

The Sustainable Development of Urban 'Scrap Sites'

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Abstract

The superimposition of high-speed vehicular thoroughfares beginning in the 1960's onto the conventional square city grid has generated urban land fragments referred to in this paper as 'scrap sites.' Their adverse characteristics including their triangular shape, awkward for building placement, vehicular noise, and isolation from surrounding urban development has led developers traditionally to consider them undesirable. Attempts to develop these leftover sites have generally produced low-density or specific-use sites.

This thesis will show that despite their inherent drawbacks scrap sites can be developed to support high-density mixed-use projects. This paper considers mixed use and high density as the necessary criteria for sustainability. Managing the problems of scrap sites allows their transformation from underused discarded sites into valuable infill projects.

The accompanying design proposal responds to the site adversities of one Ottawa scrap site and shows how a mixed-use high-density development can be produced in a contextually appropriate way.

Acknowledgements

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Table of Contents

Scrap Sites	1
Case study I: 50 Laurier Avenue East	6
Case study II: King Edward Avenue	7
Case study Conclusions	9
Sustainable Scrap Sites	11
Case study III: Clarendon Court	20
Design Strategies	24
Edge Conditions	24
Adjacencies	29
Spatial Efficiency	34
Liveliness	38
Obstacles in the Practical Application of Sustainability	44
The Nicholas Street Site	48
Design Response for the Nicholas Street Site	54
Conclusion	79
Bibliography	85
Appendices	87

List of Figures

Ottawa site plans illustrating scrap sites	4
Site plans with approximate areas (m ²) – case study scrap sites	5
50 Laurier Ave. East – site plan	7
King Edward Ave. site – site plan	8
Diversity within city blocks	18
Accessibility –Clarendon Court	22
Programming –Clarendon Court	22
Clarendon Court	23
Scrap site planning investigations – two Ottawa scrap sites	28
Adversities of building footprint increases on scrap sites	30
Retail space buffers	31
Private versus public stairs	31
Ways to utilize leftover corners	36
Adapting to the site curvature and consuming scrap space for common uses	37
Site plan – Nicholas Street scrap site and urban context	49
Expected interactions between the Nicholas Street site and surrounding urban development	51
Site edges diagram –Nicholas Street site	55
Massing on the Nicholas Street edge	56
Massing on the Waller Street edge	56

Massing on the Laurier Avenue East edge	57
Using unfavourable scrap site edges	57
Using vegetation as a sound buffer	60
Noise control design features	60
Axonometric views – Nicholas Street site massing	61
Plans of all low rise floors and a typical high rise floor for the Nicholas Street site buildings	65
Shadow studies of a northernmost high-rise footprint	71
Utilizing the triangular tip –Nicholas Street site	72
Rooftop public space	72
View from inside the public plaza looking north	75
Using corridors for interaction and daylight	76

List of Appendices

New multi-lane streets forming two Ottawa scrap sites	88
Site plans showing various block structures on different scrap sites	89
Cost-benefit analysis of different block structures on the Nicholas Street Site	91
The Nicholas Street Site context	95
University of Ottawa circuit	96
Cultural circuits	97
Other probable contextual interactions	98
All probable contextual interactions superimposed onto the <i>modified rake</i> block structure	99
Centretown demographic data	100
The Nicholas Street Site	101
Holland Cross pedestrian mall	102
Minimum areas for practical student dwellings	104
Current market rates for Ottawa retail space in or near Centretown	105

Scrap Sites

As the postwar highway construction era began to exact its change on the urban fabric of large cities, a new kind of site emerged (appendix A). Snaking highways and multi-lane streets were imposed onto existing grid structures, often resulting in the diagonal bisection of traditional city blocks (Figure 1). The triangles of land formed in this way will be referred to in this paper as “scrap sites.”

Historically, there has been little interest in the development potential of scrap sites. But, as the negative impact of urban sprawl becomes apparent, these areas, previously used only for snow dumps or parking lots, are now seen to have potential for other uses. The value of these sites is now increasing and cities are deciding that they should no longer sit idle. William H. Whyte, a sociological researcher who has spent much time observing street life, agrees:

Cities should take a closer look at what they already have. Most of them are sitting on a huge reservoir of space yet untapped by imagination. They do not need to spend millions on creating space. In their inefficiently used rights-of-way, their vast acreage of parking lots, there is more than enough space for broad sidewalks and small parks and pedestrian places – and at premium locations, at ground level. (75)

Nevertheless, some impediments keep these lands from being developed. These cut-off parcels of land have their own inherent troubles,

many of which can be directly linked to automobiles. These drawbacks include: triangular site plans, traffic noise, and isolation from surrounding sites and buildings. These adversities make scrap sites less attractive for development.

A given scrap site may demonstrate any combination of these drawbacks and be considered undesirable. In fact, three of the four case-study sites (figure 2) remain vacant today, although only one of them possesses all of the adverse characteristics that are outlined. Certain undesirable features are more influential than others in determining value. The shape of the site can be much more important than its total area. For example, the King Edward Avenue site, though smaller than the Catherine Street site, has a much better site proportion on which to position a building because it is a more symmetrical triangle (figure 2). The Catherine Street site's eastern extremity, in contrast, could not suitably support useable spaces because it is too slim –only a couple of metres wide.

Whatever the severity or combination of drawbacks affecting these scrap sites, they all share a history of having been rejected as a result of an incompatibility between their inherent characteristics and conventional site-development practices (as the subsequent case studies illustrate). This thesis demonstrates that, through design appropriate to scrap sites these spaces can become sustainable sites defined by high density and variety of

uses. The problems associated with these difficult-to-approach areas can be turned in their favour, so that some of these central Ottawa lands can become not only useful infill projects, but also can inject new life into adjacent neighbourhoods.

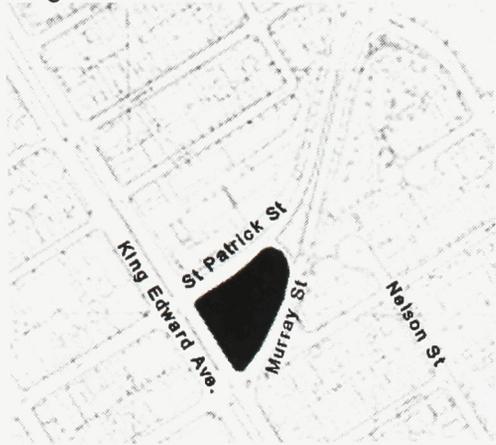
The minimum density is based upon the figure provided in the 2001 Canada Census which considers high density in the Ottawa region to stand between 6001 and 7500 persons / km² gross. (City of Ottawa, 2004) Diversity is defined by a mixture of uses on a site including residential, office, and leisure uses. Scrap sites need to fulfill both of these requirements in order to be considered sustainable in this paper.

At the end of this paper, a design is proposed for a specific scrap site. The design proposal generates a sustainable community defined by high-density and programmatic diversity. However, the problems of noise, disconnection from surrounding sites, and triangular site shape awkward for building placement are all challenges which face the design proposal and make the successful implementation of this project risky in technical and social terms. These factors are addressed by the design proposal.

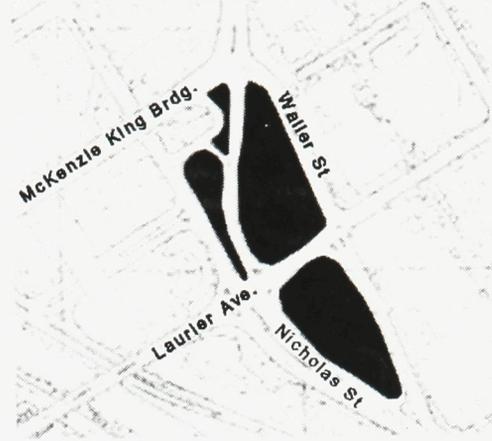
The next section takes a critical look at the unsustainable ways (lacking density or diversity) in which scrap sites have so far been developed in Ottawa, in order to launch a theoretical discussion of sustainable alternatives.

Figure 1
Ottawa site plans illustrating scrap sites – approx. scale: 1:7500
(Underlying images courtesy of the National Capital Commission)

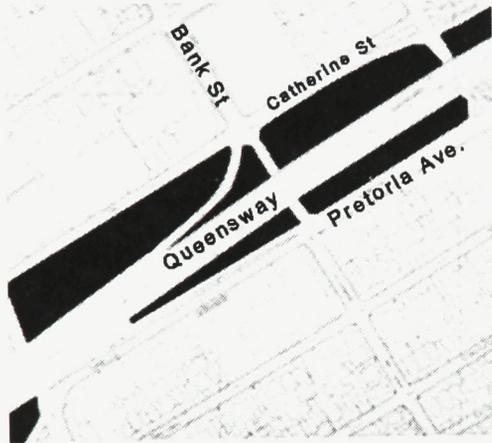
King Edward Avenue Site



Nicholas Street sites



Catherine Street Sites



Carling Avenue Sites

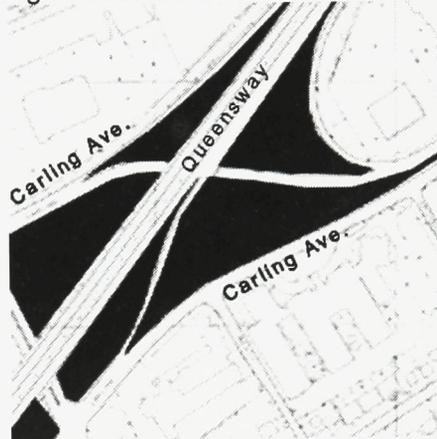
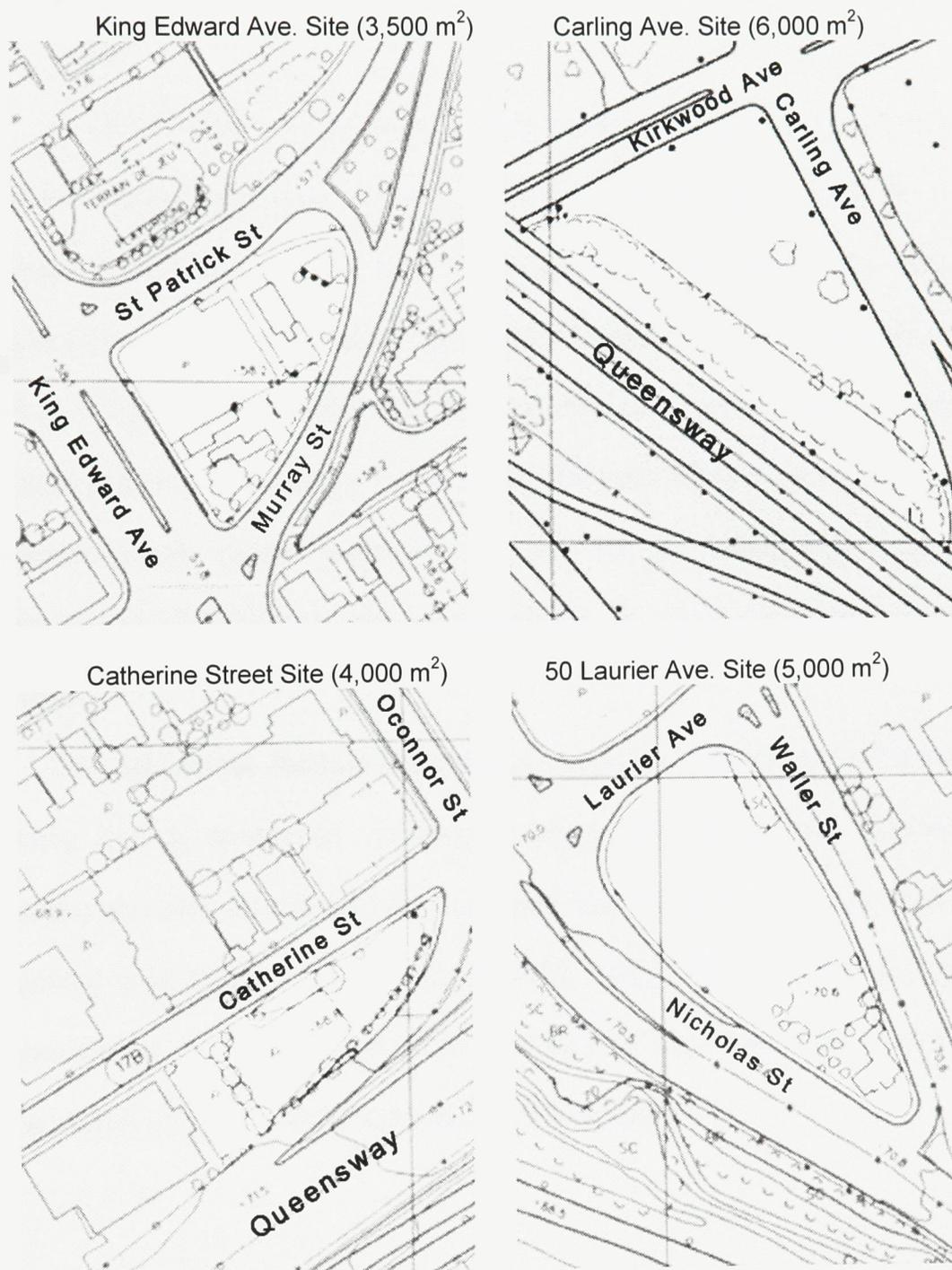


Figure 2

Site plans with approximate areas (m²) – case study scrap sites – approx. scale: 1:2000
(Underlying images courtesy of the National Capital Commission)



Case study I

50 Laurier Avenue East

50 Laurier Avenue East was recently developed with the construction of a sixteen-storey residential tower in the middle of the site (figure 3). The building's first level houses one retail venue of approximately 100 m². Residential apartments occupy the second level up to the sixteenth. This building is designed for middle- to high-income occupants, a fact reflected in its lease prices, which range between \$1,500 and \$2,600 per month. The apartment sizes range between 70 m² for a one-bedroom unit, to approximately 100 m² for a two-bedroom unit. In total, the building contains 250 units.

The 50 Laurier Avenue East site is zoned for general commercial use, meaning that a variety of commercial stores and residential spaces are permitted and that stores may convert back into housing, or into a mixture of residential-retail space. (City of Ottawa, 1998, sec. 7, 24) The site is restricted to a maximum building height of 38 metres and has been assigned a floor space index¹ of 3.35. (City of Ottawa, 1998, appendix)

¹ The floor space index is the ratio of the gross permissible area of all buildings on the site to the lot area.

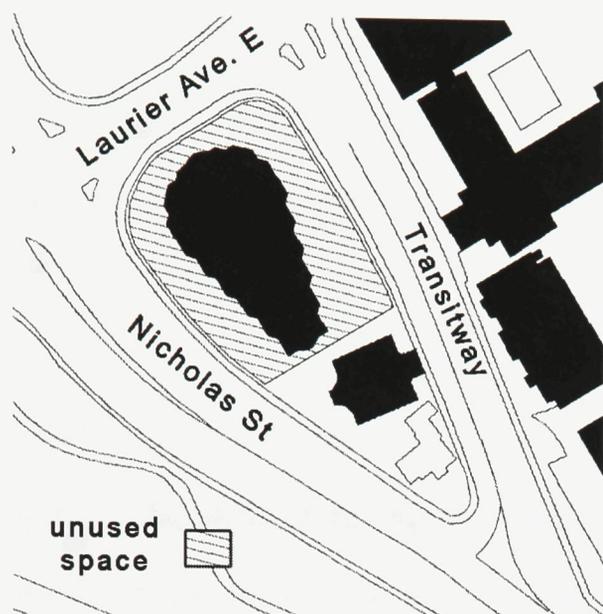


Figure 3
50 Laurier Ave. East site
– site plan

The building floor plate itself occupies about half of the total site area, even though the City of Ottawa zoning by-law states that there are no minimum setbacks for this site. (City of Ottawa, 1998, sec. 7, 26) The peripheral space is thus poorly used, since it serves no useful purpose as public space – it is too noisy and there is no mixed-use programming that might attract people to use the space as a plaza.

Case Study II

King Edward Avenue

The King Edward Avenue site is the smallest of the four studied. It contains three small remnant buildings, all two-storey residential constructions. One of these buildings previously housed a small office of approximately 200 m² but has since been vacated. A new, single storey emergency services building has just been built at the site's apex. The rest of the site sits idle and awaits development. The surrounding community is a low-density neighbourhood, consisting primarily of two-storey condominiums on either side.

The King Edward Avenue site is also zoned for general commercial use. (City of Ottawa, 1998, appendix) However, an exception has been applied to this location, restricting the retail space to a cumulative total of 111.5 square metres and limiting it also to the ground level. (City of Ottawa, 1998, sec. 15, 38) The site has a floor space index of 2.0 and a height restriction to 10.7 metres. (City of Ottawa, 1998, appendix) There are side yard set-backs on both the St. Patrick Street and Nicholas Street sides of 7.5 metres because the site abuts a residential area there. The front yard has a set-back of 3 metres. (City of Ottawa, 1998, sec. 7, 26)

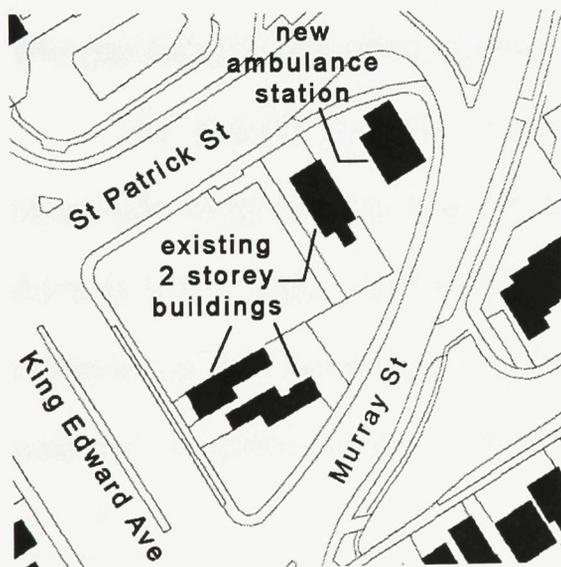


Figure 4
King Edward Avenue site – site plan

Small two-storey buildings are scattered across the site – remnants of a city block severed by traffic arteries. The site lacks any density.

Case Study Conclusions

The design approach applied to these two case study sites, with respect to density and mixed use, reveals some of the problems with the application of conventional development strategies to scrap sites. The development status quo typically does not reach the highest density potential: more useable space can be built on these sites. The King Edward Avenue site demonstrates this clearly. Although the site has a surprisingly high relative mixed-use ratio, with a couple of houses, a business (at one time) and an ambulance station, there are fewer than a dozen residents now living there. The population in this city-core area approaches lower suburban densities.²

The second problem is demonstrated by the Laurier Avenue site. Mixed-use programming has not been maximized to the site's advantage: there is but a single retail outlet – a fast-food venue – for 250 apartments. Considering that the site already houses a large number of people who are potential customers for any businesses located on the site, adding a few more

² If the assumption was made that ten individuals reside there – on an area of approximately 3,500 m² – then that would amount to just under 3000 persons over 1 km². According to Canada's 2001 census, urban densities in Ottawa begin above 3000 persons / km² in the low-density urban areas and are between 6001 and 7500 persons / km² in the highest-density urban areas found in Ottawa. (City of Ottawa, 2004)

shops should have been an obvious option for planners, particularly when the busy surrounding streets discourage walking into neighbouring consumer hubs.

Furthermore, although there is a high density at 50 Laurier Tower, potentially 400 people living on a 460 m² area, there is still a considerable amount of wasted land around the building because there are no set-back restrictions by the city at the site. (City of Ottawa, 1998, sec. 7, 26)

A perimeter-block strategy would have been a more successful approach at the 50 Laurier Avenue East case study site in the following ways. Firstly, if the building had been situated closer to the lot line, then at least as many people could be housed on fewer floors. Although approaching the site in this manner would result in reduced views from lower levels and would likely cost more to construct, the reduction in height could reduce adverse shading effects onto neighbouring buildings. Secondly, the perimeter-block approach allows for internal space that can be hollowed out and reclaimed as good quality outdoor space sheltered from noise. Neither the private nor the public space is very successful the way it has been set up, right next to a busy, noisy road. Another strategy would have been to fill up the idle space surrounding the apartment building with some retail venues to generate more vitality, more rental revenues, and help to control some of the noise by acting as a buffer between the street and dwellings.

Sustainable Scrap Sites

Some of the problems with conventional scrap site use were illustrated by the previous case study developments. The following section examines the theory behind this thesis' concept of sustainable development. Let it first be emphasized that the theory, as it is applied to scrap sites in this thesis, is no different than the theory used to discuss the sustainability of any other type of urban area. Later, however, the sustainability theory is adapted to the specific case of scrap sites, where the challenges of noise, awkward site shape for building placement and isolation from surrounding urban development further complicates the task of proposing a responsible design.

