value to better understand what we can do add value.

Post War Building Analysis

The following analysis aims to look closely at postwar concrete structures in Washington D.C. and around the country that are currently at the critical 50 year mark in their life. After an initial study of three demolished buildings around the country, it was evident that the focus of this thesis needed to be focused on more rectilinear shaped commercial post-war buildings. The main study examined 5 buildings of this more rectilinear type.

Initial Study of Demolished Buildings

Having looked carefully at Washington D.C. post war exposed concrete structures that are on the edge of being deemed obsolete, have been given life cycle extension and those who are stagnant, it was critical to look at those buildings that have been lost and try to assess why. Although many building across Washington D.C. are on the tipping point not many of them have been demolished but have plans to be. The following analysis was completed on three building of the post-war era recently demolished in Washington D.C., Baltimore and Chicago. The Third Church of Christ Scientist in Washington D.C, the Mechanic Theater in Baltimore and Chicago Women's Prentice Hospital in Chicago.

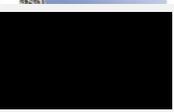
	FORM	CONTEXT	NEW BUILDING	3D AERIAL VIEW	rationale for demolition
Third Church of Christ Scientist	 I.M. Pei & Partners with Cousins as the lead architect construction started in 1966, finished 1971.		 Shalom Baranes Associates	 35 like-foot real estate later development to surround	"temporarily detached" glass tower achieved its intended purpose as a social gathering space for the church members. J. Garove Karpavich, a lay leader of the church, stated that, "That is not an inward-looking, inward origin. The building does not represent our theology or our beliefs." Built in concrete instead of limestone because of funding. A major flaw in the design of the auditorium is the electric lighting placed in the ceiling, four stories above the floor. The congregation is forced to erect costly scaffolding to replace exposed bulbs.
Prentiss Women's Hospital	 Bernard Goldberg started construction 1966, finished 1975			 proximity to white house later development surrounding	Floor plan does not accommodate modern technology for health care too much maintenance
Mechanic Theatre	 John Johnson finished in 1965			 proximity to waterfront later development surrounding	No one using it too difficult to incorporate into new design
SUMMARY	irregular form	near city's well known amenity/ amenities	newly proposed structures look eerily similar to each other DC structure uses concrete- esque facade to look like neighbors.	short in comparison and object like	problems with maintenance and "design vision"

Figure 11 Initial Demolition Study

Image by Author with collection of pictures from Google Images and by Author

General Summary

All of the post war exposed concrete structures that were demolished were of an irregular form which many of the owners argued were difficult to adaptively reuse. They were all located near each respective city's largest amenities: Washington D.C., the White House; Chicago, the Lake Michigan and John Hancock Building; and Baltimore, the Inner Harbor. The footprints of these buildings were comparable but generally smaller than the adjacent new construction. Most significantly they were very short in height in relation with their neighboring structures. They seemingly weren't capturing enough capital per their land value. These buildings were also very object like in the landscape and were therefore very unique from their context. All the buildings were replaced with similar looking buildings with glass. However the new building in Washington D.C. has attempted to mimic the exposed concrete frame building on the block.

After completing the analysis on the three structures that have been demolished within recent years, it was clear that because of this type of exposed structural concrete building has very specific and unique floor plan. This uniqueness of floorplan, proximity of building to the City's most important amenity and argument of loss of value ultimately led to the three buildings demolition

Post war Building Analysis in Washington D.C.

Methodology

After selecting 5 buildings in the Washington D.C. area that were built during the Post-war period and with a range of owners—government and private—I completed an analysis as to what features were the similarities and differences of these situations and do they reveal anything about what our society values? (Appendix I)

General Summary of Washington D.C. Analysis

The Buildings studied were a mix of public and private uses. They consisted of a range of sizable foot prints and square footage however the largest two buildings were public. The structures without retail were usually government owned buildings and were also the structures without current plans of redevelopment. 2/3 of the federal office buildings have extremely large setbacks leading to a deteriorated pedestrian realm. The Southwest district of Washington D.C. especially suffers from the aforementioned.

In their urban context most of the structures were clearly more rectilinear than their neighboring counterparts. They were all located fairly close to large scale green space except the FBI Building. They all were located close to a diagonal street as part of the

L'Enfant plan. They all had a corner condition and most were located near the mall or in the downtown core of Washington D.C. All the structures had some sort of piloti that created a concave pedestrian entry that was not easily identified by looking at the building. The Sunderland building was the building without fully peripteral columns surrounding the base, it was also the only one with a single entrance. Out of all the buildings, the Consumer Financial Protection Bureau(CFPB) was the only one with an interior courtyard however the FBI was intended to have an occupiable interior courtyard but was closed off, along with many of its entries and designed public space after the September 11th terrorist attacks.

In comparison the two buildings that have been significantly renovated have a noticeable amount of green space in comparison to the buildings that have not been. There were no security bollards in the private buildings. Most of the bollards seemed to create a more dramatic edge of where the pedestrian was and was not allowed. All of the structures had deep set windows on their facades. Their facades clearly delineated repetition and rhythm however the Sunderland building was the only one that truly expressed verticality; all other building expressed horizontality. The FBI and CFPB were the only two buildings with interplay of form expressed on their facades; all other buildings were clearly box-like.

In general, not many of these building have much green space. They have a lot of hardscape. The buildings with the greenest space are the Sunderland because of its adjacent historic property with much greenery and the CFPB which actually has grass wrapping the corner of the site. The structures have a range of square footage with the FBI being extremely large and the Sunderland building being the smallest. The two

federal buildings have the largest amount of square footage. Only one of the five buildings does not have a parking garage confirming the importance of automobile in their initial development. Most of the structures are precast concrete with a few elements that seem to be cast in place concrete. The only building that may be site cast would be CFPB. Large firms such as SOM and Gensler are the ones completing the renovations of these buildings and the current CFPB is under fire by the media for its renovation being largely over budget¹⁶.

Renovations

The proposed renovations are of particular interest. The Consumer Financial Protection Bureau building is currently under intense scrutiny for being grossly over budget. At \$316 per square foot, double that of \$150 per square foot of renovating a Class A office building, there must be some issues causing the increased budget. SOM has attempted to conserve the concrete exterior, update and bring the glazing forward to capture more space. They focused on interconnectivity of space and light between floors by using multiple light well and solar reflectors. They propose new use or program to the space by creating a childhood care center. They captured more usable space on the roof for this program. They propose to update the corner entry and provide a sustainable interior courtyard with more furniture, green space and shade. They have updated the site materials to have more color and are striving for a LEED Platinum project.

¹⁶ Pollock, Richard. "CFPB Delays Renovation of Its Pricey Headquarters, Adding Millions More to Cost." Washington Examiner. October 21, 2014. Accessed January 2016. <http://www.washingtonexaminer.com/cfpb-delays-renovation-of-its-pricey-headquarters-adding-millions-more-to-cost/article/2555059>.

The Sunderland Building only received updates to its lobby space and restrooms. The company that completed the restoration, Envision Architects, was acquired by Perkins + Will and have yet to get back in regards to any information they have.

The Motion Picture Association of America Building renovation is being completed by Gensler. They are proposing to move its glazing to the exterior of the column, recovering its concrete exposed frame with limestone paneling, encasing its ground floors in glass, possibly adding retail, recapturing space on the roof and updated to all mechanical, electrical and plumbing systems.

The FBI building has been severely changed on the exterior due to security concerns. Civilians were once able to use the pedestrian walkways inside the building and interior courtyards but since September 11th, the area is restricted. Most entranceways are now closed off and there seems to be only one secured entry in and out of the building.

Precedent Analysis

It was clear that after completing the above analysis, it was critical to look at one project that adapted a post-war concrete building.

Alice Tully Center at Julliard

The Alice Tully center at Julliard is a critical precedent to analyze. New York's Lincoln center developed in a similar way to Washington D.C's L'Enfant Plaza but is different in many ways and arguably way more successful. The Alice Tully School at Julliard was developed in 2009 by Diller Scofidio + Renfro after winning a competition for the renovation of the Julliard School in 2002. The project was an adaptive re-use of Pietro Belluschi's, and associate architects Helge Westermann and

Eduardo Catalano's 1969 brutalist concrete structure clad in travertine. Similarly to the way Southwest Washington D.C., which I later investigate as the case study for this thesis, was a large scale redevelopment, so was Lincoln Center.

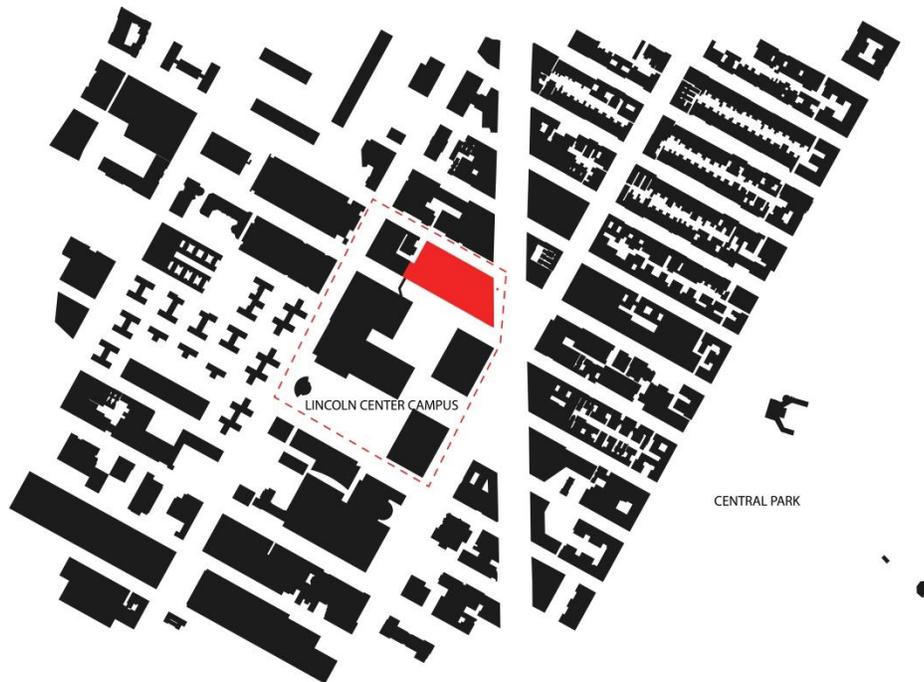


Figure 12 Lincoln Center Campus & Alice Tully Building in New York City

The Lincoln Center development razed 14 blocks of the San Juan Hill and Lincoln center neighborhoods¹⁷ just like Southwest redevelopment razed 99% of its building stock and displace thousands of lower-income African American families¹⁸ due to funds given by the Federal government for inner city redevelopment and slum clearance¹⁹. Similar to the way the Redevelopment Land Agency was to redevelop in Washington D.C, the Mayor's Slum Clearance Committee in New York had large goals for the area. Lincoln center would become a cultural center while Southwest's high aspirations of a multi-use place ultimately missed the target on becoming a

¹⁷ Lincoln Center for the Performing Arts. History of Lincoln Center: The 1950s. 2014.

¹⁸ Jaffe, Harry and Tom Sherwood. Dream City: Race, Power, and the Decline of Washington, D.C. New York: Simon and Schuster, 1994. Page 82

¹⁹ Title 1 Housing Act 1949

destination in to Washington D.C. Much like L'Enfant plaza the large scale buildings of Lincoln Center drastically changed the urban context.

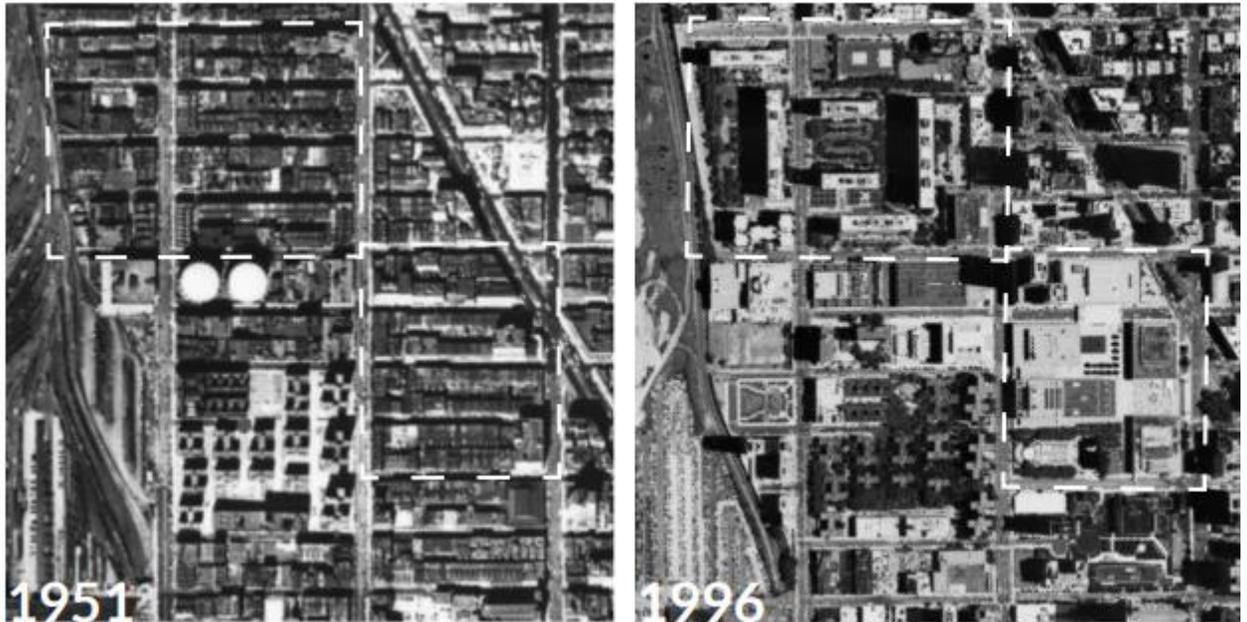


Figure 13 Dense Urban Fabric Before the Lincoln Center Development and After
Image courtesy of Arica Thornton and Google Maps

The original design of the building was built during a time, according to Richard Scofidio, that streets and culture did not mix thus the building was built on a plinth and thus reestablished a new pedestrian right of way²⁰ that would be connected to Julliard school by a 200 foot pedestrian bridge raised above the street level. The already pressing issue of visibility of the Julliard school was made even worse when the Morse addition closed off the 66th street entrance²¹

²⁰ Diller, Elizabeth and Ricardo Scofidio. *Morphing Lincoln Center* Jorge Otero-Pailos. University of Minnesota Press, Summer 2009..43

²¹ Thornton, Arica. University of Maryland

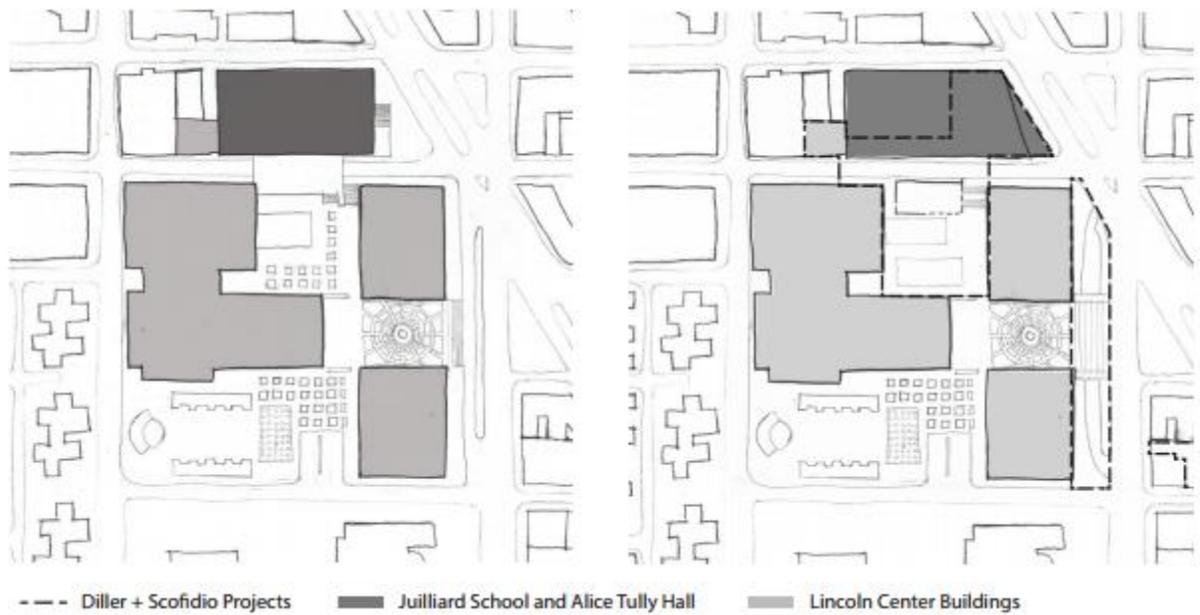


Figure 14 Proposed Design Changes for Adaptive Reuse of Alice Tully Hall
Image courtesy of Arica Thronton

The renovation was executed through their design ideals of bringing the “outside in and inside out”²² while carefully extracting the DNA of the site to create a “seamless change”²³. The site readjusted to the pedestrian along the main street thoroughfare and reestablished an open relationship with the city by eliminating the plinth and creating an urban plaza. The architects used words such as amputate, graft, extend and open throughout their description of the design process.

