

**Contribution of Neighbourhood Parks to Physical  
Activity: A Case Study of Sunrise Park, East  
Vancouver**

by

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## **Abstract**

This research is focused on the type of usage of Sunrise Park, located in a lower income neighbourhood in East Vancouver, for physical activity. This study focuses on the factors that influence the usage of Sunrise Park such as: park features, park conditions, safety concerns, the weather, the time, and gender considerations. The methodology of this study has been a mixed method approach, including a residential survey, park user interviews, park observations, and interviews with Vancouver Park Board key planners and commissioners. Results demonstrate that weather conditions and time of day affect the usage and the level of physical activity in this park. It seems that open areas, scenic views, and seating areas are more influential on the usage of this park. Males were more frequent users and also more involved in vigorous physical activity than females. The usage of this park for physical activity can be encouraged by providing walking paths and fitness equipment.

**Keywords:** neighbourhood park; physical activity; Sunrise Park; gender; low income

*I would like to dedicate this paper to my husband, Rod  
Zavari, for his tremendous help, support, and sacrifice.*

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## List of Acronyms

|        |  |
|--------|--|
| ACSM   | American College of Sports Medicine                      |
| COV    | City of Vancouver  |
| CPAT   | Community Park Audit Tool                                |
| CT     | Census Tracts  |
| EAPRS  | Environmental Assessment of Public Recreation Spaces     |
| PA     | Physical Activity  |
| POS    | Public Open Space  |
| SOPARC | Systems for Observing Play and Recreation in Communities |
| UGS    | Urban Green Space  |
| VPB    | Vancouver Park Board                                     |
| WHO    | World Health Organization                                |

# Chapter 1. Introduction

## 1.1. Research Question

The research question and objective behind this project is rooted in the usage of Sunrise Park located in East Vancouver for physical activity among local adult residents and other users of this park. The research question asks: *what is the contribution of East Vancouver's Sunrise Park to the physical activity of adult residents living within a ¼ mile (approximately 400 meters) of this park and other users of this park?*

This research aims to investigate different factors affecting the usage of Sunrise Park for physical activity. The literature review conducted for this study illustrated many diverse factors affecting the usage of parks for physical activity. This research has been narrowed down to investigate the influence of Sunrise Park's characteristics on the usage of this park for physical activity. More specifically, the influence of the features, aesthetics, condition, and safety in Sunrise Park on the usage of this park for physical activity has been the focus of this study. Also, the effect of weather and time on the usage of this park have been studied. In addition, this research elaborates on the differences in the usage of this park for physical activity among different gender groups.

Thus, the sub-questions this research will answer are: which characteristics of Sunrise Park are associated with the usage of this park for physical activity? Do different genders use this park differently for physical activity and if yes, what are the differences? And how can Sunrise Park be improved to increase the usage of this park for physical activity?

To achieve these goals, this study applies a mixed method approach including conducting a residential survey questionnaire, site observation, park user interviews, and Vancouver Park Board (VPB) key expert interviews. A ¼ mile (approximately 400 meters

or equivalent to roughly a 5-minute walk) is an acceptable distance for the service area of neighborhood parks in park planning studies (Wolche et al., 2013) and this is the distance that the City of Vancouver (COV) defines as the service area for neighborhood parks as well. Thus, a ¼ mile has been selected as the service area of Sunrise Park and the boundary for conducting a residential survey in this project.

## **1.2. Significance of the Research**

Physical inactivity is a major cause of many diseases (Sugiyama & Ward Thompson, 2008). It increases the risk of many diseases such as coronary heart disease, breast cancer, colon cancer, and type 2 diabetes (Schipperijn et al., 2013). Physical inactivity accounts for 16% of all causes of death (Cohen et al., 2012). Regular physical activity results in a variety of positive health outcomes among different groups of people. For instance, physical activity has a protective effect against many diseases such as cardiovascular disease, stroke, type 2 diabetes, colon cancer, breast cancer, hypertension, obesity, depression, osteoporosis, and premature death. Physical activity is effective in the treatment of several chronic diseases as well. Physical activity is also impactful on energy balance and body composition. (Miles, 2007; Warberon et al., 2006; Hallal et al., 2006; Colley et al., 2011; Fix and Hilldson, 2006; Haskell et al., 2007). Physical activity has health benefits for all age groups. In childhood it maintains energy balance, strengthens bones, and establishes a healthy lifestyle habit. In adulthood it decreases the risk of chronic diseases and in the senior years it counteracts age-related losses in bones and deterioration of the cardiovascular system, and decreases the risk of osteoporotic fracture (Waberton et al., 2006). Although the dangers of physical inactivity and the health benefits of physical activity have been outlined by many scholars, still worldwide 31.3% of adults (15 years and older) are physically inactive (Schipperijn et al., 2013).

The importance of physical activity is significant and promoting physical activity is integrated into many disciplines such as urban planning. Some scholars in this area suggest that urban planners can promote physical activity amongst citizens through different design or transportation policies (Handy et al., 2002). “Active living and getting outside” is one of the thirteen goals of Vancouver’s Healthy City strategy as well.

There is a growing consensus among experts that routine physical activity is shaped by the built environment (Barton & Grant, 2011; Ding et al., 2011; Koohsari et al., 2013). Different built environment factors such as walkability, traffic speed/volume, access/proximity of recreational facilities, mixed land-use, levels of open space, and residential density have an influence on the physical activity of residents (Ding et al., 2011; Saelens et al., 2003; Durand et al., 2011; Frank et al., 2005).

It is also believed that communities can facilitate physical activity by improving the design of streets and quality of parks. Making environments pedestrian friendly and parks more attractive is believed to stimulate walking and routine exercise. Providing, maintaining, and improving parks is an important part of health integration in urban planning (Barton and Grant, 2012). It is discussed by researchers that urban parks offer a significant venue for promoting active living. Public parks are accessible to most people, generally offer free year-round opportunities for physical activity, and have the potential to play an essential role in promoting physical activity (Thompson et al., 2013, Henderson, 2006). It has been discussed in several studies that public parks have significant potential to facilitate physical activity, as they provide places for individuals to walk or jog, and many of them also have specific facilities for sports, exercise, and other vigorous physical activities (Cohen et al., 2007; Cohen et al., 2005; Goodbey et al., 2005). However, many studies illustrate that parks are mostly used for sedentary activities or recreational walking and not for vigorous physical activity (Bodimo-Rung et al., 2005, Cohen et al., 2007, Cohen et al., 2012).

Therefore, conducting research on the usage of parks for physical activity and investigating different factors positively influencing their usage is necessary. A better understanding of these factors can affect that usage among different groups of people and result in having healthy cities and citizens, and active living for citizens, which is the ultimate goal of urban planning.

Different types of urban parks, including neighbourhood parks, community parks, or district parks, can be influential on the physical activity of citizens. The focus of this research project is on neighbourhood parks. Neighbourhood parks usually provide active and passive facilities for all age groups. Their service radius is between  $\frac{1}{4}$  mile to  $\frac{3}{4}$  mile

and their size is usually between 1 to 3 hectares (Joardar, 1975). In the Park Provision Standard and Metrics Study by the COV, neighbourhood parks are generally medium in size (less than 10 hectares, average size of 2.6 hectares), and have a medium number of amenities (between 3 and 7).

This research will investigate the usage of Sunrise Park for physical activity. This research will provide information regarding the usage of this park for physical activity among different groups of people and it will illustrate different factors having an impact on the usage of this park for physical activity.

The COV is incorporating a Healthy City Strategy, which is an integrated plan for healthier people, healthier places, and a healthier planet. One of the goals of this strategy is that all Vancouverites are engaged in active living and have incomparable access to nature. In this strategy, it is targeted that all Vancouver residents live within a five-minute walk of a park, greenway, or other green space by 2020. Also it is targeted that the percentage of Vancouver residents aged 18 and older who meet the Canadian Physical Activity Guidelines will be increased by 25% over 2014 levels by 2025 (City of Vancouver, 2014). This research will be important for Park Board Planners of the COV as it will provide them with information on how to create or improve the current status of public parks, with the aim of increasing the level of physical activity among citizens and being effective in reaching the goals and targets of the City's Healthy City Strategy.

### **1.3. Site Selection**

This project focuses on Sunrise Park, which is located in a lower-income area in the Sunrise-Hastings area (East Vancouver). According to a study conducted by the Vancouver Board of Parks and Recreation in 2016, 63.5% of the total population in Vancouver are within a five-minute walking distance of parks, 89.7% of the total population are within an eight-minute walking distance of parks, and 96.7% of the total population are within a ten-minute walking distance of parks. The study compares eastside and westside neighbourhoods in the City of Vancouver to illustrate the percentage of population within an eight-minute walking distance of specific amenities. Interestingly, the study illustrates that eastside neighbourhoods have more population within an eight-minute walk to softball

diamonds and tennis courts than the westside neighbourhoods. While, westside neighbourhoods have more population within an eight-minute walk to beach and water features. These two neighbourhoods have the same population within an eight-minute walk to amenities such as washrooms, off-leash dog parks, and community centers (Vancouver Board of Parks and Recreation, 2016). However, it should be mentioned that residents of higher income neighbourhoods usually have more opportunity to use private amenities such as a private gym, a club, or exercise rooms, compared to the residents of lower income neighbourhoods. Also, the residents of higher income neighbourhoods are usually more mobile and they can use amenities in other areas of the city more conveniently than the residents of lower income neighbourhoods. Because of these reasons, residents of lower income neighbourhoods have a greater need for public parks and for public physical activity facilities. Thus, a lower income neighbourhood is the focus of this thesis.

The selection of a lower income area for the purpose of this study has been based on the average household income of all Census Tracts (CT) in Vancouver compared to the average household income of the entire City of Vancouver (COV) for 2011. Those CTs with their average household income below the average household income of the entire COV were considered potential areas for this study. The average household income for the COV is \$80,460. All parks located in these CTs were extracted from the COV website. The size (between 1 to 10 hectares), different recreational facilities (passive and active facilities) and operational hours of all these parks were compared. Some of the parks are closed during winter time. Overall, twenty-eight parks were compared and then narrowed down to six parks based on their size (between 1 to 10 hectares), active and passive facilities (having more recreational facilities), and operation from dawn to dusk throughout the entire year. It should be mentioned that the six selected parks have more recreational facilities for the purpose of this study. However, it is possible that the residents of areas of eliminated parks (those had less recreational facilities) have a deeper need for physical activity facilities.

These six parks were observed during four weekends in Summer 2015, and two weekends during Fall 2015 in order to pick a suitable park as a case study for this research. The comparison that this resulted in is presented in Table 1. McLean Park,

McSpadden Park, and Templeton Park were almost empty during the summer and fall observations. Pandora Park was occupied by different groups of people during summer observations, however it was almost unoccupied during fall observations and it is closed during winter. Woodland Park was busy during observations in Summer and Fall though surrounded by mixed commercial-residential areas. Sunrise Park was occupied by different groups of people during summer and fall observations. It is open all year around, surrounded by a predominantly residential area, has passive and active facilities, and it is 3.18 hectares. Thus, Sunrise Park was selected as the case study for this project.

**Table 1. Comparison of potential case studies**

|                             | Sunrise Park   | Woodland Park   | Maclean Park   | McSpadden Park                          | Pandora Park  | Templeton Park   | City of Vancouver |
|-----------------------------|--|---|--|---|---|--|-------------------|
| Neighbourhood               | Hastings-Sunrise   | Grandview   | Strathcona   | Grandview                               | Grandview   | Grandview  |                   |
| Ave Household Income (2011) | \$64,146   | \$47,074  | \$47,682   | \$49,242                                | \$54,719  | \$54,719   | \$80,460          |
| Park Size (Hectares)        | 3.18   | 1.58  | 1.21   | 1.62                                    | 1.66  | 1.93   |                   |
| Recreational Facilities     | Baseball, Field house, Playground, Wading pool, Washrooms, Community Hall, Dog off | Playground, Softball, Soccer Fields, Wading Pool, Washrooms | Field House, Playground, Softball Field, Water Park, Washrooms | Playground, Tennis Court, Soccer Fields | Basketball Court, Playground, Field House, Tennis Court, Water Park, Washroom | Indoor Swimming Pool, Running Tracks, Softball, Playground, Soccer Field |                   |

Sunrise Park is located in a CT in the Hastings area in East Vancouver, with the average household income lower than the average household income of the COV as a whole. The average household income of this CT is \$64,146. The size of this park is 3.18 hectares, and recreational facilities of this park are two playgrounds, baseball/softball diamond, soccer field, a wading pool, sitting areas, and washrooms.

By looking at the data from Census Canada (2011), more than 83% of the people living in this CT know English. This is important for the purpose of this study as well, as it indicates that the questionnaires can be created in the English language. However, it will be explained in Chapter Three of this thesis that translating the residential questionnaire

into the Cantonese language was considered in this study as well, although because of certain limitations it was not applied.

## **Chapter 2. Literature Review**

### **2.1. Introduction**

A strong literature review facilitates the definition and importance of the research topic, the relation of findings to previous studies, and a hypothesis for the study. The conceptual framework constructed from the literature review will most importantly support the interpretation of the data and results. This research project applies a mixed-methods approach to illustrate the contribution of Sunrise Park to the leisure time physical activity of local residents living within a ¼ mile of the center of this park and to other users of this park.

In order to define the conceptual framework and considering the above, three main themes have been identified to categorize the literature review for this study.

1. Urban Planning, physical activity, and public health
2. Physical environment factors affecting public park usage for physical activity
3. Individual and policy factors affecting public park usage for physical activity

### **2.2. Urban Planning, Physical Activity, and Public Health**

This section clarifies some definitions related to the topic of this study and highlights the importance and relevance of this research topic in a broader context of literature. This section will explain why readers of this research should care about this topic and how the results and conclusions could be useful. This section discusses the health benefits of physical activity and the role of urban planning on the physical activity of citizens. This section ends with the potential role public parks can play in increasing the level of physical activity of citizens.

### **2.2.1. Health Benefits of Physical Activity**

There are many studies illustrating the positive impact of physical activity on health (Miles, 2007; Warberton et al., 2006; Hallal et al., 2006; Colley et al., 2011; Fix and Hilldson, 2006; Haskell et al., 2007). These studies highlight that physical activity has health benefits, physical and psychological effects, and helps reduce the impact of chronic diseases. Physical activity has an impact on energy balance and body composition. Physical activity has a protective effect on cardiovascular disease, stroke, type 2 diabetes, colon cancer, breast cancer, hypertension, obesity, depression, osteoporosis, and premature death. Other than its preventive effect, physical activity is recommended in the treatment of several chronic diseases.

Warberton et al. (2006) mention that physical activity exerts its benefits throughout the course of one's life, and how physical activity has health benefits for all age groups including children, adults, and the elderly. Warberton et al. (2006) explain that physical activity is important in childhood as a means of maintaining energy balance and bone strength. It is important for social interaction, well-being and establishing a good lifestyle habit for children. Warberton et al. (2006) go on to explain that physical activity is important in adulthood in order to decrease the risk of chronic diseases. Physical activity should be maintained into old age as well, for as long as capability allows, in order to counteract age-related losses in muscles and bones, deterioration of the cardiovascular system and to decrease the risk of osteoporotic fracture.

### **2.2.2. Definition and Classification of Physical Activity**

Miles (2007) defined physical activity as “bodily movement that is produced by the contraction of skeletal muscle and that substantially increases energy expenditure” (Miles, 2007, p. 318).

Physical activity can be categorized in different ways. One categorization focuses on the different modes of activity contributing to physical activity. For example, household cleaning, walking or cycling to work, or leisure time physical activities such as dancing or swimming, would all be categorized as such. Another way of categorizing physical activity is discussed by Miles (2007) and is focused on duration, intensity and frequency of

physical activity. Frequency and duration refer to how often and how long an activity is performed. Intensity refers to how hard a person is working or the rate of energy expenditure that an activity demands and is usually measured in Kcal/kg/min or METs (Metabolic Equivalent). This measurement is out of the scope of this project. The intensity of physical activity is categorized slightly differently by various researchers. For example, in some studies it is categorized into three major types of walking for recreation, moderate-to-light, and vigorous activities (Cohen et al., 2007; Humpel et al., 2002; Corti et al., 2005). Some studies categorize the level of physical activity into sedentary activity, low activity, moderate activity, and vigorous activity (Mota J et al., 2005). Some other studies categorize the level of physical activity into three groups of mild, moderate, strenuous physical activity (Saelens et al., 2003). In the study by Saelens et al. 2003, walking is considered as moderate physical activity. In their study they categorize the level of physical activity to sedentary, moderate, and vigorous physical activity. They also consider walking as moderate physical activity. The categorization of the level of physical activity in this thesis will be sedentary, moderate (including walking), and vigorous physical activity like the study by Saelens et al. 2003 and will be explained more specifically in Chapter Three. Examples of moderate and vigorous physical activities are available from the documents of agencies such as World Health Organization or the American College of Sport Medicine, which will be applied in the data analysis of this thesis.

Different combinations of duration, intensity, and frequency of different types of physical activity are used to quantify the level of physical activity (Cohen et al., 2013; Cohen et al., 2012; Corti & Donovan, 2002). For instance, one of the simplest combinations is the total duration of physical activity at a specified intensity (e.g. hours per week of moderate-intensity physical activity). These combinations are out of the scope of this thesis.

It can also be noted that many countries provide specific physical activity recommendations and guidelines for different age groups. For instance, Canada's Public Health Agency's recommendation for adults (18-65 years of age) is to "engage in 150 minutes per week of moderate-to-vigorous physical activity accumulated in bouts lasting at least 10 minutes" (Colley et al., 2011, p. 2).

### 2.2.3. The Role of Urban Planning

Traditional research on physical activity and health promotion has targeted behavioural changes as the key to increasing physical activity and, thus, promoting human health. However, because such approaches alone have not made a sufficient dent in the challenge of increasing physical activity in the population as a whole, there has been a recent focus on environmental approaches, such as modifying the community environment and making it easier for individuals to be physically active (Bodimo-Rung et al., 2005). Urban planning, with the ultimate aim of improving human health (Barton and Grant, 2012), has a significant impact on physical activity and the promotion of the health of its citizens.

The importance and relevance of urban planning in increasing physical activity of citizens has been discussed by different scholars (Koohsari et al., 2013; Jensen, 2011; Durand et al., 2011). For example, Fox and Hillsdon (2007), argue that physical activity promotion should be a critical element of urban planning and urban design in order to create neighbourhoods that include physically active spaces. Barton and Grant (2012) promote urban planning for healthy cities and they explain that urban planning has a profound effect on the health of the population.

In particular, urban planning affects physical activity and health outcomes of the population through two subfields of urban design and transportation planning (Handy et al., 2002). Urban design and transportation planning both influence physical activity among people by focusing on the built environment. The correlation between built environment and physical activity has been of interest to many scholars. The most significant factors of the built environment for physical activities are built environment walkability, traffic speed/volume, access/proximity of recreational facilities, mixed land-use, levels of open space, and residential density (Ding et al., 2011; Saelens et al., 2003; Durand et al., 2011; Frank et al., 2005).

These environmental attributes have been addressed through some urban planning paradigms such as New Urbanism or Smart Growth, as well as the introduction of solutions to sprawl and car oriented development of industrial cities of the modern era (Grant, 2006; Durand et al., 2011).

New Urbanism, as an urban design movement, and Smart Growth, as an urban planning approach for community developments, encompass some principles, which in theory can be influential on the physical activity of citizens. There have been several studies which investigated the relation between New Urbanism and Smart Growth approaches, and the increased level of physical activity of communities. Results mostly confirm that some of these approaches have made an impact on the physical activity of residents (Durand et al., 2011; Saelens et al., 2003; Almanza et al., 2012; Matthew, 2008; Jerrett et al., 2013; Geller, 2003; Handy, 2005; Dannenberg et al., 2003).

For example, Rodriguez et al. (2006) compared various measures of the physical activity of residents in a New Urbanist neighbourhood to those of a group in a conventional suburban neighbourhood in central North Carolina. They found that the residents of the New Urbanist neighbourhood were more likely to be physically active in their neighbourhood than were residents of the conventional suburban neighbourhood. In another study, Jerrett et al. (2013) conducted research to assess whether living in a Smart Growth community was associated with increased neighborhood-centered leisure-time physical activity in children aged 8–14 years, compared to those children living in a conventional community. Jerrett et al. (2013) defined Smart Growth in their study as:

A set of principles for guiding development of healthy, vibrant communities characterized by a sense of place. Principles includes mixed land use, different housing and transportation options, connected, walkable streets, areas for social interactions (parks and community centers), and compact building design. (Jerrett et al., 2013, P.46)

In their study Jerrett et al. (2013) explained that many of these principles are associated with physical activity and they concluded that the Smart Growth community residences were associated with a 46% increase in the proportion of moderate-to-vigorous physical activity, as compared to the conventional community residences (Jerrett et al., 2013).

## **2.2.4. The Role of Public Parks**

Providing amenities such as neighbourhood parks within walking distance of residences is one of the core principles of the New Urbanist movement, which has been claimed to increase the level of walking among residents.

For instance, Lund (2003) in her study tested the New Urbanist claims that placing amenities such as parks within walking distance of homes will increase pedestrian travel. The author conducted household surveys in eight neighbourhoods in the Portland, Oregon, metropolitan region (four inner-city and four suburban) with varying degrees of local access to parks and concluded that there is a relation between local access to amenities such as parks and pedestrian travel (Lund, 2003).

Barton and Grant (2012) evaluated the progress of phase IV of the World Health Organization (WHO) European Healthy City program. In their study they emphasized that promoting healthy lifestyles is part of this program and it is integrated into urban planning (Barton and Grant, 2012).

It has been discussed in several studies that public parks have significant potential to facilitate physical activity, as they provide places for individuals to walk or jog, and many of them also have specific facilities for sports, exercise, and other vigorous physical activities (Cohen et al., 2007; Cohen et al., 2005; Goodbey et al., 2005; Sallis et al., 1998). For instance, Payne et al. (2005) examined the relation between the use of local parks and self-reported individual health amongst adults aged 50 years or more. Payne et al. (2005) strongly argued that local parks should be thought of as a valuable resource for health promotion and disease prevention. Parks are common community features having the potential to provide opportunities for physical activities. However, many studies illustrate that parks are mostly used for sedentary activities (McCormack et al., 2010; Cohen et al., 2007). For instance, in their study of eight neighbourhood parks in Los Angeles, Cohen et al., 2007 indicated that two thirds of observed individuals were sedentary. Parks used for sedentary activity might be also effective in increasing the level of physical activity by causing the park users to walk to the park (Cohen et al., 2007). Many factors may have directly or indirectly influenced park usage for physical activity, which is worthwhile to focus on and study.

## **2.3. Physical Environment Factors Affecting Public Park Usage for Physical Activities**

After reviewing several relevant articles discussing diverse factors affecting the usage of parks for physical activities, all factors were divided into three categories: physical environment characteristics, individual characteristics, and policy characteristics. The first part will be discussed in this section and the two other parts will be discussed in the next section of this literature review.

Physical environment characteristics can be divided into two categories: park characteristics and neighbourhood characteristics. Bedimo-Rung et al. (2005) provided a conceptual framework regarding different “park environmental” characteristics that could be related to physical activity. This section of the literature review of this thesis has been inspired significantly by the conceptual framework provided by Bedimo-Rung et al. (2005). Knowledge obtained from this part has been applied in the selection and consideration of different variables defined in Chapter Four of this thesis to analyze the influence of Sunrise Park on the physical activity of the park’s users.

Before focusing on factors affecting the usage of public parks for physical activity, it should be clarified that different articles reviewed in this and the next section have used different terms such as “public park”, “urban green space”, “local parks”, or “public open space”. All these terms have been interpreted as “public park” in this thesis.

### **2.3.1. Park Characteristics**

Borrowing from the conceptual framework of Bedimo-Rung et al. (2005), park characteristics that influence the usage of parks have been grouped into five categories: features, access, conditions, aesthetics, and safety. Each will be defined, in turn.

Feature: Park features usually refer to different facilities in parks. Parks can include a wide range of facilities, varying from dog-specific agility equipment, to tennis courts. McCormack et al. (2010) explained that several features of parks can positively or negatively influence park use, and the importance of these features varied for different groups of people. For example, dog owners may identify dog litter bins as important park

facilities, while caregivers and children consider the presence of shade-providing equipment as important (McCormack et al. 2010). Many studies support that certain types of facilities support the usage of parks for physical activity (Paquet et al. 2013; Dallimer et al. 2014). For example, Kaczynski et al. (2008), in their observational study of thirty- three parks, identified twenty-six different park features and related the presence of paved or unpaved trails, and wooded areas as important factors to increase the level of physical activity in public parks (Kaczynski et al. 2008). Schipperijn et al. (2013) conducted a city-wide survey questionnaire in Odense, Denmark amongst 1305 adults, and found a positive correlation between several features (e.g. walking/cycling routes, wooded areas, water features, lights, bike racks, and parking lots) to physical activity within parks. While studies are inclusive regarding the effect of the type of park features on physical activity, the number of features may or may not affect the usage of parks for physical activity (Kaczynski et al. 2008; Schipperijn et al. 2013). The size of public parks can also be considered as a feature of parks. Regarding the effect of the size of parks on park usage for physical activity, opinions are not conclusive. For instance, in some studies, large public parks are associated with an increased level of physical activity (Corti et al. 2005; Koohsari et al. 2013; Corti et al. 2002). It should be noted that in these studies it was not addressed what “large” means. On the other hand, there are some studies indicating no relationship between public park size and the level of physical activity (Kaczynski et al. 2008; Schipperijn et al. 2012).

Access: Bedimo-Rung et al. (2005) defined access as the ability of people to get to a park and to navigate within a park. Four categories of access are availability, equitable access, individual access, and access within parks (Bedimo-Rung et al., 2005, p. 165). Individual access refers to the distance that an individual must travel to get to a public park and has been mentioned by many researchers as one of the strong indicators of the use of parks for physical activity. It has been demonstrated by many researchers that those living closer to public parks are more likely to visit parks more frequently and thus participate in physical activity (Bedimo-Rung et al., 2005; McCormack, 2010; Kaczynski, 2008; Paquet et al., 2013; Irvine et al., 2013; Dallimer et al., 2014; Cohen et al., 2007; Corti and Donovan, 2002; Sugiyama and Thompson, 2008; Humpel et al., 2002; Payne et al., 2005). It should also be mentioned that a few studies demonstrated no relation between individual access and park use in general or for physical activity (Koohsari et al.,

2013; Schipperijn et al., 2013; Hillsdon et al., 2006). For instance, Koohsari et al. (2013) in their study examined metric and topological measures to examine relation between the amount of walking to and within public open spaces (POS) and proximity measures. They did a residential survey in three neighbourhoods in Melbourne, Australia and asked residents about walking to and within POS and their perceptions of their neighbourhood. In their study they defined four proximity measures including distance to the closest POS, number of POS, total areas of POS within 1 km, and POS integration. The authors found no association between proximity measures and walking to and within POS (Koohsari et al., 2013). Schipperijn et al. (2013) conducted a residential survey in Odense, Denmark to examine the association between urban green space (UGS) and outdoor physical activity in general, as well as physical activity in the closest UGS. They reported no association between physical activity in general and distance to the nearest UGS. Also they reported no association between physical activity in the nearest UGS and distance to the nearest UGS. They reported no association between the amount and number of UGS and outdoor physical activity in general either (Schipperijn et al., 2013). Hillsdon et al. (2006), examined the association between access to urban green space and levels of recreational physical activity among 4950 middle-aged (40-70 years) residents of Norwich, UK. They reported there was no association between recreational physical activity and urban green space in their study sample (Hillsdon et al., 2006). Schipperijn et al. (2010) tested the relative importance of different factors on the frequency of use of the nearest urban green space among 2500 residents of the Danish city of Odense, and interestingly found that if the nearest urban green space was the most used green space, owning a dog was the only factor that significantly increased the frequency of urban green space.