Sustainable development is defined in this paper as the generation of a functional community created when the elements of high density and diversity are present. Indeed, in the view of Jane Jacobs, one of the foremost thinkers on what makes cities work, density and diversity are inherently related as offering together the best chances for the social and economic success of any city. (150-1)

Among the characteristics of liveliness that Jacobs presents is "a sufficiently dense concentration of people, for whatever purposes they may be there." (151) Some of the most vital urban places, such as markets and main streets, support this argument. Liveliness exists in these places precisely

because there is an abundance of people on the streets. Many people live in these places, while others are drawn to the neighbourhood to conduct business or take their leisure in an environment where others are there doing the same things. A high population density can generate still further human activity by attracting non-residents to places that evolve into complex urban environments.

This is not to confuse high density with overcrowding. Regarding density as a good thing has often been resisted, as Jacobs explains: "The Garden City planners and their disciples looked at slums which had both many dwelling units on the land (high density) and too many people within individual dwellings (overcrowding), and failed to make any distinction between the fact of overcrowded rooms and the entirely different fact of densely built up land." (206)

A significant increase in density can be caused by non-residents visiting a site. This increase figures no less valuably to what constitutes the density of a given site, even if it is only a temporary increase, because non-residents support the retail venues of a site at times when the local residents are usually absent from them. Public space must therefore be considered integral to scrap sites if they are to maintain vitality and economic stability. Whyte's studies suggest that a site's density increase is likely because pedestrians from up to three blocks away are lured to the area. (108)

Whyte suggests that there are a number of factors impacting the success of public plazas including, lighting, shape and size. Nevertheless, he maintains that the most significant contributor to success is simply the amount of available seating. (109-10) Some of the plazas best at drawing visitors, Whyte argues, do so because they blur the border between the street and the plaza:

A good entrance draws people – not just those who mean to go in but those who do so out of impulse. It draws them not by forcing a decision, but by making a decision unnecessary. Let me cite Paley Park for an analogy. Its attractive paving and trees extend out to the curb. There is no clear line between park and street, and because the entry space is so broad, there is a full view of the activity within. Passersby look at it. Some will pause. Some will move a few steps closer, then a few steps more, and they are in, without having decided to be. (100)

Nevertheless, density alone will not sustain vitality whether it is resident density or a temporary density caused by an influx of visitors to a public space. Jacobs demonstrates this in her discussion of the New York borough of the Bronx, where a population of one and a half million (at the time Jacobs was writing) was unable to sustain much vitality, and whose potential as a generator for diversity was wasted because there were no places where that population could interact. (149)

Part of what a healthy community embodies is a rich mixture of places to live, places to work, and places for leisure providing both a steady supply of people and an abundance of primary uses where those individuals and groups

can engage with one another. At the level of housing, residents must be able to find places to interact with neighbours. Shared facilities such as community gardens, terraces and outdoor sports facilities allow for such regular encounters. And public spaces such as plazas enable residents, workers, and non-residents alike to interact. The problem shared by each of the scrap sites, documented to this point, is precisely that they lack these elements of invigorating diversity.

Still, some places that are endowed with such diversity, and come alive during certain parts of the day and night, nevertheless revert to being dead zones at certain other times. They are only intermittently lively, largely because of an imbalance in the way they are used at different times. Addressing the same problem in Manhattan over forty years ago, Jacobs illustrates a challenge that plagues cities to this day. "To see what is wrong, it is only necessary to drop in at any ordinary shop and observe the contrast between the mob scene at lunch and the dullness at other times. It is only necessary to observe the deathlike stillness that settles on the district after five-thirty and all day Saturday and Sunday." (Jacobs 155)

Vitality cannot be said to be fully achieved if it disappears when the sun sets. One might look at a site that is developed with a mixture of places where people live and work during the daytime, and conclude that there is adequate diversity present. Indeed, there is vitality while business is in

progress, but come evening, as the office workers depart, there is little going on besides residents hunkering down for the night. Most people divide their time between work and leisure; thus site uses that take both into account must be in a sort of rough harmony for a sense of true vitality to take hold. For this reason, the inclusion of cafes, bars and restaurants, along with other primary after-sunset uses like cinemas and recreational centres, must not be overlooked if a lively community character is to prevail beyond the typical working day.

Where responsibility lies in accomplishing such a mixture of uses is difficult to establish. The developers or owners, who usually bear the most risk in development projects, cannot be expected to support mixed use unless it is lucrative. The architects conversely, have no power because they are at the service of the owners or developers. The only way that mixed use could be ensured is if cities make legislation to mandate this kind of development.

The same richness in diversity that blends various uses together extends to a varied demographic profile of residents: enough of a mix to ensure a wide range of habits to get the most use out of the site. People of contrasting ages, backgrounds and occupations spend their time differently. Young people generally tend to make time for nightlife. The elderly, usually retired, often have more time to spend outside during the day, while the middle-aged group is likely to be at work. This broad stratification into three

demographic groups suggests how bringing them together could contribute to a richer time balance on any site, provided they are offered the right type of residence to suit their various lifestyles, and the right reasons to participate fully in the life of a site. Again, the responsibility for ensuring this sustainable model has to be with the city. It must mandate owners or developers to offer a mixture of dwelling types. If this is done, prosperous families and young professionals could be part of the same community as those seeking lower-rent accommodation. Each group could contribute to the use of the site at a different time. Roger Kemble, a Canadian architect who has written critically about what he has observed in urban centres across Canada, sums it up well:

...tarting up tacky old districts means nothing if there lacks a dense base of population of all incomes: families, singles, rich and poor. People living in an affordable downtown, working, shopping, enjoying life free from debt, noise and pollution in a pleasant environment is the single overriding issue that faces the development of the modern Canadian city. (138)

From the Canadian point of view, city planning also must consider the harsh winter climate and what that means for an urban public space. On well-diversified streets, “a winter’s day,” Kemble explains “is like a summer’s day, there are so many people living close to the shops and restaurants, they cannot help but use them.” (138) Moreover, when comparing the rich density and social diversity of populations living near the Prince Arthur Mall in Montreal, Kemble notes that Ottawa’s Sparks Street Mall, by comparison,

lacks these very qualities and has “thirteen banks, too many government offices, not enough variety to attract activity after hours.” (140)

There are also many other peripheral social benefits to having a rich diversity in a community. For one thing, increased diversity translates into enhanced employment opportunities close at hand for individuals in the community; the need to move for work is thus less likely as compared to areas where families frequently change residence in search of better jobs. Furthermore, the fact those less diverse areas are also more privatized means that areas of congregation for youth are limited, reducing space for socializing and hence weakening relational bonds, which in turn can lead youth groups to engage in aggression against the neighbourhood. (Fowler 109)

In the City of Toronto, crime rates in areas of greater diversity were found to be significantly lower than in those areas of lower diversity.³ (Fowler 111-13) A diverse community is more public and participatory in nature than a homogeneous neighbourhood, resulting in an increased range of reasons for individuals to participate in watching and caring for the place in which they live, and indirectly keeping it safe.

³ Fowler examined the rate of vandalisms and break-ins reported by members of the community and concluded that in areas of greater land use mix there was also fewer of these crimes as compared with less diverse areas. (Fowler 111-13) There was a similar increase in juvenile crimes reported in areas of lower diversity. (Fowler 111-13)

A diversity of uses in urban spaces, however, implies a human scale. There usually is simply not enough land to permit a mixture of large spaces on a given city site. Thus, the various types of uses – whether places of commerce, residences, institutions or cultural centres – must become smaller than is often the norm to be compressed into available city blocks (figure 5).

Fortunately, there are advantages to the compactness of cities that areas such as suburbs or towns do not support. For example, the large populations existing in cities will permit mixtures of stores, cultural institutions and entertainment places in close proximity to thrive. (Jacobs 146) “Wherever lively and popular parts of cities are found, the small much outnumber the large.” (Jacobs 147)

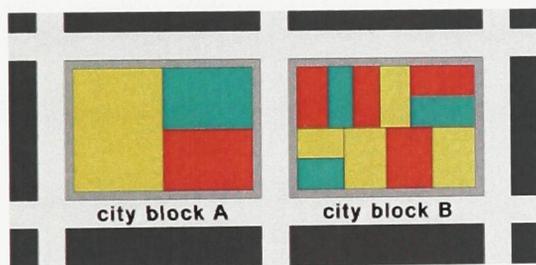


Figure 5
Diversity within city blocks

The spaces of City block B have been divided into smaller areas (illustrated by shaded fields) than block A and can therefore fit a greater diversity of uses.

Furthermore, smaller stores tend to do better in cities than do the large ones. Magnet stores were perhaps once the proud attractors for shopping centres, but they no longer enjoy this status. On the contrary, the use of large department stores as magnets in cities is fast becoming an obsolete notion. “There is no real competition outside the cities for these small and various city enterprises; but it is relatively easy for the big and standardized, in their

natural homes outside the city, to compete with what is big and standardized within.” (Jacobs 147)

This natural advantage of smallness is that more of that which is being assembled can be fit into the same area: the density can be increased. Much of the inherent value in generating sustainable approaches for scrap sites derives from the fact that not only does their smallness not preclude accommodating a diversity of primary uses, these uses will actually be *more* successful because they are brought together in a limited area.

To summarize, the elements that are most conducive to a sustainable site strategy include high density of people and functional diversity, characterized by a confluence of different dwelling types and multiple primary uses, facilitating social engagement across a broad time spectrum. Fulfilling these broad aims should enable any site a good chance at becoming a thriving community.

The following section is a brief case study examining the success of a courtyard located in the Byward Market in Ottawa. The courtyard is a good example of how to successfully integrate a mixture of uses in tight spaces and it exhibits many of the qualities discussed theoretically in this section.

Case study III

Clarendon Court

On the west periphery of Ottawa's Byward Market lays a compact courtyard enclosed by buildings fronting Sussex Drive, York Street and George Street. Clarendon Court combines uses including several restaurants, bars, and cafes on the ground level of the courtyard and high-density dwellings above them.

The accessibility of the courtyard is one of the reasons for its frequent use. Pedestrians commonly pass through Clarendon Court on their way to other destination since there are many ways in which the block between George Street and York Street can be traversed (figure 6). The presence of many benches within the court enables those passing through to stop and take a few moments to rest as well as to observe others sitting on café patios (figure 7 & 8).

Many of the enterprises in the courtyard also provide public entrances from both courtyard and street (figure 7), creating a dialogue between this mostly enclosed public space and the street outside. With these many well-articulated relationships, abundant vitality is generated, not only because of the way the active courtyard programs are connected to the streets, but also because of the engagement of residents with the interior courtyard, by way of

private elements, including gardens, balconies and entryways that are adjacent to the public spaces. For example, the roof above the restaurant *Social* is a residential garden which overlooks the courtyard and allows interaction between private and public uses.

Buildings surrounding the courtyard are constructed close to the outside street edges of the block (figure 8) and have heights ranging from three to six storeys. Building mass is only in decline once inside the courtyard. The buildings of the court therefore, maintain high density close to the street so that the inner space of the site can become a vital pedestrian zone with architecture of human proportions.

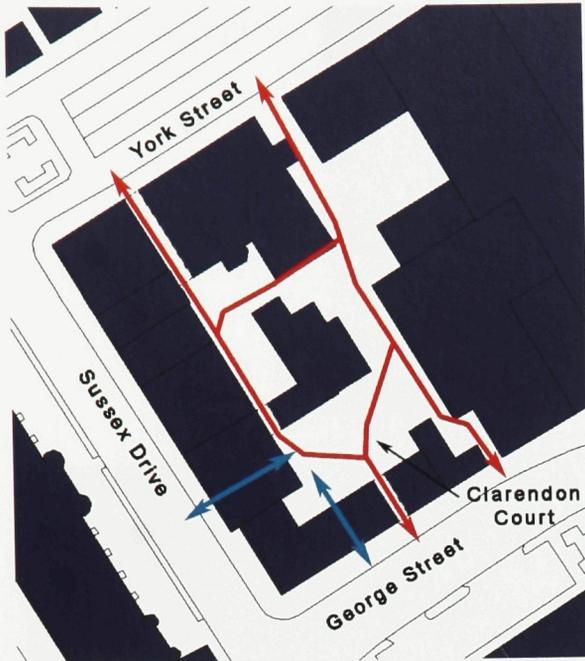


Figure 6
Accessibility –Clarendon Court

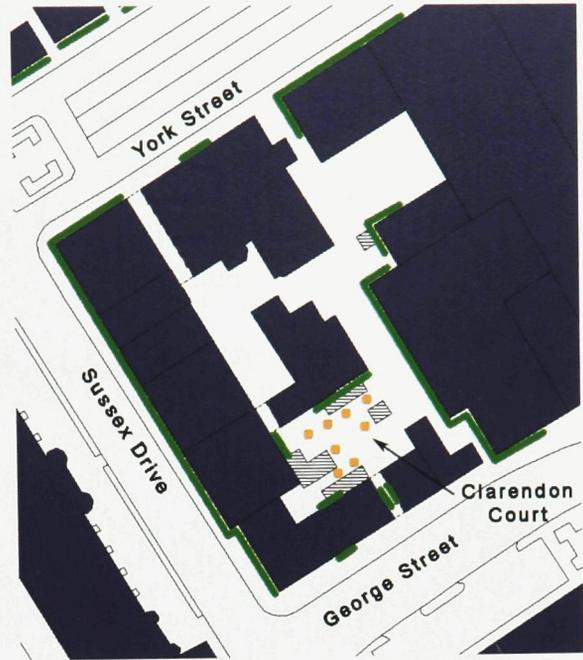
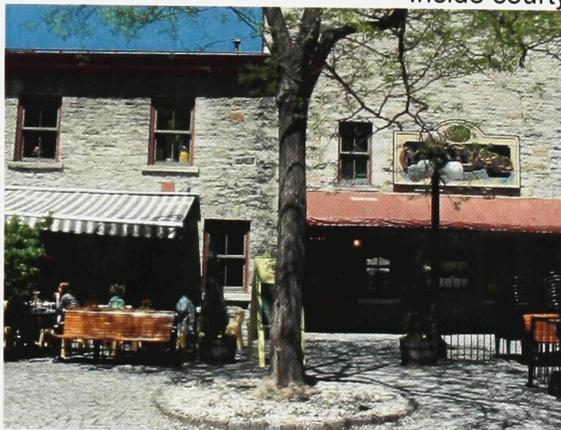


Figure7
Programming –Clarendon Court

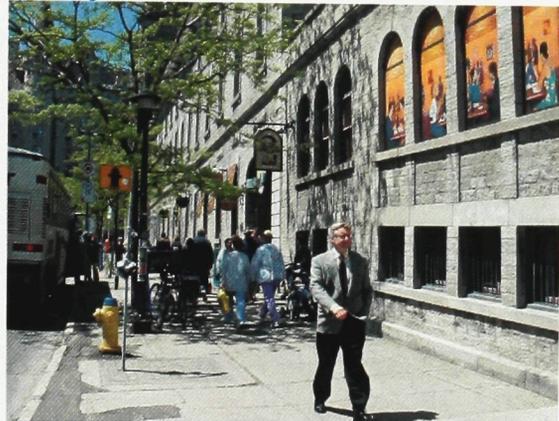
- ground floor storefronts
- ▨ restaurant and café patios
- benches
- pedestrian access
- access between street and courtyard through store



Inside courtyard looking west



Inside courtyard looking north



Looking west on George Street

Figure 8
Clarendon Court

Residential spaces with roof gardens, restaurants with access to the inner public space of the courtyard, and main level venues below the housing

Design Strategies

A theory of sustainability has been presented in the previous section, but it cannot simply be transferred to the particularities of scrap sites. Scrap sites are unique and present very particular sets of problems. This section discusses how the formula for sustainability outlined in the previous section can be realized in the case of the scrap site in such a way that these seemingly valueless sites can become useful infill projects and restore vital community life to idle spaces.

The core point to emerge from the theoretical investigation is that mixed use and density are the most significant factors influencing the nature of the community on a site. With that in mind, the challenge is to discover how density can be increased on these small and hard-to-approach sites, and how the various essential programs can best be instituted in spite of the purported site adversities.

Edge Conditions

The outward edge conditions of scrap sites are a good departure point for this investigation because they often vary greatly in character and have an enormous impact on the planning of a site. On the one hand, there are edges

that front completely incompatible surroundings, which are detrimental to the urban desire for vitality. Such edges often include highways or embankments; scrap sites may need to be sheltered from them. There can also be edges which front lively neighbourhoods that could offer something to the scrap sites. These edges must embrace the successful communities and become permeable to them in order to absorb their liveliness.

Scrap sites should not be thought of as self-sufficient even though they are by nature isolated spaces. Consider, for example, the way pedestrian access can be limited by the swirl of automobile traffic encircling the site. Often the problem is as much psychological as physical: large traffic volumes and high speeds might deter walking, but pedestrians can always use a crosswalk. The demoralizing effect might be ameliorated by making the architecture more inviting at the entry points to the site through a strategic reduction of the scale of the architecture and adding crosswalks at these points.

Nevertheless, even when the perceived danger posed by traffic can be minimized, there would still be little motivation for anybody to take the trouble to cross to scrap sites unless doing so is worthwhile. Establishing a pedestrian connection to a site's surrounding is very important.

Historically, before any attempt was made in the planning of pedestrian thoroughfares, they tended to evolve through a rather unconscious, collective process. Kemble explains:

...there have always been well-worn pedestrian throughways that people have used for generations. Not all of them have been treated like Troupe Alley, but they have been firmly rooted in the economic activities of their respective cities, unnoticed and appreciated. These throughways come out of necessity. Necessity pre-dated market research. The patterns they formed came from an unconscious response, following habits, responding to clearly defined needs of the day. The pattern these throughways etched are especially evident in older cities. (132)

Still, achieving a solid connection can be established if a detailed understanding of what the surrounding residents and businesses might benefit from is provided on a scrap site. Useful public spaces such as a well-designed plaza are often appropriate responses because they are typically in short supply in most central business districts.

Ironically, as the adversities of the multi-lane arterials forming scrap sites warrant sheltered designs, they may be subverting such organic linkages to neighbouring sites. Yet to be successful, scrap sites must maintain these time-tested connections to the street —and strong ones at that, if vitality is to survive on the inner site because urban vitality achieves its most emphatic expression on the sidewalks adjacent streets. Although a courtyard scenario can be protective from noise, as Jacobs warns, courtyards can be less vital

and less safe than many sidewalks because they are not as visible to as many eyes. (36) The key to making places safe, she argues, lies in not only defending the streets from “predatory strangers,” but in protecting “the many peaceable and well-meaning strangers who use them, insuring their safety too as they pass through.” (36) Trying to block out anyone is clearly not the answer. The last thing that should be done is to lead walkers who venture onto the site to a dead end; if they learn that they will not be able to pass through the site on their way to a destination on the same path, they will not return. Therefore, passage through scrap sites must be easy for pedestrians.

Accessibility alone however, is no guarantor of site use. The semi-sheltered plazas of scrap sites can only be expected to be mature streetscapes if they offer an adequate quotient of the attractor uses that prompt people to frequent main streets. Incorporating markets, restaurants, and bars into the centres of scrap sites can provide this essential energy. These would be the primary uses that would then feed secondary ones, like shops and small vendors. Thus, a successful plan would typically include retail space surrounding scrap sites with a number of place-defining venues acting as attractors within the site’s centre (figure 9).

A cautionary tale about the necessity of attractor programs is the failure of the Holland Cross mall in Ottawa (Appendix K). The site is desolate on a sunny summer Sunday afternoon at 2 pm, a prime leisure time. The

pedestrian mall has no stores that remain open for business during evening and weekend hours so it remains quiet. Just a few blocks away on Parkdale Avenue, the bustle of people invigorates the area because of the energy that a thriving produce market brings to the space.

