The Economics of Adaptive Reuse

of Old Buildings

A Financial Feasibility Study & Analysis

by

Nart Stas

A thesis

presented to the University of Waterloo

in fulfillment of the

thesis requirement for the degree of

Master in Arts

in

Planning

Waterloo, Ontario, Canada, 2007

AUTHOR'S DECLARATION FOR ELECTRONIC SUBMISSION OF A THESIS

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

The debate about the financial feasibility of adaptive reuse is high among investors, planners, policy makers and heritage advocates. The old argument that it is more profitable to demolish the old brick box and replace it with a new structure have left the streets of many cities across North America and Europe with abandoned and neglected sites. Traditionally, investors and owners of such properties have shown minimal interest in investing in the rehabilitation and reuse of these buildings. Still, a growing number of successful projects featuring innovative building renovation and reuse are emerging across the province.

Governments at all levels have in fact started implementing a wide range of programs and policies to stimulate private investment in old, abandoned and underutilized buildings. Such policies have led to several innovative and successful stories across the province. However, few jurisdictions have taken full advantage of the potential economic, social, and environmental opportunities that these types of investments entail.

This study examines, from a private sector perspective, the economic costs and benefits of adaptive reuse in Ontario, and compares it with other types of new construction development scenarios with an aim to determine the characteristics of success. It investigates the potential effectiveness of various government policies and programs designed to stimulate investment in adaptive reuse in Ontario by conducting financial comparisons and analyses with other types of hypothetical new construction development options.

Acknowledgements

First of all I would like to express my gratitude to my advisor, Professor Robert Shipley, for his supervision and guidance as well as his constant encouragement and support in various ways. Without his help, this work would not be possible. Also, I would like to thank Professor Clarence Woudma for his contribution and crucial comments about the methods and data analysis.

Special thanks go to my brother in law Orfan who introduced me to Professor Robert Shipley in 2002, who later became my thesis advisor.

I am very grateful to Paul Critchley architect, my mentor at Briestensky Johnson Critchley architects for his invaluable experience, advice, and help with the case studies.

My special thanks go to my cousin Hani Alasker and to Tatiana Alabee for there help with editing and proofreading.

I would like to take this opportunity to express my profound gratitude to my beloved parents for their moral support, encouragement, and patience.

Finally, I would like to dedicate this thesis to my lovely wife Asmaa and our little star Alan. Your love and support are the main reason behind all my achievements.

Table of Contents

vi

List of Figures

List of Tables

List of Drawings

Chapter 1
Introduction

Over the last two decades policy makers and urban planners in North America and Europe have been paying significantly more attention to fostering sustainable urban development and smart growth to improve the quality of life in urban areas (De Sousa, 2003).

Sprawl and its response, new urbanism, and the need to revive central cities, all are recent trends that have dominated the debate among planners and policymakers about urban revitalization. These are fundamentally critical planning topics and analyzing them is essential to understand the potential for changing our urban landscape.

Many studies suggest that "urban sprawl," or what is characterized as urban decentralization of people and jobs, undermines the health and quality of life in city centers (Ewing, 1994 and 1997; Sierra Club, 1998). The Population density in urban centers is continuing to decline as a result of the growing interest in the suburb to escape the perceived ills of the city. The decentralization of employment (especially the private sector) has been rapid. Many of businesses have relocated from traditional main streets and scattered along a few wide roads designed mainly for cars.

Across the country, a growing numbers of communities are discovering links between urban sprawl and a wide range of problems, from traffic and air pollution to central city poverty. Despite decades of growth management efforts in Ontario, our urban centers continue to sprawl. Between 1976 and 1996, the Greater Toronto Area lost about 150,000 acres of prime farmland to urbanization, an area roughly equivalent to that of the city of Toronto (Hare, 2001).

Despite all that, communities are finally discovering alternatives to conventional development patterns that cause suburban sprawl, destroy open land, siphon vitality from existing communities, and create gridlocked lifestyles (Congress for the New Urbanism, 2001).

Whatever you call it "sustainable urban development", "smart growth", or "new urbanism" this is a movement that has become widely debated among academics, policymakers, and the general public. Many new ideas and tools have been introduced. One of those tools is reviving central cites. This has become a major topic that "new urbanists" try to encourage in order to bring back life to the core and reshape the way communities grow.

Successful strategies to revive central cities include brownfield redevelopments, infill developments, and adaptive reuse of old buildings. This type of inner city development strategy is an approach to growth that can be cost-effective while providing residents with a closer proximity to jobs, public services and amenities. It can be described simply as a creative recycling of vacant and underutilized properties within cities. Many studies in North America and Europe have revealed the economic, social, and environmental benefits of infill, brownfield, and adaptive reuse developments (De Sousa, 2002; NRTEE, 1997, 1998).

Every city, town, and even older suburb has these types of properties. They vary from the single vacant site to surface parking lots to empty old industrial building. Often located in the core sections of urban areas, empty or underutilized buildings are the prime targets for urban revitalization. Once considered blots on the landscape, such buildings are becoming greatly valued potential developments that improve communities and revitalize those facing problems. The decline of heavy industry during the early and mid-twentieth century due to the shift in our economy from industrial to service provider has left a legacy of abandoned and underutilized sites across the country. Adaptive reuse of old buildings is increasingly receiving widespread attention from scholars, investors, and policy makers as it provides economic benefits through tax revenues and jobs.

There is evidence that the standard new building in the suburbs may not be the only development alternative, and that the abandoned old structure in the downtown, although it requires a different

development approach, may offer a much better alternative for a good return on investment (Shipley, 2006).

Governments at all levels have in fact started implementing a wide range of programs and policies designed to stimulate investment in underutilized and abandoned buildings. Such policies have led to several success stories of inner city and suburban recovery. However, while many communities have started to realize the importance of recycling old and underutilized buildings into productive commercial and residential properties, few have taken full advantage of the potential economic, social, and environmental opportunities that can accrue from reusing these neglected buildings.

Traditionally, developers, investors, and stakeholders have shown minimal interest in investing in these types of buildings. This lack of interest is the result of the common notion that they maybe too risky to develop, especially since they can still find many greenfield areas in the urban periphery. The old argument that the costs of rehabilitating and adapting old buildings for a new uses are high, the notion among owners, developers, bankers, and others that it is more profitable and feasible to tear down the old brick box and replace it with new structure, have left the streets of many major cities in Ontario with abandoned neglected sites.

Authors of many studies from North America and Europe have made strong economic arguments in favor of adaptive reuse developments. (Rypkema, 1994; Mason, 2005). Some of these studies showed that many old buildings are not only suitable for new uses, but often had become the premises of choice for the many dynamic functions.

Some developers have claimed that rehabilitation projects cost from 25 percent to 33 percent less than comparable new construction (Rypkema, 1994). At the same time pleas were being made before local authorities for tax credits and incentives to offset the high cost of rehabilitation (Rypkema, 1994). These contradicting facts have called into question many of the economic arguments about adaptive reuse.

This study examines, from a private sector perspective, the economic costs and risks involved in selected adaptive reuse projects in Ontario, and investigates the potential effectiveness of various policies and programs designed to stimulate investment in such sites. Most previous rehabilitation studies focused only on buildings with significant heritage values. It should be noted that the focus of this study is not on heritage buildings in the formal sense of heritage designation, rather the focus of this study is on old vacant and underutilized buildings that have the potential for rehabilitation and reuse which could contribute to urban renewal and inner city revitalization. Through data collected from experts in the field who have completed adaptive reuse projects and through analysis of alternative hypothetical development scenarios of new construction, either on the same site or on greenfield sites, the objective of this study is to identify the factors that affect the economic outcome of adaptive reuse development. When a developer considers a site with an existing old building as an investment option he or she has three options, either to adapt the existing building for a new use, demolish the old building and build a new structure, or invest there money somewhere else. This study will aim on answering the following research questions:

- Which option is more profitable adaptive reuse, demolish and rebuild or build on a greenfield site?

- What are the key factors that affect the outcome of adaptive reuse developments from an economic perspective?

- Is the return on investment of adaptive reuse projects so unattractive relative to other development scenarios such as new construction that governments are required to step in with grants and incentives to make it more profitable to investors and developers?

Many of the studies in the literature that have focused on the economics of rehabilitation and cost benefit analysis have not entertained the full spectrum of issues and alternatives associated with those case studies. They have generally not calculated and compared the economic alternatives to preservation measures (Mason, 2005). This study aims to fill this gap by introducing a research

method derived from the fields of real-estate economics and architecture. Using the case study approach, the return on investments of three typical 'real-life' adaptive reuse projects are calculated, analyzed and compared with two alternative hypothetical development scenarios of new construction designed for each case study. The first scenario is based on the option of demolishing the existing old building and building a new structure. The second scenario is based on undertaking the same development on a greenfield site.

By using a pro-forma and Cost Benefit analyses derived form the real estate literature the present study evaluates the private sectors economic benefits and return on investment concerning adaptive reuse developments in Ontario and compares it with new construction scenarios in order to present adaptive reuse as a successful and profitable investment option with or even without government incentives.

Chapter 2
Overview of Current Urban Planning Trends

2.1 Introduction

Planners in North America are constantly looking for alternatives to conventional development patterns that destroy open land, create sprawl, draw off vitality form existing communities, and create gridlocked lifestyles where unprecedented traffic loads have strained the road systems due to the full dependency on car for travel. Any understanding of the potential for changing our urban landscape needs to be based on an analysis of the following two factors that affect directly the way communities grow and develop:

- recent trends in the spatial distribution of population and employment
- sprawl and its results

And the planning responses to those factors:

- new urbanism
- reviving the central city

These trends and responses have become hot topics across the United States and Canada. They have dominated the debate among planners and policy makers, and this chapter is designed to examine the above noted trends and offer a review of previous ideas that define and examine their nature and impact on our communities.

2.2 The Decline of Population and Business in Urban Centers

Decentralization of population and employment continues to be the dominant reality of most urban centers. Many central cities and older suburbs are still struggling to compete with newer communities for jobs, and residents. A study by Edward Glaesar (2001) in the U.S. found that across the largest 100 U.S. metropolitan areas only 22 percent of people work within three miles of the central city, while a third work ten or more miles away (Glaesar, E et all, 2001). This is a

clear evidence of the decentralization of the metropolitan centers in the US. In contrast, Canadian metropolitan centers, like Toronto, have strengthened there central role as attractive places to live and work. However, this is not the case for small urban centers like Kitchener and Brantford. The rising number of empty old buildings and vacant sites is a clear indication of the decentralization of people and businesses that is happening in those core areas.

Disinvestment and decline occur in inner city neighborhoods throughout North America. The process is often associated with poverty, high level of crime, conversion of single family to multi-family housing units, abandonment of the housing stock, and movement of the middle class from inner city neighborhoods to the suburbs. Other features of inner city decline are exit of retail business, conversion of lower forms of non-residential land uses such as marginal business operations and specialized services for the poor, decline in relative or absolute land value, and in migration by economically marginalized population (CMHC, 2001).

On the local scale the decentralization of jobs and population in urban centers has continued, spreading urban development and influence over vast territories and often over many local municipalities. This decentralization process has left many of the older municipalities with reduced economic bases, declining fiscal capacity and pockets of concentrated poverty. (Bourne, 2004).

Anthony Downs in his 1999 study "Some realities about sprawl and urban decline," analyzed the link between U.S. cities growth model and core area decline. He notes that U.S. development process inherently undermines the fiscal strength of many cities and inner-ring suburbs in socially unjust and undesirable manner. There is a difference between Canadian & US metropolitan areas. In Canada tax revenue from the suburbs can support the services in metropolitan center (Sewell, 1993). Downs concludes that some form of peripheral growth around metropolitan areas has been and still is inevitable. Purely vertical growth would have been inconsistent with the rising real incomes and transport innovations that have occurred since 1950. Both of those strong trends

have caused households to want to live in lower densities with more land area and internal space per unit (Downs, 1999).

In a study aimed to examine the process of urban neighborhoods disinvestment and decline, Canada Mortgage and Housing Corporation outlined the characteristics of "declining neighborhoods" by the following: population loss; lower population density; lower resident socioeconomic status; welfare dependency; increase of elderly and non-family households; high ratio of single-parent families; changing ethnic composition; deterioration of housing stock; aging housing stock; deterioration or real estate market; falling property and rent values; falling rates of homeownership; increase in absentee landlords; increased tax delinquency; declining private investment; decline in public servicing and investment; pessimistic attitudes towards neighborhood; and weak community organizations (CMHC, 2001). It has to be noted that these characteristics for "neighborhood decline" are not universal, but can be seen in centers like Kitchener and Cambridg. We have to exclude metropolitan centers like downtown Toronto where the opposite is happening with increased property values and increased investments. The study shows that the experience of each community is unique, for instance, in Kitchener the weak economy and the proximity of attractive alternative communities are the main factors for its decline (CMHC, 2001). The same fundamental reality is described by Downs in that nearly all major problems relating to growth in cities are regional, not local, in nature. This is most obvious for air pollution and traffic congestion (Downs, 1999). The same conclusion applies to all of the other growth related problems described above.

In any community, growth is a natural thing that can't be stopped, but the key question is how urban areas grow. The decentralization of people and businesses is the result of poorly planned and sprawling growth. This threatens our environment and our quality of life in many ways, and searching for a remedy to this problem should be based on a clear understanding of sprawl, its causes, and its effects.

2.3 Sprawl and the Effects

Urban sprawl is a contentious and widely debated topic among academics, policymakers, and the general public. The term urban sprawl is now a phrase that people use to label the underlying factor they believe responsible for many of the undesirable outcomes occurring in our urban fabric. Negative urban occurrences are as diverse as increased automobile travel and congestion, air pollution, loss of farmland, tax dollars spent on duplicative infrastructures, poverty concentrated in urban centers (Ewing, 1994 & 1997; Downs, 1999).

2.3.1 What is Urban Sprawl?

Although many people use the term urban sprawl in there discussions, most would be hard pressed to specifically define it. At present, there are many definitions of the word "sprawl", depending from which angle the subject is examined.

Pohanka (2004) described sprawl as the type of growth that often occurs faster than the development of the infrastructure (e.g. schools, roads, sewer systems, and water lines) needed for support. The National Geographic[1] described sprawl with the following characteristics: high volumes of traffic; scattering of businesses, shops and malls; inadequate public transportation; unfriendly streets; zoning that divides neighborhoods from offices, shops and restaurants; and large parking lots that push buildings back and farther away from each others. Since this study aims to examine the economics of adaptive reuse which is considered an alternative for urban sprawl, we turned to the economic and planning literature for guidance in defining urban sprawl. Economists usually associate the degree of sprawl in an urban area with the occurrence of excessive suburbanization. They consider suburbanization excessive when it imposes greater net costs upon society than the net costs that would have been generated if the corresponding urban development had instead occurred in the areas with higher overall density (Mills 1999;

---

[1] Information obtained from the National Geographic Website. Site accessed September,2005
http://www.nationalgeographic.com/earthpulse/sprawl/index_flash.html

Brueckner, 2000). On the other hand planners tend to define urban sprawl through the description of specific types of undesirable urban land uses (Wassmer, 2005). Ewing (1994) describes the undesirable occurrences that have most widely appeared in the planning literature. They include:

1- Low density

2- Scattered development

3- Separation of where people live from where they work

4- Lack of functional open space

To help arrest both suburban sprawl and inner city decline and to rebuild neighborhoods, towns, and cities, a concept called new urbanism has been introduced mostly by architects and planners. New urbanism is a movement that advocates design strategies based on traditional urban forms to help revitalize the shape of our cities and towns.

2.4 New Urbanism

New urbanism has captured the imagination of the North American public like no urban planning movement in decades. New urbanists seek to redefine the nature of communities by reinforcing traditional notions of neighborhood design and fitting those ideas into a variety of urban and suburban settings. The key ideas of new urbanism are coherent regional planning, walkable neighborhoods, and attractive, accommodating civic spaces. The Congress of New Urbanism (CNU) is a Chicago-based non-profit organization that was founded in 1993.Complete with its own annual conferences, and growing number of members; the Charter of New Urbanism lays out 27 principles that contribute to making cities and towns more 'walkable', efficient, and livable. The principles range from regional policies like balancing jobs with housing in each town, to neighborhood scale principles of mixed use and mixed income, to local architectural features. The congress works with architects, developers, planners, and others involved in the creation of cities and towns, teaching them how to implement the 27 principles.

New Urbanism is the latest in a long line of reform movements that have sought to apply new design and planning principles to new suburban neighborhoods that should result in an efficient use of land. Those principles can also be applied to existing urban areas by promoting intensification and higher density.

New urbanism, similar to the previous reform movements, contains an element of utopianism (Fulton, 2004). The "Garden City" is one of the movements that have influenced new urbanists. As outlined by John Sewell in his book The Shape of the City, the founder of the Garden City movement was Ebenezer Howard, who outlined his synthesis of ideas for a new city, a garden city, in a speech in 1893 [and books in 1898 and 1902]. Howard described his garden city by 'a marriage of town and country, of rustic health and sanity and activity and urban knowledge, urban technical facility, urban political co-operation' (Sewell, 1993).

The "City Beautiful" movement also influenced new urbanists. The main principal behind this movement is the emphasis on public spaces, civic buildings and orderly neighborhoods. It used a particular set of urban design principles to shape these new urban forms on a more human scale seeking to incorporate an ideal of village life into modern urban settings (Fulton, 2004). The work of John Nolen and Daniel Burnham, two of the leading urban designers of the early twentieth century, is often cited as a model of this type of planning.

The Swiss architect Le Corbusier took these ideas and used them to bring the nature into the city itself in his "Ville Radieuse" vision where he proposed the destruction of the congested city and the replacement with soaring towers separated by wide roadways and expanses of green space. The technique proposed by Le Corbusier was somewhat different than the "garden city" approach which suggests building on the outskirts of existing cities, however, the aim was the same. Le Corbusier wanted to destroy the old city and replace it with something much more ordered (Sewell, 1993).

2.4.1 What is New Urbanism?

New urbanism is a set of principles for building walkable, mixed-use neighborhoods. New Urbanism as noted by Charles Bohl is an umbrella term, encompassing the traditional neighborhood development, or "neo-traditional" town planning of Andres Duany and Elizabeth Plater Zyberk (Krieger and Lennertz 1991), the pedestrian pocket and the transit-oriented design articulated by Peter Calthorpe (1993), Douglas Kelbaugh (1989), and Bill Liebermann; and the "quartiers" approach of Leon Krier (1988). New urbanist design principles operates on a number of scales, from buildings, lots, and blocks to neighborhoods, districts, and corridors, and ultimately to entire cities and regions (Katz 1994). Shared principles call for organizing development into neighborhoods that are divers, compact, mixed use, pedestrian oriented, and transit friendly.

In Clarence Perry's firist regional plan of New York (1929) the neighborhood is an essential building block. The neighborhood is limited to an area approximating a 5-10 minute walk from center to edge, ensuring that all neighborhood activities are within convenient walking distance of residents. Within the neighborhood there are a variety of housing types and land uses, a mix of shops, services, and civic uses capable of satisfying many of the residents; daily needs. Streets are designed for pedestrian use, with generous sidewalks, street trees, and on-street parking to provide a buffer from street traffic and make walking safer and more appealing option. Buildings are generally low to mid-rise, set close together, and built close to the street to promote pedestrian use and help define neighborhood public space in the form of streets, squares, and plazas. Small parks and civic institutions are given prominent sties and dispersed throughout the neighborhood (Duany and Plater-Zyberk 1992).

Traditional urban settings have been identified and emulated by new urbanisms. They have studied urban design patterns and buildings found in local historic neighborhoods then used them to develop the same types of building forms, lot configurations, streets, and public spaces to be included in new neighborhoods and infill development.

2.4.2 New Urbanism and Inner City Revitalization

Until recently the volumes of material written on new urbanism have focused almost exclusively on suburban new development applications (Bohl, 2000). The question remains as to what the potential applications and implications of new urbanism are for the inner city. In his article "*New Urbanism and the city: Potential applications and implications for distressed inner-city neighborhoods*" Charles Bohls notes that applying new urbanism in the context of inner city revitalization has grown rapidly in recent years. However, there is still a widespread perception that new urbanism involvement in existing urban areas is all about exterior improvements of existing buildings and applications of traditional architectural details. There are other effective tools that have been adopted by new urbanism to revive the central city. In the same article, Charles Bohl lists some of those tools such as: replacement or retrofit of public housing projects, brownfield redevelopment efforts, heavily transit-dependent developments, infill projects of all shapes and sizes and the historic rehabilitation of old buildings. Those are all types of the new urbanist's inner city revitalization strategies.

2.5 Reviving the Central City

Many city centers in Canada continue to lose families and jobs to rapidly growing new suburban communities. The shift towards developing suburbs while ignoring the core, undermines the vitality of cities and older suburbs and increase congestion, destroys farmland, and erodes communities. This deterioration of downtowns is most evident in small and medium size community centers, like Cambridge, St Catherines and Niagara Falls. where the rapid conversion of farmland and open space to a sprawling array of housing subdivisions, shopping centers, and office parks is obvious. This decentralization of people, businesses, and jobs is the real story about our community cores. One key tool to bringing urban areas back to life is revitalizing core districts. There are different methods and tools for doing that but not a lot of "how-to" books.

2.5.1 Opportunities and Obstacles

Despite the steady population loss and disinvestment in the core, community centers have assets and positive trends that can fuel revitalization. In his book The Competitive *Advantage of the Inner City*, Michael Porter identified the role of inner cities in regional prosperity by listing the following five "equities:"

1. Inner city vitality frees up resources now required to address social and economic disadvantage

2. Enhances the return to public investment in transportation infrastructure, expands the housing stock, and mitigates urban sprawl

3. Eases constraints to regional economic growth through utilizing the inner-city's labor force, land, and infrastructure more fully

4. More efficient spatial organization of regional industry

5. Substantial growth and profit opportunities in the inner city itself

On the other hand many obstacles continue to impede the revitalization of inner city. Porter identifies five major obstacles he found in the literature:

1. Poor physical condition of existing buildings

2. Poor customer and investor perceptions of neighborhoods

3. A business environment that is more costly and complex than in suburban locations

4. The limited capacity and quality of businesses serving urban centers

5. Limited access to capital

To leverage the above noted opportunities and overcome the obstacles, a variety of strategies have been used to revive urban centers. The next section examines the three major revitalization strategies, infill developments, brownfield developments; and adaptive reuse of old buildings.

14

Chapter 3

Strategies for Revitalizing Urban Centers

3.1 Introduction

A variety of revitalization strategies have been used in community centers. The most superficially obvious strategy for core recovery and densification as described by the Congress for the New Urbanism is infill development.

> "Infill development refers to the planning, design, and construction of homes, stores, workplaces, and other facilities that make existing cities and towns more livable; it describes the reuse of property and buildings in a way that makes economic sense for property owners, local governments, and the regional economy. Successful infill development channels economic growth into existing urban and suburban communities and conserves natural resources at the periphery of the metropolis."
> (Congress for the New Urbanism, 2001)

The other two strategies for reviving central cities that have received a considerable attention among scholars and planners are the brownfield redevelopment and the adaptive reuse of old buildings. Brownfield sites are abandoned or underutilized industrial or commercial sites where redevelopment is difficult due to definite or perceived contamination. Adaptive reuse on the other hand is the act of finding a new use for a building. It is often described as:

> "The process by which structurally sound older buildings are developed for economically viable new uses." (Austen, 1988)

3.2 Infill Development

Communities are finally discovering the opportunities in urban centers. Those opportunities are seen by many as ways of curbing urban sprawl and bringing life back to deteriorating urban centers. Infill development is one of the major opportunities in urban centers. Infill development is the creative recycling of vacant or underutilized lands within cities and suburbs. Every city, town, and suburb has these types of properties.

Successful infill development can offer the following rewards to communities:

- Limit development on open spaces at the edge of regions

- Increase the property tax base

- Capitalize on existing community assets such as parks, infrastructure, and transit

- Create new community assets like child care centers, art centers, and commercial centers

- Provide housing near job centers and transit

- Provide potential income for property owners by selling part of the property (Congress for the New Urbanism & Northeast Midwest Institute, 2001)

The infill development approach faces many obstacles. Usually there are a limited number of empty infill sites available in urban centers. NIMBY opposition to infill projects can be intense. Infill projects are subject to the same development charges as greenfield developments even though they don't require new infrastructure to be built. For these reasons readily available greenfield sites have been easier to develop.

3.3 Brownfield Redevelopment

As new urbanism and its promise of more livable cities catches the imagination of architects, planners, academics, and developers, the redevelopment of inner city brownfield sites becomes an even higher priority. To justify limiting development on greenfield sites, cities must find build-able land within existing city limits. In North America inner cities are home to thousands of abandoned commercial and industrial sites. Often these sites are located in the core sections of urban areas, and as such, they are prime targets for urban revitalization. Those sites are largely the aftermath of the decline of the manufacturing sector in inner cities over the last few decades. This is due to the gradual, but steady, migration of industries from cities to off shore locations and to greenfield areas since the mid 1970s and has left many large cities with innumerable underutilized or vacant industrial sites that contribute to poverty, blight, and crime in surrounding areas.

The United States Environmental Protection Agency defined brownfield as: "abandoned, idled, or under-used industrial and commercial facility the expansion or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant." (2005). It is clear from this definition that contamination is viewed as the most significant barrier to the redevelopment of urban industrial parcels. Further, both the literature and public policy emphasize contamination as a redevelopment barrier.

Although the term "brownfield" is widely used in Canada and the USA, alternative terms such as "contaminated lands", "derelict lands", and "former industrial sites" are still used. The term brownfield sites, however, is now favored by both public and private sector stakeholder because it avoids the negative connections associated with words such as "contaminated" and "derelict", and because it constitutes a semantic counterpart to greenfield, the term used universally to refer to a clean agricultural land site located in the urban periphery (De Sousa, 2001). Case studies make up the most common methodology in the brownfield literature. Most cases highlight best practices or barriers to redevelopment (Howland, 2002). The literature focuses on the role of cleanup costs, fears over future liability, the difficulty of obtaining private financing (Bartsch 1996, Swartz 1994, De Sousa 2000, De Sousa 2001) and the legal and litigation costs associated with any purchase agreements and collection of damages from other previous legally liable parties and owners (Duff 1994). Although most studies focused on the risk and liability aspects associated with brownfield redevelopment, several decades of successful cleanups and redevelopment projects reflect the existence of conditions under which some developers find it profitable in some locations to absorb the risks of purchasing, cleaning, and reusing contaminated sites (Howland, 2002). On the other hand, Howland, (2000), McGrath (1995), Page and Rabinowit (1993), all found evidence that land acquisition cost adjust to account for the costs of remediation and the subsequent legal risks. Nevertheless, most case studies of brownfield redevelopment focus on examples of public involvement. Howland (2003) notes a study by Meyer and Lyone (2000) that document the emergence of entrepreneurial firms that are redeveloping brownfield sites without

17

public sector intervention. Another study by Meyer (2000) found the evolution of environmental insurance has played an important role in reducing risks to private developers of brownfield sites.

To stimulate investment in brownfield sites, policy makers and governments throughout the USA and Europe have, over the last few years, implemented a variety of innovative environmental and economic policies and programs designed to lessen the costs and risks associated with brownfield redevelopment. However, it should be noted that Canada is moving more slowly than the USA and Europe in implementing appropriate policies and programs, largely because of the deeply ingrained perception among many policy makers that redevelopment problem is one that can best be solved by the private sector itself without government interference (De Sousa, 2000). Nevertheless, there has been recent government support to brownfield in Canada supported by several policies and initiatives. In 2001 the Brownfield Statue Law Amendment Act was implemented in Ontario with the aim to encourage the revitalization of contaminated land by making several amendments to several acts related to environmental matters. In December, 2005 Bill 51 "Planning Reform Act" was introduced and it is currently in the legislative process. Bill 51 will provide implementation tools to deal with intensification, brownfields, community revitalization and other challenges and issues.

The most influential government agencies in Canada in the field of brownfield redevelopment are: the Canadian Council of Ministers for the Environment and the NRTEE (National Round Table on the Environment and Economy) (De Sousa, 2000). In 1992, the NRTEE set up a financial services program with the task of identifying the main barriers to brownfield redevelopment and suggesting practical solutions for overcoming them through a joint effort of the financial services sector, governmental agencies and the business community. The NRTEE since has drafted three reports that constitute pivotal background studies:

- The Financial Services Sector and Brownfield Redevelopment (1996)

This report examines the opportunities, barriers and solution strategies associated with brownfield redevelopment for a lender's perspective

- Removing Barrier: Redeveloping Contaminated Sites for Housing (1997)

This report examines the housing development in the context of brownfield redevelopment from the perspective of both the government and the investor.

- State of Debate: Greening Canada's Brownfield Sites (1998)

This report is mainly a synthesis of all the research undertaken by the NRTEE on the issue. It also list a series of key issues that face the redevelopment of brownfield sites which include: - The lack of clarity and uncertainly created by different environmental laws throughout the country related to environmental liability and cleanup responsibility; - the application of joint and several liability, whereby one party can be held liable for the entire cleanup, regardless of its specific contribution to the pollution of the site; - the implementation of complex scientific standards governing cleanup; - the limited availability of liability insurance; - the lack of information and funding with respect to orphan sites; - the lack of information of the current environmental condition of the land; - the lack of public information and education on brownfield issues; - limited government funding, incentives, and initiatives to assist the private sector.

3.4 Adaptive Reuse of Old Buildings

A large number of brownfield sites contain buildings that are either abandoned or underutilized. Most of the times those buildings are subject to demolition to allow for new development after undertaking all required cleanup and remediation procedures. In some cases the investor decides to renovate the existing building and adapt it for another use. This process is called adaptive reuse. Whether it is an old school, a church, an abandoned old factory, or any type of industrial building, this type of investment is one of many tools that contribute directly to reviving urban centers. In many cases old buildings that are subject to adaptive reuse are not brownfield sites.

Contamination becomes a factor in adaptive reuse projects especially when the previous use of the building is industrial.

The field of adaptive reuse of old buildings is very similar to brownfield redevelopment, mainly from the type of risks associated with the investment, the notion with regard to whether the investment is profitable or not from a private sector perspective, the public costs and benefits, public incentives and tax credits, and the technical aspects associated with the those type of developments. From that perspective, the literature on brownfield development was influential on this study especially in designing the research method. This will be discussed more in detail in chapter five.

Chapter 4
Adaptive Reuse of Old Buildings

There is a growing recognition among politicians and public officials that economic growth, fuelled by building on greenfield, is no longer the best planning and development alternative available to cope with growth challenges. As a result, growth strategies are changing. Many municipalities are now looking into the potential of buildings that have been damaged by previous activities or abandoned for various reasons and are no longer in use or at best underutilized.

The decline of heavy industry during the early and mid-twentieth century due to the shift from an industrial based economy to service provision has left a legacy of abandoned and underutilized buildings in urban centers across the country. Every city, town, and suburb has these types of properties. Often located in the core sections of urban areas, empty and underutilized buildings are the prime targets for urban revitalization. Such buildings are becoming greatly valued potential developments that improve communities and revitalize those facing problems.

Not only do these vacant properties provide an opportunity for urban revitalization, but they also offer an alternative source of developable land that doesn't rely on green space at the urban fringe. Further, the opportunity to reuse them supports the new urbanism initiatives for more intensification and mixed use as a tool to stop urban sprawl.

4.1 Adaptive Reuse in the Context of Historic Preservation

The field of historic preservation has grown rapidly during the last decades. It is no longer primarily concerned with saving those buildings associated with the cultural elite or buildings designed by recognized architects and engineers. Today, historic preservation involves everyday buildings and landscapes that are worth to saving. The National Trust for Historic Preservation describes the term "historic" as follows:

> "Let's face it: the label "historic" gets applied to so many
> different kinds of places, from ancient ruins and Gothic
> cathedrals to World War II battlefields and Art Deco
> skyscrapers, that it's sometimes hard to figure out exactly what it
> means. What is it that makes a place "historic"? And who
> decides what's "historic" and what isn't? Clearly, it's a
> complicated issue – but there's a fairly simple way to approach
> it: instead of asking, "Is this building historic?" it may make
> more sense to ask, "Is this building worth saving?" When you
> strip away all the jargon and rhetoric, historic preservation is
> simply having the good sense to hang on to something -- an older
> building or neighborhood or a piece of landscape, for instance –
> because it's important to us as individuals and/or as a nation.
> This importance may derive from any of several factors. Some
> older buildings are important simply because they're good to
> look at. These buildings are worth saving because our
> communities would be less interesting without them. Others are
> worth saving because they have plenty of good use left in them.
> Finally, some places are worth saving because they link us with
> our past and help us understand who we are. But places that tell
> your story are worth saving too: the house where our
> grandparents lived, the school you attended, the movie theatre
> where you had your first date, the church where you were
> married." (National Trust for Historic Preservation, 2006)

The International Charter for the Conservation and Restoration of Monuments and Sites describes

the concept of historic monument as an evidence of a civilization or a historic event:

> "The concept of historic monuments embraces not only the
> single architectural work but also the urban or rural setting in
> which is found the evidence of a particular civilization, a
> significant development or a historic event. This applies not only
> to great works of art but also to more modest works of the past
> which have acquired cultural significance with the passing of
> time." (International Charter for the Conservation and
> Restoration of Monuments and Sites, 1964)

The relationship between historic preservation and adaptive reuse is dynamic. The older core of

most cities and towns, where historic buildings are concentrated, contain large industrial

buildings such as factories, mills, warehouses, and machine shops. Heavy manufacturing

buildings required huge spaces to house massive machinery and assembly lines. Due to the shift

in our economy to service based, the development in manufacturing methods and technologies,

and the advent of the automobile and highways, those massive spaces became less desirable,

which resulted not only in the abandonment of buildings but in the abandonment of entire sites in favor of newer structures on a greenfield. Those new factories are typically single story structures that occupy a large area of the greenfield site. This shift from multi story factories in the core areas to single story buildings on the greenfield resulted from the change in manufacturing techniques that used to be in place in older factories.

Those multi story vacant old industrial buildings have become ideal structures for reuse as condo, apartment or office buildings. This practice can be noticed in the core of several cities in Ontario such as downtown Kitchener. The conversion of the Kaufman building in Kitchener to condos stands as a good example of this trend.

As most old industrial buildings are located in the old core of cities and towns, many of these buildings possess significant architectural and historical value. Some of these buildings are designated or eligible for designation under the Ontario Heritage Act. Jane Jacobs wrote about the importance of ordinary historic buildings in here book "The Death and Life of Great American Cities":

> "Cities need old buildings so badly it is probably impossible for vigorous streets and districts to grow without them. By old buildings I mean not museum-piece old buildings, not old buildings in an excellent and expensive state of rehabilitation, although these make fine ingredients but also a good lot of plain, ordinary, low-value old buildings, including some rundown old buildings" (Jacobs, 1961)

A study by the Australian Department of the Environment and Heritage describes the most successful adaptive reuse of a built heritage as those that best respect and retain the building's heritage significance and add a contemporary layer that provides value for the future. The study recommends that the adaptive reuse of a historic building should have minimal impact on the heritage significance of the building and its setting. Developers should gain an understanding of why the building has heritage status, and then pursue development that is sympathetic to the

building to give it a new purpose. (Australian Department of the Environment and Heritage,

2004)

4.1.1 Preservation vs. Restoration vs. Conservation

A lot of people have the impression that the three words preservation, restoration and

conservation are almost interchangeable. The fact is that the three words are quite different and

the literature have recognized and identified those differences.

Michael Wishkoski (2006) in his article "*Historic preservation projects can be green"* defines

preservation as "an end in itself to keep or maintain intact, safe, unaltered." He also defines

conservation as "a process that preserves, protects and maintains during physical change."

(Wishkoski, 2006).

The International Charter for the Conservation and Restoration of Monuments and Sites in its

Venice Charter (1964) describes the process of conserving a historical monument as: "it implies

preserving a setting which is not out of scale. Wherever the traditional setting exists, it must be

kept. No new construction, demolition or modification which would alter the relations of mass

and colour must be allowed." The Venice Charter also defines the process of restoration as "a

highly specialized operation. Its aim is to preserve and reveal the aesthetic and historic value of

the monument and is based on respect for original materials and authentic documents. It must

stop at the point where conjecture begins, and in this case moreover any extra work which is

indispensable must be distinct from the architectural composition and must bear a contemporary

stamp. The restoration in any case must be preceded and followed by an archaeological and

historical study of the monument."

Mark Fram in his book *Well Preserved* (2003) describes the process of preserving a building as

keeping it the same without any alteration or modification as in stopping the building in time. On

the other hand, Fram explains the term "to conserve" as in allowing the evolution and reuse of a

building through sensitive change of its use with maintaining the character and heritage values of the structure.

We conclude from the above noted definitions that the process of adapting a heritage building to a new use falls under the term conservation. This process allows changing the use of a building without altering its character or compromising its heritage values. While preservation and restoration imply potentially expensive alteration to original materials and details, conservation can be accomplished practically and cost effectively.

4.2 Benefits of Adaptive Reuse

Many abandoned historic buildings hold great potential for adaptive reuse. Incorporation of these buildings in the redevelopment process presents numerous advantages. The benefits of adaptive reuse can be categorized under three main topics: environmental, social, and economic.

4.2.1 Environmental Benefits

Adaptive reuse entails very important benefits to the environment. A number of studies form around the world have touched on this subject. Our review of the literature found three main environmental benefits adaptive reuse entail. 1- Reduction of hazardous materials; 2- Preservation of the Embodied energy; 3- Preservation of the Cultural Energy

Reduction of hazardous materials:

A study carried out by Christopher De Sousa in the greater Toronto area in 2001 found that the reduction of health risks posed by hazardous contamination is the most important environmental benefits associated with brownfield development (De Sousa, 2001). This finding applies directly to adaptive reuse, as high percentage of vacant and underutilized properties represents contaminated industrial sites. Moreover, vacant properties often contain an array of conditions such as illegal dumping, leaking, and fire hazards that pose serious threats to public health and the environment (Schilling, 2002).

Preserving the embodied energy:

The retention of the original building's "embodied energy" is one of the main environmental benefits of reusing old buildings. Donovan Rypkema in his speech at the National Trust annual conference defined the term "embodied energy" as "the total expenditure of energy involved in the creation of the building and its constituent materials"(Rypkema, 2005). Graham Treloar (1997) wrote about embodied energy: "the embodied energy is the quantity of energy required by all activities associated with a production process, including the relative proportions consumed in all activities upstream to the acquisition of natural resources and the share of energy used in making equipment and other supporting functions. i.e. direct plus indirect energy" (Treloar, 1997). Wishkoski (2006) gives an example: a historic building with approximately 308,000 exterior bricks, each with an embodied energy value of 14,300 Thermal Units (BTU), represents 4.4 million BTUs of energy expended in the original construction of the building, or 1.3 million kilowatt hours of electricity (Wishkoski, 2006).

Planners, architects, investors, and public officials must be sensitive to the energy used in the production and assembly of materials needed for new buildings, from their origin to their end of life and subsequent reuse. Conservation and adaptive reuse cause much less destruction to our natural resources than new construction. Statistics reveal that building construction consumes 40 percent of the raw materials entering the global economy every year. (Bahl, 2005) Interestingly, about 85 percent of the total embodied energy in materials is used in their production and transportation. (Bahl, 2005).

In Australia, studies showed new buildings have much higher energy costs than buildings that are adaptively reused. In 2001, new buildings accounted for 25 per cent of wood harvest, 16 per cent of fresh water supplied, 44 % of landfill, 45 % of carbon dioxide production and up to half of the total greenhouse emissions from industrialized countries.(Australian Department of the Environment and Heritage, 2004)

Donovan Rypkema (2005) argues, the process of demolishing a historic building has a significant impact on the environment. When we demolish a building, first, we are throwing away tens of thousands of dollars of embodied energy. Second, we are replacing it with materials vastly more consumptive of energy. Further, modern construction methods are incredibly wasteful of resources. Studies show that Up to 25 percent of the total waste generated in the United States and other countries is directly attributed to building, construction, and demolition activities. These waste products can be environmentally hazardous and polluting, both as solids and in the atmosphere (Bahl, 2005). The waster also stresses the capacity of landfill sites.

Preserving the cultural energy:

"Cultural energy" is a term used by two researchers Vani Bahl (2005) and Michael Wishkoski (2006). It represents the old construction methods that were used for cooling and heating and to keep the weather out without consuming energy. When a historic building is preserved or restored for adaptive reuse, those old cultural methods are preserved and brought back to active duty. Very likely, the old building was strategically placed to get the best orientation to the sun to make the most use of the solar energy, and the interior space and its openings were efficiently organized to keep the air circulating and cool down the space without using any sort of air conditioning and electricity. When we preserve a historic building we avoid the consumption of additional energy by getting advantage of the old construction methods designed to cool and heat the space and keep the weather out without energy consumption.

Adaptive reuse projects entail great environmental benefits to our communities. Unfortunately, there is a notion among people that sustainability is not compatible with the practice of reusing old structure. This idea is adopted by the U.S. Green Building Council's treatment of resource reuse issues in its LEED certificate program. The council is currently circulating a draft of a proposed rating system for neighborhood developments. The system assigned a credit of two

points out of 69 for adaptively reused historic buildings, which does not reflect by any shape or form the three above noted environmental benefits that this practice entail (Wishkoski, 2006).

4.2.2 Social Benefits

The reuse of vacant and underutilized buildings entails significant social benefits. Those benefits can be categorized under 1- Job creation, 2- Crime reduction, 3- The sense of place factor:

Job creation: Since 1987, manufacturing jobs lost in the city of Toronto alone have reached about 75,000 jobs (De Sousa, 2001). Investing in vacant properties is an important tool that creates new job opportunities in communities and urban centers. Further, the labor intensity of building rehabilitation generally means that there is a greater local economic impact in jobs and income than with the same amount spent on new construction (Rypkema, 1999).

Crime Reduction: Vacant Structures can quickly become havens for vandals, homeless, arsonists, and drug dealers, and as a result drive down property values, taxes, and services, and discourage investment in a community. Joseph Schilling (2002) describes the effect of abandoned buildings on communities as a disease that once started it can quickly spread throughout a neighborhood. The residents often fell unsafe walking on streets that have abandoned buildings. Local governments may succeed rehabilitating one building but often do not have sufficient resources to keep the demand of growing number of vacant properties. Some property owners feel helpless in trying to recruit new tenants. Property owners become less interested in investing in these neighborhoods. Many residents eventually leave while those who remain become accustomed to blight as the neighborhood deteriorates. This cycle continues with each new pocket of vacant and abandoned properties. (Schilling, 2002)

In Contrast, by adapting those vacant properties for another use, the illegal activities that used to occur in those properties will be eliminated, which will bring peace and safety back to the neighborhood.

28

The sense of place factor: The built and natural environments are elements that express the distinctiveness of a community or a neighborhood. Rypkema (1999) wrote about the sense of community and ownership: "A sense of ownership acknowledges an individual benefits from, an individual stake in, and an individual responsibility for one's place. A sense of community acknowledges the obligations to and interconnectedness with the other residents of that place" (Rypkema, 1999). Deteriorated vacant buildings affect the identity of the community and drive residents to lose there sense of community ownership. This does not mean the ownership in a legal sense, but ownership in its broad meaning, where individuals acknowledge there responsibility and obligations for one's place and for other residents of that place.

4.2.3 Economic Benefits

The literature about the economic benefits of adaptive reuse can be divided into two categories:

1- Economic benefits to owners/investors

2- The manner in which reuse projects contributes to local and regional economies

There are a number of studies that suggest the re-use of vacant and underutilized buildings is a sound investment for owners/investors. This topic is the focus of this study and it will be investigated and discussed in further detail in Chapters 5, 6, and 7.

The economic benefits of conservation activities on local and regional economies have been investigated by a number of researchers. All studies have suggested positive economic benefits of several types: - Jobs created; - The multiplier effect; - Heritage tourism; - Reinvestment in downtown cores.

Donovan Rypkema (1994) argues that rehabilitation is 20 percent more labor intensive than new construction. Especially for a certain type of labor specialized in building renovations and heritage conservation (Rypkema, 1994). Ironically, the demand for labor might not be where the supply of labor exists. The US Federal Preservation Institute calls this phenomenon "economies

29

of agglomeration". This demand supply mismatch is reduced when the economic activity in an area increases. This framework can be extended to historic rehabilitation. While rehabilitation of a single historic site may not generate enough demand to draw skilled preservation professionals and labor to an area, rehabilitation of a historic district may provide enough demand to provide long term full time employment for preservation architects and craftsmen.

Rypkema (1994) notes that money paid for labor in a reuse project stays within the community and rebound through the economy magnifying the economic effect of the investment. This process is called the "multiplier effect." David Listokin (1998) in his study *The Contributions of Historic Preservation to Housing and Economic Development"* wrote: "The direct benefits associated with historic preservation - - have advantageous multiplier effect." He compared in his study the economic impact of one million dollars spent in rehabilitation projects versus equal investments in pharmaceutical and electrical productions and found that investment in rehabilitation projects exceeded the other sections in terms of job creation, income, and state and local tax revenues.

Heritage tourism is another economic benefit to local and regional economies. A research on heritage tourism in western Pennsylvania studied 19 heritage centers in nine counties and found that the preservation activities in those areas resulted in $12.2 million direct income and $5.6 million of indirect income. These regional impacts supported $5.0 million in wages and salaries and 337 jobs annually (Strauss, Lord, and Powell, 2002).

The revitalization and reinvestment in downtown cores is spreading to hundreds of communities across Canada and the USA. Fueled by government's tax credits and economic revitalization programs, reports show a positive economic impact as a result of those activities. City of Kitchener's revitalization program "The Edge" is a good example of this model. The program's goal is to stimulate the revitalization of the downtown core through a set of government incentives and tax credit programs. The "Main Street Program" is the US model for this approach.

Data obtained from the National Trust for Historic Preservation shows the following statistics as a result of the Main Street Program[2]:

The total reinvestment in physical improvements	$23.3 Billion
Average reinvestment per community	$12,431,287
Net gain in businesses	67,000
Net gain in jobs	308,370
Number of buildings rehabilitations	107,179

Figure 1: Main Street Program in the US - Statistical Data

Finally, all the arguments and findings presented in the above noted studies provide much evidence that suggest conservation and reuse of old and underutilized buildings result in a net positive effects on regional and local economies.

4.3 What are the Problems that Face Adaptive Reuse?

Developers, investors and owners face many regulatory, financial, and physical obstacles when undertaking an adaptive reuse development. Generally, the obstacles are site specific. Some buildings are more flexible and adaptable than others. Barriers for development include: -The functional problems, -Contamination, - Zoning and building code.

4.3.1 Functional Problems

The functional obstacles of reusing older buildings can be sometimes challenging. Buildings constructed during the nineteenth and early twentieth century were not equipped with modern days requirements of mechanical and electrical systems, which make it costly to upgrade those buildings and bring them up to today's standards.

---

[2] 2004 Economic Statistics: The Main Street Program's Success. Data based on the most recent numbers obtained from the National Trust of Historic Preservation web site, accessed September 3, 2006

Buildings vary in there flexibility for reuse. Structures with complicated and distinctive shapes and tightly spaced structural columns are hard to adapt for new configurations. Characteristics of adaptable buildings include modest scale, simple shapes, large open spaces, wide structural bays (distance between columns).

4.3.2 Contamination

The presence of contamination can be of a significant barrier to the adaptive reuse of an existing structure, both, in terms of added costs and liability. Contamination is viewed by many researchers as the most significant barrier to the redevelopment of urban industrial parcels (Howland, 2002).

The contaminated components and hazardous materials in old buildings should be assessed on a case by case basis. Asbestos typically is the most common contamination found in the interiors of most historic buildings. Asbestos can be found in insulation for exterior walls, around pipes, and as a fire stopping (CMHC, 2006). The use of asbestos ended in the 1980's. The other type of contamination can be found in the soil, especially in old industrial properties, where waste materials, such as paint and oil, used to be dumped frequently in a certain area on site. The uncertainty about the extent of existing contamination and remediation required, and the risk that there might be unforeseen contaminates on site, which might be discovered during construction, has a big effect on any potential investment in this type of properties.

