Inhabiting the Transitional
A Transit Hub for Ottawa's Bayview Yards
By Vanessa Worrell

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ABSTRACT

The transit hub can offer a memorable experience, a pause in a journey of rapid movement where the traveler may experience a moment of true spatial inhabitation. The collective group of urban travelers together generate a transient village which is always in a state of flux, but which has the potential to give cohesion to the city as a whole. The transitional spaces that the commuter passes by -- and through -- on their journey, offer glimpses into the city's disparate and disconnected neighbourhoods. Through the design of Ottawa's Bayview transit hub, this thesis re-asserts the importance of a city's neighbourhoods in the formation of urban identity. Designed as more than a simple structure for organizing movement, the transit hub provides an occasion for meaningful connections to the complex cultural environment of our urban life: it becomes an orientation device for one's greater position in the city and the world.

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Introduction

Historically, successful cities have been built around meaningful vessels of movement - urban movements being the privileged loci of shared urban experiences. In contemporary cities, the design of transit hubs has become a rich and central question of architecture and urbanism. Public transit through metropolitan regions must not be a drudgery, but rather an experience of anticipation and even of delight, discovery and forced repose. The transit hub can offer a memorable experience, a pause in a journey of rapid movement where the traveler may experience a moment of true spatial inhabitation. The transitional spaces that the commuter passes by -- and through -- on their journey, offer glimpses into the city's disparate and disconnected neighbourhoods. The collective group of urban travelers together generate a transient village which is always in a state of flux; but this transient village has the potential to give cohesion to the city as a whole. Through the design of interstitial spaces created at nodes of transit, this thesis re-asserts the importance of a city's neighbourhoods in the formation of urban identity.

Canada's capital city extends over an area of 2,797 square km.¹ Due to this spatial extension, the related multiplicity of Ottawa's neighbourhoods and their geographical separation, the question of urban identity is forcefully posed in this city. The problem of the design of a transit hub in Ottawa thus provides an ideal lens to study and apply research on inhabiting the transient realm and on the balancing act between the dynamic motion of transit and the stasis of a neighbourhood. The design project that emerges from this thesis is two part: firstly, the transit hub proper which will link the current North-South O-Train line with the future East-West line in the Bayview Yards district of Ottawa, and which will be a gateway to the city for those living in the future transit-oriented urban village planned for the area. Secondly are a number of additional programs which would anchor the building to the neighbourhood and site. Through the exploration of the Bayview Yards site, which sits around an important intermodal crossroad of light rail, bus and bicycle transit, larger questions pertaining to Ottawa's urban identity are addressed.

¹ http://www.ottawa.ca/city_services/statistics/counts/land_use/index_en.html

Chapter 1 explores the theme of our interconnectedness in the urban realm, and examines how we experience movement in the city. The question of how we can derive a true inhabitation of transitional spaces is here posed. Chapter 2 examines the morphology of movement – the network of points, paths and systems which are created by movement in the city - to develop a strategy for designing buildings along these paths of transit. Through an analysis and criticism of theoretical precedents for the contemporary transit hub (including the work of the Smithsons, the Dutch Structuralists and that of Bernard Tschumi), I re-examine human associations, structural systems, spatial sequences and “archaeological” layers as design generators. This chapter explores connections and translations between paths of movement as occasions for authentic experiences of inhabitation of the city. Chapter 3 investigates the pragmatic and conceptual issues of designing a transit hub for the contemporary city through a series of case studies. In particular, transit hub projects that explore dynamic paradigms and extended inhabitation (stasis) together are considered. Chapter 4 studies the site selected for this thesis – both its history and its topographical characteristics as these pertain to movement and urban relationships. Finally, Chapter 5 explores the solutions and the methodology used for the design of the Bayview Transit Hub.

This thesis proposes that the juxtaposition of dynamic and static urban spaces opens up the experience of habitation and that transportation architecture, as a result, provides a rich potential for developing places of meaningful inhabitation. What is more, the transit hub, by being entirely devoted to the business of linking and connecting people and places, holds the potential to revitalize the city at large and to sew meaningful connections to the very neighbourhood it is built in.

Chapter 1

Urban Movement and Shared Experience

Urbanity is constructed on the possibility of shared experiences amongst citizens. In this way the travel story – the sensation of moving through the city, of walking down the street, driving a car or riding the train – can become a starting point for thinking about the urban realm. The travel story seizes the choreography and experience of movement relating to the journeys and trajectories of the contemporary city. It captures the fleeting thoughts occurring while the city passes by behind a windowpane. It is the smell of coffee bought during a pause in the daily commute. It is the feeling of re-entering one's neighbourhood after the bustle of the workday and a long bus ride home. One might even say that our inhabitation of cities is at its most intense, its most intimate, when we are moving through them. By exploring the experience of movement and stasis in the city, we can derive a true means of inhabitation of the spaces of movement, and indeed, of transitional spaces.

Narrative: the Choreography of Movement

*"Our lives, individually and collectively, are defined by narrative structures. Architecture and cities can be understood as works of human making, which are designed, constructed, inhabited and interpreted. Ultimately, architecture and cities shape spaces in which human actions unfold. Narrative theory contributes to understanding these unfoldings."*²

In his chapter on "Spatial Stories" in *The Practice of Everyday Life*, Michel de Certeau links narratives and spatial practices. For de Certeau, "space is a practiced place," or in other words, stories transform spaces into places. De Certeau seems to advocate open ended architecture that welcomes personal interpretations and even subversions of intended forms of habitation. Building on de Certeau's ideas, it could be suggested that urban architecture can provide strong shared experiences when well attuned, on one hand, to dwellers' quotidian movements, and when open to multiple interpretations (and subversions) on the other. De Certeau's notion of reciprocity between inhabitant and architecture -- how architecture can create narrative (engaging the inhabitant) and how the inhabitant can subvert this intended narrative (engaging the architecture) -- is an interesting one for the purposes of considering a transit hub design. By

² Graham Livesey, *Passages: Explorations of the Contemporary City* (University of Calgary Press, Calgary, 2004) 33

understanding the way in which spatial stories are configured, we can understand how the unfolding of human actions can shape transit architecture. Our own individual movements are inextricably linked to those of others. Every story is a travel story – a spatial practice. In simple terms, we share in each other's lives by the mere fact of walking in each other's footsteps. The transit hub is a privileged urban building because it is both the producer of and produced by, movement.

Multiple Users, Multiple Narratives

Because each travel story is unique, the transit hub is the site of multiple and unforeseen narratives. Graham Livesey discusses the architect's role in the design of urban narratives in *Passages: Explorations of the Contemporary City*: "Architecture and cities can be understood as works of human making, which are designed, constructed, inhabited and interpreted."³ As authors of urban events, architects understand and give shape to buildings based on their own interpretation of sites and their ideas of how people should move through them. The architect has a specific vision and clear intentions for how the building will be received, appropriated and practised. However, with a building such as a transit hub that is inhabited by many people, each of whom has a very unique reason for being there, the possibility of a unifying narrative does not exist. Commuters move through in groups at specific times of the day, creating a kind of bundle of spatial trajectories. Unrelated persons who know nothing of each other's lives, each with their own story, pass through and collide within the transit hub at different times, repeatedly over time. This is a challenge, but also an opportunity. This multiplicity of users translates into movements and events occurring in the building that may not neatly follow the architect's vision. In designing transit hub buildings, architects are required to anticipate its uses and interpretations in more open terms than with many other building types.

In his work *Time and Narrative*, Paul Ricoeur examines three modes of narrative: prefiguration, configuration and reconfiguration, which are used here to explore the reciprocal relationship between the intentions of the architect and the subsequent inhabitation of the architecture they construct. Ricoeur describes his first mode of the narrative process as prefiguration, in which the "composition of the plot is grounded in a pre-understanding of the

³ Livesey, 44

world of action, its meaningful structures, its symbolic resources, and its temporal character.”⁴ To create the conditions to house human actions, the architect must first understand the world we live in. When an architect designs a building, it is within a dense and complex cultural context, an urban fabric which creates constraints and influences the design. The concept of the building is drawn from these challenges, as well as the history of architecture itself, its symbols and systems which may or may not be recognized by the inhabitant but refer to our collective past and language nonetheless. Architecture is both part of and emerges from this prefigured world. One building can act as a word or phrase which is part of the larger urban text, or as a moment of disruption which stands apart.

Ricoeur’s second mode, configuration, is a giving of shape to the successive actions or events determined in the prefiguration. This is the actual emplotment - the production of the story, the organization of what is to be the experience of the building. It temporally unites a series of planned events, creating the sense of a beginning, a middle and an end, shaping the journey through the building, or connecting the building within a journey through the city. It is the “giving of architectural form or structure to a disparate range of elements and requirements,”⁵ the physical construction of the work of architecture, from design phase to built phase.

The final step in Ricoeur’s narrative process is reconfiguration. This is an interpretation of the work of architecture by inhabiting it. “Through the process of reconstructing how a work is ‘received’, or how it intends itself to be received, its identity can be reconstructed.”⁶ In this case a work of architecture can be compared to a text; the story is presented to the world and the reader gains an understanding of their life and of our world by engaging the work. This configuration creates a structure of meaningful sequences and purposes, and the experience of reading the text causes the reader to refigure their own world in light of the possibilities offered. “Buildings evolve and shift functionally as they accumulate history, and through ongoing relationships with context and inhabitants.”⁷ When inhabiting a building, a person

⁴ Paul Ricoeur, Time and Narrative I (trans. Kathleen McLaughlin and David Pellauer, University of Chicago Press, Chicago, 1984) 54.

⁵ Livesey, 40

⁶ Samuel Weber, Mass Mediauras (Stanford University Press, Stanford, California, 1996) 141

⁷ Livesey, 24

reconfigures the narrative – and sometimes subverts programmed spaces -- to create their own sense of place. Through the possible understandings of the language embedded in the design, mis-understandings may occur, creating a disjunction between user and space as a result of the inhabitant's reactions to the work of architecture. This disjunction creates indeterminate narratives which do not cohere with the constructed, written and pre-scripted space. In transit buildings, there is an opportunity for architects to welcome these disjunctions and the multiplicity of readings as generators of building language and form. Design strategies that create un-programmed spaces will be examined later in this thesis.

The Transit Hub and Collective Memory

Building on this thesis's intention to show that transit buildings can provide spaces of collective memory we ask: Where are the locations of collective memory in the contemporary city? Memories are intimately bound to places. We form our urban identity and orientation, and recognize the world around us by its familiarity. This familiarity in turn is reinforced by repeated visits to a place. "There is an intimate reciprocity between a group or collective and the space it inhabits: one imprints upon the other."⁸ The most satisfying urban fabrics are ones that contain traces of the cycle of building, transforming, destroying and rebuilding, and that are imprinted by the traces of inhabitants of different times. Architecture in general represents an opportunity to participate in collective memory by providing settings for repeated visits and social rituals. Buildings are mnemonic devices. The transit building is a special case of a building where the potential to be imprinted by collective memory is even greater because it is the site of repetitive routines. Later on, in the design of a transit hub, this thesis will explore how the transit hub building can reveal truths and patterns about the site (both historically and from the present day), and how its design can bring the inhabitant to reflect on the past. The question of anchoring the building programmatically to the neighbourhood to create the potential for social interactions, and stimulate a sense of place and collective memory, will also be elaborated.

⁸ Livesey, 119

Mass Transit and the *Flâneur*

The linearity, speed and scale of modern roadways have a strong impact on the spatial fabric of the contemporary city. The flâneur's organic, slow and wandering movements described by Michel de Certeau in his book *The Practice of Everyday Life* has been superseded by the modern transit traveler who moves through the city on linear, fast paths of mass transportation. De Certeau elaborates that the spatial order organizes an ensemble of possibilities (a place in which one can move) and interdictions (for example a wall preventing one from going further). The walker "actualizes" these possibilities (i.e. makes them emerge) but also moves them about and invents others (i.e. improvises and transforms). The street was once tailored for pedestrian movement, at a pace which allowed social exchange. Now many systems of varying speeds and complexity are layered one over the other, disrupting the old order of interaction. The zoning of the city into many parallel paths and systems of transit (railways, freeways, subways, airways, etc) has tended to exclude the more simple urban activities of the pedestrian. Movement has become faster and more wide-ranging.