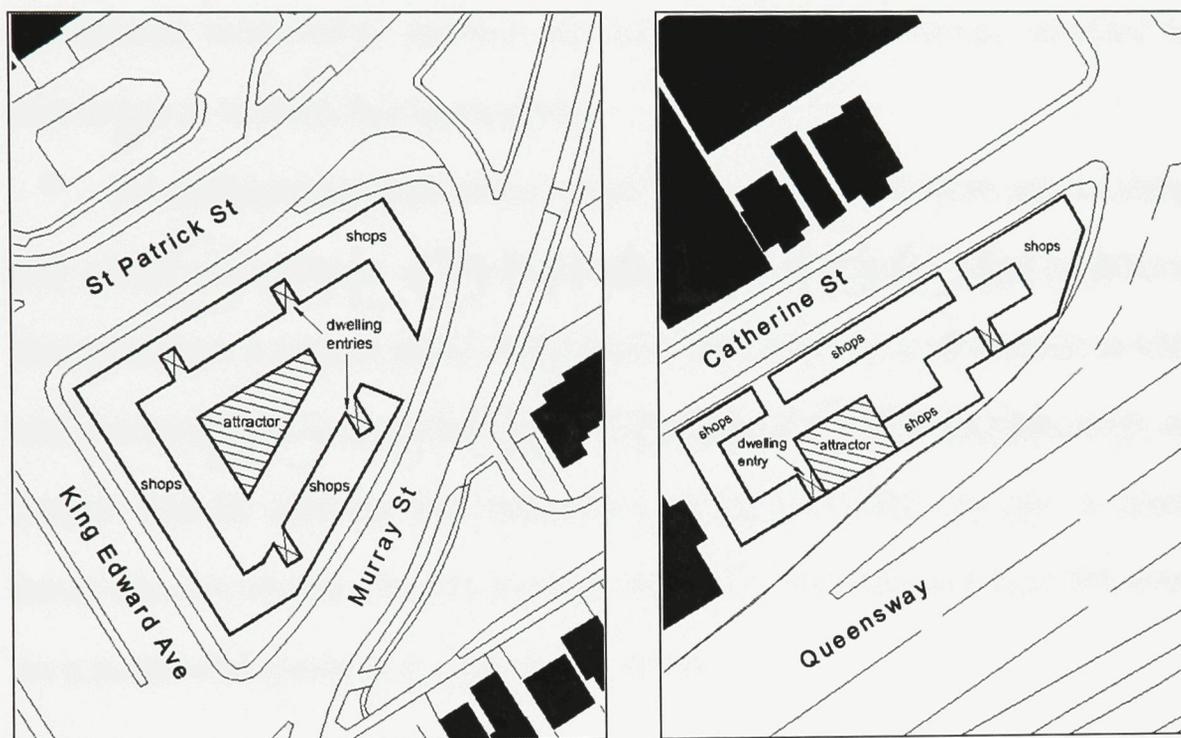


Figure 9
Scrap site planning investigations – two Ottawa scrap sites

Investigation of the layout of ground level shops to create mixed-use courtyards at the King Edward Avenue and Catherine Street scrap sites. Shops could be accessed from both street and courtyard, and attractor programs such as markets, cafes and restaurants could occupy the centres of the courtyards to draw people in. Housing would be located on upper levels to give additional life to the sites below.

The edge dynamics of scrap sites, like other sites, change relative to the different levels of any proposed building. For example, if a buffer rises to block sound on a noisy site edge, then that buffer might need to stop at the second level in order to allow sunlight to enter the internal public space. Each edge condition is unique, so a nuanced response allows the enhancement of the desired relationship between the site and its surroundings, whether to connect to or to block that surrounding.

An analysis/response study needs to be conducted when approaching any scrap site because of the contrasting and site-specific edge conditions that lend each a unique set of challenges. By achieving a connection to vital city surroundings, in providing useful programs and public spaces, such as plazas, and by allowing free pedestrian passage through the site, a given scrap site can borrow from the diversity available close by—and then link itself as a purposeful player to the larger city matrix.

Adjacencies

The importance of site-to-site adjacencies is clear but inner adjacencies are perhaps even more crucial on scrap sites than in other urban settings, due to the adverse factors inherent in their makeup. Their disproportionate, often triangular, plans tend to result in spaces not only being forced into the corners

of triangles, but winding up adjacent to busy streets when any effort is made to increase density of the site (figure 10). The pairing of spaces can thus easily be mismanaged.

Case study III points this discussion toward examples where increased density has proven to be highly functional. That case study indicates that a robust combination can be achieved when ground-floor retail space and upper-level residential spaces are paired. Stores do very well on main levels because shoppers can easily access them. This bi-level combination also happens to be equally beneficial to residents, since street noise tends to dissipate at the upper floors of a building, which further clarifies the delineation between their more tranquil private space and busy public space below (figure 11).

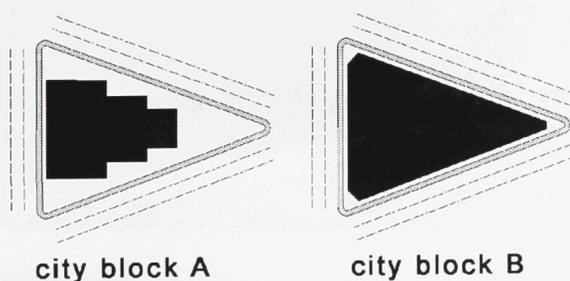


Figure 10
Adversities of building footprint increases on scrap sites

City block A fills about half of the total site area. In order to consume the other half, block B, there is no option but to use the triangular tips of the scrap site which are sandwiched between busy streets.

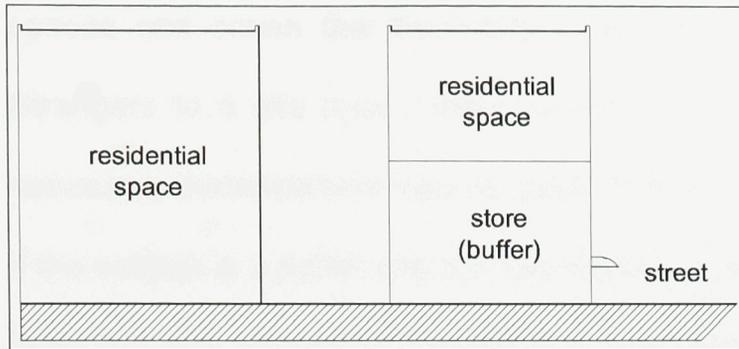


Figure 11
Retail space buffers

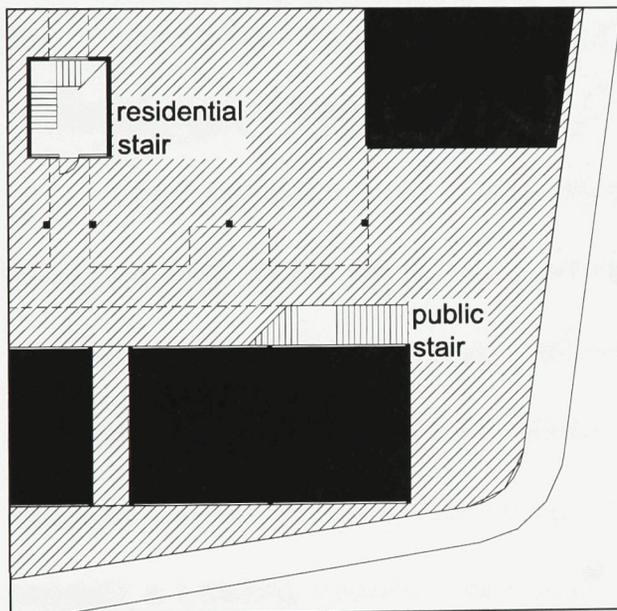


Figure 12
Private versus public stairs

The Private stair is less prominent compared to the public stair which is located directly adjacent the street and alongside the retail space (solid filled area).

Distinctions between what space is public and what space is private are crucial in scrap sites because the close-grained adjacency between such spaces can cause the boundaries between them to be undistinguishable. Strangers to a site must easily be able to identify these distinctions. The necessary demarcations may be made through emphatic physical separations; if the subject is a public second floor space accessed from a ground floor stair, then that stair should be located in a more prominent position than a private stair (figure 12). If the differentiation is not as straightforward as ground-floor/public and upper-level/private, then more subtle clarifiers might be called for. These visual signals could take the form of either distinct aesthetic or formal qualities in the architecture.

With the ground floor retail strategy, the upper levels of scrap sites would require more mass so that housing could be applied to them in significant densities. However, attention should be paid to ensure such buildings do not subject inner plazas to constant, gloomy shading. Two strategies could reconcile the goals of creating mass without compromising daylight. Loading mass in rows oriented in the east/west direction can offer runs of space between these masses which both are useful for public use and which are also sunny much of the time. Another way to increase light is by stepping back the building mass on rising levels.

The importance of contextual linking illustrated in the previous section, which suggests that scrap sites become thoroughways for surrounding pedestrian flows, has its most significant impact on site massing. In order to be destinations, scrap sites must not only accommodate attractor programs, but must also permit passage through them on the ground plane.

Trying to form pathways through already miniscule sites however, means that there is little room for some spaces to be located anywhere but directly on a noisy street-front. To reduce the problem, appropriate acoustic design strategies could be applied, including basic interventions such as planting buffers of trees or massing the site into a sound sheltering semi-courtyard as previously mentioned. The reduction of glazing area on facades, as well as the reduction of the sightline to a noise source where windows are needed, will both further reduce noise. (Savage) If large spans of glass are necessary, then double-skin walls will reflect sound with their first layer and in curtain walls, window panes of varying dimension will avoid a resonance in the glass and reduce the noise effect. (Savage) In storefronts, the use of more solid materials including hardwood instead of glass for doors and the installation of concrete walls with fewer and smaller windows (Savage) can potentially lead to some highly finished facades with merchandising peepholes that passersby cannot help but explore. But this strategy admittedly cannot work for all retail types.

In addition, one must explore what spaces would be best suited to front these noisy arterial thoroughfares. As discussed, retail space can shelter housing from noise without adverse consequences to business. Especially suited to this location might be retailers with a younger clientele where a moderately elevated soundtrack played in the store can drown the outside traffic noise, while still appealing to shoppers. (Savage) Offices are an equally suitable response provided that appropriate acoustical design strategies are used in comparison to housing where noise is a key concern. Nevertheless, certain dwelling types could be suitable if they are geared towards occupants looking for a lower rent or purchase price such as students or those requiring lower priced housing. Thus, the developer is able to not only fill the lowest quality space of the site, but, by using up the vacant space, can raise the desirability of the scrap site core.

Spatial Efficiency

Another of the pitfalls that was revealed by the case study sites was the inefficient consumption of scrap space. More efficiency in space use is needed to maximize the density of the scarce space of scrap sites.

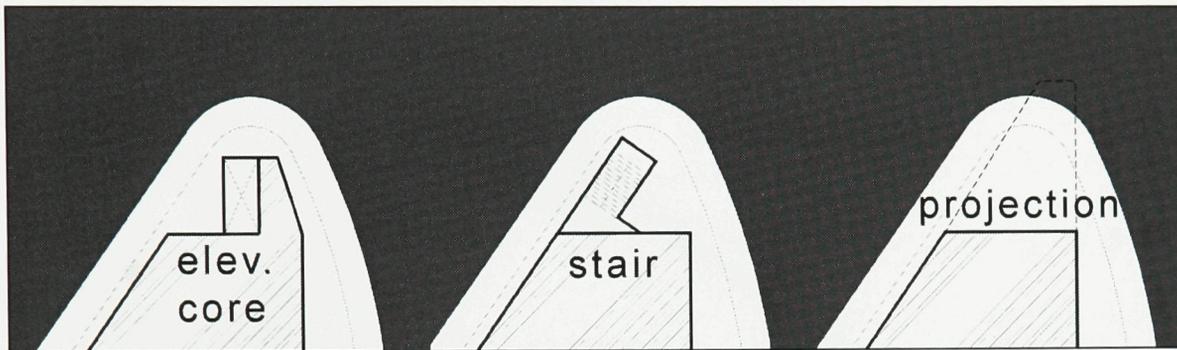
When it comes to trying to maximize precious space, ground level parking is wasteful because these urban sites, as discussed earlier, should be

primarily the realm of pedestrians so that they can link themselves to surrounding sites. If cars are permitted to park on the ground plane of scrap sites then the ground plane cannot be utilized for more important uses including retail space or public spaces such as plazas. Both of these are attractors for non-residents to the site and which would not work anywhere but on the ground plane. Although it would incur greater costs, parking can function underground. The only exceptions that may be acceptable would be loading zones when tenants such as stores and offices require them. Provision should be made for these along the edges of the main thoroughfares of scrap sites so that the useful edges, the ones that are open to pedestrians, can be preserved for them. Furthermore, locating entries and exits to underground parking garages along the disruptive busy streets is functional because these are usually also the best accessible edges for cars.

Another important spatial issue is the question of how to approach the triangular portions common to scrap sites. These triangles can have a dramatic reductive effect on building size because their interior area gets pinched off sharply at the apex. The squishing of building parts into these points is very difficult. Ways to better utilize this space would include stairwells, elevator and mechanical cores, or building projections such as balconies, none of which require large areas in plan: they can be thrust into these spaces with considerable liberty (figure 13). And, the remaining space

which is better proportioned than the triangular tip then remains available for more regularized spaces to fill.

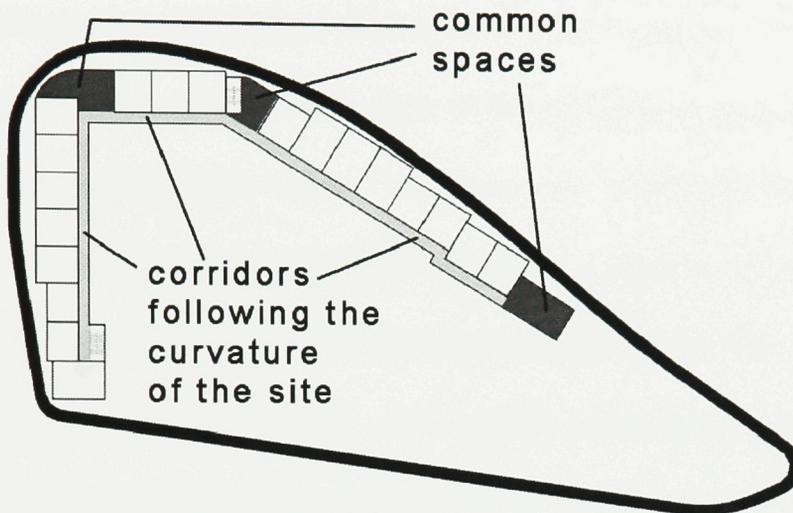
Figure 13
Ways to utilize leftover corners



The curved edges of scrap sites also make it difficult to allow a row of regular-sized spaces to align along their periphery without foreshortening. But, by freeing up floor plans a single loaded corridor (corridor that is open on only one side) can sweep the curved edges of the scrap site and easily connect regularized spaces (figure 14). These banks of space demonstrate how long but narrow runs of mass can be organized efficiently. This organization pattern can also be applied as a way to build up the solid edges of the noisy arterial streets forming scrap sites because they are typically the curved edges. Because these runs of space also buffer the inner site from traffic noise they can be called buffer spaces.

Figure 14

Adapting to the site curvature and consuming scrap space for common uses



The residual areas left over in this process of creating buffer spaces can be utilized as common space (figure 14). If the regular cells of the buffer space in figure 14 are used for student dwellings or offices, for example, then the irregular areas can become common spaces to hold elements like elevator cores, stairs, or places like washrooms or lounges.

The buffer spaces only have access to daylight at the outer edges where they meet the noisy arterial streets. Based on the acoustic strategies discussed earlier, windows should be minimized in them. This will result in very little access to daylight for any spaces located in the buffer. But if the inner edge of the buffer space is covered in glass then these regularized cells can take advantage of the natural light already filling the corridor by having glazed openings on to it.

Although the function of the buffer is to protect and increase the value of the inner site, it must not use up the most valuable space of the site because it is composed mainly of low-rent spaces. Therefore, adding spaces to the buffer on the inner side of the corridor means taking space away that could go to higher uses. However, the corridors themselves can be made functional for uses apart from circulation. By borrowing a little of the valuable inner space of the site the corridors can be fitted with programs such as small lounges or coffee stands. The vitality necessary on the internal ground level areas of scrap sites is achieved by the engagement between users of the programmed corridors and the users of the public ground plane areas.

Liveliness

Liveliness is an important derivative of both density and diversity which can be defined as a steady presence of people. It is also very much dependant on density and diversity. This section looks at how liveliness can be manifested on scrap sites by overcoming the site challenges of triangular site shape, noise, and isolation from surrounding sites.

The theoretical section suggests that varying dwelling types are needed on scrap sites because they cater to different lifestyles and in turn increase the site's use/time balance. However, the necessary housing stock depends

greatly on the needs for the area in which the scrap site is located because different areas support different demographics. Analysis of any proposed site must be conducted to determine the housing needs that would function for the area. Nevertheless, a strong diversity is most desirable when the community can support it.

Questions of development economics can affect this diversity. For instance, will low-rent housing not lower the profit margin on a given site? Low-rent housing in relation to high-rent housing is certainly less lucrative but by offering spaces which are much more valuable than either of the other two, the result can justify the mixed-rent housing option.

For example, a comparison of the average rental costs for retail versus residential tenancies in the Ottawa downtown area suggests that retail rates are more than ten times greater than even the highest dwelling rents. The leases for retail spaces on the current Ottawa real-estate market were found to be between \$20 and \$25 per square foot (appendix M), while rents for apartments in the same area cost up to \$2.20 per square foot. Clearly, retail spaces are more lucrative, and scrap sites could benefit economically if they are provided. Furthermore, this combination enables the existence of both the needed diversity and nearby locales for residents to work and shop, thereby increasing liveliness.

In order to make high-density sites out of small areas such as scrap sites, high-rises will often be necessary. The effects that these buildings have on their sites and surroundings have to be assessed. Firstly, the impact of shading relative to the site is a major concern. The outside public spaces, which are crucial in drawing people from neighbouring blocks to scrap sites, become unsuccessful if they are over-shaded. A northern high-rise footprint is most functional from the point of view of the site because this means that the public spaces below it remain sunny and attractive to visitors.

A second consideration is the breakdown of community. Many modern high-rise projects have resulted in a disconnect between people on the upper floors with the ground plane and the liveliness with which it is associated. This isolation is problematic, and often makes these buildings uninviting or even unsafe. (Jacobs 44) Ways need to be found for a community to exist in section. The problems of disconnect can be overcome if the upper levels of the building are loaded with vibrant programs because diversity does not have to be limited to two dimensions.

Contrary to U.S. practice, the Japanese do not use zoning to enforce a rigid separation of uses. They encourage a mixture, not only side by side, but upwards. In the new buildings you will see showrooms, shops, pachinko parlors, offices all mixed together and with glass-walled restaurants rising one on top of another – three, four five stories up. By day the jumble can be garish. By night it is invigorating. (Whyte 89)

Therefore, vertically mixing programs – even relatively conventional ones in comparison to the Japanese interventions – such as community gardens or exercise areas is a valid solution to overcoming the isolation dilemma.

Gardens occupying the vertical spaces of high-rises must get sufficient lighting to ensure that the plants actually survive. To this end, where the gardens cannot be located on light-rich rooftops, then they must not face north. To prevent shading of one garden by another above it the garden floor slabs can step back as they rise. In this way the roof gardens each get approximately the same level of light.

There are problems with the integration of mixed uses and high densities. Semi-private areas are hard to fit into these scrap sites when much of the space that could be used for this purpose on the ground level is consumed by retail space or public space. But the inclusion of these spaces is nevertheless needed. The rooftops of buildings should not be dismissed as areas for public interaction. These spaces, which are normally wasted, provide new avenues for contact.

The vertical mixture of programs is also an asset in further encouraging the engagement between building users and non-residents. Programming visible from multiple vantage points means that the users of the scrap site plazas or other public spaces see the site as lively or populated. Making a

scrap site lively is critically important in drawing people from neighbouring sites.

A population increase occurring through the attraction of non-residents is a vital factor contributing to the overall density of a scrap site as indicated in the theoretical section. The success of a public space in being able to attract non-residents depends on many factors. But if a good space is offered, Whyte's studies suggest that pedestrians from as far as three blocks away will be lured to the area and will increase the local density. (108)

Lighting is often thought to be the major governing factor of successful plazas. Although it is certainly part of the equation, Whyte's time-lapse studies show that the amount of daylight received by a space is not the most important factor in its desirability. (109) Other commonly suspected factors, including shape and size, are also not the principal criterion in good public space. (110) The leading reason for a successful public space is, however simple, the amount of available seating. (110)

This is quite an encouraging factor for scrap site plaza success. Indeed, neither light nor space is in abundance, regardless of whatever effort is made to maximize both. In the case of light, there will be times that sustainable scrap sites will be shaded, like there will be for any smaller plaza flanked by buildings. Furthermore, according to Whyte's findings, the

irregular shape and the small area of a scrap site public space would also not be problematic.

Another spatial factor, which may seem contrary to logic, is that exceedingly sheltered spaces (those surrounded by buildings) do not succeed as plazas. Given the noise and proximity to traffic it might seem a logical step to either raise or sink the plaza from the ground plane. However, people enjoy the connection to the life of the main street, so a large change in the relationship of the plaza to the ground plane is detrimental. Whyte suggests that elevations of more than one metre in either direction can result in a perceived disconnect between the inner space and the street. (129)

Another consideration regarding the success of public spaces is, as made clear by the above passage, programming. Shops, entertainment by way of live performances, art displays and especially food vendors are highly useful in providing reasons for visiting a certain public space. It works most effectively when several of these attractions are in place concurrently.

The arguments for diversity of uses and high density which have consistently occupied this discussion are reinforced by this section. The challenges of scrap sites can be managed to allow their development with an abundance of uses and high-density. The next section examines some of the practical obstacles which affect the design analyses conducted to this point.

Obstacles in the Practical Application of Sustainability

Much of what is being proposed here has not taken into account the implications that the practical forces acting on such a project would have on the development of scrap sites. Many of the provisions offered by this thesis in terms of developing workable designs for tight spaces could not come about without, for example, some amendment to the City of Ottawa zoning by-law.