Aesthetics: “The category of aesthetics incorporates the perceived attractiveness and appeal of the various design elements of a park” (Bedimo-Rung et al., 2005, p.165). The attractiveness of parks usually refers to some attributes such as greenery, landscaping, interesting scenery, or the presence of birds in parks. Perceived attractiveness of parks has been linked to an increased level of physical activity in different studies. For instance, Corti et al. (2005), reviewed twenty-one qualitative articles regarding different factors affecting the usage of public parks and they found that aesthetic attributes of parks, such as the existence of greenery and nice scenery, are among the important factors encouraging park usage. In another study, Humpel et al. (2002), reviewed nineteen

quantitative articles regarding associations between physical activity in parks and physical environment attributes, and found that perceived aesthetic attributes of parks have a significant and positive relation with physical activity. Paquet et al. (2013) investigated the association between accessibility, greenness, size and type of public open space (passive vs. active) and cardiometabolic disease among 4056 residents of North West Adelaide, Australia. They concluded that size, type, and greenness (an aesthetic characteristic) of public open space were inversely related to the cardiometabolic disease risk among participants.

Condition: Park condition refers to the condition of a park's features, equipment safety in parks, and visual cues of incivilities in parks that all can affect the usage of parks (Bedimo-Rung et al., 2005). Park users prefer to use parks which are maintained regularly and are kept in good condition. McComack et al. (2010) discussed that the maintenance of parks can influence cleanliness, grass quality, and the quality of the play areas which all impact park usage.

Safety: "Safety refers to personal security of park users" (Bedimo-Rung et al., 2005, p. 165). It can be defined and measured in two ways: perceived safety and objective safety. Perceived safety refers to how safe people *feel* in parks and objective safety refers to the *actual* safety that individuals experience in parks based on the nonexistence of crime. Most of the research studying the relation between safety and the usage of parks has focused on perceived safety. There are studies indicating that perceived safety issues are important barriers for park usage (McCormick and Holland. 2012; Bedimo-Rung et al., 2005; McCormack et al., 2010). Some other studies have found perceived safety as a less relevant variable for the usage of parks (Humpel et al., 2002). McCormick and Holland (2012) in their study listed some methods to prevent park crimes. These methods were mostly based on environmental design strategies and the most widely used ones were trash removal, graffiti removal, signage and the use of lighting. Some of the strategies mentioned in this article such as trash removal or graffiti removal may affect the aesthetic values of parks as well. It seems that those parks lacking aesthetic value may also have an influence on the perception of crime amongst individuals as well.

### **2.3.2. Neighbourhood Characteristics**

People usually must cross through their neighbourhood to get to a park. Therefore, neighbourhood conditions can have an influence on how a park is used. Different neighbourhood conditions may encourage or discourage the usage of public parks. Bedimo-Rung et al. (2005) in their article categorized these characteristics into three groups: neighbourhood traffic, neighbourhood aesthetics, and neighbourhood safety. There are several studies conducted on the relationship between neighbourhood characteristics and physical activity, and health benefits in general (Mota et al., 2005; Gidlow et al., 2010; Brownson et al., 2009; Koohsari et al., 2013; Handy et al., 2002; Yen et al., 2009; Seeley et al., 2009). However, it should be noted that studies on the relationship between neighbourhood characteristics and physical activity in parks are fairly limited. It should be mentioned that the principles of some urban ideas such as New Urbanism or Smart Growth can also lead to some of the neighbourhood characteristics that are discussed here as conditions affecting the usage of parks for physical activity.

**Neighbourhood Traffic:** Koohsari et al. (2013) studied the relationship between access and the frequency of walking to public parks. They found that route characteristics that people take to reach public parks may be more important in encouraging walking to parks than just proximity to the parks. Route characteristics that encourage individuals to walk include maintenance of streets, aesthetics of streets, or traffic in streets (Dills et al., 2012). In some studies, the presence of sidewalks, heavy traffic and hills were positively associated with physical activity (Brownson et al., 2001). It should be mentioned that hilly areas might be correlated to scenic locales and because of that they are positively associated with physical activity.

**Neighbourhood Aesthetics:** Attractiveness of neighbourhoods and the existence of beautiful scenery in neighbourhoods are positively associated with physical activity (Brownson et al., 2001). Conversely, other characteristics such as graffiti, abandoned homes or vacant lots, may discourage people from travelling to parks in their neighbourhood (Bedimo-Rung et al., 2005).

**Neighbourhood Safety:** Most of the studies regarding safety issues in neighbourhoods focus on the association between neighbourhood safety and physical

activity in general, and not on the association of neighbourhood safety and park usage for physical activity. Results regarding the association between perceived neighbourhood safety and physical activity in neighbourhoods have not been conclusive. For instance, Lachowycz and Jones (2012) explained that perceived or real crime in a neighbourhood may discourage people from going outside and subsequently may discourage park usage. In another study, Brownson et al. (2001) found a modest inverse relationship between perceived neighbourhood crime and physical activity in general. There has been another study that found no relationship between perceived neighbourhood safety and the usage of neighbourhood trails (Brownson et al., 2000).

## **2.4. Individual and Policy Factors Affecting Public Park Usage for Physical Activity**

Other factors that influence the usage of parks for physical activity can be summarized into two groups: individual and policy factors.

### **2.4.1. Individual Factors**

There are several studies highlighting the association between different individual characteristics and park usage. Sociodemographic characteristics of gender, age, race, and socioeconomic status are the strongest factors affecting park usage (Bedimo-Rung et al., 2005; Schipperijn et al., 2013; Lachowycz and Jones 2012). For example, Cohen et al. (2007) have stated that females are infrequent users of parks for physical activities. In their study of eight public parks in low-income neighbourhoods in Los Angeles, they concluded that males used parks more than females and males were twice as likely to be vigorously active than females (Cohen et al., 2007). Bedimo-Rung et al. (2005) have stated that elderly adults are generally non-users of parks for physical activity. Cohen et al. (2012) have stated that public parks are used less in high-poverty areas compared to low and medium poverty areas parks. Cohen et al. (2012) reported in their article that “the local environment and/or park characteristics could be primary determinants of park use, with fewer park resources and staffing leading to lower park use, or perhaps residents in high poverty areas choose to use park-based resources less” (p. 2323). Cerin and Leslie

(2008) found that more disadvantaged segments of the population were involved less in physical activity according to their study of identifying individual, social, and environmental contributors of leisure time physical activity amongst different social groups in Adelaide, Australia. They reported that individual characteristics such as self-efficacy and social support were the key factors that the disadvantaged groups of the observed population were less involved in physical activity (Cerin and Leslie, 2008).

It should be mentioned that these individual characteristics are not universal and they might differ by country, city, or even by neighbourhood.

### **2.4.2. Policy Factors**

Bedimo-Rung et al. (2005) categorized issues related to park policies into three groups: park design policies, park management, and park funding.

Bedimo-Rung et al. (2005) discussed that a major factor contributing to a park's maintenance and facility level development is its operating and capital budget. Issues related to park management include park staffing (part-time or full-time), providing regular scheduled programs, and the park's operating hours. Cohen et al. (2013) in a cross-sectional study of twenty-five neighbourhood parks in Los Angeles found that providing programmed activities in parks such as after-school programs was strongly correlated with park use and park-based physical activities. In another study, Cohen et al. (2012) again illustrated the positive correlation between park usage for physical activity and scheduled programs in parks. They also indicated that a positive association exists between park usage for physical activity and part-time (as opposed to no) staffing as well.

Weather is another factor which is related to park use that was not included in any of the aforementioned groups of factors. There are several studies confirming that suitable weather conditions (low wind, no rain or mist) positively affects the use of parks for physical activity (Corti et al., 2005; Irvine et al., 2013). However, there are also studies available that have not found a strong relationship between weather and physical activity in parks (Humpel et al., 2002).

Existence of supervised activities in parks is another factor that has been positively correlated with park usage. Cohen et al. (2006) in their study of public parks in the city of Los Angeles demonstrated that supervised activity in parks increases the usage of parks. This was partly because supervised activities and competitions can draw audiences as well to the park (Cohen et al., 2006).

## **2.5. Literature Review Conclusion**

This chapter explored the existing literature to develop a conceptual framework for this study. The conceptual framework that was extracted from reviewing the existing literature related to this study recommends that:

Public parks are mostly used for sedentary activity and recreational walking. Even when they are used for sedentary activity they increase the level of an individual's physical activity by causing them to walk to the park (Cohen et al., 2007).

Among different park features, paved/unpaved trails, wooded areas, water features, lights, bike racks, parking lots, walking/cycling paths, and pleasant views have been associated with increasing the level of physical activity within parks (Kaczynski et al., 2008; Schipperijn et al., 2013).

Existence of greenery and nice scenery were among aesthetic park characteristics that were associated with an increased level of physical activity within parks (Corti et al., 2005).

Some studies illustrated perceived safety as a less relevant barrier to park usage (Humpel et al., 2002) and some studies illustrated perceived safety as an important barrier to park usage (McCormick and Holland, 2012; Bedimo-Rung et al., 2005; McCormack et al., 2010). Among diverse strategies to improve safety in parks, trash removal, graffiti removal, signage, and lighting were positively associated with improving safety in parks (McCormick and Holland, 2012).

Regarding the relation between the condition of parks and the usage of parks, maintenance, cleanness, grass quality, the condition of park features, and quality of play areas have been positively related to the usage of parks (Bedimo-Rung et al., 2005; McComack et al., 2010).

Studies illustrate that suitable weather conditions (low wind, no rain or mist) positively affect the use of parks for physical activity (Corti et al., 2005; Irvine et al 2013). However, there are also studies available that have not found a strong relationship between weather and physical activity in parks (Humpel et al., 2002).

Some studies demonstrated that supervised activities in parks encourage the usage of parks in general (Cohen et al., 2006).

Some studies discussed that females are infrequent users of parks and males are more vigorously active than females in parks (Cohen et al., 2007).

Although much research has been conducted regarding the usage of public parks in general and for physical activity, none of them has been conducted in the City of Vancouver. This research, through qualitative and quantitative research methods, investigates the usage of Sunrise Park in East Vancouver for physical activity. This project will study the influence of park characteristics on the use of Sunrise Park for physical activities through a residential survey and park users' interviews. Individual characteristics, such as income and age variables, have been controlled in this survey by focusing on the adult and older population in a lower-income neighbourhood. However, how different genders might use this park differently will be investigated in this survey as well. In addition, how the weather and time might affect the usage of Sunrise Park for physical activity is studied through observation. Usage of this park for physical activity was investigated further through park users' and Park Board staff interviews. Studying the effect of policy factors on the usage of this park for physical activity is beyond the scope of this project. However, this project is exploratory in nature and open-ended questions, observations and interviews may provide us other variables affecting the use of Sunrise Park for physical activity.

## **Chapter 3. Methodology**

This research is an exploratory study attempting to evaluate the usage of Sunrise Park for physical activity among adult residents living within a ¼ mile and among other users of the park. This research applied a mixed-method approach including a residential survey questionnaire, park observations, park users' interviews, and interviews with key staff at Park Board Vancouver and Park Board Commissioners.

The methodology of several studies regarding the usage of public parks for physical activity was investigated and compared in order to confirm the methodology of this study. All of these studies applied one or some combination of a residential survey questionnaire, site observation, and/or interviews with park users/non-users to investigate the usage of public parks for physical activity (Cohen et al., 2012; Cohen et al., 2007; Cohen et al., 2013; Payne et al., 2005; Schipperijn et al., 2010; Schipperijn et al., 2012; Corti et al., 2005; Koohsari et al., 2013; Irvine et al., 2013; Kaczynski et al., 2008; Sugiyama and Thompson, 2008; Thompson et al., 2013). It should be mentioned that the scope of all these studies, other than the study conducted by Schipperijn et al. (2010), was bigger than the scope of this thesis and all were focused on more than one case study. However, most of them had applied one or two methodologies of a residential survey questionnaire, park observation, and park user/non-user interviews. So although this thesis is focusing on only one case study, all three methodologies of a residential survey questionnaire, park observation, and park user interviews have been employed in this thesis. In addition, seven key staff and Commissioners at Vancouver Park Board (VPB) and Thunderbird Community Centre were interviewed in this thesis.

### **3.1. Study Detail**

To evaluate the usage of Sunrise Park for physical activity, the focus of the residential survey is on the effect of Sunrise Park's characteristics on its usage. Among all variables related to park characteristics that were elaborated in Chapter Two, park features, conditions, aesthetics, safety variables and gender of users were the focus of the residential survey.

Sunrise Park usage, the frequency of its usage, its improvement, and comparison to other parks were the focus of park user interviews. Activity level, gender, age group, group of people, park usage at different times, and weather were the main variables studied through park observations. Questions regarding the usage of Sunrise Park for physical activity and how it can be improved were the focus of Park Board Commissioner and key expert interviews.

### **3.2. Residential Survey Questionnaire**

To gather data regarding the usage of Sunrise Park for physical activity, a survey questionnaire among local residents living within a ¼ mile from the center of this park has been conducted. Any resident of the selected household who is 19 years old and over could fill out the questionnaire. The focus of this study is on adults and seniors to get the maximum response rate from the residents. The adult age range in this study is between 19 and 64 years and the senior's age range is 65 and over.

Parks should be conveniently accessible so that that people can use them. Different cities have different service areas to make parks equally accessible for residents of different neighborhoods and to increase the usage of parks. However, how far reaching a park's service area should be is a complex question. It depends on an individual's willingness to walk, which in turn depends on different factors such as age, time availability, quality of surroundings, safety, etc. (Donahue, 2011). The majority of studies highlight the service area of public transportation such as buses and trains, and they do not explain the service area of recreational spots such as parks. These studies discuss the service area of public transportation for traveling to work and not travel for recreational pursuits. For instance, Proulx (2014) explained that a "5-minute walk", which is equal to a quarter mile (400 m), has been verified by different studies as the maximum distance that people, on average, are willing to walk as part of their travel to work (Proulx, 2014). Albeit a few studies discuss the service area of public parks as well and indicate that a quarter of a mile (half mile round trip) is an acceptable distance for walking to parks especially for parents to take their children to parks as well (Donahue, 2011, Wolch et al., 2013). A quarter mile is also an acceptable distance in park planning studies and this is the distance

that the COV defines as the service area for neighborhood parks, as well. Thus, this thesis considers a quarter of a mile to be the service area of Sunrise Park.

For the sampling strategy, the study area was small enough that I could number dwellings in this area on a map that was extracted from VanMap and employ systematic sampling. 150 dwellings were selected through systematic sampling.

The sampling frame was all people 19 years and older living in the systematically selected houses who received the questionnaire. The effective sample was those among the sample who completed and returned the questionnaire. The effective sample might not be representative of the theoretical population if many people are not available at the time of the survey, refuse to participate or don't return the questionnaires. In order to increase the chances of contacting as many as people as possible, it was attempted to reach the respondents at various times and days. Thus, questionnaires were delivered to selected households in person during weekdays and weekends at different times. If a household was not available at the time of the distribution of the questionnaire, this household was tried up to three times. If after three times I couldn't deliver the questionnaire, then the dwelling on the right side was contacted, and if they were not available then the dwelling on the left side was contacted. Some of the dwellings in this area had basement suites as well. If a dwelling had a basement suite and was occupied by two households, both households received the questionnaire.

For returning the survey questionnaires, I provided two options for participants to increase the response rate as well. A stamped return envelope was left with the participants and an online web survey was created, using FluidSurveys, to enable completion of the questionnaire online. The response rate was 25.3% including some fully blank returned responses. The fully answered response rate was 21.3%. Most of the responses were mailed. Only two respondents used FluidSurveys to fill out the questionnaire.

After designing the questionnaires, they were reviewed by two interviewees from VPB and based on their comments the original questionnaire was modified and made shorter. Questionnaires were short and efficient consisting of twenty-two questions that took approximately 7 minutes to complete. Also, in the CT in which Sunrise Park is located,

around 14% of the residential population do not know English. Cantonese was the most significant minority language spoken in this CT based on Statistics Canada 2011 (20% of the residential population mostly speak Cantonese at home and 24% of residential population's mother tongue is Cantonese). So, it was considered to translate the questionnaire in Cantonese as well, however, the challenge was how to read answers in Cantonese. In order to find a solution to this potential sample bias, this issue was discussed with a number of interviewees from the VPB. It was found that the COV does not translate residential surveys into other languages and surveys are offered in English only. Thus, it was decided to include the sentence "If you do not know English please ask someone who knows English to read this document for you" in Cantonese on the top first page of the questionnaire. However, it should be mentioned that I don't think that this move improved the response rate, as the fully answered response rate was still fairly low at 21.3%. Furthermore, questionnaires were piloted among a number of SFU Urban Studies students and their recommendations were also incorporated into the final version of the questionnaire.

The questionnaire was inspired by some other research instruments in this regard such as CPAT (Community Park Audit Tool) and EAPRS (Environmental Assessment of Public Recreation Spaces) that have been used in some major research regarding the usage of parks for physical activity as well (Schipperijn et al., 2010; Cohen et al., 2006). The questionnaire consisted of five parts, including:

1. Demographic questions
2. Physical activity and neighborhood parks
3. Safety and aesthetic features in the park
4. Park features and park conditions
5. Comparison with other parks and park improvements

Gender, age, mother tongue, length of time living in the area, and barriers to access the park were demographic questions. Where respondents exercise, length of typical weekly physical exercise, usage frequency of the park, and what respondents do in the park were the questions in the second part of the questionnaire, "Physical Activity and Neighborhood Parks". Perceived safety, safety and nuisance concerns were the questions in the third part of the questionnaire, which was "Safety and Aesthetic Features in the Park".

Respondents were asked in the fourth part, “Park Features and Park Condition”, to rate the importance of existing and absent park features on a three-point scale. They were also asked to rate the condition of different areas of the park on a two-point scale in this part. The final part of the questionnaire asked respondents the frequency of their usage of other parks, the reason they might use other parks and how Sunrise Park could be improved to promote physical activity. The questionnaire is listed in its entirety in Appendix A.

### **3.3. Site Observation**

The observation methodology was inspired by an article by McKenzie et al. (2006) and adjusted for the purposes of this thesis. In that article, the authors explain a methodology for observing play and recreation in communities and they call it SOPARC (Systems for Observing Play and Recreation in Communities). They have used this method in a series of research studies in Los Angeles regarding the usage of public parks for physical activity. This methodology has been used by many other scholars as well (Veitch et al., 2015; Han et al., 2015; Cohen et al., 2007; Cohen et al., 2012; Cohen et al., 2013; Bocarro et al., 2015). SOPARC is based on momentary time sampling and it uses a planned activity checklist recording. The planned activity checklist of this methodology is shown below.

DATE \_\_\_\_\_ PARK NAME \_\_\_\_\_ OBSERVER \_\_\_\_\_ PERIOD:  AM  LUNCH  AFTERNOON  EVENING  
 TARGET AREA 3 Subtarget Area # \_\_\_\_\_ Subtarget Area # of Total Subtarget areas \_\_\_\_\_  
 START TIME 3:36

**CONDITIONS OF TARGET AREA**

**Accessible** (e.g., not locked or rented to others)  Yes  No  
**Usable** (e.g., is not excessively wet or windy)  Yes  No  
**Equipped** (e.g., removable balls available)  Yes  No  
**Supervised** (i.e., by official personnel)  Yes  No  
**Organized** (e.g., team sporting event)  Yes  No  
**Dark** (e.g., insufficiently lit)  Yes  No  
**Empty** (i.e., area not occupied)  Yes  No

Comments: \_\_\_\_\_

| PEOPLE              | ACTIVITY                  | AGE GROUP |      |       |        | ETHNICITY |   |   |   | ACTIVITY LEVEL |   |   |
|---------------------|---------------------------|-----------|------|-------|--------|-----------|---|---|---|----------------|---|---|
|                     |                           | Child     | Teen | Adult | Senior | L         | B | W | O | S              | W | V |
| <b>Participants</b> | <b>Primary Activity</b>   |           |      |       |        |           |   |   |   |                |   |   |
| Female              | Soccer                    | 4         |      |       |        | 2         | 1 | 1 |   |                | 2 | 2 |
| Male                | Soccer                    | 6         |      | 2     |        | 5         |   | 3 |   | 3              | 3 | 2 |
| <b>Participants</b> | <b>Secondary Activity</b> |           |      |       |        |           |   |   |   |                |   |   |
| Female              | Cheerleading              | 10        |      | 1     |        | 11        |   |   |   | 6              | 4 | 1 |
| Male                | none                      |           |      |       |        |           |   |   |   |                |   |   |
| <b>Spectators</b>   | <b>Organized Activity</b> |           |      |       |        |           |   |   |   |                |   |   |
| Female              | None                      |           |      |       |        |           |   |   |   |                |   |   |
| Male                | None                      |           |      |       |        |           |   |   |   |                |   |   |

This is a reliability check

- |   |   |  |   |
|---|---|--|---|
| <b>Fitness Related Codes:</b><br>aerobics (dance/step aerobics)<br>fitness stations<br>jogging/running<br>strengthening exercises (pull ups)<br>walking | <b>Sport Related Codes:</b><br>baseball<br>basketball<br>cheer leading<br>dance<br>football<br>gymnastics<br>handball<br>horseshoes<br>soccer<br>tennis/racquet<br>tetherball<br>volleyball | <b>Active Game Related Codes:</b><br>climbing/sliding<br>jumping (rope, hop scotch)<br>manipulatives/racquet<br>tag/chasing games<br>active play | <b>Sedentary Related Codes:</b><br>chess/checkers/cards<br>lying down<br>picnic (food involved)<br>reading<br>standing<br>sitting |
|---|---|--|---|

**Figure 1. Planned activity checklist used in SOPARC methodology**

Note: Source (McKenzie et al., 2006)

The SOPARC planned activity checklist was adjusted for the purposes of this thesis. Date/time of observation, observation duration, weather, and condition of different areas in the park, including if they were accessible, usable, equipped, or had supervised/organized activity, were the information recorded in the activity checklist used in this thesis. Also, the activities that park users were involved in, the level of activities including sedentary (Sed), moderate (Mod), and vigorous (Vig), the gender of park users, their age group, and if there were individuals or groups of two or more people were the other information recorded in the activity checklist used in this thesis. Below is an example form that was used during this study's observations.

**Table 2. An example of planned activity checklist for observation**

| Date: April 9th |                   | Condition of Target Areas:                               |     |     |        |   |           |      |                | yes             | no             |
|-----------------|-------------------|--|-----|-----|--------|---|-----------|------|----------------|-----------------|----------------|
| Period: 20min   |                   | Accessible (e.g. not locked or rented)                   |     |     |        |   |           |      |                | √               |                |
| Morning √       |                   | Usable (e.g. is not excessively wet)                     |     |     |        |   |           |      |                | √               |                |
| Noon            |                   | Organized (Team sporting event)                          |     |     |        |   |           |      |                |                 | √              |
| Afternoon       |                   | Supervised (e.g. by official personnel)                  |     |     |        |   |           |      |                |                 | √              |
| Target Area: #2 |                   | Equipped (e.g. if that area has recreational facilities) |     |     |        |   |           |      |                | √               |                |
| Weather: Sunny  |                   |  |     |     |        |   |           |      |                |                 |                |
| participants    | Activity          | Activity Level   |     |     | Gender |   | Age Group |      |                | Group of People |                |
|                 |                   | Sed  | Mod | Vig | F      | M | Child     | Teen | Adults/Seniors | Individual      | G of 2 or more |
| 1               | play with a child |  | 1   |     |        | 1 |           |      | 1              |                 | 1              |
| 2               | playing           |  | 1   |     |        | 1 | 1         |      |                |                 | 1              |
| 3               | standing          | 1  |     |     | 1      |   |           |      | 1              |                 | 1              |
| 4               | standing          | 1  |     |     | 1      |   |           |      | 1              |                 | 1              |
| 5               | walking           |  | 1   |     |        | 1 |           |      | 1              | 1               |                |
| 6               | play with a child |  | 1   |     |        | 1 |           |      | 1              |                 | 1              |
| 7               | playing           |  | 1   |     |        | 1 | 1         |      |                |                 | 1              |
| 8               | play with a child |  | 1   |     | 1      |   |           |      | 1              |                 | 1              |
| 9               | playing           |  | 1   |     | 1      |   | 1         |      |                |                 | 1              |
| Total           |                   | 2  | 7   | 0   | 4      | 5 | 3         | 0    | 6              | 1               | 8              |

To observe the park, stratified sampling was used to divide the park into three different target areas (strata), which were observed separately. The first target area consists of baseball diamonds, soccer field, and a playground (target area #1). The second target area consists of another playground adjacent to East Fifth Street (target area #2). The third area is a steep area adjacent to Rupert Street with no recreational facilities (target area #3). The picture below shows each target area. It should be clarified that the field house was not observed during the observations.



**Figure 2. Target areas**

Before conducting observations, suitable locations to observe each target area were identified. Two weekends over a four-week period from April 2<sup>nd</sup> to April 24<sup>th</sup> were given to observations. Observations were conducted at various times (morning, noon, and afternoon). Each observation took an hour for the three target areas. The types and level of physical activity including sedentary, moderate and vigorous physical activity, were identified through these observations. These levels of physical activity were defined in accordance with some standard guidelines such as ACSM (American College of Sports Medicine) and WHO (World Health Organization). For example, based on the guidelines provided by WHO some examples of moderate-intensity physical activity are walking, dancing, active involvement in games and sports with children, and walking domestic animals. Some of the cited examples of vigorous-intensity physical activity are running, walking/climbing briskly up a hill, fast cycling, and competitive sports and games such as football, soccer, basketball, volleyball, baseball (the website for World Health Organization can be found at: [http://www.who.int/dietphysicalactivity/physical\\_activity\\_intensity/en/](http://www.who.int/dietphysicalactivity/physical_activity_intensity/en/)). Referring to these examples, activities observed such as walking without/with dog, and playing with children are considered moderate-intensity physical activity. Also, activities observed such as playing baseball, soccer, running or doing some fitness activities are considered vigorous-intensity physical activity. Activities observed such as sitting/relaxing, standing, talking, looking at the view are considered sedentary activity in the reference.

Also, the age group of people observed, including children, teen or adult/senior were recorded. In addition, if park users were individual or in groups of two or more, this was recorded as well. Time of observation (morning, noon, or afternoon), weather, target areas, if the target area was accessible (e.g. not locked or rented), usable (e.g. was not excessively wet), organized/supervised (sporting team), and equipped (e.g. that area had a recreational facility) were recorded as well.

Based on the article by McKenzie et al. (2006), for each observation I scanned the target area from left to right up to six scans and all activities that each individual was involved with were recorded in a planned activity checklist form. Individual people were the units of analysis in this thesis. The sampling frame was all people who used each stratum during the times of observation, and the effective sample was those who were observed and recorded by the researcher during the times of observations.

