ILLUMINATION: THE USE OF LIGHTING TO ENHANCE THE IDENTITY, USE AND HEALTH OF A PUBLIC PLAZA IN LANGLEY CITY.

by

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B. Environmental Studies (Geography) University of Waterloo, 2000

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF LANDSCAPE ARCHITECTURE in

THE FACULTY OF GRADUATE STUDIES

We accept this thesis as conforming To the required standard

THE UNIVERSITY OF BRITISH COLUMBIA
September 2004

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Title of Thesis: **ILLUMINATION: THE USE OF LIGHTING TO ENHANCE THE IDENTITY, USE AND HEALTH OF A PUBLIC PLAZA IN LANGLEY CITY**

Degree: MLA Year: 2004

Department of **LANDSCAPE ARCHITECTURE**
The University of British Columbia
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ABSTRACT

This project examines the role of daylight and illumination in the design of urban public space. It explores the 'civic urban public space' in its form as well as its social, health, economic and economic value. It also explores past and present studies in light psychology. Lastly this project examines the history of light - from sun celebration and ritual to the rise of public illumination. The site design proposes one way in which light can enhance the identity, use and health of a plaza in the City of Langley. It emphasizes that plaza design must combine an innovative use of daylight and shadow, as well as illumination. The proposed design uses cycles of the sun and shadow, multifunctional use of illumination, and a variety of light levels and elements. The design aspires to reduce light pollution, demonstrate sustainable technologies and enhance 'sense of community'.
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ACKNOWLEDGEMENTS

I owe a huge thanks to my advisory committee, Susan Herrington, Patrick Condon, Jeff Cutler and Joanna Staniszkis whose guidance throughout this process was invaluable. I would like also to thank Roy Bedlow from the City of Langley for providing numerous maps and drawing. Lastly, I would like to thank my family and friends for their encouragement and support.
CHAPTER ONE: INTRODUCTION

Light greatly impacts the mood of a place. Weather, season, occasion and illumination all contribute to a specific combination of colour and light. This combination influences psychological reactions and the physiological well-being of those using a place. Research has suggested that natural light affects a human being not only on a visual basis but also a nonvisual basis (Mahnke & Mahnke, 1987; Ott, 1973). Consequently, proper attention to light in the man-made environment is important for purposes other than safety and aesthetics. Designers must gain a better understanding of the cycles of the sun, and its relationship with different materials. It is only with this knowledge that designs using patterns of light and shadow will take on the mystery and fascination of the illuminated night. The excitement and wonder of night time illumination have been used in ritual and festivity throughout history. Today it takes on additional programs. In addition to fostering community, health and fitness by encouraging residents to use outdoors public spaces, it is used as a method of identity development or place-making.

1.1 THESIS GOAL
The goal of this project is to provide an example of how light can be used in the design of a dynamic multifunctional urban public space.

1.2 THESIS OBJECTIVES
The following summarize the objectives of this thesis:

1. To enhance identity by creating a unique public space with an imaginative lighting scheme.
   
   This thesis project is an opportunity to explore new lighting technologies; as well as, reinvent old ones in an urban public space as a mechanism for place-making.

2. To promote 1) health in the environment by emphasizing alternative energies and utilizing sunlight and shadow and; 2) health in the community by providing appropriate types and levels of illumination for a variety social spaces.
   
   This thesis project is an opportunity to explore the relationship between light and health. The intent is to promote a healthy environment through the use sustainable or alternative practices in the site design and illumination. The project location in the city and function as a public space also make it an important educational tool. A healthy community, both physically and mentally is also an important aspect of this project.

3. To create a public plaza with a variety of spaces whose form and illumination:
   - resonate with places that are commonly experienced by the residents of Langley and,
• heighten awareness of historic land uses.

People are comfortable with what they are familiar with and this project uses domestic space as a form giver. It is also a concept of this thesis to layer into the design historical landuse specific to the project site.

4. To support the City of Langley in its desire to densify and revitalize its historical urban core.

The City of Langley has seen tremendous growth in the last 15 years. In keeping with the Official Community Plan and the Downtown Revitalization program, this project seeks to create a densification and landuse plan in the historic downtown area.

1.3 RATIONALE AND LITERATURE REVIEW
The use of light (and dark) in the design of public space is often misused and vastly undervalued. Studies have shown that the utilization of a public space is directly affected by the amount, location and type of light (natural or illumination) it receives (Alexander, 1977; Lockwood, 2003; Mahnke & Mahnke, 1987). In the past, lighting in most urban spaces was regarded only in terms of personal safety and property security. It has not been until recently that there has been a resurgence of designers’ attention in this direction. Recent landscape architecture, planning and architecture journals have devoted entire volumes to the aesthetics and application of new and innovative light technologies. More attention must be paid to the large amount of research in light psychology. The position, amount, type and brightness of light plays a critical role in every design.

The intent of this thesis is to use light in the development of form, identity and health of an urban public space. Consequently to complete this thesis project it is essential to have a grasp of the following three topics: first, the urban open space (square) in its form and role of community development; second, the cultural significance of light; and third, the biological importance of light.

1.3.1 CIVIC URBAN OPEN SPACE

The public square is probably still the most important element in city design; it is the chief method by which a town or city is both decorated and given distinction. It is the natural setting for the most important civic and religious buildings, a place for fine sculpture, fountains and lighting and above all else, a place where people meet and socialize.

Cliff Mougton (2003)

As we move into the Twenty-first century North Americans are increasingly aware of the importance of quality urban public spaces. The quickly developing suburban centers have often been critiqued for their lack of attention in this regard. Daniel Solomon in *The Geography of Nowhere* points to the “failure to provide decent public space that brings people into casual face-to-face contact” as one of the five major problems with West Coast suburbia. The breadth of public space is often limited to the park, usually
situated on the outskirts of the downtown. The idea of an urban open space, specifically the civic urban open space has mostly been abandoned. In order to overcome its complete demise in suburbia there needs to be a deeper understanding of the benefits of having a well located and designed urban public space. What exactly is a urban open space? They are public "places of strategic or specific locations" within an urban context (Wooley, 2003). They provide many benefits including social, health, environmental and economic. According to Helen Woolley, there three main typologies of urban spaces: domestic, neighborhood, and civic. For the purposes of this thesis, only the civic open space will be discussed.

Research in recent years has confirmed the importance of the civic open space in community development. It acts as a focal landmark for the community and a place for individuals or community to meet on a formal or informal basis. Used by a mix of people civic spaces provide opportunities for people to do things, take part in events and activities or just to be (Woolley, 2003). For children these spaces may become one of many types of play spaces important in their social development. They help formulate collaborative skills, negotiating skills, confrontation and resolution of emotional crises, management of conflicts and development of moral understanding (Taylor, 1998). Adults use urban spaces mostly for passive recreation (Woolley, 2003). Opportunities for watching children, vegetation, water, activities, and/or other people, reading, meeting friends or visiting a café play a large role in its social value. Organized cultural, educational and political events in these spaces provide opportunities for community involvement enhancing a deep sense of identity.

Noise, work, crowding, family, and air pollution all contribute to everyday stress. Add to this light and other visual pollution and there can be a problem. Mental health in an urban environment is another research focus. Passive recreation opportunities take on an added value by having restorative effects in addition to community building (Woolley, 2003). Mental health is further benefited if these urban spaces include areas of vegetation and water (Kaplan, 1995; Ulrich et al,1991). Research also shows that an aesthetically pleasing space also plays a small role in mental health (Woolley, 2003). Physical health benefits are much easier to define. Active recreation such as biking, walking and jogging often play an integral role in a design. When built in North America, urban public spaces are often an essential part of a pedestrian paths, bike routes and bus routes. They often become fundamental to alternative transportation systems, providing a convenient and safe method of getting people out of the car.

Environmental benefits of civic urban open spaces depend on the design of each individual space and the proportion of hard to soft materials. The micro-climate of a space is directly influenced by the orientation, height and function of the surrounding buildings. Urban design that works with climate and physical landscape reduce energy costs by a total lack of need and by taking full advantage. A permeable paving surface allows stormwater infiltration decreasing the need for stormwater infrastructure. The more plant material not only allows for infiltration but betters air quality, moderates temperature, provides wild life habitat and decreases noise pollution. A predominantly pedestrian space will also decrease CO₂ emissions by discourage vehicle use.
Economic benefits seem to show up in three categories: employment opportunities, nodal importance and property value. The probability of employment increases in retail stores is high that face onto space that brings together constantly a large amounts of people. An urban open space also requires a number of employees as gardeners and maintenance people. These spaces will be likely viewed as a strategic location since it is a node. There is some evidence that property value will go up depending on good results from the previous two categories.

There are obviously many benefits to a civic urban public space. But to many urban designers the question is how to design them to get these benefits. In order for a plaza to 'work', urban theories have determined many design principles which are taken from its form and its function. Many under-used public spaces are identified as being too large, ceremonial and monumental (Carr et al, 1992). Principles of built form in recent publications have stressed the importance of enclosure or a sense of volume (Alexander, 1977; Moughtin, 2003; Hedman, 1984). The agreed upon height to width ratio is best at one to three. Layered into an 'enclosed' built environment is the proper location and design of edges, entrances and the circulation system (Lynch, 1960; Hedman, 1984); the amount and type of hard material, soft material (Kaplan & Kaplan, 1989, Alexander, 1977); as well as, the needs of the pedestrian, the biker, the driver, the tourist, the resident, the shop owner. In 1985 the City of Vancouver did a study on plaza design taking into consideration the climate and context of this city. The study came up with thirteen design guidelines (Appendix 1), which includes: 1) Maximizing visibility from abutting streets to enhance public recognition, 2) ensuring the plaza is sited and designed to maximize both direct and reflected sunlight exposure; and 3) providing areas of overhead weather protection that allows activities such as sitting or eating to continue in the rain. Since Vancouver and Langley share a similar climate, context and culture, most of these guidelines are relevant to this thesis project.

1.3.2 BIOLOGICAL IMPORTANCE OF LIGHT
For a long time, humans were active only during daylight hours. The composition and functioning of the human body was shaped according to this daily cycle. Even today, with our varied lifestyles, the proper functioning of our bodies still depend on a certain amounts of sunlight (Ott, 1973). Innately we know that light is good for us. In sunny weather we feel happier and more active; and in cloudy weather, depressed or calm. As architect Henry Plummer wrote in Poetics of Light, "Throughout human evolution, people have witnessed and felt inside an awakening touch of light. We experience this arousal and transfer of power day after day, as our vigor and spirits build with the growing light of daytime and springtime, only to deplete as the sun dims towards evening and winter" (1987). Studies concur. In periods of low light the number of deaths increases (Bova, 1988). In countries with long winters or with a high numbers of cloudy days have high suicide and alcoholism rates. To alleviate some of these problems better design of space, specifically public space, is needed. One must take full advantage of natural light in the positioning of buildings, building setbacks, trees and vegetation, seating areas and structural components.
In the latter part of the Twentieth century an abundance of research challenged the unprecedented use of bigger, brighter and large quantity of artificial lighting. Scientific evidence continues to show that light has more than an aesthetic and/or functional value (Mahnke & Mahnke, 1987; Ott, 1073). Physiological studies have proven that light and colour can influence human physiology in terms of blood pressure, heartbeat, breathing rate, perspiration, and even brain wave patterns. Lighting designers and landscape architects need to be aware of these effects. An illumination scheme that causes over stimulation (extreme complexity) is just as harmful as one that causes under stimulation (extreme unity).

Under stimulation showed symptoms of restlessness, excessive emotional response, difficulty in concentration, irritation, and some cases, a variety of more extreme reactions. Over stimulation (light pollution) can cause changes in the rate of breathing, pulse rate, and blood pressure; increase muscle tension; sleep disorders psychiatric reactions of varying types; and probably compounded medical consequences, such as increased susceptibility to infection, coronary disease, and ulcers (Ott, 1973; Mahnke and Mahnke, 1987). The International Dark-Sky Association is a recent advocate for the effective/proper use of light. The association has listed three forms of over stimulation, popularly termed as light pollution. Sky glow is caused by “poorly designed, unshielded, and/or improperly aimed light fixtures, such as streetlights and billboards with bottom-mounted lights. Light trespass is any light that crosses property boundaries. Glare is too little or too much illumination applied to one area” (Lockwood, 2003). The constant adjustment to extreme brightness differences, prolonged fixation of the eyes, and constant shifts in accommodation tires eyes quickly, causing headaches, tension, nausea, and other disturbances mentioned above.