Writing about his plan for the expansion of Tokyo in 1961, Kenzo Tange foresaw the central question of the intermodal station. He wrote: "Transportation today is changing the relationship that links the city structure with traffic and architecture."⁹ Tange perceived early on that stations and nodes – the moments of translation and slippage between various overlaid systems – provided the possibility for events and social exchanges to occur. Tange also noted the shifts taking place in urban movements, from the regular rhythm of train travel toward individually motivated movements: "With the growth of social organization and the division of functions, there is more and more free, individually motivated movement. In opposition to the steady flow of the commuters, this is a variable flow – one might say a flowing mobility."¹⁰ If in the industrial city the movement of commuters was repeated daily, at definite intervals (a regular permanent flow sustained by the mass transportation networks), the post-industrial city, characterized by the automobile, required the creation of a new system since it altered the relationship between streets and buildings. Neither horse and carriage, nor railways and trams, had required the creation of a new system. Individuality, freedom and spontaneity resist the control of traditional

⁹ Kenzo Tange, "A Plan for Tokyo, 1960 Toward a Structural Reorganization" in Architecture Culture 1943-1968: A Documentary Anthology (ed. Joan Ockman, Columbia Books of Architecture, New York, 1993) 332.

¹⁰ Tange, 328

systems of mass transportation. In the moving and flowing cities of our time, variable pedestrian traffic and automobile traffic must intersect with scheduled transit such as railway travel. How to carefully organize this meeting is the premise for this design exploration of an intermodal station. By examining the transitory experience and the nature of journeying through the city, we can develop strategies for designing these spaces at moments of translation.

Railway Commuting: A Positive Experience of Detachment

Michel de Certeau describes railway travel as a closed system. Immobile inside the train the traveller looks outside the window and sees unmoving things slip by. It is the ultimate closed system, an actualization of the rational utopia where everything has its place. "Inside, there is the immobility of an order. Here rest and dreams reign supreme. There is nothing to do, one is in the state of reason."¹¹ The experience of riding the train constructs a repose of distance and a quiet perspective upon one's world. Because the landscape becomes blurred, the railway view is unburdened of specific references and details. This helps the traveler leave behind the stresses of regular life and creates a sense of belonging to all of the city at once. The windowpane is a transparent boundary between observer and observed which allows the traveler to see, but not touch or hold that which passes by. The windowpane divides, and this isolation and separation between traveler and city "makes our memories speak or draws out of the shadows the dreams of our secrets."¹²

The railway station thus becomes a threshold between this detached journey and the re-emergence into the city - one you can feel and touch. It is also the crossroad between the linear movement of the journey arriving by train and the more free and spontaneous movement of the pedestrian who leaves the station on foot, or by car. The transit building is a space which creates a disjunction between the dynamic movement in the meeting of different modes of transportation and the static space of the neighbourhood one travels to and from. Through an examination of the differences and tensions between dynamic and static spaces, an understanding of what it means to inhabit transitional buildings can be determined.

¹¹ De Certeau, 111

¹² De Certeau, 112

Inhabiting Transitional Spaces: Passage

The Random House Dictionary defines the word “inhabit” as “to live or dwell in a place, to exist or be situated within it.”¹³ Our contemporary culture has tended to associate the act of inhabiting with fixed locations. The suburban ideal of individual comfort in one’s own home epitomizes this static idea of inhabitation. In the suburbs all other aspects of life in the “space” outside the home are perceived as inconvenient. But is there another way to inhabit space? Can one approach the question of contemporary inhabitation in a manner that, in contrast to this ideal, celebrates the act of movement through the urban fabric? More specifically, can we inhabit transitional spaces, and is stasis required for a dweller to feel oriented, to experience a sense of place?

There are several examples of rich experiences of inhabitation associated with non-static spatial constructs. Nomadic cultures provide an interesting example, because nomadic translations are about reconciling life with cosmic, seasonal and cultural rhythms. The latter find their anchor in movement. “In nomadic cultures a point in space is secondary, the journey is primary.”¹⁴ The very word “passage” contains the idea of movement and of stasis. As pointed out by Graham Livesey, “passage” indicates transition as well as occurrence. “There are definitions of the word “passage” that begin to suggest strategies for practice in, and inhabitation of, the contemporary city. The first is a figural or metaphorical sense of the word that means the transition from one state or condition to another. [...] An archaic form of the word suggests that it may also meaning something that ‘passes’, goes on, takes place, occurs, or is done; an occurrence, incident or event.”¹⁵ The question of inhabiting passages is a very relevant one in the contemporary city. Indeed, the modern city is conceptualized as a web or net, more so than as a center. The complexity of sites in the contemporary city is connected to this fact. Today, every site is defined by its connection to a multiplicity of other sites. This fragmentary nature of the contemporary urban fabric creates the condition of a constant journey, always passing or travelling from one place to another. This is a condition which

¹³ “inhabit.” Dictionary.com Unabridged. Random House, Inc. © Random House, Inc. 2011.

¹⁴ Livesey, 106

¹⁵ Livesey, 96

provides rich opportunities for creating designs that are meaningful and relevant to this day and age, which find stasis amidst movement and allow us to dwell in the transient.

The Contemporary City: a City of Translations

Since the beginning of industrialization, urban movements have steadily become faster and more wide-ranging, taking on a multiplicity of forms which both complement and destroy the structure of traditional urban fabrics. "Fragmentation, de-centralization, and complexity have transformed older forms of order."¹⁶ Urban growth in the last few decades has not produced traditionally stable ordered forms and spaces. Instead, they have given way to a more complex and elusive interplay of paths, nodes and systems.

Marc Augé more recently has commented on the contemporary city. New technology has transformed our systems of transportation and our communication structures, separating the body from space through fast movement and thus also disengaging the city dweller from inhabiting the city in the traditional sense. Coherent types of public spaces which were once rooted in the material dimension of the human body (such as the square and the street) now have been substituted with a multitude of spaces such as freeways, parking lots and transit stations that address the car more so than the human body. These create a disjunction between the human body and the urban fabric. New urban spatial types have arisen, creating what Marc Augé calls "non-places". Augé states that bus, train and airport terminals are places that one only remembers in generic terms and without the normal specificity of space, time and culture associated with an architecture of place. In relation, internationalisation and standardisation have lead to unified shapes and forms in these building types.

Place is normally thought of as static in the traditional paradigm. "Place and non-place are rather like opposed polarities: the first is never completely erased, the second never totally completed."¹⁷ Place is a pause, inside, at home and relating to the human body at rest. The distinguishing features of non-places are the displacement or separation of the space from its surroundings, and the space is disengaged from the "here-and-now" and the "face-to-face".

¹⁶ Livesey, 97

¹⁷ Marc Augé, Non-Places. Introduction to an Anthropology of Supermodernity (trans. John Howe, Verso, New York, 1995) 79.

Augé argues that there our new public spaces frequently lack a human dimension. Non-places, including parking lots, malls, subdivisions, brownfields and spaces of urban decay -- or un-spaces as Augé calls them -- are often the leftover spaces created by the intrusion of high speed paths of movement in the urban fabric.

The experience of the freeway has created a non-place, in that urban dwellers experience time on the freeway in the continual present: the space of the freeway separates body and city, pulling the dweller outside of time. In the contemporary city we inhabit a dense network of transportation axes and their associated spaces, transit points and temporary abodes. These spaces are abstract, transitory and solitary: layers of glass, screens and thresholds distance us from the city and create a space of distraction. Space has become displaced. To understand how to create place in these transitional non-places, we have to reconsider how we think about space. "The world of supermodernity does not exactly match the one in which we believe we live, for we live in a world that we have not yet learned to look at."¹⁸ New transit architecture offers the opportunity to expand our perceptions and ideas of space while revealing and celebrating a new approach to seeing and using space.

Building on Augé's ideas, it seems now very relevant for the urban designer to consider the nodes of intersection between modes of transportation -- part of daily movements through cities -- as central design questions. If the traditional urban centre has lost some of its focussing capacities, these places of translation between overlaid systems offer opportunities for memorable experiences in their place. The intermodal station is a privileged location for providing the necessary social structures (spatial and narrative) for our inhabitation of contemporary cities. It intersects two paradigms of inhabitation: dynamic passage and static place. Through an understanding of this tension and even disjunction, we can begin to understand transitional spaces, and to articulate a methodology for designing the buildings that belong to the transitional realm. The reconciliation of dynamic passage and static place promises to yield a sense of place and a deep inhabitation of the city.

¹⁸ Augé, 35

The Disjunction Between Dynamic and Static Spaces

In the medieval town plan, culturally important buildings punctuate vistas formed by ordinary “fabric” buildings. In this way, the medieval church, for example, is a paradigm of static building. The significant building, in traditional urban compositions, is an object formed by dominant axes on the figure-ground plane. Dynamic buildings, in stark contrast, are organized around intangible forces, vectors, systems of movement and events. They do not “sit quietly” upon the ground but are traversed and even fractured by paths of movement. They reflect the nomadic experiences of inhabitation, with the spatial dynamism of passages of transit. But how do traditional static spaces contrast with the dynamic spaces of the modern city, and what is the cause of their disjunction? How does one reconcile static programs with dynamic ones? A friction tends to exist between the static spaces of a neighbourhood and a transit hub building. There are of course scale and population differences, and divergences in rhythms and pace. The neighbourhood is designed with stasis and rest in mind, while the transit hub is designed for and produced by movement. While the neighbourhood yearns for stability and “unchanging-ness,” the latter is devoted to wide-ranging participation and unpredictability. While the act of transit can be of repetitious movement, each event that occurs within the transit hub is unique and ephemeral.

The transit hubs of the contemporary city can generate both structure (static) and engagement (dynamic). The transit building is a real and permanent urban and neighbourhood presence, yet at the same time, its inhabitants pass through it swiftly. Beyond the bounds of each individual traveler’s experience, the transit hub creates only temporary, transitional spaces that are not relational, or historical. The transit hub is in this sense incomplete, because it houses only a partial piece of a larger narrative of travel encompassing not only the hub itself, but the sites associated with each traveler’s starting point and point of arrival. In the sequence of events of the journey the transit hub is only a pause in the story. How can we begin to create a sense of place in these transitional spaces?

Creating Place in Transitional Spaces

This thesis builds upon a dynamic paradigm of building that rejects the idea that movement creates voids in space. It explores the notion that a sense of place and true habitation can be achieved in these transitional spaces. In order to discover ways to re-conceive the transitional realm, it is useful to understand the twofold nature of the question. Firstly, reintegration of transitional spaces entails the reconnection and re-creation of passage amid transit systems' segmented spaces. Secondly, there is the issue of keeping narrative and program possibilities open in order to reflect the multiplicity of users. For the transit hub to become a true place of habitation, it must allow for the actualization of many spatial experiences and for interpretations by many people. As Augé argues: "All the inhabitants have to do is recognize themselves in [the narrative of a place] when the occasion arises."¹⁹ Spatial practices and arrangements are linked to a group's identity; their language of architecture reflects meaning. A collective space is created when a large number of people have the same feeling and derive solidarity and a sense of togetherness through the shared value given to the space. Habitation is tied to emotional appropriation of a space.

When considering transit architecture and the question of place making, it is useful to return to a chapter of early postmodernist architecture, and consider the systems buildings of Herman Hertzberger. As Hertzberger aptly wrote, "The more riveted space is to significance, the less space there remains for other significations and experiences."²⁰ Space must be designed with ambiguity, transparency and layers, creating the potential for openness and for multiple significances. Where there is room for the unexpected and the undefined, there is the chance for multiple meanings and interpretations. Hertzberger underscores the act of habitation in the making of place: "The thing that turns space into place is the infill given it by its occupants/users. A location then becomes a 'particular' place coloured by occurrences past and present which lend it associations."²¹ For this reason, the Dutch architect proposed architectures of armature rather than figure: habitation, not the architect, should be the form giver. Following Hertzberger's cues and architectural legacy, one can suggest the idea of place as

¹⁹ Augé, 44

²⁰ Herman Hertzberger, *Space and the Architect. Lessons in Architecture 2* (010 Publishers, Rotterdam, 2000) 14. In this work he reflects on his career, looking back at his work from the 1950s onward

²¹ Hertzberger, 24

a longing: the expectation of possibilities on a journey, the experience of the dynamic and the open. The architect should design the conditions to make the space fit to be read as place, but not impose permanent forms. Space is modified by the transformations caused by successive contexts. By articulating the circulation space and leaving the program open for dynamic possibilities, the architect can bring a sense of place to transitional spaces which are generally thought of as devoid of place.