### **3.4. Park Users Interviews**

The next step in the process of data collection was to conduct survey interviews with the park users. In each target area of the park which was defined during site observations and explained earlier, I attempted to stay in a busy location and conduct systematic sampling for interviewing park users. Based on the crowd, after a certain number of people entering that area (e.g. every third person), they were interviewed. During some observations, the park was very busy and every three or four park users was interviewed. By contrast, during some observations only a few people were using the park and almost every one entering the target area was interviewed. During the interviews, gender, where interviewees exercise, the usage frequency of Sunrise Park, how park users get to the park, what they do in the park, the frequency usage of other parks, the reason they use other parks, and how this park could be improved were asked. These questions were similar to the questions asked in the residential survey. Interviews were very short and focused. Interview questions are available in Appendix B.

Two weekends over a four-week period from April 2<sup>nd</sup> to April 24<sup>th</sup> was the time frame for park user interviews. Interviews with park users were on the same dates of observations, though at different times. It was attempted to not interview park users who

were recorded in the observation. To do that, after each observation was conducted, I left the site for half an hour and then re-started to conduct interviews. Overall, forty-five park users were interviewed.

### **3.5. Interviews with Vancouver Park Board Key Planners**

The last step in the process of data collection was interviewing a number of key commissioners and planners in the VPB. This method would be used to supplement the other sources of data collection, and provide information regarding practices and challenges of making lower income urban park sites successful in contributing to healthy cities.

All commissioners and twenty-two key planners in the VPB were contacted through email. A number of interviewees were interested in the project and a number of them were selected through a snowball sampling strategy. Finally, six commissioners and key planners from the VPB were interviewed. Also, a key staff member from the Thunderbird Community Center was another interviewee. The reason that a key staff member from the Thunderbird Community Center was interviewed was that this person was introduced by one of the interviewees from VPB as a person very related to the topic of this thesis. Also, Thunderbird Community Center is the closest community center to Sunrise Park and provides a playground program for children and families during the summer time in Sunrise Park as well. Interviews were either in person or through phone calls. If the interview was a phone call, then the consent form was emailed to them, read for them in the beginning of the conversation and their agreement to participate in the project was recorded.

Ten questions were asked and each interview took approximately half an hour. Questions surrounding if the VPB has any specific plan for physical activity in neighbourhood parks were asked. Questions regarding the usage, and users of Sunrise Park were discussed and if there is any change being considered for Sunrise Park. Also, topics such as improvement of Sunrise Park for physical activity were discussed. The data from this part complemented the data from the three previous parts and more clearly

illustrated how Sunrise Park is used in general and for physical activity from the planners' perspectives. Interview questions are available in Appendix C.

Although employing different methodologies in this research was challenging and results from each part differed slightly from each other, this mixed methodology was fruitful as the usage of this park for physical activity, how it can be improved, and usage blocking issues were understood thoroughly from different points of view. Park users' interview questions were the short form of the residential questionnaires. These two data resources had some common questions. Responses from these two data resources were compared. Similar responses confirmed the results and explained how park users and residents might use and think about Sunrise Park differently. Some additional factors were investigated through observations as well, such as weather conditions or the time of day. The common topics between the three data resources of residential survey, park user interviews, and park observations were compared. Again, similar findings confirmed the results and also explained how responses from residents and/or park users might be different from how the usage of Sunrise Park was conceived through observations. Park Board planner interviews clarified what officials assumed the usage of Sunrise Park was in general and for physical activity. Results from this part were compared with the other data resources and explained how the officials' and planners' (interviewees') assumptions about the usage of Sunrise Park was compatible with or different from the other parts of the data.

Data collected for this study was analyzed in Excel, SPSS, and NVivo. This part has been explained further in detail in Chapter Four of this study.

## Chapter 4. Analysis

Chapter One introduced the project, Chapter Two reviewed the existing literature, and Chapter Three illustrated preliminary conceptualization and operationalization employed for the purpose of this study. This chapter consists of an analysis of the data employing quantitative and qualitative methods outlined in Chapter Three.

The focus of this study is on the usage of Sunrise Park in general and for physical activity. Sunrise Park is located in the Hastings-Sunrise area. This park is located on one of the highest points of this neighbourhood. It offers a great view of Capitol Hill, Burnaby Mountain, and a great sunrise vista. The park has open space, which is great for a variety of outdoor sports. The size of this park is 3.18 hectares, and recreational facilities of this park are two playgrounds, baseball/softball diamond, soccer field, a wading pool, and sitting areas.



**Figure 3. Sunrise Park**



**Figure 4. Sunrise Park open area**

The first part of this chapter is in reference to local residents' opinion about physical activity and neighborhood parks, Sunrise Park features and conditions, and the comparison of Sunrise Park with other neighborhood parks that residents mostly use. This data has been gathered through the residential survey explained in Chapter Three and has been analyzed in SPSS. The second part of this chapter analyzes the data gathered through site observation using the SOPARC model explained in Chapter Three. This data has been analyzed in Excel. The third part of this chapter analyzes the data gathered through park users' interviews and has been analyzed in SPSS. The fourth and last part of this chapter analyzes the data gathered through interviews with VPB key planners and commissioners. This data has been analyzed in NVivo.

#### **4.1. Data from the Residential Survey Questionnaire**

Data gathered from the survey questionnaire sheds light on demographics, the relation between physical activity of participants and neighborhood parks, participants' opinions on safety and aesthetic features in Sunrise Park, participants' opinions about Sunrise Park features and their conditions, comparison of Sunrise Park with other parks and Sunrise Park's improvement potential. The response rate of this survey was 25.3%.

The twenty-two questions of the questionnaire provided me with hundred and thirty categorical variables including nominal and ordinal variables. The frequency of all these

variables was first computed. Then the relation between the gender variable and some other variables was analyzed to understand if different gender groups use Sunrise Park differently for physical activity as well. In the following sections, the data from each part of the questionnaire will be illustrated.

The first part of the questionnaire was demographic in nature, including gender, age groups, mother tongue, length of living in the neighborhood close to Sunrise Park, and if participants have any access barriers to Sunrise Park. The frequency of gender, age groups, and mother tongue data were compared to this data from Statistics Canada 2011 Census. The frequency of gender and mother tongue showed that the sample was representative of the Census Tract on these characteristics. However, it should be clarified that since parks usage is related to distance, the result of this survey is only representative of the people living within ¼ mile of this park, which omits approximately 50% of the whole census tract.

Among respondents, 43.8% were male, 53.1 % were female and 3.1% were others.

**Table 3. Comparison of different respondents' gender group**

|       |        | Gender    |         |               |                    |
|-------|--------|-----------|---------|---------------|--------------------|
|       |        | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | Male   | 14        | 43.8    | 43.8          | 43.8               |
|       | Female | 17        | 53.1    | 53.1          | 96.9               |
|       | Other  | 1         | 3.1     | 3.1           | 100.0              |
|       | Total  | 32        | 100.0   | 100.0         |                    |

The most frequent respondents (31.3%) were between thirty to thirty-nine years old. Then, 21.9% were 40 to 49 years old. The Table showing the age groups of respondents is below.

**Table 4. Age groups of respondents**

|       |             | Age       |         |               |                    |
|-------|-------------|-----------|---------|---------------|--------------------|
|       |             | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | 19 to 29    | 5         | 15.6    | 15.6          | 15.6               |
|       | 30 to 39    | 10        | 31.3    | 31.3          | 46.9               |
|       | 40 to 49    | 7         | 21.9    | 21.9          | 68.8               |
|       | 50 to 59    | 5         | 15.6    | 15.6          | 84.4               |
|       | 60 to 65    | 2         | 6.3     | 6.3           | 90.6               |
|       | 66 and over | 3         | 9.4     | 9.4           | 100.0              |
|       | Total       | 32        | 100.0   | 100.0         |                    |

Among respondents, the most frequent response for mother tongue was English (31.3%). The list of mother tongue of respondents is shown in the Table below.

**Table 5. Mother tongue of respondents**

|       |                    | Mother Tongue |         |               |                    |
|-------|--------------------|---------------|---------|---------------|--------------------|
|       |                    | Frequency     | Percent | Valid Percent | Cumulative Percent |
| Valid | English            | 10            | 31.3    | 31.3          | 31.3               |
|       | Cantonese          | 9             | 28.1    | 28.1          | 59.4               |
|       | Italian            | 4             | 12.5    | 12.5          | 71.9               |
|       | Mandarin           | 3             | 9.4     | 9.4           | 81.3               |
|       | Vietnamese         | 3             | 9.4     | 9.4           | 90.6               |
|       | Tagalog (Filipino) | 1             | 3.1     | 3.1           | 93.8               |
|       | Punjabi            | 1             | 3.1     | 3.1           | 96.9               |
|       | Other, Fukien      | 1             | 3.1     | 3.1           | 100.0              |
|       | Total              | 32            | 100.0   | 100.0         |                    |

46.9% of respondents have been living in the neighbourhood close to Sunrise Park for more than 10 years, 21.9% of them were in the neighbourhood between 3 to 4 years, 15.6% were living in the neighborhood between 5 to 9 years, and only 3.1% of respondents have been living in the neighbourhood for less than a year. As most of the respondents have been living in the vicinity of Sunrise Park, I would conclude that their responses are credible for this study to represent neighbourhood attitudes toward and usage of the park as a whole. Among all respondents, only 3.1% experience mobility barriers to go to

Sunrise Park, and most of the respondents (96.9%) did not have any mobility barriers to use Sunrise Park.

The second part of the questionnaire “Physical Activity and Neighbourhood Parks” was about personal physical activity and usage of Sunrise Park. The definition of exercise and different types of physical activity used in this questionnaire were provided for respondents as well in this section. The first question of this section asked respondents where they usually exercise. The highest percentage of respondents use public parks for physical activity and exercise. The Table below shows the frequency of different locations respondents picked for physical activity.

**Table 6. Locations respondents usually exercise**

| Exercise Location                                |  | Responses |         | Percent of Cases |
|--|--|-----------|---------|------------------|
|  |  | N         | Percent |                  |
| Park   |  | 16        | 30.8%   | 50.0%            |
| Home   |  | 14        | 26.9%   | 43.8%            |
| Community center                                 |  | 8         | 15.4%   | 25.0%            |
| Other public spaces such as seawall or sidewalks |  | 6         | 11.5%   | 18.8%            |
| Private club                                     |  | 4         | 7.7%    | 12.5%            |
| Exercise room in building                        |  | 2         | 3.8%    | 6.3%             |
| I don't usually exercise                         |  | 2         | 3.8%    | 6.3%             |
| Total  |  | 52        | 100.0%  | 162.5%           |

Respondents were asked how long they do physical activity (exercise) in a typical week. In this question, the intensity of physical activity (moderate or vigorous) was not asked. Most respondents conduct physical activity (at any level) in a typical week either between 31 minutes and 60 minutes or more than 2.5 hours. Based on the Canadian physical activity guidelines for adults (age 18 to 65) years old, adults should accumulate at least 150 minutes (or 2.5 hours) of moderate-to vigorous-intensity aerobic physical activity per week, in bouts of 10 minutes or more (Canadian Physical Activity, and Sedentary Behaviour Guidelines). Although the intensity of physical activity respondents got involved in is not clear from this question, I can make a conclusion that respondents

are not meeting Canadian guidelines for physical activity since only 28.1% exercise more than 150 minutes per week.

**Table 7. Length of physical activity/exercise of respondents for a typical week**

|       |  | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|--|-----------|---------|---------------|--------------------|
| Valid | Less than 30 minutes                               | 2         | 6.3     | 6.3           | 6.3                |
|       | Between 31 and 60 minutes                          | 9         | 28.1    | 28.1          | 34.4               |
|       | Between 61 (1 hour) and 90 minutes (1.5 hours)     | 7         | 21.9    | 21.9          | 56.3               |
|       | Between 91 (1.5 hours) and 150 minutes (2.5 hours) | 5         | 15.6    | 15.6          | 71.9               |
|       | More than 151 minutes (2.5 hours)                  | 9         | 28.1    | 28.1          | 100.0              |
|       | Total  | 32        | 100.0   | 100.0         |                    |

All the respondents had visited Sunrise Park before. Respondents were asked to specify their frequency of usage of Sunrise Park in warm and dry and cold and wet weather on a five-point scale (less than once a month, one to three times a month, one to three times a week, four to five times a week, and daily/almost daily). The usage of Sunrise Park in warm and dry weather was significantly more than the usage of this park during cold and wet weather. Below are the Tables showing the frequency of usage of Sunrise Park during warm and dry weather and cold and wet weather.

**Table 8. Usage frequency of Sunrise Park during warm and dry weather**

|       |                        | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|------------------------|-----------|---------|---------------|--------------------|
| Valid | Less than once a month | 6         | 18.8    | 18.8          | 18.8               |
|       | 1 to 3 times a month   | 3         | 9.4     | 9.4           | 28.1               |
|       | 1 to 3 times a week    | 12        | 37.5    | 37.5          | 65.6               |
|       | 4 to 5 times a week    | 8         | 25.0    | 25.0          | 90.6               |
|       | Daily or almost daily  | 3         | 9.4     | 9.4           | 100.0              |
|       | Total                  | 32        | 100.0   | 100.0         |                    |

**Table 9. Usage frequency of Sunrise Park during cold and wet weather**

|       |                        | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|------------------------|-----------|---------|---------------|--------------------|
| Valid | Never                  | 9         | 28.1    | 28.1          | 28.1               |
|       | Less than once a month | 10        | 31.3    | 31.3          | 59.4               |
|       | 1 to 3 times a month   | 9         | 28.1    | 28.1          | 87.5               |
|       | 1 to 3 times a week    | 3         | 9.4     | 9.4           | 96.9               |
|       | 4 to 5 times a week    | 1         | 3.1     | 3.1           | 100.0              |
|       | Total                  | 32        | 100.0   | 100.0         |                    |

While more than a third of respondents (37.5%) use Sunrise Park 1 to 3 times a week during warm and dry weather, during cold and wet weather nearly a third of respondents (31.3%) use this park less than once a month. As was discussed in the literature review, weather is one of the independent variables affecting usage of parks and the results here show that too.

How respondents usually get to the park was one of the other questions asked in order to evaluate if parks can encourage physical activity indirectly by encouraging people to walk to the park. It should be mentioned that walking to parks on its own might also depend on other factors such as safety of the neighbourhood, aesthetic quality of neighbourhood, walking distance, age of users and other factors. In the case of Sunrise Park, most of the respondents (93.9%) walk to the park and only 6.1% drive to the park.

**Table 10. Frequency of how respondents get to Sunrise Park**

|                                 |                             | Responses |         | Percent of Cases |
|---------------------------------|-----------------------------|-----------|---------|------------------|
|                                 |                             | N         | Percent |                  |
| How Respondents Get to the Park | Getting to the Park by Walk | 31        | 93.9%   | 96.9%            |
|                                 | Getting to the Park by Car  | 2         | 6.1%    | 6.3%             |
| Total                           |                             | 33        | 100.0%  | 103.1%           |

What respondents do in this park was the next question, and using the playground (20.5%), sitting and relaxing (16.9%), walking without a dog (15.7%), and walking with a dog (12%) were the most common activities done in this park by respondents. The Table below shows the result.

**Table 11. Park usage**

|            |   | Responses |         | Percent of Cases |
|------------|---|-----------|---------|------------------|
|            |   | N         | Percent |                  |
| Park Usage | Using the Playground/Playing with a Child in the Park                 | 17        | 20.5%   | 53.1%            |
|            | Sitting/Relaxing in the Park  | 14        | 16.9%   | 43.8%            |
|            | Walking without a Dog in the Park                                     | 13        | 15.7%   | 40.6%            |
|            | Walking the Dog in the Park   | 10        | 12.0%   | 31.3%            |
|            | Meet Friends in the Park  | 9         | 10.8%   | 28.1%            |
|            | Playing Soccer in the Park  | 7         | 8.4%    | 21.9%            |
|            | Other group sports or physical activity such as Frisbee or volleyball | 5         | 6.0%    | 15.6%            |
|            | Using the Park for Celebrations and Picnics                           | 4         | 4.8%    | 12.5%            |
|            | Other individual sports or physical activity such as running          | 3         | 3.6%    | 9.4%             |
|            | Playing Baseball/Softball in the Park                                 | 1         | 1.2%    | 3.1%             |
| Total      |   | 83        | 100.0%  | 259.4%           |

The third part of the questionnaire “Safety and Aesthetic Features in the Park” evaluated if respondents feel safe in the park, and what safety and nuisance concerns they have. More than half of the respondents (56.3%) feel the park is safe, 34.4% feel it is very safe and only 9.4% feel it is not very safe. The Table below shows the result for how safe respondents feel in Sunrise Park.

**Table 12. How safe respondents feel**

|       |               | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|---------------|-----------|---------|---------------|--------------------|
| Valid | Very safe     | 11        | 34.4    | 34.4          | 34.4               |
|       | Not very safe | 3         | 9.4     | 9.4           | 43.8               |
|       | Safe          | 18        | 56.3    | 56.3          | 100.0              |
|       | Total         | 32        | 100.0   | 100.0         |                    |

Poor lighting was the highest safety/nuisance concern (22.6%) respondents had regarding Sunrise Park. Excessive litter (17.7%) and too few people (12.9%) were the second and third common responses, respectively. Also, 12.9% of respondents said no

safety issues are present in this park. The Table below shows the frequency of safety concerns by respondents.

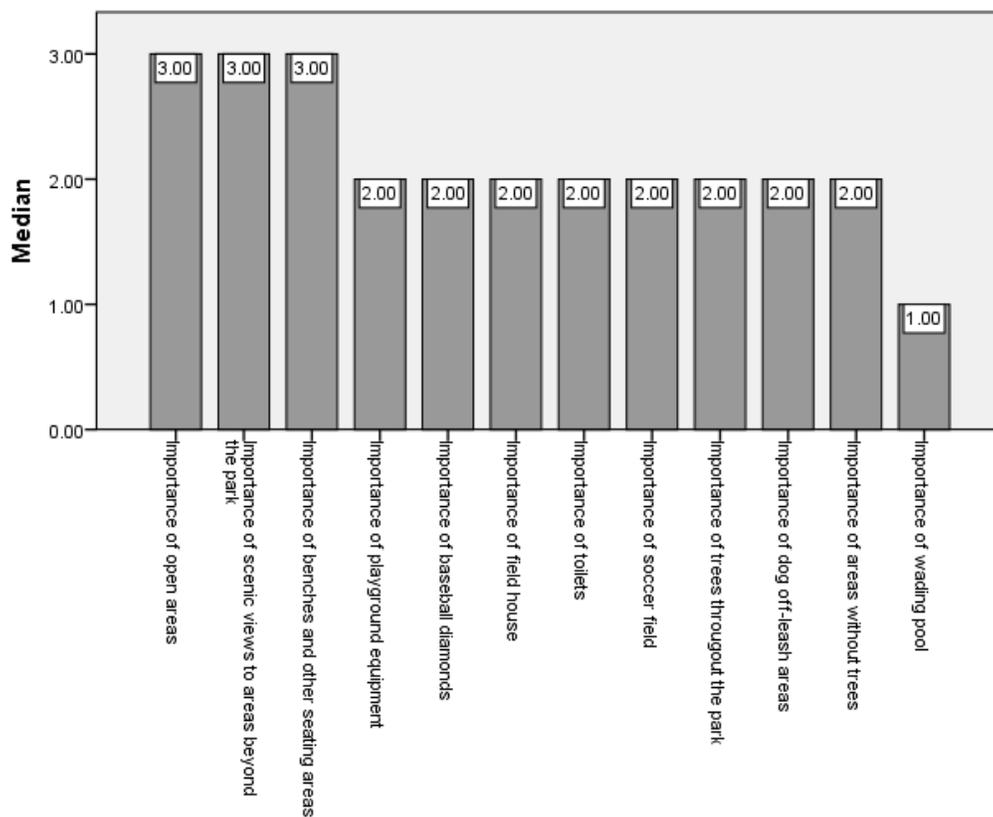
**Table 13. Frequency of safety/nuisance concerns**

| Safety Concerns                             |  | Responses |         | Percent of Cases |
|---|--|-----------|---------|------------------|
|   |  | N         | Percent |                  |
| Poor Lighting                               |  | 14        | 22.6%   | 43.8%            |
| Excessive Litter                            |  | 11        | 17.7%   | 34.4%            |
| Too Few People                              |  | 8         | 12.9%   | 25.0%            |
| None present                                |  | 8         | 12.9%   | 25.0%            |
| Evidence of threatening behavior or persons |  | 7         | 11.3%   | 21.9%            |
| Poor maintenance                            |  | 5         | 8.1%    | 15.6%            |
| Dangerous spots in the park                 |  | 4         | 6.5%    | 12.5%            |
| Vandalism                                   |  | 2         | 3.2%    | 6.3%             |
| Excessive Animal Waste                      |  | 2         | 3.2%    | 6.3%             |
| Excessive Noise                             |  | 1         | 1.6%    | 3.1%             |
| Total                                       |  | 62        | 100.0%  | 193.8%           |

The fourth part of the questionnaire “Park Features and Park Conditions” asked respondents to evaluate the importance of the presence of Sunrise Park’s features for being involved in physical activity, and to rate the condition of different areas of the park on a three-point scale. The level of importance of the park’s existing features, such as playground equipment, baseball diamonds, the field house<sup>1</sup>, open areas, scenic views, wading pool, benches, soccer field, trees, dog off-leash areas, and toilets was probed on a three point Likert Scale. The article by Schipperijn et al. (2010) was used to describe the features of Sunrise Park. This research used the EAPRS tool to describe urban green space features. Overall forty urban green space features were defined in the research by Schipperijn et al. (2010). Among all these features, those that existed in Sunrise Park were the features provided for respondents in this research. Table D1 in Appendix D compares the level of the importance of each of the park features. As the most appropriate measure

<sup>1</sup> Field house usually refers to a large building providing a variety of athletic facilities such as a basketball court, or it can be a building usually adjacent to an athletic field and equipped with changing rooms, lockers, showers and etc. In Sunrise Park the field house was only a small rental hall operated by the community association for various occasions.

of Likert Scale data is the mode or the most frequent responses, this measure has been used for the comparison of the importance level of all park features. The most frequent responses for the level of importance of Sunrise Park’s features as “very important” for being involved in physical activity were “open areas”, “scenic views to areas beyond the park”, and “benches and other seating areas”. It should be mentioned that my assumption is that respondents evaluate the importance of the park’s features for using the park in general and not specifically for physical activity. The Figure below demonstrates this comparison.

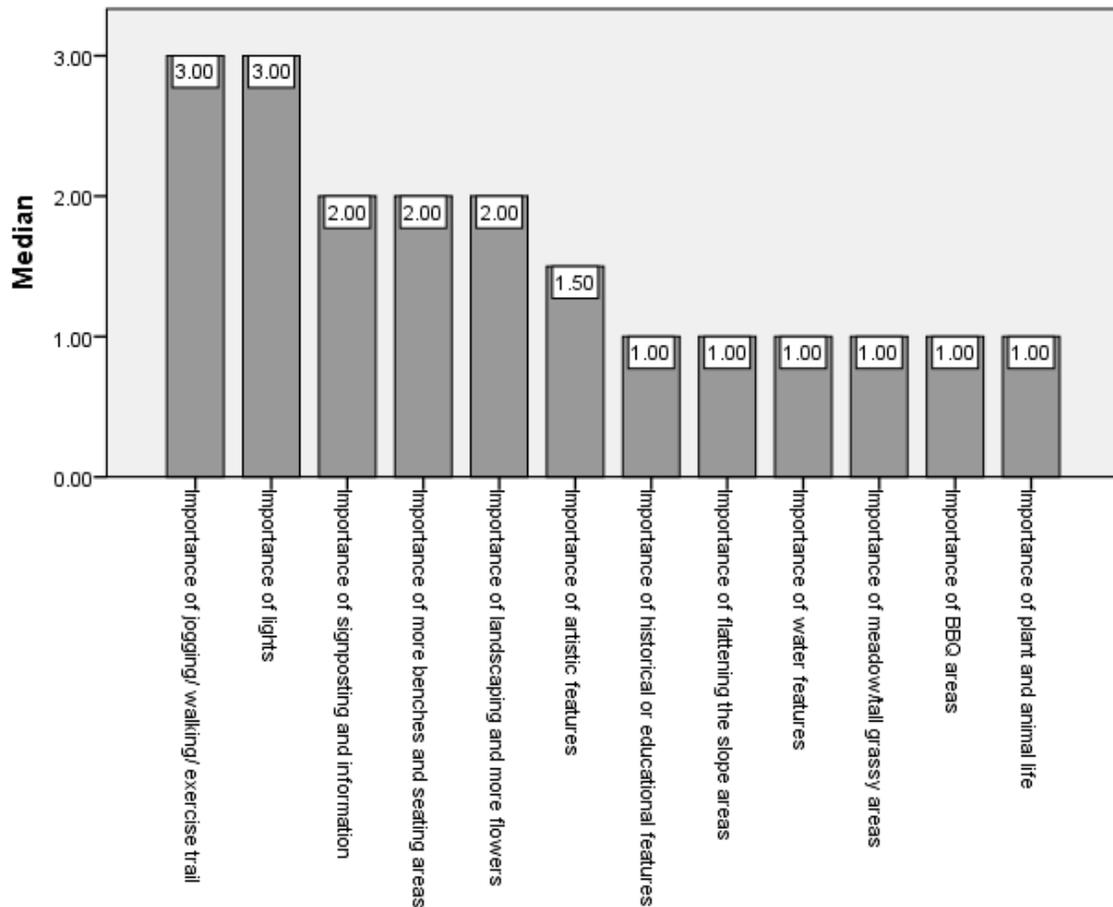


**Figure 5. Comparison of the level of importance of Sunrise Park’s features for being involved in PA**

The next question of the fourth part of the questionnaire asked respondents to rate the importance of features that might not exist in the park, that might otherwise encourage them to be involved in more physical activity based on a three-point Likert Scale (not important, important, and very important). In order to provide respondents some specific

options to rate, the article by Schipperijn et al. (2010) was applied as a reference. This research used the EAPRS tool to describe urban green space features. Overall forty urban green space features were defined in the research by Schipperijn et al. (2010). Not all of these features were applied for this thesis as many of them were not compatible with Sunrise Park. Twelve features that were compatible with Sunrise Park were provided to respondents. For instance, a bike path was not considered as a feature for Sunrise Park, as this park is not big enough for providing bike paths. These features are jogging/walking/exercise trails, lights, varied plant and animal life, sign posting and information, increased benches, evidence of landscaping, artistic features, historical or educational features, flattening the slope areas, water features, meadow, or a BBQ area. Table D2 in Appendix D compares the level of the importance of each feature.

The level of importance of these features has been compared by using a median measure for the level of importance of each feature. The most frequent responses for the level of importance of compared features as “very important” for being involved in physical activity were “jogging/walking trails”, and “lights”. The Figure below shows this comparison.



**Figure 6. Comparison of level of importance of different features for being involved in PA**

The last question in this part of the questionnaire asked respondents to rate conditions in different areas of the park. Based on the responses received, we can conclude that the playground area, baseball diamonds, dog off-leash areas, and soccer field are in good condition; while the field house, wading pool, and toilets are not in good condition. Good condition in this research means: looks clean and well-maintained (e.g., minimal rust, no graffiti, no broken parts, even surface, etc.). Table D3 in Appendix D illustrates the level of condition of each area in Sunrise Park.