²² (Diller Scofidio + Renfro 13-15)

²³ Ibid 15



Figure 15 Original Alice Tully Hall

Image by Diller, Scofidio & Renfro

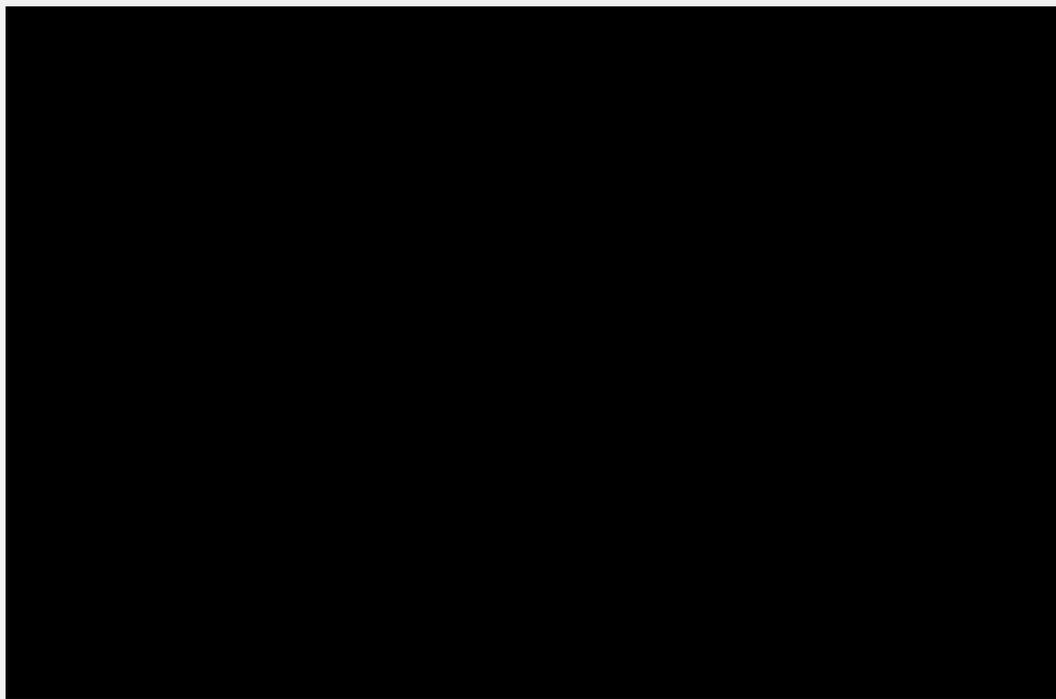


Figure 16 Image showing the Elimination of Exterior Staircase and Readjusting the Ground Plane to meet the Street

Image by Diller, Scofidio & Renfro



Figure 17 Image showing the Extension of the Building to Hold the Street Edge
Image by Diller, Scofidio & Renfro



**Figure 18 showing the clip of the new extension to match street edge and the glass to reflect the
Hall's new sense of openness to the pedestrian and NYC**
Image by Diller, Scofidio & Renfro



Figure 19 Alice Tully's Final Design by Diller, Scifidio Renfro from the Corner Hall Image by Mark Bussell

The adaptive design also adds more glass and creates series of dynamic protrusions at the entry, something that had been lack luster in the original design. The two facades are merged by overlapping the rhythms of the opening and transitioning between the new and old.

The Lincoln center is also full of hardscape much like Southwest Washington D.C. To mitigate this issue Diller, Scofidio and Renfro added program to the once unused interior urban plaza and added green space the roof, added new use and an urban park to the Lincoln Center campus. The green occupiable roof is a rare patch of green in this area and has been extremely successful



Figure 20 Newly added Program and Greenspace in Plaza

Image by ARI Burling Photography

Design Goals

The aforementioned analyses have set up a design context for post war exposed concrete life cycle. The analyses have highlighted both issues with value and how architects have tried to add value back to these buildings in order to adapt them.

1. Urban & Program
2. Architectural
3. Social
4. Deeper issue of adaptability

Urban and Program Principles

On the urban scale there were many issues with the post war movement but the most pressing are those that involve the pedestrian. There is also an issue with green space. Geometry of the box is often rigid to directly apply to the larger urbanistic moves surrounding the building. There is also an issue with use, large urban plazas need to be anchored with something and the buildings that have retail activity on the first

floor are most apt to get an extended life. These are some of the issues on the urban scale:

Improve pedestrian scale urbanism by creating openness and transparency
Incorporate more green space and less hardscape
Shorter heights make buildings of this area up for discussion of demolition
Large urban moves should respond to context such as street geometry
Additional program should be considered

Architectural Principles

Architecturally there are also many issues. These buildings seem to not show their entrances very clearly. They have deep-set windows that don't allow light into the building. Concrete itself is not well maintained. The pedestrian realm is not well designed, is often in deep recess. There seems to be too much repetition of certain elements and not enough intrigue or hierarchy. The roofs are hardly ever used. There is no dynamic use of other materials, especially green or natural growing material.

These are some of the issues on the architecture scale:

Improve ground floor level design for pedestrian
Change way light is driven into building
Appearance of Concrete
Moments of intrigue along monotonous facades
Celebrated and clear points of entry
Fix divorce of building and green space
Additional program
Updates to HVAC technology and technical joinery

Social Principles

Socially these buildings in Washington D.C. and elsewhere around the country were product of redevelopment that uprooted thousands of families and demolished historic building stock. It is critical for these buildings to be inclusionary in their use.

Social principles of inclusion and community to drive design

Improve public spaces and plaza to foster relationships

Adaptability Principles

By extending the life cycles of these building we are negating full scale building obsolescence. However it is critical to keep in mind the ability for new proposals to be flexible in their use. After employing Levitt's theory it is critical to understand that we need to adapt these buildings to add value because these buildings currently do not hold enough value to just preserve them.

How do we adapt these buildings?

After looking a range of theories including Stewart Brand, Archigrams Plug-in City, Sir Alexander John Gordon, and current trends, a clear theory about ways in which we design buildings in regards to lifecycle became clear. Architects in the past have thought about building life and obsolescence in three ways (Figure 21): 1. Architects fully understand that their design will not last forever and will be demolished. 2. Architects try to design beyond their time and create something so valuable to society that it endures 3. Architects use a design as an adaptable scaffold in which the design is inherently flexible.

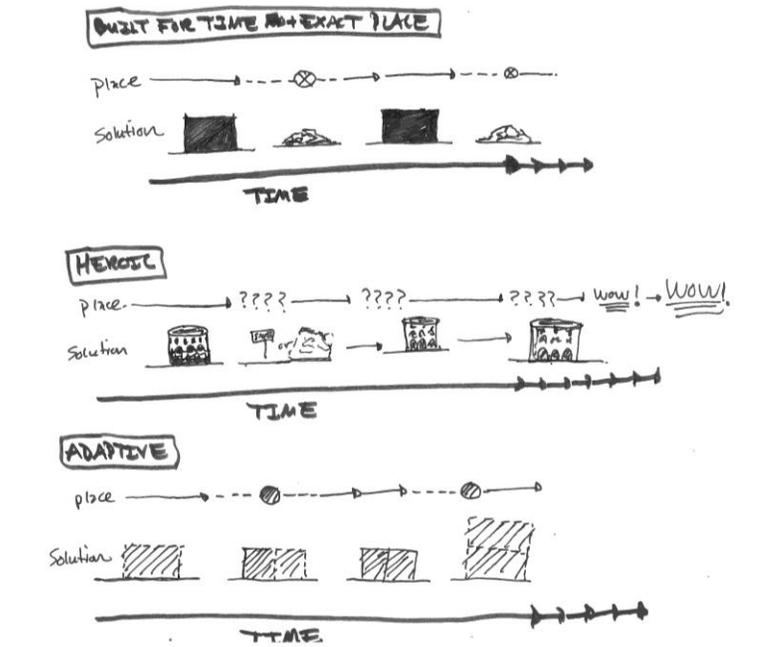


Figure 21 Architects Initial Design Approach Considering Obsolescence
Image by Author

Investigating specifically Stewart Brand's Theory on How Buildings Learn²⁴ it is critical to understand that all architecture has layers that operate at different rates of change. Architecture has layers that include site, structure, skin, services, space and stuff. For this investigation, I will only be considering the first 5 layers Brand discusses (Figure 22)

²⁴ Brand, Stewart. How Buildings Learn: What Happens after They're Built. New York, NY: Viking, 1994

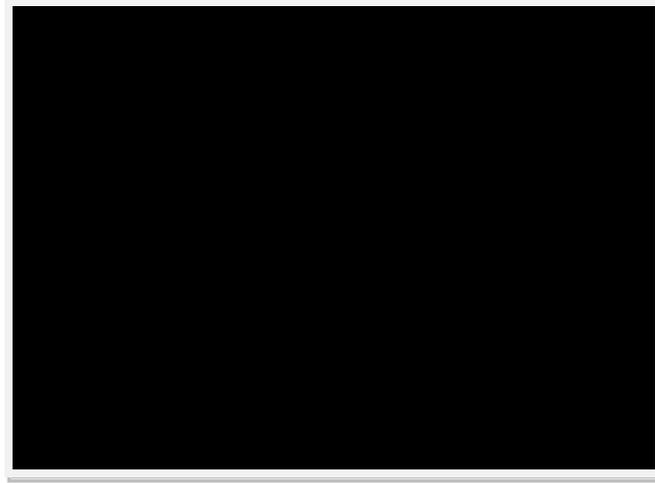


Figure 22 Stewart Brand's Theory on How Buildings Learn which Incorporates Rates of Change

Post war concrete buildings are different than other buildings in many ways as we know. Why do we especially think of these buildings as being unadaptable? Using Stewart Brand's Theory and research from a variety of sources to figure out rates of change related to this specific type of building, I mapped out post-war concrete buildings in Washington D.C. in order to understand post-war building according to Stewart Brand's Theory (Figure 23).

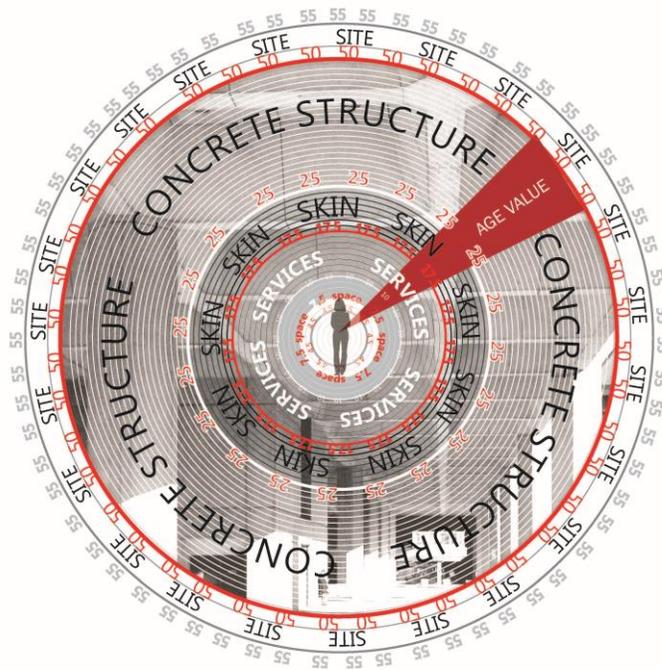


Figure 23 Washington D.C. Post War Building Layers and Rates of Change
Image by Author

Each of the layers is represented in the above diagram from Site to Space, showing the layers with the longer rate of change to the shorter rate of change respectively. Each white line on the diagram represents one year. The Site layer was determined by the current plans for the Southwest Washington D.C. to establish the Southwest EcoDistrict in which it plans to completely redo the 1960's plan for Southwest, making the rate of change of the Site layer 55 years. The Structure layer is operating at a rate of change between 25 and 50 years²⁵. The Skin layer is based on an average warrantee of 17.5 to 25 years but extending to 50 years for concrete. The Service

²⁵ O'Connor, Jennifer. "Survey on Actual Service Lives for North American Buildings." Durability Service. October 2004. Accessed January 2016. http://cwc.ca/wp-content/uploads/2013/12/DurabilityService_Life_E.pdf. and Hartnett, Kevin. "For Concrete, Climate Change May Mean a Shorter Lifespan - The Boston Globe." BostonGlobe.com. October 12, 2014. Accessed Jan 18, 2016.

layer is also based on an average warranty of commercial service or HVAC equipment. The Space layer is based on the average commercial lease in Washington D.C. at 7.5 years. And finally the individual in an office setting according to the Department of Labor is 4.6 years because that is rate at which people change jobs²⁶. After this attempt of mapping out these building layers in similar fashion to Stewart Brand, it was clear that not all the layers run concentrically. The buildings layers in post-war buildings actually overlapped making it clearer as to why people think of these building as unadaptable (Figure 24).

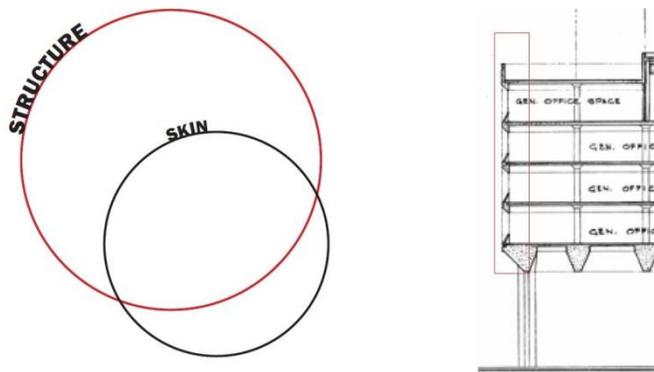


Figure 24 Structure Layer may also operate at the Skin Layer in Post-war Buildings
Image by Author

When the skin layer is also the structure layer for example in the above diagram, the depicted perimeter loaded façade system cannot be changed readily despite its nature as a precast system in which clips can be unclipped and removed. Instead, if one was to remove the façade, additional support would have to be employed at the slab edges for support because the skin system is load bearing. The fact that many of these rates

²⁶ Bureau of Labor Statistics. U.S. Department of Labor. "Employee Tenure in 2014." News release, September 18, 2014. BLS. Accessed January 2016. <http://www.bls.gov/news.release/pdf/tenure.pdf>.

of change are overlapped decreases the life of the layer that has the longer rate of change. This can be troublesome for these buildings because it does not allow each layer to operate on its own rate of change. Another critical layering issue is that of the structure layer and the service layer (Figure 25).

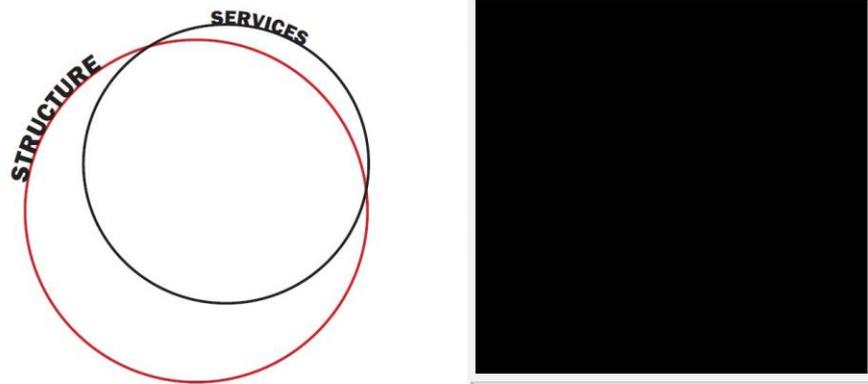


Figure 25 Service Layer Embedded in Structure Layer Making it Difficult to Adapt Service
During construction of Postwar buildings much of the electrical systems of the HVAC are either embedded within the structure or the structure is overdesigned at the moments in which it was to carry mechanical equipment, making the layers interconnected. This is troublesome because in order to get to electrical wiring you have to excavate layers of concrete, making the building less readily adaptable. Can we alter these layers so they operate independently? Instead of a group of interconnected layers, we can start to make them more adaptable by allowing them to operate on their own (Figure 26).

