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Investigation of Carbon Reduction from Overnight Lighting in Non-Domestic Building Stock

Antonio DiCesare
Worcester Polytechnic Institute

Karen Lynne Krasko
Worcester Polytechnic Institute

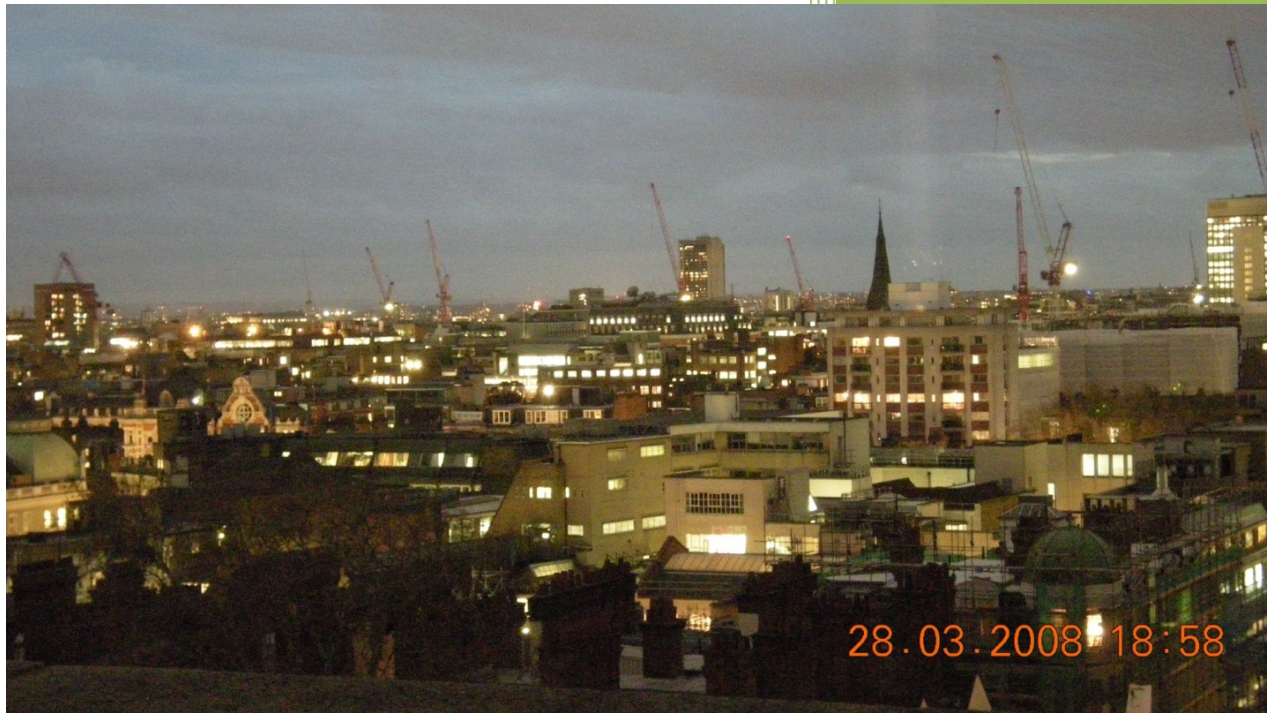Nicholas M. DiLullo
Worcester Polytechnic Institute

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Investigation of Carbon Reduction from Overnight Lighting in Non-Domestic Building Stock

Antonio Di Cesare

Nicholas DiLullo

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An Interactive Qualifying Project
Submitted to the Faculty of
WORCESTER POLYTECHNIC INSTITUTE
in partial fulfillment of the requirements for the
Degree of Bachelor of Science

By:

Antonio Di Cesare
Nicholas DiLullo
Karen Krasko

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Report Submitted to

Dr. Harry Bruhns
Carbon Reduction in Buildings

Professors Peter Hansen and Stanley Selkow
Worcester Polytechnic Institute

Abstract

Global warming has become one of the most prominent problems in the last twenty years. As we now prepare to enter the second decade of the new millennium, the dangers are more evident than ever. The use of electricity, specifically through overnight lighting in non-domestic buildings, is a cause for increasing carbon dioxide emissions. Through our project, we developed and implemented a new methodology for nighttime observations of overnight lighting in non-domestic buildings. Analysis of our data led to an estimation of power consumption as well as a more robust image of overnight lighting. CaRB will combine our results with existing data to develop a model for estimating carbon dioxide emissions in the United Kingdom.

Acknowledgments

Executive Summary

Over the past century there has been a significant increase in the energy needs of our society and in concentrations of carbon dioxide, a greenhouse gas that traps radiation from the sun in our atmosphere (IPCC, 2007). One of the many significant contributors to carbon dioxide emissions is the energy usage in the non-domestic building stock. The non-domestic building stock consists of all commercial buildings such as offices, shops, universities, government buildings, and factories. In the United Kingdom, energy use in non-domestic buildings in 1991 resulted in the emission of 116 million tons of carbon dioxide, which is about 20% of all UK carbon-dioxide emissions (Moss, 1991). Therefore, a key method in reducing carbon emissions is to reduce electricity demand by reducing the energy usage in the non-domestic building stock. Carbon Vision Buildings, sponsor of Carbon Reduction in Buildings (CaRB), is seeking to cut carbon dioxide emissions from buildings 50% before 2030. An effective way to cut carbon emissions is to reduce the use of overnight lighting in commercial buildings (Carbon Vision, 2006).

To further the goal of CaRB, our project consisted of three parts. First, we used the same methodology of a street-level survey to improve upon the data acquired by a group of WPI students in 2007 (Levin et al., 2007). On weekend nights, we observed the same group of buildings that had been sampled only on weeknights in 2007, so as to refine the 2007 estimates for power use and carbon emissions. Second, with the use of a remote camera we developed and tested a new methodology for collecting substantially more data on specific buildings. Lastly, we used this new photographic methodology to collect two weeks of data to determine trends in overnight lighting in the non-domestic building stock.

In 2007, a previous group of students from Worcester Polytechnic Institute worked in conjunction with CaRB to study overnight lighting in non-domestic buildings. They developed an equation to estimate power consumption. This equation takes into account the floor space of an individual building as well as the percentage of illuminated windows. To determine these percentages, the previous team completed four street-level surveys which allowed them to observe each of the 140 buildings in their sample during weeknights between the hours of 10 P.M. and 2 A.M.

From their findings, Dr. Harry Bruhns, Director of CaRB and sponsor of these projects, estimated that 0.8 megatonnes of carbon was emitted yearly as a result of unnecessary overnight lighting from the non-domestic building stock in the United Kingdom. In order to make this estimation, Dr. Bruhns used the weeknight observations between the hours of 10 P.M. to 2 A.M., and assumed that lighting usage steadily declined over that period, remained constant from 2 to 5 A.M. on weeknights, and on weekend nights remained constant at half the weeknight levels. Therefore, to provide the data to make a more robust estimation of the carbon emissions of the non-domestic building stock, we supplemented previous work by obtaining substantially more data between the hours of 7 to 10 P.M., from 2 to 5 A.M., and on the weekends.

Weekend Street-Level Survey

Our first objective of our project was to recreate the previous team's methodology on weekends. This was done to fill the gaps in the data collected by the previous group. Our observations determined the percentage of illuminated windows as well as an estimation of the resulting power consumption for each building. This has given CaRB the data needed in order to more accurately predict total carbon emissions of the non-domestic building stock of the United Kingdom as a result of overnight lighting.

Our weekend surveys of the previous study area indicated 16.58% of windows were illuminated between the hours of 7 – 10 P.M. The 2007 study had observed an average of 18.9% of windows illuminated during weeknight surveys. We would expect fewer people to have been at work on the weekends, and accordingly fewer lights would be left on. However, the decrease in the percentage of illuminated windows is much lower than had previously been assumed. The results from our weekend street-survey suggests that Dr. Bruhn's assumption that the average percentage of illuminated windows on weekends would be 50% of the level observed by the 2007 project team on weeknights was underestimated. Thus, previous calculations of carbon emissions from the non-domestic building stock were conservative estimates of the actual level of lights on weekends. We also calculated, by using a floor space and density equation, that the total power consumption was 543 kW. This figure has decreased from the 850 kW calculated by the 2007 project team. This is expected, as they had observed a greater percentage of illuminated windows during their observations on weeknights.

Photographic Methodology

Our second objective was to develop and test a new methodology to collect a significant amount of data on illuminated windows with the use of a remote camera. The camera provided us with the opportunity to view how lighting in buildings changed over the course of a night and on the weekend. First, the team conducted research in order to find a camera that suited our needs for the project. After the purchase of the Nikon Coolpix P50 camera along with a tripod, it was necessary for us to study the settings of the camera and to test the life of the battery. Once we learned how long we could leave the camera in place without running out of battery power, we put the methodology into practice. We set the camera up on the tenth floor of a University College London building and programmed it to take a picture every hour on the hour. After

acquiring the photographs, we developed a new methodology to determine a ratio of illuminated windows to total windows based on counting the windows on ten buildings in the photographs of our survey area. The photographs from the camera were of buildings which were part of the street-level survey, and while there was a smaller sample size, we were able to collect a significant amount of data about this set of buildings. The photographic methodology enabled us to observe patterns of lighting over each night and over the course of the week. This hourly data was a significant improvement upon the data which was gathered by the street-level survey.

Trends in Lighting in the Non-Domestic Building Stock

To determine if this new methodology was valid, we compared the percentages of illuminated windows obtained from the camera to the percentages obtained from our weekend street survey. Implementing this new methodology allowed us to record how lighting patterns of particular buildings fluctuated over a weekend as well as weeknights. On weekends, we observed 18.9% of windows illuminated using the camera survey compared to 16.58% in our street-level survey of the larger study area. On weeknights in our camera survey, the average percentage of illuminated windows rose considerably. Comparing our average results from Monday and Thursday between 10 P.M. and 2 A.M. to the average of results from the 2007 project team's observations between the hours of 10 P.M. and 2 A.M., we noticed a very large discrepancy. From our observations we had determined that on average, 27.5% of the total number of windows observed were illuminated. The 2007 project team determined that only 18.9% of windows were illuminated.

From our camera observations we determined that on average the percentage of illuminated windows gradually decreases over the course of a night from 43% to 21% and remains somewhat constant over the course of the weekend hovering around 20%. As expected,

the average percentage of illuminated windows observed during the weekend was lower than the average percentage of illuminated windows during the week as seen below.
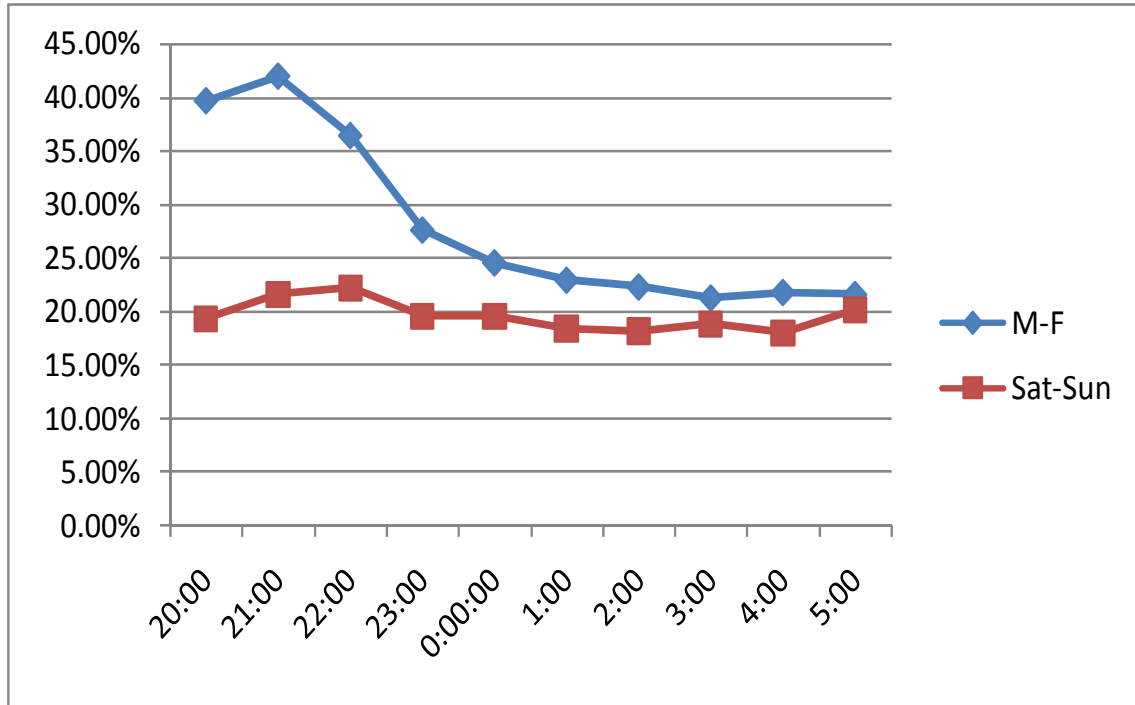
Average Percentage of Illuminated Windows during the Week versus the Weekend

We determined that since we had only observed 10 buildings from our weekend camera results compared to the larger West End sample of the 140 buildings in the street-level survey, the sample used by our photographic methodology was a poor representation of the larger sample. We believe that this large variation in data is due to the fact in the photograph we were only able to observe 217 windows which were roughly 3.45% of the whole West End sample of 6,291 windows. Because of this decreased sample size, the presence of one building with 70 windows had a significant impact on the patterns of the data. Another issue was that the photographic methodology had an incidental sample bias. The smaller buildings, which were observed during our street-level surveys, were hidden behind the larger buildings in our

photographs. We determined from our street-level surveys that the taller buildings also tended to have higher percentages of illuminated windows. Thus, since we could only observe the taller buildings in our photographs, our percentages were elevated. Therefore, the percentages we obtained were not used for estimating carbon emissions as we cannot be certain that our photograph sample was representative of the West End sample. The issue of whether the West End is representative of the UK non-domestic building stock is outside the remit of this project as determined by Dr. Bruhns. However, the data we had collected was used to estimate trends in overnight lighting in non-domestic buildings.

Another interesting observation in the photographs was groups of windows that would consistently be illuminated together in buildings. One possible explanation for this is that the groups of windows are controlled by a single light switch, this being a common practice among larger buildings. We found ten groups of windows amongst five out of the ten buildings we observed. Seven of these groups of windows were in the two largest buildings that we observed. In the ten groups, there were a total of sixty five windows, or 30% of the total number of windows we observed.

Conclusions and Recommendations

Based on our results, we recommend that future studies use more automated cameras, create a methodology for computer automated counting of windows in a photograph, and determine the reason why lights are left on overnight in the non-domestic building stock. Having more cameras in the photographic methodology allows a wider range of buildings to be observed from a tall building or other high point, and more data could be collected. This could make the data be more representative of the West End sample. Also, finding a means to automate window counting in these photographs would be less time consuming and would allow for more time to

analyze additional buildings. Finally, understanding why lights are being left on would assist in determining how much of the overnight lighting is actually wasted. This would also help to complete the socio-technical model of overnight lighting in the non-domestic building stock.

Our results also suggest that Dr. Bruhns' previous estimates of the total carbon emission from overnight lighting in the non-domestic building stock were conservative. In making his calculation, Dr. Bruhns had assumed that the percentage of illuminated windows is reduced by 50% on the weekend. However, our results show that the actual percentage of illuminated windows during the weekend is 87.7% of the total number of illuminated windows observed during the week. Therefore, a revised estimate will need to be made and will be significantly larger than 0.8 megatonnes.

Authorship

1.) Introduction – DiLullo, edited by all
2.) Background
    2.1)   Overview of Climate Change – Di Cesare, edited by all
    2.2)   Efforts to Reduce Carbon Emissions – Di Cesare, edited by all
    2.3)   Impact of the Non-Domestic Building Stock – Krasko – edited by all
    2.4)   Lighting in Non-Domestic Buildings – Krasko – edited by all
    2.5)   Camera Usage - All
3.) Methodology
    3.1)   Resurvey of Previous Building Stock – Krasko, edited by all
    3.2)   Develop and Test Photographic Methodology for Data Collection – DiLullo, edited by all
    3.3)   Calculating Total Energy Usage of Surveyed Buildings – Di Cesare, edited by all
4.) Findings
    4.1)   Resurvey of Non-Domestic Buildings – Krasko, edited by all
    4.2)   Development of Photographic Methodology – DiLullo, edited by all
    4.3)   Results of Camera Survey
        4.3.1) Building Selection – Krasko, edited by all
        4.3.2) Methodology for Counting Photographs – DiLullo, edited by all
        4.3.3) Photographic Results and Analysis – Di Cesare, edited by all
        4.3.4) Validity of Photographic Methodology – Di Cesare, edited by all
        4.3.5) Limitations of Photographic Methodology – DiLullo, edite by all
5.) Conclusions - All
6.) Recommendations – Di Cesare, edited by all

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1. Introduction

Over the past century there has been a significant increase in the energy needs of our society (IPCC, 2007). With increased demand for energy came an increase in pollution from the use of non-renewable sources of energy. As a result, there has been a significant increase in carbon dioxide concentrations around our planet over the past 50 years (Modern Global Climate Change, 2008). Carbon dioxide is a greenhouse gas, meaning that it traps radiation from the sun in our atmosphere (EPA, 2007). This solar radiation is slowly warming up the average temperatures around the globe which in turn can have disastrous effects on the environment. It is predicted that in the next hundred years, the average temperature will rise 2 – 6 degrees Celsius. This could result in droughts, stronger hurricanes, and even flooding as a result of the polar ice-caps melting (EPA, 2007).

Two of the main contributors to increasing carbon dioxide emissions are transportation and the generation of energy. The transportation industry is working to curtail their contribution by making more fuel-efficient vehicles. On the other hand, power companies are slower at switching over to renewable non-polluting energy sources. There is such a high demand for power that it makes converting entirely to non-polluting sources such as wind or solar power impractical (Krackeler, 1998). Therefore, efforts are being made by programs such as Carbon Vision Buildings (CVB) to decrease or eliminate unnecessary energy expenditures.

One strategy in development to reduce electricity demand is to reduce energy usage in the non-domestic building stock. The non-domestic building stock consists of all commercial buildings such as offices, shops, and factories. According to the Carbon Trust, UK businesses waste £1 billion a year in lost energy. At 15% of the total energy use, lighting represents a significant portion of this energy use (Carbon Emissions from Non-Domestic Buildings, 2002).

Therefore, Carbon Vision Buildings, sponsor of Carbon Reduction in Buildings is seeking to cut carbon dioxide emissions from buildings in half by 2030. One way to do this is by reducing the use of overnight lighting in commercial buildings (Carbon Vision, 2006).

In 2007, a previous project team from Worcester Polytechnic Institute worked in conjunction with CaRB to study overnight lighting. With the data collected from their research, Dr. Harry Bruhns estimated that 0.8 megatonnes of carbon is emitted yearly as a result of overnight lighting in buildings in the United Kingdom. However, it is clear that this is an accurate estimate, due to the fact that the team had collected data on sample buildings only during the hours of 10 P.M. and 2 A.M. on weeknights. During their observations, they surveyed each building twice while taking individual photographs which were analyzed at a later time.

Therefore, to further the goal of CaRB, our project involved researching overnight lighting in commercial buildings in London. This project consisted of two parts, both of which aimed to improve upon the data acquired by the 2007 project team. First, we collected more data on buildings which were previously studied. We resurveyed all of the buildings involved in the previous project on weekends from 7 P.M. to 10 P.M. at night. This enabled us to determine certain trends between our data and that of the previous project team. Our data also allowed CaRB to generate a more accurate and robust estimate on the total carbon emissions as a result of better quantifying the weekend portion of overnight lighting in the non-domestic building stock in the United Kingdom. Secondly, with the use of a remote camera we developed a new methodology for collecting substantially more data than if we were to collect all of our data by observing buildings on foot. The use of a remote camera allowed for some automation of the data collecting process as opposed to manual street surveys. We were able to collect data on buildings other than those involved in the previous project and by manually counting lit windows

in the aforementioned photographs we were able to estimate trends for energy usage as a result of overnight lighting for buildings at different times at night and on the weekends. With our findings we hope to further our CaRB's goal of creating a socio-technical model of energy use in the non-domestic building stock in the United Kingdom.

2. Background

In this chapter we will present background information relevant to our project. We begin with an overview of climate change which is the driving force behind our project; the effort to preserve our environment is the reason that CaRB has requested our help. We then discuss the role of the non-domestic building stock, and within that our project group will focus specifically upon lighting. We also will discuss the usage of cameras in scientific research.

2.1 Overview of Climate Change

While the earth's climate naturally fluctuates as a result of changes in orbit and variations in the sun's intensity (EPA, 2007); one major factor has severely altered the way the earth's global temperature changes. Humans have had an immense impact on the overall temperature of the planet, which is due largely to the industrialization of our civilization.

Industrialization and the use of non-renewable resources such as fossil fuels have led to an increase in the global warming of the earth (EPA, 2007). Global warming is a direct result of increased carbon dioxide emissions into the earth's atmosphere. Global greenhouse emissions due to human activities have grown since pre-industrial times, with an increase of 70% between 1970 and 2004, with carbon dioxide being the most prominent greenhouse gas (IPCC, 2007). As a result the panel is very confident that the net effect of human activities since 1750 has been one of warming (IPCC, 2007). The effect of increased contributions of carbon dioxide is shown in Figure 1. The graph shows a strong relationship between carbon dioxide emissions and the annual mean global temperature. The mean global temperature has consistently risen with increasing carbon dioxide emissions. Current carbon concentrations levels are greater than 380 parts per million, 80 parts per million greater than at any other period in recorded history.
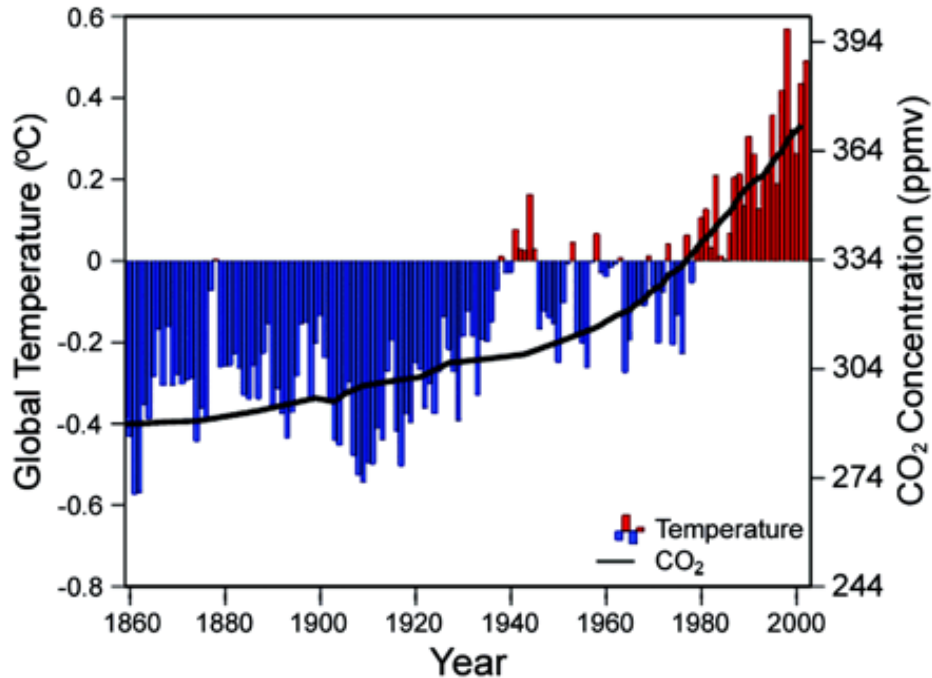
Figure 1: **CO_2 Increase Compared to Temperature Increase**
(Modern Global Climate Change, 2008)

With increasing greenhouse gas emissions and subsequent rise in carbon dioxide

concentrations, serious consequences are on the horizon. The fourth assessment report of the

Intergovernmental Panel on Climate Change notes that continued greenhouse gas emissions at or

above current rates would cause further warming and induce many changes in the global climate

system during the 21st century that would very likely be larger than those observed during the

20th century. This would result in contractions of snow covered areas, increases in thaw depth

over most permafrost regions, decreases in sea ice extent, a very likely increase in frequency of

hot extremes, heat waves, and heavy precipitation (IPCC, 2007). Therefore, methods are being

proposed and put into action to try to stop global warming.

2.2 Efforts to Reduce Carbon Emissions

One major step taken by the international community to curb carbon dioxide emissions has been to create a guideline for all industrialized nations to follow, which is known as the Kyoto Protocol. The Kyoto Protocol went into effect on February 16, 2005 and has set a goal for economically established countries that have ratified the treaty, to reduce their 1990 greenhouse gas emission levels by at least 5% between 2008 and 2012 (UNFCCC, 2008). Nearly all of the United Nations countries have agreed to participate in the protocol. The level of participation for the Kyoto Protocol by counties all over the world demonstrates the severity of the issue of climate change as a global concern.

As concern continues to rise over continued global warming, several countries in Europe, specifically England, Wales, Scotland, and Northern Island (The United Kingdom) have stepped to the forefront in the ongoing battle with climate change. One immensely important piece of legislation currently being proposed in the United Kingdom is the Climate Change Bill. The Climate Change Bill was published on March 17, 2007 and its the main goal is to reduce the United Kingdom's carbon dioxide emissions by 26% to 32% by 2020 and an overall reduction of 60% by 2060 (DEFRA, 2007). These goals are to be achieved with the establishment of a new system of legally binding five year "carbon budgets" set fifteen years ahead and with the creation of a new statutory body, the Committee on Climate Change, to provide guidance to Government to achieve target goals (DEFRA, 2007).

Another major initiative in reducing carbon emissions is presently taking place in the London area. The Carbon Reduction in Buildings Project, a subsection of Carbon Vision Buildings, is an ongoing research project whose goal is to reduce carbon emissions from buildings in the United Kingdom. The project aims to model current carbon emissions from

buildings in the UK and then implement energy saving strategies which will then ultimately

reduce the overall carbon emissions of all buildings in the United Kingdom.

2.3 The Impact of the Non-Domestic Building Stock

The non-domestic building stock significantly contributes to carbon dioxide emissions.

In the United Kingdom, energy use in non-domestic buildings in 1991 resulted in the emission of

116 million tons of carbon dioxide, which is about 20% of all UK carbon-dioxide emissions

(Moss, 1991).

A reason for this significant amount of carbon emissions is the increase in growth rate of

energy consumption in the service sector. The non-domestic building stock includes the service

sector. Since 1970, energy consumption in the service sector has increased 42 percent in the

United Kingdom (Service Sector, 2007). The Association for the Conservation of Energy states

that the UK service sector has the second fastest growing energy consumption outside of

aviation, and its use of electricity is estimated to increase by nearly 45% from 1990 to 2020.

Some explanations are because of the growth in electrical equipment like information

technology, and because of an increase in population, which in turn increases the size of the

workforce. The service sector is the largest and fastest growing sector in the UK as it employs

about half of the workforce (Service Sector, 2007). With an increase of employees, the building

floor space must increase to accommodate the workers.

The generation of electricity for use in non-domestic buildings is one of the leading

causes of carbon dioxide production. Electricity use in the service sector appears likely to

increase more rapidly than in any other economical sector, and that growth in electricity demand

would be a significant cause for increased carbon dioxide emissions (Krackeler et al., 1998).

Hammons and Toh (2001) point out that about 24% of all carbon dioxide emissions in the UK

come from generating electricity. Therefore, a key method in reducing carbon emissions is to decrease the electricity consumption in the service sector. However the characteristics of the buildings representing the non-domestic building stock are varied and there is limited information on the power demands of these buildings.

2.3.1 Challenges Associated with the Non-Domestic Building Stock

A challenge associated with the reduction of overnight lighting in the non- domestic building stock is the limited amount of detailed information available on energy use. These buildings are very diverse; they consist of a large variety of building types and sizes. The non-domestic building stock can be sub-divided into two parts:

- The public sector which covers government activities, education and health

- The private sector which covers retail, hotels, real estate and computer activities (DTI, 2002).

However, there is little information about the composition of the building stock. Fielding and Halford wrote in a U.K. Government sponsored review of the government's knowledge about urban issues,

> We do not have accurate information on the intra-urban, urban or regional
>
> changes in land uses, nor can we learn what changes have taken place in the
>
> stock of buildings by age, type or use . . . . For whatever reason, we seem
>
> to be remarkably ignorant about the physical structure of the cities within
>
> which we live out our lives. This is something which should be addressed in
>
> the planning of the Government's statistical activities and in deciding future
>
> research priorities (Bruhns et al., 1997 p 278).

To solve this problem the Non-Domestic Building Stock database was created by compiling multiple smaller databases into a robust and extensive non-domestic building stock database. The database was constructed in order "to give a better statistical picture of the non domestic stock, and of uses of energy in non-domestic buildings, than has been available . . . and to inform the government on the mitigation of greenhouse-gas emissions in accordance with UK commitments under the Climate Change Convention" (Bruhns et al., 1997 p 279). This database provided a statistical reference tool which can be used in this and future studies to facilitate development of strategies for the reduction of carbon dioxide emissions. The data was collected from multiple sources which all have individual weaknesses, but combined to form an in-depth and very usable database.

One source was the Valuation Office Agency which conducted a survey on 1.7 million buildings' uses and locations for the purpose of taxing (Bruhns et al., 1997). While the VOA provides a large list of commercial buildings and their uses it does not survey all of the building types included in the non-domestic building stock, mostly excluding buildings in the public sector. These buildings and their classifications in the VOA are further surveyed in a second database. The Valuation Support Application database also created by the Valuations Office and provides detailed information on about 1.3 million of the rated offices from the VOA database in the categories of "Retail, Offices, Warehouses and Factories" (Bruhns et al., 1997 p 283). The database contains data on floor space by level which can be used in calculations to approximate energy use. Data for buildings that were not included in the Valuations Office studies were gathered from many other sources to complete the NDBS database. While this database provided a solid background, more detailed data were needed on at least some buildings to further analyze building energy uses.