The fifth and last part of the questionnaire “Comparison with Other Parks and Park Improvements” consisted of questions on other parks that respondents may use regularly, the reason they use them and how Sunrise Park can be improved by comparison. The frequency of other park usage for the most frequent response was monthly (34.4%) and

a couple of times per month (28.1%). The Table below shows the frequency of usage of other parks by respondents.

**Table 14. Usage frequency of other parks**

|       |                           | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|---------------------------|-----------|---------|---------------|--------------------|
| Valid | Daily                     | 1         | 3.1     | 3.1           | 3.1                |
|       | Monthly                   | 11        | 34.4    | 34.4          | 37.5               |
|       | Few times a week          | 3         | 9.4     | 9.4           | 46.9               |
|       | Few times a year          | 5         | 15.6    | 15.6          | 62.5               |
|       | Once per week             | 1         | 3.1     | 3.1           | 65.6               |
|       | Never                     | 2         | 6.3     | 6.3           | 71.9               |
|       | Couple of times per month | 9         | 28.1    | 28.1          | 100.0              |
|       | Total                     | 32        | 100.0   | 100.0         |                    |

Rupert Park (20.5%), Stanley Park (18.2%), and Trout Lake Park (15.9%) were the parks that respondents most commonly used, other than Sunrise Park.

**Table 15. Other parks respondents usually go other than Sunrise Park**

|                            |  | Responses |         |                  |
|----------------------------|--|-----------|---------|------------------|
|                            |  | N         | Percent | Percent of Cases |
| Other Parks Respondents Go | Rupert Park  | 9         | 20.5%   | 32.1%            |
|                            | Stanley Park   | 8         | 18.2%   | 28.6%            |
|                            | Trout Lake Park  | 7         | 15.9%   | 25.0%            |
|                            | Other parks respondents go most often such as Clark Park, Victoria Park, New Brighten Park and etc | 7         | 15.9%   | 25.0%            |
|                            | Queen Elizabeth Park   | 6         | 13.6%   | 21.4%            |
|                            | Grandview Park   | 5         | 11.4%   | 17.9%            |
|                            | Richmond Park  | 2         | 4.5%    | 7.1%             |
| Total                      |  | 44        | 100.0%  | 157.1%           |

The reason respondents claim for using other parks are mostly the existence of walking/biking paths (29.1%), and more activities (14.5%). Table below shows the frequency of different reasons that respondents offered for using other parks as well.

**Table 16. Reasons respondents use other parks than Sunrise Park**

|                                      |  | Responses |         | Percent of Cases |
|--------------------------------------|--|-----------|---------|------------------|
|                                      |  | N         | Percent |                  |
| Reason Respondents Go to Other Parks | Walking/biking Paths                                 | 16        | 29.1%   | 59.3%            |
|                                      | More Activity  | 8         | 14.5%   | 29.6%            |
|                                      | Nice View and Scenery                                | 7         | 12.7%   | 25.9%            |
|                                      | Recreational Facility                                | 6         | 10.9%   | 22.2%            |
|                                      | Close  | 6         | 10.9%   | 22.2%            |
|                                      | Different  | 5         | 9.1%    | 18.5%            |
|                                      | More People  | 4         | 7.3%    | 14.8%            |
|                                      | Others such as water features, cleanness and gardens | 3         | 5.5%    | 11.1%            |
| Total                                |  | 55        | 100.0%  | 203.7%           |

The next question in this part asked respondents what they would like to see in Sunrise Park that would cause them to use this park more for physical activity. The most common answers were providing walking paths and trails (16.7%), park events (12.9%), and improving the children's areas (12.9%). The Table below illustrates the results for this question.

**Table 17. Opinions for improvement of Sunrise Park**

|                     |  | Responses |         | Percent of Cases |
|---------------------|--|-----------|---------|------------------|
|                     |  | N         | Percent |                  |
| Park Improvements   | Walking paths or trails                | 22        | 16.7%   | 68.8%            |
|                     | Improved children area                 | 17        | 12.9%   | 53.1%            |
|                     | Park events                            | 17        | 12.9%   | 53.1%            |
|                     | More youth sports leagues              | 12        | 9.1%    | 37.5%            |
|                     | Community gardens                      | 12        | 9.1%    | 37.5%            |
|                     | More trees/different landscaping       | 11        | 8.3%    | 34.4%            |
|                     | Park concerts/dances                   | 8         | 6.1%    | 25.0%            |
|                     | Adult sports leagues                   | 7         | 5.3%    | 21.9%            |
|                     | Bicycle Paths                          | 6         | 4.5%    | 18.8%            |
|                     | Improved Off-leash dog area            | 6         | 4.5%    | 18.8%            |
|                     | Providing part-time staffing           | 4         | 3.0%    | 12.5%            |
|                     | More fitness classes                   | 3         | 2.3%    | 9.4%             |
|                     | Providing competitions in the park     | 3         | 2.3%    | 9.4%             |
|                     | Other                                  | 2         | 1.5%    | 6.3%             |
|                     | Other supervised, organized activities | 1         | 0.8%    | 3.1%             |
| Adult dance classes | 1                                      | 0.8%      | 3.1%    |                  |
| Total               |  | 132       | 100.0%  | 412.5%           |

The next question asked respondents to explain any issues in the park that might discourage them from using this park, particularly for physical activity. The most common answer was no walking path (23.8%). However, it should be mentioned that I got the sense that respondents may have replied to this question considering using Sunrise Park “in general” and not specifically for “physical activity”. For instance, a few respondents mentioned that “no seating areas/benches” was a hindrance to not to using Sunrise Park for physical activity. Of course, usually when someone is involved in physical activity, they do not require “seating areas/benches”. Another point that should be clarified here is that the previous question asked respondents what can be improved in Sunrise Park to encourage them to use this park for physical activity. None of the respondents asked for “adding recreational facilities” while 14.3% (the second most frequent respondents) said that “no recreational facility” in Sunrise Park is preventing them from using this park for

physical activity. The Table below shows different issues respondents mentioned as discouraging their physical activity.

**Table 18. Residential opinions about usage preventing issues in Sunrise Park**

|   |  | Responses |         | Percent of Cases |
|---|--|-----------|---------|------------------|
|   |  | N         | Percent |                  |
| Usage Preventing Issues in Sunrise Park | No walking path  | 10        | 23.8%   | 37.0%            |
|   | No recreational facilities                                     | 6         | 14.3%   | 22.2%            |
|   | Drug users   | 5         | 11.9%   | 18.5%            |
|   | Nothing  | 5         | 11.9%   | 18.5%            |
|   | No community/too quiet   | 4         | 9.5%    | 14.8%            |
|   | Issues in Sunrise Park Prevents the Usage for PA:<br>Not clean | 4         | 9.5%    | 14.8%            |
|   | No seating areas and benches                                   | 3         | 7.1%    | 11.1%            |
|   | Old children area  | 3         | 7.1%    | 11.1%            |
|   | Bugs   | 2         | 4.8%    | 7.4%             |
|   | Total  | 42        | 100.0%  | 155.6%           |

The last question of the questionnaire asked respondents if they have any additional comments about Sunrise Park. The most frequent item respondents mentioned was that Sunrise Park's view is fantastic (23.1%). Then, 15.4% of respondents asked for policing for drug users, and 15.4% of respondents mentioned that this park is beautiful. The Table below shows different overall comments respondents had about Sunrise park.

**Table 19. Additional comments**

|                     |  | Responses |         | Percent of Cases |
|---------------------|--|-----------|---------|------------------|
|                     |  | N         | Percent |                  |
| Additional Comments | View   | 6         | 23.1%   | 31.6%            |
|                     | More policy/security/policing for drug users   | 4         | 15.4%   | 21.1%            |
|                     | It's a beautiful Park                          | 4         | 15.4%   | 21.1%            |
|                     | Requires better lighting                       | 3         | 11.5%   | 15.8%            |
|                     | Additional Comments about Provide walking path | 3         | 11.5%   | 15.8%            |
|                     | Love it  | 2         | 7.7%    | 10.5%            |
|                     | Nothing  | 2         | 7.7%    | 10.5%            |
|                     | More signposting especially for dog owners     | 1         | 3.8%    | 5.3%             |
|                     | Better playground for children e.g. zip line   | 1         | 3.8%    | 5.3%             |
| Total               |  | 26        | 100.0%  | 136.8%           |

After calculating the frequency of the variables explained above, the relationship between gender and number of variables was studied to understand if different genders use Sunrise Park differently in general and for physical activity. The variables were:

- *Usage frequency of the park in warm and dry weather*
- *Usage frequency of the park in cold and wet weather*
- *Park usage*

The relationship between the variables of gender and usage frequency of the park in warm and dry weather was calculated by using the chi-square test. Chi-Square=1.711 with degree of freedom (df) of 4, and P value of .789>.05 shows that there is no evidence of a statistically significant relationship between these two variables. This means that the level of usage of Sunrise Park in warm and dry weather is not significantly different between males and females. The Table below shows the independence of these two variables.

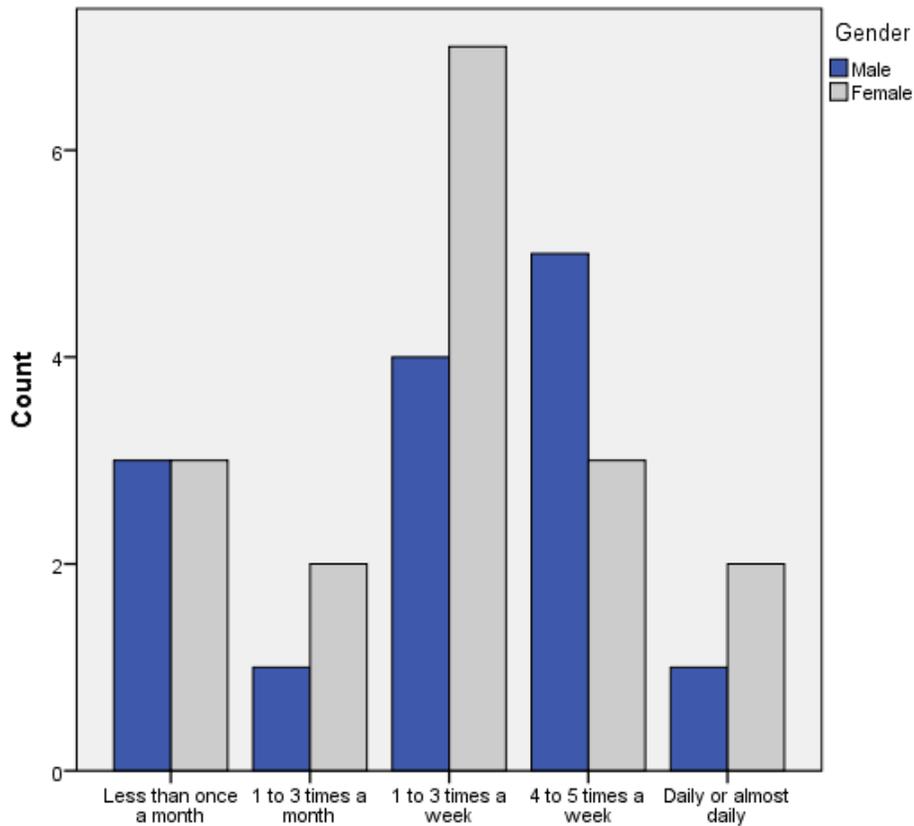
**Table 20. Gender and usage frequency in warm and dry weather crosstabulation**

|             |   | Less than once a month | 1 to 3 times a month | 1 to 3 times a week | 4 to 5 times a week | Daily or almost daily |        |
|-------------|---|------------------------|----------------------|---------------------|---------------------|-----------------------|--------|
| Gender Male | Count                                     | 3                      | 1                    | 4                   | 5                   | 1                     | 14     |
|             | % within Gender                           | 21.4%                  | 7.1%                 | 28.6%               | 35.7%               | 7.1%                  | 100.0% |
|             | % within Usage Frequency Warm&Dry Weather | 50.0%                  | 33.3%                | 36.4%               | 62.5%               | 33.3%                 | 45.2%  |
|             | % of Total                                | 9.7%                   | 3.2%                 | 12.9%               | 16.1%               | 3.2%                  | 45.2%  |
| Female      | Count                                     | 3                      | 2                    | 7                   | 3                   | 2                     | 17     |
|             | % within Gender                           | 17.6%                  | 11.8%                | 41.2%               | 17.6%               | 11.8%                 | 100.0% |
|             | % within Usage Frequency Warm&Dry Weather | 50.0%                  | 66.7%                | 63.6%               | 37.5%               | 66.7%                 | 54.8%  |
|             | % of Total                                | 9.7%                   | 6.5%                 | 22.6%               | 9.7%                | 6.5%                  | 54.8%  |
| Total       | Count                                     | 6                      | 3                    | 11                  | 8                   | 3                     | 31     |
|             | % within Gender                           | 19.4%                  | 9.7%                 | 35.5%               | 25.8%               | 9.7%                  | 100.0% |
|             | % within Usage Frequency Warm&Dry Weather | 100.0%                 | 100.0%               | 100.0%              | 100.0%              | 100.0%                | 100.0% |
|             | % of Total                                | 19.4%                  | 9.7%                 | 35.5%               | 25.8%               | 9.7%                  | 100.0% |

**Table 21. Gender and usage frequency in warm and dry weather chi-square test**

|                    | Value  | df | Asymptotic Significance (2-sided) |
|--------------------|--------|----|-----------------------------------|
| Pearson Chi-Square | 1.711a | 4  | .789                              |
| N of Valid Cases   | 31     |    |                                   |

a. 9 cells (90.0%) have expected count less than 5. The minimum expected count is 1.35.



**Figure 7. Gender and usage frequency in warm and dry weather bar chart**

In order to ensure there is no statistical relationship between gender and usage of this park in warm and dry weather, the usage frequencies were grouped into two groups of “less than once per week” and “more than once per week’. Crosstabulation of gender variable and the new usage frequency variable confirms that there is no statistically significant relationship between gender and usage frequency of Sunrise Park in warm and dry weather. This crosstabulation explains that 28.6% of males use this park less than once per week in warm and dry weather, while this number for females is 29.4%. Also, 71.4% of males and 70.6% of females uses this park more than once per week in warm and dry weather. The Chi-Square Test with the value of .003, df of 1 and P value of .959 > .05 confirms that there is no relationship between gender and usage of Sunrise Park in warm and dry weather. Tables below show the independence of these two variables.

**Table 22 Gender and new usage frequency in warm and dry weather crosstabulation**

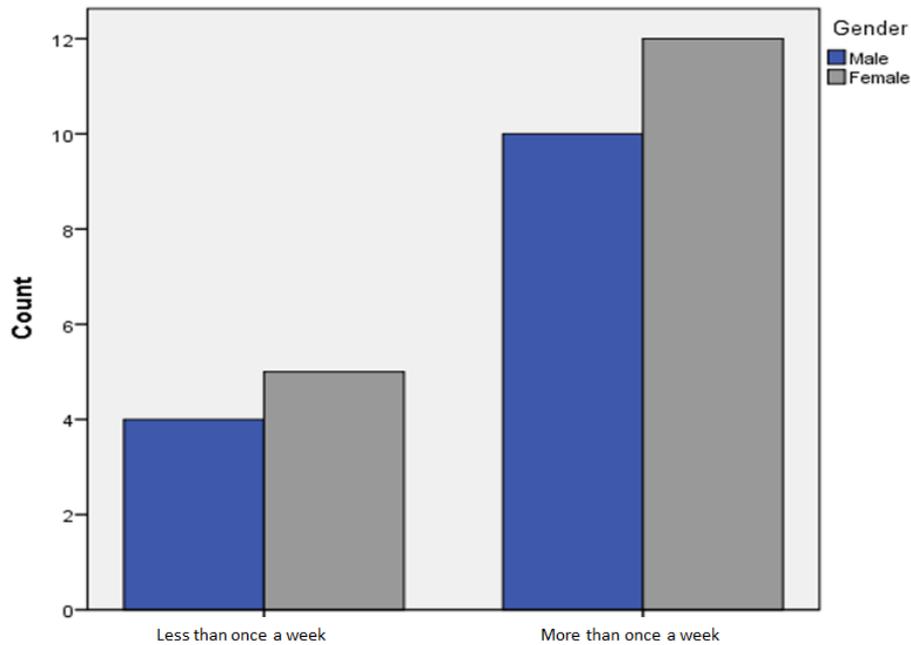
|                                     |  | Gender                                       |        | Total  |        |
|-------------------------------------|--|--|--------|--------|--------|
|                                     |  | Male   | Female |        |        |
| Usage Frequency<br>Warm&Dry Weather | Less than once per week                      | Count  | 4      | 5      | 9      |
|                                     |  | % within Usage Frequency<br>Warm&Dry Weather | 44.4%  | 55.6%  | 100.0% |
|                                     |  | % within Gender                              | 28.6%  | 29.4%  | 29.0%  |
|                                     | More than once per week                      | Count  | 10     | 12     | 22     |
|                                     |  | % within Usage Frequency<br>Warm&Dry Weather | 45.5%  | 54.5%  | 100.0% |
|                                     |  | % within Gender                              | 71.4%  | 70.6%  | 71.0%  |
| Total                               | Count  | 14   | 17     | 31     |        |
|                                     | % within Usage Frequency<br>Warm&Dry Weather | 45.2%  | 54.8%  | 100.0% |        |
|                                     | % within Gender                              | 100.0%                                       | 100.0% | 100.0% |        |

**Table 23. Gender and new usage frequency in warm and dry weather chi-square test**

|                     | Value | df | Asymptotic<br>Significance (2-<br>sided) | Exact Sig. (2-<br>sided) | Exact Sig. (1-<br>sided) |
|---------------------|-------|----|--|--------------------------|--------------------------|
| Pearson Chi-Square  | .003a | 1  | .959                                     |                          |                          |
| Fisher's Exact Test |       |    |  | 1.000                    | .637                     |
| N of Valid Cases    | 31    |    |  |                          |                          |

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 4.06.

b. Computed only for a 2x2 table



**Figure 8. Gender and new usage frequency in warm and dry weather bar chart**

Crosstabulation of the two variables of gender and usage frequency in cold and wet weather shows that there is no evidence of a statistically significant relationship between these two variables. This crosstabulation gives us the Chi-Square value of 4.799 with df of 4 and P value of  $.309 > 0.05$ . The Table below shows the result of this crosstabulation.

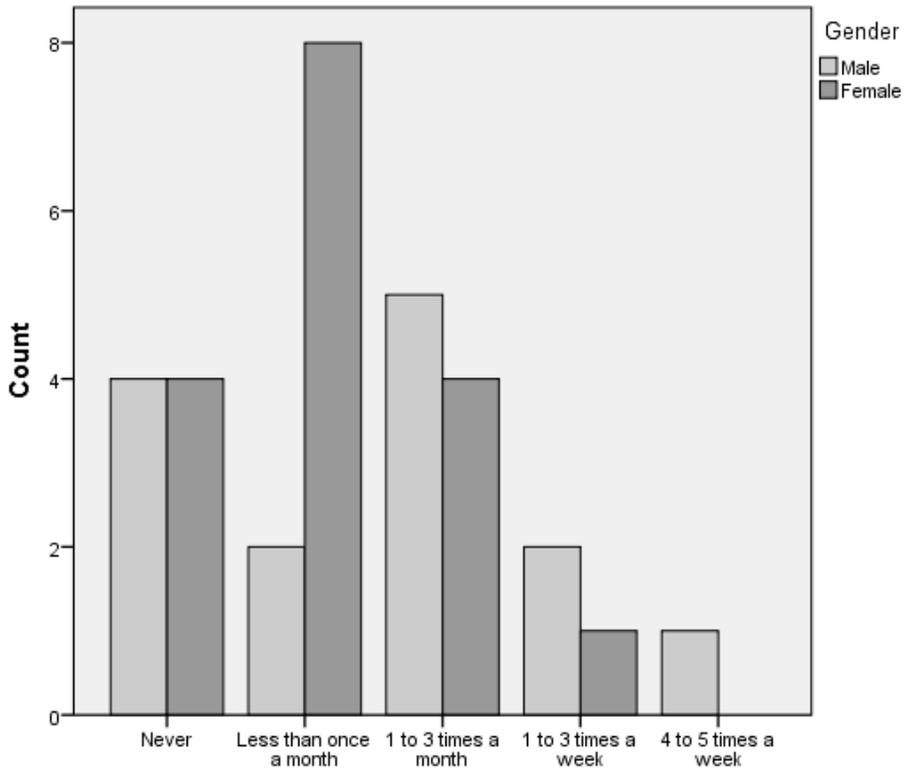
**Table 24. Gender and usage frequency in cold and wet weather crosstabulation**

|             |   | Never  | Less than once a month | 1 to 3 times a month | 1 to 3 times a week | 4 to 5 times a week |        |
|-------------|---|--------|------------------------|----------------------|---------------------|---------------------|--------|
| Gender Male | Count                                     | 4      | 2                      | 5                    | 2                   | 1                   | 14     |
|             | % within Gender                           | 28.6%  | 14.3%                  | 35.7%                | 14.3%               | 7.1%                | 100.0% |
|             | % within Usage Frequency Cold&Wet Weather | 50.0%  | 20.0%                  | 55.6%                | 66.7%               | 100.0%              | 45.2%  |
|             | % of Total                                | 12.9%  | 6.5%                   | 16.1%                | 6.5%                | 3.2%                | 45.2%  |
| Female      | Count                                     | 4      | 8                      | 4                    | 1                   | 0                   | 17     |
|             | % within Gender                           | 23.5%  | 47.1%                  | 23.5%                | 5.9%                | 0.0%                | 100.0% |
|             | % within Usage Frequency Cold&Wet Weather | 50.0%  | 80.0%                  | 44.4%                | 33.3%               | 0.0%                | 54.8%  |
|             | % of Total                                | 12.9%  | 25.8%                  | 12.9%                | 3.2%                | 0.0%                | 54.8%  |
| Total       | Count                                     | 8      | 10                     | 9                    | 3                   | 1                   | 31     |
|             | % within Gender                           | 25.8%  | 32.3%                  | 29.0%                | 9.7%                | 3.2%                | 100.0% |
|             | % within Usage Frequency Cold&Wet Weather | 100.0% | 100.0%                 | 100.0%               | 100.0%              | 100.0%              | 100.0% |
|             | % of Total                                | 25.8%  | 32.3%                  | 29.0%                | 9.7%                | 3.2%                | 100.0% |

**Table 25. Gender and usage frequency in cold and wet weather chi-square test**

|                    | Value  | df | Asymptotic Significance (2-sided) |
|--------------------|--------|----|-----------------------------------|
| Pearson Chi-Square | 4.799a | 4  | .309                              |
| N of Valid Cases   | 31     |    |                                   |

a. 9 cells (90.0%) have expected count less than 5. The minimum expected count is .45.



**Figure 9. Gender and usage frequency of Sunrise Park in cold and wet weather bar chart**

Again to ensure that there is no statistically significant relationship between gender and usage frequency of this park in cold and wet weather, the usage frequency of this park was regrouped into two categories of less than once per week and more than once per week. The Chi-Square Test with the value of 1.65, df of 1, and the P value of .199 > .05 indicates that there is no statistically significant relationship between these two variables. Also, the Fisher's Exact Test with the P value of .304 > .05 indicates no significant relationship between these two variables. Although there is no statistically significant relationship between these two variables, percentages show that males use this park more frequently than females during cold and wet weather. Crosstabulation of gender and the new usage frequency categories defined above tells us that 78.6% of males uses Sunrise Park less than once per week, while this number for females is 94.1%. Also, this Table tells us that 21.4% of males use this park more than once per week, while this number for females is 5.9%.

**Table 26. Gender and usage frequency of Sunrise Park in cold and wet weather**

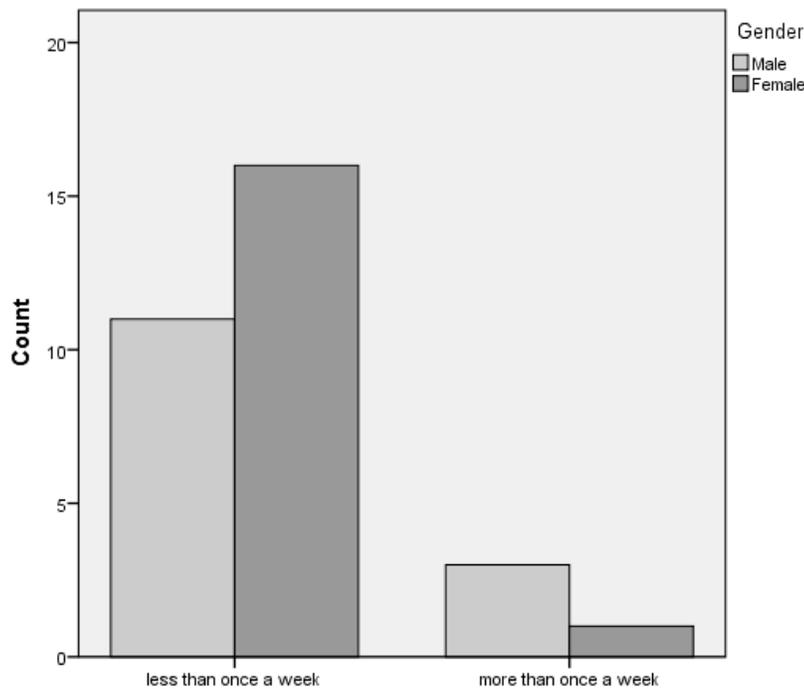
|        |   |   | Usage Frequency Cold and Wet Weather |                       | Total  |
|--------|---|---|--------------------------------------|-----------------------|--------|
|        |   |   | less than once a week                | more than once a week |        |
| Gender | Male                                      | Count                                     | 11                                   | 3                     | 14     |
|        |   | % within Gender                           | 78.6%                                | 21.4%                 | 100.0% |
|        |   | % within Usage Frequency Cold&Wet Weather | 40.7%                                | 75.0%                 | 45.2%  |
|        |   | % of Total                                | 35.5%                                | 9.7%                  | 45.2%  |
|        | Female                                    | Count                                     | 16                                   | 1                     | 17     |
|        |   | % within Gender                           | 94.1%                                | 5.9%                  | 100.0% |
|        |   | % within Usage Frequency Cold&Wet Weather | 59.3%                                | 25.0%                 | 54.8%  |
|        |   | % of Total                                | 51.6%                                | 3.2%                  | 54.8%  |
| Total  | Count                                     | 27  | 4                                    | 31                    |        |
|        | % within Gender                           | 87.1%                                     | 12.9%                                | 100.0%                |        |
|        | % within Usage Frequency Cold&Wet Weather | 100.0%                                    | 100.0%                               | 100.0%                |        |
|        | % of Total                                | 87.1%                                     | 12.9%                                | 100.0%                |        |

**Table 27. Gender and usage frequency of Sunrise Park in cold and wet weather chi-square test**

|                     | Value  | df | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|---------------------|--------|----|-----------------------------------|----------------------|----------------------|
| Pearson Chi-Square  | 1.651a | 1  | .199                              |                      |                      |
| Fisher's Exact Test |        |    |                                   | .304                 | .228                 |
| N of Valid Cases    | 31     |    |                                   |                      |                      |

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.81.

b. Computed only for a 2x2 table



**Figure 10. Gender and usage frequency of Sunrise Park in cold and wet weather bar chart**

All different activity variables were crosstabulated with gender variable. The Chi-Square Test results show that there is no statistically significant relationship between gender and different activities in this park. However, the Chi-Square Test results for some of these crosstabulations such as crosstabulation of gender and sitting/relaxing, walking a dog, and playing soccer were slightly over .05. Also, a considerable difference exists between different genders' interest in meeting friends and walking without a dog were noted. Thus, these analyses have been discussed in the following to illustrate the differences between different gender groups' interest for different types of activities.