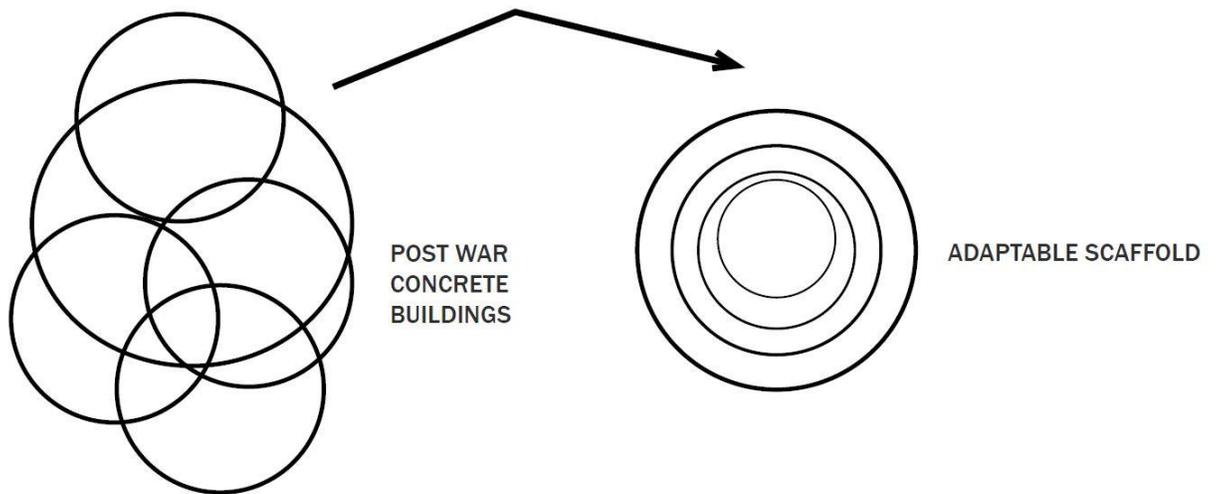


Figure 26 How we can make Post-war Buildings more Adaptable
 Adding Value and Making Post war Buildings more Adaptable

After considering the aforementioned analyses on both value and adaptability, it is clear that this thesis needs to incorporate ways to both add value and make Post-war buildings more adaptable. I will use the following 6 key elements (Figure 27) to focus on where value is currently lacking in order to provide added value and will also consider ways in which to let the Structure, Skin and Service layers of post-war building operate independently from each other.



Figure 27 Six Elements of Post-war Buildings currently not valued

By turning these six elements into valuable elements we can begin to extend the life cycle of these buildings at the current critical 50 year moment (Figure 9). However, this is also a complex problem for preservationists because these depicted elements that aren't working or aren't valued are also character defining features²⁷. This allows preservationists and architects to delve deeper into the original design intent of these building and to get creative in ways to adapt these buildings. We can begin to look at these 6 principles are find ways to add value (Figure 28).

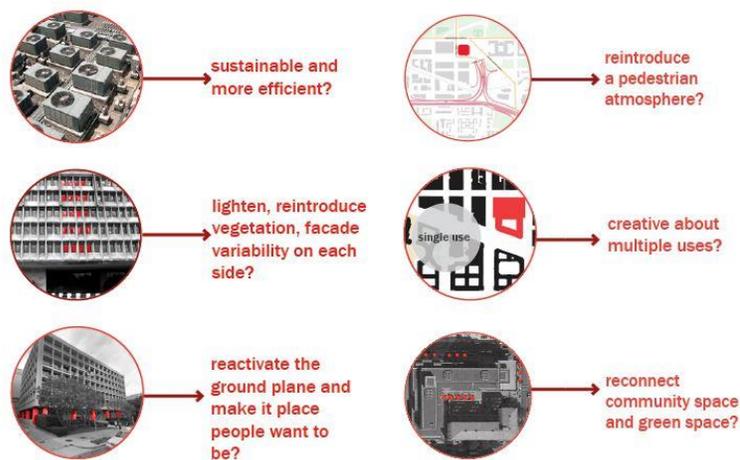


Figure 28 Adding Value to Post War Buildings

Using these six principles and keeping adaptability of the Structure, Skin and Services layers in mind, I will test how we can add value and make post-war building more adaptable using the James Forrestal Building in Washington D.C. as a case study in the proceeding chapters. The thesis will also attempt to look at addressing design of the 5 layers of: Site, Structure, Skin, Services and Space.

²⁷ Nelson, Lee H. "Preservation Brief 17: Architectural Character—Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving Their Character." National Parks Service. Accessed January 2016. <https://www.nps.gov/tps/how-to-preserve/briefs/17-architectural-character.htm>.

Chapter 2: Post War Building

Post-War Building Problem

After the Second World War, building in the United States boomed. Large scale innovation from war time efforts led to bigger thinking and more efficient building of homes, structures and infrastructure. Highways and large inter-passes soon jammed into the cities and large scale federally-funded redevelopment was happening all over the country. Currently, 55% of all of the United States non-residential building stock was built during the post war period²⁸.

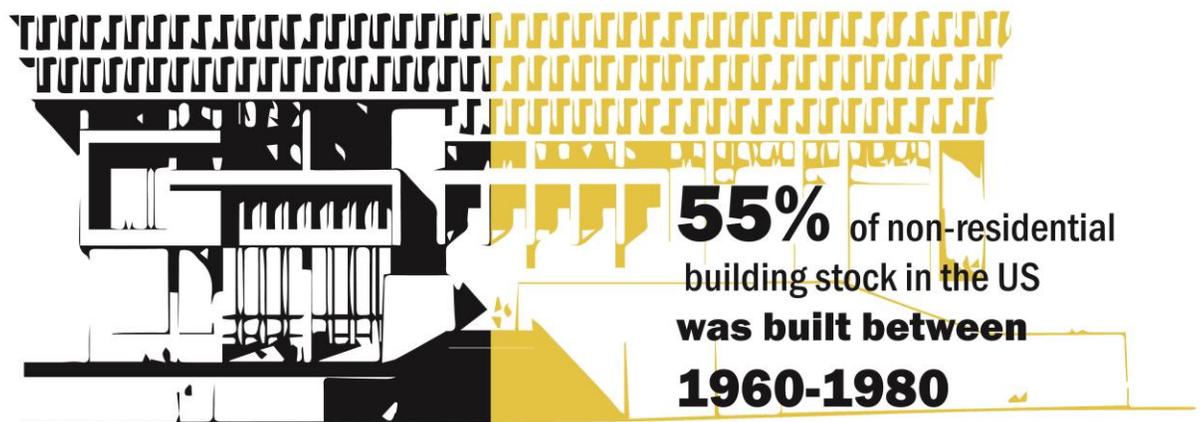


Figure 29 High Number of Commercial Buildings were Built in the Post-war Period
Infographic by Author

²⁸ Smith, Baird, and Carl Elefante. "Sustainable Design in Historic Buildings: Foundations and the Future." APT Bulletin of Preservation Technology 40, no. 3-4 (2009): 19-26. Accessed December 18, 2015. APT Bulletin Index

Beyond the typical historic preservation argument of preserving buildings from significant points in architectural and American history there are a range of factors that will be discussed. First is simply the environment. With over 36 billion square feet of material to either renovate or demolish, which could be the equivalent of dumping 49 Mannhattans into a landfill. Second is innovation, exposed frame concrete buildings were bold ad heroic and without these stepping stones, architecture would not be where it is today. Finally, is to not concede of the ability of creative thinking to continually adapt and extend the lifecycles of buildings to not promote a throwaway culture whose cycle of obsolescence is extremely small in comparison to other countries around the world

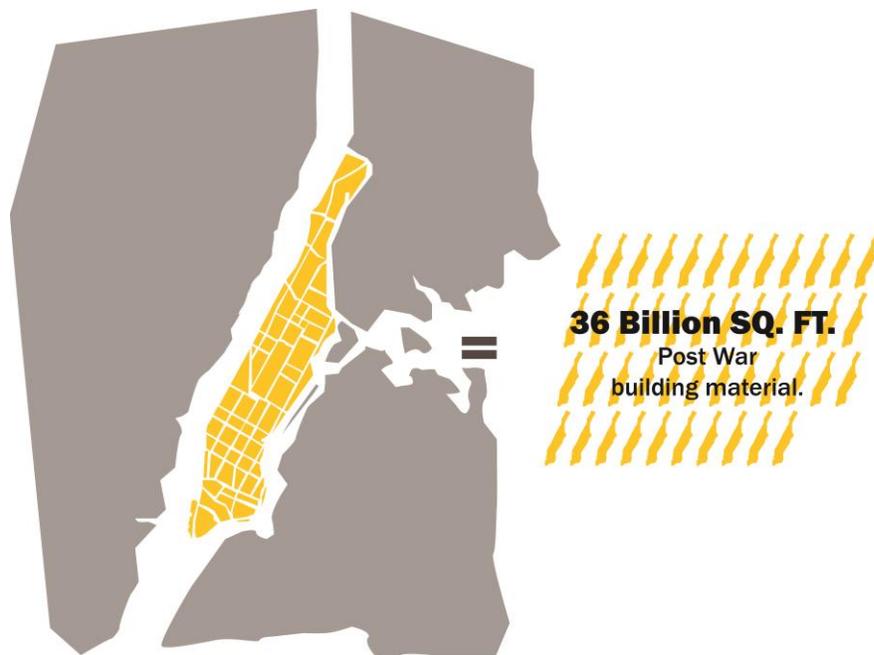


Figure 30 Amount of Building Material to End up in Landfills if We Don't Adapt Post-war Buildings

Infographic by Author

Concrete in DC

Many factors result in the great number of concrete structures in Washington D.C. Early innovation of concrete, local legislation, cost-efficiency and eventually large-scale, building by the Federal government lead to concrete being a major part of Washington D.C's identity. In 20th century Washington D.C., local, John J. Early became famous for his innovations in concrete. He was well-known for his artistic and research developments including and his Step- Gradation process concrete from 1915-1945 a period that would set up the post-war movement in Washington D.C. Early is especially known for his well-crafted aggregate mixes and concrete designs. He was an early designer of precast concrete in a sculptural and artistic way; the highly ornamental panels on the Baha'i House of Worship in Wilmette, Illinois depict his detailed craftsmanship. Early believed in high aesthetics of monolithic design, "forms for the structural concrete. It is poured into them, it is one with them, they are part of the designed thickness of the wall or the floor. They are not a veneer²⁹." Views similar to Early's were happening across the world during this time. Architects were looking creatively at concrete in attempt to push beyond its structural properties and into its design properties. Le Corbusier's famous Unite d'Habitation in France had recently become popular for its "beton brut" ideal. Using the formwork to create a texture concrete became well known for its rawness and transformability. Stemming from a distrust of political movements and architectural ideals before the war, British

²⁹ Aument, Lori Renée. Experimentation in concrete : John J. Earley at Meridian Hill Park, Washington, DC : history, technology, and characterization of exposed aggregate concrete. 1999, Master of Historic Preservation Thesis. 28

architects such as the Smithsons, “strived to create an architectural style focused on the simplest of ideas, human needs.³⁰ Brutalist structures utilized “an unyielding emphasis on structural clarity, spatial simplicity and material presence”³¹ Brutalist structures in the United States are often made of exposed concrete, appear heavy in their massing, contain broad expansive surfaces—usually with recessed windows voids thus creating a more monolithic form³². Architects around the world were stepping away from their immediate predecessors these each generation like many before them feel “a new dissatisfaction and conceives a new idea of order. This is architecture”.³³ Banham recalls the Smithsons 1957 article on New Brutalist planning as the idea of “accepting the realities of the situation” and discusses the movement’s attempts at recognizing the pedestrian however today, brutalist buildings are often known for their poor urban design. Regardless post-war building in Washington D.C. was rooted by a local craftsman and innovator but supported by an increasing popular style being used around the world

Height Act and Other Rationale

The 1899 Height Act set a construction limit of 90 feet or 7-8 stories tall in much of DC. The Act restricts height so that no building can be more than twenty feet taller than the width of the street that it faces³⁴. For tall building, steel is more economical however if Washington D.C. the height limit has often kept steel structures from

³⁰ D.C. State Historic Preservation Office. Determination of Eligibility Form. James Forrestal Building for Forrestal p 7

³¹ Stephen Sennott, *Encyclopedia of Twentieth Century Architecture*, (New York: Taylor and Francis Group, 2004), 181

³² Marcus Whiffen, *American Architecture since 1780: A Guide to Styles*, (Cambridge: M.I.T. Press, 1969), 275-279.

³³ Banham, Reyner, *A New Brutalism*, p. 64

³⁴ "Zoning in the District of Columbia." Zoning DC. http://dcoz.dc.gov/dcoz_brochure_013111.pdf.

being used which has historically rendered concrete as the more economical solution for a smaller floor depth with more room overhead to sell as ceiling height. Concrete also requires no additional fireproofing which is an additional cost savings. Post- War Washington D.C developed parts of downtown, parts of Philadelphia Avenue and Southwest in concrete because of these cost savings and accepted stylistic preference. The Federal government was building large buildings to hold its growing staff after government expansion as a resultant of the New Deal ideology. Big government meant big buildings. The federal government is quoted in many design proposals as wanting to cover new building in marble or limestone but for cost reasons settled on concrete³⁵. The Commission of Fine Arts, which is the approval body for design in Washington D.C., was under fire during the post-war period after stone lobbyists were making no money due to the amount of exposed structural concrete material desired by a new generation of modernism in Washington D.C³⁶.

Concrete

After World War II and major developments in the design of concrete especially reinforced and high strength concrete, lead to it becoming a more common building material. Many structures around the United States were using concrete not only for its practical and cost-effectiveness but also for aesthetic qualities. There are three general types of concrete systems: site cast systems, precast system and shell systems. There a range of different concrete structure types employed in these buildings (Figure 31).

³⁵ D.C. State Historic Preservation Office. Determination of Eligibility Form Determination of Eligibility For J. Edgar Hoover FBI and Determination of Eligibility for Forrestal Buildings

³⁶ Exposed Concrete Buildings Denting a Stone Wall Here. Von Eckhardt, Wolf. ProQuest Historical Newspapers: The Washington Post pg. G6 April 18th 1965

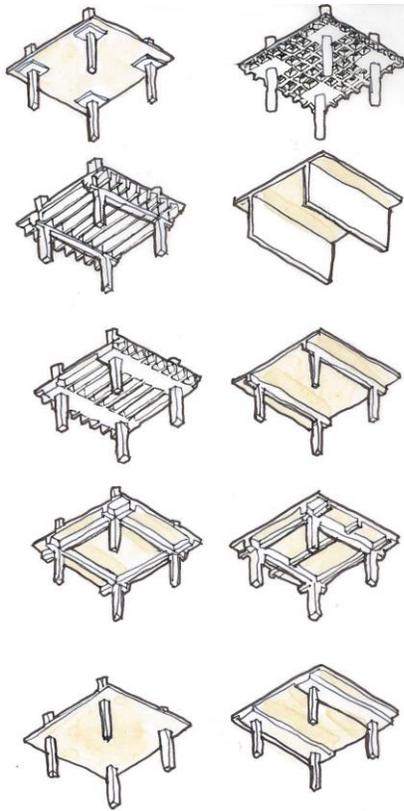


Figure 31 Example of Concrete Construction Types

Environment versus Exposed Concrete Structures

The structural systems of which are employed during the post war period vary. This thesis focuses on particular style of post war architecture loosely deemed “brutalist” in Washington D.C. Most of these buildings have an exposed structural frame. Many office buildings in Washington D.C. are typically flat plate concrete construction because of the variability in changing the skin of building and the economy of the structural system. However, buildings of key importance of this particular stylistic period (mid 1960’s and into the 1970’s) are usually built using exposed concrete systems. These buildings show their “bones”--harkening back to the aforementioned “structural clarity”. Many of these buildings suffer from exposing their structure to

the elements. There is no thermal barrier, which allows heat and cold to transfer directly from inside to outside. Maryland experiences mid to high number of freeze-thaw cycles per year (Figure 32). These cycles have a particularly negative effect on concrete as penetrates into concrete it freezes and slowly breaks down the saturated portion of the material. Spalling, staining, and cracking are also issues that may appear in historic concrete.



Figure 32 Number of Freeze-Thaw Cycles in Regions of the United States
³⁷

Studies around North American have also called out the increasingly harsh factors of the environment to be shortening the life of their concrete structures. Major cities

³⁷ Image downloaded from <http://www.stonedimensionsblog.com/blog/post.cfm/queries-and-quandaries>

such as Boston³⁸ and countries such as Canada³⁹ have completed analyses showing the factors the environment has on shortening the lifecycle of these concrete structures. The Boston related study completed by Northeastern researchers Matthew Eckelman and Mithun Saha said that 57% of Boston's concrete buildings were built in the Postwar period. Most of them were built to last 75 years but due to environmental factors such as carbonation and chlorination the lifespan of these structures is down to 50-60 years.

Washington D.C also has a great number of their concrete buildings in the downtown core built during the post-war period. These numbers were calculated by reading Washington Post Articles published during this period⁴⁰.

³⁸ Eckelman, Matthew, and Mithun Saha. "Urban Scale Mapping of Concrete Degradation from Projected Climate Change." Urban Scale Mapping of Concrete Degradation from Projected Climate Change. Accessed January 18, 2016.

³⁹ O'Connor, Jennifer. "Survey on Actual Service Lives for North American Buildings." Durability Service. October 2004. Accessed January 2016.

http://cwc.ca/wpcontent/uploads/2013/12/DurabilityService_Life_E.pdf.

