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Regenerating dross : a campus for sustainable energy systems

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Regenerating Dross:

A Campus for Sustainable Energy Systems

By

Jeff Cogliati

B. Arch. Sc., Lawrence Technological University, 2007

A design thesis project
presented to Ryerson University
in partial fulfilment of the
requirements for the degree of
Master of Architecture

Toronto, Ontario, Canada, 2011
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Jeff Cogliati

Regenerating Dross:

A Campus for Sustainable Energy Systems

M.Arch 2011

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Faculty of Engineering, Architecture and Science

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Abstract

The following thesis began as an investigation into post-industrial urban waste and the ecological remediation potential that such landscapes embody. It looks at the forces behind waste landscapes or drosscapes and examines the theories associated with the the ever-growing amount of waste landscapes throughout our cities. This thesis is largely centred on using Landscape Urbanism as a means of regenerating post-industrial waste sites. The Landscape Urbanists have proposed the use of landscape, rather than architecture, to transform urban waste and reconnect it back to the urban fabric. Where does architecture exist within this context? How can architecture act as a catalyst throughout this transformation? This thesis will examine how architecture *and* landscape can operate in unison throughout post-industrial site remediation and it will explore how built form can become an integral part of a continuous landscape.

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Dedication

For my father. Gone but never forgotten.

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Post-industrial waste sites require unconventional planning methodologies in order to deal with the multitude of social and ecological complexities often associated with such sites. Landscape Urbanism has proven to be capable of addressing these realities; however the role of built form remains unclear within this discourse. What is architecture within Landscape Urbanism?

Introduction

Almost 40 years ago, Ian McHarg proposed a bold theory and a set of ecologically related planning methods in *Design with Nature* (1969). While the practical measures he proposed have been incorporated into subsequent design and planning practices, the theoretical implications have not yet been fully realized. Present-day forms of the model include the amalgam “landscape urbanism,” with its focus on infrastructure and urban ecology, a hybrid discipline arguably indebted to McHarg while distinct in its avoidance of the more strenuous effects of his project. – Frederick R. Steiner, *The Ghost of Ian McHarg* (2009).

Cities are expanding horizontally through the forces of globalization, deindustrialization, post-Fordist modes of production, technological ingenuity and suburban sprawl (Berger, 2006). As these forces have been persistent, the post-industrial city now possesses vast tracts of contaminated land. While it is evident that

urban planning and architectural practitioners need to regroup in order to address this reality, the future of the waste landscapes continues to be ambiguous.

A body of literature has evolved in an attempt to acknowledge the complexities and opportunities afforded by the post-industrial landscapes. This has formed a number of (fill in the blank)-isms that have advanced in response to the preceding ones. Postmodernism, for example, was a reaction to the blandness and hostility of modernism. The rejection of modernism subsequently produced architecture of “abstract signs and surfaces without depth” (Allen, 1999, p.49). In the same vein, New Urbanism evolved as a critique on the planning of modernist cities. New Urbanism promotes the European concept of walkable neighbourhoods, as opposed to the sprawling suburbs that emerged under the modernist dogma. While New Urbanism initially presented itself as the next great frontier in the planning of North American

cities, there has been widespread criticism on its link to gentrification and its role in the creation of gated, upper-class communities (Gordon in Cote, 2008).

Landscape urbanism, a discourse that has emerged over the last thirty years, has become the next ism in the progression of post-industrial city planning. While the former urbanisms have shown to be lacking in terms of longevity, landscape urbanism promises endurance through flexibility and ecologically responsibility. Landscape urbanism has “[the] efficiency – the ability to produce urban effects traditionally achieved through the construction of buildings simply through the organization of horizontal surfaces [and can be used as a] medium for use in contemporary urban conditions increasingly characterized by horizontal sprawl and rapid change” (Waldheim, 2006, p.37).

Environmental degradation and suburban sprawl will continue to characterize the metropolitan landscape. In this context, landscape urbanism appears to trump conventional urban planning methodologies. While architecture has traditionally functioned as the foundation of vibrant urban environments, Charles Waldheim has asserted that the role of built form will shift under the landscape urbanism discourse:

Landscape urbanism describes a disciplinary realignment currently underway in which landscape replaces architecture as the basic building block of contemporary urbanism. For many, across a range of disciplines, landscape has become both the lens through which the contemporary city is represented and the medium through which it is constructed (Waldheim, 2006, p.13).

By virtue of modernist city planning, architecture has undoubtedly played part in the deterioration of the environment. For example, in 2005 buildings accounted for nearly forty percent of all energy consumed and thirty eight percent of total carbon emissions. Moreover, building occupants used thirteen percent of the total water consumed. (EPA, 2005). These statistics indicate that architects must shift their focus to a more sustainable mode of design, but do they also warrant an entire reordering of urban planning procedures as Charles Waldheim would have it?

This thesis is an examination of the current state of landscape urbanism through an architectural lens. Landscape urbanism has presented itself as the next frontier in post-industrial city planning, thus it is constructive to analyze the role of architecture within this discourse. As the history of urbanity has revealed that buildings are a quintessential element of the urban realm, how will landscape and built form work in unison to create thriving urban conditions, while

also addressing rapid environmental deterioration? Will landscape urbanism endure longevity or will it fall short like the preceding urbanisms.

The chapters in this thesis have been structured to reflect the course of research. As this exploration began with a fascination of urban waste and contaminated land, the first chapter *Drosscape Defined*, provides a historical and theoretical background of urban waste. The works of Lars Lerup, Ignasi de Sola Morales, Alan Berger and others are examined in an attempt to illustrate the causes of urban waste but also to show the theories surrounding the future development of the post-industrial waste sites.

The subsequent chapter, *The Promise of Landscape Urbanism*, explores the evolution the Landscape Urbanism discourse. This chapter defines Landscape Urbanism's philosophy and illustrates how the discourse has separated itself from traditional urban planning methodologies. The progression of the discourse is explored through a number of case studies. By comparing the traditional "grand park" projects - such as Boston's Emerald Necklace or the more recent Highline project - to contemporary projects such as the Toronto Brickworks and the Lower Don Lands, the current state of Landscape Urbanism is revealed. The work of Frederick Law Olmstead and Ian McHarg is explored and compared to the work of Kenneth Frampton, James Corner, Stan Allen and Andres Duany in an attempt to assess the longevity of the discourse.

The following chapter, *Regenerating Dross*, is intended as a projection of the Landscape Urbanism discourse through a design exercise. A drosscape in Windsor, Ontario has been identified and subsequently used to test the research encountered throughout the course of this thesis. The design is a critique and a continuation of Landscape Urbanism. The design project uses Landscape Urbanism as a starting point but evolves the theories by coupling Kenneth Frampton's *Megaform* with Andres Duany's *General Theory of Sustainable Urbanism*. This section begins to investigate an improved relationship between built form and landscape within a post-industrial context. The notion of an Ecological Urbanism is then offered as a means of advancing the Landscape Urbanism conversation. New projects under the Ecological Urbanism heading are revealed in this section in order to provide a comparative analysis between the Landscape Urbanism and Ecological Urbanism discourses.

1.0 DROSSCAPE DEFINED

Over the last half century great deals of publications have surfaced pertaining to the adverse effects and consequences of urban sprawl (Berger 2006, Donnan 2008, Burchell *et al* 1998, Girardet 2000, Mumford 1961, Jackson 1987). Consistent throughout this body of literature are the suspected effects that are caused by or associated with urban sprawl: loss of pristine green space and agricultural land, increased traffic congestion and the associated political pressures to build more infrastructure, increased air pollution, the high costs associated with providing utilities, roads and highways to low density “bedroom communities”, increased contentiousness with rural businesses due to their incompatibility with residential zones, (Donnan, 2008). Despite this ever-growing list of anti-sprawl rhetoric, one distinctive facet of urban sprawl persists: the interstitial urban wastelands, otherwise known as *drosscapes*. Engagement with urban waste offers architects, landscape architects and urban planners a unique opportunity to

reanimate the dead spaces throughout the urban realm. In doing so, drosscapes become an integral part of the metabolic processes of the city.

As modes of production evolve and transportation costs decrease, our cities continue to expand outwards. The inevitable reality is that waste sites will continue to accumulate in and around the city’s centre. Thus, the intent is to seek out constructive and innovative methods for dealing with urban waste. Drosscapping appears to do just that.

Urban waste theory is presented in his chapter. Literature by Lars Lerup, Lydia Kallipoliti, Ignasi de Sola-Morales, Stan Allen and Herbert Girardet are reviewed here in an attempt to provide clarity to the drosscape discussion. The aim is to illustrate the considerable potential of urban waste landscapes. This chapter attempts to prove that through drosscape remediation, some of the adverse qualities of urban sprawl can be counteracted.

1.1 An Evolution of Sprawl

All across the world urban fringe developments are springing up virtually overnight. While urban sprawl appears to be a relatively recent phenomenon, its history dates back far beyond that of the industrial era. In the seminal book, *The City in History – Its Origins, Its Transformations, and Its Prospects*, Lewis Mumford writes on the evolution of the historic suburb. The suburb originated out of the necessity to leave behind the chaotic conditions that existed within the old city walls. “Well before the industrial town had taken form, the notion of leaving behind the complexities of civilization had become attractive to the European mind once more, just as it had been during the decadence of Rome...country life seemed best; and the farther one got away from the city the more one gained in health, freedom, independence” (Mumford, 1961). Thus, the historical basis for suburban development was to provide refuge from the ill conditions of the city. One would escape to the countryside for their greater well being. Historical records show that the suburb existed nearly as early as the city itself (see fig. 1.01 & 1.02)(Mumford, 1961).

Fig. 1.01

Fig. 1.02

Initially, according to Mumford, the suburbs existed as a series of “scattered buildings in a park” (Mumford, 1961). This was considered the ideal situation for those who had been overburdened by the compact nature of the old city centre. Over time, however, isolation became problematic for those living in the suburbs and in order to have any level of social interaction the need for personal vehicular transportation became amplified (Mumford, 1961).

Today, the reliance on the automobile has changed the spatial configuration of countless historic city centres as well as the city's edge (see fig. 1.03). In many cities, urban population densities have decreased while growth at the edges of metropolitan areas is exponential (Berger, 2006). A recent statistic revealed that over 62 percent of the American population now reside outside of the old city centres (see fig. 1.04) and similar percentages of people are employed within these locations (U.S. Census, 2000). This has resulted in a shift from crowded, vertically and architecturally dominated places to “the horizontal opposite” (Berger, 2006). The main driving force behind today's urban sprawl is not so much the necessity to seek refuge from the city as it is the lower property values and the reduction in transportation costs (Berger, 2006).

Fig. 1.03

Coupled with the reduction in transportation costs, the evolution from vertically dense cities to the horizontal converse can be linked to the shift from Fordism to post-Fordism production economies. The Fordist method of mass manufacturing coincided with the spatial arrangement of cities. The Fordist city emphasised “automation, standardization, economies of scale and the technical division of labour communication”, and these attributes can also be seen in modernist city making and masterplanning (Berger, 2006). While Fordism operated through centralized production methods, post-Fordism functions through multiple agents across a broad horizontal field. Berger notes that flexibility is a term that can describe the shift from Fordism to

post-Fordism. Due to rapid changes in consumer demand, the post-Fordist methods of production consist of “flexible plants and labour that can cost-effectively produce smaller batches of more customized goods” (Berger,2006). Many of the new production facilities are no longer located in the city centre, but rather on the outskirts. These developments are supported by broad highway and infrastructural systems which link the production facilities to distribution hubs. Most of these new production plants can be seen clustered along highways all over North America. Along with the roadside production agglomerations, the urban fringe is also characterized by vast tracts of low-density, often segregated, 1-2 floor single-family homes, commercial strip developments and private highway and roadway infrastructures that link the suburbs to nearby city centres (Donnan, 2008). This trend can be witnessed across the globe in cities such as Sao Paulo, Toronto, San Diego, Denver, Melbourne as well as countless other locations (Berger,2006).