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To obtain more information on the physical characteristics of the non-domestic building stock, an extensive research project, referred to as "The Four Towns Study," was conducted from 1989 to 1992 in four English towns in the United Kingdom (Oreszczyn, 2004). Surveys were made to assist in the development of a national non-domestic building stock database including building types and different forms of energy consumption. The researchers in this study surveyed a portion of the non-domestic stock by selecting the towns of Manchester, Swinden, Tamworth and Bury-St-Edmund were selected for their commercial industry diversity. The types and sizes of the non-domestic buildings differed between the towns due to the variation of population sizes and the geographical location of the towns across the country. Therefore, this sample of the non-domestic building stock was not a random sample, but rather included a large range of building types to get a good sampling of the diversity of the stock.

A weakness of the Four Towns Study was that the data collected was incomplete. The researchers surveyed the exterior of the buildings in the sample from the street level and focused on location, activities and construction of the buildings. Difficulties arose because one can view a building differently depending on its structure and orientation. For instance, windows are different in all buildings and it is important for the researchers to have the same requirements in determining what constitutes a window. Also, depending on their location at street level, one researcher might be analyzing one face of the building while the others examine different faces.

At the time of this Four Towns Study, there was no list from which a random sample of the non-domestic building stock might be generated, nor a robust classification for stratified sampling, nor even an adequate definition of the survey data units (Bruhns et al., 1997). Results were given without an explanation or definition of units. To address this issue, the Non-

Domestic Building Stock database was created by Sheffield Hallam University (Bruhns et al., 1997 p 279).

2.4 Lighting in Non-Domestic Buildings

One of the largest electricity uses in the United Kingdom service sector is lighting. As shown in Figure 2 below, lighting in the service sector accounts for 15% of total energy usage, second only to heating. Also, the ratio of energy consumption to carbon emissions is large for lighting and represents the second largest portion of energy use in the non-domestic building stock. Studying lighting and the way energy is consumed in the non-domestic building stock will give insight on how to reduce energy demand and as an end result reduce carbon dioxide emissions. According to the Association for the Conservation of Energy, electricity consumption in the commercial sector is especially high due to excess lighting. Excess lighting can be defined as wasted electricity, or unnecessary lighting turned on without serving a purpose such as safety. Reducing the amount of "wasted" electricity in the commercial sector would dramatically decrease the carbon emissions.
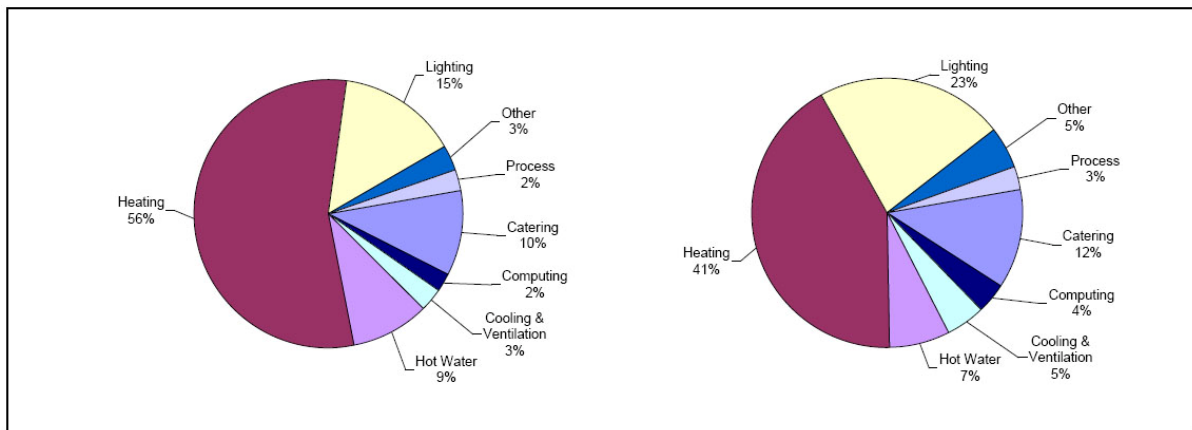
Figure 2: UK service sector energy consumption (left) and Related Carbon Emissions (right) by end use for 2000 (Carbon Emissions from Non-Domestic Buildings, 2002)

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There is, however, limited information about the use of lights and their energy consumption in non-domestic buildings. One estimate was made by the 2007 project team from Worcester Polytechnic Institute (Levin et al., 2007). The project team had developed an equation which could be used to calculate power consumption for the whole building based on the percentage of illuminated windows (Figure 3).

$$\text{Power Consumption (kW)} = (\text{Illuminated windows/Total Windows}) \times (\text{Included floor space}) \times (12.5 \text{ W/m}^2) \times (1 \text{ kW/1000 W})$$

Figure 3: **Formula used by the 2007 project team (Levin et al., 2007).**

The constant "12.5 W/m^2" is a power density used to link the ratio of visible illuminated windows (Illuminated windows/ Total windows) and the floor space to the number of lights which are in the interior of the building, and those which are not visible through a window (Levin et al., 2007). This constant allows for the estimation of power consumption to account for the entire building. Dr Bruhns then used this data to approximate the carbon emissions as a result of unnecessary nighttime lighting in non-domestic building stock. A conservative estimation based on the data collected by the project group yielded the carbon emissions to be 0.8 megatonnes of carbon per year (Bruhns, 2007).

2.5 Camera Usage

Cameras and the usage of visual data play a significant role in the modern world. They are implemented through various applications such as traffic monitoring and security systems. Because of the wide variety of camera types and technologies, image technology can be applied to many fields of research.

One city which makes extensive use of cameras is London, England. Michael McCahill and Clive Norris from the Centre of Criminology and Criminal Justice at Hull University have

completed a study on CCTV cameras in London. As a result of their study, they estimated that there is one camera for every fourteen people in London. Therefore, at the time of the study in 2002, McCahill and Norris also predicted that the UK with a population of about 60 million had at that time 4,285,000 cameras in use. McCahill and Norris determined the figure of one camera for every fourteen people by extrapolating data they had determined in surveying the area of Putney. In their survey of Putney they found that 41% of 211 sample institutions (banks, shops and offices) had CCTV cameras in operation. They then used this data to determine a total of 421,931 surveillance cameras are in London which then translates to one camera for every fourteen people in London.

A majority of the cameras in London are located in the tube and the underground stations, as well as the airports, and on select roads throughout the greater London area. These cameras serve the purpose of monitoring activity in their vicinity. One major use for cameras in London is to oversee the enforcement of the congestion charge. The congestion charge was implemented to reduce traffic and overcrowded roads. Cameras are strategically located at the boundaries and on the inside of the congestion charge zones. The zones include the whole City of London, the financial district, and the West End which is London's primary commercial and entertainment centre (Congestion Charging: In London, 2007) . To be allowed to travel in the congestion zones motorists must pay the congestion charge. When entering and exiting the zones, cameras take pictures of the cars and record the license plates of the vehicles. These plates are then checked against a database that contains all the plates that have paid to enter the area. If the driver has not paid the fee at any time during the same business day, a fine will be imposed. Other such cameras include those used for security, at banks, ATMs, and businesses. There is such a concentration of cameras in the greater London area that it has been estimated that the average

person is caught on camera 300 times a day (BBC News, 2002). This demonstrates the prevalence and range of uses of cameras in our society. This being the case, it is possible to make use of cameras for scientific research.

Chris Leung is an engineer at University College London, and has been implementing cameras in his research for years. Mr. Leung is studying the application of a temperature sensitive resin in building design. His department has developed a window which will automatically open and close according to ambient temperature. In order to test this, he has set up an apparatus involving five cameras all positioned around a window which had been fitted with this resin. Using these cameras he was able to monitor the progress of the window opening and closing over the course of a day. These cameras were placed in such a way that Chris was able to calculate the angle at which the window was open at any given time. All of these cameras were powered by solar panels and were programmed to send the images automatically to a computer (Leung, 2008). While this is more extreme than anything which we needed, it is a good example of cameras being used in scientific research. We have applied a similar methodology to our own study.

Because overnight lighting in non-domestic buildings is a large contributor to carbon dioxide emissions in the United Kingdom, we have, using the same sample of buildings as the 2007 project team, determined the average percentage of illuminated windows during the weekend. To gather data on multiple buildings in the London area we have made use of street surveys and remote cameras. The information that we have collected will benefit Dr Bruhns and the CaRB team by allowing them to determine an accurate model of carbon emissions of the non-domestic building stock of the United Kingdom.

3. Methodology

In order to assist CaRB in creating a socio-technical model of energy use of the non-domestic buildings in the United Kingdom, we employed an existing methodology used by the 2007 project team to quantify the average percentage of illuminated windows during the weekend of the non-domestic building stock. We also developed a means by which to observe buildings with the use of an automated camera. To this end, we pursued three research objectives:

1.   We resurveyed the previous sample of the non-domestic building stock to understand trends of overnight lighting patterns and to make a more robust estimate of the carbon emissions from overnight lighting.

2.   We developed and tested a new methodology for gathering and analyzing data using an automated camera.

3.   We also used the predetermined equation to calculate energy usage from overnight lighting in the non-domestic building stock.

3.1 Resurvey Previous Building Stock

Our team's first goal was to collect additional data on buildings which were previously surveyed during the months of January and February, 2007. The buildings were surveyed between the hours of 10 P.M and 2 A.M. on weekdays by the 2007 project team. Therefore, in order to create a more robust estimate of the excess carbon emissions as a result of overnight lighting, we collected further data concerning overnight lighting usage for these buildings. We have done this by resurveying all of the previous sample buildings during the weekend.

3.1.1 Replication of Previous Methodology

In order to be able to accurately compare the data collected by our project team to the data collected last year by the 2007 project team, we had to correctly replicate their methodology. To accurately recreate the data collection methods which were employed by the 2007 project team, there were several steps which we had to take. We first had to study their data tables and cross reference them with the area maps for the data collection area (Appendix E). The building identification numbers in the data sheets correspond with the building numbers on the map. This allowed us to create a data sheet which flowed in relation to the position of the buildings on the map; this way when we were surveying we would be able to record the building data in order.

Other pieces of the 2007 project team's methodology which we needed to replicate were their procedures and techniques. This was done to eliminate any other variables which could affect the results of our surveying. We had to determine the qualifications for what the previous team defined as a window, since the building structures were not consistent. For example, some buildings have a façade entirely made of glass, while other buildings have rows of continuous windows on each floor. To keep observations consistent, the 2007 project team defined a window as "any adjacent panes of glass that the building structure completely surrounds" (Levin et al 2007). According to this definition we did not consider a pane of glass or window frame to be a building structure, thus they do not separate one window from another. According to the established definition, the window section on the right, in Figure 4, accounts for four separate windows, as there are three structural divisions between them. Including the window on the far left, there are five total windows on the top row.

Figure 4: Illustration of Previous Team's Definition of a Single Window

During the 2007 project team's nighttime observations, partially lit windows, also referred to as light spillage, became a problem. Partially lit windows occur when light spills from one light source to the remainder of the room. To account for light spillage, the previous team, and thereby our team, only counted the windows with light emanating from directly behind the window. If we could see a light bulb, or if the light appeared bright enough to be directly behind the window, we would count that as an illuminated window. However, if a window was only partially illuminated, we attributed this to light spillage and would not count this as an illuminated window. The building shown in Figure 5 would only be counted as having one illuminated window rather than two, because the leftmost window is only partially illuminated due to light spillage.

Figure 5: Illustration of Light Spillage

3.1.2 Analysis of Previous Data

The data collected by the 2007 project team afforded us a better understanding of what our overall results should resemble. However, since the aforementioned team had collected their data a year prior on the same buildings during different times and not on the weekends, our data was not going to precisely match theirs. Instead, in order to be considered reliable, our data should be within a logical range of the previous data.

As a result, before comparing our data with the former team's data, we first needed to analyze their data that they had gathered for 140 buildings. Two of the more important pieces of information that we were interested in were the percentage of illuminated windows for each building as well as the power consumption (kW) of each building. These two were the most important as they allowed us to relate our data with that of the previous project team. The preceding project team had collected their data on 140 buildings with the use of street surveys. They surveyed each building twice during four observation periods which were completed during the week between the hours of 10 P.M. and 2 A.M. During that time they would determine the total number of windows per building as well as the total number of illuminated windows per building. From there they were able to determine a value for power consumption

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using the equation which they had previously established. Therefore, in order to better understand the overall picture, we related the average of their results with ours. For their data collection, the previous group determined that on average for all the buildings which were surveyed there are between 15 to 25% of windows illuminated each night during the week which leads to a total of 321 kW to 570 kW of electricity that is used at any given time of night.

3.1.3 Street Surveys

Our group decided to resurvey the same sample of 140 buildings as the 2007 project team at earlier hours between 7 P.M. and 10 P.M. on the weekend. Understanding the lighting patterns during both the weeknights and weekends are very important to create a more robust estimate of carbon emissions from overnight lighting.   We assumed the behavior of illuminated windows will be the same on both Saturday and Sunday nights because employees are not working during the weekends. For instance, if an employee leaves his office lights on when he leaves work on Friday evening it may be, depending on the actions of such people as security and cleaners, that the lights will remain on until he returns to work on Monday. Therefore, our team decided to resurvey the 140 buildings on Saturday and Sunday nights.

During our first attempt to resurvey the sample buildings on Saturday and Sunday night, we were only able to complete 90 out of the 140 buildings. We discovered it to be very time consuming having to count both the total windows for each building, and the illuminated ones. Therefore, we had two group members counting the illuminated windows, and the third member counting the number of total windows.   To finish the resurveying of the remaining buildings, we went out on a following Saturday night.

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For security reasons, our sponsor Dr. Bruhns provided each member of the group with a signed letter explaining who we are and why we are performing the research in the event that our intentions are questioned by security personnel or police officers while we are surveying.

3.2 Develop and Test Photographic Methodology for Data Collection

Along with resurveying the previous sample of buildings using street surveys we have also made use of a digital camera to allow us to take automated photographs of various buildings. The camera eliminated the need for more street surveys and provided us with the opportunity to view how lighting in buildings changed over the course of a night and on the weekend.

3.2.1 Camera Acquisition

Once we had outlined the plan for the new methodology, the first step was to research and acquire a camera. There were two means of procuring a camera which our group pursued. The first was to research cameras in use at the University College London and inquire about borrowing one for our study. The other was looking into an affordable camera which would perform the tasks required and that the CaRB team would be willing to purchase.

Our group decided to first look into procuring a camera from the university since it would not be a financial burden upon the CaRB team. We met with university experts who had several cameras in their possession and were using them for their own research. Unfortunately, the setups were very elaborate and required the use of a laptop and knowledge of programming skills. This made it infeasible for our purposes within the time window of our project. Thus we were forced to research cameras which could be purchased by CaRB.

Since our group had minimal knowledge about cameras, our first step was to consult with camera experts and photographers. We visited several local camera shops and inquired as to the specifications and prices of a variety of cameras. We recorded the information for the recommendations from each of the camera shops and went online to perform some research of our own. Once we had found the cheapest option which we believed would perform all of the needs of the project, the Nikon Coolpix P50, we returned to the camera shop that offered it. The managers allowed us to set up an experiment in their shop before buying the camera. We set the camera to take pictures every thirty seconds behind the glass display case, to see how the camera handled taking pictures from behind glass. While this test was being carried out, we presented the findings to Dr. Bruhns, and he agreed to the purchase of the camera contingent upon the results of the in-store test. Finding the results of the test to be acceptable, Dr. Bruhns purchased the Nikon Coolpix P50 for use in our research.

3.2.2 Testing the Photographic Methodology

With the Nikon Coolpix P50 camera, our team was able to take automated photographs of various buildings. We followed the same methodology of determining a percentage of illuminated windows to total windows by counting windows in the photographs. The new methodology with the use of the camera eliminates the need for street surveying and allowed us to view the change in overnight lighting patterns during a night and over the course of a weekend.

In order to get the best possible results out of the camera, our group found it necessary to familiarize ourselves with the camera and its capabilities. We had set-up the camera in the residence hall during the evening and used the time lapse feature to take a picture every five minutes to become accustomed to the camera's performance. It was crucial that both the time

and date on the camera were set properly in order for the pictures to be properly identified at later date. Also, there were several settings on the camera that had to be used in order to collect the additional data on overnight lighting for buildings. These settings were programmed in the program mode of the camera, therefore, when the camera went into sleep mode between each interval of five minutes, the settings would not be lost. It was also important that the time lapse feature operated in picture mode and not in movie mode to maximize the resolution for analyzing the photographs. Also, the flash had to always be turned off because the camera was taking photographs from behind glass. If the flash had been on, it would reflect off the window and affect the quality of the photograph. Even though the camera has night mode, it was not used because it automatically uses the flash.

After we had familiarized ourselves with the camera and its settings, we had set-up the camera at the CaRB office overnight where it was safe and would not be altered. All the settings were already programmed from the previous test in the residence hall. However, we had changed the time lapse interval to one minute. We tested the battery life, as well as how many pictures could be taken on one set of batteries. This allowed us to see if the battery life would survive a full weekend. Also, we had analyzed photographs to test how long it takes to count the ratio of illuminated windows to total windows in a single photograph. This allowed us to allocate the necessary time to survey and analyze the photographs.

3.2.3 Implementation of the New Photographic Methodology

Once we completed testing the methodology for data collection with the camera, we could then begin to implement it into our overall project. The purpose of creating this new methodology was to reduce the need for manual, street-level surveys and improve on the 2007 project team's data collection methods.

To obtain data for our sample of buildings during the weeknights, we had set up our camera in Roberts Building, the engineering building at University College of London. The camera was pointed in the same exact direction as it was for the weekend surveys. This ensured that the two data sets were comparable. We returned to the camera only as often as was necessary to replace the batteries and download the photos for analysis.

We used an SD card to transfer pictures from the camera to a laptop. From the laptop, we displayed the photos on a large LCD monitor in order to better view the pictures. To collect our data we analyzed only the photos taken between 8 P.M. and 5 A.M. to ensure that we were collecting information from photos which were taken at night. For each photo, we identified as many sample buildings as possible and for each building we determined how many windows were visible and how many windows were illuminated. This allowed us to determine what percentages of illuminated windows were in each individual building. We continued this same practice for the remainder of the week (Tuesday night, Wednesday night, Thursday night, and Friday night) as well as the weekend (Saturday night, and Sunday night).

3.3 Calculating Total Energy Usage of Surveyed Buildings

Upon completion of our street surveys, we began to make calculations of total energy usage of the buildings which were surveyed. To calculate the total energy usage of each of our observed buildings, we determined what percentages of lights were lit during weeknights and the weekend. To obtain the calculation, we have used a formula which was established by the 2007 project team from Worcester Polytechnic Institute. This power consumption equation is shown in Figure 3 pg 12. Therefore, using the data collected and the individual floor space of each building we have obtained a result for the power consumption of each observed building.

To carry out this process we made use of Microsoft Excel. We organized each observed building by their field ID (Appendix A) which corresponds to the maps in (Appendix E). This allowed for better organization of our data. Once the data had been entered we were able to obtain results for total power consumption of all the buildings during the weekend and weeknights as well as an average percentage of total illuminated lights.

This calculation step was not possible for the buildings observed via the photography method. Due to time constraints we were not able to find the floor space and necessary variables for the buildings in question. As a result we were only able to obtain quantities of power consumption for the buildings which were surveyed in our street surveys. This was not found to be of concern as only the percentages were used in the calculation of the national average.

4. Findings

Our project has resulted in several findings which help to quantify carbon emissions from the non-domestic building stock of the U.K. We have developed and tested an alternative methodology to streamline data collection. We implemented this camera-based methodology while gathering more data to quantify overnight lighting. We were able to collect data which corroborated the 2007 study's findings, aided us in determining patterns of overnight lighting, and helped us to come to conclusions concerning overnight lighting in the non-domestic building stock.

4.1 Resurvey of Non-Domestic Buildings

An important goal of our project was to resurvey the previously surveyed areas at new times and different days of the week. The 2007 study of overnight lighting observed the sample stock between the hours of 10 PM and 2 AM on Monday and Thursday evenings. In order to better understand trends of overnight lighting, our team reapplied the previous team's methodology and resurveyed the prior sample of the non-domestic building stock on the weekend between the hours of 7 PM and 10 PM.

Prior to the first night of weekend surveying, we familiarized ourselves with the area and prepared for the upcoming evenings. While becoming oriented with the area, we noticed that there was an error in the data of the previous survey. The Microsoft Excel document that contained the data of the 2007 study was corrupted. This error caused the data columns in the document to not match properly, thus the addresses did not match the buildings in question. The data was mended on Saturday with the use of the Air Conditioning Survey data that was provided by CaRB. The 2007 study had used the A/C survey in making their sample of buildings to be surveyed because detailed information was provided including addresses and

floor space.   We compared our data collection sheets with the Air Conditioning data sheets and obtained the correct addresses of our sample buildings. We also noticed the window counts did not match up either. Thus, when we were surveying we found the ratio of total illuminated windows for each building (Appendix B). While we were able to replicate their survey, these issues with the data prevented us from being able to compare individual data points from our survey to theirs. However, our project team was able to use their aggregate data to make comparisons of weekdays and weekends.

4.1.1 Percentage of Illuminated Windows

To calculate the percentage of illuminated windows for all of the buildings we observed, our team found the ratio of illuminated windows to the total number of windows counted for each building. Our team completed the survey of all 140 building across three weekend nights. We started on Saturday, March 15, continued on Sunday March 16, and finished on Saturday, March 29. There was a two week gap between the start of the surveying and the completion due to the Easter Holiday weekend. The team felt that surveying on Easter weekend would not provide data comparable to the other weekends because most businesses were on holiday leave. As a result, due to further time constraints we were only able to complete a weekend survey once during our project.

When analyzing our data from the street survey (Appendix A), we found that the percentage of illuminated lights for the weekend was 16.58%. The 2007 study concluded that the average percentage of illuminated windows during the week in the non-domestic building stock was 18.93%. This was a decrease of 2.35% between our weekend results and the 2007 project team's weeknight results. It is important to bear in mind that our weekend percentages were calculated from samples at particular points in time, and are not assumed to be

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representative of the night as a whole. For example, had these data points been taken at different times or on different weekends, they could be significantly different.

Nevertheless, our data can be used in conjunction with the 2007 project team's data by Dr. Bruhns to create a more robust estimation of carbon dioxide emission. Since the majority of employees are assumed to not be at work on weekends, Dr. Bruhns had believed that there would be a larger decrease in the percentage of illuminated windows. When calculating the amount of carbon emitted from the non-domestic building stock in the United Kingdom, Dr. Bruhns assumed that the overnight lighting percentages for each building were reduced by 50% during the weekend. Therefore, he estimated that only 9.45% of all windows would be illuminated during the weekends. However, the decrease in the percentage of illuminated lights from the week to the weekend was less substantial than previously believed. Dr. Bruhns' estimation is 7.11% less than the actual result of 16.58% of illuminated windows on during the weekend which is a very significant finding. Therefore, Dr. Bruhn's estimate that 0.8 megatonnes of carbon is emitted from overnight lighting in the non-domestic building stock most likely underestimated the actual level of carbon emissions.

4.1.2 Total Power Consumption

To determine the total power consumption from overnight lighting in our study, our project team used the power equation presented in Figure 3, that Dr. Bruhns and the previous team from Worcester Polytechnic Institute had established.

Using this equation, the fraction of illuminated windows over total windows was multiplied by the included floor space for each building. This results in an estimation of the amount of floor space in the building that is illuminated. The assumption that was made was that in each building, the percentage of windows that were illuminated corresponds to the total floor

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space in the entire building that was illuminated (Levin et al 2007). It was also imperative to determine how much power is needed to illuminate the floor space. Therefore, the product is multiplied by a power density of 12.5 W/m² which was previously approved by University College of London lighting expert P. Ryham (Levin et al 2007). However, it cannot be determined how much of the floor space was actually office space because some of the space could contribute to lobbies and stairwells. In our study, the same power density of 12.5 W/m² was used for all of the included floor space of each building we observed.

The 2007 project team found the average total power consumption of the 140 buildings they observed to be 850 kW. From our resurveying of the same sample of the non-domestic building stock during the weekend, we determined the power consumption to be 543 kW. This is consistent with the resulting percentages of illuminated windows, as the 2007 project team observed an average of 18.9% of the total windows were illuminated, compared to our average percentage of 16.58%.

Our team hypothesized that during our surveying "larger" buildings had a larger percentage of illuminated windows than "smaller" buildings; thereby increasing the power consumption without increasing average percentage of illuminated windows. For example, if a small building had zero of four windows illuminated, it would decrease the overall percentage of total illuminated windows. However, when the equation is applied, due to the minimal floor space, this 0% would not have had great effect on the total power consumption. On the other hand, a large building with 100% of the windows illuminated and an expansive floor space would significantly increase the average percentage of illuminated windows and would have a massive effect on the total power consumption.

Building Size (Total Floor Space)	Average Percent Illuminated Windows	Average Power Consumption	Number of buildings in Category
101 – 500 m^2	10.58%	0.49	29
501 – 1,000 m^2	12.41%	2.17	33
1,001 – 2,500 m^2	10.72%	2.18	38
2,501 – 5,000 m^2	18.47%	8.88	30
5,001 – 10,000 m^2	23.22%	15.41	7

Table 1: Comparison of Buildings by Size Based on Weekend Street Survey Results

Table 1 above is a depiction of the illuminated percentages compared to floor space. This table shows that larger buildings have higher percentages of illuminated windows in addition to larger floor space, thus the average power consumption is exponentially larger. Because bigger buildings have larger floor space, more light bulbs are needed to illuminate the floor space, resulting in greater power consumption than smaller buildings.

4.2 Development of the Photographic Methodology

The development of the camera methodology was one of our most important tasks. The success of this technique will allow future researchers to collect larger amounts of data faster and more easily than the previous method of street-level surveys. The analysis of the photographs can reveal trends which are crucial to the success of the CaRB mission.

4.2.1 Camera Criteria

During the development of the alternative camera methodology, our group researched a set of requirements concerning which camera equipment would fulfill our needs, and established a procedure to use such a camera to record images for a study of illuminated windows. The camera selected for this was the Nikon Coolpix P50, and it was acquired with an accompanying tripod for approximately £200.

After interviewing several camera shop owners, we came up with a list of criteria for a camera, memory card, and battery which we would need for our photographic survey. These qualities included the need to have a high resolution camera. For our purposes 8.1 Megapixels more than sufficed. At the full 8.1 megapixel size, the resolution would be 3264 x 2448 pixels. This allowed us to take a picture from a distance and still be able to zoom in several times and maintain good image quality. The camera we selected was also able to take time lapse photos, every hour, at the full resolution. Some of the cameras researched only had the ability to take time-lapse photos in movie mode which would significantly reduce the resolution of the photograph. Thus, it was necessary that our selected camera be able to take full high resolution time-lapse pictures in picture mode.

Also, the team determined that we should have a memory card with sufficient capacity to hold all of the pictures taken. As the pictures are large and contain a significant amount of data, the traditional 128 Megabyte card would have been filled with about 85 pictures. Since we would be taking at least two weeks worth of pictures every hour, this would add up to 336 pictures, thus our team selected a 2 GB card to fit our needs.

Finally, the camera selected needed to have adequate battery life so that it could be left alone for days at a time while still being trusted to perform its task. During the practice trials with the camera, the team determined that the two AA batteries were the limiting factor when determining how long the camera could be left by itself. While taking pictures every minute, the camera lasted for 12.8 hours, or 768 pictures before losing battery life. It is important to note that in practice, the battery loses power when the camera is "sleeping" as well, so it would not last 768 hours if a photo is being captured every hour. During the actual usage of the camera, the team returned to the camera at least once every three days. We found that after 88 pictures, at

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one hour intervals, the battery lost charge. This equates to a little over three and a half days that

the camera could be left on its own to perform its task.

4.2.2 Camera Set-up

After we had purchased and experimented with the Nikon P-50 camera, our next

objective was to find a location to set-up our kit. With the aid of Dr. Bruhns, we were able to

gain entrance into the Roberts Building, a tall University College London building on Torrington

Place WC1E 7JE. While we had originally intended to use Phillips House, another tall UCL

building, we were unable to gain entrance due to scheduling conflicts with the staff. Fortunately,

Dr. Thomas Crummey of the Electrical Engineering Department at UCL gave us permission to

use our choice of two rooms in the Roberts Building. After inspecting the two rooms, one on the

tenth floor and one on the eleventh, the team opted to use the lower of the two rooms for several

reasons. Upon observing the room in the eleventh floor, we noticed that the windows were not

sheltered; rain drops were coating the windows which would affect the quality of the

photographs. Secondly, this room was not secured and the team could not risk having our

camera and tripod tampered with. In comparison, the room on the tenth floor had some shelter

over the windows as there was no presence of rain drops. Most importantly, this room was

secured and very few people had access into it. Therefore, our team knew our camera set-up

would be safe.

Next, our team had to determine the direction we would point the camera to take

photographs of a good sample of the non-domestic building stock. Since we were unable to

visually single out buildings that we had previously re-surveyed, we utilized the maps from the

street surveys. This aided us in choosing the direction of the camera which would cover the

greatest concentration of the non-domestic building stock (Appendix F). Another factor that we

considered was the number of visible windows. For example, if buildings around each other were all the same height, we would be unable to count the windows. Therefore, we had to look for an area with a high concentration of non-domestic buildings, as well as a large number of visible windows.

The team chose the corner of the room which afforded the best vantage point for the photography of the non-domestic building stock. The tripod was not quite high enough by itself, so the whole kit was set up on a table. The position of the tripod feet, as well as the table feet were marked, so the photographs would be consistent throughout the two week data collection period. It was also important to make sure the blinds in the room were always closed to prevent glare in our photographs.

Figure 6: Photograph of Camera Set-up in Roberts Building

The team isolated two buildings in the distance which served as waypoints for our team when focusing the camera. These buildings can be seen in the photograph below, outlined in red.

Figure 7: Photograph of Waypoints Outlined in Red

4.3 Results of Camera Survey

Once we had completed our resurveying of the previous sample of buildings on the weekend, we also wanted to determine whether or not we could make use of a remote camera for data collection. Our resurveying of the 140 buildings on a weekend allowed us to determine whether or not there exists a significant difference in the percentage of illuminated windows between weeknights and the weekend. With the use of a remote camera, we were able to focus on a specific area and determine how overnight lighting in randomly selected buildings varies over the course of a night, a weekend, and a week.