⁴⁰ Using the following articles, I was able to establish the data reported. Report Analyzes 17 Office Buildings The Washington Post, Times Herald (1959-1973); Apr 13, 1968; ProQuest Historical Newspapers: The Washington Post pg. C8 and Midtown Office Pace Still Brisk: Office Building Pace Continues Strong in Midtown Area By John B. Willmann; Washington Post Staff Writer The Washington Post, Times Herald (1959-1973); Jul 26, 1969; ProQuest Historical Newspapers: The Washington Post pg. D1 and New Office Space Analyzed by WBR The Washington Post, Times Herald (1959-1973); Mar 25, 1967; ProQuest Historical Newspapers: The Washington Post pg. E5

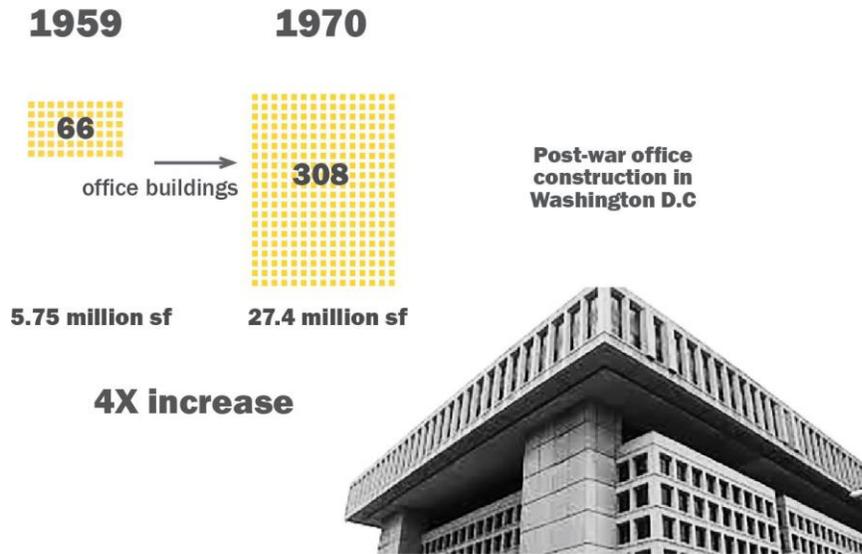


Figure 33 Post war Office Building Growth in Washington D.C. Downtown Core

Chapter 3: Southwest Washington D.C. Beginnings

Early Years

After the second World War the nation's capital, Washington D.C. went through many changes. After making large innovations for the war, planning in the post war period was also about making big moves. Washington D.C. saw redevelopment in many areas including Pennsylvania Avenue, downtown and especially in Southwest D.C.

At one time Native American land, Southwest Washington D.C. was acquired by the United States Federal government in 1791 almost in full from Maryland Plantation owner, Notley Young.⁴¹



Figure 34 Early Land Tracts of Washington D.C.

Image from Library of Congress <http://hdl.loc.gov/loc.gmd/g3851g.la002303>

⁴¹

Having been originally part of the New Troy land tract it was mainly agricultural and shipping lands. Southwest developed from a small farming community into an urban community consisting of mostly blue collar workers by the mid-20th century.

Southwest was always cut off from its northern counterpart by the National Mall and quickly developed into a distinct neighborhood.

Change in Post-War Washington D.C.

.After an increasingly growing federal government as product of the New Deal and World War II, more space was needed for Federal Employees in Washington D.C. President Roosevelt's \$142,000,000 plan to update Washington D.C. entirely changed the area's near and around the mall⁴². During the War, the mall and adjacent areas were home to "pop-ups" or temporary needed work and living space for federal employees. The constant need of more space around the mall led to ideas of redevelopment, especially in the historically lower income areas and "blighted"⁴³ of Southwest.⁴⁴ This area of time was especially critical in land use and regulation because of cases like *Berman v. Parker* (1954) allowing governments to exercise eminent domain to further the "health, safety and welfare" for its residents to promote a "common good".⁴⁵ Municipal redevelopments were also using Federal funds from the 1949 Title I of the National Housing Act to complete redevelopments around the country that razed wholesale blighted, and low-income communities. Southwest was

⁴² Jaffe, Harry and Tom Sherwood. *Dream City: Race, Power, and the Decline of Washington, D.C.* New York: Simon and Schuster, 1994. Page 82

⁴³ Bold' Plan for Southwest Urged by Building Congress'. *The Washington Post* (1923-1954); Jan 26, 1954; ProQuest Historical Newspapers: *The Washington Post* pg. 2

⁴⁴ Williams, Paul K. *Images of America: Southwest Washington D.C.* Charleston: Arcadia Publishing, 2005. p.8

⁴⁵ Stachura, Fred. "Zoning." Lecture, Preservation Law, Advocacy and Public Policy, University of Maryland, College Park, March/April 2015.

especially vulnerable. Directly adjacent to the National Mall and only steps away from the United States Capitol Building, made southwest a backdrop to one of the Nation's arguably most iconic places.



Figure 35 Southwest from Above⁴⁶

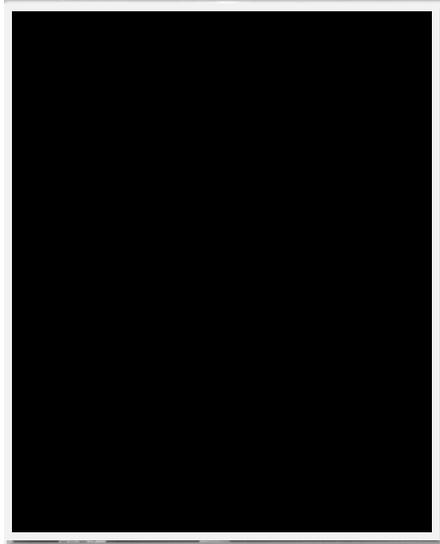


Figure 36 African American Women in bedroom with photo of FDR probably in hopes of something better for her community⁴⁷

⁴⁶ Library of Congress <http://hdl.loc.gov/loc.pnp/cph.3c39542>

⁴⁷ Library of Congress <http://hdl.loc.gov/loc.pnp/fsa.8b15291>



Figure 37 Picture depicting the importance of Southwest to look admirable in the backdrop of the Capitol Building also shown cut off from the rest of the city by the National Mall⁴⁸

Moreover after *Title I of the National Housing Act* was enacted in 1949, two thirds of the buying and clearing of the Southwest neighborhood would be paid for by the Federal Housing and Home Finance agency.⁴⁹

⁴⁸ Author highlighted. Base image from Library of Congress <http://hdl.loc.gov/loc.pnp/cph.3c39542>

⁴⁹Robert C Albrook, Staff Reporter. 1955. "RLA Votes to Give Webb and Knapp More Time to Complete Plans for Southwest Redevelopment." *The Washington Post and Times Herald* (1954-1959), Aug 09, 1. <http://search.proquest.com/docview/148675071?accountid=14696>.



Figure 38 1960 Sanborn with James Forrestal Overlay and red showing already demolished buildings⁵⁰

Under the District of Columbia Redevelopment Act of 1950 the Federal Government established the Redevelopment Land Agency and the National Capital Planning Commission to monitor the design and redevelopment of areas, specifically 442 acres⁵¹ of Southwest, that were deemed too congested or blighted. The redevelopment consisted of 500 acres that proposed housing for 5,000 families, Federal Office Buildings, A Civic Plaza and a neighborhood shopping plan⁵². There were many conflicting arguments for lower income housing and developments for higher income residents during the time⁵³.

⁵⁰ Coloring done by Author. Digital Sanborns.

⁵¹ Robert C Albbrook, Staff Reporter. 1956. "Some Property Owners Oppose Redevelopment as 'Unrealistic'." *The Washington Post and Times Herald (1954-1959)*, May 15, 17. <http://search.proquest.com/docview/148753139?accountid=14696>.

⁵² Robert C. 1956. "Southwest Redevelopment Indorsed by U.S. Agency." *The Washington Post and Times Herald (1954-1959)*, Mar 02, 25. <http://search.proquest.com/docview/148827231?accountid=14696>.

⁵³ Don Olesen, Post Reporter. 1953. "Five Urge Higher-Grade use of S.W. Redevelopment Land." *The Washington Post (1923-1954)*, Nov 13, 29. <http://search.proquest.com/docview/152604997?accountid=14696>.



Figure 39 Washington Post Image Depicting the Areas of Southwest Redevelopment⁵⁴

Redevelopment

The National Capitol Planning Commission was fairly modest in their first proposals only suggesting small interventions that kept middle and low-income families in the same place however Washington D.C. Building Congress and the local AIA adamantly supported a bolder redevelopment idea, The Justement-Smith plan that would include higher income resident priorities⁵⁵. Displacing thousands of families and business owners, many low and middle income families relocated to the Northwest and Southeast areas of Washington D.C⁵⁶. In the end the development ended up razing over 99% of existing buildings in the southwest quadrant of the

⁵⁴ 560,000 Additional District Tax Revenue Seen Possible by Architects. By Chalmers M. Roberts Post Reporter The Washington Post (1923-1954); May 21, 1952; ProQuest Historical Newspapers: The Washington Post pg. B1

⁵⁵ 'Bold' Plan for Southwest Urged by Building Congress
The Washington Post (1923-1954); Jan 26, 1954; ProQuest Historical Newspapers: The Washington Post pg. 2 and Architects Back 'Bold Plan' For Southwest
The Washington Post (1923-1954); Oct 16, 1952; ProQuest Historical Newspapers: The Washington Post pg. 30

⁵⁶ Ibid p,82

city.⁵⁷ Ultimately the residential areas of the redevelopment plan were designed by multiple modernist architects such as Cholethiel Woodard Smith and Charles Goodman, and were located south of I-395. The area just north of the I-395 became isolated from the city by severing it's tie with the southern part of southwest by highway development and the National Mall cutting off it connection to northern D.C.

The Zeckendorf plan was ultimately approved for the largest parcel north of I-39 near 10th street. The plan, created by Zeckendorf's New York based firm Webb & Knapp and involved widening 10th street to a 200 foot wide boulevard that would create a primary formal axis to the National Mall, and end with view of the waterfront and a proposed pedestrian bridge with retail and restaurants designed by Cholethiel Woodard Smith.⁵⁸ One of the main issue of the 10th street development was spanning across the railroad tracks that ran along Maryland Avenue and by 1960 Philadelphia based firm had come up with a solution that graded up toward the mall and the across the tracks⁵⁹ Many concessions were made on the part of the Commission of Fine Arts and Redevelopment Land Authority in regards to completing the 10th street mall quickly. These concessions included: more trees and extended water features along the 10th street mall, Woodard Smith's bridge, and no parking with Overlook park⁶⁰—leaving the mall, park and Southwest the isolated place it is today. The Southwest development project was delayed consistently by months and even years which often

⁵⁷ Jaffe, Harry and Tom Sherwood. *Dream City: Race, Power, and the Decline of Washington, D.C.* New York: Simon and Schuster, 1994. Page 82

⁵⁸ Luebke, Thomas E. *Civic Art: A Centennial History of the U.S. Commission of Fine Arts.* Washington, D.C.: U.S. Commission of Fine Arts, 2013.p. 249

⁵⁹ *Ibid* p.249

⁶⁰ *ibid* p. 250-252

gnawed at decision makers who were frustrated with the disruptions even leading to the Smithsonian giving up its 10th street location for the Air and Space Museum.

The Smithsonian & Southwest

Southwest and the Smithsonian have been tied together since their beginning.

Adjacent to each other, the Smithsonian Castle, the Smithsonian's most prominent icon sat directly across from Southwest—acting as an edge. The simultaneous growth of Southwest and the Smithsonian was troublesome. Both plans desired to utilize the area along the intersection of Independence Avenue and 10th Street. Wirth Committee of the National Capital Planning Commission was tasked with choosing whether the proposed air and space museum should be built at its location or carry on with the full execution of the already delayed Zeckendorf plan for Southwest redevelopment⁶¹.

Forrestal Building Development

Built between 1965 and 1969 the FOB 5 or The Forrestal Building was constructed for the Department of Defense. According the CFA, the Forrestal typified Washington D.C 1960's move toward expressive concrete structures that signified strength, monumentality and seriousness of purpose. Addressing the grade change along 10th street, while providing a gateway and edge to the National Mall was a difficult challenge. The process of building the Forrestal was extremely complicated especially between NCPC, The Commission of Fine Arts and the GSA. NCPC was fairly rational about what should be built but by the time the Commission of Fine Arts had completely turned over in 1963 to almost an entirely new boards of modern

⁶¹ D.C. State Historic Preservation Office. Determination of Eligibility Form. James Forrestal Building for Forrestal p 7

artists and architects (very different from their predecessors) Washington D.C. was looking to the future for a new type of architecture and urbanism in city.

As you can tell by Figure 40 the CFA was originally founded by some of the fathers of the historic preservation movement in the United States but then turned over to the hands of famous form makers such as Gordon Bunshaft from Skimore Owings & Merrill and even Eli Saarinens wife and great grandson of famous planner Daniel Burnham. There was a reawakening of the modern movement in Washington D.C. by these CFA members that mimicked this same movement around the world and especially in DC monumental and concrete architecture.

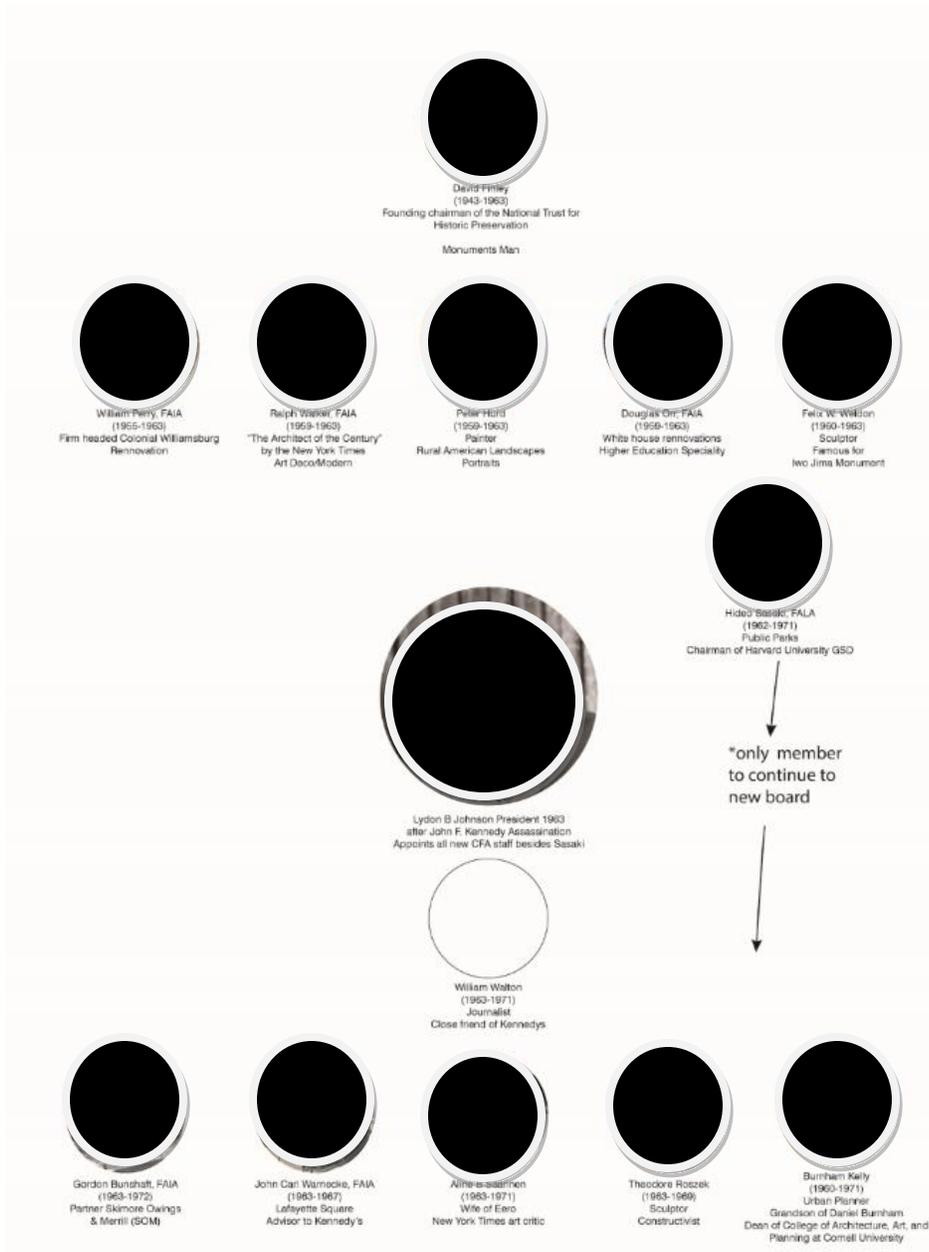


Figure 40 Commission of Fine Arts Transition from Traditionalists to Modernist after the Assassination of JFK
 Collection of Images by Author, other images from Google Images

