A Layered Approach to Succession

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by

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ABSTRACT

WASTE_SCAPE: the abandoned, remnant and dis-engaged remains of a building or urban landscape that has lost or lacks useful purpose and is in a state of refuse or decay.

Due to natural, cultural and technological shifts every built form will dissipate over time, generating "waste". As these transformations occur, waste_scapes, which are leftover or abandoned buildings and residual urban landscapes proliferate.

The factors that play a role in urban infrastructural and architectural fragmentation must be addressed to develop culturally and ecologically sustainable built environments. These include cultural associations with the notion of ruins and historical legacy, the role of technology in defining the way we use and re-use buildings over time and the essential relationships between urban forms and ecological systems. Establishing a synthesis between waste_scapes their corresponding broken networks throughout their built lifecycles can begin to forge a path towards catalyzing waste_scape re-use.

Through an examination of selected case studies that assess ecological impact, durability, resiliency along with re-adaptive potential and the retention of historical significance, directions will be explored towards re-imagining and re-weaving waste_scape sites back into their urban networks.

The intent of this project is to discover the potential of a waste_scape site in Ottawa by re-weaving it back into the city fabric and exploring re-connections of cyclical environmental, social and cultural networks within the found dis-engaged infrastructural remnants of a former train station.

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All photographs, illustrations and drawings by the author except:

FIGURES CONT'D (Case Studies)

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INTRODUCTION

"An ecological approach to design follows a very simple observation: Architecture is a dynamic adaptation to place, people and pulse."

Sim Van Der Ryn, <u>Design For Life</u>
(Salt Lake City: Gibbs Smith, Pub., 2005) 156.

CULTURAL EPOCHS: TIME, POPULATION, CONSUMPTION © SV 98

Sim Van Der Ryn, **Design For Life**, Cultural Epochs of human history. 2005
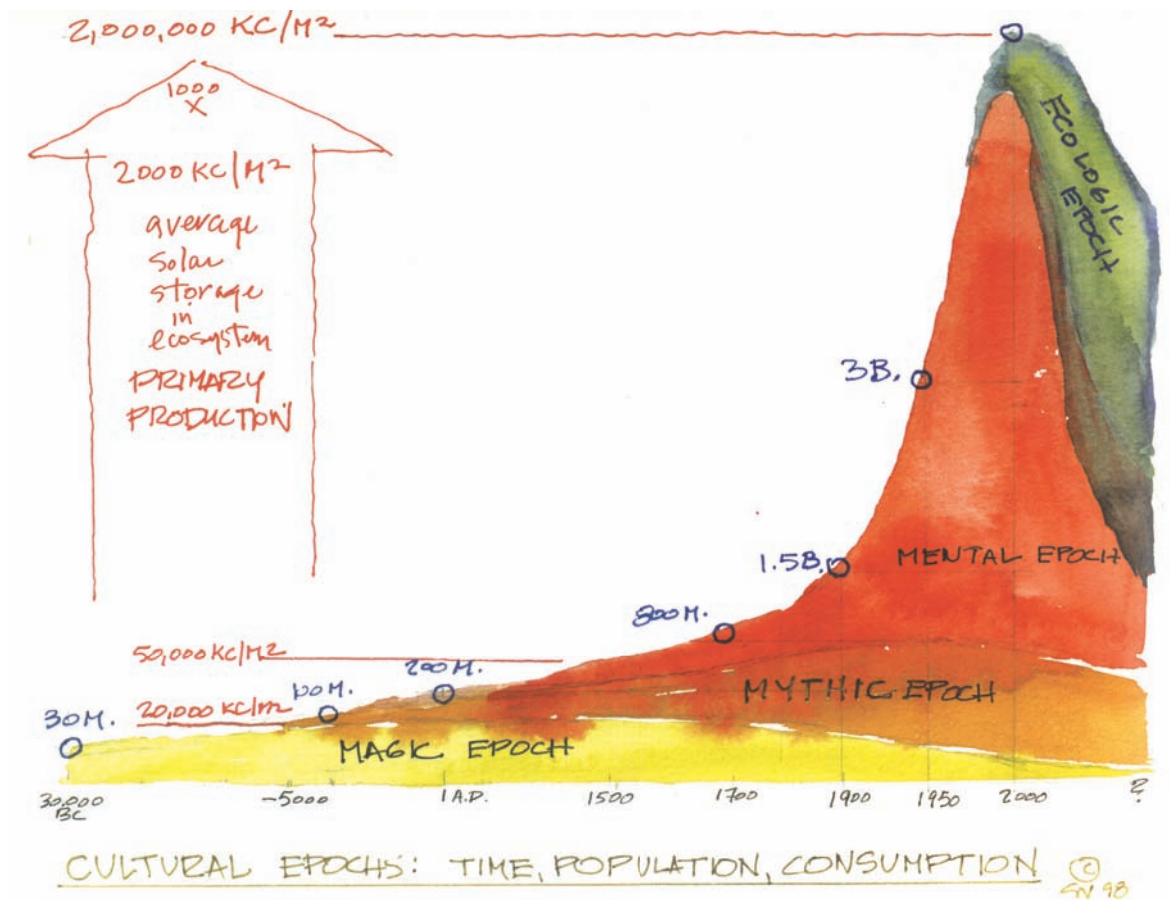
Sim Van Der Ryn, **Design For Life**, Archaic Epoch. 2005   Magical Epoch

In Sim Van Der Ryn's book, Design For Life, a description of the past million years of human history is outlined as containing four fundamental epochs of knowledge and rationalization that have resulted in today's modern dilemmas: Archaic, Magical, Mythical and Mental.[1] Having evolved and developed over hundreds of generations, human interactions with natural environments have shifted from being dominated by natural cycles of growth and decay, to modern exchanges in which the scale of our cultural and technological capacities are gradually replacing the resources we depend upon with wasteful and destructive by-products. The dominance of natural resources with human centered technologies has transformed us from being an instinctive society that lives within its ecological limits into a rational and metric based civilization where the nuances of natural systems have been enveloped and suffocated by synthetic constructions and processes.

In order to re-establish an integral way of life and design that responds to and induces improvements in both human and biophysical conditions, Ryn identifies an inevitable epoch, called the Eco-logic period that will re-formulate relationships to our primary dependencies upon natural ecologies.[2]

1. Sim Van Der Ryn, Design For Life
(Salt Lake City: Gibbs Smith, Pub., 2005) 134-141

2. Ibid, 152-154

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Mythical Epoch   Mental Epoch

By synthesizing natural, cultural and design capital through the observation of life patterns, where each input becomes essential and non-functional without the presence of the others, Ryn describes an era that will re-formulate the relationships between built and natural forms.

The primary question that arises from this scenario is how such a synthesis can be achieved within present economic and social systems? Bill Reed presents an integrative and collaborative model using each basic life support system and the interrelationships between water, soil, sun and shelter.

"Viewing sustainability through the multiple lenses of technological efficiency and living system health requires us to weave together the unique patterns of life in each place [that] we build."[3]

3. Bill Reed, Whole System Integration Process (WSIP) (Arlington, MA: Integrative Design Collaborative, 2006) 9

This is central to integrative thinking and design in which all factors that have an impact on environmental and human health are balanced against the benefits of any singular design decision. These collaborations are a starting point from which to address the ways that urban settlements can continue to develop without

posing detrimental risks to future needs.   By encouraging cycles of use that become inseparable from the forces that act upon them, dissipation and decay no longer present liabilities to a sustainable future but opportunities to synthesize ecological and human generated systems and structures.

The most problematic factor in achieving a sustainable future is how to deal with the by-products of production and growth. As everything that is created by humans will inevitably decay and degrade over time, management techniques that optimize waste is crucial to any notion of achieving ecological balance. The concept that waste equals food, coined by William McDonough in his book "Cradle to Cradle", describes an infinitely cyclical approach to manufacturing established by ensuring that the process is calibrated to accept the products it generates and reforms them into upgraded and reusable materials. "In order for something to be vital it has to have growth, it has to have a free flow of energy, and it has to have an open system of chemicals."[4] By ensuring that the process continually reclaims its outputs and re-appropriates waste, a synthesis between production, use and transformation closes the traditional cycle of a throw away economy into one where uses are considered leased or borrowed rather than consumed and depleted.

4. Will McDonough (quoted in Mau),
Institute Without Boundaries: Massive Change
(London, New York: Phaidon Press Ltd., 2004) 190

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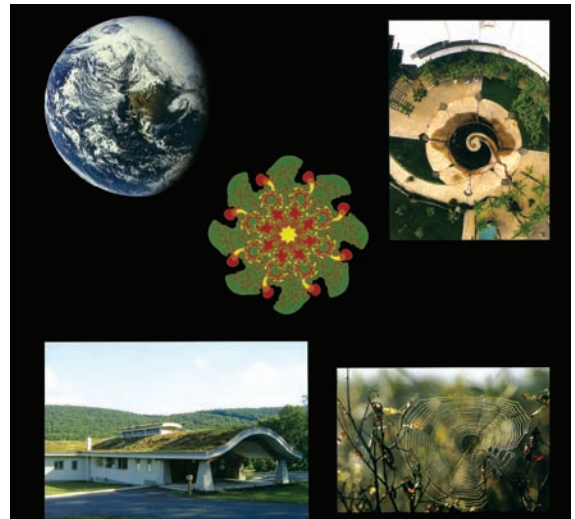
Sim Van Der Ryn, **Design For Life**, Eco-logic Epoch. 2005

5. Alan Berger. "Urban Land is a Natural Thing to Waste", Harvard Design Magazine. (Fall 2005/Winter 2006) 50

The same can apply to urban environments and the structures that form their fabric. Architecture and urban landscapes are continually transforming and shifting entities. "Cities are not static structures: they are arenas marked by continuous energy flows and transformations of which landscapes and buildings and other parts are not permanent structures but transformational manifestations. Like a biological organism, the urbanized landscape is an open-system…"[5] The technological forces that result in development and the cultural factors that legitimize the urban construct represent the free flows of energy and open system of chemicals, or capital that enable physical and economic growth to occur. Technological and cultural processes are the production factors that must become integrated with natural systems and cycles if any effort towards an ecological future is to become a reality.

DEFINING WASTE_SCAPES

"The city is largely a natural process whose unperceived complexity dwarfs those aspects of it that can be consciously controlled and planned."

Alan Berger, "Urban Land is a Natural thing to Waste",
Harvard Design Magazine (Fall 2005/Winter 2006) 48
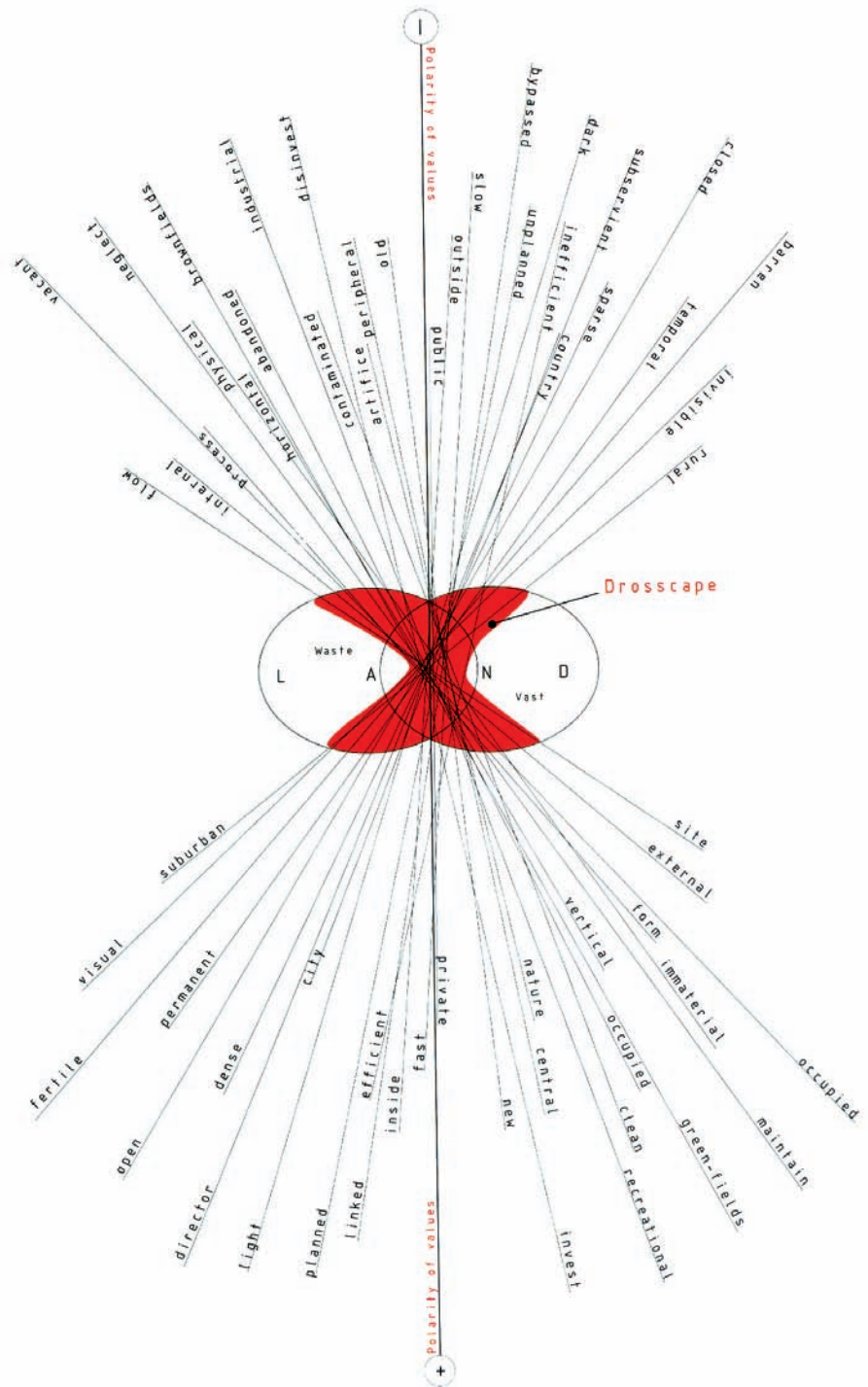
Alan Berger, **Drosscape**, 2006. (204)
Drosscape Diagram, an amalgamated zone of vast, ambiguous waste.

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Alan Berger, **Drosscape**, 2006. (34) Terrain vague within the suburban Chicago landscape. Characterized by empty and abandoned urban sites falling in-between cycles of investment.

As a "manifestation of industrial processes that naturally produce waste"[1] , the city presents a scale of production and manufacturing that implants significant challenges towards establishing a sound synthesis with the natural environment. What is considered waste at the scale and flux of urban production are the areas that encompass obsolete or abandoned infrastructures and industries, including rail lines, buildings, landfills and their residual spaces such as traffic islands, contaminated fields and parking.

Ignasi de Solà-Morales first identified these types of spaces as terrains vague, a French term derived from 1970's filmmaking, characterized as being in-between or empty, abandoned urban zones that provide design opportunities. Described as existing outside the "…city's effective circuits and productive structures… [and] foreign to the urban system,"[2] they represent contradictory conditions that simultaneously indicate healthy urban growth while generating liminal unused space. He suggested an approach to these areas using the evolutionary process of "exaptation" whereby "a trait or capability, repeated within the context of successful growth and adaptation become co-opted for unforeseen uses."[3] From a growth or evolutionary perspective, Morales

1. Alan Berger. "Urban Land is a Natural Thing to Waste", Harvard Design Magazine. (Fall 2005/Winter 2006) 48

2. Solà-Moralles (quoted in Berger). Drosscape. (New York: Princeton Architectural Press, 2006) 35

3. Alan Berger. "Urban Land is a Natural Thing to Waste", Harvard Design Magazine. (Fall 2005/Winter 2006) 54

Alan Berger, **Drosscape**, 2006. (27) Downtown Fort Worth, Texas.
Fragmented urbanism.

4. Ibid, 54

notion of exaptation implies an exercise that could "resist planned continuity by fighting to keep and use as inspiration the differences, the discontinuities, of these places as motivation for architectural projects."[4] Although this theory was one of the earliest aligned with an approach for waste sites, it gained little traction among architectural and planning circles. A translation of the terrain vague approach into a landscape discourse of reclamation is clearly one of interest today in the effort to re-appropriate areas from infrastructural corridors, contaminated manufacturing lands, abandoned, mined landscapes and the steady generation of urban waste sites attributed to natural decay and cultural flux.

5. Ibid, 50

The notion of dross, introduced by Lars Lerup in 1995, similarly suggests that there is no growth without waste. His concept of the city as a "holey plane" consists of voids or gaps in the urban fabric, of "planned and unplanned horizontal conditions around vertical urban centers…dominated by a particular sense of ongoing struggle: the struggle between economics and nature."[5] Having been formulated as the results of rapid horizontal and particularly suburban expansion in North American cities during the 20th
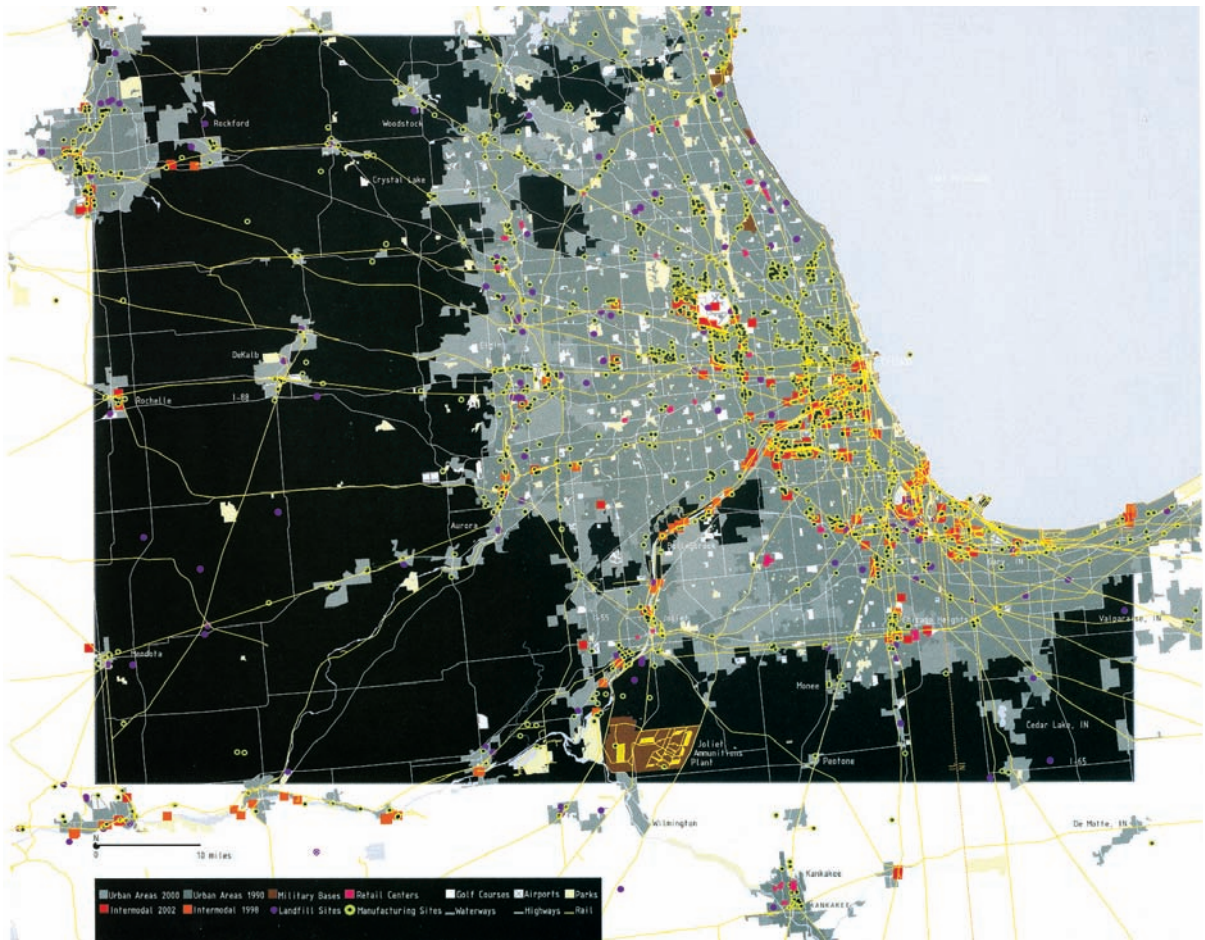
Alan Berger, "Urban Land is a Natural thing to Waste", **Harvard Design Magazine**, 2005.
Entropic Indicator Map, Chicago, Illinois.

century, Alan Berger identifies these "drosscapes" as "inescapable
entropic counterparts of evolution and urbanization, far from
marking failure, testifies to previous success and the design (or
evolutionary) challenge for its continuance."[6]

6. Ibid, 55

Berger categorizes these landscapes into six waste typologies:

■   dwelling - referring to the voids of land designed into housing developments
— ■   transitional - rail yards, parking lots, self storage
—   infrastructural - negative spaces of highways and interstates, hydro line corridors, seaports
•   obsolescence - land fills, sewage treatment plants, scrap yards
■   exchange - retail, strip and outlet malls
⊠■○ contamination - airports, military bases, abandoned mining and industrial sites

Seeing these landscapes not as individual zones of urban elusiveness
but as simultaneously productive and wasteful sites, he does not
advocate drossless cities but an integration of these inevitable zones
"into more flexible aesthetic and design strategies."[7]

7. Ibid, 50
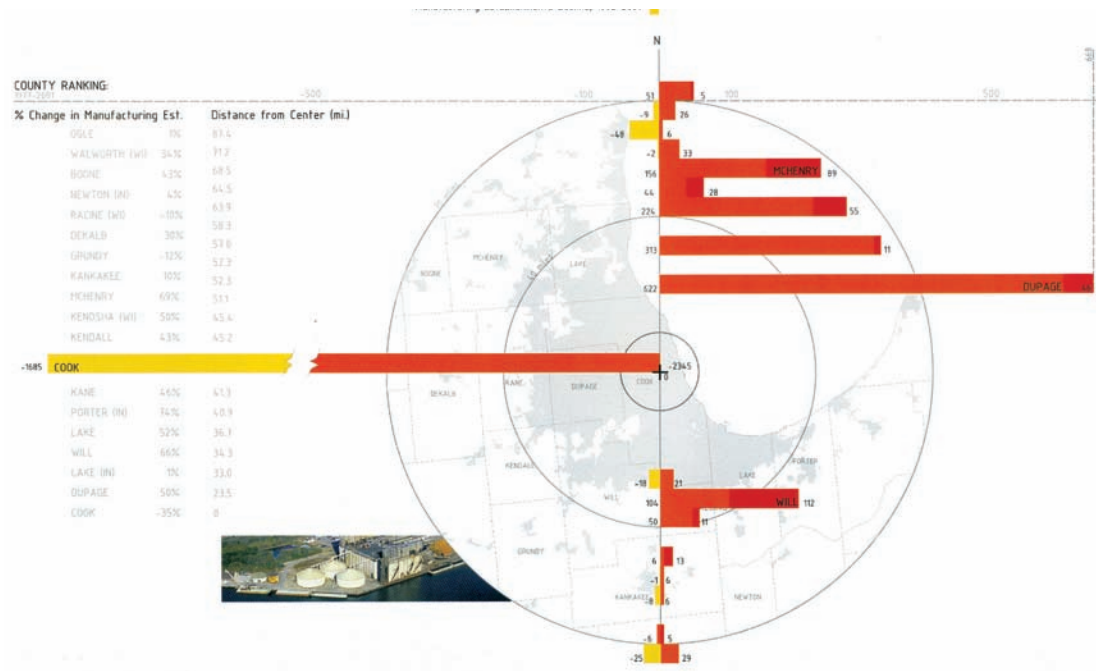
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The commonality between Solà-Morales' proposal for the terrain vague and Berger's drosscape is the contextual re-integration of waste landscapes and an accommodation for their future change rather than a clean slate, singular design methodology to re-use.

The idea of waste_scapes suggests a hybridization of both the terrain vague and drosscape approach to urban re-integration of waste sites. For the purposes of this study, the urban waste_scape refers to abandoned, remnant or contextually dis-integrated buildings and landscapes that have lost their social or economic productive purpose and remain in a state of refuse or decay. Far from unusable, these sites reflect a state of cultural and technological obsolescence, existing in dormancy until opportunities surface for their re-use. How can the social, technological and natural processes that contribute to the generation of waste sites also produce a framework of re-integration and synthesis within urban and ecological cycles? An investigation of how these three contributing factors play a role in generating waste_scapes can determine methods to re-conceptualize an integration of these sites back into urban, cultural and ecological contexts.

SOCIETY OF RUINS

Ruins of Michigan Theatre, Detroit [Online image]

"…history becomes analogous to a 'skeleton' whose condition serves as a measure of time and, in turn, is measured by time. It is this skeleton which bears the imprint of the actions that have taken place and will take place in the city…"

Aldo Rossi. The Architecture of the City. (Cambridge, Mass.: MIT Press, 1982) 5

Ruin: the remains of a city, or building, that has been destroyed or that is in a state of decay or disrepair

-a form of waste_scape, ancient or modern, that elicit social values, meaning or significance.

In order to legitimize waste_scapes within architectural debate surrounding re-use and urban revitalization, their social relevancy and cultural associations must be established. In **The Architecture of the City**, Rossi describes the structure and layering of urban fabric as the result of two processes. "One process is that of production, in the sense of the city as a work of manufacture…the second process is that of time, which ultimately produces an autonomous artifact."[1]   Accepting that the city both authors and is prescribed a role as palimpsest and recorder of multiple events and histories, the social transformation of buildings and landscapes from produced objects to valued artifacts becomes significant as they age. The dimension of time acquires the task of catalyzing social meaning and defining historical context.

1. Aldo Rossi. The Architecture of the City. (Cambridge, Mass.: MIT Press, 1982) 5

Civic and Personal Nostalgia

As a physical connection to the past, built form acts as a medium to trigger memory suggesting why aged and ancient cities have acquired the character of being read from multiple perspectives and chronological frameworks. Rossi further explains "if time in the chronological sense belonged to a classical context…then once associated with memory rather than history, it moves into a psychological context."[2] The mental association between object and experience establishes significant connections between urban artifacts and cultural rituals or conventions. The pleasures derived from observing and occupying these artifacts originate from a valued common interest in a shared past and tradition. The ancient Greeks found inspiration in their architecture through the political and historical background which it reflected. Design of buildings therefore reflected an urban architecture expressive of the city state and the notion of community and assuring social unity. At present time, the remains of these architectural waste_scapes are associated with being a form of ruin which activates a sense of civic identity and historical past.

The illusion that ruins or urban artifacts perpetually exist is a common psychological and emotional reaction to sites that have gained importance as symbols of stability, both for political and historical reasons. By associating cultural and political ideologies with urban ruins, a belief that these values will be maintained into the future is upheld as long as the sites remain in some shape or form. Stewart Brand states that "every building is potentially immortal, but very few last half the life of a human."[3] The social perception that ruins exemplify a relentless existence through history and circumstance transcends the nature of human existence as a temporary and momentary phenomenon on the scale of time.

Juxtapositions exist between a sense of permanent historical record and the continual impact of the elements and dissipation on ruins. When speaking of the monuments of antiquity from Greek, Roman or any ancient

2. Ibid, 7

3. Stewart Brand. How Building's Learn. (New York: Penguin Books, 1994) 111
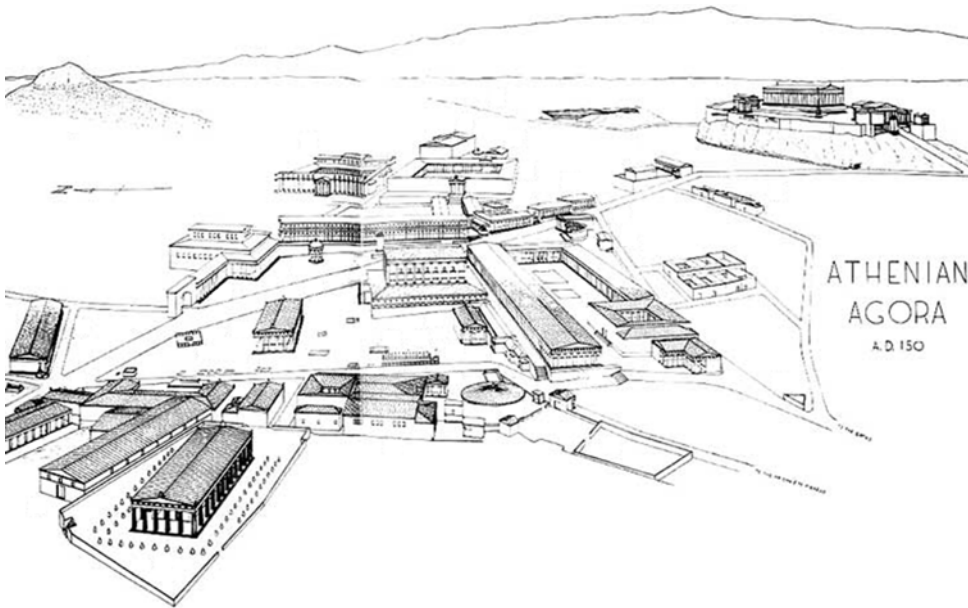
Athenian Agora, A.D. 150. [Online image]

civilization as lasting impressions of their eras, in reality they are changing continuously: "they disintegrate, they go to the earth, they are tidied up, excavated…built over, restored…"[4]   What is observed on the site and associated culturally with it at one time is very different from the natural and social acts that have shaped its transformation from its original conditions.

4. Rose Macaulay. Pleasure of Ruins.
 (Toronto: McClelland and Stewart Ltd., 1977) 7

Perceptions of Slow and Fast Decay

The rate or speed at which waste_scapes are generated can be classified as slow and fast states of natural or human induced physical decay or destruction. Whether caused by natural disasters or intentional human assault by war, arson or terrorism, the forces that cause immediate waste and ruin contain differing social meanings or significance than those factors associated with slow decay such as abandonment and neglect.

The image of abandoned waste_scapes that depict the remains of long fallen civilizations capture our attention

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Agoran ruins within modern Athens. [Online image]

5. John B. Jackson. The Necessity of Ruins. (Amherst: The University of Massachusetts Press, 1980) 94-95

and imagination because of their "celebrat[ion of] a different past, not the past which history books describe, but a vernacular past… as the chronicle of everyday existence."[5] From the identifiable everyday remnants found among the ruins of Roman temples, Manchu Picchu and South Pacific shrines such as baths, houses, tools or religious artifacts to the rusting skeletons of vacated industrial and manufacturing factories, a social allure is linked with these sites due to our ability to relate to them physically or psychologically. Not uncommonly found with broken windows, collapsed elements and signs of trespass, these artifacts invite a degree of curiosity and reminiscence into a forgotten time.   They offer an opportunity to remember a shared past and common history that has been accumulated through isolated and deserted afterlives.

The essential element that connects the generation of a ruin or waste_scape with a period of reinvested social or cultural interest in a site is the delay between decline and reaction. This phase of historical discontinuity can be viewed as an "interim of death or rejection before there

Reichsatg Berlin, 1945. [Online image]

can be renewal and reform. The old order has to die
before [it] can be born again…"[6]   It is during this time of
dormancy that visions of possibility percolate and become
both limitless and fleeting due to the perception of failure
and urban desolation.