Fig. 1.04

1.2 Urban Waste and the Evolution of Dross Praxis

An excess of adversarial conditions have been documented and linked to urban sprawl. Miron states that the adverse effects and consequences of urban sprawl were first introduced in the social science and planning fields as early as the 1950's (Miron, 2003). Since this time, a great deal of literature has been published which contains a vast quantity of anti-sprawl rhetoric. A report titled, *Economic Implications and Consequences of Population Growth, Land Use Trends and Urban Sprawl in Southern Ontario* (Donnan, 2008), associates urban sprawl to issues such as:

- irreversible losses of forests, green space, wetlands, wildlife habitat, natural environments, open space and scenery,
- loss of agricultural lands and their production, increased traffic congestion and political pressures to build more roads, increases in air pollution (mainly due to automobile emissions) and water pollution (mainly due to increases in sewage generation),
- inefficiencies due to high costs of providing utilities, roads, highways and infrastructure to scattered, low density subdivisions and bedroom communities,
- generation of "fiscal deficits" and rapidly increasing taxes for jurisdictions where infrastructure capital and servicing operating costs exceed the development charges paid by developers and additional tax revenues paid by property owners,
- increased conflicts with rural businesses and land uses that are incompatible with residential areas, eg. rendering plants, livestock farming operations, abattoirs, stone and gravel quarries.

Sifting through the anti-sprawl rhetoric, a unique facet presents itself. That is, the element of urban waste or *dross*. The term *dross*, which originally referred to the unusable scum leftovers formed in the metal making process, has found new relevance in the post-industrial landscape discussion. Lars Lerup and Alan Berger have recently adopted this term to define urban leftovers. Berger, "Drosscape is an urban design framework that looks at urbanized regions as the waste product of defunct economic and industrial processes (2006). Drosscapes begin to appear as the urban field extends outwards. This has been regarded as a relatively negative aspect of urban sprawl (Donnan, 2008), however other researchers have noted it to be a natural occurrence (Lerup, 2005). Just as nature produces waste as it grows, so do cities. Thus, questions concerning how to avoid urban wastelands become ambiguous. Rather, what are the opportunities afforded by urban waste? How can these landscapes begin to address

some of the adverse qualities of sprawl? What will the nature of these sites be in the future? How can urban waste be regenerated and incorporated back into the urban fabric?

The term *drosscape* has been tied to the wasted spaces produced by sprawl (see fig. 1.05 & 1.06). Drosscapping is the productive assimilation and salvaging of urban waste (Lerup, 1995). According to Berger, the term “implies that dross, or waste, is scaped, or resurfaced, and reprogrammed by human intentions.” It is the “condition in which vast, wasted, or wasteful land surfaces are modeled in accordance with new programs or new sets of values that remove or replace real or perceived wasteful aspects of geographical space (i.e., redevelopment, toxic waste removal, tax revenues, etc.). Drosscapping, as a verb, is the placement upon the landscape of new social programs that transform waste (real or perceived) into more productive urbanized landscapes to some degree” (Berger, 2006). Thus, the designer of a waste landscape is permitted a unique opportunity to give new life, new meaning, and a new agenda to an otherwise dead and unproductive constituent of the urban realm.

Fig. 1.05

Fig. 1.06

Berger is amongst a growing number of theorists and practitioners set to define and understand the forces which create and define drosscapes. Lydia Kallipoliti, Lars Lerup and Ignasi de Sola-Morales have written extensively on the possibilities afforded through drosscape praxis. In *Dross; Regenesis of Diverse Matter* (2005), Kallipoliti reviews the generative potential of obsolete objects and spaces. Kallipoliti argues that dross praxis differs from traditional design methodology in that one does not start from scratch but rather from the “reality of an existing inoperative component...it can no longer be located in the process of representing an abstract concept, but in the act of manipulating matter and bonding new functions to objects that have lost their previous, fixed identity” (Kallipoliti, 2005). Kallipoliti’s theory is distinct in that it reverses

conventional urban planning methodologies. Drosscape practitioners must deal with the difficulties of post-industrial sites, existing slum neighbourhoods, and dead ecologies amongst a multitude of additional complexities. These circumstances can prove to be more fruitful for the planner because they permit a mosaic of new and old, which ultimately adds more value than an entirely new development.

Lars Lerup's seminal report, *Stim & Dross* (1995) uses the city of Houston (see fig. 1.07) to elucidate the forces acting on urban sprawl. The "stim characterizes the places, buildings, programs and events that most people would identify as being developed or built for human use (dwelling, occupation, industry, recreation, etc.) whereas the dross characterizes the landscape leftovers, or waste landscapes, typically found in-between the stims and undervalued for many reasons (pollution, vacancy, natural conditions unsuitable for building, unprofitability, etc)" (Lerup, 1995). He views the city as vast organism which contains a series of productive and unproductive landscapes. Lerup envisions Houston as a "holey plane", the holes being the drosscapes in the urban field. Although the stimdross environment is seemingly chaotic and unorganized, as Berger notes, "its physical presence is ordered by the need to produce dross as it grows" (Berger, 2006). Lerup views the dross as being a critical component to the city's success. Without dross, the stimulation or stims of the city become less important.

Fig. 1.07

Similarly, the late Spanish architect Ignasi de Sola-Morales shared theories to that of Lerup and Kallipoliti, although de Sola-Morales' concepts were further grounded in practice. Instead of the *stindross* terminology, de Sola-Morales used the French term *terrains vagues* to describe what he saw as the in-between parts of the city. The *terrain vague* landscapes referred to by Sola-Morales include: industrial wastelands, vacant and derelict properties and declining suburban developments. Such landscapes, according to Sola-Morales, are now ignored because they are no longer producing income for the city. De Sola-Morales saw "great potential for understanding the *terrains vagues* of the metropolis as an architectural opportunity when few others did" (de Sola-Morales, 1995). De Sola-Morales noted that designers often had difficulty coping with the *terrains vagues* because they tend to be so vast that they escape traditional masterplanning methodologies. Sola-Morales' assertion defies the modernist's notion of masterplanning in that the architecture in the *terrain vague* must not be used as "an aggressive instrument of power and abstract reason", but rather, architecture must act through "attention to continuity: not the continuity of the planned, efficient, and legitimated city, but of the flows, the energies, the rhythms established by the passing of time and the loss of limits" (de Sola-Morales, 1995)

The flows that de Sola-Morales refers to can be found within nature's processes. As *dross* is produced in the city in the same way that it is in nature, it seems logical to use natural processes to guide the design of these landscapes. Cities can be understood as having a "definable metabolism" similar to that of organisms (Girardet, 2000). Girardet argues that, "the *metabolism* of most 'modern' cities is essentially linear, with resources flowing through the urban system without much concern about their origin and about the destination of wastes; inputs and outputs are considered as largely unrelated...the linear metabolic system of most cities is profoundly different from Nature's circular metabolism, whereby every output by an organism is also an input, which renews and sustains the whole living environment" (Girardet, 2000). *Drosscapes* could become the place where outputs and inputs operate. By reversing the nature of urban waste sites (i.e., unproductive to generative), *drosscapes* are no longer voids in the urban fabric but rather solid contributors to a healthy urban system. Once a *drosscape* has been defined according to the input/output structure, the stage is set for future programming to occur, thus making the site more productive than it once was.

Girardet's input/output theory has been further developed by proponents of landscape and infrastructural urbanism. These emerging disciplines provide focus to systems rather than objects in space (the opposite of modernist planning). Form does matter, however the

operations that occur in and around built form are considered to be more imperative. The focus thus shifts away from what an object looks like to how it performs. In *Infrastructural Urbanism*, Stan Allen proposes that we shift the focus away from what an object looks like to how it operates. The designer of a waste landscape will not propose built form, but rather assemble the site itself which will prepare the site for future building and set the grounds for future events (Allen, 1999). Landscapes will remain “flexible and anticipatory, work with time and be open to change” (Allen, 1999). To Allen, waste landscapes should be a place where systems of flow, movement, and exchange should occur (see fig. 1.08 & 1.09).

Fig. 1.08

Fig. 1.09

2.0 The Promise of

Landscape Urbanism

In mobilizing the new ecologies of our future metropolitan regions, the critically minded landscape urbanist cannot afford to neglect the dialectical nature of being and becoming, of differences both permanent and transient, the lyrical play between nectar and NutraSweet, between birdsong and Beastie Boys, between the springtime flood surge and the drip of tap water, between mossy heaths and hot asphaltic surfaces, between controlled spaces and vast wild reserves, and between all matters and events that occur in local and highly situated moments, is precisely the ever-diversifying source of human enrichment and creativity. I can think of no greater reason for persisting with the advancement of landscape urbanism than this. (Corner, 2006, p.33)

Waste landscapes are continuing to accumulate throughout North America. To exploit the value of the void spaces, an improved design methodology is in order to address the complexities of the contaminated land and the dilapidated

buildings. Landscape urbanism has emerged over the last twenty five years as a field capable of this. The discourse is centered on using landscape as the grounds for a new form of urbanism. The term landscape does not imply images of nature but rather the overlap of “infrastructural systems and the landscapes they engender” (Waldheim, 2006, p.39). The discourse can be seen as an evolution of the work Frederick Law Olmstead (1858), J.C.A. Alphand (1870), Ian McHarg (1969), Kenneth Frampton (1995) and others. Olmstead’s Emerald Necklace in Boston (1878), can be conceived as one of the first landscape urbanism examples. In Boston, transport infrastructure, flood and drainage systems, scenic landscapes, and built form were overlapped as a unified strategy. Mossop adds that “the close collaboration between landscape design, urban strategies, and engineering produced a complex project integrating ideas about nature and infrastructure as well as health, recreation and scenery” (Mossop, 2006).

Between 1852 and 1870, Jean-Charles Alphand was also constructing highly engineered “natural” landscapes in Paris under Baron Haussmann. Alphand’s transformation of an old dump site into the constructed landscape of Parc des Buttes Chaumont exhibits the essence of landscape urbanism, however at Chaumon the landscape was used as more of a pastoral image which camouflaged an extensive underground system of services. Komara describes the complexity of the groundwork for Parc des Buttes Chaumon:

The park engaged new materials and construction practices in many ways. This included using steam-powered machines for earthwork, connecting to the extended and improved city-wide sewer and drainage systems, the introduction of cast iron gaslights and macadamized roads, hydraulic pumps installed to create water cascades, new tree-planting machinery and recent developments in uses of hothouse and exotic plants, and an *arrosage*, or integrated irrigation system. (Komara, 2004, p.5)

The overlapping of systems and landscape in Alphand’s work parallels the work of Frederick Law Olmstead. While the frameworks for nineteenth century park design and landscape urbanism are congruent, James Corner has confirmed that landscape urbanism is exclusive in that it is looser in how it views built space versus open, green space. Corner adds that Central Park was constructed so that New Yorkers could have “relief from the relentless urban fabric of Manhattan” (Corner, 2005. p.24). In this sense, the park and adjacent buildings have a clear delineation. But this separation of landscape and built form is precisely the grounds for the emergence of the discourse. In *Terra Fluxus*, Corner asserts that urban planning has failed to assimilate landscape into the urban form. While Central Park provides a refuge from the chaos of Manhattan, it has also been linked to the soaring real estate prices along the edge. The aspect of using landscape as a driver is comparable to the landscape urbanist archetype (Corner, 2005. p.25).