To a certain degree, the existing City of Ottawa by-laws are conducive to the cause. Namely, zoning laws for general commercial areas, in which three of the four scrap sites are located, permit mixed use of commercial and residential space. They even go so far as to allow no minimum set-back from impeding the maximization of land use. However, there can be restrictions in regards to the building heights. The code seeks to align the heights of new buildings with the surrounding ones. Such limitations are not altogether negative, except when they restrict the development of a given site from including enough housing on it to make that site have a high population density.

Furthermore, the floor space index is in place to protect the views and natural light sources of neighbouring sites, ensuring that a new building is either large in area but not very tall, or that a building steps in as it rises. But a floor space index does not recognize that the particularities of a site may

allow for a taller building placed at a northern edge which would only cast shadows on a roadway. By-laws cannot foresee such conditions because they are in place to make consideration in general cases, but if a better approach can be found then there should be no reason to deny the exception. Writing about blanket policies, Canada Mortgage and Housing Corporation (CMHC) warns that although these regulations:

... can result in economies of scale by eliminating the need to 'reinvent the wheel' every time a new road is built or subdivision is planned, when entrenched too rigorously it can also prohibit the implementation of lower-cost more sustainable local solutions...The simplicity of control provided by blanket policies is no longer affordable and the underlying issues behind their formation must be open for discussion with regulation agencies. (61)

CMHC also suggests that:

Blanket practices should be reviewed in the particular context to ensure the intent of the practice is being addressed or could not be better addressed in other manners. (66)

Zoning by-laws are not the only hurdles to be overcome. A survey of Ottawa and Toronto developers, entitled *How Property Taxes and Development Charges Can Be Used to Shape Cities*, concludes that indeed property taxes and developer fees influence the locations developers choose for their projects, provided that market conditions, zoning and the approvals process are equal in the comparative areas. (Skaburskis and Tomalty 30)

If scrap sites are to be developed to their full potential, development fees and property taxes must be properly adjusted. However, it is not easy to judge whether increases or decreases are the right measure when it comes to these fees. For example, a downtown revitalization initiative, originally undertaken by the City of Ottawa in 1994, exempted developers from planning and development fees in the downtown area. (Tomalty 6) The measure has been credited with facilitating the construction of 4,300 new housing units in the down town area. (Tomalty 7)

However, Skaburskis and Tomalty conclude that in areas of low land prices, the fees should not be reduced. (30) Rather, development fee increases are an effective way of spurring developers to strive for the highest-value use of the land. With steeper fees, they would have no choice but to try to get a higher return for the property, suggesting the fee increase would render low-density development unfeasible by cause the housing price to increase too much. (Skaburskis and Tomalty 30) Of course, these inferences could change depending on the marketplace, re-absorption rate, and policy objectives but they all bear on the possibility of developing scrap sites.

In the last decade a number of Canadian cities have undertaken initiatives towards urban intensification.⁴ These provisions have enabled

⁴ Vancouver generated new communities by rezoning and selling former industrial areas to developers. (Tomalty 6-7) Ottawa encouraged downtown revitalization by reducing

several formerly low-use sites across the country to be transformed into vital mixed-use, high-density projects. Zoning amendments, property tax reductions, and building permit rebates are some of the incentives that have been used to encourage these transformations. The City of Toronto promoted intensification by loosening its zoning and planning by-laws under the King's Regeneration Initiative, which permitted residential and commercial uses in a former industrial area near downtown. (Tomalty 7) These policy initiatives, and others with the same aims, would need to be utilized in order to realize the development of scrap sites to their full potential.

development and planning application fees. (Tomalty 6-7) In Saskatoon, taxes were decreased on urban rental housing along with a 50% reimbursement on building permit fees for new housing development. (Tomalty 6-7) Under the "King's Regeneration Initiative," an "adaptive re-use redevelopment" plan, Toronto encouraged residential/commercial buildings in two previous urban industrial areas. (Tomalty 6-7)

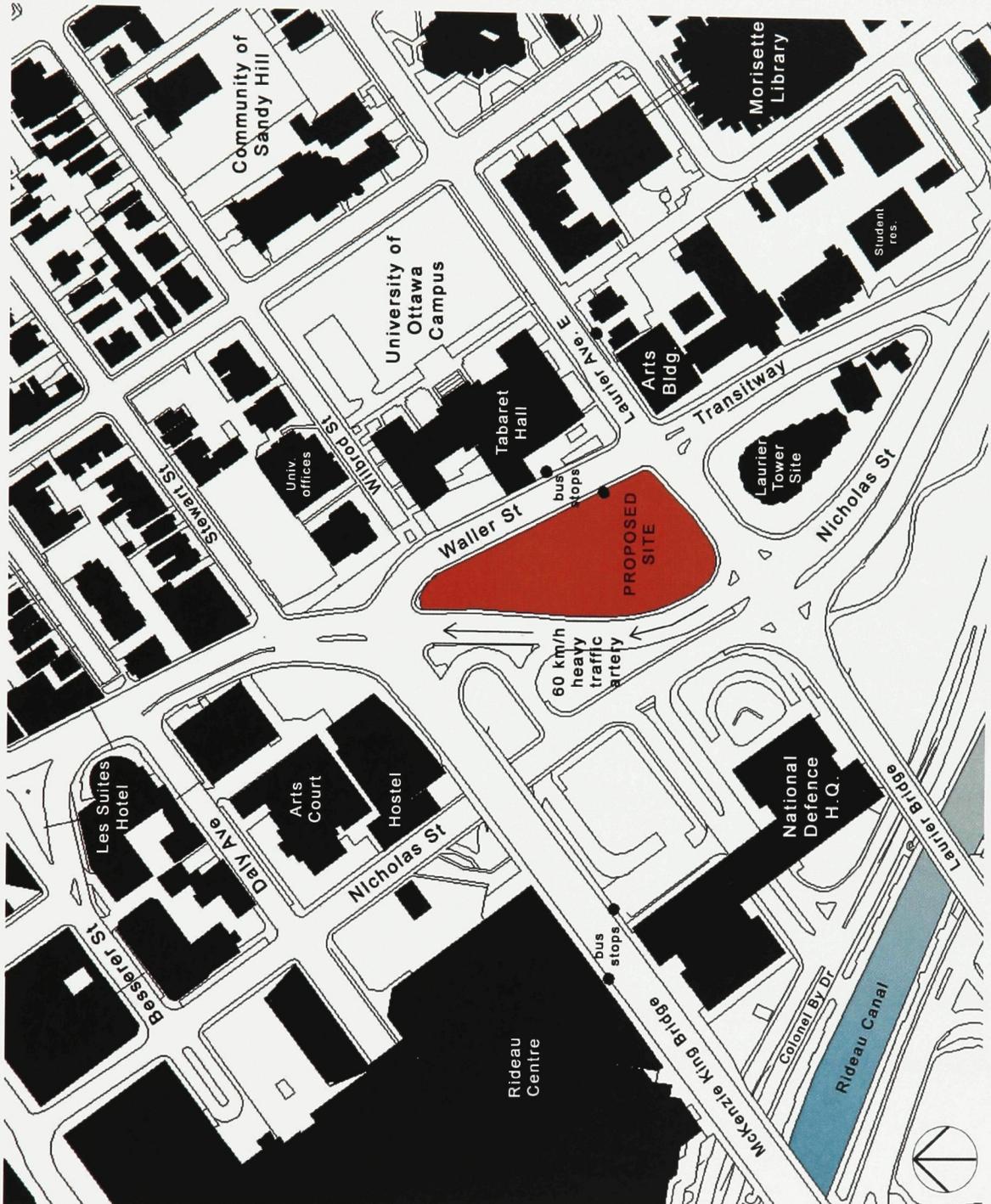
The Nicholas Street Site

The design project accompanying this paper proposes a series of mixed-use high-density buildings to be located on the scrap site where Nicholas Street, Waller Street, and Laurier Avenue intersect in Centretown Ottawa (figure 15). The proposed site will be referred to as the Nicholas Street site.

This site emerged between the late 1970s and early 1980s, during the planning for the urban regional mall known as the Rideau Centre. (Miguelez) In this process, the north-westbound lanes of Nicholas Street were curved northward as of Laurier Avenue East and resulted in the formation of the scrap site triangle. The move was brought on by the City's desire to redirect trucking routes from the Queensway highway to avoid an important portion of Rideau Street. (Miguelez)

The site's urban context includes the campus of the University of Ottawa across the entire east edge. To the south, the site neighbours a fourteen storey residential tower, 50 Laurier Tower (*Case Study 1*), which is incidentally also built on a scrap site. Finally, to the west across Nicholas Street, the major six lane thoroughfare which created the scrap site, stands National Defence Headquarters, a large government office for thousands of workers.

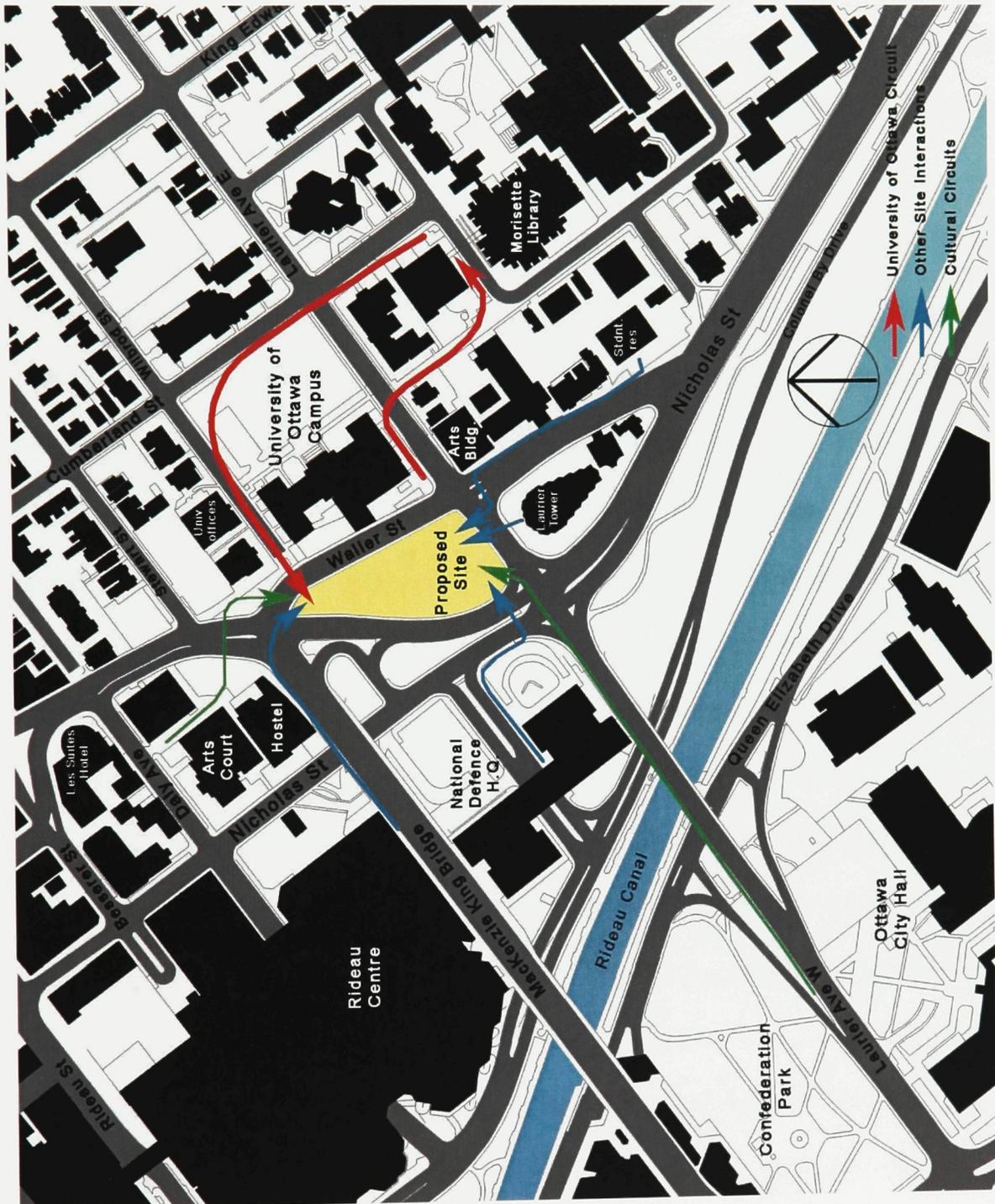
Figure 15
Site plan – Nicholas Street scrap site and urban context – approx.
scale: 1:3000



The Nicholas Street site is in a central location within close proximity to the Rideau Canal, the Rideau Centre to the northwest, and the Byward Market further north. These nearby amenities along with its easy accessibility to the Queensway make the Nicholas Street site a very favourable one to develop. The canal and the market offer attractive leisure opportunities; the nearby university means that anyone living at the site would be within walking distance to educational or employment opportunities; and the nearness of the Queensway, Ottawa's main highway, makes it easy to reach the site by car from other city areas.

An analysis of the Nicholas Street site reveals there are significant interactions that could be expected between the site and the surrounding urban development if the site were pursued as a building location (figure 16). A significant interaction would occur between the Nicholas Street site and the University of Ottawa. Tabaret Hall is a major administrative building for the university and is located directly across Waller Street. Along Wilbrod Street, which intercepts the Nicholas Street site to the northeast, rests a row of university offices. The proximity of these university buildings and others more than four blocks to the east and south ensures important interactive possibilities between the campus and the Nicholas Street site.

Figure 16
Expected interactions between the Nicholas Street site and surrounding urban development
—not to scale



Secondly, a cultural path between both Confederation Park and Ottawa City Hall to the west across the Laurier Avenue Bridge and Arts Court, to the North of the Nicholas Street site, is a likely one for pedestrians to undertake. This is relevant to the site because it would be intercepted by any pedestrian following that cultural path.

Additional interaction could be predicted from the south of the Nicholas Street site because there are two high-rise buildings located there, 50 Laurier Tower and a student residence further along Waller Street. Residents en route from these buildings to either the Rideau Centre or the Byward Market would find the most direct path to these areas by traversing the Nicholas Street site. The large population of workers based at National Defence Headquarters, whose only other adjoining commercial site is the Rideau centre, would certainly use the site if there were amenities including restaurants and coffee shops they could use at break times. Finally, the presence of bus stops on and around the site and the fact that the site rests on a major public transit route into the city at Waller Street, means that the site is intercepted on a daily basis by commuters from surrounding development.

In summary, the most important interactions would exist at the Nicholas Street site's east and south edges. Interactions from Nicholas Street itself are considered unlikely due to the disconnection from the adjacent site by six lanes of traffic.

The Nicholas Street site is clearly a feasible development site from a contextual point of view. However, the site is affected by the inherent problems which plague scrap sites including triangular site shape, noise, and disconnection from surrounding sites. These drawbacks raise questions such as: how can the hard-to-approach triangular plan be loaded with significant density and yet thoughtfully incorporate a wide mixture of uses? What can be done to overcome the noise generated by Nicholas Street? And finally, given its inherent disconnection, how can the Nicholas Street site attach itself to the larger city matrix and become a purposeful player in its context? A response to each of these inherently related questions is made in the next section, *Design Response for the Nicholas Street Site*.

Design Response for the Nicholas Street Site

This section presents the design decisions that have allowed an increase in both density and diversity to occur on the Nicholas Street site despite the previously listed site challenges.

Analysis of the interactions between the Nicholas Street site and surrounding development were described in figure 16 and discussed in the previous section. Figure 17 demonstrates an appropriate response to these previously outlined conditions. The Nicholas Street edge is solid and impermeable in order to block noise from that edge. The site's east edge, at Waller Street, on the other hand, is permeable in order to encourage an interaction with the campus of the University of Ottawa. The Laurier Avenue East edge, to the south is a combination of the other two. On the one hand, that edge is close enough to the intersection with noisy Nicholas Street to require a build up of mass, but if it is totally impermeable an important southern interaction base would be lost. Therefore, the southern edge of the site is semi-permeable.

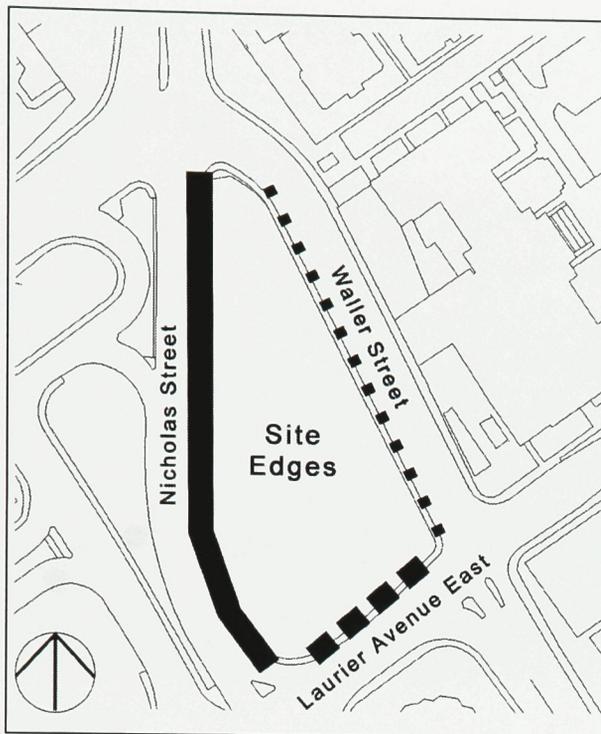


Figure 17
Site edges diagram –Nicholas Street site

In order to create a buffer zone for the site at Nicholas Street that edge is loaded with mass up to four storeys (figure 18). The opposite strategy is used along the Waller Street edge of the Nicholas Street site, where the site will engage the campus of the University of Ottawa. On that side, the site is permeable and instead of having one long mass, several masses are installed there to allow passage into the site (figure 19). Along Laurier Avenue East, a combination of the previous two edge conditions is established. There the mass is loaded up to three stories to reduce the effect of the noise generated at Nicholas Street on the inner site. But, the mass on Laurier Avenue East is also penetrable on the ground level in order to accommodate the important interactions expected from the south (figure 20).



Figure 18
Massing on the Nicholas Street edge

The building is raised to four levels along this edge because there is little engagement predicted here and the noise generated by Nicholas Street is blocked by the solid mass.



Figure 19
Massing on the Waller Street edge

The building is raised between three and twelve levels along this edge in order to build up mass. There are three openings into the site between buildings to allow access to the plaza by visitors from the campus of the University of Ottawa.

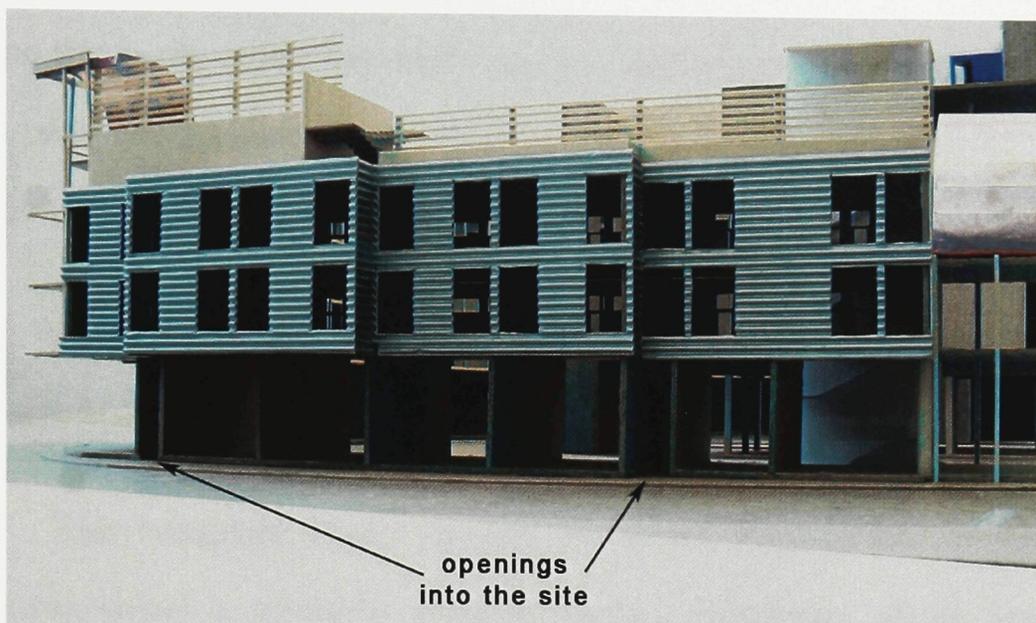


Figure 20
Massing on the Laurier Avenue East edge

The building is raised between three and four levels along this edge because it is still adjacent the intersection with Nicholas Street and noise is a problem. However, there are two openings on the ground level to permit passage through the site.