Chapter 2

The Morphology of Movement

*"Stations and paths together form a system. Points and lines, being and relations. What is interesting might be the construction of the system, the number and disposition of stations and paths. Or it might be the flow of messages passing through the lines. In other words, a complex system can be formally described. One might have sought the formation and distribution of the lines, paths, and stations, their borders, edges and forms. But one must write as well of the interceptions, of the accidents in the flow along the way between stations. What passes may be a message but static prevents it from being heard, and sometimes, from being sent."*²²

Figural space has historically been central to architecture. Postmodernism proposed alternate visions to the stable building placed upon a well defined urban site, pursuing instead buildings that situated themselves within dynamic networks and that absorbed urban changes and movements. Postmodernist architects believed that the city was organized around movement and that these paths of movement, along with stations, formed a network of systems which make up the urban fabric.

In his book *The Image of the City*, Kevin Lynch presented his research into the visual perception of the urban form and stated that the city image can be divided into five categories: path, landmark, edge, node and district. He believed that the intersections of these elements offered the richest spaces in the dynamic contemporary city. These intersections - accidents within the defined system - imply an architecture that admits change, uncertainty and improvisation. As the transit hub is a building that is a node, path, line of movement and edge, an examination of these elements is important to this thesis. This chapter explores the morphology of movement and how the points, paths and systems of the city can generate the sites of greatest potential in a dynamic, transformative paradigm.

Points: The Figural Building (Landmark) vs. The Node (Junction Point)

In the traditional figure-ground plan, constructed space is represented by black figures (pochés), while void spaces including streets and other lines of transportation are left white. The figural landmark building is a symbol with clearly marked use and importance: a stable orienting

²² Michel Serres, *The Parasite* (trans. Lawrence R. Schehr, Baltimore: Johns Hopkins University Press, 1982) 10-1

figure which is simply defined by the urban forms that surround it. The landmark may symbolize a constant direction and, when seen from a distance, be endowed with the capacity to draw people towards it. Landmarks help state explicitly and visually that a place is functionally important. Modern urban space reconsidered the landmark building paradigm because the latter tended to correspond to stable notions of place and to singular paths of travel belonging to pre-industrial rhythms and spatial constructs. In the view of numerous architects from the Modern period onward, the dynamic building -- with its multiple entry points, lack of symbolic iconographies and non-hierarchical massing and layouts -- provided a more fitting response to contemporary movement and patterns of urban living than the axial figural building.

In the pre-modern city, streets and social spaces were distinct from one another. The streets were linear openings in the urban fabric for movement and the plazas or squares were places for gathering and lingering. These well defined public spaces grew around clearly defined intersections and junction points. Modern technology brought with it modern modes of movement above ground and below ground, in ways and combinations not seen in pre-modern cities. As railways and subways carved their way through traditional urban fabrics, new layers and new points of intersection between the old and the new were created. These new intersections often anchored economic and social vitality in the modern city. What were once just gateway points have become gathering spaces.

It is in the intersections of the new multi-modal paths that we find the public life of the new city. Kevin Lynch described these junctions as nodes, one of a series of elements that makes the city legible. Nodes are strategic spots in a city you can enter, to and from. The node is related to the neighbourhood since the node is typically the intensive foci of an area, a polarizing center from which all influence radiates outwards. They are typically places of a break in transportation, occurring at a crossing or convergence of paths. Nodes tie firmly into major features of the city. They can be differentiated from the general character of the neighbourhood around it as a distinctive landmark, or an oriented shape that clarifies the direction from which one enters. Rail stations are strategic junction nodes, and the city has long been organized around them (transit-oriented design). The dynamic node is a junction point from which movement flows in and out. It is compelling for the inhabitant of the city because decisions

must be made at junctions. People's attentions are heightened as they perceive nearby elements with more clarity than usual.

Because junction nodes occur automatically at major transit intersections and terminals, their forms should reinforce those critical moments in a journey. The paths of movement in a city are given identity and life not only by their own form or site but by the regions they pass through, the edges they move along, and the landmarks distributed along their length. If made significant, these intersections or translation points between modes of transportation can weave themselves into the narrative structure of the city. The transit stations and hub building participate in a larger order of paths of the city: the network created by a multitude of lines and their crossing points.

Paths: Movement in the Urban Fabric

Traditional streets formed a system of vital public spaces in the city, buildings and spaces intertwined which were scaled to the human figure and the movement of the body in space. In contrast, modern streets were designed with high speed movement in mind. Mechanical technology has transformed the nature of our paths and modern forms of transportation such as the automobile and train, which have created new forms of urban passages. They are enlarging the city horizontally, and replacing organic forms with more linear ones: straight, wide boulevards and long, unbroken freeways. These trenches for fast paths of movement constitute barriers for pedestrians and inhibit social interactions. These have also created new spatial conditions, in particular, liminal zones and in-between spaces. What is more, the automobile landscape has diluted urban public spaces. Livesey points out the simple matter: "The overtly private nature of the car and the overblown scale of road and parking systems required to accommodate it severely altered the traditional street that had been carefully scaled to the pedestrian and pre-industrial forms of passage."²³ We need new methods of building that can adapt to and enrich these leftover spaces, embracing and enhancing the journey of movement in the modern city.

²³ Livesey, 89

Lines of Movement

The transportation hub building offers an interesting opportunity for reclaiming urban space because it is directly involved with paths and lines of movement. And because it must be in dialogue with and make sense of lines of human movement, the hub can also be a subversive building in the urban fabric, a building that contributes to reorienting older spatial rules. In the contemporary city lines define the urban fabric. Ranging from physical delineations to the infinite lines of movement that pass through, above and below the city, lines criss-cross the city at all levels. They delimit, guide, outline, measure, mark and imply a course of action. They can unite - but also separate, divide and confine. Lines provide the language of operation for our disciplines of design: surveying, cartography, urban planning and architecture. We build within the planned order of the city and design within the existing lines while creating new ones.

Graham Livesey describes the city as having four kinds of lines: those we follow (routes), those that follow us (trajectories), those we cross (networks), and those we cannot cross (edges).²⁴ These four categories of lines take into account the city as weaving together of respectively personal agendas, symbolic orders, infrastructural paths, and legal or topographical orders. Our movements in the city combine those of the flâneur, those of the nomad, the wandering lines of a walker constantly re-evaluating and composing their own path, and those of the law abiding, responsible citizen on a direct path to work. Read in this way, the city is an accumulation of lines. Lines produce networks, or patterns of overlapping linear systems. In the network of lines of the city there are many points where two lines cross, creating intersections, moments or events in space. At some of these points we can traverse the lines (crosswalks, bridges), but others become impassable thresholds or points of resistance. Lines that cannot or should not be crossed were more explicit in traditional cities; in contemporary city they are frequently less clear boundaries or liminal zones.

Liminal Zones: Edges and Boundaries

Reconceptualization and inhabitation of edge sites are a compelling way to address the question of the contemporary conditions of the public realm. How can a building offer the

²⁴ Livesey, 105

feeling of a strong public and urban place and yet be constructed on a site that is a marginalized space, disconnected from the urban fabric due to high-speed movement? This thesis explores one of these liminal sites and creates an architecture which engages the inhabitants of the city through the dynamic design potential of interstitial spaces.

In stark contrast with the medieval fortified town, where walls provided security but also a limit to what was the understandable space of the city and a differentiation between inside and outside, city and rural lands, the contemporary city's boundaries are blurred and ever-shifting. The appropriation of land on the outskirts to build new suburbs accentuates this fact. These edges form liminal zones, peripheral spaces experienced at the threshold of boundaries and lines. In-between and marginal spaces are forgotten in traditional architecture, these territories go unseen, and are not inhabited in significant ways. The most difficult of these edge sites are leftover spaces produced by linear cuts carved through the morphological continuity of the urban fabric by paths of high speed transportation – freeways, highways and railways. The resulting interstitial space “often generates seemingly uninhabitable zones and problematic discontinuities in the physical and social fabric. Yet these sites may also be understood as fortuitous seams that offer “found” land in apparently built-out urban areas, thereby reducing rural development pressures and increasing public engagement through greater physical density and design.”²⁵ These liminal spaces where urban scales of movement meet human scales of architecture are rarely considered worthy of attention, yet they present interesting design challenges.

²⁵ Phoebe Crisman, “Inhabiting the Inbetween Architecture and Infrastructure Intertwined”, 2009, 1

Precedents for the Contemporary Transit Hub

“The new, we are saying, has to be thought-through in the context of what exists seen in the context of the existing patterns of human association patterns of use patterns of movement seen in the context of the existing zones of stillness, quiet or noise seen in the context of the existing patterns of form all in so far as we can uncover them The design for a building, or building group, cannot be evolved outside its context”²⁶

The 1950s saw new interest with regards to public space. Modernist mechanistic model of urbanism was rejected for more empirical patterns of association, its didactic established style replaced by a more plastic and flexible system, which reciprocated in architectural form existing ecological patterns. The traditional views of figural, prototypical architecture were being challenged as architects sought inspiration from the spontaneity of popular culture, in-situ context and anthropological sources. New concepts brought forth by young architects in the 1950s came as a reaction to Modernist ideals. In the 1960s structuralist, linguistic, semiotic and typological approaches to design flourished on the border between science and culture. Architect-planners like Kevin Lynch and Jane Jacobs contributed to the social reformism of architecture and led to a form of urbanism which was integrated with the social fabric of the city. These new paradigms of the 50s and 60s characterized urban design as a material form of examining the whole problem of relationships – between inhabitants, buildings and communities.

Of interest for this thesis is the manner in which these architects addressed the questions of urban patterns, systems of movement, human associations and structural systems for the design of circulation spaces. They stressed the examination of social, cultural and historical aspects of the city to create a method of designing within the context of human movement. These architects and planners looked at new ways of viewing space as a network of systems and as layers of associations. The work of the Team 10 architects and Dutch Structuralists in the 1950s and 1960s profoundly influenced architects of their time and of later generations, leading to the creation of systems architecture and the concept of networked space. Their ideas remain important to the issues of the transit hub building and are worth

²⁶ Alison and Peter Smithson, Without Rhetoric. An Architectural Aesthetic 1955-1972 (Latimer New Dimensions, London, 1973) 85

examining in some depth to determine strategies for designing architecture of movement and translation.

Systems of Movement and Human Associations – Team 10 and the Smithsons

In 1955 Alison and Peter Smithson published a text in *Architectural Design* deploring the mechanical limitations of the Modern Movement as it had developed in the 1930s and criticizing CIAM for not coming to grips with the issues of the modern urban city. Team 10 attacked CIAM's ideas and personalities; they felt that the Modernist architects were ignoring what were emerging as critical problems of the time regarding automobile traffic and social associations. Team 10 no longer saw urban design as a result of functions, but as a material form of relationships where scale, use, movement and the evolution of the urban landscape over time, mattered more than grand design. "With these references [to] the urban situation, we [saw] an acknowledgment of new circumstances that had been virtually imperceptible to the assured protagonists of CIAM."²⁷ Team 10's aims were to make meaningful change in urban design through the observation and study of growth, flow and vitality of communities. Their efforts to escape the orthodoxy of Modernism were early indicators of a new appreciation of pluralism and heterogeneity and of their impact on the design of the contemporary city.