Despite the extraordinary synthesis of parkscape and infrastructure by the nineteenth century landscape architects and urban planners, a shift occurred in the 1950s which has effectively reduced urban planning, architecture and landscape architecture to a mere “decorative practice” (Waldheim, 2006, p 27). Corner suggests that after WWII, the “the art of architecture and planning were pushed aside for rapidly shifting demographics, which primarily were, the massive influx of veterans, government foresight of a baby boom, rapacious new infrastructure to meet the demand for automobiles, etc.” (Corner, 2006). Kenneth Frampton has added that as a result of that post-WWII building boom, the architecture and planning

professions have been “whitewashed of [their] former art and prominence” and thus the result is the sprawling megalopolis (Frampton in Cote, 2008).

Corner and Frampton’s views on post-WWII urban planning are in sync with the work of Ian McHarg’s in the 1960s. In *Design with Nature* (1969), McHarg emphasised the importance of ecological planning for the metropolitan region. He asserted that urban growth was unrelated to natural processes and that future regional development should use ecology as a driving force. McHarg: “the basic proposition is that any place is the sum of historical, physical, and biological processes, that these are dynamic, and they constitute social values, that each area has an intrinsic suitability for certain land uses and finally, that certain areas lend themselves to multiple coexisting land uses” (McHarg, 1969, pg. 12). Additionally he has declared that:

Once it has been accepted that the place is a sum of natural processes and that these processes constitute social values, inferences can be drawn regarding utilization to ensure optimum use and enhancement of social values. For example, flat land with good surface and soil drainage is intrinsically the most suitable land for intensive recreation, while areas of diverse topography represent a higher value for passive recreation” (McHarg, 1969, p.13).

McHarg’s work was advanced in the 1980’s by Kenneth Frampton. In *Towards a Critical Regionalism: Six Points for an Architecture of Resistance* (1983), Frampton argued for an “Architecture of Resistance” to “mediate the impact of universal civilization” (Frampton, 1983, p.30). For Frampton, traditional modes of urban planning have been unable to “resist the flattening out of cultures” and the only “plausible instrument is the re-engagement with landscape through megaforms and landforms” (Frampton in Shannon, 2006. p.144). His thesis uses landscape as a medium for city building which is an extension of Peter Rowe’s (1991) theory of using the horizontal plane as a “middle landscape” (Shannon, 2006, p.144). In *Towards an Urban Landscape* (1994), Frampton elucidates the “middle landscape”:

Two salient factors may be derived from Rowe’s thesis: first, that priority should now be accorded to landscape, rather than to freestanding built form, and second, that there is a pressing need to transform certain megalopolitan types such as shopping malls, parking lots and office parks into landscaped built form...The dystopia of the megalopolis is already an irreversible historical fact: it has long since installed a new way of life, not to say a new nature...I would submit that instead we need to conceive of a remedial landscape that is capable of playing a critical and compensatory role in relation to the ongoing, destructive commodification of our man-made world. (Frampton in Shannon, 2006, p.144).

Frampton's approach involves the employment of environmental metrics to the landscape. He has argued that designers should assess resource and waste inputs and outputs on a site at the beginning of a project. In doing so, a list of environmental strategies can be developed and applied during the initial stages of the project. This promotes the creation of "continuous performative surfaces in the horizontal plane" (Hagan in Frampton, 2010, p.461). Once the performative landscape has been established, buildings and infrastructure can be plugged into the landscape so that they become part of an integral system (Frampton, 1994, p.83).

In the late part of the 1990's Frampton's doctrine shifted from McHarg's. In *Megaform as Urban Landscape* (1999), Frampton acknowledged that the spontaneous suburbanization of former agricultural land through "the expansion of autoroute infrastructure" (p.1) has inevitably rendered traditional urban planning methodologies to be ineffective and thus designers are now unable to "project urban form with any degree of confidence" (p.2). As a result, Frampton predicted that the future planning of the urban core will be centred on strategies of landscape remediation and it is in this context in which the "megaform" operates. The term, which was coined by Frampton, refers to "the form-giving potential of certain kinds of horizontal urban fabric capable of effecting some kind of topographic transformation in the megalopolitan landscape" (p.3). Through the careful planning of landscape and built form, the megaform serves as a device for the unification of the existing urban fabric. Frampton illustrated his point by comparing the Centre Pompidou in Paris to Robson Square in Vancouver. The Pompidou, Frampton noted, acts as a *megastructure* rather than a *megaform*, whereas Robson Square is a true megaform in the way in which the layered landscape is coupled with the existing built form of downtown Vancouver. Frampton concludes that this unification was made possible through the "fertile collaboration between its architect, Arthur Erickson, and the landscape architect, Cornelia Oberlander" (p.5).

Frampton defined the megaform through five main characteristics:

1) the form is large and horizontal 2) complex but not defined by structural or mechanical subsets 3) the form must be capable of balancing with its existing context 4) the form is not freestanding, it is an extension of the existing surroundings 5) the form must be oriented towards urban density.

Frampton's theories of megaforms and performative surfaces are found at the heart of landscape urbanism. As the forces of post-industrialization and horizontal suburbanization have fragmented former city centres and produced an overflow of urban waste sites, the proponents of landscape urbanism have evolved Frampton's theories in response. The post-industrial waste sites have shown to be the perfect testing ground for Frampton's theories because of the sheer scale and complex environmental characteristics. Waldheim has noted that the transformation of the rapidly decentralized field cannot be achieved through traditional urban planning strategies because it is too costly and because those strategies are unable to address the current nature of urban growth (Waldheim, 2006, p.37).

Stan Allen also explores the rationale of overlapping ecology and infrastructure. He notes that the shift from the mode of serial fabrication (modernism) to arbitrary superficiality (post-modernism) coincides with a decrease in funding for public infrastructure (Allen, 2005). In *Infrastructural Urbanism*, Stan Allen argues that "while architects are relatively powerless to provoke the changes necessary to generate renewed investment in infrastructure, they *can* begin to redirect their own imaginative and technical efforts toward the questions of infrastructure" (Allen, 2005, p. 174). By redirecting focus from how a building looks, to what it does (via infrastructure or ecology) architects can regain a more prominent role in the city building process. Allen proposes seven propositions in this context:

1. Infrastructure works not so much to propose specific buildings on given sites, but to construct the site itself. Infrastructure prepares the ground for future building and creates the conditions for future events. Its primary modes of operation are: the division, allocation, and construction of surfaces; the provision of surfaces to support future programs; and the establishment of networks for movement, communication, and exchange. Infrastructures medium is geography.
2. Infrastructures are flexible and anticipatory. They work with time and are open to change. By specifying what must be fixed and what is subject to change, they can be precise and indeterminate at the same time. They do not progress toward a predetermined state (as with master planning strategies), but are always evolving within a loose envelope of constraints.
3. Infrastructural work recognizes the collective nature of the city and allows for the participation of multiple authors. Infrastructures give direction to future work in the city not by the establishment of rules or codes (top down), but by fixing points of service, access, and structure (bottom-up). Infrastructure creates a directed field where different architects and designers can contribute, but it sets technical and instrumental limits to their work.
4. Infrastructures accommodate local contingency while maintaining overall continuity. In the design of highways, bridges, canals, or aqueducts, for example, an extensive catalogue of strategies exist to accommodate irregularities in the terrain (doglegs, viaducts, cloverleaves, switchbacks,

etc.), which are creatively employed to accommodate existing conditions while maintaining functional continuity. Nevertheless, infrastructure's default condition is regularity – in the desert, the highways run straight. Infrastructures are above all pragmatic. Because it operates instrumentally, infrastructural design is indifferent to formal debates. Invested neither in (ideal) regularity nor in (disjunctive) irregularity, the designer is free to employ whatever works given any particular condition.

5. Although static in and of themselves, infrastructures organize and manage complex systems of flow, movement, and exchange. Not only do they provide a network of pathways, they also work through systems of locks, gates, and valves – a series of checks that control and regulate flow. It is therefore a mistake to think that infrastructures can in a utopian way enable new freedoms, that there is possibility of a net gain through new networks. What seems crucial is the degree of play designed into the system, slots left unoccupied, space left free for unanticipated development.
6. Infrastructural systems work like artificial ecologies. They manage the flows of energy and resources on a site, and they direct the density and distribution of habitat. They create the conditions necessary to respond to incremental adjustments in resource availability, and modify the status of inhabitation in response to changing environmental conditions.
7. Infrastructures allow detailed design of typical elements or repetitive structures, facilitating an architectural approach to urbanism. Instead of always moving down in scale from general to the specific, infrastructural design begins with the precise delineation of specific architectural elements within specific limits. Unlike other models (planning codes or typological norms, for example) that tend to schematize and regulate architectural form and work by prohibition, the limits to architectural design in infrastructural complexes are technical and instrumental. In infrastructural urbanism, form matters, but more for what it can do than for what it looks like.

Allen's seven propositions make clear the landscape urbanist agenda: to incorporate ecology and infrastructure through a multidisciplinary and flexible approach and to treat the site as an evolving constituent of the urban realm. This becomes quite different from the traditional master planning strategies set forth by most urban planners and architects.

3.0 CASE STUDIES

The projects presented in this section have been included to illustrate the progression of architecture in the landscape urbanism discourse from 1982 to present day. In comparing projects from a range of years, the objective is to distinguish characteristics from each project and subsequently provide a critique on the current state of the discourse through an architectural lens. This chapter is intended as a precursor to the following, in which a design research project is introduced as part of the critique.

3.1 Parc de la Villette - France (1982)

In 1982 a design competition was held for Parc de la Villette, the site of a former slaughter house in Paris. Two of the entries are of relevance in the landscape urbanism discussion: the design proposals by Bernard Tschumi (winning design)(fig. 3.01 & 3.02) and the more publicly celebrated proposal by OMA (Fig.10 & 11). Although the competition occurred fifteen years before landscape urbanism's rise to fruition, the philosophy of each proposal was centered on landscape urbanist strategies of open-endedness and indeterminacy. For both projects, the concept for the site, "part of the work left derelict by shifts in economies of production and consumption" (Corner, 2006), was to become the grounds for "layered, non-hierarchical, flexible and strategic designs" (Corner, 2006).

Fig. 3.01

Fig. 3.02

Tschumi's design was based off of a grid system which incorporated 35 red deconstructivist follies. The follies are intended to act as reference points throughout the park.

The design of the park was also intended to act as a connecting device to the surrounding parts of the city. What was once an area of disconnect has now been transformed into a thoroughfare by means of the parkscape. At the time of inception, the park was criticized for having too much built form and not enough landscape. This criticism has since been reduced though as the landscape has had time to mature. The park has also been criticized by architects and landscape architects alike for its lack of historical relevance due to the arbitrary red structures scattered throughout. The winning proposal by Tschumi is relevant to the landscape urbanist discourse in the way in which the park and the follies have evolved over time. Architecturally speaking the park functions in a landscape urbanist fashion because the follies are interchangeable. What were once empty structures have now evolved into programmed spaces such as restaurants and cafes, shops and so on.