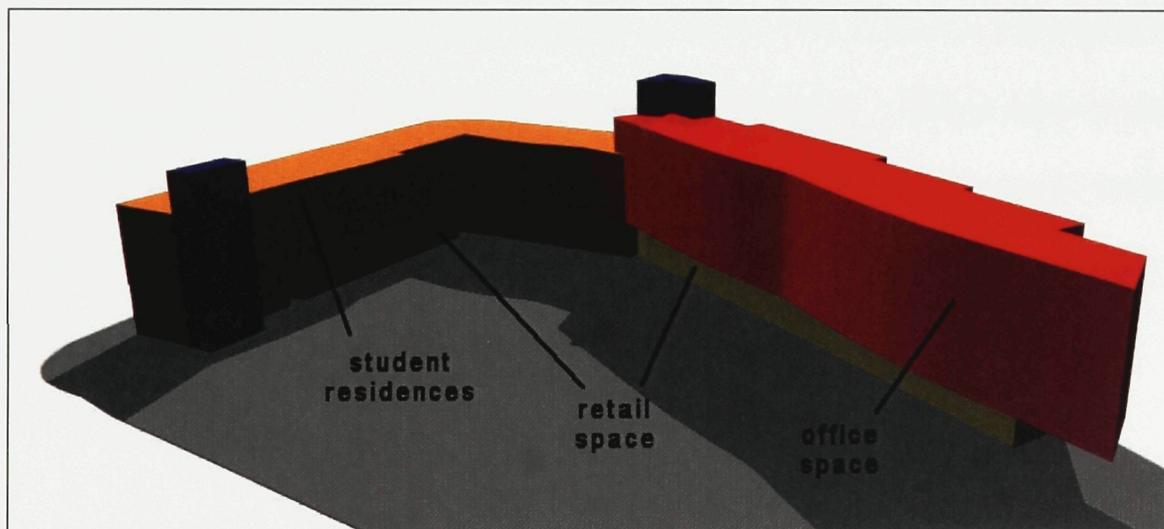


Figure 21
Using unfavourable scrap site edges

The use of the unfavourable Nicholas Street edge for spaces of reduced rent or for programs where noise is not of major concern increases site desirability within the core

The design proposal for the Nicholas Street site now connects the site to the larger city matrix because it is permeable in the necessary directions. The site design also establishes a protective buffer against the noisy disconnected Nicholas Street edge.

The spaces established in this functional massing strategy must be organized in the most programmatically appropriate way in response to the site challenges of noise, disconnection and triangular site shape.

The low-grade space nearest the main thoroughfare of the site, Nicholas Street, is utilized by graduate student residences, offices, and retail space in order to buffer the inner space of the site for higher-uses (figure 21). Employing appropriate acoustic design strategies would permit both student residences and office spaces to function adjacent the noisy traffic artery. The student residences function because the tenants there would be trading-off the amenity of a quieter apartment for reasons of economy. Offices also function there because the relatively low levels of noise that these offices would endure (given appropriate acoustic design measures) are acceptable for that type of use but would not be acceptable for high-rent dwelling types.

Several techniques are employed to deal with the noise problem for the space types nearest to the disturbance source (figures 22 & 23). One strategy used is limiting window openings. Where windows are required, they are placed higher on the floor plane so that it is the wall rather than the glass that intercepts the angle between the noise source and the occupant's ear. Where curtain wall is needed on the offices along the Nicholas Street edge, it is a double glazed wall with unequal panes of glass –both techniques reduce the effect of the noise. Finally, because vegetation also reduces noise transmission, a system of wooden latticework intended for vine growth is used along the roof terraces on the Nicholas Street edge instead of a guard rail.



Figure 22

Using vegetation as a sound buffer

It is intended that crawling vines attach themselves to the latticework and reduce the effect of the noise of Nicholas Street.

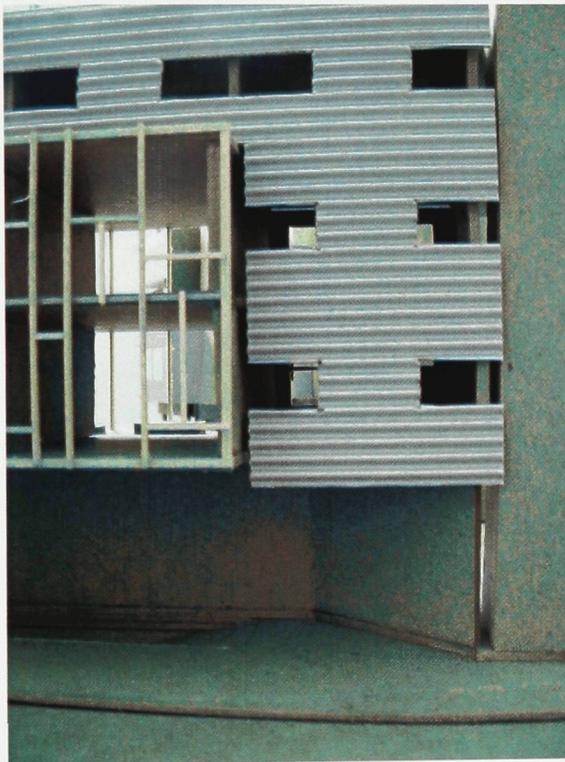
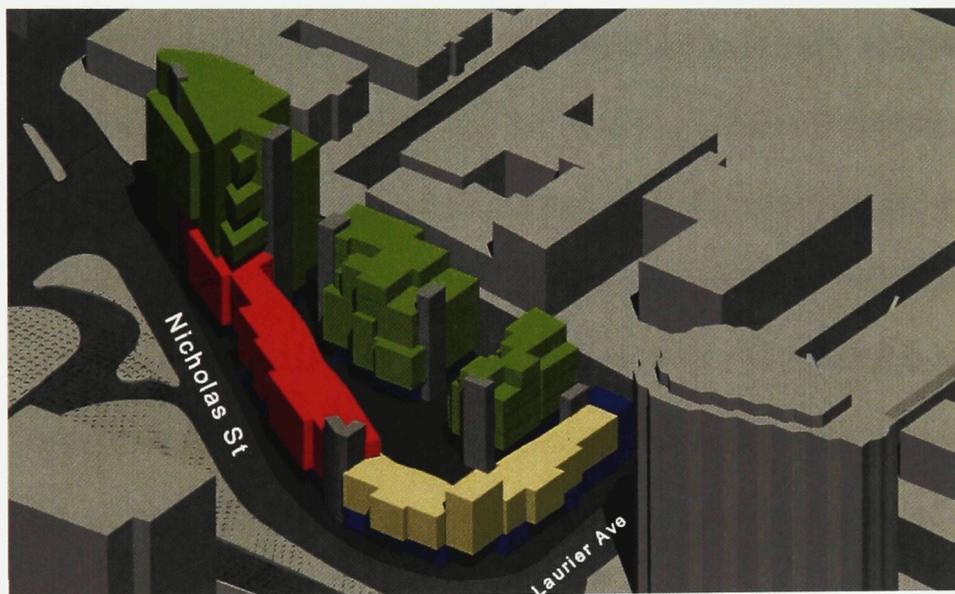
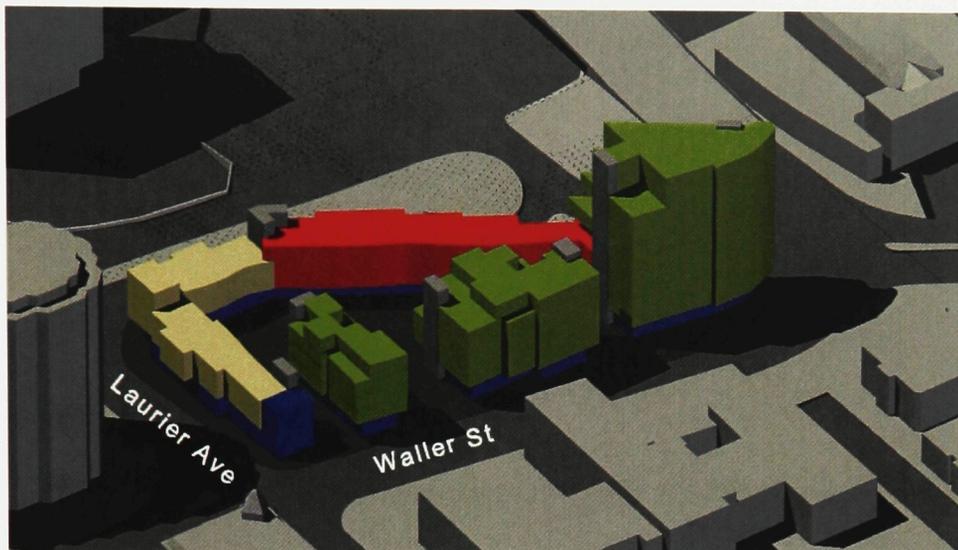


Figure 23

Noise control design features

The use of mass on the ground level in place of glazing buffers the inner site from noise. On upper levels, windows are located 1.5 metres above the floor plane so that the wall intercepts the noise and reduces the noise effect. Where curtain wall is needed for offices the panes of glass are of varying shape to diminish the vibration and noise effect.

Figure 24
Axonometric views – Nicholas Street site massing



- Office Space
- Retail Space
- Student Residence
- Other Dwellings

The plans for the proposed building on the Nicholas Street site (figure 25) and the massing model (figure 24) illustrate that a wide mixture of uses are incorporated into the site. Offices, rental apartments, and ground floor retail space have been combined. Furthermore, a diversity of living accommodation sizes and qualities has been offered (figure 25). Graduate student residences, middle-rent, and high-rent dwellings offer housing types which suit various lifestyles.

The appropriate type of housing for the Nicholas Street site is based on the demographics of the surrounding community. Appendix I lists important census data pertaining to the Centretown area and alludes to the kind of dwellings that would be useful there. The information indicates that Centretown is predominantly a community of young people, living either alone or with only one other person. It also suggests that those same people tend to be childless. The Centretown data and the fact that the site is surrounded in large by the University of Ottawa campus suggests that smaller dwellings are an appropriate contextual response to the local constituency.

Small low-rent spaces serve students well because many of them cannot afford to live in larger dwellings and, they tend to spend little time at home. One expects they will be attending classes, studying in libraries or indulging in leisure activities most of the time so large living accommodations are uneconomical for students.

Slightly larger units with multiple bedrooms in which a group of students could reside together, and split the rent, also cater to a student lifestyle. Both types of apartments are kept relatively cheap by providing shared kitchens and living spaces. Appendix L shows some of the tightest formations that are possible for student dwellings. These models suggest that areas of 37, 46 and 56 m² are the minimum areas that could realistically accommodate bachelor, two bedroom and three bedroom suites respectively for these students.

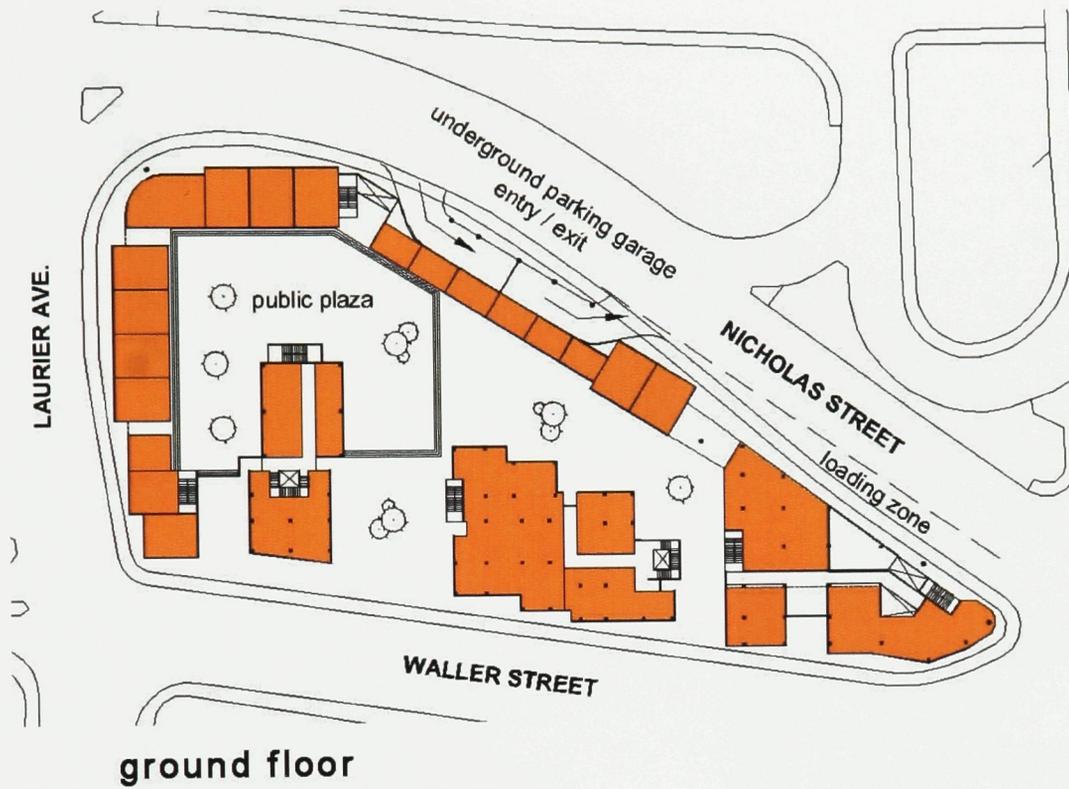
The other part of the demographic of Centretown, the groups of young professionals, is accommodated by medium- to high-rent spaces with up to two bedrooms. These individuals have greater amounts of disposable income to spend on rent and are likely to be interested in fewer bedrooms because they tend to be, as the statistics suggest, predominantly unmarried and without children. Large studio and open plan apartments are offered for this demographic and is an appropriate response for such lifestyles.

The modulated unit-type range provided at the proposed Nicholas Street site design avoids the high-rent uniformity exhibited at 50 Laurier Avenue East (*Case Study 1*), and more honestly reflects the existing demographic profile of its urban area. Low-rent, middle-rent and high-rent spaces are roughly balanced and divided into three apartment sizes to accommodate the expected variety of lifestyles. And, to justify the high-rental

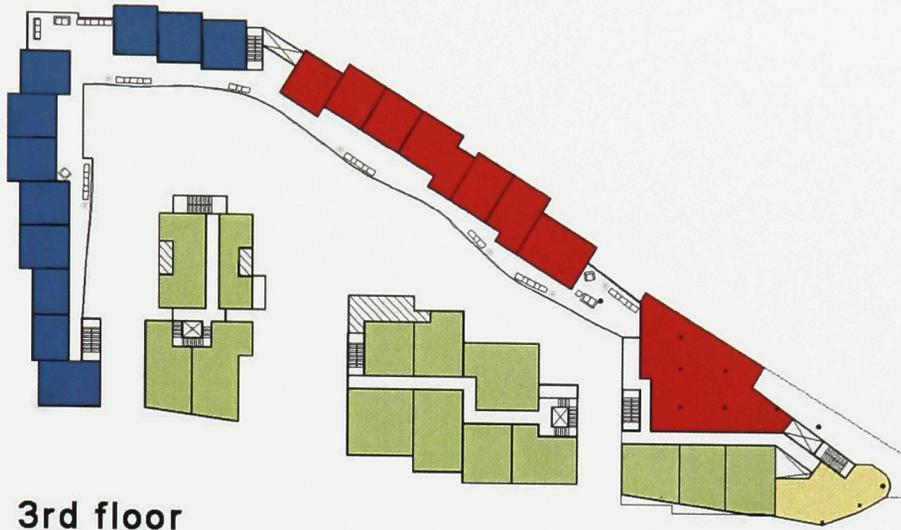
prices for the largest apartments, amenities such as private roof terraces, skylights, and atriums are offered.

Dwellings in the design proposal are always located over ground floor commercial space. Stores are the primary programs used to vitalize the site. Retail space is also exploited to provide double service along the Nicholas Street edge, by serving both to enliven the public space of the ground plane and by shielding the inner site from car noise coming from that direction (figure 21). Using the retail space to buffer the inner site in this way is functional because traffic noise is less of a concern to store clientele whereas it is of considerable concern in dwellings.

Figure 25 (and continued on the three subsequent pages)
 Plans of all low rise floors and a typical high rise floor for the Nicholas Street site buildings

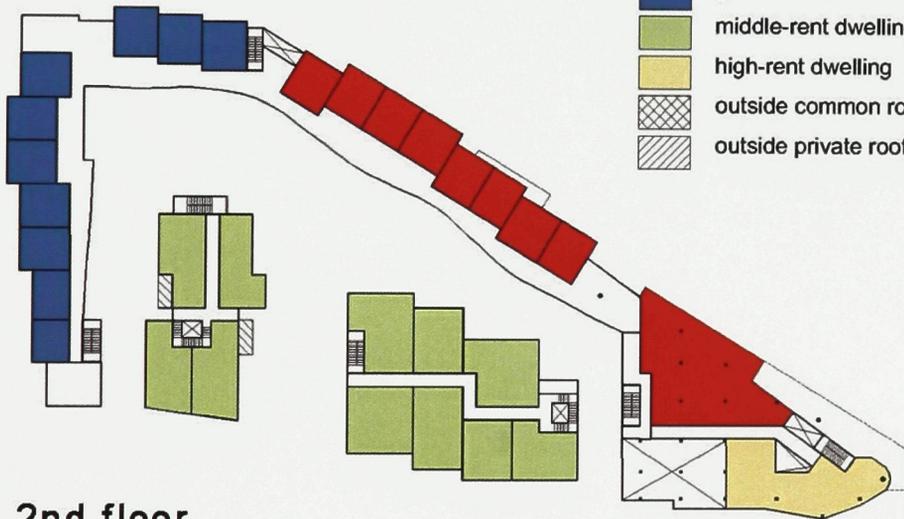


- retail space
- office space
- graduate student residence
- middle-rent dwelling
- high-rent dwelling
- outside common roof terrace
- outside private roof terrace

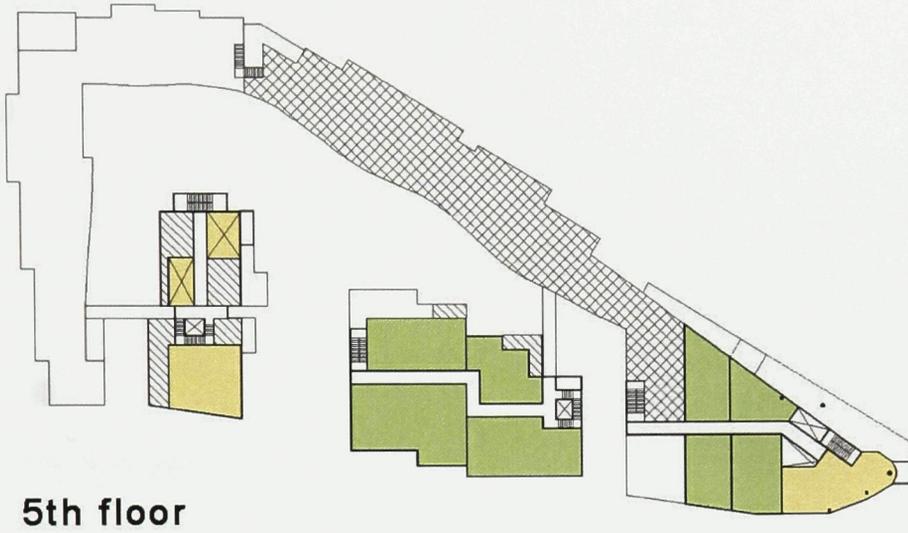


3rd floor

-  retail space
-  office space
-  graduate student residence
-  middle-rent dwelling
-  high-rent dwelling
-  outside common roof terrace
-  outside private roof terrace

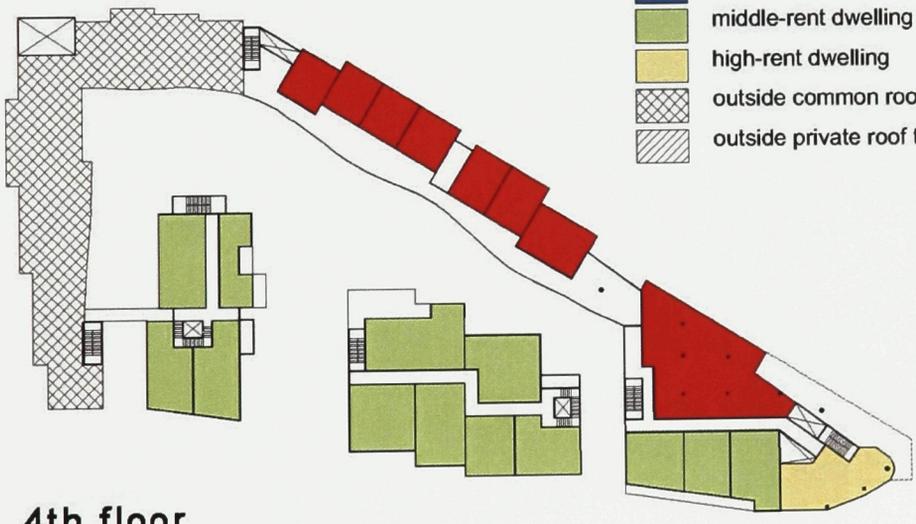


2nd floor

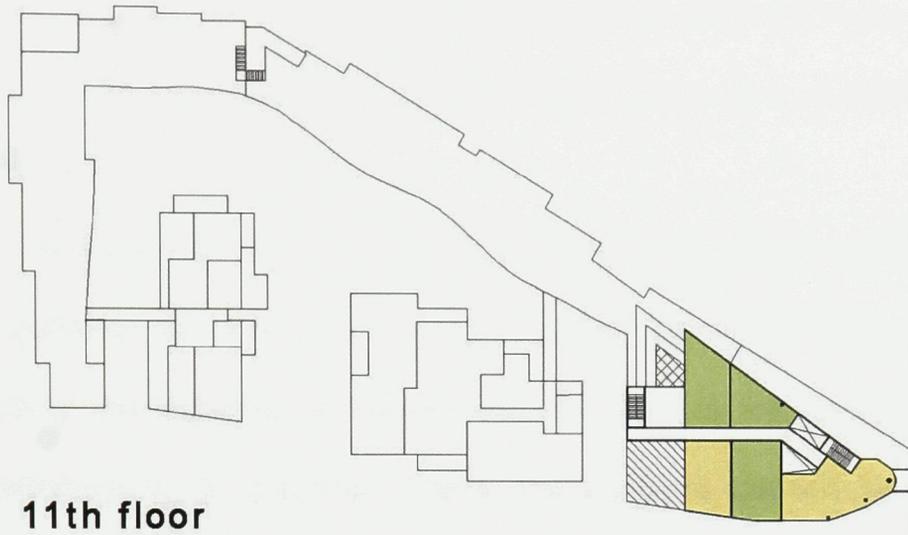


5th floor

-  retail space
-  office space
-  graduate student residence
-  middle-rent dwelling
-  high-rent dwelling
-  outside common roof terrace
-  outside private roof terrace