According to Addington (2003) the eye has several complex mechanisms for seeing, all based on relative differences of stimuli within the field of view. The differences may include colour, texture, orientation, or movement, in addition to luminance (light levels). A surface with a low light will appear dark if placed next to a surface with a higher light level, and light if placed adjacent to a surface with a low light level. Research has also shown that the eye is insensitive to constancy. The eye cannot differentiate between a steady high light level and a steady low light level. Consequently the eye does not recognize any stimuli in absolute terms. There is, however, a minimum light level of 0.3 foot-candles necessary for vision. A contrast of 3 to 1 between the lightest surface and the darkest surface in the field of vision is considered quite good for distinguishing objects and details. A contrast of above 25 to 1 is considered glare and a contrast of below 2 to 1 is considered low visual performance. Lighting standards do not recognize this and are written in absolute terms. Most call for absolute light levels that are 100 – 10,000 times higher than our vision threshold. It may be of interest to a landscape architect that the human eye is most sensitive to yellow-green light. Consequently plants, trees, grasses are perceived more quickly than another objects in the visual field (Mahnke & Mahnke, 1987).

Whether our response to light, dark and colour is due to our biological make-up or to our cultural conditioning has never been full resolved. The love of light and fear of darkness may be common in
western society, but is it universal? Studies seem to show that response to light and colour falls into the classic nature verses nurture dilemma. Some components seem to be innate and some seem to be cultural. According to Wolfgang Schivelbusch, the newer the culture, the more it fears nightfall (p. 83). In western culture, dark colours are often rated unfavorable and may be associated with gloom, inactivity, boredom or danger. Junichiro Tanizaki (1977) in his book In Praise of Shadow explains the appreciation of shadow in the Japanese culture:

The quality that we call beauty, however, must always grow from the realities of life, and our ancestors, forced to live in dark rooms, presently came to discover beauty in shadows. So it has come to be that the beauty of a Japanese room depends on a variation of shadows, heavy shadows against light shadows. It is indirect light that makes for us the charm of a room. (p.18)

In terms of biology, the eye does not allow for colour vision in low light conditions; therefore, our emotional association to darker colours may come from our associations with how each culture perceives the night.

Every culture has different associations with light and colour developed through cultural traditions, climate, geography, religion, as well as, fluctuations of taste and education level. Despite this, fractious cultural studies seem to have found a general census. Reddish colours are thought to be warm and bluish colours as cool. Red, yellow and orange are usually associated with excitement, passion. Blue and green are restful, calming hues. Purple is often identified with dignity or even sadness, while black, brown and grey are the colours of melancholy and depression. Although these findings may be vague and constantly changing, it does have some bearing for a designer of public spaces. Awareness of cultural associations to light, dark and colour can have a huge impact on design solutions.

1.3.3 CULTURAL ISSUES IN LIGHTING

Celebration of Light:

Early civilizations were created and formed around the cycles of the sun. They recognized the importance of light. The primordial image of the “divine light” shed by the sun was a universally shared symbol, buried deep in our human history. Light and light-filled objects were enthusiastically prayed to, celebrated, worshipped (Plummer, 1983). Fire, the original artificial light, was used in ceremonies celebrating the sun’s creative energy. The rise of agriculture required people to have an intimate knowledge of the effect of sunlight on the planting, growing, and harvesting of crops. The annual cycle of life, death and decay in agriculture became associated to that of the human race. Consequently this association also linked the human race to the energy of the sun (U.S. Committee for UNICEF, 1983).

Most ancient cultures worshiped the sun or had rituals related to the sun. These rituals and festivities were all expressed through the form of a bonfire. At summer solstice, as well as the spring and autumn equinox, ceremonies of light and fire were preformed to strengthen the sun’s life-giving powers (U.S.
Committee for UNICEF, 1983). At winter solstice, when people feared that the sun might disappear, people built large fires to return to the sun some of the energy that was its gift to the world. In many early North American cultures the sun was considered the source of life; fire being its representative on earth. In early Egyptian culture, an annual ritual reenactment of the death and resurrection of Osiris (representing the seasonal decay and growth of vegetation) ensured that life would continue on earth (U.S. Committee for UNICEF, 1983). Furthermore, their supreme god was Ra: the giver of life and light. Two common themes in light celebration seem to be representative of the world over past and present: the sun’s life-enhancing power and the sun as symbol of goodness, truth and knowledge.

The forms of these ancient festivities and rituals: the bonfires, candles and fireworks have stayed part of our cultures in varying degrees. Spectacles of light became part of European festivities during the rise of the courtly culture of the seventeenth- and eighteenth-century. It was at this time that bonfires and fireworks ceased to be the same entity; firework displays had become an element in itself (Schivelbusch, 1983). This was a dramatic change from the Middle Ages and the Renaissance where festivities took place during the day (Schivelbusch). According to Richard Alewyn the shift in the time of festivities was motivated by indicating difference in class, rank and privilege (Schivelbusch, 1983: p.139). Only the wealthy could keep late hours or enjoy oneself into the night where as working people needed to sleep. Soon middle classes tried to distance themselves from the petty bourgeoisie and the artisan class in the same way. Eventually it became the higher one’s social class, the higher one’s rank. The natural rhythm of the sun by which people for centuries was suddenly a mark of a simple life. Despite this, until the middle of the eighteenth century urban dwellers were still as familiar with the angles of the sun and phases of the moon as those working in agriculture (Noreen, 1975). The decline in knowledge of the sun cycles occurred simultaneously with the rise of this ‘culture of the night’; a lifestyle that has framed modern night life as we know it today.

Public Illumination:
The evolution of illumination is a long a detailed history. Consequently the following summary will focus primarily on illumination in the public realm. All information, unless otherwise stated is taken from Susan Noreen’s “The Origins of Municipal Lighting” (1975).

Evidence shows that a few ancient cities had attempted artificial illumination. In China, gas channelized into bamboo tubes lined the streets of Peking. In Antioch, 5th century A.D, a street lighting system was devised of oil lamps suspended from rope. But in most cities any degree of street lighting occurred only during festivals, but that of course was only temporary. During the Middle Ages very little was attempted. Among common people there was a strong religious, social and economic resistance to street lighting that was to persist in varying degrees throughout the gaslight era of the nineteenth century. The feeling existed that by erecting street lamps municipal authorities were interfering with the divine plan of the world which preordained darkness at night. In this era once the sun went, city gates were locked, house doors barred and the nightwatch began his patrol carrying weapons and a torch. There was suspension that those who went out at night were evilly disposed. And then if anyone out at night without a light could
be arrested immediately (Schivelbusch, 1983). In this “nocturnal noman's-land” the torch both lit the way and symbolized of the forces of order. The common fear was if streets were lit, fear of darkness would vanish and drunkenness and depravity increase. And, finally, the constant illumination of the streets would rob festive occasions of their charm and joyousness.

Despite resistance, in 1417 the mayor of London made one of the first attempts at comprehensive street lighting when he ordered “lanthorns with lights to bee hanged out on the winter evenings betwixt Hallowtide and Candleasse” (p.1). The attempt failed. People hung the lanterns, but did not light the candles. This early resistance on the part of the householder to pay for street lighting began what has since become a continuing theme in the history of public illumination. The high cost of lighting limited excessive use to courtly culture and festivals but in 1558 Paris was among the first to install lighting (pitch burning vases) at important intersections. By the early eighteenth century a dramatic increase in crime saw to the installation oil lighting of entire central districts of large European cities including Amsterdam (1669), Hamburg (1675) and Vienna (1689). In Paris these lights were fixed on the street, rather than on houses as part of the new absolutist state. Through this and other measures, it extended its order and control to the street; a place bemoaned by Boileau, “Compared with Paris, the darkest and loneliest forest is a safe retreat” (Schivelbusch, 1983). As lanterns showed who lit the streets and who ruled them; lantern smashing became a method of revolt. As this 'lighting of order' came into existence so did simultaneously a 'lighting of festivity' (Schivelbusch, 1983).

In the nineteenth century social changes were taking place in the urban centers. The development of an active night life urged cities to “turn day into night”. Gas light entered the scene at an opportune time. Gas light, the wickless light, produced a dazzling brightness that had never been seen before. People began to use the street for business and pleasure and consequently wanted more protection against criminals, revelers, galloping horses and the physical hazards of the many unpaved streets. By the mid 1830s there was widespread acceptance of this new light. But just as quickly as oil lights came and went, as did gas lighting as another technology surfaced: electric lights. When in the 1870s and 1880s cities began to install arc lights (electric) on shopping streets, the surrounding streets still lit by gas seemed to be in twilight (Schivelbusch, 1983). The aim of public lighting at this time was to “make the streets so bright that one could dread a newspaper and see the flies on the wall of houses” (Schivelbusch, 1983). But electric lights were expensive and generally unsuitable for general purpose lighting. Their

![Figure 1-1 Early Electric Lighting in Plazas](image)
light levels made it necessary for them to be hung outside a pedestrian’s normal field of vision – not in the street but above it (Figure 1.1). The high intensity of these early electric lights lead to the belief that entire cities could be lit by one or several, well positioned ‘light towers’. In Europe this manner of banishing shadow stated Utopian dream, but in America it became a reality. In Detroit, where a system lay through the entire city, the uniform light from these towers were hailed as providing democracy and equality. Despite this, the system was abandoned 30 years later. The uniform twilight glow over a large area did not compensate for the lack of efficient light anywhere. This was a time of experimentation.

At the turn of the century, the use of electric light for commercial and celebration became the norm. Important building facades or landmarks were floodlit and held a prominent role in the nightscape – “as long as the nighttime was still dominated by dark shadow” (Jackle, 2001). ‘Saturating the night with light’ began in the 1920s. Urban lighting became totally subservient to the rising popularity of the automobile. Streetlights for the car dominated the city; “lit signs were intended not to stand out in dark shadow so much as to stand out in the spillover haze of bright streetlights (Jackle, 2001). In the 1950s and 1960s the highest light intensities ever seen in America were brought into downtown cores. This combined with the greenish-blue or golden pink colouring completely obliterated form-giving shadows. By the 1970s, largely gone was the sense of mystery that once characterized streets through contrasting patterns of light and dark. "Gone, in large measure, was the romance of the night" (Jackle, 2001). Consequently in the 1980s on, there has been an ongoing attempt to ‘rediscover of the night’. An understanding that night has become our leisure time and a number of new technologies has motivated resurgence of experimentation in public lighting. Attempts to regain a sense of mystery are noticeable in the increased number of outdoor night festivals in many urban centers. Planners have realized that the popularity of these events do more than ‘regain the mystery of the night’, they are an important method of developing a ‘sense of community’. Spectacles of light (festivals of light, fireworks competitions, lantern festivals, celebrations of winter and summer solstice) have never failed to attract and bring together people with a similar sense of purpose, crossing all class, age and ethnic lines.

1.3.4 CURRENT ISSUES IN LIGHTING

Lighting has a way of reflecting the values and ideals of a community. Communities that place more value on the vehicle can be distinguished from places that place more value in the pedestrian in how routes are lit. Fifty years ago, writers and scientists were already concerned over the use of light the public space. Unfortunately today many people still see lighting in a purely functional scope and consequently the establishment of light pollution laws are needed to protect and improve quality of life. Charles Lockwood argues that there should be light pollution laws, “just as a town has regulations prohibiting high-speed traffic, noise, and harmful industrial emissions” (2003).

A number of biases towards light and its role in the built environment have been preventative in the introduction and establishment of improved light policies. The view that brighter and more lights are needed to prevent crime is one such bias. “Lighting does not decrease (the rate of) crime; it only allays the fear of crime,” wrote scientist B.A.J. Clark in Outdoor Lighting and Crime. He continues, “there is no
reliable evidence that more or brighter outdoor lighting reduces crime rates" (In Lockwood, 2003) In some more specific studies, crime actually increased as ‘better’ lighting brought more people into a busy area in the mistaken belief that they were now safer...high-glare outdoor lighting tends to provide deep shadows for criminals to hide in". This is not to say that one should abandon all lighting for safety and security. It is a matter of the proper use of light and technology. A ‘dark-campus strategy’ implemented on Texas school campuses turned off background lighting between 11pm and 5am. This indicted the area as off limits during this time to staff, student and the police. The cost of repair due to vandalism dropped from $160,000 to $41,000 per year since the implementation of this strategy (Lockwood, 2003).