Figures 1 & 2. The Smithsons' sketches of their proposed "elevated city", part of their study of pedestrian and motor vehicle systems

Of the Smithsons' large body of work, the project most relevant to this thesis was their London Roads Study. The London Roads Study was about creating an architecture that could adapt, rebuild or adjust because of the motorway. Their general concept was of take-off points,

²⁷ George Baird, *The Space of Appearance* (Massachusetts Institute of Technology, 1995) 313

rapid-transit stations acting as points of connection for the pedestrian system. They felt we must deeply consider the systems of transit in the city (roads, car-parking, rail stations, etc.) to create complementary public places. The Smithsons' work dealt with the relationships between inhabitants and communities. They encouraged an architecture designed with regard to the context of a specific site, under specific social conditions, at the time of the design. Reacting to the Modernist monumental building the Smithsons endorsed developing a building for its situation. They suggested "layers of strength", a frame of permanence, overlaid with "lighter" layers of transience. These lighter layers would shift in response to functional needs or organisational changes. Thus their designs were adaptive.

Structural Systems and the Transit Hub

The transit hub is a large building and therefore poses important structural questions. Structure is the guiding formal element of transportation buildings because of roof spans, and extended linear spaces. Is structure in this kind of building to be hidden, or visible? What role can it play in the production of internal space? A look at the Structuralist movement is useful here because these architects questioned the role of structure in the articulation and importance of circulation space. The following section will examine how Aldo van Eyck used structure to bring substance to the threshold, and how he blurred the line between inside and outside. Herman Hertzberger's use of structural systems to create dynamic public spaces and the possibility of multiple programs will also be examined. Finally, the example of Bernard Tschumi's Parc de la Villette will provide clues in how to combine layers of movement and stasis to generate conditions for a reinvention of the traditional figural paradigm.

Aldo van Eyck and the Notion of "Kasbahism"

Aldo van Eyck believed the speed and scale of contemporary life called for a new spatial order in cities. Key terms and evocative mottos in van Eyck's work included the shift from 'space and time' to 'place and occasion', "kasbahism," the in-between realm, twin phenomenon (dualism in life), and reciprocity and relativity. He saw the city as a hierarchy of superimposed configurative systems multilaterally conceived - a metonymic rather than additive solution to great numbers. His notion of kasbahism was about making buildings less like objects, and more as assemblages of dynamic components, conceived as parts that enclose an urban collective

space. The in-between realm referred to the dialogue between interior and exterior, and the notion of the threshold and encounter as means of transition between the two. The design of these transitional areas became a fundamental concept for van Eyck, leading to buildings designed with spatial transitions in mind: celebrating circulation space.

Van Eyck's design of the Burgerweeshuis orphanage in Amsterdam (1960) was his most celebrated building, one which "brought to the surface an idiosyncratic interpretation of modern architectural ideas enriched by pattern and forms and by balancing repetitive pavilions."²⁸ It reconciled a centralist layout with a dispersed decentralization, playing on the inside/outside dichotomy with transitions that were both turned outward and self-contained. The entrance court was made to be the heart of the building, leading to the spacious lobby which was at the intersection of the building's two main internal streets of circulation. A system of pavilions perforated the built volume of the main block, creating a polycentric building that articulated large and small, and inside and outside spaces, through a succession of well defined units. A multiplicity of structural elements consisting of columns, load-bearing walls and architraves formed a complex pattern, consciously giving a form to the transitional areas of the inner streets and courtyards.

Figures 3 & 4. Plan and aerial photo, Burgerweeshuis orphanage in Amsterdam

The building was conceived as a configuration of intermediary places, which were clearly defined and articulated by a strictly upheld architecture order. In this scenario, the in-between spaces (the circulations spaces and the transition between inside and outside) were central to the

²⁸ Dennis Sharp, *Twentieth-Century Architecture A Visual History* (The Images Publishing Group Pty Ltd , Australia, 2002) 240.

design conception. This composition was in recognition of the need for reciprocity with the inhabitants, and reflects a desire for flexibility and the possibility of change characteristic of the Structuralists' work. That in subsequent years the orphanage building would be transformed for other uses follows naturally from the design approach.²⁹

Herman Hertzberger: Architectural "Competence"

Herman Hertzberger viewed the city as a social system, one all about seeing and being seen. To Hertzberger, collective social spaces were important because it is at those places we invariably end up, where we meet others. By examining his ideas about the role of structure, circulation spaces and social spaces in architecture, an understanding of how to design the public spaces of a building which intersects dynamic spaces with static spaces can be achieved. His most successful built form of his ideas was in the Central Beheer office building in Apeldoorn, the Netherlands.

Hertzberger believed the chance of random encounters made for a more favourable environment for social intercourse and that the social space in buildings would function as a tiny city with internal structures of streets and squares. These networks of busy internal circulation would allow the space to open itself up so that the city would itself be carried into the building. He said: "the fact is, public and private, whether inside or outside, are relative concepts. Only the containment of buildings vis-à-vis the openness of the street presents a barrier in the continuity of this system of successive transitions."³⁰ He organized the Central Beheer office building for encounter by diagramming and arranging strategic sight lines, places for sojourn and intersections of circulation routes. All major internal circulation was confined to a central space so that everyone kept returning to it, their paths constantly crossing. This central space was articulated by inserting voids, landings, bridges, light and dark places, transparency, views out and views through.

²⁹ Over time the building suffered from the process of deterioration and in 1986 it was slated to be half demolished and replaced with a new structure. These plans were countered by Herman Hertzberger, who organized a campaign to save the building, believing it to be of exceptional architectural significance. His dedication to the cause led to the restoration and refurbishment of the building which received a new cultural allocation, one which included the architecture school of the Berlage Institute.

³⁰ Hertzberger, 134

Figures 5 & 6 Plan and interior photo of main circulation space, Central Beheer office building

Hertzberger also believed that the architect's role was not to provide a complete solution but to instead create a spatial framework to be eventually filled in by the users. "A clear spatial structure or infrastructure promises durability, and because of it makes more space in which to capitalize on the need for change," he wrote in 2000.³¹ A building should have maximum "competence"³², in that the underlying concept must be secure - regardless of the future appropriation of the space. Key to this idea was securing the public realm and creating a smoothly functioning circulation. A clearly organized infrastructure would lead to a 'correct' network of social space. The main load bearing structure of Central Beheer followed the collective space and expressed it with clarity. He believed this would give a building the ability to stand up to change, his definition of "competence." Hertzberger's structural systems created space for the unexpected and for change over time. The dualism of the constant structure and the temporary infill is what is key to Structuralism: a properly designed order using the right structure can lead to freedom and make space for the unexpected.

³¹ Hertzberger, 176

³² Hertzberger, 179

Figures 7 & 8: Hertzberger diagram of “seeing and being seen” in circulation spaces, axonometric drawing of circulation space articulated by structure in Central Beheer

Hertzberger called “making space” and “leaving space” the “tug-of-war” between the potential for signification and the interpretations of that potential by the users.³³ He felt that Modern architecture had forced rooms to have specific functions and that this preconceived idea of form would drive the stream of life of a building into rigid channels of use. This would hamper the natural activities of the people for whom buildings are built. His work saw space as a potential, as the signifiable and the as yet unsigned. In Hertzberger’s designs “we [saw] the emphasis shift from the certainties of an established order entrenched in forms as fixed meanings, to the perpetual dependence of each form on the context in which it figures.”³⁴ When signification is stripped away, the potential for programmatic symbolism becomes less institutional and more dynamic, and in tune with the conditions of the contemporary city.

Layers of Movement: Bernard Tschumi and Parc de la Villette

Bernard Tschumi’s designs and writings have dealt with the rejection of signification and have seen a focus on social and human associations through layers of systems, networks or frameworks for possibilities. His works articulate concepts which are important to the design of the transit hub: “how an “in-between” space is activated by the motion of bodies in that space. How programmed activities, when strategically located, can charge an un-programmed space

³³ Hertzberger, 180

³⁴ Hertzberger, 37

(the in-between). How architecture is about designing conditions, rather than conditioning designs; how architecture is about identifying, and ultimately, releasing potentialities hidden in a site, a program, or their social context.”³⁵

Built in Paris in 1982, Parc de la Villette was Tschumi’s first major public work and was his chance to implement his design research. Tschumi had a specific aim with his design: to prove that it was possible to construct a complex architectural organization without resorting to traditional rules of composition, hierarchy and order, displacing the traditional relationship between program and architecture. He questioned established architectural conventions with operations of superimposition, permutation and substitution. In the design of his park Tschumi chose to create an abstract system to mediate between the site and the complex, program mandate, and the technical and political constraints of the design. He wished to eliminate the presumption of a pre-established causality between program, architecture and signification. The park design encouraged intertextuality and the dispersion of meaning by avoiding figural relation to its surroundings. Parc de la Villette proposed a strong conceptual framework, suggesting multiple combinations and substitutions which could allow for future contributions by others. One part could replace another, or a building’s program could be revised or changed while the overall identity of the park would be maintained by its organizing structure. The structure was one without center or hierarchy, negating the causal relationship between a program and its resulting architecture.

Within his design Tschumi combined program, form and ideology in three different kinds of operations which were based upon his three main principles. The first is *event*, a series of occurrences and possibilities which encouraged fantasies and dreams not normally found in traditional city parks. The second is *space*, a series of places where the dreams and fantasies could be played out. And the final is *movement*, the suggestion by the lines and curves that were built into the landscape of a series of movements through space. The project also had three component systems: lines, surfaces and points. Each is a different and autonomous system, creating superimpositions by being layered one upon each other. There was no identification between architecture and program, though the concept of program was not eliminated or rejected for pure architectonics. The program played the same role as a textual narrative in that

³⁵ Bernard Tschumi, Architecture In/Of Motion (NAI Publishers, Rotterdam, 1997) 21.

it could be reinterpreted, rewritten, and deconstructed by the inhabitant, creating content filled with calculated distortions, interruptions and disjunctions.

Figures 9 & 10 Tschumi's diagrammatic design drawings for Parc de la Villette, showing layers of systems

The park plan's first component layer was the system of points. Intersections of an ordinance survey grid became the locations of each architectural intervention. These interventions were bright red structures Tschumi called "folies". Each folie, initially a cube 10x10x10 meters, was submitted to a process of substitutions, transformations and permutations. Tschumi associated the lack of any historical precedents in the folies' form to a "non-meaning". The forms of the folies became signifiers as opposed to signifieds —and they would mean nothing until given meaning by the process of shaping and inhabiting them. The grid, as an organizing device, also suggested disjunction between an architectural signifier and its programmatic signified, between space and the use made of it. The point grid became a tool, one that resisted the individuality of the author, a sign without origin. Through its regular and repetitive structure the grid represented a potentially infinite field and extension of points. In the design of a park the grid was anti-nature and anti-functional, anti-contextual and infinite. It created a series of dynamic oppositions to the requirements of the project.

The second layer was the system of lines, an orthogonal system of high-density pedestrian movements that crossed the park. The North-South passage linked the gates and subway

stations, while the East-West linked Paris to its suburbs. The most frequented activities were placed along these paths. Tschumi also designed the Path of Thematic Gardens, a seemingly random curvilinear route that intersected the axes at various places, providing for unexpected encounters with programs that were more unusual in nature. The final layer was the surfaces, which were open spaces that were used to their full potential for a maximum amount of programs. These were the main surfaces of the park not occupied by folies or pedestrian paths and which housed markets, playgrounds, and mass entertainment facilities.

Figures 11 & 12 Photos of “folie” and paths of movement on multiple levels

Along with the built project came numerous writings from Tschumi, Jacques Derrida and others about Parc de La Villette. In his writing Tschumi speaks of disjunctions, disassociations and the variables involved in his event nodes. The concept of disjunction “implies constant, mechanical operations that systematically produce dissociation in space and time, where an architectural element only functions by colliding with a programmatic element, with the movement of bodies.”³⁶ By arguing that there is no space without event and movement Tschumi determined conditions for a reinvention of the traditional figural paradigm. Rather than repeating established aesthetic or symbolic conditions of design his architecture became a framework for dynamic situations. The latter is an important precedent for this thesis.

³⁶ Bernard Tschumi, *Architecture and Disjunction* (The MIT Press, Cambridge, 1994) 213

Chapter 3

Program: Ground Travel Transit Hub

Design Issues

What is a Transit Hub?