OMA's proposal for Parc de la Villette was arguably more landscape urbanist in nature due to the extensive overlap of program, landscape, open space and circulation. In *Delirious New York*, OMA's Rem Koolhaas notes that he thought of the park as a "social condenser" and that of a "skyscraper in section" (Koolhaas, 1997, p.152). These principles were translated into the park space by means of ever-changing and unprecedented activities. The OMA strategy for Parc de la Villette was to "combine architectural specificity with programmatic indeterminacy" (Koolhaas, 1995, p.921). This was achieved through a series of layers or strips which ran in an east-west direction and contained elements such as thematic gardens play areas, discovery gardens, etc. According to Koolhaas, "this arrangement makes the strips permeable allowing easy program mutation and the dialogue among the strips' play with the depth of the activities" (Koolhaas, 1997, p.152). The site was then divided by circulation and access strips which run in a north-south orientation.

OMA proposed three categories for the allocation of landscape (Marrou, N.D.):

1) Strips of landscape act as program. These include thematic gardens, play prairies, and educational gardens.

2) Planted walls act as the floor slabs of the skyscraper in section. Due to the different heights of the walls, views of the park become framed.

3) Linear and round forests. The linear forest can be thought of as a backdrop or the "natural" forest whereas the round forest is used to provoke consciousness.

In OMA's proposal for the park (see fig. 3.03 & 3.04), the void space is also viewed as an opportunity. Koolhaas: "It claims a kind of erasure from all the oppression, in which architecture plays an important part. Our profession is indoctrinated to never allow indetermination. Every design has hundreds of ideas, an ambition to express something. Great attention is given to the package of the space but not to the space itself" (Koolhaas, 1996, p.63). Thus, the void spaces at the park were used to generate congestion. The open or void bands that the park is ordered around could become the place for a variety of performances (Marrou, N.D.).

Fig. 3.03

Fig. 3.04

3.2 Downsview Park - Toronto (2000)

In 2000 a competition was held for a 320 acre military air base located in Toronto, Ontario. The Downsview Park competition had similar programmatic requests to that of the Parc de la Villette competition held almost two decades prior. One of the significant differences however was the location of the Downsview site. The former military base is located on the periphery of Toronto's urban center, with an abundance of single family war-time homes sitting adjacent to the site. The park was to be the Government of Canada's first national urban park which would also harmonize with a widespread system of national wilderness parks (Czerniak, 2002). Many of the submissions for the competition were similar in nature to the submissions for the Parc de la Villette competition and several of the competitors were also the same. Most teams recognized the importance of a space-time aspect in order to provide the most versatility for the site. Two projects in particular are worth mentioning here with regards to landscape urbanism, that of James Corner and Stan Allen and the winning proposal by Rem Koolhaas and OMA.

Corner and Allen's proposal *Emergent Ecologies* (Fig.3.05,3.06,3.07,3.08) was structured around the “apparent dichotomies of specificity vs. open endedness and human activities vs. natural systems” and subsequently resolved through the “deployment of a precise series of forms and pathways that will each support the emergence of self-organizing flows and behaviours in time” (pg. 34). They also note that “geometry and form is less important for what it might mean or look like than what it actually does” (Czerniak, 2002). The project does not necessarily propose a final solution for the site, but instead a “carefully gauged framework – a matrix of interacting systems - that is both integrative and flexible” (Czerniak, 2002).

The winning submission by Rem Koolhaas and OMA titled *Tree City* (Fig.3.09, 3.10) had paralleled ambitions to Corner and Allen's proposal. The project aimed to use “trees rather than buildings [that would] serve as the catalyst of urbanization” (pg. 45). An additional goal of the project was to “do more by building less, producing density with natural permeability, property development with perennial enrichment” (pg. 46).

The submissions by OMA and Corner/Allen indicate a desire to use landscape as a medium for future growth. They also reveal an aspiration to allow a site to develop over time rather than proposing a fixed and final vision for the project.

Fig. 3.05

Fig. 3.06

Fig. 3.07

Fig. 3.08

Fig. 3.09

Fig. 3.10

3.3 Fresh Kills Landfill – Staten Island (2006)

The Fresh Kills landfill, located in Staten Island in New York, operated as the world's largest landfill site from 1948 until it was closed in 2001. Over 2000 acres in size, the site contains a number of tidal wetlands and wildlife habitats. Because of these features, the state of New York vowed to transform the site into a place of recreation and leisure activities. From the executive statement: "We hope that Fresh Kills Park, with its unprecedented size, metropolitan context, and challenging but rich opportunities for end-use development, will serve as a model for land reclamation projects around the world" (Fresh Kills, 2006). Through the reclamation of the landscape, the state hopes to convert the unoccupied site to a major tourist destination and a place of cultural activity (see fig. 3.11, 3.12, 3.13, 3.14).

Field Operations, the landscape based design firm commissioned to the project, used the term "Landscape" as a design methodology. Landscape is an ecological process of "environmental reclamation and renewal on a vast scale, recovering not only the health and biodiversity of ecosystems across the site, but also the spirit and imagination of people who will use the new park" (Fresh Kills, 2006). The promise of Landscape is an overlap of ecological and socioeconomic processes. It includes "cultivation of new ecologies over time" and time—ecologies of soil, air and water; of vegetation and wildlife; of program and human activity; of financing, stewardship and adaptive management; of environmental technology, renewable energy and education; and of new forms of interaction among people, nature, technology and the passage of time" (Fresh Kills, 2006).

Fig. 3.11

Fig. 3.12

Fresh Kills is intended to be developed in phases and proposes to become a self-sustaining ecosystem. The park will include over 40 miles of walking, running, equestrian and bike paths. It will also improve local connectivity via new park drives and access points. A unique facet of the park's evolution is that the community will be directly involved with the process. A comprehensive vehicular circulation plan has also been designed for the site. Where parking lots are required, Field Operations proposed strategies such as permeable surfaces in order to collect water and cleanse it.

The proposal for Fresh Kills is best described in section due to its vast layering scheme. On the surface the park functions as any other. New program, circulation and habitats are intertwined as a unified whole. Below grade the park has a network of systems which are related to the landfill. Under the soil there are elements such as an impermeable liner, gas extraction network, liquid collection and containment, and over 150 million tons of waste. This network, which will be under constant monitoring, is designed to ensure that the site is safe for public use and wildlife.

Fig. 3.13

Fig. 3.14

3.4 High Line – New York (2006)

In the 1930's the city of New York built the High Line in order to remove dangerous freight trains from the pedestrian realm. As part of a public-private infrastructure project, train tracks were raised 30 feet above the city grid. The High Line remained inoperable from the 1980's until 2002, when it gained renewed interest from the public. In 2005 the train infrastructure was donated to the city by CSX Transportation Inc. with hopes for revival (Highline, N.D.). In 2003 an open ideas competition titled "Designing the High Line" was held. From the 720 proposals a design team was selected for the High Line. Landscape architects Field Operations and architects Diller Scofidio + Renfro were commissioned to give the High Line a new purpose. The team proposed that the High Line be converted into a trail which would have unique architectural integrity and it would also function as an ecological corridor (Highline, N.D.) (see fig.3.15, 3.16).

Fig. 3.15

Fig. 3.16

In 2006 construction was underway for the first phase of the High Line project. The train tracks were removed and stored so that they could be reinstalled as part of the park's landscape. By 2009 the High Line was open for public use. It has since gained widespread interest due to the unique quality of public space. Residents and visitors alike are able to access the High Line from various points throughout the city from which they are given the opportunity to populate the variety of hard and softscapes along the former rail line. The High Line is exemplary of a post-industrial transformation (see fig. 3.17, 3.18).

Fig. 3.17

Fig. 3.18

3.5 Lower Don Lands –Toronto (2007)

Toronto's Lower Don Lands, which is situated at the mouth of the Don River and connects to Lake Ontario, is a 125 hectare post-industrial drosscape (see fig. 3.19). As Toronto is one of the fastest growing metropolitan areas in North America (Mayor's Statistics, 2006) the Lower Don Lands has the potential to become a prime piece of real estate. The site, however, has been plagued by decades of contamination. Lister: "suffering from oxygen depletion, high turbidity, poor flow, and seasonal contamination by sewage effluent, the river is effectively stagnant, polluted, and choked with debris. As such, the Don is characteristic of many post-industrial waterfront sites: derelict and forgotten as the armature of the city has all but subsumed it" (2006, p. 541).

Fig. 3.19

In 2007, Waterfront Toronto held an international competition to find innovative schemes for the Lower Don Lands. The competition brief called for innovative strategies that merged nature and built form into a “green, integrated and sustainable community” (Waterfront Toronto, N.D.). The brief requested that the competition entries include the following:

- Naturalize the mouth of the Don River
- Create a continuous riverfront park system
- Provide for harmonious new development
- Connect waterfront neighbourhoods
- Prioritize public transit
- Develop a gateway into the Port Lands
- Humanize existing infrastructure
- Enhance the Martin Goodman Trail
- Expand opportunities for interaction with the water
- Promote sustainable development

While the proposal by Michael Van Valkenburgh Associates ultimately won the competition because of the “cost effective and achievable” design (Design Observer, 2008, p.18), the scheme pitched by Stoss Landscape Urbanism has been celebrated for its “radical and bold exploration of the creative tension between ‘nature’ and ‘culture’ in the urban condition” (Lister, 2010, p.541). The Stoss proposal titled, *River + City + Life*, was a twofold scheme that simultaneously incorporated the reengineering of the Don River floodplain with the creation of a new urban edge (see fig.3.20, 3.21). Lister describes the Stoss scheme as:

Effectively [proposing] a new set of integrated cultural and natural ecologies for the site, organized principally by the river and its own self-organizing hydrology. The engagement of a complex ecological system, social-cultural, and economic system rests squarely on ‘putting the river first’, reversing the convention of the last century and a half. In hinging the design on ‘renewal’ rather than ‘restoration’, the Stoss team made explicit and central the bold (but essential) notions of adaptation to occasional flooding, mediation between ‘natural’ and ‘alien’ species, and a thick layering of habitats and ecotones – some cultural, others natural; some seasonal and others permanent (2010, p.542).

The *River + City + Life* proposal reveals the possibilities embedded in the post-industrial urban landscapes. This scheme illustrates that post-industrial cities can use these landscapes as a means of ecological remediation /renewal, and they can also be used as the grounds for future urban growth .

Fig. 3.20

Fig. 3.21

3,6 Evergreen Brickworks – Toronto (2008)

Also located in Toronto, the Evergreen Brickworks is a former quarry site that was filled in and subsequently transformed into 28-acre wetland in the 1990s (see fig. 3.22, 3.23). Soil from the excavation of the Scotia Plaza in the downtown core of the city was used to create wetlands throughout the site. 12 acres of historical buildings also occupy the site (see fig. 3.24, 3.25). Currently, most of the buildings remain vacant; however they will also be transformed over time by the Evergreen charity group. An extensive design team of architects, landscape architects, archaeologists, environmental engineers, flood protection specialists, transportation consultants, and civil engineers have been assembled in an attempt to properly manage the complexities of the site. Evergreen has raised over thirty million dollars in an attempt to revitalize the industrial buildings and remediate the landscape (Lister, 2010, p.542). The

The ultimate goal for this urban waste site is to “deepen the connection between people and nature by bringing nature, culture, and community together in the city” (see fig. 3.26, 3.27). Additionally, the master plan contains an environmental discovery centre which will integrate cultural and natural heritage, and ecological and social services (Evergreen in Lister, 2010, p.543). The plan incorporates a wide array of program typologies: plant nurseries, farmers’ markets, restaurants, event spaces, children’s camps, are all housed within “green” buildings on the site.