Another bias is the misconception that more light will increase appreciation, interest and/or notice. Commercial districts, public spaces and especially parking/transportation areas often apply mass lighting techniques partly because of this bias. “Owners all want to be more visible than their competitors, so they install lighting arrays with 88- to 90- foot candles, which is the same amount of light you need on a surgical tray in an operating suite.” Even a specialist can’t tell the difference between 800 and 1000 lux, only when the range falls between fifty and one hundred is difference easily detected. It is even easier to detect difference between one and ten. Within the range of 0.1 (full moon) and 100 the sensitivity of the human eyes seems to narrow arithmetically as the intensity of light increases (Motoko Ishii in Jankowski, 1993). Quality lighting at lower levels can best be enjoyed when the brightness and darkness levels are in harmony. A study out of Colorado found most people want outdoor lighting to be as bright as the full moonlight, which is 1/100th of a foot-candle, far less than the five-ten foot-candle lighting used on most parking lots (Lockwood, 2003).

The International Dark-Sky Association is a persuasive advocate for changes in lighting policies. In the United States various states are beginning to establish outdoor lighting codes directed at parking lots, golf courses, golf driving ranges and country clubs. Others have focused on commercial, industrial, and residential areas (Lockwood, 2003). In New Mexico, a night protection act was passed which prohibits the sale or installation of mercury vapor lighting fixtures, requiring shielding for all outdoor lighting fixtures and requires that non-conforming light fixtures have automatic shut-off devices activated from 11:00pm to sunrise. Outside the United States on a national scale, light pollution laws have passed by the Czech Republic, Australia and Chile.

Back in 1987 Mahnke and Mahnke acknowledged that “architects, designers, city planners, and lighting engineers today are confronted more and more often with artificial environments and are faced with questions that they are ill-equipped to answer.” The public exterior artificial environment is especially difficult. A lot is demanded of it. It needs to be multi-functional, safe, accessible, and incorporate different users. Light plays a powerful role in transforming space for new or different uses. But light and lighting is complicated. It is only through interdisciplinary study that theoretical concepts of light can be combined to provide practical information to improve the design and consequently the health, use and awareness of our environment.
1.4 THESIS LIMITATIONS

This thesis has three important limitations. First, as the quality and quantity of light has been the thesis focus it has been impossible to address fully a number of issues that would typically inform town densification and plaza formation. Cultural and demographic composition of surrounding residents, current economic condition and demand are all area neglected.

The design makes significant additions to the city's built form. The layout and design of these additions need to be more fully explored and detailed. What need to be taken from the new structures is there orientation to the sun, there role in the formation of the plaza and connecting routes, and linkages between building use and adjacent public space design and program.

Lastly, the lighting design in this project has been largely hypothetical. Lighting design is a field on to itself and has been impossible to address the technical aspects of all the illumination fixtures. The exact luminance for each element is merely an estimate. A lighting designer will need to be consulted. That being said, all fixtures in this thesis are in existence and may be purchased from various manufactures.
CHAPTER TWO: DESIGN FRAMEWORK

2.1 INTRODUCTION
All public open places have one thing in common: they are people places. Places for people to use, gather and socialize. In order to promote a greater usage and wider range of activities, designers have recently paid more attention to lighting effects and illumination levels for day and night. Not only does this demonstrate an understanding of the urban dweller but it shows understanding of the economic, social and environmental benefits of developing multifunctional places. Today the night has become of equal importance to the day. It is during the night that most people have time to relax and socialize. A public space should reflect the changing lifestyle patterns of the twenty-first century. Motoko Ishii, an award winning lighting designer, shares this ideal. In her designs she endeavors to 'create new spaces' within the 12 nighttime hours. She states:

[I am] not trying to invent a source of light similar to solar light or turn night into day, a goal striven in the past. Night and day are different. The earth and its creatures know that. I believe the lighting designer's target is the use of light at night unlike that in the daytime and the creation of new lighting environments different from those during the daylight.

During the night illumination can enliven a public space, and add a touch of excitement to the environment. During the day filtered light and strong use of shadow have a timeless beauty and the ability to connect to our soul. A public space that achieves both is likely to draw people throughout a twenty-four hour period year round.

2.2 PRECEDENT STUDY
The following sections look at two examples of new or renovated urban public spaces that have an innovative use of light and have paid special attention to sustainable practices and technologies. The public spaces have also been chosen for their overall design, use and/or have a similar context to the thesis site. A third example looks at a private garden that uses innovative materials and lighting techniques to create year round interest. The elements in this garden can easily be applied to an urban public space. Each example has had a direct influence on the design solution of City Square.

2.2.1 PLAZA DE LOS FUEROS, ESTELLA, SPAIN
Plaza de los Fureros is a medieval square in Estella a small town in northern Spain. Like most medieval squares its function and character was derived from its origins as a market. Over the years it has became a space both underused and undervalued. The northeast corner the square is dominated by a church, while a mix

Figure 2-1: Plan of Plaza de los Fueros
The design solution called for opening up the center of the square so that it could "become the nucleus of the space" (Asensio Cerver, 1997). Multifunctionality or "freedom of movement for a more complete use of the square" was a main concept. Sight lines were important to allow the appreciation of the square itself and the surrounding buildings. These goals were achieved through the removal to two elements: 1) a fountain at the center of the square and 2) a thick stand of trees surrounding the fountain.

By 'opening' the square, a main focus and unifying element of the design is the surface treatment. The center of the square is defined by the use of square block of Gredos granite (100 by 100 by 7cm) between horizontal stripes of Jadish stone, creating a hierarchical division of space. A ring of bollards encase the entire square, separating the main part of the square. To the south and east sides lengthy benches inset from the bollards emphasizing the shape and size of the square. Lengthwise along the western side, a promenade composed of two rows of trees visually connect the two ends of the square as well as create a visual barrier between a car accessible zone (Figure 2-2).

The lighting in Plaza de los Fueros serves various functions. Night lighting highlights the facade of the church. The rows of bollards on the west side provide light emphasizing the longitudinal connection between the two ends (Figure 2-3). Pole lights strategically placed along the promenade and add an art-like vertical element as well as provide small places of area lighting. Lastly, a ring ground lights designates the center of the square as well as being integral to the town's traditional 'Dance of the Era'. Daylight elements are considerably simpler. Patterns of light and shadow that move daily across the building facades provide a continuous and immediate notice/awareness. However the only significant shadow-giving element comes from the row of trees on the promenade, a continuous repetition of light and dark. The deep recesses of the pergola surrounding three sides of the plaza become the only significant shelter from the Spanish sun.

Perhaps the most important design lesson to take from Plaza de los Fueros is the integration of different functions into single elements. For example, in this design, bollards act as a place of sitting, a boundary between the central square and regular pedestrian traffic. During the day the row of bollards becomes an important way-finding devise and visually connects the ends of the square and during the night their imbedded lights play an integral part in the lighting design providing structure and connection.
The following elements in Plaza de los Fueros influenced the design solution for Langley city center:

- General Multifunctionality Lighting elements: surface and bollard lights,
- Furniture Design and Placement
- Surface Treatment
- Materials

2.2.2 PLACE DES TERREAUX, LYON, FRANCE

Place des Terreaux is located in the historic center of Lyon. A large rectangular public square, it is surrounded by buildings of commercial and cultural institutional importance dating back to the 1600s. In 1994 Place des Terreaux was renovated by Architect/Landscape architect Christian Drevet as part of Lyon’s cohesive public space policy (Gehl, 2001).

The renovation had a minimal design solution with a main focus on the surface treatment (Figure 2-4). It made two fundamental changes in the square. First, automobile traffic was restricted to the north side of the plaza and parking was removed to newly built underground parking. Second, the historic Bartholdi fountain was moved off center to allow full view of the beautiful Palais St-Pierre.

The new surface treatment consisted of a grid of 5.9 by 5.9 meter black granite pavers. Sixty-nine of these squares held small water jets that form an innovative vertical element in the center of the square (Figure 2-5). Towards the south are several short pedestals for seating, delineating the boundary for car and bus traffic. The north side features a row of columns forming a backbone for a large number of café chairs and tables beckoning from the sunny side of the square.

The simple grid of small water jets transforms the square into a complex space both day and night. In daylight each water jet captures and reflects the sunshine. The glassy water spill out mirrors the image of the surrounding buildings (Figure 2-6). Complex patterns of light and shadow appear on the ornate building facades as the sun courses through the sky. The row of
columns cast a repetitious row of shadows along the
appropriately placed south facing café district. The nighttime
lighting design provides a harmonies balance between light and
dark. Water jets are lit from below creating a space that is bold
yet softly luminous (Figure 2-7). The minimalist lighting of the
ground surface tricks the eye into thinking that there is more light
than there actually is. Voids of darkness are off set by the
repetition of vertical lighting of the water jets. The additional up
lighting on the surrounding buildings make use of the wet
pavement from the water jets providing irregular shimmering
reflections, adding light in the 'void' in a very subtle manner.
Christian Drevet preserves the historic focus of the square by
flood lighting Bartholdi fountain. This retained the square's historic character amidst the renovated modern
design.

The following elements in Place des Terreaux influenced the design solution for Langley city center:
- Simple Grid paving pattern
- Café positioning
- Use of water reflection
- Multifunctionality of surface and fountain lighting
- Façade lighting

2.2.3 PAUL COOPER GARDEN, LONDON, ENGLAND
The Paul Cooper Garden is located at the back of a semi-detached house
in London (Figure 2-8). The longer than typical plot size is framed by a
three story house to the south, a square'ish' one-story conservatory to the
north, and fences to the east and west. A number of large deciduous
trees within the space and bordering plots dominated the space. These
trees, subject to preservation orders, allowed little or no direct sunlight
into the garden. Adding to this 3 stories of shadow from the house and
the site has the potential to be a dismal place.

The goal of the garden was to create a garden that used the “retrained,
geometric, and unfussy forms of modern architecture” (p.185). It also
needs to be a place of visual interest year-round and night or day. The
design solution was based around two squares separated by a
rectangular formal pool. The square nearest to the house, the more
shaded of the two, is planted with hardy woodland grasses with randomly
placed spring bulbs and surrounded on two sides with shade-tolerant ground cover. To the west encasing a planting bed is a low retaining wall, a visual extension of the house. The second square in the northern end of the lot “is simply a clearly defined lawn and provides a sense of space in what is otherwise a confined garden.” It is the sunniest area in the garden.

Throughout the entire site are strategically placed vertical elements. Simple, tall, rectangular frames encase back-projection material creating a theatrical atmosphere. During the day these light-sensitive screens bounce additional light into the shadowy spaces. These elements also break up the site into a series of “rooms”, adding a sense of mystery. At night these screens turn into illuminated walls. Both single colours and intriguing images are projected on the screens creating a sense of energy and drama (Figure 2-9). Colours and images can be manipulated to take full advantage of silhouettes from trees, plants or people. In addition the lighting/projection devices are remote controlled, allowing for changes in season, weather or individual mood.

The following elements in the Paul Cooper Garden influenced the design solution for Langley city center:

- Use of uncharacteristic materials for lighting elements
- Use of day/night and year-round interest.
- The modern formal design

2.3 CONCLUSION

Plaza De Los Fueros, Place Des Terreaux and the Paul Cooper Garden all have unique lighting elements that both compliment and play an integral role in the site design. Multifunctionality is key their success. The mixing of alternative energies, sustainable materials, sun & shadow and new technologies have created a flood of innovative designs. Multifunctionality makes it so necessary elements such as safety, vandal resistance, durability, and ease of maintenance can dealt with eloquently – in both form and function.
CHAPTER THREE - THE SITE CONTEXT AND PROPOSED DENSIFICATION

3.1 INTRODUCTION
The site of this thesis project is located in the geographic, political and historic heart of the City of Langley. Very little acknowledges this fact as a parking lot occupies the entire area. The redesign of this site is an opportunity for the City of Langley to break free from its suburban character and create a strong center and identifiable place.