4.3.1 Building Selection

After determining what qualifications we needed for taking night photos of buildings, we then implemented our camera methodology in the Roberts Building. We set our camera to take a photograph every hour on the hour from Friday through Monday. Once we obtained the

photographs, we calculated the percentage of illuminated windows from eleven buildings which

had windows that could be seen. To ensure that these buildings accurately represented the non-

domestic building stock, we located them on street level. During this research, we learned that

one of the eleven buildings was a luxury apartment complex and was thereby removed from the

survey. Below in Figure 8, is a photograph taken from the camera on the tenth floor of Roberts

Building. The ten buildings we observed are labelled below in accordance with our data

collecting sheets in Appendix D.
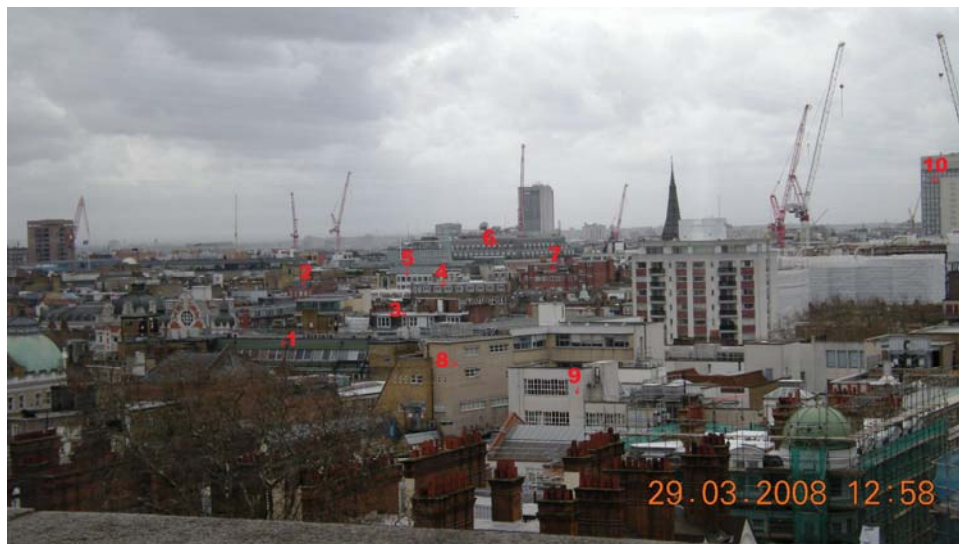
Figure 8: Photograph of the Ten Observed Buildings

(See larger version in Appendix C)

4.3.2 Methodology for Counting Photographs

While counting windows in the photographs, the team developed a methodology for

speeding up the process. In order to maximize the efficiency of counting, the nights were

separated, with each team member taking one night at a time. The team member would then

start with the first building (labeled "1") and then count all the illuminated windows for that

building at 8 PM. Then, rather than counting another building at 8 PM, the researcher would

then proceed to count the number of illuminated windows for the same building at 9 PM. This way it would be apparent if there was any change. If there was no change between times, then there is no need to recount all of the windows for said building. The team member would then proceed through the entirety of the night for the first building before returning to 8 PM to count the number of illuminated windows for the second building. By utilizing this methodology, the team was able to optimize the speed at which data was collected. Our individual times to complete one night are depicted in Table 2.

Team Member	Time
Antonio Di Cesare	25 minutes
Nicholas DiLullo	24 minutes
Karen Krasko	32 minutes
Average	27 minutes

Table 2: Time to Count One Night Worth of Photographs

4.3.3 Photograph Results and Analysis

As a result of our implementation of our camera methodology we completed observations for ten sample buildings over 14 different nights between the hours of 8 P.M and 5 A.M. at one hour intervals. The photos were observed between this time period to compensate for the change in times of sunrise and sunset as a result of daylight savings. Therefore, a total of 1400 observations were made over the period of two weeks. From these 1400 observations we have determined for each week, the average percentage of illuminated windows at each one hour interval. These values for week 1 (March 28 to April 3) are shown in the following Figure. Due to daylights savings, there is no data point for March 31 at 5:00 A.M.

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Time	Friday 28-Mar	Saturday 29-Mar	Sunday 30-Mar	Monday 31-Mar	Tuesday 1-Apr	Wednesday 2-Apr	Thursday 3-Apr
20:00	42.97%	25.35%	21.66%	50.69%	43.78%	43.32%	41.01%
21:00	40.56%	24.88%	23.04%	43.78%	42.40%	41.47%	40.09%
22:00	38.96%	24.88%	21.66%	34.56%	37.33%	40.55%	41.01%
23:00	28.51%	24.42%	20.28%	33.64%	33.64%	28.11%	35.48%
0:00	23.69%	23.96%	20.74%	34.56%	34.10%	23.96%	29.03%
1:00	18.07%	22.58%	19.35%	30.88%	26.73%	24.42%	31.80%
2:00	17.27%	22.58%	18.43%	32.72%	27.19%	22.58%	25.81%
3:00	18.07%	22.58%	18.43%	33.64%	24.88%	25.35%	25.81%
4:00	17.27%	20.48%	18.43%	32.72%	26.73%	23.04%	27.19%
5:00	18.07%	21.69%	23.04%		29.95%	23.04%	24.88%
Average	26.34%	23.34%	20.51%	36.35%	32.67%	29.59%	32.21%

Table 3: Week 1 Camera Data
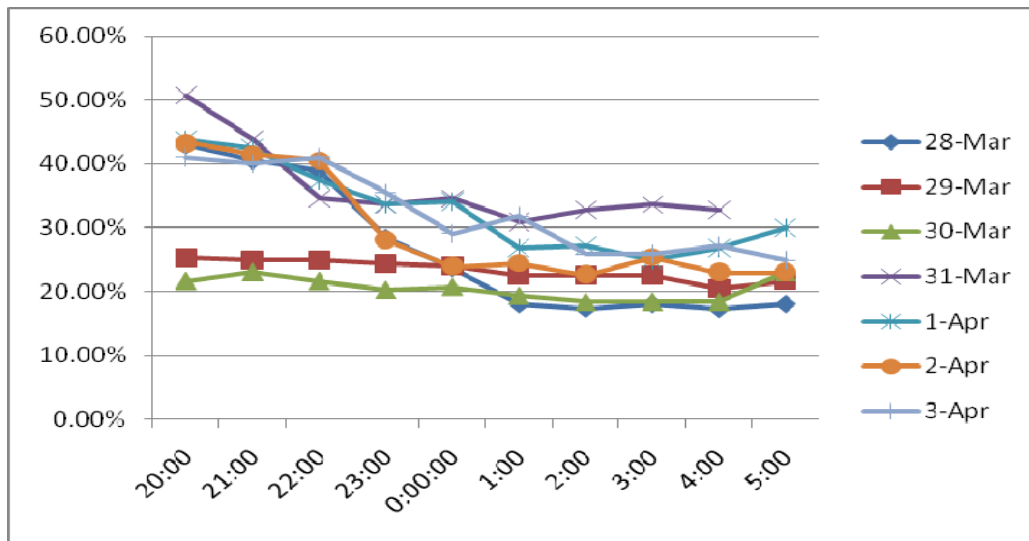
Figure 9: Average Percentage of Illuminated Windows at One Hour Intervals for Week 1

As shown in Figure 9, Monday March 31 had the greatest average percentage of illuminated windows followed by Tuesday April 1. The average percentage then decreases further on April 2, but then rises on April 3. Although there is a slight "hump" in the overall data trend from Monday night to Thursday night, one fact is for certain; the average percentages of illuminated windows for the weekend (March 29 and March 30) are considerably less than the values obtained during the weeknights. However, in order to obtain a more accurate representation of observations we decided to continue our observations through a second week.

Time	Friday 4-Apr	Saturday 5-Apr	Sunday 6-Apr	Monday 7-Apr	Tuesday 8-Apr	Wednesday 9-Apr	Thursday 10-Apr
20:00	42.86%	13.36%	17.05%	37.33%	33.18%	33.18%	28.57%
21:00	48.39%	18.43%	20.28%	47.47%	40.55%	35.48%	39.63%
22:00	32.36%	21.20%	21.20%	44.24%	38.71%	26.73%	29.95%
23:00	18.43%	16.13%	17.51%	30.88%	25.81%	22.12%	19.35%
0:00	17.05%	16.13%	17.51%	25.81%	19.82%	20.28%	17.05%
1:00	17.05%	15.67%	16.13%	23.50%	19.82%	19.35%	17.51%
2:00	19.35%	15.67%	16.13%	23.04%	20.28%	18.89%	15.67%
3:00	13.82%	17.05%	17.51%	22.12%	19.35%	14.29%	15.21%
4:00	13.82%	17.05%	16.13%	22.12%	19.35%	17.51%	17.97%
5:00	15.21%	17.05%	18.89%	26.27%	19.35%	16.59%	16.13%
Average	23.82%	20.29%	19.44%	32.96%	28.84%	25.53%	32.22%

Table 4: Week 2 Camera Data
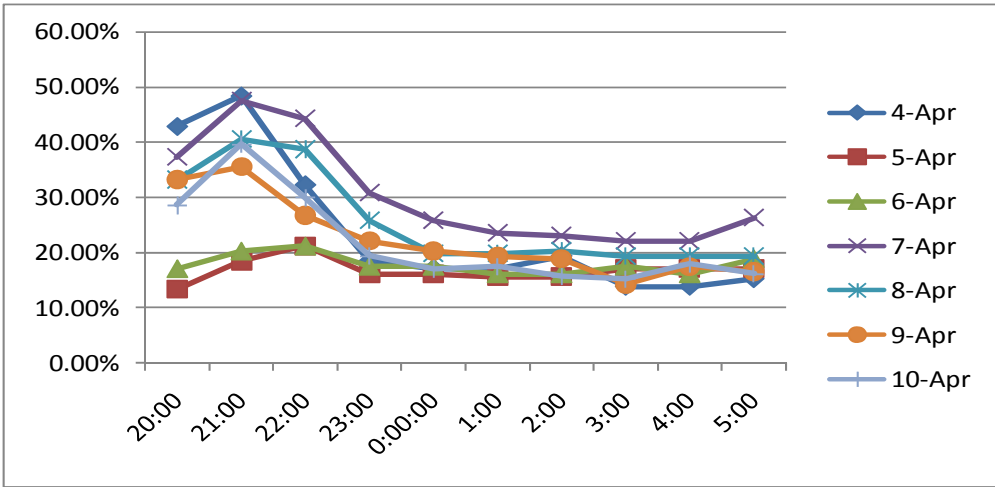
Figure 10: Average Percent of Illuminated Windows at One Hour Intervals for Week 2

The data trends observed from our second week of observations were as expected, very similar to what we had observed in week 1. The percentages of illuminated windows during the weekend (Saturday, April 5 and Sunday, April 6) were noticeably lower than what was recorded for the remainder of the week (April 7 to April 10). This clearly matches our observations from week 1. Another similarity which exists is the trend of percentage of illuminated windows during the week. As in week 1, the data for week 2 shows that from Monday to Wednesday the percentages gradually decrease only to rise again on Thursday. Therefore, we decided to take

the average of both weeks in order to obtain the most accurate representation of the data as

possible.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
20:00	44.01%	38.48%	38.25%	34.79%	41.16%	19.35%	19.35%
21:00	45.62%	41.47%	38.48%	39.86%	42.17%	21.66%	21.66%
22:00	39.40%	38.02%	33.64%	35.48%	34.54%	23.04%	21.43%
23:00	32.26%	29.72%	25.12%	27.42%	23.69%	20.28%	18.89%
0:00	30.18%	26.96%	22.12%	23.04%	20.08%	20.05%	19.12%
1:00	27.19%	23.27%	21.89%	24.65%	16.67%	19.12%	17.74%
2:00	27.88%	23.73%	20.74%	20.74%	17.27%	19.12%	17.28%
3:00	27.88%	22.12%	19.82%	20.51%	15.46%	19.82%	17.97%
4:00	27.42%	23.04%	20.28%	22.58%	14.66%	18.77%	17.28%
5:00	26.27%	24.65%	19.82%	20.51%	15.66%	19.37%	20.97%
Average	32.81%	29.15%	26.01%	26.96%	24.14%	20.06%	19.17%

Table 5: Average Percentage of Illuminated Windows for a Week
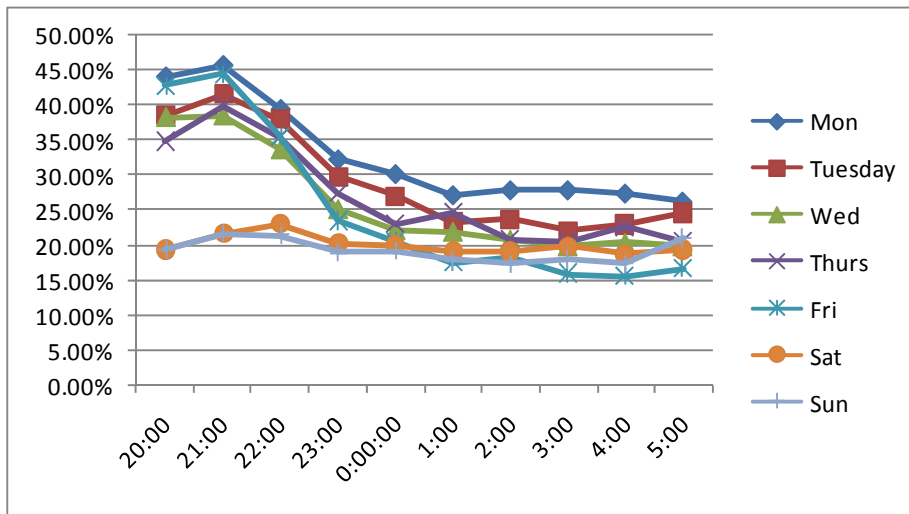
Figure 11: Average Percent of Illuminated Windows for Weeks 1 and 2

The data presented in Table 5 and Figure 11 represents how the percentage of illuminated

windows had varied in our sample over the course of two weeks. The data shows for each day

how the percentage of illuminated windows had varied over each night at one hour intervals.

Between the hours of 20:00 and 21:00 there is an increase in the percentage of illuminated

windows especially during the weekdays. We attributed this effect to the fact that prior to 20:00

the sun is setting and therefore, less windows would be illuminated and thus after 20:00 more windows are illuminated due to the increase in the number of lights being turned on. From this data we also determined that the average percentage of illuminated windows decreases over the course of a night as well as over the course of a week. For each night there is a gradual decrease in the percentage of illuminated windows albeit with some minor variations. Also, as shown in the previous analysis of week 1 and week 2, the average percentage of illuminated windows observed during the weekend is considerably lower than the average percentage of illuminated windows observed during weeknights. As shown in Figure 12 below, there is a larger variance in the data between the average week and the average weekend. This suggests that there is a greater amount of activity within the buildings during weeknights than on weekends. While Figure 12 is the combined data from both weeks 1 and 2, charts for the individual weeks can be found in Appendix G.
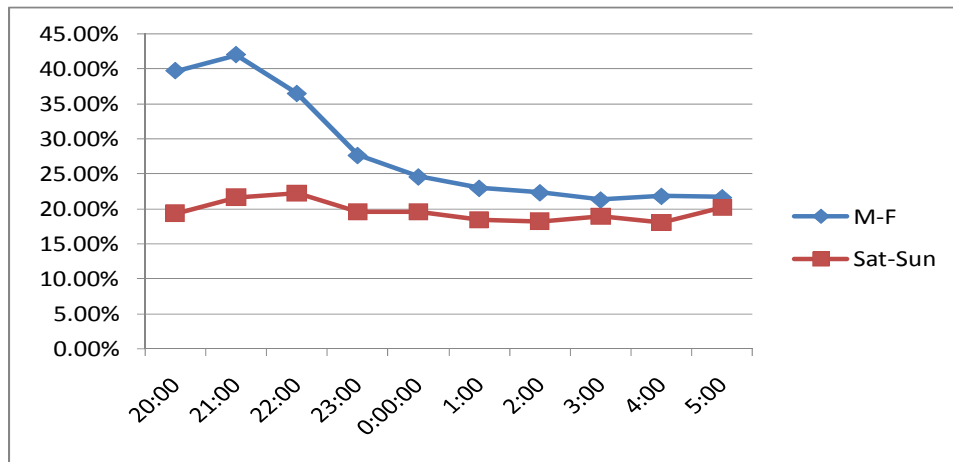
Figure 12: Average Percentage of Illuminated Windows During the Week Versus the Weekend

While counting the illuminated windows in the photographs, the team made several interesting observations. One of the observations was that there are groups of windows which

are always on or off together. This suggests that they are illuminated by lights which are controlled by one light switch. These groupings can be noticed in the photographs when consecutive illuminated windows would come on at the same time together and then turn off at the same time.

While analyzing the ten buildings, we found that half of them have groupings of windows controlled by one light switch. In these five buildings, we found ten groupings of windows. Seven of these groups of windows are in the two largest buildings that we observed, these groups can be seen in Figure 13.   It is not unexpected that many of the larger non-domestic buildings have one light switch to control entire floors.

In the ten groupings of windows in our sample, there were 65 windows. This means that at least 30% of the windows we observed were illuminated by lights which are on the same circuit as other lights.   Therefore, if one person is working late, the entire floor is lit and not just one office.

Figure 13: Picture of the Outline of Illuminated Window Groupings

(See larger version in Appendix H)

4.3.4 Validity of Photographic Methodology

Using the results obtained from our camera methodology we wanted to determine whether or not the camera is reliable in providing accurate data of overnight lighting in non-domestic buildings. To do this we compared the data we obtained from our camera to the data we gathered in observing our sample in our street surveys along with the data obtained by the 2007 project team when they had observed the sample buildings during weeknights. This data is presented in Table 6 and 7.

	2008 Camera (Weekend)	2008 Street Survey (Weekend)
Saturday Mar 29	23.59%	
Sunday Mar 30	20.53%	
Saturday Apr 5	15.25%	
Sunday Apr 6	16.21%	
Average	18.90%	16.58%
Confidence Interval	18.9% ± 3.8% 95% confidence	

Table 6: Weekend Data and Confidence Interval

Time	2007 Project Team (Monday and Thursday 22:00 to 3:00)	2008 Camera (Monday and Thursday 22:00 to 3:00)	2008 Camera (Monday to Friday 22:00 to 3:00)
22:00-23:00	26.8%	33.64%	32.01%
23:00-0:00	16.8%	28.23%	26.07%
0:00-1:00	19.4%	26.27%	23.72%
1:00-2:00	17.4%	25.12%	22.60%
2:00-3:00	14.2%	24.25%	21.77%
Average	18.9%	27.50%	25.23%
Confidence Interval	18.9% ± 4.19% 95% confidence	27.50% ± 3.28% 95% confidence	

Table 7: Week Data from Photographic Methodology and Comparison

As shown the results of our camera methodology during the weekend are similar to what we observed as a result of our street surveys during the weekend. The results of the camera survey during the weekend yield an average of 18.9% of illuminated windows. From our street survey the average percentage of illuminated windows was calculated to be 16.58%. We determined that since we had only used 10 buildings for our weekend camera results and then comparing this result to the west end sample which consisted of the 140 buildings we surveyed,

the sample we had used for our photographic methodology is not representative of the west end sample. Therefore, the results cannot be compared until further research is completed. The 2007 project team from WPI had calculated that the average percentage of illuminated windows observed during the weeknight between the hours of 10 P.M. and 3 A.M. was 18.9% with a standard deviation of 3.39%. Since the 2007 project team had completed their observations on Monday and Thursday nights we averaged the values we obtained with the camera from Monday and Thursday night between the hours of 10 P.M. and 3 A.M. The result is that we observed an average of 27.5% of windows that were illuminated. This is a difference of 8.6%. Large variations are also noticeable at each hour interval. The data has been categorized by one hour intervals due to the fact that both teams had used different data collection methods. The 2007 project team had observed their 140 sample buildings during four observations between the hours of 22:00 and 3:00. During each observation each building was observed at different times than they were observed in a previous observation. During our camera surveying each building was observed at one hour intervals, therefore, to present the data in comparable manner we have averaged our results for each time period 22:00-23:00 etc. The results show that for each time period there is a significant difference in the average percentage of illuminated windows. We believe that this is due to our sample size as well as incidental bias in our camera survey. The incidental bias we had noticed was that due to the nature of the photographs most if not all of our buildings were relatively large. Using the conclusion we had made with our street surveys that buildings with a large floor space have on average a higher percentage of illuminated windows, we determined that the data we had collected from our photographs had been affected by the size of the buildings we had observed. Due to these constraints we were unable to make significant conclusions using the results of our camera survey.

4.3.5 Limitations of Photographic Methodology

Although we did agree that the camera could be used for gathering data to establish trends and percentages of illuminated windows, the camera methodology does make serious assumptions. For example, in a photograph we were only able to account for windows that were visible in the photos and, therefore, we assumed that the visible windows were representative of the rest of the building. Another assumption was that the buildings in the survey area which we analyzed were truly representative of the non-domestic building stock.

Due to the nature of the camera methodology, most of the buildings that we were able to view in the photograph were relatively large buildings. As seen in Table 1, we determined from our weekend surveying that buildings with a greater floor space have a higher percentage of illuminated windows. Our analysis of the street-level survey data from 2007 and 2008 indicated that 23.22% of windows were illuminated in buildings between 5,001 – 10,000 square meters in size. Our camera methodology recorded that on average 25.23% of windows were illuminated between 22:00 to 3:00. Therefore, we might speculate that because the area which we photographed was very densely built, it is possible that a number of "small" buildings in the survey area were not visible, and this may have led to an incidental bias toward larger buildings in our sample. This in turn may have caused our results to be as high as they are. Finally, one other concern that we had was the limited number of windows we were able to observe in our photographs. During our analysis of our photographs we had surveyed a total of 217 windows for each photo. This is roughly 3.5% of the 6,291 total windows we had surveyed in our weekend street survey. The 2007 project team had observed a total of 7,359 windows in their weeknight surveys. Consequently, we believe that our results may have been affected by our relatively small sample size.

        To overcome these limitations more cameras and camera locations should be used to

observe a larger number of buildings. With a greater number of camera views, a larger number

of façades will be visible which will provide a more accurate representation of illuminated

windows of each sample building. Increasing the sample size will allow for a more accurate

comparison between the camera methodology and the street surveys. Once the sample size of

the observed buildings is increased, than a true validation of the camera methodology can be

made.

5. Conclusions

  With the data collected over the course of this project we have determined several trends regarding overnight lighting with the use of a remote camera. In addition, data from our weekend street survey was used in order to make a more robust estimate of carbon dioxide emissions as a result of overnight lighting in the non-domestic building stock of the United Kingdom. We have been able to determine that the previous estimate of 0.8 megatonnes of carbon released per year as a result of unnecessary overnight lighting, based on the previous data, is likely to have been underestimated.

Weekend Resurveying

  One of the missing links to Dr. Bruhn's estimation of carbon dioxide emissions was the need for weekend data for the previous sample of buildings used by the 2007 project team. One of the priorities for our project was to continue building upon the results of this study. They had completed their observations during the hours of 10 P.M. and 2 A.M. on weeknights. Therefore, to obtain a more detailed picture of power consumption of the sample buildings it was necessary that we complete our observations during the weekend. From our observations we had found that there is a minimal decrease in the percentage of illuminated windows between weeknights and the weekend. The 2007 project team determined that the average percentage of illuminated windows during the week was 18.9%. Through our resurveying we had determined that the average percentage of illuminated windows during the weekend is 16.58%, a difference of 2.32%. Our sponsor, Dr. Harry Bruhns had assumed that the average percentage of illuminated windows during the weekend would be 50% of what was observed during the weeknight. With this assumption, he had estimated that 0.8 megatonnes of carbon is emitted per year as a result of overnight lighting in the non-domestic building stock of the United Kingdom. However, with

our recent findings Dr Bruhns' estimate will have to be recalculated in order to compensate for the percentage of illuminated windows during the weekend.

Camera Methodology

Upon completion of our street surveys, one other priority was to determine an alternative method for data collection. One idea, which was proposed by Dr. Bruhns, was to observe buildings with an automated camera from an elevated building. Our team researched, developed, tested and implemented the photographic methodology.

The team found and purchased a camera with tripod for 200 pounds. This camera was able to take high resolution pictures at a set time interval and was able to remain by itself for extended periods of time. The camera was set-up in Roberts Building at University College of London on the tenth floor and was programmed to take photographs of the same ten non-domestic buildings every hour. Our project team analyzed the photographs taken between 8 PM and 5 AM for two full weeks.

This method demonstrates a faster way of collecting data specific to a selected sample of non-domestic buildings compared to the previously employed street survey method. While the sample size is smaller, many more hourly data observations were able to be made. The more regular data points allow for more efficient trend determination. Through our research we determined that our sample size was too small. Because of the constraints of our camera study, we are unable to make any conclusions only estimates concerning patterns of overnight lighting in the non-domestic buildings. Although our weekend camera results were similar to our weekend street survey results, our weeknight results obtained with our camera were in no way equivalent or similar to what the 2007 project team had determined during their weeknight observations because of the fact that the ten buildings we observed in our camera survey were

not representative of the 140 buildings which we had surveyed on the weekend and that the 2007 project team had surveyed during their observations.

Observational Trends

By analyzing the photographs from throughout the night for two weeks, we were able to estimate trends in the overnight lighting patterns for the non-domestic building stock. As predicted, the weekend percentages were lower than those from the week. However, they also corroborated our street surveys in that the weekend values are more than 50% of the weeknight values. We were also able to demonstrate the rate at which people turn off lights as they leave work, this is a major improvement from the previous study, as their data points were taken over the course of four hours, from 10 PM to 2 AM. We found that people began to be turn off lights around 9PM, and the rate leveled out at about midnight.

6. Recommendations

Through our research we were able to draw significant conclusions which will aide CaRB in creating a socio-technical model of energy usage of the non-domestic building stock of the United Kingdom as a result of overnight lighting. In the process of making these conclusions, we have developed recommendations which will allow CaRB to make further progression in its valuable research.

Surveys of the inside of buildings

In order to achieve a more accurate result for an individual building's power consumption due to overnight lighting, it will be beneficial to survey the inside of sample buildings. Due to time constraints we were unable to enter any of our sample buildings. Therefore, to further validate our results, and the results obtained by the 2007 project team from WPI, it would be beneficial to gain access to as many buildings as possible. This would help to determine the actual number of illuminated lights and their individual power consumption to obtain a more robust estimate of power consumption. This information can then be used to make alterations to the power consumption equation for future studies.

Determine "WHY?"

Determining why lights are being left on is just as important as determining how much power is being consumed as a result of overnight lighting. Once a final quantity has been determined for total power consumption as a result of overnight lighting, it will be necessary to discover the reasons behind overnight lighting. This can be done through interviews with building managers. Through these interviews teams will be able to discern "why" lights are being left on and possibly define what constitutes wasted electricity in terms of overnight lighting. It would also be useful to look further into the causes behind entire floors being on, as

was observed by the team. It is currently believed that this is because the floors are operated by a single switch. This information will lead the way for future project teams involved with CaRB and other similar projects to pursue the goal of reducing carbon dioxide emissions in the non-domestic building stock of the United Kingdom.

Make use of more automated cameras

To properly survey a building with the use of automated cameras, there must be a sufficient number of cameras to capture images of all the visible façades. This will eliminate the assumption that the visible façade in the photograph is an accurate representation of the remaining façades of the building not visible in the photograph. Also, with a greater number of cameras, a larger sample of non-domestic buildings can be viewed in the photographs. This will allow for a more robust estimate to be made concerning the percentage of illuminated windows compared to the results obtained with only one camera.

Method for automated data collecting with photographs

Collecting data from photographs for multiple buildings is a time consuming process. If more cameras were used, it will be advantageous for future groups to determine a methodology for automating the data collection process of photographs. Automating the data collection process will allow for significantly more photos to be taken at shorter time intervals. The resulting data will therefore be more robust as there will be fewer significant gaps between data points.

More studies to be completed in other parts of London and the U.K.

To progress the project as a whole and to eliminate as many assumptions as possible from the estimation of carbon dioxide emissions, it would be extremely beneficial if similar studies were completed in other parts of the greater London area, as well as other major cities in the

United Kingdom.   This will increase the overall surveyed sample size and thus reduces some of the effects involved in extrapolating the data obtained from one sample of buildings to represent the entire non-domestic building stock of the United Kingdom.   This will allow for more accurate observations of the non-domestic building stock of the United Kingdom and would provide data for a more robust calculation of the total carbon dioxide emissions of non domestic buildings in the United Kingdom as a result of overnight lighting.