The fear of liability among purchasers, lenders, and investors is another major barrier for any potential investment in old properties. Ontario's approach to the liability for contaminated properties has been beyond the model "polluter is liable." Katherine Van Rensburg (2006) in her paper "*The Brownfields Equation and Liability Concerns"* describes the provinces approach to this issue as: "In addition to those who caused the contamination, any past or present owners, occupants and parties with management or control of property may be subject to administrative clean-up and cost recovery orders." We should note that since 2001 there has been a significant

improvement to the provinces approach in dealing with the liability of brownfield contamination. However, the civil liability issue continues to be the main risk that fears any potential investor or lender. The fear comes form the fact that by being a shareholder in this type of properties, the investor/owner becomes exposed to the risk of being sued and found responsible if anybody from the public is affected by the contamination on the property, even if the contamination is caused by a previous owner(s).

4.3.3 Zoning By-laws

Zoning often acts as regulatory barriers to the adaptive reuse of vacant properties. A zoning bylaw contains provisions that regulate the use, size, height, density and location of buildings on properties within a city to promote healthier and safer communities. As a matter of fact, it may take major studies, analyses, and consultations with various committees to amend or allow even minor adjustment to the zoning regulations that govern a certain property.

When an adaptive reuse is considered, often an official plan amendment or/and re-zoning is required, especially when changing the use is proposed. The extra costs and the lengthy administrative process could have substantial negative impact on the profitability of the project.

In urban areas, vacant properties can be threatened if those properties are located in areas where intense developments are allowed. Development rights might advocate the demolition of a vacant or underutilized structure if it allows the owners to develop the site to more intense use than the existing structure. One of the options that can be used to protect old buildings from demolition is the "Transfer of Development Rights" concept. The goal in this model is to protect the property from demolition by allowing the owner to sell the "rights to develop" to another site. This process can compensate the owner and make the adaptive reuse development option more financially

viable. Section 37 of Ontario Planning Act[3] allows municipalities to develop there own systems

for height and density transfer, to allow landowners to sell the development rights to other

developers who then use those development rights to increase the density of development on

another piece of property at another location. There are two variations[4] of that type of a (TDR),

the first one is a situation in which the developer transfers the development rights from one

property to another property the developer owns. The second variation allows a local government

to establish a (TDR) bank to transfer development rights. In this method, developers, who wish to

develop at a higher density than current zoning allows, would purchase development rights from

the local government. The higher density is the incentive for the developer to purchase the

development rights. The local government could then use these funds to purchase development

rights of properties that it wants to protect such as vacant buildings and structures with historical

significance.

Finally, we should note that in some cases existing old buildings have more floor areas than

would the current zoning by-law allows for on the site. In such cases the operating income

generated from the existing building would be higher than in the case of building a new structure

on the site.

4.3.4 Building Code

Often, vacant or underutilized buildings are left abandoned or demolished because it is too

difficult to meet applicable building code requirement. Complying with local building codes is

often one of the most challenging barriers that face adaptive reuse projects, as most old buildings

---

[3] "37. (1) The council of a local municipality may - - authorize increases in the height and density of development otherwise permitted by the by-law that will be permitted in return for the provision of such facilities, services or matters as are set out in the by-law." (Ontario Planning Act, 1990)

[4] From a fact sheet posted on University of Ohio website. http://ohioline.osu.edu/cd-fact/1264.html

were constructed prior to the enactment of a building code and thus are in most cases not in full compliance.

When a change of use to an existing building is proposed, the code most likely requires the upgrade of the "performance level" of the building so it meets the requirements of the new occupancy[5]. Those upgrades may include fire rating the floors and roof, adding a sprinkler system, reducing the amount of opening in an exterior wall…etc.

Sometimes, and due to structural and construction difficulties, alternative measures may be utilized upon the satisfaction of the "chief building official."[6]

In some cases, variances or waivers might be an option to get out of certain building code requirements. We should note that it is important for the design team to engage in direct discussions with the local authorities in the early design stages. Those discussions are very useful for introducing alternative and more feasible ways for applying certain code requirements.

The government of Ontario is moving towards the adoption of a new objective based building and fire codes. This new Code, expected to be adopted in 2006, will substitute the current prescriptive based code. The new objective based code will focus on the fundamental purposes that the code seeks to achieve. This will have several potential benefits for potential reuse projects such as, greater flexibility for considering feasible alternatives and more clarity around the intent and objectives of each code requirements.

4.4 Incentives and Policy Tools for Adaptive Reuse

Traditionally, the incentives approach has been the prominent tool used by government bodies to stimulate conservation and preservation in North America and some European countries. There is a wide spread notion among investors, property owners, and government officials that the lack of

---

[5] Ontario Building Code. Section 11.4.

[6] Ontario Building Code. Sentence 11.5.2.1(1)

meaningful incentives undermines support from private sector and misses on opportunities for

private investors in heritage conservation projects.

The purpose of heritage incentives is to:

- Ensure that investors are not disadvantage by the constraints that regulatory expenses

  may impose

- Attract private capital investment in heritage conservation

In Ontario, heritage incentive programs can be divided into three categories: Federal incentives,

provincial incentives, and municipal incentives.

4.4.1 Federal Incentives

The federal heritage incentive program in Canada in called the "Federal Historic Preservation Tax

Incentive". This program allows "a tax credit of up to 20% of the cost of renovation for certified

rehabilitation of a certified historic structure. It applies to any project that the Secretary of the

Interior designates a certified rehabilitation of a certified historic structure." [7]

4.4.2 Provincial Incentives

Provincial heritage incentives are available through number of agencies. Superbuild Ontario,

Northern Ontario Heritage Fund Corporation, Ontario Heritage Foundation, and Trillium

Funding, all offers different and variable grants and incentives for heritage conservation programs

(Shipley, 2006a). Furthermore, there is provincial legislation that allows municipalities the ability

to provide property tax relief to heritage buildings to encourage the preservation and conservation

of those properties.[8]

---

[7] Information obtained from Infrastructure Canada website: http://www.infrastructure .gc.ca/research-
recherche/rresul/rs/rs03_e.shtml, Website accessed October 2006.

[8] Municipal Act *Section 365.(1)*

4.4.3 Municipal Incentives

Municipalities are allowed under the Municipal Act to waive the development charges and to offer property tax rebates of 10 to 40% for properties designated under part IV or Part V of the Ontario Heritage Act. [9] Furthermore, municipalities are allowed under Ontario Heritage Act to make grants and loans to the owners of a property designated under part IV of Ontario Heritage Act for the purpose to paying for the whole or partial cost of the rehabilitation or alteration of such property.[10] We should note also that even if the property is not designated under part IV or part V of the Ontario Heritage Act, municipalities, under the Planning Act and for the purpose of carrying out a community improvement plan, can offer grants and loans to the owners of such property for the purpose of carrying out a rehabilitation or alteration project.[11]

---

[9] Municipal Act *Section 365.2.(1)*

[10] Ontario Heritage Act, *Section 39. (1)*

[11] Planning Act, *Section 28.(7)*

Chapter 5

The Economics of Adaptive Reuse

The relationship between the two subjects, adaptive reuse and economics is very complex. Often the economics of adaptive reuse is interpreted as simple questions such as "How can the project be financed? What kinds of tax incentives are available? What will be the effect on the property value?" In reality, the economics of adaptive reuse is a much more comprehensive topic than questions about, financing or taxation.

The adequacy of the literature in this field depends on the question that is being asked (Mason, 2005). The questions range across the issues of the impact on the local and regional economy to those about the economics of individual projects. This study aims at clarifying the notion about the main questions concerning the economics of adaptive reuse projects from the investor's point of view. The literature reveals that there has been insufficient study concerning the private economic benefits of adaptive reuse. This study will contribute to understanding this issue.

5.1 Methods Used to Understand the Values of Adaptive Reuse

A comprehensive review of the economics of rehabilitation literature can be found in Randal Mason's (2005) publication "*Economics and historic preservation: A Guide and Review of the Literature.*" This review cites 272 studies mostly from the US but also from the UK and Canada. Although Mason's title uses the term "preservation", the arguments apply equally to the rehabilitation and adaptive reuse of buildings with historic value. Mason reviews several methods used in evaluating the economics of saving and reusing older buildings. Those methods vary in the degree of complexity and objectives. The following is a brief review of those methods.

Economic impact studies: This dimension deals with the manner in which historic preservation contributes to the local and regional economies. Typically the economic benefits are measured in terms of job creation, income creation, tax revenues, value added, and property values. Such

subjects are usually approached by performing economic impact studies. There have been a significant number of studies undertaken across the U.S. that focused on the economic impact of rehabilitation projects on the economy on more than "project-by-project" bases. (Mason, 2005). All studies have proved that "historic preservation yields significant benefits to the economy." In Canada, our literature review found that there is lack of studies about the economic impact of adaptive reuse on the economy. Nevertheless, few similar studies on brownfield developments exist in Canada (De Sousa 2000; De Sousa 2002) and in the US (Howland 2002; Meyer & Lyons, 2000).

Regression analyses: These type of studies aim to determine the effect of non economic factors such as, the proximity to a historic site on market prices of other goods. The most common and important type of studies that used regression analysis in the field of historic preservation are studies that looked at the economic impact of heritage designation on property values (Leichenko, et all, 2001; Shipley 2000).

"Travel-cost" is one of the key variables developed and used in regression methods. It has been used to evaluate the economic behavior of heritage sites by measuring the costs people are willing to pay to travel to visit those sites. This variable of interest has been used mainly to study the economics of recreational and natural heritage sites. A study by Poor & Simth (2004) is a good example of this model. The study looked at the average travel cost that consumers paid during a period of three years to visit the heritage city of St. Mary located in rural southern Maryland.

Stated-preference studies (Contingent Valuation & Choice Modeling): These methods often rely on survey instruments or other means of asking the general public about their preferences with regard to a public good. Contingent Valuation methods might speculate about how much the respondents would pay if the market for a public good (heritage element) would exist. A good example of contingent valuation methods is a study by Chambers and Whitehead (1996). Their study looked at the public willingness to support the preservation of a school in Missouri by

asking people through a detailed survey what would they be willing to pay to see the school preserved (Chambers et all, 1998).

Choice modeling: Another survey based method for collecting the public's preference about a public good. This method uses a more detailed survey by asking the respondents to rank deferent attributes such as price, feel, look, etc, in order to determine how the public value a public good. The purpose behind this method is to break down the total value of a public good into several attributes to determine what the public exactly value in this good rather that asking a person how much he would pay to visit a certain site. Mourato & Mazzanti (2002) provide the best description of choice modeling applications on historic preservation in there study "Economic Valuation of Cultural Heritage: Evidence and Prospects" (Mason, 2005).

Basic cost benefit analysis case studies CBA: The quantitative cost benefit analysis approach remains prominent in the literature as it relies primarily on math and statistics (Mason, 2005). The literature is extensive about the technical side of the cost benefit analysis method. However, with regard to the economics of adaptive reuse, it is believed that there has not been any study that examined the profitability of adaptive reuse in comparison with new construction during a period of time using the CBA method.

The CBA approach can be in some cases very straightforward and simple (private sector CBA) or very complex and comprehensive (public sector CBA).

When examining the cost benefits of private investment projects a simple straightforward type of CBA analysis can be used (some people call it Return on Investment Analysis ROI). In most cases this type of analysis considers a limited set of costs and benefits which are very easy to quantify as they can be presented as dollar values.

Public sector CBA's are more complex and comprehensive due to there scale and the amount and type of variables that are involved. Those studies estimates and totals up the equivalent dollar

value of the costs and benefits of large scale public projects (highways, dams, healthcare facilities, etc) on communities. In some cases the project may provide benefits and costs which cannot be directly expressed in dollar figures as in large scale historic sites preservation projects sponsored by the government. It is challenging to provide monetary values for the social and economic benefits and costs of such projects. In this case techniques such as "travel cost", "wellingless to pay", and "stated preference" are used for measurement.

In CBA time is a very important factor that has to be accounted for, in both, private and public projects. In every project the benefits and costs have to be expressed in terms of dollars in a particular time. A dollar available five years from now doesn't have the exact value of a dollar available now. This is not only because of inflation, but also because a dollar available now can be invested and generate interest and it would be worth more after a period of time. By using current interest and inflation rates the present value of a dollar available after 5 years can be calculated using simple straightforward math. This value is called "net present value" NPV or the discounted value.

Economic impact studies, regression analyses, choice modeling and stated preference are all methods used to monitor how the public value preservation projects, quantify how they contribute to local and regional economies and analyze there effects on the public. For the purpose of this study, the cost benefit analyses is the most effective method to analyze and quantify from a private investor's perspective the return on investment of adaptive reuse project. For that reason, the basic cost benefit analysis approach has been used in this study in order to answer the three research questions noted in Chapter 1 which relate to the choices building owners and investors have to make with regard to the soundness of their investment in re-using heritage and other older buildings. The cost benefit analysis used in this study is the simple type of CBA which is mainly used in calculating the costs and benefits of private investment projects.

41

5.2 Relevant Research Base

Most previous studies that looked at adaptive reuse private return on investment have relied mainly on financial calculations, cost-benefit analyses, and development 'pro-formas' derived from the real-estate. Donovan Rypkema (1994) makes the clearest case for this framework. In his booklet *The Economics of Rehabilitation* published by the National Trust for Historic Preservation, Rypkema discusses 19 "myths" about relative costs of building rehabilitation versus new construction. In his work Rypkema uses a detailed pro-forma analysis and comparison between hypothetical new construction and rehabilitation projects. These pro forma analyses, and the accompanying detailed explanations, demonstrate that adaptive reuse is an effective and profitable scenario among other development options. He concludes "the rehabilitation project with all its handicaps, still ended up as the more economically attractive alternative" (Rypkema, 1994). Rypkema's goal through this study was to develop a tool for developers that would empirically help preservationists make informative decisions about the prospects of the option of adaptive reuse.

The Lazarus Effect is a study carried out by Robert Shipley (2006a). The study analyses a broad sampling of adaptive reuse projects in Ontario to determine the characteristics of successful reuse developments. Shipley goes on to discuss the findings of several detailed interviews with various stakeholders. The survey findings revealed various facts about constraints of older building reuse, return on investment, benefits of older buildings and government incentives. The study also conducted a broad cost comparison between adaptive reuse and new construction and found that adaptive reuse is not
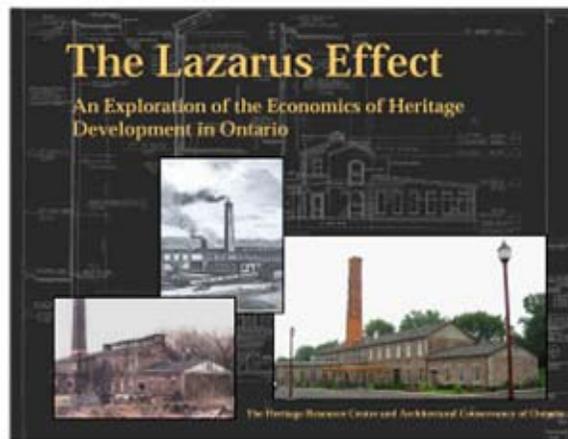
always less expensive than new construction. However, the study found that regardless of the cost, the heritage developments yielded much higher return on investment.

A handful of studies about the economics of individual case studies exist in the literature. Those studies provide broad financial documentation and stories about successful historic preservation projects. For instance, details of successful rehabilitation projects have been published by the US National Trust for Historic Preservation.

Our review of the literature reveals that there is a relative lack of academic research on the profitability of preservation projects. Mason (2005) supports this fact and explains the reason for that as the lack of experts and established research institutions to support sustained research on the broad topic of preservation. In his study, Shipley (2006b) points out another constraint, the lack of willingness of developers to share financial data.

5.3 The Need for this Study

All the above noted studies suggest the reuse of heritage and older building is a profitable business. It is true, as Mason (2005) notes, the academic research in this field is mainly weighed toward advocacy, and all researchers are somewhat proponents to heritage preservation. Still, any way the economic effects are measured, historic preservation tends to yield significant economic benefits (Rypkema, 1994; Mason, 2005). There is a need, therefore, for an analysis with enough critical distance and honest evaluation of the proposed questions to challenge or confirm the findings of previous studies. Also, more attention needs to be paid to how investment in preservation projects compares to other kinds of investment. For instance, how does investing in an adaptive reuse project compare to other type of investments such as building on a greenfield? Such scenarios are very important to justify to investors and to the public if investing in preservation is economically sound. This comparison has rarely been done in the field of adaptive

reuse. The above noted study by David Rypkema (1994) has introduced this model; however, it did not analysis actual market data for "real-life" preservation case studies.

The reliability of cost benefit analysis studies depends on how comprehensive and detailed the study is in terms of what factors and data are included in the study, i.e. has the study included, and analyzed, the cost of environmental clean ups, demolition and disposal, municipal incentives….etc. and has the study factored in all applicable costs in the comparison with other alternative development scenarios.

The need for the current study comes from the fact that it builds on what has been done before and fills in the gaps found in previous studies. This study focuses on the economic feasibility of adaptive reuse of heritage and older buildings versus alternative investment scenario. The main objective is not to rationalize an investment in preservation as a better option than an investment in new construction, rather, the objective here is to investigate and identify the factors that affect the economic outcome of investing in preservation projects by conducting a one on one comparison with other alternative development scenarios of new construction, considering all factors and costs associated with those scenarios. The main objective of this analysis is to make a clear case for municipalities and the public whether it is profitable or not to invest in old vacant or under utilized buildings, and to identify tools and ideas for municipalities to make this type of investment more attractive for investors by identifying the factors that affect the outcome of such investment.

Chapter 6
The Research Method

6.1 Introduction

In order to answer the research question which we outlined in the introduction, we based our research method on the case study approach with the focus on collecting financial data and conducting experimental modes of inquiry.

For the sake of clarity, we have to start by defining the term *experiment*. In an experiment, the basic intent is to test the impact of a treatment or an intervention on an outcome, controlling for all factors that might influence the outcome (Creswell, 2003). When evaluating and comparing the cost and return on investment of an adaptive reuse scenario with new construction, the main challenge is the difficulty of undertaking a comparison among different projects on different sites. Each real estate project has its' own financial, 'locational', and physical characteristics whether its' an adaptive reuse or a new construction. That makes it difficult for the purpose of generalization to conduct a logical and valid comparison. In order to overcome this challenge, we have conveniently identified three adaptive reuse projects in Ontario and gathered and analyzed there financial data using a 'pro-forma' analysis derived from the real estate literature. Using experimental mode of inquiry, and based on understanding of site constraints and opportunities, two hypothetical development scenarios were designed for each 'real-life' adaptive reuse case study. The first scenario is based on the development option of completely tearing down the existing old building and erecting a new structure, while the second hypothetical scenario was based on the option of developing the site assuming there is no existing building and the site is located on a greenfield. The advantages of creating these scenarios is to conduct a valid comparison among the three options, adaptive reuse; demolition and new construction; and

development on greenfield by maintaining the same 'locational', municipal, and site specific characteristics.

6.2 The Two Alternative Hypothetical Scenarios

Based on understanding the site constraints and opportunities, two alternative development concept plans of new construction were prepared for each case study based on varying assumptions and principles for establishing hypothetical development scenarios.

It is important to note that this model is not designed to lead to a single preferred development concept. Rather, the alternative concepts provide an understanding of the potential capacity of the site for varying product type and the basis for a return on investment analysis to determine their potential financial capacity. This in turn will provide a better understanding of how various schemes perform financially on a site. Furthermore, the two concept plans are not intended to illustrate all development amenities, details, and improvements on the site. However, they are intended to illustrate the basic features of a development scheme including major site work requirements including building type and location, building height, building area, and parking requirements.

Each of the two hypothetical development concepts is briefly described as follows:

Site Development Scenario # 1: First scenario is based on the option of completely demolishing the existing old building and building a new structure. In this concept a new building on the site is erected. The new building will have the same use as the 'real-life' adaptive reuse project. The area and number of stories of the proposed building is maximized based on local zoning by-laws and set-backs requirements.

The following are general concepts that are considered in this concept:

-   This concept realizes no value from the existing old building and incurs demolition costs for building removals

- Makes full use of the entire site

- Environmental constraints and applicable clean-up procedures are carefully accounted for.

Site Development Scenario # 2: The second hypothetical scenario illustrates the option of developing the site assuming there is no existing building on the site (i.e. greenfield site without any existing structures or previous contaminations.) The advantage of using this scenario as part of the evaluation is to conduct a convincing and legitimate comparison between the option of adaptive reuse and new construction on greenfield by maintaining the same 'locational', municipal, and site specific characteristics.

The followings are general concepts that are considered in this concept:

- The concept realizes no demolition cost

- Makes full use of the entire site

- Environmental constraints and applicable remediation procedures and costs are not applicable

- Site servicing and applicable new development fees are considered

The comparison between the three scenarios is not a direct comparison in terms of building types and characteristics, rather, the comparison is between the 'real-life' option of adaptive reuse and different alternative investment options that might be undertaken by the same develop or different kinds of developers.

It should be noted that there are 'locational' differences between the potions on the same site and the option on greefield. The development scenarios in downtown might have more 'locational' advantages such as ambiance and prestige. In other cases the greenfield scenario might have more 'locational' advantages than the downtown options. Location is an important factor that needs to

be analyzed and quantified. Due to the difficulty associated with quantifying and analyzing the

'locational' factor, this study was unable to account for this factor and considered the effect of the

location on the return on investment equal among the three development scenarios.

6.3 The Pro-Forma Analysis

For the propose of analyzing the financial data of the

'real-life' adaptive reuse development and the two

alternative development scenarios of new construction,

a financial feasibility study is conducted on each

scenario using a pro-forma analysis derived from the

real-state literature (Richard, 1992; Rypkema, 1994

> *Net Cash Proceeds*: *The net proceeds to the owner after paying all bills and collecting rent.*
> *Appreciation*: *The ability to sell the property for more than the amount spent on the development.*
> *Amortization*: *The equity in the property increases by reducing the debt which has the same affect on property value as the increase on value.*
> *Tax Savings and government grants*: *Reduction of taxable income increases the net cash proceeds. Also, government grants reduce the debt and increase the equity in the property.* *(Rypkema, 1994)*

When consideration is being given to investing in a real-estate project, the investor will consider

the dollars involved in four categories: capital cost, operating income, operating expenses, and

financing.

6.3.1 Capital Cost

This cost has two different aspects: acquisition cost and construction cost. In the case of a

rehabilitation project, the acquisition cost represents the price of the land and the existing

building. However, in the case of a new development on a greenfield the acquisition cost includes

only the land. Construction cost on the other hand represents the cost for rehabilitation and the

cost for demolition. In the case of the 'real-life' adaptive reuse scenario this includes only the cost

of rehabilitation. In the second scenario where the existing building is torn down and replaced

with a new structure there is a demolition cost that should be accounted for. In all three concepts

the construction is broken down into hard costs and soft costs. Hard costs are those that would be

part of the general contractor's responsibilities such as labor and construction materials. Soft

costs include costs such as consultant's fees, building permits, development charges, legal fees,

etc.

48

6.3.2 Operating Income

An important variable to be considered when making an investment decision is the operating income. Obviously, there are factors that affect the operating income of a property such as vacancy rates, and net to gross ratio which represents the relationship between the total floor area and the gross rentable area of a building. Higher net to gross ratio increases the operating income of a property. However, a higher vacancy rate decreases the operating income.

6.3.3 Operating Expenses

A Significant portion of the rent in any real-estate investment will be spent on operating the building. This include different types of expenses such as maintenance, advertising, monthly utility bills, etc. In fact, the lower the operating expenses the more profitable the investment. Construction method is an essential factor that affects the operating expenses. In new buildings, new construction technologies like insulation techniques reduces the amount of energy used to heat or cool the building. These expenses vary from one property to another. The financial data that we gathered had little information about the operating expense of the adaptive reuse scenario. Based on a study by Rypkema (1994) the percentage of income going to operating expenses is more favorable for new building. Based on this fact we have assumed the operating expense ratio of the adaptive reuse scenario is 12% of the operating income and 10% for the new construction scenario.

6.3.4 Financing

The cost of borrowing money is a significant factor in deciding whether the investment is profitable or not. In most cases the higher the risk of the investment the higher the borrowing cost is likely to be. There are three factors that affect the cost of borrowing and the return on investment: the interest rate, the loan term, and the loan to value ratio.

Interest rate: is a percentage used by the bank to calculate the annual borrowing cost. Usually, the higher the perceived risk of the investment, the higher the interest rate is likely to be. In our case we assumed the interest rate is the same for all three options. In our pro-forma we have used a rate of 4.7% which is the current interest rate offered by the banks for commercial real-estate investments at the time this research was conducted.

Loan Term: is the period of time over which the loan is to be repaid. Because increased time means more uncertainty, the shorter the loan term the less risk for the lender. In most cases the loan term for commercial real-estate finance is 5 years, however, the loan repayments are based on much longer period, called the 'amortization' period which in most cases is set for 20 years. At the end of the five years the entire unpaid balance of the loan is due to the bank. However, the borrower at this point will have to either refinance the remaining portion of the loan or sell the property. In our case we set the amortization period for all three options at 20 years.

Loan to value ratio: is the portion of the entire value of the property that the banker is willing to loan. We should note here that the value is not the actual cost required to buy the land and build the structure, it is based on how much the property will generate net income to the owner after the project is complete. This distinction between value and cost is a very important one which will be discussed in the following paragraph. Based on the fact that the higher the loan to value ratio, the lower the risk to the lender, we assumed the bank will consider the investment in the adaptive reuse scenario as a higher risk than the other two options of new construction and will offer a 70% loan to value ratio as opposed to a 75% loan to value ratio for new construction.

Value based on appraisal: The value of a commercial property is the price at which a typical buyer would buy and a typical seller will sell in an open and competitive marketplace (Rypkema, 1994). Before determining the amount of money the bank is willing to lend the investor, the bank uses the potential net operating income of the property and divides that by a fixed percentage.

6.4 The Pro-Forma

The 'pro-forma' analysis is the main tool in this study as developers themselves use it to determine the potential return and the feasibility of undertaking a real-estate investment. Developers use this analysis in two stages. The first stage is a one column summary called a "quick-and-dirty" analysis (Peiser and Schawanke, 1992). This summary gives an overall look on the project. It outlines the main characteristics and the costs associated with the construction period.

Table 1 (Construction Cost)				
	Factor	Rehabilitation	New Same Site	New on Greenfield
1	Lot Size	0.00	0.00	0.00
	Building Gross Floor Area — Reuse (Residential)	0.00 sqf	0.00	0.00
	Reuse (Garage)	0.00 sqf	0.00	0.00
	New (Residential)	0.00 sqf	0.00	0.00
	New (Garage)	0.00 sqf	0.00	0.00
2	Total	0.00 sqf	0.00	0.00
3	Number of rentable units	0 unit	0	0
4	Number of parking required	0 space	0	0
	Number of parking provided	0 space	0	0
5	**Hard Costs**			
6	Demolition	$0	$0	$0
7	Building Construction Hard Cost (sq.ft) — Reuse	$0	$0	$0
8	New	$0	$0	$0
9	Building Construction Hard Cost (Total)	$0	$0	$0
10	Site cleanup	$0	$0	$0
11	Outdoor Parking / paving	$0	$0	$0
	Other Site Work	$0	$0	$0
	Total	$0	$0	$0
12	**Soft Costs**			
13	Consulting fees	$0	$0	$0
14	Demolition Permit	$0	$0	$0
15	City of Guelph Permits and Fees	$0	$0	$0
16	Insurances	$0	$0	$0
17	Development Charges	$0	$0	$0
18	Total	$0	$0	$0
19	Total Construction Costs:	$0	$0	$0

Table 1: The Pro-Forma Analysis – Construction Cost

The second stage is a "multi-period" cash-flow analysis (Peiser and Schawanke, 1992). This 'pro-forma' outlines all the factors that affect the return on investment including hard and soft construction costs, operating income, operating expenses, financing, and tax credits and grants. Developers perform both stages of analysis before they commit any money to a project. They then update the cash-flow analysis on a regular basis as they establish sales, price, and cost information with greater accuracy. The 'multi-period' return on investment analysis becomes the

main tool for determining the project's economic feasibility and for convincing lenders and investors to support the project. The purpose of the 'pro-forma' with its two stages is to provide a concise conception of projected costs, risks, and feasibility of a project from the preliminary design and consulting stages to its' final lease or sale. Tables 1 and 2 represent a generic pro-forma analysis, refer to tables 3 and 4 for a complete case study 'pro-forma' analysis.

Table 2 (Return on Investment)			
20	**Capital Costs:**			
21	Acquisition Cost	$0	$0	$0
22	Construction Cost	$0	$0	$0
	Unit Price (Dollar per sq/f)	$0	$0	$0
24	Total Capital Cost	$0	$0	$0
25	**Operating Income:**			
26	Vacancy Rate	0.0%	0.0%	0.0%
27	Average Rent per sq/ft	$0	$0	$0
28	Net to Gross Ratio	0%	0%	0%
29	Rentable Square Feet	0 sqf	0	0
30	Rent Total	$0	$0.00	$0.00
31	Vacancy	$0	$0.00	$0.00
33	Total Annual Operating Income:	$0	$0	$0
34	**Operating Expenses:**			
	Property Tax	$0	$0	$0
35	Operating Expense Ratio	0%	0%	0%
36	Total Operating Expenses	$0	$0	$0
37	Net Operating Income	$0	$0	$0
40	**Financing:**			
41	Capitalization Rate	0%	0%	0%
42	Value Based on Appraisal	$0	$0	$0
43	Loan to Value Ratio	0%	0%	0%
44	Available Loan	$0	$0	$0
45	Investor Cash required	$0	$0	$0
46	Loan Term	0 year	0	0
47	Interest Rate	0.0%	0.0%	0.0%
48	Annual Payment on Loan	$0	$0	$0
49	Cash Flow	$0	$0	$0
37	Unleveraged Investment Return	0.00%	0.00%	0.00%
50	Investor Cash on Cash Return	0.00%	0.00%	0.00%
51	Gap Between Cost and Value	$0	$0	$0
	Available Incentives			
	Government Grant	$0	$0	$0
	Capital Cost After Adjustment	$0	$0	$0
	Investor Cash required After Adjustment	$0	$0	$0
	Unleveraged Investment Return	0.00%	0.00%	0.00%
	Investor Cash on Cash Return After Adjustment	0.00%	0.00%	0.00%

Table 2: The Pro-Forma Analysis - Return on Investment

6.4.1 Research Challenges

The main challenge in this research was the lack of peoples willing to share detailed financial data of rehabilitation projects. As well, that construction documents were also difficult to obtain

as consultants regard those as intellectual properties, and in most cases refuse to release them. For

that reason the research was limited to only three case studies.

This challenge was reported in several previous rehabilitation studies. Shipley (2006a)

acknowledged this limiting factor in his study the "Lazarus Effect". Mason (2005) in his survey

of the rehabilitation literature reported several similar challenges in studying the return on

investment in rehabilitation projects. Nevertheless, many sources were available to obtain the

required data to construct the alternative hypothetical two scenarios for each case study such as

general contractors, construction costing manuals and municipalities.

The three case studies that have been examined in this research were conveniently chosen

because:

- They are located within a reasonable travel distance for the researcher

- Their site specific characteristics are suitable for both adaptive reuse and new build

    scenarios

- Developers and consultants were willing to share financial data and drawings required to

    establish the two hypothetical scenarios of new construction

6.4.2 The Experiment

The pro-forma template that was developed made it feasible to undertake further experiments

with alternative incentive scenario and quickly see the result. The study looked at three deferent

government incentive scenarios and analyzed how each incentive scenario influenced the return

on investment of the 'real-life' adaptive reuse scenario in comparison with the other two

hypothetical development scenarios of new construction.

- 30% Property tax credit

- 6% tax credit on construction cost

- 0% interest loan available

- Reduce the parking requirement

In most cases parking requirement is one of the most restricting aspects that affect the size of a building on a site. Normally, municipalities regulates the number of parking required in the zoning by-law which specifies the number of parking required for each land use by either space per square foot or amount of parking per unit. In the case of the Waterloo Ave case study, 3 parking spaces are required for every two residential units. By reducing the amount of parking required by 3 the investor is allowed to add two more rentable units on the site which shall increase the income of the investment. This study will test and analyze this option on the 'real-life' adaptive reuse scenario and compare the outcome with the other two hypothetical scenarios of new construction.

6.4.3 Cost Benefit Analysis

The Cost Benefit Analysis (CBA) is a well established and widely used method for analyzing complex and large scale public investment projects. This study uses a simple CBA model with the net present value method, over 30 year span, to determine the costs and benefits of the three deferent development scenarios of each case study. This approach made it possible to compare, on the same present value basis, the different costs and benefits that are accrued each year during the analyzed life span of both the 'real-life' and hypothetical projects.

The lack of available data availability represents the most significant limitation of this study. In some cases, the study was not able to quantify some of the costs and benefits the investments entailed, and as a result some benefits were eliminated and assumptions were used for others. The following summarizes the key costs and benefits that were analyzed:

Costs:

1- Net operating expense: In the pro-forma analysis the operating expense was calculated based on a fixed percentage of the total operating income of the property and added to that was the annual property tax in accordance with current municipal property tax rate. It is known that the operating expense of a property increases with time due to added

repairs and maintenance costs. Due to the lack of data with regard to the annual increase

in maintenance cost, this study made the assumption that there is an annual 1% fixed

increase in the operating expense.

2- Interest income on investor's cash required: The amount of cash the developer invested in

the project could have been invested somewhere else and earn interest and it would be

worth more after 30 years. Based on this fact, and by using the assumed discount rate the

annual interest on the cash invested has been calculated and added to the table as a cost to

the investor.

Benefits:

1- Operating income: The gross income of the property generated from rental before any

other expenses is considered the key benefit of the project. The annual rent increase is a

very important factor that has to be accounted for. The rate of rent increase varies from

year to year and from city to city. For instance the rent increase in 2006 in Kitchener is

2.1 vs. 2.2 in Toronto and 1.5 in St. Catharines and Niagara[12]. For simplicity, this study

allowed for a 2% annual rent increase for all three case studies.

2- Equity: The study considered the amount of loan principle paid every year is an added

benefit to the project. However, it should be noted that the appreciation in property value

has not been considered due to the lack of data and complexity.

The Discount Rate: The discount rate is the rate used to adjust the values of the benefits and costs

of a project that accrue in the future to there present values so that a reliable comparison can be

conducted. This is due to the difference in the value of the currency at different times. A 100

dollar available after 10 years from now is not as good as if it was available now. This is because

the 100 dollar if it is available now it can be invested and earn profit for 10 years and would be

worth more than the 100 available after 10 years. Choosing a discount rate for the analysis is not a

---

[12] Source: Canada Mortgage and Housing Corporation. Housing Market Outlook. Fall, 2006

simple task, however, in the contrary the choice of a rate in a cost benefit analysis is fairly

arbitrary (National Center for Environmental Decision-Making Research, 2006). The main two

factors that affect the rate of discount are interest and inflation rates. In order to determine the

discount rate for the CBA analysis, experts in the field have been consulted. Through those

consultations it was found that a 10% discount rate is an appropriate rate for the purpose of this

study which is normally higher than the discount rate used for analyzing public projects. Using

different discount rates affects the projected costs and benefits over a period of time. For the

purpose of comparison, changing the discount rate will change the rate of increase or decrease of

the net benefits of each scenario over time differently.

Chapter 7
Case Studies

7.1 Case Study 1 (371 Waterloo Avenue, Guelph)

This site is located on the North West corner of the intersection of Waterloo Avenue and Beechwood Avenue near Guelph's downtown. The 1.127 acre lot is the home to a 992m² (10,678 sqf) old stone building which has been renovated/retrofitted as part of 44-unit affordable housing development. The project included the adaptive reuse of the old square shaped structure facing Waterloo Avenue and an addition of a new construction located on the north east side of the site and a parking lot constructed on the north west side as well as few spaces on the east side to the south. The north half of the new addition's basement is allocated for an additional 11 parking spaces for a total of 53 spaces.

7.1.1 Historical Overview

In 1894 George Sleeman, a local businessman of Guelph, approached city council for a street railway charter and thus was the born of Guelph Railway Company. Construction began in April 1895 using 56 pound rail. The initial route of the GRC was south along Woolwich Street, through the downtown and along Dundas Road, with a second line running from the Sleemand owned Silvercreek Brewery on Waterloo Avenue where a stone car-barn and powerhouse were also built. The carbarn later served as the garage for the Guelph Transportation Commission buses until the 1970's, and still stands today at 371 Waterloo Avenue (Guelph Radial Railway, 2005).

Photo Courtesy of Guelph Radial Railway

Figure 2: Guelph Radial Railway: Front View Prior to Adaptive Reuse

Photo Courtesy of Guelph Radial Railway

Figure 3: Guelph Radial Railway: Front View Prior to Adaptive Reuse

Photo Courtesy of Guelph Radial Photo

Figure 4: Guelph Radial Railway: Rear View Prior to Adaptive Reuse

The three figures 2, 3 & 4 shows the former Guelph Radial Railway car-shop. It appears that there were only two tracks through the building in the second photo while the end of the building in the lower photo clearly indicates that there were three doorways for cars to enter and exit. Two of the doors were later closed in which may have been done at the time the building was converted to a bus garage.

With the end of street-car service, the buildings were used to store and repair the silver roofed cream and red buses of the Guelph Transportation Commission until a new larger garage was built in the early 1970's. (Guelph Radia Railway, 2005)

7.1.2 The 'Real Life' Adaptive Reuse Scenario

The adaptive reuse project was carried out by Lammer Development Ltd and designed by

Briestensky Johnson Critchley Architects Inc. The project consisted of a 27,965 sqf addition and

the rehabilitation of the 24,833 sqf existing building. The project contained 44 rentable units, 42

off street parking, and 11 underground parking spaces. The project received 1 million dollar

funding. This grant was available through a direct Government of Canada funding with matching

contributions from the Government of Ontario and City of Guelph under the Canada-Ontario

Affordable Housing Program. Also, a variance on the parking requirements was offered by the

City of Guelph (61 parking spaces would have been required in accordance with City of Guelph

zoning by-law. The number of parking spaces provided was 53).

The followings are the actual construction drawings of the adaptive reuse scenario obtained from

the offices of BJC Architects.

BASEMENT FLOOR PLAN "REALLIFE" SCENARIO

7.1.3 The Alternative Hypothetical Scenario of New Construction

After analyzing the sites opportunities and constraints, a new construction scenario based on the municipal zoning by-laws and building code requirements was developed. The approach considered the maximum building size allowable on the site based on establishing the required set backs and providing the required number of parking spaces and landscaped areas in accordance with applicable zoning by laws. The design consisted of a 3 storey 81,464 sqf residential building with 51 rentable units and 69 parking spaces 19 of them are underground parking. The followings are the drawings that were developed for the hypothetical scenario of new construction.

SITE PLAN NEW BUILDING SCENARIO

WATERLOO AVENUE

BEECHWOOD AVENUE

(P.3 ZONE)

EXISTING
ONE STOREY
BUILDING

(OR-36 ZONE)

NEW BUILDING

NEW 3 STOREY
RESIDENTIAL BUILDING

TOTAL = 51 UNITS

BUILDING AREA = 7,568m² (81,464 sqf)
GARAGE SPACE AREA = 1,226m² (13,196 sqf)

ZONING REQUIREMENTS

ZONING CATEGORY

ZONE: OR-36   PLAN OF PART OF LOT 21, DIVISION A

ZONING REQUIREMENTS
MINIMUM FRONT YARD: 3.10m   (9'-10 1/8")
MAXIMUM FRONT YARD: 7.50m   (24'-7 1/4")
MINIMUM SIDE YARD: 1.5m   (4'-11 1/16")
MAXIMUM BUILDING HEIGHT: 10.0m
                                   3 STOREYS

PARKING REQUIRED: 1.5 PER UNIT AND 1.25 IN EXCESS OF 20
PARKING REQUIRED = (1.5x20)+(1.25x 31) = 69 SPACES
PARKING PROVIDED: = 69 SPACES INCLUDING BARRIER FREE PARKING

PARKING SPACE SIZE: 5.50m x 2.75m   (18'-0" x 9'-0")
BARRIER FREE PARKING SPACE SIZE: 4.00m x 5.50m   (13'-1" x 18'-0")
BARRIER FREE PARKING REQUIREMENTS: (51- 200 PARKING SPACE REQD= 2)   PROVIDED 2 SPACES

1 SITE PLAN NEW BUILDING SCENARIO

PROJECT NORTH

PROJECT
371 Waterloo Ave.

SITE PLAN
NEW BUILDING SCENARIO

DRAWING 3

BASEMENT FLOOR PLAN NEW BUILDING SCENARIO

PRINCIPAL ENTRANCE

MECHANICAL ROOM / LAUNDRY / MAIL ROOM /

LOBBY

STAIR

ELEVATOR

UNIT 007
AREA 105m²
(1,130 sqf)

UNIT 004
AREA 105m²
(1,130 sqf)

UNIT 008
AREA 105m²
(1,130 sqf)

MECHANICAL ROOM

STORAGE

PARKING AREA

RAMP

BASEMENT PARKING
GARAGE ENTRANCE

STAIR

PROJECT
371 Waterloo Ave.

BASEMENT / GROUND
FLOOR PLAN
NEW BUILDING SCENARIO

DRAWING 4

1

65
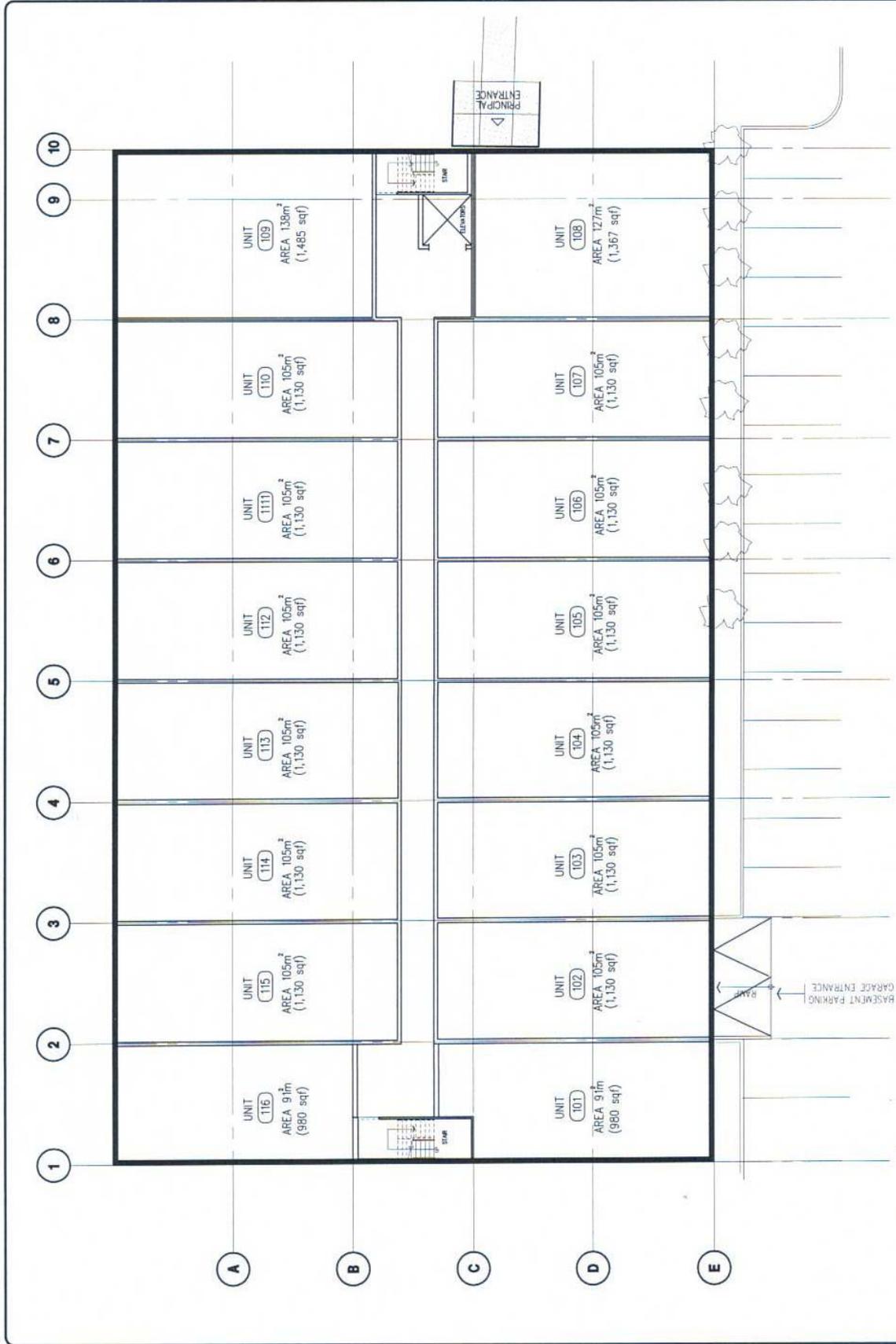
1ST, 2ND & 3RD
FLOOR PLANS
NEW BUILDING SCENARIO

PROJECT
371 Waterloo Ave.