3.2 CITY OF LANGLEY - CONTEXT

3.2.1 REGIONAL CONTEXT
The City of Langley is a 10.18 sq-km community is located in the lower mainland of Vancouver, Southwestern British Columbia. It is surrounded to the north, east and south by the township of Langley and to the west by the City of Surrey (Figure 3-1). Situated roughly halfway between Vancouver (44 km) and the rural communities in the Fraser Valley it has become an important commercial center. Its location near Highway One (Tran Canada), the Canada/USA Pacific Border Crossings (9.6 km) on Hwy 15 and the Tsawassen Ferry Terminal (63 km) have supported its development. The City of Langley has essentially turned into a gateway between city and country.

![Figure 3-1: Map of Greater Vancouver](image)

3.2.2 HISTORIC SETTLEMENT PATTERNS AND LOCAL HISTORY
The Fraser Valley was originally home to the Sto:lo people, a group of Coast Salish First Nations Peoples. The specific area that comprises the City of Langley was not used heavily by the Sto:lo. It is thought however to be an area passed frequently en route to the lower Fraser Canyon via the Nicomekl and Salmon River (Figure 3-2).

![Figure 3-2: 1875 Transportation Network](image)  
![Figure 3-3: 1924 Transportation Network](image)

Early accounts of Europeans in the
lower Fraser dates in the late 18th and early 19th centuries. Europeans first inland to the site of what was to become the City of Langley in the winter of 1824. An expedition Party ‘discovered it’ in their quest for a new trading post on the lower Fraser River calling it a “pretty little plain” (Sommer, 1999). In 1827 a trading outpost, Fort Langley, was constructed at the intersection of Salmon River and the Fraser. The fort first concentrated trade with furs, but eventually expanded to salmon and cranberries when these became desirable in Hawaii and elsewhere in the Pacific Rim. Instructions from the Company (Hudson Bay Company) that the fort should become essentially self-sufficient led to the development of a farm outside the fort’s palisade. Agricultural activity increased phenomenally in the early 1830s, when the fort’s third Chief Factor, James Murray Yale, established a 2,000 acre farm southeast of the fort, at Langley Prairie. Known in later years as the “Hudson’s Bay Company Farm,” the new operation occupied most of the land which McMillan had portaged in 1824. The boundaries of the farm stretched from became Trinity Western University in the northeast, to just outside the boundaries of the future city. Although the Company did not farm anywhere in the City, it seems likely that men from the farm utilized the area as a source for game, and other natural resources.

In 1856 the discovery of gold on the sandbars of the Fraser Canyon put the fort at a convenient location en route. Thousands of would-be miners quickly streamed north from California. The influx of American rouse fears of an American take over and the mainland was quickly made a colony of Britain in 1858. This action resulted in the entrance of a contingent of Royal Engineers, who was sent by the British government to survey the land and to undertake public works. When the Company ended operations in 1886, its farmland and surrounding territory was divided and sold. In the early 1870s Adam and William Innes became the first European long-term residents of Langley Prairie (Sommer, 1999). The corner of their property - Yale Road (Fraser Highway) and Trunk Road (Glover Road) - became the basis for a new hamlet known unofficially as “Innes Corner”. This was crossroads of the only inter-regional east-west and north-south routes. In the 1900s smaller lot sizes and a large promotional campaign attracted more families to the area, but even as late as the turn of the century there was scarcely more than a dozen families in Langley Prairie, nowhere near enough to support even a few businesses. The nearest store was in New Westminster to the west or Murrayville to the east. It was not until 1909 that Langley opened its first commercial enterprise: a general store. Combined with the arrival of the British Columbia Electric Railway (BCER) Langley Prairie...
had entered a new era (3-6 to 3-8). The railway crossed to the north of Innes corner, running directly through the center of the project site, forming the present day size and shape. Businesses followed the railway and “Innes Corner” grew into the village of “Langley Prairie” (Figure 3-3).

The construction of the Fraser Highway in the 1920s and the Patullo Bridge in 1937 made Langley the commercial hub of outer regions (Figure 3-4 to 3-5). In 1955, approximately 10 square kilometers, succeeded from the Township establishing the City of Langley. Its proximity to Vancouver, Seattle and B.C. Interior markets has made it an attractive area for investment and development. Housing starts, business licenses and development applications have seen and continue to see high growth rates. In 1956 the population of Langley was 2,000. By 1975 it was 10,000 and in 1981 it was 16,500. Currently Langley’s population sits around 23,753 with its population expected to continue its rapid growth to 30,944 in 2021.

3.2.1 PLANNING CONTEXT
The City of Langley is committed to working with the Greater Vancouver Regional District to achieve the goals and objectives outlined in the Livable Region Strategic Plan (1996). Since Langley now has the status of a regional town center, the building of a complete community is a central component in Langley’s Official Community Plan (Figure 3-9). The goal is to create opportunities for people to live and work within the City of Langley and “avoid the pitfall of developing as just another suburb of Vancouver. This has and will be achieved by providing for a range of affordable housing types, retaining existing and attracting new commercial and industrial ventures through protection of areas designated for these uses and, finally, fostering social and cultural opportunities within City limits”. Initiatives such as the ‘Downtown Revitalization’ help to advance this goal by calling for higher density development, alternative transportation methods (pedestrian/bus routes) and more and improved public open spaces (City of Langley, 2003).

Langley’s Land Use Map is ordered around the centralization of density and activity in the historic downtown. Rings of decreasing density radiate out this center forming districts of residential, industrial and service commercial. Industry and service commercial is located primarily to the north. To the south residential zones are interlaced with riparian, park or recreation zones. Langley’s population is just under
24,000 (City of Langley Stats, 2003), but with a projected population of 32,100 in 2021 Langley planners are constantly increasing the percent of high density residential. In addition, the population growth has important implications to the success of the renovation of the historic downtown.

The Downtown Revitalization effort to regenerate the historic core of Langley (Downtown Commercial Zone) has been an ongoing initiative since the 1970s. The success of this revitalization is essential to the success of the O.C.P. In the mid-1990s a new multi-facetted approach was set into action that combined civic, organizational and marketing components. The ensuing vision statement is as follows:

To create a well defined downtown business core with a distinct identity and foster an upper end retail marketing image to serve as a destination shopping centre for the surrounding communities.

2.5 million dollars have been delegated to a variety of civic improvements including road/streetscape improvements, pedestrian pathways, pocket parks, public spaces, boulevards, landscaping, streetlights, signs and special structures.

This project supports the objectives of the O.C.P. It works within the framework of the Land Use Map and the Downtown Revitalization effort, proposing one solution for densification, revitalization and identity creation. The project site, located in the heart Downtown Commercial Zone, aims to increase the allowable mix of retail, commercial and institutional uses and become a gathering point for Langley residents. This project also directly supports the Downtown Revitalization effort to develop the ‘City Square’ (the thesis site) into a public space (Appendix 2). The proposed design creates a center for the city and a ‘node’ in the historic shopping district.

3.2.4 PHYSICAL GEOGRAPHY: Topography, Drainage and Climate

Langley was rightly called ‘Langley Prairie’. As part of the floodplain of Nicomekl River Watershed, the landscape is mostly flat. The river is located south of the project site and flows southwest towards the ocean. Many tributary streams run down into Nicomekl River from the only hill in the City, situated along the southern border.

The number of aquifers in this region (The City and Township of Langley) makes it necessary to take special care of this watershed. The Langley-Brookswood Aquifer, the only aquifer within the City boundaries, occupies areas along the south border (Figure 3-10). In total this aquifer covers an area of
about 38 square kilometers, and extends through the Township into Surrey (Township of Langley, 2004). It is comprised of sands and gravels of the Sumas Drift, with an average thickness of 30 m (Township of Langley, 2004). A possible factor influencing landscape design is its largely unconfined and generally shallow water table (less than 10 m below ground surface). In addition, the aquifer is reportedly recharged from precipitation and exfiltration from Anderson and Campell Creeks (Township of Langley, 2004).

As with all towns in the Pacific North West the climate of this region is generally mild. Temperatures are above 0°C in the winter and under 20 in the summer leading to large amounts of precipitation but few snowfalls. That being said, weather patterns in the Vancouver region are changing. The tendency for hotter, drier summers and colder, stormy winters needs to be taken into design consideration.

Lastly, the location of Langley on the 49th parallel has important implications on the amount and intensity of the sunlight. During the winter solstice the sun angle peaks at 18 degrees, while during summer solstice the sun angle is 65 degrees. These angles result in long winter shadows, which have important implications in urban and landscape design.

3.3 CITY CENTER – EXISTING AND PROPOSED

In order to create a strong city center there needs to be a good built form, a large population base and a mix of services. Consequently the densification of the area around the project site (a part of the historic core of Langley) is one of the objectives of this thesis. The following sections will first look at the existing built form and then at the proposed changes; first, at the neighborhood scale and then at the site scale.

3.3.1 HISTORIC DOWNTOWN: Existing Built Form & Land-Use and Circulation

The removal of the railway in 1960s, the rise of the shopping mall in the 1970s, the changing economic base in the 1980s and the revitalization efforts in the 1990s have created an interesting and dynamic mix of land uses and built form in the historic downtown. As is typical in many suburban centers the automobile has dominated the landscape. Irregular road pattern and high number of surface parking areas cover the land with a seemingly high portion of asphalt. The British Columbia Electric Railway, removed in the 1960s, left huge swaths of derelict land in its wake. The tracks had cut across corner of the Fraser Highway/Glover Road intersection and through the ‘City Square’ site (Figure 3-11). Its removal left an irregularly shaped lot (the project site) and a number of awkward intersections and roads.
The economic base of Langley has changed resulting in massive changes in land use. Manufacturing no longer plays or is zoned to play a role in the historic area but has left a number of derelict sites in its wake. The seemingly derelict site to the north is one such area. In the last 10 years it was rezoned Downtown Commercial and is currently being developed into a multiplex casino. To the east is the main concentration of historic buildings. Here the revitalization efforts are being felt the strongest. Measures such as reducing traffic through one-way flow and angle parking, the creation of pocket public spaces, as well as, emphasizing pedestrian routes have been successful. The buildings are all 1-2 stories and are originally made of wood with a brick base. To the south a strip mall sits where the historic Timm’s Market Garden Company used to be, still occupying the historic property lines. The associated parking lot is the biggest offender of densification. To the east there is a continuation of commercial street frontage which needs little changes except for perhaps a face lift.

3.3.2 CITY SQUARE: Existing Built form & Land-Use and Circulation
The built form at City Square is currently a mash of various architectural styles and time periods. Buildings enclose the site on all sides, except for a section to the north-east and to the north-east, forming a roughly a diagonal rectangle. This awkward site shape resulted from development around what was the BC Electric Railway line. The mass/void study (Figure 3-12) highlights the lack of enclosure on the site.
To the north-east is a small strip of moderately neglected historic buildings (Figure 3-13). They are all 1-story commercial buildings except for one that has a second floor addition that is rented out residential. They all have good street frontage and form a compact strip of businesses. The current uses are generally low-end service and retail establishments that include a money mart, dance clothing store, Money Mart and various collectable shops. Among the many challenges that these buildings present to this site is an irregular and angled edge and ugly facades that have no architectural unity between themselves as well as the rest of the buildings on the site.

![Figure 3-13: Historic Commercial Buildings](image)

To the south-east are three 2-story buildings that house a combination of commercial and institutional uses (Figure 3-14). Langley City Hall and the Langley Library are located in the most recent building at the intersection of 204th and Douglas Crescent. Among the challenges that these buildings present to the design of City Square is: 1) the lack of entry directly onto the site, the location of the parking garage and the disunity of the building with the surrounding architecture. However the design maintains the historic setback creating a good street frontage.

![Figure 3-14: Library and City Hall](image)
The single building located along the south side of the site is Timm's Community Center (Figure 3-15). Named for the family who first settled the land south of the railway, the building was built as the Langley Library, but had recently been converted into a youth center, gym and community meeting area. Like the City Hall/Library, this building is lacking an entrance onto the site. In addition the building will need a number of structural changes to create a useful space for the community. The lack of architectural unity with the surrounding buildings on the site is an additional challenge.