Crosstabulation of the gender and sitting/relaxing variables shows that the Chi-Square value is 2.837,  $df=1$ , and the P value is  $.09 > .05$  indicating no statistically significant relation between these two variables. As the P value is slightly over .05, results from the crosstabulation of these two variables has been compared. Results show that 58% of females mentioned that they use Sunrise Park for sitting and relaxing, while this number for males is 28.6, which indicates females are more interested in this activity compared to

males. The Tables below show the results of crosstabulation of gender and sitting/relaxing in the park.

**Table 28. Gender and sitting/relaxing in the park crosstabulation**

|        |                                       |                                       | Sitting/Relaxing in the Park |        | Total  |
|--------|---------------------------------------|---------------------------------------|------------------------------|--------|--------|
|        |                                       |                                       | No                           | Yes    |        |
| Gender | Male                                  | Count                                 | 10                           | 4      | 14     |
|        |                                       | % within Gender                       | 71.4%                        | 28.6%  | 100.0% |
|        |                                       | % within Sitting/Relaxing in the Park | 58.8%                        | 28.6%  | 45.2%  |
|        |                                       | % of Total                            | 32.3%                        | 12.9%  | 45.2%  |
|        | Female                                | Count                                 | 7                            | 10     | 17     |
|        |                                       | % within Gender                       | 41.2%                        | 58.8%  | 100.0% |
|        |                                       | % within Sitting/Relaxing in the Park | 41.2%                        | 71.4%  | 54.8%  |
|        |                                       | % of Total                            | 22.6%                        | 32.3%  | 54.8%  |
| Total  | Count                                 | 17                                    | 14                           | 31     |        |
|        | % within Gender                       | 54.8%                                 | 45.2%                        | 100.0% |        |
|        | % within Sitting/Relaxing in the Park | 100.0%                                | 100.0%                       | 100.0% |        |
|        | % of Total                            | 54.8%                                 | 45.2%                        | 100.0% |        |

**Table 29. Gender and sitting/relaxing in the park Chi-Square Test**

|                     | Value  | df | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|---------------------|--------|----|-----------------------------------|----------------------|----------------------|
| Pearson Chi-Square  | 2.837a | 1  | .092                              |                      |                      |
| Fisher's Exact Test |        |    |                                   | .149                 | .093                 |
| N of Valid Cases    | 31     |    |                                   |                      |                      |

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.32.

b. Computed only for a 2x2 table

The Chi-Square Test with a value of 3.67, df of 1 and P value of .055<.05 indicates no significant relationship between gender and walk a dog in Sunrise Park. As the P value is slightly over .05 results from crosstabulations of these two variables has been illustrated below. Crosstabulation of gender and using the park to walk a dog shows that males (50%) use the park to walk their dog more than females (17.6%). The Tables below illustrate this interpretation.

**Table 30. Gender and walking the dog in the park crosstabulation**

|        |                                      |                                      | Walking the Dog in the Park |        | Total  |
|--------|--------------------------------------|--------------------------------------|-----------------------------|--------|--------|
|        |                                      |                                      | No                          | Yes    |        |
| Gender | Male                                 | Count                                | 7                           | 7      | 14     |
|        |                                      | % within Gender                      | 50.0%                       | 50.0%  | 100.0% |
|        |                                      | % within Walking the Dog in the Park | 33.3%                       | 70.0%  | 45.2%  |
|        |                                      | % of Total                           | 22.6%                       | 22.6%  | 45.2%  |
|        | Female                               | Count                                | 14                          | 3      | 17     |
|        |                                      | % within Gender                      | 82.4%                       | 17.6%  | 100.0% |
|        |                                      | % within Walking the Dog in the Park | 66.7%                       | 30.0%  | 54.8%  |
|        |                                      | % of Total                           | 45.2%                       | 9.7%   | 54.8%  |
| Total  | Count                                | 21                                   | 10                          | 31     |        |
|        | % within Gender                      | 67.7%                                | 32.3%                       | 100.0% |        |
|        | % within Walking the Dog in the Park | 100.0%                               | 100.0%                      | 100.0% |        |
|        | % of Total                           | 67.7%                                | 32.3%                       | 100.0% |        |

**Table 31. Gender and walking the dog in the park chi-square**

|                     | Value  | df | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|---------------------|--------|----|-----------------------------------|----------------------|----------------------|
| Pearson Chi-Square  | 3.677a | 1  | .055                              |                      |                      |
| Fisher's Exact Test |        |    |                                   | .121                 | .063                 |
| N of Valid Cases    | 31     |    |                                   |                      |                      |

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.52.

b. Computed only for a 2x2 table

The Chi-Square Test indicates that the value of chi-square is 4.37, the df is 1 and the P value is  $.036 < .05$ . This result shows that there is evidence for a statistically significant relation between gender and using the park for playing soccer. However, in this analysis two cells have an expected count less than five. So, the P value of the Chi-Square Test is not reliable for drawing a conclusion in this case. By looking at the P value of Fisher's Exact Test of  $.067 > .05$ , it can be concluded that there is not a statistically significant relationship between these two variables either. However, because the P value of the Chi-Square and Fisher's Exact Tests are slightly over  $.05$ , it is interesting to compare the results from crosstabulation of these two variables. Crosstabulation of gender and

using the park to play soccer indicates that 35.7 % of males use Sunrise Park to play soccer, while this number for females is 5.9% indicating that males in my sample are much more interested in using this park for playing soccer than females. The Tables below illustrate this interpretation.

**Table 32. Gender and playing soccer in the park crosstabulation**

|        |                                     |                                     | Playing Soccer in the Park |        | Total  |
|--------|-------------------------------------|-------------------------------------|----------------------------|--------|--------|
|        |                                     |                                     | No                         | Yes    |        |
| Gender | Male                                | Count                               | 9                          | 5      | 14     |
|        |                                     | % within Gender                     | 64.3%                      | 35.7%  | 100.0% |
|        |                                     | % within Playing Soccer in the Park | 36.0%                      | 83.3%  | 45.2%  |
|        |                                     | % of Total                          | 29.0%                      | 16.1%  | 45.2%  |
|        | Female                              | Count                               | 16                         | 1      | 17     |
|        |                                     | % within Gender                     | 94.1%                      | 5.9%   | 100.0% |
|        |                                     | % within Playing Soccer in the Park | 64.0%                      | 16.7%  | 54.8%  |
|        |                                     | % of Total                          | 51.6%                      | 3.2%   | 54.8%  |
| Total  | Count                               | 25                                  | 6                          | 31     |        |
|        | % within Gender                     | 80.6%                               | 19.4%                      | 100.0% |        |
|        | % within Playing Soccer in the Park | 100.0%                              | 100.0%                     | 100.0% |        |
|        | % of Total                          | 80.6%                               | 19.4%                      | 100.0% |        |

**Table 33. Gender and playing soccer in the park chi-square**

|                     | Value  | df | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|---------------------|--------|----|-----------------------------------|----------------------|----------------------|
| Pearson Chi-Square  | 4.377a | 1  | .036                              |                      |                      |
| Fisher's Exact Test |        |    |                                   | .067                 | .050                 |
| N of Valid Cases    | 31     |    |                                   |                      |                      |

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.71.

b. Computed only for a 2x2 table

Crosstabulation of gender and meeting friends in Sunrise Park shows that females are more interested in this activity than males. While 35.3% of females are interested to go to the park to meet friends, this number for males is 21.4%. The Table below illustrates these numbers.

**Table 34. Gender and meeting friends in the park crosstabulation**

|        |                                   |                                   | Meet Friends in the Park |        | Total  |
|--------|-----------------------------------|-----------------------------------|--------------------------|--------|--------|
|        |                                   |                                   | No                       | Yes    |        |
| Gender | Male                              | Count                             | 11                       | 3      | 14     |
|        |                                   | % within Gender                   | 78.6%                    | 21.4%  | 100.0% |
|        |                                   | % within Meet Friends in the Park | 50.0%                    | 33.3%  | 45.2%  |
|        |                                   | % of Total                        | 35.5%                    | 9.7%   | 45.2%  |
|        | Female                            | Count                             | 11                       | 6      | 17     |
|        |                                   | % within Gender                   | 64.7%                    | 35.3%  | 100.0% |
|        |                                   | % within Meet Friends in the Park | 50.0%                    | 66.7%  | 54.8%  |
|        |                                   | % of Total                        | 35.5%                    | 19.4%  | 54.8%  |
| Total  | Count                             | 22                                | 9                        | 31     |        |
|        | % within Gender                   | 71.0%                             | 29.0%                    | 100.0% |        |
|        | % within Meet Friends in the Park | 100.0%                            | 100.0%                   | 100.0% |        |
|        | % of Total                        | 71.0%                             | 29.0%                    | 100.0% |        |

Crosstabulation of gender and walking without a dog shows that females (47.1%) are more interested than males (35.7%) in this activity. Before it was mentioned that males are more interested in walking with a dog compared to females. So, it can be concluded both genders are interested in walking in Sunrise Park.

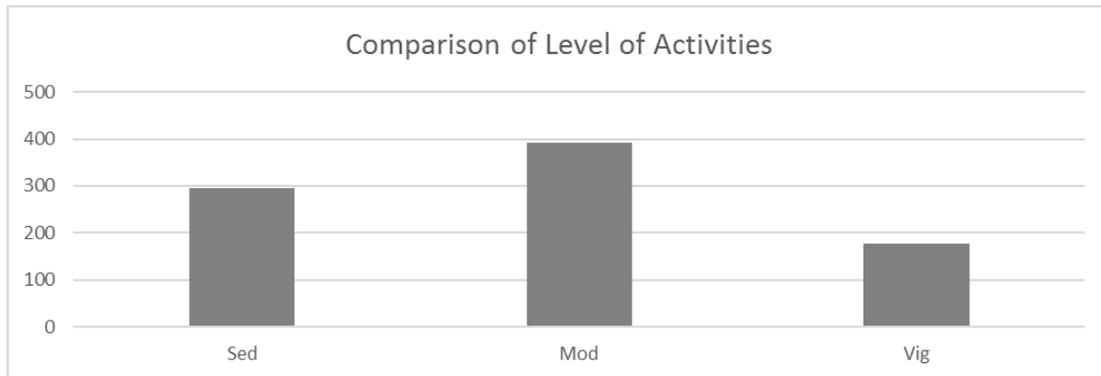
**Table 35. Gender and walking without a dog crosstabulation**

|        |  | Walking without a Dog in the Park          |        | Total  |        |
|--------|--|--|--------|--------|--------|
|        |  | No   | Yes    |        |        |
| Gender | Male                                       | Count                                      | 9      | 5      | 14     |
|        |  | % within Gender                            | 64.3%  | 35.7%  | 100.0% |
|        |  | % within Walking without a Dog in the Park | 50.0%  | 38.5%  | 45.2%  |
|        |  | % of Total                                 | 29.0%  | 16.1%  | 45.2%  |
|        | Female                                     | Count                                      | 9      | 8      | 17     |
|        |  | % within Gender                            | 52.9%  | 47.1%  | 100.0% |
|        |  | % within Walking without a Dog in the Park | 50.0%  | 61.5%  | 54.8%  |
|        |  | % of Total                                 | 29.0%  | 25.8%  | 54.8%  |
| Total  | Count                                      | 18   | 13     | 31     |        |
|        | % within Gender                            | 58.1%                                      | 41.9%  | 100.0% |        |
|        | % within Walking without a Dog in the Park | 100.0%                                     | 100.0% | 100.0% |        |
|        | % of Total                                 | 58.1%                                      | 41.9%  | 100.0% |        |

## 4.2. Data from Site Observation

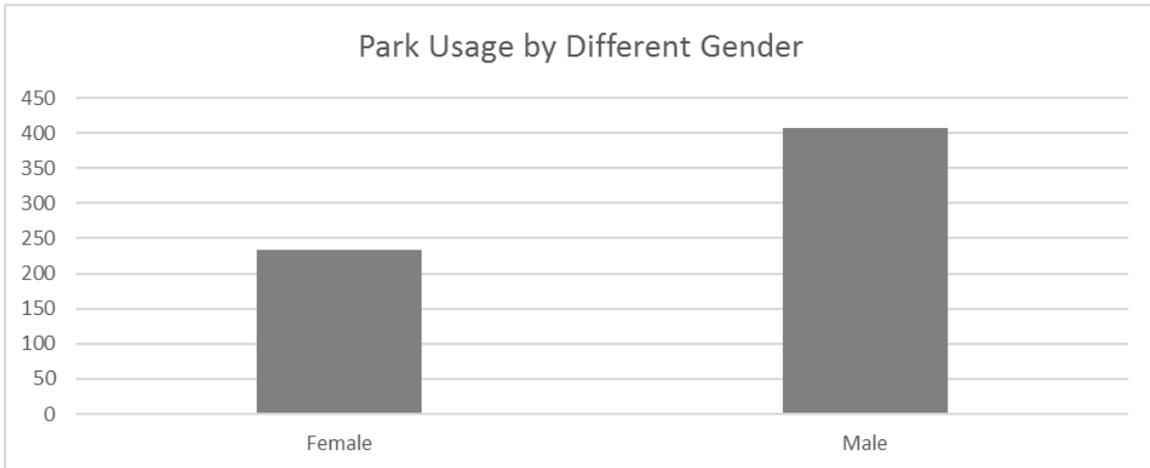
Data from site observation including the types, level of physical activity including sedentary, moderate and vigorous physical activity, gender, age, groups of people, time of observation (morning, noon, or afternoon), weather, and target areas, if the target areas were accessible, usable, organized/supervised (sporting team), and equipped has been analyzed in Excel.

Site observation data analysis illustrates that Sunrise Park is more used for moderate physical activity, rather than for either sedentary or vigorous physical activity. The figure below demonstrates the results for comparison of the level of physical activity observed in Sunrise Park.

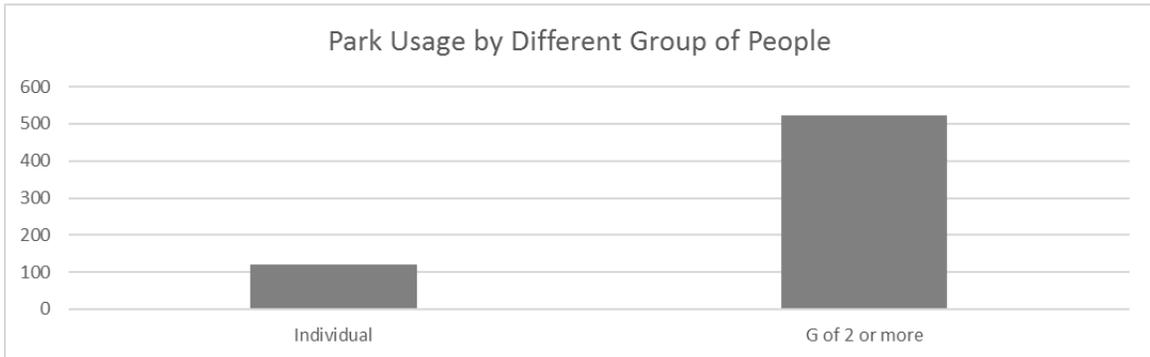


**Figure 11. Comparison of activity levels**

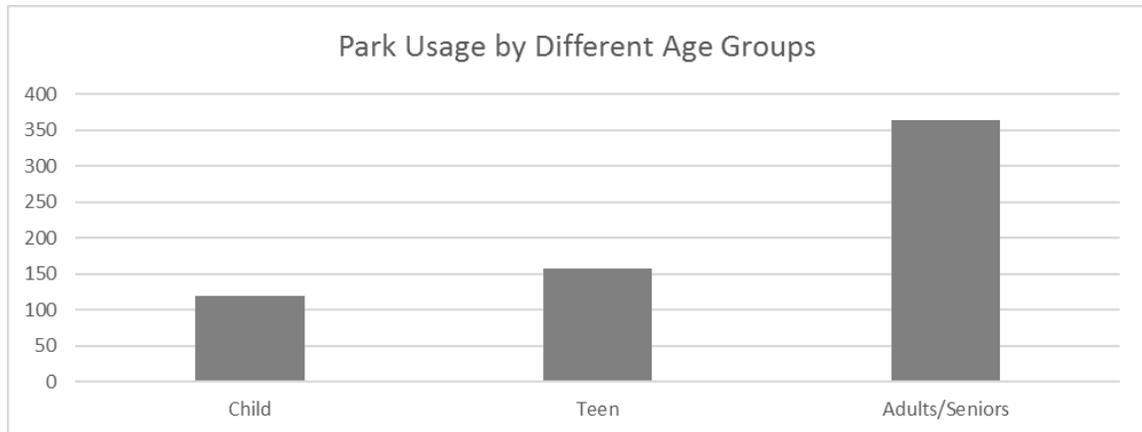
Based on the data from site observation this park was male dominated, mostly used by groups of people rather than by individuals, and adults/seniors were the most common users of the park. However, it should be noted that “adults/seniors” consists of two groups of people (adults and seniors), thus it makes sense that this group of people be dominant. However, very generally it can be concluded that Sunrise Park is used by various age groups. The Figures below illustrate the results.



**Figure 12. Comparison of usage of Sunrise Park by gender**



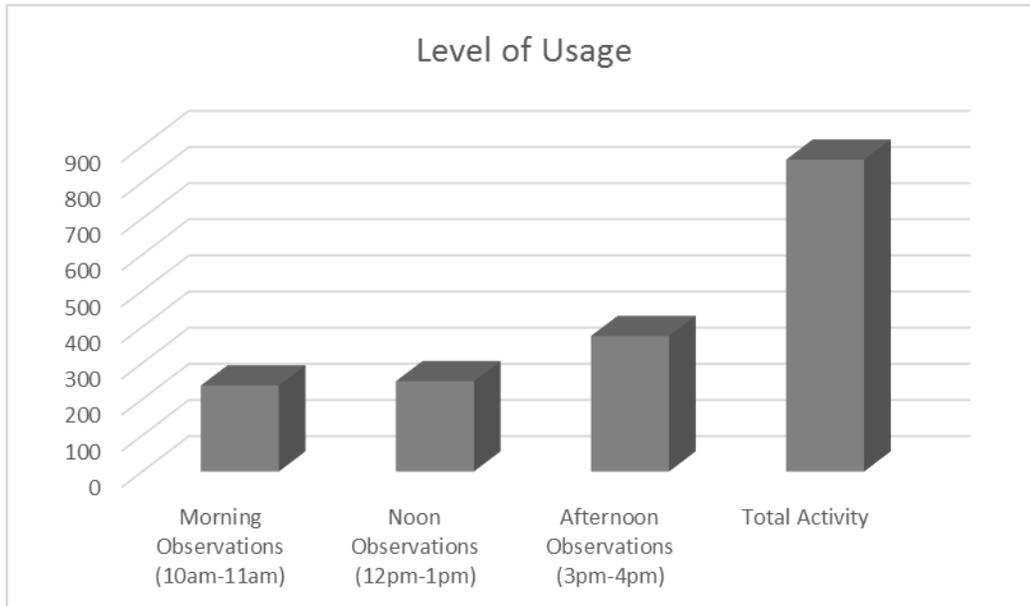
**Figure 13. Comparison of Sunrise Park usage by different group of people**



**Figure 14. Comparison of Sunrise Park usage by different age groups**

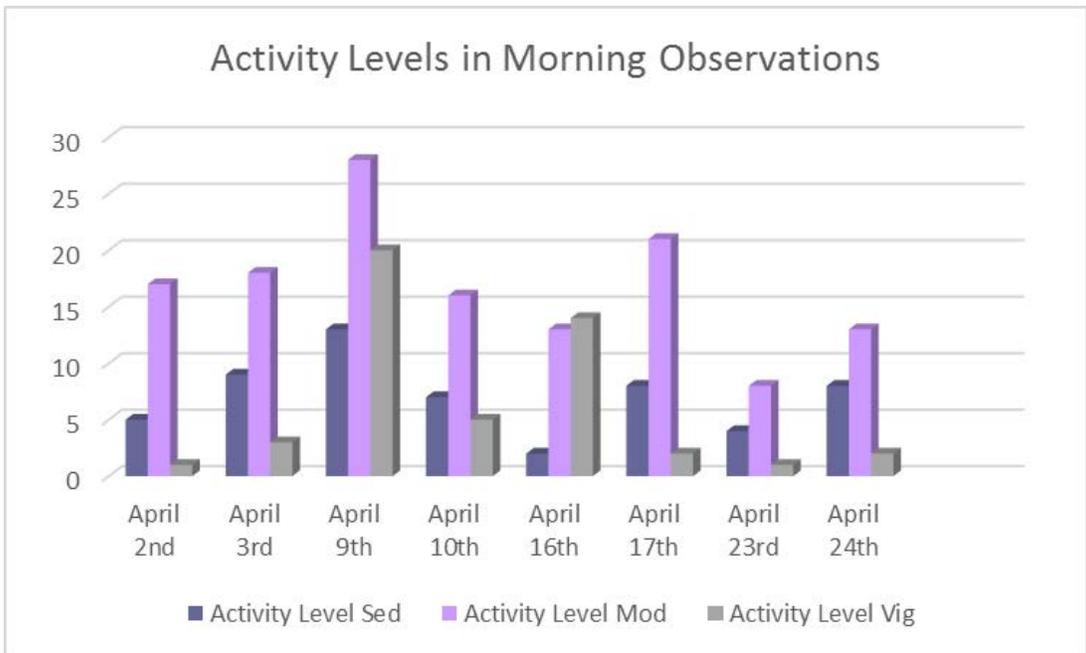
Activities were observed at different times and were analyzed to investigate if there is any difference in the level of usage of the park at different times. Results shows that

Sunrise Park is used more in the afternoon, rather than in the morning or at noon. The Figure below illustrates the result.

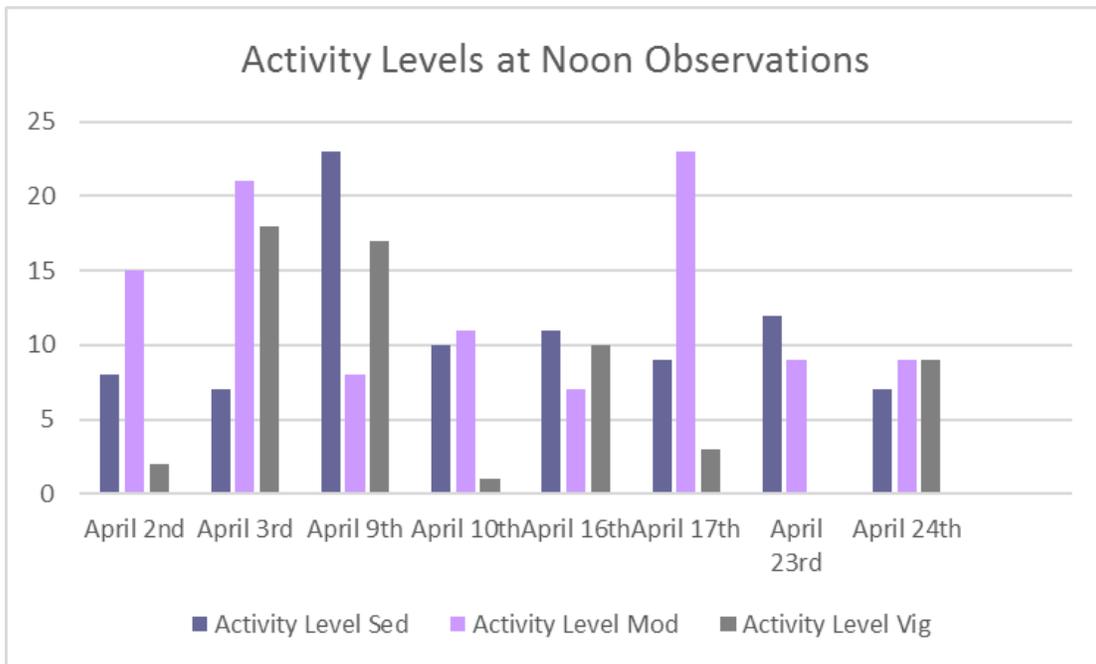


**Figure 15. Comparison of Sunrise Park usage at different times**

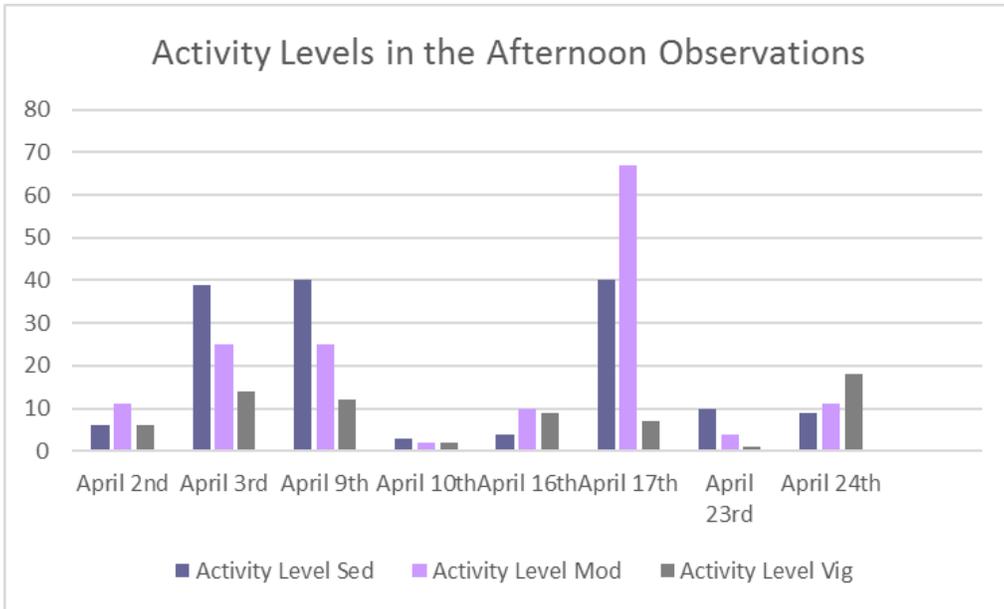
The frequency of physical activities during different times of observations was analyzed to understand how park users are active at different times. Results demonstrate that in the morning, at noon, and in the afternoon, moderate physical activity is the most common activity. Sedentary physical activity is the second common activity during the three observation times. However, in the morning, the frequency difference between vigorous and sedentary physical activities is less than the difference between them at the other times. Thus, it can be concluded that the usage of the park for vigorous physical activity in the morning is more than the usage of this park for vigorous physical activity at noon or in the afternoon. The three Figures below illustrate the activity levels at different times of observations.