It is through the re-use or reclamation of waste_scapes
that one generation can pass history on to the next.   This
could be considered a motivation for having re-used and
adapted the old Reichstag in Berlin, returned as the seat
of the German government following the re-unification
of the country in 1989. Having been abandoned after the
fall of the legislative parliament in 1918 [7] and suffering
damage from both World Wars the building sat in a state
of limbo until it was rebuilt in the 1950's, short of a full
rehabilitation and re-use. Wishing to use the building as
way to solve the country's identity crisis in re-unification
and not wanting to associate the newly reformed
democracy with the fascist ideals symbolized within
the residue of the original structure, the re-interpreted
adaptation of the building for the Parliamentary assembly

6. Ibid 102

7. Sebastian Schmailing. "Masked Nostaligia, Chic
Regression", Harvard Design Magazine. (Fall 2005/Winter
2006) 28

Restored Reichstag. c.2000 [Online image]

preserves the past while integrating modern values and positive visions of the future through new technology. "A critical reappraisal of the past legitimizes the selective reappropriation of certain elements of history while omitting others."[8] Such are the motivations for many preservation projects that use urban waste_scapes, wishing not to erase history through demolition but to re-interpret and recall original ideas and social associations, whether positive or negative, while optimistically moving forward.

8. Ibid 28

Ruins of Commodification

The proliferation of ruins can also be traced to phenomena associated with fast destruction, attributed to natural or human induced disasters. The land encompassing ground zero in Manhattan could be considered a giant waste_scape created by an unprecedented act of destruction. At the same time, the site has become a relic to thousands of visitors that stream by and witness the site daily while representing a liability to the property owners, generating
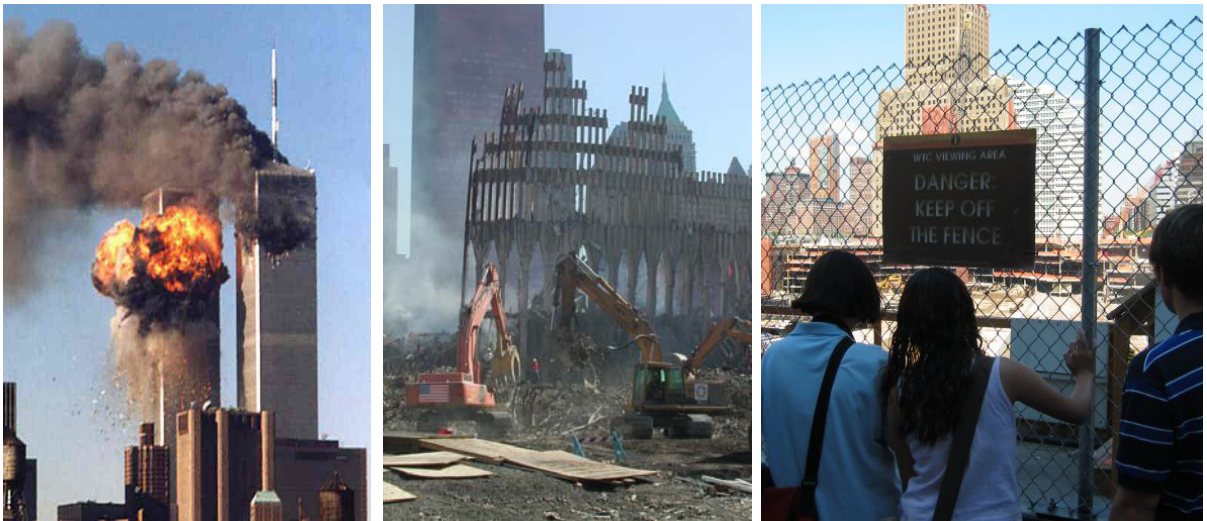
Urban valuation of ruins as sites of sacred social ritual and economic significance.
From left, Sept. 11, 2001; middle, WTC ruins; right, public viewing platforms. [Online images]

little to no revenue from the empty lot. Motivations between preserving the significance of the site and its ruins as a memorial and the economic incentives to re-build offer two conflicting social paradigms. The immediate fall to ruin in such sites could contain a similar source of nostalgia and attention that is paid to ancient structures, the difference being that recent events resonate more emotionally due to the physical experience of the event or history. The ramifications of fast ruin-ization reverberate throughout society quicker than slow decay, immortalizing the significance of a place far sooner through destruction than could ever be achieved through perpetual commercial or cultural success.

Capitalism and a monetary valuation have just as much an impact on the social perception of destroyed structures and how they are noticed or assessed. Suffice to say that the World Trade Center's central location has contributed to its tourist attraction value, the circumstances of other forms of ruin by fast destruction in less visible or economically prosperous areas could lead to their abandonment or

1917 - In 1886 the Kann family opened a clothing store in the Second-Empire-style building (1875) on the corner of Pennsylvania Avenue and 8th Street. Two brothers named Saks then were expanding their clothing business in the new (1884) building on the right corner—it later became the famed Saks Fifth Avenue in New York. By 1917 Kann's had grown to occupy the whole block, punching through interior brick walls to join four buildings. Keep your eye on the building with cupola to the right.

1977 - Kann's prospered through constant innovation. It was the first Washington department store to offer highly discounted prices, full return on goods sold, credit to low-income customers, and it was the first to use black models in its ads. But with the recession of 1974 and pressure from city planners, Kann's had to close in 1975. It was boarded up and some of the aluminum facade was removed by 1977.

1979 - A mysterious fire on February 2, 1979, ended the debate over whether to save the old buildings.

1981 - For most of a decade the space remained empty, awaiting redevelopment. The old Fireman's Insurance Company building at the far right still had no cupola.

Stuart Brand, **How Building's Learn**, 1994. **(76-77)**
An example of fast and forced ruinization through destruction.
Photographic timeline of Kahn's Department Store, Washington D.C.

9. Stewart Brand. How Building's Learn.
(New York: Penguin Books, 1994) 77

forced removal. In the case of Kann's Department store along Pennsylvania Ave. in Washington, 60 years of urban layering and accumulated history was not enough for preservationists to save the old commercial building following a fire in 1979 attributed to arson, forcing its demolition.[9] Where the impacts of failed economic profit or growth override the significance of historical value, such sites become vulnerable to demolition that further disconnect the city from itself and its history. In areas of even less significance such as suburbs or outlying industrial lands, destroyed structures could sit for decades without notice subjected to slow decay and natural collapse, or removed in giant swaths of re-development.

Christo and Jeanne-Claude. **Wrapped Reichstag, Berlin, 1995 [Online Image]**

The idea of the waste_scape renewal as a consumable product has as much to do with tourist attraction as economic profitability. The land artist Christo is best known for his monumental 'wrapped' landscape pieces as a commentary on mass commercial consumption. By wrapping the Reichstag in Berlin with synthetic fabric in 1995, the act of waste_scape preservation and re-use was re-interpreted from the perspective of producing a spectacle commodity. Drawing tourist and economic benefits, the denial of the site history became the value of cultural re-imagining. Considered both preserving and obliterating the Reichstag in one act, this project drew as much attention to mass consumption and the exploitation of waste_scapes for commercial or tourism profit as it did to the potential re-appropriation of these sites.
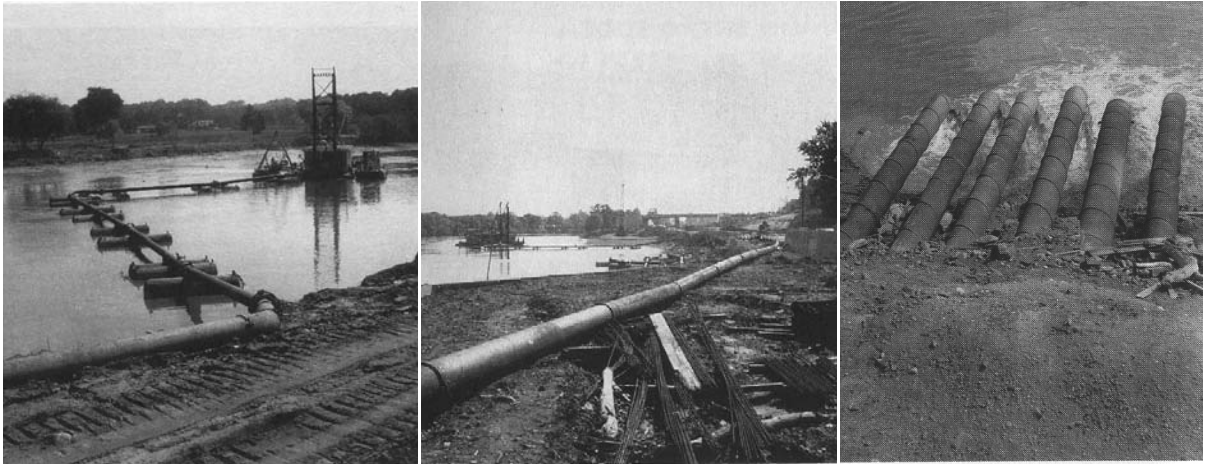
Robert Smithson, **The Collected Writings,** 1996. (70-71, 169)
Monuments of Passaic, New Jersey.

Rise to Ruin

Within contemporary modern society, a new form of ruin
has emerged from the waste landscape. The documentary
work of Robert Smithson in his "Monuments of Passaic"
photography series are poignant examples of newly built
infrastructures that acquire a characteristic degree of ruin
in the very act of their creation. "…the landscape was no
landscape, but 'a particular kind of heliotypy' (Nabokov), a
kind of self-destroying postcard world of failed immortality
and oppressive grandeur."[10] One could almost consider
the type of short term construction that plagues North
American cities today, the structures of temporality built
with unintelligent systems and hasty assembly means as a
form of built ruin. With a constantly changing and shifting
technology base that redefines building systems, structures
are ruin-ized shortly after they become occupied. Smithson
further describes that "Passaic seems full of 'holes'… and
these holes in a sense are the monumental vacancies that
define, without trying, the memory-traces of an abandoned
set of futures."[11]

10. Flam, Jack (ed.) Robert Smithson:
The Collected Writings. (Berkeley, Los
Angeles, London: University of California
Press, 1996) 72

11. Ibid, 72

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Alan Berger, **Drosscape,** 2006. (218-219)
Rising to waste_scape and ruin.

The waste_scapes of outlying residual urban lands and
suburbia best exemplify a state of social unconsciousness
for ruin production generated as these regions develop.
The retail big-box store, oceans of asphalt parking lots,
tract housing construction, hydro corridors, scrap yards
and landfills all represent forms of urban development
that are also waste_scapes or urban ruins in the making.
These sites are valued relatively little by society considering
their frequent use of low quality materials and lack of
built density that would promote accumulative re-use and
historical layering over time. Rather than improve with
age and contribute to an urban prosperity that enhances
cultural and historical diversity, they only deplete and
negate productive social and ecological networks. To the
degree that buildings constructed prior to modern mass
consumption and production could leave traces of shifting
technologies layered within their heavy, solid urban fabric,
today, rather than being built to accommodate change and
take on a palimpsest character, structures are gutted or
completely demolished and re-built to suit the order of the
time.

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Alan Berger, **Drosscape,** 2006. (208-209)
Suburban exchange waste_scape.

TECHNOLOGIES OF CHANGE

Bruce Mau, **Massive Change,** 2004. (152) Self-assembling structures.

"Instead of [re-]designing a thing, we [re-]design a designing thing."

Bruce Mau. Institute Without Boundaries: Massive Change. (London, New York: Phaidon Press Ltd., 2004) 141

Innovation has always taken a leading role in the efforts towards architectural re-use and renewal. Development of techniques that maximize production and assembly processes have evolved rapidly over the past two hundred years to the point where building materials today have begun to take on a design intelligence of their own. Recognizing that re-use possibilities for waste_scapes are limitless, technological and construction resiliency and adaptability are central goals towards using the potential of existing built frameworks in ways that optimize the recovery and recycling of spaces and structures.

In an effort to preserve and retain historical and cultural relevancy within waste sites, the intent and capabilities of the original structures must be considered. In ancient Greece, when maintenance or rebuilding occurred, "the plans of earlier buildings had to be respected and the old materials which were frequently reused…could impose their pattern or proportions."[1]   The choice and compatibility of new materials adjacent to the old suggests an awareness of visual cohesiveness within the urban environment, along with responsible management of built capital and resources.

1. Roland Martin. Living Architecture: Greek. (New York: Grosset & Dunlap, Inc., 1967) 43

Christoph Heinrichsen, **Japan, Culture of Wood**, 2004. (54, 164)
Ise Shrine Cypress wood preparation and tools.
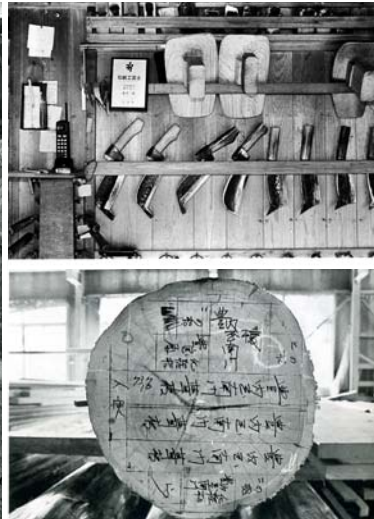
Yashuhiro Ishimoto, **Ise Jing**, 1995. (67)
Ise Shrine finished foundation columns.

2. Christoph Heinrichsen. Japan,
Culture of Wood. (Basel, Berlin, Boston:
Birkhäuser, 2004) 57

A prolific method of prolonging and upgrading material life can be observed in the Japanese construction and processing techniques of cypress wood used in the Ise Shrine. Rebuilt every twenty years as a long standing religious tradition, the logs needed for the project are carved and stripped using traditional wood planers and hooks that follow the grain of the wood, and then clad in sheet copper which helps to delay rot.[2] Although this process can preserve the structures for hundreds of years, the twenty year rebuilding cycles are believed to originate from the logical interval of passing from one generation to the next the technological knowledge needed to duplicate and remove the shrine structures without the use of fasteners or preservatives. Although this practice is inherently unsustainable, in having limited the local supply of Japanese Cypress wood sought for the ten thousand logs needed for each reconstruction; which consequently now have to be brought in from a distance; the technical and spiritual process of re-building and maintaining longevity in the structure is as important as the finished product. Recent practices now maximize the effort of time and material invested in each renewal by re-using as much of the disassembled shrines for smaller structures on the site or to replace pieces of the current shrine. This form

Bing Thom Architects, **Surrey_short list captions_wood.** (15, 18)
Peeler core processing and assembly techniques for Surrey City Center atrium,
Surrey, British Columbia

of technical skill in craft and assembly can be classified as
an historical ritual of re-building and recycling embedded
within the cultural domain.

Peeler cores are a waste product from the timber
production industry. They are cored, central sections
that are scrapped once timber has been planed from the
rest of the log. Although relatively useless for nominal
lumber, they can commonly be seen along countryside
roads as fence posts due to their density and durability,
being the oldest and strongest section of a tree. Using
"the strength of dowel-nut connections [with] Douglas-
fir peeler cores for space frame applications focused on
axial tension,"[3] innovation has extended the use of these
waste products from mere space dividers to structural
components for roofing and building systems. An example
of this application is seen in the central atrium span of Bing
Thom's mixed-use Surrey Center complex in Surrey, British
Columbia. With the prominence of lumber processing
industries comprised in the Lower Mainland, Douglas-fir
peeler cores were readily available for this project and
sourced from regional mills minimizing transportation
costs.

3. Ronald W. Wolfe et al. "Space frame
connection for small-diameter round
timber", World Conference on Timber
Engineering. (Whistler, B.C.: WCTE, 2000) 2

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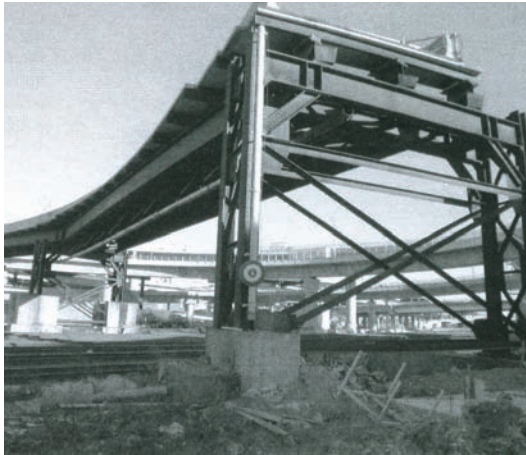
Alex Marshall. "Next Generation Winner," **Metropolis.** 2004. (155) Disassembling Boston's I-93 to make way for the Big Dig.

SINGLE speed DESIGN. **Big Dig House.** 2006. [Online image] Salvaged pieces of the interstate were used to frame the structure for this Cambridge home.

4. Treehugger. "Single Speed Design Big Dig House and Building", Design & Architecture. May 2005 (Online) <www.treehugger.com>

With large urban infrastructural projects such as highways and bridges, built with certain lifecycles in mind, they eventually require restoration or replacement. In the largest infrastructural project in the United States, Boston's big dig sought to replace a grade and overhead highway system with a tunnel. In the removal of the original infrastructure, vast amounts of waste were generated from huge pieces of steel overpasses that would have otherwise gone to landfill. Using these elements, the firm Single Speed Design has built and proposed the recycling of such waste_scapes as structural components for houses and multi-family dwellings. Using highway panels and bridge piers to create the skeletal framework around which facades and interior divisions are placed, these "prototypes serve to demonstrate the value of recycling interstate pieces into buildings."[4]

By maintaining and re-engaging the embodied energy and structural capability of these elements, waste_scape re-use takes on the ability to conserve material rather than add to its further proliferation within landfills. They also create new frameworks that share similarities to pre-fabricated construction with the added benefit of customization and flexibility of use.

Bruce Mau, **Massive Change,** 2004. (144)
Superlight Solids - the insulating properties of aerogels can protect from flame and support loads 125 times its weight (2 g aerogel block supporting a 2.5 kg brick).
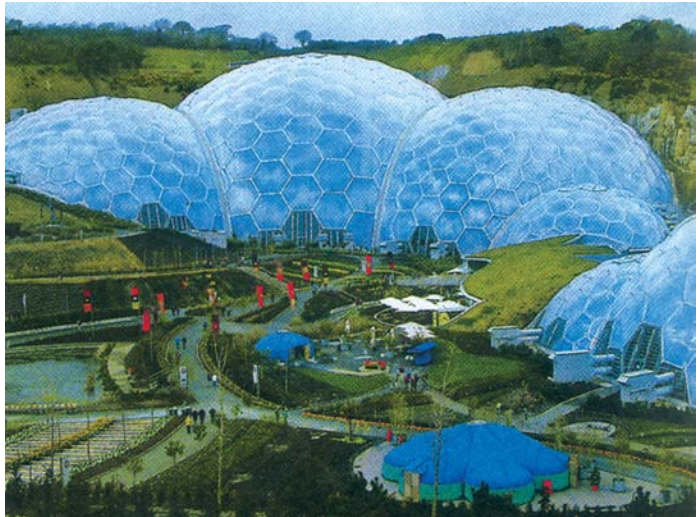
Post-Industrial Instability

With the development of stem cell research, aerospace and nanotechnology and the ability to model scenarios or material characteristics through digital media, new methods are emerging that present the ability to stretch the capabilities of material endurance or re-use innovations.

With the "interdependency of global systems [we] have become keenly aware of the earth's dwindling raw materials, diminishing fossil fuels and the problems associated with industrial waste. Many new product innovations, therefore, are based on using less raw material and energy, repurposing existing materials into new forms and creating materials which are less toxic for the environment."[5]

5. Blaine Brownell {ed.} Transmaterial.
 (New York: Princeton Architectural Press, 2006) 7

Research into self-cleaning window and paint products that use hydrophobic micro bumps to shed water are one way of using innovation to reduce our dependency on resources for maintenance and upkeep. Other synthetic fibers being developed to generate self-healing materials; such as fiberglass and plastic polymers, along with lighter carbon-fibers for building materials such as nylon and Kevlar are being generated using modeling software and molecular manipulation techniques.[6] With the increasing availability of manufactured and artificial technologies

6. Bruce Mau. Institute Without Boundaries: Massive Change (London, New York: Phaidon Press Ltd., 2004) 149

33

Superlight Structures: The Eden Project in Cornwall, England uses the lightness of
plastic films and moulded structures to span large areas.

to deal with resource depletion and waste management,
the justification of expending time and energy to develop
'super materials' begs the question of whether innovation
alone is capable of replacing the natural services of waste
assimilation and diversification through growth.

The desire that technology is capable of solving all our
future needs may explain the complete absence of
debate over the negative impact it has had over the
past century. The proliferation of toxins in our everyday
products, reduced air and water quality and a gourmet of
unrecoverable polymers and plastics have emerged as a
result of industrialization and technological advancement
having been processed into forms that are completely
removed from their environmental source.
"…this incremental electronic [and synthetic] shift has
tended to make nature an even more abstract concept than
it was already…"[7]   Through the proliferation of digital,
synthetic technological invention, is the final distancing
from nature now underway? An approach to waste_scapes
that combine man-made processes with natural systems,
materials and cycles to organize their re-use could produce
more productive results in establishing synergies with the
environment rather than further replicating or replacing it.

7. James Steele. Ecological Architecture.
(Singapore, New York: Thames & Hudson,
2005) 21

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ECOLOGICAL IMPERATIVES

Justin Watt. Cambodian Ruins of Angkor Wat [Online image]

"…it is quite impossible to consider the building as one thing, its furnishings another and its settings and environment still another. The Spirit in which these buildings are conceived sees all these together at work as one thing…"

<div align="right">Frank Llyod Wright on Organic Architecture</div>

Ulrich Conrads (ed.) Programs and Manifestoes on 20th-Centrury Architecture. (Cambridge, Mass.: MIT Press, 2002) 25

Year 1   Year 10

1. NEWLY MOWED MEADOW | 2. PLANT DIVERSIFICATION
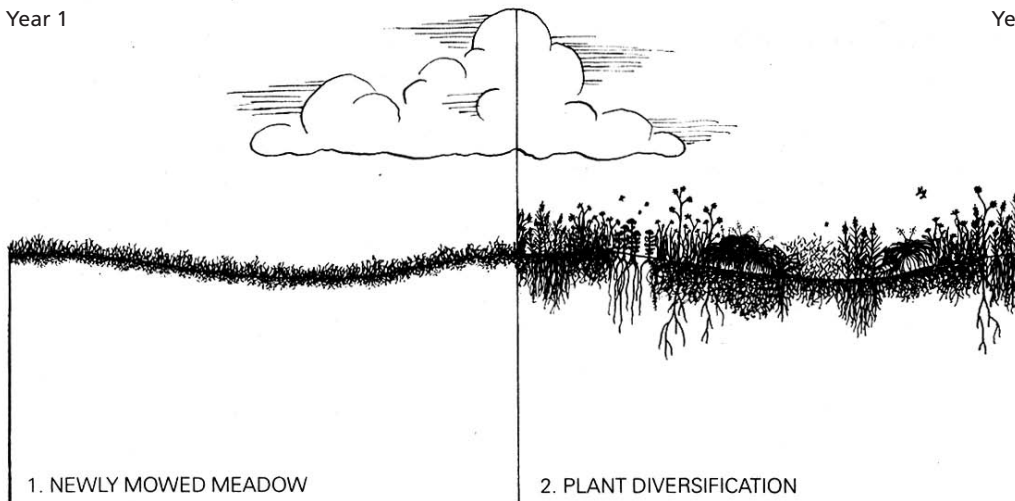
This page and next. John and Nancy Todd, **Ecology as the Basis for Design,** 1984. (146-7)
Biological terrestrial succession in a meadow (measured in decades).

Year 1   Year 3   Year 5   Year 9

Stewart Brand, **How Buildings Learn,** 1994. (110-11)
Successive decay of Wright's Mill, Maryland over a ten year period.

Year 20   Year 30

3. INVASION OF SCHRUBS AND WOODY PLANTS   4. MATURING WOODS
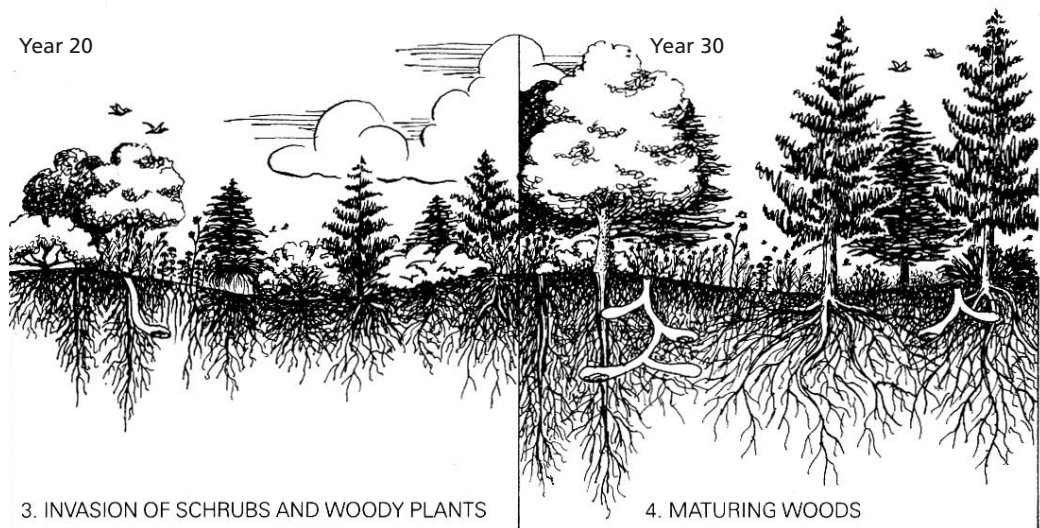
1. John and Nancy Todd. Ecology as the
Basis of Design. (San Francisco: Sierra
Club Books, 1984) 28

In nature, waste does not exist. Instead biological cycles use solar energy to break down materials at a molecular level and transform them into nutrients that other organisms use as food for their own growth. A design approach that considers not only the immediate post-construction product, but the long term succession and impact on future use and synthesis with ecology is essential to an integrated approach to waste_scapes. "As ecosystems unfold, succession leads to change, maturation, and increases in diversity and complexity."[1] This description of ecosystems parallels the idea of the city as palimpsest and record of history that arguably contributes to the diversity, energy and beauty of the urban environment. What is missing between these two notions of succession however is that the city does not generate any form of ecological retrieval or growth as a result of producing waste. An organism that is unable to grow or re-integrate because of inflexible frameworks that only produce waste is a system that will inevitably fail.

Luigi Alini, **Kengo Kuma.** 2006. (163, 27)
Left: Soba Restaurant uses gaps in its facade to blur the distinction between what is built and what is natural.
Right: Omotesando building in Tokyo uses similar particalization to dematerialize the mass of the structure.

Designing with Particles

The ability for nature to assimilate waste, produce energy from the
sun and sustain growth is through a level of design that is focused
on the individual workings of materials at a molecular level.
One way of looking at the structure of natural ecology and the
components of waste_scapes is from a concept that Kengo Kuma
calls particalization. His approach to breaking up architecture
into fine particles is related to an idea that all things perceived as
objects are merely phenomena comprised of many interrelated
components and interactions. When associated closely together
these pieces create an image or realization of something else.
"…if [materials] appear as single masses, then…they are not vivid,
because they do not change their expression. If materials are
thoroughly particalized, they are transient, like rainbows."[2]

2. Luigi Alini. Kengo Kuma.
(Milan: Electa Architecture, 2006) 222

The Japanese carpentry technique of Kiwari is a principle used
to determine the size and proportion of each component and
module in the design and construction of wooden structures.
Without setting this particle size, deciding dimensions of the
building become meaningless. Through the Kiwari method which

particlizes the construction process, the building evolves based on the assembly of individual and potentially discontinuous elements. The object or site looses its significance as we realize the importance of the factors, events, light, materiality and vibrancy that are manifest through the built object. For waste_scapes, the phenomena or reality that must be understood to respond to their circumstance while creating growth and renewal from waste is that of decay. Through a fundamental understanding of the interactions between waste and entropy, the potential to create new social cycles of use that engage with natural cycles of growth can be considered.

Embracing Entropy

"Picture in your mind's eye [a] sand box divided in half with black sand on one side and white sand on the other. We take a child and have him run hundreds of times clockwise in the box until the sand gets mixed and begins to turn grey; after that we have him run anti-clockwise, but the result will not be restoration of the original division but a greater degree of greyness and an increase of entropy."[3]

3. Flam, Jack (ed.) Robert Smithson: The Collected Writings. (Berkeley, Los Angeles, London: University of California Press, 1996) 74

1. NEWLY DUG POND   2. AQUATIC DIVERSIFICATION
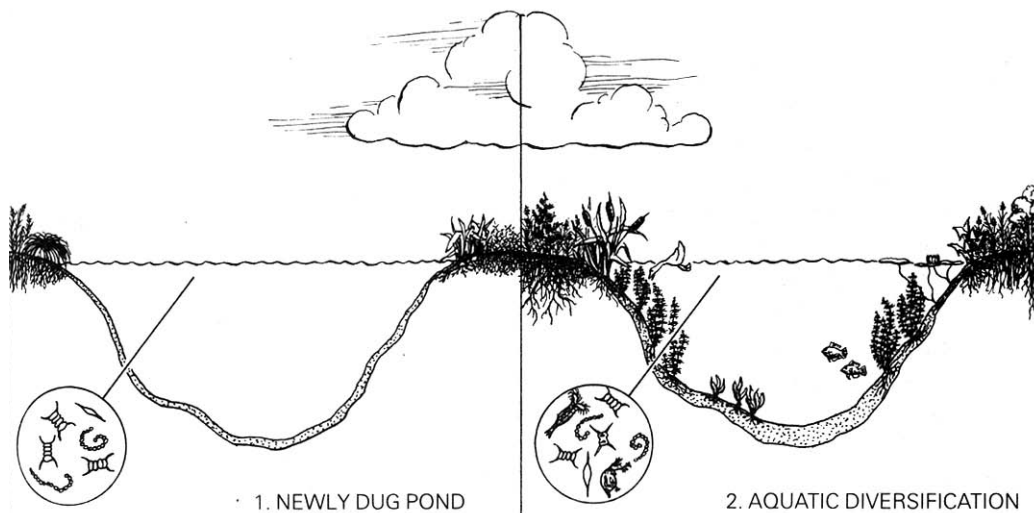
This page and next. John and Nancy Todd, **Ecology as the Basis for Design,** 1984. (27)
Aquatic succession and biological community building.

The slow state of destruction imposed by time and the elements
are sources of decay that create waste_scapes. These forces need
to be closely associated with approaches to production and re-use
to ensure that waste sites can become dynamic contributors to
social and natural ecologies. Vernacular architecture such as adobe
or wooden structures that are erected quickly as barns or houses
contain strong cultural values despite the temporality of the
building itself. "Once the roof and windows…were open, even its
sturdy timber frame construction could not save it from the effects
of constant moisture. To insects and fungus, wet wood is food."[4]
Although these remains are often left alone to entropic devises,
they speak to a cultural tradition that intend not to produce
lasting monuments or ruins for posterity but to return their
resources to the earth once their useful lives are over.

4. Stewart Brand. How Building's Learn. (New York:
Penguin Books, 1994) 111

Entropy, like history is irreversible. The sooner that our build
structures and production methods embrace this concept, the
closer we will be to a socially appropriate occupation and re-
integration of the urban landscape with ecological systems. The
question stands, what are the use applications that can engage
with decay as an inevitable and irreversible process that aids in the
generation of productive waste_scapes?