The buildings on the west side of the site include one 5-story residential block and two 2-story office buildings (Figure 3-16). The residential building is Langley's first attempt mixing residential into the historic downtown core. Unfortunately it is out of context with the rest of the built form on the site. There was an attempt, however, to made to use historic elements in material and in certain forms. The two office buildings house a number of Langley's law offices, chartered accountants, and financial services. Once again, they are of a different architectural style. These three buildings present a number of challenges: First, a windowless first floor of the residential building (covered parking garage) creates an unfriendly edge. This edge combined with the office buildings creates a long dark narrow corridor. Second, the massive size of the residential building dwarfs the surrounding buildings. The last challenge is the blank side wall of the office buildings facing onto the site.
3.3.2 PROPOSED DENSIFICATION

The densification of the city of Langley’s historic neighborhood requires three moves (Figure 3-17). The first is to create a built form that encloses the old railway strip turned parking lot creating the basic ingredients for an urban square. The second is to develop high density residential units in the overly large strip mall parking lot. The third is to modify the surface parking lot plans for the new casino, i.e. making it so the parking does not come all the way up to the Fraser Highway. One option is to have a parking garage with first floor commercial along the street front or ideally to redesign the casino site so that the building has a street frontage.

The form of the central square required special attention (Figure 3-18). Because the residents of Langley are not accustomed to urban public spaces it is necessary to look at all the variables that go into making a comfortable welcoming public square. A sense of enclosure is created with the infill of street frontage on the north side. Attention is paid to the height to width ratio and is in keeping with research by Alexander (1977) and Hedman (1984). Because all buildings are least 2 stories, the implication is that the historic buildings will need to be renovated and a floor(s) added. In addition to creating a sense of enclosure, this dramatic change is necessary to compete with the future casino and visually unity with the 5 story residential building on the eastern edge. The architecture of the new and renovated buildings should in some way reference the historic materials or style. There should also be a mix of building uses including a variety of residential units and a variety of eating establishments. A variety of residential units provide a demographic mix in residents. A variety in eating establishments provides opportunities for all people to feel part of the community. According to Alexander “The street café provides a unique setting, special to cities: a place where people can sit lazily, legitimately, be on view and watch the world go by...It helps enormously to increase the identity of a neighbourhood” (p.437). They also help enormously in the 24-hour usage of a place.
Lastly, the rudimentary circulation pattern creates a natural meeting space near the center of the square and entrances on to the site come from all directions. The entrance passages were of special attention. The main entrance was designed to 1) keep the angle of the old railway line and 2) create a feeling of passage at all entrances).
CHAPTER FOUR - DESIGN STRATEGY AND PROGRAM

4.1 INTRODUCTION – PRIMARY GOAL AND OBJECTIVES
Since City Square is the geographic, political and historical heart of the City of Langley it is important to provide this primary civic urban public space with two objectives. One, its form and illumination should resonate with places commonly experienced by the residents of Langley, and two, it should heighten awareness of historic land use. From these objectives a concept emerges that combines the intimacy of the home with historic landscapes of the city.

4.2 FORMATIVE DESIGN CONCEPTS
The writings of the urban theorist Christopher Alexander, architect James Cutler and numerous others have all promulgated the idea of ‘rooms’ in the exterior environment. The idea is not new. The outdoor space as an extension of an interior space has been designed for centuries, especially in warmer climates. Cutler and Alexander both argue that outdoor rooms are entities unto themselves. Cutler writes, “these ‘room’ environments, if done well, [become] more than servants to the architecture” (In Zevon, 1999).

To create these ‘room’ spaces, a landscape designer needs to apply the same principles to an outdoor space as an architect does to an interior space. The idea of walls, floors and ceilings become fundamental form givers; different spaces or ‘rooms’ take shape in and around these elements. “An outdoor space becomes a room when it is well enclosed with walls of the building, walls of foliage, columns, trellis and/or sky” (Alexander, 1977). The formative design concept for this project takes this idea to a further extreme. The physical floor plan of a home, a space that resonates with places commonly experience by the residents of Langley (objective 3), becomes a medium, an overlay, in which spaces are sized, ordered, oriented, filled and lit. This concept works well with both the proposed program for the site, as well as, its highly enclosed physical form. A floor plan implies distinctly different activities contained by real or implied boundaries. Every room in a home was created because of a different need or necessity. Consequently each has a different type and arrangement of furniture, location and orientation, and lighting types, locations and levels. The first part of the design concept for City Square strives to exploit these differences to create a variety of space in keeping with the project objectives.

The second part of the design objective is to heighten awareness of historic land use. The historical layers of this site should be incorporated into the individual design of each ‘room’. The point is not to literally represent historical elements on the site but to use their form. Different land uses on this site include the original prairie grasslands, the farmland, the railway, and lastly, the historic commercial buildings.
4.2.1 THE ‘ROOMS’

For the purposes of this thesis project, only a selection of rooms in a home floorplan will be represented. In Figure 4-1 seven rooms are shown: the entrances (front door and backdoor), the foyer, the green room, the kitchen, the living room, the hallway and the garage.

The first part of this thesis project, densification of the City Square, creates a space that lends itself to the ‘Home Floor Plan’ concept. It creates a sense of enclosure, distinct entrances, and the formation of nodal places. Building-use adjacencies also play a large part in ‘room’ placement within City Square. The Green Room is placed next to the Library because both are associated with study, solitude or reading. The Living Room is placed next to Timm’s Community Center because both are associated with group events and socializing. A full explanation of the placement of each room on the site is described in the following sections. They will start with a short discussion of the form and function of each room followed by their translation into site and lighting design.

4.2.1.1 THE ENTRANCE AREAS

An entrance area functions as a place of both activity and inactivity, a place of passage and of gathering. It is a place that should orientate and direct (Figure 4-2). “The entrance must be placed in such a way that people who approach [a building] see the entrance or some hint of where the entrance is, as soon as they see the building” (Alexander, 1978, p. 541). It should have a relatively narrow portal of simple or complex design. One should get the sense of walking through, into, or arriving at a ‘different’ place. There may be a sense of shelter or intimacy. “The experience of entering a building influences the way you feel inside...If the transition is too abrupt there is no feeling of arrival, and the inside of the building fails to be an inner sanctum” (Alexander, 1987...
Lastly, the materials and form of the entrance should speak to the history of the place and/or the values of the residents.

On the project site the Front Door is placed at the most exposed entrance (Figure 4-3). It is positioned at the historic 'Innes Corner', still one of the busiest intersections in the City of Langley. The Back Door, is placed at the north entrance into City Square. These entrances have been singled out because they enter/exit directly onto the street and intersection. Because the form of the entrances, i.e. the height and width, has already been set in the previous densification scheme, additional focus to these areas must be developed through means such as lighting, plantings and/or furniture. The design must create of interest and a sense of welcome to people outside the square. The illumination levels must be high enough to attract from a distance. Daytime interest through shadow patterns could do a lot to create a memorable portal. Any elements should be indicative of what the atmosphere and landscape is within.

4.2.1.2 THE FOYER
A Foyer also functions as a place of activity and inactivity. It is the calm space before exiting and is the welcoming place on return. The form of the space is usually small with simple furnishings. It is open or has a spacious feeling that allows for movement, preparation and orientation (Figure 4-4). Often there is a place to sit, a mirror for that last check and a protective mat or carpet on the floor.
In City Square the foyer is placed adjacent to the main entrance (Figure 4-5), as it would in a home. It is a space that all must enter to get to the other ‘rooms’ of City Square. The design of this space should be relatively open and uncluttered with furniture or plantings. This will then focus sight lines to other areas of City Square and provide easy access to the variety of destinations within. The floor treatment should be hard (accessible) paving and lighting should compliment that of the entrances - spread out on the buildings façades (wall lights) and/or in the paving (‘carpet’ of lights).

4.2.1.3 THE KITCHEN
The kitchen is always a place of activity. Whether it is in food preparation, lunch with a friend or a study group, the kitchen is one central hub of the home. Its atmosphere is often one of relaxation and comfort despite the constant flow of activities (Figure 4-6). The kitchen has the ability to accommodate few or many. The kitchen can have a range of forms and is the one space linked throughout history to the idea of the outdoor ‘room’. The link between the outdoors and the place of food preparation is an obvious one. The formal kitchen gardens of the middle ages or the back patio of the present all speak of very concrete, structured living spaces. They are furnished and decorated as would in interior space; the essential elements being the table and set of chairs.

In City Square the kitchen space is placed on the south facing side of the square adjacent to a main pedestrian axis. In this area the densification plan proposes a strip of street cafés, bars and restaurants. With this in mind the translation of kitchen concept into this space becomes obvious. There should be outdoor patios spaces for all restaurants along the pedestrian route that allows people watching opportunities. There should be a planting of deciduous trees to provide sun in the winter and shade in the
summer. The form of these planting should take advantage of its location through the play with patterns of light and shadow during the day and with illumination during the night. Within the patio space lighting should reflect the intimacy involved in eating with low levels of illumination. The use of candle light/fire would be appropriate in specific locations.

4.2.1.4 THE GREEN ROOM
The Green Room is meant to be a place of relaxation, a place of escape and usually can only accommodate a few. Its restful atmosphere is due to two reasons. One, the room is a small enclosed space that has few entrances, yet is visual open (Figure 4-8). A number of urban theorists have noted that spaces partially enclosed are comfortable (Alexander; Hedman). Two, a green room is often composed of a large number of plants. Visual and/or physical access to plants has proven to be beneficial to mental health (Kaplan; Grahn).

In City Square the Green Room placed beside the library entrance and is bounded to the north by the ‘Kitchen’ and the east by the ‘Foyer’. It adjacency to the library is deliberate. The space

Figure 4-7: Kitchen Placement

Figure 4-8: Green Room Concept in the landscape

Figure 4-9: Green Room Placement
should encourage people exiting the library to sit, read or simply relax outdoors. An assortment of plantings should form the space to be partially enclosed but with views to the surrounding 'rooms'. Plantings should have interesting architectural form and have the ability to 'catch light'. Illuminations should emphasis the planting material.

4.2.1.5 THE LIVING ROOM

The Living Room is the heart of the home. It is a multifunctional space that can be shaped to meet the needs of many family activities. It can be still and quiet one moment and loud and boisterous the next. (Figure 4-10) It is usually a space with multiple entrances and big enough for large groups of people. Typical furnishings in a living room may include a television, various forms of seating, and multiple light elements.

In City Square the Living room is placed at the crossroads of the east-west and north-south pedestrian pathway, the hub of activity on the site (Figure 4-11). In addition to the crossroad, building adjacencies have heavily influenced the placement of the living room. Most bordering buildings are high activity places. To the south is Timm's Community Centre; to the north-east are the proposed strip of cafés and restaurants; and to the north-west is variety of service stores. The focus of these building-uses around the crossroad, framing the 'room' space, strengthens its function as the activity center, drawing people in both night and day. This space should be considered a gathering space, a place for community events. As market gardens, festivals, and political events etc need a lot of space, the Living Room is given the most space on the site. Other elements that indicate this as a different/important space should be included such as a change in paving material, a focal design element or a strong
architectural form. Lighting should be varied and adaptable for different events. The space should be physically open to allow for as much sunlight as possible.
CHAPTER FIVE - PROPOSED DESIGN

5.1 INTRODUCTION
The design for City Square attempts to create a new public square that unifies the underused landscape and diverse building styles into a single entity. The intention is for the place to have a composite character, neither dominated by architecture and hard floors, or trees and other greenery. There is an exploration with light that varies from subtle to bold, that varies the atmosphere and character of the space during day and night. The 'rooms' in this site are equally distinguished by variation in lighting as by hard/soft materials.

5.2 SITE CIRCULATION
The site design is structured around the circulation pattern established by the densification scheme (see chapter 3). Because the space is primarily pedestrian the design aimed to build upon and strengthen these internal circulation routes as well as the edges and connections to the surrounding city. There are two major pedestrian routes, one runs in an east-west direction and the other in a north-south direction (Appendix 3a). The latter route makes strong connections to the proposed high density residential development to the south and to the casino and commercial/office space to the north. Where as the first route connects to the historic shopping district and routes to the Langley bus loop and Kwantlen College to the east and to Nicomekl River to the west. Minor routes enter the the site from the City Hall access road and from between the west end profession buildings. There are seemly endless minor routes of moving internally due to the nature of a square.