**Figure 16. Comparison of activity levels in Sunrise Park during morning observations**

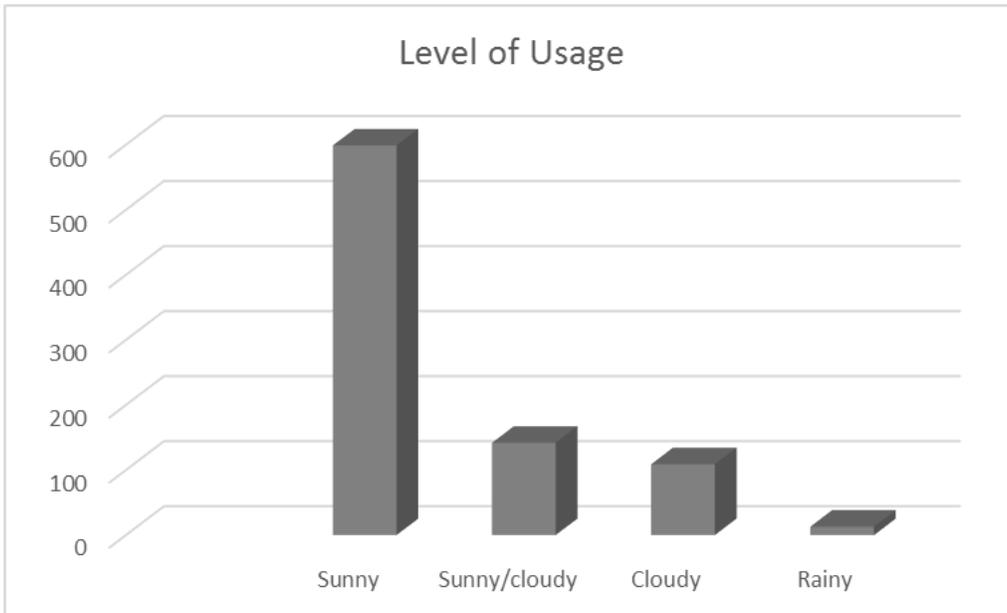


**Figure 17. Comparison of activity levels in Sunrise Park during noon observations**



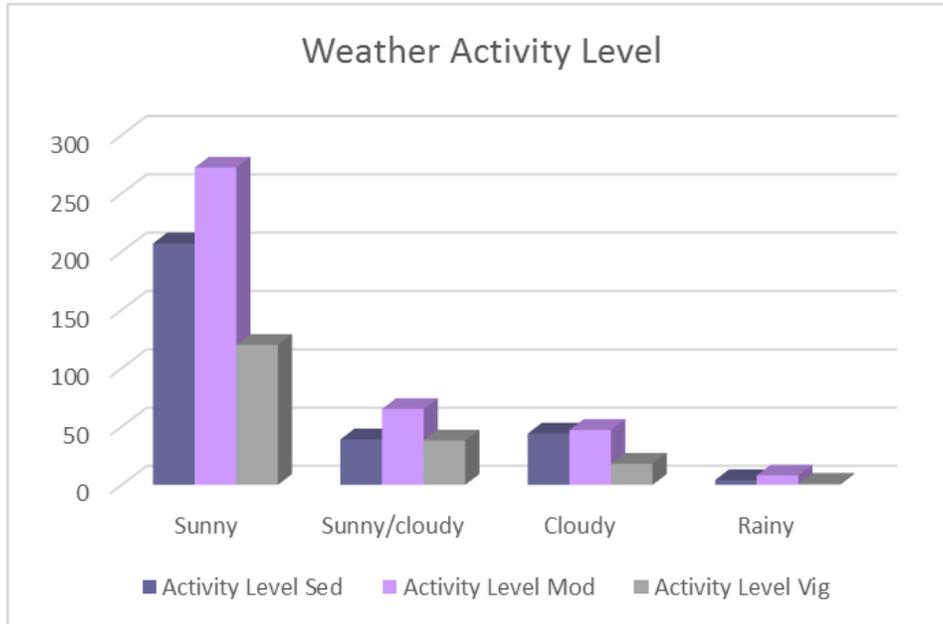
**Figure 18. Comparison of activity levels in Sunrise Park during afternoon observations**

Data analysis of the level of usage of Sunrise Park for various weather conditions indicates this park is significantly more used when the weather is sunny. Second, this park is used in sunny/cloudy weather conditions, then thirdly in cloudy weather, and lastly in rainy weather. The Figure below demonstrates this result.



**Figure 19. Comparison of level of usage of Sunrise Park during different weathers**

Analyzing the level of physical activity during different weather indicates that moderate physical activity is the most common activity in any weather, followed by sedentary activity. The Figure below illustrates the results of this analysis.



**Figure 20. Comparison of activity levels in Sunrise Park during different weather**

As explained earlier, the whole area of the park was divided into three target areas of “target area #1”, “target area #2”, and “target area #3”. The level of usage of these target areas was analyzed. Results demonstrate that target area #1 is used more than the other two target areas. Target area #2 is the second most used area. Explanation about each target area has been provided in Chapter Three. Target area #1 is larger in size. It has a baseball diamond, soccer field and playground. It is also flat. Target area #2 has a playground too, it has trees, and it is a bit steep. Target area #3 doesn’t have any recreational facility. It is also steep, and has more trees than the other target areas. Pictures below demonstrate the aerial and lateral views of the three target areas. The Figure below illustrates the comparison of usage level of these three target areas.



**Figure 21. Aerial view of target areas**  
Map data: Google



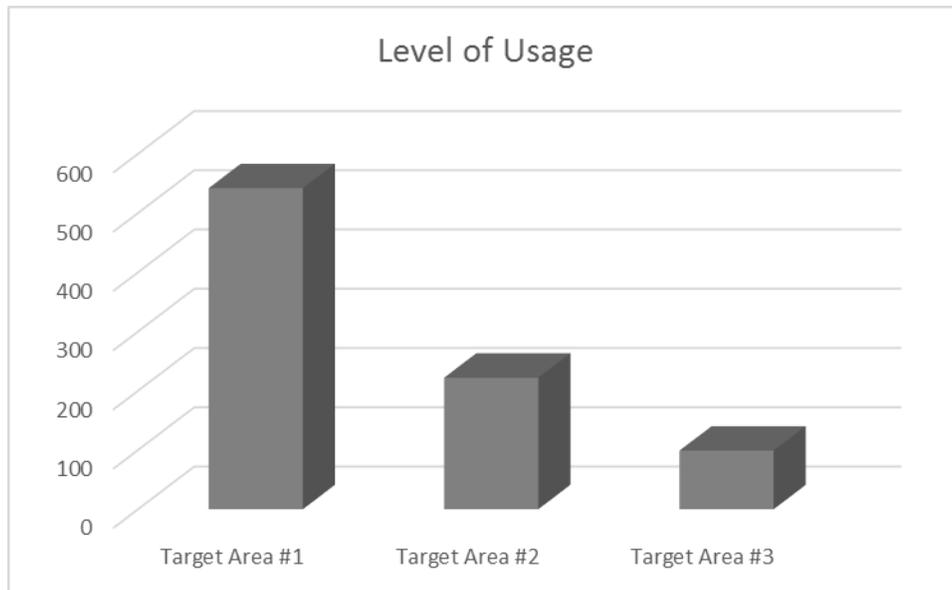
**Figure 22. Target area #1**



**Figure 23. Target area #2**

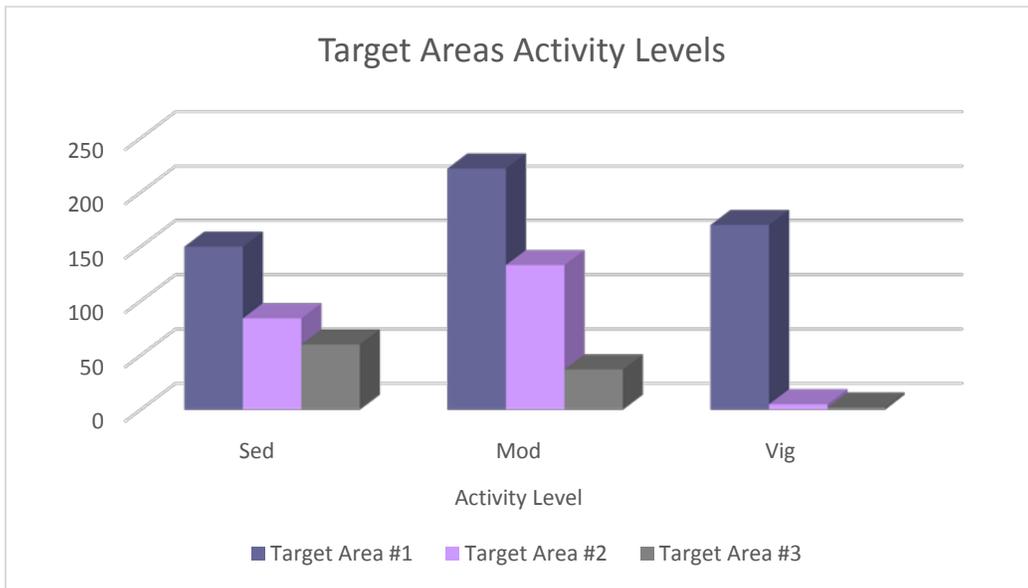


**Figure 24. Target area #3**



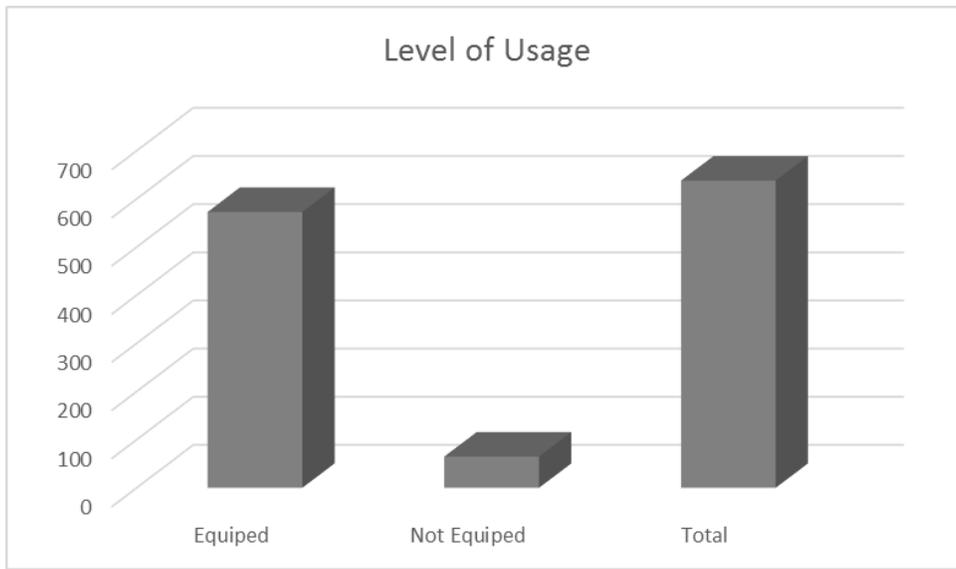
**Figure 25. Comparison of level of usage of different target areas in Sunrise Park**

Activity levels were also compared in different target areas. In all previous analyses, the most common physical activity was first moderate physical activity, then sedentary and lastly vigorous physical activity. An interesting outcome from this analysis is that the frequency of vigorous physical activity in target area #1 is more than the frequency of sedentary physical activity in this target area. Also, interestingly this analysis indicates that in target area #3, which doesn't have any recreational facility, sedentary physical activity is the most common type of physical activity. In all previous analyses in this study, moderate physical activity was the most common type of physical activity. This analysis indicates that either when an area is provided with recreational facilities it encourages physical activity or other characteristics of each target area such as slope, or trees are impactful on not using that area for physical activity. Because for example target area #3 which does not have a recreational facility, it is steep too and there are more trees there compared to other target areas. The Figure below demonstrates the results from this comparison.



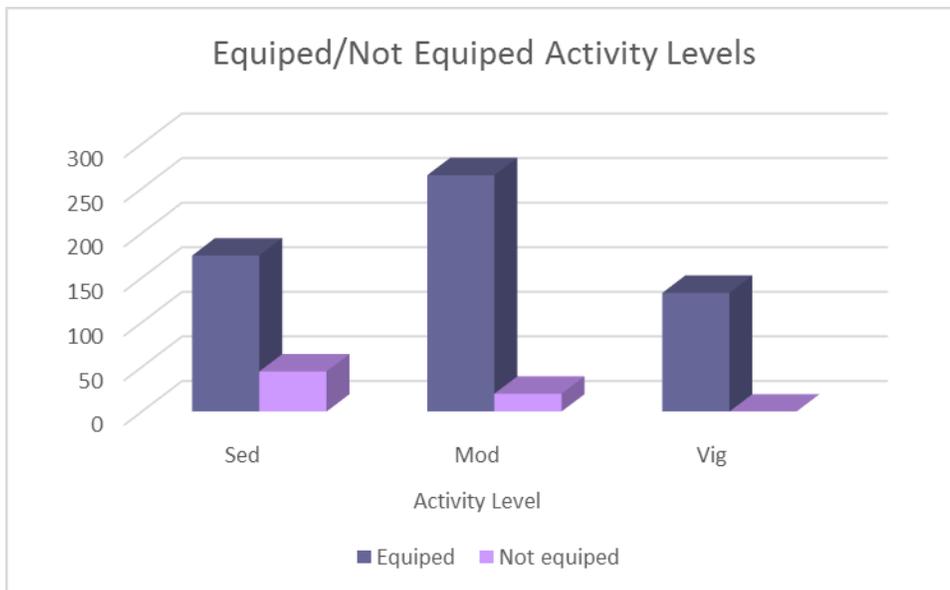
**Figure 26. Comparison of activity level in different target areas in Sunrise Park**

Target area #1 and target area #2 are considered equipped, as they had recreational facilities. Target area #3 is considered not equipped as it didn't have any recreational facility. Level of usage was analyzed for equipped and not equipped target areas. The analysis shows that there is a significant difference in the level of usage of the park between equipped and not equipped areas. However, it should be mentioned that this difference might be because of other characteristics of these areas such as the slope of the area, or landscaping, and not necessarily only because of "equipped" and "not equipped" areas.



**Figure 27. Comparison of level of usage of equipped and not equipped areas in Sunrise Park**

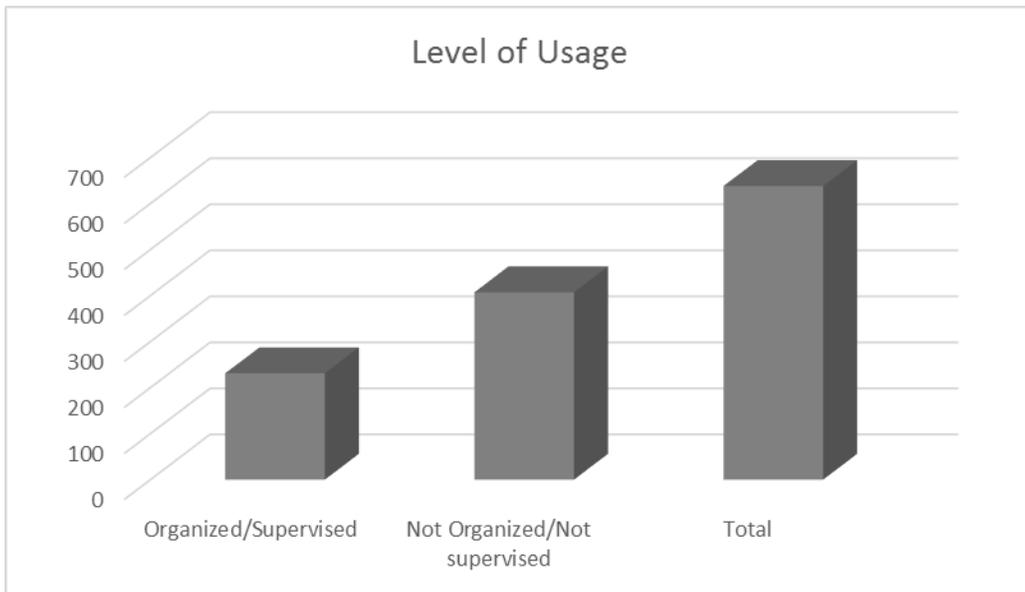
Activity levels of equipped and not equipped areas were compared as well. The most common type of physical activity was moderate, then sedentary, and then vigorous physical activity. The Figure below shows the result.



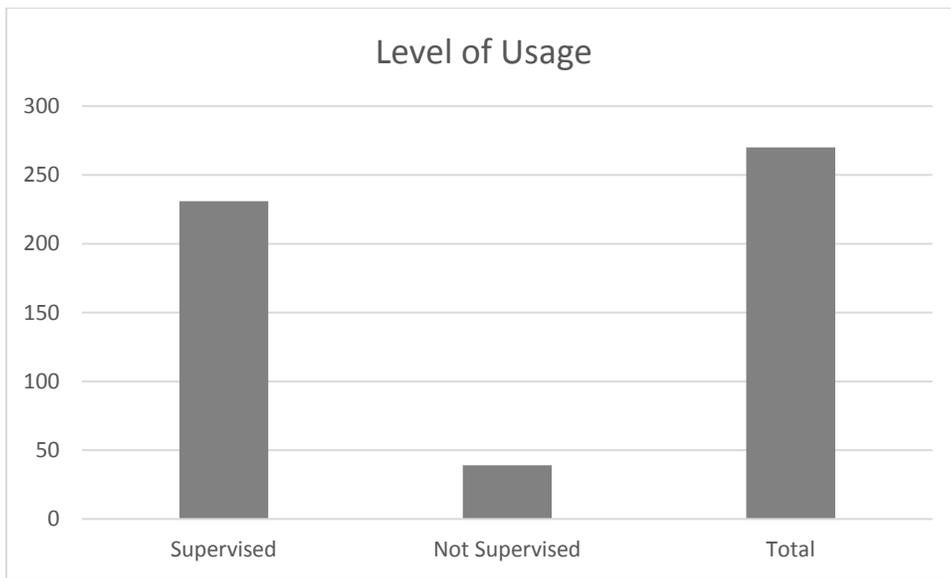
**Figure 28. Comparison of activity levels of equipped and not equipped areas in Sunrise Park**

Then the level of usage and activity level of organized/supervised and not-organized/not-supervised areas were compared. Results demonstrate that the level of usage of areas that have no supervised/organized activity is more than the level of usage of areas having organized/supervised activities. However, it should be clarified that the number of observations of no supervised/organized activity in the park was more than the number of observations of supervised/organized activity. Thus, it makes sense that the level of usage of areas not having supervised/organized activity would be more than the level of usage of areas having supervised/organized activity (Figure 29). In order to be able to compare the two categories of organized/supervised and not organized/not supervised more reasonably, the same number of not organized/not supervised observations as organized/supervised observations were randomly selected and then the level of usage of the two categories of organized/supervised and not organized/not supervised were compared. In this case, the level of usage of areas having organized/supervised activities was much more than the level of usage of areas not having supervised/organized activities (Figure 30). Also, the level of usage of areas not having organized/supervised activity and areas having organized/supervised activities that were observed at the same time/date were compared as well. This comparison also demonstrates that areas having organized/supervised activity are used more than the areas not having organized/supervised activity (Figure 31). It should be mentioned that only target area #1 had supervised/organized activity and this area was flat, with less trees, and has more recreational facilities as well.

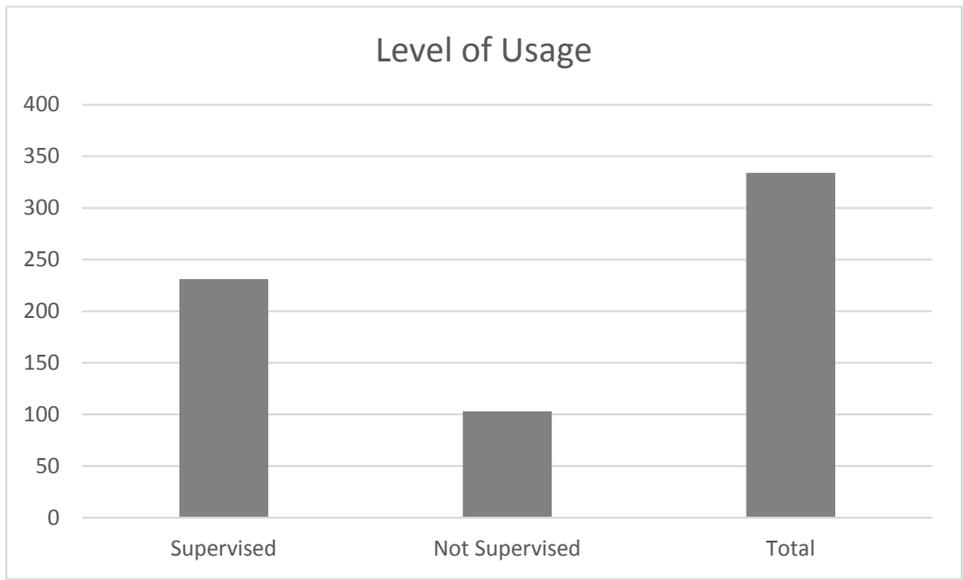
When the area is not-organized/not-supervised, the frequency of moderate and sedentary physical activity is more than those in organized/supervised areas. However, the frequency of vigorous physical activity is higher in organized/supervised areas than in not-organized/not-supervised areas. The Figures below show the results.



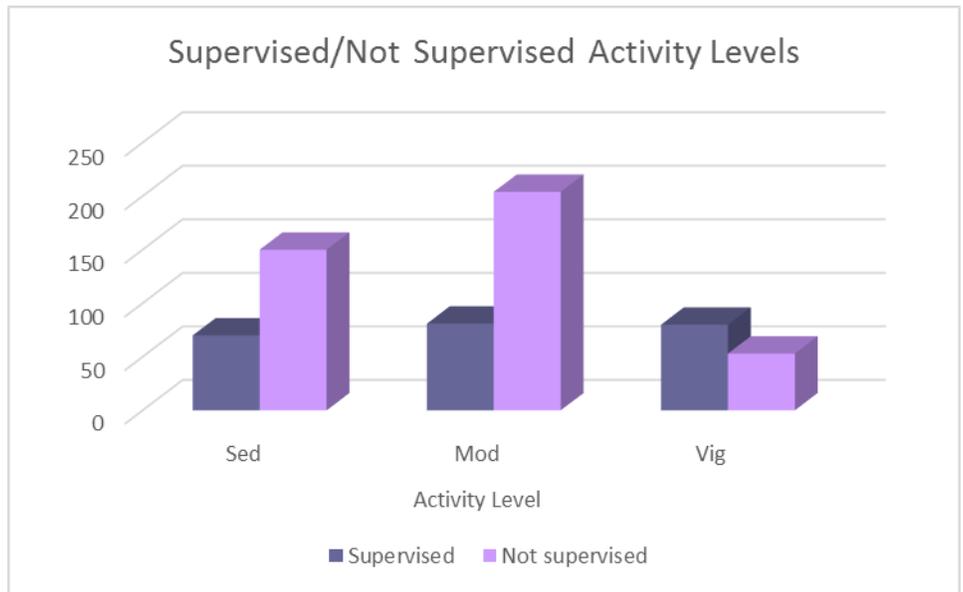
**Figure 29. Comparison of levels of usage of organized/supervised and not organized/not supervised areas in Sunrise Park**



**Figure 30. Comparison of level of usage of organized/supervised and not organized/not supervised areas with the same number of observations in the two categories**



**Figure 31. Comparison of level of usage of organized/supervised and not organized/not supervised areas with the same date and time of observations**



**Figure 32. Comparison of activity levels of organized/supervised areas in Sunrise Park**

### 4.3. Data from Park User Interviews

I conducted a total of 45 interviews with park users at Sunrise Park. Data gathered from park user interviews included gender of interviewees, where interviewees exercise, the usage frequency of Sunrise Park, how park users get to the park, what they do in the park, the frequency of usage of other parks, the reason they use other parks, and how this park could be improved.

The questionnaire consisted of eight questions that provided me with eighty-one categorical variables including nominal and ordinal variables. The frequency of all the variables and independent “gender” variables with some other variables have been calculated in SPSS and are illustrated in this section.

The percentage of respondents who were male (51.1%) is slightly more than those who were female (48.9%).

**Table 36. Gender percentage of park users’ interviewees**

|       |        | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|--------|-----------|---------|---------------|--------------------|
| Valid | Male   | 23        | 51.1    | 51.1          | 51.1               |
|       | Female | 22        | 48.9    | 48.9          | 100.0              |
|       | Total  | 45        | 100.0   | 100.0         |                    |

Over a third of respondents use parks for physical activity and exercise (35.9%). The Table below shows the frequency of different locations park users use for physical activity.

**Table 37. Where park users usually exercise**

|                            |   | Responses |         | Percent of Cases |
|----------------------------|---|-----------|---------|------------------|
|                            |   | N         | Percent |                  |
| Where Respondents Exercise | Park  | 23        | 35.9%   | 51.1%            |
|                            | Home  | 14        | 21.9%   | 31.1%            |
|                            | Community Centre                                | 12        | 18.8%   | 26.7%            |
|                            | Other Public Space such as Seawall or Sidewalks | 8         | 12.5%   | 17.8%            |
|                            | I Don't Usually Exercise                        | 4         | 6.3%    | 8.9%             |
|                            | Private Club                                    | 3         | 4.7%    | 6.7%             |
| Total                      |   | 64        | 100.0%  | 142.2%           |

Usage of Sunrise Park is very different during warm and dry weather and cold and wet weather. Just under a third of interviewees mentioned that they use this park during warm and dry weather four to five times a week (31.1%), while a third of the interviewees (33.3%) indicated that they never use this park in cold and wet weather. The Tables below illustrate the results.

**Table 38. Usage frequency of Sunrise Park in warm and dry weather**

|       |                        | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|------------------------|-----------|---------|---------------|--------------------|
| Valid | Never                  | 3         | 6.7     | 6.7           | 6.7                |
|       | Less than Once a Month | 5         | 11.1    | 11.1          | 17.8               |
|       | 1 to 3 Times a Month   | 2         | 4.4     | 4.4           | 22.2               |
|       | 1 to 3 Times a Week    | 14        | 31.1    | 31.1          | 53.3               |
|       | 4 to 5 Times a Week    | 14        | 31.1    | 31.1          | 84.4               |
|       | Daily or almost Daily  | 7         | 15.6    | 15.6          | 100.0              |
|       | Total                  | 45        | 100.0   | 100.0         |                    |

**Table 39. Usage frequency of Sunrise Park in cold and wet weather**

|       |                        | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|------------------------|-----------|---------|---------------|--------------------|
| Valid | Never                  | 15        | 33.3    | 33.3          | 33.3               |
|       | Less than Once a Month | 10        | 22.2    | 22.2          | 55.6               |
|       | 1 to 3 Times a Month   | 6         | 13.3    | 13.3          | 68.9               |
|       | 1 to 3 Times a Week    | 11        | 24.4    | 24.4          | 93.3               |
|       | 4 to 5 Times a Week    | 1         | 2.2     | 2.2           | 95.6               |
|       | Daily or almost Daily  | 2         | 4.4     | 4.4           | 100.0              |
|       | Total                  | 45        | 100.0   | 100.0         |                    |

The majority of interviewees get to the park by walking (70.8%). One quarter of respondents (25%) get to the park by car and only 4.2% get to the park by biking. So, this park encourages physical activity among park users by offering them the opportunity to walk to the park.