PROJECT
NORTH

PRINCIPAL
ENTRANCE

UNIT 109
AREA 138m²
(1,485 sqf)

UNIT 108
AREA 127m²
(1,367 sqf)

UNIT 110
AREA 105m²
(1,130 sqf)

UNIT 107
AREA 105m²
(1,130 sqf)

UNIT 111
AREA 105m²
(1,130 sqf)

UNIT 106
AREA 105m²
(1,130 sqf)

UNIT 112
AREA 105m²
(1,130 sqf)

UNIT 105
AREA 105m²
(1,130 sqf)

UNIT 113
AREA 105m²
(1,130 sqf)

UNIT 104
AREA 105m²
(1,130 sqf)

UNIT 114
AREA 105m²
(1,130 sqf)

UNIT 103
AREA 105m²
(1,130 sqf)

UNIT 115
AREA 105m²
(1,130 sqf)

UNIT 102
AREA 105m²
(1,130 sqf)

UNIT 116
AREA 91m²
(980 sqf)

UNIT 101
AREA 91m²
(980 sqf)

STAIR

FLEW THE

BASEMENT PARKING
GARAGE ENTRANCE
RAMP

1ST, 2ND & 3RD FLOOR PLANS NEW BUILDING SCENARIO

1

A B C D E

1 2 3 4 5 6 7 8 9 10

Table 3 (Construction Cost)

371 Waterloo Avenue
Guelph, Ontario

	Factor		Rehabilitation	New Same Site	New on Greenfield	Notes
1	Lot Size		1.127 Acre	1.127 Acre	1.27 Acre	The study assumes the greenfield site's area is the same as the existing site
	Building Gross Floor Area	Reuse (Residential)	20,103 sqf	0.00	0.00	
		Reuse (Garage)	0 sqf	0.00	0.00	
		New (Residential)	27,965 sqf	68,268	68,268	
		New (Garage)	4,730 sqf	13,196	13,196	
2		Total	48,068 sqf	81,464	81,464	
3	Number of rentable units		44 unit	51	51	City of Guelph zoning by-law: 1.5 space per unit + 1.25
4	Number of parking required		58 space	69	69	space for any excess of 20 units
5	Number of parking provided		53 space	69	69	City of Guelph reduced the parking requirement for the adaptive reuse project by 5 Stalls
6	Hard Costs					
7	Demolition		$0	$204,045	$0	$0.3/CF (Reed Construction Data, 2005)
8	Building Construction Hard Cost (sq.ft)	Reuse	-	$0	$0	$98.18/SQF Average Cost Low Rise Condominium $74.13/SQF Average Cost for Parking Garage Source: (Reed Construction Data, 2005)
9		New	-	$7,680,772	$7,680,772	Data source for adaptive reuse total construction cost : Paul Critchley, Project Architect
10	Building Construction Hard Cost (Total)		$3,070,000	$7,884,817	$7,680,772	Adaptive Reuse: Site cleanup+asbestos cleanup New
11	Site cleanup		$27,000	$17,000	$0	same site: Only site cleanup
12	Outdoor Parking / paving		$15,720	$20,371	$20,371	$13.1/SY (Reed Construction Data, 2005)
13	Other Site Work		$185,000	$185,000	$185,000	The study assumes the cost is the same for New Construction Scenarios
14	Total		$3,297,720	$8,107,188	$7,886,142	
15	Soft Costs					
16	Consulting fees		$247,329	$608,039	$591,461	7.5% of construction cost. Source: Adaptive reuse architect
17	Demolition Permit		$0	$1,005	$0	$0.05/SQF Based on City of Guelph (2005) permit fees
18	City of Guelph Permits and Fees		$33,167	$56,210	$56,210	$0.69/SQF Based on City of Guelph (2005) permit and fees
19	Insurances		$35,000	$35,000	$35,000	
20	Development Charges		$196,372	$227,613	$253,368	$4463 per unit in downtown area. $4968 per unit outside downtown area. Based on City of Guelph Development Charges (2005)
21	Total		$511,868	$927,867	$936,039	
22	Total Construction Costs:		$3,809,588	$9,035,055	$8,822,181	

67

Table 4 (Return on Investment)

#	Item				Notes
23	Capital Costs:				The study assumes the greenfield site's acquisition cost is the same as the existing site, and the acquisition cost in the reuse and the new construction on same site
24	Acquisition Cost	$835,000	$835,000	$835,000	$835,000 include the cost of the existing building in both cases.
25	Construction Cost	$3,809,588	$9,035,055	$8,822,181	
26	Unit Price (Dollar per sq/f)	$79.3	$110.9	108.3	
27	Total Capital Cost	$4,644,588	$9,870,055	$9,657,181	
28	Operating Income:				
29	Vacancy Rate	3.3%	3.3%	3.3%	website.
30	Average Rent per sq/ft	$1.3	$1.3	$1.3	Data is modified to accommodate $/sqf format
31	Net to Gross Ratio	71%	86%	86%	Rentable Area / Total Building Area
32	Rentable Square Feet	34,069 sqf	59,004	59,004	
33	Rent Total	$44,290	$76,705.20	$76,705.20	33 x 30
34	Vacancy	$1,462	$2,531.27	$2,531.27	33 x 29
35	Total Annual Operating Income:	$513,938	$890,087	$890,087	(33 - 34) x 12
36	Operating Expenses:				
37	Property Tax	$140,332	$298,214	$291,782	3.021404% statistical data obtain from CMHC website.
38	Operating Expense Ratio	12%	10%	10%	The Study assumes higher ratio for adaptive reuse
39	Total Operating Expenses	$202,004	$387,223	$380,791	(38 x 35) + 37
40	Net Operating Income	$311,933	$502,864	$509,296	35 -39
41	Financing:				
42	Capitalization Rate	8%	8%	8%	8% capitalization rate assumed (Rypkema, 1994)
43	Value Based on Appraisal	$3,899,167	$6,285,802	$6,366,200	40 / 42
44	Loan to Value Ratio	70%	75%	75%	
45	Available Loan	$2,729,417	$4,714,352	$4,774,650	43 x 44
46	Investor Cash required	$1,915,171	$5,155,703	$4,882,531	27 - 45
47	Loan Term	20 year	20	20	
48	Interest Rate	4.7%	4.7%	4.7%	
49	Annual Payment on Loan	$210,764	$364,040	$368,696	40 - 59
50	Cash Flow	$101,169	$138,824	$140,600	40 - 59
51	Unleveraged Investment Return	6.72%	5.09%	5.27%	40 / 27
52	Investor Cash on Cash Return	5.28%	2.69%	2.88%	50 / 46
53	Gap Between Cost and Value	$745,421	$3,584,253	$3,290,981	27 - 43
54	Available Incentives				
55	Government Grant	$1,000,000	$0	$0	
56	Capital Cost After Adjustment	$3,644,588	$9,870,055	$9,657,181	27 - 55
57	Investor Cash required After Adjustment	$915,171	$5,155,703	$4,882,531	56 - 45
58	Unleveraged Investment Return	8.56%	5.09%	5.27%	40 / 56
59	Investor Cash on Cash Return After Adjustment	11.05%	2.69%	2.88%	51 / 57

Table 5 (The Experiment)

#	Item				Formula
60	**Property Tax Credit Available**				
61	Property Tax Credit Available	30%	0%	0%	
62	Property Tax After Adjustment	$98,232	$298,214	$291,782	37 - (37 x 61)
63	Total Operating Expenses After Adjustment	$159,905	$387,223	$380,791	39 - 37 + 62
64	Net Operating Income After Adjustment	$354,033	$502,864	$509,296	34 - 63
65	Value Based on Appraisal After Adjustment	$4,425,412	$6,285,802	$6,366,200	64 / 42
66	Loan to Value Ratio	70%	75%	75%	
67	Available Loan	$3,097,788	$4,714,352	$4,774,650	66 x 65
68	Investor Cash required After Adjustment	$1,546,800	$5,155,703	$4,882,531	27 x 67
69	Loan Term	20	20	20	
70	Interest Rate	4.7%	4.7%	4.7%	
71	Annual Payment on Loan	$239,210	$364,040	$368,696	
72	Cash Flow After Adjustment	$114,823	$138,824	$140,600	64 - 71
73	Unleveraged Investment Return	7.62%	5.09%	5.27%	64 / 27
74	Investor Cash on Cash Return After Adjustment	7.42%	2.69%	2.88%	72 / 68
75	**Construction Tax Credit Available**				
76	Tax Credit Available on Construction Cost	6%	0.00%	0.00%	
77	Eligible Expenditure	$3,809,588	$9,035,055	$8,822,181	from 25
78	Tax Credit Available	$228,575	$0	$0	77 x 76
79	Total Capital Cost After Credit	$4,416,013	$9,870,055	$9,657,181	27 x 88
80	Investor Cash Required Before Credit	$1,915,171	$5,155,703	$4,882,531	from 46
81	Investor Cash After Credit	$1,686,595	$5,155,703	$4,882,531	80 - 78
82	Cash Flow	$101,169	$138,824	$140,600	from 50
83	Unleveraged Investment Return	7.06%	5.09%	5.27%	40 / 79
84	Investors Cash on Cash Return After Adjustments	6.00%	2.69%	2.88%	82 / 81
85	**0% Interest Government Loan Available**				8% 8% capitalization rate assumed (Rypkema, 1994)
86	Capitalization Rate	8%	8%	8%	
87	Value Based on Appraisal	$3,899,167	$6,285,802	$6,366,200	40 / 50
88	Loan to Value Ratio	70%	75%	75%	
89	Available Loan	$2,729,417	$4,714,352	$4,774,650	87 - 88
90	Investor Cash required	$1,915,171	$5,155,703	$4,882,531	27 - 89
91	Loan Term	20 year	20	20	
92	Interest Rate	0.0%	4.7%	4.7%	
93	Annual Payment on Loan	$136,485	$364,040	$368,696	
94	Cash Flow	$175,449	$138,824	$140,600	40 -93
95	Unleveraged Investment Return	6.72%	5.09%	5.27%	40 / 27
96	Investor Cash on Cash Return	9.16%	2.69%	2.88%	94 / 90

#	Item				
97	**Reduce the Number of Parking Required**				
98	Number of Parking Required	53 space	69	69	From 5
99	Number of Parking Provided Reduced by 3	50 space	66	66	By reducing the number of parking required by 3 the investor is allowed to add two more rentable units
100	Building Gross Floor Area Reuse (Residential)	20,103 sqf	0.00	0.00	
101	Reuse (Garage)	4,730 sqf	0.00	0.00	
102	New (Residential)	34,956 sqf	68,268	68,268	
103	New (Garage)	0.00 sqf	13,196	13,196	
104	Total	59,789 sqf	81,464	81,464	
105	Number of rentable units	50 unit	51	51	
106	Added Construction Cost for the Added Two Units	$686,401	$0	$0	
107	Total Construction Cost After Adjustment	$4,495,989	$9,035,055	$8,822,181	116 / 25
108	Total Capital Cost After Adjustment	$5,330,989	$9,870,055	$9,657,181	106 + 27
109	**Operating Income:**				
110	Vacancy Rate	3.3%	3.3%	3.3%	Based on 2005 statistical data obtained from CMHC website.
111	Average Rent per sq/ft	$1.3	$1.3	$1.3	Based on 2005 statistical data obtained from CMHC website. Data is modified to accommodate $/SQF format
112	Rentable Square Feet	39,024 sqf	59,004	59,004	
113	Rent Total	$50,731	$76,705.20	$76,705.20	111 x 112
114	Vacancy	$1,674	$2,531.27	$2,531.27	110 x 113
115	Total Annual Operating Income:	$588,687	$890,087.14	$890,087.14	(113 – 114) x 12
116	**Operating Expenses:**				
117	Property Tax	$135,842	$272,986	$266,554	Based on City of Guelph's multi residential tax rate: 3.021404% statistical data obtain from CMHC website.
118	Operating Expense Ratio	12%	10%	10%	The Study assumes higher ratio for adaptive reuse
119	Total Operating Expenses	$206,484	$361,994	$355,562	(118 + 115) + 117
120	Net Operating Income	$382,203	$528,093	$534,525	115 – 119
121	**Financing:**				
122	Capitalization Rate	8%	8%	8%	
123	Value Based on Appraisal	$4,777,536	$6,601,161	$6,681,559	120 / 122
124	Loan to Value Ratio	70%	75%	75%	
125	Available Loan	$3,344,275	$4,950,871	$5,011,169	123 x 124
126	Investor Cash required	$1,986,714	$4,919,184	$4,646,012	108 - 125
127	Loan Term	20 year	20	20	
128	Interest Rate	4.7%	4.7%	4.7%	
129	Annual Payment on Loan	$258,243	$382,304	$386,960	
130	Cash Flow	$123,960	$145,789	$147,565	120 - 129
131	Unleveraged Investment Return	7.17%	5.35%	5.53%	120 / 108
132	Investor Cash on Cash Return	6.24%	2.96%	3.18%	130 / 126

Table 6: Cost Benefit Analysis - 371 Waterloo Ave
Adaptive Reuse Scenario

Rent Increase Rate: 2.00% Discount Rate: 10.00%

Year	Cost								Benefit				
	Interest on Capital	Operating Expense	Expense Increase Rate	Loan Payment	Annual Costs	Cumulative Costs	Discounted Annual Costs	Discounted Cumulative Costs	Operating Income	Equity	Annual Benefit	Cumulative Benefit	Discounted Annual Benefit
1	$191,517	$204,024	1%	$210,764	$606,306	$606,306	$551,187	$551,187	$513,938	$84,282	$598,220	$598,220	$543,836
2	$191,517	$206,044	2%	$210,764	$608,326	$1,214,631	$502,749	$1,003,828	$524,216	$172,612	$696,829	$1,295,048	$575,891
3	$191,517	$208,064	3%	$210,764	$610,346	$1,824,977	$458,562	$1,371,132	$534,701	$257,302	$792,003	$2,087,051	$595,044
4	$191,517	$210,084	4%	$210,764	$612,366	$2,437,343	$418,254	$1,664,738	$545,395	$362,201	$907,596	$2,994,647	$619,900
5	$191,517	$222,205	10%	$210,764	$624,486	$3,061,829	$387,757	$1,901,155	$556,303	$463,878	$1,020,181	$4,014,828	$633,452
6	$191,517	$212,105	5%	$210,764	$614,386	$3,676,215	$346,805	$2,075,128	$567,429	$570,438	$1,137,867	$5,152,695	$642,296
7	$191,517	$214,125	6%	$210,764	$616,406	$4,292,621	$316,314	$2,202,793	$578,777	$682,116	$1,260,893	$6,413,589	$647,038
8	$191,517	$216,145	7%	$210,764	$618,426	$4,911,047	$288,500	$2,291,040	$590,353	$799,157	$1,389,510	$7,803,099	$648,217
9	$191,517	$218,165	8%	$210,764	$620,446	$5,531,493	$263,130	$2,345,893	$602,160	$921,819	$1,523,979	$9,327,078	$646,316
10	$191,517	$232,305	15%	$210,764	$634,586	$6,166,079	$244,660	$2,377,291	$614,203	$1,050,372	$1,664,575	$10,991,653	$641,766
11	$191,517	$220,185	9%	$210,764	$622,466	$6,788,545	$218,171	$2,379,344	$626,487	$1,185,099	$1,811,586	$12,803,239	$634,950
12	$191,517	$222,205	10%	$210,764	$624,486	$7,413,032	$198,981	$2,362,020	$639,017	$1,326,296	$1,965,313	$14,768,552	$626,209
13	$191,517	$224,225	11%	$210,764	$626,506	$8,039,538	$181,477	$2,328,768	$651,797	$1,474,274	$2,126,071	$16,894,624	$615,847
14	$191,517	$226,245	12%	$210,764	$628,526	$8,668,064	$165,511	$2,282,572	$664,833	$1,629,359	$2,294,192	$19,188,816	$604,133
15	$191,517	$228,265	13%	$210,764	$630,546	$9,298,610	$150,948	$2,226,013	$678,130	$1,791,892	$2,470,022	$21,658,838	$591,304
16	$191,517	$230,285	14%	$210,764	$632,566	$9,931,176	$137,665	$2,161,313	$691,692	$1,962,231	$2,653,924	$24,312,762	$577,571
17	$191,517	$232,305	15%	$210,764	$634,586	$10,565,763	$125,550	$2,090,380	$705,526	$2,140,751	$2,846,277	$27,159,039	$563,121
18	$191,517	$234,325	16%	$210,764	$636,606	$11,202,369	$114,499	$2,014,845	$719,637	$2,327,844	$3,047,481	$30,206,520	$548,116
19	$191,517	$236,345	17%	$210,764	$638,626	$11,840,996	$104,421	$1,936,097	$734,030	$2,523,922	$3,257,952	$33,464,472	$532,701
20	$191,517	$242,405	20%	$210,764	$644,687	$12,485,682	$95,829	$1,855,917	$748,710	$2,729,417	$3,478,127	$36,942,599	$517,001
21	$191,517	$238,365	18%	$0	$429,882	$12,915,564	$58,090	$1,745,288	$763,684	$2,729,417	$3,493,102	$40,435,701	$472,025
22	$191,517	$240,385	19%	$0	$431,902	$13,347,466	$53,057	$1,639,682	$778,958	$2,729,417	$3,508,375	$43,944,076	$430,990
23	$191,517	$242,405	20%	$0	$433,922	$13,781,389	$48,460	$1,539,080	$794,537	$2,729,417	$3,523,954	$47,468,031	$393,549
24	$191,517	$244,425	21%	$0	$435,942	$14,217,331	$44,259	$1,443,423	$810,428	$2,729,417	$3,539,845	$51,007,876	$359,385
25	$191,517	$246,445	22%	$0	$437,962	$14,655,293	$40,422	$1,352,625	$826,637	$2,729,417	$3,556,054	$54,563,929	$328,210
26	$191,517	$248,465	23%	$0	$439,982	$15,095,275	$36,917	$1,266,576	$843,169	$2,729,417	$3,572,586	$58,136,516	$299,759
27	$191,517	$250,485	24%	$0	$442,002	$15,537,278	$33,715	$1,185,148	$860,033	$2,729,417	$3,589,450	$61,725,966	$273,795
28	$191,517	$252,505	25%	$0	$444,022	$15,981,300	$30,790	$1,108,197	$877,233	$2,729,417	$3,606,650	$65,332,616	$250,097
29	$191,517	$254,525	26%	$0	$446,042	$16,427,343	$28,118	$1,035,570	$894,778	$2,729,417	$3,624,195	$68,956,811	$228,467
30	$191,517	$262,606	30%	$0	$454,123	$16,881,465	$26,025	$967,452	$912,673	$2,729,417	$3,642,091	$72,598,902	$208,723
					Undiscounted $16,881,465		Discounted $5,670,820				Undiscounted $72,598,902		Discounted $15,249,709

Table 6 (Continued)

	Net Benefit				
Discounted Cumulative Benefit	Net Annual Benefit	Net Cumulative Benefit	Discounted Net Annual Benefit	Discounted Net Cumulative Benefit	Discount
$543,836	-$8,086	-$8,086	-$7,351	-$7,351	1.100
$1,070,288	$88,503	$80,417	$73,143	$66,460	1.210
$1,568,033	$181,657	$262,074	$136,482	$196,900	1.331
$2,045,384	$295,230	$557,304	$201,646	$380,646	1.464
$2,492,892	$395,695	$952,999	$245,695	$591,737	1.611
$2,908,562	$523,481	$1,476,480	$295,491	$833,434	1.772
$3,291,185	$644,488	$2,120,968	$330,724	$1,088,392	1.949
$3,640,203	$771,084	$2,892,052	$359,716	$1,349,163	2.144
$3,955,591	$903,533	$3,795,585	$383,186	$1,609,698	2.358
$4,237,758	$1,029,989	$4,825,574	$397,105	$1,860,468	2.594
$4,487,457	$1,189,120	$6,014,694	$416,779	$2,108,114	2.853
$4,705,716	$1,340,827	$7,355,521	$427,229	$2,343,696	3.138
$4,893,771	$1,499,565	$8,855,086	$434,371	$2,565,003	3.452
$5,053,015	$1,665,666	$10,520,752	$438,622	$2,770,443	3.797
$5,184,954	$1,839,476	$12,360,228	$440,356	$2,958,940	4.177
$5,291,165	$2,021,357	$14,381,585	$439,906	$3,129,852	4.595
$5,373,271	$2,211,691	$16,593,277	$437,571	$3,282,891	5.054
$5,432,908	$2,410,875	$19,004,151	$433,617	$3,418,064	5.560
$5,471,709	$2,619,325	$21,623,477	$428,281	$3,535,611	6.116
$5,491,282	$2,833,441	$24,456,917	$421,173	$3,635,365	6.727
$5,464,099	$3,063,219	$27,520,137	$413,935	$3,718,812	7.400
$5,398,353	$3,076,473	$30,596,610	$377,932	$3,758,670	8.140
$5,301,142	$3,090,032	$33,686,642	$345,089	$3,762,062	8.954
$5,178,605	$3,103,903	$36,790,545	$315,126	$3,735,182	9.850
$5,036,032	$3,118,091	$39,908,636	$287,787	$3,683,407	10.835
$4,877,971	$3,132,604	$43,041,240	$262,843	$3,611,395	11.918
$4,708,314	$3,147,447	$46,188,688	$240,080	$3,523,166	13.110
$4,530,382	$3,162,628	$49,351,316	$219,307	$3,422,186	14.421
$4,346,997	$3,178,153	$52,529,468	$200,349	$3,311,427	15.863
$4,160,538	$3,187,968	$55,717,436	$182,698	$3,193,086	17.449

Total Project Benefit $55,717,436
Total Project Cost $9,578,889

72

Table 7: Cost Benefit Analysis - 371 Waterloo Ave
New on Same Site Scenario

Rent Increase Rate: <mark>2.00%</mark> Discount Rate: <mark>10.00%</mark>

Year	Cost									Operating Income	Equity	Benefit		
	Interest on Capital	Operating Expense	Expense Increase	Loan Payment	Annual Costs	Cumulative Costs	Discounted Annual Costs	Discounted Cumulative Costs				Annual Benefit	Cumulative Benefit	Discounted Annual Benefit
1	$515,570	$391,095	1%	$364,040	$1,270,706	$1,270,706	$1,155,187	$1,155,187	$890,087	$145,575	$1,035,662	$1,035,662	$941,511
2	$515,570	$394,967	2%	$364,040	$1,274,578	$2,545,283	$1,053,370	$2,103,540	$907,889	$298,142	$1,206,031	$2,241,693	$996,720
3	$515,570	$398,840	3%	$364,040	$1,278,450	$3,823,733	$960,518	$2,872,827	$926,047	$458,035	$1,384,081	$3,625,774	$1,039,881
4	$515,570	$402,712	4%	$364,040	$1,282,322	$5,106,056	$875,843	$3,487,505	$944,568	$625,607	$1,570,174	$5,195,948	$1,072,450
5	$515,570	$425,945	10%	$364,040	$1,305,556	$6,411,611	$810,647	$3,981,106	$963,459	$801,227	$1,764,686	$6,960,634	$1,095,731
6	$515,570	$406,584	5%	$364,040	$1,286,194	$7,697,806	$726,023	$4,345,211	$982,728	$985,282	$1,968,010	$8,928,644	$1,110,890
7	$515,570	$410,456	6%	$364,040	$1,290,067	$8,987,872	$662,008	$4,612,200	$1,002,383	$1,178,176	$2,180,558	$11,109,202	$1,118,971
8	$515,570	$414,329	7%	$364,040	$1,293,939	$10,281,811	$603,632	$4,796,541	$1,022,430	$1,380,333	$2,402,763	$13,511,966	$1,120,907
9	$515,570	$418,201	8%	$364,040	$1,297,811	$11,579,622	$550,399	$4,910,890	$1,042,879	$1,592,200	$2,635,079	$16,147,044	$1,117,531
10	$515,570	$445,306	15%	$364,040	$1,324,917	$12,904,539	$510,813	$4,975,258	$1,063,737	$1,814,241	$2,877,977	$19,025,022	$1,109,585
11	$515,570	$422,073	9%	$364,040	$1,301,683	$14,206,223	$456,232	$4,979,194	$1,085,011	$2,046,947	$3,131,958	$22,156,980	$1,097,732
12	$515,570	$425,945	10%	$364,040	$1,305,556	$15,511,778	$415,990	$4,942,531	$1,106,711	$2,290,828	$3,397,539	$25,554,519	$1,082,561
13	$515,570	$429,817	11%	$364,040	$1,309,428	$16,821,206	$379,295	$4,872,504	$1,128,846	$2,546,421	$3,675,266	$29,229,785	$1,064,594
14	$515,570	$433,690	12%	$364,040	$1,313,300	$18,134,506	$345,833	$4,775,382	$1,151,423	$2,814,290	$3,965,712	$33,195,498	$1,044,296
15	$515,570	$437,562	13%	$364,040	$1,317,172	$19,451,678	$315,321	$4,656,577	$1,174,451	$3,095,023	$4,269,474	$37,464,972	$1,022,078
16	$515,570	$441,434	14%	$364,040	$1,321,045	$20,772,723	$287,498	$4,520,750	$1,197,940	$3,389,239	$4,587,179	$42,052,150	$998,304
17	$515,570	$445,306	15%	$364,040	$1,324,917	$22,097,640	$262,128	$4,371,900	$1,221,899	$3,697,585	$4,919,484	$46,971,634	$973,294
18	$515,570	$449,179	16%	$364,040	$1,328,789	$23,426,429	$238,994	$4,213,449	$1,246,337	$4,020,739	$5,267,076	$52,238,710	$947,330
19	$515,570	$453,051	17%	$364,040	$1,332,661	$24,759,090	$217,901	$4,048,309	$1,271,264	$4,359,413	$5,630,676	$57,869,386	$920,661
20	$515,570	$464,668	20%	$364,040	$1,344,278	$26,103,368	$199,818	$3,880,099	$1,296,689	$4,714,352	$6,011,041	$63,880,427	$893,503
21	$515,570	$456,923	18%	$0	$972,493	$27,075,861	$131,414	$3,658,777	$1,322,623	$4,714,352	$6,036,974	$69,917,401	$815,780
22	$515,570	$460,795	19%	$0	$976,366	$28,052,227	$119,943	$3,446,103	$1,349,075	$4,714,352	$6,063,427	$75,980,828	$744,868
23	$515,570	$464,668	20%	$0	$980,238	$29,032,465	$109,471	$3,242,292	$1,376,057	$4,714,352	$6,090,408	$82,071,236	$680,166
24	$515,570	$468,540	21%	$0	$984,110	$30,016,575	$99,912	$3,047,451	$1,403,578	$4,714,352	$6,117,930	$88,189,166	$621,126
25	$515,570	$472,412	22%	$0	$987,982	$31,004,557	$91,187	$2,861,597	$1,431,649	$4,714,352	$6,146,001	$94,335,167	$567,251
26	$515,570	$476,284	23%	$0	$991,855	$31,996,412	$83,222	$2,684,673	$1,460,282	$4,714,352	$6,174,634	$100,509,801	$518,085
27	$515,570	$480,156	24%	$0	$995,727	$32,992,139	$75,952	$2,516,564	$1,489,488	$4,714,352	$6,203,840	$106,713,641	$473,215
28	$515,570	$484,029	25%	$0	$999,599	$33,991,738	$69,316	$2,357,101	$1,519,278	$4,714,352	$6,233,629	$112,947,270	$432,261
29	$515,570	$487,901	26%	$0	$1,003,471	$34,995,209	$63,258	$2,206,077	$1,549,663	$4,714,352	$6,264,015	$119,211,285	$394,880
30	$515,570	$503,390	30%	$0	$1,018,960	$36,014,169	$58,395	$2,063,920	$1,580,657	$4,714,352	$6,295,008	$125,506,294	$360,758
					Undiscounted $36,014,169		Discounted $11,929,520				Undiscounted $125,506,294		Discounted $26,376,917

73

Table 7 (Continued)

Discounted Cumulative Benefit	Net Annual Benefit	Net Cumulative Benefit	Discounted Net Annual Benefit	Discounted Net Cumulative Benefit	Discount
$941,511	-$235,044	-$235,044	-$213,676	-$213,676	1.100
$1,852,638	-$68,547	-$303,591	-$56,651	-$250,901	1.210
$2,724,098	$105,631	-$197,959	$79,362	-$148,730	1.331
$3,548,903	$287,852	$89,893	$196,607	$61,398	1.464
$4,322,006	$459,130	$549,023	$285,084	$340,900	1.611
$5,039,987	$681,815	$1,230,838	$384,867	$694,776	1.772
$5,700,777	$890,492	$2,121,330	$456,963	$1,088,578	1.949
$6,303,432	$1,108,824	$3,230,154	$517,275	$1,506,891	2.144
$6,847,923	$1,337,268	$4,567,422	$567,132	$1,937,033	2.358
$7,334,969	$1,553,061	$6,120,482	$598,772	$2,359,711	2.594
$7,765,886	$1,830,275	$7,950,757	$641,500	$2,786,692	2.853
$8,142,457	$2,091,984	$10,042,741	$666,570	$3,199,927	3.138
$8,466,828	$2,365,839	$12,408,579	$685,299	$3,594,323	3.452
$8,741,412	$2,652,412	$15,060,992	$698,463	$3,966,030	3.797
$8,968,816	$2,952,302	$18,013,293	$706,758	$4,312,239	4.177
$9,151,773	$3,266,134	$21,279,427	$710,806	$4,631,023	4.595
$9,293,087	$3,594,567	$24,873,994	$711,166	$4,921,187	5.054
$9,395,591	$3,938,287	$28,812,281	$708,335	$5,182,142	5.560
$9,462,107	$4,298,015	$33,110,296	$702,760	$5,413,798	6.116
$9,495,418	$4,666,763	$37,777,059	$693,685	$5,615,319	6.727
$9,447,978	$5,064,481	$42,841,540	$684,366	$5,789,202	7.400
$9,333,939	$5,087,061	$47,928,601	$624,925	$5,887,836	8.140
$9,165,564	$5,110,171	$53,038,772	$570,694	$5,923,272	8.954
$8,953,458	$5,133,819	$58,172,591	$521,214	$5,906,007	9.850
$8,706,758	$5,158,019	$63,330,610	$476,064	$5,845,162	10.835
$8,433,320	$5,182,780	$68,513,389	$434,863	$5,748,647	11.918
$8,139,869	$5,208,113	$73,721,502	$397,263	$5,623,305	13.110
$7,832,142	$5,234,030	$78,955,533	$362,945	$5,475,041	14.421
$7,515,009	$5,260,544	$84,216,077	$331,622	$5,308,932	15.863
$7,192,584	$5,276,048	$89,492,125	$302,363	$5,128,664	17.449

Total Project Benefit $89,492,125
Total Project Cost $14,447,397

74

Table 8: Cost Benefit Analysis - 371 Waterloo Ave
New on Greenfield Scenario

Rent Increase Rate: 2.00% Discount Rate: 10.00%

Year	Interest on Capital	Operating Expense	Expense Increase	Loan Payment	Annual Costs	Cumulative Costs	Discounted Annual Costs	Discounted Cumulative Costs	Operating Income	Equity	Annual Benefit	Cumulative Benefit	Discounted Annual Benefit
1	$488,253	$384,599	1%	$368,696	$1,241,548	$1,241,548	$1,128,680	$1,128,680	$890,087	$147,437	$1,037,524	$1,037,524	$943,204
2	$488,253	$388,407	2%	$368,696	$1,245,356	$2,486,905	$1,029,220	$2,055,293	$907,889	$301,955	$1,209,844	$2,247,368	$999,871
3	$488,253	$392,215	3%	$368,696	$1,249,164	$3,736,069	$938,516	$2,806,964	$926,047	$463,893	$1,389,939	$3,637,307	$1,044,282
4	$488,253	$396,023	4%	$368,696	$1,252,972	$4,989,041	$855,797	$3,407,582	$944,568	$633,609	$1,578,176	$5,215,483	$1,077,916
5	$488,253	$418,870	10%	$368,696	$1,275,820	$6,264,861	$792,184	$3,889,986	$963,459	$811,475	$1,774,934	$6,990,417	$1,102,094
6	$488,253	$399,831	5%	$368,696	$1,256,780	$7,521,641	$709,420	$4,245,770	$982,728	$997,884	$1,980,612	$8,971,029	$1,118,004
7	$488,253	$403,639	6%	$368,696	$1,260,588	$8,782,229	$646,881	$4,506,672	$1,002,383	$1,193,245	$2,195,627	$11,166,656	$1,126,704
8	$488,253	$407,447	7%	$368,696	$1,264,396	$10,046,625	$589,850	$4,686,825	$1,022,430	$1,397,988	$2,420,418	$13,587,074	$1,129,143
9	$488,253	$411,254	8%	$368,696	$1,268,204	$11,314,829	$537,842	$4,798,592	$1,042,879	$1,612,565	$2,655,444	$16,242,518	$1,126,167
10	$488,253	$437,910	15%	$368,696	$1,294,859	$12,609,688	$499,224	$4,861,581	$1,063,737	$1,837,446	$2,901,182	$19,143,700	$1,118,531
11	$488,253	$415,062	9%	$368,696	$1,272,012	$13,881,700	$445,832	$4,865,451	$1,085,011	$2,073,128	$3,158,139	$22,301,839	$1,106,908
12	$488,253	$418,870	10%	$368,696	$1,275,820	$15,157,519	$406,515	$4,829,653	$1,106,711	$2,320,128	$3,426,839	$25,728,678	$1,091,897
13	$488,253	$422,678	11%	$368,696	$1,279,628	$16,437,147	$370,663	$4,761,256	$1,128,846	$2,578,991	$3,707,836	$29,436,515	$1,074,028
14	$488,253	$426,486	12%	$368,696	$1,283,435	$17,720,582	$337,969	$4,666,383	$1,151,423	$2,850,286	$4,001,708	$33,438,223	$1,053,775
15	$488,253	$430,294	13%	$368,696	$1,287,243	$19,007,826	$308,156	$4,550,322	$1,174,451	$3,134,610	$4,309,061	$37,747,284	$1,031,555
16	$488,253	$434,102	14%	$368,696	$1,291,051	$20,298,877	$280,970	$4,417,627	$1,197,940	$3,432,589	$4,630,529	$42,377,813	$1,007,738
17	$488,253	$437,910	15%	$368,696	$1,294,859	$21,593,736	$256,181	$4,272,206	$1,221,899	$3,744,878	$4,966,777	$47,344,590	$982,650
18	$488,253	$441,718	16%	$368,696	$1,298,667	$22,892,403	$233,577	$4,117,400	$1,246,337	$4,072,166	$5,318,503	$52,663,092	$956,579
19	$488,253	$445,526	17%	$368,696	$1,302,475	$24,194,878	$212,965	$3,956,056	$1,271,264	$4,415,172	$5,686,435	$58,349,528	$929,778
20	$488,253	$456,949	20%	$368,696	$1,313,899	$25,508,777	$195,303	$3,791,717	$1,296,689	$4,774,650	$6,071,339	$64,420,866	$902,466
21	$488,253	$449,334	18%	$0	$937,587	$26,446,364	$126,697	$3,573,712	$1,322,623	$4,774,650	$6,097,272	$70,518,139	$823,928
22	$488,253	$453,141	19%	$0	$941,395	$27,387,758	$115,647	$3,364,476	$1,349,075	$4,774,650	$6,123,725	$76,641,863	$752,275
23	$488,253	$456,949	20%	$0	$945,203	$28,332,961	$105,558	$3,164,173	$1,376,057	$4,774,650	$6,150,706	$82,792,570	$686,900
24	$488,253	$460,757	21%	$0	$949,010	$29,281,971	$96,349	$2,972,870	$1,403,578	$4,774,650	$6,178,227	$88,970,797	$627,248
25	$488,253	$464,565	22%	$0	$952,818	$30,234,790	$87,941	$2,790,550	$1,431,649	$4,774,650	$6,206,299	$95,177,096	$572,817
26	$488,253	$468,373	23%	$0	$956,626	$31,191,416	$80,266	$2,617,130	$1,460,282	$4,774,650	$6,234,932	$101,412,028	$523,145
27	$488,253	$472,181	24%	$0	$960,434	$32,151,850	$73,260	$2,452,469	$1,489,488	$4,774,650	$6,264,138	$107,676,166	$477,814
28	$488,253	$475,989	25%	$0	$964,242	$33,116,092	$66,864	$2,296,381	$1,519,278	$4,774,650	$6,293,927	$113,970,094	$436,442
29	$488,253	$479,797	26%	$0	$968,050	$34,084,142	$61,025	$2,148,644	$1,549,663	$4,774,650	$6,324,313	$120,294,407	$398,681
30	$488,253	$495,029	30%	$0	$983,282	$35,067,424	$56,350	$2,009,663	$1,580,657	$4,774,650	$6,355,306	$126,649,713	$364,213

Cost: Undiscounted $35,067,424 Discounted $11,645,701

Benefit: Undiscounted $126,649,713 Discounted $26,586,752

Table 8 (Continued)

Discounted Cumulative Benefit	Net Annual Benefit	Net Cumulative Benefit	Discounted Net Annual Benefit	Discounted Cumulative Net Benefit	Discount
$943,204	-$204,025	-$204,025	-$185,477	-$185,477	1.100
$1,857,329	-$35,513	-$239,537	-$29,349	-$197,965	1.210
$2,732,763	$140,775	-$98,762	$105,766	-$74,201	1.331
$3,562,245	$325,204	$226,442	$222,119	$154,663	1.464
$4,340,499	$499,114	$725,556	$309,911	$450,513	1.611
$5,063,912	$723,832	$1,449,388	$408,584	$818,142	1.772
$5,730,260	$935,039	$2,384,427	$479,823	$1,223,588	1.949
$6,338,470	$1,156,022	$3,540,450	$539,293	$1,651,646	2.144
$6,888,413	$1,387,240	$4,927,689	$588,325	$2,089,821	2.358
$7,380,725	$1,606,323	$6,534,012	$619,307	$2,519,145	2.594
$7,816,659	$1,886,127	$8,420,140	$661,076	$2,951,208	2.853
$8,197,950	$2,151,020	$10,571,159	$685,381	$3,368,297	3.138
$8,526,710	$2,428,209	$12,999,368	$703,366	$3,765,454	3.452
$8,805,329	$2,718,273	$15,717,641	$715,806	$4,138,946	3.797
$9,036,400	$3,021,817	$18,739,459	$723,399	$4,486,077	4.177
$9,222,647	$3,339,478	$22,078,936	$726,768	$4,805,020	4.595
$9,366,875	$3,671,917	$25,750,854	$726,469	$5,094,669	5.054
$9,471,920	$4,019,836	$29,770,689	$723,003	$5,354,520	5.560
$9,540,614	$4,383,960	$34,154,649	$716,813	$5,584,558	6.116
$9,575,751	$4,757,440	$38,912,089	$707,163	$5,784,034	6.727
$9,529,156	$5,159,686	$44,071,775	$697,231	$5,955,444	7.400
$9,415,144	$5,182,330	$49,254,105	$636,628	$6,050,669	8.140
$9,246,122	$5,205,504	$54,459,609	$581,341	$6,081,949	8.954
$9,032,813	$5,229,217	$59,688,826	$530,899	$6,059,944	9.850
$8,784,465	$5,253,481	$64,942,307	$484,875	$5,993,915	10.835
$8,509,022	$5,278,306	$70,220,613	$442,879	$5,891,892	11.918
$8,213,289	$5,303,704	$75,524,316	$404,554	$5,760,820	13.110
$7,903,068	$5,329,685	$80,854,002	$369,578	$5,606,687	14.421
$7,583,288	$5,356,263	$86,210,264	$337,656	$5,434,644	15.863
$7,258,112	$5,372,025	$91,582,289	$307,863	$5,248,448	17.449

Total Project Benefit $91,582,289
Total Project Cost $14,941,051

Table 9: Cost Benefit Analysis - 371 Waterloo Ave
Adaptive Reuse with Government Incentives

Rent Increase Rate: 2.00% Discount Rate: 10.00%

Year		Cost								Benefit			
	Interest on Capital	Operating Expense	Expense Increase	Loan Payment	Annual Costs	Cumulative Costs	Discounted Annual Costs	Discounted Cumulative Costs	Operating Income	Equity	Annual Benefit	Cumulative Benefit	Discounted Annual Benefit
1	$91,517	$204,024	1%	$210,764	$506,306	$506,306	$460,278	$460,278	$513,938	$84,282	$598,220	$598,220	$543,836
2	$91,517	$206,044	2%	$210,764	$508,326	$1,014,631	$420,104	$838,538	$524,216	$172,612	$696,829	$1,295,048	$575,891
3	$91,517	$208,064	3%	$210,764	$510,346	$1,524,977	$383,430	$1,145,738	$534,701	$257,302	$792,003	$2,087,051	$595,044
4	$91,517	$210,084	4%	$210,764	$512,366	$2,037,343	$349,953	$1,391,533	$545,395	$362,201	$907,596	$2,994,647	$619,900
5	$91,517	$212,105	5%	$210,764	$514,386	$2,551,729	$319,393	$1,584,423	$556,303	$463,878	$1,020,181	$4,014,828	$633,452
6	$91,517	$214,125	6%	$210,764	$516,406	$3,068,135	$291,498	$1,731,882	$567,429	$570,438	$1,137,867	$5,152,695	$642,296
7	$91,517	$216,145	7%	$210,764	$518,426	$3,586,561	$266,034	$1,840,473	$578,777	$682,116	$1,260,893	$6,413,589	$647,038
8	$91,517	$218,165	8%	$210,764	$520,446	$4,107,007	$242,792	$1,915,949	$590,353	$799,157	$1,389,510	$7,803,099	$648,217
9	$91,517	$220,185	9%	$210,764	$522,466	$4,629,473	$221,577	$1,963,348	$602,160	$921,819	$1,523,979	$9,327,078	$646,316
10	$91,517	$222,205	10%	$210,764	$524,486	$5,153,959	$202,212	$1,987,074	$614,203	$1,050,372	$1,664,575	$10,991,653	$641,766
11	$91,517	$224,225	11%	$210,764	$526,506	$5,680,465	$184,537	$1,990,968	$626,487	$1,185,099	$1,811,586	$12,803,239	$634,950
12	$91,517	$226,245	12%	$210,764	$528,526	$6,208,991	$168,405	$1,978,376	$639,017	$1,326,296	$1,965,313	$14,768,552	$626,209
13	$91,517	$228,265	13%	$210,764	$530,546	$6,739,538	$153,680	$1,952,204	$651,797	$1,474,274	$2,126,071	$16,894,624	$615,847
14	$91,517	$230,285	14%	$210,764	$532,566	$7,272,104	$140,241	$1,914,972	$664,833	$1,629,359	$2,294,192	$19,188,816	$604,133
15	$91,517	$232,305	15%	$210,764	$534,586	$7,806,690	$127,976	$1,868,860	$678,130	$1,791,892	$2,470,022	$21,658,838	$591,304
16	$91,517	$234,325	16%	$210,764	$536,606	$8,343,297	$116,781	$1,815,744	$691,692	$1,962,231	$2,653,924	$24,312,762	$577,571
17	$91,517	$236,345	17%	$210,764	$538,626	$8,881,923	$106,564	$1,757,241	$705,526	$2,140,751	$2,846,277	$27,159,039	$563,121
18	$91,517	$238,365	18%	$210,764	$540,646	$9,422,570	$97,240	$1,694,732	$719,637	$2,327,844	$3,047,481	$30,206,520	$548,116
19	$91,517	$240,385	19%	$210,764	$542,666	$9,965,236	$88,730	$1,629,396	$734,030	$2,523,922	$3,257,952	$33,464,472	$532,701
20	$91,517	$242,405	20%	$210,764	$544,687	$10,509,923	$80,964	$1,562,233	$748,710	$2,729,417	$3,478,127	$36,942,599	$517,001
21	$91,517	$244,425	21%	$0	$335,942	$10,845,865	$45,396	$1,465,608	$763,684	$2,729,417	$3,493,102	$40,435,701	$472,025
22	$91,517	$246,445	22%	$0	$337,962	$11,183,827	$41,517	$1,373,888	$778,958	$2,729,417	$3,508,375	$43,944,076	$430,990
23	$91,517	$248,465	23%	$0	$339,982	$11,523,809	$37,969	$1,286,958	$794,537	$2,729,417	$3,523,954	$47,468,031	$393,549
24	$91,517	$250,485	24%	$0	$342,002	$11,865,812	$34,722	$1,204,684	$810,428	$2,729,417	$3,539,845	$51,007,876	$359,385
25	$91,517	$252,505	25%	$0	$344,022	$12,209,834	$31,752	$1,126,919	$826,637	$2,729,417	$3,556,054	$54,563,929	$328,210
26	$91,517	$254,525	26%	$0	$346,042	$12,555,877	$29,035	$1,053,507	$843,169	$2,729,417	$3,572,586	$58,136,516	$299,759
27	$91,517	$256,545	27%	$0	$348,063	$12,903,939	$26,549	$984,283	$860,033	$2,729,417	$3,589,450	$61,725,966	$273,795
28	$91,517	$258,565	28%	$0	$350,083	$13,254,022	$24,276	$919,078	$877,233	$2,729,417	$3,606,650	$65,332,616	$250,097
29	$91,517	$260,586	29%	$0	$352,103	$13,606,124	$22,196	$857,722	$894,778	$2,729,417	$3,624,195	$68,956,811	$228,467
30	$91,517	$262,606	30%	$0	$354,123	$13,960,247	$20,294	$800,042	$912,673	$2,729,417	$3,642,091	$72,598,902	$208,723
					Undiscounted $13,960,247		Discounted $4,736,097				Undiscounted $72,598,902		Discounted $15,249,709

Table 9 (Continued)

		Net Benefit			
Discounted Cumulative Benefit	Net Annual Benefit	Net Cumulative Benefit	Discounted Net Annual Benefit	Discounted Net Cumulative Benefit	Discount
$543,836	$91,914	$91,914	$83,558	$83,558	1.100
$1,070,288	$188,503	$280,417	$155,787	$231,750	1.210
$1,568,033	$281,657	$562,074	$211,613	$422,295	1.331
$2,045,384	$395,230	$957,304	$269,947	$653,852	1.464
$2,492,892	$505,795	$1,463,099	$314,059	$908,469	1.611
$2,908,562	$621,461	$2,084,560	$350,799	$1,176,680	1.772
$3,291,185	$742,468	$2,827,028	$381,003	$1,450,712	1.949
$3,640,203	$869,064	$3,696,092	$405,425	$1,724,254	2.144
$3,955,591	$1,001,513	$4,697,605	$424,739	$1,992,243	2.358
$4,237,758	$1,140,089	$5,837,694	$439,554	$2,250,684	2.594
$4,487,457	$1,285,080	$7,122,774	$450,413	$2,496,489	2.853
$4,705,716	$1,436,787	$8,559,561	$457,805	$2,727,340	3.138
$4,893,771	$1,595,525	$10,155,086	$462,167	$2,941,567	3.452
$5,053,015	$1,761,626	$11,916,712	$463,891	$3,138,043	3.797
$5,184,954	$1,935,436	$13,852,148	$463,328	$3,316,094	4.177
$5,291,165	$2,117,317	$15,969,465	$460,790	$3,475,421	4.595
$5,373,271	$2,307,651	$18,277,116	$456,556	$3,616,030	5.054
$5,432,908	$2,506,835	$20,783,951	$450,876	$3,738,176	5.560
$5,471,709	$2,715,285	$23,499,236	$443,971	$3,842,313	6.116
$5,491,282	$2,933,441	$26,432,677	$436,037	$3,929,049	6.727
$5,464,099	$3,157,159	$29,589,836	$426,629	$3,998,491	7.400
$5,398,353	$3,170,413	$32,760,249	$389,472	$4,024,465	8.140
$5,301,142	$3,183,972	$35,944,221	$355,580	$4,014,184	8.954
$5,178,605	$3,197,843	$39,142,064	$324,663	$3,973,921	9.850
$5,036,032	$3,212,031	$42,354,095	$296,458	$3,909,113	10.835
$4,877,971	$3,226,544	$45,580,639	$270,725	$3,824,464	11.918
$4,708,314	$3,241,387	$48,822,026	$247,246	$3,724,031	13.110
$4,530,382	$3,256,568	$52,078,594	$225,821	$3,611,304	14.421
$4,346,997	$3,272,093	$55,350,687	$206,271	$3,489,275	15.863
$4,160,538	$3,287,968	$58,638,655	$188,429	$3,360,496	17.449

Total Project Benefit $58,638,655
Total Project Cost $10,513,612

78

Figure 5
371 Waterloo Ave
Annual Cost & Benefit
30 Year Plot
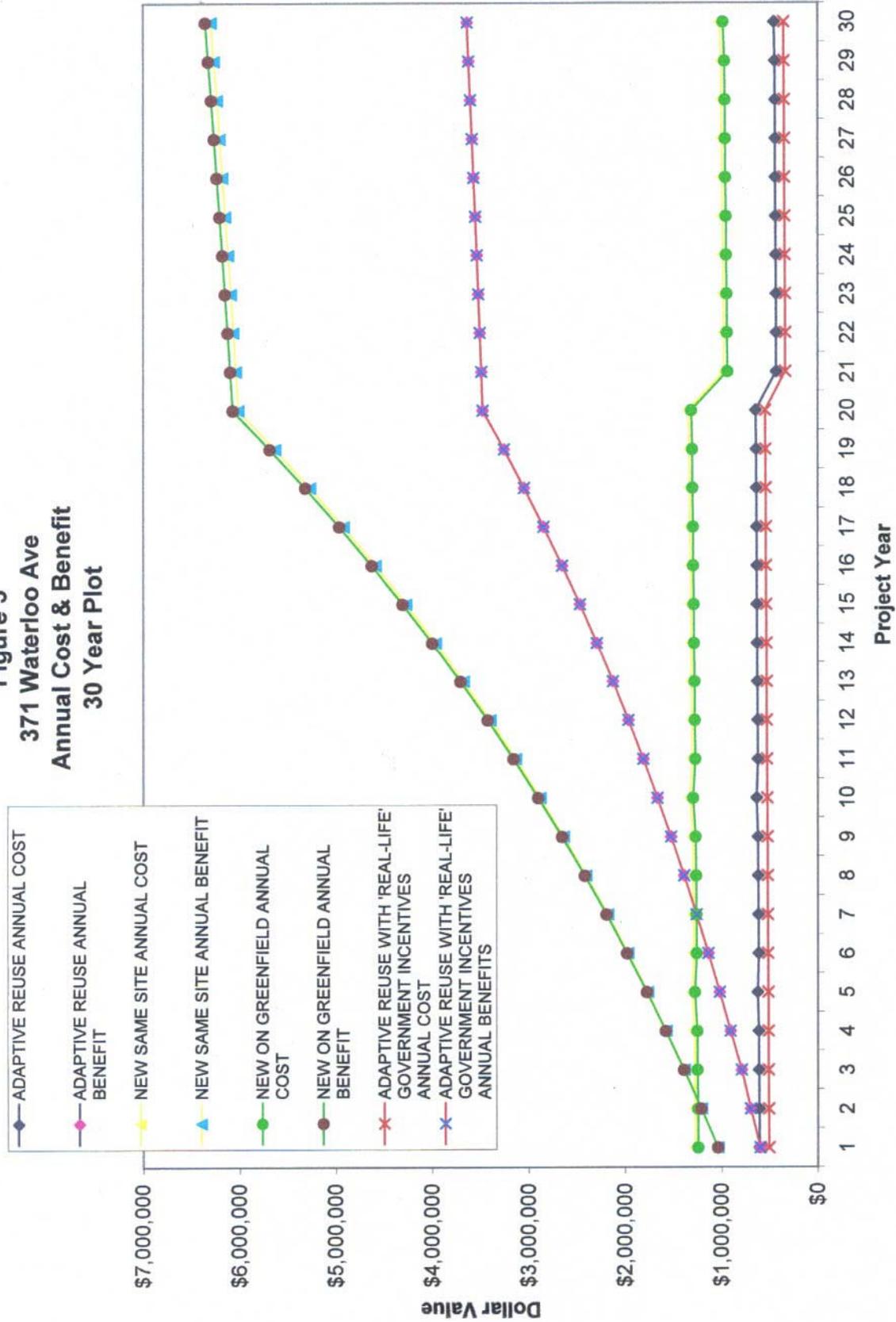
7.2 Case Study 2 (Lawyer's Hall 76 Colborne Street, Brantford, Ontario)

This building was constructed in 1869 by B.G. Tisdale, a prominent stove manufacturer in Brantford. Called Tisdale's Masonic Hall, and the Lawyer's Hall, the building functioned as a Masonic meeting place until 1896. Afterwards the building was occupied by Charles Duncan's furniture company.