No vehicles are able to park on the site except for residents of the existing 5 story residential block. And in this case, the parking stalls are only located along the western edge of the square (adjacent to the southern pedestrian route. All other parking has been removed to above and below ground parking garages. The upper floors of two infill buildings are now designated parking places; the ground level is devoted to retail or office space. A temporary parking/ drop off 'round-about' is located off the north entrance. This space is to be used for service deliveries for the stores and restaurants; for guest drop off or as a 'moving' space for residents'; or for additional room for community events. On the west side of the City Hall another round-about is added to provide a convenient and accessible drop off from the south side of the square.

5.3 SITE DESIGN
The site design has three unifying elements: the trees, the water, and the directional paving pattern (Appendix 3b). First, a single type of tree is used throughout the site. These trees follow most pedestrian routes and form a Bosque at the square center. Second, water is present in all areas. A formal water element that originates in the eastern sections transforms into an informal swale system in the western section. One branch of the swale runs west along the pedestrian corridor/office building back and another runs south between the Community Center and the pedestrian pathway. The third unifying element is the paving. A 1000mm by 2000mm paving stone is used throughout the entire site unite the components of
the different 'rooms'. All three of these elements are aligned along the north-east to south west direction of the historic railway line.

5.3 LIGHTING DESIGN

The first section will discuss the sun-shadow elements in the proposed design, where as the second will discuss the elements of illumination.

5.3.1 LIGHT-SHADOW PLAN (Appendix 3c)

Bold, delicate, simple or intricate patterns of light and shadow provide energy and life to a space. The use of light/shadow is an inexpensive and transient expression on the landscape. In this design solution the aim was to create a combination of experimental and classic forms. Classic forms use everyday structural forms in a repeating pattern. In the site this includes shadows from elements such as the rows of trees, the line of bollards, the repeating wood element in the overhang and the grid of lights at the main entrance. Experimental forms use unique shapes or materials to manipulate or emphasis shadows. This includes the shadow screens in the ornamental grasses and along the café patios. There has also been consideration of the built form enclosing the square. The north facing facades are often made of glass and/or their upper floors are offset to allow more sunlight into the plaza. The positioning of the shadow elements in City Square is important as the surrounding City Hall, Community center and apartment building casts large shadows. Most elements are located on the south-facing side of the square, unless they also part of the illumination plan.

5.3.1.2 ILLUMINATION PLAN (Appendix 3d)

The art of illumination is complex. In this design solution the aim was to combine a number of innovative elements with a few common ones. Uplighting is a common method of tree illumination. It reverses the direction of sunlight highlighting textures and spaces hidden during the day. Uplighting is used on all trees on the project site. Shadowing is the shining of light on an object to gain its shadow against a vertical surface behind. Minimal amounts of light are needed emphasizing the fact that light is often “much more noticeable by its absence as by its presence” (Powell, 2001). In the proposed design screens are located in the ornamental grasses and the along side the café patios. The screens will catch the shadows of the grasses in the first area and human figures in the second. Mirroring is a method of utilizing uplighting in combination with still water to create a particularly dramatic effect. In the site this method is used by lining up lit trees along the pool. Among the innovative forms is image projection. Rotating screens located in front of Timm’s Community Center can be used together as a movie screen or separately for the varing needs of the community center. The screens could be use for projecting community information, karaoke songs, or cheerful images in the winter. Solar powered energy is used in an innovative paving block which uses inset LED lights small enough to be charged by capturing enough energy from the sun daily. Overhead ‘string’ lighting is redesigned in a particularly dramatic way creating a memorable main entrance. Indirect pole lighting lining the ‘living room’ space is a result of recent innovative methods to reduce glare. In addition the light levels of these light poles are adjustable to user needs. All the
elements are site specific and are directly related to the development of the design concept by emphasizing the ‘walls’, ‘floor’ or ‘ceiling’ of a particular ‘room’.

5.3.2 DESIGN DETAILS
The following sections explore the square design in greater detail within the context of the concept. The spaces previously designated to each ‘room’ will be discussed separately – the entrances, the foyer, the kitchen, the green room and the living room.

5.3.2.1 ENTRANCES (Appendix 3e)
The main entrances have perhaps the boldest illumination features in this design. Each feature is a simply grid of individually encased lights. The narrow entrance corridors are emphasized either by a ceiling of lights (at the main entrance) or a floor of lights (at the ‘back’ entrance). By emphasizing these two areas, users become aware that they are entering a new space; a sense of transition is created. In the ‘back’ entrance, the surface illumination pattern plays a secondary role as traffic laneways. A central line of lights is absent to delineate the two lanes. The ceiling of light at the main entrance extends out past the building walls creating a gateway. At night the hundreds of lights create a steady glow; during the day the grid-like construction design creates an intricate pattern of shadows. Wood trimmed concrete blocks used for planters and seating repeats the cube shape of the individual lights at ground level. The diagonal direction emphasized by the form of the entrance, the lighting design and paving pattern was shaped by historic railway tracks, no longer present. This direction is emphasized throughout the entire site and serves as the main unifying element.

5.3.2.2 FOYER (Appendix 3f)
The foyer room is designed to be visually open space. The only vertical element in this space is a row of three trees on the north side that delineate the pedestrian/bicycle passageway. A subtle reflecting pool (6 by 10 meters) has a water level flush with the ground surface creating a mirror-like effect in the center of the space. Water flows through the pool at a one percent slope and into a channel that flows lengthwise throughout most of the square. During times of dry weather water will circulate from the channel back to the pool. Any excess water (storm water) will drain into the swale located at the end of the channel. Benches on two sides of the pond provide a seating area along the pool providing opportunities for people to dip their toes or simply relax by a water feature. Reflected images of the surrounding buildings and the row of trees to the north are reflected in the pool both day and night. These design elements are aligned with the diagonal orientation originating from the main entrance. The main light element in the ‘foyer’ emphasizes the ground surface space. Embedded in the concrete pavers are hundreds of tiny solar powered LED lights creating an opposite effect to the adjacent main entrance ‘ceiling lighting’.

5.3.2.3 GREEN ROOM (Appendix 3g)
The green room is designed to be somewhat of an urban oasis. This space is shaped by four elements: 1) grass-like plant species, 2) a transparent screen, 3) water channel and 4) a row of south-facing benches. Grass-like species are chosen to represent original prairie landscape of this. Five of the grass-
like plants same are arranged in mono-species rows approximately two meters wide. These rows follow the width and direction of the paving stones in the previous two ‘rooms’. A more detailed description of the individual species will be discussed in Section 5.4.2 of the Materials Palette. Cutting through the planting beds are two paths that converge on the north side. Running along the western edge of one path is a transparent screen. The direction of the screen (and path) is shaped by the existing walls of the historic commercial buildings to the north, playing upon another of the site’s land uses. The screen extends from an existing wall breaking only for pathways. The primarily purpose of this screen acts is a shadow wall, animating the space by silhouetting both plant and person. The water channel flows from the reflecting pool runs along the north side the grass rows, again emphasizing the paving direction, as well as, providing the calming sound of running water and a play area for children. The rows of south-facing benches interspersed by trees provide borders to this ‘room’. Extended use of the bench areas are promoted through a south-facing orientation, comfortable bench design and panoramic views of most the site.

5.3.2.4 KITCHEN (Appendix 3h)
The kitchen area is designed to be a comfortable and somewhat intimate space. Since the densification scheme designated the north-central building frontage to be café’s, bars or restaurants creating a ‘kitchen space’ is achieved by providing multiple patio spaces for each. As it is popular tradition now days to eat outdoors the concept of a ‘kitchen room’ is not as unusual as others in this project. In addition to behavior (eating/socializing), the types of furniture and method lighting is the same or similar to what would be used in an interior space. The design of this space creates three patio spaces that are located north of the main pedestrian passageway that runs through a bosque of trees. The bosque of deciduous trees provides an important element in the functioning of the site. Because the kitchen area is south-facing the trees provide shade in the summer and sun in the winter allowing for comfortable conditions year round. (see Materials Palette for tree species and design requirements). The patio spaces have views onto the passageway activity but are also tucked behind a series of translucent screens that act as low walls edging various patio spaces. These screen establish a physical but not visible barrier between the themselves and the activity of the passageway creating a high level of comfort. In the eastern most patio space an outdoor fireplace/candle area is built into a wall, providing an opportunity for people to reconnect the original artificial light - fire.

5.3.2.5 LIVING ROOM (Appendix 3i)
The living room is the activity center of the site and is designed to accommodate a variety of activities. It is composed of rectangular open area with a central space specially designated by a change in paving. On the south side this central space is also framed by L-space seating walls. The ‘room’ is almost entirely shaped by trees or buildings creating a strong sense of enclosure. It also serves to screen the existing residential high rise to the west. The south side of this design is considered ‘extended Community Center space’. Two rotating walls allow spaces to be sectioned off. Most importantly, the walls join together to become a movie screen. This allows for community events such as an outdoor movie festival, concerts or art installations. To the west, the overflow (uncirculated) channel water drains into the swale. In the swale
area, the rows of plantings are continued from the 'green room' eventually fading to a mixture of water loving swale plants. The junction of the two pedestrian routes occurs midway through the 'room' creating a natural separation for the vehicle accessible area to the north. Because there is no change in paving, of bollards frame the round-about, setting boundaries for vehicle access.

5.4 MATERIALS PALETTE

5.4.1 HARD SCAPE
There are 3 dominant paving materials: textured concrete paving stones (1 meter by 2 meters), 200 mm slate bricks (200mm by 400mm), and crushed aggregate with mica (Figure 5-1). These materials will maintain the yellow/red colour palette used throughout the facade and landscape of historic building strip, City Hall/Library and the apartment block. The concrete paver, the stone with the most surface area, is light colour so as to keep the plaza as bright as possible in cloudy conditions. In a slightly darker colour is the crushed aggregate. The mica chips create a 'shimmermess' to the central node in the rain and moon light. The darkest paving stone colour is in the slate bricks. This emphasizes the longitudinal orientation of the site design and tie into the darker colours on the building facades.

Site Furniture is composed of yellow cedar wood and stainless steel. The yellow cedar wood ties into the historic colours and materials of the site. Accents in stainless steel provide a refreshing change in colour and finish (Figure 5-2). The surface of all benches and chairs is wood while stainless steel makes up the material for the lighting, tables, bike racks as well as the framework for the benches and chairs.

The translucent screens located in the ornamental grasses and around the café patios are made of sand blasted Plexiglas (Figure 5-3).
5.4.2 SOFT SCAPE
The design solution proposes a relatively uncomplicated planting design. The required elements include one tree species, five grass-like plants and a moderate variety of swale plants. Trees are import elements in many urban designs. They introduce important vertical as well as horizontal elements into the landscape. Grass-like species have recently been ‘discovered’ as optimal species in urban situation as they can be contained and maintained. They also have qualities that include “reliability, long season interest and tolerance of a wide range of different, and often difficult, environments” (Oudolf, 2000). They also have an amazing ability to respond to light and relate to nature. As discussed in earlier chapters, vegetation is important to mental health and well-being and therefore should be included in the urban landscape to forma visual complexity of alternative textures, colours and lighting.

The following principles serve as guidelines for their selection. The first are a set of ecological principles and the second are specific planting design requirements for this site.

Ecological Principles:
1) All plant species must be in keeping with Langley’s coastal forest ecosystem and hardiness zone (6-7 and lower).
2) All plant species must be tolerant of varying disturbances of an urban site, i.e. people, pets/pests, compaction or pollution.
3) All plant species must not be invasive or spreading.