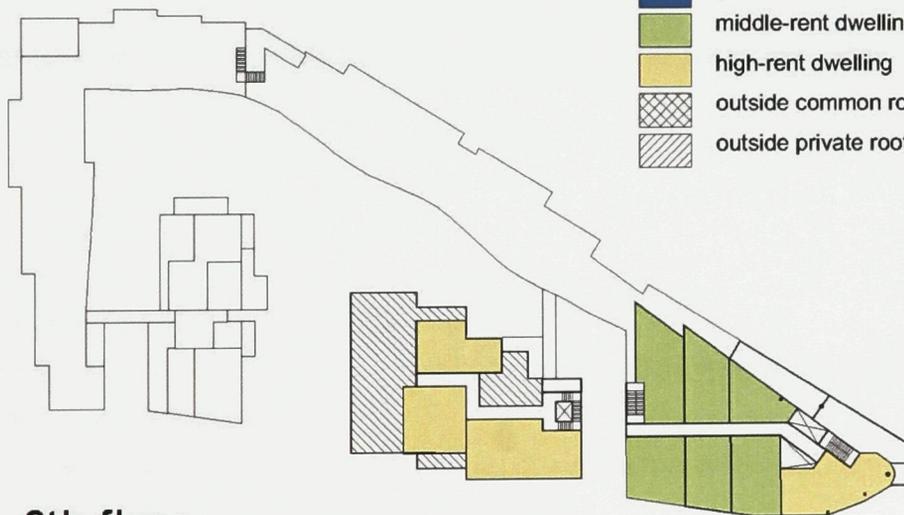


4th floor



11th floor

-  retail space
-  office space
-  graduate student residence
-  middle-rent dwelling
-  high-rent dwelling
-  outside common roof terrace
-  outside private roof terrace



6th floor

Using the upper margin of 7500 persons / km² as the base-level density required in order to produce a sustainable scrap site, the Nicholas Street site which has an area of approximately 6000 m² must allow at least 92 people to reside within its site area.⁵

Because this level of density for the Nicholas Street site calls for a high-rise building, the effects of the tall building are considered. The shading effects of the high-rise on the site are managed by the building's location at the northern tip of the site. There, the shadows caused by the tower fall mostly on the intersection of Nicholas Street and Waller Street north of the site. Even, during the winter months, with long shadows, it has been possible to minimize shading to neighbouring buildings (figure 26). The building placement in this way eliminates shading on the Nicholas Street site's plazas

⁵ The minimum density was calculated as follows:

$1,000,000 \text{ m}^2 / 6000 \text{ m}^2$ (Nicholas Street site area) = 166.6 which is the factor by which the Nicholas Street site area fits into 1 km².

The inverse of this factor therefore, multiplied by the base-level density / km² determines the base-level density for the Nicholas Street site area:

$(1 / 166.6) \times 7500 \text{ persons} / \text{km}^2$ (base-level density / km²) = 46 persons / 6000 m².

However, since the base-level density is based on a gross area, the figure should be adjusted to account for the inclusion of the public realm (including roads, parks etc.) in this area figure.

Therefore, assuming that the public realm accounts for 50% of the gross area, the net site density is therefore closer to 92 persons.

and it minimizes the effect of the shading on the surrounding spaces and is therefore the most appropriate place for a high-rise for the Nicholas Street site.

In order to further maximize density on the site, space is used efficiently. The triangular site tips are utilized for building elements which do not have much of an area in plan such as elevator and stair cores and building projections, which have no ground floor contact area (figure 27). Spaces having a regular proportion and which are repeated in sequence recede or project as needed to follow the site curvature. These spaces include the offices and graduate student residences because they are located on the curved edge defined by Nicholas Street. The three residual spaces resulting from this process are utilized as both communal spaces including meeting rooms for the offices and a lounge for the student residences as well as being dealt with in the same way as the triangular spaces of the site –for elevator and stair cores.

Parking is suppressed below ground and the semi-private space reserved for the residents is placed on the roof in the form of a roof terrace (figure 28) instead of in a courtyard. Both of these decisions liberate the ground plane for more density of dwellings, stores, and a public plaza.

Figure 26

Shadow studies of a northernmost high-rise footprint – not to scale

The study also illustrates that the plaza space is sunny much of the time. Even during the shortest day of the year when buildings cast their longest shadows, half of the plaza will experience sunlight at lunch hour – a popular time to use plazas.



Figure 27
Utilizing the triangular tip –Nicholas Street site

Elevator cores, stairs, and building projections, all elements with little or no area in plan, are used to consume the space in the triangular tip of the scrap site. This strategy liberates the wider areas on the site so that they can be used for modular spaces that would not fit into the triangles.

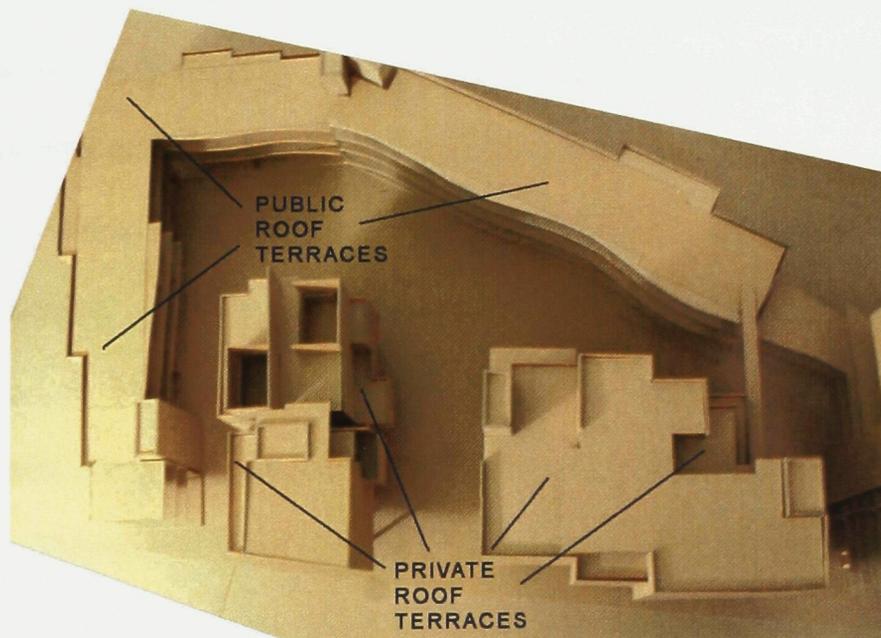
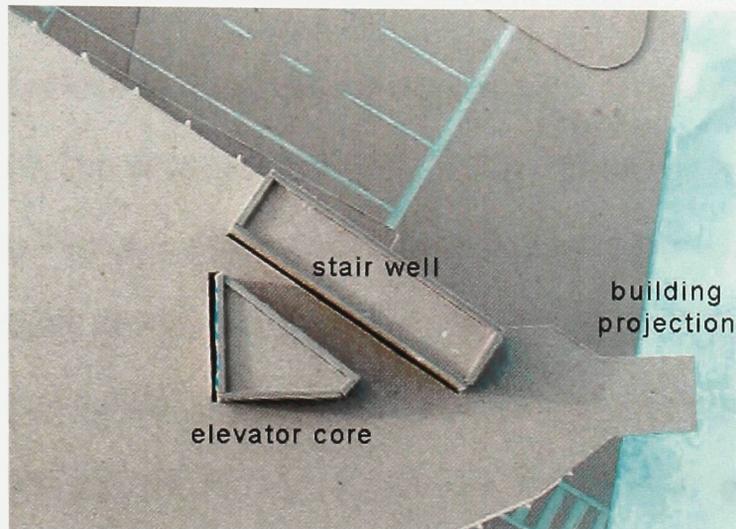


Figure 28
Rooftop public space

The consumption of roof space for semi-private space allows the ground plane to be used for public plaza space or to built up the density of dwellings and retail spaces.

The plaza is present to draw people from surrounding areas to the site. Not only is the site accessible from the needed directions to create interaction with the surrounding urban development but the plaza offers a reason for non-residents to use the site.

The conditions for liveliness, or the presence of people, are integrated into the design. The inner corridor which unites the student residences and offices fronting Nicholas Street and Laurier Avenue East is glazed from the outside (figure 29) so that people visiting the site are able to see and engage those inside that space. Furthermore, this corridor has an undulating plan which allows there to be extra space in the corridor large enough for small lounges where students can read and drink coffee and office workers can meet clients. This strategy benefits the students because their dwellings are very small and lack a substantial living space (figure 30).

The interior space of the student dwellings is not sealed off from the lively hallways. These tight student quarters incorporate windows in the bedrooms at the rear of the suite, but the common living rooms and kitchenettes located adjacent the corridor, do not have direct access to daylight. Therefore, large windows from these common areas in the suites face the hallway; residents allow the natural light already flooding the corridor by raising a blind, or lowering it for privacy (figure 30). This set up is also used in the offices along Nicholas Street to bring light to the reception areas.

The programming of this corridor creates further engagement with non-residents in the courtyard. The three suspended roof terraces of the high-rise overlooking the plaza also encourage interaction between the residence and courtyard visitors (figure 29). Establishing this interaction increases the “eyes on the street effect”⁶ which makes the relatively enclosed internal spaces of this and other scrap sites safer and is perceived as liveliness by non-residents.

⁶ The “eyes on the street effect” is a term referring to Jacobs’ view that well observed spaces are safer spaces because there are people present who unconsciously monitor them. (31) Store owners and residents alike engage in this process reporting trouble to police if it should happen but more importantly they act to deter aggression in the first place by just being seen. The “eyes on the street effect” is needed in the relatively tight enclosure of the public plazas that could occupy scrap sites in order to keep them safe.

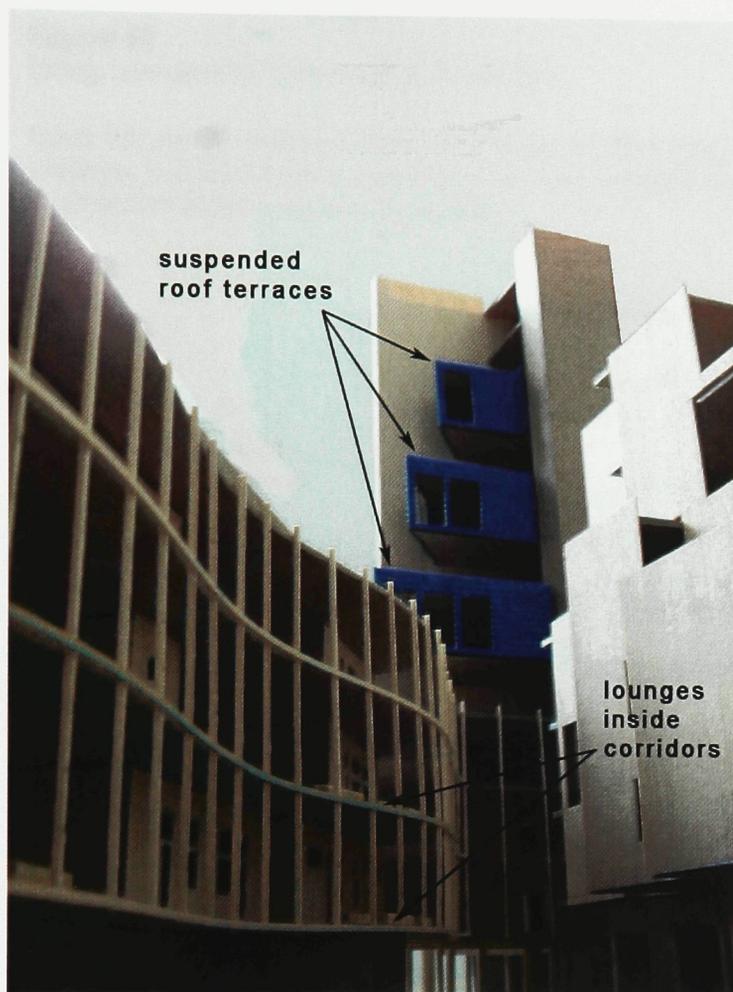


Figure 29

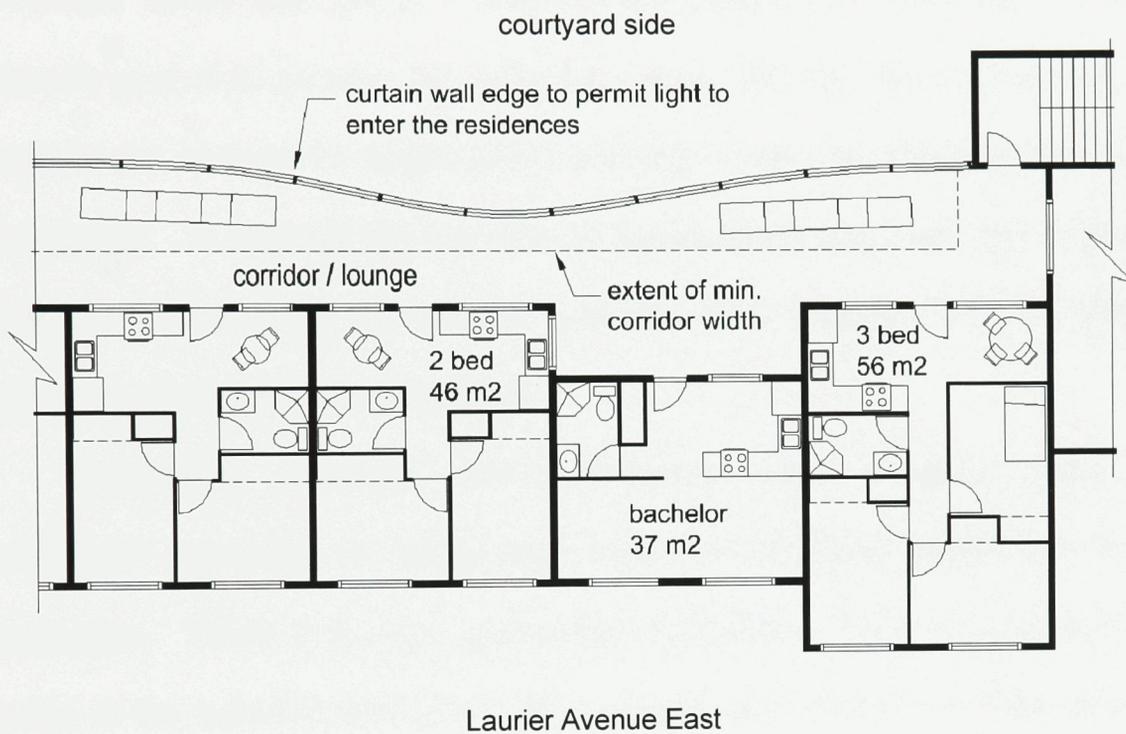
View from inside the public plaza looking north

People on the roof terraces and in the lounges behind the glass of the curved corridors would be seen by non-residents using the plaza. This design move would generate liveliness on the site.

Figure 30

Using corridors for interaction and daylight

Corridors can be used to offer both places for interaction and daylight when the smallness and placement of the student dwellings disallows sunlight or any comfortable sized common space to exist in the suite itself – not to scale



In relationship to the practical application of the design for the Nicholas Street site, some of the provisions applied to the site have been ignored when occasion was thought to be warranted. For example, the space index for the Nicholas Street site, set at 7, restricts the design from reaching the high-density goal of 92 persons set out in this thesis. But the intent of the index, to protect the interest of neighbouring buildings from over-shading, has been respected. In locating the high-rise at the northern site apex, the 12 floors needed to reach the high-density goal are accommodated without casting shadows on neighbouring buildings.

Secondly, although 'Central Business' zones normally permit 'no minimum' set-backs on designated sites, the Nicholas Street site is an exception. There is to be a landscaped perimeter of three metres from the edge of the sidewalk and landscaped western and northern corners of eight and fourteen metres respectively. (City of Ottawa, 1998, schedule 195) The exceptional set-back is likely in place to make pedestrian passage safer given the proximity of Nicholas Street and its six lane capacity. However, because the Nicholas Street site design enables easy pedestrian passage through the site the provision's intent was fulfilled without adherence to it.

The proposed design is otherwise in keeping with 'Central Business' designated zoning which mandates spaces to remain the regional hubs for employment and commerce while allowing cultural and entertainment uses

and ensuring lively, pedestrian friendly, ground planes. (City of Ottawa, 1998, sec. 7, 27)

Conclusion

Scrap site development in Ottawa has not been approached in the most sustainable way possible. This paper has demonstrated that both significantly greater densities and higher ratios of mixed use can be achieved if design principles appropriate for the sites are applied.

It was possible to successfully incorporate 109 residential units into the site design, where only as many as 92 would have been required ⁷ in order to match the highest level of density found in Ottawa (7500 persons / km²). (City of Ottawa, 2004) The Nicholas Street site design therefore, exceeds the high-density norm for the city Ottawa. Furthermore, the design offers diversity in both program and dwelling types. Office, retail and residential uses as well as a public plaza have all been accommodated on the scrap site in the best ways possible in view of the site adversities.

The contextual disconnection of the case-study sites also indicates that little thought has gone into stitching those scrap sites that have been developed into their surrounding communities. Yet the argument here has been that the contextual integration essential to the optimal development of these sites could be readily identified and implemented without great difficulty.

⁷ If any of the 92 people that would have to live on the Nicholas Street site in order to match the density of 7500 persons / km² were to live in the same private dwelling, then fewer than 92 apartments might be all that is needed to meet the density requirement.

This thesis has only offered a developed solution for the Nicholas Street site. Nevertheless, the ideas that serve to solve the challenges of the Nicholas Street site lend themselves to other urban scrap sites. Although many of the physical characteristics that are shared among these sites also allows the strategies applied in solving the problems of one to be applied more broadly to others, the ideas presented here are not a wide-sweeping solution for all scrap sites. There are certainly cases of scrap sites which are afflicted with too many problems and which would under no circumstances be a candidate for high-density mixed-use development.

A checklist of conditions could be used to judge if a given scrap site is developable. Firstly, if there are surrounding sites which are more favourable for development adjacent scrap sites, ones which do not have the drawbacks of scrap sites, then it is unlikely that the scrap site will be chosen. Secondly, there are site areas which are too small and site shapes which are too awkward for building placement. Although it is impossible to quantify exactly what these minimums are because that would depend upon the type of building needed to be sited and on the type of building the surrounding urban context would require. However, it is at least clear that a traffic median no more than a couple of metres wide, would be useless for any type of development. A scrap site also could not be developed if there was no program that could be put on it which could usefully integrate that site with the

surrounding community. Additionally, even if there was a desperately needed programmatic intervention that could be built on the scrap site, it would be unsuitable for development if it was inaccessible. The Nicholas Street site is handicapped by one major thoroughfare of six lanes but other sites may have them from all sides. With these access limitations a site is surely undevelopable. There is certainly also a noise threshold above which any kind of acoustic treatment would be insufficient to make the site desirable. Finally, all of the previous conditions are contingent on economic feasibility. If the sum of the drawbacks impede from generating a return in the desired time period, developers will not choose the site. All of these conditions must be weighed in making a determination of a scrap site's feasibility for development.