It is a three storey brick classic revival building originally built to accommodate commercial uses at grade level and meeting halls above. The high ground floor storefront and entry have been totally altered. The upper floors are largely intact and exhibit find decorative brickwork and balanced composition. The building is designated as a heritage property under part IV of the Ontario Heritage Act.[13]

Figure 6: Lawyer's Hall – The Original Building

---

[13] Information and photo obtained from Brantford Heritage Inventory, www.city.brantford.on.ca/heritage/index.htm

7.2.1 The 'Real Life' Adaptive Reuse Scenario

The project was carried out by Shawky Faehl, a well known adaptive reuse developer. The project

has provided Wilfred Laurier University in Brantford with a 28 bed student housing unit.

The City of Brantford granted Shawky Fahel $717,000 as a direct grant and waived the

development charges for the project. The following are the actual construction drawings obtained

from the developer for the adaptive reuse project.

Figure 7: Lawyer's Hall – Adaptive Reuse[14]

---

[14] Photo obtained from Brantford Heritage Inventory.

www.city.brantford.on.ca/heritage/index.htm

FRONT ELEVATION

MASONIC HALL 1869

HALL

LAWYERS

QUEEN STREET

DELHUOSIE STREET

BACK LANE

LAWYERS HALL BUILDING

COLBORN STREET

N
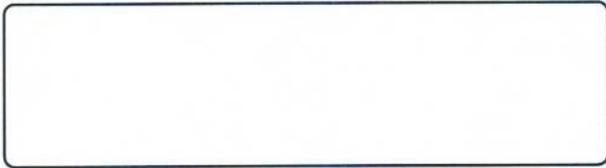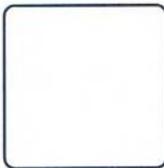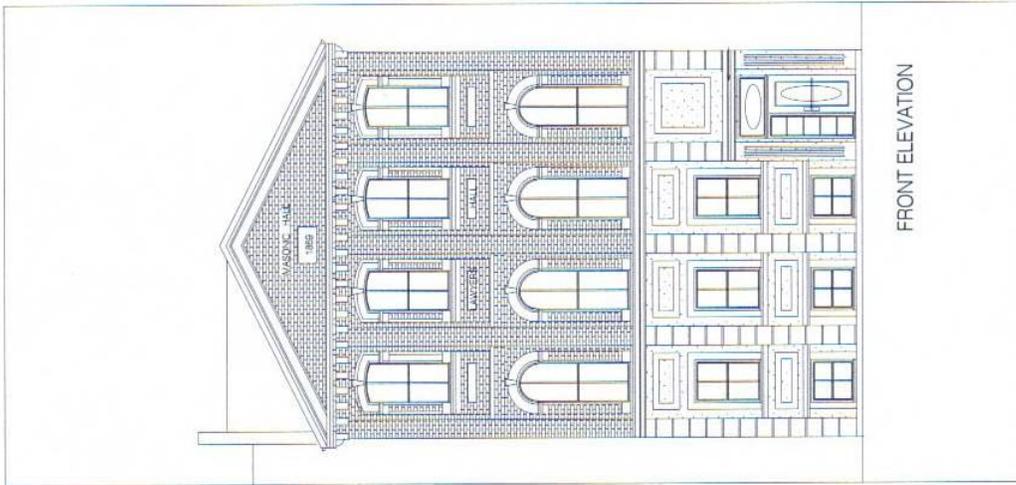
1 SITE PLAN AND FRONT ELEVATION

BASEMENT FLOOR PLAN
3 BEDROOMS
AREA 3,960 sf

1 BASEMENT FLOOR PLAN ADAPTIVE REUSE SCENARIO

1ST FLOOR PLAN
6 BEDROOMS
AREA 3,720 sf

2 1ST FLOOR PLAN ADAPTIVE REUSE SCENARIO

PROJECT
LAWYER'S HALL BLDG
76 COLBORN STREET
BRANTFORD, ONTARIO

BASEMENT AND 1ST
FLOOR PLANS
EXISTING BUILDING
ADAPTIVE REUSE SCENARIO

DRAWING 7

2ND FLOOR PLAN ADAPTIVE REUSE SCENARIO
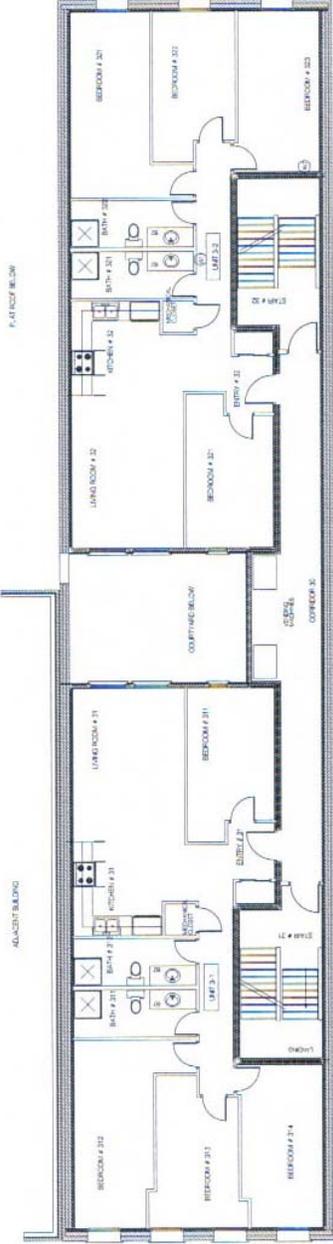
2ND FLOOR PLAN
6 BEDROOMS
AREA - 3,720 sf

(1)

3RD FLOOR PLAN ADAPTIVE REUSE SCENARIO

3RD FLOOR PLAN
6 BEDROOMS
AREA - 3,705 sf

(2)
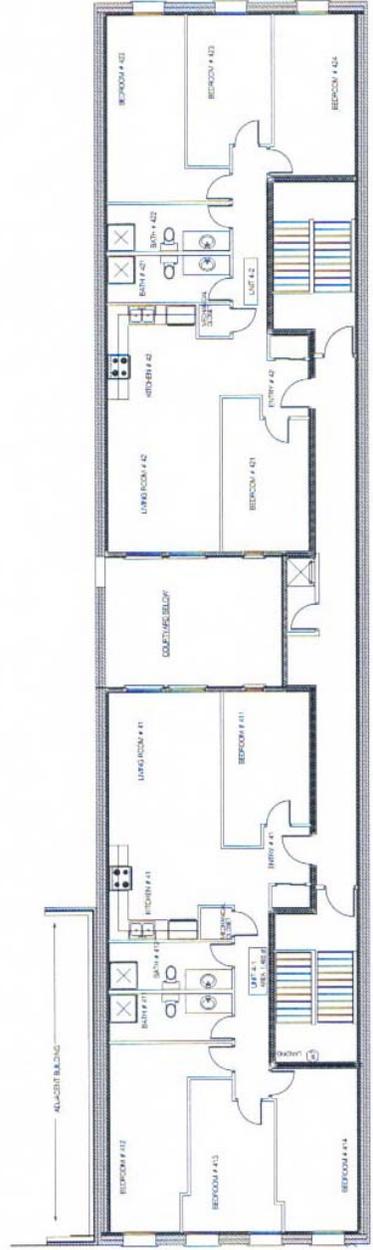
7.2.2 The alternative Hypothetical Scenario of New Construction

After analyzing the sites opportunities and constraints, a new construction scenario based on the municipal zoning by-laws and building code requirements was developed. The site is located in the downtown area of Brantford where uses are exempt from providing parking spaces and for that reason it has not been considered in our hypothetical design the requirement for parking spaces. The design consists of a 3 storey 15,135 sqf residential building. The followings are drawings for the hypothetical option of new construction.
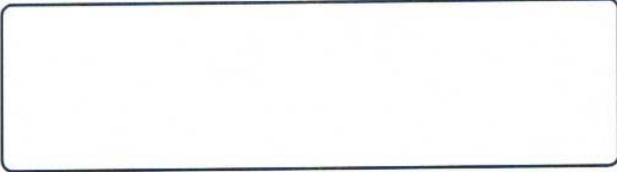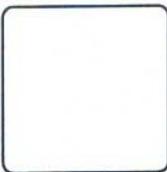
BASEMENT FLOOR PLAN
AREA 3,720 sf

① BASEMENT FLOOR PLAN NEW BUILDING SCENARIO

OFFICE SPACE 4
(103m2) 1107 SQF

OFFICE SPACE 3
(103m2) 1107 SQF

1ST FLOOR PLAN
AREA 3,720 sf

② 1ST FLOOR PLAN NEW BUILDING SCENARIO

PROJECT:
LAWYER'S HALL BLDG
76 COLBORN STREET
BRANTFORD, ONTARIO

BASEMENT AND 1ST
FLOOR PLANS
NEW BUILDING SCENARIO

DRAWING 9

OFFICE SPACE 1
(117m2) 1260 SQF

OFFICE SPACE 1
(117m2) 1260 SQF

COURTYARD

2ND FLOOR PLAN
AREA 3,720 sf

1 2ND FLOOR PLAN NEW BUILDING SCENARIO

OFFICE SPACE 1
(117m2) 1260 SQF

OFFICE SPACE 1
(117m2) 1260 SQF

COURTYARD
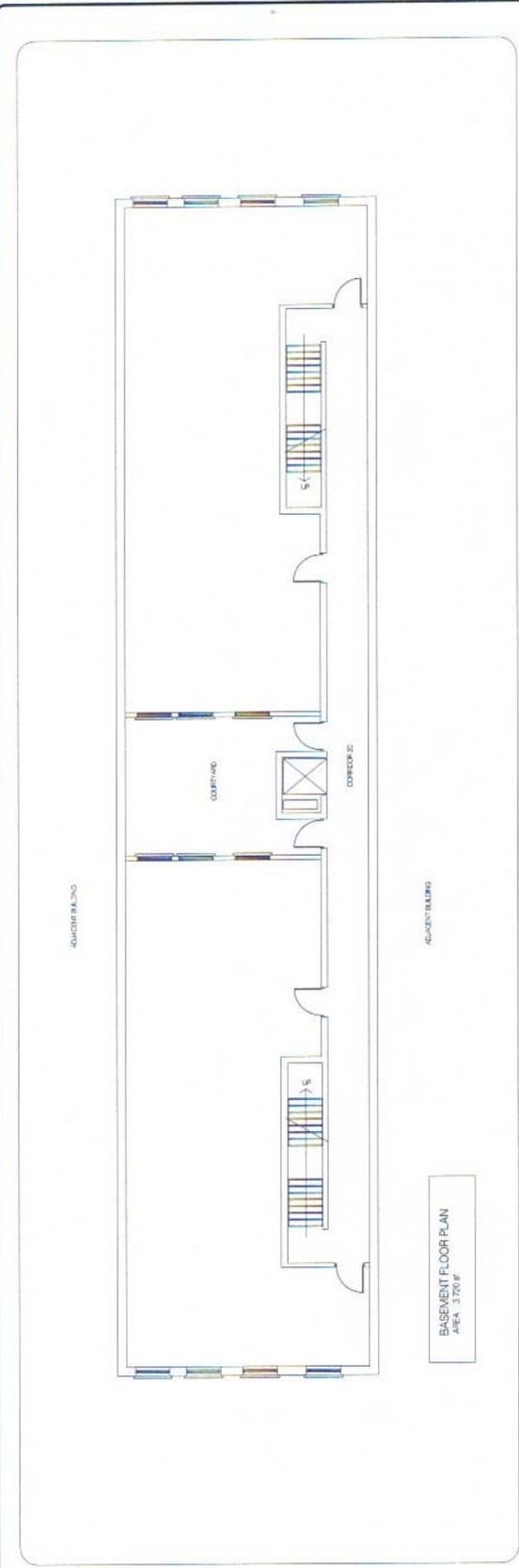
3RD FLOOR PLAN
AREA 3,720 sf
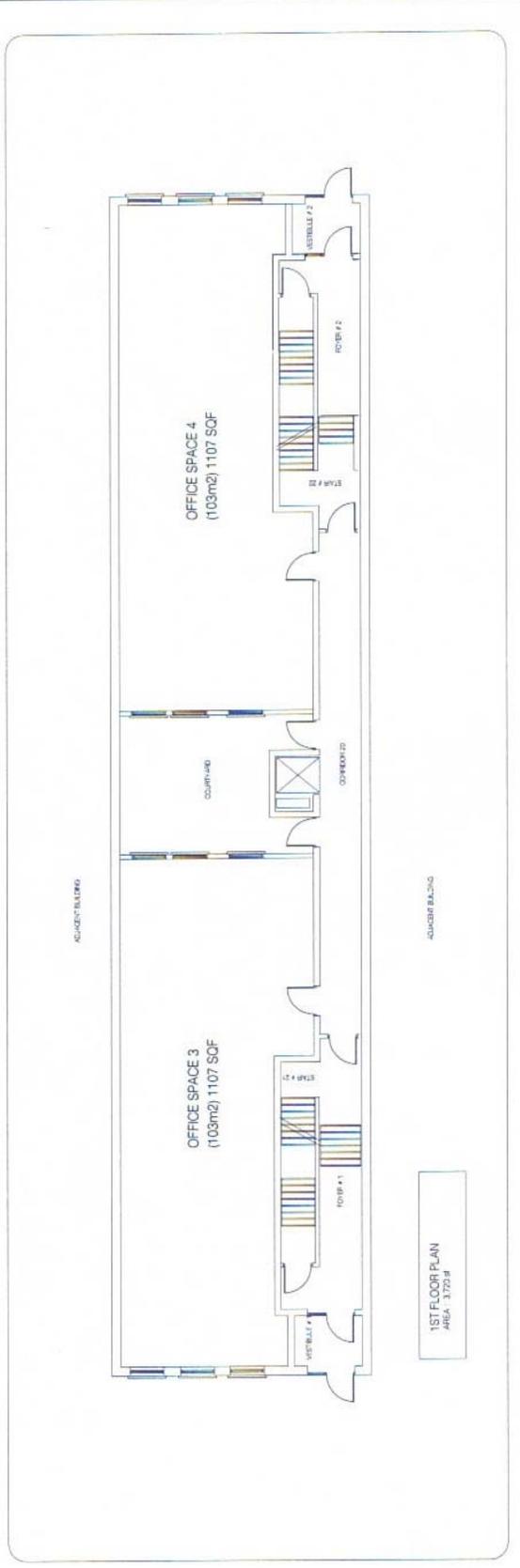
2 3RD FLOOR PLAN NEW BUILDING SCENARIO

Lawyer's Hall Building

76 Colborn Street, Brantford, Ontario

Table 10 (Construction Cost)

	Factor		Rehabilitation	New Same Site	New on Greenfiled	Notes
1	Lot Size		3960 sqf	3960 sqf	9000 sqf	
	Building Groos Floor Area	Reuse	15,135 sqf	0	15,135	
		New	0 sqf	15,135	0	
2		Total	15,135 sqf	15,135	15,135	
3	Number of rentable units		28 unit	8	8	
4	Number of parking required		0 space	0	0	
5	Number of parking provided		0	0	0	
6	Hard Costs					
7	Demolition		$0	$153,620	$0	$0.3/CF (Reed Construction Data, 2005)
8	Building Construction Hard Cost (sq.ft)	Reuse	$1,500,000	$0	$0	$98.18/SQF Average Cost Low Rise Condominium Source: (Reed Construction Data, 2005)
9		New	$0	$1,485,954	$1,486,106	
10	Building Construction Hard Cost (Total)		$1,500,000	$1,639,575	$1,486,106	
11	Environmental cleanup		$16,000	$0	$0	
12	Outdoor Parking / paving		$0	$0	$0	
13	Other Site Work		$0	$0	$30,000	The study assumes additonal site work required for greenfield scenario
14	Total		$1,516,000	$1,639,575	$1,516,106	
15	Soft Costs					
16	Consulting fees		$97,500	$106,572	$98,547	6.5% of construction cost. Source: Adaptive reuse architect
17	Demolition Permit		$0	$25	$0	
18	City of Brantford permits and deposits		$13,500	$14,756	$13,375	Source: City of Brantford
19	Insurances		$35,000	$35,000	$35,000	Source: Developer
20	Total		$146,000	$156,354	$146,922	
21	Development Charges:					
22	Development Charges		$0.00	$31,632	$31,632	Development charges waived in the core
23	Total Construction Costs:		$1,662,000	$1,827,560	$1,663,027	14 + 20 + 22

Table 11 (Return on Investment)

#	Item				Notes	Formula
24	**Capital Costs:**					
25	Acquesition Cost	$500,000	$500,000	$500,000	The study assumes the greenfield site's acquisition cost is the same as the existing site, and the acquisition cost in the reuse and the new construction on same site include the $500,000 cost of the existing building in both cases.	
26	Construction Cost	$1,662,000	$1,827,560	$1,663,027		26 / 2
27	Unit Price (Dollar per sqf)	$109.8	$120.8	$109.9		
28	Total Capital Cost	$2,162,000	$2,327,560	$2,163,027		25 + 26
29	**Operating Income:**					
30	Vacancy Rate	3.3%	3.3%	3.3%	Based on 2005 statistical data obtain from CMHC website.	
31	Average Rent	$1.3	$1.3	$1.3	Based on 2005 statistics obtain from CMHC website. Data is modified to accommodate $/sqf format	
32	Net to Gross Ratio	70%	70%	70%		
33	Rentable Square Feet	10540 sqf	10619	10619	Obtained from drawings	
34	Rent Total	$13,702.00	$13,804.70	$13,804.70		33 x 31
35	Vacancy (4)	$452.17	$455.56	$455.56		34 x 30
36	Total Annual Operating Income:	$158,998.01	$160,189.74	$160,189.74		(34 - 35) x 12
37	**Operating Expenses:**					
38	Property Tax	$70,237.91	$75,616.54	$70,271.29	Brantford commercial property tax	
39	Operating Expense Ratio	12%	10%	10%		
40	Total Operating Expenses	$89,318	$91,636	$86,290	The Study assumes higher ratio for adaptive reuse	39 x 36 + 38
41	Net Operating Income	$69,680	$68,554.22	$73,899.47		40 - 36
42	Net Income To Construction Cost Ratio	4.19%	3.75%	4.44%		41 / 23
43	**Financing:**					
44	Capitalization Rate	8%	8%	8%	8% capitalization rate assumed (Rypkema, 1994)	
45	Value Based on Appraisal	$871,004	$856,928	$923,743		41 / 44
46	Loan to Value Ratio	70%	75%	75%		
47	Available Loan	$609,703	$642,696	$692,808		46 x 45
48	Investor Cash required	$1,552,297	$1,684,864	$1,470,220		47 - 28
49	Loan Term	20 year	20	20		
50	Interest Rate	4.7%	4.7%	4.7%		
51	Annual Payment on Loan	$47,081	$49,629	$53,498		
52	Cash Flow	$22,599	$18,926	$20,401		41 - 51
53	Unleveraged Investment Return	3.22%	2.95%	3.42%		41 / 28
54	Investor Cash on Cash Return	1.46%	1.12%	1.39%		42 / 48
55	Gap Between Cost and Value	$1,290,996	$1,470,632	$1,239,284		28 - 45
	Available Incentives					
56	Government Grant	$717,000	$0	$0	government grant	
57	Capital Cost After Adjustment	$1,445,000	$2,327,560	$2,163,027		28 - 56
58	Investor Cash required After Adjustment	$835,297	$1,684,864	$1,470,220		57 - 47
59	Unleveraged Investment Return	4.82%	2.95%	3.42%		41 / 57
60	Investor Cash on Cash Return After Adjustment	2.71%	1.12%	1.39%		52 58

Table 12 (The Experiment)

#					Formula
61	**Property Tax Credit Available**				
62	Property Tax Credit Available	30%	0%	0%	
63	Property Tax After Adjustment	$49,167	$75,617	$70,271	38 - (38 x 62)
64	Total Operating Expenses After Adjustment	$68,246	$91,636	$86,290	40 - 38 + 63
65	Net Operating Income After Adjustment	$90,752	$68,554	$73,899	36 - 64
66	Value Based on Appraisal After Adjustment	$1,134,396	$856,928	$923,743	65 - 44
67	Loan to Value Ratio	70%	75%	75%	
68	Available Loan	$794,077	$642,696	$692,808	66 x 67
69	Investor Cash required After Adjustment	$1,367,923	$1,684,864	$1,470,220	28 - 68
70	Loan Term	20	20	20	
71	Interest Rate	4.7%	4.7%	4.7%	
72	Annual Payment on Loan	$61,318	$49,629	$53,498	
73	Cash Flow After Adjustment	$29,433	$18,926	$20,401	65 - 72
74	Unleveraged Investment Return	4.20%	2.95%	3.42%	65 / 28
75	Investor Cash on Cash Return After Adjustment	2.15%	1.12%	1.39%	73 / 69
76	**Construction Tax Credit Available**				
77	Tax Credit Available on Construction Cost	6%	0.00%	0.00%	
78	Eligible Expenditure	$1,662,000	$1,827,560	$1,663,027	from 26
79	Tax Credit Available	$99,720	$0	$0	77 x 78
80	Total Capital Cost After Credit	$2,062,280	$2,327,560	$2,163,027	28 - 79
81	Investor Cash Required Before Credit	$1,552,297	$1,684,864	$1,470,220	from 48
82	Investor Cash After Credit	$1,452,577	$1,684,864	$1,470,220	81 - 79
83	Cash Flow	$22,599	$18,926	$20,401	from 52
84	Unleveraged Investment Return	3.38%	2.95%	3.42%	41 / 80
85	Investors Cash on Cash Return After Adjustments	1.56%	1.12%	1.39%	83 / 82
86	**0% Interest Government Loan Available**				
87	Capitalization Rate	8%	8%	8%	
88	Value Based on Appraisal	$871,004	$856,928	$923,743	41 / 87
89	Loan to Value Ratio	70%	75%	75%	
90	Available Loan	$609,703	$642,696	$692,808	88 x 89
91	Investor Cash required	$1,552,297	$1,684,864	$1,470,220	28 x 90
92	Loan Term	20 year	20	20	
93	Interest Rate	0.0%	4.7%	4.7%	
94	Annual Payment on Loan	$30,488	$49,629	$53,498	
95	Cash Flow	$39,192	$18,926	$20,401	41 - 94
96	Unleveraged Investment Return	3.22%	2.95%	3.42%	41 / 28
97	Investor Cash on Cash Return	2.52%	1.12%	1.39%	95 / 91

Table 13: Cost Benefit Analysis / Net Present Values (30 Years Plot)

Lawyer's Hall
Adaptive Reuse Scenario

Rent Increase Rate: 2.00% Discount Rate: 10.00%

Year	Interest on Capital	Operating Expense	Expense Increase Rate	Loan Payment	Annual Costs	Cumulative Costs	Discounted Annual Costs	Discounted Cumulative Costs	Operating Income	Equity	Annual Benefit	Cumulative Benefit	Discounted Annual Benefit	Discounted Cumulative Benefit
1	$155,230	$90,211	1%	$47,081	$292,522	$292,522	$265,929	$265,929	$158,998	$18,828	$177,826	$177,826	$161,660	$161,660
2	$155,230	$91,104	2%	$47,081	$293,415	$585,936	$242,491	$484,245	$162,178	$38,559	$200,737	$378,563	$165,898	$312,862
3	$155,230	$91,997	3%	$47,081	$294,308	$880,244	$221,118	$661,340	$165,422	$59,238	$224,659	$603,222	$168,790	$453,210
4	$155,230	$92,890	4%	$47,081	$295,201	$1,175,445	$201,626	$802,845	$168,730	$80,910	$249,640	$852,862	$170,507	$582,516
5	$155,230	$98,249	10%	$47,081	$300,560	$1,476,005	$186,624	$916,483	$172,105	$103,622	$275,727	$1,128,589	$171,204	$700,765
6	$155,230	$93,784	5%	$47,081	$296,094	$1,772,100	$167,137	$1,000,304	$175,547	$127,426	$302,973	$1,431,561	$171,020	$808,079
7	$155,230	$94,677	6%	$47,081	$296,987	$2,069,087	$152,402	$1,061,769	$179,058	$152,373	$331,431	$1,762,992	$170,076	$904,694
8	$155,230	$95,570	7%	$47,081	$297,881	$2,366,968	$138,963	$1,104,208	$182,639	$178,518	$361,157	$2,124,149	$168,482	$990,931
9	$155,230	$96,463	8%	$47,081	$298,774	$2,665,741	$126,709	$1,130,535	$186,292	$205,918	$392,209	$2,516,358	$166,335	$1,067,181
10	$155,230	$102,715	15%	$47,081	$305,026	$2,970,767	$117,601	$1,145,359	$190,017	$234,635	$424,652	$2,941,010	$163,722	$1,133,887
11	$155,230	$97,356	9%	$47,081	$299,667	$3,270,434	$105,031	$1,146,267	$193,818	$264,730	$458,548	$3,399,558	$160,718	$1,191,524
12	$155,230	$98,249	10%	$47,081	$300,560	$3,570,994	$95,768	$1,137,829	$197,694	$296,271	$493,965	$3,893,523	$157,392	$1,240,596
13	$155,230	$99,143	11%	$47,081	$301,453	$3,872,448	$87,320	$1,121,710	$201,648	$329,327	$530,975	$4,424,498	$153,805	$1,281,619
14	$155,230	$100,036	12%	$47,081	$302,346	$4,174,794	$79,617	$1,099,354	$205,681	$363,970	$569,651	$4,994,149	$150,007	$1,315,115
15	$155,230	$100,929	13%	$47,081	$303,240	$4,478,034	$72,593	$1,072,006	$209,794	$400,277	$610,071	$5,604,220	$146,046	$1,341,606
16	$155,230	$101,822	14%	$47,081	$304,133	$4,782,167	$66,188	$1,040,739	$213,990	$438,328	$652,318	$6,256,538	$141,963	$1,361,605
17	$155,230	$102,715	15%	$47,081	$305,026	$5,087,193	$60,348	$1,006,474	$218,270	$478,206	$696,476	$6,953,015	$137,794	$1,375,617
18	$155,230	$103,608	16%	$47,081	$305,919	$5,393,112	$55,022	$969,999	$222,636	$519,999	$742,635	$7,695,649	$133,569	$1,384,130
19	$155,230	$104,502	17%	$47,081	$306,812	$5,699,924	$50,166	$931,983	$227,088	$563,800	$790,888	$8,486,537	$129,317	$1,387,617
20	$155,230	$107,181	20%	$47,081	$309,492	$6,009,416	$46,004	$893,261	$231,630	$609,703	$841,333	$9,327,870	$125,059	$1,386,528
21	$155,230	$105,395	18%	$0	$260,625	$6,270,041	$35,218	$847,274	$236,263	$609,703	$845,966	$10,173,836	$114,316	$1,374,796
22	$155,230	$106,288	19%	$0	$261,518	$6,531,558	$32,126	$802,376	$240,988	$609,703	$850,691	$11,024,527	$104,504	$1,354,319
23	$155,230	$107,181	20%	$0	$262,411	$6,793,969	$29,306	$758,738	$245,808	$609,703	$855,511	$11,880,037	$95,542	$1,326,741
24	$155,230	$108,074	21%	$0	$263,304	$7,057,273	$26,732	$716,494	$250,724	$609,703	$860,427	$12,740,464	$87,355	$1,293,483
25	$155,230	$108,968	22%	$0	$264,197	$7,321,471	$24,384	$675,742	$255,738	$609,703	$865,441	$13,605,906	$79,877	$1,255,771
26	$155,230	$109,861	23%	$0	$265,090	$7,586,561	$22,243	$636,554	$260,853	$609,703	$870,556	$14,476,462	$73,044	$1,214,654
27	$155,230	$110,754	24%	$0	$265,984	$7,852,545	$20,289	$598,974	$266,070	$609,703	$875,773	$15,352,235	$66,802	$1,171,033
28	$155,230	$111,647	25%	$0	$266,877	$8,119,421	$18,506	$563,028	$271,392	$609,703	$881,094	$16,233,329	$61,098	$1,125,673
29	$155,230	$112,540	26%	$0	$267,770	$8,387,191	$16,880	$528,724	$276,819	$609,703	$886,522	$17,119,852	$55,886	$1,079,225
30	$155,230	$116,113	30%	$0	$271,343	$8,658,534	$15,550	$496,208	$282,356	$609,703	$892,059	$18,011,910	$51,123	$1,032,237

Cost: Undiscounted $8,658,534 Discounted $2,779,894

Benefit: Undiscounted $18,011,910 Discounted $3,902,913

Table 13: (Continued)

Net Annual Benefit	Net Cumulative Benefit	Discounted Net Annual Benefit	Discounted Net Cumulative Benefit	Discount
-$114,696	-$114,696	-$104,269	-$104,269	1.100
-$92,678	-$207,373	-$76,593	-$171,383	1.210
-$69,648	-$277,022	-$52,328	-$208,131	1.331
-$45,561	-$322,583	-$31,119	-$220,328	1.464
-$24,834	-$347,417	-$15,420	-$215,718	1.611
$6,878	-$340,538	$3,883	-$192,225	1.772
$34,443	-$306,095	$17,675	-$157,075	1.949
$63,276	-$242,819	$29,519	-$113,277	2.144
$93,436	-$149,383	$39,626	-$63,353	2.358
$119,626	-$29,757	$46,121	-$11,473	2.594
$158,881	$129,124	$55,687	$45,257	2.853
$193,405	$322,529	$61,625	$102,768	3.138
$229,522	$552,050	$66,484	$159,909	3.452
$267,304	$819,354	$70,390	$215,762	3.797
$306,832	$1,126,186	$73,453	$269,600	4.177
$348,186	$1,474,372	$75,775	$320,866	4.595
$391,450	$1,865,822	$77,446	$369,143	5.054
$436,715	$2,302,537	$78,547	$414,132	5.560
$484,076	$2,786,613	$79,150	$455,634	6.116
$531,841	$3,318,454	$79,055	$493,267	6.727
$585,341	$3,903,795	$79,097	$527,522	7.400
$589,173	$4,492,969	$72,378	$551,943	8.140
$593,100	$5,086,068	$66,236	$568,003	8.954
$597,123	$5,683,191	$60,623	$576,989	9.850
$601,244	$6,284,435	$55,492	$580,028	10.835
$605,466	$6,889,901	$50,802	$578,100	11.918
$609,789	$7,499,690	$46,513	$572,059	13.110
$614,218	$8,113,908	$42,592	$562,646	14.421
$618,752	$8,732,660	$39,006	$550,502	15.863
$620,716	$9,353,376	$35,572	$536,028	17.449

Total Project Benefit $9,353,376
Total Project Cost $1,123,019

92

Table 14: Cost Benefit Analysis / Net Present Values (30 Years Plot)
Lawyer's Hall
New on Same Site Scenario

Rent Increase Rate: 2.00% Discount Rate: 10.00%

Year	Interest on Capital	Operating Expense	Expense Increase	Loan Payment	Cost				Operating Income	Equity	Benefit			
					Annual Costs	Cumulative Costs	Discounted Annual Costs	Discounted Cumulative Costs			Annual Benefit	Cumulative Benefit	Discounted Annual Benefit	Discounted Cumulative Benefit
1	$168,486	$92,552	1%	$49,629	$310,667	$310,667	$282,425	$282,425	$160,190	$19,846	$180,036	$180,036	$163,669	$163,669
2	$168,486	$93,468	2%	$49,629	$311,583	$622,250	$257,507	$514,256	$163,394	$40,645	$204,038	$384,074	$168,627	$317,416
3	$168,486	$94,385	3%	$49,629	$312,500	$934,750	$234,786	$702,292	$166,661	$62,443	$229,104	$613,178	$172,129	$460,690
4	$168,486	$95,301	4%	$49,629	$313,416	$1,248,166	$214,067	$852,514	$169,995	$85,288	$255,282	$868,461	$174,361	$593,170
5	$168,486	$96,217	5%	$49,629	$314,332	$1,562,498	$195,176	$970,189	$173,395	$109,230	$282,624	$1,151,085	$175,487	$714,733
6	$168,486	$97,134	6%	$49,629	$315,249	$1,877,747	$177,950	$1,059,939	$176,862	$134,321	$311,183	$1,462,268	$175,655	$825,412
7	$168,486	$98,050	7%	$49,629	$316,165	$2,193,912	$162,243	$1,125,824	$180,400	$160,618	$341,017	$1,803,286	$174,996	$925,371
8	$168,486	$98,966	8%	$49,629	$317,081	$2,510,994	$147,921	$1,171,397	$184,008	$188,178	$372,185	$2,175,471	$173,627	$1,014,873
9	$168,486	$99,883	9%	$49,629	$317,998	$2,828,992	$134,862	$1,199,769	$187,688	$217,061	$404,749	$2,580,220	$171,653	$1,094,265
10	$168,486	$100,799	10%	$49,629	$318,914	$3,147,906	$122,955	$1,213,654	$191,442	$247,331	$438,772	$3,018,992	$169,166	$1,163,952
11	$168,486	$101,715	11%	$49,629	$319,831	$3,467,736	$112,099	$1,215,420	$195,270	$279,056	$474,326	$3,493,319	$166,248	$1,224,387
12	$168,486	$102,632	12%	$49,629	$320,747	$3,788,483	$102,200	$1,207,128	$199,176	$312,303	$511,479	$4,004,797	$162,973	$1,276,052
13	$168,486	$103,548	13%	$49,629	$321,663	$4,110,146	$93,174	$1,190,563	$203,159	$347,148	$550,307	$4,555,104	$159,404	$1,319,451
14	$168,486	$104,464	14%	$49,629	$322,580	$4,432,726	$84,945	$1,167,275	$207,223	$383,666	$590,888	$5,145,993	$155,599	$1,355,101
15	$168,486	$105,381	15%	$49,629	$323,496	$4,756,222	$77,442	$1,138,602	$211,367	$421,937	$633,304	$5,779,296	$151,608	$1,383,518
16	$168,486	$106,297	16%	$49,629	$324,412	$5,080,634	$70,602	$1,105,694	$215,594	$462,047	$677,641	$6,456,938	$147,474	$1,405,218
17	$168,486	$107,214	17%	$49,629	$325,329	$5,405,963	$64,365	$1,069,541	$219,906	$504,083	$723,989	$7,180,927	$143,237	$1,420,708
18	$168,486	$108,130	18%	$49,629	$326,245	$5,732,208	$58,678	$1,030,988	$224,304	$548,138	$772,442	$7,953,369	$138,931	$1,430,483
19	$168,486	$109,046	19%	$49,629	$327,161	$6,059,369	$53,493	$990,755	$228,790	$594,309	$823,099	$8,776,468	$134,583	$1,435,023
20	$168,486	$109,963	20%	$49,629	$328,078	$6,387,447	$48,767	$949,453	$233,366	$642,696	$876,062	$9,652,530	$130,221	$1,434,787
21	$168,486	$110,879	21%	$0	$279,365	$6,666,813	$37,751	$900,890	$238,034	$642,696	$880,729	$10,533,259	$119,013	$1,423,365
22	$168,486	$111,795	22%	$0	$280,282	$6,947,094	$34,431	$853,423	$242,794	$642,696	$885,490	$11,418,749	$108,779	$1,402,747
23	$168,486	$112,712	23%	$0	$281,198	$7,228,292	$31,404	$807,242	$247,650	$642,696	$890,346	$12,309,095	$99,432	$1,374,657
24	$168,486	$113,628	24%	$0	$282,114	$7,510,407	$28,642	$762,499	$252,603	$642,696	$895,299	$13,204,394	$90,896	$1,340,584
25	$168,486	$114,544	25%	$0	$283,031	$7,793,438	$26,123	$719,303	$257,655	$642,696	$900,351	$14,104,745	$83,099	$1,301,812
26	$168,486	$115,461	26%	$0	$283,947	$8,077,385	$23,825	$677,737	$262,808	$642,696	$905,504	$15,010,249	$75,977	$1,259,442
27	$168,486	$116,377	27%	$0	$284,864	$8,362,248	$21,729	$637,853	$268,064	$642,696	$910,760	$15,921,009	$69,471	$1,214,418
28	$168,486	$117,293	28%	$0	$285,780	$8,648,028	$19,817	$599,683	$273,426	$642,696	$916,122	$16,837,131	$63,527	$1,167,543
29	$168,486	$118,210	29%	$0	$286,696	$8,934,725	$18,073	$563,240	$278,894	$642,696	$921,590	$17,758,721	$58,096	$1,119,499
30	$168,486	$119,126	30%	$0	$287,613	$9,222,337	$16,483	$528,519	$284,472	$642,696	$927,168	$18,685,889	$53,135	$1,070,861

Cost — Undiscounted $9,222,337 / Discounted $2,953,932
Benefit — Undiscounted $18,685,889 / Discounted $4,031,075

93

Table 14: (Continued)

	Net Benefit			
Net Annual Benefit	Net Cumulative Benefit	Discounted Net Annual Benefit	Discounted Net Cumulative Benefit	Discount
-$130,631	-$130,631	-$118,756	-$118,756	1.100
-$107,545	-$238,176	-$88,880	-$196,840	1.210
-$83,395	-$321,572	-$62,656	-$241,602	1.331
-$58,134	-$379,705	-$39,706	-$259,344	1.464
-$31,708	-$411,413	-$19,688	-$255,455	1.611
-$4,066	-$415,479	-$2,295	-$234,527	1.772
$24,852	-$390,627	$12,753	-$200,453	1.949
$55,104	-$335,523	$25,706	-$156,524	2.144
$86,751	-$248,772	$36,791	-$105,504	2.358
$119,858	-$128,914	$46,211	-$49,702	2.594
$154,496	$25,582	$54,150	$8,966	2.853
$190,732	$216,314	$60,773	$68,924	3.138
$228,644	$444,958	$66,230	$128,888	3.452
$268,309	$713,267	$70,654	$187,825	3.797
$309,808	$1,023,074	$74,166	$244,916	4.177
$353,229	$1,376,303	$76,873	$299,524	4.595
$398,660	$1,774,964	$78,873	$351,167	5.054
$446,197	$2,221,161	$80,252	$399,495	5.560
$495,938	$2,717,099	$81,090	$444,267	6.116
$547,984	$3,265,083	$81,454	$485,334	6.727
$601,364	$3,866,447	$81,263	$522,475	7.400
$605,208	$4,471,655	$74,347	$549,325	8.140
$609,148	$5,080,803	$68,029	$567,415	8.954
$613,184	$5,693,987	$62,254	$578,085	9.850
$617,320	$6,311,307	$56,976	$582,508	10.835
$621,557	$6,932,864	$52,152	$581,705	11.918
$625,897	$7,558,761	$47,742	$576,565	13.110
$630,342	$8,189,103	$43,710	$567,860	14.421
$634,894	$8,823,996	$40,023	$556,260	15.863
$639,555	$9,463,552	$36,652	$542,342	17.449

Total Project Benefit $9,463,552
Total Project Cost $1,077,142

94

Table 15: Cost Benefit Analysis / Net Present Values (30 Years Plot)
Lawyer's Hall
New on Greenfield Scenario

Rent Increase Rate: 2.00% Discount Rate: 10.00%

Year	Interest on Capital	Operating Expense	Expense Increase	Loan Payment	Annual Costs	Cumulative Costs	Discounted Annual Costs	Discounted Cumulative Costs	Operating Income	Equity	Annual Benefit	Cumulative Benefit	Discounted Annual Benefit	Discounted Cumulative Benefit
1	$147,022	$87,153	1%	$53,498	$287,673	$287,673	$261,521	$261,521	$160,190	$21,394	$181,583	$181,583	$165,076	$165,076
2	$147,022	$88,016	2%	$53,498	$288,536	$576,210	$238,460	$476,206	$163,394	$43,814	$207,207	$388,790	$171,246	$321,314
3	$147,022	$88,879	3%	$53,498	$289,399	$865,609	$217,430	$650,345	$166,661	$67,312	$233,973	$622,763	$175,787	$467,891
4	$147,022	$89,742	4%	$53,498	$290,262	$1,155,871	$198,253	$789,476	$169,995	$91,938	$261,932	$884,696	$178,903	$604,259
5	$147,022	$94,919	10%	$53,498	$295,440	$1,451,311	$183,445	$901,150	$173,395	$117,747	$291,141	$1,175,837	$180,776	$730,102
6	$147,022	$90,605	5%	$53,498	$291,125	$1,742,436	$164,332	$983,560	$176,862	$144,795	$321,657	$1,497,494	$181,567	$845,296
7	$147,022	$91,468	6%	$53,498	$291,988	$2,034,424	$149,836	$1,043,981	$180,400	$173,142	$353,541	$1,851,035	$181,423	$949,874
8	$147,022	$92,331	7%	$53,498	$292,851	$2,327,275	$136,617	$1,085,691	$184,008	$202,850	$386,857	$2,237,892	$180,472	$1,043,993
9	$147,022	$93,193	8%	$53,498	$293,714	$2,620,988	$124,563	$1,111,555	$187,688	$233,986	$421,673	$2,659,566	$178,831	$1,127,915
10	$147,022	$99,234	15%	$53,498	$299,754	$2,920,742	$115,568	$1,126,073	$191,442	$266,616	$458,057	$3,117,623	$176,601	$1,201,979
11	$147,022	$94,056	9%	$53,498	$294,577	$3,215,319	$103,247	$1,126,950	$195,270	$300,814	$496,084	$3,613,707	$173,874	$1,266,582
12	$147,022	$94,919	10%	$53,498	$295,440	$3,510,759	$94,136	$1,118,636	$199,176	$336,654	$535,829	$4,149,536	$170,732	$1,322,170
13	$147,022	$95,782	11%	$53,498	$296,302	$3,807,061	$85,828	$1,102,770	$203,159	$374,215	$577,374	$4,726,910	$167,245	$1,369,217
14	$147,022	$96,645	12%	$53,498	$297,165	$4,104,226	$78,253	$1,080,771	$207,223	$413,581	$620,803	$5,347,713	$163,477	$1,408,220
15	$147,022	$97,508	13%	$53,498	$298,028	$4,402,255	$71,346	$1,053,865	$211,367	$454,836	$666,203	$6,013,916	$159,484	$1,439,684
16	$147,022	$98,371	14%	$53,498	$298,891	$4,701,146	$65,047	$1,023,106	$215,594	$498,074	$713,668	$6,727,583	$155,315	$1,464,118
17	$147,022	$99,234	15%	$53,498	$299,754	$5,000,900	$59,305	$989,401	$219,906	$543,387	$763,293	$7,490,876	$151,013	$1,482,030
18	$147,022	$100,097	16%	$53,498	$300,617	$5,301,517	$54,069	$953,524	$224,304	$590,877	$815,181	$8,306,057	$146,617	$1,493,917
19	$147,022	$100,960	17%	$53,498	$301,480	$5,602,997	$49,294	$916,135	$228,790	$640,648	$869,438	$9,175,495	$142,160	$1,500,267
20	$147,022	$103,548	20%	$53,498	$304,069	$5,907,065	$45,198	$878,048	$233,366	$692,808	$926,174	$10,101,669	$137,670	$1,501,549
21	$147,022	$101,823	18%	$0	$248,845	$6,155,910	$33,626	$831,852	$238,034	$692,808	$930,841	$11,032,510	$125,785	$1,490,829
22	$147,022	$102,685	19%	$0	$249,707	$6,405,617	$30,676	$786,904	$242,794	$692,808	$935,602	$11,968,112	$114,935	$1,470,234
23	$147,022	$103,548	20%	$0	$250,570	$6,656,188	$27,983	$743,351	$247,650	$692,808	$940,458	$12,908,569	$105,029	$1,441,605
24	$147,022	$104,411	21%	$0	$251,433	$6,907,621	$25,527	$701,300	$252,603	$692,808	$945,411	$13,853,980	$95,983	$1,406,534
25	$147,022	$105,274	22%	$0	$252,296	$7,159,917	$23,286	$660,832	$257,655	$692,808	$950,463	$14,804,443	$87,724	$1,366,391
26	$147,022	$106,137	23%	$0	$253,159	$7,413,076	$21,241	$621,997	$262,808	$692,808	$955,616	$15,760,059	$80,181	$1,322,355
27	$147,022	$107,000	24%	$0	$254,022	$7,667,098	$19,376	$584,828	$268,064	$692,808	$960,872	$16,720,931	$73,293	$1,275,434
28	$147,022	$107,863	25%	$0	$254,885	$7,921,983	$17,675	$549,337	$273,426	$692,808	$966,233	$17,687,164	$67,002	$1,226,487
29	$147,022	$108,726	26%	$0	$255,748	$8,177,730	$16,122	$515,519	$278,894	$692,808	$971,702	$18,658,866	$61,256	$1,176,244
30	$147,022	$112,177	30%	$0	$259,199	$8,436,930	$14,854	$483,508	$284,472	$692,808	$977,280	$19,636,145	$56,006	$1,125,319

Cost: Undiscounted $8,436,930 — Discounted $2,726,116

Benefit: Undiscounted $19,636,145 — Discounted $4,205,462

95

Table 15: (Continued)

	Net Benefit			
Net Annual Benefit	Net Cumulative Benefit	Discounted Net Annual Benefit	Discounted Net Cumulative Benefit	Discount
-$106,090	-$106,090	-$96,446	-$96,446	1.100
-$81,329	-$187,419	-$67,214	-$154,892	1.210
-$55,426	-$242,846	-$41,643	-$182,453	1.331
-$28,330	-$271,176	-$19,350	-$185,217	1.464
-$4,298	-$275,474	-$2,669	-$171,048	1.611
$30,532	-$244,942	$17,234	-$138,263	1.772
$61,553	-$183,389	$31,587	-$94,107	1.949
$94,006	-$89,382	$43,855	-$41,698	2.144
$127,960	$38,577	$54,267	$16,361	2.358
$158,303	$196,880	$61,033	$75,906	2.594
$201,507	$398,388	$70,627	$139,632	2.853
$240,390	$638,778	$76,596	$203,534	3.138
$281,071	$919,849	$81,416	$266,447	3.452
$323,638	$1,243,487	$85,224	$327,449	3.797
$368,174	$1,611,661	$88,138	$385,819	4.177
$414,777	$2,026,438	$90,267	$441,012	4.595
$463,539	$2,489,976	$91,709	$492,629	5.054
$514,564	$3,004,540	$92,549	$540,393	5.560
$567,958	$3,572,498	$92,866	$584,132	6.116
$622,105	$4,194,604	$92,472	$623,501	6.727
$681,997	$4,876,600	$92,159	$658,978	7.400
$685,894	$5,562,495	$84,259	$683,330	8.140
$689,887	$6,252,382	$77,045	$698,254	8.954
$693,977	$6,946,359	$70,456	$705,233	9.850
$698,167	$7,644,526	$64,438	$705,559	10.835
$702,457	$8,346,983	$58,940	$700,357	11.918
$706,850	$9,053,833	$53,917	$690,605	13.110
$711,348	$9,765,181	$49,327	$677,150	14.421
$715,954	$10,481,135	$45,133	$660,725	15.863
$718,080	$11,199,216	$41,152	$641,811	17.449

Total Project Benefit $11,199,216
Total Project Cost $1,479,346

96

Table 16: Cost Benefit Analysis / Net Present Values (30 Years Plot)
Lawyer's Hall
Adaptive Reuse with Government Incentives