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Appendix A: Street Survey Building Data

ID	Field	survey ID	Section	Block	Street	St_Nr
45	54	1	9	B	Alfred Pl	19-30
52	55	2	9	A	Alfred Pl	15
46	57	3	9	A	Alfred Pl	10
105	58	4	9	A	Alfred Pl	1
44	59	5	9	B	Alfred Pl	33-34
106	12	6	9	D	Bedford Ave	null
107	17	7	9	E	Bedford Sq	32
108	18	8	9	C	Bedford Sq	26
51	19	9	9	C	Bedford Sq	25
49	94	11	5	D	Berners St	58-60
110	95	23	5	A	Berners St	14-15
113	103	15	5	D	Berners St	40
31	104	16	5	D	Berners St	41-42
119	105	17	5	D	Berners St	43-44
120	106	18	5	D	Berners St	45-46
121	107	19	5	D	Berners St	47
131	96	24	6	A	Berners St	16-18
109	97	20	6	A	Berners St	19-20
114	98	21	6	A	Berners St	21.00
118	99	22	6	A	Berners St	22
25	100	12	6	A	Berners St	25-27
111	101	13	6	A	Berners St	28
112	102	14	6	A	Berners St	29-33
47	93	10	9	D	Berners St	61
42	7	25	2	F	Capper St	11-30/2-10/1-9

43	48	26	3	C	Charlotte Mws	7-10
133	45	27	3	B	Charlotte St	80
134	46	28	3	C	Charlotte St	76-78
50	49	29	3	C	Charlotte St	74a
28	50	30	3	A	Charlotte St	77-79
132	38	39	4	A	Charlotte St	59
41	63	31	7	A	Charlotte St	43-45
136	65	33	7	A	Charlotte St	33a
122	67	37	7	A	Charlotte St	39
30	72	38	7	C	Charlotte St	1
135	64	32	8	A	Charlotte St	38
29	68	35	8	C	Charlotte St	26
26	69	36	8	C	Charlotte St	24
27	56	40	4	D	Chenies St	11
100	47	41	3	B	Chitty St	15
129	115	42	3	A	Cleveland St	34-42
128	116	43	3	A	Cleveland St	30
130	39	44	1	D	Conway St	Null
138	41	45	1	A	Conway St	26-28
103	40	46	1	B	Fitzroy Sq	26
104	43	47	2	A	Fitzroy St	13
40	16	48	9	E	Horwell St	16
55	27	49	2	B	Howland St	18
123	44	50	3	B	Howland St	23
124	26	51	1	E	Maple St	10
10	42	52	1	A	Marylebone Rd	355
11	108	53	5	D	Mortimer St	19-21

20	109	56	5	D	Mortimer St	27
21	110	54	5	A	Mortimer St	16
22	111	55	5	D	Mortimer St	37-41
54	117	66	6	B	Newman St	55
56	118	67	6	B	Newman St	60-62
125	119	72	6	B	Newman St	64
12	120	61	6	B	Newman St	65
15	123	69	6	B	Newman St	68
16	124	70	6	B	Newman St	72
18	126	73	6	B	Newman St	73
60	128	75	6	B	Newman St	74
61	129	76	6	B	Newman St	75
62	130	77	6	B	Newman St	77
67	133	80	6	C	Newman St	84
69	134	57	6	C	Newman St	87-91
71	135	58	6	C	Newman St	93
23	90	62	7	B	Newman St	28
24	91	63	7	B	Newman St	26
53	92	65	7	B	Newman St	25
13	121	64	7	B	Newman St	30
14	122	68	7	B	Newman St	29
17	125	71	7	B	Newman St	24
19	127	74	7	B	Newman St	22
63	131	78	7	B	Newman St	Null
66	132	79	7	B	Newman St	17-17a
76	136	82	7	B	Oxford St	76
77	137	81	7	D	Oxford St	81

78	20	87	8	E	Percy St	22
32	73	88	8	F	Percy St	18
34	74	89	8	F	Percy St	10_11
35	75	83	8	D	Percy St	32
36	76	84	8	F	Percy St	8
97	77	85	8	F	Percy St	7
98	78	86	8	D	Percy St	33
96	79	90	8	F	Percy St	6
95	80	91	8	F	Percy St	5
91	81	92	8	F	Percy St	3
57	62	93	7	B	Rathbone Pl	33-34
58	138	94	8	G	Rathbone Pl	3_5
59	139	95	8	G	Rathbone Pl	Null
64	140	96	8	G	Rathbone Pl	19-22
65	85	97	7	A	Rathbone St	29-35
68	84	98	7	A	Rathbone St	25
70	82	99	7	A	Rathbone St	7
74	83	100	7	A	Rathbone St	15
75	86	101	7	C	Rathbone St	24
79	36	102	4	B	Scala St	24
39	61	103	8	F	Stephen St	21
99	60	104	9	C	Store St	25
80	52	105	4	D	Torrington Pl	2_16
127	53	106	4	D	Torrington Pl	22
33	1	115	1	C	Tottenham Court Rd	149
126	2	116	1	E	Tottenham Court Rd	118
37	3	107	1	E	Tottenham Court Rd	110-113

38	4	108	1	E	Tottenham Court Rd	109a
139	5	109	2	D	Tottenham Court Rd	170
140	6	110	2	C	Tottenham Court Rd	97
84	8	111	2	F	Tottenham Court Rd	175-176
87	9	112	2	F	Tottenham Court Rd	177-178
81	10	113	2	F	Tottenham Court Rd	180
101	11	114	2	E	Tottenham Court Rd	90
86	51	120	2	E	Tottenham Court Rd	85
82	13	117	9	D	Tottenham Court Rd	251
83	14	118	9	D	Tottenham Court Rd	248
85	15	119	9	D	Tottenham Court Rd	247
88	87	123	3	A	Tottenham Mws	13
89	88	121	3	A	Tottenham Mws	11_12
90	89	122	3	A	Tottenham Mws	7
92	37	124	3	C	Tottenham St	30
93	112	126	5	B	Wells St	66-67
94	113	125	5	C	Wells St	24
2	114	127	5	E	Wells St	19-23
9	28	135	2	C	Whitfield St	null
102	29	131	3	B	Whitfield St	89
6	30	132	3	B	Whitfield St	81
115	31	136	3	B	Whitfield St	67-69
116	32	137	3	C	Whitfield St	55
117	33	138	3	C	Whitfield St	45-51
48	34	139	3	C	Whitfield St	43
1	24	130	4	C	Whitfield St	32
5	23	133	4	C	Whitfield St	30

8	25	134	4	C	Whitfield St	40
7	35	140	4	C	Whitfield St	44-46
3	21	128	8	B	Whitfield St	12_14
4	22	129	8	A	Whitfield St	27-29

Appendix B: Street Survey Data

Street	St_Nr	Time	Vis. Fac.	Illum. Windows	Total Windows	Nr_Floors	Area per floor m2	Total Area	Floorspace
Alfred Pl	19-30	6:52	3	79	306	3	1751	5253	(XL) 5,001 - 10,000 m2
Alfred Pl	15	6:54	1	14	25	4	870.8	3483.2	(VL) 2,501 - 5,000 m2
Alfred Pl	10	6:55	2	0	9	4	840.56	3362.24	(VL) 2,501 - 5,000 m2
Alfred Pl	1	6:56	1	8	8	6	525.15	3150.9	(M) 501 - 1,000 m2
Alfred Pl	33-34	6:57	2	0	24	4	203.7	814.8	(M) 501 - 1,000 m2
Bedford Ave	null	7:16	2	0	80	5	416.6	2083	(L) 1,001 - 2,500 m2
Bedford Sq	32	7:08	3	0	8	3	165	495	(M) 501 - 1,000 m2
Bedford Sq	26	7:05	2	0	6	3	150.1	450.3	(M) 501 - 1,000 m2
Bedford Sq	25	7:06	1	0	6	3	147.7	443.1	(M) 501 - 1,000 m2
Berners St	58-60	9:05	2	10	50	3	447.86	1343.58	(L) 1,001 - 2,500 m2
Berners St	14-15	9:04	3	0	30	5	573.3	2866.5	(VL) 2,501 - 5,000 m2
Berners St	40	8:46	3	12	52	5	478.2	2391	(L) 1,001 - 2,500 m2
Berners St	41-42	8:50	1	1	20	5	705.2	3526	(VL) 2,501 - 5,000 m2
Berners St	43-44	8:51	2	0	10	5	477.8	2389	(L) 1,001 - 2,500 m2
Berners St	45-46	8:55	2	1	24	5	331.54	1657.7	(M) 501 - 1,000 m2
Berners St	47	8:56	1	0	30	5	768.67	3843.35	(VL) 2,501 - 5,000 m2
Berners St	16-18	9:02	2	7	35	5	714.8	3574	(L) 1,001 - 2,500 m2
Berners St	19-20	9:00	1	0	35	5	209.5	1047.5	(M) 501 - 1,000 m2
Berners St	21.00	8:57	1	0	20	5	749.6	3748	(L) 1,001 - 2,500 m2
Berners St	22	8:57	1	30	75	4	469.1	1876.4	(XL) 5,001 - 10,000 m2
Berners St	25-27	8:55	2	0	45	5	212.1	1060.5	(M) 501 - 1,000 m2
Berners St	28	8:52	1	0	5	5	257.1	1285.5	(M) 501 - 1,000 m2
Berners St	29-33	8:48	1	1	100	4	284.8	1139.2	(M) 501 - 1,000 m2
Berners St	61	9:06	1	0	99	5	490.7	2453.5	(L) 1,001 - 2,500 m2
Capper St	11-30/2-	7:56	1	28	72	5	1285	6425	(VL) 2,501 - 5,000 m2

Charlotte Mws	7-10	8:36	3	0	6	2	177.5	355	(M) 501 - 1,000 m2
Charlotte St	80	8:40	2	22	120	4	163.8	655.2	(M) 501 - 1,000 m2
Charlotte St	76-78		2	0	30	5	455.6	2278	(L) 1,001 - 2,500 m2
Charlotte St	74a	9:00	1	0	23	5	274.5	1372.5	(L) 1,001 - 2,500 m2
Charlotte St	77-79	9:15	3	4	20	6	296.8	1780.8	(L) 1,001 - 2,500 m2
Charlotte St	59	8:30	2	0	4	5	195.6	978	(M) 501 - 1,000 m2
Charlotte St	43-45	8:01	2	17	39	2	156.94	313.88	(M) 501 - 1,000 m2
Charlotte St	33a	8:02	2	15	32	3	50.09	150.27	(S) 101 - 500 m2
Charlotte St	39	8:03	3	3	14	4	26.77	107.08	(S) 101 - 500 m2
Charlotte St	1	7:46	1	0	28	3	393.3	1179.9	(L) 1,001 - 2,500 m2
Charlotte St	38	7:59	1	0	12	3	69.06	207.18	(S) 101 - 500 m2
Charlotte St	26	8:09	1	0	9	1	63.42	63.42	(S) 101 - 500 m2
Charlotte St	24	8:10	1	0	9	4	80.07	320.28	(S) 101 - 500 m2
Chenies St	11	6:50	1	10	22	3	281.3	843.9	(M) 501 - 1,000 m2
Chitty St	15	9:40	4	5	21	3	435.6	1306.8	(L) 1,001 - 2,500 m2
Cleveland St	34-42	8:40	3	1	24	4	1141.52	4566.08	(XL) 5,001 - 10,000 m2
Cleveland St	30	8:36	2	26	77	5	648.9	3244.5	(VL) 2,501 - 5,000 m2
Conway St	Null	7:15	2	0	15	3	130.8	392.4	(M) 501 - 1,000 m2
Conway St	26-28	7:00	2	0	39	3	365.2	1095.6	(L) 1,001 - 2,500 m2
Fitzroy Sq	26	7:10	2	1	15	3	96.09	288.27	(S) 101 - 500 m2
Fitzroy St	13	8:27	1	25	235	6	1293	7758	(VL) 2,501 - 5,000 m2
Horwell St	16	7:14	1	0	37	4	189.1	756.4	(S) 101 - 500 m2
Howland St	18	6:28	1	45	128	5	547.9	2739.5	(VL) 2,501 - 5,000 m2
Howland St	23	8:25	1	119	340	5	1183	5915	(XL) 5,001 - 10,000 m2
Maple St	10	7:25	2	0	45	4	171.6	686.4	(M) 501 - 1,000 m2
Marylebone Rd	355	7:05	1	13	28	6	1099	6594	(XL) 5,001 - 10,000 m2
Mortimer St	19-21	9:14	1	3	9	3	274.3	822.9	(L) 1,001 - 2,500 m2

Street	Number	Time							Type
Mortimer St	27	9:13	2	0	49	2	564.77	1129.54	(VL) 2,501 - 5,000 m2
Mortimer St	16	9:12	5	1	6	3	236.5	709.5	(M) 501 - 1,000 m2
Mortimer St	37-41	9:11	2	1	66	4	397.3	1589.2	(L) 1,001 - 2,500 m2
Newman St	55	9:20	1	11	40	3	151.5	454.5	(S) 101 - 500 m2
Newman St	60-62	9:21	1	18	72	3	118.6	355.8	(S) 101 - 500 m2
Newman St	64	9:22	1	5	28	3	221.6	664.8	(M) 501 - 1,000 m2
Newman St	65	9:23	1	1	4	5	789.9	3949.5	(VL) 2,501 - 5,000 m2
Newman St	68	9:30	1	0	72	4	731.2	2924.8	(VL) 2,501 - 5,000 m2
Newman St	72	9:32	1	0	9	4	294.7	1178.8	(L) 1,001 - 2,500 m2
Newman St	73	9:34	1	0	9	4	149.4	597.6	(S) 101 - 500 m2
Newman St	74	9:35	1	0	13	4	263.6	1054.4	(M) 501 - 1,000 m2
Newman St	75	9:36	2	3	8	4	149.6	598.4	(M) 501 - 1,000 m2
Newman St	77	9:37	1	0	12	4	685.4	2741.6	(VL) 2,501 - 5,000 m2
Newman St	84	9:40	1	0	3	3	84.92	254.76	(S) 101 - 500 m2
Newman St	87-91	9:41	1	4	19	5	471.5	2357.5	(L) 1,001 - 2,500 m2
Newman St	93	9:44	1	3	26	3	223.2	669.6	(S) 101 - 500 m2
Newman St	28		2	0	4	5	292.2	1461	(M) 501 - 1,000 m2
Newman St	26	9:29	1	0	9		247	0	(M) 501 - 1,000 m2
Newman St	25	9:31	1	4	12	5	254.2	1271	(S) 101 - 500 m2
Newman St	30	9:25	1	0	8	4	434	1736	(L) 1,001 - 2,500 m2
Newman St	29	9:26	1	0	9	5	669.6	3348	(L) 1,001 - 2,500 m2
Newman St	24	9:34	1	0	10	4	707.1	2828.4	(L) 1,001 - 2,500 m2
Newman St	22	9:37	1	0	12		193.2	0	(M) 501 - 1,000 m2
Newman St	Null	9:38	1	0	36	5	968	4840	(L) 1,001 - 2,500 m2
Newman St	17-17a	9:39	1	0	10	4	541	2164	(L) 1,001 - 2,500 m2
Oxford St	76	9:47	1	24	247	4	1227	4908	(L) 1,001 - 2,500 m2
Oxford St	81	9:57	2	19	129	4	1638.8	6555.2	(VL) 2,501 - 5,000 m2
Percy St	22	7:30	2	66	549	9	899.8	8098.2	(VL) 2,501 - 5,000 m2

Percy St	18	7:29	1	0	6	6	121.4	728.4	(S) 101 - 500 m2
Percy St	10_11	7:41	1	3	23	11	717.3	7890.3	(VL) 2,501 - 5,000 m2
Percy St	32	7:42	1	0	8	1	74.84	74.84	(S) 101 - 500 m2
Percy St	8	7:43	1	0	6	4	87.95	351.8	(S) 101 - 500 m2
Percy St	7	7:45	1	0	6	3	162	486	(M) 501 - 1,000 m2
Percy St	33	7:44	1	0	11	3	133.7	401.1	(S) 101 - 500 m2
Percy St	6	7:46	1	0	3	2	127.4	254.8	(S) 101 - 500 m2
Percy St	5	7:47	1	0	8	3	81.39	244.17	(S) 101 - 500 m2
Percy St	3	7:48	1	0	6	2	160.7	321.4	(S) 101 - 500 m2
Rathbone Pl	33-34	8:20	2	4	20	3	274.5	823.5	(M) 501 - 1,000 m2
Rathbone Pl	3_5	9:57	1	0	18	2	472.7	945.4	(L) 1,001 - 2,500 m2
Rathbone Pl	Null	8:25	1	3	9	4	603.3	2413.2	(VL) 2,501 - 5,000 m2
Rathbone Pl	19-22	8:24	1	19	70	3	648.3	1944.9	(VL) 2,501 - 5,000 m2
Rathbone St	29-35	8:16	1	0	32	3	304.1	912.3	(L) 1,001 - 2,500 m2
Rathbone St	25	8:17	1	0	6	5	51.31	256.55	(S) 101 - 500 m2
Rathbone St	7	8:19	1	4	9	4	613.8	2455.2	(VL) 2,501 - 5,000 m2
Rathbone St	15	8:18	1	0	11	3	231.3	693.9	(L) 1,001 - 2,500 m2
Rathbone St	24	8:14	1	12	30	3	243.8	731.4	(L) 1,001 - 2,500 m2
Scala St	24	9:45	1	1	33	3	137.3	411.9	(M) 501 - 1,000 m2
Stephen St	21	7:24	2	0	90	2	792.8	1585.6	(VL) 2,501 - 5,000 m2
Store St	25	7:02	1	0	76	4	1150	4600	(XL) 5,001 - 10,000 m2
Torrington Pl	2_16	6:42	1	11	33	5	940.89	4704.45	(VL) 2,501 - 5,000 m2
Torrington Pl	22	6:45	1	4	40	6	696.8	4180.8	(VL) 2,501 - 5,000 m2
Tottenham Court Rd	149	7:35	1	35	315	5	2164	10820	(XL) 5,001 - 10,000 m2
Tottenham Court Rd	118	7:31	1	0	6	4	38.66	154.64	(S) 101 - 500 m2
Tottenham Court Rd	110-113	7:28	1	2	42	7	414.1	2898.7	(M) 501 - 1,000 m2
Tottenham Court	109a	7:26	1	0	3	3	75.51	226.53	(S) 101 - 500 m2

Rd									
Tottenham Court Rd	170	7:40	3	7	48	4	813.82	3255.28	(VL) 2,501 - 5,000 m2
Tottenham Court Rd	97	7:45	1	0	58	1	743.5	743.5	(L) 1,001 - 2,500 m2
Tottenham Court Rd	175-176	7:46	1	3	56	4	198	792	(M) 501 - 1,000 m2
Tottenham Court Rd	177-178	7:48	1	0	36	4	193.9	775.6	(M) 501 - 1,000 m2
Tottenham Court Rd	180	7:50	1	5	18	5	359.6	1798	(L) 1,001 - 2,500 m2
Tottenham Court Rd	90	8:00	4	19	157	5	609.6	3048	(VL) 2,501 - 5,000 m2
Tottenham Court Rd	85	8:06	1	25	142	4	671.4	2685.6	(VL) 2,501 - 5,000 m2
Tottenham Court Rd	251	7:18	1	44	85	5	221.9	1109.5	(M) 501 - 1,000 m2
Tottenham Court Rd	248	7:22	1	0	28	6	984.78	5908.68	(VL) 2,501 - 5,000 m2
Tottenham Court Rd	247	7:25	1	70	160	5	921.9	4609.5	(VL) 2,501 - 5,000 m2
Tottenham Mws	13	9:20	1	1	12	3	121.7	365.1	(S) 101 - 500 m2
Tottenham Mws	11_12	9:20	1	0	11	5	162.07	810.35	(S) 101 - 500 m2
Tottenham Mws	7	9:20	1	2	7	2	58.42	116.84	(S) 101 - 500 m2
Tottenham St	30	9:30	1	2	6	4	78.23	312.92	(S) 101 - 500 m2
Wells St	66-67	9:10	1	0	18	3	212.95	638.85	(L) 1,001 - 2,500 m2
Wells St	24	9:09	1	5	12	2	115.1	230.2	(S) 101 - 500 m2
Wells St	19-23	9:07	1	7	21	3	345	1035	(L) 1,001 - 2,500 m2
Whitfield St	null	8:15	1	16	68	3	474.1	1422.3	(M) 501 - 1,000 m2
Whitfield St	89	8:18	1	29	128	3	73.27	219.81	(S) 101 - 500 m2
Whitfield St	81	9:45	1	4	24	4	190.95	763.8	(M) 501 - 1,000 m2
Whitfield St	67-69	9:40	4	4	32	3	252.9	758.7	(L) 1,001 - 2,500 m2
Whitfield St	55	9:37	1	14	33	4	499.1	1996.4	(L) 1,001 - 2,500 m2
Whitfield St	45-51	9:31	1	3	21	3	719	2157	(L) 1,001 - 2,500 m2

Whitfield St	43	9:27	1	0	23	2	456.8	913.6	(L) 1,001 - 2,500 m2
Whitfield St	32	8:20	1	4	9	4	882.5	3530	(VL) 2,501 - 5,000 m2
Whitfield St	30	8:28	1	6	55	5	268.4	1342	(L) 1,001 - 2,500 m2
Whitfield St	40	9:40	1	1	24	5	729.4	3647	(VL) 2,501 - 5,000 m2
Whitfield St	44-46		3	3	12	4	392.1	1568.4	(VL) 2,501 - 5,000 m2
Whitfield St	12_14	7:51	1	5	21	4	321.6	1286.4	(L) 1,001 - 2,500 m2
Whitfield St	27-29	7:52	1	6	20	3	339.4	1018.2	(L) 1,001 - 2,500 m2

Appendix C: Numbered Buildings in Photographic Sample

Appendix D: Camera Survey Data Tables:

March 28

Building	Date	Time	Description	Total Windows	Illum.Windows	% Illum. Windows
1	3/28/08	19:00:00	Green siding/angled windows left center	16	9	56.25%
2	3/28/08	19:00:00	Red building/Left Center in Photo	5	5	100.00%
3	3/28/08	19:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	3/28/08	19:00:00	Grey building Center of Photo Midway	16	11	68.75%
5	3/28/08	19:00:00	Grey building Center/White Windows	10	10	100.00%
6	3/28/08	19:00:00	Large grey/black back of photo	44	20	45.45%
7	3/28/08	19:00:00	large red right center	22	16	72.73%
8	3/28/08	19:00:00	grey center front of photo angled back	25	9	36.00%
9	3/28/08	19:00:00	large white right center front of photo	3	2	66.67%
10	3/28/08	19:00:00	large white right center red balconies	32	10	31.25%
11	3/28/08	19:00:00	large white office building back right	70	47	67.14%
					Average	55.82%

Building	Date	Time	Description	Total Windows	Illum.Windows	% Illum. Windows
1	3/28/08	20:00:00	Green siding/angled windows left center	16	0	0.00%
2	3/28/08	20:00:00	Red building/Left Center in Photo	5	3	60.00%
3	3/28/08	20:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	3/28/08	20:00:00	Grey building Center of Photo Midway	16	8	50.00%
5	3/28/08	20:00:00	Grey building Center/White Windows	10	10	100.00%
6	3/28/08	20:00:00	Large grey/black back of photo	44	21	47.73%
7	3/28/08	20:00:00	large red right center	22	12	54.55%
8	3/28/08	20:00:00	grey center front of photo angled back	25	6	24.00%
9	3/28/08	20:00:00	large white right center front of photo	3	0	0.00%

10	3/28/08	20:00:00	large white right center red balconies	32	8	25.00%
11	3/28/08	20:00:00	large white office building back right	70	39	55.71%
					Average	
						42.97%
1	3/28/08	21:00:00	Green siding/angled windows left center	16	0	0.00%
2	3/28/08	21:00:00	Red building/Left Center in Photo	5	0	0.00%
3	3/28/08	21:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	3/28/08	21:00:00	Grey building Center of Photo Midway	16	9	56.25%
5	3/28/08	21:00:00	Grey building Center/White Windows	10	10	100.00%
6	3/28/08	21:00:00	Large grey/black back of photo	44	10	22.73%
7	3/28/08	21:00:00	large red right center	22	14	63.64%
8	3/28/08	21:00:00	grey center front of photo angled back	25	8	32.00%
9	3/28/08	21:00:00	large white right center front of photo	3	0	0.00%
10	3/28/08	21:00:00	large white right center red balconies	32	9	28.13%
11	3/28/08	21:00:00	large white office building back right	70	41	58.57%
					Average	
						40.56%
1	3/28/08	22:00:00	Green siding/angled windows left center	16	0	0.00%
2	3/28/08	22:00:00	Red building/Left Center in Photo	5	0	0.00%
3	3/28/08	22:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	3/28/08	22:00:00	Grey building Center of Photo Midway	16	10	62.50%
5	3/28/08	22:00:00	Grey building Center/White Windows	10	10	100.00%
6	3/28/08	22:00:00	Large grey/black back of photo	44	13	29.55%
7	3/28/08	22:00:00	large red right center	22	16	72.73%
8	3/28/08	22:00:00	grey center front of photo angled back	25	6	24.00%

9	3/28/08	22:00:00	large white right center front of photo	3	0	0.00%
10	3/28/08	22:00:00	large white right center red balconies	32	9	28.13%
11	3/28/08	22:00:00	large white office building back right	70	33	47.14%

Average

38.96%

1	28/3/08	23:00:00	Green siding/angled windows left center	16	0	0.00%
2	3/28/08	23:00:00	Red building/Left Center in Photo	5	0	0.00%
3	3/28/08	23:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	3/28/08	23:00:00	Grey building Center of Photo Midway	16	9	56.25%
5	3/28/08	23:00:00	Grey building Center/White Windows	10	10	100.00%
6	3/28/08	23:00:00	Large grey/black back of photo	44	10	22.73%
7	3/28/08	23:00:00	large red right center	22	2	9.09%
8	3/28/08	23:00:00	grey center front of photo angled back	25	9	36.00%
9	3/28/08	23:00:00	large white right center front of photo	3	0	0.00%
10	3/28/08	23:00:00	large white right center red balconies	32	7	21.88%
11	3/28/08	23:00:00	large white office building back right	70	24	34.29%

Average

28.51%

1	28/3/08	0:00:00	Green siding/angled windows left center	16	0	0.00%
2	3/28/08	0:00:00	Red building/Left Center in Photo	5	0	0.00%
3	3/28/08	0:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	3/28/08	0:00:00	Grey building Center of Photo Midway	16	5	31.25%
5	3/28/08	0:00:00	Grey building Center/White Windows	10	10	100.00%
6	3/28/08	0:00:00	Large grey/black back of photo	44	10	22.73%
7	3/28/08	0:00:00	large red right center	22	2	9.09%

8	3/28/08	0:00:00	grey center front of photo angled back	25	6	24.00%
9	3/28/08	0:00:00	large white right center front of photo	3	0	0.00%
10	3/28/08	0:00:00	large white right center red balconies	32	8	25.00%
11	3/28/08	0:00:00	large white office building back right	70	18	25.71%
					Average	
						23.69%
1	28/3/08	1:00:00	Green siding/angled windows left center	16	0	0.00%
2	3/28/08	1:00:00	Red building/Left Center in Photo	5	0	0.00%
3	3/28/08	1:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	3/28/08	1:00:00	Grey building Center of Photo Midway	16	5	31.25%
5	3/28/08	1:00:00	Grey building Center/White Windows	10	0	0.00%
6	3/28/08	1:00:00	Large grey/black back of photo	44	10	22.73%
7	3/28/08	1:00:00	large red right center	22	2	9.09%
8	3/28/08	1:00:00	grey center front of photo angled back	25	6	24.00%
9	3/28/08	1:00:00	large white right center front of photo	3	0	0.00%
10	3/28/08	1:00:00	large white right center red balconies	32	8	25.00%
11	3/28/08	1:00:00	large white office building back right	70	14	20.00%
					Average	
						18.07%
1	28/3/08	2:00:00	Green siding/angled windows left center	16	0	0.00%
2	3/28/08	2:00:00	Red building/Left Center in Photo	5	0	0.00%
3	3/28/08	2:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	3/28/08	2:00:00	Grey building Center of Photo Midway	16	5	31.25%
5	3/28/08	2:00:00	Grey building Center/White Windows	10	0	0.00%
6	3/28/08	2:00:00	Large grey/black back of photo	44	11	25.00%

7	3/28/08	2:00:00	large red right center	22	2	9.09%
8	3/28/08	2:00:00	grey center front of photo angled back	25	6	24.00%
9	3/28/08	2:00:00	large white right center front of photo	3	0	0.00%
10	3/28/08	2:00:00	large white right center red balconies	32	5	15.63%
11	3/28/08	2:00:00	large white office building back right	70	14	20.00%
					Average	
						17.27%

1	28/3/08	3:00:00	Green siding/angled windows left center	16	0	0.00%
2	3/28/08	3:00:00	Red building/Left Center in Photo	5	0	0.00%
3	3/28/08	3:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	3/28/08	3:00:00	Grey building Center of Photo Midway	16	5	31.25%
5	3/28/08	3:00:00	Grey building Center/White Windows	10	0	0.00%
6	3/28/08	3:00:00	Large grey/black back of photo	44	12	27.27%
7	3/28/08	3:00:00	large red right center	22	2	9.09%
8	3/28/08	3:00:00	grey center front of photo angled back	25	7	28.00%
9	3/28/08	3:00:00	large white right center front of photo	3	0	0.00%
10	3/28/08	3:00:00	large white right center red balconies	32	5	15.63%
11	3/28/08	3:00:00	large white office building back right	70	14	20.00%
					Average	
						18.07%

1	28/3/08	4:00:00	Green siding/angled windows left center	16	0	0.00%
2	3/28/08	4:00:00	Red building/Left Center in Photo	5	0	0.00%
3	3/28/08	4:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	3/28/08	4:00:00	Grey building Center of Photo Midway	16	5	31.25%
5	3/28/08	4:00:00	Grey building Center/White Windows	10	0	0.00%

6	3/28/08	4:00:00	Large grey/black back of photo	44	11	25.00%
7	3/28/08	4:00:00	large red right center	22	2	9.09%
8	3/28/08	4:00:00	grey center front of photo angled back	25	7	28.00%
9	3/28/08	4:00:00	large white right center front of photo	3	0	0.00%
10	3/28/08	4:00:00	large white right center red balconies	32	5	15.63%
11	3/28/08	4:00:00	large white office building back right	70	13	18.57%

Average

17.27%

1	28/3/08	5:00:00	Green siding/angled windows left center	16	0	0.00%
2	3/28/08	5:00:00	Red building/Left Center in Photo	5	2	40.00%
3	3/28/08	5:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	3/28/08	5:00:00	Grey building Center of Photo Midway	16	5	31.25%
5	3/28/08	5:00:00	Grey building Center/White Windows	10	0	0.00%
6	3/28/08	5:00:00	Large grey/black back of photo	44	13	29.55%
7	3/28/08	5:00:00	large red right center	22	2	9.09%
8	3/28/08	5:00:00	grey center front of photo angled back	25	6	24.00%
9	3/28/08	5:00:00	large white right center front of photo	3	0	0.00%
10	3/28/08	5:00:00	large white right center red balconies	32	4	12.50%
11	3/28/08	5:00:00	large white office building back right	70	13	18.57%