3. AQUATIC MATURATION
& TERRESTRIAL INVASION

4. TERRESTRIAL COMMUNITY
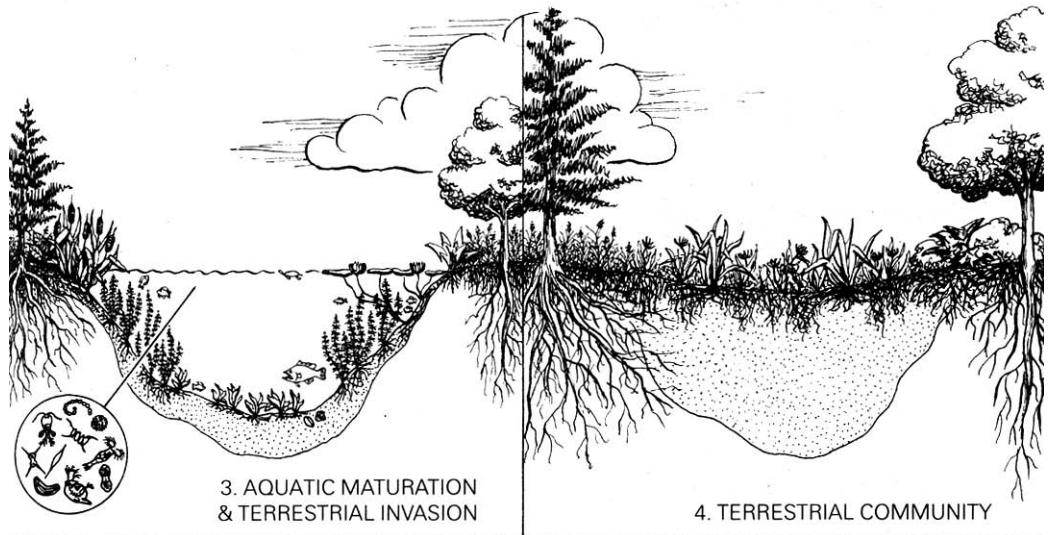
Natural Assimilation

Like any city or urban environment, the natural world lives in flux and experiences constant change. The wastes generated from one process are the nutrients that feed the growth cycles of another. This downward succession of waste processing is what enables the contained conditions of ecosystems to diversify and expand. "Nature depends upon connections through different levels of biological organization…no organism is an island onto itself."[5] To the same degree that a tree is an active contributor and member of an ecosystem, individual buildings and waste_scapes are just as crucial to the vitality and life of a city system. In generating ways for both systems to reclaim and maximize the capabilities embedded within the "food" waste they produce, they will become more immune to sudden shifts or fluctuations and begin to resemble cycles of waste management observed in natural ecosystems.

An example of this kind of urban waste neutralization and ecology maximization is the technique developed by John and Nancy Todd of treating sewage and liquid wastes using living machines. These
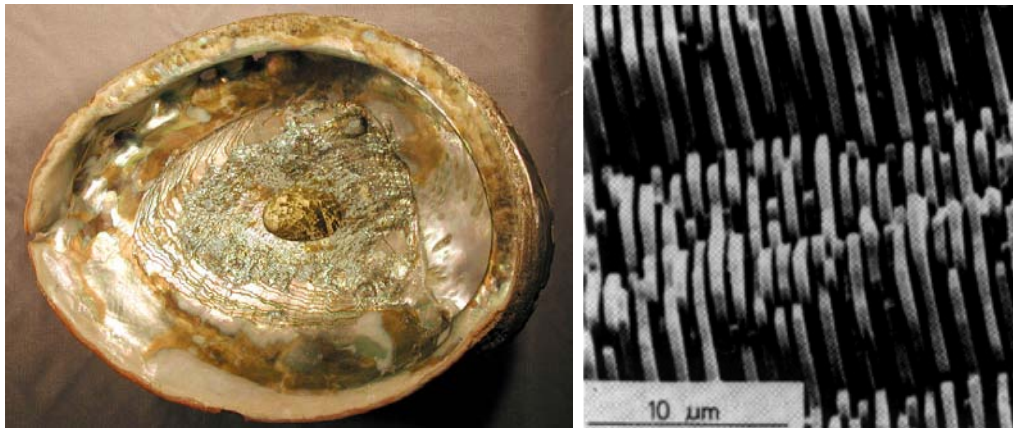
5. John and Nancy Todd. Ecology as the Basis of Design. (San Francisco: Sierra Club Books, 1984) 25
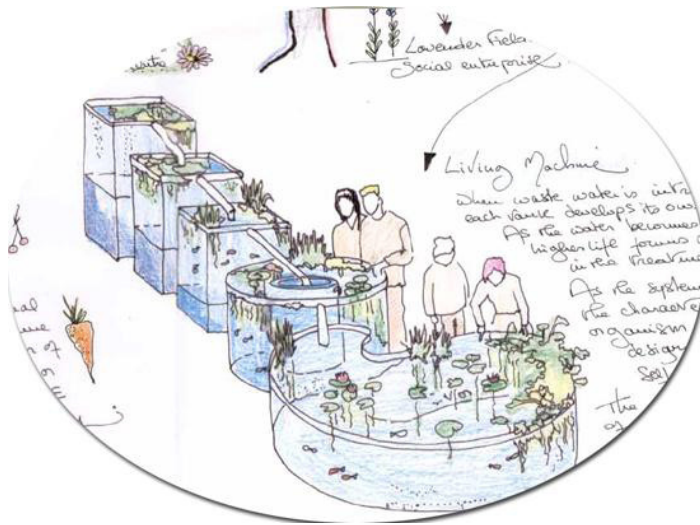
John and Nancy Todd, **Living machine waste water treatment.** [Online image]

constructed ecosystems that are built within existing structures or as part of a larger wetland strategy use the capability of organisms to break down waste inputs through a series of aerobic and anaerobic chambers or steps. As the water passes from one section to the next, organisms are engaged to remove and dissipate solids, bacteria and phosphates so that at the end of the process potable water is generated. The Todds have employed this method to harvest mushrooms and breed Cod off the Atlantic coast as a result of the beneficial outputs of neutralizing and generating food from waste.

"…holding that the health of natural systems is directly connected to our own physical/psychic health as individuals and as a species, we must be constantly interconnecting our own world with other natural systems."[6]

6. Jim Dodge (Quoted in Todd) Ecology as the Basis of Design. (San Francisco: Sierra Club Books, 1984) 44-45

If waste_scapes and their interactions with the city can relate to and improve conditions in the natural environment, then we may return waste back to the ecosphere to its reciprocal benefit. The idea of built systems echoing those of the natural world is a concept that Janine Beynus has called biomimicry.

Twice as tough as man-made ceramics, mollusks achieve their rigid strength using a molecular nacre, which acts as a ligament-like mortar between layers, that enables the shell to deform without cracking while under stress.

7. Janine Benyus. Biomimicry: Innovation Inspired by Nature. (New York: William Morrow and Co. Inc., 1997) 97

Citing examples from nature such as the strength of spider silk, which far out performs the strength of steel, ounce for ounce, and the self-healing or repair capabilities of bone, wood, skin, and muscle, they all "are made to live out their useful life and then to fade back, to be reabsorbed by another kind of life through the grand cycle of death and renewal."[7]   Through life-friendly manufacturing processes, self-assembly capabilities and ordered hierarchical structure, modeling construction techniques from nature goes hand in hand with solving many of the problems faced with waste production and assimilation.

WASTE_SCAPE:
SUCCESSION STUDIES

Without waste, cities would have no future. Waste_scapes provide an opportunity to re-envision how urban space is used and experienced. In re-positioning how these sites respond to the flux and change of the networks and systems that orphaned them in the first place, their re-use can channel energy and urban forces towards dynamic and catalytic development. As part of urban evolution, waste_scape retention and revitalization enables the urban fabric to trace and record its own change.

Through observations of four case studies which involve the re-use and re-integration of a ruin, building, infrastructure and landscape in contrasting urban contexts, findings will be extracted to consider architectural approaches which respect original historical fabric, maintain and gainfully utilize the structural integrity of the existing structures and identify the success in re-legitimizing the waste_scape's presence in the city through its adaptive transformation over time. These findings will form the basic goals for an approach to the selected Ottawa site.

Re-Imagining a Ruin:
Kolumba Museum, Cologne, Germany

Cologne Cathedral

Former
museum
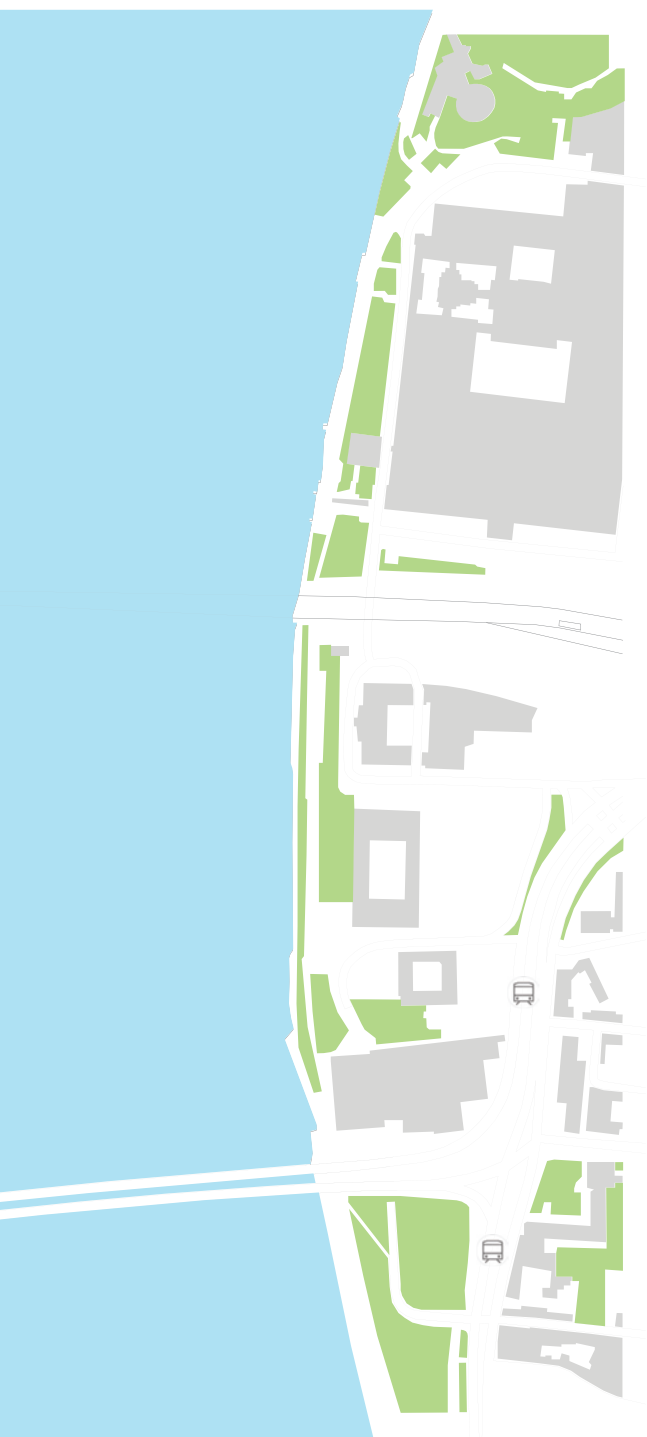
Roman settlement: c. 50bc
Original structure built: c.1470
Interim preservation / excavation: c.1950 - 1975

Successive re-use adaptation: 2002 - 2007
Architect: Peter Zumthor

Founded in 1853, the Diozesanmuseum in Cologne, Germany is
the second oldest public collection of sacred art in the country.
The original museum was destroyed during WWII, located south
of the Cathedral, which resulted in the collection being moved
to temporary off-site locations until the building was re-built on
the same site in 1972. Due to funding problems, the collection
was transferred in ownership to the Archdiocese of Cologne. This
transition spurred a re-evaluation of the museum location, what
the collection should contain and methods of its display.
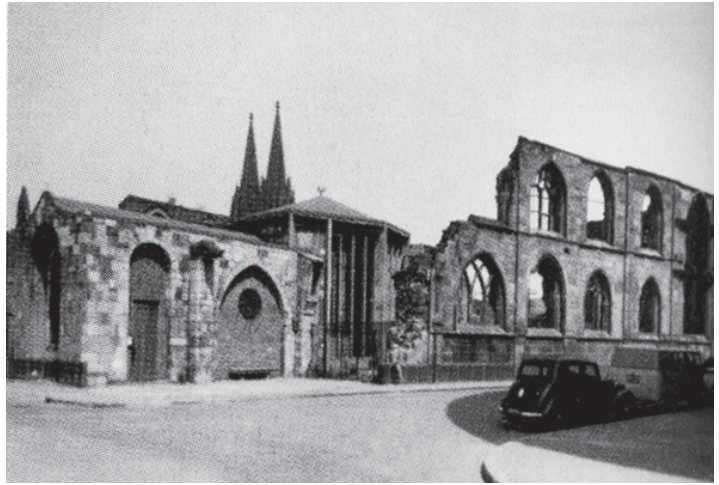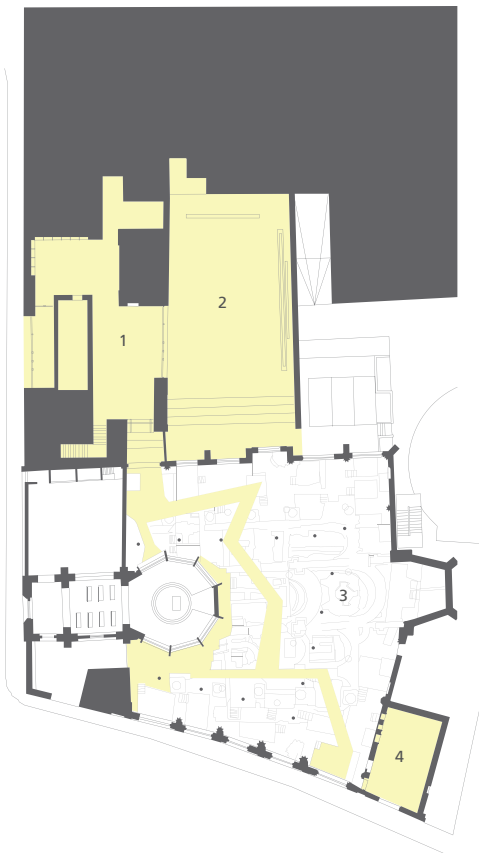
10m   50m   100m   200m   Subway Station

Kolumba museum. Original St. Kolumba Church, Cologne. [Online image] c.1930

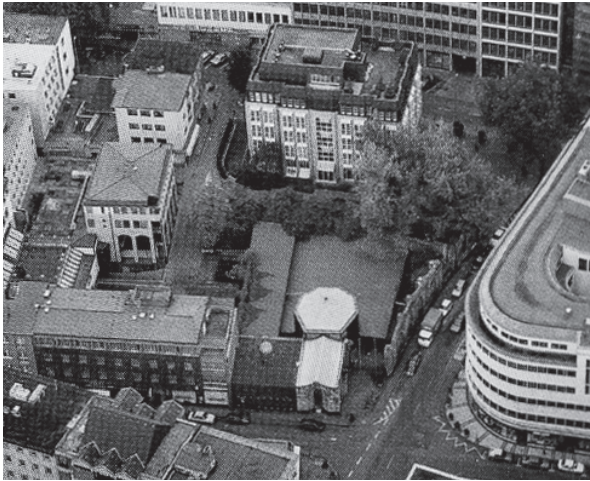Chiara Baglione, "1997-2006: Peter Zumthor," **Cababella.** 2004 (74) St. Kolumba ruins, c.1955.

1 Foyer
2 Yard
3 Excavation site
4 Former sacristy
5 Gallery
6 Storage
7 North tower
8 East storage
9 East tower
10 South storage
11 South tower
12 Curatorial

Ground Floor Plan

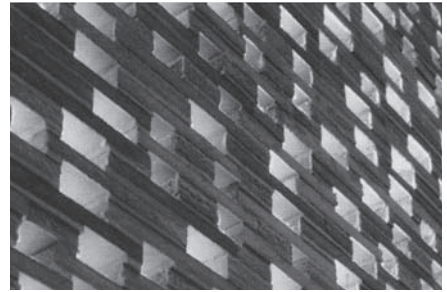Floor 3, main gallery space

2m   6m   10m   20m

Chiara Baglione, "1997-2006: Peter Zumthor," **Cababella.** 2004 (74)
St. Kolumba chapel, c.1975.

Helene Binet, **Building Design.** 2007. [Online image]
Zumthor's contemporary addition bakes new and old together.

The nearby site of St. Kolumba church, also owned by the Archdiocese, contained that churchs' ruins and remains from WWII raids that flattened the city core. Having used the site as a quarry for materials during post-war reconstruction, the ruins were left as a monument to the past. A small chapel and canopy were built over the site in 1950 to preserve their significance and integrity over time, containing archeological fragments from Roman antiquity as the surrounding city fabric was re-established based on the original medieval plan.

Within this context, the Archdiocese decided to use the site of the Kolumba church as the location to build the museum and house its growing contemporary collections. As a reclamation of a ruin waste_scape, the new Diozesanmuseum has emerged as a result of the site contents. Rather than clear the site, Peter Zumthor's approach was to fuse the two structures together, initiating a dialogue between old and new that preserves the ruins in a publicly accessible way, enabling them to be incorporated as part of the collection.

Chiara Baglione, "1997-2006: Peter Zumthor," **Cababella.** 2004 (76)
Masonry exterior wall detail
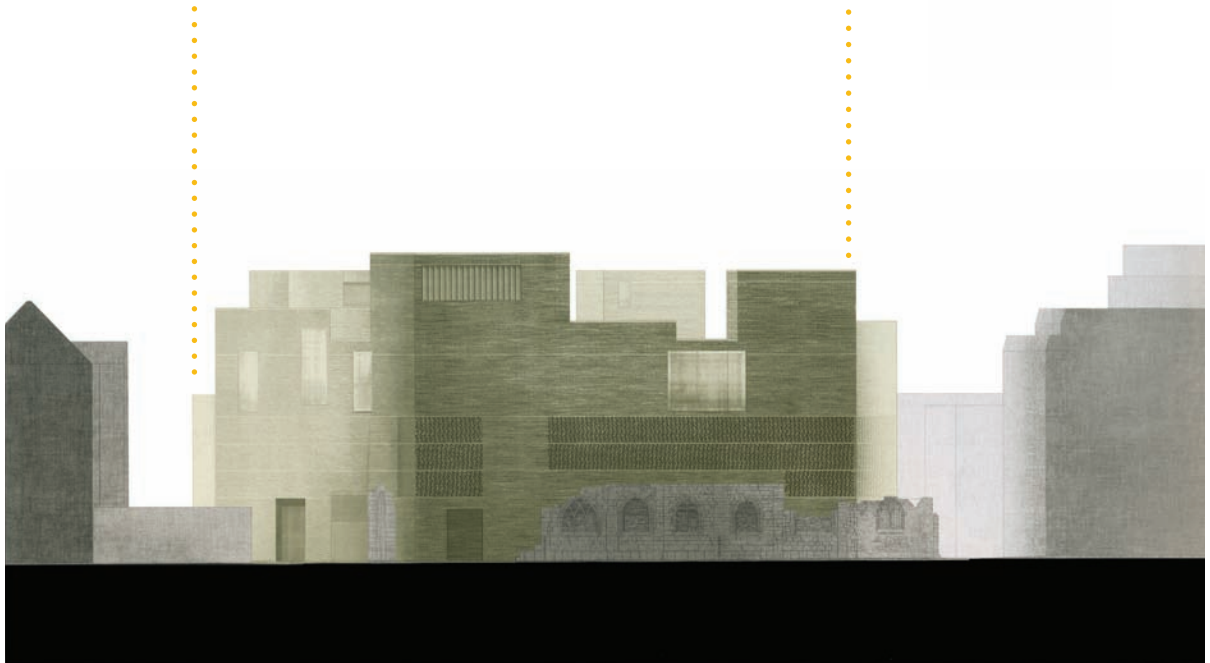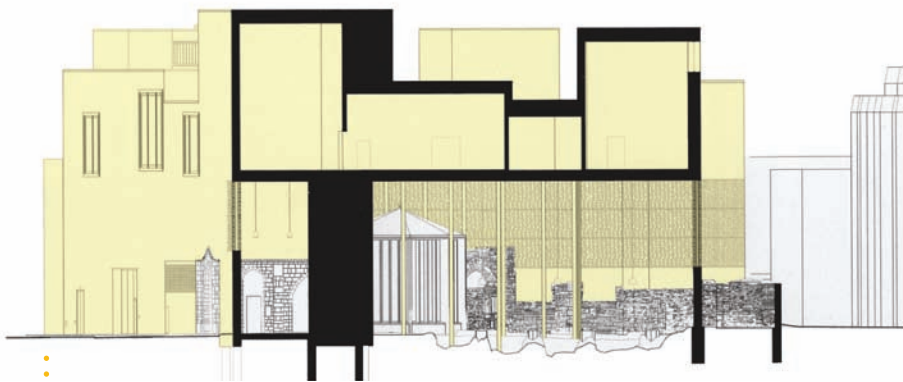
Chiara Baglione, "1997-2006: Peter Zumthor," **Cababella.** 2004 (73, 76)
South elevation of Kolumba museum. Section A above.

Left: Kolumba museum, **Construction photo.** [Online image]
Right: Helene Binet, **Building Design.** 2007. [Online image]
Kolumba museum hovers over the excavation site as a protective canopy while preserving public access and
providing walls of pixilated light that dematerialize the mass of the structure.

The re-use of the ruins, grafted with a contemporary addition
that respects the historic fabric of the site in plan and section, act
as an organizing device to the new structure establishing layout,
circulation and atmosphere. A pixilated open-air masonry facade
within the enclosed ruin space retains an interior that is aware and
confronted with the presence of urban activity. The immediacy of
adjacent noises and functions indicate a sensual inter-relatedness
between reflection in the past and abruptness of the present.

With a desire to collect modern as well as traditional sacred art,
not as an investment for monetary gain or public marketing, the
Archdioceses' approach to the new museum sees it as a cultural
investment which acknowledges the significance of the past as
much as the present. The Kolumba museum is similarly conceived
as a fusion between space of historic reflection and contributor to
a contemporary urban architectural dialogue.

Re-Imagining a Building:
Tate Modern, London

St. Paul's Cathedral

Globe
Theatre

1. Frances Spalding. The Tate: A History.
(London: Tate Gallery Publ. Ltd., 1998) 276

Original structure built:	1947 - 1963
Waste_scape state:	1981 - 1994
Successive re-use adaptation:	1995 - 2000
Architect:	Herzog & de Meuron

Bankside power station served as a centrally located oil-powered electricity plant in London for 30 years. The energy crisis of the 1970's made the use of oil prohibitively expensive, leading to the station's eventual decommissioning in 1981. During the period that followed, several requests were submitted by developers to demolish the station considering its prime waterfront location across from the city center.

Not until the Twentieth Century Society, a London based preservation group, had begun to take action towards saving the structure did it come to the attention of then Tate Gallery Director, Peter Serota.[1] Having announced the need for a new site for its modern collections in 1994, the Tate began discussions with the owners Stanhope Properties to investigate conversion costs of the structure to be turned into a new gallery.

10m   50m   100m   200m

London Underground

Rowan Moore, **Building Tate Modern.** 2000. (154)
Bankside site, 1947.

Turbine Hall

Waterloo Station
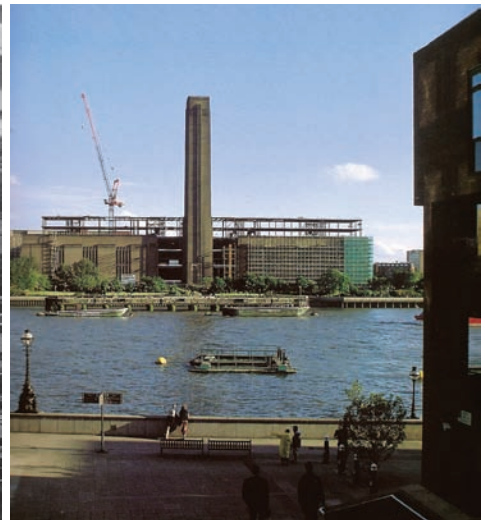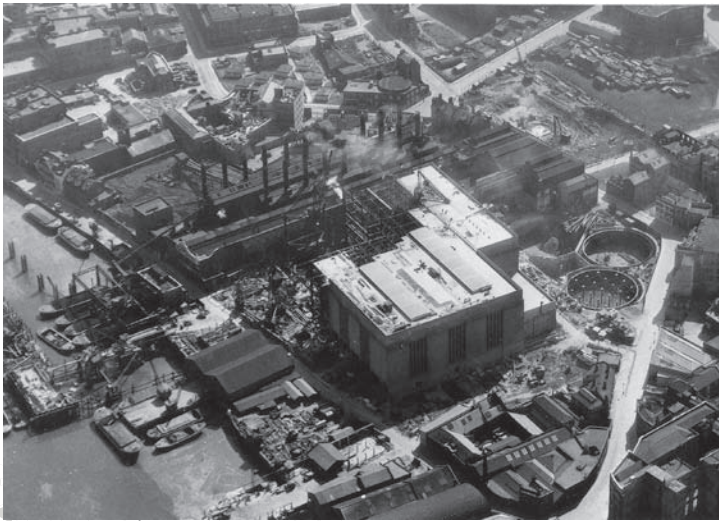
Left: Rowan Moore, **Building Tate Modern.** 2000. (187) Bankside construction, 1951.
Right: Ibid. (73) Re-adaptive construction for Tate Gallery,1998.

2. Ibid 278

Located across from St. Paul's cathedral, the Bankside site provided a pivotal attraction for the Southbank city council to enhance the prestige of the dreary industrial neighborhood and establish pedestrian connections with the north side of the Thames and the rest of the city. At the time that the Tate was considering the site, the Jubilee line extension was also taking place, which connected Waterloo and Southbank stations with the rest of London. In combination with the employment opportunities, connectivity and area revitalization presented in such a proposal, Southbank council decided to back the project both legislatively and financially.[2]

Part of the winning competition proposal for the re-envisioning of the power station by Herzog & de Meuron was to use the soaring central turbine hall space of the building as a public entry way and access point to enter the gallery and establish greater urban pedestrian connections, thus blurring the traditional distinction between public and private museum patron space.

The other key components of their proposal incorporated a luminous penthouse across the run of the river frontage and a freed ground surface for public use.

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As a gesture to respect and accept the
existing building and to work with it rather
than against it, Herzog & de Meuron
decided to retain as much of the physical
shell and framework of the structure as
possible while removing the former power
station to accommodate the new gallery.
Over a 15 month de-planting process,
all excessive concrete and machinery
was extracted by hand without the use
of explosives so as not to damage the
structure.

The main floor of the building was
removed during the stripping to install a
continuous entry ramp that begins from
grade level outside creating a seamless
connection between interior and exterior. This heightens
the impact of the turbine hall space and enables natural
light to penetrate the lower spaces of the building. Access
to the gallery is achieved through a central portion of the
floor that was maintained for a stair. This element also
encourages north-south public circulation directly through
the building making the structure itself and its surroundings
key elements of the urban topography.

Gallery floors were built within the shell of the old boiler
room on the north side of the turbine hall facing the river.
The layout of gallery floors and elevations were established
by respecting the direct contact of the space with the
original cathedral windows of the facade. Two new floors
were added above the structure for administrative and
dining services which acts as a signature light beam at night.
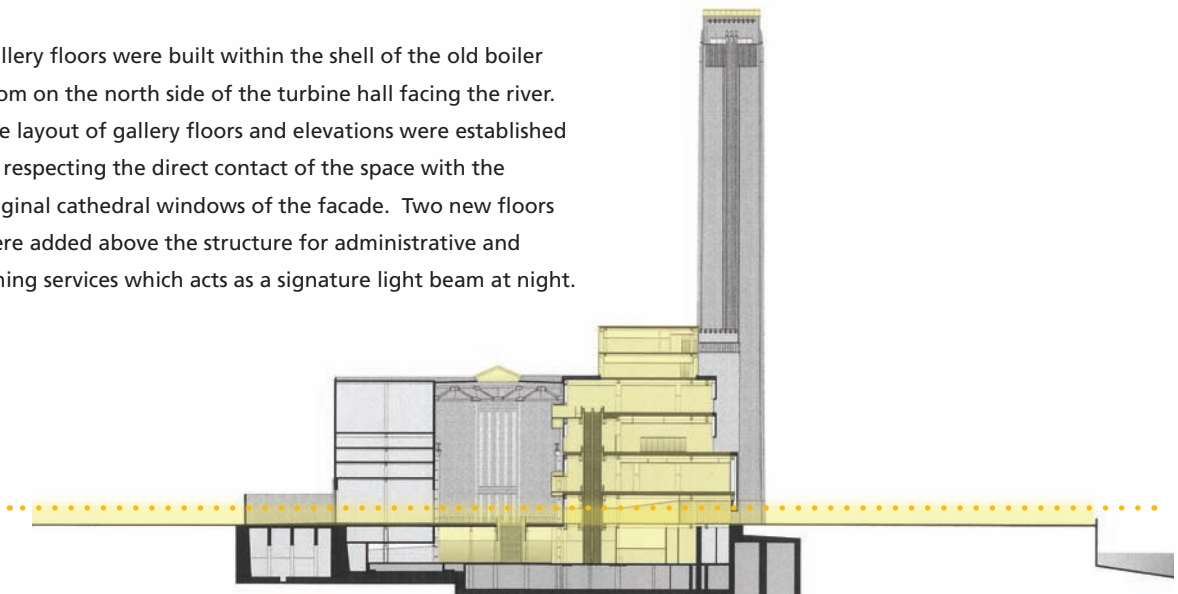
Rowan Moore, **Building Tate Modern.** 2000. (174)
 North-South section through Turbine Hall. Yellow spaces indicate newly introduced elements to Bankside structure.
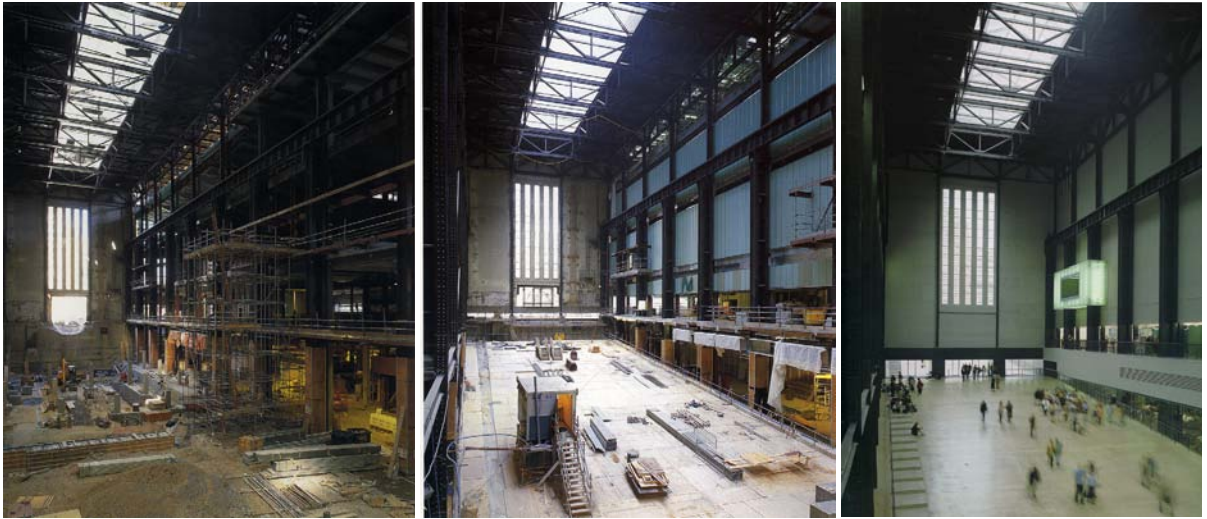
Opposite page from left: Rowan Moore, **Building Tate Modern.** 2000. (62) Bankside before de-planting.
Philip Upspring, **Herzog & de Meuron: Natural History.** 2002. (144) Bankside de-planting, central turbine hall and boiler room.