Rent Increase Rate: 2.00% Discount Rate: 10.00%

Year	Interest on Capital	Operating Expense	Expense Increase	Loan Payment	Cost Annual Costs	Cost Cumulative Costs	Discounted Annual Costs	Discounted Cumulative Costs	Operating Income	Equity	Benefit Annual Benefit	Benefit Cumulative Benefit	Discounted Annual Benefit	Discounted Cumulative Benefit
1	$83,530	$90,211	1%	$47,081	$220,822	$220,822	$200,747	$200,747	$158,998	$18,828	$177,826	$177,826	$161,660	$161,660
2	$83,530	$91,104	2%	$47,081	$221,715	$442,536	$183,235	$365,732	$162,178	$38,559	$200,737	$378,563	$165,898	$312,862
3	$83,530	$91,997	3%	$47,081	$222,608	$665,144	$167,249	$499,733	$165,422	$59,238	$224,659	$603,222	$168,790	$453,210
4	$83,530	$92,890	4%	$47,081	$223,501	$888,645	$152,654	$606,957	$168,730	$80,910	$249,640	$852,862	$170,507	$582,516
5	$83,530	$98,249	10%	$47,081	$228,860	$1,117,505	$142,104	$693,883	$172,105	$103,622	$275,727	$1,128,589	$171,204	$700,765
6	$83,530	$93,784	5%	$47,081	$224,394	$1,341,900	$126,665	$757,467	$175,547	$127,426	$302,973	$1,431,561	$171,020	$808,079
7	$83,530	$94,677	6%	$47,081	$225,287	$1,567,187	$115,608	$804,215	$179,058	$152,373	$331,431	$1,762,992	$170,076	$904,694
8	$83,530	$95,570	7%	$47,081	$226,181	$1,793,368	$105,515	$836,619	$182,639	$178,518	$361,157	$2,124,149	$168,482	$990,931
9	$83,530	$96,463	8%	$47,081	$227,074	$2,020,441	$96,301	$856,864	$186,292	$205,918	$392,209	$2,516,358	$166,335	$1,067,181
10	$83,530	$102,715	15%	$47,081	$233,326	$2,253,767	$89,957	$868,925	$190,017	$234,635	$424,652	$2,941,010	$163,722	$1,133,887
11	$83,530	$97,356	9%	$47,081	$227,967	$2,481,734	$79,901	$869,833	$193,818	$264,730	$458,548	$3,399,558	$160,718	$1,191,524
12	$83,530	$98,249	10%	$47,081	$228,860	$2,710,594	$72,922	$863,679	$197,694	$296,271	$493,965	$3,893,523	$157,392	$1,240,596
13	$83,530	$99,143	11%	$47,081	$229,753	$2,940,348	$66,551	$851,714	$201,648	$329,327	$530,975	$4,424,498	$153,805	$1,281,619
14	$83,530	$100,036	12%	$47,081	$230,646	$3,170,994	$60,736	$835,022	$205,681	$363,970	$569,651	$4,994,149	$150,007	$1,315,115
15	$83,530	$100,929	13%	$47,081	$231,540	$3,402,534	$55,429	$814,540	$209,794	$400,277	$610,071	$5,604,220	$146,046	$1,341,606
16	$83,530	$101,822	14%	$47,081	$232,433	$3,634,967	$50,584	$791,075	$213,990	$438,328	$652,318	$6,256,538	$141,963	$1,361,605
17	$83,530	$102,715	15%	$47,081	$233,326	$3,868,293	$46,162	$765,321	$218,270	$478,206	$696,476	$6,953,015	$137,794	$1,375,617
18	$83,530	$103,608	16%	$47,081	$234,219	$4,102,512	$42,126	$737,873	$222,636	$519,999	$742,635	$7,695,649	$133,569	$1,384,130
19	$83,530	$104,502	17%	$47,081	$235,112	$4,337,624	$38,443	$709,236	$227,088	$563,800	$790,888	$8,486,537	$129,317	$1,387,617
20	$83,530	$107,181	20%	$47,081	$237,792	$4,575,416	$35,346	$680,106	$231,630	$609,703	$841,333	$9,327,870	$125,059	$1,386,528
21	$83,530	$105,395	18%	$0	$188,925	$4,764,341	$25,529	$643,808	$236,263	$609,703	$845,966	$10,173,836	$114,316	$1,374,796
22	$83,530	$106,288	19%	$0	$189,818	$4,954,158	$23,318	$608,598	$240,988	$609,703	$850,691	$11,024,527	$104,504	$1,354,319
23	$83,530	$107,181	20%	$0	$190,711	$5,144,869	$21,298	$574,570	$245,808	$609,703	$855,511	$11,880,037	$95,542	$1,326,741
24	$83,530	$108,074	21%	$0	$191,604	$5,336,473	$19,453	$541,789	$250,724	$609,703	$860,427	$12,740,464	$87,355	$1,293,483
25	$83,530	$108,968	22%	$0	$192,497	$5,528,971	$17,767	$510,302	$255,738	$609,703	$865,441	$13,605,906	$79,877	$1,255,771
26	$83,530	$109,861	23%	$0	$193,390	$5,722,361	$16,227	$480,137	$260,853	$609,703	$870,556	$14,476,462	$73,044	$1,214,654
27	$83,530	$110,754	24%	$0	$194,284	$5,916,645	$14,820	$451,308	$266,070	$609,703	$875,773	$15,352,235	$66,802	$1,171,033
28	$83,530	$111,647	25%	$0	$195,177	$6,111,821	$13,534	$423,814	$271,392	$609,703	$881,094	$16,233,329	$61,098	$1,125,673
29	$83,530	$112,540	26%	$0	$196,070	$6,307,891	$12,360	$397,646	$276,819	$609,703	$886,522	$17,119,852	$55,886	$1,079,225
30	$83,530	$116,113	30%	$0	$199,643	$6,507,534	$11,441	$372,937	$282,356	$609,703	$892,059	$18,011,910	$51,123	$1,032,237
					Undiscounted $6,507,534		Discounted $2,103,984				Undiscounted $18,011,910		Discounted $3,902,913	

97

Table 16: (Continued)

| | Net Benefit | | | |
Net Annual Benefit	Net Cumulative Benefit	Discounted Net Annual Benefit	Discounted Net Cumulative Benefit	Discount
-$42,996	-$42,996	-$39,087	-$39,087	1.100
-$20,978	-$63,973	-$17,337	-$52,871	1.210
$2,052	-$61,922	$1,541	-$46,523	1.331
$26,139	-$35,783	$17,853	-$24,440	1.464
$46,866	$11,083	$29,100	$6,882	1.611
$78,578	$89,662	$44,355	$50,612	1.772
$106,143	$195,805	$54,468	$100,479	1.949
$134,976	$330,781	$62,967	$154,312	2.144
$165,136	$495,917	$70,034	$210,317	2.358
$191,326	$687,243	$73,765	$264,962	2.594
$230,581	$917,824	$80,817	$321,692	2.853
$265,105	$1,182,929	$84,471	$376,917	3.138
$301,222	$1,484,150	$87,253	$429,905	3.452
$339,004	$1,823,154	$89,270	$480,094	3.797
$378,532	$2,201,686	$90,618	$527,066	4.177
$419,886	$2,621,572	$91,379	$570,530	4.595
$463,150	$3,084,722	$91,632	$610,296	5.054
$508,415	$3,593,137	$91,443	$646,257	5.560
$555,776	$4,148,913	$90,874	$678,380	6.116
$603,541	$4,752,454	$89,713	$706,422	6.727
$657,041	$5,409,495	$88,786	$730,988	7.400
$660,873	$6,070,369	$81,186	$745,720	8.140
$664,800	$6,735,168	$74,244	$752,171	8.954
$668,823	$7,403,991	$67,903	$751,695	9.850
$672,944	$8,076,935	$62,110	$745,469	10.835
$677,166	$8,754,101	$56,818	$734,517	11.918
$681,489	$9,435,590	$51,982	$719,725	13.110
$685,918	$10,121,508	$47,564	$701,859	14.421
$690,452	$10,811,960	$43,526	$681,580	15.863
$692,416	$11,504,376	$39,681	$659,299	17.449

Total Project Benefit $11,504,376
Total Project Cost $1,798,929

Figure 8
Lawyer's Hall
Annual Cost & Benefit
30 Year Plot
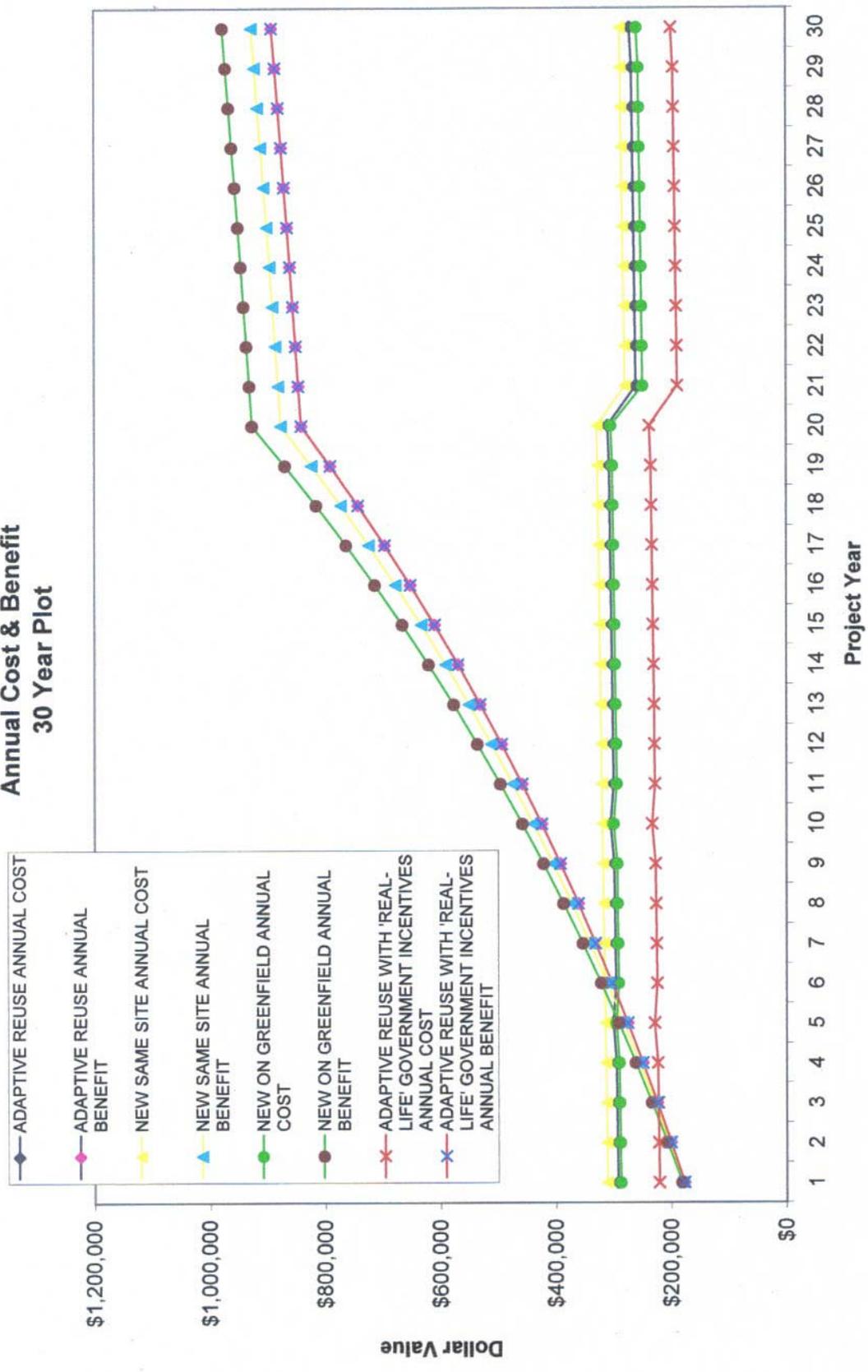
7.3 Case Study 3 (The Wilkes Building)

Built in 1870 the original building is a 2 storey square plan house with a raised basement. The original building has undergone three additions in the years 1931, 1932, and 1978.

Figure 9: The Wilkes Building – The Original Building[15]

7.3.1 The 'Real-Life' Adaptive Reuse Scenario

The existing 4,740 sqf building was converted to student housing for Wilfred Laurier University. A 19,846 sqf structure was added to the existing building of which 11,346 sqf was used as residential space and 8,500 sqf was used as a gymnasium. For the purpose of calculating the return on investment and to conduct a reliable comparison, the gymnasium have been considered as a commercial space and the return on investment have been calculated based on the average rent for a commercial space in the City of Brantford.

Based on its location, the site happened to be in a parking exemption area where the number of parking spaces required for the development had to be 75% of the number of parking spaces

---

[15] Information and photos obtained from Brantford Heritage Inventory.
www.city.brantford.on.ca/heritage/index.htm

required. However, due to the function of the new use as student housing, the project was exempt

from providing any parking on the site. In our analysis, to conduct a reliable comparison between

the two options of adaptive reuse and new construction an additional cost to provide an

underground parking structure for 36 cars have been considered similar to the new construction

scenario. The following are the actual construction drawings obtained from the developer for the

adaptive reuse project.

Figure 10: The Wilkes Building – Adaptive Reuse[16]

PROJECT:
THE WILKES BUILDING
BRANTFORD, ONTARIO

DRAWN BY:
SITE PLAN
EXISTING BUILDING
ADAPTIVE REUSE SCENARIO

DRAWING 11

DARLING STREET

CITY SIDEWALK

3.0m
SET BACK

BLDG A
EXISTING OLD BUILDING
TO BE RENOVATED
NEW 2 STOREY
RESIDENTIAL BUILDING

BLDG. A BUILDING AREA = 1305m² (14,050sqf)

BLDG B
NEW ADDITION
NEW 4 STOREY
RESIDENTIAL / COMMERCIAL BUILDING

RESIDENTIAL AREA = 730m² (7,860sqf)
COMMERCIAL AREA = 734m² (7,900sqf)
TOTAL AREA = 1464m² (15,760sqf)

CONC. SIDEWALK

PROPERTY LINE

3.0M
SET BACK

CHARLOTTE STREET

7.5m
SET BACK

3.0
SET BACK

CONC. SIDEWALK

PROPERTY LINE
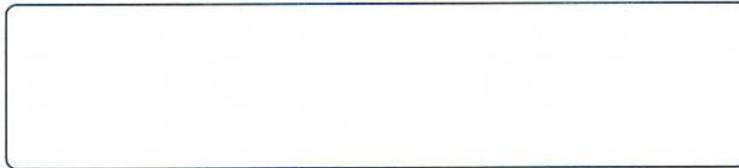
PROJECT
THE WILKES BUILDING
BRANTFORD, ONTARIO

BASEMENT FLOOR PLAN
EXISTING BUILDING
ADAPTIVE REUSE SCENARIO

DRAWING 12

BASEMENT FLOOR PLAN
"REALLIFE" ADAPTIVE REUSE SCENARIO
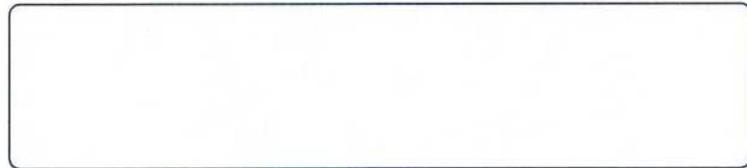
1

1ST FLOOR PLAN
"REALLIFE" ADAPTIVE REUSE SCENARIO

PROJECT
THE WILKES BUILDING
BRANTFORD, ONTARIO

1ST FLOOR PLAN
EXISTING BUILDING
ADAPTIVE REUSE SCENARIO

DRAWING 14

APARTMENT # 7

APARTMENT # 8
LOFT LEVEL

APARTMENT # 6
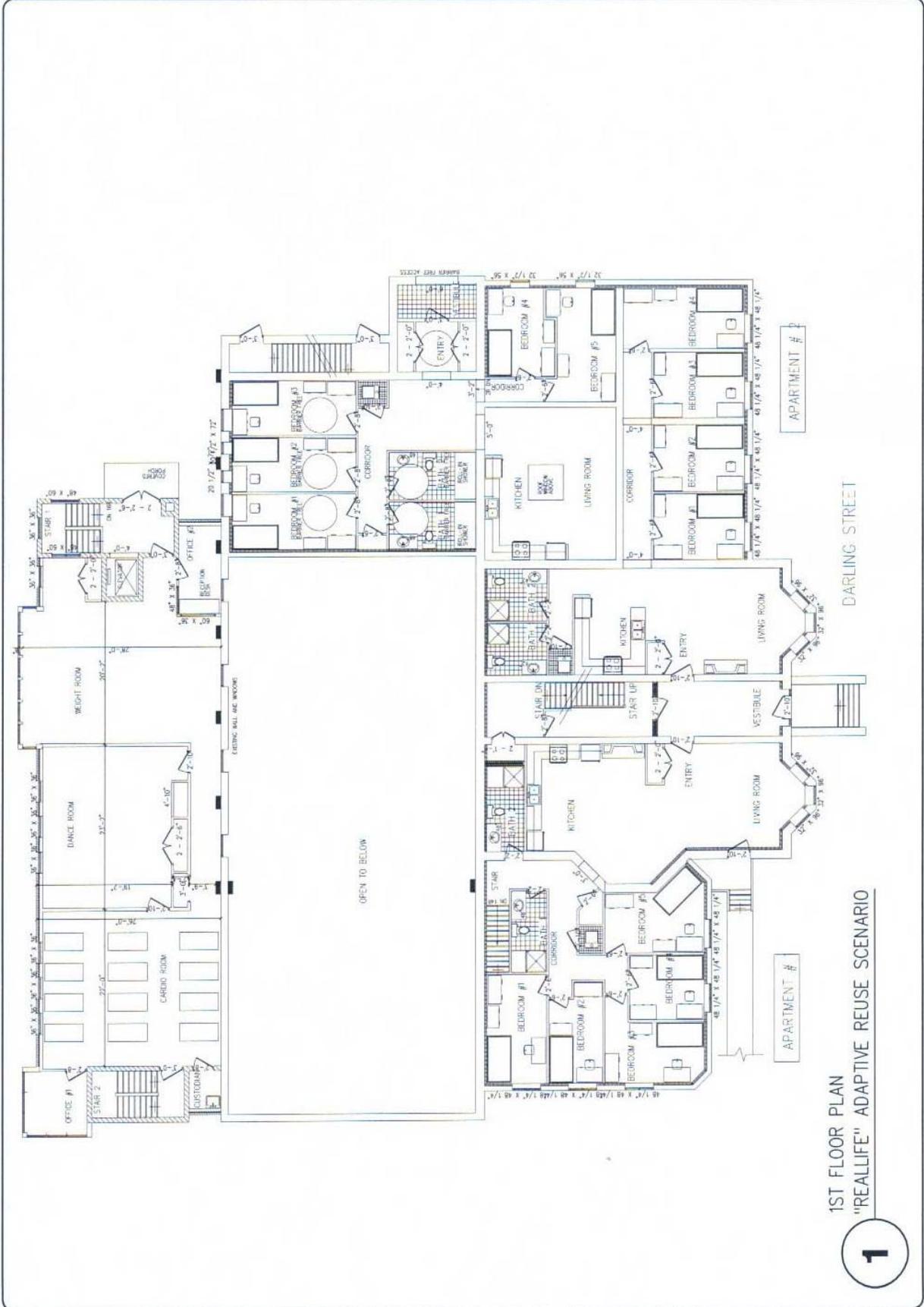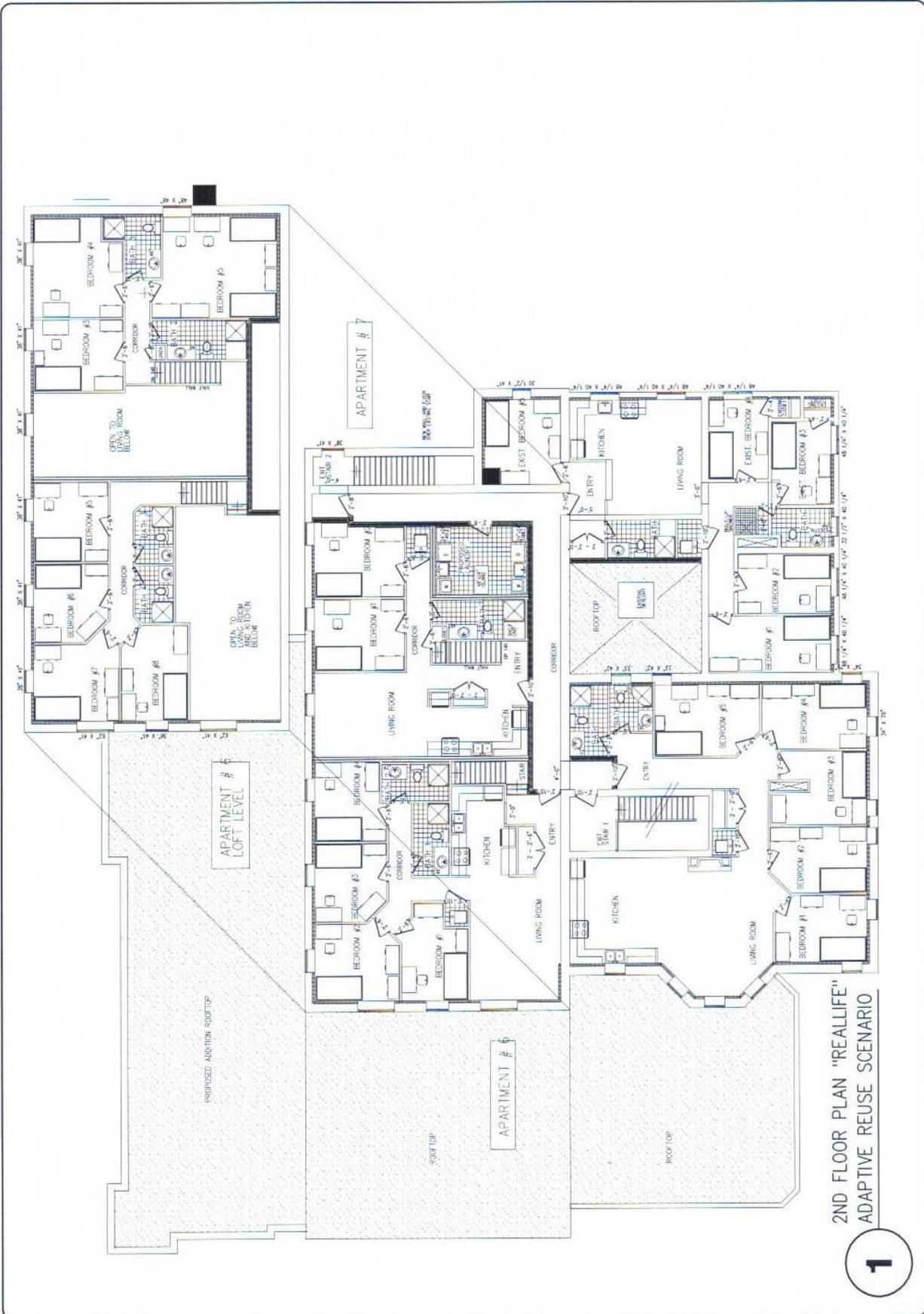
2ND FLOOR PLAN "REALLIFE"
ADAPTIVE REUSE SCENARIO

1

7.3.2 The Alternative Hypothetical Scenario of New Construction

After analyzing the site's opportunities and constraints, a new construction scenario based on the municipal zoning by-laws and building code requirements was developed. The new design allowed for the maximum building size allowable on the site after establishing the required set backs and providing the required number of parking spaces and landscaped areas in accordance with applicable zoning by laws. The new construction scenario that was developed is for a 3 storey 25,876 sqf building with 16 rentable units on the 1st and 2nd floors, 9 off street parking spaces and 13 parking spaces in the basement. The 6,469 main floor was developed as a commercial space so that the function in the New construction option is similar to the function in the adaptive reuse scenario. The 6,469 sqf basement was developed as a parking space for 13 cars.

The following are the drawings that we have developed for the hypothetical development scenario of new construction.
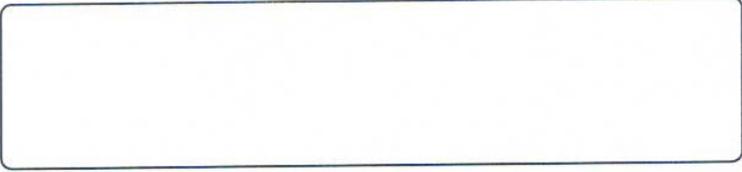
NEW RESIDENTAIL BUILDING

NEW 4 STOREY
RESIDENTIAL / COMMERCIAL BUILDING
RESIDENTIAL AREA = 1,202m² (12,938sqf)
COMMERCIAL AREA = 601m²(6,469sqf)
PARKING GARAGE = 601m²(6,469sqf)

TOTAL AREA = 2,404m² (25,876sqf)

DARLING STREET

CHARLOTTE STREET

STAIRS UP TO
COMMERCIAL SPACE

CITY SIDEWALK

ENTRY TO PARKING
AT BASEMENT LEVEL

LANDSCAPED AREA

LANDSCAPED AREA

BASEMENT FLOOR PLAN

STORAGE

STAIR

MECH.
ROOM

STAIR

EXTERIOR STAIR
TO COMMERCIAL SPACE
ON 1ST LEVEL

ENTRY TO PARKING
AT BASEMENT LEVEL

28m (92'-0"±)

21.5m (70'-6"±)

PROJECT
THE WILKES BUILDING
BRANTFORD, ONTARIO

BASEMENT FLOOR PLAN
NEW BUILDING SCENARIO

DRAWING 16

1

1ST FLOOR PLAN (COMMERCIAL)

COMMERCIAL SPACE
NET RENTABLE SPACE: 575m2 (6,190 sq(±)

EXTERIOR STAIR
TO COMMERCIAL SPACE
ON 1ST LEVEL

28m (92'-0"±)

2.15m (70'-6"±)

STAIR

STAIR

PROJECT
THE WILKES BUILDING
BRANTFORD, ONTARIO

1ST FLOOR PLAN
NEW BUILDING SCENARIO

DRAWING 17

2ND & 3RD FLOOR PLAN (RESIDENTIAL)

UNIT 101 — AREA: 67.2m2
UNIT 102 — AREA: 67.4m2
UNIT 103 — AREA: 67.4m2
UNIT 104 — AREA: 48.7m2
UNIT 105 — AREA: 70.6m2
UNIT 106 — AREA: 67.4m2
UNIT 107 — AREA: 67.4m2
UNIT 108 — AREA: 52.7m2

EXTERIOR STAIR TO COMMERCIAL SPACE ON 1ST LEVEL

STAIR
UP

28m (92'-0"±)

21.5m (70'-6"±)
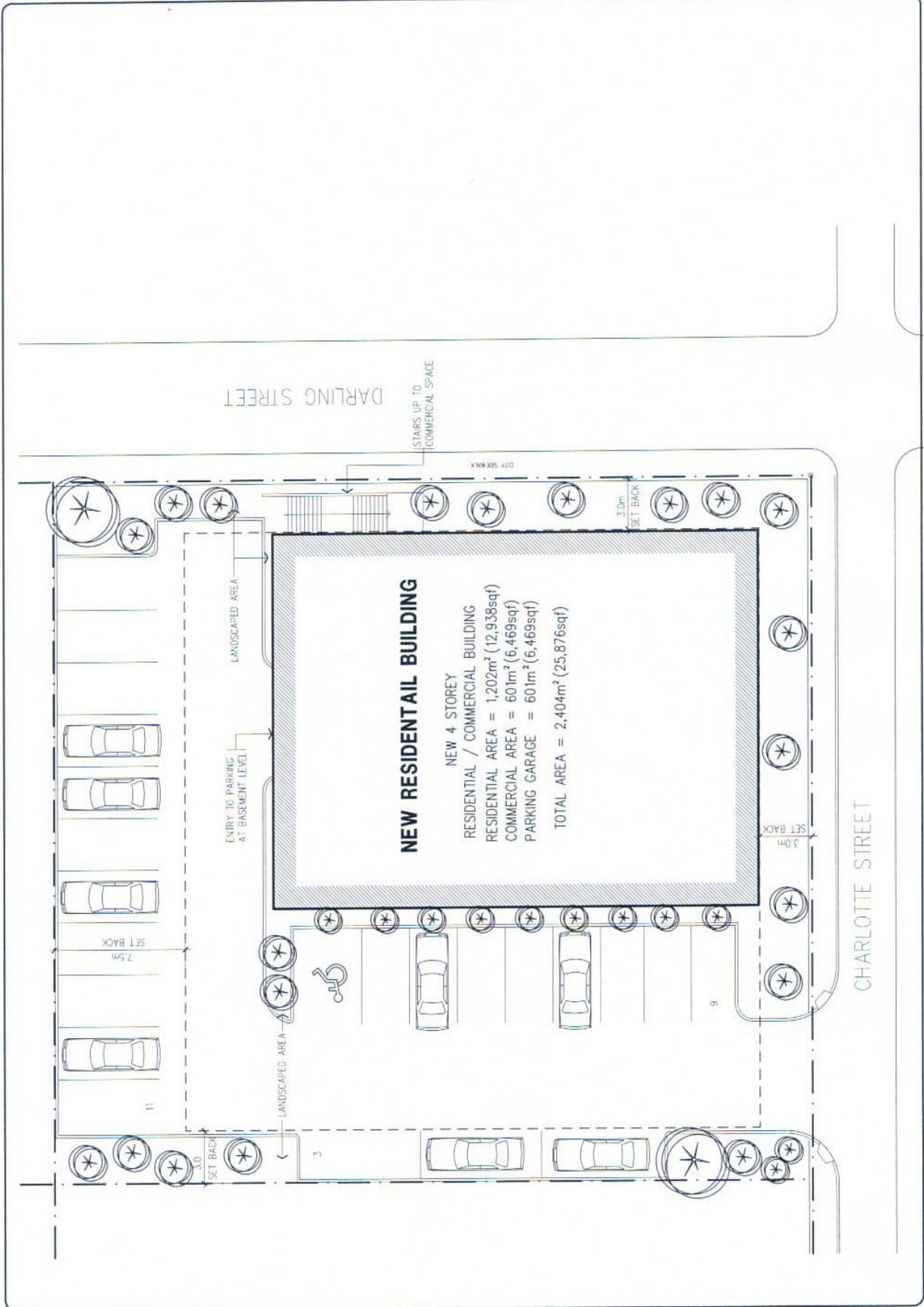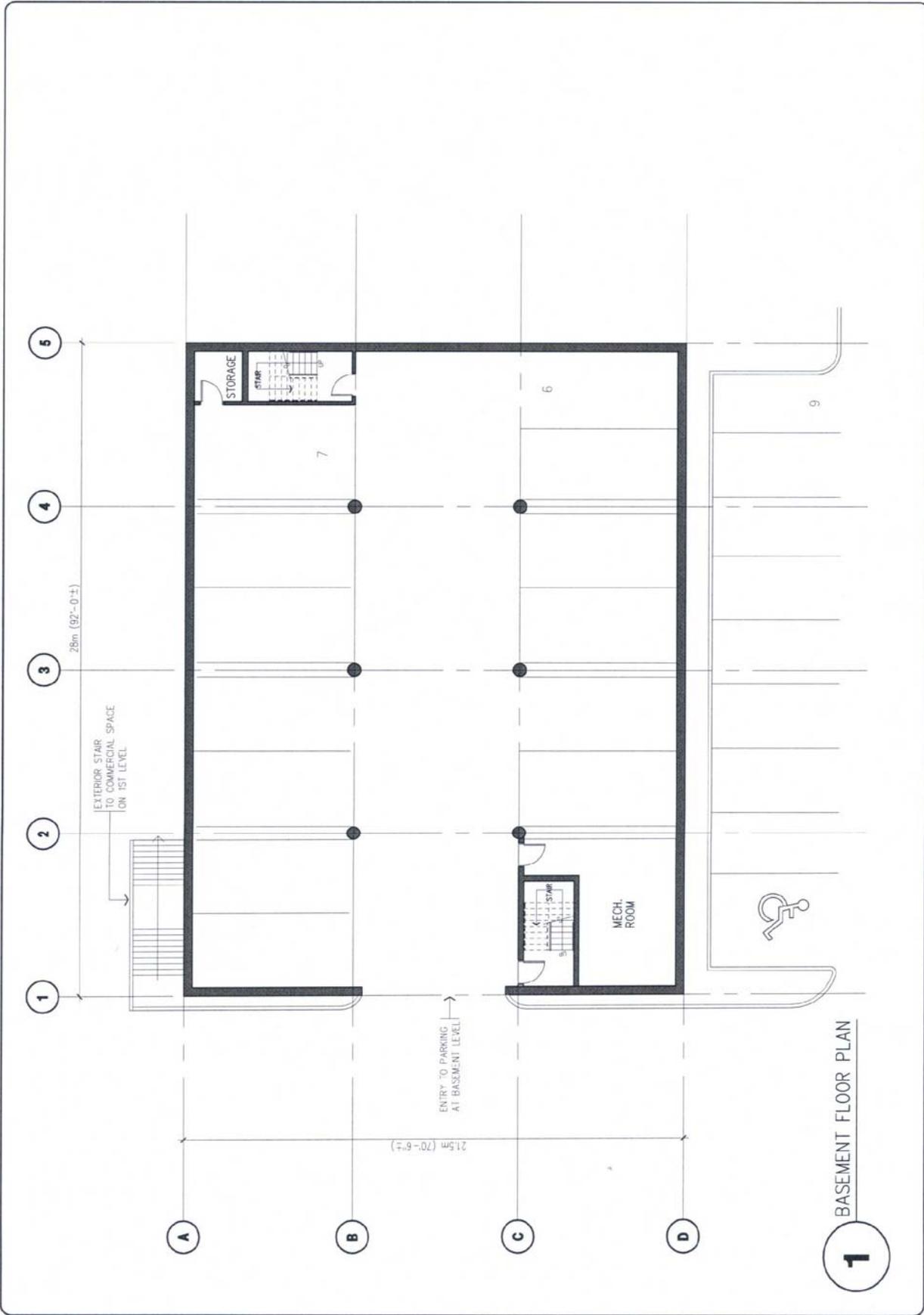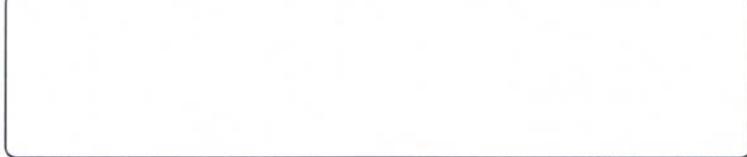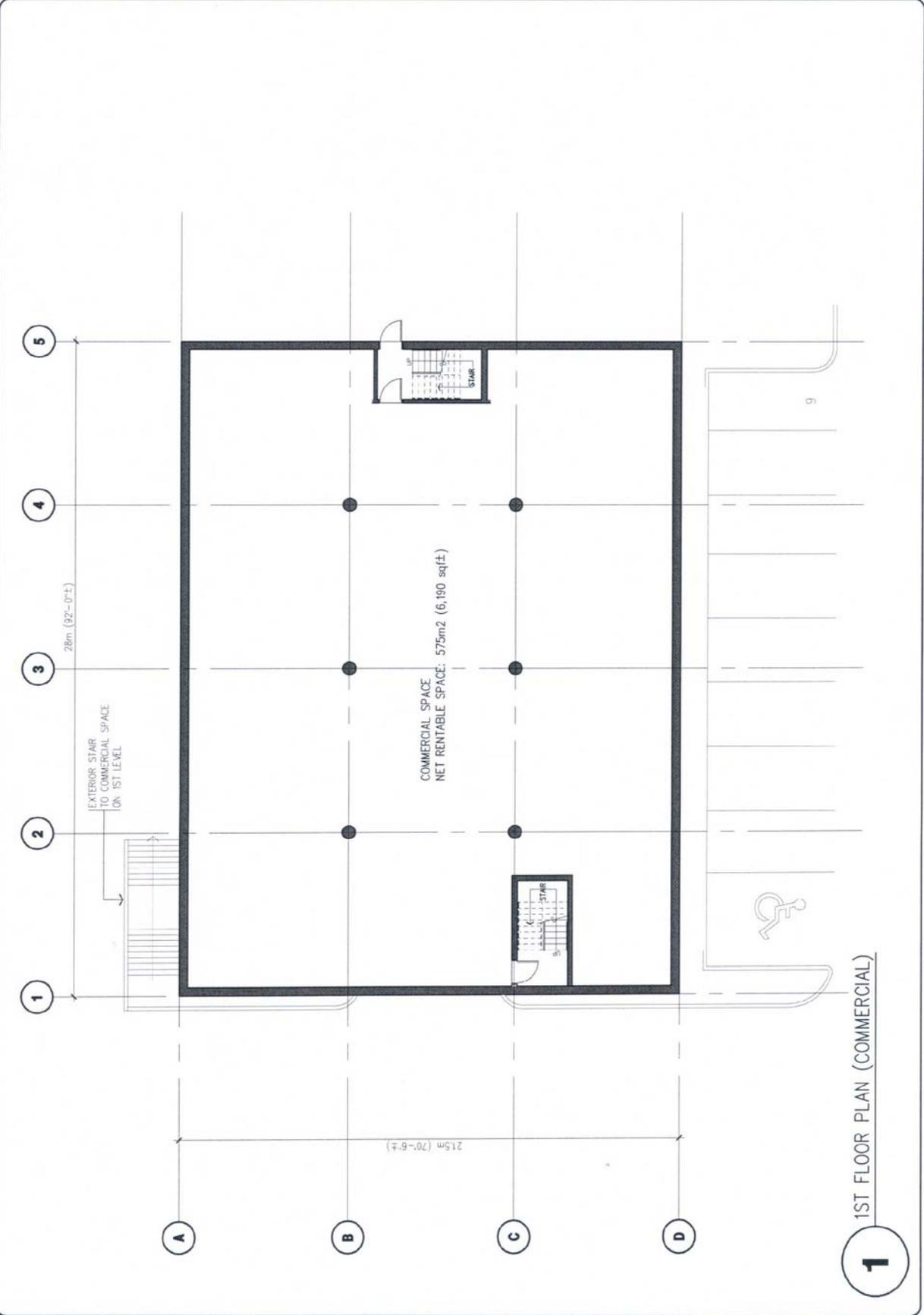
PROJECT
THE WILKES BUILDING
BRANTFORD, ONTARIO

2ND & 3RD FLOOR PLANS
NEW BUILDING SCENARIO

DRAWING 18

The Wilkes Building
119-121 Darling Street, Brantford, Ontario

Table 17 (Construction Cost)

#	Factor		Rehabilitation	New Same Site	New on Greenfiled	Notes
1	Lot Size		1680m² (18,084 sqf)	1680m² (18,084 ≤18,084 sqf)	1680m² (18,084 sqf)	
2	Building Gross Floor Area	Reuse Residential	4,740 sqf	0	0	
3		New Residential	11,346 sqf	12,938	12,938	
4		New Commercial	8,500 sqf	6,469	6,469	
5		New Other (Garage)	6,469	6,469	6,469	
6		Total	31,055 sqf	25,876	25,876	
7	Number of rentable units		44 unit	16	16	
8	Number of parking required		36 space	36	36	City of Brantford Zoning By-Law
9	Number of parking provided		36	36	36	
	Hard Costs					
10	Demolition		$0	$55,484	$0	$0.3/CF (Reed Construction Data, 2005)
11	Building Construction Hard Cost (sq.ft)	Reuse	-	$0	$0	$98.18/SQF Average Cost Low Rise Condominium $74.13/SQF Average Cost for Parking Garage Source 112.56 Average Cost Commercial Space: (Reed Construction Data, 2005)
12		New	-	$2,477,950	$2,477,950	
13	Building Construction Hard Cost (Total)		$3,079,547	$2,533,434	$2,477,950	10 + 12
14	Environmental cleanup		$0	$0	$0	
15	Outdoor Parking / paving		$0	$12,466	$12,466	(Reed Construction Data, 2005)
16	Other Site Work		$0	$105,000	$105,000	(Reed Construction Data, 2005)
17	Total		$3,079,547	$2,650,900	$2,595,416	
18	**Soft Costs**					
19	Consulting fees		$200,171	$172,308	$168,702	6.5% of construction cost. Source: Adaptive reuse architect
20	Demolition Permit		$0	$25	$0	City of Brantford
21	City of Brantford permits and deposits		$27,716	$22,801	$22,302	City of Brantford
22	Insurances		$35,000	$35,000	$35,000	Source: Developer
23	Total		$262,886	$230,134	$226,004	
24	**Development Charges:**					
25	Development Charges		$0.00	$50,800.00	$50,800.00	development charges waived in the core (Source: City of Brantford)
26	Total Construction Costs:		$3,342,433	$2,931,834	$2,872,220	

Table 18 (Return on Investment)

#	Item				Notes
27	**Capital Costs:**				The study assumes the greenfield site's acquisition cost is the same as the existing site, and the acquisition cost in the reuse and the new construction on same site include the cost of the existing building in both cases.
28	Acquisition Cost	$300,000	$300,000	$300,000	
29	Construction Cost	$3,342,433	$2,931,834	$2,872,220	from 26
30	Unit Price (Dollar per sqf)	$107.6	$113.3	$111.0	29 / 6
31	Total Capital Cost	$3,642,433	$3,231,834	$3,172,220	28 / 29
32					
	Operating Income:				
33	Vacancy Rate (Residentail)	3.3%	3.3%	3.3%	Based on 2005 statistical data obtain from CMHC website.
34	Vacany Rate (Commercial)	6.0%	6.0%	6.0%	
35	Average Rent (Residentail)	$1.30	$1.30	$1.30	Based on 2005 statistics obtain from CMHC website. Data is modified to accommodate $/sqf format
36	Average Rent (Commercial))	$2.0	$2.0	$2.0	
37	Net to Gross Ratio	69%	88%	88%	
38	Rentable Square Feet (Residential)	13,032.00 sqf	10,953.70	10,953.70	From Drawings
39	Rentable Square Feet (Commercial)	8,500.00 sqf	6,217.00	6,217.00	From Drawings
40	Rent (Residential) Per Month	$16,941.60	$14,239.81	$14,239.81	38 x 35
41	Rent (Commercial) Rent Per Month	$17,000.00	$12,434.00	$12,434.00	39 x 36
42	Rent Total Per Month	$33,941.60	$26,673.81	$26,673.81	40 + 41
43	Vacancy (4)	$1,579.07	$1,215.95	$1,215.95	(40 x 33) + (41 + 34)
44	Total Annual Operating Income:	$388,350.33	$305,494.28	$305,494.28	(42 - 43) x 12
45	Net Income to Construction Cost Ratio	11.62%	10.42%	10.64%	44 / 26
	Operating Expenses:				
46	Property Tax	$118,333.45	$104,994.12	$103,057.40	Source: City of Brantford
47	Operating Expense Ratio	12%	10%	10%	The Study assumes higher ratio for adaptive reuse
48	Total Operating Expenses	$46,602	$30,549.43	$30,549.43	44 x 47
49	Net Operating Income	$223,415	$169,950.73	$171,887.45	44 - 48 - 46
	Financing:				
50	Capitalization Rate	8%	8%	8%	8% capitalization rate assumed (Rypkema, 1994)
51	Value Based on Appraisal	$2,792,685	$2,124,384	$2,148,593	49 / 50
52	Loan to Value Ratio	70%	75%	75%	
53	Available Loan	$2,549,703	$1,593,288	$1,611,445	51 x 52

#		Col 1	Col 2	Col 3	Ref
54	Investor Cash required	$1,092,730	$1,638,546	$1,560,775	31 - 53
55	Loan Term	20 year	20	20	
56	Interest Rate	4.7%	4.7%	4.7%	
57	Annual Payment on Loan	$196,887	$123,033	$124,435	
58	Cash Flow	$26,528	$46,918	$47,452	49 - 57
59	Unleveraged Investment Return	6.13%	5.26%	5.42%	49 / 31
60	Investor Cash on Cash Return	2.43%	2.86%	3.04%	58 / 54
61	Gap Between Cost and Value	$849,748	$1,107,450	$1,023,627	39 - 51
	Available Incentives				
62	Government Grant	$975,000	$0	The adaptive reuse project received $717,000 as a $0 government grant	
63	Capital Cost After Adjustment	$2,667,433	$3,231,834	$3,172,220	31 - 62
64	Investor Cash required After Adjustment	$117,730	$1,638,546	$1,560,775	63 - 53
65	Unleveraged Investment Return	8.38%	5.26%	5.42%	49 / 63
66	Investor Cash on Cash Return After Adjustment	22.53%	2.86%	3.04%	58 / 64

113

Table 19 (The Experiment)

#					
67	**Property Tax Credit Available**				
68	Property Tax Credit Available	30%	0%	0%	
69	Property Tax After Adjustment	$82,833	$104,994	$103,057	
70	Total Operating Expenses After Adjustment	$129,435	$135,544	$133,607	
71	Net Operating Income After Adjustment	$258,915	$169,951	$171,887	
72	Value Based on Appraisal After Adjustment	$3,236,436	$2,124,384	$2,148,593	
73	Loan to Value Ratio	70%	75%	75%	
74	Available Loan	$2,265,505	$1,593,288	$1,611,445	
75	Investor Cash required After Adjustment	$1,376,928	$1,638,546	$1,560,775	
76	Loan Term	20	20	20	
77	Interest Rate	4.7%	4.7%	4.7%	
78	Annual Payment on Loan	$174,941	$123,033	$124,435	
79	Cash Flow After Adjustment	$83,974	$46,918	$47,452	
80	Unleveraged Investment Return	7.11%	5.26%	5.42%	
81	Investor Cash on Cash Return After Adjustment	6.10%	2.86%	3.04%	
	Construction Tax Credit Available				
84	Tax Credit Available on Construction Cost	6%	0.00%	0.00%	M
85	Eligible Expenditure	$3,342,433	$2,931,834	$2,872,220	from 23
86	Tax Credit Available	$200,546	$0	$0	51x52
87	Total Capital Cost After Credit	$3,441,887	$3,231,834	$3,172,220	
88	Investor Cash Required Before Credit	$1,092,730	$1,638,546	$1,560,775	from 43
89	Investor Cash After Credit	$892,184	$1,638,546	$1,560,775	55-53
90	Cash Flow	$26,528	$46,918	$47,452	from 47
91	Unleveraged Investment Return	6.49%	5.26%	5.42%	
92	Investors Cash on Cash Return After Adjustments	2.97%	2.86%	3.04%	57/56
	0% Interest Government Loan Available				
93	Capitalization Rate	8%	8%	8%	J
94	Value Based on Appraisal	$2,792,685	$2,124,384	$2,148,593	36 / 39
95	Loan to Value Ratio	70%	75%	75%	K
96	Available Loan	$2,549,703	$1,593,288	$1,611,445	40X41
97	Investor Cash required	$1,092,730	$1,638,546	$1,560,775	24-42
98	Loan Term	20 year	20	20	K
99	Interest Rate	0.0%	4.7%	4.7%	K
100	Annual Payment on Loan	$127,498	$123,033	$124,435	L
101	Cash Flow	$95,917	$46,918	$47,452	36-46
102	Unleveraged Investment Return	6.13%	5.26%	5.42%	36 / 24
103	Investor Cash on Cash Return	8.78%	2.86%	3.04%	47 /43

114

Table 20: Cost Benefit Analysis / Net Present Values (30 Years Plot)
The Wilkes Building
Adaptive Reuse Scenario