The design of transit interchanges along light rail lines, bus stations and airports has re-emerged as a prominent part of world architecture. Transit hubs provide services, not just transportation. They organize transitional spaces between public and private urban realms, work and leisure, family and social space. They are not meant as final destinations, but as pauses in the journey, steps along the way, places not for planned meetings but for chance encounters. Transit hubs are about movement, from one place to another, in large groups, as quickly and efficiently as possible. Transit stations are places of connection, of transfer and of social interaction. They are gateways to the web of connecting spaces of the city – the threads of urban life. They breed commercial and social culture. Operating at different scales they interface between landscape and urban elements. “A good interchange is rather more a framework for people than a fixed architecture monument, although in reality the best transport interchanges contain both fluid (over time) and fixed elements.”³⁷ The ground travel transit hub for bus and light rail intra-city travel is a specific case of transit hub architecture. This building is also a neighbourhood building and a structure that is woven into local economy and urban vitality to a much more intimate degree than, for example, an airport or ferry terminal.

The formation of our urban fabrics occur around transit buildings, they are urban anchors which become the heart of a neighbourhood; transactions occur there which cater to people’s needs. “Transit hubs can trigger mercantile vitality and character. They are the drivers of commercial and social culture with their peripheral uses.”³⁸ The transit hub has the possibility to become a wonderful urban space, one which offers glimpses of its neighbourhood, conceptually represents its spirit. We can capture the experience of the neighbourhood in its hub, by creating an architecture which reflects and registers its characteristics – materially, formally, programmatically, culturally and topographically. These patterns and rhythms can be

³⁷ Brian Edwards, Sustainability and the Design of Transport Interchanges (Routledge, New York, 2011) 3.

³⁸ Peter Buchanan of Shift Architecture, Vancouver. Telephone conversation, March 4, 2011.

used to make reference to a neighbourhood and reconnect it to the city at large. The following section examines some of the specific challenges and opportunities of intermodal transit hub design for bus and light rail train.

The Challenges of Designing a Transit Hub

The transit hub presents design many challenges. As a building that is first and foremost about movement, circulation will be the most critical design issue. Programmatically the building must be about intuitive way-finding, creating a reference system and a language for *making connections to manage the flow of people*. The transit hub may also act as a neighbourhood landmark and orientation device. The hub will have many layers of infrastructure: car, bus, light rail, bicycle and pedestrian traffic. How these lines of passages meet and interact will be crucial. The transit hub makes a place for transition and movement that also accommodates people while waiting. Providing ease of travel and comfort during waiting periods is important. The transit hub must take into account two opposing scales of experience, that of the crowd and that of the individual. The experience of mass transit is simultaneously linked to crowds and to the safety and comfort of each individual's needs when travelling amongst many others in public space.

Another dichotomy of the transit hub is its utilitarian function *versus* its potential to be a vibrant space, full of life. Transit hubs have a dynamic relationship with daily life. The rhythms of the city are most visible here with surges of people at peak hours; people are either moving through the hub or waiting. Most people entering the building are passing through going elsewhere, most likely to work. The transit hub is associated with the narrative of drudgery and circular motion, of routine and "the daily grind". But it also a space of activity, of randomness, interactions, shared moments and experiences. It can be a celebrated passage instead of a forgotten one - that is where the architecture of the transit hub/station comes into play. Travelers leave their private world and enter the public realm of mass transit. The dichotomy of seeing/being seen is experienced by each user. The hub becomes a stage for a spectacle: watching others go about their journey, while others watch you go about yours.

Figures 13-16: O-Train commuters waiting, embarking, traveling and disembarking

Successful public transit requires the participation of many. To get enough people to transit stations, the urban density around them must be high enough to attract riders. The scale of the transit hub must be proportional to the amount of people expected to move through it, and the surrounding neighbourhood should be sufficiently dense for the scale of the infrastructure. The transit hub becomes an orientation device for the residents, a beacon to draw them to the building, for transportation and for their daily needs. The latter can register patterns of human association and interaction, the building blocks for an architecture of place imbued with culture, memory, and connections to our neighbourhoods.

Case Studies: Train Stations/Hubs

The train station and transportation interchange hubs chosen as case studies have all been designed with keen regard to the movement of people through space and to the creation of possibilities of social interactions and “events” due to the organization of a variety of programs within the circulation spaces. They have also taken into consideration their surrounding sites and act as regenerators by re-connecting their surrounding neighbourhoods to the city, and providing bridges over the barriers of transportation corridors. By examining these works of architecture, which all have different strategies for these issues of movement and connection, methodologies for tackling the Bayview Transit Hub can be determined.

Body-Produced Space: Napoli-Afragola Railway Station

Zaha Hadid - Naples, Italy – 2003-2012

Once completed in 2012, Zaha Hadid's design of a new railway station in Naples, Italy will be used by high speed trains traveling the Rome-Naples corridor. Hadid's building will also act as a transport hub and point of connection with local, intermodal transit lines. With an area of 20,000 square meters and a length of 350m, this facility encompasses not only the passenger waiting platforms but regional services including bus, taxi and car parking, a natural park, agricultural experimentation facilities, shopping areas and sports facilities. The core of Hadid's design was to create a well organized transport interchange that would simultaneously serve as a new landmark gateway to announce the approach to Naples, and act as a connection to the new proposed neighbourhood surrounding it. The Napoli-Afragola railway station is most interesting in its design approach, for it is the result of mappings of the body moving through space as a generator of form.³⁹

The proposal for design is a raised bridge extending nine meters high, stretching across the tracks. The concept of the bridge emerged from the idea of widening the overhead concourse area which connected the platforms, to such an extent that it would become the main passenger concourse itself. The station's low profile and sinuous form is meant to prevent interruption to the continuity of the surrounding urban fabric. By utilizing the space above the tracks it causes the least amount of disruption to the neighbourhood, simultaneously bridging the impassable barrier of the railway tracks and demonstrating easily recognized and accessible entry points. By providing these entry points on both sides of the tracks the station acts as a thoroughway, providing an urbanized public link over the impenetrable barrier of the railway. The bridge concept also allows for two strips of extended parkland to move openly through the site alongside the tracks, connecting the building to the surrounding landscape.

³⁹ Zaha Hadid Architects' website, <http://www.zaha-hadid.com/transport/napoli-afagola-train-station> provided documentation of this project, and this thesis draws from it.

Figure 17. Plans of Napoli-Afragola railway station, levels 3, 4 and the roof

The architectural language proposed was obviously designed with regard to the articulation of movement. As is usually considered with Hadid's work, within the interior of the building the trajectory of the travelers determines the geometry of the space. The body moving in space produces space. Constructed of concrete and glass, the structure is organic in form, rising up with a greater slope at the ends. Passengers enter at either end and travel to the heart of the station in the grand hall, whose facades are made up of large panes of glass to offer a view out in the vast landscape beyond, as well as a view down to the platforms. From the grand hall passengers can ascend to the upper level where the shopping area and restaurants are, descend to the tracks. In Hadid's transit hub the experience of inhabitation, while in transit, secures its meaning in a direct reference to the body in motion. The architecture refers to organic forms and the plan emulates natural passage with curved walls, soft, smooth, body-like paths. Hadid's building facilitates the path of least resistance, overcoming the inconvenient disruption of urban transit and creating the easiest flow from point A to point B. The travellers' trajectories determine the plan and section. It is a massing that enables passage through non-platonic geometries.

Figures 18 & 19 Aerial view of the station stretching across the tracks (above) and interior view of inhabited circulation space over the railway tracks (below)

The “Stitch” or “Spine”: Chatswood Transport Interchange

Cox Richardson Architects and Design Inc. [as CoxDesignInc] - Sydney, Australia – 2005-2009

The Chatswood Interchange by Cox Richardson Architects and Design Inc. is located in the bustling business district of Chatswood, a major economic hub of Sydney. This building provides a useful case study for our purposes because its site is analogous in certain ways to the site considered in this thesis project. The rail line created a disconnection between the hub and the neighbourhood and the configuration of the transit lines had a North-South axis meeting an East-West one. The architects' solution to these problems of fabric rupture was to create a central circulation “spine” containing passages of movement and physical connections to the surrounding neighbourhood. The Chatswood Interchange stitches itself into the urban fabric by embedding itself into the site. An intermodal public transport interchange built on the site of the old Chatswood Railway station, a building which was historically rich - but lacking the scale required for the growing neighbourhood. Over 40,000 commuters per weekday use the new station. The process of design began with a concept design which attempts to broadly define transport, access and civic amenities. The architects addressed the fundamental problems of the site, that the barrier of the railway line caused the old station to be disconnected from the surrounding neighbourhood, and that the original building was dreary and poorly designed, such that movement through it was difficult.⁴⁰

⁴⁰ Metro Chatswood's website, <http://www.metrochatswood.com.au> provided comprehensive documentation of this project, and this thesis draws from it.

Figures 20 & 21: The original Chatswood station (left) and the new station (right)

Figures 22 & 23: Interior photos of circulation spaces and main atrium

The new interchange includes a major reconfiguration of Chatswood Station with improved pedestrian access and connections to adjoining buildings and public spaces. This project involved the design and construction of a new railway station with twin rail platforms, a commuter concourse, connector bridges, a new bus interchange, taxi stands, kiss-and-ride facilities and an underground car parking. Programmatically the architects sought to combine a state of the art rail infrastructure system with a large shopping centre over eighty metres in length and twenty metres in height. The shopping centre in “Chatswood is arranged over four distinct retail trading levels each offering specific trading opportunities which reflect the retail space available, customer access points and direct synergies with complimentary land uses in close proximity.”⁴¹ The planners’ aim was to create a sense of place by tying a unique shopping experience in with the experience of mass transit. The project also includes bringing further life and activity to the hub with the construction of three residential towers over the interchange

⁴¹ <http://www.metrochatswood.com.au>

planned for the near future.⁴² Their design takes into consideration the needs of a growing community, whose immediate resident population base will be significantly expanding in the near future. Three green spaces have been provided along the North-South axis, including the remodelling and incorporating of the previously unconnected Garden of Remembrance, which used to sit isolated at the southern end of the old station.

The building is based around two dominant axes – one running North-South following the rail line while the other running East-West is buried, meeting the first on a diagonal. Both axes are lined with shops, creating a sense of a pedestrian mall. The intersection of the two is an open space topped with a lofty transparent canopy, with clear axial sightlines to the concourses. The station is highly visible and accessible from the street by a combination of well-situated escalators, stairs and elevators. Connections with surrounding buildings, as well as the permeability of pedestrian movement through the interchange, are enhanced by a system of sky bridges at different levels. The architecture of the entire interchange is one of connection.

Figures 24 & 25: Aerial photo showing atrium “spine”, ground floor plan showing connections with surrounding neighbourhood

Approaching the station by train, passengers are afforded interesting views of the art deco townscape of the surrounding Chatswood area, as well as the mall concourse and pedestrian streets of the station itself. These views provide a sense of relation to the neighbourhood. The bulk of the interchange’s retail components face the urban centre side of Chatswood and at ground level shops come out to the pedestrian street edge. From the upper galleria of the shops

⁴² After construction of the interchange, various public works initiatives which will further enhance the Chatswood city centre have begun, including a major performing arts venue with a 1,000 seat concert hall, a 500 seat theatre, exhibition space and library facilities.

and restaurants, as well as from the bus interchange, passing trains can be viewed. The North-South rail Line passes directly through the shopping centre in a dramatic, architecturally designed 'Rail Corridor' which overlooks the public mall areas. This makes the experience of mass transit travel an active and shared part of the urban experience. In their design for this interchange hub, the architects have shown a strong concern for connectivity with the urban fabric, movement and revitalization of the Chatswood neighbourhood.

Multi-Level Network: Interface Flon Railway and Metro Station

Bernard Tschumi - Lausanne, Switzerland - 1994-2001

As in the previous case study, there are analogies between the sites of the Flon Station by Bernard Tschumi and the Bayview Transit Hub site. Tschumi's Interface Flon Railway and Metro Station is a simultaneously raised and sunken multi level network, creating connections to

buildings at many levels and with many modes of transportation. As opposed to Hadid's organic forms and Cox Richardson Architects' infill design, Tschumi's design solution is orthogonal and geometrical. The Interface is not as an end point, but a momentary pause along the journey through Lausanne, one where social interactions and collisions are to be encouraged as mass transit lines and moving people intersect a wide variety of programmatic functions.