The CFA at one point wanted to put no windows to preserve its monumentality but the Department of Defense and GSA fought back for windows to their office spaces⁶². Additionally the Forrestal Building was meant to be the next American Building type as spoken by Curtis, Director of the CFA, “The building must be completely different from any yet built there [Washington, D.C.], not for the sake of being different, but because it must be an honest and straightforward expression of new materials, systems and methods of construction not available to the builders of classical Greece. It would be an American building....”⁶³



Figure 41 The design of the 10th Street mall approved by city planners in 1961. FOB 5 was shown as four distinct buildings.⁶⁴

⁶² D.C. State Historic Preservation Office Determination of Eligibility Form. James Forrestal Building. p. 15

⁶³ Ibid. p.16

⁶⁴ Wilson, George. “At Long Last, Capital Gets Plan for New Mall on Tenth Street.” v

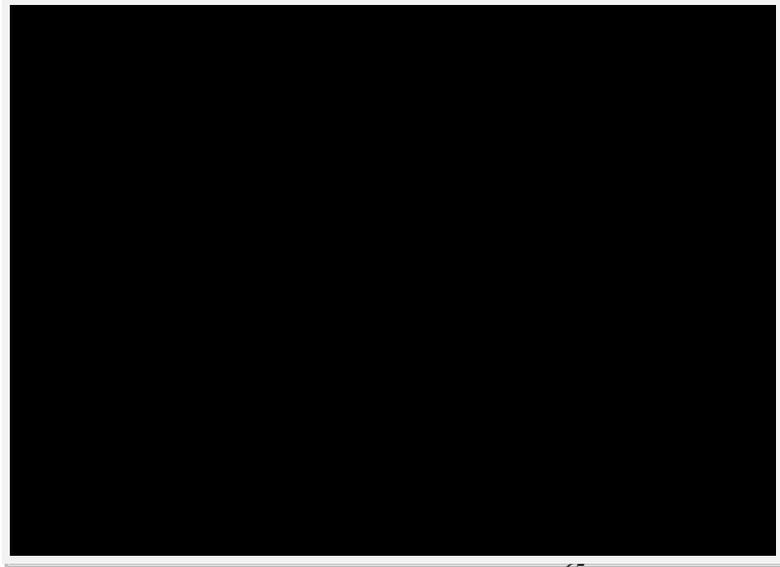


Figure 42 Early Model of FOB 5⁶⁵



Figure 43 Proposed Water Elements Passing Under the Elevated Block of FOB 5⁶⁶

⁶⁵ Stern, Laurence. "Elevated 'Junior Pentagon Plan Is Unveiled by GSA for SW Mall.'" Washington Post, May 13, 1962. <http://www.proquest.com>

⁶⁶ US Designs Floating Gateway for New \$39 Million Dollar Mall Building." Washington Star, May 13, 1962.

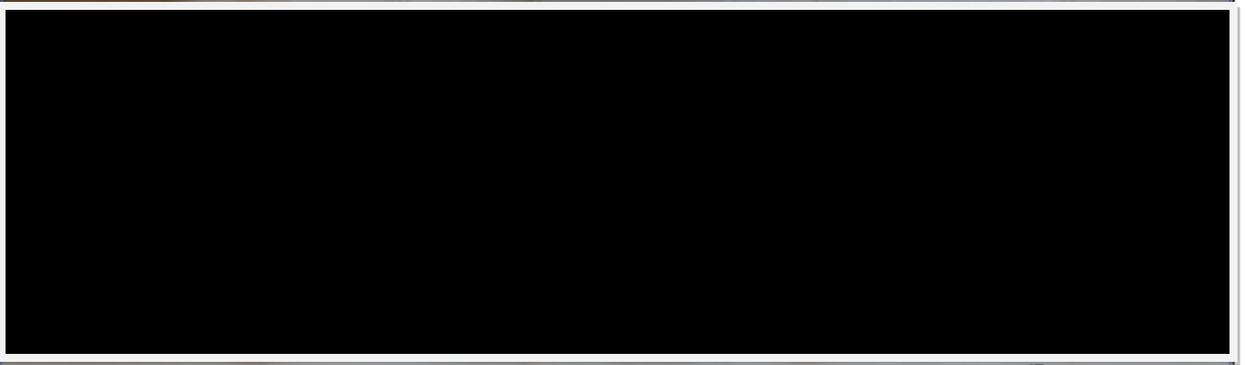


Figure 44 Proposed North Elevation in 1963 depicting a Pyramidal Glass and Steel Façade ⁶⁷



Figure 45 Proposed model with two adjacent flanking buildings ⁶⁸

⁶⁷ Curtis, Nathaniel. Proposed North Elevation. National Archive. Records of the Commission of Fine Arts, RG 66. April 17, 1963.

⁶⁸ Grad, Bernard J. Adventures into Architecture. New York: Arco Publishing Company, 1968



Figure 46 Proposed Pyramidal Glass Facade Glowing at Night⁶⁹

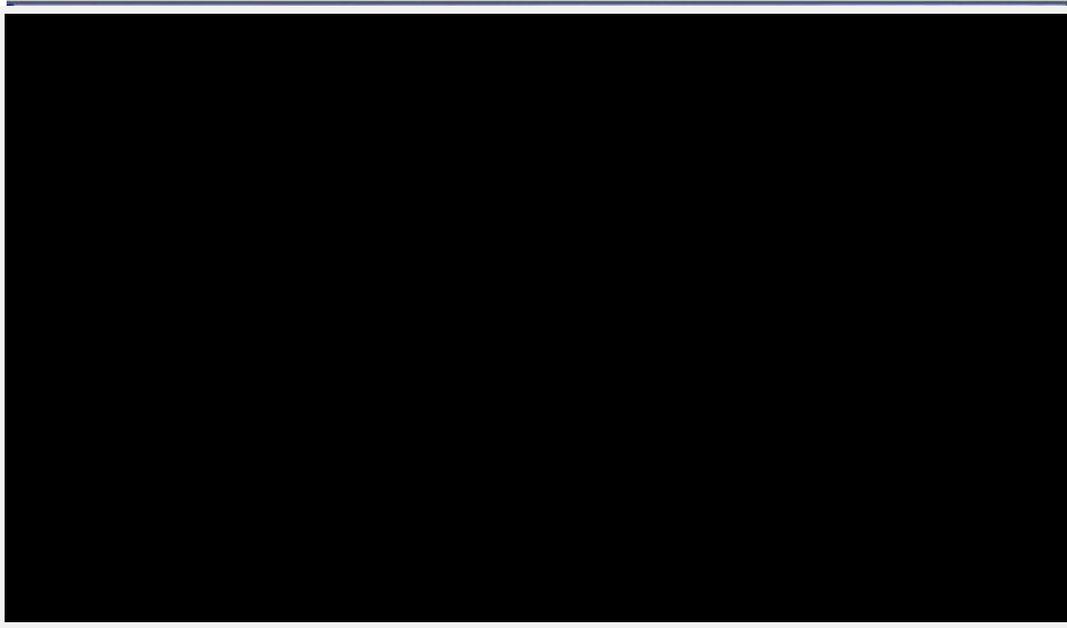


Figure 47 Final Proposed Design Model⁷⁰

⁶⁹ *ibid*

⁷⁰ "President Releases Plan for Complex on Independence Avenue." *Washington Post*. June 16, 1965.

Chapter 4: Existing Conditions at The James Forrestal Building

Why the James Forrestal as the Case Study?

Currently recuperating from a recent and still present economic crash of 2008, cities around the country are taking a second look at this large quantity of building stock and deeming it obsolete. Buildings such as Women's Prentice Hospital in Chicago, The Mechanic Theatre in Baltimore and Third Church of Christ Scientist have all felt victim to society's judgement on what is obsolete? Currently Southwest Washington D.C., one of the Nation's largest post war planning efforts, is on the edge of falling into obsolescence at its critical moment of 50 years. Two plans are proposed for the area. The BIG or Bjarke Ingels, a Danish architect, in conjunction with the Smithsonian has a new plan for their land directly to the north of site and NCPC's new proposal for an "Eco-District" that demolishes the James Forrestal Building to put smaller scale private and public buildings in its place (Figure 48). This is an idea site for the thesis because of its site prevalence but also because it is a key example and holds all the elements previously discussed in post-war buildings.



Figure 48 Red Depicting the Current Location of the Forrestal Building in the NCPC Plan to the left and the Smithsonian Plan to the right

This Chapter will discuss Existing Conditions of the Forrestal touching on the 6 key things that aren't valued about post-war building focusing generally on the five layers of: Site, Structure, Skin, Services and Space. This thesis will only specifically focus on the bar building that spans across 10th street. The other two parts of the building, both the large courtyard building and the smaller cafeteria will not be discussed,

Site Layer: Existing Conditions



Figure 49 Aerial view of Forrestal Complex ⁷¹

The Forrestal today is occupied by the Department of Energy. There have been changes to landscaping but other than that it, it still has its historical integrity. The GSA has recently looked into a Determination of Eligibility for the building and have

⁷¹ Color done by Author, Google Maps. January 2016

deemed it ineligible for the National Register of Historic Places. However, the GSA also has plans to demolish this building and build a new center for Department of Energy in its place⁷² making this determination troublesome. Briefly looking at the document it is apparent much of the statements on integrity are broad brush and small lacking design elements are given too much weight in declaring the building has lost its integrity.

Often seen as an ironic building for the Department of Energy the building is hated for its blocking of the Smithsonian castle and its lack luster gateway to the Southwest and riverfront.

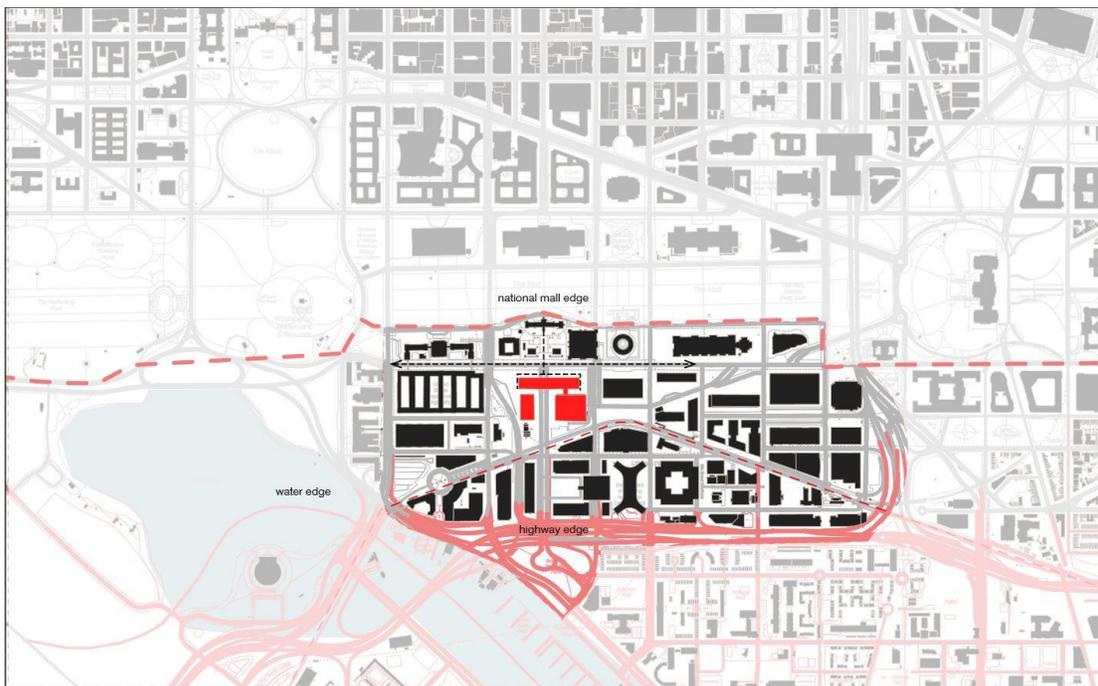


Figure 50 Figure Ground of Surrounding Context with Forrester Highlighted in Red
Image by Author

It is very apparent L'Enfant plaza differentiates itself from the rest of the city. It is segregated by the southeast and southwest freeway to the south and the National Mall to the North. The amount of open space around the builds is extremely large (Figure

⁷² NCPD Eco- District Plans

50). Southwest on a whole is home to many large buildings especially compared to neighborhoods in Washington D.C. such as the Capitol Hill Neighborhood (Figure 51).

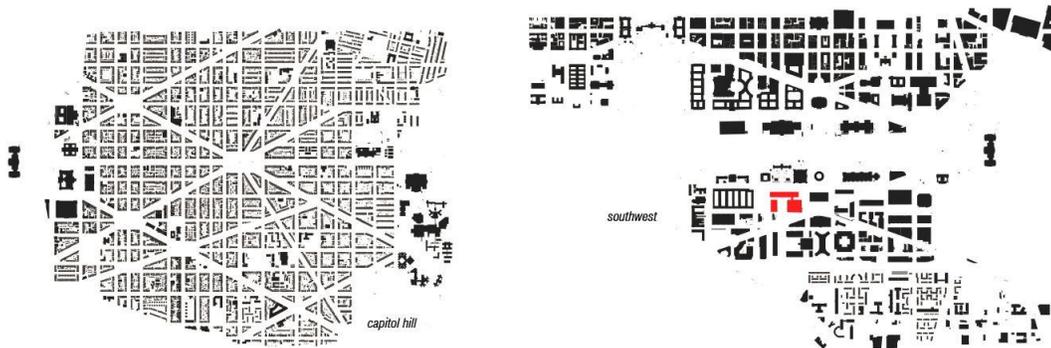


Figure 51 Figure Ground of Southwest compared to a neighboring Capitol Hill Community

The Forrestal Building remains an edge along Independence Avenue, blocking view up 10th street and back toward the Smithsonian Castle itself. The neighborhood is completely automobile oriented and is not pedestrian friendly. Only time pedestrian can be seen are during the morning hours heading into the building, lunch hours and at 5:00PM when all the Department of Energy employees are leaving for the day.

There is also no housing in the area, making the area completely uninhabited by 6:00 when all Federal office workers have gone home from an area dominated by Federal office use. 10th street, with hardly any green space or trees, acts a bridge to Banneker park which is completely desolate. Most of the tree planters no longer have trees. The opportunity to connect back to the water as was intended in L'Enfant's plan is completely missed. Having 4 of the 6 value issues on the Site level is a major issue: automobile oriented urban design, inactive piloti space, no greenspace or community

space and inefficient systems such as a large amount of hardscape (Figure 53). The following are photos of the current conditions on the site level.

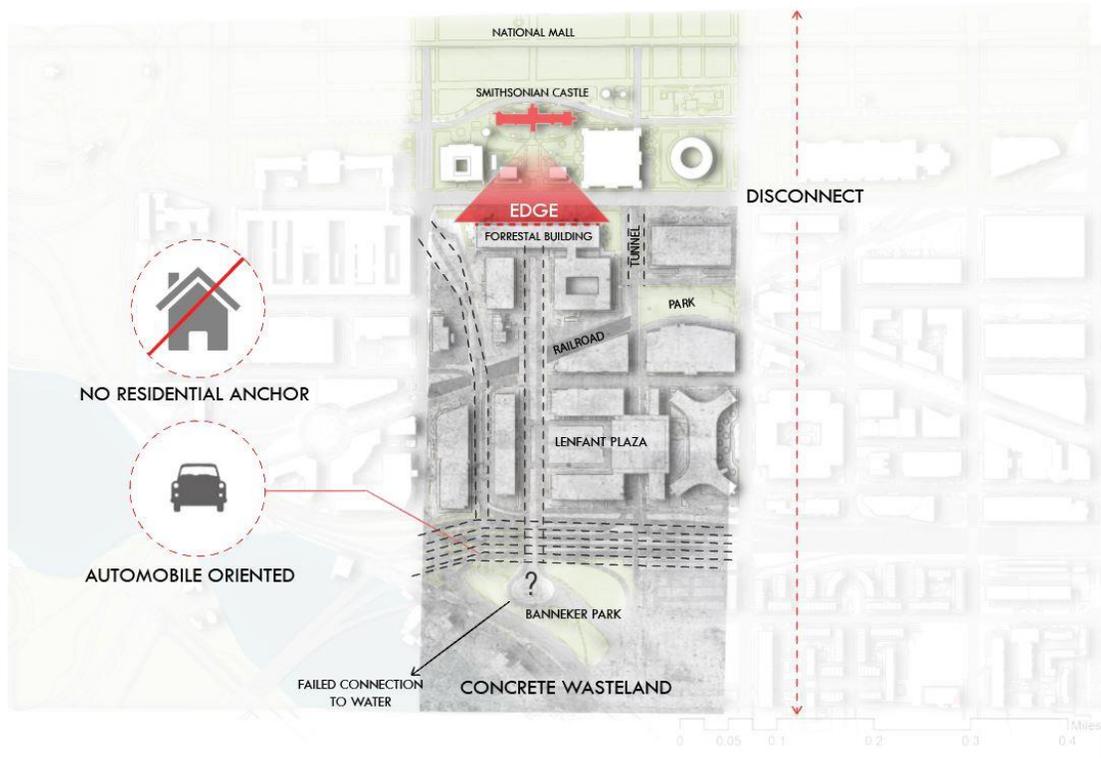


Figure 52 Diagram of Current issues on Site
Image by Author



Figure 53 Forrestal has 4 of the 6 Value Issues on the Site Scale
Image by Author



Figure 54 Author Photo Looking South from Independence Avenue. Shows Forrestal creating a wall and blocking the view up 10th street



Figure 55 Author Photo of Desolate and unused space under Piloti



Figure 56 Author Photo shows space looking south down 10th Street with no greenspace and just hardscape. Additionally shows few pedestrians but rows of cars



Figure 57 Author Photo shows 10th Street looking back to blocked view of Smithsonian Castle

Structure Existing Conditions

The existing structure is on almost 4foot wide hexagonal piloti with a cast in place waffle slab, flat plate floors, only two vertical cores and smaller hexagonal columns on each floor(Figure 58). The structure itself is very horizontal. You can't see between floors.