Rent Increase Rate: **2.00%** Discount Rate: **10.00%**

Year	Interest on Capital	Operating Expense	Expense Increase Rate	Loan Payment	Annual Costs	Cumulative Costs	Discounted Annual Costs	Discounted Cumulative Costs	Operating Income	Equity	Annual Benefit	Cumulative Benefit	Discounted Annual Benefit	Discounted Cumulative Benefit
1	$109,273	$47,068	1%	$196,887	$353,228	$353,228	$321,116	$321,116	$388,350	$78,733	$467,084	$467,084	$424,622	$424,622
2	$109,273	$47,534	2%	$196,887	$353,694	$706,922	$292,309	$584,233	$396,117	$161,247	$557,365	$1,024,448	$460,632	$846,652
3	$109,273	$48,000	3%	$196,887	$354,160	$1,061,082	$266,086	$797,207	$404,040	$247,723	$651,763	$1,676,212	$489,679	$1,259,363
4	$109,273	$48,466	4%	$196,887	$354,626	$1,415,708	$242,214	$966,948	$412,120	$338,353	$750,474	$2,426,685	$512,584	$1,657,459
5	$109,273	$48,932	5%	$196,887	$355,092	$1,770,800	$220,484	$1,099,528	$420,363	$433,335	$853,698	$3,280,384	$530,079	$2,036,860
6	$109,273	$49,398	6%	$196,887	$355,558	$2,126,358	$200,703	$1,200,274	$428,770	$532,879	$961,650	$4,242,033	$542,826	$2,394,517
7	$109,273	$49,864	7%	$196,887	$356,024	$2,482,382	$182,697	$1,273,855	$437,346	$637,203	$1,074,549	$5,316,582	$551,414	$2,728,247
8	$109,273	$50,330	8%	$196,887	$356,490	$2,838,872	$166,305	$1,324,355	$446,092	$746,538	$1,192,631	$6,509,213	$556,371	$3,036,596
9	$109,273	$50,796	9%	$196,887	$356,956	$3,195,828	$151,384	$1,355,343	$455,014	$861,123	$1,316,138	$7,825,351	$558,171	$3,318,713
10	$109,273	$51,262	10%	$196,887	$357,422	$3,553,251	$137,802	$1,369,932	$464,115	$981,212	$1,445,327	$9,270,678	$557,236	$3,574,248
11	$109,273	$51,728	11%	$196,887	$357,888	$3,911,139	$125,438	$1,370,830	$473,397	$1,107,068	$1,580,465	$10,851,143	$553,943	$3,803,259
12	$109,273	$52,194	12%	$196,887	$358,354	$4,269,493	$114,183	$1,360,392	$482,865	$1,238,968	$1,721,833	$12,572,976	$548,629	$4,006,138
13	$109,273	$52,660	13%	$196,887	$358,820	$4,628,313	$103,937	$1,340,657	$492,522	$1,377,203	$1,869,726	$14,442,702	$541,593	$4,183,536
14	$109,273	$53,126	14%	$196,887	$359,286	$4,987,599	$94,611	$1,313,391	$502,373	$1,522,077	$2,024,450	$16,467,152	$533,101	$4,336,316
15	$109,273	$53,592	15%	$196,887	$359,752	$5,347,352	$86,122	$1,280,113	$512,420	$1,673,908	$2,186,328	$18,653,480	$523,390	$4,465,495
16	$109,273	$54,058	16%	$196,887	$360,218	$5,707,570	$78,394	$1,242,134	$522,668	$1,833,031	$2,355,700	$21,009,180	$512,669	$4,572,210
17	$109,273	$54,524	17%	$196,887	$360,684	$6,068,254	$71,359	$1,200,572	$533,122	$1,999,796	$2,532,918	$23,542,098	$501,124	$4,657,679
18	$109,273	$54,990	18%	$196,887	$361,150	$6,429,405	$64,956	$1,156,385	$543,784	$2,174,571	$2,718,356	$26,260,454	$488,920	$4,723,173
19	$109,273	$55,456	19%	$196,887	$361,616	$6,791,021	$59,127	$1,110,386	$554,660	$2,357,739	$2,912,399	$29,172,853	$476,201	$4,769,995
20	$109,273	$55,922	20%	$196,887	$362,082	$7,153,103	$53,821	$1,063,263	$565,753	$2,549,703	$3,115,457	$32,288,310	$463,093	$4,799,452
21	$109,273	$56,388	21%	$0	$165,661	$7,318,765	$22,386	$988,989	$577,068	$2,549,703	$3,126,772	$35,415,081	$422,522	$4,785,660
22	$109,273	$56,854	22%	$0	$166,127	$7,484,892	$20,408	$919,489	$588,610	$2,549,703	$3,138,313	$38,553,394	$385,529	$4,736,129
23	$109,273	$57,321	23%	$0	$166,594	$7,651,486	$18,605	$854,504	$600,382	$2,549,703	$3,150,085	$41,703,479	$351,796	$4,657,368
24	$109,273	$57,787	24%	$0	$167,060	$7,818,545	$16,961	$793,782	$612,389	$2,549,703	$3,162,093	$44,865,572	$321,033	$4,555,004
25	$109,273	$58,253	25%	$0	$167,526	$7,986,071	$15,462	$737,082	$624,637	$2,549,703	$3,174,341	$48,039,913	$292,979	$4,433,892
26	$109,273	$58,719	26%	$0	$167,992	$8,154,062	$14,095	$684,170	$637,130	$2,549,703	$3,186,833	$51,226,746	$267,393	$4,298,203
27	$109,273	$59,185	27%	$0	$168,458	$8,322,520	$12,850	$634,823	$649,872	$2,549,703	$3,199,576	$54,426,322	$244,056	$4,151,514
28	$109,273	$59,651	28%	$0	$168,924	$8,491,444	$11,714	$588,825	$662,870	$2,549,703	$3,212,573	$57,638,895	$222,771	$3,996,874
29	$109,273	$60,117	29%	$0	$169,390	$8,660,833	$10,678	$545,974	$676,127	$2,549,703	$3,225,831	$60,864,726	$203,354	$3,836,876
30	$109,273	$60,583	30%	$0	$169,856	$8,830,689	$9,734	$506,074	$689,650	$2,549,703	$3,239,353	$64,104,079	$185,643	$3,673,712

Cost: Undiscounted **$8,830,689**; Discounted **$3,185,942**

Benefit: Undiscounted **$64,104,079**; Discounted **$13,223,353**

115

Table 20: (Continued)

	Net Benefit			
Net Annual Benefit	Net Cumulative Benefit	Discounted Net Annual Benefit	Discounted Net Cumulative Benefit	Discount
$113,856	$113,856	$103,505	$103,505	1.100
$203,671	$317,527	$168,323	$262,419	1.210
$297,603	$615,130	$223,594	$462,156	1.331
$395,848	$1,010,977	$270,369	$690,511	1.464
$498,606	$1,509,584	$309,595	$937,333	1.611
$606,091	$2,115,675	$342,123	$1,194,243	1.772
$718,525	$2,834,200	$368,717	$1,454,393	1.949
$836,141	$3,670,341	$390,066	$1,712,241	2.144
$959,182	$4,629,522	$406,787	$1,963,369	2.358
$1,087,905	$5,717,427	$419,434	$2,204,316	2.594
$1,222,577	$6,940,004	$428,506	$2,432,429	2.853
$1,363,479	$8,303,483	$434,446	$2,645,746	3.138
$1,510,905	$9,814,389	$437,655	$2,842,879	3.452
$1,665,164	$11,479,552	$438,490	$3,022,925	3.797
$1,826,576	$13,306,129	$437,268	$3,185,381	4.177
$1,995,482	$15,301,610	$434,275	$3,330,076	4.595
$2,172,234	$17,473,844	$429,765	$3,457,107	5.054
$2,357,205	$19,831,049	$423,964	$3,566,789	5.560
$2,550,783	$22,381,832	$417,073	$3,659,608	6.116
$2,753,374	$25,135,207	$409,272	$3,736,188	6.727
$2,961,110	$28,096,317	$400,136	$3,796,671	7.400
$2,972,185	$31,068,502	$365,121	$3,816,640	8.140
$2,983,492	$34,051,994	$333,191	$3,802,864	8.954
$2,995,033	$37,047,027	$304,073	$3,761,222	9.850
$3,006,815	$40,053,842	$277,517	$3,696,809	10.835
$3,018,842	$43,072,684	$253,297	$3,614,033	11.918
$3,031,118	$46,103,802	$231,207	$3,516,691	13.110
$3,043,650	$49,147,452	$211,057	$3,408,049	14.421
$3,056,441	$52,203,893	$192,676	$3,290,903	15.863
$3,069,498	$55,273,390	$175,908	$3,167,638	17.449

BCR: 7.26
Discounted BCR: 4.15

Total Project Benefit $55,273,390
Total Project Cost $10,037,410

Table 21: Cost Benefit Analysis / Net Present Values (30 Years Plot)
The Wilkes Building
New on Same Site Scenario

Rent Increase Rate: 2.00% Discount Rate: 10.00%

Year	Interest on Capital	Operating Expense	Expense Increase	Loan Payment	Annual Costs	Cumulative Costs	Discounted Annual Costs	Discounted Cumulative Costs	Operating Income	Equity	Annual Benefit	Cumulative Benefit	Discounted Annual Benefit	Discounted Cumulative Benefit
1	$163,855	$30,855	1%	$123,033	$317,742	$317,742	$288,857	$288,857	$305,494	$49,200	$354,694	$354,694	$322,449	$322,449
2	$163,855	$31,160	2%	$123,033	$318,048	$635,790	$262,850	$525,447	$311,604	$100,762	$412,366	$767,061	$340,799	$633,934
3	$163,855	$31,466	3%	$123,033	$318,353	$954,144	$239,184	$716,862	$317,836	$154,800	$472,636	$1,239,697	$355,099	$931,403
4	$163,855	$31,771	4%	$123,033	$318,659	$1,272,803	$217,648	$869,342	$324,193	$211,434	$535,627	$1,775,324	$365,840	$1,212,570
5	$163,855	$33,604	10%	$123,033	$320,492	$1,593,295	$199,000	$989,311	$330,677	$270,787	$601,464	$2,376,788	$373,462	$1,475,798
6	$163,855	$32,077	5%	$123,033	$318,964	$1,912,259	$180,047	$1,079,421	$337,290	$332,992	$670,282	$3,047,070	$378,357	$1,719,992
7	$163,855	$32,382	6%	$123,033	$319,270	$2,231,529	$163,836	$1,145,127	$344,036	$398,183	$742,219	$3,789,290	$380,876	$1,944,505
8	$163,855	$32,688	7%	$123,033	$319,575	$2,551,105	$149,084	$1,190,109	$350,917	$466,505	$817,422	$4,606,712	$381,333	$2,149,065
9	$163,855	$32,993	8%	$123,033	$319,881	$2,870,986	$135,661	$1,217,578	$357,935	$538,109	$896,044	$5,502,756	$380,010	$2,333,706
10	$163,855	$35,132	15%	$123,033	$322,019	$3,193,005	$124,152	$1,231,042	$365,094	$613,151	$978,245	$6,481,001	$377,156	$2,498,706
11	$163,855	$33,299	9%	$123,033	$320,186	$3,513,192	$112,223	$1,231,352	$372,396	$691,797	$1,064,193	$7,545,194	$372,993	$2,644,544
12	$163,855	$33,604	10%	$123,033	$320,492	$3,833,684	$102,119	$1,221,530	$379,844	$774,221	$1,154,065	$8,699,259	$367,721	$2,771,852
13	$163,855	$33,910	11%	$123,033	$320,797	$4,154,481	$92,924	$1,203,405	$387,441	$860,603	$1,248,044	$9,947,302	$361,514	$2,881,379
14	$163,855	$34,215	12%	$123,033	$321,103	$4,475,584	$84,556	$1,178,561	$395,189	$951,133	$1,346,323	$11,293,625	$354,529	$2,973,964
15	$163,855	$34,521	13%	$123,033	$321,408	$4,796,992	$76,943	$1,148,362	$403,093	$1,046,011	$1,449,104	$12,742,729	$346,904	$3,050,508
16	$163,855	$34,826	14%	$123,033	$321,714	$5,118,706	$70,014	$1,113,980	$411,155	$1,145,446	$1,556,601	$14,299,330	$338,762	$3,111,951
17	$163,855	$35,132	15%	$123,033	$322,019	$5,440,726	$63,710	$1,076,419	$419,378	$1,249,656	$1,669,034	$15,968,365	$330,210	$3,159,256
18	$163,855	$35,437	16%	$123,033	$322,325	$5,763,051	$57,973	$1,036,535	$427,766	$1,358,871	$1,786,637	$17,755,001	$321,342	$3,193,393
19	$163,855	$35,743	17%	$123,033	$322,630	$6,085,681	$52,753	$995,057	$436,321	$1,473,331	$1,909,652	$19,664,654	$312,243	$3,215,328
20	$163,855	$36,659	20%	$123,033	$323,547	$6,409,228	$48,093	$952,691	$445,047	$1,593,288	$2,038,336	$21,702,989	$302,986	$3,226,011
21	$163,855	$36,048	18%	$0	$199,903	$6,609,131	$27,013	$893,096	$453,948	$1,593,288	$2,047,237	$23,750,226	$276,644	$3,209,382
22	$163,855	$36,354	19%	$0	$200,208	$6,809,339	$24,595	$836,500	$463,027	$1,593,288	$2,056,315	$25,806,541	$252,610	$3,170,230
23	$163,855	$36,659	20%	$0	$200,514	$7,009,853	$22,393	$782,847	$472,288	$1,593,288	$2,065,576	$27,872,117	$230,680	$3,112,707
24	$163,855	$36,965	21%	$0	$200,819	$7,210,673	$20,388	$732,068	$481,734	$1,593,288	$2,075,022	$29,947,139	$210,668	$3,040,401
25	$163,855	$37,270	22%	$0	$201,125	$7,411,798	$18,563	$684,079	$491,368	$1,593,288	$2,084,656	$32,031,795	$192,405	$2,956,407
26	$163,855	$37,576	23%	$0	$201,430	$7,613,228	$16,901	$638,791	$501,196	$1,593,288	$2,094,484	$34,126,279	$175,739	$2,863,381
27	$163,855	$37,881	24%	$0	$201,736	$7,814,964	$15,388	$596,107	$511,220	$1,593,288	$2,104,508	$36,230,787	$160,527	$2,763,601
28	$163,855	$38,187	25%	$0	$202,041	$8,017,005	$14,010	$555,926	$521,444	$1,593,288	$2,114,732	$38,345,519	$146,643	$2,659,007
29	$163,855	$38,492	26%	$0	$202,347	$8,219,352	$12,756	$518,143	$531,873	$1,593,288	$2,125,161	$40,470,680	$133,969	$2,551,248
30	$163,855	$39,714	30%	$0	$203,569	$8,422,921	$11,666	$482,705	$542,510	$1,593,288	$2,135,798	$42,606,479	$122,400	$2,441,716

Cost — Undiscounted $8,422,921 Discounted $2,905,300
Benefit — Undiscounted $42,606,479 Discounted $8,966,868

117

Table 21: (Continued)

	Net Benefit			
Net Annual Benefit	Net Cumulative Benefit	Discounted Net Annual Benefit	Discounted Net Cumulative Benefit	Discount
$36,952	$36,952	$33,593	$33,593	1.100
$94,318	$131,270	$77,949	$108,488	1.210
$154,283	$285,553	$115,915	$214,540	1.331
$216,968	$502,521	$148,192	$343,229	1.464
$280,972	$783,493	$174,461	$486,488	1.611
$351,318	$1,134,811	$198,310	$640,571	1.772
$422,949	$1,557,760	$217,040	$799,377	1.949
$497,847	$2,055,607	$232,249	$958,956	2.144
$576,163	$2,631,770	$244,350	$1,116,127	2.358
$656,226	$3,287,996	$253,003	$1,267,665	2.594
$744,006	$4,032,002	$260,770	$1,413,192	2.853
$833,573	$4,865,575	$265,602	$1,550,322	3.138
$927,246	$5,792,821	$268,590	$1,677,974	3.452
$1,025,220	$6,818,041	$269,972	$1,795,403	3.797
$1,127,696	$7,945,737	$269,961	$1,902,146	4.177
$1,234,887	$9,180,624	$268,747	$1,997,971	4.595
$1,347,015	$10,527,639	$266,500	$2,082,837	5.054
$1,464,312	$11,991,951	$263,369	$2,156,858	5.560
$1,587,022	$13,578,973	$259,491	$2,220,271	6.116
$1,714,789	$15,293,761	$254,892	$2,273,320	6.727
$1,847,334	$17,141,095	$249,631	$2,316,286	7.400
$1,856,107	$18,997,202	$228,015	$2,333,730	8.140
$1,865,062	$20,862,264	$208,287	$2,329,859	8.954
$1,874,202	$22,736,466	$190,280	$2,308,333	9.850
$1,883,532	$24,619,998	$173,842	$2,272,327	10.835
$1,893,053	$26,513,051	$158,838	$2,224,590	11.918
$1,902,772	$28,415,823	$145,139	$2,167,493	13.110
$1,912,691	$30,328,514	$132,632	$2,103,081	14.421
$1,922,814	$32,251,328	$121,213	$2,033,105	15.863
$1,932,230	$34,183,558	$110,733	$1,959,010	17.449

Total Project Benefit: $34,183,558
Total Project Cost: $6,061,568

Table 22: Cost Benefit Analysis / Net Present Values (30 Years Plot)
The Wilkes Building
New on Greenfield Scenario

Rent Increase Rate: 2.00% Discount Rate: 10.00%

Year	Interest on Capital	Operating Expense	Expense Increase	Loan Payment	Annual Costs	Cumulative Costs	Discounted Annual Costs	Discounted Cumulative Costs	Operating Income	Equity	Annual Benefit	Cumulative Benefit	Discounted Annual Benefit	Discounted Cumulative Benefit
1	$156,078	$30,855	1%	$124,435	$311,367	$311,367	$283,061	$283,061	$305,494	$78,733	$384,228	$384,228	$349,298	$349,298
2	$156,078	$31,160	2%	$124,435	$311,673	$623,040	$257,581	$514,909	$311,604	$161,247	$472,852	$857,079	$390,786	$708,330
3	$156,078	$31,466	3%	$124,435	$311,978	$935,019	$234,394	$702,493	$317,836	$247,723	$565,560	$1,422,639	$424,913	$1,068,850
4	$156,078	$31,771	4%	$124,435	$312,284	$1,247,303	$213,294	$851,925	$324,193	$338,353	$662,546	$2,085,185	$452,528	$1,424,210
5	$156,078	$33,604	10%	$124,435	$314,117	$1,561,420	$195,042	$969,519	$330,677	$433,335	$764,012	$2,849,198	$474,391	$1,769,128
6	$156,078	$32,077	5%	$124,435	$312,589	$1,874,009	$176,449	$1,057,829	$337,290	$532,879	$870,170	$3,719,367	$491,188	$2,099,486
7	$156,078	$32,382	6%	$124,435	$312,895	$2,186,904	$160,565	$1,122,228	$344,036	$637,203	$981,240	$4,700,607	$503,531	$2,412,155
8	$156,078	$32,688	7%	$124,435	$313,200	$2,500,104	$146,110	$1,166,317	$350,917	$746,538	$1,097,455	$5,798,062	$511,971	$2,704,839
9	$156,078	$32,993	8%	$124,435	$313,506	$2,813,610	$132,957	$1,193,245	$357,935	$861,123	$1,219,059	$7,017,121	$517,000	$2,975,944
10	$156,078	$35,132	15%	$124,435	$315,644	$3,129,255	$121,695	$1,206,463	$365,094	$981,212	$1,346,306	$8,363,427	$519,059	$3,224,463
11	$156,078	$33,299	9%	$124,435	$313,811	$3,443,066	$109,989	$1,206,774	$372,396	$1,107,068	$1,479,464	$9,842,891	$518,543	$3,449,873
12	$156,078	$33,604	10%	$124,435	$314,117	$3,757,183	$100,087	$1,197,154	$379,844	$1,238,968	$1,618,812	$11,461,704	$515,803	$3,652,052
13	$156,078	$33,910	11%	$124,435	$314,422	$4,071,605	$91,077	$1,179,399	$387,441	$1,377,203	$1,764,644	$13,226,348	$511,155	$3,831,202
14	$156,078	$34,215	12%	$124,435	$314,728	$4,386,333	$82,878	$1,155,059	$395,189	$1,522,077	$1,917,267	$15,143,614	$504,876	$3,987,787
15	$156,078	$34,521	13%	$124,435	$315,033	$4,701,367	$75,416	$1,125,470	$403,093	$1,673,908	$2,077,002	$17,220,616	$497,218	$4,122,479
16	$156,078	$34,826	14%	$124,435	$315,339	$5,016,705	$68,627	$1,091,781	$411,155	$1,833,031	$2,244,186	$19,464,803	$488,400	$4,236,108
17	$156,078	$35,132	15%	$124,435	$315,644	$5,332,350	$62,449	$1,054,977	$419,378	$1,999,796	$2,419,175	$21,883,977	$478,621	$4,329,628
18	$156,078	$35,437	16%	$124,435	$315,950	$5,648,300	$56,826	$1,015,896	$427,766	$2,174,571	$2,602,337	$24,486,314	$468,053	$4,404,079
19	$156,078	$35,743	17%	$124,435	$316,255	$5,964,555	$51,710	$975,252	$436,321	$2,357,739	$2,794,060	$27,280,375	$456,851	$4,460,559
20	$156,078	$36,659	20%	$124,435	$317,172	$6,281,727	$47,146	$933,739	$445,047	$2,549,703	$2,994,751	$30,275,126	$445,151	$4,500,205
21	$156,078	$36,048	18%	$0	$192,126	$6,473,853	$25,962	$874,815	$453,948	$2,549,703	$3,003,652	$33,278,777	$405,885	$4,496,980
22	$156,078	$36,354	19%	$0	$192,431	$6,666,284	$23,639	$818,926	$463,027	$2,549,703	$3,012,731	$36,291,508	$370,102	$4,458,266
23	$156,078	$36,659	20%	$0	$192,737	$6,859,021	$21,524	$766,003	$472,288	$2,549,703	$3,021,991	$39,313,500	$337,490	$4,390,459
24	$156,078	$36,965	21%	$0	$193,042	$7,052,063	$19,599	$715,965	$481,734	$2,549,703	$3,031,437	$42,344,937	$307,768	$4,299,095
25	$156,078	$37,270	22%	$0	$193,348	$7,245,411	$17,845	$668,722	$491,368	$2,549,703	$3,041,072	$45,386,009	$280,679	$4,188,947
26	$156,078	$37,576	23%	$0	$193,653	$7,439,064	$16,249	$624,178	$501,196	$2,549,703	$3,050,899	$48,436,908	$255,987	$4,064,121
27	$156,078	$37,881	24%	$0	$193,959	$7,633,023	$14,795	$582,229	$511,220	$2,549,703	$3,060,923	$51,497,831	$233,480	$3,928,135
28	$156,078	$38,187	25%	$0	$194,264	$7,827,287	$13,471	$542,770	$521,444	$2,549,703	$3,071,147	$54,568,978	$212,964	$3,783,996
29	$156,078	$38,492	26%	$0	$194,570	$8,021,857	$12,266	$505,693	$531,873	$2,549,703	$3,081,576	$57,650,555	$194,261	$3,634,257
30	$156,078	$39,714	30%	$0	$195,792	$8,217,649	$11,221	$470,942	$542,510	$2,549,703	$3,092,214	$60,742,768	$177,210	$3,481,080
					Undiscounted $8,217,649		Discounted $2,843,923				Undiscounted $60,742,768		Discounted $12,295,165	

119

Table 22: (Continued)

| | Net Benefit | | | |
Net Annual Benefit	Net Cumulative Benefit	Discounted Net Annual Benefit	Discounted Net Cumulative Benefit	Discount
$72,860	$72,860	$66,237	$66,237	1.100
$161,179	$234,039	$133,205	$193,421	1.210
$253,581	$487,620	$190,519	$366,356	1.331
$350,262	$837,883	$239,234	$572,285	1.464
$449,895	**$1,287,778**	**$279,350**	**$799,609**	**1.611**
$557,580	$1,845,358	$314,740	$1,041,657	1.772
$668,345	$2,513,703	$342,966	$1,289,927	1.949
$784,255	$3,297,958	$365,861	$1,538,522	2.144
$905,553	$4,203,511	$384,043	$1,782,699	2.358
$1,030,662	**$5,234,173**	$397,365	**$2,018,000**	**2.594**
$1,165,653	$6,399,825	$408,554	$2,243,100	2.853
$1,304,695	$7,704,521	$415,716	$2,454,898	3.138
$1,450,222	$9,154,742	$420,078	$2,651,803	3.452
$1,602,539	$10,757,281	$421,999	$2,832,728	3.797
$1,761,968	$12,519,250	$421,801	$2,997,009	4.177
$1,928,848	$14,448,097	$419,773	$3,144,327	4.595
$2,103,530	$16,551,627	$416,172	$3,274,651	5.054
$2,286,387	$18,838,015	$411,227	$3,388,183	5.560
$2,477,805	$21,315,820	$405,141	$3,485,307	6.116
$2,677,579	**$23,993,399**	$398,005	**$3,566,466**	**6.727**
$2,811,526	$26,804,925	$379,923	$3,622,165	7.400
$2,820,299	$29,625,224	$346,462	$3,639,340	8.140
$2,829,255	$32,454,479	$315,966	$3,624,456	8.954
$2,838,395	$35,292,874	$288,170	$3,583,130	9.850
$2,847,724	$38,140,598	$262,834	$3,520,225	10.835
$2,857,246	$40,997,843	$239,739	$3,439,943	11.918
$2,866,964	$43,864,808	$218,685	$3,345,906	13.110
$2,876,883	$46,741,691	$199,493	$3,241,225	14.421
$2,887,007	$49,628,698	$181,995	$3,128,564	15.863
$2,896,422	**$52,525,120**	$165,990	**$3,010,139**	**17.449**

Total Project Benefit: **$52,525,120**
Total Project Cost: **$9,451,242**

Table 23: Cost Benefit Analysis / Net Present Values (30 Years Plot)
The Wilkes Building
Adaptive Reuse with Government Incentives

Rent Increase Rate: 2.00% Discount Rate: 10.00%

Year	Interest on Capital	Operating Expense	Expense Increase	Loan Payment	Annual Costs	Cumulative Costs	Discounted Annual Costs	Discounted Cumulative Costs	Operating Income	Equity	Annual Benefit	Cumulative Benefit	Discounted Annual Benefit	Discounted Cumulative Benefit
1	$11,773	$47,068	1%	$196,887	$255,728	$255,728	$232,480	$232,480	$388,350	$78,733	$467,084	$467,084	$424,622	$424,622
2	$11,773	$47,534	2%	$196,887	$256,194	$511,922	$211,731	$423,076	$396,117	$161,247	$557,365	$1,024,448	$460,632	$846,652
3	$11,773	$48,000	3%	$196,887	$256,660	$768,582	$192,832	$577,447	$404,040	$247,723	$651,763	$1,676,212	$489,679	$1,259,363
4	$11,773	$48,466	4%	$196,887	$257,126	$1,025,708	$175,621	$700,572	$412,120	$338,353	$750,474	$2,426,685	$512,584	$1,657,459
5	$11,773	$51,262	10%	$196,887	$259,922	$1,285,630	$161,391	$798,275	$420,363	$433,335	$853,698	$3,280,384	$530,079	$2,036,860
6	$11,773	$48,932	5%	$196,887	$257,592	$1,543,222	$145,404	$871,109	$428,770	$532,879	$961,650	$4,242,033	$542,826	$2,394,517
7	$11,773	$49,398	6%	$196,887	$258,058	$1,801,280	$132,425	$924,342	$437,346	$637,203	$1,074,549	$5,316,582	$551,414	$2,728,247
8	$11,773	$49,864	7%	$196,887	$258,524	$2,059,804	$120,603	$960,914	$446,092	$746,538	$1,192,631	$6,509,213	$556,371	$3,036,596
9	$11,773	$50,330	8%	$196,887	$258,990	$2,318,794	$109,837	$983,395	$455,014	$861,123	$1,316,138	$7,825,351	$558,171	$3,318,713
10	$11,773	$53,592	15%	$196,887	$262,252	$2,581,047	$101,110	$995,105	$464,115	$981,212	$1,445,327	$9,270,678	$557,236	$3,574,248
11	$11,773	$50,796	9%	$196,887	$259,456	$2,840,503	$90,938	$995,579	$473,397	$1,107,068	$1,580,465	$10,851,143	$553,943	$3,803,259
12	$11,773	$51,262	10%	$196,887	$259,922	$3,100,425	$82,819	$987,891	$482,865	$1,238,968	$1,721,833	$12,572,976	$548,629	$4,006,138
13	$11,773	$51,728	11%	$196,887	$260,388	$3,360,813	$75,425	$973,508	$492,522	$1,377,203	$1,869,726	$14,442,702	$541,593	$4,183,536
14	$11,773	$52,194	12%	$196,887	$260,854	$3,621,667	$68,691	$953,698	$502,373	$1,522,077	$2,024,450	$16,467,152	$533,101	$4,336,316
15	$11,773	$52,660	13%	$196,887	$261,320	$3,882,988	$62,558	$929,556	$512,420	$1,673,908	$2,186,328	$18,653,480	$523,390	$4,465,495
16	$11,773	$53,126	14%	$196,887	$261,786	$4,144,774	$56,972	$902,024	$522,668	$1,833,031	$2,355,700	$21,009,180	$512,669	$4,572,210
17	$11,773	$53,592	15%	$196,887	$262,252	$4,407,026	$51,885	$871,907	$533,122	$1,999,796	$2,532,918	$23,542,098	$501,124	$4,657,679
18	$11,773	$54,058	16%	$196,887	$262,718	$4,669,744	$47,252	$839,895	$543,784	$2,174,571	$2,718,356	$26,260,454	$488,920	$4,723,173
19	$11,773	$54,524	17%	$196,887	$263,184	$4,932,929	$43,033	$806,573	$554,660	$2,357,739	$2,912,399	$29,172,853	$476,201	$4,769,995
20	$11,773	$55,922	20%	$196,887	$264,582	$5,197,511	$39,328	$772,577	$565,753	$2,549,703	$3,115,457	$32,288,310	$463,093	$4,799,452
21	$11,773	$54,990	18%	$0	$66,763	$5,264,274	$9,022	$711,364	$577,068	$2,549,703	$3,126,772	$35,415,081	$422,522	$4,785,660
22	$11,773	$55,456	19%	$0	$67,229	$5,331,504	$8,259	$654,954	$588,610	$2,549,703	$3,138,313	$38,553,394	$385,529	$4,736,129
23	$11,773	$55,922	20%	$0	$67,695	$5,399,199	$7,560	$602,973	$600,382	$2,549,703	$3,150,085	$41,703,479	$351,796	$4,657,368
24	$11,773	$56,388	21%	$0	$68,161	$5,467,361	$6,920	$555,077	$612,389	$2,549,703	$3,162,093	$44,865,572	$321,033	$4,555,004
25	$11,773	$56,854	22%	$0	$68,627	$5,535,988	$6,334	$510,950	$624,637	$2,549,703	$3,174,341	$48,039,913	$292,979	$4,433,892
26	$11,773	$57,321	23%	$0	$69,094	$5,605,082	$5,797	$470,297	$637,130	$2,549,703	$3,186,833	$51,226,746	$267,393	$4,298,203
27	$11,773	$57,787	24%	$0	$69,560	$5,674,641	$5,306	$432,848	$649,872	$2,549,703	$3,199,576	$54,426,322	$244,056	$4,151,514
28	$11,773	$58,253	25%	$0	$70,026	$5,744,667	$4,856	$398,354	$662,870	$2,549,703	$3,212,573	$57,638,895	$222,771	$3,996,874
29	$11,773	$58,719	26%	$0	$70,492	$5,815,158	$4,444	$366,584	$676,127	$2,549,703	$3,225,831	$60,864,726	$203,354	$3,836,876
30	$11,773	$60,583	30%	$0	$72,356	$5,887,514	$4,147	$337,405	$689,650	$2,549,703	$3,239,353	$64,104,079	$185,643	$3,673,712

Cost — Undiscounted $5,887,514 Discounted $2,264,980

Benefit — Undiscounted $64,104,079 Discounted $13,223,353

Table 23: (Continued)

| | Net Benefit | | | |
Net Annual Benefit	Net Cumulative Benefit	Discounted Net Annual Benefit	Discounted Net Cumulative Benefit	Discount
$211,356	$211,356	$192,142	$192,142	1.100
$301,171	$512,527	$248,901	$423,576	1.210
$395,103	$907,630	$296,847	$681,916	1.331
$493,348	$1,400,977	$336,963	$956,886	1.464
$593,776	$1,994,754	$368,688	$1,238,585	1.611
$704,058	$2,698,811	$397,422	$1,523,409	1.772
$816,491	$3,515,302	$418,989	$1,803,906	1.949
$934,107	$4,449,409	$435,768	$2,075,682	2.144
$1,057,148	$5,506,556	$448,334	$2,335,317	2.358
$1,183,075	$6,689,631	$456,127	$2,579,142	2.594
$1,321,009	$8,010,640	$463,006	$2,807,681	2.853
$1,461,911	$9,472,551	$465,810	$3,018,247	3.138
$1,609,337	$11,081,889	$466,168	$3,210,028	3.452
$1,763,596	$12,845,485	$464,410	$3,382,618	3.797
$1,925,008	$14,770,493	$460,832	$3,535,939	4.177
$2,093,914	$16,864,406	$455,697	$3,670,186	4.595
$2,270,666	$19,135,072	$449,239	$3,785,772	5.054
$2,455,637	$21,590,710	$441,668	$3,883,279	5.560
$2,649,215	$24,239,925	$433,168	$3,963,421	6.116
$2,850,874	$27,090,799	$423,764	$4,026,875	6.727
$3,060,008	$30,150,807	$413,501	$4,074,296	7.400
$3,071,084	$33,221,890	$377,270	$4,081,175	8.140
$3,082,390	$36,304,280	$344,236	$4,054,395	8.954
$3,093,931	$39,398,211	$314,113	$3,999,927	9.850
$3,105,713	$42,503,924	$286,645	$3,922,942	10.835
$3,117,740	$45,621,664	$261,595	$3,827,906	11.918
$3,130,016	$48,751,681	$238,750	$3,718,665	13.110
$3,142,548	$51,894,228	$217,915	$3,598,520	14.421
$3,155,339	$55,049,567	$198,911	$3,470,292	15.863
$3,166,998	$58,216,565	$181,496	$3,336,307	17.449

Total Project Benefit: $58,216,565
Total Project Cost: $10,958,373

122

Figure 11
The Wilkes Building
Annual Costs and Benefits
30 Year Plot
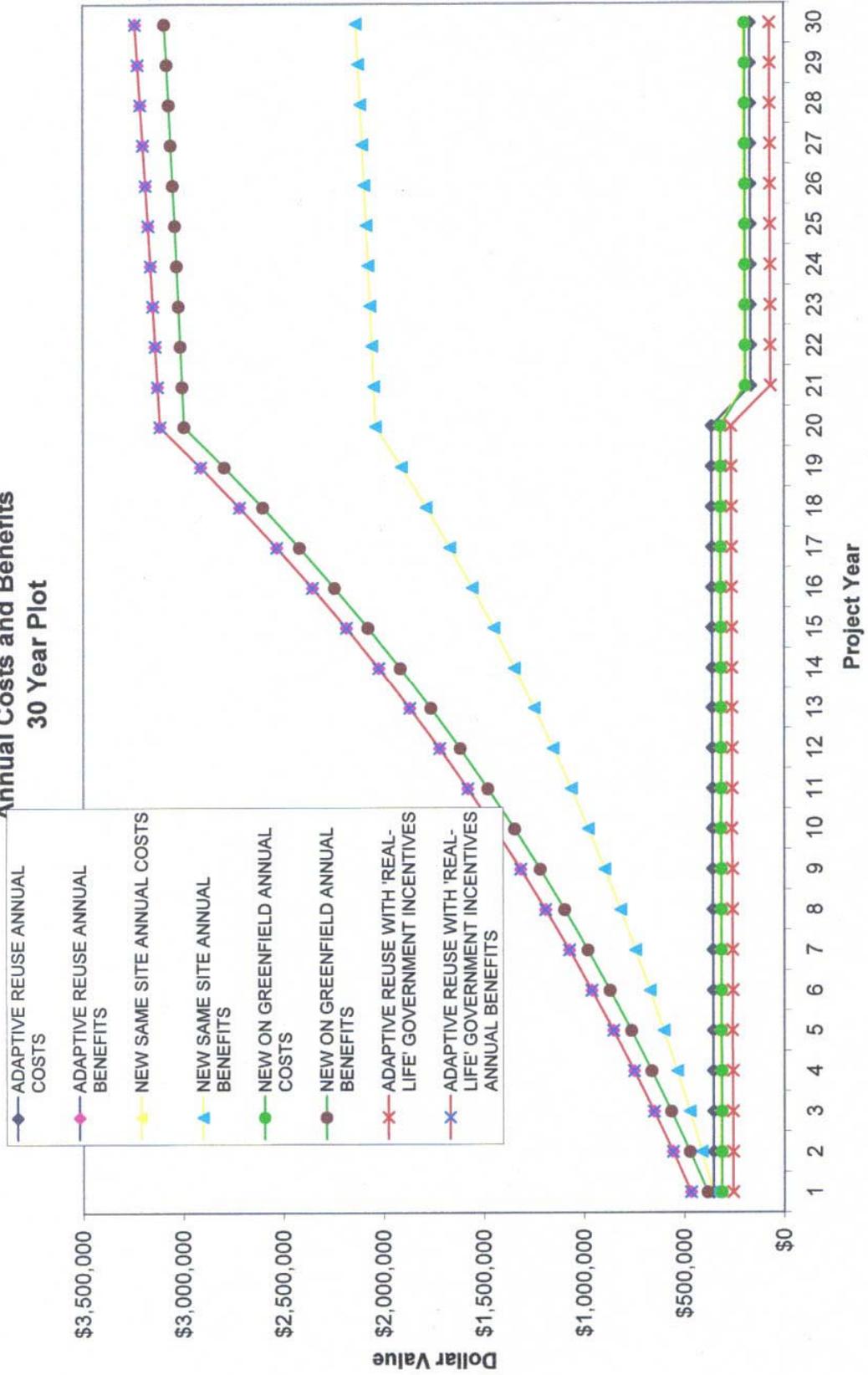
Chapter 8
Findings & Analysis

When an investor considers a particular real-estate development, the prospective investor will look at the dollars involved in four main categories: The return on investment, Government grants (if available), the capital cost and the projection of the annual costs and benefits the project entails. This study was able to compare the economic feasibility of conservation versus new construction within the framework of these categories.

8.1 The Return on Investment (ROI)

This study looked at the return on investment from two perspectives; 1- the unleveraged return on investment, where no financing has been considered and the capital cost of the project has been funded completely by the owner; 2- the cash on cash return on investment where a portion of the capital cost is financed by the bank.

Unleveraged return on investment: Overall, the figures that were gathered indicate that the unleveraged return on investment of the adaptive reuse scenario without considering any government incentives comes out to be generally higher than the option of demolition and new construction. When we compare the unleveraged ROI of adaptive reuse with the option of new construction on greenfield we found that the Waterloo Ave and the Wilkes building case studies turned out to be of higher unleveraged ROI, on the other hand, the adaptive reuse of the Lawyer's Hall case study was slightly of a lower unleveraged ROI from it's alternative hypothetical scenario of new construction on greenfield.

	Waterloo Ave	Lawyers Hall Building	The Wilkes Building
Adaptive Reuse	6.7 1 %	3.22 %	6.13 %
New Same Site	5.09 %	2.95 %	5.26 %
New on Greenfield	5.27 %	3.35 %	5.42 %

Table 24: Unleveraged Return on Investment

Source: The pro-forma analyses pages 79, 100, 124

<u>Cash on cash return on investment:</u> this analysis represent the annual ROI based on what the cash flow stands for as a percentage of what the investor put into the project. We based our analysis on the amount of money the bank is willing to lend the investor based on a capitalization rate set by the bank. This rate is used to determine the value of the project based on its' net operating income. A loan to value ratio is used by the bank to calculate the amount of money the bank is willing to put into the project. It was assumed the bank will use a 75% loan to value ratio for both the adaptive reuse and new construction scenarios. Out analysis revealed that in the case of higher cash on cash return on investment in the Waterloo Ave, and the Lawyer's Hall case studies. In the case of the Wilkes Building the cash on cash return on investment of the adaptive reuse scenario was considerably lower than the two hypothetical scenarios of new construction.

	Waterloo Ave	Lawyers Hall Building	The Wilkes Building
Adaptive Reuse	5.27 %	1.46 %	2.43 %
New Same Site	2.69 %	1.12 %	2.86 %
New on Greenfield	2.88 %	1.39. %	3.04 %

Table 25: Cash on Cash Return on Investment

Source: The pro-forma analyses pages 79, 100, 124

	Waterloo Ave	Lawyers Hall Building	The Wilkes Building
Unit Price	*1-Adaptive Reuse* *2- New Greenfield* *3- New Same Site*	*1-Adaptive Reuse* *2- New Greenfield* *3- New Same Site*	*1-Adaptive Reuse* *2-New Greenfield* *3-New Same Site*
Net Income To Construction Cost Ratio	*1-Adaptive Reuse* *2-New Greenfield* *3-New Same Site*	*1-New Greenfield* *2-Adaptive Reuse* *3-New Same Site*	*1-Adaptive Reuse* *2-New Greenfield* *3-New Same Site*
Unleveraged ROI	*1-Adaptive Reuse* *2- New Greenfield* *3- New Same Site*	*1-New Greenfield* *2- Adaptive Reuse* *3- New Same Site*	*1-Adaptive Reuse* *2-New Greenfield* *3-New Same Site*
Cash on cash ROI	*1-Adaptive Reuse* *2- New Greenfield* *3- New Same Site*	*1-New Greenfield* *2-Adaptive Reuse* *3-New Same Site*	*1-New Greenfield* *2-New Same Site* *3-Adaptive Reuse*

Table 26: Which Scenario made the most economic sense?

By analyzing table 4 we found the following:

1- The construction cost of Adaptive Reuse turned out to be the lowest in all three case studies.

2- The adaptive reuse option proved a generally higher unleveraged return on investment

3- The option of new construction on the same site did not compete with the other two options of adaptive reuse and new construction on greenfield and in almost all cases this option made the least economic sense in terms of construction cost, unleveraged ROI, and cash on cash ROI.

4- From table 4, by using a scoring system in each category so that a score of 1 will be assigned to an option if it turned out to be the first in a category and 2 if 2nd and 3 if 3rd, which means the lower the score the more economically feasible the option is. It was found that the adaptive reuse option scored 17, the new greenfield option scored 20, and the new on the same site option scored 35.

8.2 Government Grants

By applying the grants that each real-life adaptive reuse project received from the government to the equation we found that those grants increased the ROI for the adaptive reuse scenarios significantly. The 1st case study, 371 Waterloo Ave, Guelph, received a government grant of $1,000,000. Our analysis revealed that this grant has doubled the ROI of this project to 11.0%. The same applies to the 2nd case study, the Lawyer's Hall which received a government grant of $717,000. This grant almost doubled the ROI to 2.71%. Whereas in the 3rd case study, the Wilkes Building, a government grant of $975,000 has increased the ROI not as significant as the others (to 2.53% from 2.43%.)

	Waterloo Ave	Lawyers Hall Building	The Wilkes Building
Adaptive Reuse	*From 5.28% To 11.00 % Increased by 108%*	*From 1.46 To 2.71 % Increased by 86%*	*From 2.43% To 22.53 % Increased by 827%*
New Same Site	*3.24 %*	*1.12 %*	*2.86 %*
New on Greenfield	*3.44 %*	*1.32. %*	*2.52 %*

Table 27: Cash on Cash ROI After Government Grant

Source: The pro-forma analyses pages 79, 100, 124

On the other hand, if we look at the unleveraged return on investment after applying the government grant we can see that there has been increase in the ROI but not as significant as the increase of cash on cash ROI.

	Waterloo Ave	Lawyers Hall Building	The Wilkes Building
Adaptive Reuse	*From 6.72% To 8.56 % Increased by 27 %*	*From 3.22% To 4.82 % Increased by 49%*	*From 6.13% To 8.38 % Increased by 36%*
New Same Site	*3.24 %*	*1.12 %*	*2.86 %*
New on Greenfield	*3.44 %*	*1.32. %*	*2.52 %*

Table 28: Unleveraged ROI After Government Grant

Source: The pro-forma analyses pages 79, 100, 124

From the above noted table it is clear that the government grant had a significant positive affect on the cash on cash ROI which is the first thing the investor looks at when considering a real-estate investment. Why the increase is much higher in the cash on cash ROI than the unleveraged ROI? The answer to this question is simple. The government grant reduces the amount of money the investor is required to spend on the project which increased the ratio of the cash flow to the capital cost.

Tax incentives:

In our experiment we looked at several types of government incentives and how it might affect the return on investment for the adaptive reuse scenario.

1- Government incentive = 30% property tax credit.

	Waterloo Ave	Lawyers Hall Building	The Wilkes Building
Adaptive Reuse	7.40 % Increased by 40%	2.51 % Increased by 72%	5.07 % Increased by 126%
New Same Site	2.69 %	1.12 %	2.86 %
New on Greenfield	2.88 %	1.32. %	2.52 %

Table 29: Cash on Cash ROI after 30% Property Tax Credit

Source: The pro-forma analyses pages 80, 101, 125

2- Government incentive = 6% tax credit on construction cost.

	Waterloo Ave	Lawyers Hall Building	The Wilkes Building
Adaptive Reuse	7.06 % Increased by 34%	1.56 % Increased by 39%	2.74 % Increased by 22%
New Same Site	2.69 %	1.12 %	2.86 %
New on Greenfield	2.88 %	1.32. %	2.52 %

Table 30: Cash on Cash ROI after 6% Tax Credit on Construction Cost

Source: The pro-forma analyses pages 90, 101, 125

3- Government incentive = 0% interest loan equal to the amount of money offered by the bank.

	Waterloo Ave	Lawyers Hall Building	The Wilkes Building
Adaptive Reuse	*9.14 %* *Increased by 73%*	*2.52 %* *Increased by 125%*	*8.78 %* *Increased by 261%*
New Same Site	*2.69 %*	*1.12 %*	*2.86 %*
New on Greenfield	*2.88 %*	*1.32. %*	*2.52 %*

Table 31: Cash on Cash ROI with 0% interest loan available

Source: The pro-forma analyses pages 80, 101, 125

By comparing the above three tables, we found the most effective government incentive is the 0% interest loan which increased the cash on cash return on investment significantly and put the adaptive reuse option by far in favor of the other two options of new construction on the same site and on greenfield.

Relief on parking requirements: When this research was started it was assumed that the relief on the parking requirements would have a significant impact on the return on investment. Normally, the top priority of developers is to maximize the building area on the property. The main obstacle they face when pursuing this objective is parking requirement. Parking occupies large area of the property which limits the area of building allowable on the property. In our experiment on the Waterloo Ave case study we assumed the city offered the investor a reduction in the number of parking required by 3 spaces which allowed the investor to add one more additional rentable unit on his property. Our analysis revealed an increase in the cash on cash return on investment by 18% and 7% increase in the unleveraged ROI. Although the increase is not significant when we compare it with other types of government incentives, but for sure this type of incentive puts the adaptive reuse option in favor of the new construction options and makes it more attractive for investors without the need from the city to contribute any money to the project.

	Waterloo Ave (Adaptive Reuse Scenario)	
	Without Incentives	With Relief on Parking Requirements
Unleveraged ROI	*6.71 %*	*7.16 %* *Increased by* **7%**
Cash on Cash ROI	*5.27%*	*6.22%* *Increased by* **18%**

Table 32: Parking Relief (Waterloo Ave Case Study)

Source: The pro-forma analysis pages 79 and 81

8.3 The Capital Cost

There are three types of capital costs involved in both new construction and adaptive reuse: construction cost, demolition cost, and acquisition cost. In terms of construction cost comparison between adaptive reuse and new construction, the study revealed interestingly a volatile mix of different results. The adaptive reuse 'real-life' scenario of 371 Waterloo Ave, came out to be of a considerably lower cost than its two new construction hypothetical scenarios. In the case of the Lawyer's Hall building and the Wilkes building in Brantford the construction cost of adaptive reuse project was slightly lower than the cost of new construction. In general, in all three case studies, the construction cost of adaptive reuse turned out to be lower than the cost of demolition and new construction.

	Waterloo Ave	Lawyers Hall Building	The Wilkes Building
Adaptive Reuse	*$72.2*	$109.8	$107.6
New Same Site	*$110.9*	$120.8	$113.3
New on Greenfield	*$107.5*	$109.9	$111

Table 33: Construction Cost

Source: The pro-forma analyses pages 78, 99, 122

Demolition cost: In all three case studies the construction cost of new on the same site came out higher than the construction cost of new on greenfield by $3/sqf in the case of 371 Waterloo Ave,

$1/sqf in the case of the Wilkes building and $9/sqf in the case of The Lawyer's Hall. This is mainly due to the demolition cost and the environmental clean up cost associated with new on the same site scenario. This difference in the construction cost between the new construction scenarios had led to an approximately 0.2% difference in the cash on cash ROI in favor of the new on greenfield scenarios (see Table 25: Cash on Cash ROI).

8.4 Annual Costs and Benefits (The Cost Benefit Analysis)

Using the Cost Benefit Analysis approach, the study was able to calculate the total net benefit of each scenario over the span of 30 years. The outcome was a volatile mix of deferent results.

8.4.1 Cost Benefit Analysis - 371 Waterloo Ave

With regard to 371 Waterloo Ave case study, the initial outcome of the 'pro-forma' analysis revealed the adaptive reuse scenario as the most economically viable option; even without the need for government incentives (See table 25 page 136). However, the cost benefit analysis Revealed that the net and discounted net total project benefit of the two new construction scenarios turned out to be significantly higher than the adaptive reuse scenario with and without 'real-life' government incentives.