This page from left: Rowan Moore, **Building Tate Modern.** 2000. (187) Gallery super-structure erection within Bankside shell.
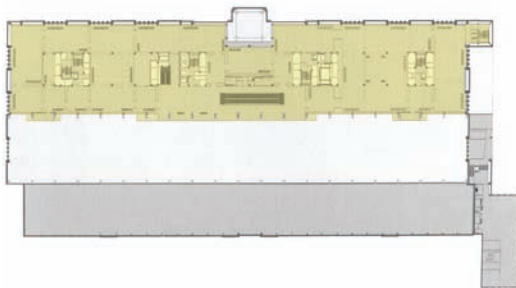Ibid. (140) Turbine hall entry ramp construction and gallery fit-out.
Helen Searing, **Art Spaces.** 2004. (114) Completed revitalization of Bankside into the Tate Modern.
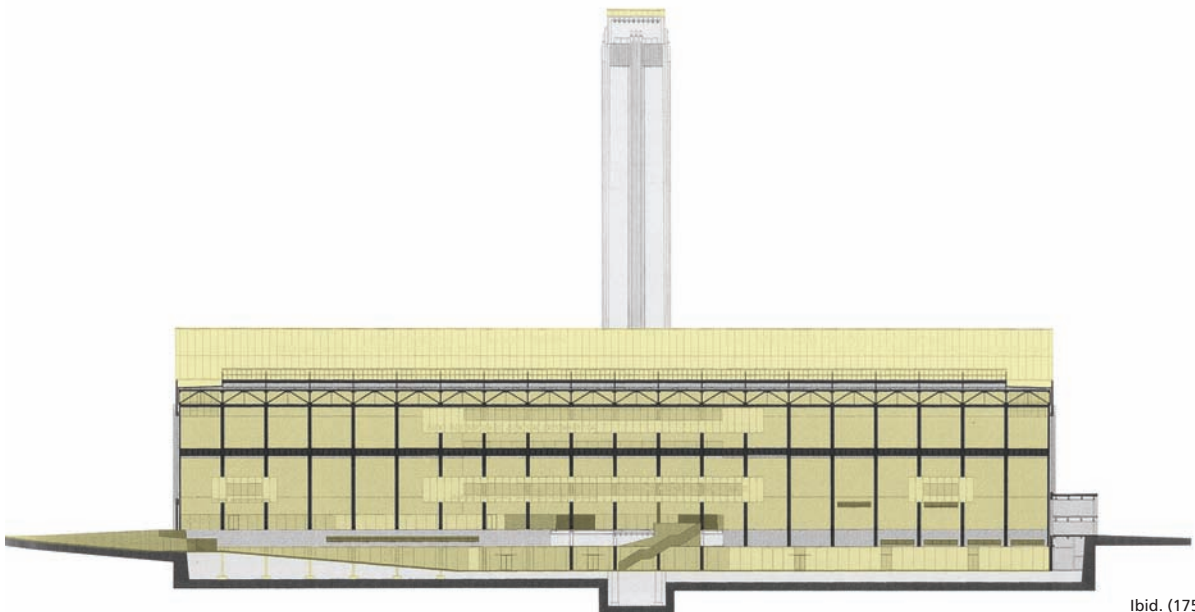
Ibid. (175)
East-West section through Turbine Hall

Helen Searing, **Art Spaces.** 2004. (114)
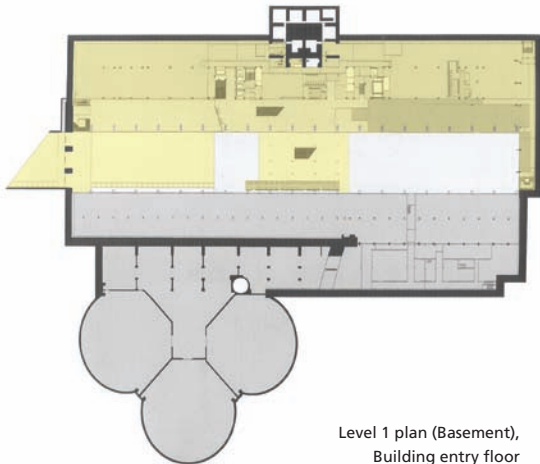Differentiating original from introduced. Tate modern entry ramp.

Rowan Moore, **Building Tate Modern.** 2000. (167-9) Tate Modern floor plans.
Level 3 plan (Yellow indicates new elements to Bankside structure.)   Level 2 plan, gallery entry
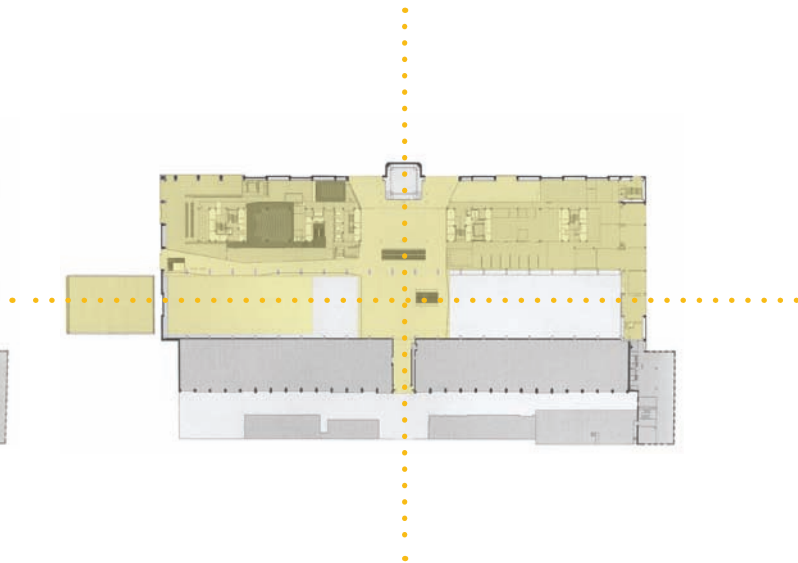
The area south of the turbine hall is an electrical sub-station that remains in use. When this space eventually becomes available, the Tate modern intends on using former circular oil tanks below the public plaza as a additional gallery space as well as completing the north-south connection of the building between the Thames and the urban facades. Gift shop and cafe spaces on the south facade will further enhance the character and activation of the building with the urban fabric.

Part of what has made Bankside's transformation into the Tate modern so successful is the great flexibility of the gallery spaces, the connections made with the greater city fabric and a respectful integrity for the original structure that has been maintained. "Something new has emerged that is more exciting than the pure preservation of a given structure and more complex than a completely new building."[3] As Rowan Moore described in *Building Tate Modern,* "Bankside looks set to have a much longer life as an art gallery then it ever did serving the purpose for which it was designed."[4]

Level 1 plan (Basement),
Building entry floor

3. Nobuyuki Yoshida (ed.) "H + de M",
A+U. **(**Feb. 2002) 221

4. Rowan Moore, **Building Tate Modern.**
(London: Tate Gallery Publ. Ltd., 2000) 190
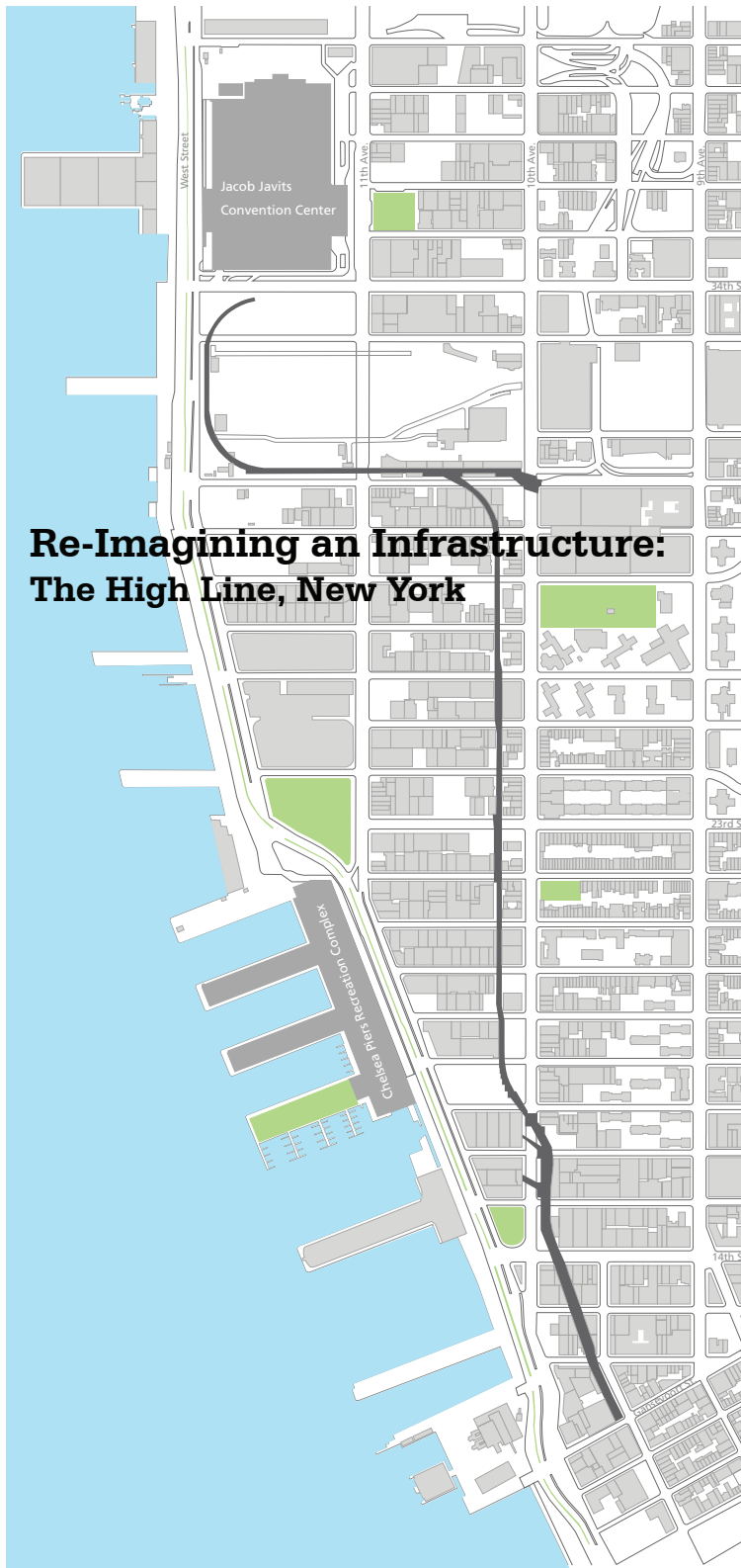
Re-Imagining an Infrastructure:
The High Line, New York

Jacob Javits
Convention Center

West Street

11th Ave.

10th Ave.

9th Ave.

34th St.

23rd St.

14th St.

Chelsea Piers Recreation Complex

10m   50m   100m   200m

Original structure built: 1930 - 1935
Waste_scape state: 1980 - 2002

Successive re-use adaptation: 2006 -   .
Architect: Diller + Scofidio +Renfro

Originally built as an industrial rail route from Albany to New York City, the New York Central Railroad corridor is located along the west side of Manhattan. The Tenth Ave section of the line, dubbed "death avenue" due to the 100+ casualties per year from street accidents with the steam trains, was elevated during the 1930's to reduce the manufacturing district's congestion between rail, shipping, auto and pedestrian traffic. Used primarily to deliver freight to factories, the route was built twenty feet over the street meeting and passing through the 3rd floor of various buildings along the way to reduce street traffic conflicts.[1]

1. .Joshua David. Reclaiming the High Line.
(New York: AOL Time Warner, 2002) 44-50

With the onset of the interstate highway system and the use of big rigs to deliver goods, the High Line began to decline in use starting in the 1960's. This resulted in the demolition of the line's southern most section. By 1980 the entirety of the High Line elevated structure was discontinued for train use.

Recent demolition requests from local property owners have been counteracted by a non-profit organization called Friends of the High Line, which conducted assessments of how the line could be returned to public use and access. Gaining local commercial and political support to preserve the line due to higher economic and public amenity benefits gained through its retention, the High Line was successfully "rail-banked" with a federal program that opens up the corridor to public use while retaining the ability to revert it back to rail use at a future time.

Tenth Ave. trains lead to street congestion along Manhattan's lower west side that rendered the need for a grade elevated track in 1930. [Online image]

Joshua David, **Reclaiming the High Line.** 2002 (4-5)
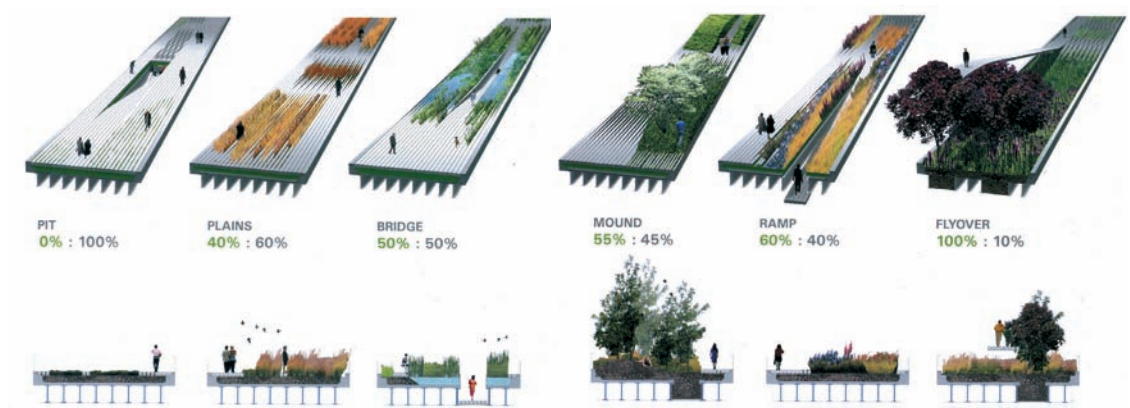View looking north from 17th St. along the newly completed High Line, 1934.

1920

1930

1940

1970

1990

2010
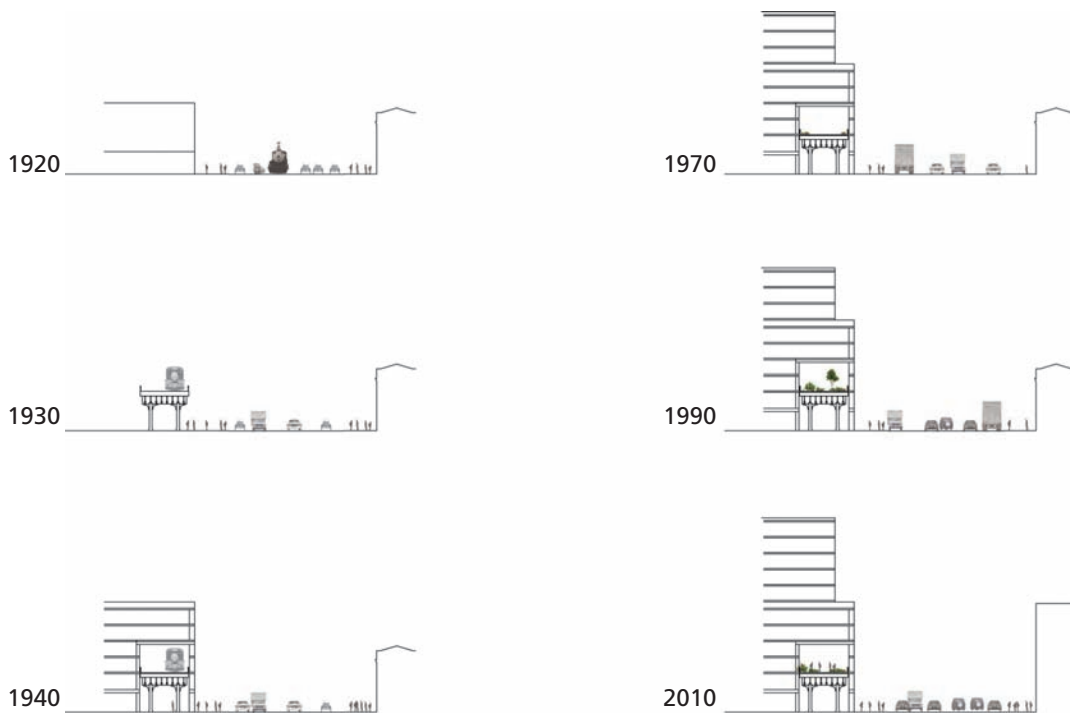
Sectional progression of High-Line use.

Left: Jennifer Lee, "Taking a Sneak Peak at the High Line", **The New York Times.** [Online image]
Right: Diller + Scofidio + Renfro, **High Line imagining.** [Online image]
Abandoned in 1980, the High Line has been reclaimed by nature. This state of ecological balance and social
re-integration is the goal of its re-use strategy in its most recent adaptation.

| PIT | PLAINS | BRIDGE | MOUND | RAMP | FLYOVER |
| 0% : 100% | 40% : 60% | 50% : 50% | 55% : 45% | 60% : 40% | 100% : 10% |

Guido Incerti, **The Ciliary Function.** 2007 (203)
"Agri-tecture" typology ratios at work on the surface of the High Line.

Diller + Scofidio + Renfro, **High Line imaginings.** [Online images]
Gansevoort St. Market entrance to the High Line
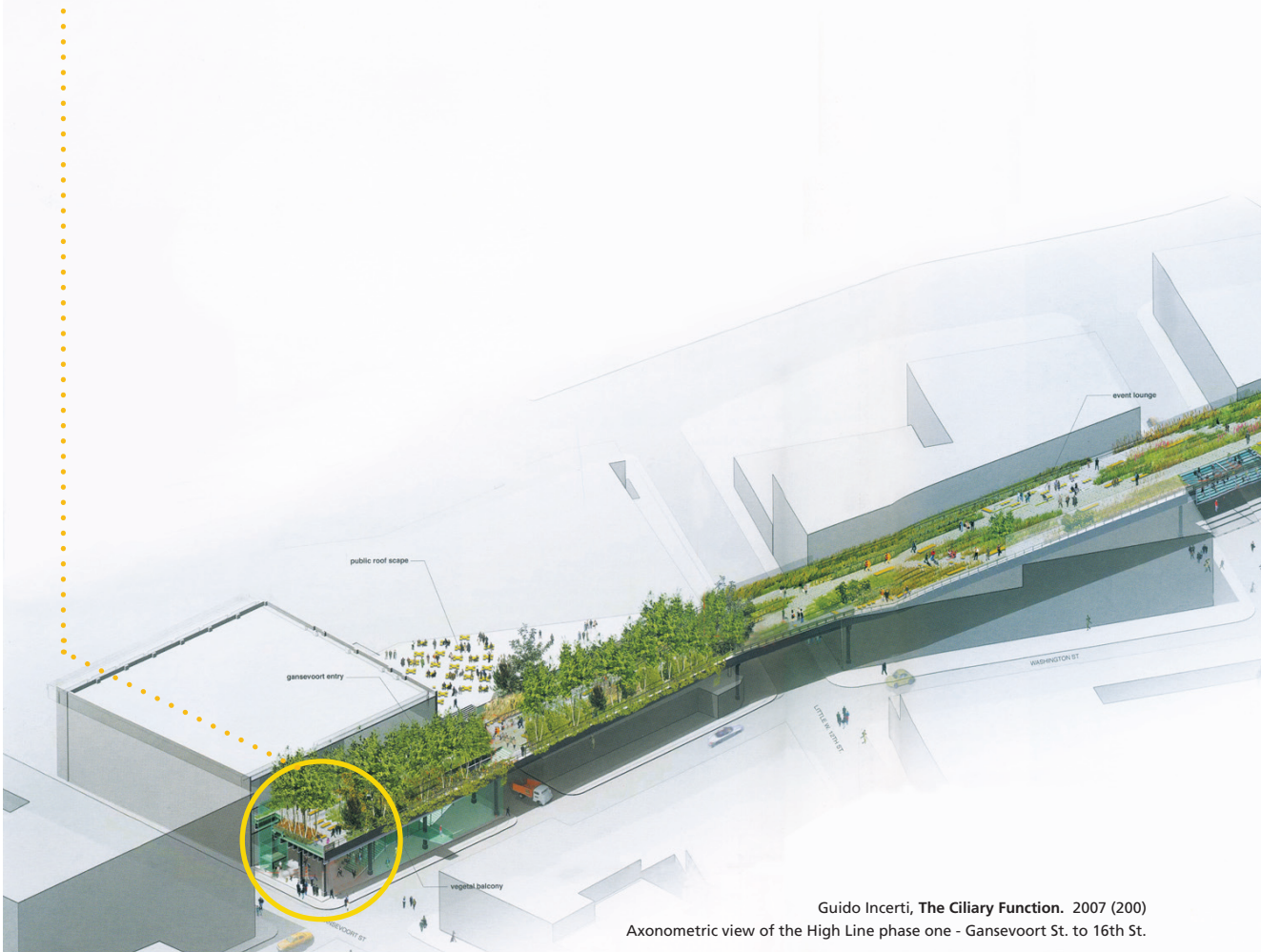
Guido Incerti, **The Ciliary Function.** 2007 (200)
Axonometric view of the High Line phase one - Gansevoort St. to 16th St.

Diller + Scofidio + Renfro, **High Line imaginings.** [Online images]
Urban aquarium

Guido Incerti, **The Ciliary Function.** 2007 (200)
10th Avenue over-look.

2 .Rogers (quoted in David). Reclaiming the
High Line. (New York: AOL Time Warner,
2002) 83.
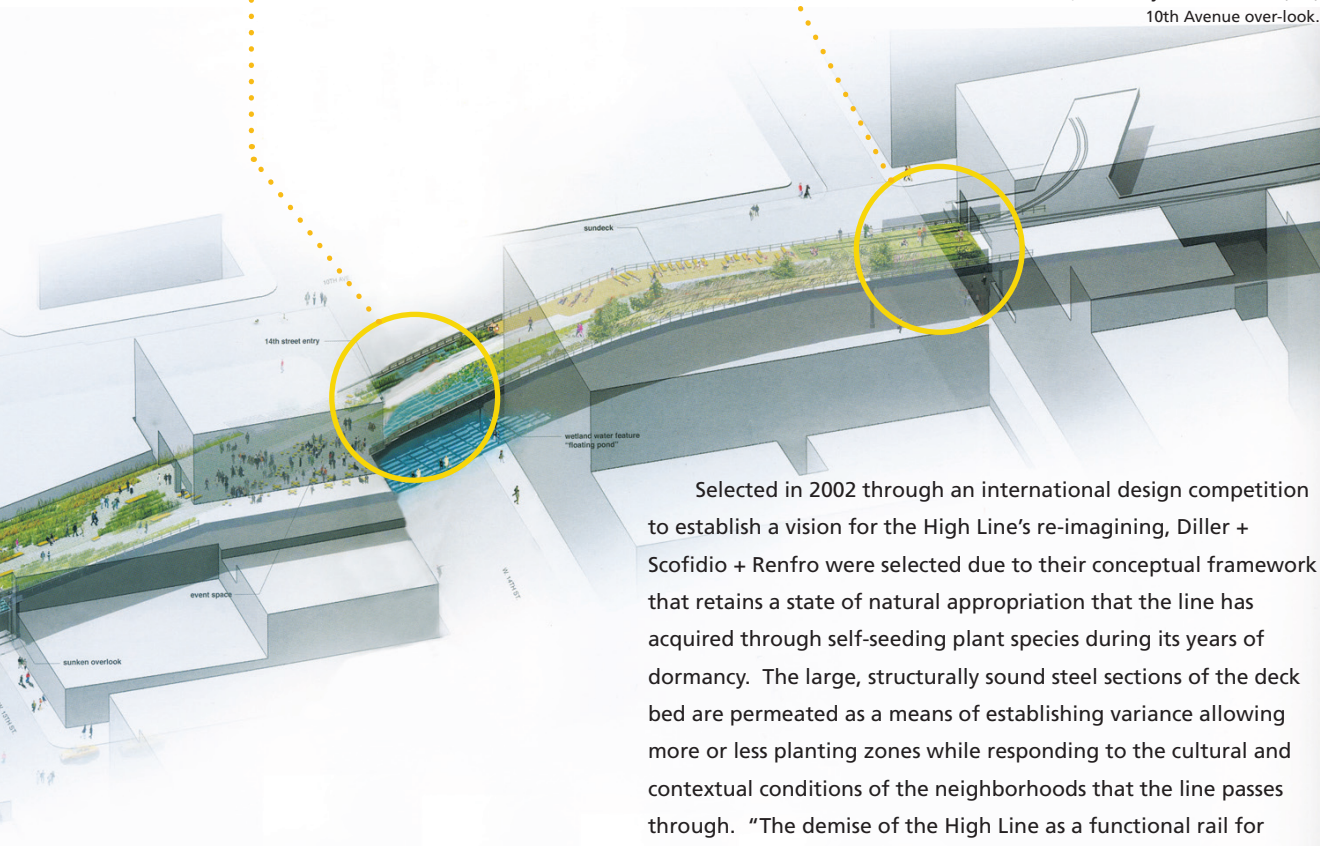
Selected in 2002 through an international design competition to establish a vision for the High Line's re-imagining, Diller + Scofidio + Renfro were selected due to their conceptual framework that retains a state of natural appropriation that the line has acquired through self-seeding plant species during its years of dormancy. The large, structurally sound steel sections of the deck bed are permeated as a means of establishing variance allowing more or less planting zones while responding to the cultural and contextual conditions of the neighborhoods that the line passes through. "The demise of the High Line as a functional rail for freight is part of the transformation of New York's economy...to one that is more exclusively based on global financial commerce, tourist hospitality and entertainment, creative design services, and media and arts production."[2] Through a simultaneous layering of past and present, the High-Line's re-birth as a public park marks an ambiguous zone for urban exploration and ecological diversification while reconnecting neglected areas of the west side.

Re-Imagining a Landscape:
Duisburg-Nord Park, Ruhr Valley, Germany

Ramsfjell Architects Inc., 2004.
Duisburg-Nord industrial landscape park, core area plan

1 .Brenda J. Brown. "Reconstructing the Ruhrgebiet", **Landscape Architecture.** (Vol. 91, No. 4, April 2001) 69

Original structures built:	1899 - 1935
Waste_scape state:	1985 - 1994
Successive re-use adaptation:	1995 - .
Architect:	Peter Latz & Partner

The Ruhr valley part of the German rust belt, a once thriving area of small towns agglomerated through industrial mining and heavy manufacturing. Duisburg-Nord Park is one example of a closed industrial system that overexploited surrounding resources to the point that further steel production became prohibitively expensive due to material import costs and competition.

Abandoned in 1985 by the Thyssen steel company, the Dusiburg-nord site contained various contaminants from blast furnaces, ore bunkers, sintering plants and open sewers.[1] Facing mass migration due to unemployment, the International Building Exhibition (IBA) was established as a government funded initiative to host competitions that would clean up and return these vast landscapes scattered throughout the region back to public use. As a means of appealing to the emerging service-sector economy and addressing issues of shrinking urban density, the Emscher park initiative sought to infuse open ecological and cultural operations that would stimulate economic growth and remediate the landscape.