Examining the example of *Case Study Site II*, the King Edward Avenue site, for development feasibility using the checklist of conditions listed above, suggests that that site might be found to be worthy of development. Firstly, the site might appropriately integrate itself into the urban context if it located a mental health institution with links to the *Shepherds of Good Hope*, a shelter and outreach organization across the street. The predominantly low-rent neighbourhood, which is also made up of a large number of rooming houses to lodge the homeless or mentally ill, could find a good neighbour in this type of site response. The area and shape of that site could foreseeably accommodate a small institutional building of this type. The King Edward

Avenue site plan is almost an equilateral triangle which is even more favourable than the elongated one forming the Nicholas Street site. Despite its disconnection problem, the site has multiple crosswalks to enable accessibility. And although it is noisy, appropriate acoustical design strategies could manage the problem, particularly for the institutional building where noise is less of a concern than it is for housing.

The only condition that is not met is the fact that there are a few vacant sites surrounding the King Edward Avenue site. Given that three out of four conditions are met on the King Edward Avenue site, leaving only economic feasibility as an unknown, the site seems a likely candidate for development particularly because its land cost is probably lower (being a scrap site) than those of the surrounding vacant sites.

Apart from the drawbacks of scrap sites so often talked about in this paper, these sites also have some characteristics which could be seen as assets. Few city sites within the regular city grid can boast of having multiple street fronts. Although disadvantageous because of noise and the cause of disconnection for scrap sites, the thoroughfares which generate the triangular plans of scrap sites also offer these sites the unique ability to engage three different edge conditions and communities. Furthermore, by virtue of these sites being bordered by arterial roadways into the city, scrap sites are also easily accessible by car from other ends of the city, and vice versa. This fact

means that the site has a broader interaction area for commerce. And finally, because scrap land is often deemed as it is termed: 'scrap,' these sites can be cheaper to buy even if they end up costing more to develop in order to resolve their inherent problems.

As challenging and expensive as it may be to develop on scrap land, the true cost of continuing with cheap and easy development outside of urban centres could be greater in both social and real capital terms. For example, more spread-out Canadian cities have no choice but to spend more on infrastructure, maintenance for roads, sanitation and other services compared to more compact cities. (Fowler 35-60) "Compact development standards result in fewer linear metres of regional infrastructure such as water, sewage and regional roads." (CMHC 16) Fowler goes so far as to say that, "It must be underlined that it is not simply deconcentration of land but lack of land-use mix which causes spending to escalate." (41) "They [suburban homeowners] are spending more of their money on urban transportation because of urban land-use segregation, not just because of deconcentration. " (Fowler 41)

Another issue is the fate of these sites if they are abandoned in favour of suburban ones. They would remain, as the case studies presented here show, low-use parking lots or dilapidated slums. As Fowler argues, accepting that grim status quo does not make financial sense: "They [governments] habitually turn over extremely valuable down-town land in urban North

America to automobile transportation (including parking), depriving citizens of millions of dollars of possible land development. (Land right at the centre and farther out, in turn, tends to be overvalued).” (42) Thus, whatever the criterion for gauging the cost, be it the social toll or real capital cost, it makes more sense to try to put scrap sites to a higher use.

Considering all this, it should be no surprise that Jacobs argues that cities require “an intricate and close-grained diversity of uses that give each other constant mutual support, both economically and socially. The components of the diversity can differ enormously and socially, but they must supplement each other in certain concrete ways.” (14)

Fowler believes that, “we are squandering billions of dollars in North America because our built environment lacks judicious amounts of concentrated land use, small-scale-land use mix, and mixtures of old and new buildings – in short, it lacks physical diversity.” His inquiries into the economics of our urban form illustrate that both the expansiveness of our cities and suburbs, along with their segregated zonings, are responsible for huge sums of money wasted in business delay and transportation costs.

The approach to scrap sites proposed here is not the whole solution to this complex set of problems, of course, but it would mark a positive step towards more responsible land use.

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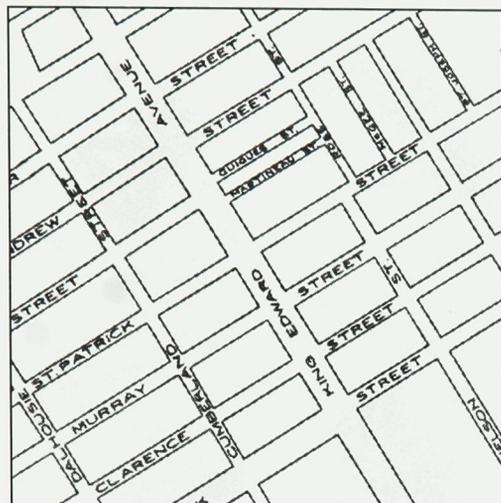
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Appendices

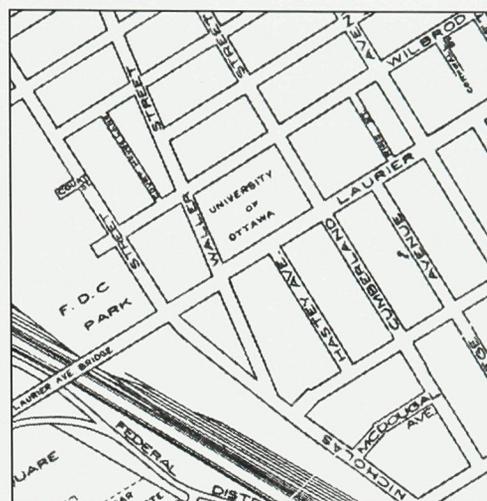
Appendix A
 New multilane streets forming two Ottawa scrap sites
 (Corporation of the City of Ottawa, 1936)



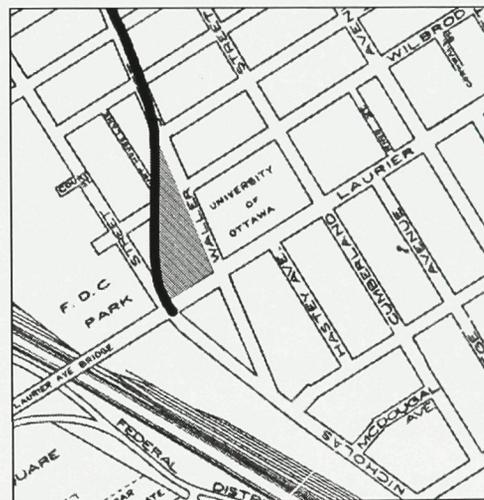
Circa 1936 map of King Edward Avenue Site



Roadwork changes occurring sometime before the 1970s on the same site



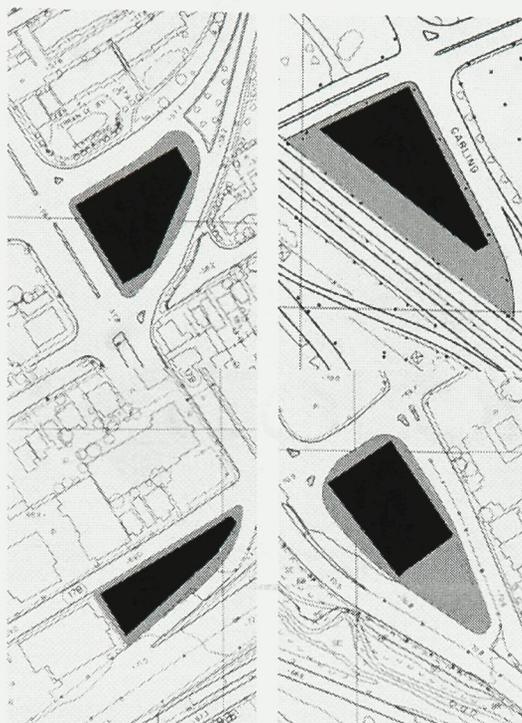
Circa 1936 map of Nicholas Street site



Roadwork changes occurring sometime in the late 1970s or early 1980s on the same site

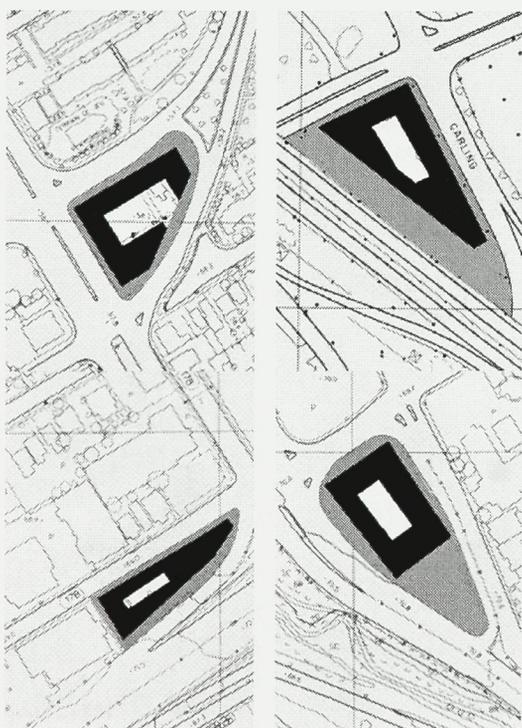
Appendix B

Site plans showing various block structures on different scrap sites



Perimeter blocks

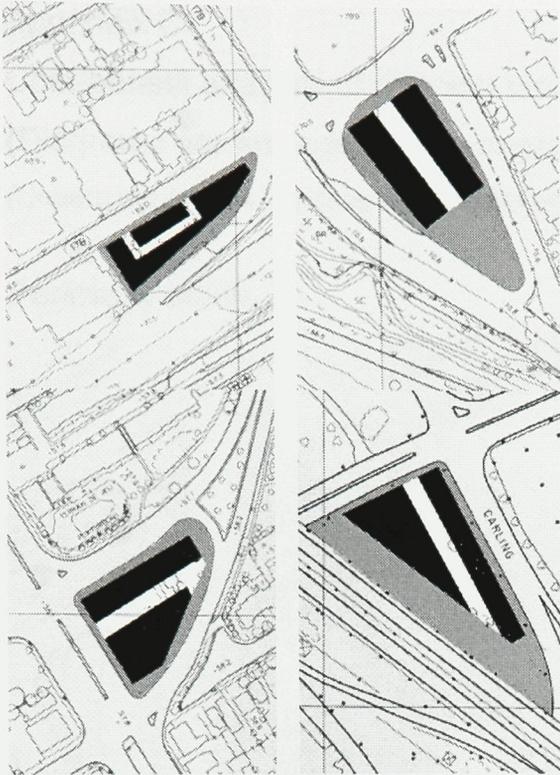
These block structures are useful in maximizing land use but they do not offer any public spaces.



Courtyards

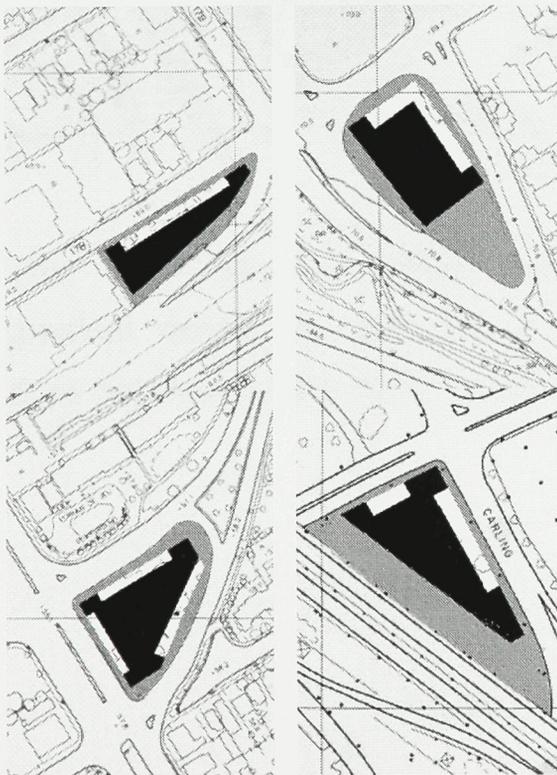
When courtyards are combined with perimeter blocks they result in relatively high-density sites because of the land maximization and also offer inner plaza space, which is sheltered from the ill-effects of traffic.

Clearly, sites which are too slim are unsuitable for courtyards.



Pedestrian Malls

Malls offer both some density and some shelter from traffic effects. They are also usually several times longer than they are wide compared with courtyards, which means that malls are also directional. Malls are thus useful only when the site can be successfully connected with its neighbours along an axis of travel.



Street-front recessions

Recessions in perimeter blocks offer a high density while offering some public space. The problem is that this space does not serve as good public space, being so close to traffic, particularly on scrap sites where traffic effects are severe. Also, large recessions tend to create a disconnect between the building and the street.

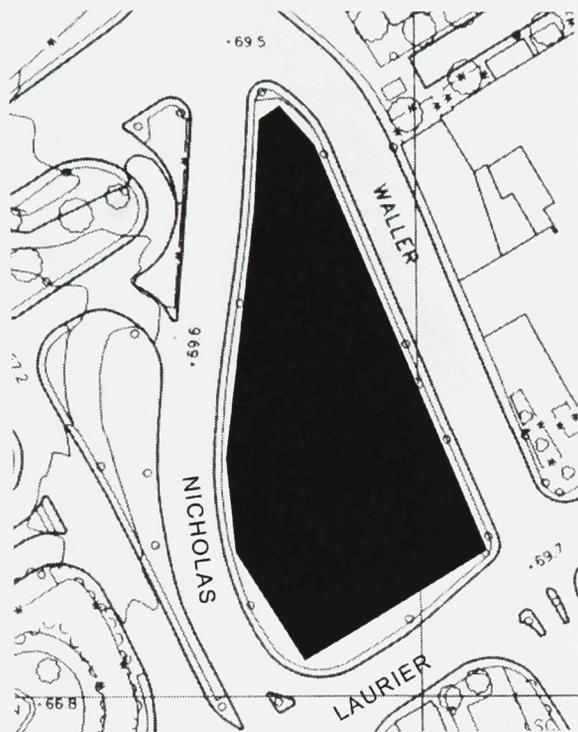
Appendix C

Cost-benefit analysis of different block structures on the Nicholas Street site

(Diagrams are arranged in progression from least to most successful)

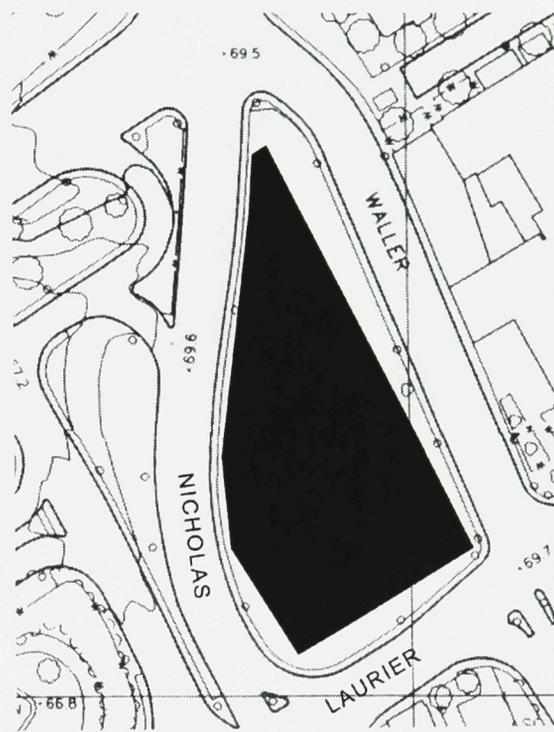
(Underlying images courtesy of the National Capital Commission)

Perimeter block



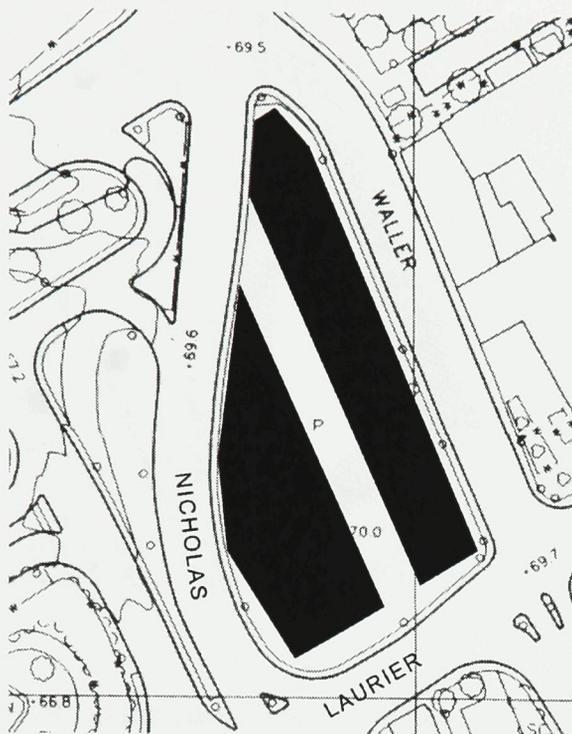
This block structure offers the greatest density for the site but does not allow for any public space.

Street-side Recession



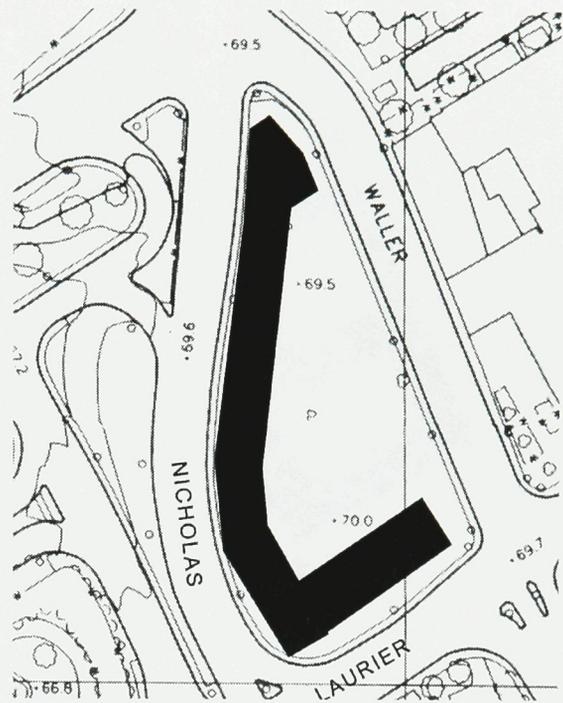
The street-side recession offers high density and space for public interaction along the street edge. However, the recession itself does not have the spatial qualities (enclosure surrounded by a diversity of program) to constitute a place or destination.

Mall



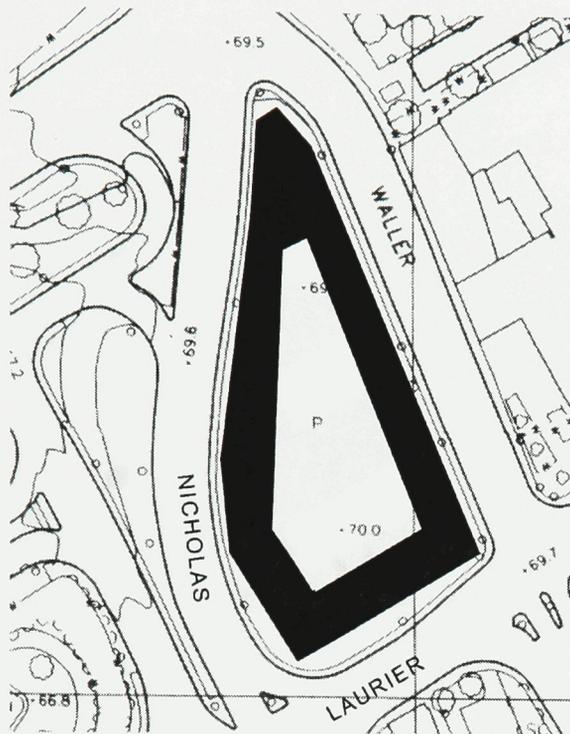
With respect to the contextual requirements on this site, the mall strategy fails because it creates an axis between two points which are of little use when connected – a path between a residential tower which abruptly dead-ends at a busy roadway. Designing the mall on the other axis has the same problem

Edge



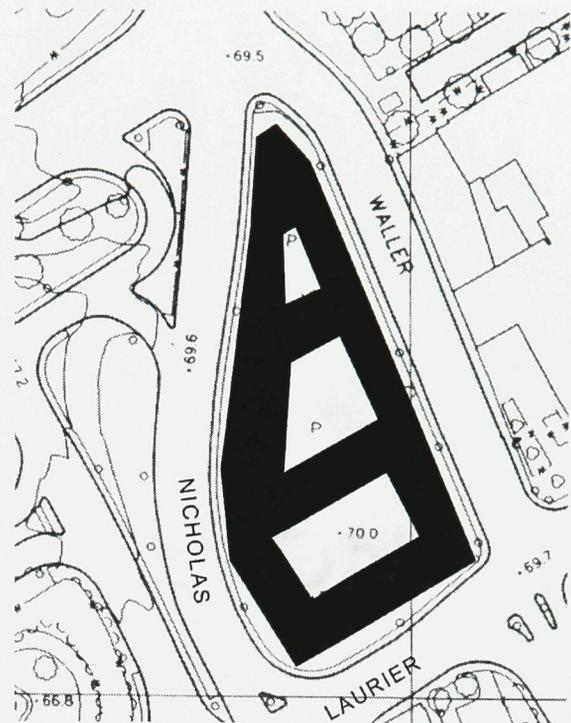
The Edge block structure is useful only in applying mass to shelter the inner site from the noise of Nicholas Street. However, despite opening itself to the campus of the University of Ottawa at Waller Street, the public space that is created is far too vast to be useful as a plaza and there is too little density.