**Table 40. How interviewees get to the park**

|                                 |                             | Responses |         |                  |
|---------------------------------|-----------------------------|-----------|---------|------------------|
|                                 |                             | N         | Percent | Percent of Cases |
| How respondents get to the park | Getting to the Park by Walk | 34        | 70.8%   | 75.6%            |
|                                 | Getting to the Park by Car  | 12        | 25.0%   | 26.7%            |
|                                 | Getting to the Park by Bike | 2         | 4.2%    | 4.4%             |
| Total                           |                             | 48        | 100.0%  | 106.7%           |

The most frequent activities that park users are doing in Sunrise Park are using the playground (32.3%), and walking the dog (12.9%). Using the playground can be categorized both as sedentary or moderate physical activity. If users of the playground are involved actively in playing with their kids, it is considered moderate physical activity. If participants sit and watch their kids playing, it is considered a sedentary activity. Walking the dog is considered as moderate physical activity in this study.

**Table 41. Usage of Sunrise Park**

|            |  | Responses |         | Percent of Cases |
|------------|--|-----------|---------|------------------|
|            |  | N         | Percent |                  |
| Park Usage | Playground or play with a child  | 30        | 32.3%   | 66.7%            |
|            | Walk the dog   | 12        | 12.9%   | 26.7%            |
|            | Other individual sports or physical activity such as walking/running, kitting, physical exercise | 11        | 11.8%   | 24.4%            |
|            | Sit or relax   | 10        | 10.8%   | 22.2%            |
|            | Soccer   | 8         | 8.6%    | 17.8%            |
|            | Walk without a dog   | 8         | 8.6%    | 17.8%            |
|            | Baseball/softball  | 7         | 7.5%    | 15.6%            |
|            | Meet friends   | 4         | 4.3%    | 8.9%             |
|            | Celebrations, picnics  | 2         | 2.2%    | 4.4%             |
|            | Other group sports or physical activity such as pickle ball                                      | 1         | 1.1%    | 2.2%             |
| Total      |  | 93        | 100.0%  | 206.7%           |

A large minority of interviewees (40%) indicated that they use other parks once a week as well. Rupert Park is the most frequent park that interviewees mentioned. The main reasons interviewees mentioned for using other parks as well are playgrounds (18.4%), and walking/biking paths (17.1%). The Tables below illustrate the results.

**Table 42. How often respondents use other parks**

|       |                           | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|---------------------------|-----------|---------|---------------|--------------------|
| Valid | Monthly                   | 12        | 26.7    | 26.7          | 26.7               |
|       | Few times a week          | 6         | 13.3    | 13.3          | 40.0               |
|       | Few times a year          | 2         | 4.4     | 4.4           | 44.4               |
|       | Once per week             | 18        | 40.0    | 40.0          | 84.4               |
|       | Never                     | 4         | 8.9     | 8.9           | 93.3               |
|       | Couple of times per month | 3         | 6.7     | 6.7           | 100.0              |
|       | Total                     | 45        | 100.0   | 100.0         |                    |

**Table 43. Other parks park users frequent**

|                           |  | Responses |         | Percent of Cases |
|---------------------------|--|-----------|---------|------------------|
|                           |  | N         | Percent |                  |
| Other Park Respondents Go | Grandview Park, Hastings Falaise Park, Thunderbird Park and etc. | 20        | 37.0%   | 48.8%            |
|                           | Rupert Park  | 13        | 24.1%   | 31.7%            |
|                           | Troute Lake Park   | 11        | 20.4%   | 26.8%            |
|                           | Stanley Park   | 3         | 5.6%    | 7.3%             |
|                           | Any Park   | 3         | 5.6%    | 7.3%             |
|                           | Blue Mountain Park   | 2         | 3.7%    | 4.9%             |
|                           | Central Park Burnaby   | 2         | 3.7%    | 4.9%             |
| Total                     |  | 54        | 100.0%  | 131.7%           |

**Table 44. Reasons park users frequent other parks**

|       |                         | Responses |         | Percent of Cases |
|-------|-------------------------|-----------|---------|------------------|
|       |                         | N         | Percent |                  |
|       | Kids Friendly/PG        | 14        | 18.4%   | 34.1%            |
|       | Walking/Biking paths    | 13        | 17.1%   | 31.7%            |
|       | Close                   | 11        | 14.5%   | 26.8%            |
|       | Recreational facilities | 10        | 13.2%   | 24.4%            |
|       | Nice                    | 10        | 13.2%   | 24.4%            |
|       | Different               | 6         | 7.9%    | 14.6%            |
|       | Big                     | 4         | 5.3%    | 9.8%             |
|       | Water features          | 4         | 5.3%    | 9.8%             |
|       | Dog off-leash areas     | 4         | 5.3%    | 9.8%             |
| Total |                         | 76        | 100.0%  | 185.4%           |

The most common suggestions by interviewees for improving the usage of Sunrise Park for physical activity were “providing fitness equipment in the park” and “creating walking paths”.

**Table 45. Interviewees’ opinions on improving Sunrise Park**

|                    |  | Responses |         | Percent of Cases |
|--------------------|--|-----------|---------|------------------|
|                    |  | N         | Percent |                  |
| Park Improvements  | Providing more fitness equipment   | 23        | 18.5%   | 51.1%            |
|                    | Walking paths or trails  | 22        | 17.7%   | 48.9%            |
|                    | Improved children area   | 20        | 16.1%   | 44.4%            |
|                    | More recreational facilities such as basketball court, pickle ball court   | 10        | 8.1%    | 22.2%            |
|                    | Converting wading pool to s.th useful  | 9         | 7.3%    | 20.0%            |
|                    | Community gardens  | 7         | 5.6%    | 15.6%            |
|                    | Signposting  | 6         | 4.8%    | 13.3%            |
|                    | Others such as: flattening the steep areas, improving the grass quality, converting CA to CH, Fencing off the off-leash dog area | 5         | 4.0%    | 11.1%            |
|                    | Park concerts/dances   | 4         | 3.2%    | 8.9%             |
|                    | Park events  | 3         | 2.4%    | 6.7%             |
|                    | Adult sports leagues   | 2         | 1.6%    | 4.4%             |
|                    | More fitness classes   | 2         | 1.6%    | 4.4%             |
|                    | More youth sports leagues  | 2         | 1.6%    | 4.4%             |
|                    | Other supervised, organized activities such as Tai Chi   | 2         | 1.6%    | 4.4%             |
|                    | Security   | 2         | 1.6%    | 4.4%             |
|                    | Nothing  | 2         | 1.6%    | 4.4%             |
|                    | Bicycle paths  | 2         | 1.6%    | 4.4%             |
| Off-leash dog area | 1  | 0.8%      | 2.2%    |                  |
| Total              |  | 124       | 100.0%  | 275.6%           |

A plurality of interviewees (40%) believed that there are no issues in Sunrise Park preventing them from engaging in physical activity. 18.2% indicated that some people may drink alcohol in this park or use drugs, which prevents them from using this park in general. Another group (18.2%) also indicated that the grass quality of this park is not good and prevents them from conducting physical activity in this park. The Table below shows the results.

**Table 46. Issues in Sunrise Park Preventing respondents from using this park for physical activity**

|                         |   | Responses |         | Percent of Cases |
|-------------------------|---|-----------|---------|------------------|
|                         |   | N         | Percent |                  |
| Usage Preventing Issues | Nothing   | 22        | 40.0%   | 48.9%            |
|                         | People drinking/drug users                          | 10        | 18.2%   | 22.2%            |
|                         | Grass quality                                       | 10        | 18.2%   | 22.2%            |
|                         | Garbage   | 5         | 9.1%    | 11.1%            |
|                         | Dogs  | 3         | 5.5%    | 6.7%             |
|                         | Slope   | 3         | 5.5%    | 6.7%             |
|                         | Quality of children area                            | 1         | 1.8%    | 2.2%             |
|                         | People do not respect that is an off-leash dog park | 1         | 1.8%    | 2.2%             |
| Total                   |   | 55        | 100.0%  | 122.2%           |

The final question for interviewees was regarding any additional comments on Sunrise Park. Most of the interviewees (57.8%) had no further comment about this park. 13.3% suggested converting the wading pool to something more useful and 13.3% mentioned that Sunrise Park is a beautiful park. The Table below illustrates the results.

**Table 47. Additional comment about Sunrise Park**

|                     |  | Responses |         | Percent of Cases |
|---------------------|--|-----------|---------|------------------|
|                     |  | N         | Percent |                  |
| Additional Comments | Nothing                                | 26        | 57.8%   | 59.1%            |
|                     | It is a beautiful park                 | 6         | 13.3%   | 13.6%            |
|                     | Convert the wading pool to s.th useful | 6         | 13.3%   | 13.6%            |
|                     | Love this park                         | 3         | 6.7%    | 6.8%             |
|                     | View is fantastic                      | 2         | 4.4%    | 4.5%             |
|                     | Providing better lighting              | 1         | 2.2%    | 2.3%             |
|                     | Connect this park to the other parks   | 1         | 2.2%    | 2.3%             |
| Total               |  | 45        | 100.0%  | 102.3%           |

The rest of the analysis in this part is mainly about the relationship between the variables of gender and usage frequency of Sunrise Park and how the park is used. The analysis illustrates that there is no relationship between gender and usage frequency of

this park, either in warm and dry weather or in cold and wet weather. The Tables below show the independence of these variables.

**Table 48. Gender and usage of Sunrise Park in warm and dry weather crosstabulation**

|        |        | Frequency of Sunrise Park usage in warm and dry weather |                        |                      |                     |                     |                       | Total |
|--------|--------|---|------------------------|----------------------|---------------------|---------------------|-----------------------|-------|
|        |        | Never   | Less than Once a Month | 1 to 3 Times a Month | 1 to 3 Times a Week | 4 to 5 Times a Week | Daily or almost Daily |       |
| Gender | Male   | 1   | 4                      | 1                    | 8                   | 6                   | 3                     | 23    |
|        | Female | 2   | 1                      | 1                    | 6                   | 8                   | 4                     | 22    |
| Total  |        | 3   | 5                      | 2                    | 14                  | 14                  | 7                     | 45    |

**Table 49. Gender and usage of Sunrise Park in warm and dry weather chi-square test**

|                              | Value  | df | Asymptotic Significance (2-sided) |
|------------------------------|--------|----|-----------------------------------|
| Pearson Chi-Square           | 2.827a | 5  | .727                              |
| Likelihood Ratio             | 2.962  | 5  | .706                              |
| Linear-by-Linear Association | .557   | 1  | .455                              |
| N of Valid Cases             | 45     |    |                                   |

a. 8 cells (66.7%) have expected count less than 5. The minimum expected count is .98.

**Table 50. Gender and usage of Sunrise Park in cold and wet weather crosstabulation**

|        |        | Frequency of Sunrise Park usage in cold and wet weather |                        |                      |                     |                     |                       | Total |
|--------|--------|---|------------------------|----------------------|---------------------|---------------------|-----------------------|-------|
|        |        | Never   | Less than Once a Month | 1 to 3 Times a Month | 1 to 3 Times a Week | 4 to 5 Times a Week | Daily or almost Daily |       |
| Gender | Male   | 8   | 6                      | 3                    | 4                   | 1                   | 1                     | 23    |
|        | Female | 7   | 4                      | 3                    | 7                   | 0                   | 1                     | 22    |
| Total  |        | 15  | 10                     | 6                    | 11                  | 1                   | 2                     | 45    |

**Table 51. Gender and usage of Sunrise Park in cold and wet weather chi-square test**

|                              | Value  | df | Asymptotic Significance<br>(2-sided) |
|------------------------------|--------|----|--------------------------------------|
| Pearson Chi-Square           | 2.264a | 5  | .812                                 |
| Likelihood Ratio             | 2.662  | 5  | .752                                 |
| Linear-by-Linear Association | .216   | 1  | .642                                 |
| N of Valid Cases             | 45     |    |                                      |

a. 7 cells (58.3%) have expected count less than 5. The minimum expected count is .49.

Crosstabulations of gender and different activities interviewees do in Sunrise Park show that different genders use this park differently. Analyses indicate that there is evidence of a significant relationship between gender and:

- *sitting/relaxing in the park*
- *meeting friends in the park*
- *walking without a dog*

Although, a statistically significant relationship was not found between gender and other activities, the percentage differences between different genders for using Sunrise Park for some activities such as playing baseball, using the playground, walking without a dog, and doing individual activities were important for the purposes of this study. Thus, analyses of significant and not significant relationships between genders and the aforementioned activities will be discussed below.

Crosstabulation of gender and sitting/relaxing in Sunrise Park shows that mostly women are interested in this activity. Results of crosstabulation indicate that 40.9% of women answered they sit/relax in this park while this percentage is 4.3% for men. The Chi-Square value of 8.9, with df of 1, P value of  $.003 < .05$  and Fisher's Exact Test P value of  $.004 < .05$  indicates a strong relationship between gender and sitting/relaxing in Sunrise Park. The Tables below demonstrate the results. Figure D1 in Appendix D demonstrates this result as well.

**Table 52. Gender and sitting/relaxing in Sunrise Park crosstabulation**

|        |        |   | What respondents do in this park: Sit or relax |        | Total  |
|--------|--------|---|--|--------|--------|
|        |        |   | No   | Yes    |        |
| Gender | Male   | Count   | 22   | 1      | 23     |
|        |        | % within Gender   | 95.7%  | 4.3%   | 100.0% |
|        |        | % within What respondents do in this park: Sit or relax | 62.9%  | 10.0%  | 51.1%  |
|        |        | % of Total  | 48.9%  | 2.2%   | 51.1%  |
| Gender | Female | Count   | 13   | 9      | 22     |
|        |        | % within Gender   | 59.1%  | 40.9%  | 100.0% |
|        |        | % within What respondents do in this park: Sit or relax | 37.1%  | 90.0%  | 48.9%  |
|        |        | % of Total  | 28.9%  | 20.0%  | 48.9%  |
| Total  |        | Count   | 35   | 10     | 45     |
|        |        | % within Gender   | 77.8%  | 22.2%  | 100.0% |
|        |        | % within What respondents do in this park: Sit or relax | 100.0%   | 100.0% | 100.0% |
|        |        | % of Total  | 77.8%  | 22.2%  | 100.0% |

**Table 53. Gender and sitting/relaxing in Sunrise Park Chi-Square Test**

|                     | Value  | df | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|---------------------|--------|----|-----------------------------------|----------------------|----------------------|
| Pearson Chi-Square  | 8.696a | 1  | .003                              |                      |                      |
| Fisher's Exact Test |        |    |                                   | .004                 | .004                 |
| N of Valid Cases    | 45     |    |                                   |                      |                      |

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 4.89.

b. Computed only for a 2x2 table

Going to Sunrise Park to meet a friend is also an activity that interests mostly females. The crosstabulation of gender and meeting friends in Sunrise Park indicates that 18.2% of female mentioned that they go to Sunrise Park to meet a friend while this percentage for males was 0%. Chi-Square value of 4.5 with df of 1 and P value of .032<.05 explains a strong relationship between these two variables. However, because two cells have an expected count less than five, the P value of Fisher's Exact Test should be read for a reliable conclusion. The P value of Fisher's Exact Test is .049<.05 confirming a

statistically significant relationship between these two variables. The Tables below explain the analysis. Figure D2 in Appendix D demonstrates this result as well.

**Table 54. Gender and meeting friends in Sunrise Park crosstabulation**

|        |   |   | What respondents do in this park:<br>Meet friends |        | Total  |
|--------|---|---|---|--------|--------|
|        |   |   | No  | Yes    |        |
| Gender | Male  | Count   | 23  | 0      | 23     |
|        |   | % within Gender   | 100.0%  | 0.0%   | 100.0% |
|        |   | % within What respondents do in this park: Meet friends | 56.1%   | 0.0%   | 51.1%  |
|        |   | % of Total  | 51.1%   | 0.0%   | 51.1%  |
|        | Female  | Count   | 18  | 4      | 22     |
|        |   | % within Gender   | 81.8%   | 18.2%  | 100.0% |
|        |   | % within What respondents do in this park: Meet friends | 43.9%   | 100.0% | 48.9%  |
|        |   | % of Total  | 40.0%   | 8.9%   | 48.9%  |
| Total  | Count   | 41  | 4   | 45     |        |
|        | % within Gender   | 91.1%   | 8.9%  | 100.0% |        |
|        | % within What respondents do in this park: Meet friends | 100.0%  | 100.0%  | 100.0% |        |
|        | % of Total  | 91.1%   | 8.9%  | 100.0% |        |

**Table 55. Gender and meeting friends in Sunrise Park Chi-Square Test**

|                     | Value  | df | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|---------------------|--------|----|-----------------------------------|----------------------|----------------------|
| Pearson Chi-Square  | 4.590a | 1  | .032                              |                      |                      |
| Fisher's Exact Test |        |    |                                   | .049                 | .049                 |
| N of Valid Cases    | 45     |    |                                   |                      |                      |

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.96.

b. Computed only for a 2x2 table

Crosstabulation of gender and walking without a dog in Sunrise Park shows that 31.8% of females go to Sunrise Park to walk without a dog, while only 4.3% of males go to Sunrise Park to walk without a dog. The Chi-Square test with the value of 5.8, and df of 1, with P value of .016<.05 indicates a significant relationship between the variables of gender and walking without a dog in Sunrise Park. However, again as two cells have an

expected count less than five, the P value of Fisher’s Exact Test is reliable to draw a conclusion. The P value of Fisher’s Exact Test is .022<.05, confirming that there is evidence of a statistically significant relationship between these two variables. The Tables below demonstrate the results. Figure D3 in Appendix D shows this result as well.

**Table 56. Gender and walking without a dog in Sunrise Park crosstabulation**

|        |   | What respondents do in this park:<br>Walk without a dog       |        |        |        |
|--------|---|---|--------|--------|--------|
|        |   | No  | Yes    | Total  |        |
| Gender | Male  | Count   | 22     | 1      | 23     |
|        |   | % within Gender   | 95.7%  | 4.3%   | 100.0% |
|        |   | % within What respondents do in this park: Walk without a dog | 59.5%  | 12.5%  | 51.1%  |
|        |   | % of Total  | 48.9%  | 2.2%   | 51.1%  |
|        | Female  | Count   | 15     | 7      | 22     |
|        |   | % within Gender   | 68.2%  | 31.8%  | 100.0% |
|        |   | % within What respondents do in this park: Walk without a dog | 40.5%  | 87.5%  | 48.9%  |
|        |   | % of Total  | 33.3%  | 15.6%  | 48.9%  |
| Total  | Count   | 37  | 8      | 45     |        |
|        | % within Gender   | 82.2%   | 17.8%  | 100.0% |        |
|        | % within What respondents do in this park: Walk without a dog | 100.0%  | 100.0% | 100.0% |        |
|        | % of Total  | 82.2%   | 17.8%  | 100.0% |        |

**Table 57. Gender and walking without a dog in Sunrise Park Chi-Square Test**

|                     | Value  | df | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|---------------------|--------|----|-----------------------------------|----------------------|----------------------|
| Pearson Chi-Square  | 5.805a | 1  | .016                              |                      |                      |
| Fisher's Exact Test |        |    |                                   | .022                 | .020                 |
| N of Valid Cases    | 45     |    |                                   |                      |                      |

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 3.91.

b. Computed only for a 2x2 table

Crosstabulation of gender and playing baseball indicates that 21.7% of males are interested in this activity, while this number for females is 9.1%. So, although the relation between gender and playing baseball was not found to be significant with this sample, a difference was noted between females’ and males’ interest for doing this activity in Sunrise

Park (males being more interested for using Sunrise Park for playing baseball). The Table below demonstrates this result.

**Table 58. Gender and playing baseball/softball in Sunrise Park crosstabulation**

|        |        |   | What people do in this park:<br>Baseball/softball |        |        |
|--------|--------|---|---|--------|--------|
|        |        |   | No  | Yes    |        |
| Gender | Male   | Count   | 18  | 5      | 23     |
|        |        | % within Gender   | 78.3%   | 21.7%  | 100.0% |
|        |        | % within What people do in this park: Baseball/softball | 47.4%   | 71.4%  | 51.1%  |
|        |        | % of Total  | 40.0%   | 11.1%  | 51.1%  |
| Female | Female | Count   | 20  | 2      | 22     |
|        |        | % within Gender   | 90.9%   | 9.1%   | 100.0% |
|        |        | % within What people do in this park: Baseball/softball | 52.6%   | 28.6%  | 48.9%  |
|        |        | % of Total  | 44.4%   | 4.4%   | 48.9%  |
| Total  |        | Count   | 38  | 7      | 45     |
|        |        | % within Gender   | 84.4%   | 15.6%  | 100.0% |
|        |        | % within What people do in this park: Baseball/softball | 100.0%  | 100.0% | 100.0% |
|        |        | % of Total  | 84.4%   | 15.6%  | 100.0% |

Crosstabulation of gender and using the playground in Sunrise Park shows that no statistically significant relationship exists between these two variables. However, a difference was noted between females' and males' interest to go to this park to use the playground. And it seems that females (77.3%) are more interested in using the playground in this park than males (56.5%). The Table below shows this result.

**Table 59. Gender and using the playground in Sunrise Park crosstabulation**

|        |  |  | What respondents do in this park:<br>Playground or play with a child |        | Total  |
|--------|--|--|--|--------|--------|
|        |  |  | No   | Yes    |        |
| Gender | Male   | Count  | 10   | 13     | 23     |
|        |  | % within Gender  | 43.5%  | 56.5%  | 100.0% |
|        |  | % within What respondents do in this park: Playground or play with a child | 66.7%  | 43.3%  | 51.1%  |
|        |  | % of Total   | 22.2%  | 28.9%  | 51.1%  |
|        | Female   | Count  | 5  | 17     | 22     |
|        |  | % within Gender  | 22.7%  | 77.3%  | 100.0% |
|        |  | % within What respondents do in this park: Playground or play with a child | 33.3%  | 56.7%  | 48.9%  |
|        |  | % of Total   | 11.1%  | 37.8%  | 48.9%  |
| Total  | Count  | 15   | 30   | 45     |        |
|        | % within Gender  | 33.3%  | 66.7%  | 100.0% |        |
|        | % within What respondents do in this park: Playground or play with a child | 100.0%   | 100.0%   | 100.0% |        |
|        | % of Total   | 33.3%  | 66.7%  | 100.0% |        |

Also, analyses show that a difference was noted between how different genders use this park for conducting individual physical activity, although it was not shown to be statistically significant with this sample. While 31.8% of females are interested to use Sunrise Park for conducting individual physical activity, this number for males is 17.4%. The Table below shows this analysis.

**Table 60. Gender and doing individual physical activity in Sunrise Park crosstabulation**

|        |  | What respondents do in this park:<br>Other individual sports or physical<br>activity such as walking/running,<br>kiting, physical exercise             |        |        |        |
|--------|--|--|--------|--------|--------|
|        |  | No   | Yes    | Total  |        |
| Gender | Male   | Count  | 19     | 4      | 23     |
|        |  | % within Gender  | 82.6%  | 17.4%  | 100.0% |
|        |  | % within What respondents do in<br>this park: Other individual sports or<br>physical activity such as<br>walking/running, kiting, physical<br>exercise | 55.9%  | 36.4%  | 51.1%  |
|        |  | % of Total   | 42.2%  | 8.9%   | 51.1%  |
|        | Female   | Count  | 15     | 7      | 22     |
|        |  | % within Gender  | 68.2%  | 31.8%  | 100.0% |
|        |  | % within What respondents do in<br>this park: Other individual sports or<br>physical activity such as<br>walking/running, kiting, physical<br>exercise | 44.1%  | 63.6%  | 48.9%  |
|        |  | % of Total   | 33.3%  | 15.6%  | 48.9%  |
| Total  | Count  | 34   | 11     | 45     |        |
|        | % within Gender  | 75.6%  | 24.4%  | 100.0% |        |
|        | % within What respondents do in<br>this park: Other individual sports or<br>physical activity such as<br>walking/running, kiting, physical<br>exercise | 100.0%   | 100.0% | 100.0% |        |
|        | % of Total   | 75.6%  | 24.4%  | 100.0% |        |

#### **4.4. Data from Interviews with Vancouver Park Board Key Planners**

Results from interviewing VPB commissioners/key planners and key staff from Thunderbird Community Centre were analyzed in NVivo. This software was used to classify, categorize, and code the transcribed interviews. Open coding was the methodology for categorizing common themes. I searched for common themes and issues in responses, and turned responses into different categories. I continued to regroup into smaller and smaller categories, until the highest level of abstraction was achieved. Overall seven interviews were conducted and ten questions were asked. In the following, the final coding categories for each question are explained.

The first and second questions asked interviewees if VPB has any specific planning to improve the usage of parks for physical activity and which types of park are the target (if any). Based on the discussions, VPB focuses on all parks to improve their usage for physical activity. If VPB renovates a park, or if they build a new park, providing facilities for physical activity is considered. However, it was also mentioned in the interviews that the VPB typically allocates more resources towards destination parks such as Stanley Park, Q.E. Park, Hastings Park and John Hendry Park.

Regarding the VPB plans to improve the usage of parks for physical activity, responses have been categorized in seven groups:

*Capital plans: Capital plans come out every three years and they focus on the improvement of the usage of parks throughout the city. Each time some specific spots are chosen for improvements. These improvements may affect the usage of parks for physical activity as well.*

*Park master planning: Creating a master park plan for recreational activities is also part of the City's considerations to improve the usage of parks for physical activity.*

*Upgrading neighbourhood parks: Upgrading neighbourhood parks can be done through facility assessment and providing physical activity facilities.*

*Facility assessment: Keeping basic facilities such as washrooms, fountains, or benches updated and maintained is also part of the City's consideration to increase the usage of parks in general which is occasionally tied to a planning and/or development project happening in the surrounding community.*

*Providing physical activity facilities: The Park Board considers increasing the usage of neighbourhood parks for physical activity by providing facilities for physical activity in neighbourhood parks. However, the challenge is that providing facilities with a long term view is difficult since many things, such as demographic characteristics of the neighbourhood, or the interests of people may change. So the Park Board usually plans for multiple use recreational facilities in neighbourhood parks. Other physical activity facilities that the Park Board may be looking at currently in upgrading neighbourhood parks are providing outdoor recreational facilities for seniors such as providing a seniors-oriented physical activity circuit. In addition, the Park Board is considering upgrading playgrounds in neighbourhood parks which affect the usage of neighbourhood parks in general and for physical activity among children. Currently the Park Board is replacing and updating six playgrounds throughout the city. As was stated in the interviews, there is a real interest now in developing children's play structures that are very unstructured and very organic, in order to encourage creativity among children as well.*

*Increasing the amount of green space and the number of parks: Based upon some joint projects between the City and Park Board, such as "creating new parks", "improving existing parks", and "creating and improving trails" the City is providing more green space/parks throughout the city especially wherever there is less green space. Providing more green space and parks encourages residents to use parks more regularly and it affects the level of physical activity they might be involved in. Also, the City has the Greenest City Action Plan strategy and "Access to Nature" is one of the ten goals of this strategy. The targets are that all Vancouver residents live within a five-minute walk of a park or any green space, and to plant 150,000 new trees. Based upon this strategy, the City is providing more green space as well, and more green space may encourage residents to be more physically active as well.*

*Collaboration with different organization: One of the planning issues to improve the usage of parks for physical activity is to work with a number of organizations or leagues, such as Sport BC. As stated in the interviews, collaboration between Park Board and the different organizations improves the usage of parks for physical activity. Through this collaboration, parks have fields rented for sport activities and parks are used for regular sport activities such as baseball or soccer throughout the year. The Park Board also has a close relationship with the School Board. The Park Board provides playgrounds in different locations especially close to schools which don't have play areas. Through this collaboration between the Park Board and the School Board, an active lifestyle for children is being encouraged. It was not mentioned that this collaboration may be effective on adult physical activity though.*

The third question asked interviewees about the purposes for creating Sunrise Park's Recreational Facilities. It was discussed that overall, all parks have been created as public amenities and Sunrise Park has been created for that too. It was built as a green space to provide recreational, leisure, and social opportunities for the community. At the time that this park was built, residents of Italian background were the dominant local residents and this park probably was built based on the needs of those people. From a recreational point of view, providing sport fields and playgrounds were the common facilities to encourage physical activity and this is apparent in this park as well.