Average

18.07%

March 29

Building	Date	Time	Description	Total Windows	Illum. Windows	% Illum. Windows
1	29/3/08	19:00:00	Green siding/angled windows left center	16	0	0.00%
2	29/3/08	19:00:00	Red building/Left Center in Photo	5	1	20.00%
3	29/3/08	19:00:00	Black/Brown Building Large Windows/Center	6	2	33.33%
4	29/3/08	19:00:00	Grey building Center of Photo Midway	16	5	31.25%
5	29/3/08	19:00:00	Grey building Center/White Windows	10	7	70.00%
6	29/3/08	19:00:00	Large grey/black back of photo	44	14	31.82%
7	29/3/08	19:00:00	large red right center	22	5	22.73%
8	29/3/08	19:00:00	grey center front of photo angled back	25	14	56.00%
9	29/3/08	19:00:00	large white right center front of photo	3	1	33.33%
10	29/3/08	19:00:00	large white office building back right	70	18	25.71%
					Average	
						30.88%
1	29/3/08	20:00:00	Green siding/angled windows left center	16	0	0.00%
2	29/3/08	20:00:00	Red building/Left Center in Photo	5	1	20.00%
3	29/3/08	20:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	29/3/08	20:00:00	Grey building Center of Photo Midway	16	6	37.50%
5	29/3/08	20:00:00	Grey building Center/White Windows	10	5	50.00%
6	29/3/08	20:00:00	Large grey/black back of photo	44	14	31.82%
7	29/3/08	20:00:00	large red right center	22	5	22.73%
8	29/3/08	20:00:00	grey center front of photo angled back	25	8	32.00%
9	29/3/08	20:00:00	large white right center front of photo	3	1	33.33%
10	29/3/08	20:00:00	large white office building back right	70	14	20.00%
					Average	
						25.35%

1	29/3/08	21:00:00	Green siding/angled windows left center	16	0	0.00%
2	29/3/08	21:00:00	Red building/Left Center in Photo	5	1	20.00%
3	29/3/08	21:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	29/3/08	21:00:00	Grey building Center of Photo Midway	16	8	50.00%
5	29/3/08	21:00:00	Grey building Center/White Windows	10	5	50.00%
6	29/3/08	21:00:00	Large grey/black back of photo	44	12	27.27%
7	29/3/08	21:00:00	large red right center	22	5	22.73%
8	29/3/08	21:00:00	grey center front of photo angled back	25	7	28.00%
9	29/3/08	21:00:00	large white right center front of photo	3	1	33.33%
10	29/3/08	21:00:00	large white office building back right	70	15	21.43%

Average

24.88%

1	29/3/08	22:00:00	Green siding/angled windows left center	16	0	0.00%
2	29/3/08	22:00:00	Red building/Left Center in Photo	5	1	20.00%
3	29/3/08	22:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	29/3/08	22:00:00	Grey building Center of Photo Midway	16	6	37.50%
5	29/3/08	22:00:00	Grey building Center/White Windows	10	5	50.00%
6	29/3/08	22:00:00	Large grey/black back of photo	44	12	27.27%
7	29/3/08	22:00:00	large red right center	22	5	22.73%
8	29/3/08	22:00:00	grey center front of photo angled back	25	8	32.00%
9	29/3/08	22:00:00	large white right center front of photo	3	1	33.33%
10	29/3/08	22:00:00	large white office building back right	70	15	21.43%

Average

24.88%

1	29/3/08	23:00:00	Green siding/angled windows left center	16	0	0.00%
2	29/3/08	23:00:00	Red building/Left Center in Photo	5	1	20.00%
3	29/3/08	23:00:00	Black/Brown Building Large Windows/Center	6	3	50.00%
4	29/3/08	23:00:00	Grey building Center of Photo Midway	16	6	37.50%
5	29/3/08	23:00:00	Grey building Center/White Windows	10	5	50.00%
6	29/3/08	23:00:00	Large grey/black back of photo	44	13	29.55%
7	29/3/08	23:00:00	large red right center	22	5	22.73%
8	29/3/08	23:00:00	grey center front of photo angled back	25	8	32.00%
9	29/3/08	23:00:00	large white right center front of photo	3	1	33.33%
10	29/3/08	23:00:00	large white office building back right	70	11	15.71%
					Average	
						24.42%

1	29/3/08	00:00:00	Green siding/angled windows left center	16	0	0.00%
2	29/3/08	00:00:00	Red building/Left Center in Photo	5	1	20.00%
3	29/3/08	00:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	29/3/08	00:00:00	Grey building Center of Photo Midway	16	5	31.25%
5	29/3/08	00:00:00	Grey building Center/White Windows	10	5	50.00%
6	29/3/08	00:00:00	Large grey/black back of photo	44	13	29.55%
7	29/3/08	00:00:00	large red right center	22	5	22.73%
8	29/3/08	00:00:00	grey center front of photo angled back	25	11	44.00%
9	29/3/08	00:00:00	large white right center front of photo	3	1	33.33%
10	29/3/08	00:00:00	large white office building back right	70	10	14.29%
					Average	
						23.96%

RAIN DROPS ON WINDOW

| 1 | 29/3/08 | 01:00:00 | Green siding/angled windows left center | 16 | 0 | 0.00% |

2	29/3/08	01:00:00	Red building/Left Center in Photo	5	1	20.00%
3	29/3/08	01:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	29/3/08	01:00:00	Grey building Center of Photo Midway	16	5	31.25%
5	29/3/08	01:00:00	Grey building Center/White Windows	10	5	50.00%
6	29/3/08	01:00:00	Large grey/black back of photo	44	13	29.55%
7	29/3/08	01:00:00	large red right center	22	5	22.73%
8	29/3/08	01:00:00	grey center front of photo angled back	25	8	32.00%
9	29/3/08	01:00:00	large white right center front of photo	3	1	33.33%
10	29/3/08	01:00:00	large white office building back right	70	10	14.29%

Average

22.58%

1	29/3/08	02:00:00	Green siding/angled windows left center	16	0	0.00%
2	29/3/08	02:00:00	Red building/Left Center in Photo	5	1	20.00%
3	29/3/08	02:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	29/3/08	02:00:00	Grey building Center of Photo Midway	16	5	31.25%
5	29/3/08	02:00:00	Grey building Center/White Windows	10	5	50.00%
6	29/3/08	02:00:00	Large grey/black back of photo	44	13	29.55%
7	29/3/08	02:00:00	large red right center	22	5	22.73%
8	29/3/08	02:00:00	grey center front of photo angled back	25	8	32.00%
9	29/3/08	02:00:00	large white right center front of photo	3	1	33.33%
10	29/3/08	02:00:00	large white office building back right	70	10	14.29%

Average

22.58%

1	29/3/08	03:00:00	Green siding/angled windows left center	16	0	0.00%
2	29/3/08	03:00:00	Red building/Left Center in Photo	5	1	20.00%

3	29/3/08	03:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	29/3/08	03:00:00	Grey building Center of Photo Midway	16	5	31.25%
5	29/3/08	03:00:00	Grey building Center/White Windows	10	5	50.00%
6	29/3/08	03:00:00	Large grey/black back of photo	44	13	29.55%
7	29/3/08	03:00:00	large red right center	22	5	22.73%
8	29/3/08	03:00:00	grey center front of photo angled back	25	8	32.00%
9	29/3/08	03:00:00	large white right center front of photo	3	1	33.33%
10	29/3/08	03:00:00	large white office building back right	70	10	14.29%
					Average	
						22.58%
1	29/3/08	04:00:00	Green siding/angled windows left center	16	0	0.00%
2	29/3/08	04:00:00	Red building/Left Center in Photo	5	1	20.00%
3	29/3/08	04:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	29/3/08	04:00:00	Grey building Center of Photo Midway	16	5	31.25%
5	29/3/08	04:00:00	Grey building Center/White Windows	10	5	50.00%
6	29/3/08	04:00:00	Large grey/black back of photo	44	13	29.55%
7	29/3/08	04:00:00	large red right center	22	5	22.73%
8	29/3/08	04:00:00	grey center front of photo angled back	25	8	32.00%
9	29/3/08	04:00:00	large white right center front of photo	3	1	33.33%
10	29/3/08	04:00:00	large white office building back right	70	10	14.29%
					Average	
						22.58%
1	29/3/08	05:00:00	Green siding/angled windows left center	16	0	0.00%
2	29/3/08	05:00:00	Red building/Left Center in Photo	5	1	20.00%
3	29/3/08	05:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%

4	29/3/08	05:00:00	Grey building Center of Photo Midway	16	5	31.25%
5	29/3/08	05:00:00	Grey building Center/White Windows	10	5	50.00%
6	29/3/08	05:00:00	Large grey/black back of photo	44	13	29.55%
7	29/3/08	05:00:00	large red right center	22	5	22.73%
8	29/3/08	05:00:00	grey center front of photo angled back	25	11	44.00%
9	29/3/08	05:00:00	large white right center front of photo	3	1	33.33%
10	29/3/08	05:00:00	large white office building back right	70	10	14.29%

Average

23.96%

March 30

Building	Date	Time	Description	Total Windows	Illum. Windows	% Illum. Windows
1	30/3/08	19:00:00	Green siding/angled windows left center	16	0	0.00%
2	30/3/08	19:00:00	Red building/Left Center in Photo	5	1	20.00%
3	30/3/08	19:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	30/3/08	19:00:00	Grey building Center of Photo Midway	16	7	43.75%
5	30/3/08	19:00:00	Grey building Center/White Windows	10	5	50.00%
6	30/3/08	19:00:00	Large grey/black back of photo	44	12	27.27%
7	30/3/08	19:00:00	large red right center	22	4	18.18%
8	30/3/08	19:00:00	grey center front of photo angled back	25	6	24.00%
9	30/3/08	19:00:00	large white right center front of photo	3	1	33.33%
10	30/3/08	19:00:00	large white office building back right	70	8	11.43%
					Average	
						20.74%
1	30/3/08	20:00:00	Green siding/angled windows left center	16	0	0.00%
2	30/3/08	20:00:00	Red building/Left Center in Photo	5	1	20.00%
3	30/3/08	20:00:00	Black/Brown Building Large Windows/Center	6	2	33.33%
4	30/3/08	20:00:00	Grey building Center of Photo Midway	16	6	37.50%
5	30/3/08	20:00:00	Grey building Center/White Windows	10	5	50.00%
6	30/3/08	20:00:00	Large grey/black back of photo	44	12	27.27%
7	30/3/08	20:00:00	large red right center	22	4	18.18%
8	30/3/08	20:00:00	grey center front of photo angled back	25	6	24.00%
9	30/3/08	20:00:00	large white right center front of photo	3	1	33.33%
10	30/3/08	20:00:00	large white office building back right	70	10	14.29%
					Average	
						21.66%

1	30/3/08	21:00:00	Green siding/angled windows left center	16	0	0.00%
2	30/3/08	21:00:00	Red building/Left Center in Photo	5	1	20.00%
3	30/3/08	21:00:00	Black/Brown Building Large Windows/Center	6	2	33.33%
4	30/3/08	21:00:00	Grey building Center of Photo Midway	16	6	37.50%
5	30/3/08	21:00:00	Grey building Center/White Windows	10	5	50.00%
6	30/3/08	21:00:00	Large grey/black back of photo	44	12	27.27%
7	30/3/08	21:00:00	large red right center	22	4	18.18%
8	30/3/08	21:00:00	grey center front of photo angled back	25	9	36.00%
9	30/3/08	21:00:00	large white right center front of photo	3	1	33.33%
10	30/3/08	21:00:00	large white office building back right	70	10	14.29%

Average

23.04%

1	30/3/08	22:00:00	Green siding/angled windows left center	16	0	0.00%
2	30/3/08	22:00:00	Red building/Left Center in Photo	5	1	20.00%
3	30/3/08	22:00:00	Black/Brown Building Large Windows/Center	6	2	33.33%
4	30/3/08	22:00:00	Grey building Center of Photo Midway	16	6	37.50%
5	30/3/08	22:00:00	Grey building Center/White Windows	10	5	50.00%
6	30/3/08	22:00:00	Large grey/black back of photo	44	12	27.27%
7	30/3/08	22:00:00	large red right center	22	4	18.18%
8	30/3/08	22:00:00	grey center front of photo angled back	25	9	36.00%
9	30/3/08	22:00:00	large white right center front of photo	3	1	33.33%
10	30/3/08	22:00:00	large white office building back right	70	7	10.00%

Average

21.66%

1	30/3/08	23:00:00	Green siding/angled windows left center	16	0	0.00%
2	30/3/08	23:00:00	Red building/Left Center in Photo	5	1	20.00%
3	30/3/08	23:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	30/3/08	23:00:00	Grey building Center of Photo Midway	16	6	37.50%
5	30/3/08	23:00:00	Grey building Center/White Windows	10	5	50.00%
6	30/3/08	23:00:00	Large grey/black back of photo	44	12	27.27%
7	30/3/08	23:00:00	large red right center	22	4	18.18%
8	30/3/08	23:00:00	grey center front of photo angled back	25	7	28.00%
9	30/3/08	23:00:00	large white right center front of photo	3	1	33.33%
10	30/3/08	23:00:00	large white office building back right	70	7	10.00%
					Average	
						20.28%

1	30/3/08	0:00:00	Green siding/angled windows left center	16	0	0.00%
2	30/3/08	0:00:00	Red building/Left Center in Photo	5	1	20.00%
3	30/3/08	0:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	30/3/08	0:00:00	Grey building Center of Photo Midway	16	6	37.50%
5	30/3/08	0:00:00	Grey building Center/White Windows	10	5	50.00%
6	30/3/08	0:00:00	Large grey/black back of photo	44	12	27.27%
7	30/3/08	0:00:00	large red right center	22	4	18.18%
8	30/3/08	0:00:00	grey center front of photo angled back	25	9	36.00%
9	30/3/08	0:00:00	large white right center front of photo	3	1	33.33%
10	30/3/08	0:00:00	large white office building back right	70	7	10.00%
					Average	
						20.74%

1	30/3/08	1:00:00	Green siding/angled windows left center	16	0	0.00%

2	30/3/08	1:00:00	Red building/Left Center in Photo	5	1	20.00%
3	30/3/08	1:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	30/3/08	1:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	30/3/08	1:00:00	Grey building Center/White Windows	10	5	50.00%
6	30/3/08	1:00:00	Large grey/black back of photo	44	12	27.27%
7	30/3/08	1:00:00	large red right center	22	4	18.18%
8	30/3/08	1:00:00	grey center front of photo angled back	25	9	36.00%
9	30/3/08	1:00:00	large white right center front of photo	3	1	33.33%
10	30/3/08	1:00:00	large white office building back right	70	7	10.00%

Average

19.35%

1	30/3/08	2:00:00	Green siding/angled windows left center	16	0	0.00%
2	30/3/08	2:00:00	Red building/Left Center in Photo	5	1	20.00%
3	30/3/08	2:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	30/3/08	2:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	30/3/08	2:00:00	Grey building Center/White Windows	10	5	50.00%
6	30/3/08	2:00:00	Large grey/black back of photo	44	12	27.27%
7	30/3/08	2:00:00	large red right center	22	4	18.18%
8	30/3/08	2:00:00	grey center front of photo angled back	25	7	28.00%
9	30/3/08	2:00:00	large white right center front of photo	3	1	33.33%
10	30/3/08	2:00:00	large white office building back right	70	7	10.00%

Average

18.43%

1	30/3/08	3:00:00	Green siding/angled windows left center	16	0	0.00%
2	30/3/08	3:00:00	Red building/Left Center in Photo	5	1	20.00%

3	30/3/08	3:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	30/3/08	3:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	30/3/08	3:00:00	Grey building Center/White Windows	10	5	50.00%
6	30/3/08	3:00:00	Large grey/black back of photo	44	12	27.27%
7	30/3/08	3:00:00	large red right center	22	4	18.18%
8	30/3/08	3:00:00	grey center front of photo angled back	25	7	28.00%
9	30/3/08	3:00:00	large white right center front of photo	3	1	33.33%
10	30/3/08	3:00:00	large white office building back right	70	7	10.00%

Average

18.43%

1	30/3/08	4:00:00	Green siding/angled windows left center	16	0	0.00%
2	30/3/08	4:00:00	Red building/Left Center in Photo	5	1	20.00%
3	30/3/08	4:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	30/3/08	4:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	30/3/08	4:00:00	Grey building Center/White Windows	10	5	50.00%
6	30/3/08	4:00:00	Large grey/black back of photo	44	12	27.27%
7	30/3/08	4:00:00	large red right center	22	4	18.18%
8	30/3/08	4:00:00	grey center front of photo angled back	25	7	28.00%
9	30/3/08	4:00:00	large white right center front of photo	3	1	33.33%
10	30/3/08	4:00:00	large white office building back right	70	7	10.00%

Average

18.43%

1	30/3/08	5:00:00	Green siding/angled windows left center	16	0	0.00%
2	30/3/08	5:00:00	Red building/Left Center in Photo	5	1	20.00%
3	30/3/08	5:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%

4	30/3/08	5:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	30/3/08	5:00:00	Grey building Center/White Windows	10	5	50.00%
6	30/3/08	5:00:00	Large grey/black back of photo	44	12	27.27%
7	30/3/08	5:00:00	large red right center	22	4	18.18%
8	30/3/08	5:00:00	grey center front of photo angled back	25	7	28.00%
9	30/3/08	5:00:00	large white right center front of photo	3	1	33.33%
10	30/3/08	5:00:00	large white office building back right	70	17	24.29%

Average

23.04%

March 31

Building #	Date	Time	Description	Total Windows	Illum. Windows	% Illum. Windows
1	31/3/2008	19:00:00	Green siding/angled windows left center	16	1	6.25%
2	31/3/2008	19:00:00	Red building/Left Center in Photo	5	5	100.00%
3	31/3/2008	19:00:00	Black/Brown Building Large Windows/Center	6	2	33.33%
4	31/3/2008	19:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	31/3/2008	19:00:00	Grey building Center/White Windows	10	10	100.00%
6	31/3/2008	19:00:00	Large grey/black back of photo	44	18	40.91%
7	31/3/2008	19:00:00	large red right center	22	11	50.00%
8	31/3/2008	19:00:00	grey center front of photo angled back	25	7	28.00%
9	31/3/2008	19:00:00	large white right center front of photo	3	1	33.33%
10	31/3/2008	19:00:00	large white office building back right	70	29	41.43%
					Average	
						40.55%
1	31/3/2008	20:00:00	Green siding/angled windows left center	16	1	6.25%
2	31/3/2008	20:00:00	Red building/Left Center in Photo	5	3	60.00%
3	31/3/2008	20:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	31/3/2008	20:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	31/3/2008	20:00:00	Grey building Center/White Windows	10	10	100.00%
6	31/3/2008	20:00:00	Large grey/black back of photo	44	24	54.55%
7	31/3/2008	20:00:00	large red right center	22	17	77.27%
8	31/3/2008	20:00:00	grey center front of photo angled back	25	11	44.00%
9	31/3/2008	20:00:00	large white right center front of photo	3	1	33.33%
10	31/3/2008	20:00:00	large white office building back right	70	39	55.71%
					Average	
						50.69%

1	31/3/2008	21:00:00	Green siding/angled windows left center	16	1	6.25%
2	31/3/2008	21:00:00	Red building/Left Center in Photo	5	1	20.00%
3	31/3/2008	21:00:00	Black/Brown Building Large Windows/Center	6	4	66.67%
4	31/3/2008	21:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	31/3/2008	21:00:00	Grey building Center/White Windows	10	10	100.00%
6	31/3/2008	21:00:00	Large grey/black back of photo	44	14	31.82%
7	31/3/2008	21:00:00	large red right center	22	17	77.27%
8	31/3/2008	21:00:00	grey center front of photo angled back	25	11	44.00%
9	31/3/2008	21:00:00	large white right center front of photo	3	1	33.33%
10	31/3/2008	21:00:00	large white office building back right	70	33	47.14%

Average

43.78%

1	31/3/2008	22:00:00	Green siding/angled windows left center	16	4	25.00%
2	31/3/2008	22:00:00	Red building/Left Center in Photo	5	1	20.00%
3	31/3/2008	22:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	31/3/2008	22:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	31/3/2008	22:00:00	Grey building Center/White Windows	10	10	100.00%
6	31/3/2008	22:00:00	Large grey/black back of photo	44	16	36.36%
7	31/3/2008	22:00:00	large red right center	22	1	4.55%
8	31/3/2008	22:00:00	grey center front of photo angled back	25	8	32.00%
9	31/3/2008	22:00:00	large white right center front of photo	3	1	33.33%
10	31/3/2008	22:00:00	large white office building back right	70	30	42.86%

Average

34.56%

1	31/3/2008	23:00:00	Green siding/angled windows left center	16	0	0.00%
2	31/3/2008	23:00:00	Red building/Left Center in Photo	5	1	20.00%
3	31/3/2008	23:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	31/3/2008	23:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	31/3/2008	23:00:00	Grey building Center/White Windows	10	10	100.00%
6	31/3/2008	23:00:00	Large grey/black back of photo	44	18	40.91%
7	31/3/2008	23:00:00	large red right center	22	1	4.55%
8	31/3/2008	23:00:00	grey center front of photo angled back	25	8	32.00%
9	31/3/2008	23:00:00	large white right center front of photo	3	1	33.33%
10	31/3/2008	23:00:00	large white office building back right	70	30	42.86%

Average

33.64%

1	31/3/2008	00:00:00	Green siding/angled windows left center	16	0	0.00%
2	31/3/2008	00:00:00	Red building/Left Center in Photo	5	1	20.00%
3	31/3/2008	00:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	31/3/2008	00:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	31/3/2008	00:00:00	Grey building Center/White Windows	10	10	100.00%
6	31/3/2008	00:00:00	Large grey/black back of photo	44	17	38.64%
7	31/3/2008	00:00:00	large red right center	22	1	4.55%
8	31/3/2008	00:00:00	grey center front of photo angled back	25	11	44.00%
9	31/3/2008	00:00:00	large white right center front of photo	3	1	33.33%
10	31/3/2008	00:00:00	large white office building back right	70	30	42.86%

Average

34.56%

1	31/3/2008	01:00:00	Green siding/angled windows left center	16	0	0.00%

2	31/3/2008	01:00:00	Red building/Left Center in Photo	5	1	20.00%
3	31/3/2008	01:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	31/3/2008	01:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	31/3/2008	01:00:00	Grey building Center/White Windows	10	10	100.00%
6	31/3/2008	01:00:00	Large grey/black back of photo	44	13	29.55%
7	31/3/2008	01:00:00	large red right center	22	1	4.55%
8	31/3/2008	01:00:00	grey center front of photo angled back	25	8	32.00%
9	31/3/2008	01:00:00	large white right center front of photo	3	1	33.33%
10	31/3/2008	01:00:00	large white office building back right	70	30	42.86%

Average

30.88%

1	31/3/2008	02:00:00	Green siding/angled windows left center	16	0	0.00%
2	31/3/2008	02:00:00	Red building/Left Center in Photo	5	1	20.00%
3	31/3/2008	02:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	31/3/2008	02:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	31/3/2008	02:00:00	Grey building Center/White Windows	10	10	100.00%
6	31/3/2008	02:00:00	Large grey/black back of photo	44	17	38.64%
7	31/3/2008	02:00:00	large red right center	22	1	4.55%
8	31/3/2008	02:00:00	grey center front of photo angled back	25	8	32.00%
9	31/3/2008	02:00:00	large white right center front of photo	3	1	33.33%
10	31/3/2008	02:00:00	large white office building back right	70	30	42.86%

Average

32.72%

1	31/3/2008	03:00:00	Green siding/angled windows left center	16	0	0.00%
2	31/3/2008	03:00:00	Red building/Left Center in Photo	5	1	20.00%

3	31/3/2008	03:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	31/3/2008	03:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	31/3/2008	03:00:00	Grey building Center/White Windows	10	10	100.00%
6	31/3/2008	03:00:00	Large grey/black back of photo	44	19	43.18%
7	31/3/2008	03:00:00	large red right center	22	1	4.55%
8	31/3/2008	03:00:00	grey center front of photo angled back	25	8	32.00%
9	31/3/2008	03:00:00	large white right center front of photo	3	1	33.33%
10	31/3/2008	03:00:00	large white office building back right	70	30	42.86%

Average

33.64%

1	31/3/2008	04:00:00	Green siding/angled windows left center	16	0	0.00%
2	31/3/2008	04:00:00	Red building/Left Center in Photo	5	1	20.00%
3	31/3/2008	04:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	31/3/2008	04:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	31/3/2008	04:00:00	Grey building Center/White Windows	10	10	100.00%
6	31/3/2008	04:00:00	Large grey/black back of photo	44	17	38.64%
7	31/3/2008	04:00:00	large red right center	22	1	4.55%
8	31/3/2008	04:00:00	grey center front of photo angled back	25	8	32.00%
9	31/3/2008	04:00:00	large white right center front of photo	3	1	33.33%
10	31/3/2008	04:00:00	large white office building back right	70	30	42.86%

Average

32.72%

April 1

Building	Date	Time	Description	Total Windows	Illum. Windows	% Illum. Windows
1	1/4/08	20:00:00	Green siding/angled windows left center	16	0	0.00%
2	1/4/08	20:00:00	Red building/Left Center in Photo	5	0	0.00%
3	1/4/08	20:00:00	Black/Brown Building Large Windows/Center	6	2	33.33%
4	1/4/08	20:00:00	Grey building Center of Photo Midway	16	7	43.75%
5	1/4/08	20:00:00	Grey building Center/White Windows	10	10	100.00%
6	1/4/08	20:00:00	Large grey/black back of photo	44	19	43.18%
7	1/4/08	20:00:00	large red right center	22	7	31.82%
8	1/4/08	20:00:00	grey center front of photo angled back	25	11	44.00%
9	1/4/08	20:00:00	large white right center front of photo	3	1	33.33%
10	1/4/08	20:00:00	large white office building back right	70	38	54.29%
					Average	
						43.78%
1	1/4/08	21:00:00	Green siding/angled windows left center	16	0	0.00%
2	1/4/08	21:00:00	Red building/Left Center in Photo	5	0	0.00%
3	1/4/08	21:00:00	Black/Brown Building Large Windows/Center	6	3	50.00%
4	1/4/08	21:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	1/4/08	21:00:00	Grey building Center/White Windows	10	10	100.00%
6	1/4/08	21:00:00	Large grey/black back of photo	44	19	43.18%
7	1/4/08	21:00:00	large red right center	22	7	31.82%
8	1/4/08	21:00:00	grey center front of photo angled back	25	9	36.00%
9	1/4/08	21:00:00	large white right center front of photo	3	1	33.33%
10	1/4/08	21:00:00	large white office building back right	70	39	55.71%
					Average	
						42.40%

1	1/4/08	22:00:00	Green siding/angled windows left center	16	0	0.00%
2	1/4/08	22:00:00	Red building/Left Center in Photo	5	0	0.00%
3	1/4/08	22:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	1/4/08	22:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	1/4/08	22:00:00	Grey building Center/White Windows	10	10	100.00%
6	1/4/08	22:00:00	Large grey/black back of photo	44	19	43.18%
7	1/4/08	22:00:00	large red right center	22	7	31.82%
8	1/4/08	22:00:00	grey center front of photo angled back	25	9	36.00%
9	1/4/08	22:00:00	large white right center front of photo	3	1	33.33%
10	1/4/08	22:00:00	large white office building back right	70	30	42.86%

Average

37.33%

1	1/4/08	23:00:00	Green siding/angled windows left center	16	0	0.00%
2	1/4/08	23:00:00	Red building/Left Center in Photo	5	0	0.00%
3	1/4/08	23:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	1/4/08	23:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	1/4/08	23:00:00	Grey building Center/White Windows	10	10	100.00%
6	1/4/08	23:00:00	Large grey/black back of photo	44	19	43.18%
7	1/4/08	23:00:00	large red right center	22	7	31.82%
8	1/4/08	23:00:00	grey center front of photo angled back	25	6	24.00%
9	1/4/08	23:00:00	large white right center front of photo	3	1	33.33%
10	1/4/08	23:00:00	large white office building back right	70	25	35.71%

Average

33.64%

1	1/4/08	0:00:00	Green siding/angled windows left center	16	0	0.00%
2	1/4/08	0:00:00	Red building/Left Center in Photo	5	0	0.00%
3	1/4/08	0:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	1/4/08	0:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	1/4/08	0:00:00	Grey building Center/White Windows	10	10	100.00%
6	1/4/08	0:00:00	Large grey/black back of photo	44	19	43.18%
7	1/4/08	0:00:00	large red right center	22	1	4.55%
8	1/4/08	0:00:00	grey center front of photo angled back	25	10	40.00%
9	1/4/08	0:00:00	large white right center front of photo	3	1	33.33%
10	1/4/08	0:00:00	large white office building back right	70	29	41.43%

Average

34.10%

1	1/4/08	1:00:00	Green siding/angled windows left center	16	0	0.00%
2	1/4/08	1:00:00	Red building/Left Center in Photo	5	0	0.00%
3	1/4/08	1:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	1/4/08	1:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	1/4/08	1:00:00	Grey building Center/White Windows	10	10	100.00%
6	1/4/08	1:00:00	Large grey/black back of photo	44	16	36.36%
7	1/4/08	1:00:00	large red right center	22	1	4.55%
8	1/4/08	1:00:00	grey center front of photo angled back	25	6	24.00%
9	1/4/08	1:00:00	large white right center front of photo	3	1	33.33%
10	1/4/08	1:00:00	large white office building back right	70	20	28.57%

Average

26.73%

1	1/4/08	2:00:00	Green siding/angled windows left center	16	0	0.00%

2	1/4/08	2:00:00	Red building/Left Center in Photo	5	0	0.00%
3	1/4/08	2:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	1/4/08	2:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	1/4/08	2:00:00	Grey building Center/White Windows	10	10	100.00%
6	1/4/08	2:00:00	Large grey/black back of photo	44	16	36.36%
7	1/4/08	2:00:00	large red right center	22	1	4.55%
8	1/4/08	2:00:00	grey center front of photo angled back	25	6	24.00%
9	1/4/08	2:00:00	large white right center front of photo	3	1	33.33%
10	1/4/08	2:00:00	large white office building back right	70	21	30.00%
					Average	
						27.19%
1	1/4/08	3:00:00	Green siding/angled windows left center	16	0	0.00%
2	1/4/08	3:00:00	Red building/Left Center in Photo	5	0	0.00%
3	1/4/08	3:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	1/4/08	3:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	1/4/08	3:00:00	Grey building Center/White Windows	10	10	100.00%
6	1/4/08	3:00:00	Large grey/black back of photo	44	16	36.36%
7	1/4/08	3:00:00	large red right center	22	1	4.55%
8	1/4/08	3:00:00	grey center front of photo angled back	25	6	24.00%
9	1/4/08	3:00:00	large white right center front of photo	3	1	33.33%
10	1/4/08	3:00:00	large white office building back right	70	16	22.86%
					Average	
						24.88%
1	1/4/08	4:00:00	Green siding/angled windows left center	16	0	0.00%
2	1/4/08	4:00:00	Red building/Left Center in Photo	5	0	0.00%