371 Waterloo Ave	30 Year Total Accumulated Net Benefits	
	Undiscounted	**Discounted**
Adaptive Reuse	*$55,717,436*	*$3,193,086*
New Same Site	*$89,492,125*	*$5,128,448*
New on Greenfield	*$91,582,289*	*$5,248,448*
Adaptive Reuse W/ 'Real-Life' Incentives	*$58,638,655*	*$3,360,496*

**Table 34: 30 Year Total Accumulated Net Benefits - 371 Waterloo Ave**
Source: The CBA analysis pages 83, 85, 87, 89

Further, both new construction scenarios, after five years, they started to generate more profit (net benefit) than the two adaptive reuse scenario (with and without 'real-life' government grant.)

**Figure 12: Net Annual Benefit / 30 Year Plot - 371 Waterloo Ave**
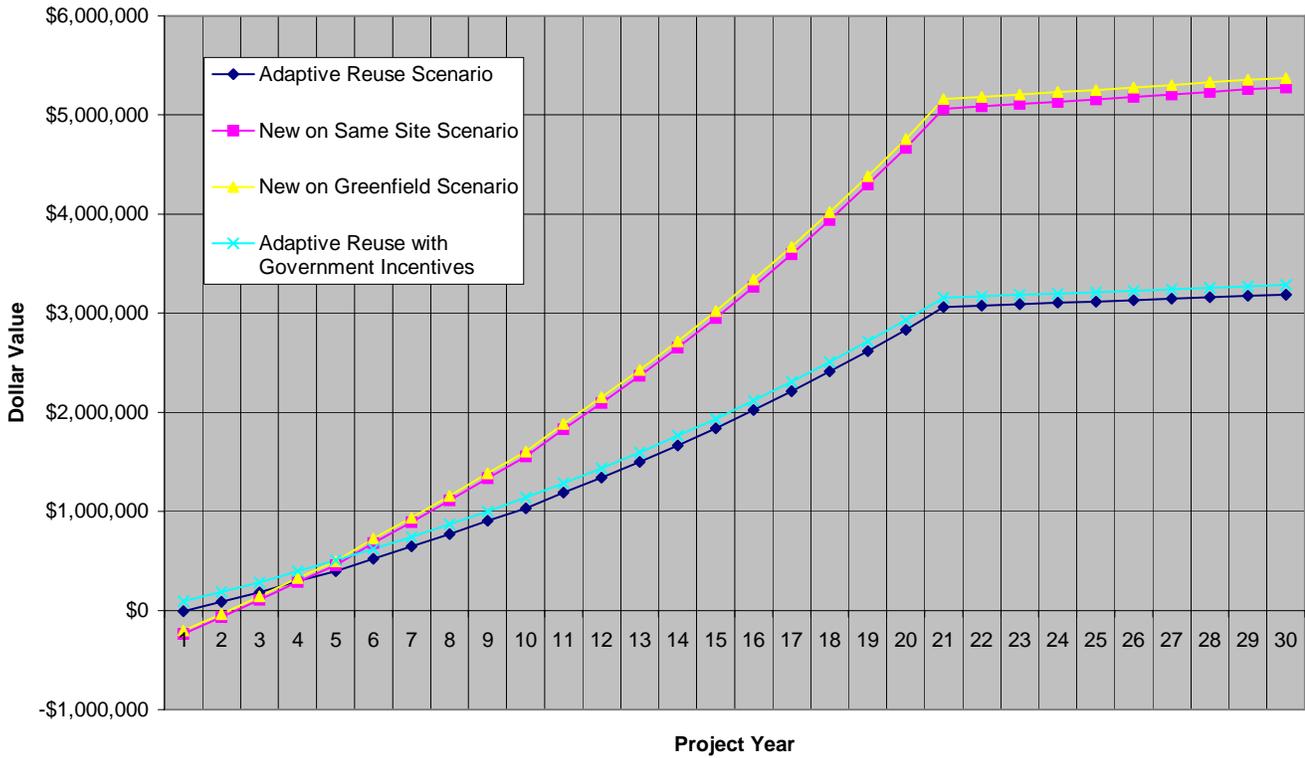
Figure 13: Discounted Net Annual Benefit / 30 Year Plot - 371 Waterloo Ave
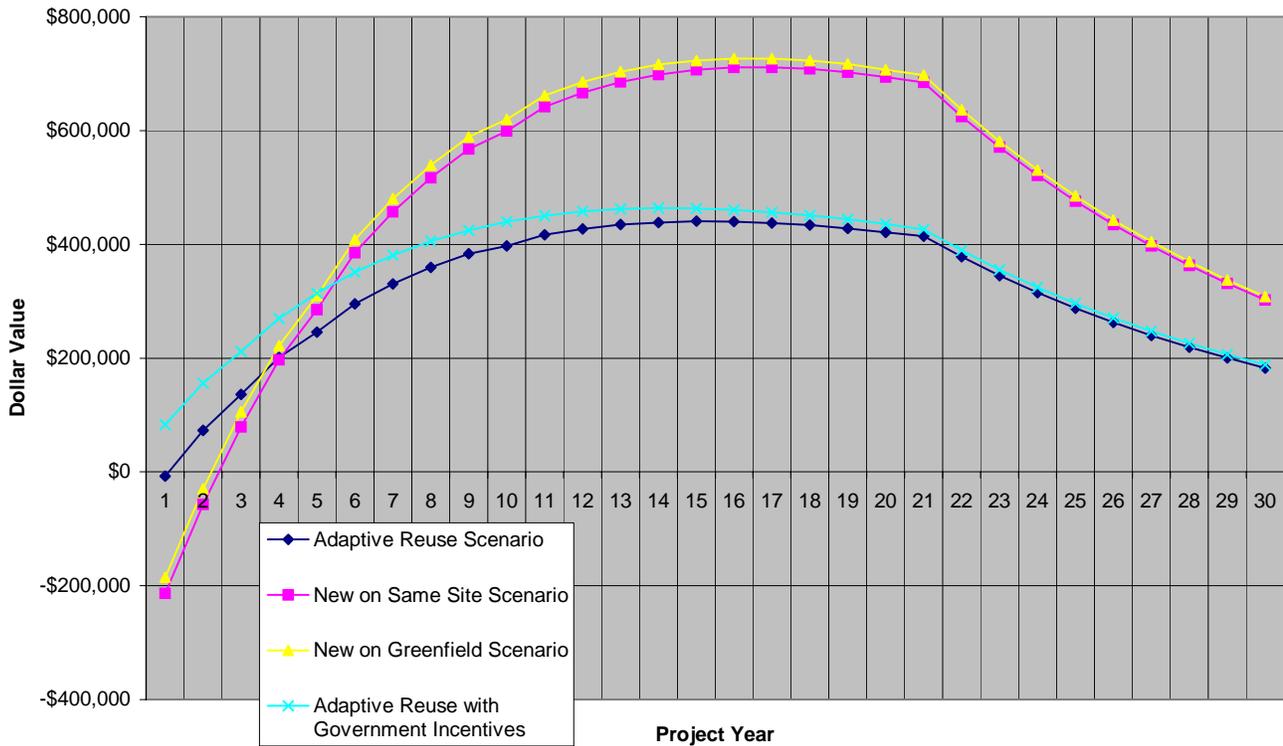
Figure 14: Net Cumulative Benefit / 30 Year Plot - 371 Waterloo Ave
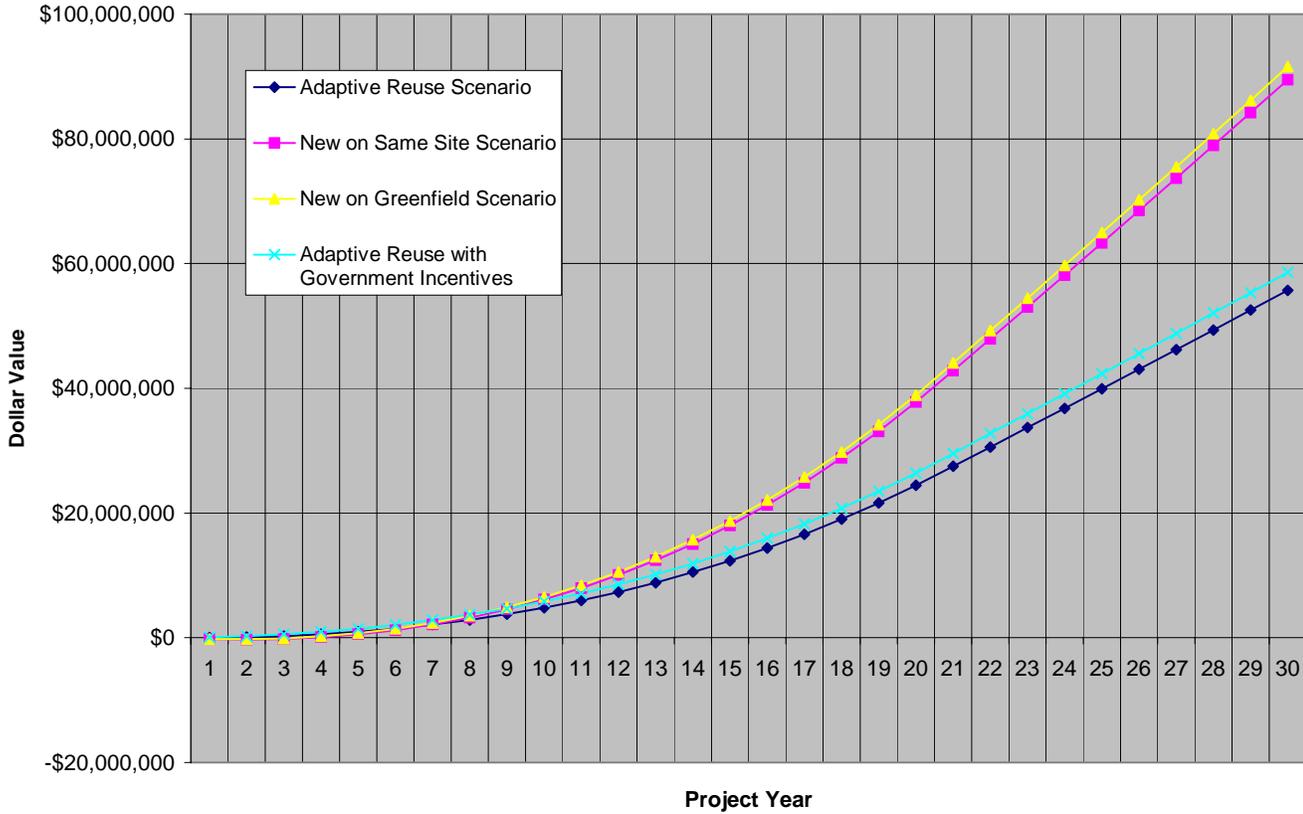

**Figure 15: Net Cumulative Benefit / 12 Year Plot – 371 Waterloo Ave**
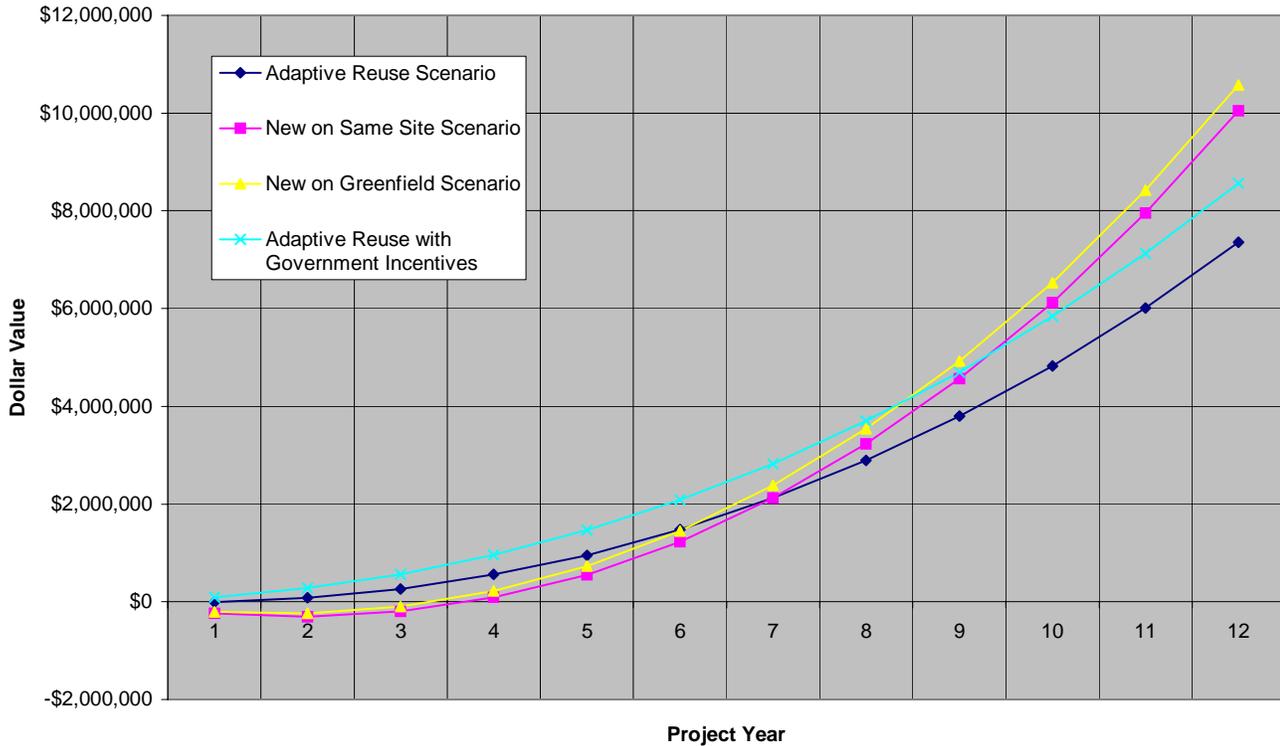
Figure 16: Discounted Cumulative Net Benefit / 5 Year Plot - 371 Waterloo Ave
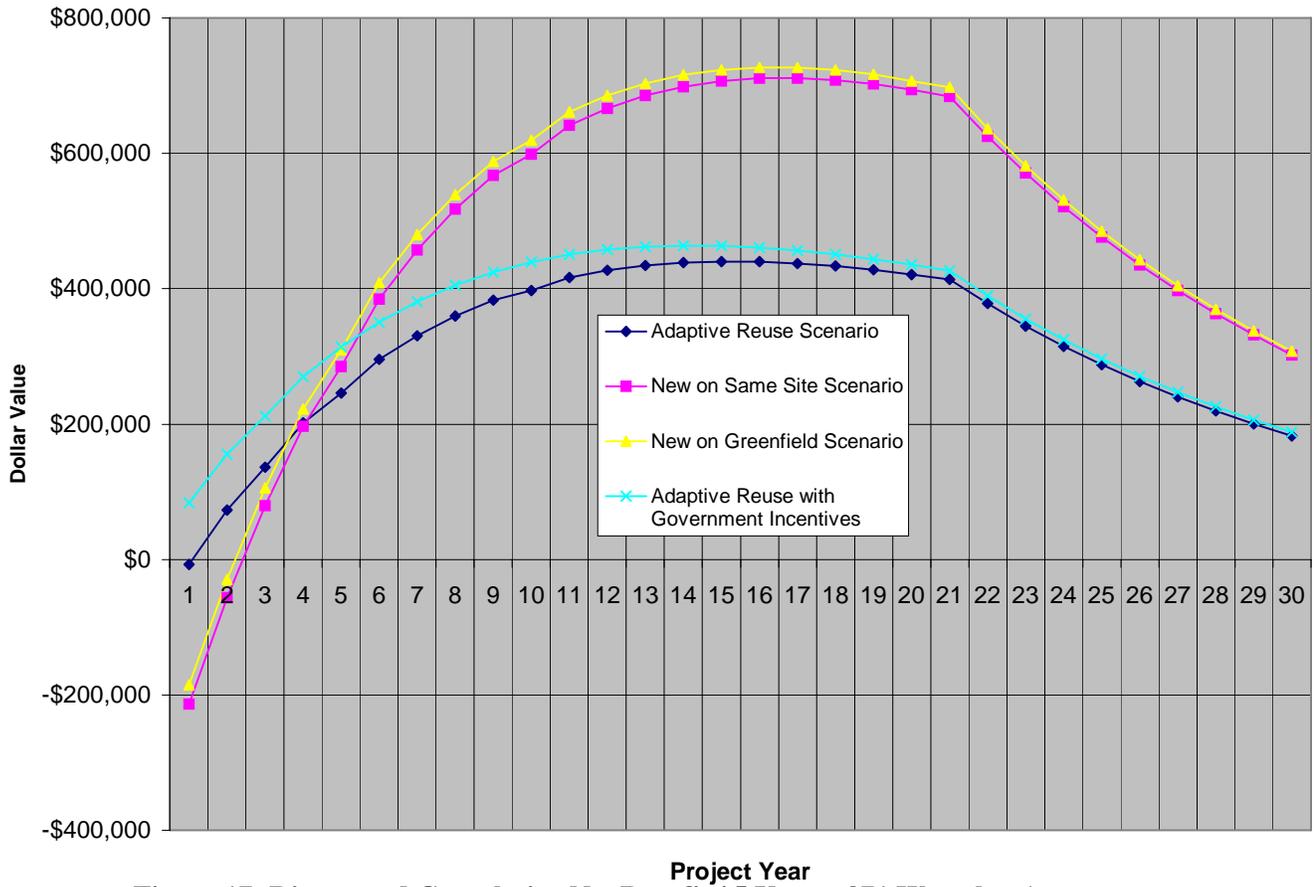
Figure 17: Discounted Cumulative Net Benefit / 5 Year – 371 Waterloo Ave

134
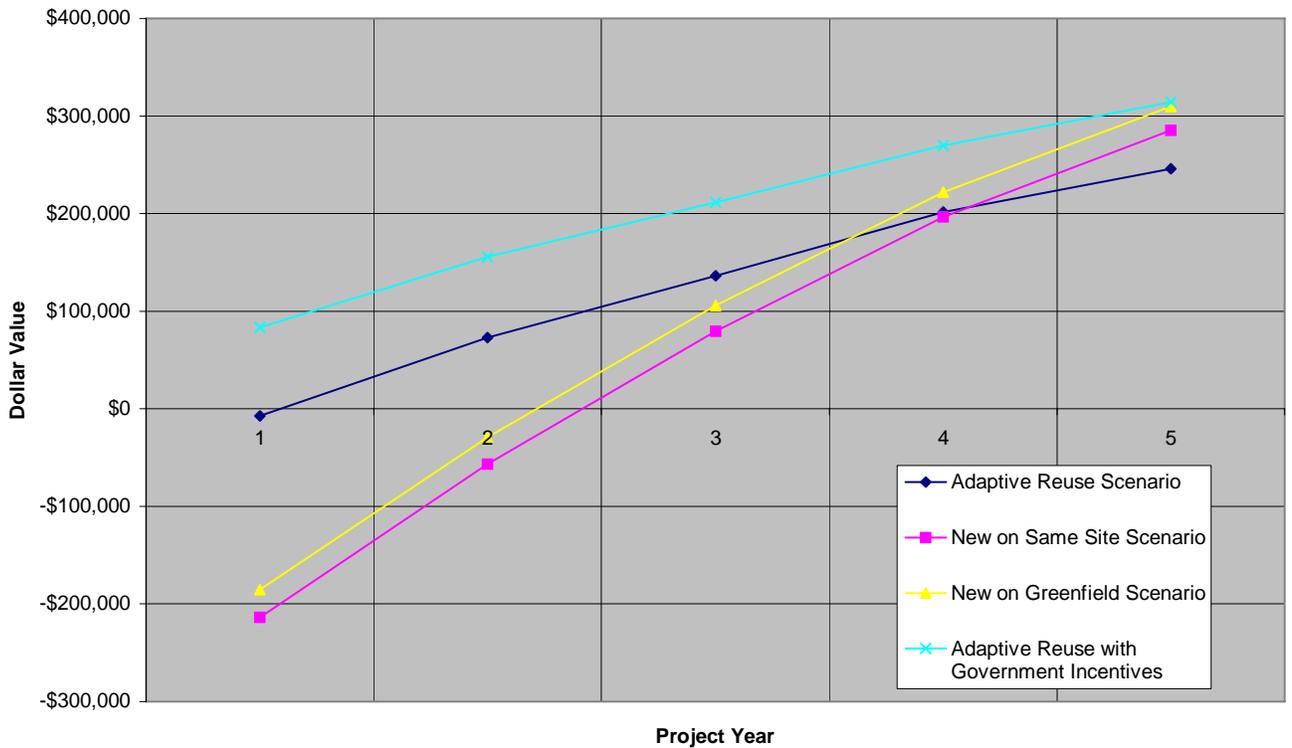
## 8.4.2 Cost Benefit Analysis – Lawyer's Hall

The 'pro-forma' analysis revealed higher cash on cash return on investment of the adaptive reuse scenario than the two hypothetical new construction scenarios. The CBA analysis on the other hand revealed that this status is not sustainable. The 'real-life' government incentive made the adaptive reuse option more profitable than the other two new construction scenarios for 17 year. At year 17, the New on greenfield scenario became more profitable. However, if we look at the cumulative net benefit chart, the total accumulated net benefit of the adaptive reuse scenario with government incentives is still higher that the accumulated net benefit of the two new construction scenarios. Nevertheless, by discounting the accumulated net annual benefits the study revealed that the total accumulated net benefit of the new on greenfield scenario after 30 years is higher than the accumulated net benefit of the adaptive reuse with and without government incentives.

| Lawyer's Hall	30 Year Total Accumulated Net Benefits	
	Undiscounted	**Discounted**
Adaptive Reuse	$9,353,376	$536,028
New Same Site	$9,463,552	$542,342
New on Greenfield	$11,199,216	$641,811
Adaptive Reuse W/ 'Real-Life' Incentives	$11,504,376	$659,299

Table 35: 30 Year Total Accumulated Net Benefits - Lawyer's Hall

Source: The CBA analysis pages 103, 105, 107, 109

**Figure 18: Net Annual Benefits / 30 Year Plot – Lawyer's Hall**
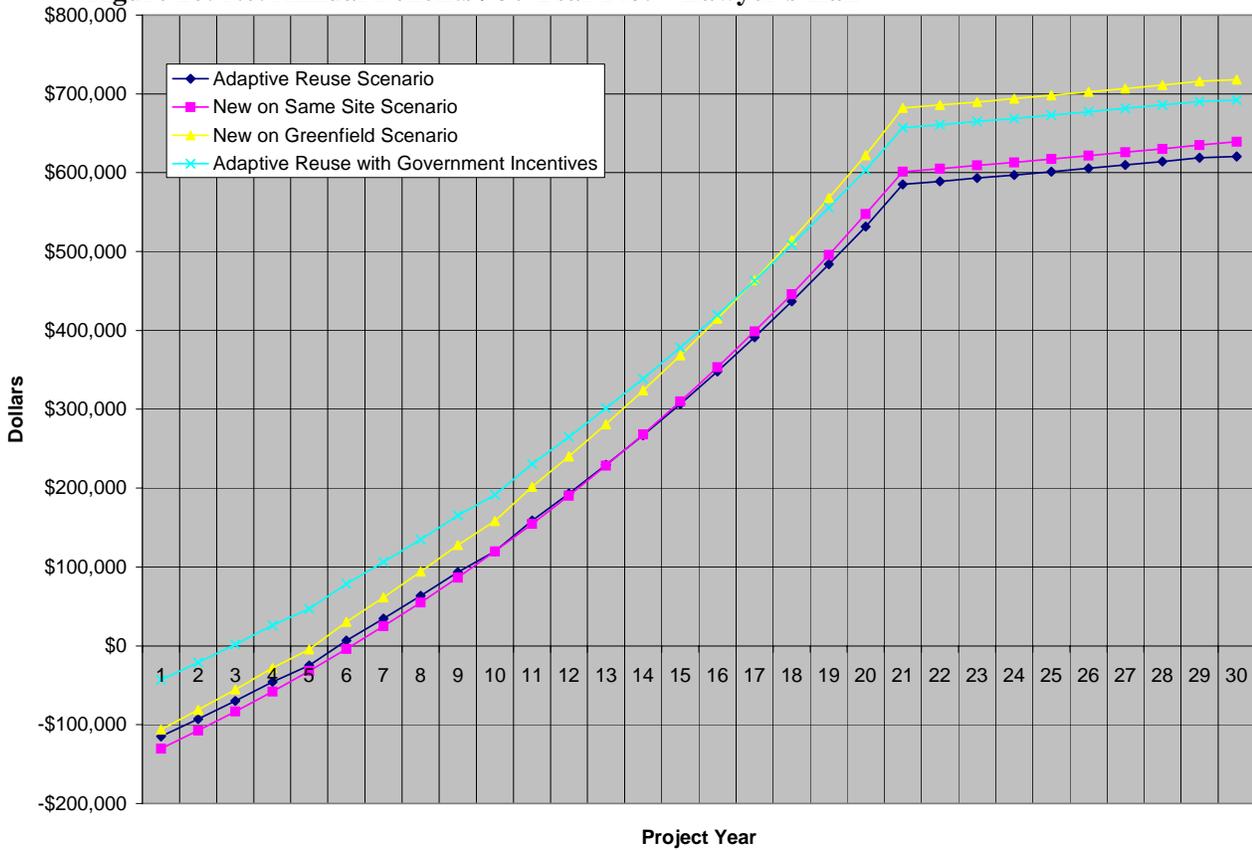
**Figure 19: Discounted Net Annual Benefits / 30 Year Plot - Lawyer's Hall**
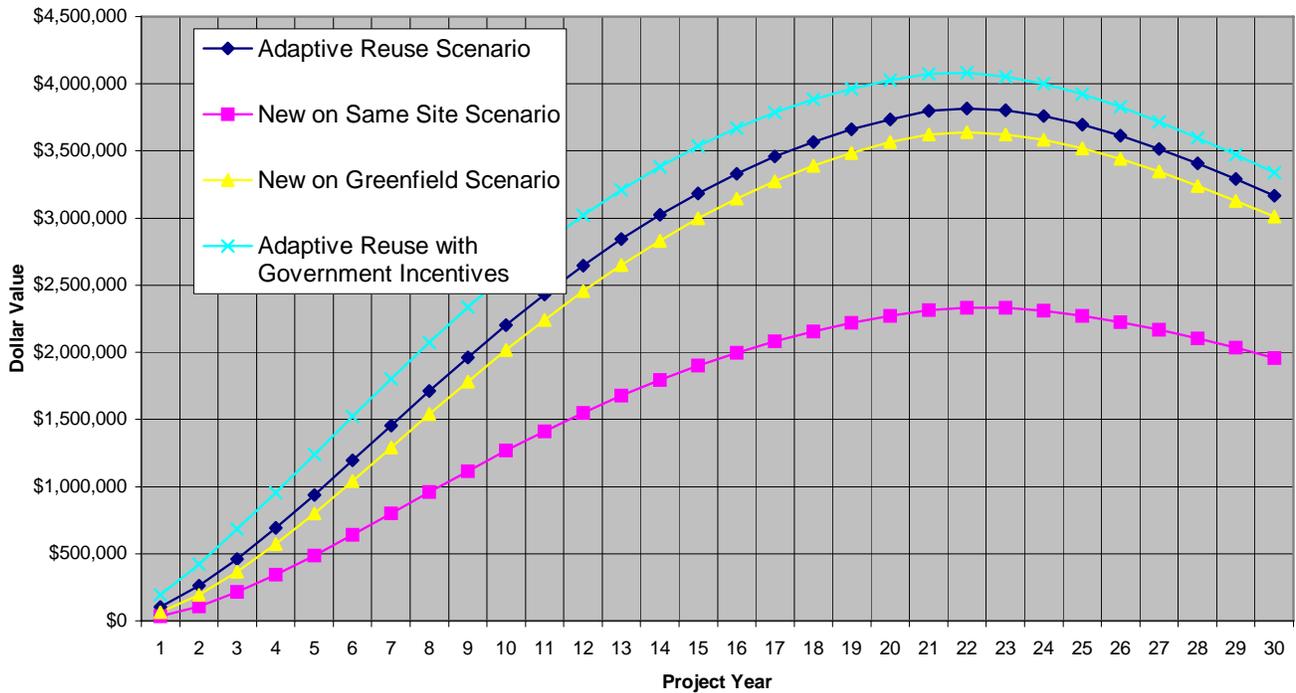
Figure 20: Net Cumulative Benefit / 30 Year Plot - Lawyer's Hall
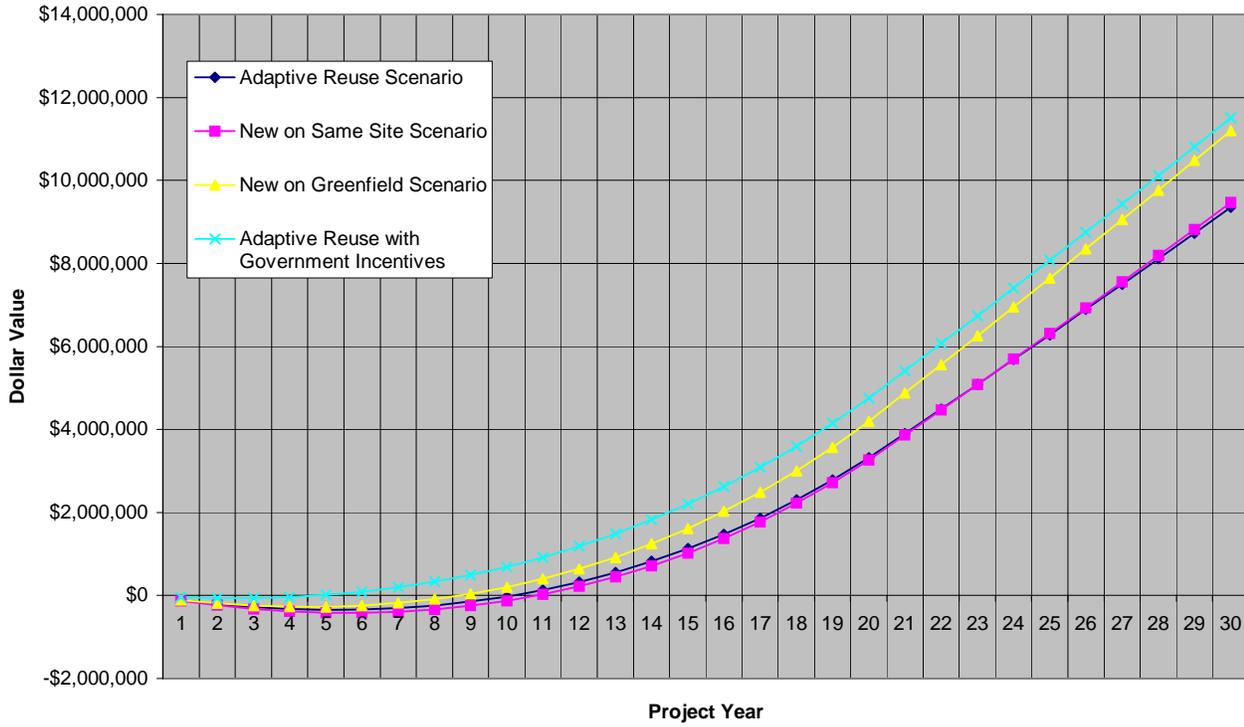
Figure 21: Net Cumulative Benefits / 10 Year Plot - Lawyer's Hall
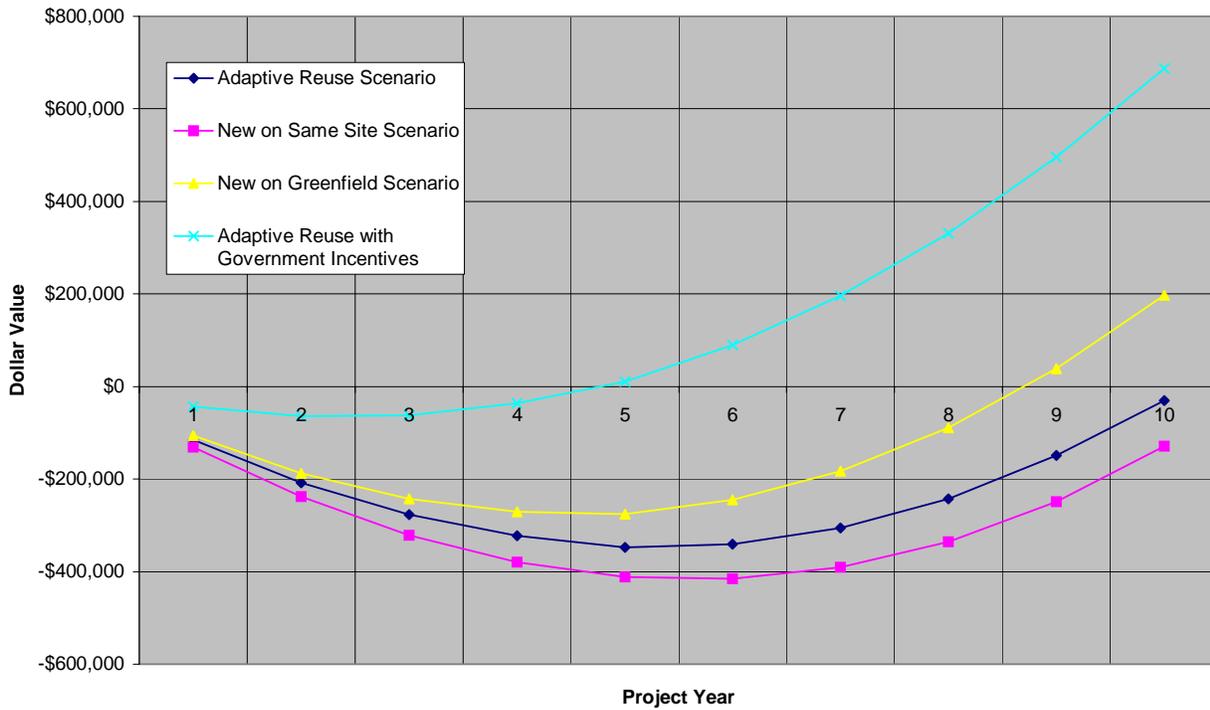
Figure 22: Discounted Cumulative Net Benefits / 30 Year Plot - Lawyer's Hall
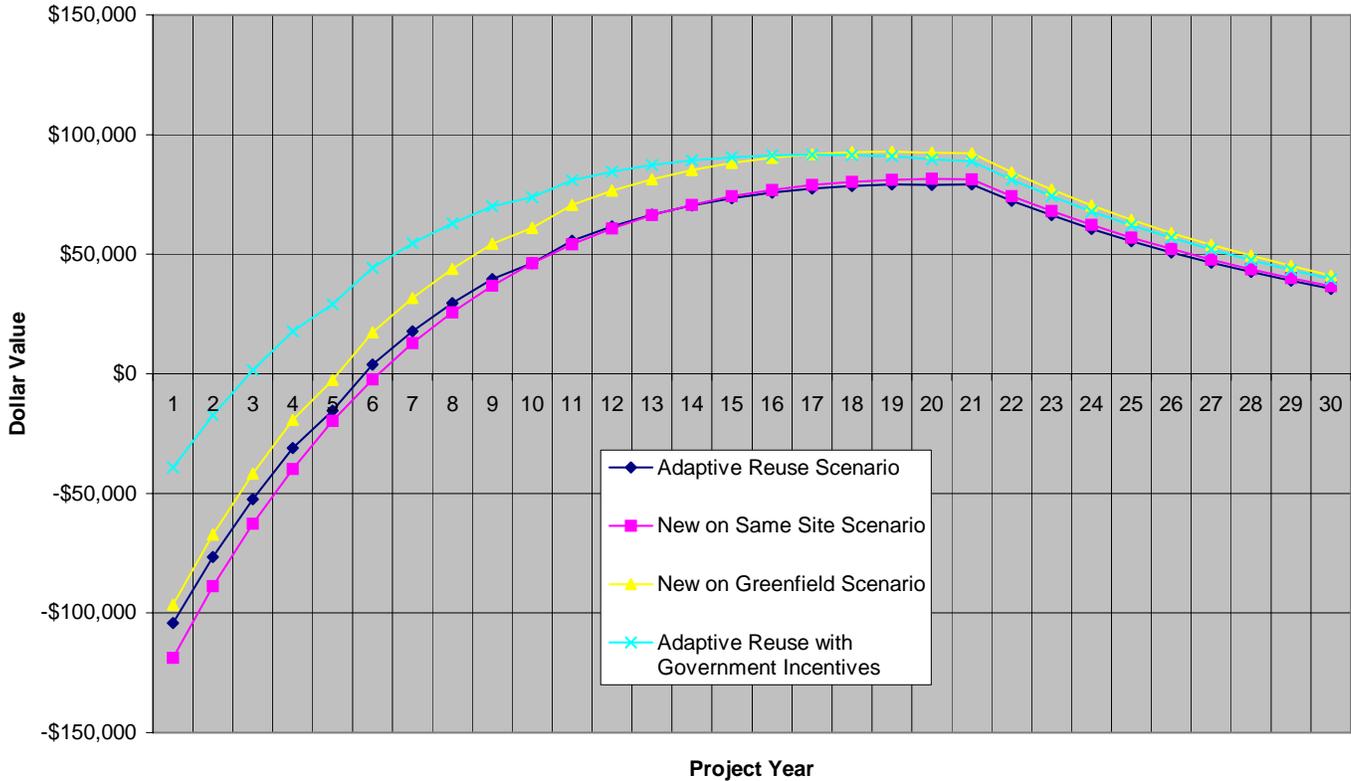
8.4.3 Cost Benefit Analysis – The Wilkes Building

The Cost Benefit Analysis of the Wilkes Building proved the adaptive reuse scenario is the most

economically viable option among the other options, even without government incentives. In fact,

the $717,00 government grant that was contributed to the 'real-life' adaptive reuse project

increased the return on investment, however, it wasn't required to make the adaptive reuse

scenario more attractive than the two new construction scenarios of demolish and rebuild and

build on greenfield. Nevertheless, the previous 'pro-forma' analysis proved the opposite. The

cash on cash return on investment (without government incentives) in the 'pro-forma' analysis for

the adaptive reuse scenario was less than the other two new construction scenarios. The reason for

this inconsistency in the results between the pro-forma and the CBA analysis is that the 'pro-

forma doesn't account for the equity the investor is acquiring annually by making the mortgage

payment. The study was able to account for this factor in the CBA analysis which proved the

adaptive reuse scenario is the most profitable scenario among the other options.

| The Wilkes Building	30 Year Total Accumulated Net Benefits	
	Undiscounted	**Discounted**
Adaptive Reuse	*$55,273,390*	*$3,167,638*
New Same Site	*$34,183,558*	*$1,959,010*
New on Greenfield	*$52,525,120*	*$3,010,139*
Adaptive Reuse W/ 'Real-Life' Incentives	*$58,216,565*	*$3,336,307*

Table 36: 30 Year Total Accumulated Net Benefits - The Wilkes Building

Source: The CBA analysis pages 127, 129, 131, 133

**Figure 23: Net Annual Benefit / 30 Year Plot - The Wilkes Building**
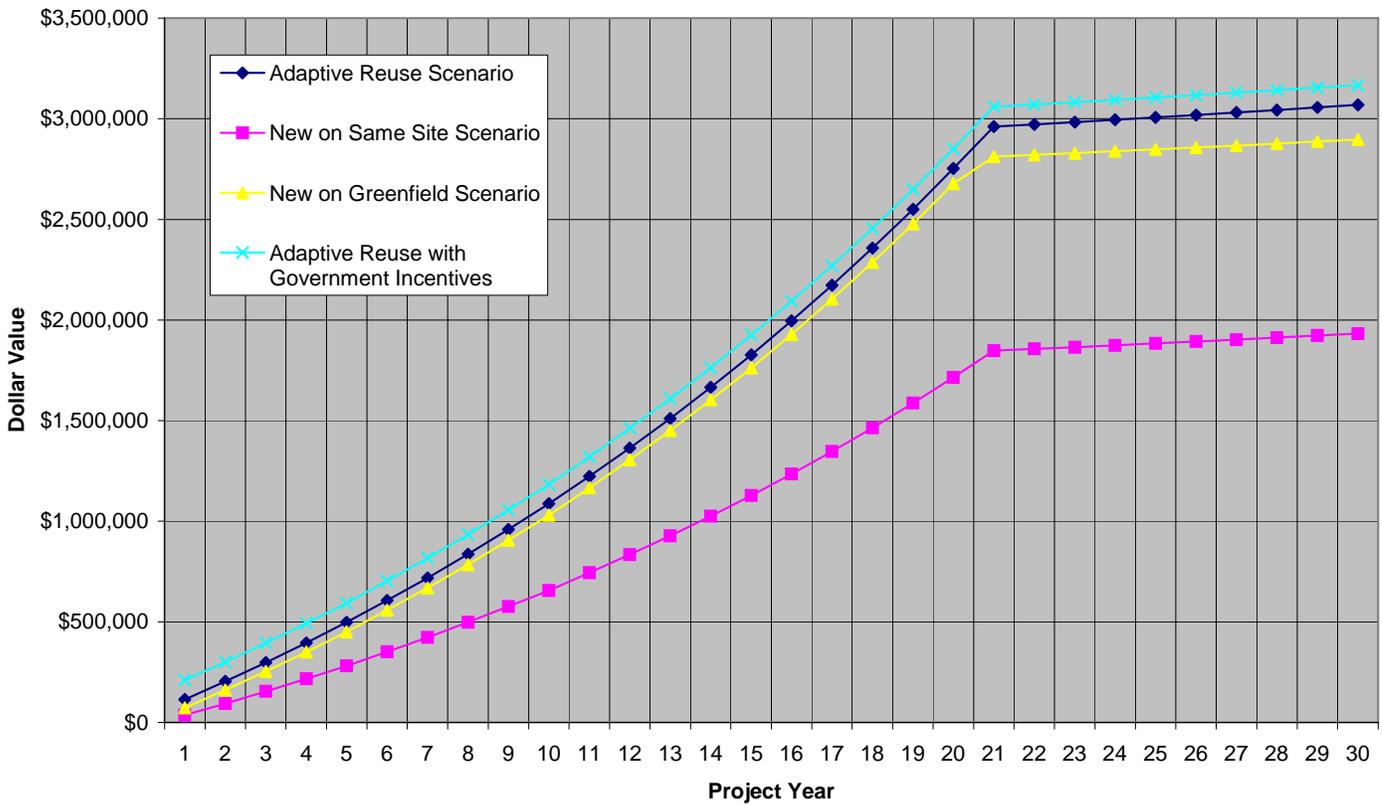
Figure 24: Discounted Net Annual Benefit / 30 Year Plot - The Wilkes Building
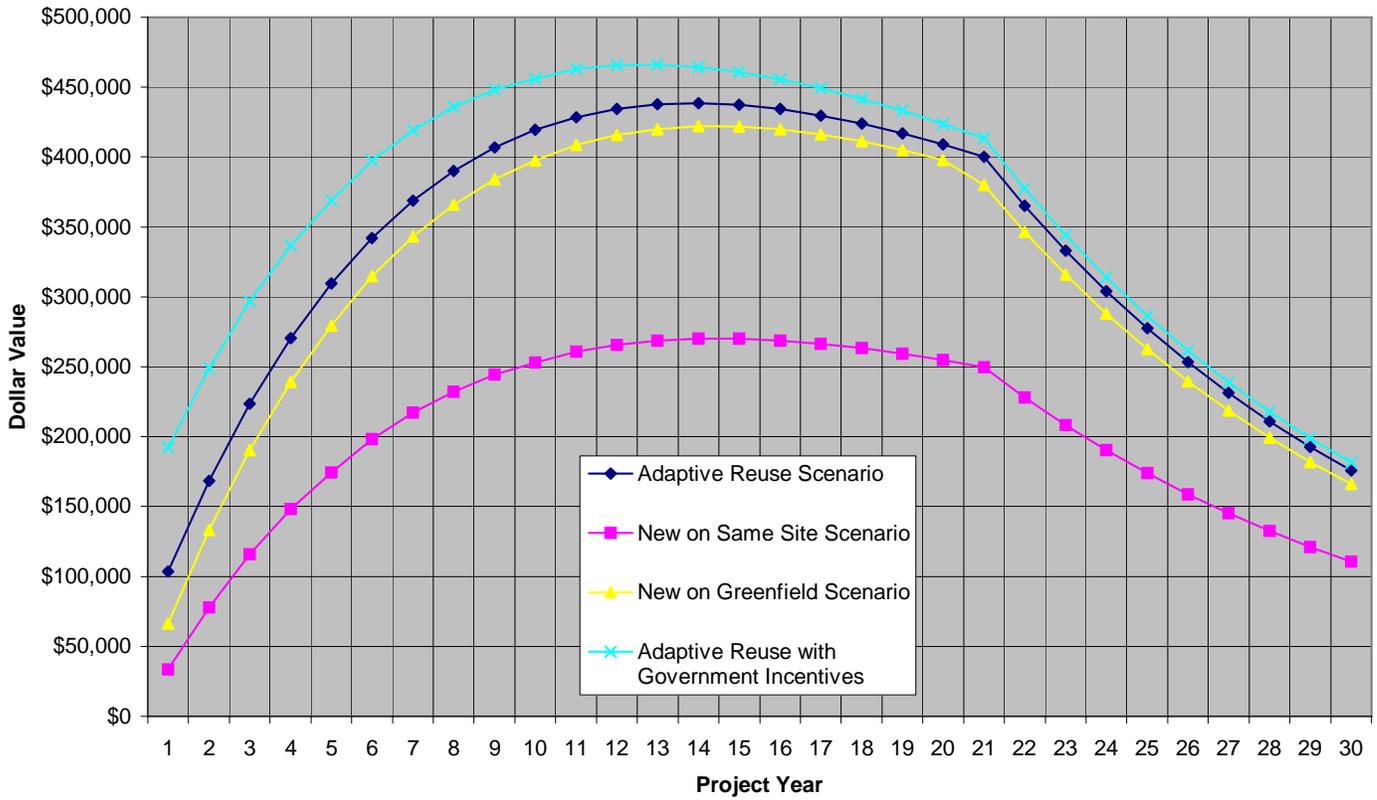