Courtyard



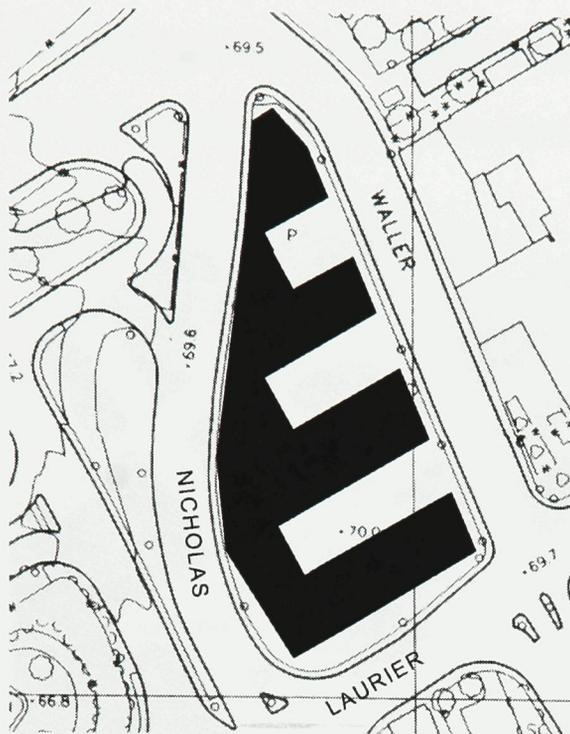
The courtyard strategy trades off some of the density of the perimeter block for internal plaza space. The loss in density in this configuration, however, is too large to make it a viable option. Also, although it successfully blocks the noise of the Nicholas Street edge, the site does not open itself up to the campus of the University of Ottawa at Waller street.

Courtyards



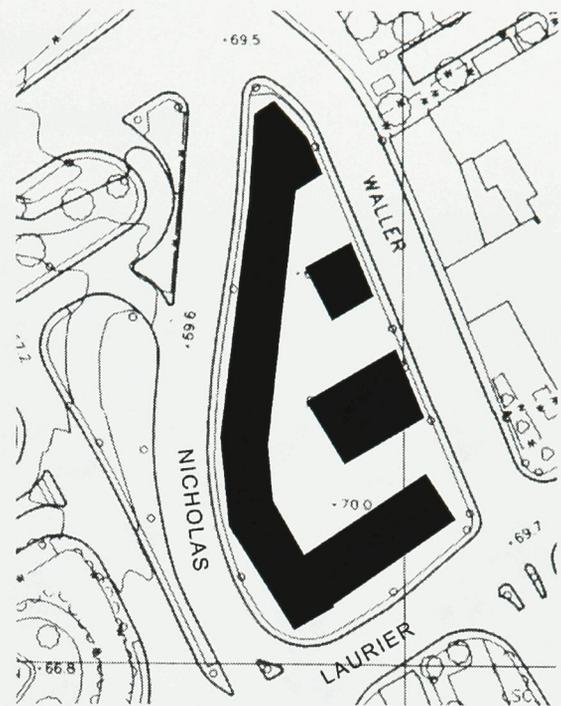
Multiple courtyards permit more mass than a single courtyard does but although this strategy maximizes density and public space, it is impermeable to the University campus on the Waller Street front and lacks an interconnection between the courtyards or anywhere else.

Rake



The rake structure combines all of the benefits of density and permeability to the campus of the University of Ottawa at Waller Street. However, this combination fails to interconnect the internal public spaces thereby restricting free access across the entire site.

Modified Rake

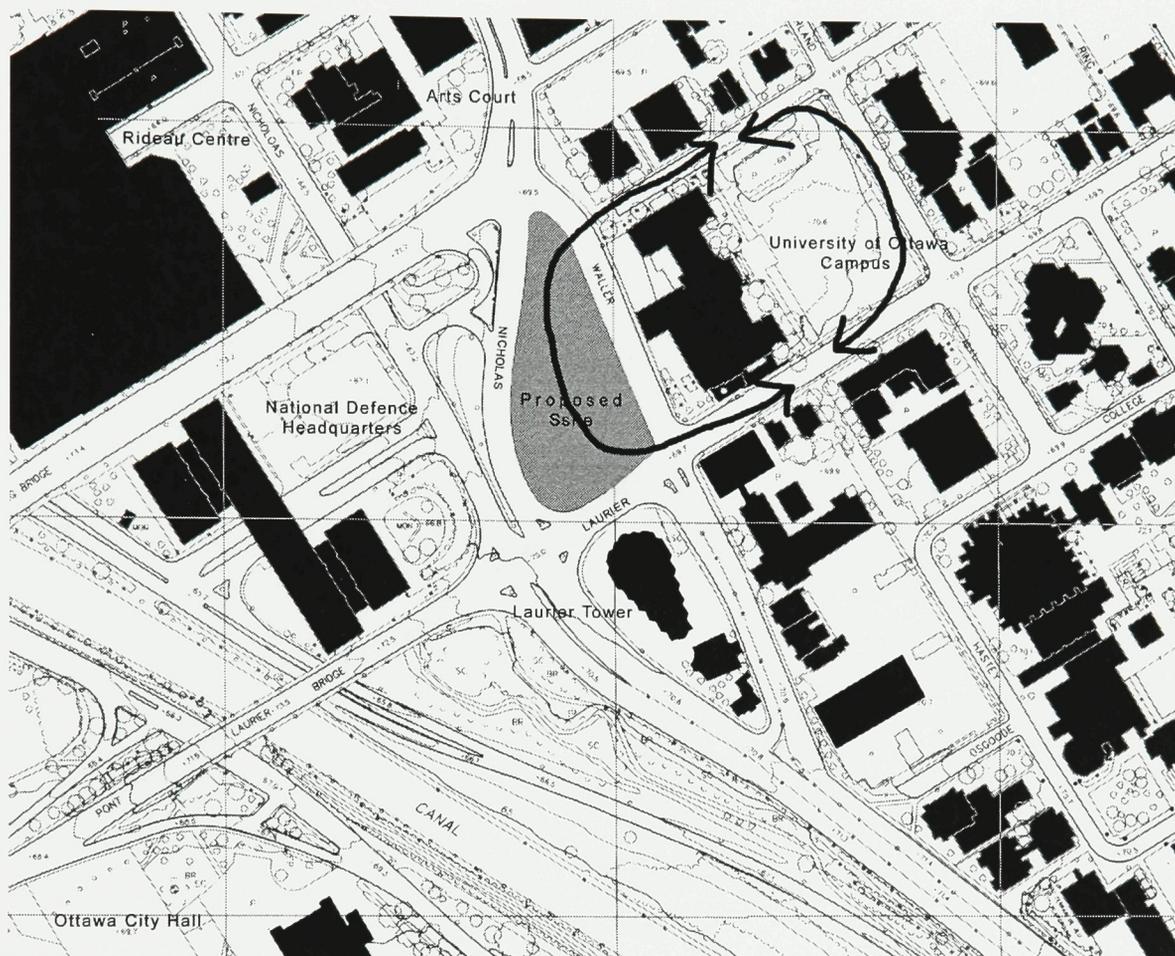


The modified rake block structure offers all of the necessary permeability to the campus of the University of Ottawa at Waller Street as well as offering a connection between all the internal plaza space. The strategy also permits nearly as much density as the rake structure and is protective of the site at the Nicholas Street edge

Appendix E

University of Ottawa circuit – scale: 1:4000

(Underlying images courtesy of the National Capital Commission)



The University of Ottawa circuit represents the most important contextual relationship to the Nicholas Street site. It is crucial that a loop be established so that the Nicholas Street site will engage with its surrounding.

Appendix F

Cultural circuits – scale: 1:4000

(Underlying images courtesy of the National Capital Commission)

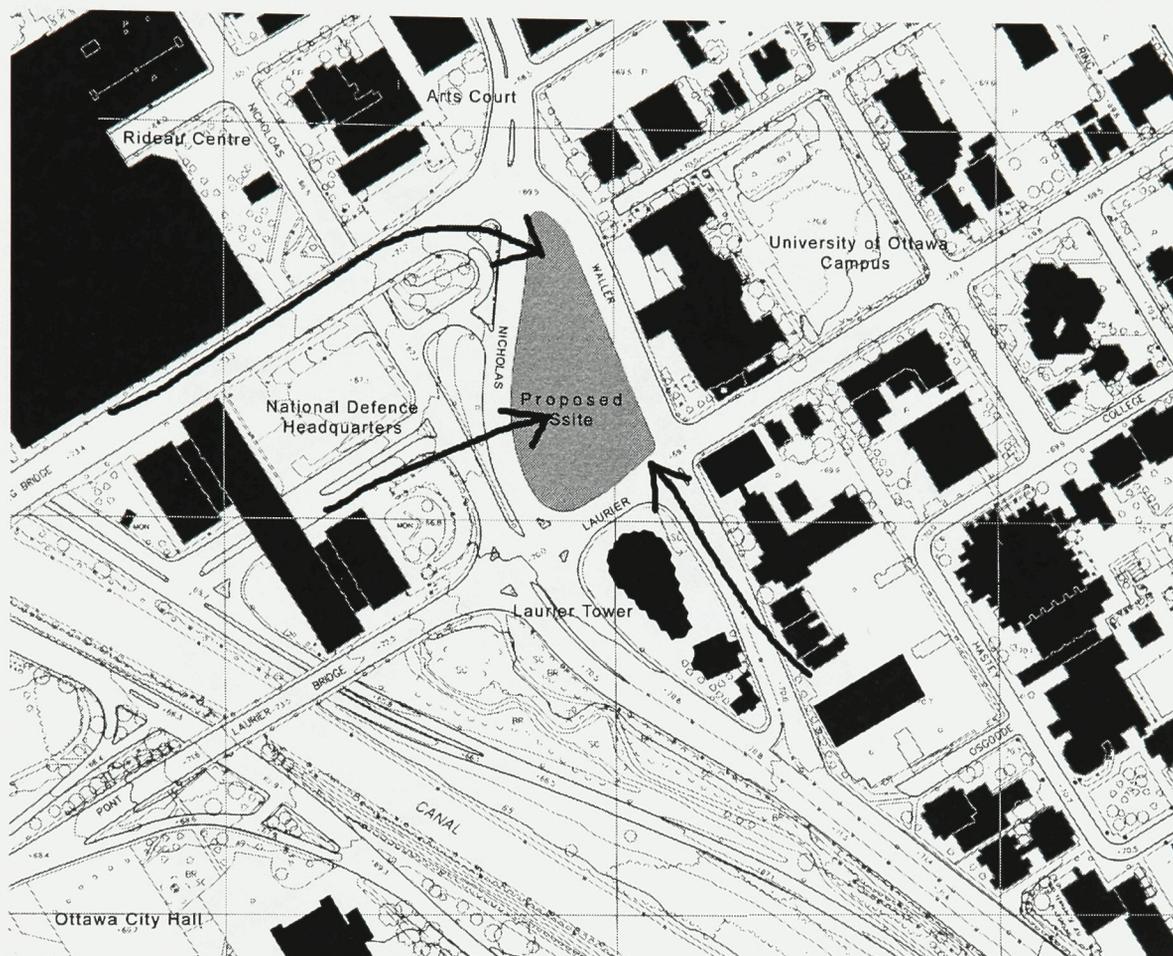


Cultural interactions are expected from both Arts Court and from the Confederation Park area where Ottawa City Hall is also located. The Nicholas Street site should act as a thoroughfare in this circuit so that the year round activities that occur in both hubs can bring people to the site.

Appendix G

Other probable contextual interactions – scale: 1:4000

(Underlying images courtesy of the National Capital Commission)

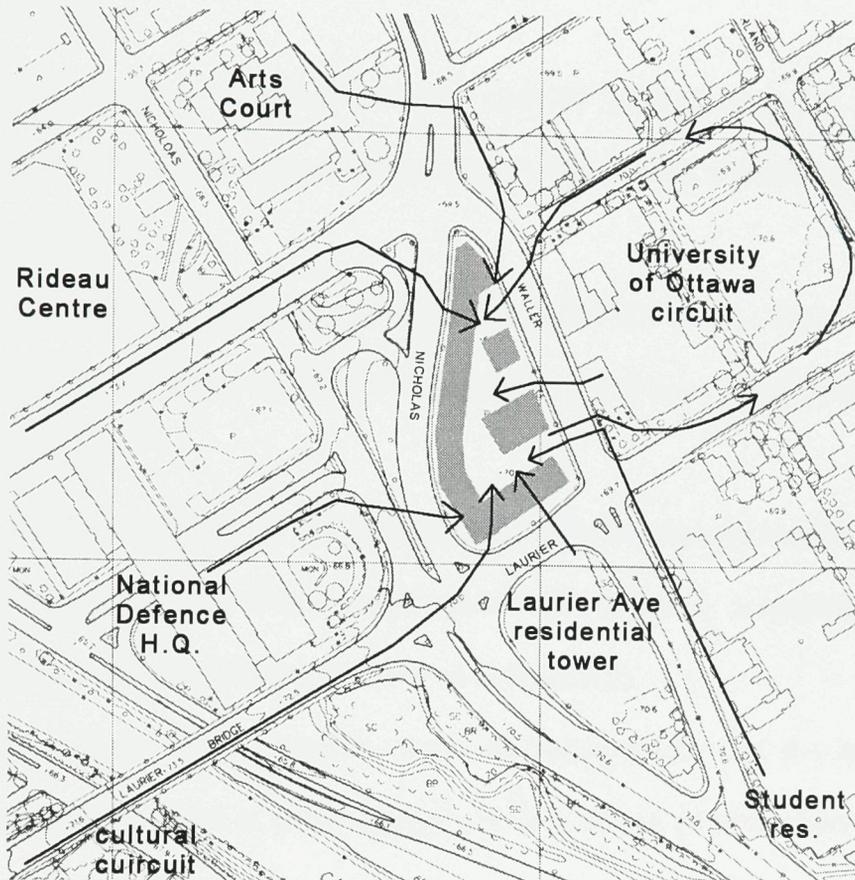


National Defence workers would likely seek a pleasant lunch restaurant or pick up coffee on their way from the bus stop in the morning. The high density student residences south of the site could provide shoppers for retail venues or night life activities. Rideau Centre shoppers might continue their shopping experience at the Nicholas Street site.

Appendix H

All probable contextual interactions (explored in appendices E through G) superimposed onto the *modified rake* block structure (appendix C) – not to scale

(Underlying images courtesy of the National Capital Commission)



The *modified rake* strategy enables the site to engage the campus of the University of Ottawa at Waller Street. Secondly, the plan well accommodates pedestrian passage from Arts Court. Finally, with some small openings penetrating the building masses fronting Laurier Avenue and Nicholas Street, all of the other probable contextual interactions could be accommodated while offering shelter from noise to the inside public plaza space.

Appendix I

Centretown demographic data

(City of Ottawa, 2004)

- Centretown is inhabited mostly by men and women between the ages of 20 and 39, with the highest number of residents between the ages of 25 and 29 years of age.
- Married couples and common law couples without children at home (or without children altogether) far outnumber those with children by as much as thirteen times.
- Single individuals make up the largest segment of the population.
- Non-family persons in private households compose more than half of the population.
- The average number of individuals per private household is about 1.6 versus about three in typical Ottawa area suburbs like Orleans, or Nepean.
- Apartment buildings make up 85% of all dwellings.
- Walking is the most common mode of transportation for the area's labour force aged 15 years or older, applying to almost half of all workers in the area.
- More than half of the population between the ages of 15 and 24 is going to school at least part-time.
- The average gross dwelling rent for the area was \$769 per month at the time of the 2001 census.

Appendix J

The Nicholas Street site



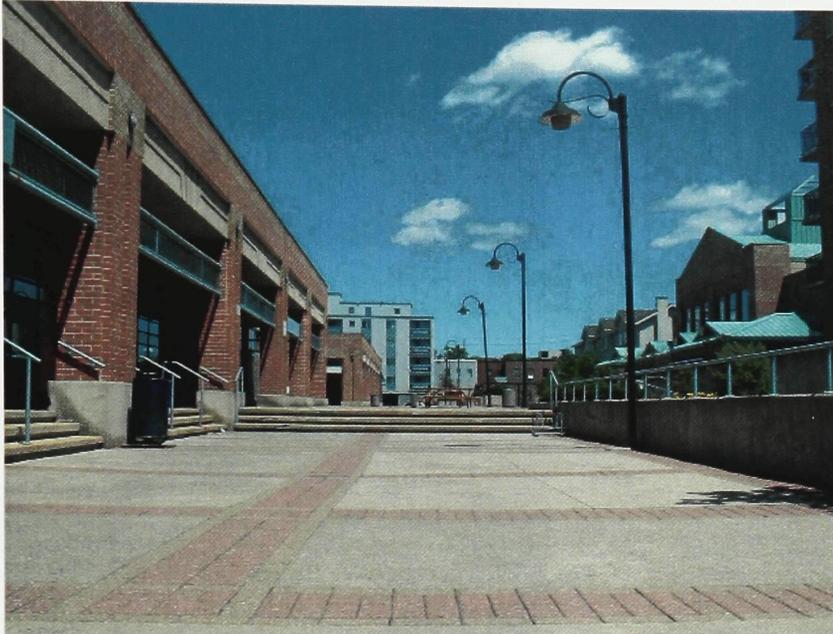
View to the south-east from the University of Ottawa



View south along Nicholas Street

Appendix K

Holland Cross pedestrian Mall



The mall is a desolate area after business hours. This photo was taken at 2:00 pm on a Sunday afternoon when the temperature was 20° C. The lack of shops, bars, and restaurants means that the site is only active during the hours in which the site's offices are in business.

Furthermore, its raised ground plane, several metres above the street level, further alienates it from absorbing any potential street life. Lastly, the mall goes from nowhere to nowhere – it does not link itself to any useful pedestrian circuits.

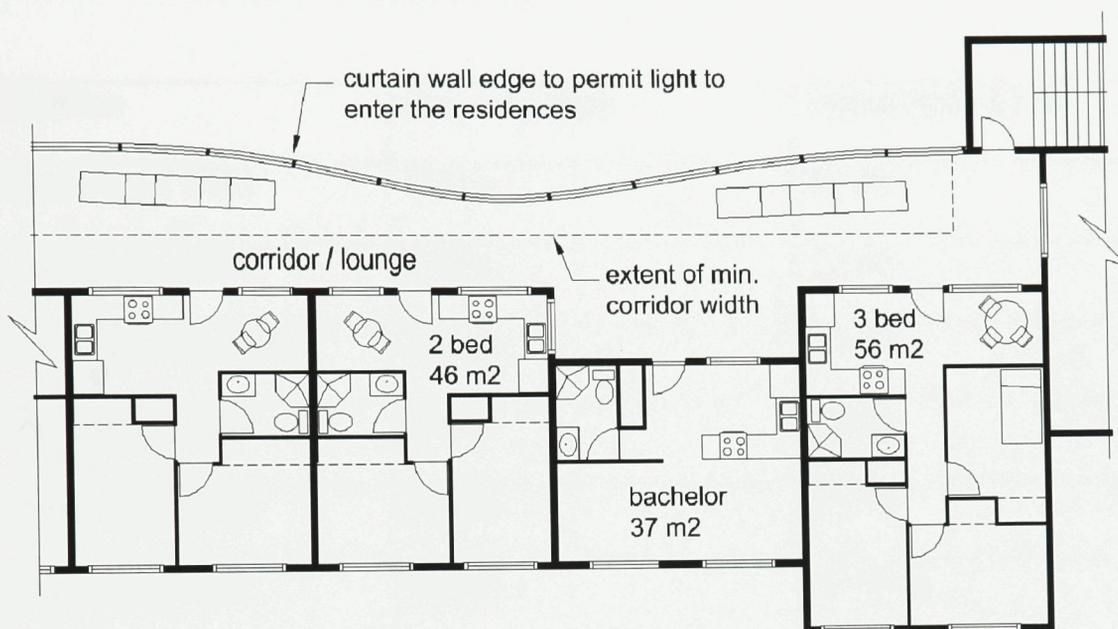


The sidewalk around this building (left), only a couple of blocks away from Holland Cross and photographed at the same time, is quite active in contrast. It fronts two busy streets and is located across from the Parkdale Market (lower left).



Combining the bustling market and the mall at Holland Cross would have given a better time spread to both sites.

Appendix L



Appendix M

Current market rates for Ottawa retail space in or near Centretown
(Canadian Real Estate Association)

Location	Property Type	Lease Rate \$ / SF
Centretown 4101	Office	20.00
Lowertown 4001	Office	20.00
Civic Hospital 4504	Retail	21.75
Lowertown 4001	Office	25.00
Lowertown 4002	Retail	25.00
Lowertown 4001	Retail	27.00
Centretown 4101	Office	15.50