Lister adds that the Brick Works is unique from other landscape urbanism projects because the main agenda for the site has not solely been placed on restoration. Rather, Evergreen’s intent is to create a relationship between nature and culture through the merger of multiple ecological systems and an urban landscape (2010, p.543). The Brick Works site has become the grounds for cohabitation as many different types of species are now found onsite.

Fig. 3.22

Fig. 3.23

Fig. 3.24

Fig. 3.25

Fig. 3.26

Fig. 3.27

3.7 Growing Water – Chicago (2009)

The Growing Water proposal by architects Sarah Dunn and Martin Felsen is a response to a report that revealed that two out of every three people in the United States will be facing water shortages by 2025 (InformeDesign, 2005). Using the city of Chicago as their testing bed, the architects devised a scheme that introduced a new and productive boulevard typology throughout the city as opposed to the conventional tree-lined boulevards that one may find throughout historical urban centres (see fig. 3.28, 3.29, 3.30, 3.31). Chicagoans have been routinely flushing more than one billion gallons of fresh water (extracted from Lake Michigan) each day (InformeDesign, 2005). This coupled with the fact that most of the flushed water doesn't return to Lake Michigan, became the motivation for the *Eco-boulevard* concept by Dunn and Felsen. The role of the eco-boulevard is two-fold. First it acts as new public green space. Roads and sidewalks, or “grey infrastructure”, will be transformed to create lush “fingers” throughout the city. Simultaneously, the green strips will be used as a filtering device, which will clean and redirect water back into Lake Michigan. This will be accomplished through parks, wetlands, preserves, bio-conduits, and native landscapes. The designers conclude that the “green-infrastructure fosters community engagement by seeking participation of residents in the conceptualization, learning, design, planting, and upkeep of greenways. The ultimate goal of green-infrastructure Eco-Boulevards is to radically improve Chicago's environmental health, and the overall well-being of the Great Lakes ecosystem (InformeDesign, 2005).

Fig. 3.28

Fig. 3.29

Fig. 3.30

Fig. 3.31

4.0 Landscape Urbanism Evolved

The term *landscape* has recently been given new life in the offices of urban planners, architects and landscape architects. In providing the case studies throughout this thesis, the aim was to show the evolution of the landscape urbanism discourse and the evolution of architecture within this discourse. Additionally, a goal was set to estimate the longevity of landscape urbanism and to acknowledge how this discourse will become a stepping stone in the evolution of urban planning theory. As other urbanisms have fallen short through the test of time for a variety of reasons, it is important to look critically at the current forms of urban planning to determine their relevance in terms of the realities of rapid horizontal growth and ecological responsibility. In doing so, one can also determine whether or not the most recent urbanisms will fall short as well.

Early in landscape urbanism's infancy, Waldheim claimed that landscape will "replace architecture as the basic building block of contemporary urbanism" (2006, urbanism case studies. For example, the Brick Works in Toronto has used the remediated landscape to promote the reuse of the existing warehouses on the site.

p.11). As time has passed, however, it has become apparent that landscape *and* architecture will be the quintessential building blocks for the contemporary city. In comparing the case studies in the last chapter, the position of landscape in city planning has certainly evolved. Consider the role of the landscape at Parc de la Villette. While some built form does exist throughout the landscape (the red follies), the Parisian post-industrial site is still largely a grand park design. The site acts as a void space with existing urban density occurring at the periphery. Now consider the relationship between built form and landscape at the Highline project in Manhattan. No buildings exist within the Highline itself; however the transformation of the landscape has played part in the new built development that has occurred at the edge of the Highline. In this sense, landscape has been used as an attractor for city growth. This use of landscape as a magnet for urban development can be witnessed across the majority of the more recent landscape

Similarly, Stoss' proposal for the Lower Don Lands in Toronto, and the Ecoboulevards proposal by Dunn and

Felsen, indicate the potential for landscape and built form to mutually contribute to a sustainable urban realm. As it has become clear that Waldheim's theories of landscape are now dated, the focus shifts back towards the incorporation of built form into urban development. What has become of the landscape urbanism discourse in this context?

Recently, the absence of built form within the landscape urbanism discourse has been exploited by practitioners and theorists alike (Cote, 2008 & Duany, 2010). As a result, the adjectival modifier *landscape* has been superseded by the term *ecological*. Thus, an Ecological Urbanism has emerged in the next frontier. In *Topos 71: Landscape Urbanism* (2010), this evolution from the term landscape to ecology has been addressed by Waldheim. He notes that there is an "ongoing need for re-qualifying urban design as it attempts to describe the environmental, economic, and social conditions of the contemporary city" (2010, p.21). Additionally, Waldheim acknowledges that, "...we need to continually redefine the disciplinary boundaries that still persist in urban planning. While no one modifier completely captures the potential, the root of cross-disciplinary study does continue to drive all of the more compelling ideologies, including ecological and landscape urbanism, as they become a more holistic response to the increasingly complete inter- and multi-disciplinary context of professional practice" (2010,p.22).

In this transition from one form of urbanism to the next, it is important to retain some of the ideologies of each discourse. In *A General Theory of Sustainable Urbanism*, Andres Duany, the figurehead for New Urbanism, compared and contrasted the differing urban theories that have evolved over the last two decades. In the opening paragraphs, Duany links the need for a new type of urbanism to the environmental degradation that has ensued as a result of poor city planning. This recognition parallels the ecological importance presented under the landscape urbanism dogma, however, Duany goes a step further to provide a comparative analysis of the recent urbanism typologies in order to project the future of urban planning. His analysis of the more recent sustainable urbanism "contenders" can begin to inform us of the future of city planning.

Duany explores the similarities and differences between four of the most recent and sustainable urbanism theories: Old Urbanism, New Urbanism, Landscape Urbanism, and Sustainable Urbanism. In comparing the four, his objective in this is to eliminate the confusion that remains between these paradigms (Duany, 2010, p.406).

Old Urbanism, according to Duany, has been “in resurgence as more people notice that living densely, walking, and taking transit is an environmentally responsible lifestyle. The word is that a Manhattanite has half of the ecological footprint of the average American (2010, p. 407). Duany points out that the notion of an Old Urbanism is not appropriate for our cities today because it is:

Technically at odds with current environmental standards. The Manhattan that we know is an unattainable ideal that could not be built today for a multitude of reasons – the first being the hundreds of streams buried in pipes that its urban pattern requires. While it is an environmental success in its secondary consequences, it is an environmental disaster in its technical premises. The Old Urbanism values nature not at all – and those days are over (2010, p. 407)

Subsequently, Duany reflects that New Urbanism is a more promising discourse in comparison to Old Urbanism for a number of reasons. The first being that “...in the past, cities used to compete with other cities on a level playing field, but today, cities compete with their own suburbs – which have a greater range of typological resources”. Additionally, he concludes that New Urbanism “mitigates the enormous physical impact of the car, but does not eliminate it” and that “...its predicament as a hybrid is that it is capable of combining the best as well as the worst aspects of both city and suburb” (2010, p407). Duany’s integration of vehicular transportation and suburban growth is critical due to the nature of our rapidly expanding cities. As cities continue to push horizontally, it is unrealistic to assume that the use of the motor vehicle will subside. It is also unrealistic to theorize cities without the suburban constituent as Old Urbanism was able to.

Duany regards Landscape Urbanism as being comparable to New Urbanism in the sense that it is a merger of old and new ideals. While New Urbanism hybridizes the characteristics of Old Urbanism and suburbia, Landscape Urbanism operates under a combination of garden design and city planning. For Duany, “Landscape Urbanism cannot avoid the ruralisation of even high-density schemes (the other side of New Urbanism’s urbanizing of low density)” (2010, p.407). Additionally, Duany concludes that “an urban paradigm cannot be based on the implantation of natural vignettes in the residual places between buildings” and “Landscape Urbanism is too adept at being compromised by providing a green camouflage for the so-called unprecedented typologies of big-box retailers and junkspace office parks” (2010, p.408).

In comparing the inefficiencies of Old Urbanism, New Urbanism and Landscape Urbanism, Duany proposes that a Sustainable Urbanism will address the needs of the 21st century cities, while acting in an environmentally sound way. His theory for a Sustainable Urbanism can be seen as an evolution of his former theories for New Urbanism. Centred on the Rural-to-Urban Transect concept, Sustainable Urbanism begins to address a variety of conditions that exist in metropolitan regions throughout the world. Duany:

The transect is an environmental theory based on geography that ranges from wilderness to urban core. By integrating environmental methodology for habitat management with zoning methodology for urban design, the Transect breaks down the customary specialized assessment, enabling environmentalists to consider the design of cultural habitats, and urbanists to protect the natural ones (2010, p.408)

While the Rural-to-Urban transect may appear vague, Duany has offered an equation which can be applied to the transect to appreciate the success of such a concept. The General Theory of Sustainable Urbanism measures “the aggregate density of the social and natural diversity after urbanization [and] must be approximately equal to or greater than the density of the natural diversity prior to urbanization” (Duany, 2010, p.410). The equation is structured in this way:

$$N: \Sigma [Ds+Dn]_{\text{post}} \approx > N:[DN]_{\text{pre}}$$

Where:

N = a constant number

Ds = the diverse socioeconomic activities per unit of land, after urbanization

Dn = the diverse natural habitats per unit of land, after urbanization

DN = the diverse natural habitats per unit of land before urbanization.

Subsequently, Duany applied the General Theory of Sustainable Urbanism equation to the Old Urbanism, New Urbanism, and Landscape Urbanism theories in an attempt to evaluate their level of sustainability. The results can be compared in the graph below (see fig. 4.01).

Fig. 4.01

Duany's chart illustrates that the most recent urban planning typologies have been imbalanced with regards to built form and ecology. For example, the graph shows that Old Urbanism favoured social diversity, whereas Landscape Urbanism "has the worst performance" due to the fact that there is an "absolute privileging of natural diversity". For Duany, this fact reveals a "serious conceptual flaw" for that paradigm (2010, p.410). While New Urbanism and Sustainable Urbanism are relatively comparable, Duany notes that Sustainable Urbanism has levelled out some of the flaws that New Urbanism previously encompassed. In calculating the social and ecological diversity of the latest forms of urban planning, Duany has effectively established a middle ground between the extremes presented in Landscape Urbanism and Old Urbanism. This reveals that under the Sustainable Urbanism discourse, cities can have *both* urban vibrancy and a diverse ecosystem.

While Duany has devised a methodology for integrating built form and landscape equally into the urban environment, he has not suggested a strategy for an ecologically integrative architecture. Rather than just defining *where* architecture should exist within the Rural-to-Urban transect, we can begin to imagine *how* architecture can operate within this context.

The Barcelona Urban Ecology Agency, a public consortium that employs forty professionals from all disciplines, has experimented with new types of architecture within the urban realm that seem suitable for Duany's vision of a Sustainable Urbanism. Their work is centred on the notion of a three-level design strategy (see fig. 4.02). In their essay, *A Holistic View of the Urban Phenomenon*, the Agency explains that:

Conventional urban planning works on a two-dimensional at ground level. This does not resolve the challenges that the city must face in the information age. Instead, new urban planning projects operate on three levels (underground, ground, and upper level), with the same detail and at the same scale that currently applies to the ground level (B.U.E.A., 2010, p.364).