10m   50m   100m

Park Layering

+5 m elevation: Top layer
Railway Park, consisting of high-level
promenades and ramps

0 - 5 m elevation: Ground layer
Grade level walks, bicycle paths, roads, rails
and industrial structures
Single fields of clump vegetation, both
native and reintroduced

-5 - 0 m elevation: Subterranean layer
Water park, consisting of the Emscher
river itself, gasometer diving center and
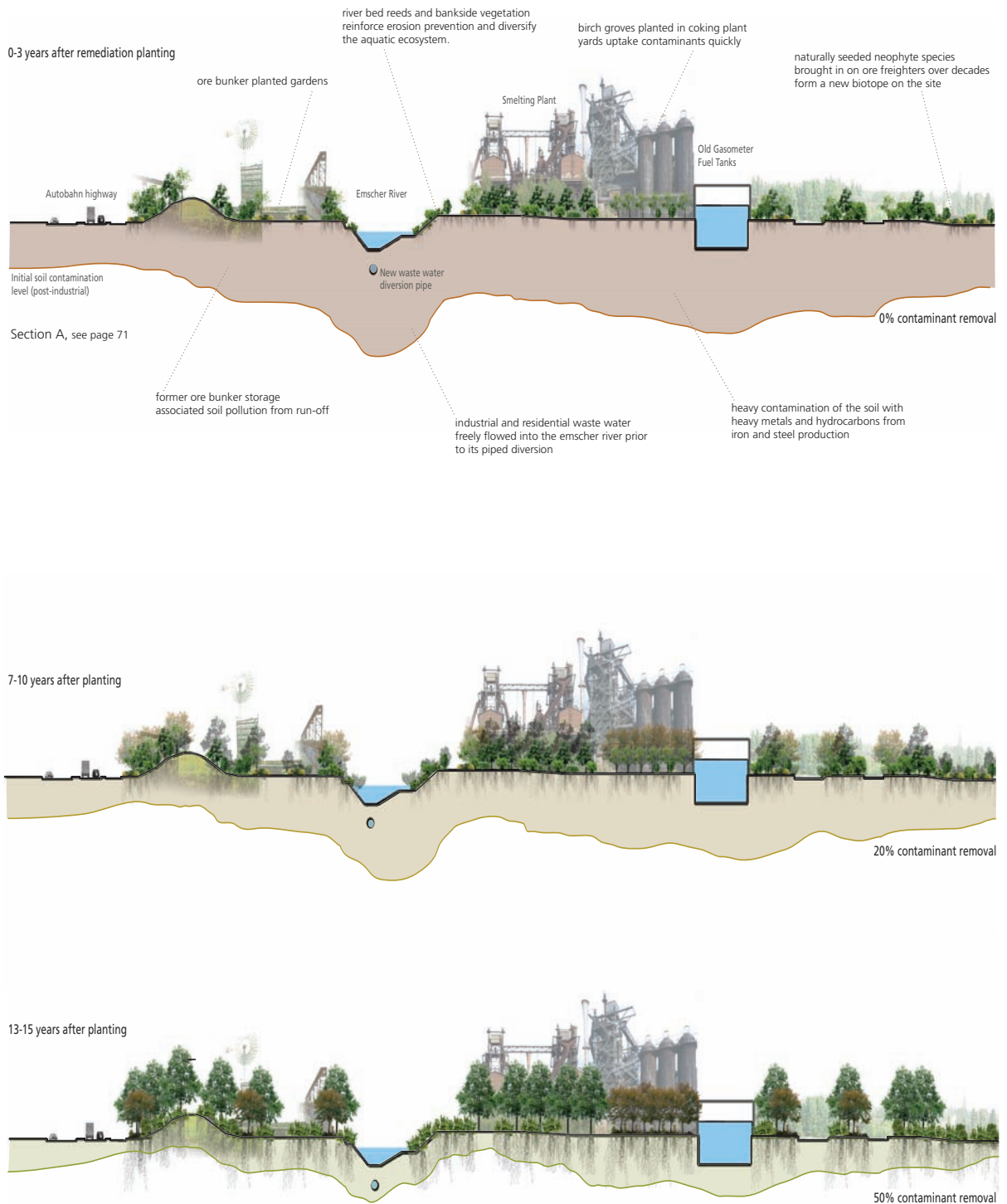underground water tunnels
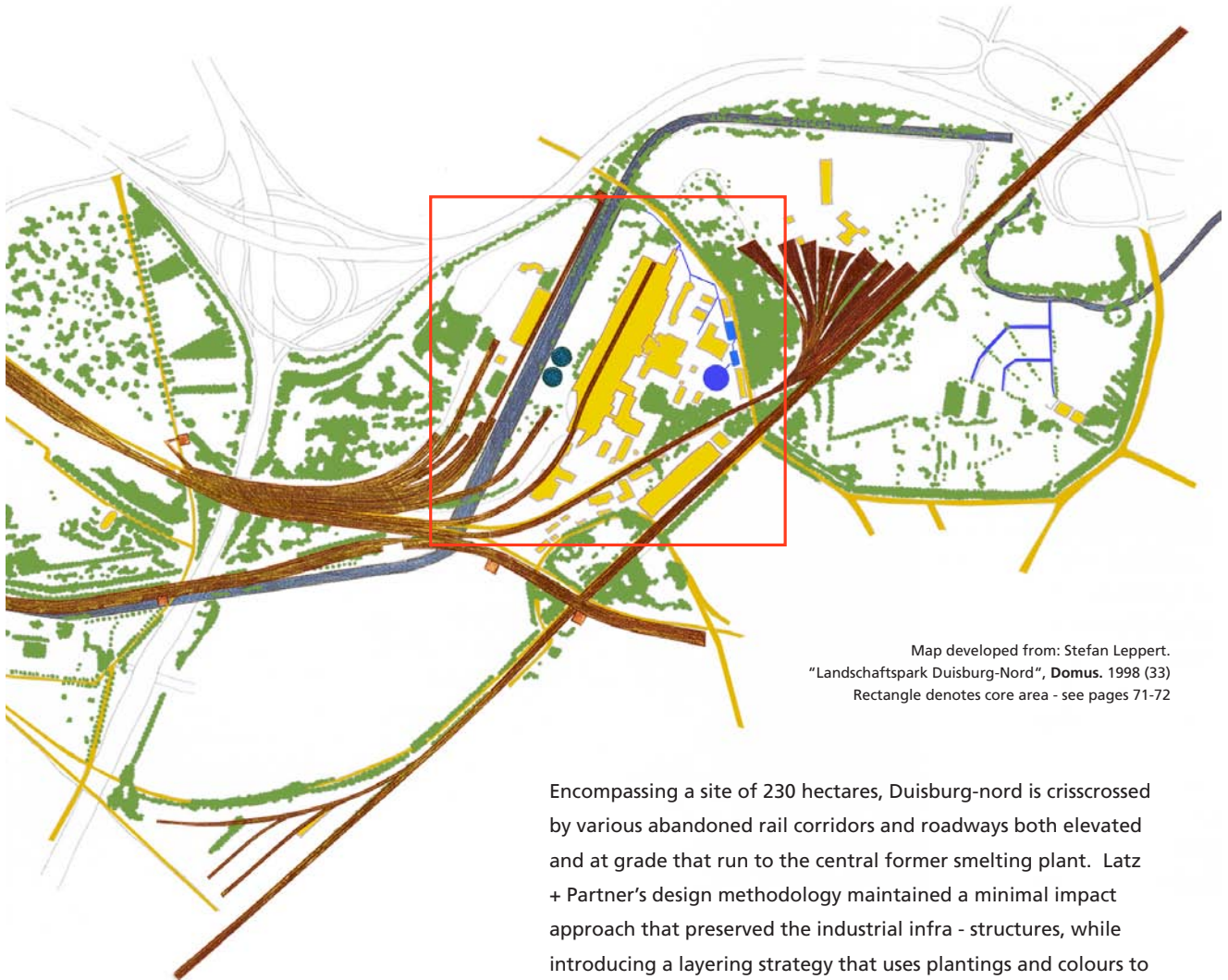
Encompassing a site of 230 hectares, Duisburg-nord is crisscrossed by various abandoned rail corridors and roadways both elevated and at grade that run to the central former smelting plant. Latz + Partner's design methodology maintained a minimal impact approach that preserved the industrial infra - structures, while introducing a layering strategy that uses plantings and colours to distinguish between old and new, accessible and contaminated areas.

The uppermost layer consists of elevated rail lines that act as walkways from which to observe the park. Painted in bright colors, they portray to the user areas of safety from the contaminated surroundings. The ground layer includes steel production and storage structures from the smelting plant to rail and roadway corridors. The lowest layer includes the old Emscher river, which formerly acted as an open sewer. Now that waste water is piped in a line under the river, the Emscher acts as a retention surface for rainwater that falls on the park which is filtered along bankside vegetation before it is allowed to enter the river biotope.

0-3 years after remediation planting

river bed reeds and bankside vegetation reinforce erosion prevention and diversify the aquatic ecosystem.

birch groves planted in coking plant yards uptake contaminants quickly

naturally seeded neophyte species brought in on ore freighters over decades form a new biotope on the site

ore bunker planted gardens

Smelting Plant

Old Gasometer
Fuel Tanks

Autobahn highway

Emscher River

Initial soil contamination
level (post-industrial)

New waste water
diversion pipe

0% contaminant removal

Section A, see page 71

former ore bunker storage
associated soil pollution from run-off

industrial and residential waste water
freely flowed into the emscher river prior
to its piped diversion

heavy contamination of the soil with
heavy metals and hydrocarbons from
iron and steel production

7-10 years after planting

20% contaminant removal

13-15 years after planting

50% contaminant removal

71

In order to initiate a process of site renewal, the contamination of the soil with heavy metals, ores and hydrocarbons had to be purified. Given that the original use of the site had varying intensities of industrial activity and corresponding contamination, a number of passive strategies were implated to allow toxins in the soil to dissipate gradually. Capping the site or relocating dirty soils to landfill would not only have cost more but would have meant the removal and disruption of many of the existing site structures that provide the framework for the park's cultural re-use.

Using naturally seeded and local species adapted to speed up contaminant dissipation and removal, their growth over the park's lifespan introduces an open ecological growth that redefines how to deal with harmful and destructive substances in the context of a public space. This in return allows the public earlier access to less contaminated areas of the park and gradual access to more problematic areas that are observed in the meantime from elevated promenades until soil contaminants dissipate to an acceptable level.

The evolution of the park and its cleanup is an on-going, collaborative process between ecological systems and social networks of gardeners and botanists. The introduction of these additional systems permeates the former closed environmental and economic cycle of the site, which ultimately lead to its closing as well as its economic and social degradation.
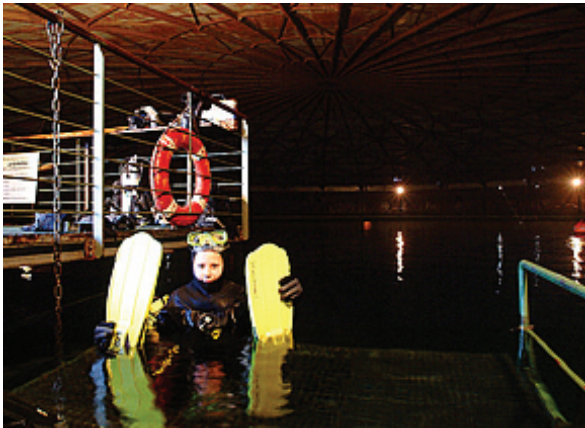
Landschaftspark Duisburg-Nord GmbH, **Gasometer diving experience.**
[Online image]

Rowan Moore, **Vertigo.** 1999. (179, 190)
Old steelworks plant, now observatory deck and playgrounds.
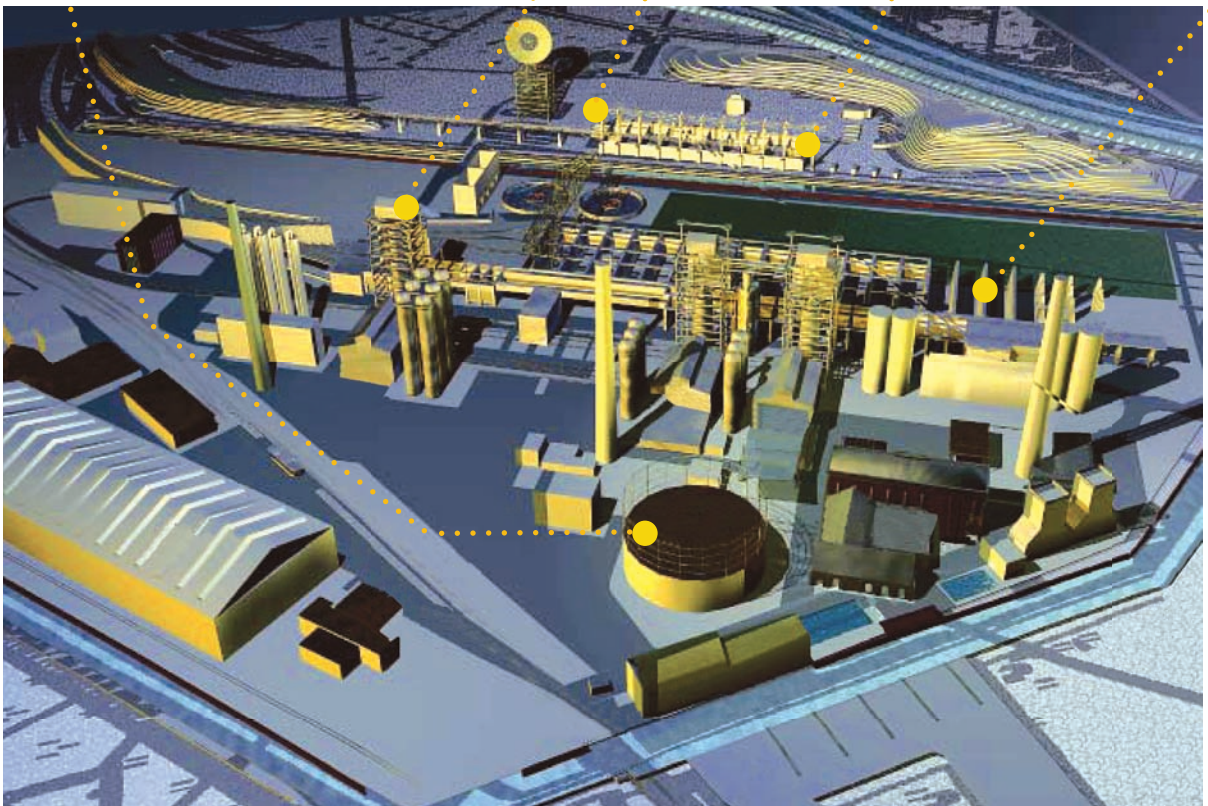
Landschaftspark Duisburg-Nord GmbH, **Park map.** [Online image]

Peter Reed, **Groundswell.** 2005. (129, 130)
Left: Former ore bunkers now gardens.
Right: Ore bunker climbing clubs.

Part of the cultural re-programming of the site has involved local involvement of clubs and organizations that have helped to use the state of the existing structures to their highest capacity of engagement. For example, the former ore bunkers have been revitalized as a mountain-climbing facility. Crop gardens that now practice sustainable agriculture host school groups and take advantage of former cultivation grounds that used to provide food to mill-owned shops. As a means of re-connecting the project with the surrounding neighborhoods, rail corridors and pathways were extended beyond the site boundaries acting as walking paths to enter the park and integrate with the wider bicycling network in the region. A former gasometer that provided fuel to the plant was cleaned and flooded along with the connecting pipe lines to create the world's largest indoor scuba-diving center.

The reconnection of Duisburg-nord park with the surrounding urban fabric while preserving industrial heritage and using natural remediation techniques to clean the site establishes cultural connections "with a deep respect for the integrity of the existing forms and structures."[2]

2 .Niall Kirkwood. **Manufactured Sites.** (London, New York: Spon Press, 2001) 162

Re-Imagining an Urban Hub:
Union Station, Ottawa

National Gallery
of Canada

Byward Market

Ottawa River

Major's Hill Park

Ottawa locks

Chateau
Laurier Hotel

Westin
Hotel

Parliament Hill

Ottawa
Congress Centre

Confederation
Square

MacKenzie King Bridge

National
Arts Center

Laurier Bridge

Confederation Park

Downtown Business
Core

Wellington St.

Sparks St.

Queen St.
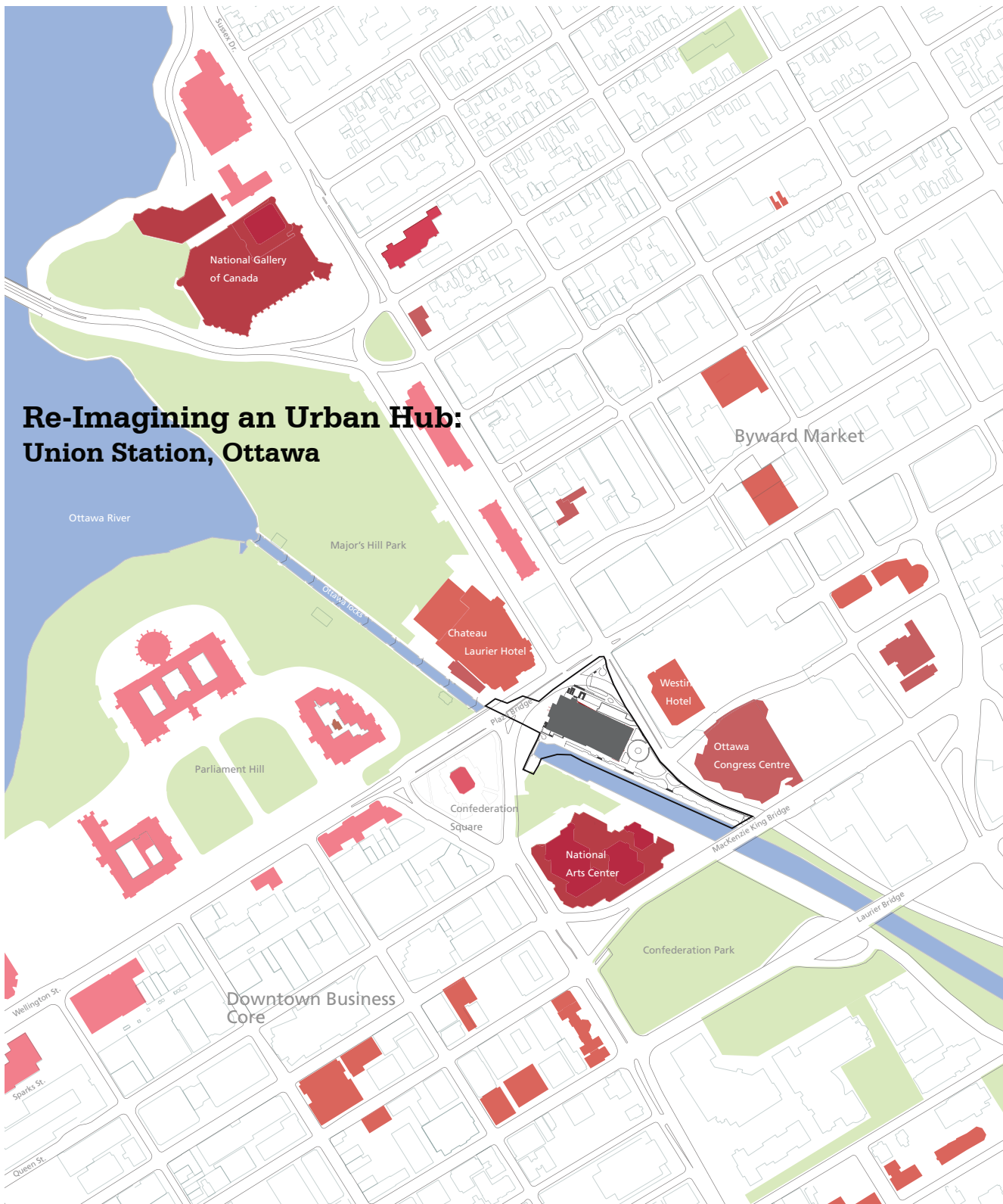
Original structure built: 1910 - 1912
Original Architect: Bradford Lee Gilbert
Waste_scape state: 1962 - .

Successive re-use adaptation: 2008 - .

Built as part of the transcontinental Grand Trunk Railway, Ottawa's Union station was the primary entry point into the city. Constructed at the same time as the Chateau Laurier Hotel in 1912, the building embodies associations with the historic connections between rail travel and chateau style hotels that emerged during the first part of the 20th Century in Canada as a means of improving travel and commerce across the continent.

Situated adjacent to the Rideau Canal between the Federal precinct of Parliament north of Wellington Street and the municipal precinct of the surrounding city, the building has historically acted as a gateway to the capital for national and international dignitaries and monarchs as well as common citizens. This site both blurred and bridged an identity between town and crown, the official and the everyday.

Government Buildings (federal)
Hotels
Cultural Buildings / Museums

10m   50m   100m

1880 - Rail network and horse-drawn streetcar routes establish first Union Station

1915 - Development of rail transit in city, construction of current Union Station and Chateau Laurier hotel

1930 - Further growth and development of Union Station complex within expanding service networks

1950's_Re-location of Union Station rail service to suburbs _removal of streetcar lines for bus only transit

1940's_first bus service routes

1920's_Union Station gateway to city for residents and dignitaries

1910-12_Construction of new Union Station and Chateau Laurier hotel

c.1880_first Union Station built

Public Transit Ridership_in millions (dotted_projected increase with subway)

Historical time graph comparing Union Station passenger traffic per year to city transit use.

77

1960 - Relocation of station to suburbs; removal of rail lines; streetcars replaced with buses; building and adjacent support services shrink or disappear

1990 - Rapid bus transit on Mackenzie Bridge further relocates activity away from the site

2015 - Proposed underground light rail line re-connects networks to station allowing building to return as a central hub to the surrounding city

2013_light rail tunnel opens with
Union Station as downtown metro hub

1985_Rapid bus transitway opens
on Mackenzie bridge

1967-68_Union Station closed to public after centennial
_building saved as Government Conference Hall

18

15

12

9

6

3

Union station passenger quantities_in millions
(dotted_projected increase with subway)

1960   1970   1980   1990   2000   2010   2020   2030   2040
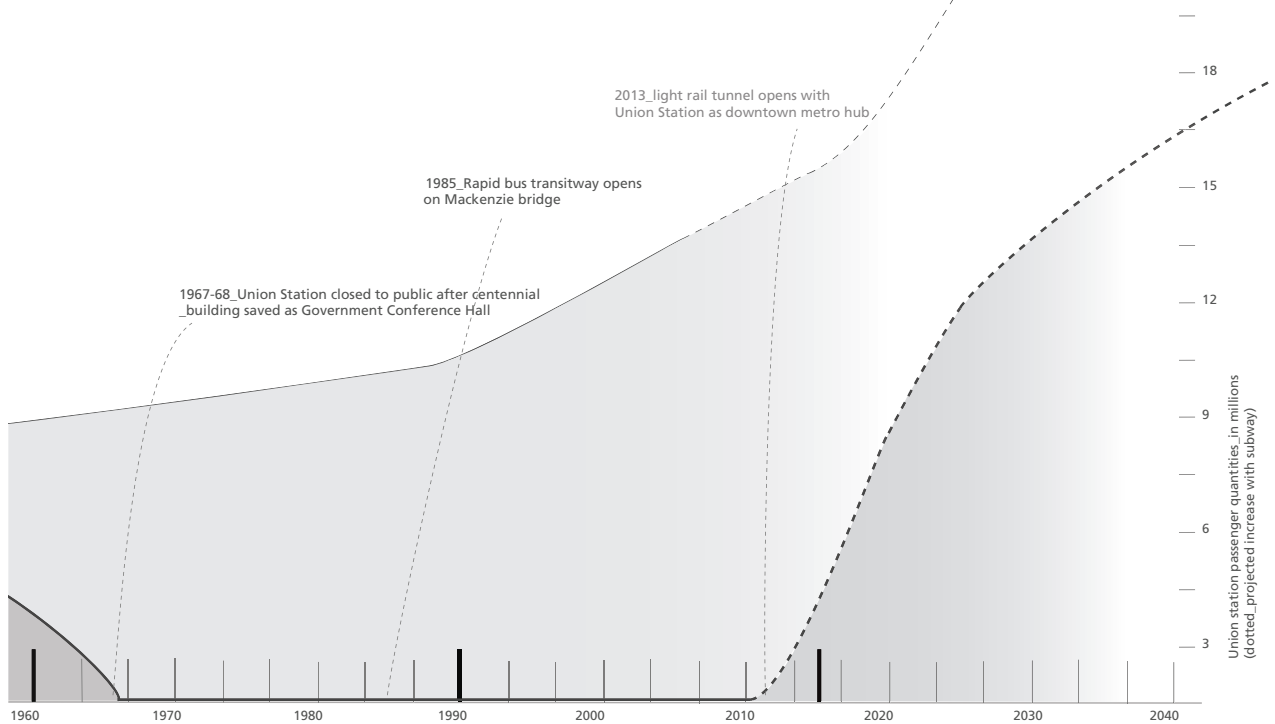
National Capital Commission (NCC), National Film Board Photo.
Union Station Ottawa site, c.1900.
View from the north-west

NCC, National Film Board Photo.
Union Station Ottawa site, c.1920.

National Capital Commission (NCC), National Film Board Photo.
Union Station and canal basin looking north, c.1965.

From left: Bill McKeown. **Ottawa's Streetcars. 2004.** View of Rideau street in front of station looking west, 1948.
NCC, National Film Board Photo. Veteran homecoming, March 1919.
NCC, Information and Historical Division. View of Waiting Room, July 30, 1944.

Union station was fully operational as a train station for 54 years, from 1912 to 1966. As an anchor destination in the city, the building and its surroundings naturally forged a public room in which homecomings, ceremonies and large gatherings took place. Motivated in the 1960's to rid the ceremonial city core of unsightly smoke from locomotives, a new vision for the city included the introduction of highways, parkways, a greenbelt, large public parks and the relocation of Union station to the suburbs.

Considering that 1967 was the country's centennial year and major festivities would take place in the city core, officials decided that Union Station should not be demolished prior to this year for aesthetic purposes, despite the removal of the train sheds and adjacent structures in 1966.

In 1968, with the fate of the structure in limbo having been orphaned and isolated from the rest of the city and its supportive networks, the federal government stepped in and saved the building as a Government Conference Center. In 1982 the Canadian Constitution Act was drafted here, only recently earning the station historical significance as a national landmark.

Union Station, Ottawa. Looking west from the rooftop terrace of the Westin Hotel towards Colonel By Drive road slip.

Union Station Waiting Room, 2008.

Cliff Buckman, Apr. 1966. NCC library. Grand Waiting Room.

Union Station, Ottawa. Looking east from Confederation Square flag plaza.

1 .Roger du Toit Architects Ltd. **Former Union Station, Ottawa: Design Guidelines.** (Ottawa: NCC, June 2000) 1

Still in use as a federal building, the structure's recent legacy has resulted in poor upkeep, insensitive additions and restorations to the building and surrounding urban fabric, and severe underuse. Various elements of the site have contributed to this trajectory of misuse over time, "isolation from pedestrian flows [with] the city from the west because of the Rideau canal and on the east because of the pedestrian 'no-man's land' occupied by extensive roadways, a slip ramp and underpass."[1] It is precisely the features that were implemented in the 1950's to improve vehicular and pedestrian flows around the structure that have ultimately isolated it.

To effectively initiate and catalyze a more public re-use of the building, its remnant infrastructures and residual landscape must become re-connected to the series of charged systems and networks that currently bypass the site. In proposing to re-weave abandoned and unconsidered waste_scape elements around the station with pedestrian, bicycle, recreational and transportation circuits, a new use trajectory for the building will be projected. By tracking and layering the current circulational, natural and cultural networks at play on the site, an approach that exposes and harnesses seasonal transformations can further extend the resiliency and vibrancy of use and activity within and around Union Station.

Existing Site Circuits
Highlighting areas of disconnection
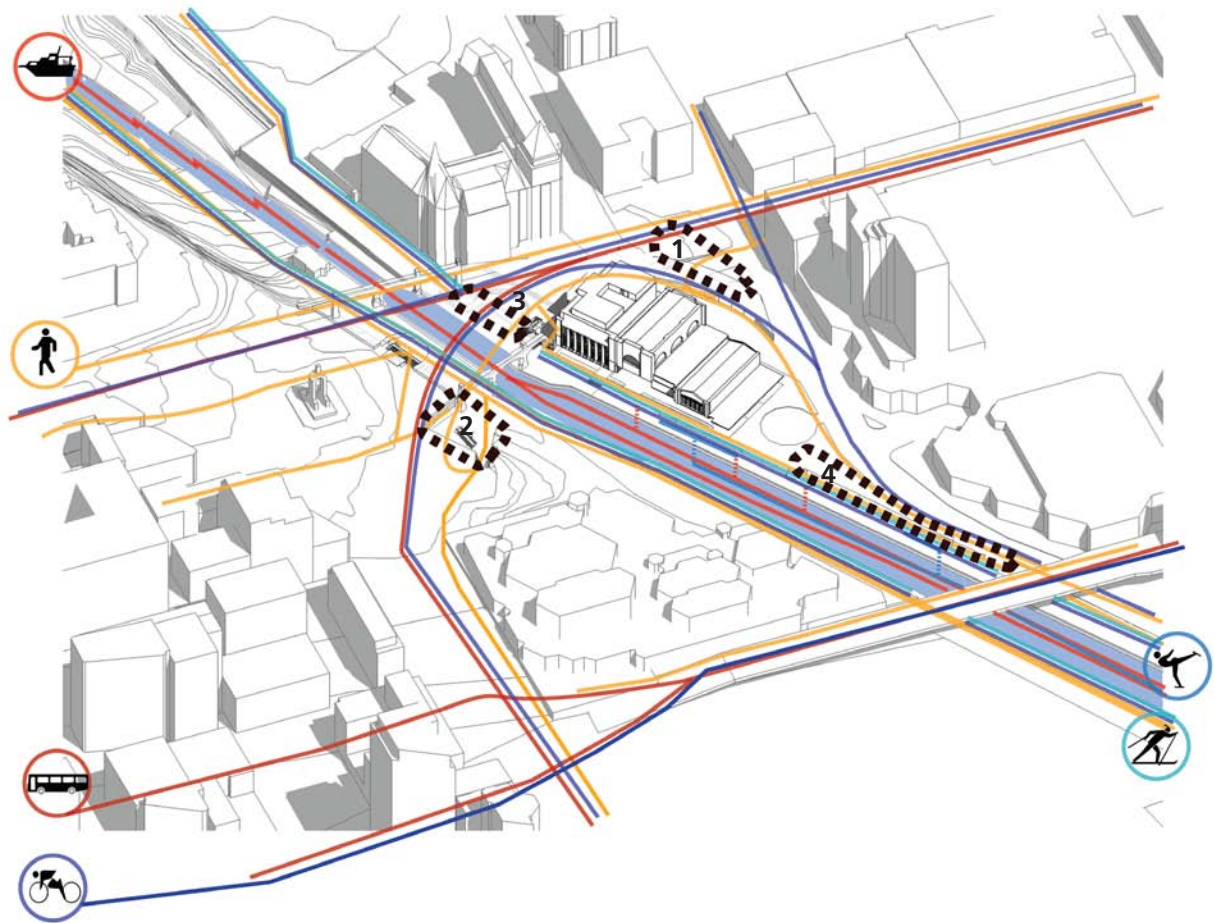
2. Confederation Square Plaza "crypt"

John Gregg, 2007. **PWGSC Archeology Dept.** Crypt space under flag poles.

1. Colonel By Drive overpass

Existing moments around the site currently act as unprogrammed or seasonal breaks in use networks.   These areas act to further isolate the building by presenting tunnels that are either seasonally closed or foster homeless occupation and highlight unprogrammed or underpopulated spaces. To identify re-connection potential within these areas, select investigations of their cyclical use and characteristics are required.

3. Plaza Bridge archway tunnel

4. Canal pathway retaining wall

Plaza Bridge pathways _
seasonal recreational activity

Rideau canal_
cyclical occupation

Jan   Feb   Mar   Apr   May   June   July   Aug   Sept

weekend peaks ....

1000
900
800
700
600
500
400
300
200
100
0

avg. # recreational users

stairs to canal paths closed for winter

Feb 1-16_
Winterlude festival
weekends

April 15_
rent-a-bike season
begins

May 14_
recreational boating
on canal begins

Spring flooding
(5 days)

100%
80%
60%
40%
20%
0%

% species population within ecosystem limits

clams survive winter in canal sediment
zebra mussels
sunfish
carp
cat fish
turtles
frog larvae hatch
river ducks
minnows
open locks
crappies, blue gills, smallmouth bass
macrophyte growth spawns
asian milfoil growth
milfoil growth reaches water surface
milgrowth harvesting

Oct. Thanksgiving,
last weekend before
canal draining

x-country skiers with
first snows

canal ice maintenance

Fall draining
(3 days)

2m
Water depth
1m

fall draining flushes most
species to Ottawa river

The pathways and recreational activities along the Rideau canal
are closely associated with the seasonal rise and fall of the water
level. The low level of the waterway in winter supports ice skating
and acts as a pedestrian bridge, while higher levels during the
summer support tour and pleasure boat use while simultaneously
supporting an aquatic ecosystem that regenerates itself yearly.