3	1/4/08	4:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	1/4/08	4:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	1/4/08	4:00:00	Grey building Center/White Windows	10	10	100.00%
6	1/4/08	4:00:00	Large grey/black back of photo	44	16	36.36%
7	1/4/08	4:00:00	large red right center	22	1	4.55%
8	1/4/08	4:00:00	grey center front of photo angled back	25	6	24.00%
9	1/4/08	4:00:00	large white right center front of photo	3	1	33.33%
10	1/4/08	4:00:00	large white office building back right	70	20	28.57%

Average

26.73%

1	1/4/08	5:00:00	Green siding/angled windows left center	16	0	0.00%
2	1/4/08	5:00:00	Red building/Left Center in Photo	5	0	0.00%
3	1/4/08	5:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	1/4/08	5:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	1/4/08	5:00:00	Grey building Center/White Windows	10	10	100.00%
6	1/4/08	5:00:00	Large grey/black back of photo	44	14	31.82%
7	1/4/08	5:00:00	large red right center	22	1	4.55%
8	1/4/08	5:00:00	grey center front of photo angled back	25	6	24.00%
9	1/4/08	5:00:00	large white right center front of photo	3	1	33.33%
10	1/4/08	5:00:00	large white office building back right	70	29	41.43%

Average

29.95%

1	1/4/08	06:00:00	Green siding/angled windows left center	16	0	0.00%
2	1/4/08	06:00:00	Red building/Left Center in Photo	5	0	0.00%
3	1/4/08	06:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%

4	1/4/08	06:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	1/4/08	06:00:00	Grey building Center/White Windows	10	10	100.00%
6	1/4/08	06:00:00	Large grey/black back of photo	44	14	31.82%
7	1/4/08	06:00:00	large red right center	22	7	31.82%
8	1/4/08	06:00:00	grey center front of photo angled back	25	6	24.00%
9	1/4/08	06:00:00	large white right center front of photo	3	1	33.33%
10	1/4/08	06:00:00	large white office building back right	70	25	35.71%

Average

30.88%

April 2

Building	Date	Time	Description	Total Windows	Illum. Windows	% Illum. Windows
1	2/4/08	20:00:00	Green siding/angled windows left center	16	0	0.00%
2	2/4/08	20:00:00	Red building/Left Center in Photo	5	2	40.00%
3	2/4/08	20:00:00	Black/Brown Building Large Windows/Center	6	4	66.67%
4	2/4/08	20:00:00	Grey building Center of Photo Midway	16	7	43.75%
5	2/4/08	20:00:00	Grey building Center/White Windows	10	3	30.00%
6	2/4/08	20:00:00	Large grey/black back of photo	44	18	40.91%
7	2/4/08	20:00:00	large red right center	22	15	68.18%
8	2/4/08	20:00:00	grey center front of photo angled back	25	12	48.00%
9	2/4/08	20:00:00	large white right center front of photo	3	1	33.33%
10	2/4/08	20:00:00	large white office building back right	70	32	45.71%
					Average	
						43.32%
1	2/4/08	21:00:00	Green siding/angled windows left center	16	0	0.00%
2	2/4/08	21:00:00	Red building/Left Center in Photo	5	2	40.00%
3	2/4/08	21:00:00	Black/Brown Building Large Windows/Center	6	5	83.33%
4	2/4/08	21:00:00	Grey building Center of Photo Midway	16	5	31.25%
5	2/4/08	21:00:00	Grey building Center/White Windows	10	3	30.00%
6	2/4/08	21:00:00	Large grey/black back of photo	44	17	38.64%
7	2/4/08	21:00:00	large red right center	22	15	68.18%
8	2/4/08	21:00:00	grey center front of photo angled back	25	8	32.00%
9	2/4/08	21:00:00	large white right center front of photo	3	1	33.33%
10	2/4/08	21:00:00	large white office building back right	70	34	48.57%
					Average	
						41.47%

1	2/4/08	22:00:00	Green siding/angled windows left center	16	0	0.00%
2	2/4/08	22:00:00	Red building/Left Center in Photo	5	1	20.00%
3	2/4/08	22:00:00	Black/Brown Building Large Windows/Center	6	5	83.33%
4	2/4/08	22:00:00	Grey building Center of Photo Midway	16	6	37.50%
5	2/4/08	22:00:00	Grey building Center/White Windows	10	3	30.00%
6	2/4/08	22:00:00	Large grey/black back of photo	44	17	38.64%
7	2/4/08	22:00:00	large red right center	22	15	68.18%
8	2/4/08	22:00:00	grey center front of photo angled back	25	8	32.00%
9	2/4/08	22:00:00	large white right center front of photo	3	1	33.33%
10	2/4/08	22:00:00	large white office building back right	70	32	45.71%

Average

40.55%

1	2/4/08	23:00:00	Green siding/angled windows left center	16	0	0.00%
2	2/4/08	23:00:00	Red building/Left Center in Photo	5	0	0.00%
3	2/4/08	23:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	2/4/08	23:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	2/4/08	23:00:00	Grey building Center/White Windows	10	3	30.00%
6	2/4/08	23:00:00	Large grey/black back of photo	44	14	31.82%
7	2/4/08	23:00:00	large red right center	22	1	4.55%
8	2/4/08	23:00:00	grey center front of photo angled back	25	8	32.00%
9	2/4/08	23:00:00	large white right center front of photo	3	1	33.33%
10	2/4/08	23:00:00	large white office building back right	70	30	42.86%

Average

28.11%

1	2/4/08	0:00:00	Green siding/angled windows left center	16	0	0.00%
2	2/4/08	0:00:00	Red building/Left Center in Photo	5	0	0.00%
3	2/4/08	0:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	2/4/08	0:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	2/4/08	0:00:00	Grey building Center/White Windows	10	3	30.00%
6	2/4/08	0:00:00	Large grey/black back of photo	44	16	36.36%
7	2/4/08	0:00:00	large red right center	22	1	4.55%
8	2/4/08	0:00:00	grey center front of photo angled back	25	8	32.00%
9	2/4/08	0:00:00	large white right center front of photo	3	1	33.33%
10	2/4/08	0:00:00	large white office building back right	70	20	28.57%

Average

23.96%

1	2/4/08	1:00:00	Green siding/angled windows left center	16	0	0.00%
2	2/4/08	1:00:00	Red building/Left Center in Photo	5	0	0.00%
3	2/4/08	1:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	2/4/08	1:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	2/4/08	1:00:00	Grey building Center/White Windows	10	3	30.00%
6	2/4/08	1:00:00	Large grey/black back of photo	44	12	27.27%
7	2/4/08	1:00:00	large red right center	22	1	4.55%
8	2/4/08	1:00:00	grey center front of photo angled back	25	8	32.00%
9	2/4/08	1:00:00	large white right center front of photo	3	1	33.33%
10	2/4/08	1:00:00	large white office building back right	70	25	35.71%

Average

24.42%

| 1 | 2/4/08 | 2:00:00 | Green siding/angled windows left center | 16 | 0 | 0.00% |

2	2/4/08	2:00:00	Red building/Left Center in Photo	5	0	0.00%
3	2/4/08	2:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	2/4/08	2:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	2/4/08	2:00:00	Grey building Center/White Windows	10	3	30.00%
6	2/4/08	2:00:00	Large grey/black back of photo	44	12	27.27%
7	2/4/08	2:00:00	large red right center	22	1	4.55%
8	2/4/08	2:00:00	grey center front of photo angled back	25	8	32.00%
9	2/4/08	2:00:00	large white right center front of photo	3	1	33.33%
10	2/4/08	2:00:00	large white office building back right	70	21	30.00%
					Average	
						22.58%
1	2/4/08	3:00:00	Green siding/angled windows left center	16	0	0.00%
2	2/4/08	3:00:00	Red building/Left Center in Photo	5	0	0.00%
3	2/4/08	3:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	2/4/08	3:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	2/4/08	3:00:00	Grey building Center/White Windows	10	3	30.00%
6	2/4/08	3:00:00	Large grey/black back of photo	44	12	27.27%
7	2/4/08	3:00:00	large red right center	22	1	4.55%
8	2/4/08	3:00:00	grey center front of photo angled back	25	12	48.00%
9	2/4/08	3:00:00	large white right center front of photo	3	1	33.33%
10	2/4/08	3:00:00	large white office building back right	70	23	32.86%
					Average	
						25.35%
1	2/4/08	4:00:00	Green siding/angled windows left center	16	0	0.00%
2	2/4/08	4:00:00	Red building/Left Center in Photo	5	0	0.00%

3	2/4/08	4:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	2/4/08	4:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	2/4/08	4:00:00	Grey building Center/White Windows	10	3	30.00%
6	2/4/08	4:00:00	Large grey/black back of photo	44	13	29.55%
7	2/4/08	4:00:00	large red right center	22	1	4.55%
8	2/4/08	4:00:00	grey center front of photo angled back	25	8	32.00%
9	2/4/08	4:00:00	large white right center front of photo	3	1	33.33%
10	2/4/08	4:00:00	large white office building back right	70	21	30.00%

Average

23.04%

1	2/4/08	5:00:00	Green siding/angled windows left center	16	0	0.00%
2	2/4/08	5:00:00	Red building/Left Center in Photo	5	0	0.00%
3	2/4/08	5:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	2/4/08	5:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	2/4/08	5:00:00	Grey building Center/White Windows	10	3	30.00%
6	2/4/08	5:00:00	Large grey/black back of photo	44	13	29.55%
7	2/4/08	5:00:00	large red right center	22	1	4.55%
8	2/4/08	5:00:00	grey center front of photo angled back	25	8	32.00%
9	2/4/08	5:00:00	large white right center front of photo	3	1	33.33%
10	2/4/08	5:00:00	large white office building back right	70	21	30.00%

Average

23.04%

1	2/4/08	06:00:00	Green siding/angled windows left center	16	0	0.00%
2	2/4/08	06:00:00	Red building/Left Center in Photo	5	0	0.00%
3	2/4/08	06:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%

4	2/4/08	06:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	2/4/08	06:00:00	Grey building Center/White Windows	10	3	30.00%
6	2/4/08	06:00:00	Large grey/black back of photo	44	13	29.55%
7	2/4/08	06:00:00	large red right center	22	4	18.18%
8	2/4/08	06:00:00	grey center front of photo angled back	25	8	32.00%
9	2/4/08	06:00:00	large white right center front of photo	3	1	33.33%
10	2/4/08	06:00:00	large white office building back right	70	25	35.71%

Average

26.27%

April 3

Building #	Date	Time	Description	Total Windows	Illum. Windows	% Illum. Windows
1	3/4/2008	20:00:00	Green siding/angled windows left center	16	0	0.00%
2	3/4/2008	20:00:00	Red building/Left Center in Photo	5	0	0.00%
3	3/4/2008	20:00:00	Black/Brown Building Large Windows/Center	6	2	33.33%
4	3/4/2008	20:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	3/4/2008	20:00:00	Grey building Center/White Windows	10	10	100.00%
6	3/4/2008	20:00:00	Large grey/black back of photo	44	14	31.82%
7	3/4/2008	20:00:00	large red right center	22	14	63.64%
8	3/4/2008	20:00:00	grey center front of photo angled back	25	15	60.00%
9	3/4/2008	20:00:00	large white right center front of photo	3	1	33.33%
10	3/4/2008	20:00:00	large white office building back right	70	30	42.86%

Average

41.01%

Building #	Date	Time	Description	Total Windows	Illum. Windows	% Illum. Windows
1	3/4/2008	21:00:00	Green siding/angled windows left center	16	0	0.00%
2	3/4/2008	21:00:00	Red building/Left Center in Photo	5	3	60.00%
3	3/4/2008	21:00:00	Black/Brown Building Large Windows/Center	6	3	50.00%
4	3/4/2008	21:00:00	Grey building Center of Photo Midway	16	1	6.25%
5	3/4/2008	21:00:00	Grey building Center/White Windows	10	10	100.00%
6	3/4/2008	21:00:00	Large grey/black back of photo	44	16	36.36%
7	3/4/2008	21:00:00	large red right center	22	10	45.45%
8	3/4/2008	21:00:00	grey center front of photo angled back	25	13	52.00%
9	3/4/2008	21:00:00	large white right center front of photo	3	1	33.33%
10	3/4/2008	21:00:00	large white office building back right	70	30	42.86%

Average

40.09%

1	3/4/2008	22:00:00	Green siding/angled windows left center	16	0	0.00%
2	3/4/2008	22:00:00	Red building/Left Center in Photo	5	0	0.00%
3	3/4/2008	22:00:00	Black/Brown Building Large Windows/Center	6	3	50.00%
4	3/4/2008	22:00:00	Grey building Center of Photo Midway	16	1	6.25%
5	3/4/2008	22:00:00	Grey building Center/White Windows	10	10	100.00%
6	3/4/2008	22:00:00	Large grey/black back of photo	44	17	38.64%
7	3/4/2008	22:00:00	large red right center	22	10	45.45%
8	3/4/2008	22:00:00	grey center front of photo angled back	25	19	76.00%
9	3/4/2008	22:00:00	large white right center front of photo	3	1	33.33%
10	3/4/2008	22:00:00	large white office building back right	70	28	40.00%

Average

41.01%

1	3/4/2008	23:00:00	Green siding/angled windows left center	16	2	12.50%
2	3/4/2008	23:00:00	Red building/Left Center in Photo	5	0	0.00%
3	3/4/2008	23:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	3/4/2008	23:00:00	Grey building Center of Photo Midway	16	1	6.25%
5	3/4/2008	23:00:00	Grey building Center/White Windows	10	10	100.00%
6	3/4/2008	23:00:00	Large grey/black back of photo	44	17	38.64%
7	3/4/2008	23:00:00	large red right center	22	1	4.55%
8	3/4/2008	23:00:00	grey center front of photo angled back	25	17	68.00%
9	3/4/2008	23:00:00	large white right center front of photo	3	1	33.33%
10	3/4/2008	23:00:00	large white office building back right	70	28	40.00%

Average

35.48%

1	3/4/2008	00:00:00	Green siding/angled windows left center	16	0	0.00%
2	3/4/2008	00:00:00	Red building/Left Center in Photo	5	0	0.00%
3	3/4/2008	00:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	3/4/2008	00:00:00	Grey building Center of Photo Midway	16	1	6.25%
5	3/4/2008	00:00:00	Grey building Center/White Windows	10	10	100.00%
6	3/4/2008	00:00:00	Large grey/black back of photo	44	15	34.09%
7	3/4/2008	00:00:00	large red right center	22	1	4.55%
8	3/4/2008	00:00:00	grey center front of photo angled back	25	17	68.00%
9	3/4/2008	00:00:00	large white right center front of photo	3	1	33.33%
10	3/4/2008	00:00:00	large white office building back right	70	18	25.71%

Average

29.03%

1	3/4/2008	01:00:00	Green siding/angled windows left center	16	0	0.00%
2	3/4/2008	01:00:00	Red building/Left Center in Photo	5	0	0.00%
3	3/4/2008	01:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	3/4/2008	01:00:00	Grey building Center of Photo Midway	16	1	6.25%
5	3/4/2008	01:00:00	Grey building Center/White Windows	10	10	100.00%
6	3/4/2008	01:00:00	Large grey/black back of photo	44	15	34.09%
7	3/4/2008	01:00:00	large red right center	22	17	77.27%
8	3/4/2008	01:00:00	grey center front of photo angled back	25	14	56.00%
9	3/4/2008	01:00:00	large white right center front of photo	3	1	33.33%
10	3/4/2008	01:00:00	large white office building back right	70	11	15.71%

Average

31.80%

1	3/4/2008	02:00:00	Green siding/angled windows left center	16	0	0.00%
2	3/4/2008	02:00:00	Red building/Left Center in Photo	5	0	0.00%
3	3/4/2008	02:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	3/4/2008	02:00:00	Grey building Center of Photo Midway	16	1	6.25%
5	3/4/2008	02:00:00	Grey building Center/White Windows	10	10	100.00%
6	3/4/2008	02:00:00	Large grey/black back of photo	44	15	34.09%
7	3/4/2008	02:00:00	large red right center	22	1	4.55%
8	3/4/2008	02:00:00	grey center front of photo angled back	25	17	68.00%
9	3/4/2008	02:00:00	large white right center front of photo	3	1	33.33%
10	3/4/2008	02:00:00	large white office building back right	70	11	15.71%

Average

25.81%

1	3/4/2008	03:00:00	Green siding/angled windows left center	16	0	0.00%
2	3/4/2008	03:00:00	Red building/Left Center in Photo	5	0	0.00%
3	3/4/2008	03:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	3/4/2008	03:00:00	Grey building Center of Photo Midway	16	1	6.25%
5	3/4/2008	03:00:00	Grey building Center/White Windows	10	10	100.00%
6	3/4/2008	03:00:00	Large grey/black back of photo	44	15	34.09%
7	3/4/2008	03:00:00	large red right center	22	1	4.55%
8	3/4/2008	03:00:00	grey center front of photo angled back	25	17	68.00%
9	3/4/2008	03:00:00	large white right center front of photo	3	1	33.33%
10	3/4/2008	03:00:00	large white office building back right	70	11	15.71%

Average

25.81%

1	3/4/2008	04:00:00	Green siding/angled windows left center	16	0	0.00%

2	3/4/2008	04:00:00	Red building/Left Center in Photo	5	0	0.00%
3	3/4/2008	04:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	3/4/2008	04:00:00	Grey building Center of Photo Midway	16	1	6.25%
5	3/4/2008	04:00:00	Grey building Center/White Windows	10	10	100.00%
6	3/4/2008	04:00:00	Large grey/black back of photo	44	20	45.45%
7	3/4/2008	04:00:00	large red right center	22	1	4.55%
8	3/4/2008	04:00:00	grey center front of photo angled back	25	15	60.00%
9	3/4/2008	04:00:00	large white right center front of photo	3	1	33.33%
10	3/4/2008	04:00:00	large white office building back right	70	11	15.71%

Average

27.19%

1	3/4/2008	05:00:00	Green siding/angled windows left center	16	0	0.00%
2	3/4/2008	05:00:00	Red building/Left Center in Photo	5	0	0.00%
3	3/4/2008	05:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	3/4/2008	05:00:00	Grey building Center of Photo Midway	16	1	6.25%
5	3/4/2008	05:00:00	Grey building Center/White Windows	10	10	100.00%
6	3/4/2008	05:00:00	Large grey/black back of photo	44	15	34.09%
7	3/4/2008	05:00:00	large red right center	22	1	4.55%
8	3/4/2008	05:00:00	grey center front of photo angled back	25	15	60.00%
9	3/4/2008	05:00:00	large white right center front of photo	3	1	33.33%
10	3/4/2008	05:00:00	large white office building back right	70	11	15.71%

Average

24.88%

1	3/4/2008	06:00:00	Green siding/angled windows left center	16	0	0.00%
2	3/4/2008	06:00:00	Red building/Left Center in Photo	5	0	0.00%

3	3/4/2008	06:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	3/4/2008	06:00:00	Grey building Center of Photo Midway	16	1	6.25%
5	3/4/2008	06:00:00	Grey building Center/White Windows	10	10	100.00%
6	3/4/2008	06:00:00	Large grey/black back of photo	44	15	34.09%
7	3/4/2008	06:00:00	large red right center	22	7	31.82%
8	3/4/2008	06:00:00	grey center front of photo angled back	25	19	76.00%
9	3/4/2008	06:00:00	large white right center front of photo	3	1	33.33%
10	3/4/2008	06:00:00	large white office building back right	70	17	24.29%

Average

32.26%

April 4

Building #	Date	Time	Description	Total Windows	Illum. Windows	% Illum. Windows
1	4/4/2008	20:00:00	Green siding/angled windows left center	16	0	0.00%
2	4/4/2008	20:00:00	Red building/Left Center in Photo	5	5	100.00%
3	4/4/2008	20:00:00	Black/Brown Building Large Windows/Center	6	2	33.33%
4	4/4/2008	20:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	4/4/2008	20:00:00	Grey building Center/White Windows	10	10	100.00%
6	4/4/2008	20:00:00	Large grey/black back of photo	44	20	45.45%
7	4/4/2008	20:00:00	large red right center	22	13	59.09%
8	4/4/2008	20:00:00	grey center front of photo angled back	25	7	28.00%
9	4/4/2008	20:00:00	large white right center front of photo	3	3	100.00%
10	4/4/2008	20:00:00	large white office building back right	70	30	42.86%
					Average	
						42.86%
1	4/4/2008	21:00:00	Green siding/angled windows left center	16	0	0.00%
2	4/4/2008	21:00:00	Red building/Left Center in Photo	5	1	20.00%
3	4/4/2008	21:00:00	Black/Brown Building Large Windows/Center	6	2	33.33%
4	4/4/2008	21:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	4/4/2008	21:00:00	Grey building Center/White Windows	10	10	100.00%
6	4/4/2008	21:00:00	Large grey/black back of photo	44	20	45.45%
7	4/4/2008	21:00:00	large red right center	22	13	59.09%
8	4/4/2008	21:00:00	grey center front of photo angled back	25	5	20.00%
9	4/4/2008	21:00:00	large white right center front of photo	3	1	33.33%
10	4/4/2008	21:00:00	large white office building back right	70	50	71.43%
					Average	
						48.39%

1	4/4/2008	22:00:00	Green siding/angled windows left center	16	0	0.00%
2	4/4/2008	22:00:00	Red building/Left Center in Photo	5	1	20.00%
3	4/4/2008	22:00:00	Black/Brown Building Large Windows/Center	6	2	33.33%
4	4/4/2008	22:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	4/4/2008	22:00:00	Grey building Center/White Windows	10	10	100.00%
6	4/4/2008	22:00:00	Large grey/black back of photo	44	10	22.73%
7	4/4/2008	22:00:00	large red right center	22	13	59.09%
8	4/4/2008	22:00:00	grey center front of photo angled back	25	5	20.00%
9	4/4/2008	22:00:00	large white right center front of photo	3	1	33.33%
10	4/4/2008	22:00:00	large white office building back right	70	25	35.71%
					Average	
						32.26%

1	4/4/2008	23:00:00	Green siding/angled windows left center	16	0	0.00%
2	4/4/2008	23:00:00	Red building/Left Center in Photo	5	1	20.00%
3	4/4/2008	23:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	4/4/2008	23:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	4/4/2008	23:00:00	Grey building Center/White Windows	10	10	100.00%
6	4/4/2008	23:00:00	Large grey/black back of photo	44	7	15.91%
7	4/4/2008	23:00:00	large red right center	22	0	0.00%
8	4/4/2008	23:00:00	grey center front of photo angled back	25	2	8.00%
9	4/4/2008	23:00:00	large white right center front of photo	3	1	33.33%
10	4/4/2008	23:00:00	large white office building back right	70	15	21.43%
					Average	
						18.43%

1	4/4/2008	00:00:00	Green siding/angled windows left center	16	0	0.00%
2	4/4/2008	00:00:00	Red building/Left Center in Photo	5	1	20.00%
3	4/4/2008	00:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	4/4/2008	00:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	4/4/2008	00:00:00	Grey building Center/White Windows	10	10	100.00%
6	4/4/2008	00:00:00	Large grey/black back of photo	44	7	15.91%
7	4/4/2008	00:00:00	large red right center	22	0	0.00%
8	4/4/2008	00:00:00	grey center front of photo angled back	25	4	16.00%
9	4/4/2008	00:00:00	large white right center front of photo	3	1	33.33%
10	4/4/2008	00:00:00	large white office building back right	70	10	14.29%

Average

17.05%

1	4/4/2008	01:00:00	Green siding/angled windows left center	16	0	0.00%
2	4/4/2008	01:00:00	Red building/Left Center in Photo	5	1	20.00%
3	4/4/2008	01:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	4/4/2008	01:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	4/4/2008	01:00:00	Grey building Center/White Windows	10	10	100.00%
6	4/4/2008	01:00:00	Large grey/black back of photo	44	7	15.91%
7	4/4/2008	01:00:00	large red right center	22	0	0.00%
8	4/4/2008	01:00:00	grey center front of photo angled back	25	4	16.00%
9	4/4/2008	01:00:00	large white right center front of photo	3	1	33.33%
10	4/4/2008	01:00:00	large white office building back right	70	10	14.29%

Average

17.05%

1	4/4/2008	02:00:00	Green siding/angled windows left center	16	0

2	4/4/2008	02:00:00	Red building/Left Center in Photo	5	1	20.00%
3	4/4/2008	02:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	4/4/2008	02:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	4/4/2008	02:00:00	Grey building Center/White Windows	10	10	100.00%
6	4/4/2008	02:00:00	Large grey/black back of photo	44	7	15.91%
7	4/4/2008	02:00:00	large red right center	22	0	0.00%
8	4/4/2008	02:00:00	grey center front of photo angled back	25	4	16.00%
9	4/4/2008	02:00:00	large white right center front of photo	3	1	33.33%
10	4/4/2008	02:00:00	large white office building back right	70	15	21.43%

Average

19.35%

1	4/4/2008	03:00:00	Green siding/angled windows left center	16	0	
2	4/4/2008	03:00:00	Red building/Left Center in Photo	5	1	20.00%
3	4/4/2008	03:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	4/4/2008	03:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	4/4/2008	03:00:00	Grey building Center/White Windows	10	10	100.00%
6	4/4/2008	03:00:00	Large grey/black back of photo	44	7	15.91%
7	4/4/2008	03:00:00	large red right center	22	0	0.00%
8	4/4/2008	03:00:00	grey center front of photo angled back	25	2	8.00%
9	4/4/2008	03:00:00	large white right center front of photo	3	1	33.33%
10	4/4/2008	03:00:00	large white office building back right	70	5	7.14%

Average

13.82%

1	4/4/2008	04:00:00	Green siding/angled windows left center	16	0	0.00%

2	4/4/2008	04:00:00	Red building/Left Center in Photo	5	1	20.00%
3	4/4/2008	04:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	4/4/2008	04:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	4/4/2008	04:00:00	Grey building Center/White Windows	10	10	100.00%
6	4/4/2008	04:00:00	Large grey/black back of photo	44	7	15.91%
7	4/4/2008	04:00:00	large red right center	22	0	0.00%
8	4/4/2008	04:00:00	grey center front of photo angled back	25	2	8.00%
9	4/4/2008	04:00:00	large white right center front of photo	3	1	33.33%
10	4/4/2008	04:00:00	large white office building back right	70	5	7.14%

Average

13.82%

1	4/4/2008	05:00:00	Green siding/angled windows left center	16	0	0.00%
2	4/4/2008	05:00:00	Red building/Left Center in Photo	5	1	20.00%
3	4/4/2008	05:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	4/4/2008	05:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	4/4/2008	05:00:00	Grey building Center/White Windows	10	10	100.00%
6	4/4/2008	05:00:00	Large grey/black back of photo	44	10	22.73%
7	4/4/2008	05:00:00	large red right center	22	0	0.00%
8	4/4/2008	05:00:00	grey center front of photo angled back	25	2	8.00%
9	4/4/2008	05:00:00	large white right center front of photo	3	1	33.33%
10	4/4/2008	05:00:00	large white office building back right	70	5	7.14%

Average

15.21%

1	4/4/2008	06:00:00	Green siding/angled windows left center	16	0	0.00%
2	4/4/2008	06:00:00	Red building/Left Center in Photo	5	1	20.00%
3	4/4/2008	06:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	4/4/2008	06:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	4/4/2008	06:00:00	Grey building Center/White Windows	10	10	100.00%
6	4/4/2008	06:00:00	Large grey/black back of photo	44	10	22.73%
7	4/4/2008	06:00:00	large red right center	22	0	0.00%
8	4/4/2008	06:00:00	grey center front of photo angled back	25	2	8.00%
9	4/4/2008	06:00:00	large white right center front of photo	3	1	33.33%
10	4/4/2008	06:00:00	large white office building back right	70	5	7.14%

Average

13.25%

April 5

Building #	Date	Time	Description	Total Windows	Illum. Windows	% Illum. Windows
1	5/4/2008	20:00:00	Green siding/angled windows left center	16	0	0.00%
2	5/4/2008	20:00:00	Red building/Left Center in Photo	5	0	0.00%
3	5/4/2008	20:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	5/4/2008	20:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	5/4/2008	20:00:00	Grey building Center/White Windows	10	8	80.00%
6	5/4/2008	20:00:00	Large grey/black back of photo	44	7	15.91%
7	5/4/2008	20:00:00	large red right center	22	1	4.55%
8	5/4/2008	20:00:00	grey center front of photo angled back	25	1	4.00%
9	5/4/2008	20:00:00	large white right center front of photo	3	1	33.33%
10	5/4/2008	20:00:00	large white office building back right	70	7	10.00%
					Average	
						13.36%

Building #	Date	Time	Description	Total Windows	Illum. Windows	% Illum. Windows
1	5/4/2008	21:00:00	Green siding/angled windows left center	16	0	0.00%
2	5/4/2008	21:00:00	Red building/Left Center in Photo	5	0	0.00%
3	5/4/2008	21:00:00	Black/Brown Building Large Windows/Center	6	2	33.33%
4	5/4/2008	21:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	5/4/2008	21:00:00	Grey building Center/White Windows	10	10	100.00%
6	5/4/2008	21:00:00	Large grey/black back of photo	44	12	27.27%
7	5/4/2008	21:00:00	large red right center	22	2	9.09%
8	5/4/2008	21:00:00	grey center front of photo angled back	25	2	8.00%
9	5/4/2008	21:00:00	large white right center front of photo	3	1	33.33%
10	5/4/2008	21:00:00	large white office building back right	70	8	11.43%
					Average	
						18.43%

1	5/4/2008	22:00:00	Green siding/angled windows left center	16	0	0.00%
2	5/4/2008	22:00:00	Red building/Left Center in Photo	5	1	20.00%
3	5/4/2008	22:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	5/4/2008	22:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	5/4/2008	22:00:00	Grey building Center/White Windows	10	10	100.00%
6	5/4/2008	22:00:00	Large grey/black back of photo	44	14	31.82%
7	5/4/2008	22:00:00	large red right center	22	2	9.09%
8	5/4/2008	22:00:00	grey center front of photo angled back	25	2	8.00%
9	5/4/2008	22:00:00	large white right center front of photo	3	1	33.33%
10	5/4/2008	22:00:00	large white office building back right	70	12	17.14%