According to the Agency, the three-level design methodology "enables a set of interventions that represent decisive steps in the path toward sustainability" (B.U.E.A., 2010, p.364). These are:

- Biodiversity: A biodiversity layer at the upper level (green roofs) can connect to a layer below (trees and other urban greenery), restoring in part the biological capacity that the city has lost with buildings' pre-eminence.
- Urban Metabolism: The integration of metabolic flows, minimizing consumption and its impact on buildings and public space, allows for the capture and storage of rainwater. It also makes

possible sun, wind, and geothermal energy collection, and the installation of devices that act as passive systems for energy efficiency. The recycling of materials and the hierarchy of waste management (reduce, reuse, recycle) should be taken into account in the development of an urban area, its functioning, and eventually its deconstruction.

- Services and logistics: Underground planning includes the construction of accommodation for water and gas pipes, electricity, telecommunications, and platforms for merchandise distribution
- Mobility and functionality: Implementing a network for every modality of transport and promoting public mass-transit networks in the underground and ground level minimizes friction among transport modalities.
- Public space: the multiplication of the uses and functions of public space on the ground level lets people once again feel that they own the city and raises their status from pedestrians to citizens. To achieve this goal, some areas committed to parking and traffic must be liberated from these uses, without disturbing the functionality of the urban system.
- Urban complexity and the knowledge society: Three-level urban planning aligns with a compact, complex, efficient, and socially cohesive city model, as it makes possible greater proximity between uses and functions. At the same time it encourages mixture, multiplying organizational complexity. The information and knowledge society is articulated primarily within the framework of urban complexity.

Fig. 4.02

Although the experiments conducted by the Barcelona Urban Ecology Agency are mainly theoretical at this point in time, their theories can be witnessed in practice as Living Buildings have begun to surface. In 2009, the US Green Building Council and the Canada Green Building Council proposed a Living Building Challenge. Since this time, more than one hundred projects have been registered under this challenge. One project in particular should be shown here to illustrate the possibility of a three-level planning strategy.

The Omega Centre for Sustainable Living, located in Rhinebeck, New York, is an exemplar three-level design case study. The project is situated on a site that was formerly used for industry and thus plagued by years of contamination. The site has been transformed both above and below grade in such a way that built form and the landscape operates in unison as a productive whole (see fig. 4.03, 4.04, 4.05, 4.06). While the building serves to function as an educational tool for ecology, it also functions as a waste water filtration facility that is capable of transforming grey water into fresh drinking water. This is possible through the introduction of a “living machine”. Potable water is collected on site via private wells. Once this water has been used by bathroom lavatories, drinking fountains, janitorial sinks and wash sinks, it is sent to the living machine. From there, the water is cleaned by way of extensive plantings and then returned to a wetland which sits adjacent the building. Through the form of the building, rain water can also be captured and collected in underground cisterns and then cleaned by the living machine. The wetland has become a place for public gathering and ecological growth. In this sense, there is a deep relationship between built form, landscape and ecology. While the building’s main function is a water filtration facility, it is also an energy producer. Located on the roof and the walls of the building, a number of solar panels enable the building to operate without the need of grid energy. It produces a surplus of energy, which is housed in the electrical room until it is needed.

Fig. 4.03

Fig. 4.04

Fig. 4.05

Fig. 4.06

By analyzing the work of the Barcelona Urban Ecology Agency and the Omega Centre for Sustainable Living, we can begin to envision a new form of architecture that coincides with Duany's Sustainable Urbanism theory.

5.0 Design Project:

A Campus for Sustainable Energy Systems

This chapter is intended as a synthesis of the entirety of research encountered throughout the thesis project. The objective is to identify a post-industrial drosscape and subsequently use it as a testing ground to theorize the role of architecture within the Landscape Urbanism discourse. As cities continue to deindustrialize throughout the world, design exercises such as this one can be viewed as being universally applicable. While post-industrial landscapes are complex in nature, they are also very similar to one another in the sense that they are often located within or adjacent to an urban core, and they are also typically the product of horizontal urbanization.

The main goal of this thesis was to illustrate the incomplete nature of the Landscape Urbanism discourse, and subsequently theorize a new mode of urbanism for the post-industrial waste land. With this in mind, the design project will also attempt to reflect this. Landscape Urbanism theories will be overlaid to a selected site, from which it will be acknowledged if the strategies provided under the discourse are capable of transforming a complex post-industrial site into an integrated urban constituent. From

there, the site will be analyzed through Duany's Sustainable Urbanism theory. As Sustainable Urbanism has shown to omit the character of architecture present under this discourse, an effort will be made to continue that dialogue.

The city of Windsor, Ontario will be the city of focus of this chapter. As Windsor portrays all of the classic symptoms of a post-industrial city, it seems rational to perform this exercise here. The intent is not to provide a master plan strategy, as the modernist planners may have done, but rather to present a number of vignettes that will illustrate the potential for architecture within a Landscape Urbanism and Sustainable Urbanism context. The first section of the chapter will provide a brief history of the city so that its current state can be understood. The following section will present the main design project. This section can be regarded as a direct response to the historical evolution of the city.

Once the design possibilities have been explored in this chapter, the final chapter will be used as a projection for the future of urban planning and architecture.

5.1 Background: Deindustrialization in the City of Windsor

Since the early part of the twentieth century, Ontario has been a powerhouse in manufacturing. The stretch along the eastern edge of the Golden Horseshoe towards Windsor, Ontario is home to more than fifty percent of Canada's manufacturing and an even higher percentage of heavy manufacturing is estimated in this area. Several industries operate in this stretch, including steel, chemical, and electronic manufacturing. The most economically prosperous in the region, however, has been the automotive industry (Laxer, 2009). The close proximity and physical connection to the United States has enabled Southwestern Ontario to have a direct linkage to the manufacturing that occurs in cities such as Detroit, Michigan and other parts of the American Midwest.

The creation of the Canada-U.S. Auto-Pact Agreement of 1965 permitted automobiles as well as smaller automotive components to be regularly shipped, free of duty, across the Canada-U.S. border. The most noteworthy point of Canada-U.S. automotive trade became the Windsor-Detroit border crossing as a result of the pact (Laxer, 2009). Since the time of the Auto-Pact Agreement, the Ambassador Bridge as well as the Detroit-Windsor Tunnel have become the most important trade points between Canada and the United States (see figs. 5.01 & 5.02). A border crossing study produced in 2004 showed that 150,000 jobs in the area and thirteen billion dollars in annual production depend on the Windsor-Detroit border crossings. The study also showed that it is the busiest international border crossing in North America relating to trade and that more than twenty five percent of all merchandise trade in North America crosses the Ambassador Bridge (D.R.C.,2006).

Fig. 5.01

Fig. 5.02

Throughout most of the 20th century, the automotive industry in Southwestern Ontario was thriving. By the 1990's, however, the industry started to decline. In 2009, Economist James Laxer noted that the decline has been a result of “a new series of basic problems that have set the stage for the future”. According to Laxer, two main issues have developed simultaneously and have greatly affected automotive production in Canada: the rise in the Canadian dollar versus that of the U.S. dollar, and the exponential increase in the price of gasoline (Laxer, 2009). During 2007 the value of the Canadian dollar surpassed the U.S., which subsequently made labour prices higher in Canada in comparison to the U.S. This coupled by the rise in the price of gasoline provided for an exceptionally reduced demand for new vehicles. These two problems were then followed by the economic recession of 2008, which in turn provided an additional blow to the automotive manufacturing sector in Canada.

The reduced vehicle production in Canada and Southwestern Ontario has impacted a great number of cities that are linked to the industry. Economically, the city of Windsor has been hit the hardest. Windsor - once referred to as the automotive capital of Canada -has transformed into an archetypal post-industrial city. The decentralized automotive production coupled with the continuous horizontal suburban growth in the area has fragmented the urban fabric. At one time, the city was relatively dense throughout the urban core. Now, multitudes of waste landscapes exist throughout the city. Figures 5.03, 5.04, 5.05 illustrate the city's progression from a relatively vertically dense city, to the horizontal opposite. These landscapes have continuously appeared over the last two decades. Subsequently, the neighbourhoods adjacent to these sites have become divided by them.

Fig. 5.03

Fig. 5.04

Fig. 5.05

As Windsor has been transitioning from a Fordist to Post-Fordist city, the Big 3 (Ford, GM, Chrysler) have abandoned many of their assembly plants throughout the urban core. The former automotive facilities occupy expansive landscapes. Moreover, the small scale parts suppliers, which are often in close proximity to the vast automotive sites, have also ended production as well. Thus, a series of large and small voids are scattered across the region (see fig. 5.06).

Fig. 5.06

Despite the fact that the automotive plant closures have fragmented the city's terrain, a unique opportunity for remediation is afforded under this circumstance. While Windsor has been continuously characterized for its contribution to environmental degradation (City of Windsor, N.D.), the remediation of these contaminated landscapes can't come soon enough. What if these sites were transformed to become new sustainable neighbourhoods? How could a city such as Windsor go about this transformation? One can begin to imagine how the theories presented by Charles Waldheim or Andres Duany could be applied here. Thus, the exploration of the automotive drosscapes throughout the city of Windsor will be the first step in this design exercise. As Windsor contains so many of these sites, which one(s) are best suited within the context of this thesis?

The map below (fig. 5.07) shows a number of abandoned automotive facilities throughout the city (outlined in red). The yellow box illustrates the location of the city centre.

Fig. 5.07

Site A is the former Ford Engine Plant. Site B and C are former Chrysler plants. Site D contains two plants: a semi-operational Ford Plant and an abandoned GM Transmission Plant. While each site shown above is relatively similar to the next in terms of scale and proximity to single family housing, site D is of particular interest due to its proximity to the urban core and the Detroit River.

Windsor's urban centre has been scrutinized for the last several years for its lack of cultural amenities. While most city centres provide an array of activities for their citizens, downtown Windsor is distinct in that it has an excessive concentration of adult entertainment and alcohol related facilities. This has deterred the citizens from venturing into this part of the city. While most citizens avoid the downtown core, the riverfront is still a common ground for Windsorites. The lush riverfront occupies over 6km of land and terminates at the Hiram Walker whiskey distillery which is located at the bottom of site D. Although the riverfront is enjoyed by many, the river itself has been plagued by years of contamination.

Site D is also unique from the others in that there is a distinct divide between the two adjoining neighbourhoods. The Walkerville and Drouillard communities were once the most thriving neighbourhoods in Windsor. The decline in automotive production has had an incredible impact on this part of the city. While Walkerville has maintained some of its prestigious characteristics, Drouillard has continuously declined.

The map below (fig. 5.08) shows Site D's relationship to the riverfront (see fig. 5.09), as well as the Hiram Walker distillery buildings. The distillery buildings currently create a break in the riverfront. Given the ecological and socio-cultural characteristics for this part of the city, it becomes evident that this part of the city could benefit immensely from a landscape urbanism intervention. But can the problems that exist in this part of Windsor be reconciled through landscape urbanism strategies alone? Before addressing this question, a brief background of the Walkerville and Drouillard neighbourhoods will be provided in order to justify the intervention.

Fig. 5.08

Fig. 5.09

5.2 The Walker Road Divide

Fig. 5.10: The red box indicates the Walkerville neighbourhood. The blue box indicates the Drouillard neighbourhood. The white box indicates the city centre. Located between Walkerville and Drouillard sits a massive drosscape which formerly contained a GM manufacturing facility.