Winter and summer uses along the Rideau canal and adjacent pathways.
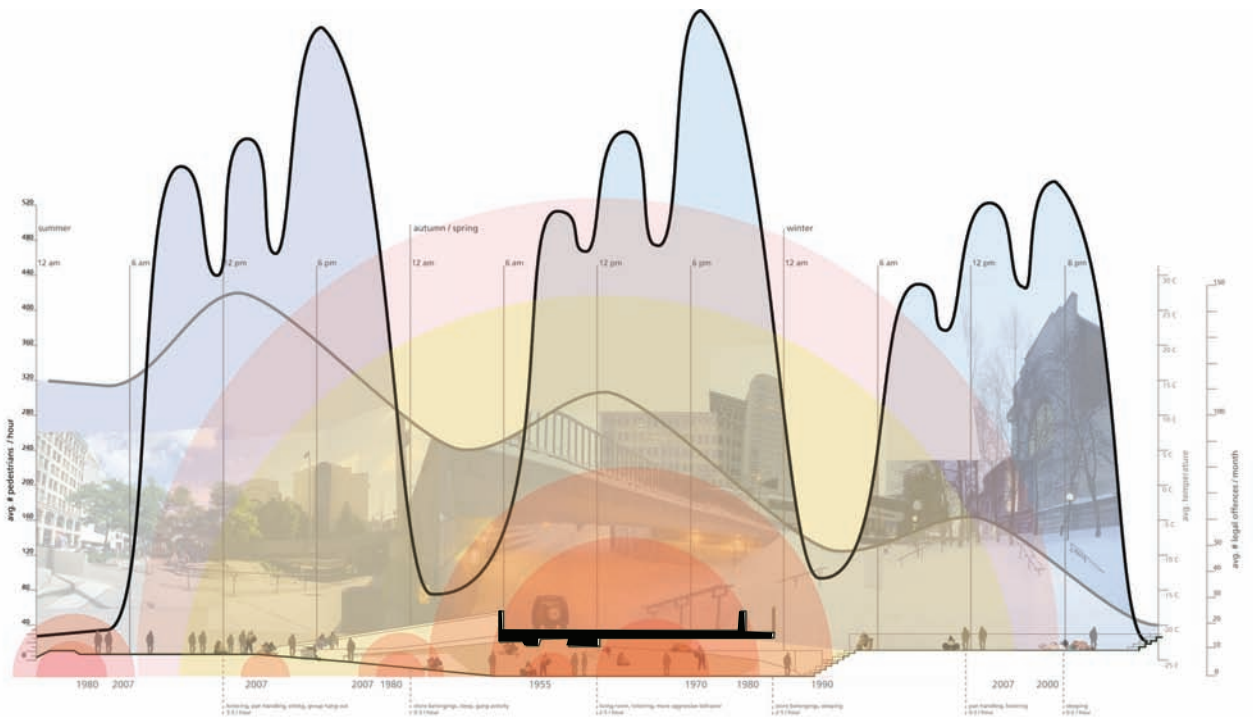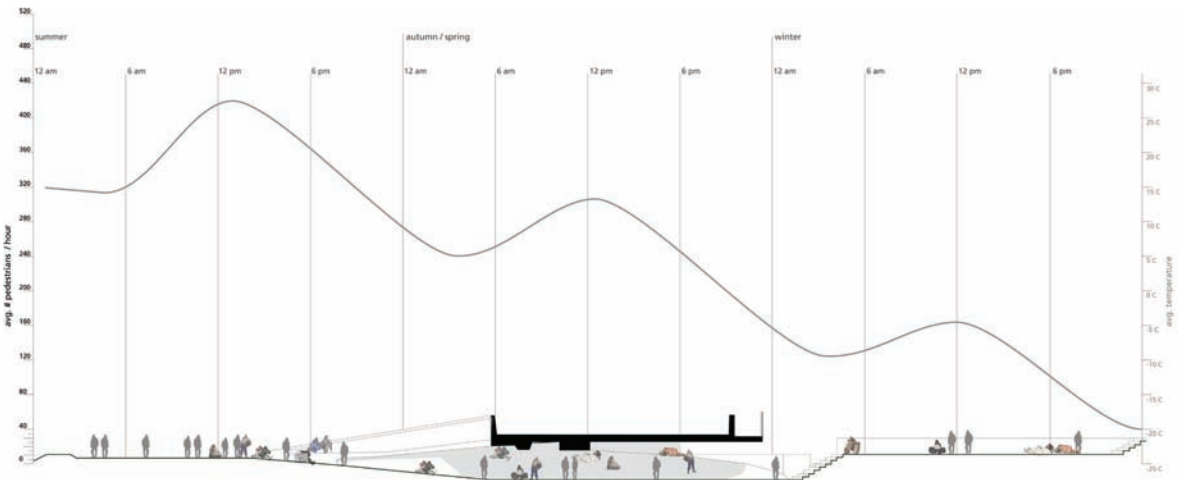
The Colonel By Drive overpass was built as part of the 1950's plan to remove rail infrastructure and improve vehicular circulation through the city. Since that time the area under the ramp is the only way for pedestrians to cross the street and has consequently earned a reputation as an area riddled with disturbances, muggings and homeless occupation. Although the number of homeless varies depending on time of year and temperature, the number of pedestrians that use the passage well outnumbers the amount of crime that takes place in this location.

Following the murder of a local homeless man in 2006 over a dispute for space under the ramp, the city has installed iron bars to discourage occupation here. Rather than prevent people from using this space and further isolating the area from activity, an opportunity exists to re-imagine the area under the ramp as a new means of engaging with leftover and unprogrammed urban space.

Proposed Circuit Re-connections
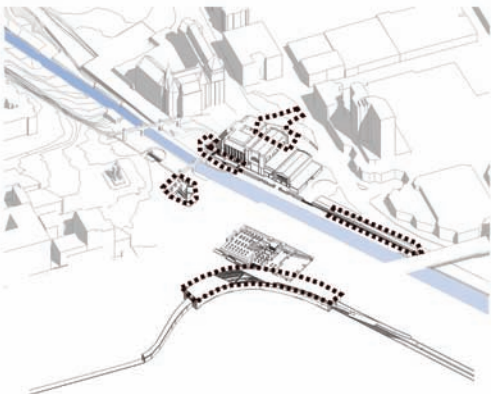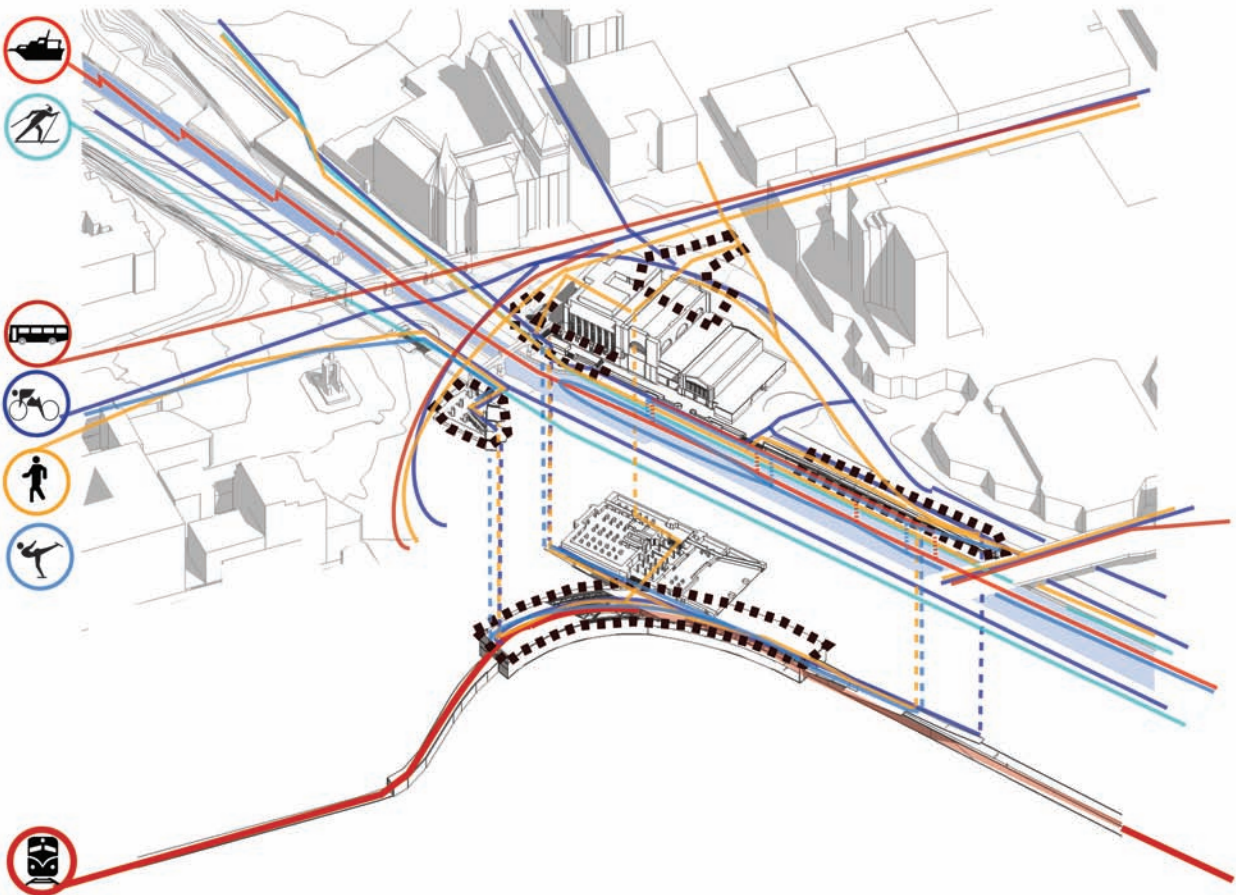
New site connection nodes
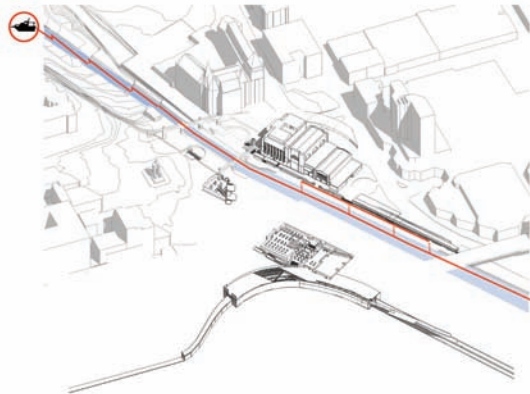
THINGS YOU RIDE: Recreational and Tour Boats
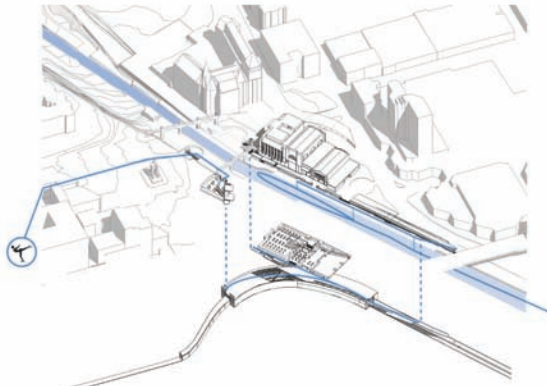
THINGS YOU DO: Skating - concessions along canal path
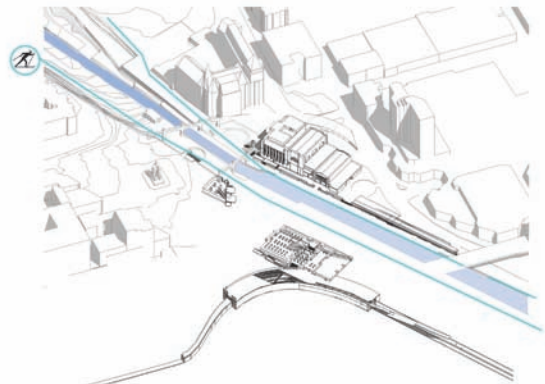
Cross-country Skiing - canal recreation paths
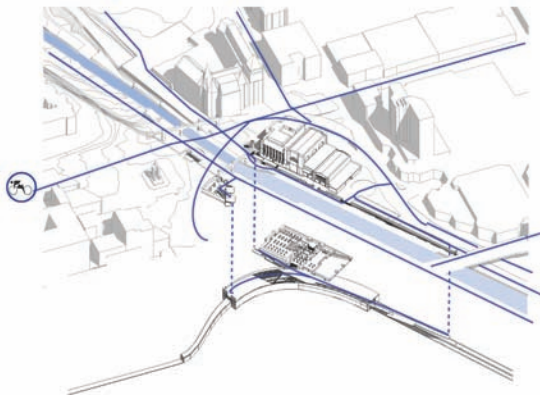
Bicycling - reconnect pathway networks
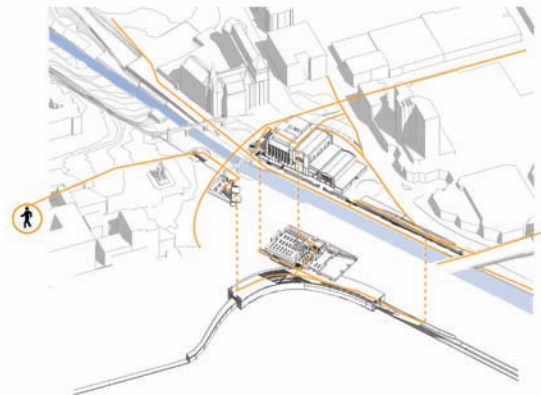
Pedestrian Routes - reconnect Union station with the rest of the site and city networks
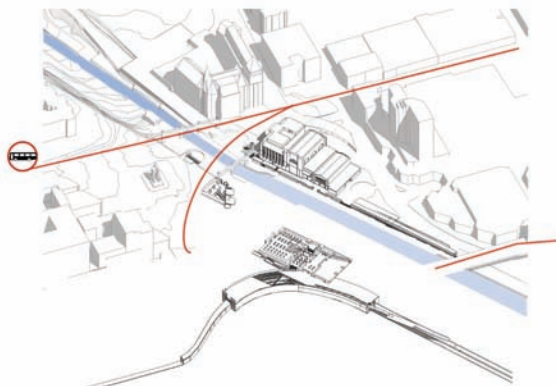
Major Bus Routes
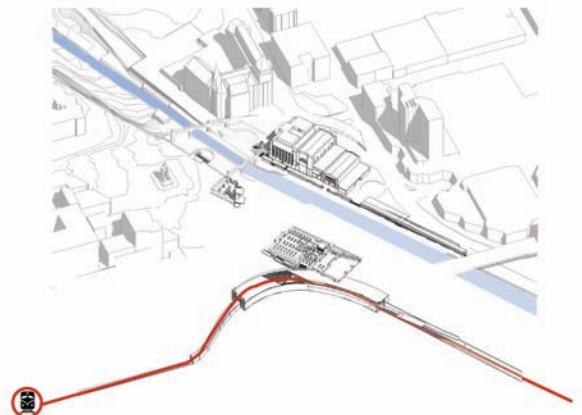
NEW Light Rail underground transit

A newly planned light rail transit tunnel to pass through Ottawa's downtown core is the primary device to re-engage Union Station and its surrounding landscape. By boring under the Rideau canal and curving the line to compliment the existing rapid transit bus system, a subway can organize new flows of circulation that take advantage of the Union station structure, and most importantly activate new access points from which to enter the building itself and catalyze its public re-use.

By reconfiguring networks and systems around Union station to take advantage of the building and its residual landmarks to gain access to the subway, people no longer have to make a conscious choice to visit or experience the building. Channeling flows through the subway node can link areas of the site that have previously been inaccessible or impassable and can breath new life into them given an increased volume of users.
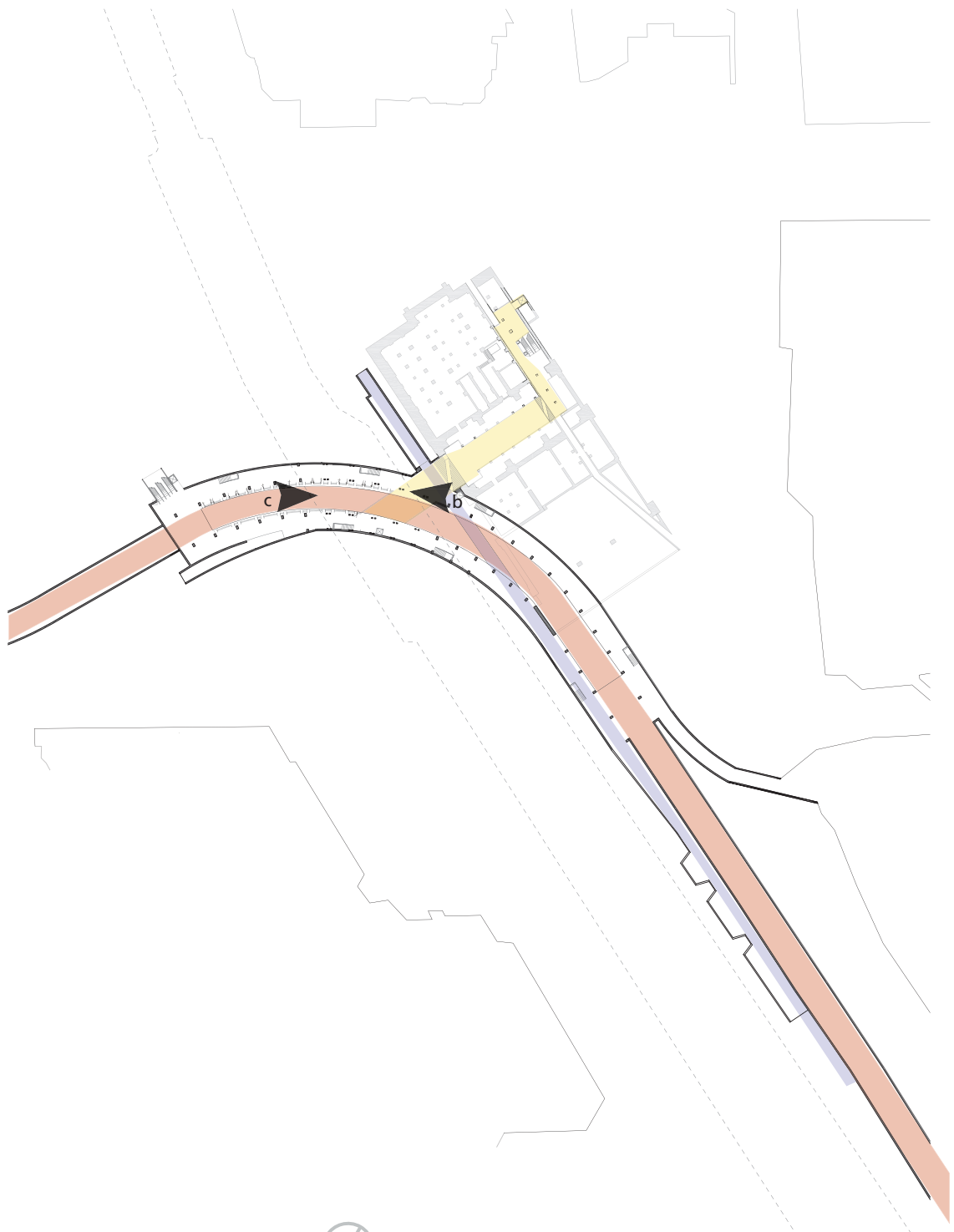
Subway level plan_ +55 m

Given the concentration of nationally significant structures and institutions in this area of the city, a new subway that channels large numbers of people through Union Station and its urban landscape can easily support the historic building's re-use as a locally oriented arts and cultural center. Within proximity to convention and performing arts facilities, hotels and tourist destinations, the station's large spaces could easily be formatted to accommodate a new concert hall and performance venue. The front part of the building facing Rideau street and the slip ramp could become studios for music, arts and dance groups with a steady exposure to the busy public walkway accessing the subway below.

Through the careful re-weaving of circulation networks and seasonal transformations into the building and adjacent site connection nodes, new opportunities to return the train station and its landscape to a public use can be energized. The reintegration of these structures back into the urban fabric through the medium of a mass transit stop encourages the public to use and experience these spaces in socially and culturally gainful ways.
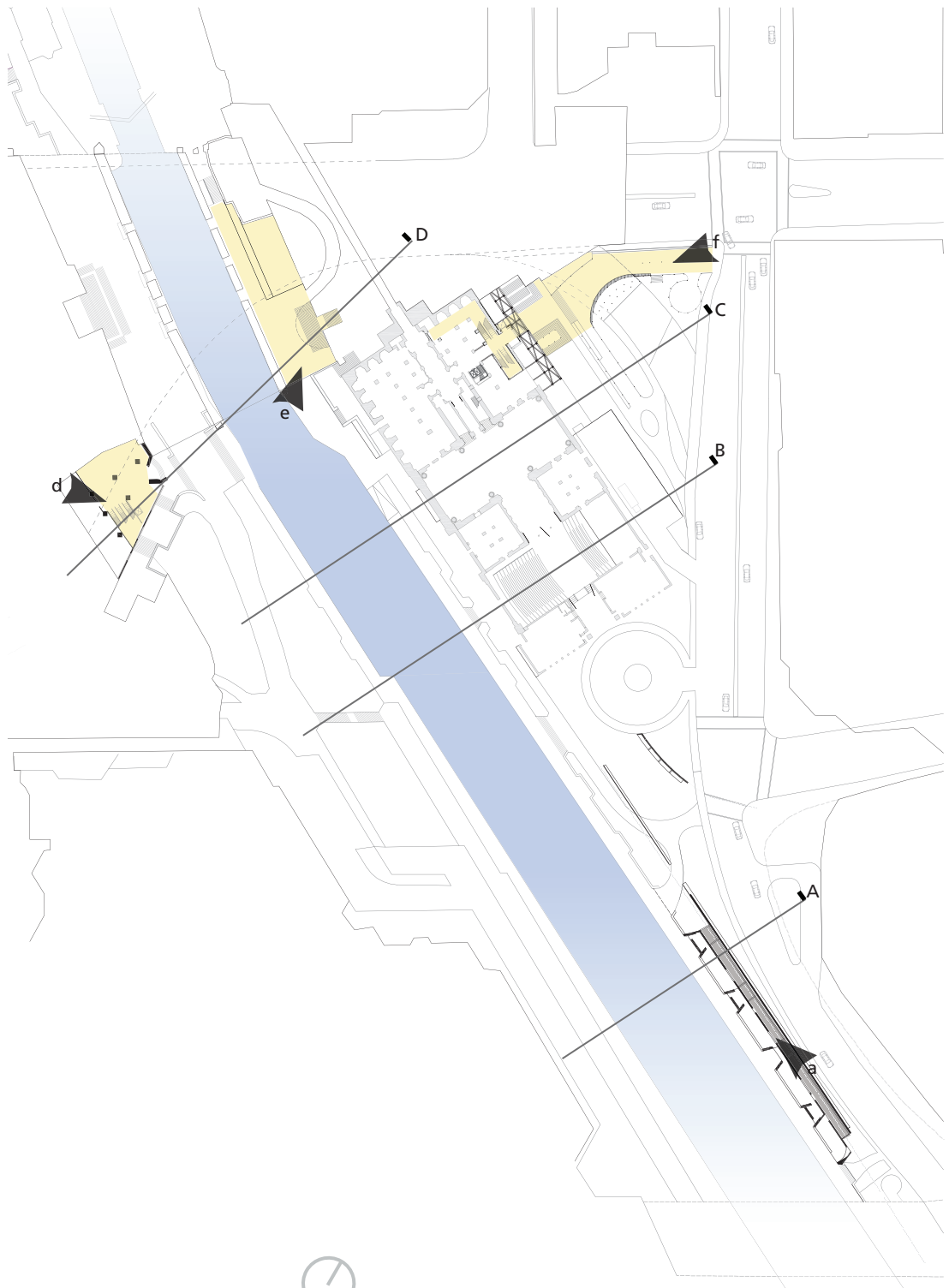
Concourse / site plan_ +64 m

94

Re-engaged canal pathway including concession stands for seasonal activities.
Continuous green roof over ramp and stalls preserves views to Parliament Hill.
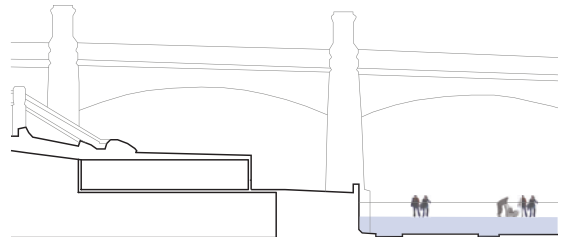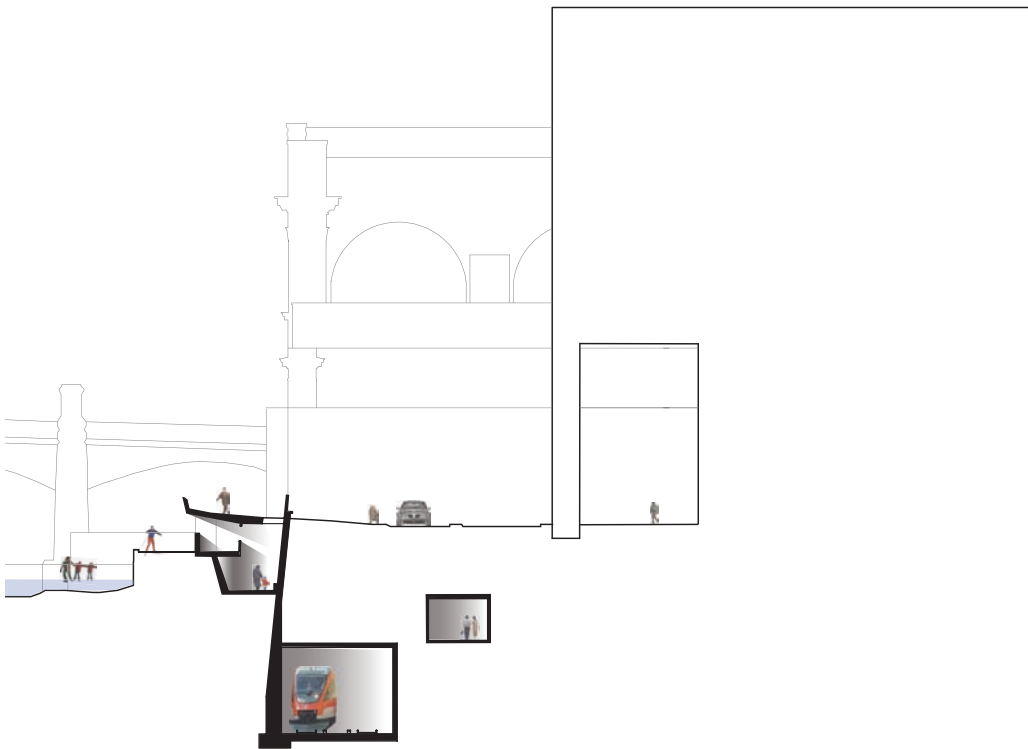
Section A _ Recreation path / Ramp concessions
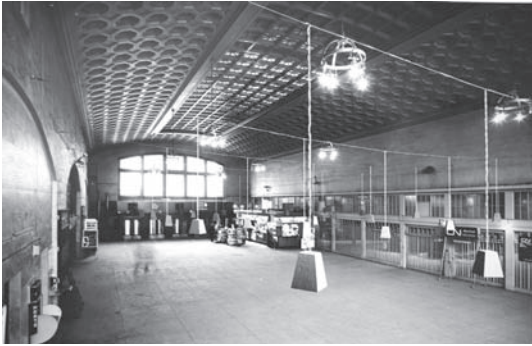
Cliff Buckman, Apr. 1966. **NCC Library.** Union Station Concourse
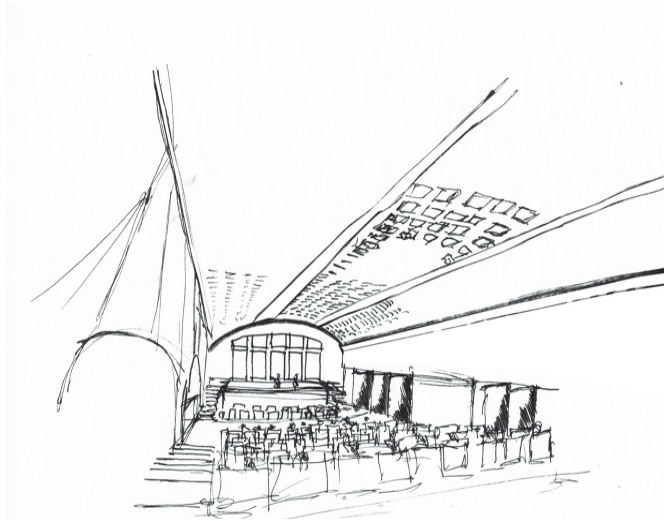
Speculative re-imagining of concourse as medium-sized concert hall.
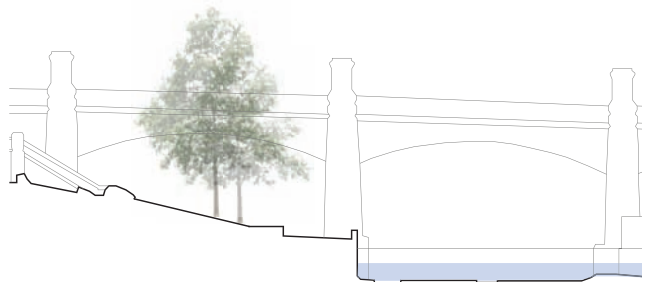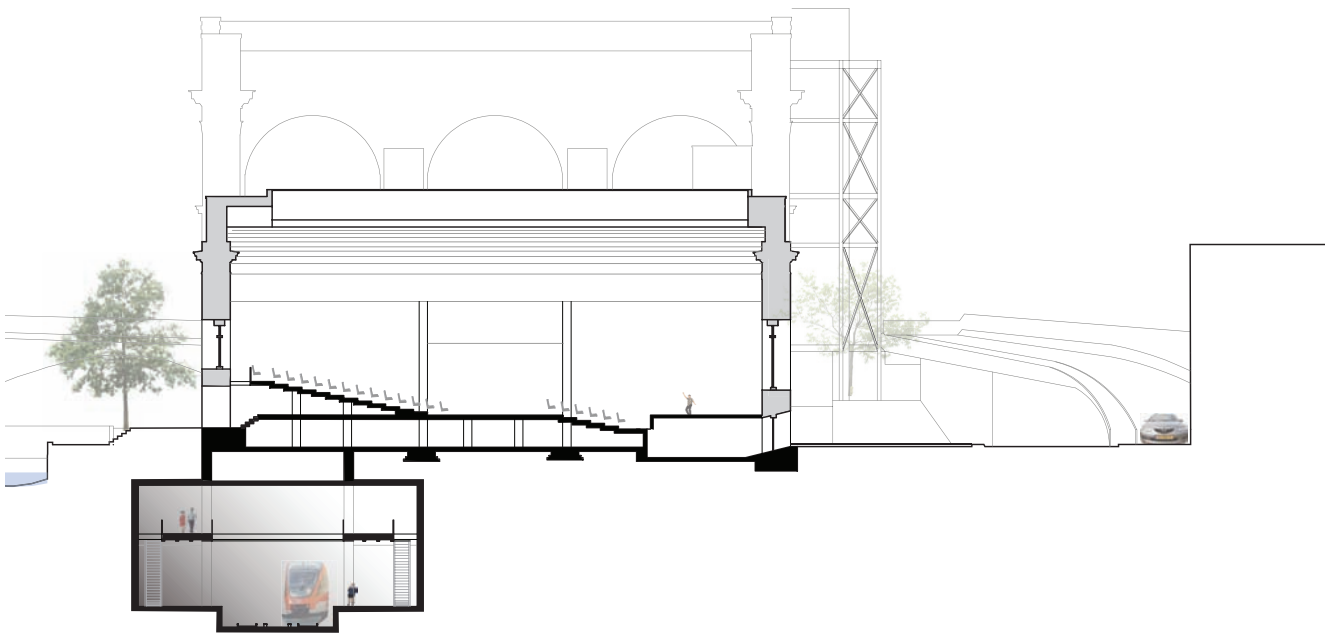
Section B_ Concourse Theatre
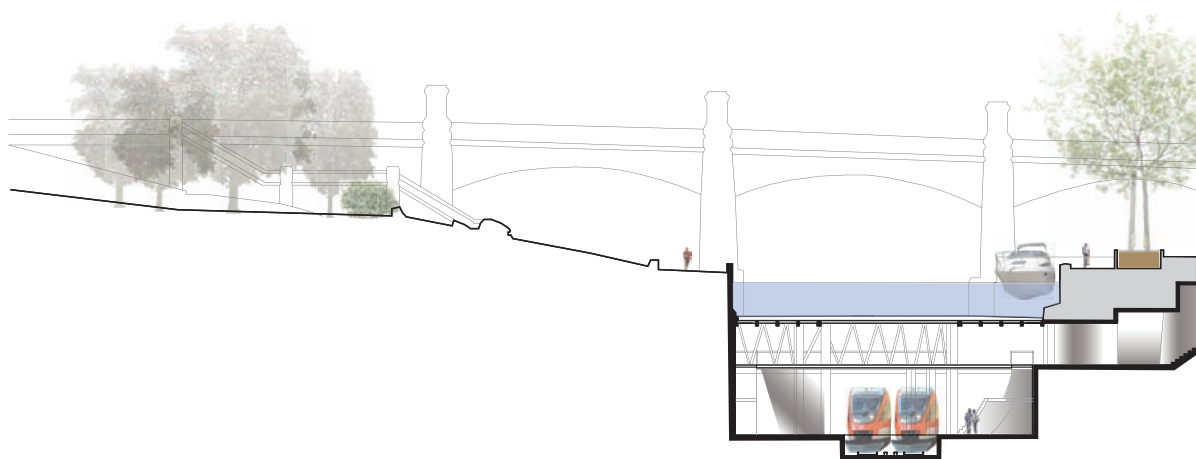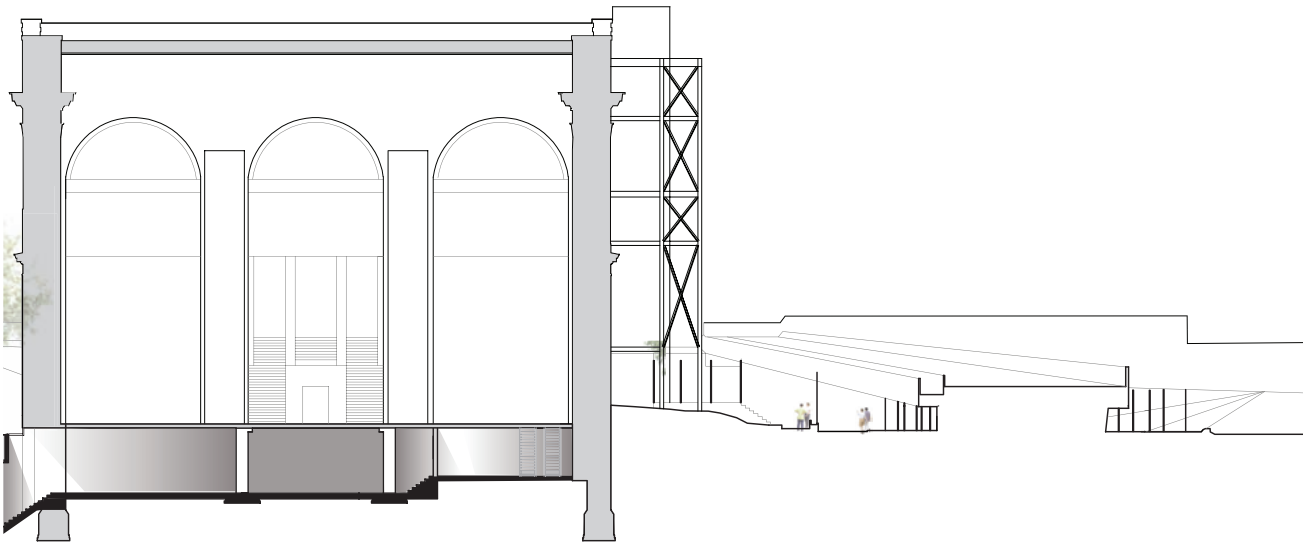
Section C_ Grand Waiting Room / Platform
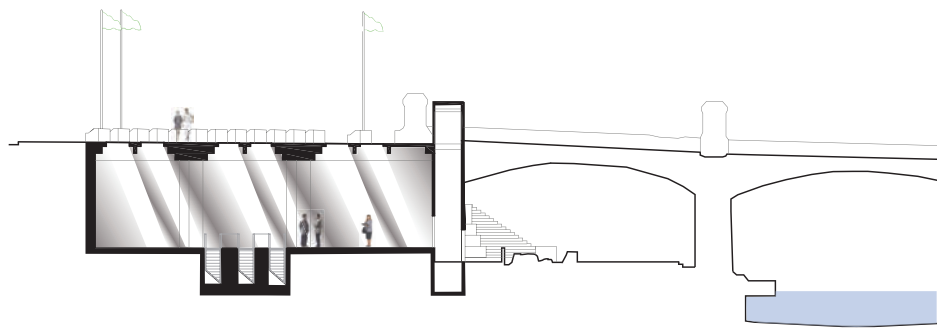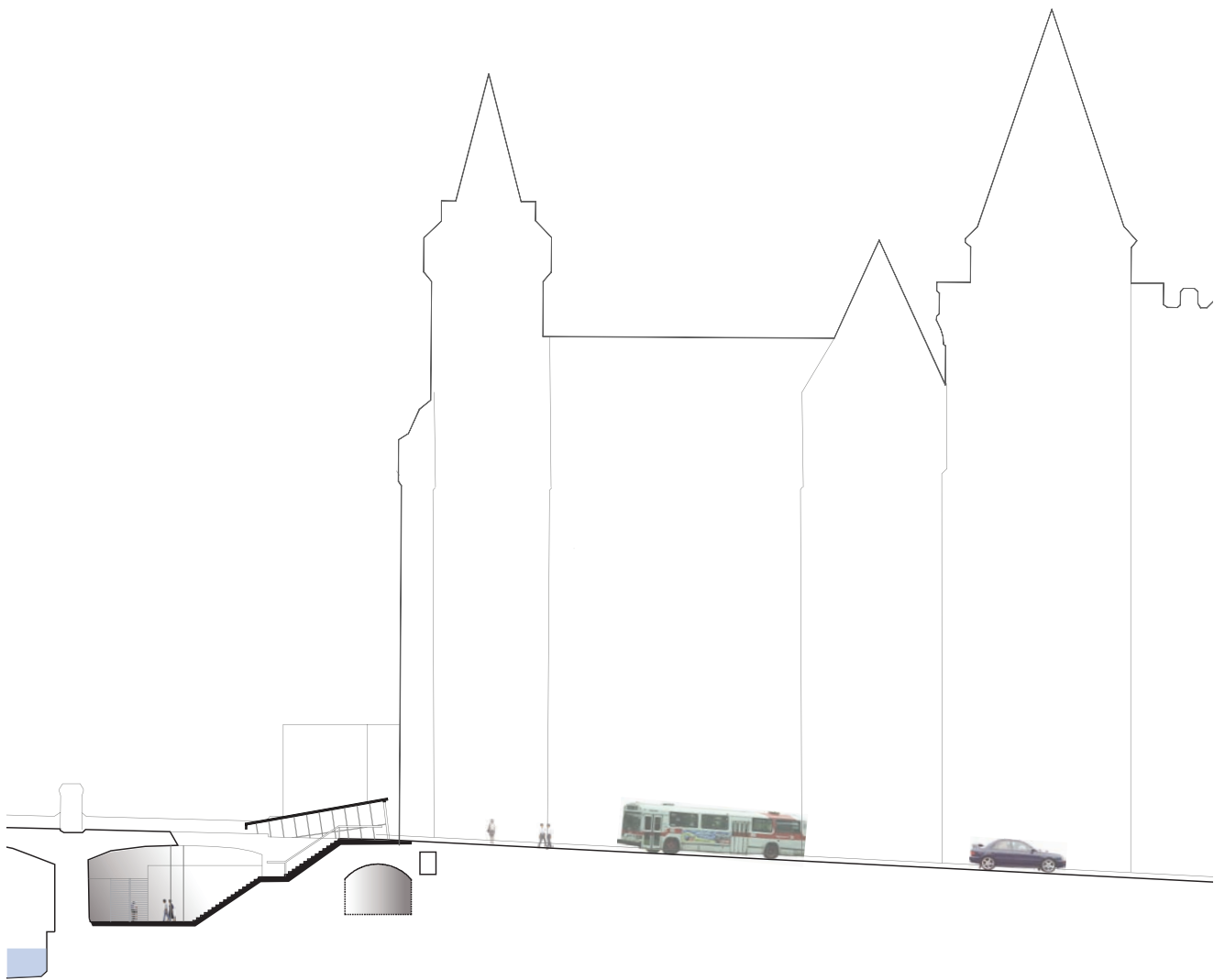
Section D_ Crypt / Tunnel entrance