Average

21.20%

1	5/4/2008	23:00:00	Green siding/angled windows left center	16	0	0.00%
2	5/4/2008	23:00:00	Red building/Left Center in Photo	5	0	0.00%
3	5/4/2008	23:00:00	Black/Brown Building Large Windows/Center	6	2	33.33%
4	5/4/2008	23:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	5/4/2008	23:00:00	Grey building Center/White Windows	10	10	100.00%
6	5/4/2008	23:00:00	Large grey/black back of photo	44	12	27.27%
7	5/4/2008	23:00:00	large red right center	22	2	9.09%
8	5/4/2008	23:00:00	grey center front of photo angled back	25	2	8.00%
9	5/4/2008	23:00:00	large white right center front of photo	3	1	33.33%
10	5/4/2008	23:00:00	large white office building back right	70	3	4.29%

Average

16.13%

1	5/4/2008	00:00:00 Green siding/angled windows left center	16	0	0.00%
2	5/4/2008	00:00:00 Red building/Left Center in Photo	5	0	0.00%
3	5/4/2008	00:00:00 Black/Brown Building Large Windows/Center	6	2	33.33%
4	5/4/2008	00:00:00 Grey building Center of Photo Midway	16	3	18.75%
5	5/4/2008	00:00:00 Grey building Center/White Windows	10	10	100.00%
6	5/4/2008	00:00:00 Large grey/black back of photo	44	12	27.27%
7	5/4/2008	00:00:00 large red right center	22	2	9.09%
8	5/4/2008	00:00:00 grey center front of photo angled back	25	2	8.00%
9	5/4/2008	00:00:00 large white right center front of photo	3	1	33.33%
10	5/4/2008	00:00:00 large white office building back right	70	3	4.29%

Average

16.13%

1	5/4/2008	01:00:00 Green siding/angled windows left center	16	0	0.00%
2	5/4/2008	01:00:00 Red building/Left Center in Photo	5	0	0.00%
3	5/4/2008	01:00:00 Black/Brown Building Large Windows/Center	6	2	33.33%
4	5/4/2008	01:00:00 Grey building Center of Photo Midway	16	3	18.75%
5	5/4/2008	01:00:00 Grey building Center/White Windows	10	10	100.00%
6	5/4/2008	01:00:00 Large grey/black back of photo	44	11	25.00%
7	5/4/2008	01:00:00 large red right center	22	2	9.09%
8	5/4/2008	01:00:00 grey center front of photo angled back	25	2	8.00%
9	5/4/2008	01:00:00 large white right center front of photo	3	1	33.33%
10	5/4/2008	01:00:00 large white office building back right	70	3	4.29%

Average

15.67%

1	5/4/2008	02:00:00 Green siding/angled windows left center	16	0	0.00%

2	5/4/2008	02:00:00 Red building/Left Center in Photo	5	0	0.00%
3	5/4/2008	02:00:00 Black/Brown Building Large Windows/Center	6	2	33.33%
4	5/4/2008	02:00:00 Grey building Center of Photo Midway	16	3	18.75%
5	5/4/2008	02:00:00 Grey building Center/White Windows	10	10	100.00%
6	5/4/2008	02:00:00 Large grey/black back of photo	44	11	25.00%
7	5/4/2008	02:00:00 large red right center	22	2	9.09%
8	5/4/2008	02:00:00 grey center front of photo angled back	25	2	8.00%
9	5/4/2008	02:00:00 large white right center front of photo	3	1	33.33%
10	5/4/2008	02:00:00 large white office building back right	70	3	4.29%

Average

15.67%

1	5/4/2008	03:00:00 Green siding/angled windows left center	16	0	0.00%
2	5/4/2008	03:00:00 Red building/Left Center in Photo	5	0	0.00%
3	5/4/2008	03:00:00 Black/Brown Building Large Windows/Center	6	2	33.33%
4	5/4/2008	03:00:00 Grey building Center of Photo Midway	16	3	18.75%
5	5/4/2008	03:00:00 Grey building Center/White Windows	10	10	100.00%
6	5/4/2008	03:00:00 Large grey/black back of photo	44	14	31.82%
7	5/4/2008	03:00:00 large red right center	22	2	9.09%
8	5/4/2008	03:00:00 grey center front of photo angled back	25	2	8.00%
9	5/4/2008	03:00:00 large white right center front of photo	3	1	33.33%
10	5/4/2008	03:00:00 large white office building back right	70	3	4.29%

Average

17.05%

1	5/4/2008	04:00:00 Green siding/angled windows left center	16	0	0.00%
2	5/4/2008	04:00:00 Red building/Left Center in Photo	5	0	0.00%

3	5/4/2008	04:00:00 Black/Brown Building Large Windows/Center	6	1	16.67%
4	5/4/2008	04:00:00 Grey building Center of Photo Midway	16	3	18.75%
5	5/4/2008	04:00:00 Grey building Center/White Windows	10	10	100.00%
6	5/4/2008	04:00:00 Large grey/black back of photo	44	12	27.27%
7	5/4/2008	04:00:00 large red right center	22	5	22.73%
8	5/4/2008	04:00:00 grey center front of photo angled back	25	2	8.00%
9	5/4/2008	04:00:00 large white right center front of photo	3	1	33.33%
10	5/4/2008	04:00:00 large white office building back right	70	3	4.29%
				Average	
					17.05%
1	5/4/2008	05:00:00 Green siding/angled windows left center	16	0	0.00%
2	5/4/2008	05:00:00 Red building/Left Center in Photo	5	0	0.00%
3	5/4/2008	05:00:00 Black/Brown Building Large Windows/Center	6	1	16.67%
4	5/4/2008	05:00:00 Grey building Center of Photo Midway	16	3	18.75%
5	5/4/2008	05:00:00 Grey building Center/White Windows	10	10	100.00%
6	5/4/2008	05:00:00 Large grey/black back of photo	44	15	34.09%
7	5/4/2008	05:00:00 large red right center	22	2	9.09%
8	5/4/2008	05:00:00 grey center front of photo angled back	25	2	8.00%
9	5/4/2008	05:00:00 large white right center front of photo	3	1	33.33%
10	5/4/2008	05:00:00 large white office building back right	70	3	4.29%
				Average	
					17.05%
1	5/4/2008	06:00:00 Green siding/angled windows left center	16	0	0.00%
2	5/4/2008	06:00:00 Red building/Left Center in Photo	5	0	0.00%
3	5/4/2008	06:00:00 Black/Brown Building Large Windows/Center	6	1	16.67%

4	5/4/2008	06:00:00 Grey building Center of Photo Midway	16	3	18.75%
5	5/4/2008	06:00:00 Grey building Center/White Windows	10	10	100.00%
6	5/4/2008	06:00:00 Large grey/black back of photo	44	9	20.45%
7	5/4/2008	06:00:00 large red right center	22	2	9.09%
8	5/4/2008	06:00:00 grey center front of photo angled back	25	2	8.00%
9	5/4/2008	06:00:00 large white right center front of photo	3	1	33.33%
10	5/4/2008	06:00:00 large white office building back right	70	3	4.29%

Average

14.29%

April 6

Building #	Date	Time	Description	Total Windows	Illum. Windows	% Illum. Windows
1	6/4/2008	20:00:00	Green siding/angled windows left center	16	0	0.00%
2	6/4/2008	20:00:00	Red building/Left Center in Photo	5	0	0.00%
3	6/4/2008	20:00:00	Black/Brown Building Large Windows/Center	6	2	33.33%
4	6/4/2008	20:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	6/4/2008	20:00:00	Grey building Center/White Windows	10	8	80.00%
6	6/4/2008	20:00:00	Large grey/black back of photo	44	7	15.91%
7	6/4/2008	20:00:00	large red right center	22	3	13.64%
8	6/4/2008	20:00:00	grey center front of photo angled back	25	1	4.00%
9	6/4/2008	20:00:00	large white right center front of photo	3	1	33.33%
10	6/4/2008	20:00:00	large white office building back right	70	12	17.14%

Average

17.05%

Building #	Date	Time	Description	Total Windows	Illum. Windows	% Illum. Windows
1	6/4/2008	21:00:00	Green siding/angled windows left center	16	0	0.00%
2	6/4/2008	21:00:00	Red building/Left Center in Photo	5	0	0.00%
3	6/4/2008	21:00:00	Black/Brown Building Large Windows/Center	6	3	50.00%
4	6/4/2008	21:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	6/4/2008	21:00:00	Grey building Center/White Windows	10	10	100.00%
6	6/4/2008	21:00:00	Large grey/black back of photo	44	7	15.91%
7	6/4/2008	21:00:00	large red right center	22	7	31.82%
8	6/4/2008	21:00:00	grey center front of photo angled back	25	2	8.00%
9	6/4/2008	21:00:00	large white right center front of photo	3	1	33.33%
10	6/4/2008	21:00:00	large white office building back right	70	11	15.71%

Average

20.28%

1	6/4/2008	22:00:00	Green siding/angled windows left center	16	0	0.00%
2	6/4/2008	22:00:00	Red building/Left Center in Photo	5	0	0.00%
3	6/4/2008	22:00:00	Black/Brown Building Large Windows/Center	6	2	33.33%
4	6/4/2008	22:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	6/4/2008	22:00:00	Grey building Center/White Windows	10	10	100.00%
6	6/4/2008	22:00:00	Large grey/black back of photo	44	14	31.82%
7	6/4/2008	22:00:00	large red right center	22	3	13.64%
8	6/4/2008	22:00:00	grey center front of photo angled back	25	2	8.00%
9	6/4/2008	22:00:00	large white right center front of photo	3	1	33.33%
10	6/4/2008	22:00:00	large white office building back right	70	11	15.71%

Average

21.20%

1	6/4/2008	23:00:00	Green siding/angled windows left center	16	0	0.00%
2	6/4/2008	23:00:00	Red building/Left Center in Photo	5	0	0.00%
3	6/4/2008	23:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	6/4/2008	23:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	6/4/2008	23:00:00	Grey building Center/White Windows	10	10	100.00%
6	6/4/2008	23:00:00	Large grey/black back of photo	44	14	31.82%
7	6/4/2008	23:00:00	large red right center	22	2	9.09%
8	6/4/2008	23:00:00	grey center front of photo angled back	25	2	8.00%
9	6/4/2008	23:00:00	large white right center front of photo	3	1	33.33%
10	6/4/2008	23:00:00	large white office building back right	70	5	7.14%

Average

17.51%

1	6/4/2008	00:00:00	Green siding/angled windows left center	16	0	0.00%
2	6/4/2008	00:00:00	Red building/Left Center in Photo	5	0	0.00%
3	6/4/2008	00:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	6/4/2008	00:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	6/4/2008	00:00:00	Grey building Center/White Windows	10	10	100.00%
6	6/4/2008	00:00:00	Large grey/black back of photo	44	13	29.55%
7	6/4/2008	00:00:00	large red right center	22	2	9.09%
8	6/4/2008	00:00:00	grey center front of photo angled back	25	5	20.00%
9	6/4/2008	00:00:00	large white right center front of photo	3	1	33.33%
10	6/4/2008	00:00:00	large white office building back right	70	3	4.29%
					Average	
						17.51%

1	6/4/2008	01:00:00	Green siding/angled windows left center	16	0	0.00%
2	6/4/2008	01:00:00	Red building/Left Center in Photo	5	0	0.00%
3	6/4/2008	01:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	6/4/2008	01:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	6/4/2008	01:00:00	Grey building Center/White Windows	10	10	100.00%
6	6/4/2008	01:00:00	Large grey/black back of photo	44	13	29.55%
7	6/4/2008	01:00:00	large red right center	22	2	9.09%
8	6/4/2008	01:00:00	grey center front of photo angled back	25	2	8.00%
9	6/4/2008	01:00:00	large white right center front of photo	3	1	33.33%
10	6/4/2008	01:00:00	large white office building back right	70	3	4.29%
					Average	
						16.13%

1	6/4/2008	02:00:00	Green siding/angled windows left center	16	0	0.00%

2	6/4/2008	02:00:00	Red building/Left Center in Photo	5	0	0.00%
3	6/4/2008	02:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	6/4/2008	02:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	6/4/2008	02:00:00	Grey building Center/White Windows	10	10	100.00%
6	6/4/2008	02:00:00	Large grey/black back of photo	44	13	29.55%
7	6/4/2008	02:00:00	large red right center	22	2	9.09%
8	6/4/2008	02:00:00	grey center front of photo angled back	25	2	8.00%
9	6/4/2008	02:00:00	large white right center front of photo	3	1	33.33%
10	6/4/2008	02:00:00	large white office building back right	70	3	4.29%

Average

16.13%

1	6/4/2008	03:00:00	Green siding/angled windows left center	16	0	0.00%
2	6/4/2008	03:00:00	Red building/Left Center in Photo	5	0	0.00%
3	6/4/2008	03:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	6/4/2008	03:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	6/4/2008	03:00:00	Grey building Center/White Windows	10	10	100.00%
6	6/4/2008	03:00:00	Large grey/black back of photo	44	13	29.55%
7	6/4/2008	03:00:00	large red right center	22	2	9.09%
8	6/4/2008	03:00:00	grey center front of photo angled back	25	5	20.00%
9	6/4/2008	03:00:00	large white right center front of photo	3	1	33.33%
10	6/4/2008	03:00:00	large white office building back right	70	3	4.29%

Average

17.51%

1	6/4/2008	04:00:00	Green siding/angled windows left center	16	0	0.00%
2	6/4/2008	04:00:00	Red building/Left Center in Photo	5	0	0.00%

3	6/4/2008	04:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	6/4/2008	04:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	6/4/2008	04:00:00	Grey building Center/White Windows	10	10	100.00%
6	6/4/2008	04:00:00	Large grey/black back of photo	44	13	29.55%
7	6/4/2008	04:00:00	large red right center	22	2	9.09%
8	6/4/2008	04:00:00	grey center front of photo angled back	25	2	8.00%
9	6/4/2008	04:00:00	large white right center front of photo	3	1	33.33%
10	6/4/2008	04:00:00	large white office building back right	70	3	4.29%

Average

16.13%

1	6/4/2008	05:00:00	Green siding/angled windows left center	16	0	0.00%
2	6/4/2008	05:00:00	Red building/Left Center in Photo	5	0	0.00%
3	6/4/2008	05:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	6/4/2008	05:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	6/4/2008	05:00:00	Grey building Center/White Windows	10	10	100.00%
6	6/4/2008	05:00:00	Large grey/black back of photo	44	19	43.18%
7	6/4/2008	05:00:00	large red right center	22	2	9.09%
8	6/4/2008	05:00:00	grey center front of photo angled back	25	2	8.00%
9	6/4/2008	05:00:00	large white right center front of photo	3	1	33.33%
10	6/4/2008	05:00:00	large white office building back right	70	3	4.29%

Average

18.89%

1	6/4/2008	06:00:00	Green siding/angled windows left center	16	0	0.00%
2	6/4/2008	06:00:00	Red building/Left Center in Photo	5	0	0.00%
3	6/4/2008	06:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%

4	6/4/2008	06:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	6/4/2008	06:00:00	Grey building Center/White Windows	10	10	100.00%
6	6/4/2008	06:00:00	Large grey/black back of photo	44	10	22.73%
7	6/4/2008	06:00:00	large red right center	22	2	9.09%
8	6/4/2008	06:00:00	grey center front of photo angled back	25	9	36.00%
9	6/4/2008	06:00:00	large white right center front of photo	3	1	33.33%
10	6/4/2008	06:00:00	large white office building back right	70	15	21.43%

Average

23.50%

April 7

Building #	Date	Time	Description	Total Windows	Illum. Windows	% Illum. Windows
1	7/4/2008	20:00:00	Green siding/angled windows left center	16	0	0.00%
2	7/4/2008	20:00:00	Red building/Left Center in Photo	5	0	0.00%
3	7/4/2008	20:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	7/4/2008	20:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	7/4/2008	20:00:00	Grey building Center/White Windows	10	8	80.00%
6	7/4/2008	20:00:00	Large grey/black back of photo	44	15	34.09%
7	7/4/2008	20:00:00	large red right center	22	13	59.09%
8	7/4/2008	20:00:00	grey center front of photo angled back	25	13	52.00%
9	7/4/2008	20:00:00	large white right center front of photo	3	1	33.33%
10	7/4/2008	20:00:00	large white office building back right	70	26	37.14%
					Average	
						37.33%
1	7/4/2008	21:00:00	Green siding/angled windows left center	16	0	0.00%
2	7/4/2008	21:00:00	Red building/Left Center in Photo	5	0	0.00%
3	7/4/2008	21:00:00	Black/Brown Building Large Windows/Center	6	3	50.00%
4	7/4/2008	21:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	7/4/2008	21:00:00	Grey building Center/White Windows	10	10	100.00%
6	7/4/2008	21:00:00	Large grey/black back of photo	44	20	45.45%
7	7/4/2008	21:00:00	large red right center	22	13	59.09%
8	7/4/2008	21:00:00	grey center front of photo angled back	25	17	68.00%
9	7/4/2008	21:00:00	large white right center front of photo	3	1	33.33%
10	7/4/2008	21:00:00	large white office building back right	70	35	50.00%
					Average	
						47.47%

1	7/4/2008	22:00:00	Green siding/angled windows left center	16	0	0.00%
2	7/4/2008	22:00:00	Red building/Left Center in Photo	5	0	0.00%
3	7/4/2008	22:00:00	Black/Brown Building Large Windows/Center	6	2	33.33%
4	7/4/2008	22:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	7/4/2008	22:00:00	Grey building Center/White Windows	10	10	100.00%
6	7/4/2008	22:00:00	Large grey/black back of photo	44	21	47.73%
7	7/4/2008	22:00:00	large red right center	22	15	68.18%
8	7/4/2008	22:00:00	grey center front of photo angled back	25	7	28.00%
9	7/4/2008	22:00:00	large white right center front of photo	3	1	33.33%
10	7/4/2008	22:00:00	large white office building back right	70	36	51.43%

Average

44.24%

1	7/4/2008	23:00:00	Green siding/angled windows left center	16	2	12.50%
2	7/4/2008	23:00:00	Red building/Left Center in Photo	5	0	0.00%
3	7/4/2008	23:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	7/4/2008	23:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	7/4/2008	23:00:00	Grey building Center/White Windows	10	10	100.00%
6	7/4/2008	23:00:00	Large grey/black back of photo	44	16	36.36%
7	7/4/2008	23:00:00	large red right center	22	1	4.55%
8	7/4/2008	23:00:00	grey center front of photo angled back	25	7	28.00%
9	7/4/2008	23:00:00	large white right center front of photo	3	1	33.33%
10	7/4/2008	23:00:00	large white office building back right	70	26	37.14%

Average

30.88%

1	7/4/2008	00:00:00	Green siding/angled windows left center	16	0	0.00%
2	7/4/2008	00:00:00	Red building/Left Center in Photo	5	2	40.00%
3	7/4/2008	00:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	7/4/2008	00:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	7/4/2008	00:00:00	Grey building Center/White Windows	10	10	100.00%
6	7/4/2008	00:00:00	Large grey/black back of photo	44	15	34.09%
7	7/4/2008	00:00:00	large red right center	22	1	4.55%
8	7/4/2008	00:00:00	grey center front of photo angled back	25	7	28.00%
9	7/4/2008	00:00:00	large white right center front of photo	3	1	33.33%
10	7/4/2008	00:00:00	large white office building back right	70	16	22.86%

Average

25.81%

1	7/4/2008	01:00:00	Green siding/angled windows left center	16	0	
2	7/4/2008	01:00:00	Red building/Left Center in Photo	5	1	20.00%
3	7/4/2008	01:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	7/4/2008	01:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	7/4/2008	01:00:00	Grey building Center/White Windows	10	10	100.00%
6	7/4/2008	01:00:00	Large grey/black back of photo	44	13	29.55%
7	7/4/2008	01:00:00	large red right center	22	1	4.55%
8	7/4/2008	01:00:00	grey center front of photo angled back	25	8	32.00%
9	7/4/2008	01:00:00	large white right center front of photo	3	1	33.33%
10	7/4/2008	01:00:00	large white office building back right	70	13	18.57%

Average

23.50%

1	7/4/2008	02:00:00	Green siding/angled windows left center	16	0	0.00%

2	7/4/2008	02:00:00	Red building/Left Center in Photo	5	1	20.00%
3	7/4/2008	02:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	7/4/2008	02:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	7/4/2008	02:00:00	Grey building Center/White Windows	10	10	100.00%
6	7/4/2008	02:00:00	Large grey/black back of photo	44	13	29.55%
7	7/4/2008	02:00:00	large red right center	22	1	4.55%
8	7/4/2008	02:00:00	grey center front of photo angled back	25	7	28.00%
9	7/4/2008	02:00:00	large white right center front of photo	3	1	33.33%
10	7/4/2008	02:00:00	large white office building back right	70	13	18.57%
					Average	
						23.04%
1	7/4/2008	03:00:00	Green siding/angled windows left center	16	0	0.00%
2	7/4/2008	03:00:00	Red building/Left Center in Photo	5	0	0.00%
3	7/4/2008	03:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	7/4/2008	03:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	7/4/2008	03:00:00	Grey building Center/White Windows	10	10	100.00%
6	7/4/2008	03:00:00	Large grey/black back of photo	44	13	29.55%
7	7/4/2008	03:00:00	large red right center	22	1	4.55%
8	7/4/2008	03:00:00	grey center front of photo angled back	25	7	28.00%
9	7/4/2008	03:00:00	large white right center front of photo	3	1	33.33%
10	7/4/2008	03:00:00	large white office building back right	70	12	17.14%
					Average	
						22.12%
1	7/4/2008	04:00:00	Green siding/angled windows left center	16	0	0.00%
2	7/4/2008	04:00:00	Red building/Left Center in Photo	5	0	0.00%

3	7/4/2008	04:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	7/4/2008	04:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	7/4/2008	04:00:00	Grey building Center/White Windows	10	10	100.00%
6	7/4/2008	04:00:00	Large grey/black back of photo	44	13	29.55%
7	7/4/2008	04:00:00	large red right center	22	1	4.55%
8	7/4/2008	04:00:00	grey center front of photo angled back	25	7	28.00%
9	7/4/2008	04:00:00	large white right center front of photo	3	1	33.33%
10	7/4/2008	04:00:00	large white office building back right	70	12	17.14%

Average

22.12%

1	7/4/2008	05:00:00	Green siding/angled windows left center	16	0	0.00%
2	7/4/2008	05:00:00	Red building/Left Center in Photo	5	0	0.00%
3	7/4/2008	05:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	7/4/2008	05:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	7/4/2008	05:00:00	Grey building Center/White Windows	10	10	100.00%
6	7/4/2008	05:00:00	Large grey/black back of photo	44	15	34.09%
7	7/4/2008	05:00:00	large red right center	22	1	4.55%
8	7/4/2008	05:00:00	grey center front of photo angled back	25	7	28.00%
9	7/4/2008	05:00:00	large white right center front of photo	3	1	33.33%
10	7/4/2008	05:00:00	large white office building back right	70	19	27.14%

Average

26.27%

1	7/4/2008	06:00:00	Green siding/angled windows left center	16	0	0.00%
2	7/4/2008	06:00:00	Red building/Left Center in Photo	5	0	0.00%

3	7/4/2008	06:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	7/4/2008	06:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	7/4/2008	06:00:00	Grey building Center/White Windows	10	8	80.00%
6	7/4/2008	06:00:00	Large grey/black back of photo	44	9	20.45%
7	7/4/2008	06:00:00	large red right center	22	2	9.09%
8	7/4/2008	06:00:00	grey center front of photo angled back	25	7	28.00%
9	7/4/2008	06:00:00	large white right center front of photo	3	1	33.33%
10	7/4/2008	06:00:00	large white office building back right	70	16	22.86%

Average

21.66%

April 8

Building #	Date	Time	Description	Total Windows	Illum. Windows	% Illum. Windows
1	8/4/2008	20:00:00	Green siding/angled windows left center	16	0	0.00%
2	8/4/2008	20:00:00	Red building/Left Center in Photo	5	2	40.00%
3	8/4/2008	20:00:00	Black/Brown Building Large Windows/Center	6	2	33.33%
4	8/4/2008	20:00:00	Grey building Center of Photo Midway	16	5	31.25%
5	8/4/2008	20:00:00	Grey building Center/White Windows	10	0	0.00%
6	8/4/2008	20:00:00	Large grey/black back of photo	44	15	34.09%
7	8/4/2008	20:00:00	large red right center	22	13	59.09%
8	8/4/2008	20:00:00	grey center front of photo angled back	25	5	20.00%
9	8/4/2008	20:00:00	large white right center front of photo	3	0	0.00%
10	8/4/2008	20:00:00	large white office building back right	70	30	42.86%
					Average	33.18%
1	8/4/2008	21:00:00	Green siding/angled windows left center	16	2	12.50%
2	8/4/2008	21:00:00	Red building/Left Center in Photo	5	0	0.00%
3	8/4/2008	21:00:00	Black/Brown Building Large Windows/Center	6	2	33.33%
4	8/4/2008	21:00:00	Grey building Center of Photo Midway	16	5	31.25%
5	8/4/2008	21:00:00	Grey building Center/White Windows	10	2	20.00%
6	8/4/2008	21:00:00	Large grey/black back of photo	44	17	38.64%
7	8/4/2008	21:00:00	large red right center	22	17	77.27%
8	8/4/2008	21:00:00	grey center front of photo angled back	25	9	36.00%
9	8/4/2008	21:00:00	large white right center front of photo	3	0	0.00%
10	8/4/2008	21:00:00	large white office building back right	70	34	48.57%
					Average	40.55%

1	8/4/2008	22:00:00	Green siding/angled windows left center	16	2	12.50%
2	8/4/2008	22:00:00	Red building/Left Center in Photo	5	0	0.00%
3	8/4/2008	22:00:00	Black/Brown Building Large Windows/Center	6	2	33.33%
4	8/4/2008	22:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	8/4/2008	22:00:00	Grey building Center/White Windows	10	2	20.00%
6	8/4/2008	22:00:00	Large grey/black back of photo	44	14	31.82%
7	8/4/2008	22:00:00	large red right center	22	12	54.55%
8	8/4/2008	22:00:00	grey center front of photo angled back	25	12	48.00%
9	8/4/2008	22:00:00	large white right center front of photo	3	0	0.00%
10	8/4/2008	22:00:00	large white office building back right	70	37	52.86%

Average

38.71%

1	8/4/2008	23:00:00	Green siding/angled windows left center	16	0	0.00%
2	8/4/2008	23:00:00	Red building/Left Center in Photo	5	0	0.00%
3	8/4/2008	23:00:00	Black/Brown Building Large Windows/Center	6	2	33.33%
4	8/4/2008	23:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	8/4/2008	23:00:00	Grey building Center/White Windows	10	2	20.00%
6	8/4/2008	23:00:00	Large grey/black back of photo	44	14	31.82%
7	8/4/2008	23:00:00	large red right center	22	1	4.55%
8	8/4/2008	23:00:00	grey center front of photo angled back	25	12	48.00%
9	8/4/2008	23:00:00	large white right center front of photo	3	0	0.00%
10	8/4/2008	23:00:00	large white office building back right	70	22	31.43%

Average

25.81%

1	8/4/2008	00:00:00	Green siding/angled windows left center	16	0	0.00%
2	8/4/2008	00:00:00	Red building/Left Center in Photo	5	0	0.00%
3	8/4/2008	00:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	8/4/2008	00:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	8/4/2008	00:00:00	Grey building Center/White Windows	10	2	20.00%
6	8/4/2008	00:00:00	Large grey/black back of photo	44	14	31.82%
7	8/4/2008	00:00:00	large red right center	22	1	4.55%
8	8/4/2008	00:00:00	grey center front of photo angled back	25	12	48.00%
9	8/4/2008	00:00:00	large white right center front of photo	3	0	0.00%
10	8/4/2008	00:00:00	large white office building back right	70	10	14.29%

Average

19.82%

1	8/4/2008	01:00:00	Green siding/angled windows left center	16	0	0.00%
2	8/4/2008	01:00:00	Red building/Left Center in Photo	5	0	0.00%
3	8/4/2008	01:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	8/4/2008	01:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	8/4/2008	01:00:00	Grey building Center/White Windows	10	2	20.00%
6	8/4/2008	01:00:00	Large grey/black back of photo	44	14	31.82%
7	8/4/2008	01:00:00	large red right center	22	1	4.55%
8	8/4/2008	01:00:00	grey center front of photo angled back	25	12	48.00%
9	8/4/2008	01:00:00	large white right center front of photo	3	0	0.00%
10	8/4/2008	01:00:00	large white office building back right	70	10	14.29%

Average

19.82%

1	8/4/2008	02:00:00	Green siding/angled windows left center	16	0	0.00%

2	8/4/2008	02:00:00	Red building/Left Center in Photo	5	0	0.00%
3	8/4/2008	02:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	8/4/2008	02:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	8/4/2008	02:00:00	Grey building Center/White Windows	10	2	20.00%
6	8/4/2008	02:00:00	Large grey/black back of photo	44	14	31.82%
7	8/4/2008	02:00:00	large red right center	22	1	4.55%
8	8/4/2008	02:00:00	grey center front of photo angled back	25	12	48.00%
9	8/4/2008	02:00:00	large white right center front of photo	3	0	0.00%
10	8/4/2008	02:00:00	large white office building back right	70	11	15.71%

Average

20.28%

1	8/4/2008	03:00:00	Green siding/angled windows left center	16	0	0.00%
2	8/4/2008	03:00:00	Red building/Left Center in Photo	5	0	0.00%
3	8/4/2008	03:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	8/4/2008	03:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	8/4/2008	03:00:00	Grey building Center/White Windows	10	2	20.00%
6	8/4/2008	03:00:00	Large grey/black back of photo	44	14	31.82%
7	8/4/2008	03:00:00	large red right center	22	1	4.55%
8	8/4/2008	03:00:00	grey center front of photo angled back	25	12	48.00%
9	8/4/2008	03:00:00	large white right center front of photo	3	0	0.00%
10	8/4/2008	03:00:00	large white office building back right	70	9	12.86%

Average

19.35%

1	8/4/2008	04:00:00	Green siding/angled windows left center	16	0	0.00%
2	8/4/2008	04:00:00	Red building/Left Center in Photo	5	0	0.00%