Design Specific Requirements:
1) The tree species must:
   - Be deciduous to allow sun in the winter and shade in the summer
   - Have good architectural form to create a good lighting subject and winter interest
   - Be a fast grower with a high canopy to allow passage under
   - Be late to bloom and provide dappled shade in the summer
   - Be low maintenance (falling branches, surface roots etc) as necessary in urban site
   - Be long lived
2) Grass-like species must:
   - Have differing heights to provide various levels of screening
   - Have different blooming season to provide year long interest
   - Have different colours and textures to differentiate plantings
   - Have a upright arching or mounded form

Figure 5-4: Katsura Tree - Spring and Autumn
3) Swale Plants
   - Tolerant of wet and dry conditions

The Katsura Tree (Cercidiphyllum japonicum) is the tree species used on the site (Figure 5-4). It consequently is an important unifying factor. The Katsura Tree is compliant with both the ecological principles and design specific requirements. It has a hardiness of four to eight and is tolerant of wet conditions. A deciduous tree with good winter form, it usually grows to 10 – 15 metres. Tiny bright red flowers appear on spur shoots in later winter before the aspen-like leaves. When these trees are young the fall leaves are purplish-pink and later produce subtle shades of pale yellow and pink.

What makes this tree unique and well suited to the overall site concept is its distinct fall smell of burnt sugar or caramel. As a concentration of these trees form a bosque on one side of the ‘kitchen room’ it is fitting to have a tree with a food smell.
   - Growth Rate: Medium to fast
   - Light: Partial shade to full sun
   - Relatively pest free
   - Climate: cool
   - Soils: slightly acid

Grasses are not usually grown exclusively together. However, mixing grasses of similar form but of different colour and texture can create a dramatic effect when in formal patterns. The following is the five species with a list of their characteristics.

1. *Calamagrostis arundinacea var. brachytricha* (fall-blooming reed grass)
   - **Zone:** 5 – 9
   - **Form:** Medium, upright divergent
   - **Size:** Foliage - 51 cm; Flower - 90 m; Width - 76 cm
   - **Finest Seasonal Colour:** Autumn - yellow
   - **Flower Colour and Timing:** Pinkish turning bronze, late summer
   - **Growing Conditions:** Sun to shade; ordinary garden conditions
   - **Landscape use:** Single, mass planting, screen
   - **Growth Habit:** Clumping
2. Deschampsia cespitosa (tufted hair grass)
   - Zone: 3-8
   - Form: Medium, mounded
   - Size: Foliage - 40 cm; Flower - 1 m; Width - 89 cm
   - Foliage: Dark Green
   - Finest Seasonal Colour: Summer - Green
   - Flower Colour and Timing: Yellow to gold panicles, May - June
   - Growing Conditions: Sun to shade; ordinary garden conditions
   - Landscape use: Single, mass planting
   - Growth Habit: Clumping

3. Miscanthus sinensis 'Morning Light'
   - Zone: 4-9
   - Form: Medium, upright divergent
   - Size: Foliage - 1.2 m; Flower - 1.2 m; Width - 90 cm
   - Finest Seasonal Colour: Summer - white and green variegated, Autumn - blonde
   - Flower Colour and Timing: Bronze, November
   - Growing Conditions: Sun, ordinary garden conditions
   - Landscape use: Single, mass planting
   - Growth Habit: Clumping

4. Pennisetum alopecuroides (hardy fountain grass)
   - Zone: 5-9
- **Form:** Medium, arching
- **Size:** Foliage - 75 cm; Flower - 90 m; Width - 90 cm
- **Finest Seasonal Colour:** Autumn and winter - yellow
- **Flower Colour and Timing:** Pinkish July - August
- **Growing Conditions:** Sun; ordinary garden conditions
- **Landscape use:** Single, mass planting
- **Growth Habit:** Clumping

5. **Molinia caerulea 'Moorhexe'

- **Zone:** 4 – 9
- **Form:** Medium, upright divergent
- **Size:** Foliage – 30 cm; Flower – 90 m; Width – 60 cm
- **Foliage:** Dark Bluish Green
- **Finest Seasonal Colour:** Autumn – blonde
- **Flower Colour and Timing:** Purplish turning light bronze, July - August
- **Growing Conditions:** Sun to Shade, ordinary garden conditions
- **Landscape use:** Single, mass planting
- **Growth Habit:** Clumping

Molinia caerulea and Miscanthus sinensis were chosen for their light catching ability: Molinia caerulea is a “starburst sprays of fine, thrusting, brown stems are warmly illuminated by low autumn sunshine” (Oudolf, 2000). Miscanthus sinensis varieties have creamy, silver, pink or brown flowers in autumn and seedheads in winter.

Calamagrostis brachytricha, Deschampsia cespitosa, Miscanthus sinensis, and Molina caerulea were picked for their distinct shape and consequently their ability to throw interesting shadows onto the screen.

Figure 5-11: Molinia caerulea
CONCLUSION

This project examines the role of daylight and illumination in the design of urban public space. It proposes one way in which light can enhance the identity, use and health of a plaza in the City of Langley. If one goes a step further, the same principles could be applied to the entire city. This has been done by a few cities in Europe, notably Lyon, France (Figure 6-1), by developing lighting master plans. These plans define the role to be fulfilled by lighting in the city. Generally they aim to:

- Improve the nightly ambience and image of the city for visitors and residents
- Underline sites of activity
- Increase the nightly “readability” of the city, both from close up and from far away, by adequately lighting access roads and perspective views and landmarks
- Highlight interesting sites, or objects

These ideas and concepts from Lyon’s Lighting Master Plan can easily be incorporated into a similar plan for the City of Langley. A plan, in which, the proposed design of City Square could act as both an example and a starting point.

Figure 6-1: Lyon’s Lighting Master Plan

Green: illuminate with a vegetal character
Ochre: illuminate with a urban character
Yellow: to improve the “reading” of nocturnal routes and major road axes
Blue: to create a “light spectacle” emphasizing the major perspectives of the city
Grey: To emphasize the architectural heritage and picturesque elements of the city.
BIBLIOGRAPHY


A City of Vancouver study came up with several design guidelines for creating more successful plazas in our climate and culture (Buchan & Simmons, 1985):

1. **Maximize visibility from abutting streets to enhance public recognition, visual interest and user security.** Good street to plaza visibility advertises the plaza’s internal attractions, it signifies that it is a public space, it permits plaza users to watch street activity, and it makes the space safer.

2. **Provide plentiful seating which is both physically and socially comfortable including opportunities for flexible sitting patterns and uses.** Good seating is important to plaza users and without it fewer people would stop and use the space. Wooden seating is more preferred than stone or metal seating, for it is warmer to the touch and softer to sit on. Seating that accommodates different seating patterns are preferable.

3. **Design the plaza to accommodate diverse activities and where socializing, encounters, relaxation and festivities can take place.** Retail and food outlets in particular are encouraged. When shopping facilities are not present, it is very important to provide other attractions. Successful plazas are generally characterized by several activity generators, whereas unsuccessful plazas have few attractions.

4. **Provide natural phenomenon such as water, grass, shrubbery, flowers and trees, as well as a variety of colours and textures.** One of the ways of providing such variety and colour is through the use of vegetation, and, whenever possible, some lawn should be provided, as it is an effective seating area when the conditions are right and is visually “softer” than harder paved surface. In addition, vegetation should never create substantial enclosures from the street.

5. **Provide amenity features such as art work, game tables, kiosks, open air cafes and, where appropriate, children’s play equipment.** A plaza which is furnished with a variety of amenity features encourages general public usage and creates a sense of liveliness and excitement. Art work often provides a focal point for the plaza, while kiosks and open air cafes draw the public to these spaces. Where possible, game tables and children’s play equipment would be encouraged.

6. **Ensure that the plaza is sited and designed to maximize both direct and reflected sunlight exposure, particularly during the noon time period of spring, summer and early fall.** Exposure to direct sunlight is especially important in cooler temperatures for its warmth. Such direct sunlight can increase usability of the plazas capacity when seating allows users to face into
the sun to maximize the warming effect. Where direct sunlight is not available, reflective surfaces can provide secondary illumination and some warmth.

7. **Design with sufficient surface and spatial articulation so that larger open spaces are identifiable and relatable areas.** This helps break up open spaces into manageable bits for the users, and its facilities orientation and territory definitions. People commonly gather at articulated edges in or around the plaza.

8. **Provide good plaza management, with emphasis on maintenance, operation and activity programming.** This is not only affects how a plaza looks, but also how well it can attract users. By keeping flowers fresh, the grounds clean, and by operating a food service, the management will create a lively urban space.

9. **Design the plaza to minimize the impact of noise and wind on the users.** High levels of traffic and other ambient noises detract from the enjoyment of the plaza. Similarly, downdrafts from surrounding high rise buildings will cause user discomfort and should be avoided.

10. **Design the plaza as a defensible space with visibility to and from their various parts maintained.** The plaza should afford good visual surveillance opportunities both from within the space and along the edges. People need to feel safe and will usually avoid dark hidden corners. Design plazas to maximize opportunities for casual monitoring from either the parameters or abutting development.

11. **Provide good night time lighting to discourage loitering and increase passerby safety.** Good night time lighting is essential to enhancing security and safety of the plaza, particularly if it functions as a short cut or through route for pedestrians. Proper lighting at night will also discourage loitering.

12. **Provide easy and direct access particularly for the elderly, handicapped and young children.** Design the plaza to afford good public access, particularly for those who are less capable or mobile physically.

13. **Provide areas of overhead weather protection that allows activities such as sitting or eating to continue even in the rain.** In rainy climates such as Vancouver, the plaza should be designed with some overhead weather protection to permit extended usage of the space and to provide temporary shelter or refuge for the pedestrians.
DOWNTOWN REVITALIZATION
"FROM CONCEPT TO REALITY"

(A refurbished McBurney Lane has evolved as the visual focus of downtown)
HISTORICAL CONTEXT

AGRICULTURAL ROOTS

Downtown Langley originated with a cluster of homesteads at the junction of Smuggler's Trail (Glover Road) and Yale Road (Fraser Highway). This spot was later named Innes Corners after Adam and William Innes who settled there in the 1870's. The area thrived as a commercial hub for the surrounding agricultural activities.

TRANSPORTATION SPURS COMMERCIAL GROWTH

Transportation access made Langley Prairie the commercial hub of the surrounding region. In 1910, The B.C. Electric Railway between New Westminster and Chilliwack was built through the Langley settlement to carry produce to the Vancouver market. Construction of the Fraser Highway in the 1920's and the Patullo Bridge across the Fraser River in 1937 contributed to its steady growth.

A NEW CITY IS BORN

In the 1950's residents of the Langley Prairie community grew upset that this regional and commercial and business center was not receiving its share of services. On March 15, 1955, this area succeeded from Langley Prairie and the City of Langley was established.

(1960 Aerial View of Langley City shows its distinct presence in the midst of the Fraser Valley farms lands)
HISTORICAL CONTEXT CONT'D

DOWNTOWN LANGLEY FALTERS

After enjoying nearly 25 years as the shopping and service centre for the surrounding rural and agricultural areas, downtown Langley faded as commercial activity moved northeast to Willowbrook Area. Langley City would follow the trend of many other North American Cities with a major Shopping Mall being constructed on the outskirts of town.

EARLY EFFORTS AT DOWNTOWN REVITALIZATION (1982)

In the early 1980's, the City of Langley initiated a downtown revitalization effort focused primarily on beautification.

BEAUTIFICATION ELEMENTS

Sidewalk paver installation, decorative street lighting and tree lighting intended to create an attractive atmosphere in the downtown core.

(Refer to Slide #1, 2 - Landscaping & brickwork, Premier Bill Vanderzan)

LIMITED SUCCESS

Langley City's downtown of the 1980's and early 1990's was characterized by vacant stores, low leasing rates and a general lack of consumer confidence. Many buildings were in disrepair, unable to compete with larger shopping centres on the outskirts of town.

SINGLE DIMENSIONAL PROGRAM

This Downtown Revitalization effort capitalized on available provincial funding and left a significant inventory of civic improvements which would later provide a valuable base from which to build.

However, like most other downtown revitalization efforts throughout the Province, it did not incorporate significant organizational and marketing components. In short, it represented a single-dimensional program and did not prevent the exodus of commercial activity to the Willowbrook area.

"Business People were happy with the improvements but it didn't stop businesses from closing."

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DOWNTOWN REVITALIZATION: A NEW APPROACH

UNIQUE ELEMENTS

Downtown Langley, like most major cities has unique social, economic and architectural elements. These elements have deteriorated over time due to regional development patterns and the emergence of the shopping mall in the 1970's with its associated consumer shopping habits and preference.