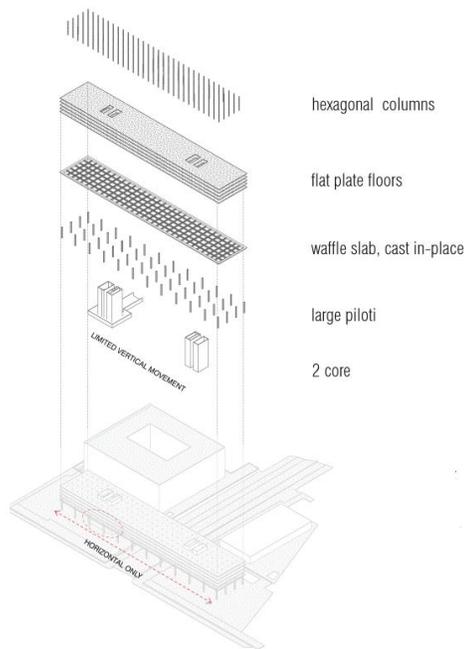


Figure 58 Showing Existing structural Condition of Forrestal Building
Image by Author

The columns inbetween floors are located on a 20 by 20 column grid(Figure 59) but the current expansion joints over 10th street are a signal for intervention. Additionally after meeting with local structural engineers who work with this type of building, by today's engineering and load standards, these types of post-war concrete buildings are generally over designed, which makes adding floors and and more load to certain areas a possibility⁷³.

⁷³ Tomlin, Mike. Discussion, Office of Silman Engineers, Washington D.C., February 2016

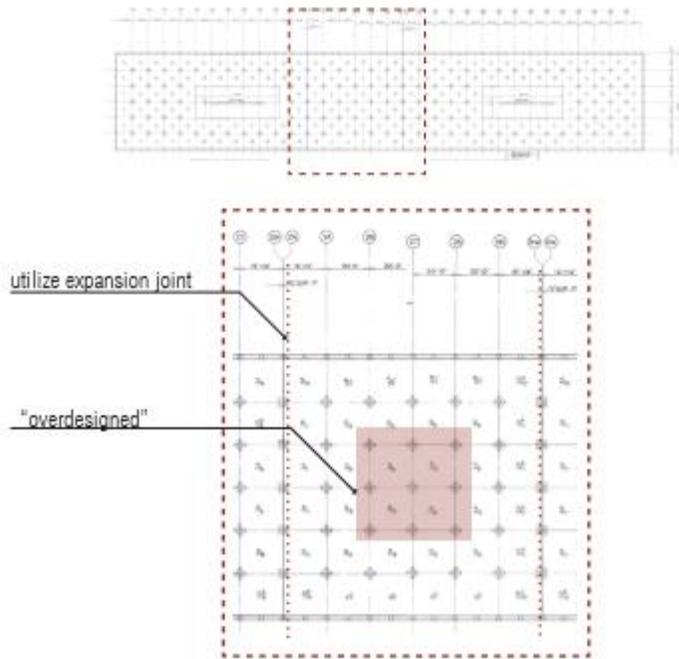


Figure 59 Structural Plan Showing Opportunity to Capitalize on Expansion Joints over 10th street
 Image by Author

Skin Existing Conditions

The current façade on the building is similar on all four sides with exception of an upper level bridge connecting the top floors of the long bar building and the large courtyard building. It is 660 feet long of the same precast panel, on a 10x12 grid(Figure 60).

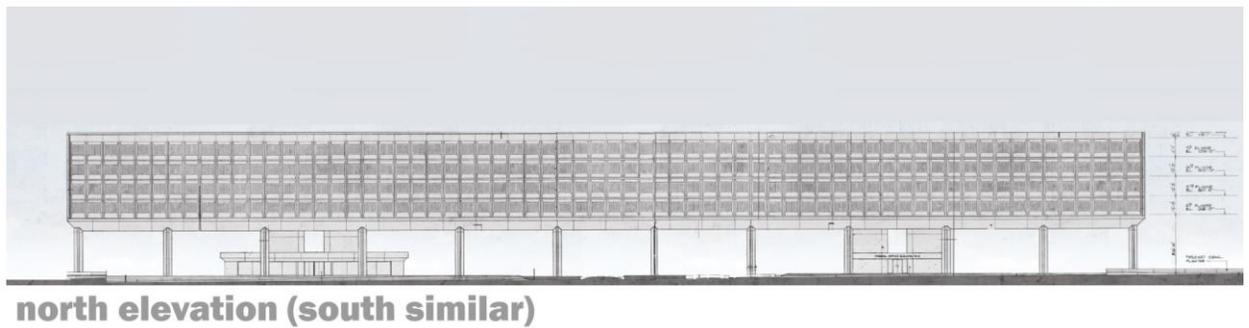


Figure 60 Existing North Elevation
 Image by Author

The façade is extremely horizontal, like a ship, with slender piloti, giving it the appearance that is floating.

Service Existing Conditions

The entire penthouse floor is dedicated to mechanical equipment. Considering this is the home to the Department of Energy, there is limited interaction with the HVAC system. There is no visual connection, the large systems are out of date and unsustainable and there are no operable windows to bring fresh air into the office space,

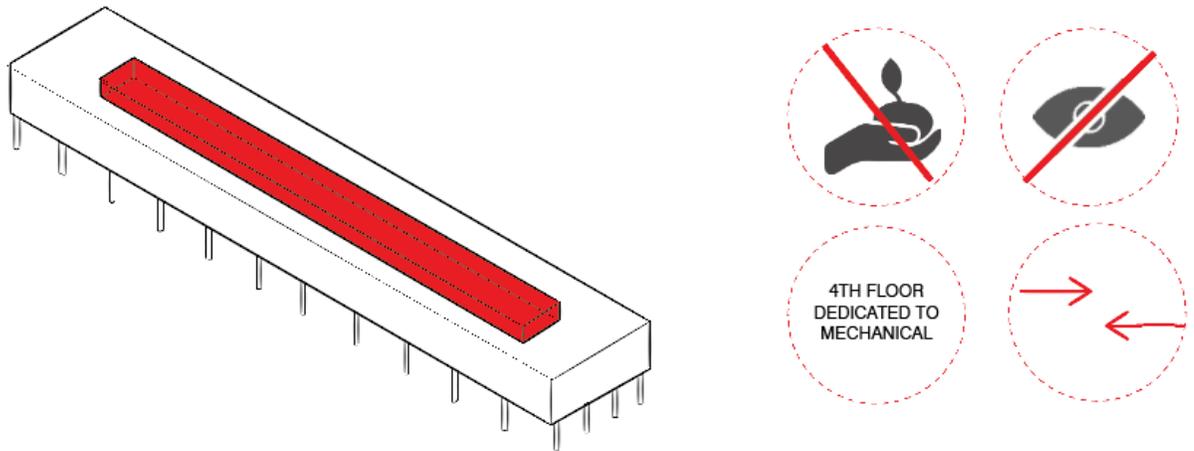


Figure 61 Existing Penthouse Core is entirely dedicated to Mechanical Equipment
Image by Author

Space Existing Conditions

The Department of Energy currently has an entirely inactive ground floor piloti condition. The office space is a labyrinth of cubicles off long hallways with sad and

inactive spaces (Figure 62). It is understandable why employees do not value the building.

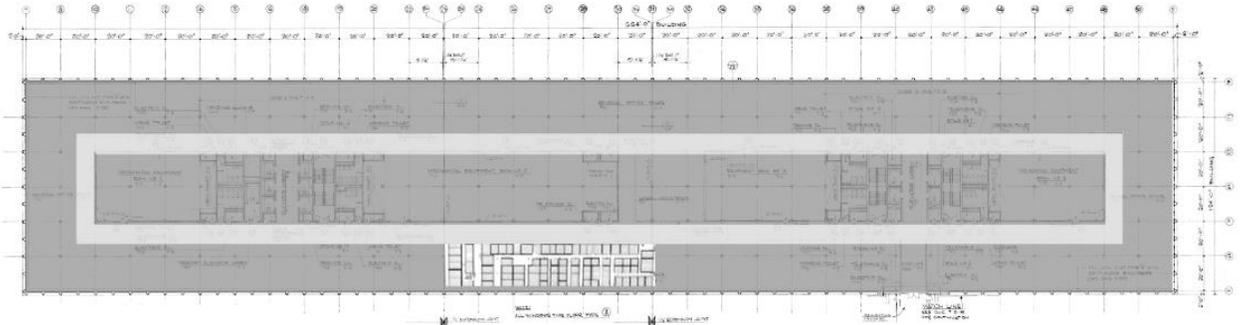


Figure 62 Example Floor Plan of Cubicles and long Corridors
Image by Author

The below images are images from inside the Department of Energy depicting typical office space.

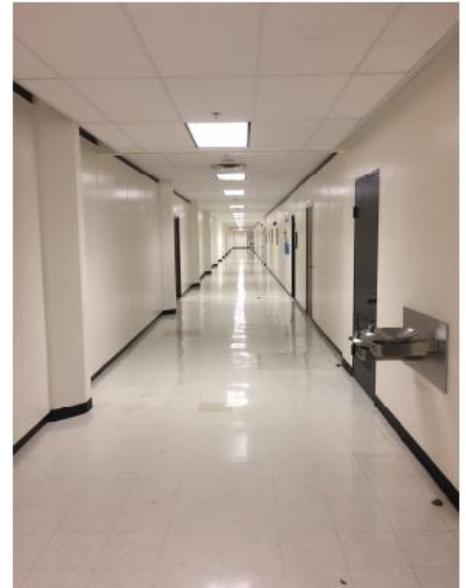


Figure 63 Typical office and Hallway Condition at the DOE
Image by Author

Chapter 5: Program and Work Culture

Open office plan. Most offices have it but do its users really want? 70 percent of U.S. offices have no or low partitions, according to the International Facility Management Association. The open space plans maximizes space and cost while employing a certain level of employee office governance. Famous companies such as Google, Facebook and other Silicon Valley companies have advocated for its openness and collaborative resultant. The Open office plan was originally conceived by group of researchers in Hamburg Germany in the 1950's in order to promote communication and idea flow⁷⁴.

In a 1980 study⁷⁵ researchers found that “architectural privacy—as embodied in places with physical means of visual and acoustic isolation—was consistently associated with personal privacy and thus productivity”. Hardly any relationship was found between physical accessibility and social contact among coworkers. The study suggest that there might have been a slight increase in interaction among coworkers but 6 months after an open-plan adjustment, users self-regulated social interactions back to the same they were before an open office plan. This is particularly interesting because it indicates the need for social interaction regulation in a place of work. The researchers also attribute the results as partly from freedom from distractions in private places, from the capacity of private spaces to signify status and partly from the link with self-identity.

⁷⁴ Konnikova, Maria. "The Open-Office Trap." *The New Yorker*. 2014. Accessed January 18, 2016. <http://www.newyorker.com/business/currency/the-open-office-trap>.

⁷⁵ Sundstrom, Eric, Robert E. Burt, and Douglas Kamp. 1980. "Privacy at Work: Architectural Correlates of Job Satisfaction and Job Performance". *The Academy of Management Journal* 23 (1). Academy of Management: 101–17. <http://www.jstor.org/stable/255498>.

The New York Times discusses,

“Open offices also remove an element of control, which can lead to feelings of helplessness. In a 2005 study that looked at organizations ranging from a Midwest auto supplier to a Southwest telecom firm, researchers found that the ability to control the environment had a significant effect on team cohesion and satisfaction. When workers couldn’t change the way that things looked, adjust the lighting and temperature, or choose how to conduct meetings, spirits plummeted.”

A 2000 study looked at the effects of sound on office workers for 3 hours of office workers and found workers were able to solve fewer puzzles, adjusted themselves ergonomically fewer time and had increased levels of epinephrine ⁷⁶. In summary they were less motivated and less creative after being exposed to noise.

Engaged User Design

Where do people want to sit an office? What do people want their space to look like? During a site visit to the Forrestal in Early January, the below pictured tool was used with office workers to depict what meant the most to them in the office space. By turning each piece, it is a playful way to engage office users in the process of office space design (Figure 64).

⁷⁶ 1: Evans GW, Johnson D. Stress and open-office noise. J Appl Psychol. 2000 Oct;85(5):779-83. PubMed PMID: 11055149.

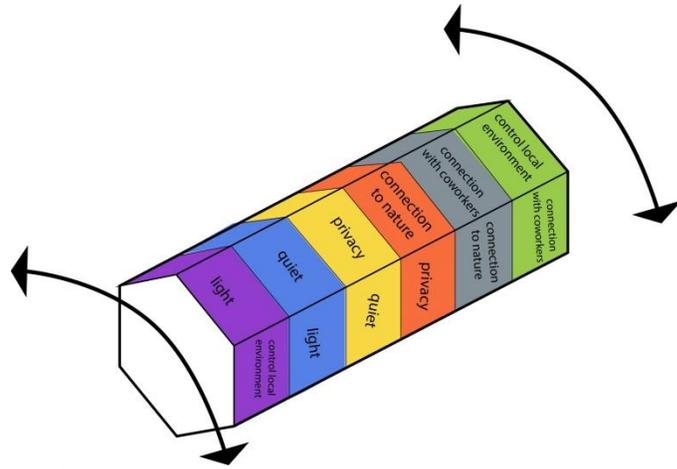


Figure 64 Proposed User engaged Tool to promote work place space diversity
 Image by Author

After considering a range of sources, it is critical to employ a range of office conditions. This thesis will employ that range of space diversity in the workplace.

Chapter 6: Creating the Department of Energy Center for Innovation and the Smithsonian D.C. at the James Forrestal.

Time of Innovation at the DOE

The Department of Energy (DOE) currently doesn't use 168 hours of its usable time due to the 9 to 5 work day. Currently 40% of DOE employees use alternative workplace scenarios⁷⁷, allowing employees to telework, work from home etc. This was evident on my site visit. Additionally, 33% of all DOE staff will be eligible for retirement in 2016⁷⁸. Now is the time for innovation for the DOE.

⁷⁷ Archuleta, Katherine. "2013 Status of Telework in the Federal Government." Telework.gov. December 2013. Accessed January 2016. <https://www.telework.gov/reports-studies/reports-to-congress/2013reporttocongress.pdf>.

⁷⁸ "Human Capital Strategic Plan." US DEPT of Energy. 2015. <http://energy.gov/sites/prod/files/DOE-Human-Capital-Strategic-Plan-2011-2015.pdf>.

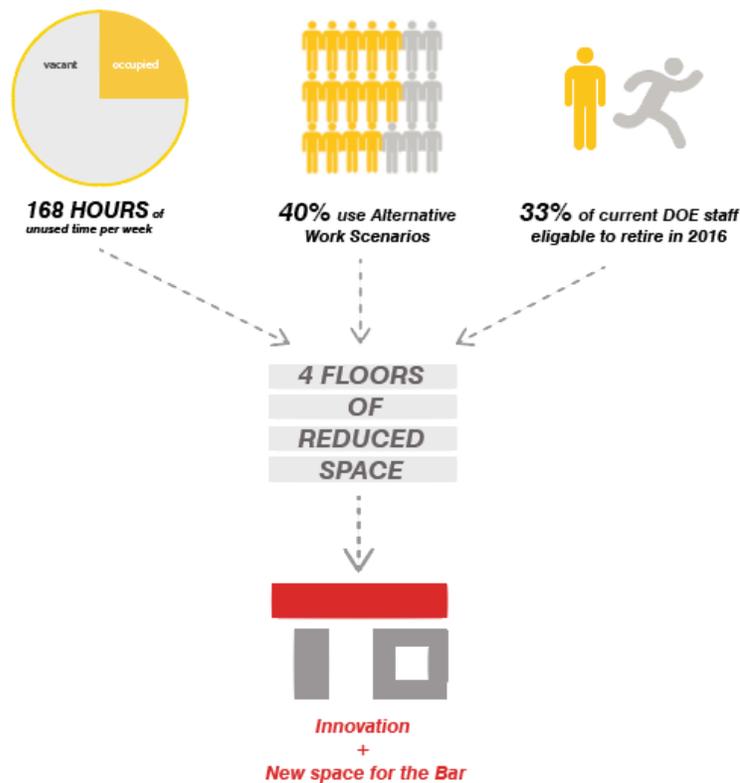


Figure 65 Time for DOE to be Innovative at the Forrestal
Image by Author

This thesis proposes that the DOE should recruit the most intelligent young scientists around nation to work on energy research. By incorporating a live work scenario in which the Federal government would fund young scientists housing, they could attract the best and brightest to live in Washington D.C. Instead of paying to live in one of the most expensive cities in the United States, Scientists would be funded by United States Department of Energy to oversee and coordinate innovative projects all over the country and locally.