3	8/4/2008	04:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	8/4/2008	04:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	8/4/2008	04:00:00	Grey building Center/White Windows	10	2	20.00%
6	8/4/2008	04:00:00	Large grey/black back of photo	44	14	31.82%
7	8/4/2008	04:00:00	large red right center	22	1	4.55%
8	8/4/2008	04:00:00	grey center front of photo angled back	25	12	48.00%
9	8/4/2008	04:00:00	large white right center front of photo	3	0	0.00%
10	8/4/2008	04:00:00	large white office building back right	70	9	12.86%

Average

19.35%

1	8/4/2008	05:00:00	Green siding/angled windows left center	16	0	0.00%
2	8/4/2008	05:00:00	Red building/Left Center in Photo	5	0	0.00%
3	8/4/2008	05:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	8/4/2008	05:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	8/4/2008	05:00:00	Grey building Center/White Windows	10	2	20.00%
6	8/4/2008	05:00:00	Large grey/black back of photo	44	14	31.82%
7	8/4/2008	05:00:00	large red right center	22	1	4.55%
8	8/4/2008	05:00:00	grey center front of photo angled back	25	12	48.00%
9	8/4/2008	05:00:00	large white right center front of photo	3	0	0.00%
10	8/4/2008	05:00:00	large white office building back right	70	9	12.86%

Average

19.35%

1	8/4/2008	06:00:00	Green siding/angled windows left center	16	0	0.00%
2	8/4/2008	06:00:00	Red building/Left Center in Photo	5	0	0.00%
3	8/4/2008	06:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%

4	8/4/2008	06:00:00	Grey building Center of Photo Midway	16	3		18.75%
5	8/4/2008	06:00:00	Grey building Center/White Windows	10	2		20.00%
6	8/4/2008	06:00:00	Large grey/black back of photo	44	14		31.82%
7	8/4/2008	06:00:00	large red right center	22	4		18.18%
8	8/4/2008	06:00:00	grey center front of photo angled back	25	12		48.00%
9	8/4/2008	06:00:00	large white right center front of photo	3	0		0.00%
10	8/4/2008	06:00:00	large white office building back right	70	9	Average	
							20.74%

April 9

Building #	Date	Time	Description	Total Windows	Illum. Windows	% Illum. Windows
1	9/4/2008	20:00:00	Green siding/angled windows left center	16	0	0.00%
2	9/4/2008	20:00:00	Red building/Left Center in Photo	5	0	0.00%
3	9/4/2008	20:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	9/4/2008	20:00:00	Grey building Center of Photo Midway	16	6	37.50%
5	9/4/2008	20:00:00	Grey building Center/White Windows	10	2	20.00%
6	9/4/2008	20:00:00	Large grey/black back of photo	44	15	34.09%
7	9/4/2008	20:00:00	large red right center	22	13	59.09%
8	9/4/2008	20:00:00	grey center front of photo angled back	25	13	52.00%
9	9/4/2008	20:00:00	large white right center front of photo	3	0	0.00%
10	9/4/2008	20:00:00	large white office building back right	70	22	31.43%
					Average	
						33.18%
1	9/4/2008	21:00:00	Green siding/angled windows left center	16	0	0.00%
2	9/4/2008	21:00:00	Red building/Left Center in Photo	5	0	0.00%
3	9/4/2008	21:00:00	Black/Brown Building Large Windows/Center	6	2	33.33%
4	9/4/2008	21:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	9/4/2008	21:00:00	Grey building Center/White Windows	10	2	20.00%
6	9/4/2008	21:00:00	Large grey/black back of photo	44	14	31.82%
7	9/4/2008	21:00:00	large red right center	22	13	59.09%
8	9/4/2008	21:00:00	grey center front of photo angled back	25	13	52.00%
9	9/4/2008	21:00:00	large white right center front of photo	3	0	0.00%
10	9/4/2008	21:00:00	large white office building back right	70	29	41.43%
					Average	
						35.48%

1	9/4/2008	22:00:00	Green siding/angled windows left center	16	0	0.00%
2	9/4/2008	22:00:00	Red building/Left Center in Photo	5	0	0.00%
3	9/4/2008	22:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	9/4/2008	22:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	9/4/2008	22:00:00	Grey building Center/White Windows	10	2	20.00%
6	9/4/2008	22:00:00	Large grey/black back of photo	44	14	31.82%
7	9/4/2008	22:00:00	large red right center	22	11	50.00%
8	9/4/2008	22:00:00	grey center front of photo angled back	25	2	8.00%
9	9/4/2008	22:00:00	large white right center front of photo	3	0	0.00%
10	9/4/2008	22:00:00	large white office building back right	70	25	35.71%

Average

26.73%

1	9/4/2008	23:00:00	Green siding/angled windows left center	16	2	12.50%
2	9/4/2008	23:00:00	Red building/Left Center in Photo	5	0	0.00%
3	9/4/2008	23:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	9/4/2008	23:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	9/4/2008	23:00:00	Grey building Center/White Windows	10	2	20.00%
6	9/4/2008	23:00:00	Large grey/black back of photo	44	17	38.64%
7	9/4/2008	23:00:00	large red right center	22	1	4.55%
8	9/4/2008	23:00:00	grey center front of photo angled back	25	2	8.00%
9	9/4/2008	23:00:00	large white right center front of photo	3	0	0.00%
10	9/4/2008	23:00:00	large white office building back right	70	20	28.57%

Average

22.12%

1	9/4/2008	00:00:00	Green siding/angled windows left center	16	0	0.00%
2	9/4/2008	00:00:00	Red building/Left Center in Photo	5	0	0.00%
3	9/4/2008	00:00:00	Black/Brown Building Large Windows/Center	6	2	33.33%
4	9/4/2008	00:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	9/4/2008	00:00:00	Grey building Center/White Windows	10	2	20.00%
6	9/4/2008	00:00:00	Large grey/black back of photo	44	14	31.82%
7	9/4/2008	00:00:00	large red right center	22	1	4.55%
8	9/4/2008	00:00:00	grey center front of photo angled back	25	2	8.00%
9	9/4/2008	00:00:00	large white right center front of photo	3	0	0.00%
10	9/4/2008	00:00:00	large white office building back right	70	20	28.57%

Average

20.28%

1	9/4/2008	01:00:00	Green siding/angled windows left center	16	0	0.00%
2	9/4/2008	01:00:00	Red building/Left Center in Photo	5	0	0.00%
3	9/4/2008	01:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	9/4/2008	01:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	9/4/2008	01:00:00	Grey building Center/White Windows	10	2	20.00%
6	9/4/2008	01:00:00	Large grey/black back of photo	44	14	31.82%
7	9/4/2008	01:00:00	large red right center	22	1	4.55%
8	9/4/2008	01:00:00	grey center front of photo angled back	25	2	8.00%
9	9/4/2008	01:00:00	large white right center front of photo	3	0	0.00%
10	9/4/2008	01:00:00	large white office building back right	70	19	27.14%

Average

19.35%

1	9/4/2008	02:00:00	Green siding/angled windows left center	16	0	0.00%

2	9/4/2008	02:00:00	Red building/Left Center in Photo	5	0	0.00%
3	9/4/2008	02:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	9/4/2008	02:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	9/4/2008	02:00:00	Grey building Center/White Windows	10	2	20.00%
6	9/4/2008	02:00:00	Large grey/black back of photo	44	14	31.82%
7	9/4/2008	02:00:00	large red right center	22	1	4.55%
8	9/4/2008	02:00:00	grey center front of photo angled back	25	2	8.00%
9	9/4/2008	02:00:00	large white right center front of photo	3	0	0.00%
10	9/4/2008	02:00:00	large white office building back right	70	18	25.71%
					Average	
						18.89%
1	9/4/2008	03:00:00	Green siding/angled windows left center	16	0	0.00%
2	9/4/2008	03:00:00	Red building/Left Center in Photo	5	0	0.00%
3	9/4/2008	03:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	9/4/2008	03:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	9/4/2008	03:00:00	Grey building Center/White Windows	10	2	20.00%
6	9/4/2008	03:00:00	Large grey/black back of photo	44	14	31.82%
7	9/4/2008	03:00:00	large red right center	22	1	4.55%
8	9/4/2008	03:00:00	grey center front of photo angled back	25	2	8.00%
9	9/4/2008	03:00:00	large white right center front of photo	3	0	0.00%
10	9/4/2008	03:00:00	large white office building back right	70	8	11.43%
					Average	
						14.29%
1	9/4/2008	04:00:00	Green siding/angled windows left center	16	0	0.00%
2	9/4/2008	04:00:00	Red building/Left Center in Photo	5	0	0.00%

3	9/4/2008	04:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	9/4/2008	04:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	9/4/2008	04:00:00	Grey building Center/White Windows	10	2	20.00%
6	9/4/2008	04:00:00	Large grey/black back of photo	44	18	40.91%
7	9/4/2008	04:00:00	large red right center	22	1	4.55%
8	9/4/2008	04:00:00	grey center front of photo angled back	25	5	20.00%
9	9/4/2008	04:00:00	large white right center front of photo	3	0	0.00%
10	9/4/2008	04:00:00	large white office building back right	70	8	11.43%

	Average
	17.51%

1	9/4/2008	05:00:00	Green siding/angled windows left center	16	0	0.00%
2	9/4/2008	05:00:00	Red building/Left Center in Photo	5	0	0.00%
3	9/4/2008	05:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	9/4/2008	05:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	9/4/2008	05:00:00	Grey building Center/White Windows	10	2	20.00%
6	9/4/2008	05:00:00	Large grey/black back of photo	44	16	36.36%
7	9/4/2008	05:00:00	large red right center	22	1	4.55%
8	9/4/2008	05:00:00	grey center front of photo angled back	25	2	8.00%
9	9/4/2008	05:00:00	large white right center front of photo	3	0	0.00%
10	9/4/2008	05:00:00	large white office building back right	70	11	15.71%

	Average
	16.59%

1	9/4/2008	06:00:00	Green siding/angled windows left center	16	0	0.00%
2	9/4/2008	06:00:00	Red building/Left Center in Photo	5	2	40.00%
3	9/4/2008	06:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%

4	9/4/2008	06:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	9/4/2008	06:00:00	Grey building Center/White Windows	10	2	20.00%
6	9/4/2008	06:00:00	Large grey/black back of photo	44	10	22.73%
7	9/4/2008	06:00:00	large red right center	22	3	13.64%
8	9/4/2008	06:00:00	grey center front of photo angled back	25	1	4.00%
9	9/4/2008	06:00:00	large white right center front of photo	3	0	0.00%
10	9/4/2008	06:00:00	large white office building back right	70	11	15.71%

Average

15.21%

April 10

Building #	Date	Time	Description	Total Windows	Illum. Windows	% Illum. Windows
1	10/4/2008	20:00:00	Green siding/angled windows left center	16	0	0.00%
2	10/4/2008	20:00:00	Red building/Left Center in Photo	5	0	0.00%
3	10/4/2008	20:00:00	Black/Brown Building Large Windows/Center	6	2	33.33%
4	10/4/2008	20:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	10/4/2008	20:00:00	Grey building Center/White Windows	10	10	100.00%
6	10/4/2008	20:00:00	Large grey/black back of photo	44	13	29.55%
7	10/4/2008	20:00:00	large red right center	22	4	18.18%
8	10/4/2008	20:00:00	grey center front of photo angled back	25	5	20.00%
9	10/4/2008	20:00:00	large white right center front of photo	3	0	0.00%
10	10/4/2008	20:00:00	large white office building back right	70	25	35.71%

Average

28.57%

Building #	Date	Time	Description	Total Windows	Illum. Windows	% Illum. Windows
1	10/4/2008	21:00:00	Green siding/angled windows left center	16	0	0.00%
2	10/4/2008	21:00:00	Red building/Left Center in Photo	5	0	0.00%
3	10/4/2008	21:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	10/4/2008	21:00:00	Grey building Center of Photo Midway	16	3	18.75%
5	10/4/2008	21:00:00	Grey building Center/White Windows	10	10	100.00%
6	10/4/2008	21:00:00	Large grey/black back of photo	44	20	45.45%
7	10/4/2008	21:00:00	large red right center	22	9	40.91%
8	10/4/2008	21:00:00	grey center front of photo angled back	25	5	20.00%
9	10/4/2008	21:00:00	large white right center front of photo	3	0	0.00%
10	10/4/2008	21:00:00	large white office building back right	70	38	54.29%

Average

39.63%

1	10/4/2008	22:00:00	Green siding/angled windows left center	16	0	0.00%
2	10/4/2008	22:00:00	Red building/Left Center in Photo	5	0	0.00%
3	10/4/2008	22:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	10/4/2008	22:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	10/4/2008	22:00:00	Grey building Center/White Windows	10	10	100.00%
6	10/4/2008	22:00:00	Large grey/black back of photo	44	15	34.09%
7	10/4/2008	22:00:00	large red right center	22	9	40.91%
8	10/4/2008	22:00:00	grey center front of photo angled back	25	1	4.00%
9	10/4/2008	22:00:00	large white right center front of photo	3	0	0.00%
10	10/4/2008	22:00:00	large white office building back right	70	25	35.71%

Average

29.95%

1	10/4/2008	23:00:00	Green siding/angled windows left center	16	0	0.00%
2	10/4/2008	23:00:00	Red building/Left Center in Photo	5	0	0.00%
3	10/4/2008	23:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	10/4/2008	23:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	10/4/2008	23:00:00	Grey building Center/White Windows	10	10	100.00%
6	10/4/2008	23:00:00	Large grey/black back of photo	44	12	27.27%
7	10/4/2008	23:00:00	large red right center	22	1	4.55%
8	10/4/2008	23:00:00	grey center front of photo angled back	25	1	4.00%
9	10/4/2008	23:00:00	large white right center front of photo	3	0	0.00%
10	10/4/2008	23:00:00	large white office building back right	70	13	18.57%

Average

19.35%

1	10/4/2008	00:00:00	Green siding/angled windows left center	16	0	0.00%
2	10/4/2008	00:00:00	Red building/Left Center in Photo	5	0	0.00%
3	10/4/2008	00:00:00	Black/Brown Building Large Windows/Center	6	1	16.67%
4	10/4/2008	00:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	10/4/2008	00:00:00	Grey building Center/White Windows	10	10	100.00%
6	10/4/2008	00:00:00	Large grey/black back of photo	44	13	29.55%
7	10/4/2008	00:00:00	large red right center	22	1	4.55%
8	10/4/2008	00:00:00	grey center front of photo angled back	25	1	4.00%
9	10/4/2008	00:00:00	large white right center front of photo	3	0	0.00%
10	10/4/2008	00:00:00	large white office building back right	70	7	10.00%

Average

17.05%

1	10/4/2008	01:00:00	Green siding/angled windows left center	16	0	0.00%
2	10/4/2008	01:00:00	Red building/Left Center in Photo	5	0	0.00%
3	10/4/2008	01:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	10/4/2008	01:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	10/4/2008	01:00:00	Grey building Center/White Windows	10	10	100.00%
6	10/4/2008	01:00:00	Large grey/black back of photo	44	13	29.55%
7	10/4/2008	01:00:00	large red right center	22	1	4.55%
8	10/4/2008	01:00:00	grey center front of photo angled back	25	5	20.00%
9	10/4/2008	01:00:00	large white right center front of photo	3	0	0.00%
10	10/4/2008	01:00:00	large white office building back right	70	5	7.14%

Average

17.51%

1	10/4/2008	02:00:00	Green siding/angled windows left center	16	0	0.00%

2	10/4/2008	02:00:00	Red building/Left Center in Photo	5	0	0.00%
3	10/4/2008	02:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	10/4/2008	02:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	10/4/2008	02:00:00	Grey building Center/White Windows	10	10	100.00%
6	10/4/2008	02:00:00	Large grey/black back of photo	44	13	29.55%
7	10/4/2008	02:00:00	large red right center	22	1	4.55%
8	10/4/2008	02:00:00	grey center front of photo angled back	25	1	4.00%
9	10/4/2008	02:00:00	large white right center front of photo	3	0	0.00%
10	10/4/2008	02:00:00	large white office building back right	70	5	7.14%

Average

15.67%

|						
1	10/4/2008	03:00:00	Green siding/angled windows left center	16	0	0.00%
2	10/4/2008	03:00:00	Red building/Left Center in Photo	5	0	0.00%
3	10/4/2008	03:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	10/4/2008	03:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	10/4/2008	03:00:00	Grey building Center/White Windows	10	10	100.00%
6	10/4/2008	03:00:00	Large grey/black back of photo	44	13	29.55%
7	10/4/2008	03:00:00	large red right center	22	1	4.55%
8	10/4/2008	03:00:00	grey center front of photo angled back	25	1	4.00%
9	10/4/2008	03:00:00	large white right center front of photo	3	0	0.00%
10	10/4/2008	03:00:00	large white office building back right	70	4	5.71%

Average

15.21%

1	10/4/2008	04:00:00	Green siding/angled windows left center	16	0	0.00%
2	10/4/2008	04:00:00	Red building/Left Center in Photo	5	0	0.00%

3	10/4/2008	04:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	10/4/2008	04:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	10/4/2008	04:00:00	Grey building Center/White Windows	10	10	100.00%
6	10/4/2008	04:00:00	Large grey/black back of photo	44	19	43.18%
7	10/4/2008	04:00:00	large red right center	22	1	4.55%
8	10/4/2008	04:00:00	grey center front of photo angled back	25	1	4.00%
9	10/4/2008	04:00:00	large white right center front of photo	3	0	0.00%
10	10/4/2008	04:00:00	large white office building back right	70	4	5.71%

Average

17.97%

| 1	10/4/2008	05:00:00	Green siding/angled windows left center	16	0	0.00%
2	10/4/2008	05:00:00	Red building/Left Center in Photo	5	0	0.00%
3	10/4/2008	05:00:00	Black/Brown Building Large Windows/Center	6	0	0.00%
4	10/4/2008	05:00:00	Grey building Center of Photo Midway	16	4	25.00%
5	10/4/2008	05:00:00	Grey building Center/White Windows	10	10	100.00%
6	10/4/2008	05:00:00	Large grey/black back of photo	44	15	34.09%
7	10/4/2008	05:00:00	large red right center	22	1	4.55%
8	10/4/2008	05:00:00	grey center front of photo angled back	25	1	4.00%
9	10/4/2008	05:00:00	large white right center front of photo	3	0	0.00%
10	10/4/2008	05:00:00	large white office building back right	70	4	5.71%

Average

16.13%

Appendix E: Maps of Street Survey Area
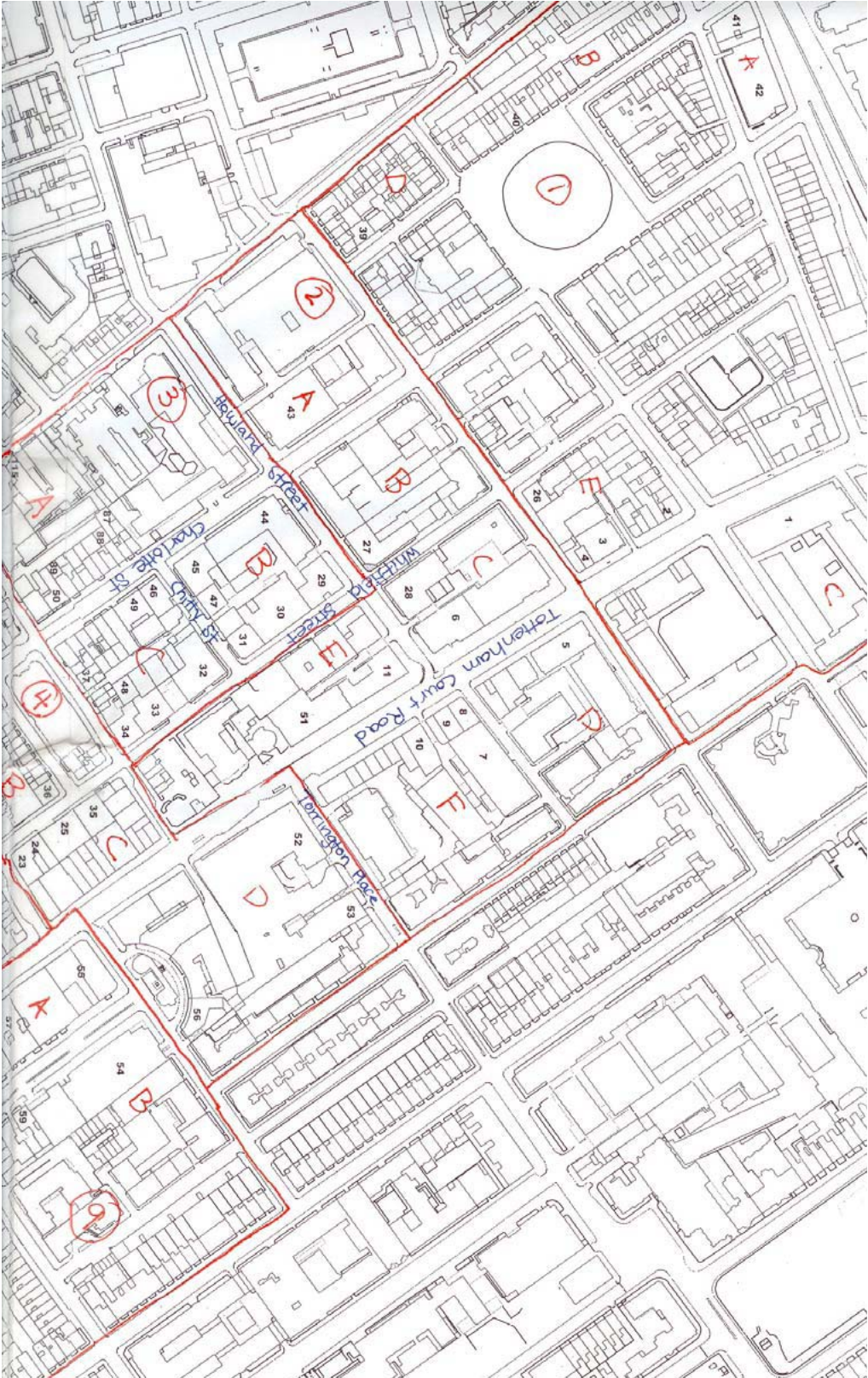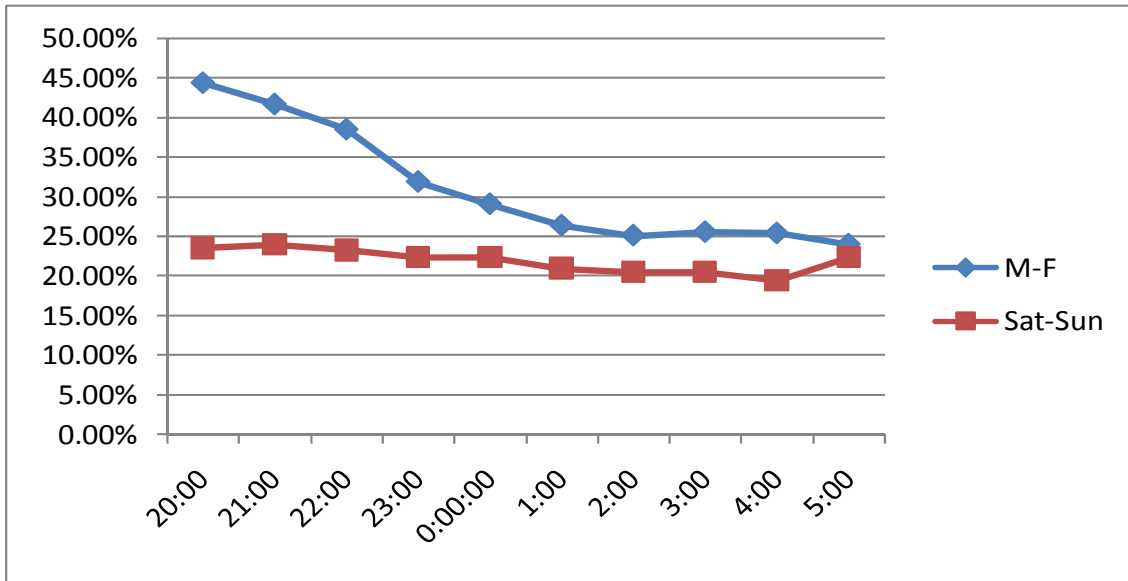
Northern Half
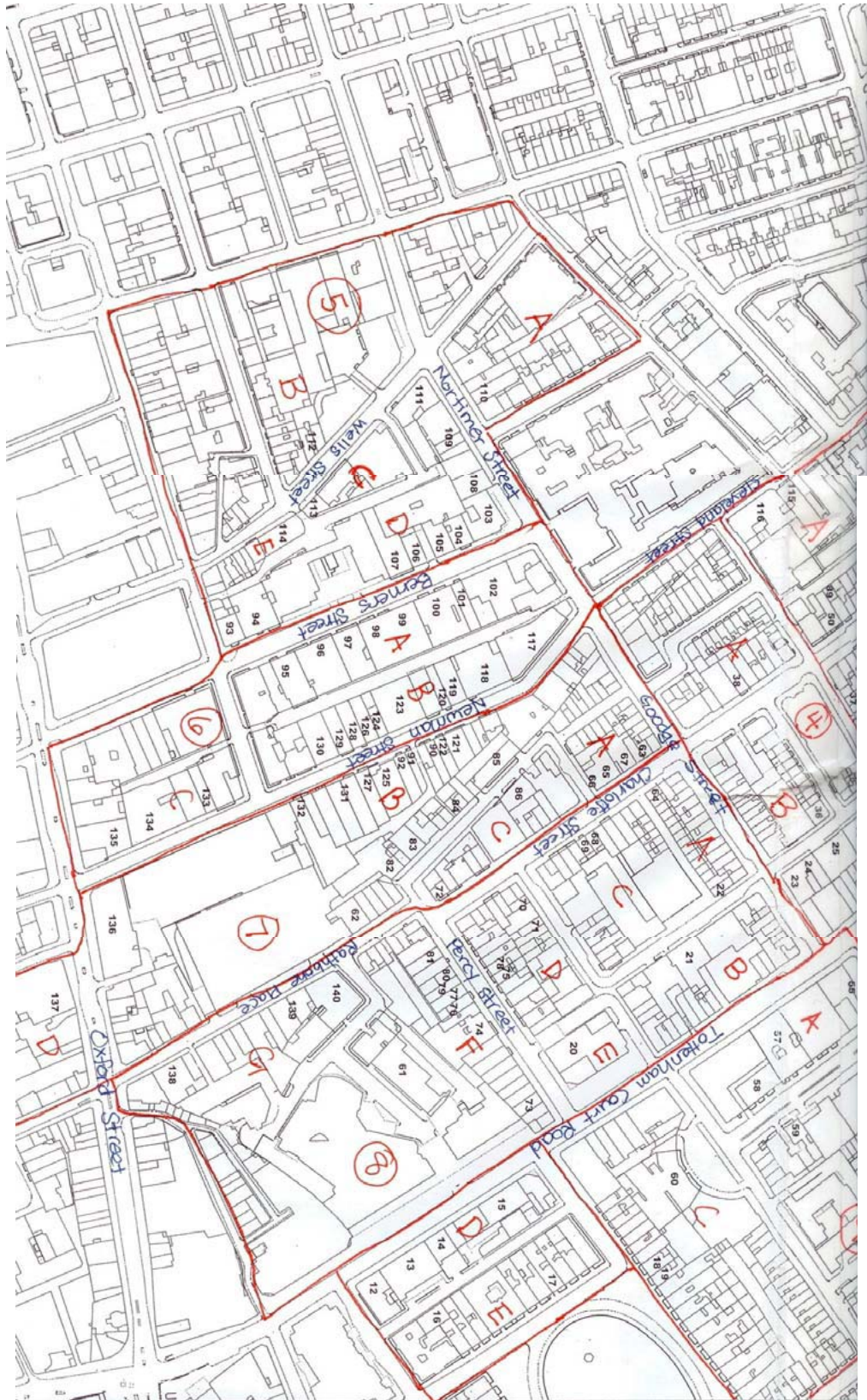
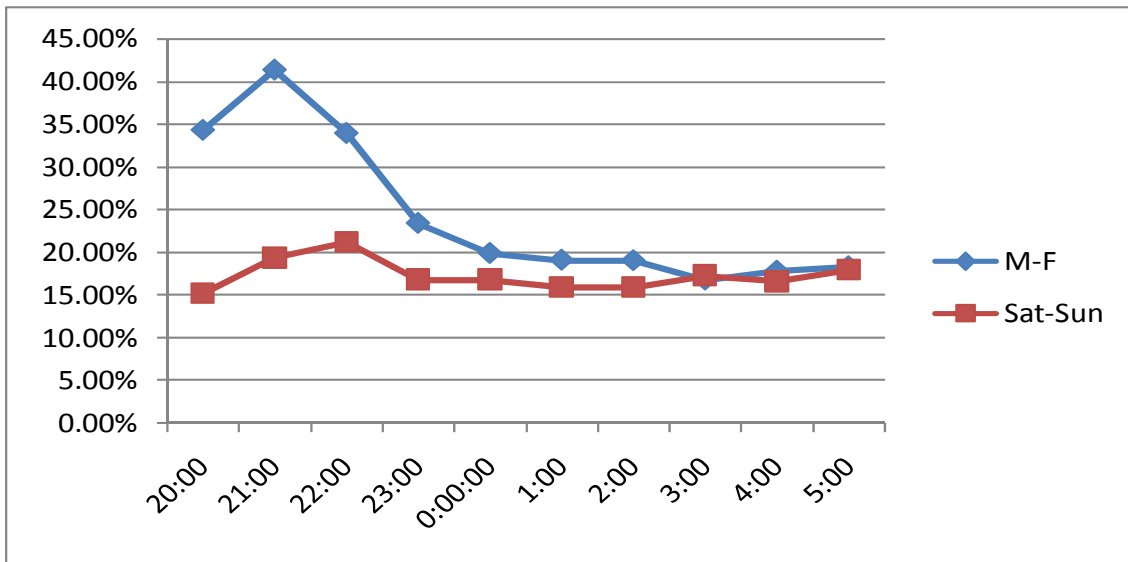# Appendix F: Survey Area with Approximate Camera View

Note: The red lines are inclusive of the approximate field of vision of our camera, originating at
The Roberts Building on Torrington Place

Appendix G: Camera Methodology Weekly Averages

Week 1 Average Percentage of Illuminated Windows

Week 2 Average Percentage of Illuminated Windows

Appendix H: Outline of Illuminated Window Groupings