REVITALIZATION PHILOSOPHY

The key to a successful revitalization program is to recognize and borrow techniques employed in the shopping mall environment, but to adapt and modify them to fit downtown Langley's distinct characteristics. Downtown Langley, with its diversity, history, individuality, atmosphere, and pedestrian links to surrounding neighborhoods, belongs to Langley City residents in a way that a conventional mall cannot.

To reverse the commercial decline, Langley City required a practical and comprehensive approach to Downtown Revitalization. One devoted to creating inviting pedestrian spaces, erecting appropriate signs, encouraging compatible new buildings, improving building facades, organizing and nurturing strong relationships with merchants and, perhaps most importantly, using all of the above to promote downtown business.

POLITICAL AND COMMUNITY SUPPORT GROWS

DECLINE OF DOWNTOWN EMERGES AS A POLITICAL ISSUE

Throughout the 1980's the issue of downtown revitalization rarely entered the local political arena in a significant way. There was no deep-rooted political or community support. By 1993, vacancy rates has reached nearly 50% and leasing rates were a dismal $6-7 per square foot. It was clear that something significant needed to be done.

"The business community was depressed. People felt they didn't have the knowledge or ability to compete with Willowbrook."

1993 CITY ELECTION

In the 1993 municipal election, Langley City residents re-elected four Councillors and elected two new Councillors and Mayor. For the first time, Council met as a unified group to discuss goal setting - Langley's downtown was at the top of the list.
"It was the first time that Council had done such a thing and what emerged was a really strong desire to make a difference, particularly in the downtown. We agreed that since the taxpayer's pocket was the only place the money would come from, whatever decisions we made about downtown revitalization would have to be practical and long serving."

**CONSULTATION WITH DOWNTOWN PROPERTY OWNERS**

Soon after taking office, Council surveyed downtown property owners and working people. Following a round table meeting of more than 80 people, it became clear that the four major issues were marketing, working together, developing a theme for downtown and parking. Four committees were struck to address each of these topics, and were later merged under one umbrella – the Downtown Langley Merchants' Association. Soon after, Council acted on the advice of this group and commissioned a Parking and Traffic Study for $40,000.

"When the Marlene invited us to a round table discussion, we knew there was commitment from the City to downtown revitalization."

**NEW DIRECTOR OF DEVELOPMENT SERVICES HIRED**

After retirement of the City's Planner, Council began to look for someone to bring their concepts of revitalization to fruition. Gerald Minchuk joined the City as Director of Development Services in the Spring of 1994.

**STAKEHOLDERS IN DOWNTOWN REVITALIZATION**

**Downtown Property Owners**

There are approximately 231 Class 6 properties in the Core Commercial Area with an aggregate 1993 assessed value of $116,782,050. Property values and property taxes are two of their main concerns. This group would ultimately give Council the authority to create a Specified Area Bylaw and borrow $2.5 million to finance the Downtown Revitalization Project.

**Business Owners, Managers & Employees**

Langley City has about 750 licensed businesses in the downtown area alone. Business owners, managers and employees rely on the downtown for their livelihoods.

**City Council**

With a new Mayor and two new Councillors elected in 1993, Council would commit $2.5 million towards Downtown Revitalization. Langley City Council was the only municipal Council in British Columbia to be re-elected in its entirety in 1996.
Development Services Department

A small but dedicated group of staff committed to securing Langley's future as a compact, complete community.

Downtown Langley Merchants Association

A fledgling group of business owners and managers which was founded in 1993. There are now 130 members. This group continues to work closely with the City and has now expanded its role as one of the City's primary marketing entities.

Development Industry

Land development and real estate professionals concerned primarily with leasing existing buildings, attracting new niche markets and developing new commercial activity.

Langley City Residents

A vested interest in the success of the downtown and in maintaining reasonable property taxes. The residential tax rate would rise by 1% in 1998 to pay for a portion of the Revitalization financing.

CORNERSTONES OF DOWNTOWN REVITALIZATION

MINISTRY OF MUNICIPAL AFFAIRS DOWNTOWN REVITALIZATION PROGRAM

The Downtown Revitalization Program was initiated under the auspices of the Ministry of Municipal Affairs Downtown Revitalization Program. This program made funding available to local governments for Concept Plan development and façade improvements programs.

The Downtown Revitalization Program fosters joint efforts by merchants, municipal councils and the province toward improving the physical and promotional presence of downtown areas in communities throughout British Columbia.

Note: The Ministry of Municipal Affairs Downtown Revitalization Program was dropped by the Provincial Government in 1997.

ROBERT INWOOD (MAINSTREET CONSULTING)

Acting on a staff recommendation, Council retained the services of Robert Inwood of Mainstreet Consulting Associates in 1994. Robert Inwood is arguably the most
A well-known and experienced consultant associated with Downtown Revitalization in the entire Province. He has implemented successful programs in several communities including Nelson and Roseland.

With a clear mandate from Council, this first phase of the downtown revitalization plan would focus primarily on design.

CREATING AN IDENTITY

Consensus among business community, staff and Council that the City should avoid "theme" type of revitalization and focus on developing the downtown core based upon the principles of the shopping mall through contemporary design principles based on custom designed and built streetlight fixtures, signage, gateway features, special use structures and pedestrian amenities, coupled with consistent facade improvements.

Utilize shopping mall principles to build upon Langley's history, diversity, individuality, atmosphere and pedestrian links to surrounding neighborhoods.

CONCEPT PLAN

A general guide and blueprint for rejuvenation of Langley's downtown area. Developed by Mainstreet Consultants in consultation with all stakeholders. Several public meetings and Council workshops were held. The primary components of the Concept Plan were identification of civic improvements and development of Façade Design Guidelines.

(Relate to Sec. 2 - Downtown Revitalization Concept Plan)

"Vision Statement: To create a well defined downtown business core with a distinct identity and foster an upper end retail marketing image to serve as a destination shopping centre for the surrounding communities."

The Concept plan work cost a total of $20,000. The City received a grant for ½ of the cost ($10,000) from the Ministry of Municipal Affairs – Downtown Revitalization Program.

CIVIC IMPROVEMENTS

$2.5 million dollars earmarked for a variety of civic improvements including road/streetscape improvements, pedestrian pathways, pocket parks, public spaces, boulevards, landscaping, streetlights, signs and special use structures, etc.

The original list of Civic Improvements included in the Downtown Revitalization Program were as follows:

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<th>CIVIC IMPROVEMENTS</th>
<th>ESTIMATED COST</th>
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Common components included curb & storm drainage, sidewalk and crosswalk pavers, ornamental lighting, street trees, gate structures and furnishings.

DESIGN GUIDELINES / FAÇADE IMPROVEMENT PROGRAM

Building façade guidelines were developed and later incorporated within the City’s Official Community Plan. Tailored to our downtown addressing standards for architectural style, exterior finish and materials. Ministry of Municipal Affairs program...Several building owners would later take advantage of this program.
The cost of developing the City's Core Commercial Façade design Guidelines was $20,000. The City received a grant for 1/3 of this amount from the Ministry of Municipal Affairs – Downtown Revitalization Program (DRP). The DRP also provided grants to help merchants (owners and tenants) to improve the facades of existing retail buildings. Façade Improvement Grants would pay:

- One-third of the cost to a maximum of $350 per linear metre to improve the front of the building;
- 20 per cent of the cost to a maximum of $200 per linear metre for improvements to sides and rear surfaces; and
- 50% per cent of the cost of making retail shops/public buildings wheelchair accessible to a maximum of $1,000 per entrance.

(Maximum grant per property of $5,000, two or more stores on one title, maximum grant of $10,000)

"To establish a visual, unifying motif through the creation of a unique pattern of vertical structural elements within the downtown area. Coupled with individual building façade renovations, a high quality visual setting will be developed ... and allow a new high end retail and service industry to evolve."

MULTI-FACETED DOWNTOWN REVITALIZATION

FRASER HIGHWAY DECLASSIFICATION

Staff initiated the transfer of Fraser Highway from the Province to City along with a maintenance budget of $600,000. This gave the City control over Highway which used to separate the community and used primarily by commuters and non-destination traffic. Difficult to park... This decision would pave the way for a future one-way traffic system with angled parking.

PARKING & TRAFFIC MANAGEMENT

Council commissioned a $40,000 study and acted upon its recommendations.

Fraser Highway became a one-way street with angled parking in 1996 – DLMA played a large role with presentation (after trial period) to Council supporting the idea. The goals included to slow traffic down, improve pedestrian safety, encourage people to look at stores as they drive by and increase parking.

Staff propose that the City take over the 2 mile portion Fraser Highway between east and west intersections with Langley Bypass – successful application with MoTH – received $600,000 towards a five year maintenance plan – this is now considered a windfall since the Provincial government has since downloaded maintenance responsibilities of various highways without the funding.

Comparison of traffic counts (15,000 each way in 1994?)

DOWNTOWN LANGLEY MERCHANTS ASSOCIATION
This group has grown to 130 members and coordinates a number of festivals and events including Community Day, Chinese New Year, Arts Alive, Cruise In and Christmas in the park. This group has emerged as the City's primary marketing tool – now receives a $10,000 annual grant, Farmers' Market.

(get Downtown Chatter)

Arts Alive / Cruise-In Slides & Chinese New Year Photo

CITY MARKETING & PROMOTION INITIATIVES

Prior to 1994, City lacked a strong identity. As a precursor to the Downtown Revitalization Program, Council began to market the City as a complete, compact community.

Between 1995 and 1998 the City undertook a number of promotional initiatives including an Economic Development Magazine (15,000 copies?), Corporate / Community Brochure, Tourism Brochure and also developed a Web Page, City Business Directory, Mural Program, new City Logo with corporate colors, Coat of Arms and flag and Entrance Signage. Staff are now proceeding to develop a historical profile of the City and, with information gathering through annual Heritage Tea gatherings with long time residents.

Neighborhood and Stanta Council meetings

Positive press from Journal of Commerce, Business in Vancouver, Western Investor

(see front page of documents)

PROPERTY ACQUISITION & CITY PROJECTS

Innes Corners Plaza, McBurney Lane public plazas. Acquisition and construction costs not funded directly through revitalization program. Intended as initial step and catalyst to revit program. Design, colors, etc. prepared in keeping with design guidelines.

Douglas Recreation Centre - upgrade to facility and park

Innes Corners Plaza – $500,000 from capital budget – focal point with tiled pools, waterfalls, trees and seating – opened in June 1996.

McBurney Lane – Oddfellows hall burned down – plan to purchase and put in road linking Douglas Crescent and Fraser Highway – Council decided to wait for Concept Plan – first project fully funded by revit program – opened in 1996

SQUARE ONE.
7 acre parcel in the centre of town at intersection of Fraser Highway and Glover Road. Council had sold this to pension fund... Remains one of the keys to successful revit program.

DEVELOPMENT BYLAWS AND PROCEDURES

Meeting with developers, Council, staff around time that Revit program was being initiated. The result was significant changes to streamline application review process, input to new zoning bylaw?, densification study and subsequent amendment to Official Community Plan.

(525 new multi-family units added since 1995)

REGULATORY BYLAWS

Zoning Bylaw, Building Bylaw, Sign Bylaw and Business Licence Bylaw

PUBLIC/PRIVATE PARTNERSHIPS

Twin Rinks, One of Councils top goals for 1998.

RELOCATION OF COMMUNITY POLICE STATION

Community Police Office relocated from outskirts of town to Salt Lane, a pedestrian lane, recently enhanced through the civic improvement component of the revitalization program.

REGIONAL TOWN CENTRE STATUS

Willowbrook / Willoughby area recognized as a Regional Town Centre by the Greater Vancouver Regional District (Livable Region Strategic Plan). (used to be a Valley Town Centre)

THE FUTURE OF DOWNTOWN REVITALIZATION

ADDITIONAL CIVIC IMPROVEMENTS

MARKETING

Business Retention and Recruitment Strategy
Langley Trade Area
Population Graph

CIVIC COMPLEX

Proposed 30,000 square foot City Hall and Library

SQUARE ONE

FRASER HIGHWAY PARKING STUDY
APPENDIX 3: DESIGN DRAWINGS

3a – Site Design and Circulation
3b – Plaza Design
3c – Light/Shadow Plan
3d – Illumination Plan
3e – Entrance Details
3f – Foyer Details
3g – Green Room Details
3h – Kitchen Details
3i – Living Room Details