Additionally, in order to heal a relationship both with the southwest community and the Smithsonian itself, this proposal recaptures the ground floor piloti space as the Smithsonian D.C. This Gallery would feature local Washington D.C. artists and help

to reconnect Southwest to the community it once destroyed. The additional program has added value to the once single-use office space.

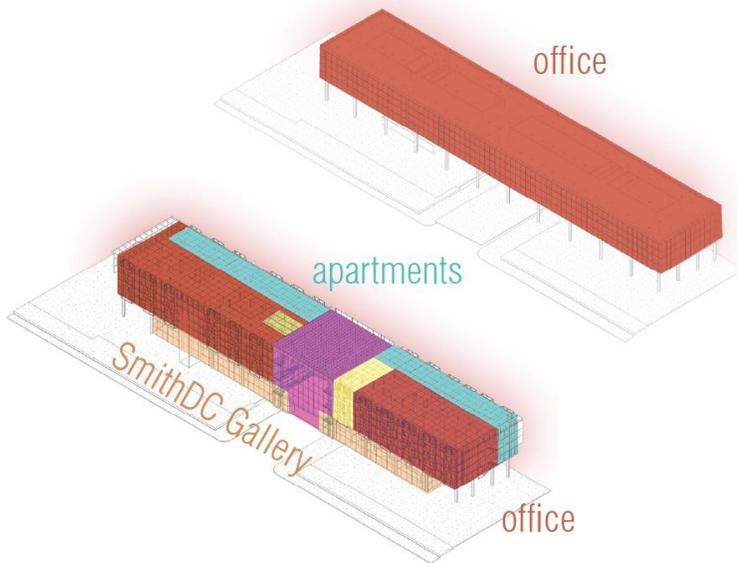


Figure 66 Single Use Office Space transformed into the DOE Center for Innovation and the Smithsonian D.C.

Image by Author

It is critical to understand that to North of the Forrestal is not any site but one of the most prominent site in the United States, The National Mall. To the South of the new DOE or this new area facing Southwest, should be seen as a more experimental side.



Figure 67 Monumental North and Experimental South with a split work-live scenario
Image by Author

Design on the Site Scale to add value and make more adaptable

After considering the 6 lacking values, the site intervention had to incorporate the 6 ways to add value. Additionally the site intervention considered how to make the site condition more adaptable by providing “Scaffold Park” which may serve as market stall, biennale space, community space etc as needed for the new Southwest community. The proposed site plan(Figure 68) reintroduces the pedestrian experience by pedestrianizing 10th street with only emergency and loading vehicle access. Instead of just being greenspace, “Scaffold Park” introduces new use along 10th street. The greenspace turns what was once desolate hardscape into an area that may mitigate over 2 million gallons of rainwater runoff and collect it to be reused for the park. It reestablishes Maryland Avenue as a green axis. It brings anchor, mixed-income communities back to Southwest. It makes southwest more sustainable and

gives users a reason to walk through the DOE building to reach a node at the waterfront.

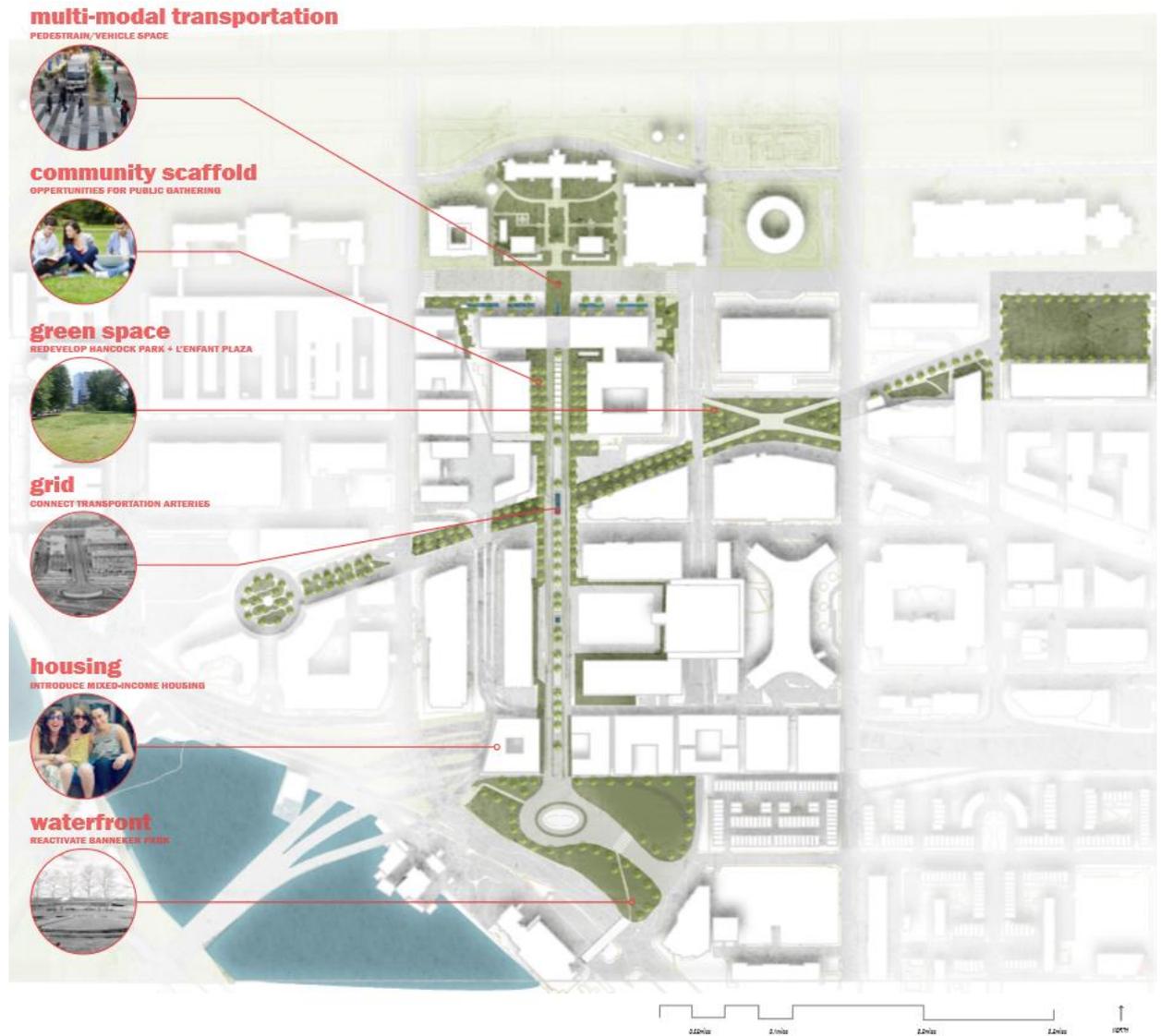


Figure 68 Proposed Site Plan
Image by Author

FUNCTIONAL GREENSPACE brings a diversity of users + creates a corridor to the waterfront

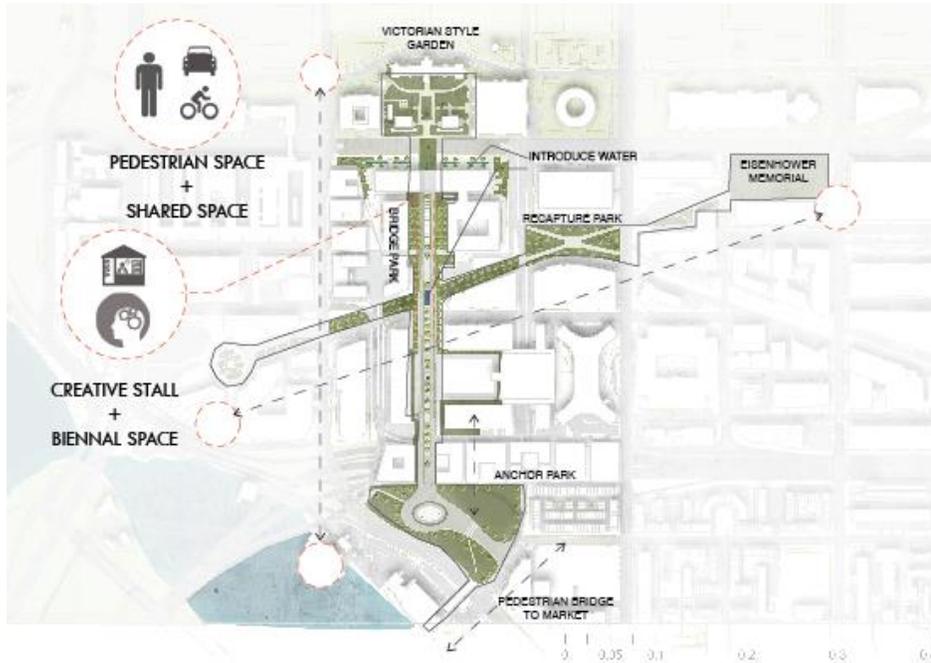


Figure 69 Functional Greenspace Diagram
Image by Author

REINTRODUCING HOUSING back to southwest creates anchors for new community space



Figure 70 Community Anchor Diagram
Image by Author

The new Park and site condition allows for the site to gain value from sustainability. Not only does the park have green space, shade and trees but it also collects water to be reused.

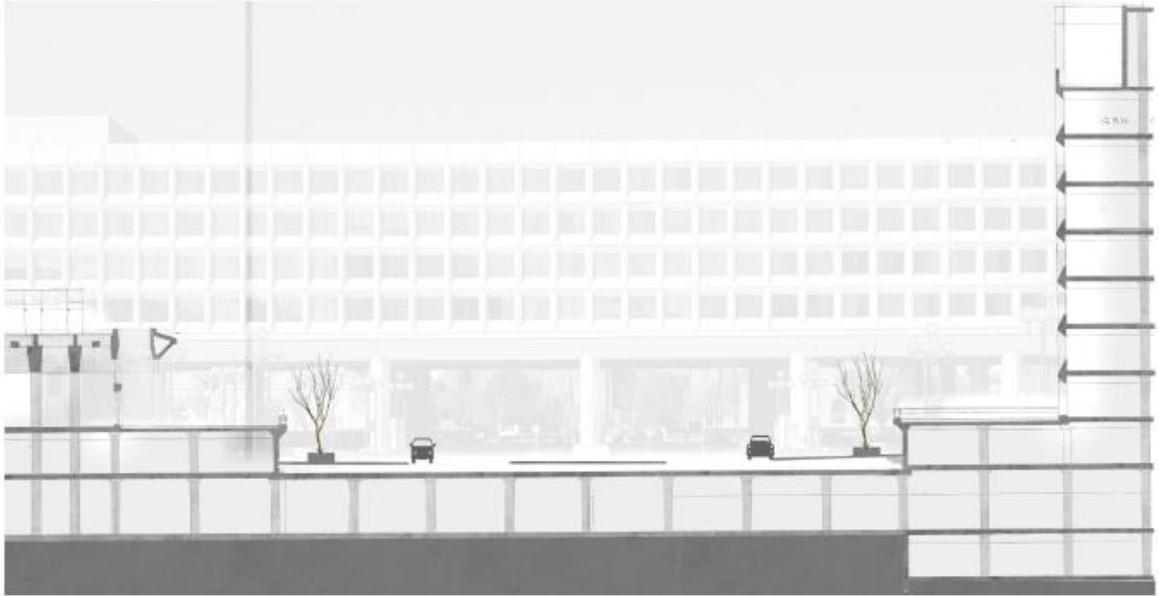


Figure 71 Existing Site Section Cut Perpendicular through 10th street looking north
Image by Author



Figure 72 Proposed Park Section
Image by Author



Figure 73 Perspective of park with Green trellis and Smithsonian in the background
Image by Author

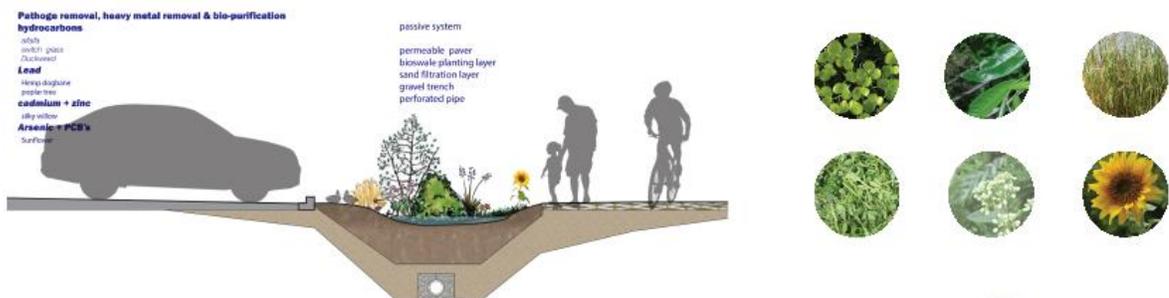


Figure 74 New Road kidneys in Shared Automobile and Pedestrian Space
Image by Author

After the proposal establishes a new green armature off the mall that has a node near the riverfront it was critical to establish a portal gate way condition that would reconnect the Smithsonian castle visually and take advantage of the expansion joints in the structure along 10th street. Carefully selecting this portal opportunity as the major move and then two smaller structural moves within the core of the existing to drive light down into the space, provide visual connection between floors and also provide a stack effect for ventilation was key. Additionally two exterior stairs were added to provide signal of vertical movement on the exterior but to connect the inner office floors in a new way.

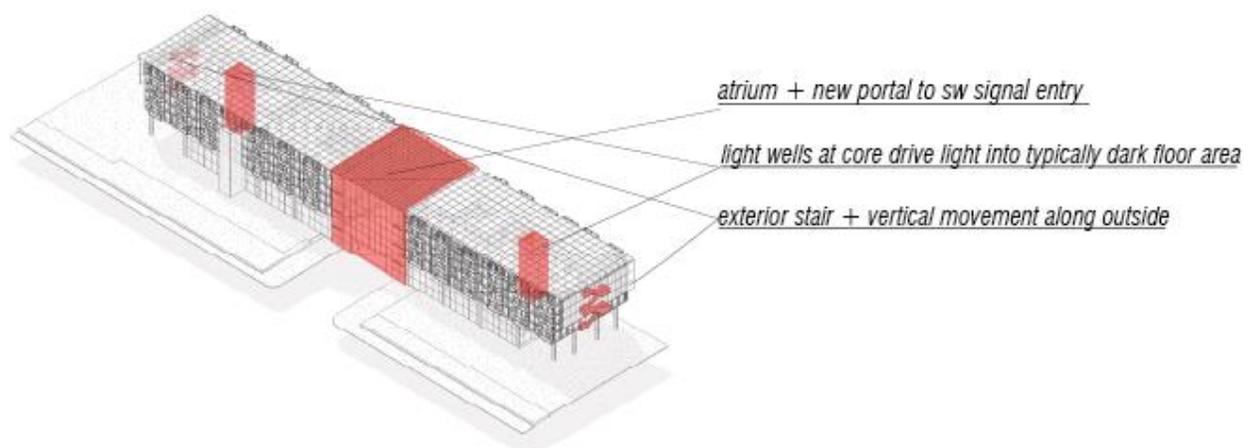


Figure 75 Three Major moves structurally
Image by Author

CONCRETE



*HEAVY + IMMOVABLE
+PERMANENCE*

STEEL



*LIGHT + ADAPTABLE
SIGNALS PLACES OF
ADAPTABILITY*

Figure 76 At structural intervention steel will highlight places of adaptability
Image by Author