The station, located in Tschumi's hometown of Lausanne in the heart of the Flon Valley, is the first part of a larger infrastructure network of transportation systems that has been built to link Lausanne's suburbs with its city center. The project responds to the topography of Lausanne, which is as hilly as San Francisco. This topography has defined the relationship between streets and buildings and Lausanne's urban space itself: "The practical irrelevance of a consistent datum plane has also transformed the very concept of urbanism in this city," writes Tschumi.⁴³ Buildings function as vertical passageways, rooftops as entry levels and bridges are key to the function of multi-level circulation. This area of Lausanne also has the unusual condition of being home to many of the obsolete industrial buildings of the city, and therefore

⁴³ Tschumi, *Architecture In/Of Motion*, 41

Figure 26: Plan and section of Interface Flon

calls for a more complex design process. The opportunity Tschumi saw here was to implement contemporary activities and architectural ideas in the heart of the historical city fabric. Not unlike the West Ottawa site considered in this thesis project, the Lausanne site was vacant and full of potential due to its existing conditions, and due to its nature as a junction point of many modes of transportation.

The Interface Railway was conceived as part of a larger master plan and functions foremost as a new transportation interchange for the city, linking three separate train and subway lines on one level, two bus lines on another, and pedestrian traffic coming from four different levels. Four inhabited bridges were proposed – and each of these was given a specific character. The bridges all would act as urban generators, encouraging unpredictable events and allowing for new programmatic functions to appear in the future. Each bridge has two categories of use, including public/commercial use and pedestrian traffic. “Along the valley’s North-South axis, the inhabited bridges used programs to link two parts of the city of conflicting scale and character.”⁴⁴ Thus it is the circulation that brings the building together and it is its programmatic functions within these circulation spaces that anchor the building to the neighbourhood.

⁴⁴ Tschumi, *Architecture In/Of Motion*, 41

The building is a steel-framed structure, and it is clad in red glass. The modern design includes glass-enclosed bridges and an obliquely shaped plaza. The station was designed conceptually as movement vectors in a dynamic circulation system. It is an architecture of pure infrastructure, designed with many ramps, escalators and elevators that connect the lower levels of Flon Valley with the upper levels of historic Lausanne. The bridge on the North side connects a series of unoccupied buildings and vacant lots. City planners hoped this connection would trigger transformations of the surrounding context - such as new construction and rehabilitation of existing structures. By creating this connection, Tschumi also created the possibility for a new network of urban relationships, which would in turn act as regenerators for the urban center, supporting the wide variety of its programs by an influx of new inhabitants, who bring with them new life and vitality.

Figures 27 & 28: Views of Interface Flon showing the elevated bridges and multi-level connections

Chapter 4

Bayview Transit Hub Design Project: The Site

Movement in Ottawa and the Island Effect

Figures 29 & 30: Paths of movement in Ottawa, diagram showing the island effect separating the design site into fragments

To be “somewhere” in Canada’s capital city is intrinsically bound with the question of “getting there.” Historically, Ottawa has been shaped by various modes of transit. Originally founded at the confluence of three rivers, the National Capital was influenced by the Rideau Canal, the Canadian Pacific Railway, the Trans-Canada highway, the public Transitway and its various scenic parkways and roadways. Ottawa’s boundaries continue to stretch outwards beyond its Greenbelt. As its roads push further and further into the countryside, the lack of mass transit connections between the central city and the far flung districts that since amalgamation (in 2001) have formed part of the administrative urban construct “The City of Ottawa,” have become painfully obvious. The fast pace of a city so focused on movement and the quickest paths between points of departure and arrival has constituted disruptive forces on the urban fabric. There is a lack of integration between the city and its neighbourhoods. These have become satellites that are no longer connected with each other. Public transportation in Ottawa is often a dreary journey, with banal stations offering the only links between neighbourhoods. This thesis seeks to undo the island effect and to re-connect, or re-stitch transit sites back into the urban fabric. In particular, this thesis considers the current Bayview O-Train station, located at the intersection of the North-South O-Train line with the Transitway

and Scott Street. Through a deep analysis of the area, its culture and its history, “truths” about the site are sought which could then inform the transit hub design. Through physical connections (bridges and other multi-level passageways) and visual relationships (views of the river and downtown), the hub can potentially link Bayview Yards with the City of Ottawa in a memorable way.

Bayview Yards

Figure 31: Location of Bayview Yards in Ottawa

Site History

The site for this project is located in the Ottawa neighbourhood of Mechanicsville, West of downtown between Lebreton Flats and Tunney's Pasture, and North of Chinatown and Little Italy. This region of the city is bounded by the Ottawa River to the North, Scott Street to the South, Parkdale Avenue to the West and the former CPR rail line (now the OC Transpo O-Train line) to the East. It is neighboured by Hintonburg, Ottawa's up and coming arts district, which was one of Ottawa's first industrial suburbs accessed by streetcar. Mechanicsville was home to Chaudière Falls mill workers and railway workers starting in 1872. Houses were small, two

storeys in height with inhabited attics, built by hand from brick and lumber, and rarely included basements - as the rock substrate was so close to the surface. In the 1870s land was acquired from the area to develop the Canadian Pacific and Canadian National railways (CP and CN). At that time this was regarded as economic progress to be encouraged which would bring work and workers to Mechanicsville, fostering growth. The railways have always played a dominant part in the life of this neighbourhood. The great fire of April 26, 1900 did not destroy Hintonburg and Mechanicsville due to the protection of the railway lines.

Figures 33 & 34: Steam locomotives at the old coal chute just North of Wellington Bridge (left), and at the old roundhouse (right)

As mentioned above, the specific site for this project is the current Bayview O-Train station. The scope of this project includes what is now considered the “Bayview Yards” area – from Stonehurst Avenue and Bayview Road to the West, to the City Centre building just East of the O-Train line, and from the Ottawa River and Nepean Bay to the North, to just South of Scott Street. The bulk of the site was once underwater - originally Nepean Bay extended South as far as Scott Street, until it was filled in by the National Capital Commission (NCC) between the 1940s and 1960s, in order to construct the parkway over top in 1968 (acquisition of land to create it began in 1948). The NCC removed derelict industrial buildings from the area and recreated the shoreline, leaving an open green space along its length for “car tourists”. Unfortunately, however, the parkway separates the site from this green space along the river. Just South of Nepean Bay was the Bayview Railyards, with tracks for the CP and CN railways.

It was Parisian planner Jacques Gréber who advised the city to remove the railways which had so long defined this area. The railways were thought to be a negative reminder of the Industrial era, polluting the air and obstructing roads (as all tracks were at grade). The Queensway replaced the line to the South. The Scott Street CP railway line to the North, which originally ran the “Dominion”

Figures 35 & 36: Aerial views of Bayview Yards and Nepean Bay, 1960

and “Canadian” line trains that passed through Ottawa on their way between Vancouver and Montreal, was abandoned in the 1980s and later replaced by the Transitway. Now only the Easternmost line remains as train tracks in the form of the O-Train. This O-Train line was once the Canada Central Railway line, running through the old Ottawa West Station (which was closed in 1967), over the Prince of Wales Bridge, through Hull to the Alexandria Bridge and back into Ottawa at the Union Station.

Off Bayview Road, just South of Scott Street is the Tom Brown Arena. Originally occupying this site was a railway roundhouse built in 1911. The roundhouse, a semi-circular building with smokestacks on top, was the place for storage and servicing of steam engines, and could hold up to 37 at one time. It was the centre of employment for many CP railway workers living in the neighbourhood. Its demise was due to the conversion of trains from steam to diesel in 1955; with diesel engines came simpler maintenance and fewer workers were required. The roundhouse continued its activities until 1966, and for a short time after was occupied by a building supplies company. The roundhouse was demolished in 1968, the same year the parkway opened, and the Tom Brown Arena was built shortly after, named for a local activist whose dedication to youth sports organizations made the construction of the arena possible. Today the arena is an important destination for the youth of the Mechanicsville area.

Figures 37 & 38: Then and now: the railway roundhouse and present day Tom Brown Arena

To the East of the site is the City Centre office building, planned as a large circle that may have been inspired by the roundhouse. This land was once home to the D. Kemp Edwards lumberyard as well as a coal distributor, and the current storage units were used as warehouses which had convenient access to goods coming off the railway. Beside it was the O-Keefe/Bradings Old Stock Ale brewery, which is now a housing development on Albert and

Champagne Streets. These businesses made good use of the railroads, and thrived in the early 20th century. In 1967, Wellington Street was severed by the expropriation and demolition of LeBreton Flats, and by the demolition of the rickety bridge over the rail line which crossed over the site just South of the existing Scott Street bridge, and linked Wellington Street in Hintonburg to Wellington Street in LeBreton Flats. This is why today there is a Wellington Street East and a Wellington Street West, a distinction that is cause for some confusion among newcomers or visitors to the city. This demolition of the bridge led to a cutting off of traffic, which decreased Mechanicsville's once thriving retail community. The still existing Prince of Wales Bridge to the North was built in 1880 and named after Albert Edward, Prince of Wales. This bridge crossed the river at Lemieux Island and provided the connection for CP railway passenger trains heading through Hull into Ottawa.⁴⁵

Figures 39 & 40: (left) CP Rail steam engine train loaded with coal headed to Prescott in front of the old Wellington Street bridge and Bradings Old Stock Ale Brewery, (right) Freight train arriving at Ottawa West station in October 1967

What Exists Now and the City's Proposal

The site itself still holds some traces and remains of the industrial era. There is Merkley's builders yard and stone masonry workshop, once a junk yard and lumberyard, and the City Works building on Bayview Road. The nearby waterworks water filtration plant at Lemieux Island is the site of the 1896 Hintonburg pumping station, which was destroyed in a fire, and is now sitting in ruins. The neighbourhood in the past has been threatened to be Lebreton-ized – that is, razed and cleared of the “slum” housing. Fortunately a more natural regeneration has

⁴⁵ Facts for Site History from John Leaning, Hintonburg & Mechanicsville: A Narrative History (Hintonburg Community Association, Ottawa, 2003) 11.

occurred piece by piece, plot by plot. The Hintonburg-Mechanicsville area is slowly being turned into a new arts district, with urban renewal projects such as paving stones on the sidewalks, public art sculptures, the new Great Canadian Theatre Company (GCTC), galleries and condos. Alongside the river, joggers and cyclists make use of the city pathway, though the parkway provides a barrier to accessing the site.

Figures 41 & 42: The last train to cross the Prince of Wales Bridge in 2001 (left) and the bridge as it is in disuse today (right)

The Bayview O-Train station was built in 2001 as a new transfer point between the Transitway buses and the newly revamped North-South light rail line that runs from South Keys to Bayview, passing through Carleton University. The city purchased the Prince of Wales Bridge along with the CP rail line for use by the O-Train, but so far it has not been used since it was embargoed on July 26, 2001. The North end of the bridge is still used regularly by the Quebec-Gatineau railway to access the Eddy spur. The NCC has expressed interest in plans to use the bridge as a pedestrian and cyclist passageway, or as a rapid bus transit route connecting Gatineau to Ottawa.

Figures 43 & 44. The existing O-Train station at Bayview

In 2005 the City of Ottawa issued the results of a planning study of the Bayview Yards area. This new official plan outlined a newly designated mixed-used centre, with high to medium density residential buildings as well as a mixed use civic facility, and a proposed national/government facility. Parkland to the Northeast of the transit station will continue to be green space and the city proposed a study for a future transit hub. Unpublished plans include a 32 storey office tower on an unused parcel of land between Scott Street and the current City Center building. This thesis takes into consideration the city's proposal, and makes further recommendations and gestures to bring the strategy for new development more in line with a transit-oriented development. Here the creation of a high-density, mixed-use, liveable, compact, walkable community is centered around the public transit system -- where the hub becomes a focal point and anchor for the neighbourhood.