Fig. 5.11: Walkerville neighbourhood. Arguably one of the most thriving neighbourhoods in Windsor.

Fig. 5.12: Drouillard neighbourhood. The majority of crime occurs in this part of the city.

Fig. 5.13-Fig. 5.14: The contrast between the Walkerville (left) neighbourhood and the Drouillard (right) neighbourhood can most likely be linked to the defunct landscape which divides them.

The Walkerville and Drouillard communities were not always in such an imbalanced state. At the beginning of the 20th century, both communities thrived due to the economic activity associated with the automotive industry. Most of the automotive executives resided in Walkerville, while the labourers lived in the Drouillard area. As the automotive industry halted production, Walkerville has managed to maintain some of its original character while Drouillard has not. (see fig. 5.15 & 5.16)

Fig. 5.15 & 5.16: The decline in automotive production has created stark differences between two adjoining neighbourhoods.

The area to the west of Walker Road (Walkerville), contains some of the city's most expensive homes (see fig. 5.17), is known for its lush boulevards and is also a relatively walkable district. To the east of Walker Road is the Drouillard neighbourhood, which is currently one of the highest crime areas in the city. What is most interesting about these two regions is their history.

The Walkerville district developed in the early 20th century. The name Walkerville was derived from Hiram Walker, who began producing Canadian Club whiskey at the turn of the century. Many of Walker's facilities were designed by the well known architect Albert Kahn and are located along the river's edge. The citizens who resided in this area worked for Hiram Walker and were well paid.

Fig. 5.17

The Drouillard district is a polar opposite to that of the Walkerville neighbourhood. In Walkerville there are a multitude of old stone mansions, tree lined streets, and shops. Many of the homes are unique from the next, which is one of the fundamental aspects for home buyers in this area. Drouillard, on the other hand, contains a series of dilapidated structures, a lack of foliage, and abundance of adult entertainment facilities. The area was once known as Windsor's

downtown and was appropriately named “Ford City”. The Drouillard district was formerly home to some of the city’s most architecturally renowned churches (see fig. 5.18, 5.19) and was considered the most prosperous part of the city.

Our Lady of Rosary, 1908
2879 Riverside Dr. E. / Drouillard Rd.

Fig. 5.18

Holy Trinity, 1947
1420 Drouillard Rd.

Fig. 5.19

Although Ford City was once a thriving part of the city of Windsor, its prosperity lasted less than a quarter of a century (Price, 1992). Now all that remains of Ford City is a series of murals depicting the areas past, most of which are painted on the sides of the defunct structures that the district is so well known for (see fig. 5.20, 5.21). The Drouillard neighbourhood is in desperate need of a rebirth for two reasons. Firstly, because Drouillard is the first impression given to outsiders entering the city by train. Secondly, because of the areas strong sense of disconnect from the rest of the city.

Fig. 5.20

Fig. 5.21

The diagram below shows the effect that the automotive drosscape has had on the adjacent community (fig. 5.22).

Fig. 5.22

5.3 Site Analysis

Fig. 5.23 - Existing Figure Ground

Fig. 5.24 - Dilapidated Buildings

Fig. 5.25 - Existing Historical Buildings

Fig. 5.26 - Existing Industrial Buildings

Fig. 5.27 - Misc. Buildings

Fig. 5.28 - Residential Buildings

Fig. 5.29 - Retail Buildings

Fig. 5.30 - Existing Paved Surfaces

Fig. 5.31 - Existing Green Space

Fig. 5.32 - Existing Vehicular Circulation

The site analysis illustrates the level of discontinuity that exists due to the drosscape situated between the Walkerville and Drouillard neighbourhoods. This disconnect occurs on a number of levels. First, vehicular transportation across the site is extremely limited. There are currently only two thoroughfares that cross the site. The limited number of roads becomes apparent when compared to the block sizes on either side of the site. Second, the site creates a break in green space for the two neighbourhoods as well as the riverfront. This break in green space has occurred as a result of the excessive amount of impermeable surface which occupies the former automotive landscape. Third, there are limited occupied buildings along the entire landscape. In comparing historical maps to current ones, this part of the city used to have a low vacancy rate. However, as the automotive industry has ended production, many of these buildings (mainly commercial and residential) have become vacant. Some of the abandoned buildings are still in good shape and could be adaptively reused. Others would most likely need to be torn due to their dilapidated state.

The site analysis on the previous pages has shown how a drosscape can divide neighbourhoods within a city. How can these sites be repurposed and reintroduced to the urban realm? Can they be salvaged by new industries?

Although the automotive industry in Windsor has been in dire straits for years, the industrial base has recently shifted. Sustainable energy systems such as wind turbines and solar panels are now being manufactured in the old automotive facilities. Recent news reports have indicated that the city of Windsor intends to rebrand itself as the “energy manufacturing hub of Ontario” (Windsor Star, 2010). Simultaneously, the University of Windsor is expanding as the city has recognized the importance of the education. This will become the point of departure for the design project. Specifically, a campus for Sustainable Energy Systems will be designed on the former automotive drosscape. The goal is to use landscape urbanism as a tool for site design, while also being able to retrofit existing industrial buildings for new use.

Figure 5.33 – The automotive industry is no longer the main economic driver

Figure 5.34 – 5.36 – The new industrial base is now sustainable energy systems and education

The case studies presented in the previous chapters have shown that landscape urbanism values ecology and infrastructure as the basis for urban design. With this in mind, a series of ecological and infrastructural strands become the conceptual driver for the organization of the campus (see fig. 5.37)

Figure 5.37 – Ecological and infrastructural strands

At the heart of the campus, the ecological and infrastructural strands can be pushed and pulled to define places for parking, recreation, the location of built form, etc (see fig. 5.38).

Figure 5.38 – Ecology/Infrastructure strands splayed to create unique spaces at campus

At the riverfront, the strands can be used in the same sense as at the campus zone, but also for new programs such as outdoor pools, solar fields, bioremediation ponds, etc (see fig. 5.39)

Figure 5.39 – Ecology/Infrastructure strands splayed to create unique spaces at riverfront

The drosscape, as it currently can be found, has negative effects in terms of a lack of ecology and a lack of flow (see fig. 5.40)

Figure 5.40 – An excess of asphalt paving and limited flow across the site

Ecological remediation can begin by overlaying a green mat onto the site (see fig. 5.41)

Figure 5.41 –Remediation begins by superimposing a green mat onto the site.

Figure 5.42 –Remediation begins by superimposing a green mat onto the site.

The green mat concept and the ecological/infrastructural strand concept are combined in order to provide continuity and flow across the site (see fig. 5.43).

Figure 5.43 –Ecological and infrastructural continuity are defined through a green mat and strand concept.

Built form can become an integral part of the ecological/infrastructural strands. In this sense the landscape and buildings work as one entity (see fig. 5.44).

Figure 5.44 –Built form and landscape become intertwined through the strand concept.

The superimposition of an ecological blanket onto the site by way of the strands is the starting point for the design of the campus. Before these concepts can be realized as a coherent design, a program for the site must be defined. The diagram below illustrates a hypothetical program definition. The program was derived through careful analysis of the site (see previous diagrams). The site analysis revealed that the site could be divided into three main zones: the riverfront zone, the campus zone, and the industrial zone. By breaking the site into three components, a rough program for each zone was defined (see fig. 5.45)

Figure 5.45 –Diagram illustrates a loose program for three distinct zones.

Recalling OMA's proposal for Parc de la Villette (see Case Study chapter), a more refined list of programmatic functions can be defined for the campus. The Parc de la Villette proposal promised diversity through nearly 50 different programmatic elements such as recreation areas, dense vegetal zones, discovery gardens, thematic gardens, walking and bike trails, and so forth. The program for the campus for Sustainable Energy Systems begins by borrowing some of these programmatic elements. Taking the proposal one step further, new high-tech features can be incorporated into the planning of the site and can be thought of as program as well. For example, solar fields and wind turbine arrays can be woven together with public space. Imagine the use of small wind turbines as sculptural elements across the site. The diagram below (fig. 5.46) illustrates a catalogue of program in 2d and 3d. The goal is to study how the different catalogue components can operate with one another based on their relative landscape thickness and performative characters.

Figure 5.46—A catalogue of program is defined based off of OMA's proposal for Parc de la Villette.

Figure 5.47 –The programmatic elements shown in 2d the previous diagram are studied in 3d to recognize their thickness and to determine the appropriate placement across the site.

The following series of diagrams are intended to illustrate the prioritizing of the site.

Fig. 5.48 illustrates the defined boundary of the site.

Figure 5.48 –The defined boundary of the site.

Fig. 5.49 shows that the remediation of the river can become a feature for the campus. A wetland spine can meander across the site towards the river. The diagram also illustrates how the site can be broken down into three zones (as previously stated): the riverfront, the campus

and the industrial zones. Each zone can become distinct from the next by way of an ecological transition zone.

Figure 5.49 –A wetland spine runs through the site. The three zones become distinct by way of transitional zones.

Fig. 5.50 shows the definition of nodes (shown as red dots) within each main zone. The riverfront zone contains an existing train station. The train station currently serves as a gateway

to the city. A new campus centre node is shown in the diagram as well. This can be thought of as the heart of the campus. Towards the industrial zone, another node has been identified. There are a number of abandoned industrial buildings in this zone. These buildings can be repurposed and retrofit to become new areas for the public.

Figure 5.50 –Nodes identified at each zone.

Fig. 5.51 illustrates how the three zones and their respective nodes can be linked through the ecological and infrastructural strands that were previously mentioned.

Figure 5.52 –Each zone and node are connected through ecological and infrastructural strands.

Now that the three main zones and their respective nodes have been defined, the *General Theory of Sustainable Urbanism* by Andres Duany (see Case Study section) can be applied to the site in order to define ecological and socio-economic diversity. Duany's theory proposes that the ecological and socio-economic aspects of the site must be greater post-urbanization. The following diagrams illustrate the site conditions pre and post urbanization.

Figure 5.53 –Diverse natural habitat (pre and post-urbanization) at riverfront zone.

Figure 5.54 –Diverse socio-economic (pre and post-urbanization) at riverfront zone.

Figure 5.55 –Diverse natural habitat (pre and post-urbanization) at transition zone.

Figure 5.56 –Diverse socio-economic (pre and post-urbanization) at transition zone.

Figure 5.57 –Diverse natural habitat (pre and post-urbanization) at transition zone.

Figure 5.59 –Diverse socio-economic (pre and post-urbanization) at campus zone.

Figure 5.60 –Diverse natural habitat (pre and post-urbanization) at transition zone.

Figure 5.61 –Diverse socio-economic (pre and post-urbanization) at transition zone.

Given that a program and the placement of such program have been defined, it is now possible to organize the site for the new campus. The aim is not to provide a final master plan (as this goes against Landscape Urbanism ideology), but rather to design a framework so that urban growth can occur naturally. The following series of diagrams illustrates this point. The program catalogue (shown in previous diagrams) can be arranged across the site based off of Andres Duany's *General Theory for Sustainable Urbanism* (shown in previous diagrams).

Figure 5.62 –The prominent features of the site (wetlands, walking trails, bike trails) are overlaid first.

Figure 5.63 –Additional ecological strands are integrated into the site plan.

Figure 5.64 –Built forms are woven into the strands (shown as white rectangles)

The site has now been organized to permit flux and change overtime through a flexible site plan. The next step is to determine a type of architecture that can exist within this context.