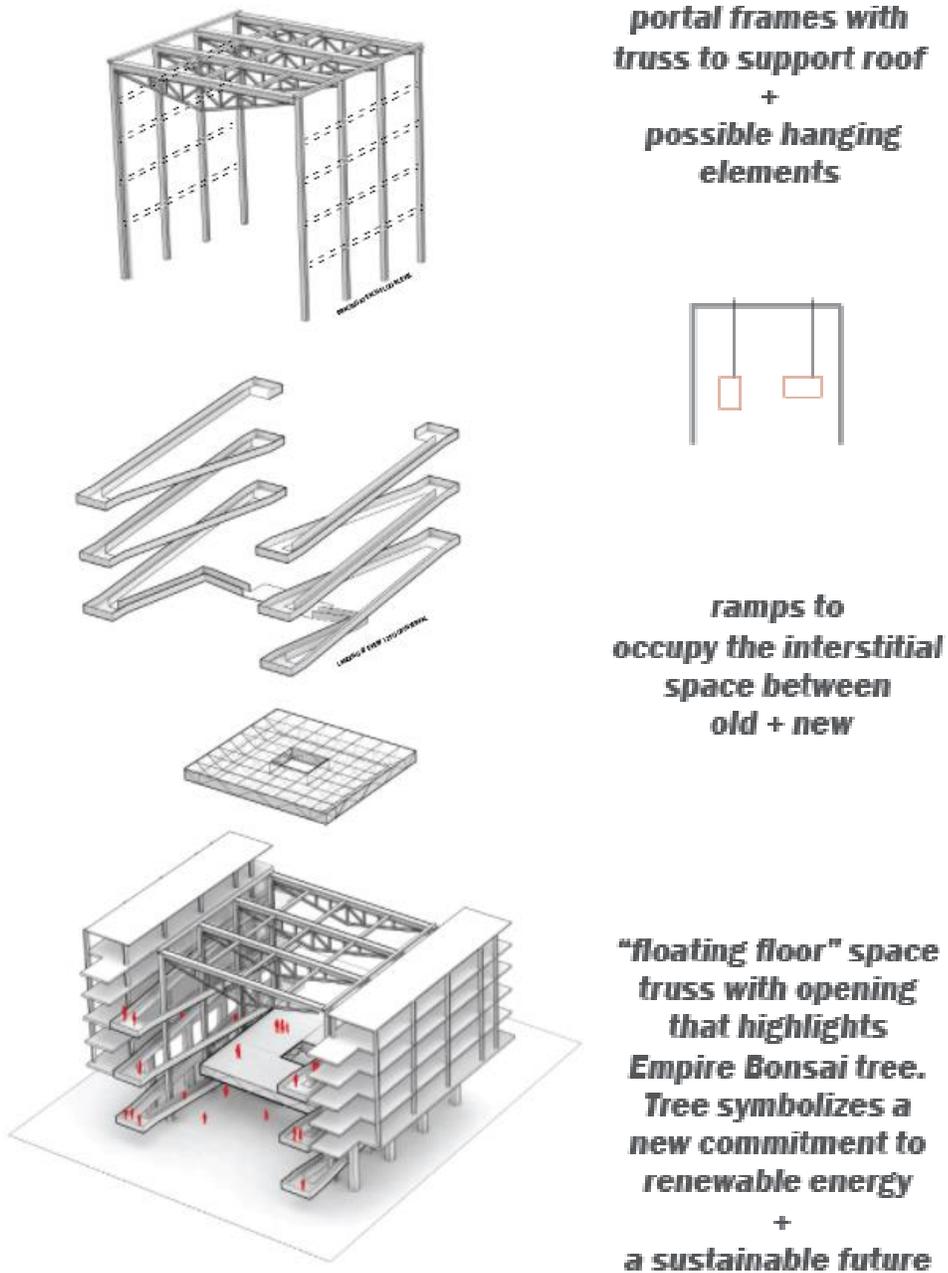


Figure 77 Structural insertion Diagram at 10th Street

Image by Author



Figure 78 Portal Frame leading toward new Southwest with hanging art installation
Image by Author

The repeating portal frames create a procession and a gateway into Southwest and at night they are a glowing signal of passage to a new place. The floating floor harkens back to the original design in that it too seems to be floating like the heaving structure on piloti. Water elements reestablish a relationship with Southwest and the waterfront. A site that once not valued adds value and extends the building's life. The structure itself is also meant to be adaptable to hang future installation, floors etc.

Skin Proposal

The proposal (Figure 79) for the skin takes into account the issue that the current skin is a load bearing skin, issues at the ground floor, and the monotonous façade on the remaining upper floors. By wrapping the ground floor in large panels of glass with a sleek mullion system, the original intent of a floating volume on pilotis is maintained. This allows for the Smithsonian D.C. to become the anchor institution of the previously underutilized public pilotis space but it still allows it to stay in public hands.

On the upper floors, verticality and exterior balconies are introduced but the North and the South facades are treated differently. The north may be seen as the city, public and more monumental side while the South may be seen as the garden, more private and experimental side. The section shows that the North has materials such as glass and steel and is more transparent while the south has adaptable wood shades, steel, vertical gardens. Additionally, the south vertical balconies start to be broken down into two elements, making them more human scaled.

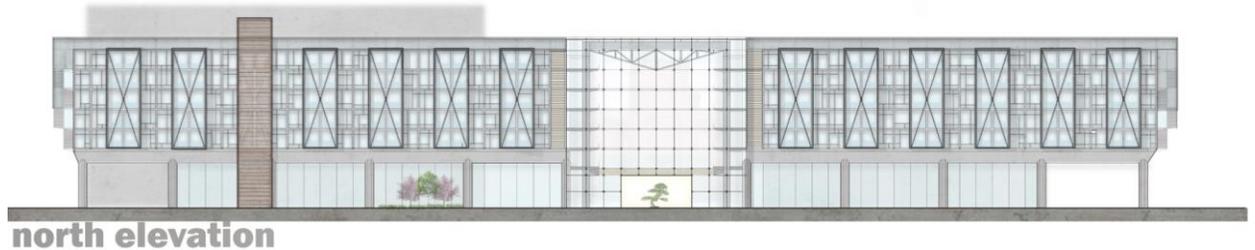


Figure 79 Proposed North and South Elevations

Image by Author



Figure 80 Wall Section of the North (left) and South (right) facades
 Image by Author



Figure 81 Cross Section through Light Well
Image by Author

Services Proposal

By splitting the program into live and work, half of the building can run more efficiently during the 9 to 5 work day. The proposed diagram shows the new values added(Figure 82). By employing a new, more efficient chilled beam system, the foot print of the mechanical room can decrease and the old, over designed penthouse floor core can be used for large assembly such as auditorium space. Keeping in mind the issue of adaptability with services being traditionally embedded in post-war concrete buildings, the proposals are all operate separately.

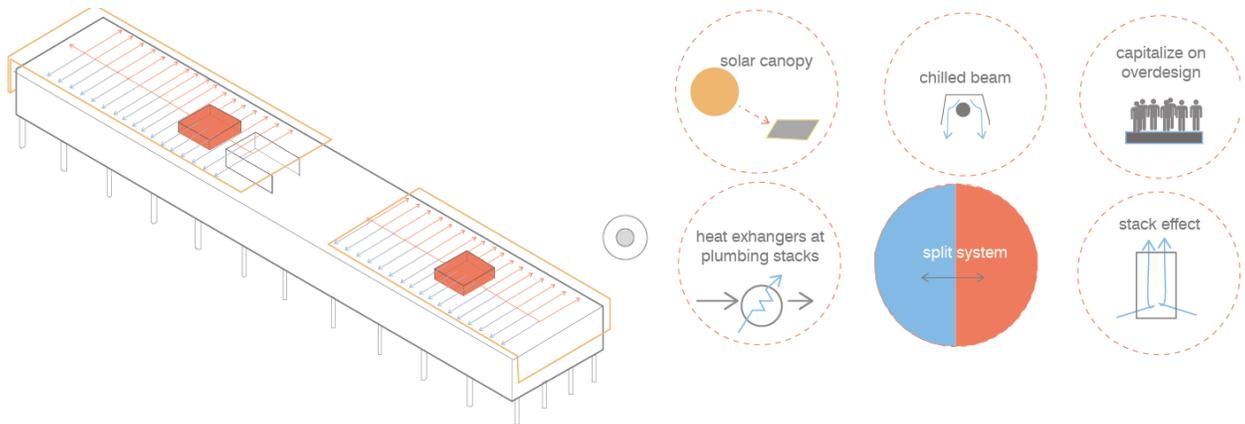


Figure 82 Proposed Services
Image by Author

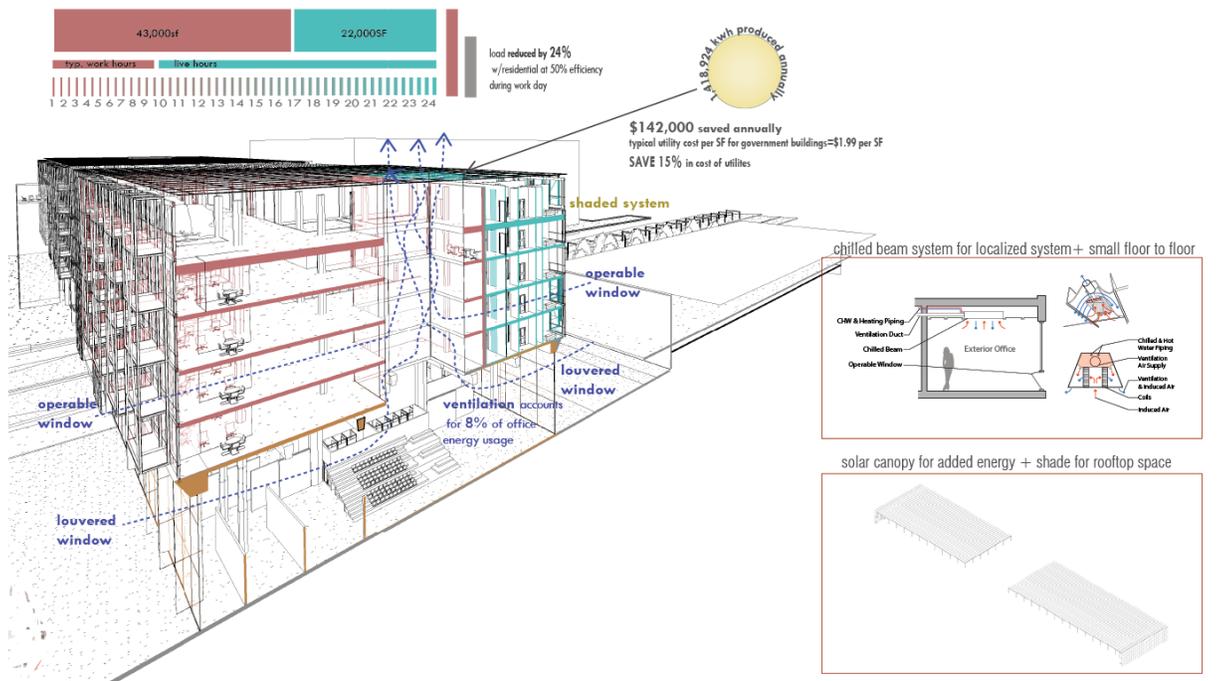


Figure 83 Added Efficiency and more Sustainable Services
Image by Author

Space Proposal

Considering the different users from all different departments of the Department of Energy, it was critical to understand what type of post-doc researchers from which departments could be using the space. The post-doc researchers range from Masters of Finance to PhD. recipients in Chemical Engineering. They all need different types of space with different levels of noise, transparency, collaboration etc. The proposed Center for Innovation accounts for a diversity of space for all users.

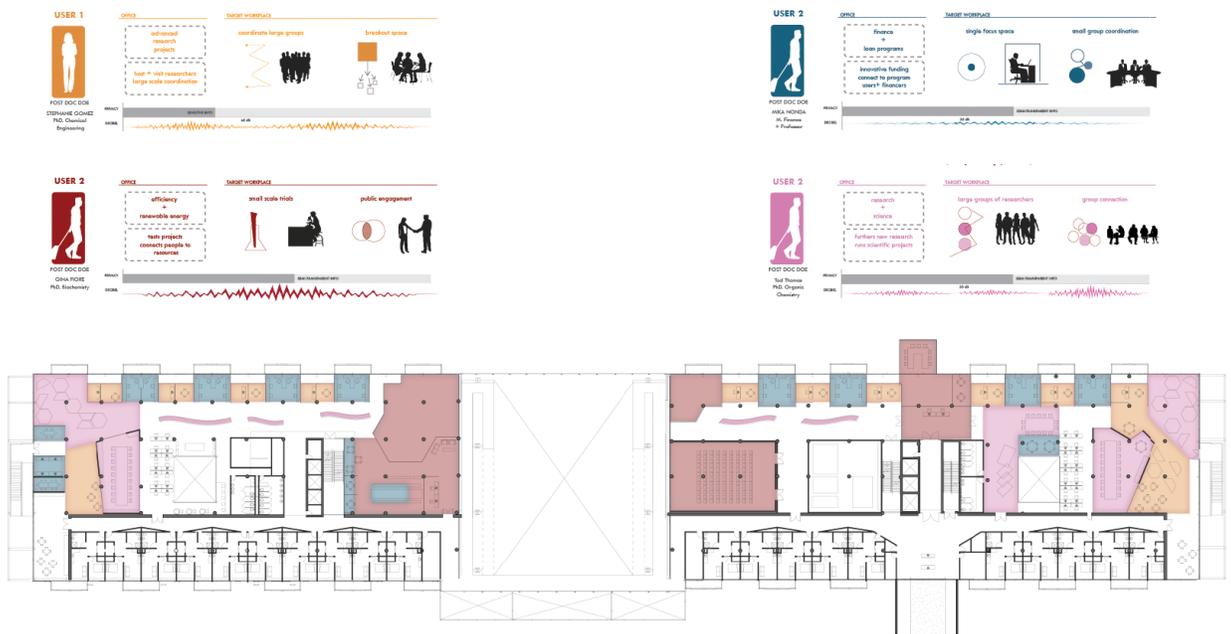


Figure 84 Diversity of Space at the DOE Center of Innovation. Typical Floor plan
Image by Author

The rendering below shows a diverse group of talented researchers using different types of space. Additionally, you can see the exposed chilled beam systems and newly added human scale of materials and green walls



Figure 85 Rendering of DOE Center of Innovation
Image by Author

The Gallery Space

The proposed Gallery space will include a series of galleries, an adaptable seating platform, the atrium and the café. By enclosing the piloti space, the Smithsonian D.C. can secure local artist work. This newly enclosed space still says in the public hands, recapturing the public space that was product of the 1960's planning efforts.

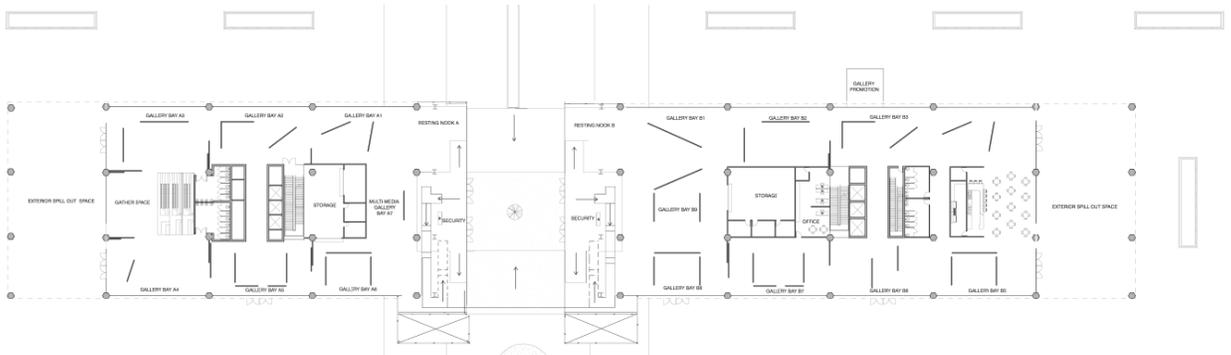


Figure 86 Smithsonian DC and New Ground Floor Condition
Image by Author



Figure 87 Rendering of Proposed Ground Floor Condition
Image by Author

Conclusion

In conclusion this thesis answered the question, can we adapt and add value to post-war concrete buildings. After thorough investigation of obsolescence, theory, rates of change, history and existing conditions, the Forrestal proved to be a productive case study. In the end it is our environmental responsibility to adapt these buildings to ensure that 49 Manhattans worth of post-war building material does not end up in a landfill. It is also are social responsibility to ensure that public space, that displaced thousands of families stays public space.

Appendix I

Image by Author

Building	Location	Year Built + Architect	Public/Private	Basic Plan	Use	Urban context	photo	photo?	Facade study	deep set windows? 'greenery' or planting?	proximity to major transport
	1931-1932 WASHINGTON, DC	1931 Hess + Krieger	Public Columbian Museum		OFFICE WORKSHOP						
	1929 WASHINGTON, DC	1929 Hess + Krieger	Public Columbian Museum		OFFICE						
	1927 WASHINGTON, DC	1927 Hess + Krieger	Public Columbian Museum		OFFICE						
	1928 WASHINGTON, DC	1928 Hess + Krieger	Public Columbian Museum		OFFICE						
	1927-1927 WASHINGTON, DC	1927-1927 Hess + Krieger	Public Columbian Museum		OFFICE						

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