Figure 45 The City's official plan for the Bayview Yards site

Disconnections and Obstacles on the Bayview Site

One of the main challenges of this site is that the roadways and railway form continuous barriers that are almost impenetrable by cross movement. They are visually prominent at the peripheries, hoisted far enough above grade to be seen from a distance. To the North is the Ottawa River Parkway, slicing the site from the river. Despite having been meant for “car tourists”, motorists are separated from the river by being both on top of an embankment and behind the glass of their car windows. Focused on getting to their destination at at least 60km/hour (though most times more than that), they have little chance to glance out on the beauty of the Parkway’s green spaces. As such, one of the design issues of utmost importance becomes establishing a strong connection between the new transit hub and the Ottawa River.

Figures 46 & 47: The Ottawa River Parkway and the unused bridge leading under it to the river

Currently, pedestrians are forbidden from walking along the Ottawa River Parkway and the only crossing is an almost hidden sombre bridge built for the railway track, which while unused and abandoned still passes beneath. This area holds many relicts from the time of the railway, such as old signals and equipment, left to be overgrown by weeds. The railway tracks twin out just before Bayview Station, the line passing under the parkway bridge which heads across the Prince of Wales Bridge to Lemieux Island having been in disuse since 2001. These sets of tracks cut the site in two: on the West, the land currently home to Merkley’s masonry workshop which will be the future residential development, and on the East the parkland and future train station. Access to the currently used O-Train tracks is forbidden; tall fences have been erected

on either side with signs posted indicating the fines for trespassing. There is no way to cross these tracks save the roadways above. The new transit hub here proposed will embrace and enfold these tracks within it, providing access to pedestrians both over and around them.

To the South of the site are the two roadways that span above the train station and tracks with two twin bridges – the Transitway and Scott Street. The Transitway Bridge is inaccessible to pedestrians, and the Scott Street is crossable by people and cars only at the underpasses located at the train station and Bayview Road. Scott Street is a slightly less impenetrable barrier, but as a main thoroughfare car traffic speeds along so quickly that it is difficult for pedestrians to cross. The sole pedestrian traffic light is located far beyond the train station. Currently, pedestrians coming from Mechanicsville are forced to climb the steep embankment by the Tom Brown Arena and jaywalk across busy Scott Street, or else face a much longer, inconvenient journey to get to the O-Train and Transitway. The proposed design for the transit hub takes into consideration making these connections easier and opening this area up at grade, so that pedestrians can flow through the site more easily.

Figures 48 & 49: (left) Scott Street, (right) the twin bridges of the site: the Transitway and Scott Street

Why is the Transit Hub Needed For This Site?

The Transitway will be home to the future East-West light rail line, which will be encompassed in the new transit hub building. As outlined above, the Bayview site has a long history of transportation activity, from the old Ottawa West train Station and CP/CN railways and railyards, to the modern day O-Train station and Transitway. This project proposes the

reuse of an historic transit node in a new way. The transit hub will create a much needed connection to Carleton University and as an alternative to downtown Rideau Centre and Billings Bridge Plaza it will provide shopping and restaurants to students with just a short 5 minute trip from the school. It can be a meeting place, a comfortable space to study or to take a break from the educational environment. It provides a key destination point for the North-South line, instead of riding from South Keys to an area with no identity, Bayview Yards helps tie the path together. It also creates a measurable halfway point between East and West. Those riding the train will recognize the distance remaining by “scaling” the sequence of stations off the hub.

As a focus on transit-oriented development the hub becomes a transformation point for the site, bringing people there at all times of the day, inspiring both new construction and densification. The hub becomes a strategic tool for the urban plan in that the site will be transformed by it, and the building transformed by the future developments in a reciprocal relationship. Finally, in a city that since amalgamation extends far beyond a scale that is understandable to the city dweller, the Bayview Transit Hub aspires to provide a meaningful form of orientation and understanding of this City and its landscape.

Figure 50: Artist's concept of the City of Ottawa's future light rail station at Tunney's Pasture

Chapter 5

Design Project: Methodology

The ideas explored through Chapters 1 through 4 provide the basis for a design project: a transit hub for Ottawa. This thesis's final chapter presents a proposition and elaborates upon the site conditions, the urban context and design methodology. The goal of the design is to illustrate the idea that a building dedicated to organizing movement can provide meaningful experiences of inhabitation. The project relies on a weaving together of both movements and stable connections to the neighbourhood.

Figures 51 & 52. Site analysis. (left) paths of movement and gathering points, (right) superimposition of the old Nepean Bay shoreline AutoCAD plans City of Ottawa, graphic emphasis by the author

The design project for the Bayview Yards site combines programmatically a transit hub with a neighbourhood library branch, community center, retail, food services and offices. The building is situated parallel to Scott Street. Its massing organizes two linear 'bars' which connect to the train platforms, and which hold the main transit hub functions as well as a library and community center. These bars are offset horizontally from each other, suggesting a slippage, or the movement of two trains passing by each other. They frame the central circulation space, which itself is rhythmically punctuated by the structural elements – concrete columns spaced on a five meter grid. The East-West light rail train tracks are elevated above grade and they retain the current elevation of the existing Transitway. The parallel tracks effectively split apart to surround the transit hub, and then are joined again, on either side of the new building. These tracks penetrate the linear bars on the second level where new platforms, seven meters in width, provide an interface to receive and manage the flow of passengers. The eastbound tracks are located on the South side of the building and the westbound tracks on the North. By

incorporating the tracks with the building, access to transit is made easier and movement through the site flows from every direction. The North side of the hub opens itself up to the river, the East to the downtown core, and the West and South to the surrounding neighbourhoods of Bayview Yards and Hintonburg. The new multilevel transit hub strives to establish meaningful connections to the neighbourhood and landscape. The multiplicity of connections, scales and access points all contribute to the project of creating stasis amidst movement.

Figure 53 Site plan showing the City of Ottawa's new proposed residential development and 32-storey office tower surrounding the design for the new Bayview transit hub. Source of aerial photo. Google Earth, shadows and transit hub massing plan by the author.

Anchoring the Hub: The Programmatic Elements

"A city's very structure consists of a mixture of uses, and we get closest to its structural secrets when we deal with the conditions that generate diversity."⁴⁶

The question of how to anchor the hub to the site programmatically arose early in the design process. What types of programs could spin off this functional transit node? What urban infrastructure projects could be included? The possibilities for this site were rich and numerous from both social and urban points of view. The chosen programs needed to take full advantage of the site's possibilities: the needs of a new neighbourhood in the making, and the transient flow of passengers from all corners of the city. From the point of view of this thesis, the intermodal hub was required to incorporate two kinds of programmatic components: dynamic ones (relating to the urban transit situation and public spaces) and static ones (relating to the neighbourhood). These programmatic offerings needed to keep travelers engaged, whether moving or waiting. Finally, because the experience of place is closely tied to the variety of social experiences, the design of the hub's peripheral elements needed to encourage public life and interaction.

The first choice for an anchoring program was a new main library for Ottawa. Currently, the city is searching for a new home for the central library and has commissioned functional studies and examined various downtown sites. In parallel to this, the city's proposed master plan for Bayview Yards indicated a possible national or civic facility adjacent to the transit hub. A branch library promised to impart a specific urban identity to the site and create a focal point that would encourage public transit to and from the neighbourhood. By embracing the current paradigm of library typology unfolding in Europe and North America (one where the library becomes a hub for information and recreation -- a meeting place that is also a site for social interactions), the building would provide a contrast to traditional libraries that are stable urban figures. By incorporating a diversity of programs which would be shared with the transit hub, the main library could become a landmark anchor for the community to strengthen its presence locally. It would be flexible enough to create a receptacle for the dynamic flow of life in our modern city.

⁴⁶ Jane Jacobs, The Death and Life of Great American Cities (Random House, New York, 1961) 376.

However, as the design proceeded, it became obvious that the task of taking on two buildings of such importance was problematic. Was the building a transit hub with a main library, or a main library with a transit hub attached? Would the hierarchical status of a central library have the effect of overshadowing the transit hub, and, in a sense, rendering it transitory? Would this imbalance undermine the thesis's main goal, to create stasis amidst movement, in the transit hub? These conflicting questions led to the decision to develop a neighbourhood branch library rather than the main library proper. The addition of a community center to serve the new neighbourhood, as well as more ephemeral programmatic elements, reconnects the neighbourhood to the city through the transit hub. (See Appendix A for the Functional Program)

Figure 54: The third floor entry to the library is a special space, differentiated materially from the rest of the building as a wood pavilion juxtaposed against the brick, concrete and glass. The floor is stone tile, reused from Merkley's stone masonry workshop. One long wall is a gallery space, displaying works from local Ottawa artists, providing a connection to the rest of the city. Adjacent to this space is the library bookstore and café. Along the entry corridor to the library is a "museum" of the heritage of Ottawa, perhaps displaying a model of the city as well as images from its past and present.

Transit Architecture as Hinge: The Dynamic Between Hub and City

The transit hub acts as a dynamic hinge between the movement of the city and the stasis of the neighbourhood. Travelers flow through the building in many ways. They are either ending their journey in the hub as a destination point – to accede to the neighbourhood, or pausing there – or disembarking from trains and re-embarking on others. It is a transitional space where programmatically the more "static" elements (library, community center, etc.) which anchor the hub to the neighbourhood contrast with the more "dynamic" ones of the transit station and the

ephemeral spaces of coffee shops, fast food and retail. To reconcile this disjunction between the static and dynamic programmatic elements, and use it as a tool for design, I have situated these spaces in a way in which they coincide and intersect with one another.

The static elements are situated on the upper levels, in a sense 'weighting' down the building, grounding it with the neighbourhood. They provide the hub with functions that root it to the neighbourhood, that give reasons for people to inhabit the building other than for pure movement and transition. The hub can be a point of brief passage or a longer term destination. Interaction occurs between the long and short term visitors in the central circulation space. The people who sit to wait for the trains have a visual connection with the library patrons across the atrium, and those reading books in the library can look down and watch travelers come to and from the platforms.

Figure 55 Conceptual sketch for the design showing adaptation of van Eyck's notions of kasbahism and Hertzberger's structural competence as well as coinciding and intersecting dynamic and static spaces.

Context and Conditions for Design

Revealing the Site: Layers of History

This design project is interested in developing the transit hub as a space of collective experience, one that can become part of collective memory over time. Because it is a landscape element and a fundamental geographical connector, I felt that the transit hub should reflect the

rich history of the site. While this principle should certainly apply to each station that the transit line stops at throughout the greater Ottawa region, it is especially important at the site of the hub proper. Additionally, the multiplicity of users, their fundamental anonymity and the transitory presence, all called for a very open ended approach to programmatic narrative. Responding to these conditions, I created a conceptual drawing of the site early in the design process. This drawing layered various “readings” of the site together and attempted to be objective and documentary in nature. Making references to the scale and size of neighbourhood buildings, both in the present day and historically, the drawing sought to capture the rhythms, patterns and scales of the surrounding site. As will be discussed later in more detail, the drawing intersects important topographical elevations, orientations and site features, with a row of pure rectangles – hereon referred to as “pavilions” – dimensioned and spaced as typical vernacular worker houses of this neighbourhood.

Figure 56 Layered 'given spatial overlaps' conceptual drawing

Figure 57: Close-up of conceptual drawing showing spatial overlaps and intersection of elements

This conceptual drawing resulted from a similar process to Tschumi's site plan drawings for the Parc de La Villette, in which Tschumi generated a layered diagram made of discontinuous referential elements: a grid of points, a system of lines and a layer of surfaces or open spaces. Eschewing picturesque approaches to landscape and any kind of naturalism, Tschumi accepted the intersections as givens, allowing the park design to emerge out of the flattened diagram. As described in the captions illustrating his competition plates, this approach encouraged "the combination of apparently incompatible activities (the running track passes through the piano bar inside the tropical greenhouse)."⁴⁷ As in a jazz composition, every element played across the paper at its own unique, different measure. These playful rhythms and sequences were utilized as generators of form, and the design began to emerge. In the case of this project, the conceptual drawing was accepted as a given, as it were, and was extruded and exploded to

⁴⁷ Bernard Tschumi, Cinegramme Folie: Le Parc de la Villette (Princeton Architectural Press, January 1988) 4.

generate the plans, sections and elevations of the transit hub. No attempt was made to design the “correct” urban figures, as such, to house the program. Rather, the design process involved layering and collapsing the site’s “truths” (dimensional, topographical, cultural) and then extracting spaces of habitation from this layering. We could describe the formal principle employed a play of “as given spatial overlaps.”