Figure 25: Net Cumulative Benefits / 30 Year Plot - The Wilkes Building
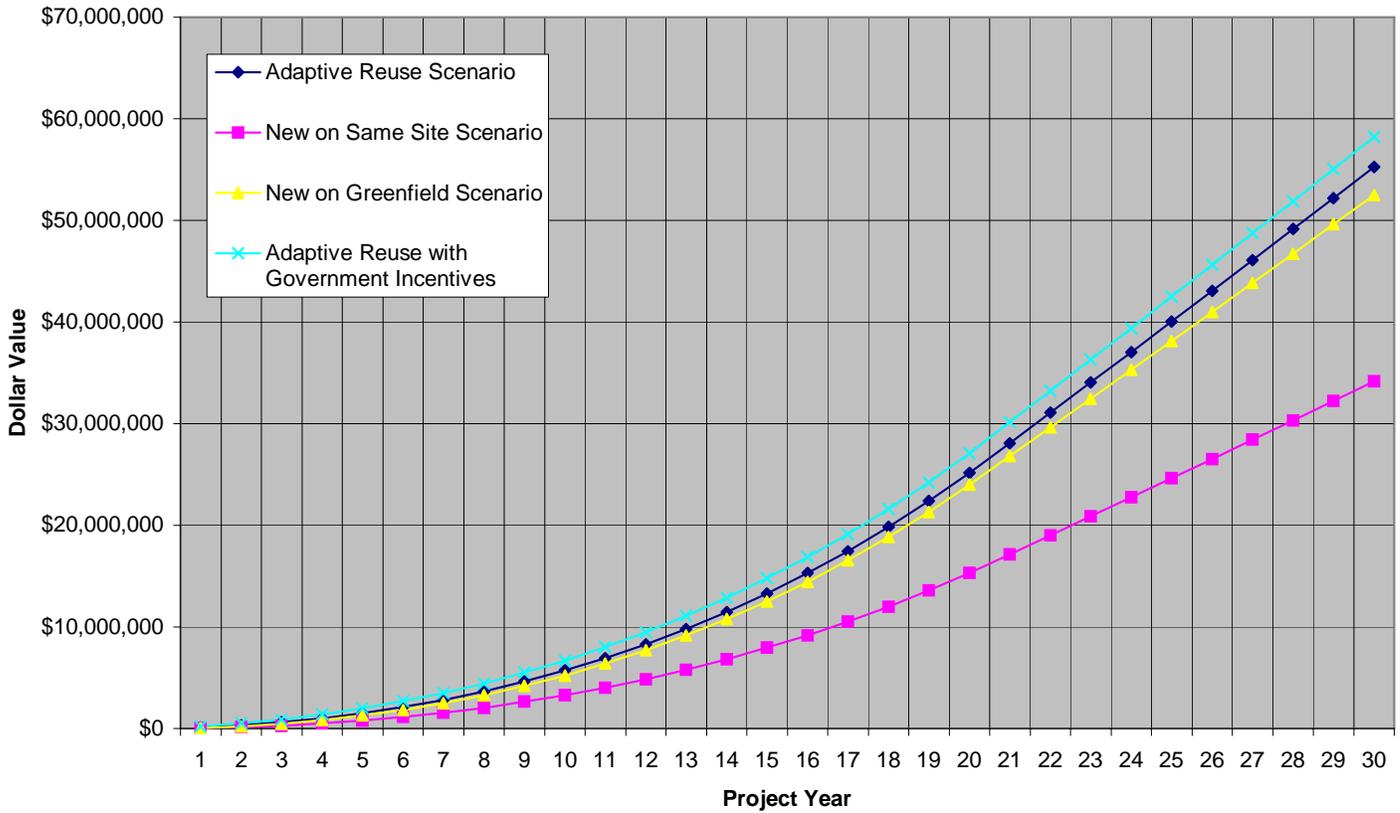
**Figure 26: Net Cumulative Benefits / 5 Year Plot - The Wilkes Building**
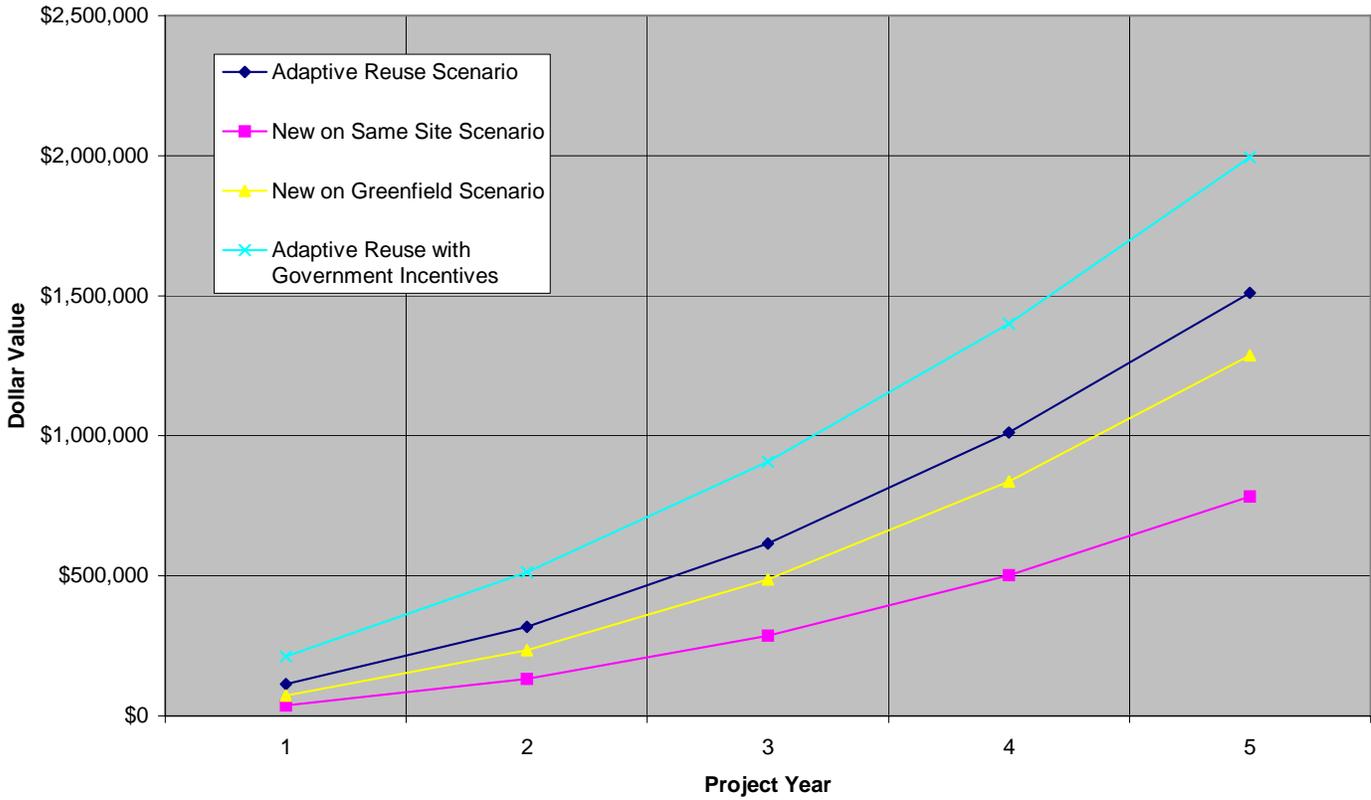
Figure 27: Discounted Cumulative Net Benefits / 30 Year Plot - The Wilkes Building
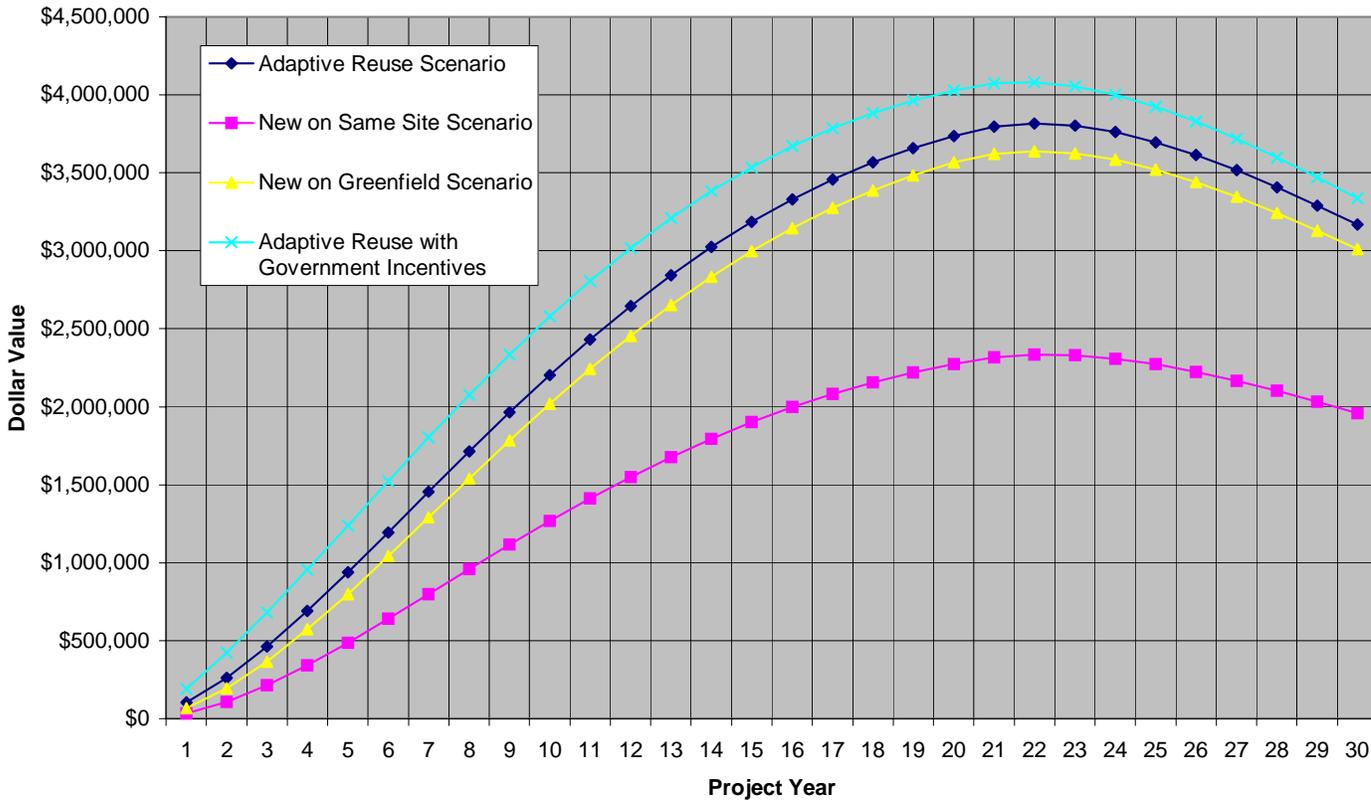
8.5 Design Efficiency

One myth that surrounds the business of adaptive reuse is: "Older buildings suffer from functional obsolescence resulting from the inefficiency of older buildings" (Rypkema, 1994). This can be related to several aspects such as: floor layout, ceiling height, floor loads, and existing mechanical systems. Certainly those factors are legitimate issues that in some cases put restraints on the reuse of old buildings. This study has looked at the design efficiency of the adaptive reuse scenario and compared it with the new construction scenarios and found that the adaptive reuse scenario of Waterloo Ave and the Wilkes Building case studies turned out to be less efficient than the new construction option. This is due to the rectangular shape of the old building at 371 Waterloo Ave which led to an unusable space in the core. In the Wilkes Building case study the inefficient design was due to the extra square footage used for hallways and corridors. Further, the design of the new construction and the adaptive reuse scenarios of the Layer's Hall case study were inefficient due to the shape of the site.

Net Rentable Area to Gross Building Area

	Adaptive Reuse (1)	2	3	New Same Site (4)	5	New on Greenfield (6)
371 Waterloo Ave	71%			86%		86%
Lawyer's Hall Building	70%			70%		70%
The Wilkes Building	69%			88%		88%
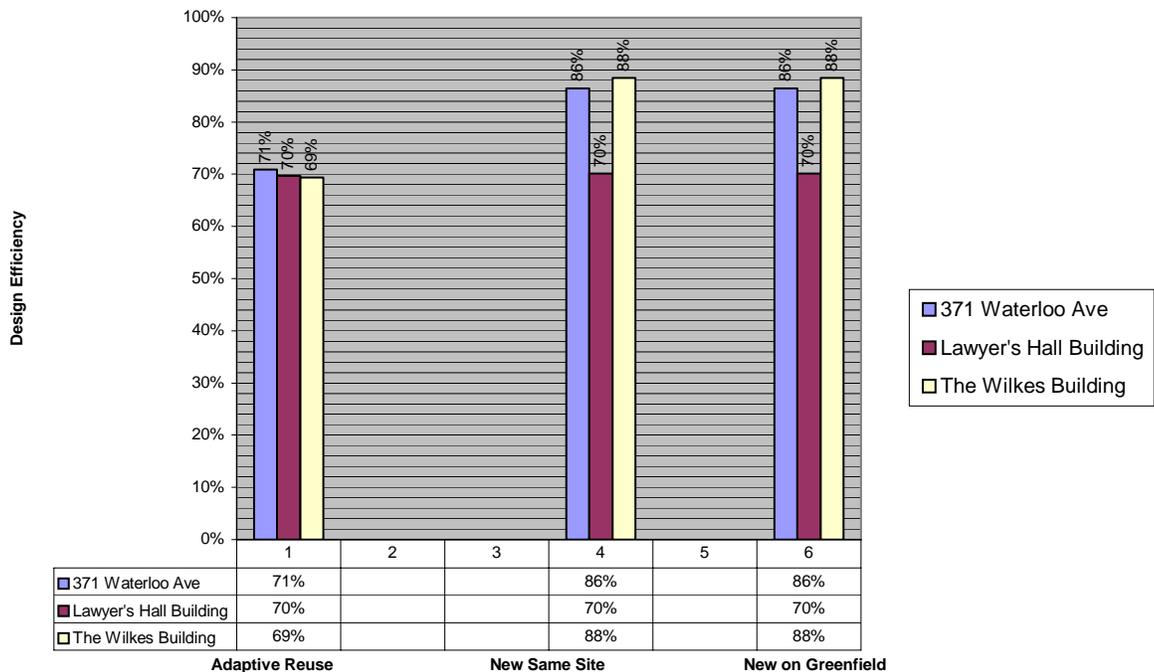
Our analysis revealed that functional obsolescence does exist when looking at the adaptive reuse. But, that doesn't mean an inefficient design means less return on investment when we compare the three scenarios. For instance, with regard to the Wilkes Building, the design efficiency ratio of the adaptive reuse is considerably lower than the option of new construction. Nevertheless, the CBA analysis revealed higher return on investment for the adaptive reuse scenario. There are a lot of factors that play into the final conclusion of whether the adaptive reuse is more profitable or not, and the design efficiency is one of these factor. However, looking at this factor separate from the others and based on it making a final decision to tear down the building and erect a new one is not the write thing to do.

Chapter 9
Conclusion & Recommendations

9.1 Conclusion

There is no doubt that adaptive reuse is one of the most effective ways to promote new urbanism and resist urban sprawl. Old buildings to a great extent contribute to the significance and identity of the urban fabric, and maintaining these buildings enhances the values of history, continuity, identity and smart growth, all elements that are essential for a sustainable economic development, not only for the core but also for the whole community and region as such.

The study revealed that there is no magic formula to determine if the adaptive reuse of a certain structure is more profitable than to tear it down and rebuild a new one, or even to invest on another site on greenfield. The pro-forma and cost benefit analyses of the three case studies revealed that even though the pro-forma might prove a lower construction cost and higher cash on cash ROI of adaptive reuse vs. new construction, but the cost benefit analysis might in favor the new construction scenarios with regard to the long term return on investment, and vise versa. Further, the study found that each site had its own 'locational', physical' and regulatory characteristics that influenced the final comparison of the financial benefits between the three development scenarios. For that reason, the study was not able to generalize about which option is more profitable.

Further, the study was able through the pro-forma and CBA analyses to identify the major factors that affect the final outcome of the adaptive reuse as the following:

- The Construction Cost
- The total area of the building which determines the lease-able or sell-able space of the structure

- The appraised value of the property which is based on the income the property will generate. This value determines the amount of loan available, the investor's cash required and the equity that result from the investment.

With regard to government incentives, the study revealed that in some cases government grant was not required to make the adaptive reuse option more profitable than to demolish and rebuild. On the other hand, in one case study, even with government grant the new construction scenarios turned out to be significantly more profitable than the adaptive reuse scenario.

The experiment this study conducted on the different types of government incentives revealed that the 'real-life' direct grant was the most effective incentive. However, it should be noted that further research should be conducted on the different incentive scenarios using the Cost Benefit Analysis approach as the 'pro-forma' analysis that was used in this experiment is limited and does not reflect the actual return on investment during an extended period of time.

9.2 Recommendations

Municipalities that want to promote smart growth should appreciate the fact that adaptive reuse is one of the most effective tools for a sustainable urban development. In this context, it is evident the benefits that this practice entail range from environmental, social and economical. For that reason, municipalities should adopt and develop new policies and programs to promote adaptive reuse and make it an integral part of there smart growth initiatives.

Municipalities should enforce a strict design guidelines in neighborhoods were potential adaptive reuse buildings exist in order to attract more investments, protect the character of the community and increase the value of the properties in those areas and protect potential and previous investments.

Municipalities should enforce a prescriptive base rather than descriptive base building and fire codes when dealing with adaptive reuse projects. This method will give designer more flexibility to implement the required safety standards easily without compromising the feasibility of the

project. On the other hand, building officials and inspectors should be coordinated in a way to provide more fixable interpretations of regulatory standards and code requirements.

The complexity of the aspects that influence the costs and benefits of adaptive reuse in particular and urban development in general call for innovative skills to handle the increasing number of factors that influence these processes. Therefore, the formation of partnerships between public agencies and the private sector is one of the most promising tools to overcome this challenge. Through these partnerships, public and private corporations can put there resources and expertise together to come up with innovate approaches of problem solving to tackle these complex challenges that dominate the field of heritage conservation and adaptive reuse.

Further, it is very important for municipalities to undertake studies in advance on there stock of existing vacant and underutilized buildings to unveil there potential and to offer the required financial or regulatory incentives, in order to attract potential private investors.

Municipal services are constantly undergoing a progressive decentralization to accommodate new developments in the suburbs. It would be necessary for municipalities to establish some sort of specific guidelines and restrictions on servicing new developments on the fringe in order to promote investments in the core as a more profitable and viable options.

Bibliography

Austin, L.R. (1988). *Adaptive Reuse: Issues and Case Studies in Building Preservation*. New York: Van Nostrand Reinhold Company.

Australian Department of the Environment and Heritage, (2004). *Adaptive Reuse: Preserving our Past, Preserving our Future*. Commonwealth of Australia. ISBN: 0-642-55030-1

Bahl, V. (2005). Ethics of Adaptive Reuse. *Architectural Week*. No.240. pp: B1.1-B1.2

Bohl, C. (2000). New Urbanism and the City: Potential Applications and Implications for Distressed Inner-City Neighborhoods. *Housing Policy Debate*. Volume 11, Issue 4, pp: 761-801.

Bartsch, C. (1996). Paying for our Industrial Past, *Commentary*. Winter: 14-23.

Building Technologies Inc. (2001). Smart Codes in Your Community: A Guide to Building Rehabilitation Codes. Prepared for the Department of Housing and Urban Development. http://www.huduser.org/publications/destech/smartcodes.html.

Braber, S. (2003). Municipal Tax Incentives in Victoria, British Columbia. A Case Study. *Plan Canada*. 43:2, pp: 20-22

Calthorpe, P. (1993). The *Next American Metropolis: Ecology, Community, and the American Dream. New York*. Princeton Architectural Press.

Canada Mortgage and Housing Corporation. (2001). Disinvestment and the Decline of Urban Neighborhoods. *Socio Economic*. Series 90.

Canada Mortgage and Housing Corporation. (2006). *Asbestos*. http://www.cmhc-schl.gc.ca/en/co/maho/yohoyohe/inaiqu/inaiqu_001.cfm

Chambers, C.M., Cahmbers, P.E., and Whitehead, J.C. (1998). Contingent Valuation of Quasi-Public Goods: A Validity and Reliability Assessment. *Public Finance Review*. V.26, n.2, pp: 137-54.

Creswell, J. (2003). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Thousand Oaks, California. Sage Publications, Inc.

Congress For The New Urbanism & Northeast - Midwest Institute (2001). *Strategies For Successful Infill Development*. (ISBN: 1-882061-82-9)

Cunningham, S. 2002. *The Restoration Economy.* San Francisco, CA: Berrett-Koheler Publishers, Inc. (ISBN: 1-57675-191-0)

Donohue, K. (2001). Preserving Our Heritage. Center for Arts and Culture. Art, Culture & the National Agenda Issue Paper. http://culturalpolicy.org/pdf/heritage.pdf

De Sousa, C. (2000). Brownfield Redevelopment Versus Greenfield Development: A Private Sector Perspective on the Costs and Risks Associated with Brownfield Redevelopment in the Greater Toronto Area. *Journal of Environmental and Planning Management.* 43(6). pp: 831-853.

De Sousa, C. (2001). Contaminated Sites: The Canadian Situation in an International Context. *Journal of Environment Management*, 62. pp: 131-154.

De Sousa, C. (2002). Measuring the public costs and benefits of brownfield versus greenfield developments in the Greater Toronto Area. *Environment and Planning*. Vol 29. pp: 251-280.

De Sousa, C. (2003). Turning brownfield into green space in the City of Toronto. *Landscape and Urban Planning*. Vol 62 (2003). pp: 181-198.

Downs, A. (1999). Some Realities about Sprawl and Urban Decline. *Housing Policy Debate.* Vol 10, Issue 4.

Duany, A. & E. Plater-Zyberk. (1992). The Second Coming of the American Small Town. *Plan Canada*. Vol May. pp: 6-13.

Duff, L. B. (1994). Groundwater Contamination and Property Transfer. *Maryland Bar Journal*. January/February. pp: 25-28.

Ewing, R.H. (1994). Characteristics, causes, and Effects of Sprawl: A Literature Review. *Environmental and Urban Issues*. Winter. pp: 1-15.

Federal Preservation Institute, National Park Service, Department of Interior. (2005). Measuring the Economic Impact of Federal Historic Properties. An Introduction to the Impact of Federal Stewardship of Historic Properties on Economic Vitality

Flynn, L. (2002). Conservation Economy. *Building Design & Construction*. June 2002. pp.39-46.

Fram, M. (2003). *Well Preserved: The Ontario Heritage Foundation's Manual of Principles and Practice for Architectural Conservation*. Boston Mills Press. ISBN: 1550463861

Fulton, W. (2004). *The New Urbanism: Hope or Hype for American Communities?*. Lincoln Institute of Land Policy. Cambridge, MA. ISBN: 1-55844-129-8

Glaesar, E. Khan, M. and Chenghuan, C. (2001). *Job Sprawl: Employment Location in U.S. Metropolitan Areas.* Washington, D.C.: Brookings Institution.

Government Finance Research Centre, (1991). The Economic Benefits of Preserving Community Character: A Case Study from Fredericksburg, Virginia.

Hare, M. (2001). Exploring Growth Management Roles in Ontario: Learning from "Who Does What"Elsewere*. A report prepared for The Ontario Professional Planners Institute. http://www.ontarioplanners.on.ca/pf\df/growth_1011001_position.pdf

Howland, M. (2002). The Legacy of Contamination and the Redevelopment of Inner-City Industrial Districts*. Lincoln Institute of Land Policy.* http://www.lincolninst.edu/pubs/pub-detail.asp?id=121

International Charter for the Conservation and Restoration of Monuments and Sites, (1964). *The Venice Charter – 1964.* IInd International Congress of Architects and Technicians of Historic Monuments, Venice, 1964.

Jacobs, J. (1961). The *Death and Life of Great American Cities*. Random House, Inc., New York, NY. ISBN 0-679-74195-x

Katz, P. (1994). *The New Urbanism: Toward an Architecture of Community.* New York. McGraw-Hill

Kidney, C.W. (1976). *Working Place: The Adaptive Use of Industrial Buildings.* Pittsburg, PA: Ober Park Associates, Inc.

Krieger, A., Lennertz, W. (1991). *Andres and Elizabeth Plater-Zyberk: Towns and Town- Making Principles*. New York: Rizzoli.

Liechenko, R.M., Edward, N.C., Listokin, D. (2001). Historic Preservation and Residential Property Values: An Analysis of Taxes Cities. *Urban Studies*. Vol. 38, No. 11. pp: 1973-1987, 2001

Leichenko, R.M., Coulson, E., and Listokin, D. (2001). Historic Preservation and residential Property Values: An Analysis of Texas Cities. *Urban Studies*. 38 (11). pp: 1973-1987.

Listokin, D., Listokin, B., Lahr, M. (1998). The Contributions of Historic Preservation to Housing and Economic Development*. Housing Policy Debate*. Vol 9(3). pp: 479-485.

Mason, R. (2005). Economics and Historic Preservation: A Guide and Review of the Literature. A Discussion Paper Prepared for the Brookings Institution Metropolitan Policy Program, Washington D.C.: Brookings Institution.

Mason, R. (1998). Economics and Heritage Conservation. Report on A Meeting Organized by the Getty Conservation Institute. The Getty Conservation Institute. Published on the web www.getty.edu/conservation/resources/econrpt.pdf

McGrath, D. (1995). *An Investigation into the Impact of Hazardous Waste Contamination Liability on Urban Industrial Land Redevelopment in the City of Chicago.* Chicago, Illinois: Great Cities Institute, University of Illinois, December.

Mourato, S. & Mazzanti, M. (2002). Economic Valuation of Cultural Heritage: Evidence and Prospects. Assessing the Values of Cultural Heritage. De La Torre, ed. Los Angeles: Getty Conservation Institute, 2002.

Meyer, B.P & Lyons, S. (2000). Lessons from the Private Sector Brownfield Redevelopers: Planning Public Support for Urban Regeneration. *Journal of the American Planning Association*. Winter 2000. Vol 66. pp 46-57.

Ministry of Municipal Affairs and Housing. (2004). *Brownfields Showcase II: Opportunities In Our Own Backyard.* Produced by the Ministry of Municipal Affairs and Housing, Provincial Planning and Environmental Services Branch. http://www.mah.gov.on.ca

Ministry of Municipal Affairs and Housing, (2003). 2003 Ontario Codes Public Consultation. Ontario Codes Publications. http://www.obc.mah.gov.on.ca/userfiles/HTML/nts_4_10651_1.html

Municipal Act. (2001). Section 365. Cancellation, reduction, or refund of taxes.

National Center for Environmental Decision-Making Research, (2006). Module 4: The Choice of Discount Rate. http://sunsite.utk.edu/ncedr/tools/othertools/costbenefit/module4.htm

National Round Table on the Environment and the Economy (NRTEE), (1996). The Financial Services Sector and Brownfield Redevelopment. Ottawa, NRTEE, Financial Services Task Forces, Report operated by M.M. Dillon Ltd, Global Risk Management Corporation & Result.

National Round Table on the Environment and the Economy (NRTEE), (1997). Removing Barriers: Redeveloping Contaminated Sites for Housing (Ottawa, NRTEE & CMHC) Report prepared by Delcan Corporation, Golder Associates Ltd & McCarthy-Tetrault).

National Round Table on the Environment and the Economy (NRTEE), (1998). State of the Debate

: Greening Canada's Brownfield Sites. (Ottawa, NRTEE), Ontario Ministry of the Environment (1996) Guidelines for the Use at Contaminated Sites in Ontario.

National Trust for Historic Preservation (1976). *Economic Benefits of Preserving Old Buildings.* Washington, D.C.: The Preservation Press. (ISBN:0-89133-37-2).

National Trust for Historic Preservation (2002). Appraising Historic Properties. Report by: Judith Reyhold. Washington D.C.: National Trust for Historic Preservation.

National Trust for Historic Preservation, (2006). http://www.nationaltrust.org. Website accessed May, 2006.

Page, W., Rabinwitz, H. (1993). Potential for Redevelopment of Contaminated Brownfield Sites*. Economic Development Quarterly*. Vol 8, 4.pp: 353-363.

Persky, J., Daniel, F. and Wiewel, W. (1994). *A Methodology for Measuring the Benefits and Costs of Economic Development Programs.* Chicago: University of Illinois at Chicago Centre for Urban Economic Development.

Pearsky, J. and Wiewel, W. (1995). *Brownfields, Greenfields: the Costs and Benefits of Metropolitan Employment Decentralization.* Chicago, University of Illinois at Chicago, Great Cities Institute.

Pohanka,M., Fitzgerald, S. (2004). Urban Sprawl and You: How Sprawl Adversely Affects Worker Health. *Am. Ass. Occ. Health Nurses*, 52, 6. pp: 242-246

Poor, P.J and Smith, M.J. (2004). Travel Cost Analysis of a Cultural Heritage Site: The Case of Historic St. Mary's City of Maryland. *Journal of Cultural Economics*. Vol 28, Number 3 / August, 2004. pp: 217-229.

Powell, K. (1999). *Architecture Reborn: Converting Old Buildings for New Uses*. New York: Rizzoli.

Reed Construction Data, (2005). *Yardsticks for Costing: Cost Data for the Canadian Construction Industry.* RSMeans, Markham, On. ISBN: 0-87629-778-5

Richard, B.P. (1992). *Professional Real Estate Development: The ULI Guide to the Business.* New York: Dearborn Financial Publishing Inc. (ISBN: 0-79310-392-4).

Rypkema, D. (1994). The Economics of Rehabilitation: A Community Leader Guide. National Trust for Historic Preservation.

Rypkema, D., Wiehagen, K. (2000). *Dollars and Sense of Historic Preservation. The Economic Benefits of Preserving Philadelphia's Past*. Washington D.C.: National Trust for Historic Preservation.

Rypkema, D. (1999). Culture, Historic Preservation and Economic Development in the 21st Century. Paper submitted to the Leadership Conference on Conservancy and Development.

Schilling, J.M. (2002). The Revitalization of Vacant Properties: Where Broken Windows Meet Smart Growth. International City/County Management Association.

Shipley, R. (2006a). The Lazarus Effect: An Exploration of the Economics of Heritage Development in Ontario. Published on the web http://www.fes.uwaterloo.ca/research/hrc/lazarus-jan20-verA.pdf

Shipley, R., Utz, S., Parsons, M. (2006b). Does Adaptive Reuse Pay? A Study of the Business of Building Renovation In Ontario, *Canada. International Journal of Heritage Studies*. Volume 12, number 6/ November 2006. pp: 505-520

Shipley, R. and Reyburn, K. (2003). Lost Heritage: a survey of historic building demolitions in Ontario, Canada. *International Journal of Heritage Studies*. 9(2), pp 151-168.

Shipley, R. (2000). The Impact of Heritage Designation on Property Values. *International Journal of Heritage Studies*. 6(1). pp: 83-100.

Singbeil, K. (2005). Study of the Comparative Value of Heritage and Non-heritage Houses in Vancouver. A study compiled for the Vancouver Heritage Foundation. www.vancouverheritagefoundation.org/ projects/documents/ResearchProject.pdf

Strauss, C., Lord, B., Powell, M. (2002). Path of Progress Heritage System: Visitor Characteristics and Economic Impacts. Economic Impact of Tourism with a Multi-County Region. Hollidaysburg. PA: Westsylvania Heritage Corporation. (www.westsylvania.org/documents/PSUResearch2002.pdf).

Sewell, J. (1993). *The Shape of the City: Toronto Struggles with Modern Planning*. Toronto, University of Toronto Press. (ISBN: 080207409X)

Swartz, R.O. (1994). Michigan's Approach to Urban Redevelopment Involving Contaminated Properties. *Economic Development Quarterly*, 8,4. pp: 329-337.

Treloar, G. (1997). Extracting Embodied Energy Paths from Input-Output Tables: Towards an Input-Output-Based Hybrid Energy Analysis Method. *Economic Systems Research, Taylor and Francis Journal.*Vol. 9(4), pp: 375-91, December.

U.S. Environmental Protection Agency. (1997). Brownfields Economic Redevelopment Initiative, Washington, D.C.: U.S. Environmental Protection Agency, Solid Waste and Emergency Response.

Van Rensburg, K, Henderson, G.H. (2006). The Brownfields Equation and Liability Concerns. A paper prepared for the Second Annual National Environmental, Energy and Resources Law Summit presented by the Canadian Bar Association and the American Bar Association's sections of Environmental, Energy and Resources Law, April 26-29, 2006. http://www.gowlings.com/resources/PublicationPDFs/VanRensburgBrownfields.pdf

Walljes, I. , Ball, R. (1997*).* Exploring the Realities of the Sustainable City Through the Use and Reuse of Vacant Industrial Buildings. *European Environment*. Vol. 7, pp: 194-202.

Wassmer, W. (2005). Causes of Urban Sprawl (Decentralization) in the United States: Natural Evolution, Flight from Blight, and the Focalization of Land Use. Unpublished Paper.

Wishkoski, M. (2006). Historic Preservation Projects can be Green. Article published online: http://www.djc.com/news/en/11177209.html

Wood, E. B. (1997). *The Economics of Rehabilitation.* Preservation. Washington D.C: National Trust for Historic Preservation.

Vogt, C. (1999). Creating Long Documents using Microsoft Word. Published on the Web at the University of Waterloo.

Appendix A
Additional Figures

Unleveraged Return On Investment

	1	2	3	4	5	6
■ 371 Waterloo Ave	6.72%			5.09%		5.27%
■ Lawyer's Hall Building	3.22%			2.95%		3.42%
□ The Wilkes Building	6.13%			5.26%		5.42%
	Adaptive Reuse			**New Same Site**		**New on Greenfield**

Legend:
- ■ 371 Waterloo Ave
- ■ Lawyer's Hall Building
- □ The Wilkes Building
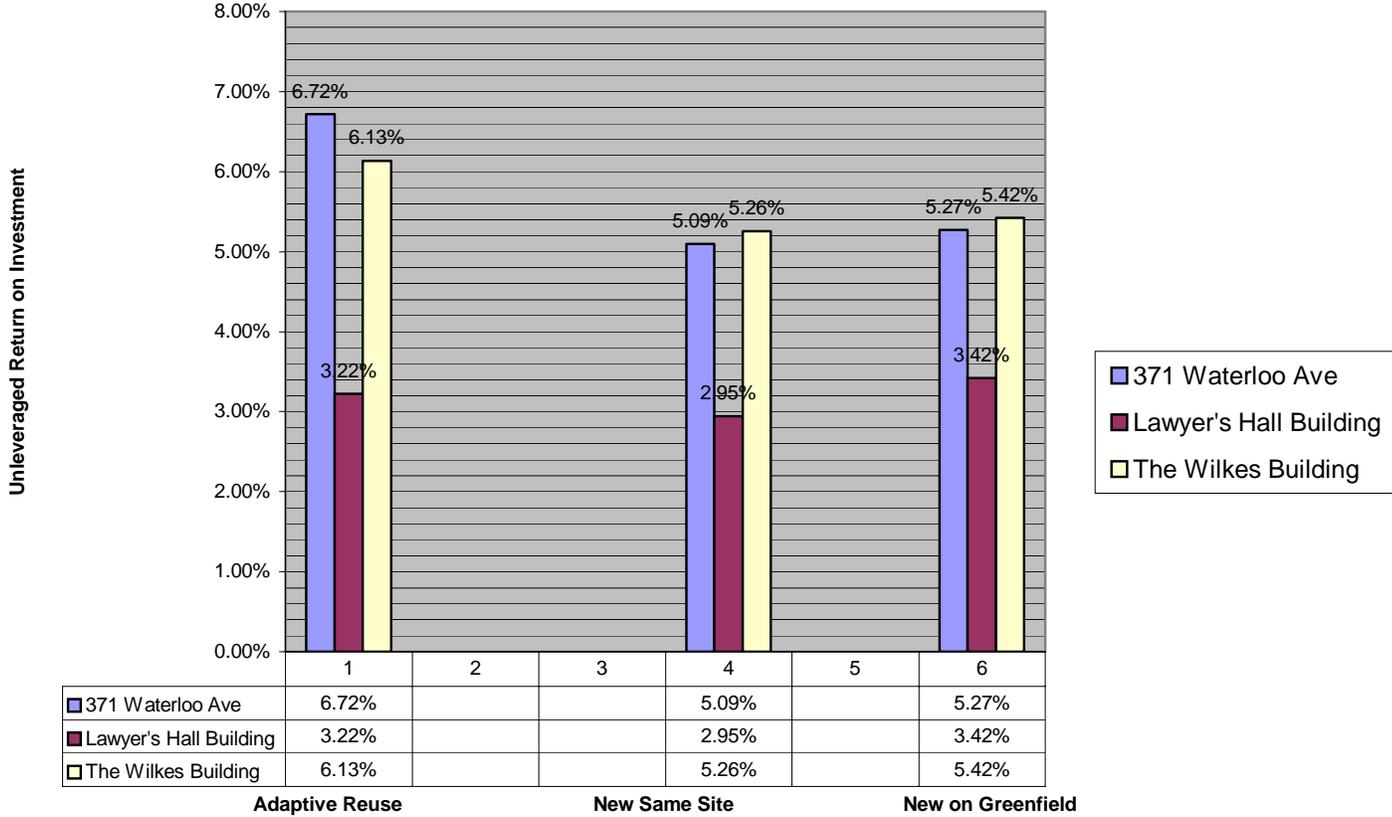
Investor's Cash on Cash Return
(Without Government Incentives)

	1	2	3	4	5	6
■ 371 Waterloo Ave	5.28%			2.69%		2.88%
■ Lawyer's Hall Building	2.15%			1.12%		1.39%
□ The Wilkes Building	2.43%			2.86%		3.04%

Adaptive Reuse   **New Same Site**   **New on Greenfield**

155
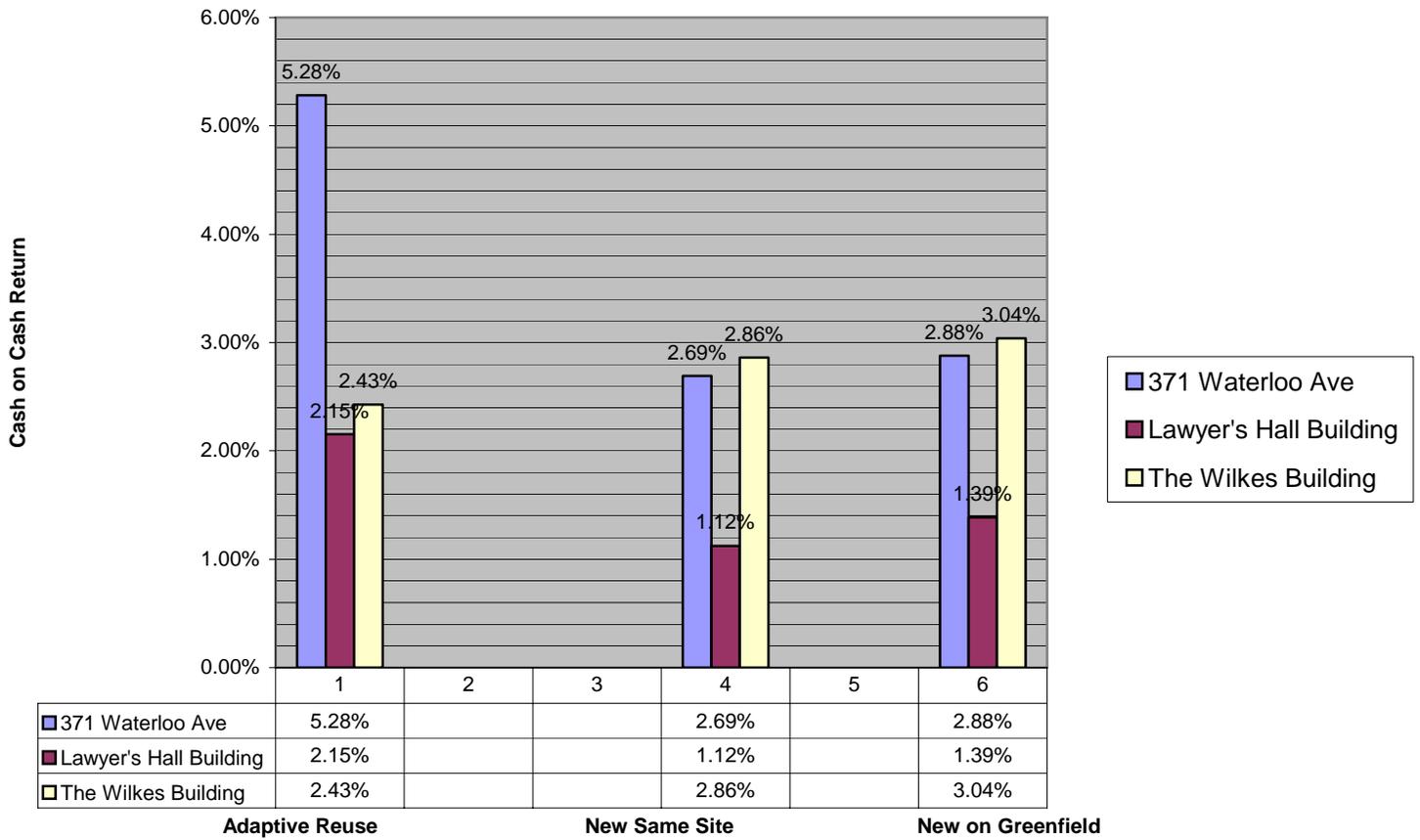
Investor's Cash on Cash Return on Investment
(After Government Grant)

	1	2	3	4	5	6
■ 371 Waterloo Ave	11.05%			2.69%		2.88%
■ Lawyer's Hall Building	2.71%			1.12%		1.39%
□ The Wilkes Building	22.53%			2.86%		3.04%

Adaptive Reuse   **New Same Site**   **New on Greenfield**

Legend:
- ■ 371 Waterloo Ave
- ■ Lawyer's Hall Building
- □ The Wilkes Building

Y-axis: Cash on Cash Return

Data labels on chart:
- 22.53%
- 11.05%
- 2.71%
- 2.69% 2.86%
- 1.12%
- 2.88% 3.04%
- 1.39%
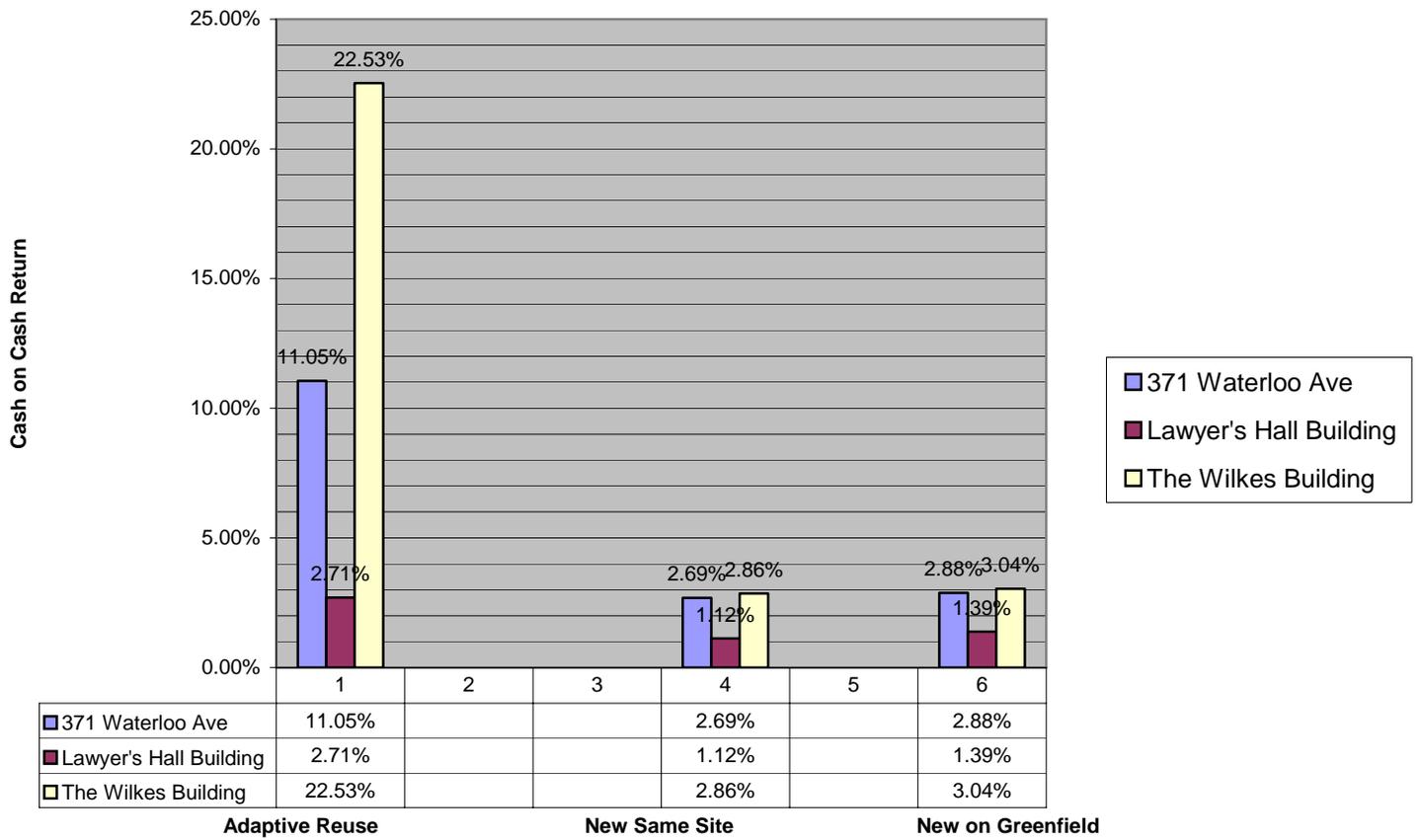
Investor's Cash on Cash Return on Investment)
(After 30% Property Tax Credit)

	1	2	3	4	5	6
■ 371 Waterloo Ave	7.42%			2.69%		2.88%
■ Lawyer's Hall Building	2.15%			1.12%		1.39%
□ The Wilkes Building	6.10%			2.86%		3.04%
	Adaptive Reuse			**New Same Site**		**New on Greenfield**

Legend:
- ■ 371 Waterloo Ave
- ■ Lawyer's Hall Building
- □ The Wilkes Building
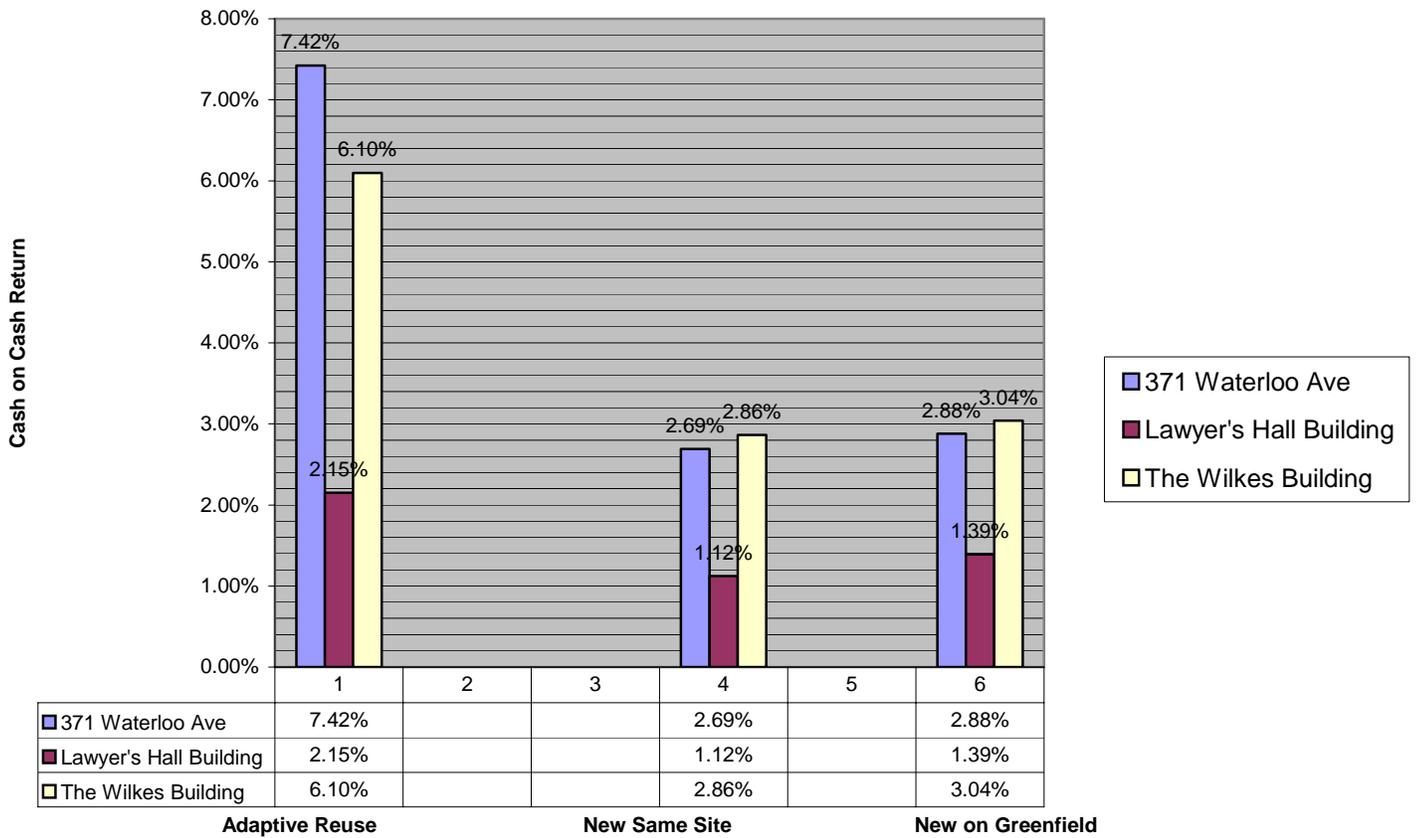
(Investor's Cash on Cash Return on Investment)
(Tax Credit on Construcion Cost Available)

	1	2	3	4	5	6
■ 371 Waterloo Ave	6.00%			2.69%		2.88%
■ Lawyer's Hall Building	1.56%			1.12%		1.39%
□ The Wilkes Building	2.97%			2.86%		3.04%
	Adaptive Reuse			**New Same Site**		**New on Greenfield**

Legend:
- 371 Waterloo Ave
- Lawyer's Hall Building
- The Wilkes Building

Y-axis: Cash on Cash Return

Data labels on chart:
- Adaptive Reuse: 6.00%, 1.56%, 2.97%
- New Same Site: 2.69%, 1.12%, 2.86%
- New on Greenfield: 2.88%, 1.39%, 3.04%