As the research in this thesis has illustrated that the role of the building is unclear within the landscape urbanism discourse, the following diagrams begin to address this question.

Figure 5.65 –What is architecture's role within the Landscape Urbanism discourse?

Recalling the work of Kenneth Frampton and his Megaform theory, the megaform can be used to weave together the strands of landscape. See fig. X.

Figure 5.66 –The use of the Megaform to weave together landscape strands

Since the automotive drosscape is contaminated from years of industry, the Megaform can become not only a place where built form exists, but it can also act as a remediation devise. Fig. X illustrates the combination of built form and soil to form a continuous horizontal surface. Thus, the contaminated soil is covered over by the megaform. Over time the new top soil layer will filter the rain water and clean the contaminated land.

Figure 5.67 –The Megaform can be a hybrid of clean top soil and built form.

The following series of images are intended as a summary of the landscape strand

Figure 5.68 –Walking and bike trail strands connect to the riverfront via the campus

Figure 5.69 –Bioremediation wetland strands run alongside the trails

Figure 5.70 –New riverfront program is directly linked to the campus strands

Figure 5.71 –Strands of vegetation are used to create ecological continuity and to define space.

Figure 5.72 –Vast tracts of fields are introduced for recreation and remediation.

Figure 5.73 –Megaforms become woven into the landscape strands.

Figure 5.74 –Complete view of campus for Sustainable Energy Systems

Figure 5.75 –Overview of zones

Figure 5.76 – Riverfront Zone.

Figure 5.77 – Campus zone.

Figure 5.78 – Industrial zone.

Figure 5.79 – Aerial view of campus.

Recalling the concept of the living building (see Case Study section), one can imagine how the Megaforms throughout the campus could be used to not only promote site remediation, but to also act as a means of constructing the site itself. The following diagrams illustrate a number of possibilities for the Megaforms. These hybrid buildings are multifaceted in the sense that they are integral components of the landscape, they promote flow, and they encourage remediation.

Figure 5.80 – Existing site condition.

Figure 5.81 – New Ecoboulevards.

Figure 5.82 – Wetlands and new birms form the open space throughout the campus

Figure 5.83 – Megaforms are seamlessly woven into the landscape

Figure 5.84 – Birms and wetlands create public space and also remediated soil.

Figure 5.85 – New Megaforms are concealed within the remediation birms.

Figure 5.86 – Megaforms are used as a way of manufacturing the landscape.

Figure 5.87 – Flow is permitted across the site by lifting and lowering buildings.

Figure 5.88 – Megaforms form part of drainage swales.

Figure 5.89 – Megaforms are seamlessly folded into the flows of the site

Figure 5.90 – Megaforms used to link the riverfront to the campus

Figure 5.91 – How can the existing warehouses be repurposed?

Figure 5.92 – Existing warehouse become greenhouses which can be used by the public and they also aid in the creation of the parkscape.

The rendering below begins to show the potential character of the Megaform. This hybrid type of architecture would enable itself to be unique due to the seamless integration with the landscape.

Figure 5.93 – Megaform architecture imagined throughout the campus.

6.0 References

- 2000 U.S. Census. Referenced by Allen Burger (2006) in: *Drosscape – Wasting Land in Urban America*. New York, New York: Princeton Architectural Press.
- Allen, S. (1999). *Points and Lines: Diagrams and Projects for the city*. New York, New York: Princeton Architectural Press.
- Ambassador Bridge, (n.d.). Retrieved November 9, 2010, from http://en.wikipedia.org/wiki/Ambassador_Bridge
- Architecture Research Unit Factory – Brikett Factory (n.d.). Retrieved November 2, 2010, from <http://aru.londonmet.ac.uk/>
- Automotive Industry – The Canadian Encyclopedia (2008). Retrieved Oct 18, 2010, from <http://www.thecanadianencyclopedia.com/index.cfm?PgNm=TCE&Params=A1ARTA0000412>
- Bad News for Windsor's Automotive Plants – GM Closes (2010). Retrieved Oct 15, 2010, from <http://blogs.marketwatch.com/canada/2010/07/28/windsors-90-year-old-gm-plant-closes/>
- Belanger, P. (2009). *Landscape as Infrastructure*. Landscape Journal: University of Wisconsin System
- Berger, A., Waldheim, C. (2008). *Logistics Landscape*. Landscape Journal: University of Wisconsin System
- Berger, A. (2006). *Drosscape – Wasting Land in Urban America*. New York, New York: Princeton Architectural Press.
- Canada's Vital Auto Industry: Past, Present & Future (2009). Retrieved Nov 10, 2010, from http://blog.jameslaxer.com/2009_04_01_archive.html
- CBC News: GM Pulls Out of Canada's Former Auto Capital (2010). Retrieved Oct 12, 2010, <http://www.cbc.ca/canada/windsor/story/2010/07/27/wdr-gm-transmission-plant-closure-100727.html>
- Corner, J. (1999). *The Agency of Mapping*. London: Reaction Books.

- Czerniak, J. (2002). *Case: Downsview Park Toronto*. New York, New York: Prestel Publishing
- Cote, M. (2008). *Landscape Urbanism, Fetish?* Retrieved April 4, 2011, from http://umass.academia.edu/MichaelCote/Papers/10739/_Landscape_Urbanism_Fetish_
- Denton, Corker, Marshall – *Architecture and Urban Design* (n.d.). Retrieved Oct 11, 2010, <http://www.dentoncorkermarshall.com>
- de Sola-Morales, I. (1995). *Terrain Vague*. Cambridge, Massachusetts: The MIT Press
- Detroit: *Syncopating an Urban Landscape* (2010). Retrieved Oct 4, 2010, from <http://www.designobserver.com/places/entry.html?entry=14288>
- Detroit Arcadia: *Exploring the Post American Landscape* (2007). Retrieved Oct 4, 2010, from <http://www.harpers.org/archive/2007/07/0081594>
- Doherty, G, Mostafavi, M (2011). *Ecological Urbanism*. Baden, Switzerland: Lars Muller Publishers
- Donnan, Jack A.. *Economic Implications And Consequences of Population Growth, Land Use Trends, and Urban Sprawl in Southern Ontario*. Toronto, ON, Canada: Environmental Commissioner of Ontario, (2008). Retrieved on April 2, 2011, from <http://site.ebrary.com/lib/oculryerson/Doc?id=10270622&ppg=7>
- Downsview Park (n.d.). Retrieved Nov 9, 2010, from http://en.wikipedia.org/wiki/Downsview_Park
- Effects of the 2008 -2010 Auto Industry Crisis on Canada (n.d.). Retrieved Nov 4, 2010, from http://en.wikipedia.org/wiki/Effects_of_the_20082010_automotive_industry_crisis_on_Canada
- Flint, Michigan (n.d.). Retrieved Nov 2, 2010, from http://en.wikipedia.org/wiki/Flint,_Michigan
- Girardet, H. (2000). *Ethics and the Built Environment*. New York, New York: Routledge.
- Jackson, K. (1985). *Crabgrass Frontier – The Suburbanization of the United States*. New York, New York: Oxford University.

Kallipoliti, L. (2005). *Dross; Regenesi s of Diverse Matter*. New York, New York: Routledge

Landschaftspark Duisburg-Nord (n.d.). Retrieved Oct 8, 2010, from
http://en.wikipedia.org/wiki/Landschaftspark_Duisburg-Nord

Lerup, L. (2010). *Stim and Dross: Rethinking the Metropolis*. The MIT Press

Lyon Confluence (2009). Retrieved Oct 15, 2010, from
<http://www.lyon.confluence.fr>

Marrou, V. (n.d.). Wiki 101 Parc de la Villette. Retrieved Oct 22, 2010, from
<http://parcdelavillette.wikispaces.com/file/view/Parc+de+la+Villette,+Rem+Koolhaas.pdf>

Miron, J. (2003). *Urban Sprawl in Canada and America: Just How Dissimilar?* Toronto:
University of Toronto at Scarborough, Retrieved on March 2003 by Jack Donnan.
Referenced from: <http://pc218.cus.utoronto.ca>.

MILUNet Implementation Lab – Strijp Eindhoven (2006). Retrieved Oct 27, 2010, from
www.habiforum.nl/.../Rapportenserie/Rapport-15%20Strijp-S%20Eindhoven.pdf

Mumford, L. (1961). *The City in History – Its Origins, Its Transformations, and Its Prospects*.
New York, New York: Harcourt Inc.

New Urbanism (n.d.). Retrieved Oct 2, 2010, from
http://en.wikipedia.org/wiki/New_urbanism

New Urbanism and Landscape Urbanism – Milan Poly (2009). Retrieved Oct 26, 2010, from
[www.laboratoriorapu.it/UPD10/.../Lesson%206.3_2010%20\(Gabellini\).pdf](http://www.laboratoriorapu.it/UPD10/.../Lesson%206.3_2010%20(Gabellini).pdf)

OMA – Parc de la Villette (n.d.). Retrieved Oct 26, 2010, from
<http://www.oma.eu>

Parc de la Villette (n.d.). Retrieved Oct 26, 2010, from
http://en.wikipedia.org/wiki/Parc_de_la_Villette

Perrault, D. (2001). *Dominique Perrault: Selected and Current Works* . Australia: The Images
Publishing Group.

Placa de la Glories Catalanes Barcelona (n.d.). Retrieved Oct 22, 2010, from

http://en.wikipedia.org/wiki/Pla%C3%A7a_de_les_Gl%C3%B2ries_Catalanes,_Barcelon

Reclaiming the Ruin: Detroit (2009). Retrieved Oct 2, 2010, from
<http://www.designobserver.com/places/entry.html?entry=1144>

Kontentreal. (Producer), (2008). *Road to the Future* [Motion picture]. United States:
 PBS

Scale Down Windsor (n.d.). Retrieved Oct 23, 2010, from
<http://www.scaledown.ca>

Shannon, K. (2001). Stalking Detroit Book Review. School of Natural Resources and Environment, University of Michigan.

Steinmetz, G. (2009). Detroit: A Tale of Two Crises . Environment and Planning D: Society and Space.

Steel Winds (n.d.). Retrieved Oct 2, 2010, from
http://en.wikipedia.org/wiki/Steel_Winds

St. Louis Ford Plant Redevelopment (2009). Retrieved Nov 2, 2010, from
http://money.cnn.com/2006/01/23/news/companies/ford_closings/index.htm

Superbuild Transportation Directions Windsor – Building Ontario (2009). Retrieved Nov 2, 2010, from <http://www.fin.gov.on.ca>

Ted Talks – James Howard Kunstler (Ted Talks), (2007). *The Tragedy of Suburbia* [Motion picture]. United States

The End of Suburbia – James Howard Kunstler (YouTube), (2007). *The Tragedy of Suburbia* [Motion picture]. United States

Urban Renewal in Post Industrial Detroit -Planetizen (2006). Retrieved Nov 1, 2010, from <http://www.planetizen.com/node/20515>

Matthews, S. (n.d.). Cedric Price: From the Brain Drain to the Knowledge Economy. The Architectural Review.

Waldeim, C. (2006). The Landscape Urbanism Reader. New York, New York: Princeton Architectural Press

Waldeim, C. (2003). What's Up? Downsview. Canadian Architect.

Walter Hood Macon Street Design, Georgira (n.d.). Retrieved Nov 5, 2010, from <http://www.wjhooddesign.com>