Sequentially repeated along the axis of the hub, the masonry pavilions provide static formal anchors. These in turn house programmatic functions necessary to support the population of this new neighbourhood. Recalling the traditional homes in the neighbourhood via their form, scale and materiality, the pavilions house smaller, more transient programmatic elements such as retail spaces, coffee shops and offices. Depending on their location, they exemplify different kinds of movement. On the upper levels and the train platform level, they pass through but are less accessible; in contrast, they manifest a more rooted presence as they reach down to the ground. Their skewed axis in relation to the train and hub building reflects the angle of the streets of the nearby residential neighbourhood. The ground floor of the building is also set to the datum plane of this neighbourhood’s ground level, providing a further connection.

A bicycle and pedestrian ramp leading from the river to the building makes reference to the old shoreline. The movement along this path is similar to that of the old industrial railroad tracks - which used to run along the water’s edge. The facade of the building takes its rhythm and scale from the repetition of the scale of one train car, rotated vertically. The de-commissioned second railroad track which used to run alongside the North-South O-Train line and across the bridge to Quebec has been turned into a pedestrian and bicycle path, with a linear ‘garden’ alongside it. Beginning at the northeast edge of the Tom Brown arena and cutting through the entire site leading up to the top of the hill beside the parkway is a causeway, an elevated and enclosed path which makes reference in proportion, materiality and form to the nearby Prince of Wales bridge. It is a quick journey from the neighbourhood to the top of the hill near the parkway, and to the view to the river which that vantage point proffers.

Figures 58-60 Longitudinal section through building showing masonry pavilions (above), Detail of pavilions showing more transient programmatic activities (middle), Traditional brick homes in the Hintonburg-Mechanicsville neighbourhoods (bottom)

Celebrating Circulation: Structure and Movement

Movement occurs through the building from all directions in a network of paths which connect at multiple levels. The ground level of the building has access points from all directions. Whether coming from the surrounding neighbourhoods by foot, from the river by bicycle, from the South by train or by bus or car from downtown, the traveller finds an entry point facing each path of arrival. Coming from the East or West by light rail train, passengers disembark on the second floor platforms. All of these entries converge in the main circulation space and from there commuters can enter the retail spaces of the ground floor, ascend one level to the transit platforms, or continue to the library and community center on the upper floors.

All vertical circulation occurs in this main atrium, which is brightly lit by skylights above. The hub is all about seeing and being seen, as these circulation paths are highly visible from all levels. The main circulation atrium provides several communal spaces where commuters can pause and gather. The circulation space of the transit hub is the most celebrated space in the building. Centrally located, this 24 meter tall atrium space is rhythmically articulated by the building's structure. There are multiple choices for how to move through the building and many arrival and departure points, but all of these options lead back to this main space, making wayfinding easy. The atrium circulation space is one that you always return to and pass through, and the intersection of this circulation space with the programmatic pavilions yields unexpected encounters.

Figure 61 Detail of one of the entry spaces on the ground floor. The masonry pavilions are elevated off of the ground floor here, allowing the smooth flow of people arriving and departing. Beneath these raised boxes are lights which accentuate the entrance space. The floor below them is cork, while the floor between has gratings to catch water and snow. These materials emphasize the threshold with their tactile nature. (above)

Figures 62-63. Photos of the model showing interaction between elements: the two programmatic bars, the main atrium space between and the elevated walkway from the neighbourhood to the hilltop

Accommodating the Unexpected: Creating Possibilities for Events

The transit hub design seeks to fulfill the idea expressed in earlier chapters: that the creation of memorable experiences of place is a function of rich social interaction between inhabitants, the possibility for meaningful “events”, and the architecture’s capacity to provide a sense of orientation. Using the principle of “as given spatial overlap” and volumetric intersection, the transit hub’s collective spaces trigger memorable encounters for a large number of people. The building does not have strictly defining spaces which are rooted to one program. These programmatically undefined spaces leave the building open to dynamic narrative possibilities, to the unexpected and the undefined. There is the chance for multiple meanings and interpretations. As all of the circulation occurs in the main atrium space, movement at different levels creates the possibility for intersections between the dynamic paths and the static neighbourhood functions. Here is the framework for the collective social space of the building, the potential for spontaneous and chance encounters. The interstitial space of the transit hub thus becomes a generator of meaningful inhabitation.

Conclusion

Figure 64: The author waiting for the approaching O-Train at the existing Bayview station, the day of the defense of this thesis: April 27, 2011.

Now, more than ever, our relationship to urban space is dynamic and our ties to the public realm are based in movement and change more so than on fixity. But the act of habitation, necessarily an intimate one and for which the first condition is a sense of closeness with one's environment, is in contradiction with the act of moving. With much of our modern life is spent in transit, it would seem important to inhabit the anonymous and dispersed realm of public transit spaces and to reconcile two seemingly irreconcilable conditions. There is no doubt that the transitory moment is one that can be enriching. It is during our translations between places, our journeys through the city, that we come into contact with the other inhabitants of our urban realm. For this reason, the buildings located at the intersections of these paths of movement -- our public transit system architecture -- are culturally significant. These transit spaces bring us together much in the same way the church or the public square once did, as places where our identities as co-inhabitants of the same city can be developed and expressed. They register patterns of human association and interaction, the building blocks for an architecture of place. They are occasions for creating wonderful, dynamic urban spaces and are

invitations to open up a sense of place imbued with culture, memory, and connections to our neighbourhoods.

The design proposition for the Bayview Transit Hub seeks to provide meaningful experiences of inhabitation at the intersection of passages, and attempts to revitalize and reconnect the neighbourhood with its history and the greater city. The Bayview Transit Hub acts as a dynamic hinge between the movement of the city and the stasis of the neighbourhood, weaving together dynamic paths with static programmatic functions to engage the inhabitant in a part of a greater story. The history of the site and vernacular traces inspired the building's design. Site and building plan emerged from the intersection of spatial and historical traces at the neighbourhood scale with larger transit movements of the metropolitan region. These intersections were strategies to open up the transit hub's spaces to new meanings of inhabitation.

In its most profound meaning architecture is about orienting us, helping us understand where we are in the world. A building needs to primarily orient us with a site and a program, and with functions that are dependent on location and need. Here again, the transit hub provides an interesting architectural question in a very general sense. The transit building is, from a pragmatic point of view, entirely devoted to the mundane business of wayfinding. That it can also become an orientation device for one's greater position in the city and in the world, is appropriate. The transit hub inherently provides an occasion for meaningful connections to the complex cultural environment of our urban life. By becoming more than a simple structure for organizing movement, the transit building may also become an occasion for Architecture.

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Appendix A: Functional Program

Transit Hub Program

Functional Component	Gross Square Footage*
<u>A – Light Rail Services and Operations</u>	
A1 – Waiting and Queuing, Platforms	25,000
A2 – OC Transpo/City Information Center Desk	500
A3 – Ticketing Stands	200
A4 – Security, First Aid/Emergency and Light Rail Administration Offices	4,000
A5 – Lockers & Vending Machines	500
<u>B – Public/Retail Spaces</u>	
B1 – Main Concourse	15,000
B2 – Newsstand/Magazine shop	800
B3 – Corner Store	800
B4 – Food Services: Fast Food	3,000
B5 – Retail Shops	3,000
B6 – Offices	6,000
<u>C – Local Branch Library</u>	
C1 – Coffee Shop and Library Book Store	800
C2 – Welcome Centre/Checkout Desk	500
C3 – Fiction, Newspapers and Magazines	2,500
C4 – Technology and Digital Services (Computer Terminals)	2,500
C5 – Non-Fiction and Reference	2,500
C6 – Children’s Section	3,000
C7 – Learning Centre A: Languages and Literacy	650
C8 – Learning Centre B: Local History	350
C9 – Reading Areas (Including Outdoor Reading Garden)	4,800
C10 – Library Administration and Materials Handling	2,000
<u>D – Community Center</u>	
D1 – Gymnasium	4,000
D2 – Locker Rooms (Male and Female)	500
D3 – Kitchen/Food Preparation	900
D4 – Media and Activity Rooms	2,500
D5 – Community Rooms	1,500
D6 – Classrooms	2,500
D7 – Offices	2,000
Total Transit Hub Space	92,300*
Total Building Gross Area	120,000**

* includes washrooms, custodial closets

** includes 30% gross-up for circulation space (public elevators, main staircases and emergency staircases), mechanical, electrical and structural systems

Appendix B: Drawings

Drawing 1:	Conceptual Site Analysis Drawing
Drawing 2:	Conceptual Floor Plan
Drawing 3:	Site Plan
Drawing 4:	Ground floor plan (1:400)
Drawing 5:	Second floor plan (1:400)
Drawing 6:	Third floor plan (1:400)
Drawing 7:	Fourth floor plan (1:400)
Drawing 8:	Longitudinal Section (1:400)
Drawing 9:	Section (1:200)
Drawing 10:	North Elevation (1:400)

**Conceptual site analysis: spatial overlaps
and vernacular rhythms and forms**

Conceptual floor plan: structure and "archaeological layers"

LEGEND:

- 1. PATH TO HINTONBURG NEIGHBOURHOOD
- 2. GARDEN PATH TO RIVER
- 3. BIKE PATH TO RIVER
- 4. TRANSIT HUB SECURITY, FIRST AID, ADMIN. OFFICES
- 5. RETAIL / OFFICE / FOOD SERVICE
- 6. ENTRANCE TO ELEVATED WALKWAY
- 7. NORTH-SOUTH O-TRAIN PLATFORM
- 8. STAIRS TO SCOTT STREET BRIDGE
- 9. WASHROOM
- 10. PATH TO BUS STOP / CAR PARK
- 11. REFLECTING POOL
- 12. UNPROGRAMMED GATHERING SPACE

Ground floor plan - 1:400

3.

LEGEND:

- 1. EAST-WEST LIGHT RAIL TRAIN WAITING PLATFORM
- 2. COFFEE SHOP / FAST FOOD / NEWSSTAND / CORNER STORE
- 3. SCOTT STREET BRIDGE
- 4. STAIRS DOWN TO NORTH-SOUTH O-TRAIN PLATFORM

LEGEND:

- 1. COMMUNITY ROOM**
- 2. ACTIVITY ROOM**
- 3. COMMUNITY CENTER RECEPTION**
- 4. CHANGE ROOMS**
- 5. GYM**
- 6. LOCAL ART GALLERY WALL**
- 7. LIBRARY COFFEE SHOP / BOOKSTORE**
- 8. LIBRARY ENTRY WAY WITH OTTAWA "MUSEUM"**
- 9. LIBRARY CHECKOUT**
- 10. TECHNOLOGY CENTER**
- 11. LIBRARY ADMINISTRATION OFFICES**
- 12. CHILDREN'S CENTER**

LEGEND:

- 1. REFERENCE SECTION
- 2. OUTDOOR READING GARDEN
- 3. LEARNING CENTER
- 4. CLASSROOM
- 5. KITCHEN
- 6. ACTIVITY ROOM
- 7. COMMUNITY CENTER OFFICES

Longitudinal site section - looking North

LEGEND:

- 1. SIGNAGE / LIGHTING
- 2. COFFEE SHOP
- 3. RETAIL / OFFICE
- 4. LIBRARY ENTRANCE
- 5. LIBRARY BOOKSTORE / COFFEE SHOP

Detail of longitudinal site section - 1:400

LEGEND:

1. COVERED ROOF FOR BIKE PATH
2. LIBRARY
3. EAST-WEST LIGHT RAIL PLATFORM
4. TRANIST HUB SECURITY OFFICES
5. COMMUNITY CENTER (GYM)
6. ELEVATED WALKWAY
7. SCOTT STREET BRIDGE
8. NORTH-SOUTH O-TRAIN PLATFORM

Cross section - looking East

Detail of cross section - 1:200

1.

North elevation

LEGEND:

- 1. TOM BROWN ARENA
- 2. SCREEN
- 3. ELEVATED WALKWAY
- 4. COVERED ROOF FOR BIKE PATH
- 5. BIKE PATH
- 6. GARDEN PATH

Detail of North elevation