Long Site Section _ Model of recreation pathway along subway line.

Long Site Section _ Recreation ramp path leading to underground passage below canal and entry to Union Station.
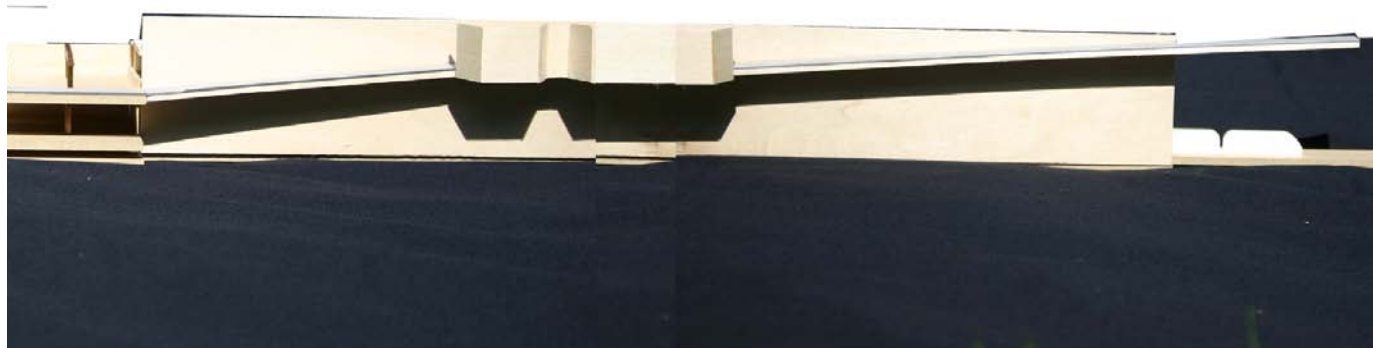
View a_ Recreation ramp seasonal transformation and use
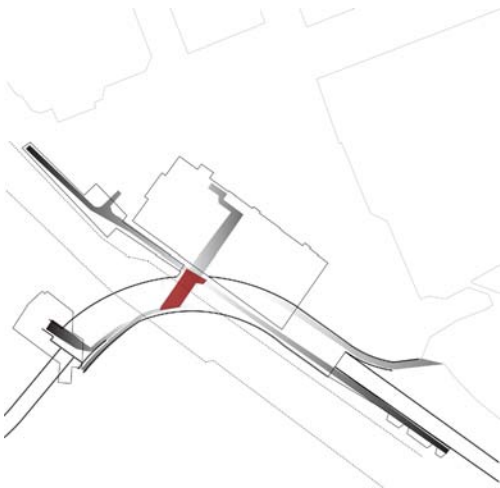
View b_ Summer view below canal on upper platform

View c_ Winter view below canal on lower train platform
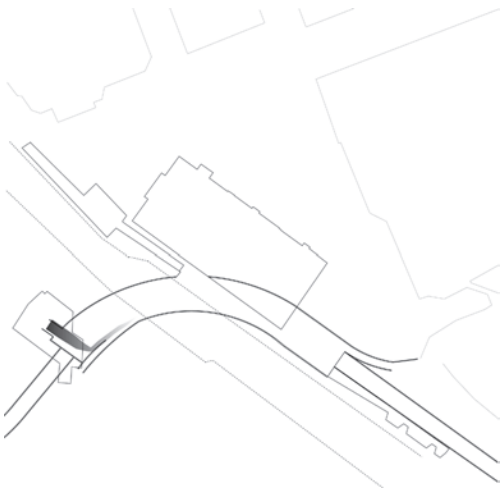
View d_ Summer view of crypt entrance to subway
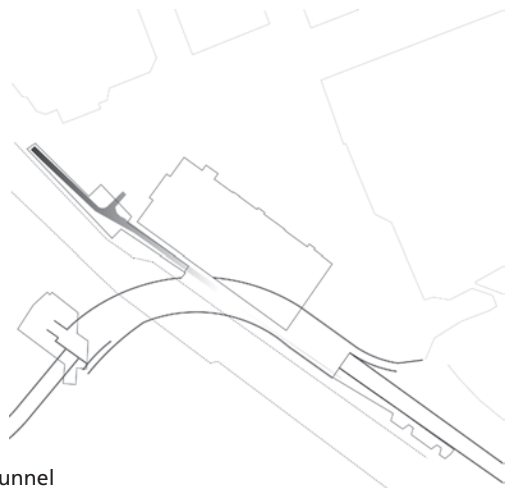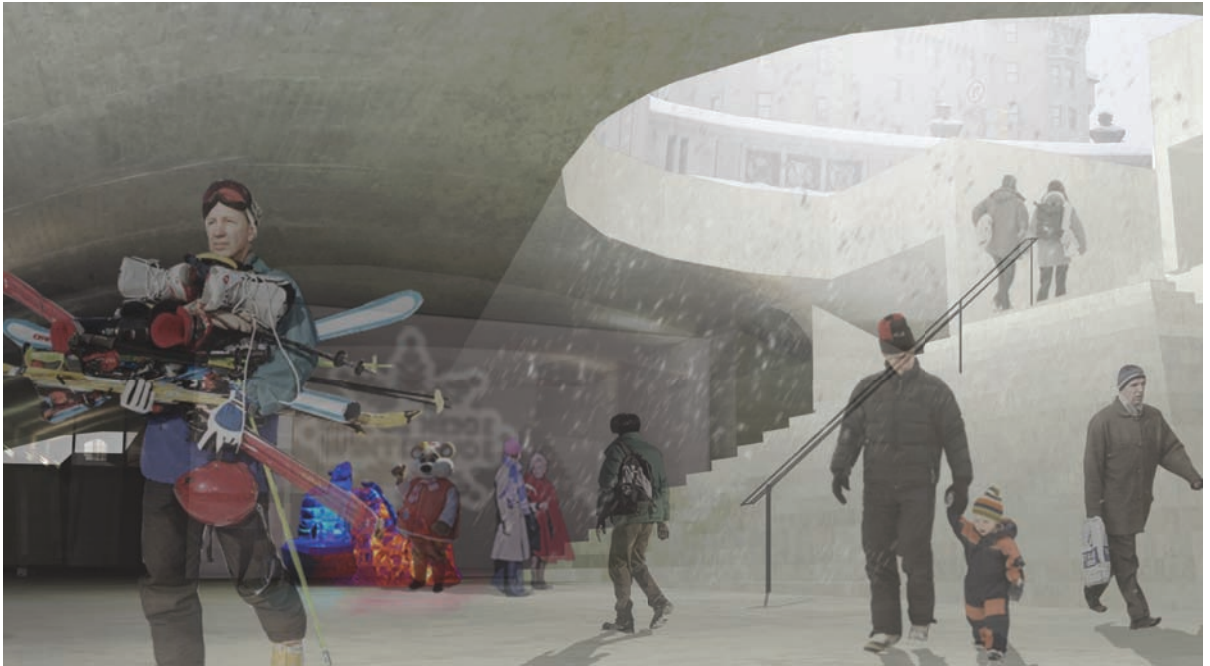
View e_ New stair and winter ice sculpture program in tunnel
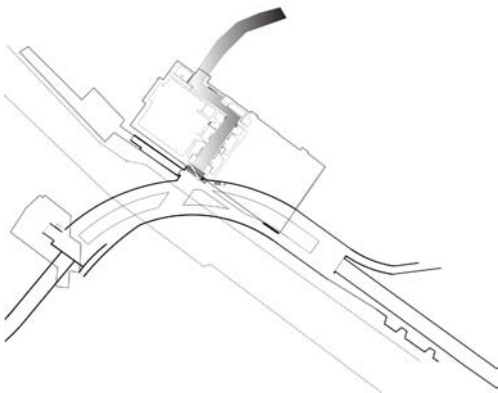
View f. New entry to Union Station via underpass encouraging local arts functions, exhibitions and installations. Light rods provide new framework of occupying space for homeless by creating enclosures with tarps or cardboard. Could be used as visual markers of a new arts precinct within and around Union Station.

+72 m

+68 m

+64 m

113
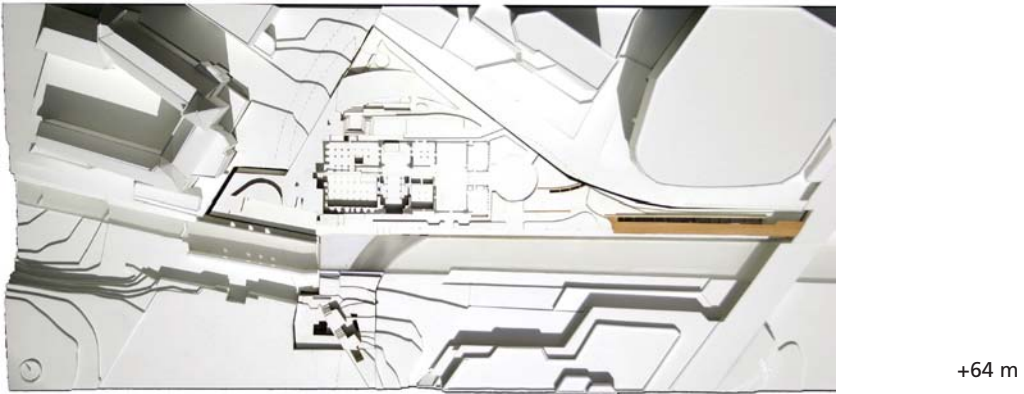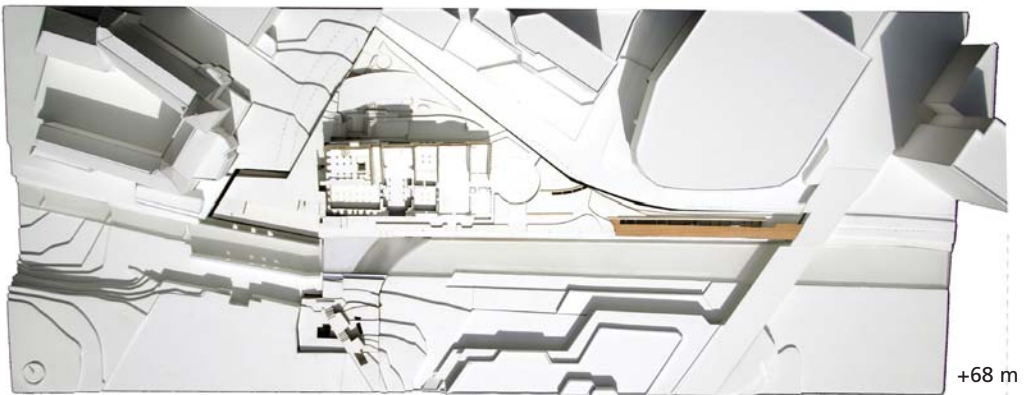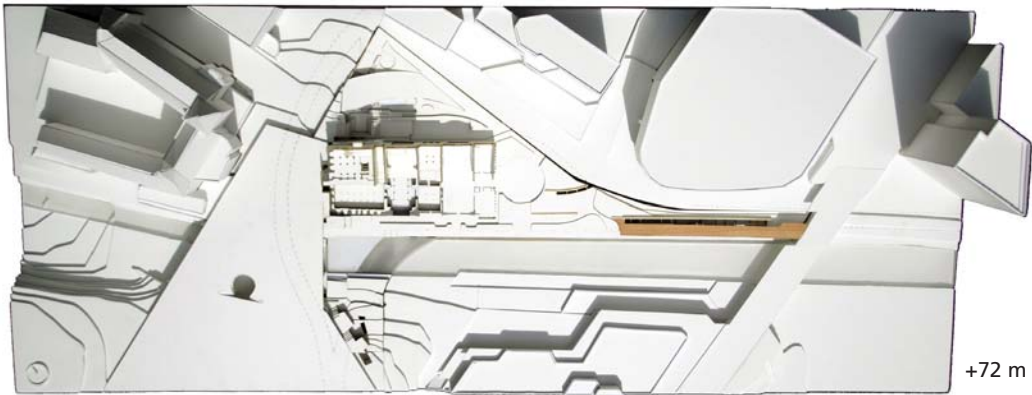
+60 m
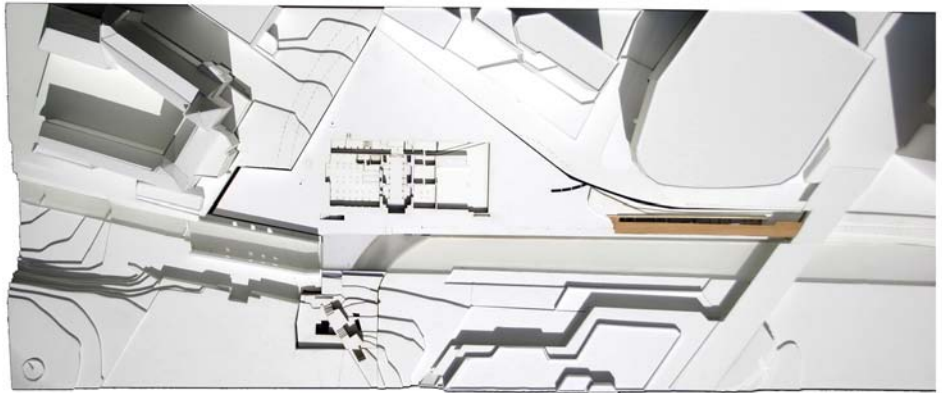
+55 m

Sectional view of subway and pathway concourse connection to Union Station

Final Presentation Panels

WASTE_SCAPES

A layered approach to succession

UBC School of Architecture Graduation Project_ April 2008
Eric A. Charron

Due to natural, cultural and technological shifts every built form will dissipate over time, generating "waste". As these transformations occur, waste_scapes, which are leftover or abandoned buildings and residual urban landscapes proliferate. The intent of this project is to discover the potential of a waste_scape site in Ottawa by re-weaving it back into the city fabric and exploring re-connections of cyclical environmental, social and cultural networks within the found dis-engaged infrastructural remnants of a former train station.

The goals of the project include respecting the historical architectural fabric of the waste_ scape, engaging with the structural and passive environmental capabilities of the existing objects and providing a framework of environmental and cultural adaptability that can extend the useful life of these structures well into the future.

CONTEXT PLAN
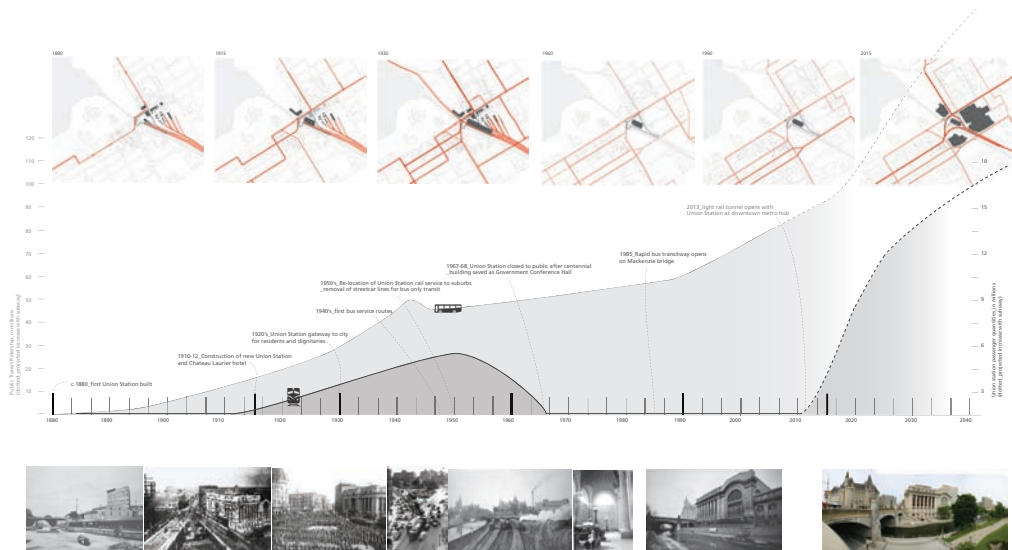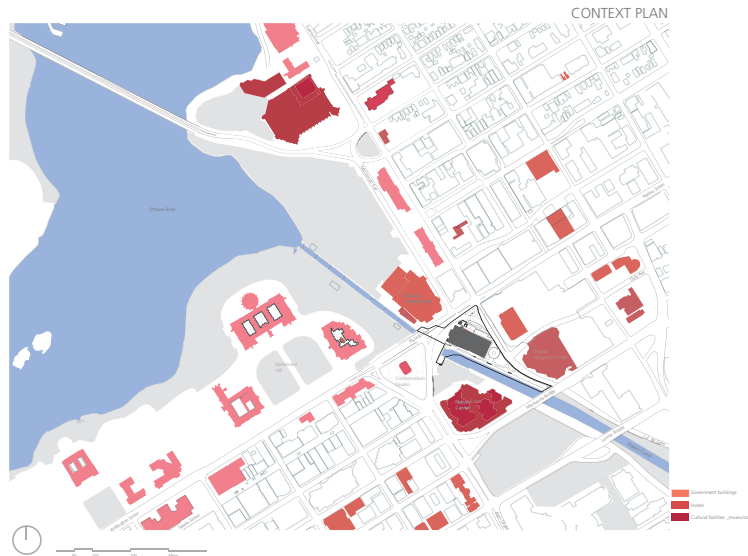
Panel 2
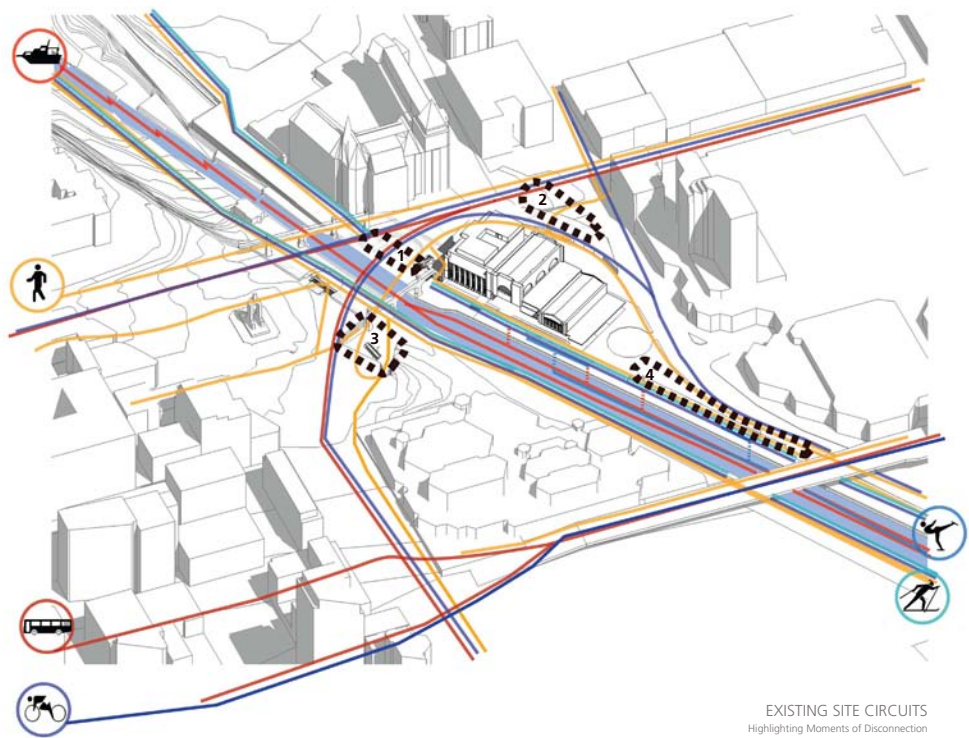
EXISTING SITE CIRCUITS
Highlighting Moments of Disconnection

Plaza Bridge pathways _
seasonal recreational activity

Rideau canal_
cyclical occupation
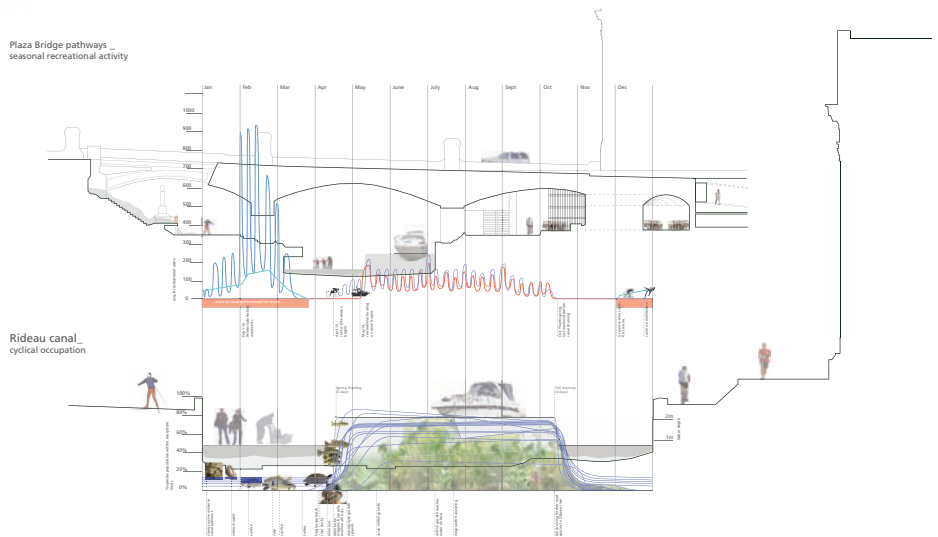
Plaza Bridge tunnel_1   Mackenzie Road Slip_2   Confederation Plaza "crypt"_3   Canal Wall_4
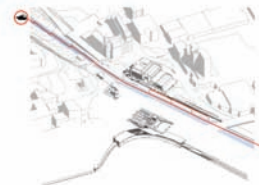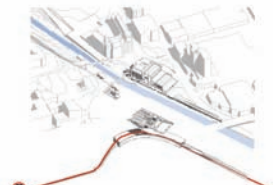
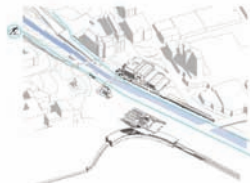PROPOSED CIRCUIT RECONNECTIONS
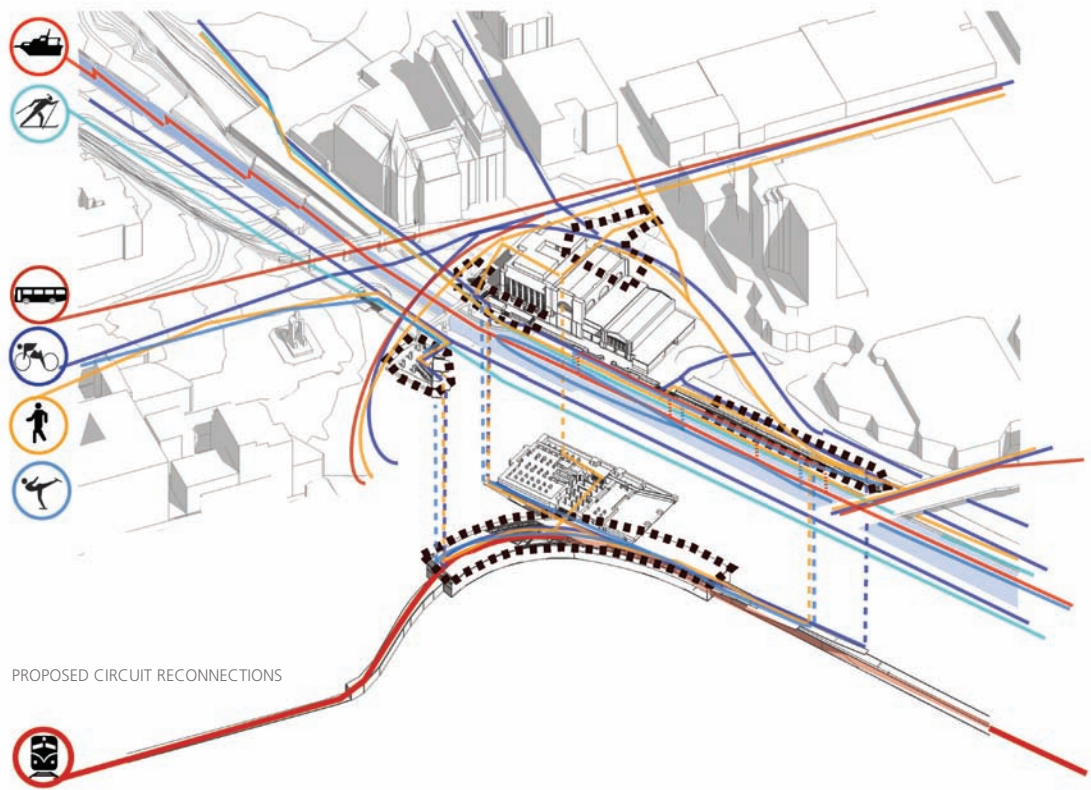
New site connection nodes

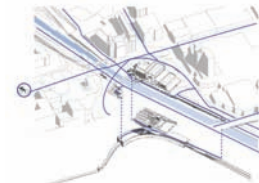THINGS YOU RIDE
Major bus lines
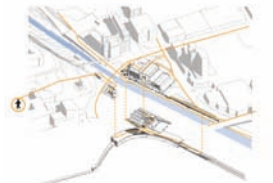

Recreational and Tour boats

NEW Light Rail Transit

THINGS YOU DO
Cross-country skiing - canal recreation paths
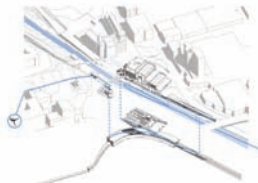
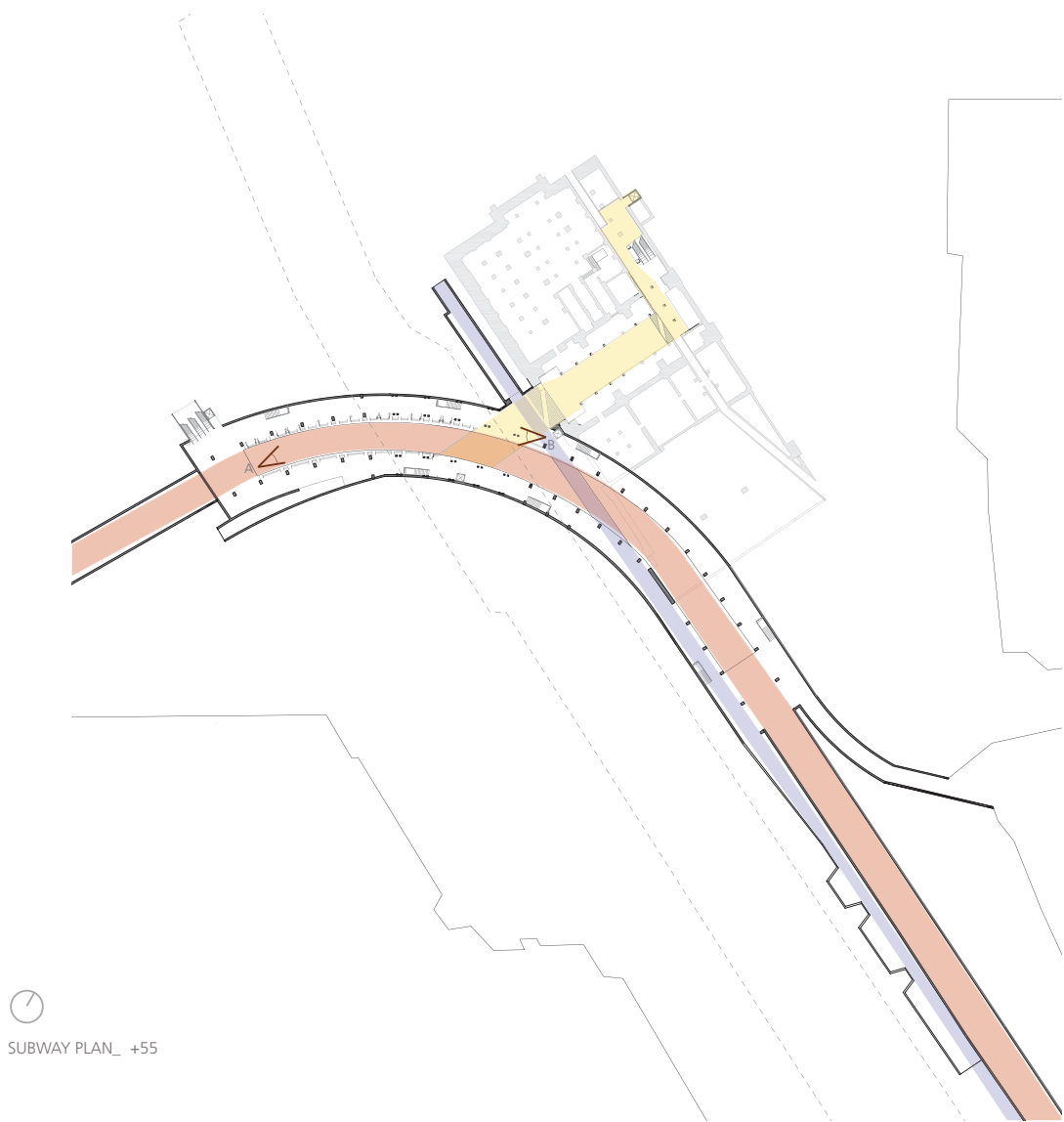

Skating - concessions along canal path

Cycling - re-connect pathway and road networks

Pedestrian routes - connect Union Station with
the rest of the site and city networks

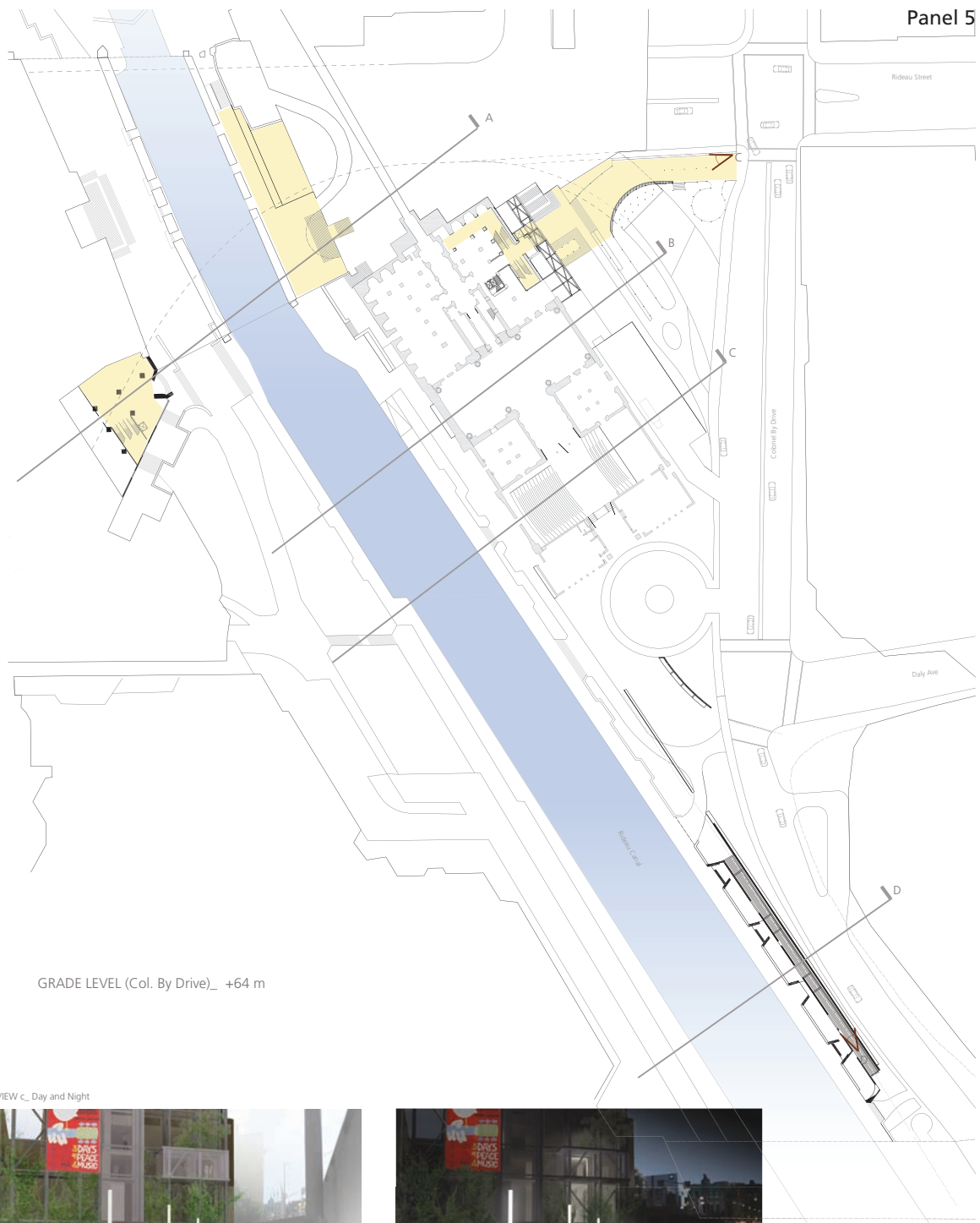SUBWAY PLAN_ +55
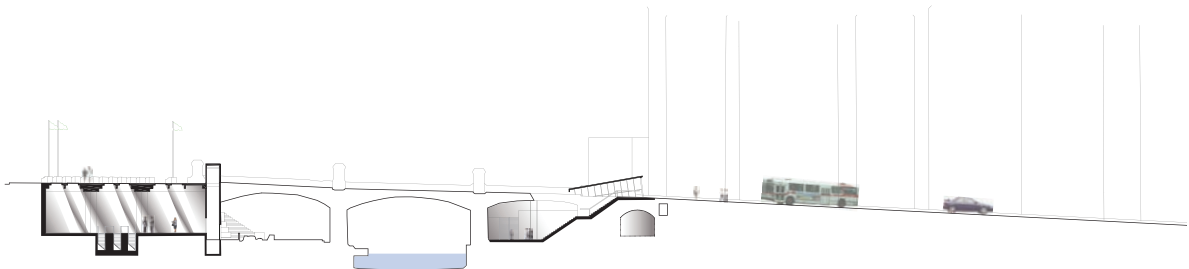
VIEW a_ January to March

VIEW b_ May to October

Rideau Street

Colonel By Drive

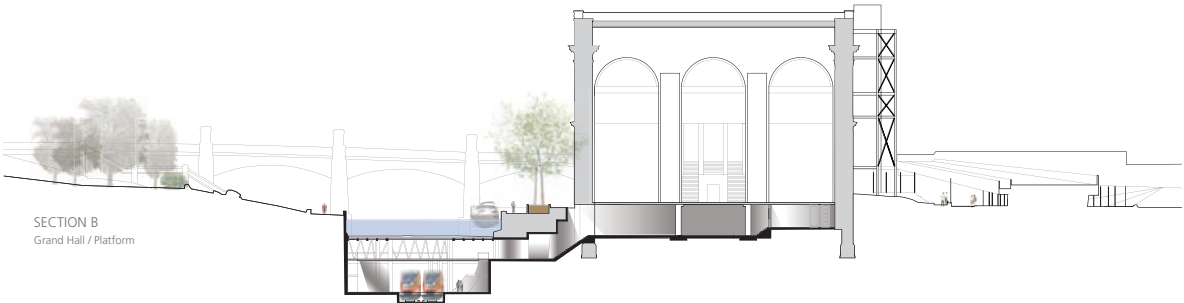Daly Ave

Rideau Canal

GRADE LEVEL (Col. By Drive)_ +64 m
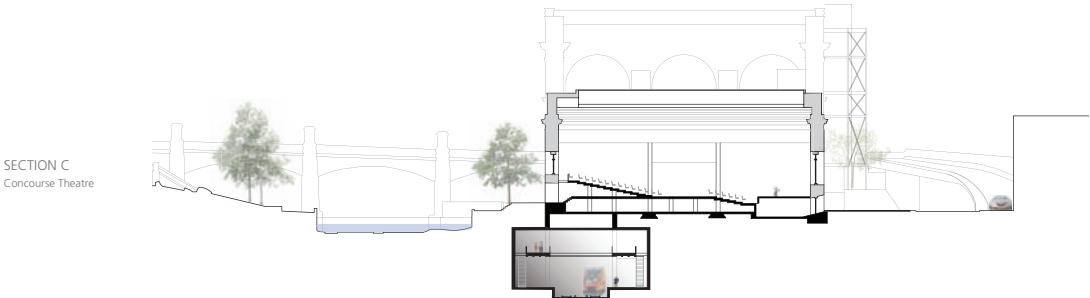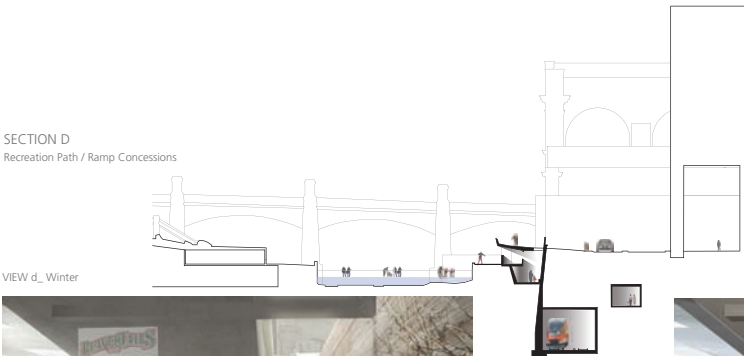
A

C

B

C

D

VIEW c_ Day and Night

SECTION A
Crypt / Tunnel Entrance

SECTION B
Grand Hall / Platform

SECTION C
Concourse Theatre

SECTION D
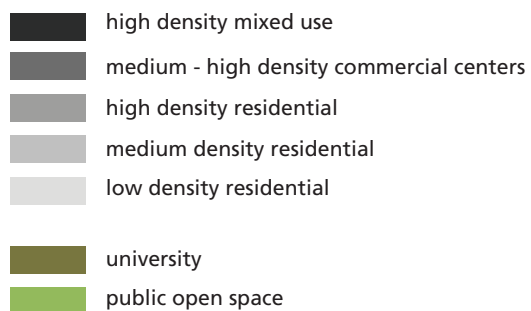Recreation Path / Ramp Concessions
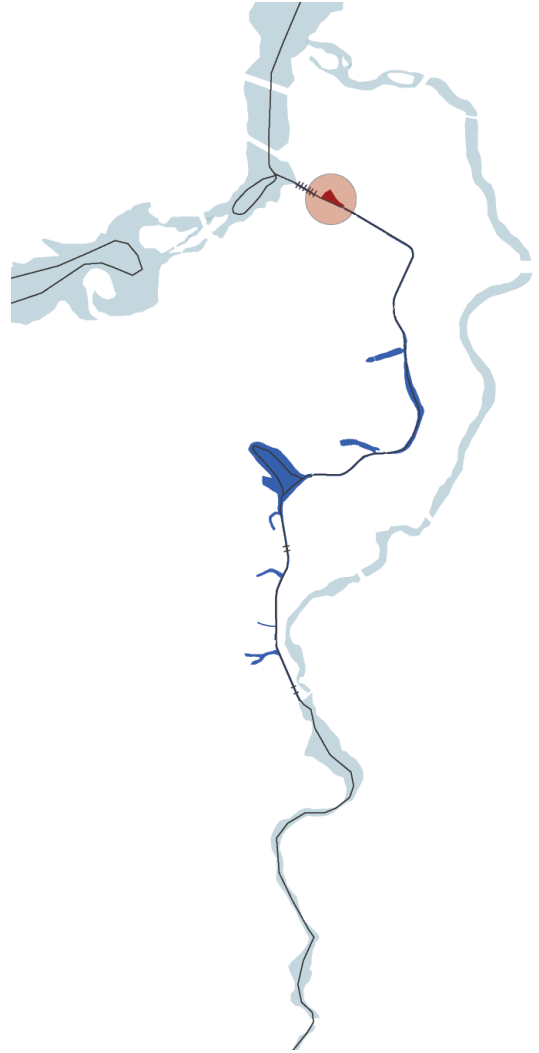
VIEW d_ Winter

VIEW d_ Summer

Appendix

Ottawa Urban Analysis

▪	high density mixed use
▪	medium - high density commercial centers
▪	high density residential
▪	medium density residential
▪	low density residential
▪	university
▪	public open space

Downtown Ottawa, zoning use density
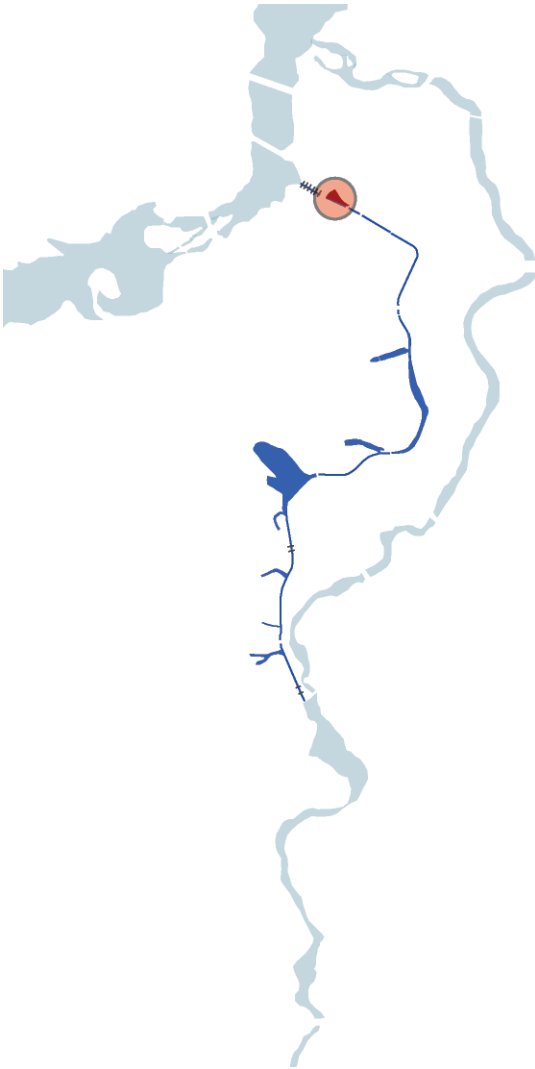
Rideau Canal Corridor

━━┣┣━━ lock station

Tour and Recreation Boat Routes
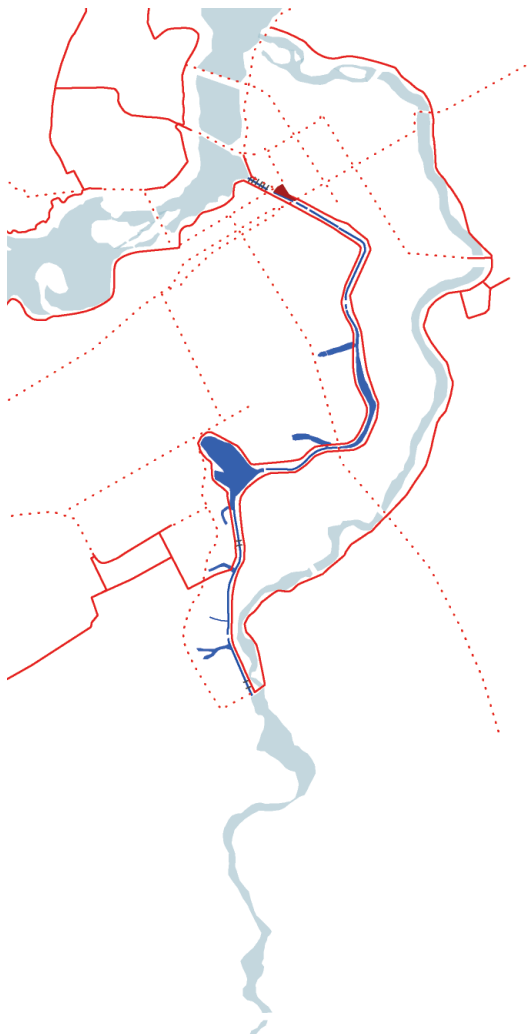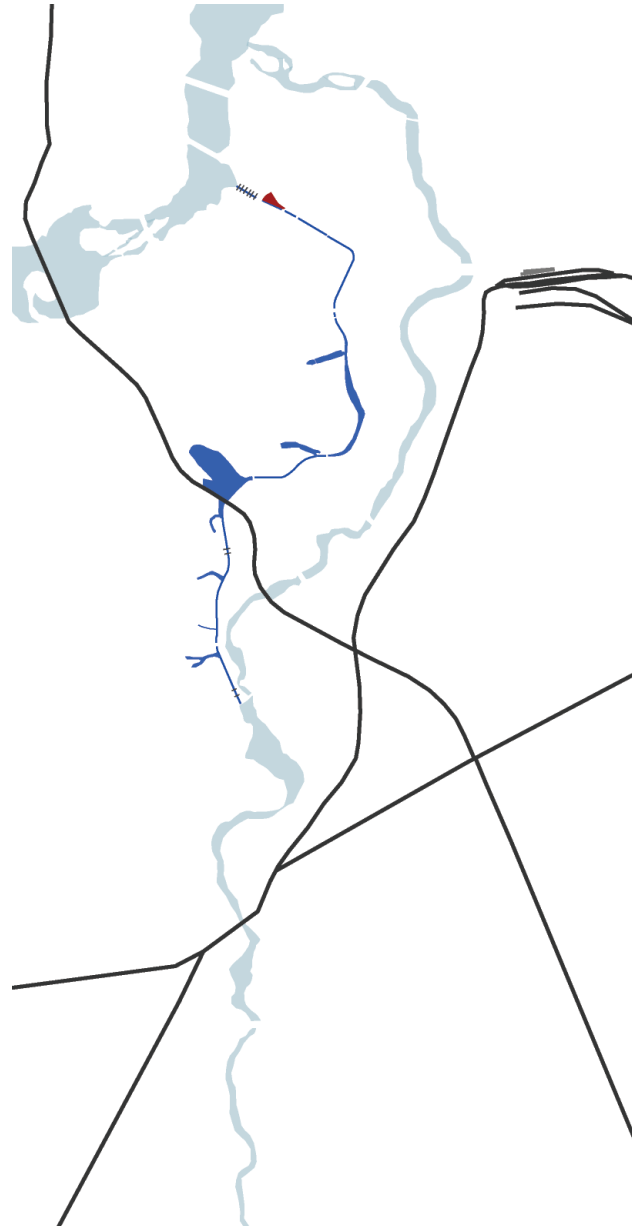
Bicycle Route Network

——————— off-street pathways
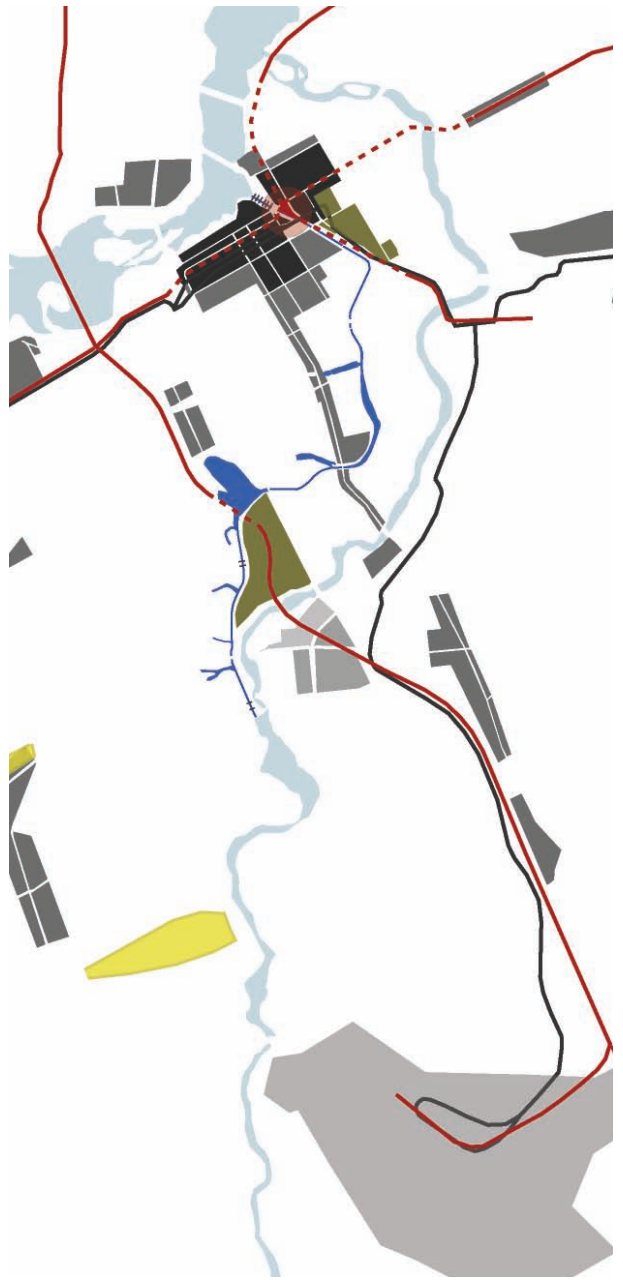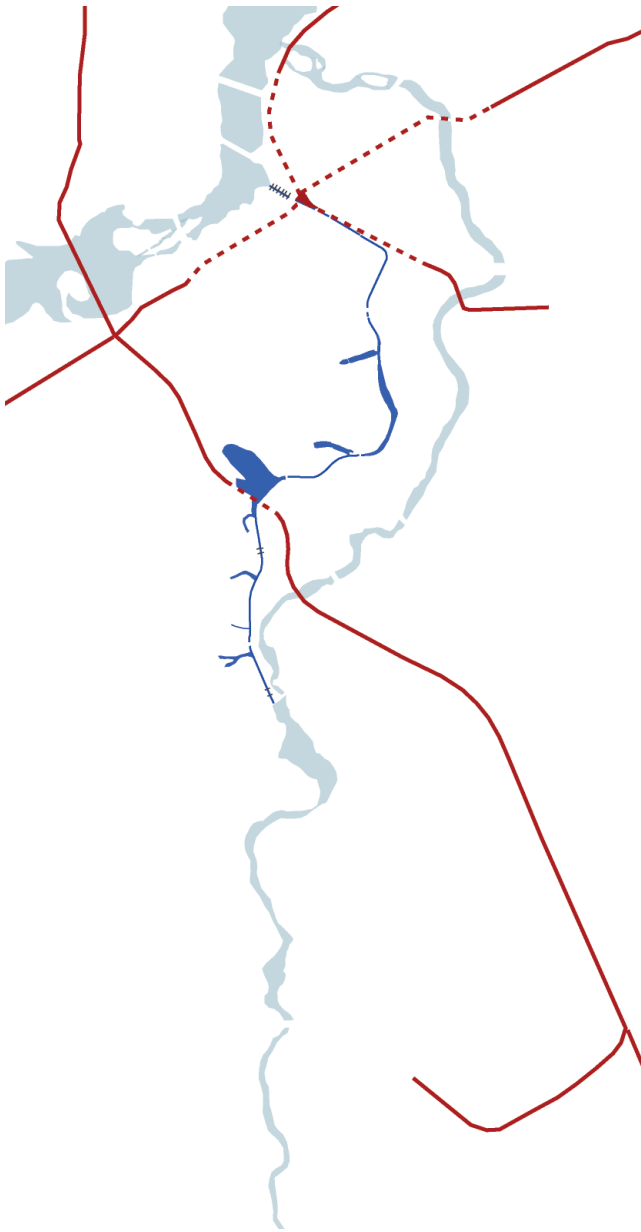- - - - - - - - - on-street markings
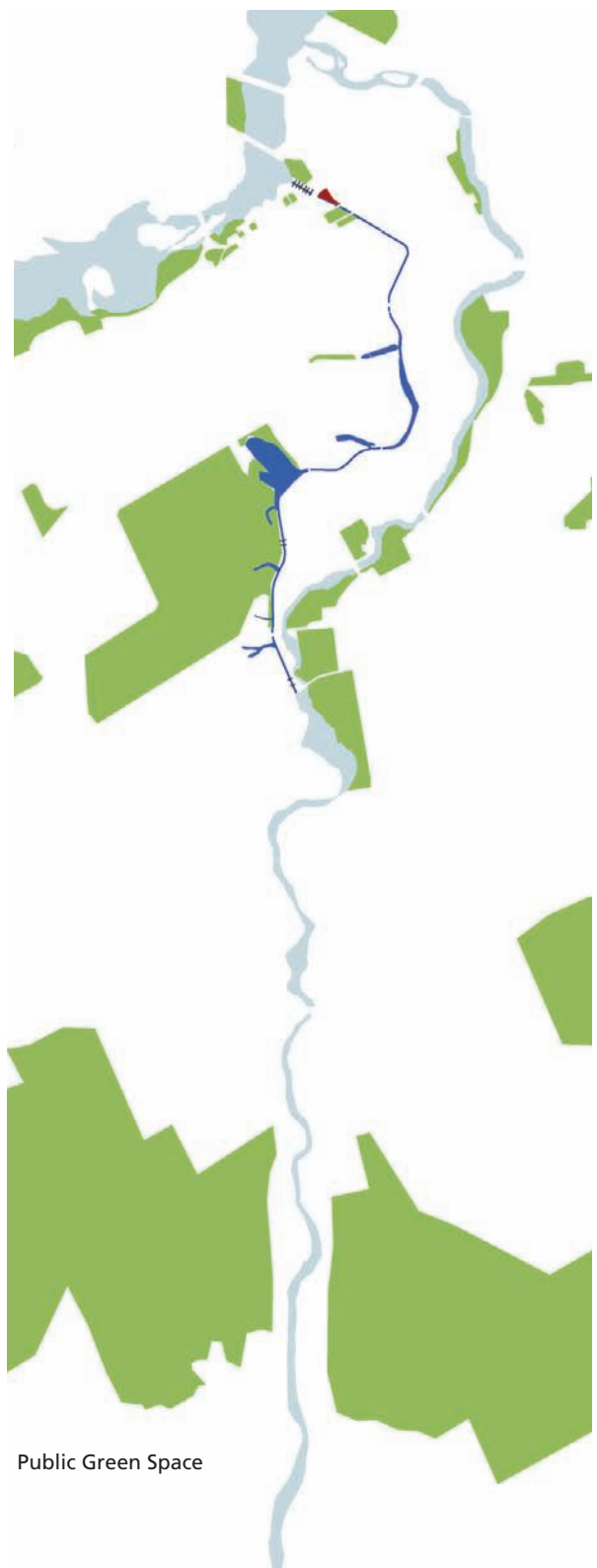
Public Green Space

Existing Express Bus Routes

Existing Rail Corridors

Proposed Light Rail Transit Routes

——————— at-grade rail
- - - - - - - underground tunnel

Urban Hubs Served by Proposed Transit Network

commercial center

airport

university

High Tech Park

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