The fourth question asked interviewees if Sunrise Park had been created with a specific group of people in mind. Answers can be categorized in two groups. First for local community and secondly for some organizations and leagues.

*Local community: Sunrise Park was built for the community around the park and those who were living in the neighbourhood which would be single family residences and likely mostly of Italian descent. So, based on the needs of this group of people, Sunrise Park was created.*

*Organizations and Leagues: Historically probably there were organizations and leagues when Sunrise Park was created asking for diamonds and sport fields. And these facilities responded to these requests. At the time this park was built, LEADER league, Hasting league, and Renfrew league were in that area. It was not discussed what types of leagues*

*these were. However, the perception of the researcher is that these leagues were some baseball/soccer leagues at the time this park was built.*

The fifth and sixth questions asked interviewees about their perception of the usage of Sunrise Park in general and for physical activity. All responses can be categorized in three groups of active, passive, and low usages.

*Active usage: Thunderbird Community Center provides a playground program for children and families during the summer time in Sunrise Park. The Community Center encourages the usage of this park for physical activity among toddlers, teenagers, and families. Playing soccer, baseball, walking the dog, and using the playgrounds were activities mentioned by some interviewees for usage of this park for physical activity. It was mentioned that this park has an A grade soccer field and a medium age diamond. And both are really well utilized. Fields are used to their yearly maximum capacity and this park is used quite well for the recreational facility that it provides.*

*Passive usage: some of the interviewees assumed that this park has some open spaces and passive areas which are probably used for picnics, sitting or relaxing. They believe that since this park has such a beautiful view, it is more of a passive park, and people come here to enjoy the view on a hot summer day, and in winter it is likely low use.*

*Low usage: a few interviewees believed that this park would be a great park if it had a community center as well. They believed that if it had a community center inside the park, people would use it a lot more. They mentioned that there are not enough attractions in this park and it needs more attractions to draw people to the park. There are many days where it is underutilized. One of the interviewees stated that as they don't hear a lot of conflicts about this park, probably it is not an overused park in general. This interviewee stated that when a park is overused, there are usually some conflicts regarding the park as well and the City will hear about them. They thought that they could probably do a lot more in this park by providing running trails or other facilities to encourage people to do recreation activities.*

The seventh question asked interviewees if the Park Board is considering any changes to Sunrise Park in the future. It was mentioned there is no change planned for

Sunrise Park. The only thing that might change is the wading pool, which is a concern for the City. It was mentioned in the interviews that the wading pools are getting shut down in the city because the Health department is concerned that the water used in the wading pools is not filtered and hence not safe for use. It is very expensive to put filtration in all wading pools.

The eighth question asked if there are any specific outdoor programs in this park. Interestingly there are a few outdoor programs in this park. Thunderbird Community Centre runs summer playground programs for children and families in Sunrise Park. Different organizations and leagues may rent the soccer field and baseball diamonds for sport activities and programs. Also, currently there are considerations from Park Board to create "Youth Programs" in parks as the City hears requests for this program from a lot of students studying Recreational programs at UBC, or Langara or other colleges programming recreation studies. My perception from interviews is that this program is for students studying Recreational programs to supervise different sport classes/programs in parks.

The ninth question asked interviewees if they think the above mentioned programs may increase the usage of this park in general. And the answer was "yes, absolutely it does". Interviewees agreed that these programs are attractions in the park and people go for them. Also, when people see other people using this park they get encouraged to use it as well. By quoting William H. Whyte (a mentor of the Project for Public Spaces), one of the interviewees mentioned that "people go where people are" so if people are in the park, more people probably will come.

The last question was about improvement of this park. There are some great ideas that experts mentioned for the improvement of usage of this park. However, there are some challenges as well. Thus, responses can be categorized into "ideas' and "challenges".

*Ideas: fitness amenities should be added to this park and it will definitely increase the usage of this park for physical activity. The playground can also be improved and it will affect the usage of this park. Putting artificial fields instead of grass fields since they can be used year round for sports, such as soccer. Providing designated dog off-leash areas*

*that residents can freely go with their dogs without affecting other users. Providing community gardens can be a great attraction too, as recently many communities ask for that in their neighbourhood parks. Providing basic amenities is very important to increase the usage of parks in general as well. There are different creative programs in community centers that can provide different programs in the parks as well, which increases the usage of parks in general.*

*Challenges: the two challenges mentioned by the experts were resources and trends. It was discussed that resources and funds were the drawbacks to encourage the usage of parks in general. And another challenge is that different ideas to encourage the usage of parks and for physical activity have been tried and they were successful for a while but unfortunately the trend changed and they didn't work long-term. This is due to demographic changes. So some ideas work for a while for a specific group of people, but when demographic changes occur they don't work anymore. So, it is challenging to increase the usage of parks for the long term as park users' needs and interests may change over time.*

#### **4.4.1. Synthesis**

This section discusses what has been learned from interviews with VPB and Thunderbird Community Center key staff. These findings include some thoughts on the usage of parks for physical activity and different strategies to encourage its usage. It also discusses perceptions of interviewees about the users of Sunrise Park, usage of Sunrise Park, and ideas and challenges to encourage the usage of Sunrise Park for physical activity.

VPB and the City have different strategies to improve the usage of parks for physical activity. For instance, creating a master park plan for recreational activities is part of the City's consideration. Whenever a park is built or renovated, providing recreational facilities is part of the City's or VPB's consideration. Also, upgrading the playground in neighbourhood parks is a consideration by VPB as well, which affects the level of physical activity amongst children. Currently there are some playgrounds that have been upgraded or selected to be upgraded. Another thing VPB is considering is to provide recreational

facilities, such as a seniors-oriented physical activity circuit in neighbourhood parks. Besides, VPB collaborates with different sports organizations, such as Sport BC, to improve the usage of parks for physical activity. Parks having fields are rented to these organizations for some sport activities. VPB has a close relationship with the School Board as well and provides playgrounds close to schools that do not have a yard.

Interviewees discussed that recreational facilities in Sunrise Park have been provided as public amenities, especially for the local people and likely for residents of Italian background, who were the dominant local residents when this park was built. Also, it was mentioned by one of the interviewees that this park and its recreational facilities may have been created in response to the demand of some leagues, such as Renfrew League or Hastings League, that existed at the time of creation of this park. Although it was not clear what type of leagues these were, my perception was that they were some soccer/baseball leagues, as Sunrise Park has soccer fields and baseball diamonds.

The perception of interviewees about the usage of Sunrise Park was that it is used for playing soccer/baseball, walking dogs, using the playgrounds, picnics or sitting and relaxing. As Sunrise Park has a great view some interviewees' perceptions were that it's a great passive park and probably most people may come to this park to enjoy the view. Some of the interviewees also thought that the usage of this park is low because there are not enough attractions in this park to draw people. For instance, there is no community center inside this park (some interviewees believed that community centers inside parks are great attractions). It was mentioned that there is a summer playground program provided by Thunderbird community center for children and families in this park. Also, different organizations and leagues rent the soccer field and baseball diamonds at this park and provide some competitions and sport classes there. Interviewees believed that these outdoor programs definitely increase the usage of this park for physical activity.

However, no change is under consideration for Sunrise Park in the near future. The only thing that will change is to shut down the wading pool (which is happening in all parks that have wading pools). Although no change is considered for Sunrise Park, interviewees discussed great ideas to improve the usage of this park for physical activity. They believed that fitness amenities should be added to this park and that will definitely

encourage the usage of this park for physical activity. Also, improving the current status of Sunrise Park's playground, replacing the natural grass of the field with artificial grass, providing designated dog off-leash areas, and providing community gardens were other ideas interviewees mentioned for increasing the usage of Sunrise Park for physical activity. However, there are some challenges and pursuit of these ideas is not that easy for VPB either. The main challenge to implement these ideas is financial resources. The other challenge for VPB is that trends usually change, usually driven by demographic changes, or people's tastes and requests might change as well.

## **Chapter 5. Conclusion**

Project introduction, literature review, data collection methodology, and data analysis have been discussed in this study. This chapter illustrates the summary of analyzed data from a residential survey, park users' interviews, park observation, and Park Board key experts' interviews. This data will be compared together, then it will be compared with the theoretical framework resulting from the literature review. Conclusion, and limitations of this study will be discussed as well.

### **5.1. Conclusion and Recommendations**

Various data collection methodologies were applied in this study to investigate the usage of Sunrise Park in general and for physical activity. It was investigated further to understand how the usage of this park as a neighbourhood park in a lower income neighbourhood in East Vancouver can be improved for physical activity. How this park is used between different genders was another issue which was discussed in this piece of research. Results from different sections of data collection were demonstrated and compatible results were illustrated.

Parks were cited as the most popular location that respondents in the residential survey and park user interviews used for their physical activity. This finding confirms and emphasizes the finding from the literature review that neighbourhood parks are great locations to encourage physical activity (Cohen et al., 2007; Cohen et al., 2005; Goodbey et al., 2005; Sallis et al., 1998). Based on the findings from observations, Sunrise Park was mostly used for moderate physical activity, then for sedentary, and then for vigorous physical activity. Findings from the residential survey indicated that moderate and sedentary physical activity at Sunrise Park were the most common types of activities. Moreover, findings from park users' interviews also confirmed that Sunrise Park is mostly used for either moderate or sedentary physical activity. Perception of interviews from VPB professionals and a Thunderbird Community Center member for the usage of Sunrise Park was close to the findings from observations, residential survey, and park user interviews as well. Other than a few exceptions (perceiving Sunrise Park usage is very

low), most of the interviewees perceived that Sunrise Park is either used for some physical activities such as using playgrounds, walking with/without a dog, or playing soccer/baseball, or for some sedentary activities such as enjoying the view or sitting/relaxing as well. Findings from the literature review indicated that public parks are mostly used for sedentary activity and recreational walking (Cohen et al., 2007).

From the residential survey it was found that respondents are not meeting the Canadian guidelines for physical activity. Since parks are the location that most respondents used for their exercises and physical activity, parks do have the potential to encourage more physical activity amongst local residents and park users. Hence parks can be effective in helping to meet the Canadian guidelines for physical activity among local residents and park users.

Weather affected the usage of Sunrise Park in general and for physical activity. This finding confirms the results from some studies that illustrates that suitable weather conditions (low wind, no rain or mist) positively affects the use of parks for physical activity (Corti et al., 2005; Irvine et al., 2013).

Respondents from the residential survey and park users interviewed get to the park mostly by walking. This finding confirms that parks can encourage physical activity indirectly by encouraging people to walk to the park (Cohen et al., 2007).

Among different features of Sunrise Park, open areas, scenic views, benches and seating areas were the ones considered as “very important” features in the park for using this park for physical activity. It was mentioned earlier in this study that it’s possible that respondents considered these features as “very important” features for the usage of this park in general, rather than for physical activity though. Among the features that do not exist in the park but might otherwise encourage respondents to be involved in more physical activity in Sunrise Park, jogging/walking trails and lights were considered “very important” features. Scenic views, jogging/walking trails, and lights were among features that have been associated with increasing the level of physical activity within parks in previous studies as well (Kaczynski et al., 2008; Schipperijn et al., 2013).

Sunrise Park is perceived as “safe” by the majority of respondents in the residential survey, and the only safety concerns cited for this park were poor lighting, too few people, and litter in the park. It seems that trash removal and adding lights in Sunrise Park can improve perceived safety in this park, which confirms other findings from previous studies. Among diverse strategies, trash removal, graffiti removal, signage, and lighting were positively associated with improving safety in parks (McCormick and Holland, 2012)

Regarding the relation between the condition of parks and the usage of parks, maintenance, cleanness, grass quality, condition of park features, and quality of play areas have been positively related to the usage of parks (Bedimo-Rung et al., 2005, McComack et al., 2010). Findings from my research on Sunrise Park illustrate that the field house, wading pool, and toilets are not in good condition. Interviews with VPB professionals also indicated that VPB is considering shutting down the wading pools in all parks that have wading pools. Thus, improving the condition of the field house, wading pool, and toilets might be effective in increasing the usage of this park for physical activity.

Regarding the usage of parks and gender, some previous studies cited females as infrequent users of parks and males as vigorously more active than females in parks (Cohen et al., 2007). In this thesis, the findings from the observations of Sunrise Park was that it is male dominated for general usage. Based on the findings from the residential survey there was no statistically significant relationship between gender and different activities in this park, although analyses showed that different genders use Sunrise Park differently. Males are more interested in moderate to vigorous physical activity (walking the dog, and playing soccer), while females are more interested in sedentary to moderate physical activity (sitting/relaxing, meeting friends, and walking without dog). Based on the findings from the park user interviews, females were significantly more involved in sitting/relaxing, meeting friends, and walking without a dog compared to males. These activities are again sedentary to moderate physical activity. Also females were more involved in using the playground and doing individual physical activity than males. Using the playground can be considered either sedentary or moderate physical activity. Conducting individual physical activity can also be considered either moderate or vigorous physical activity. Also, park user interview analysis showed that males were more interested to use this park for playing soccer than females, which is considered vigorous

physical activity. Thus, it can be concluded that males were more interested in vigorous to moderate physical activity and females were more interested in sedentary to moderate physical activity.

The other findings from this thesis are that Sunrise Park is used more by groups of people, rather than by individuals. In general, it is used more frequently in the afternoon, than in the morning and noon time. However, vigorous physical activities were observed most frequently in the mornings. Areas that were more equipped in the park were used more as well. However, it should be mentioned that the usage difference between the equipped and not equipped areas might be because of other characteristics of these areas such as a slope or landscape characteristics. Also, based on the findings from the observations, areas having supervised/organized activities were used more than areas not having supervised/organized activities. Areas with supervised/organized activities were also used more for vigorous physical activity compared to areas with no supervised/organized physical activities. These findings confirm the findings from the literature review that the existence of supervised activities in parks encourages the usage of parks (Cohen et al., 2006).

The reason the majority of respondents go to other parks was “walking paths”, “more activities”, and “children’s areas”. Rupert Park was the other cited park that the most frequent respondents in the survey and interviews go to as well.

No walking path, the presence of drinking/drug users, and grass quality were cited as preventing issues in the park by the majority of respondents from the survey and interviews. Also, converting the wading pool to something more useful was mentioned.

For improving the usage of Sunrise Park for physical activity, the first three common answers of questions such as “ideas for improving the usage of Sunrise Park for physical activity”, “usage preventing issues in the park”, and “additional comments” from the residential survey and park user interviews were compared. A value of 1 was given to the first three common answers of the “ideas for improving the usage of Sunrise Park for physical activity” and “additional comments” questions. And a value of -1 was given to the first three common answers for “usage preventing issues in the park” question. Also, a value of -1 was given to those areas in good conditions and a value of 1 was given to

areas not in good condition. Then these values were summed. Based on these numbers three categories of “very important”, “important” and “less important” recommendations were created.

Providing a walking path, fitness equipment, recreational facilities and minimizing drug users and people drinking alcohol are the “very important” recommendations. Adding lights, converting the wading pool to something more useful, maintaining the cleanliness of the park, and improving the children’s areas are “important” recommendations. And providing benches and seating areas, park events, improving the grass quality, providing supervised/organized activity, designated dog off-leash areas, and providing community gardens are “less important” recommendations. These recommendations along with comparison with the data from observations and professionals’ ideas for the improvement of this park for physical activity has been illustrated in the table below.

**Table 61. Recommendation for encouraging physical activity in Sunrise Park**

| Recommendations  | Frequency of common requests from survey and park users’ interviews | Observed data | Professionals’ ideas |
|--|---|---------------|----------------------|
| Providing a walking path                               | 6   |               |                      |
| Providing fitness equipment or recreational facilities | 3   | √             | √                    |
| Minimizing drug users/drinking people                  | 3   |               |                      |
| Adding lights  | 2   |               |                      |
| Converting wading pool to something more useful        | 2   |               |                      |
| Maintaining cleanness                                  | 2   |               |                      |
| Improving children areas                               | 2   |               | √                    |
| Providing benches and seating areas                    | 1   |               |                      |
| Providing park events                                  | 1   |               |                      |
| Improving the grass quality                            | 0   |               | √                    |
| Providing supervised/organized activity                | 0   | √             |                      |
| Providing designated dog-off leash areas               | 0   |               | √                    |
| Providing community gardens                            | 0   |               | √                    |

As discussed earlier, the majority of park users’ interviewees and survey respondents use public parks for their physical activity and get to this park by walking.

Also, the majority of the survey respondents did not meet the Canadian guidelines for physical activity. These results show the significant potential of neighbourhood parks for encouraging physical activity among locals and helping them to meet the Canadian guidelines for physical activity. The COV is implementing a Healthy City Strategy. In this strategy, it is targeted that the percentage of Vancouver residents aged 18 and older who meet the Canadian Physical Activity Guidelines will be increased by 25% over 2014 levels by 2025 (City of Vancouver, 2014). Neighbourhood parks have great potential to play a role in facilitating this goal. Thus, conducting research regarding the usage of neighbourhood parks, how their usage for physical activity can be encouraged, and implementing the results of this research are highly recommended to VPB planners, and researchers to help the COV in achieving goals of Healthy City Strategy.

With respect to the methodology of this research, this piece of research applied a mixed method approach. This is recommended as a methodology for future studies on the usage of parks, as it provided data from different perspectives including ordinary users, professional planners, and the observer. The residential survey questionnaire was the most complete and detailed source of data for Sunrise Park. However, collecting responses from residents was the most challenging part of this data collection process. In order to have a representative effective sample, a bigger group of researchers and greater funding is definitely required. Personally I would not recommend conducting a residential survey for understanding the usage of parks in a student scale project. However, it is highly recommended that the COV or VPB conduct this type of research and provide translations of the surveys into other languages to increase the response rate.

Sunrise Park user interviews were a very short and focused form of the residential survey. Interpreting data from interviews was easier than interpreting data from the residential survey, as clarifications could be asked on-the-fly. Interviewing park users in a similar research to this thesis is highly recommended for either student scale projects or City projects. The SOPARC model is highly recommended for conducting observations. It provides a very organized and convenient way of observing a public park.

Conducting interviews with professionals is also recommended for student scale projects. Professionals not only generously spent time participating in this project, but they were very helpful in providing me with very useful information regarding this research.

There were some limitations involved in this piece of research as well, such as translating the residential questionnaire into Cantonese and collecting responses from residents. Also, comparison studies between different neighbourhood parks is highly recommended, as it will be very useful to clarify the differences and similarities between neighbourhood parks' usage as well.

Below are summaries of findings from different sources of data.

**Table 62. Summary of the results from residential survey**

| Summary of the Residential Survey Results  |   |
|--|---|
| Location where respondents exercise  | Park  |
| Usage frequency and weather  | Warm/dry>cold/wet   |
| Get to the park  | Walk  |
| Park usage   | Playground, walk w/out dog, walk w dog (moderate physical activity)                 |
| Perceived safety   | Safe  |
| Safety concern   | Poor lighting, excessive litter, too few people                                     |
| Park's features being <u>very important</u> for respondents to use the park/being involved in PA                   | Open areas, scenic views, benches and sitting areas                                 |
| Park's features being <u>important</u> for respondents to use the park/being involved in PA                        | Trees throughout the park, playground, areas without trees, toilets                 |
| Park's features being <u>not important</u> for respondents to use the park/being involved in PA                    | Field house, wading pool, soccer fields   |
| Non existing features in the park being <u>very important</u> for respondents to use the park/being involved in PA | Jogging/walking trails, lights  |
| Non existing park's features being <u>important</u> for respondents to use the park/being involved in PA           | Play equipment, sign posting, benches   |
| Non existing park's features being <u>not important</u> for respondents to use the park/being involved in PA       | Animal life, artistic features, flattening the slope, meadow/tall grassy areas, BBQ |
| Areas in good condition  | Playground, dog off-leash areas, soccer fields                                      |
| Areas in not good condition  | Field house, wading pool, toilets   |
| Usage frequency of other parks   | Monthly   |
| Other park   | Rupert Park, Stanley Park, Trout lake Park  |
| Reason to go to other parks  | Walking/biking path, more activities  |
| Park improvement   | Walking path and trails, park events, improving the children areas                  |
| Preventing issues  | No walking path   |
| Comments   | View is fantastic, policing for drug users  |
| Gender & walk a dog  | Male>Female   |
| Gender & playing soccer  | Male>Female   |
| Gender & sitting/relaxing  | Female>Male   |
| Gender & meeting friends   | Female>Male   |
| Gender & walking without a dog   | Female>Male   |

**Table 63. Summary of the results from park users' interviews**

| Summary of the Park Users' Interview                 |   |
|--|---|
| Location where respondents exercise                  | Park  |
| Usage frequency and weather                          | Warm/dry>cold/wet                           |
| Get to the park                                      | Walk  |
| Park usage   | Playground, walking the dog                 |
| Usage frequency of other parks                       | Once a week                                 |
| Other park   | Rupert Park                                 |
| Reason to go to other parks                          | Playground, walking/biking path             |
| Park improvement                                     | More fitness equipment, walking path        |
| Preventing issues                                    | Nothing, drinking/drug users, grass quality |
| Comments   | Converting wading pool to s.th useful       |
| Gender & sitting/relaxing (significantly)            | Female>Male                                 |
| Gender & meeting friends in the park (significantly) | Female>Male                                 |
| Gender & walk without a dog (significantly)          | Female>Male                                 |
| Gender & using the playground                        | Female>Male                                 |
| Gender & conducting individual physical activity     | Female>Male                                 |
| Gender & playing baseball/softball                   | Male>Female                                 |

**Table 64. Summary of results from park observations**

| Results from Park Observations                                       |   |
|--|---|
| level of physical activity   | Mod>Sed>Vig   |
| Gender and park usage  | Male>Female   |
| Group of people and park usage                                       | Group>Individuals                                   |
| Time and park usage  | Afternoon>Noon>Morning                              |
| Level of physical activity and time                                  | Vig in the morning>Vig at noon and in the afternoon |
| Weather and park usage   | Sunny>Sunny/cloudy>Cloudy>Rainy                     |
| Level of usage and target areas                                      | Target area #1> Target area #2> Target area #3      |
| Level of usage and equipped/not equipped areas                       | Equipped>Not equipped                               |
| Level of usage and organized-supervised/not organized-not supervised | Organized-Supervised>Not organized-Not supervised   |

**Table 65. Summary of results from professionals' interviews**

| Results from Vancouver Park Board Key Experts Interviews             |   |
|--|---|
| Planning for improvement of usage of parks for physical activity     | Capital plan, Park master planning, upgrading neighbourhood parks, increasing the amount of green space, collaboration with number of organizations |
| Target parks   | Any park, destination parks   |
| Purpose of Sunrise Park's recreational facilities                    | For the community   |
| For what group of people Sunrise Park has been created               | Local community and recreational facilities for some organizations and leagues that had asked for   |
| Perceived usage of Sunrise Park in general and for physical activity | Playground, playing soccer, playing baseball, walk the dogs, sitting, or no use   |
| Any change for Sunrise Park  | No  |
| Any outdoor program in Sunrise Park                                  | Summer playground programs, soccer and baseball   |
| If outdoor programs increase the park usage                          | Yes   |
| Improving the usage of Sunrise Park for physical activity            | Fitness amenities, playground improvement, artificial fields, designated dog off-leash areas, improved basic amenities,                             |

The Table below compares the results from the four data resources of this study and illustrates the compatibles results as well.

**Table 65. Comparison of the results from four data sources**

| Comparison of the Results               |  |   |
|---|--|---|
| Variables                               | Results                                  | Common in Data Resources  |
| Where respondents exercise              | Park                                     | Residential survey, Park users' interviews  |
| Get to the park                         | Walk                                     | Residential survey, Park users' interviews  |
| Sunrise Park usage                      | Playground, walk the dog                 | Residential survey, Park users' interviews, Park Board interviews                   |
| Sunrise Park level of physical activity | Moderate and sedentary physical activity | Residential survey, Park users' interviews, Park observation                        |
| Weather and park usage                  | Warm/dry>Cold/wet                        | Residential survey, Park users' interviews, Park observation, Park Board interviews |
| Other park respondents go               | Rupert Park                              | Residential survey, Park users' interviews  |
| Reasons respondents go to other parks   | Walking/biking path                      | Residential survey, Park users' interviews  |
| Park improvements                       | Walking paths                            | Residential survey, Park users' interviews  |
| Park improvements                       | Fitness equipment                        | Park users' interviews, Park Board interviews                                       |
| Gender & Sitting/relaxing               | Female>Male                              | Residential survey, Park users' interviews  |

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# Appendix A.

## Residential Survey Questionnaire

如果你不懂英语·请找懂的英语的阅读给你听。

### Residential Survey Questionnaire

#### **Contribution of Neighbourhood Parks to Physical Activity:**

#### **A Case Study of Sunrise Park, East Vancouver**

Dear Participant,

I am conducting this 5 minute questionnaire as part of my Master's research project in Urban Studies at SFU. My research is focused on the usage of Sunrise Park for physical activity among local adult residents.

You have been randomly selected to participate in this anonymized and confidential study. This questionnaire is to be completed by a household occupant aged 19 years old and over. Your participation is completely voluntary but you will need to sign the included consent form if you decide to participate. Your participation would be highly valued and may help generate great ideas for park planners to improve the status of this and other neighbourhood parks for physical activities.

While I would appreciate you answering each question, you may skip any questions. There are two options to complete the questionnaire (please pick whatever is most convenient for you):

1. An online version of this questionnaire is available at <https://sfu.fluidsurveys.com/s/SunrisePark>
2. Complete the attached hard copy and return it with the included stamped envelope

*Please complete this survey by Wednesday April 20<sup>th</sup>.*

The online version is issued using Fluid Survey, which complies with BC's Freedom of Information and Protection of Privacy Act.

Thank you kindly,

Maryam Lotfi, SFU Grad Student

### Section 1: Demographic Questions

1. Please specify your gender  
 Female     Male     Other, please specify if you wish \_\_\_\_\_
2. Which of the following categories best describes your age?  
 19 to 29     30 to 39     40 to 49     50 to 59     60 to 65     66 and over
3. What is your mother tongue?  
 English     Spanish     Mandarin     French     Cantonese     Italian  
 Vietnamese     Japanese     Tagalog (Filipino)     Panjabi     Persian  
 Other, please specify \_\_\_\_\_
4. How long have you been living in the neighbourhood close to Sunrise Park? (Check one)  
 Less than 1 year     Between 1-2 years     Between 3-4 years     Between 5-9 years  
 More than 10 years
5. Do you have any barriers to mobility that prevent you physically from using this park?  
 Yes, please explain: \_\_\_\_\_  
 No

### Section 2: Physical Activity and Neighbourhood Parks

**Note: Exercise and physical activity mean the same in this research which is moderate intensity and/or moderate-to-vigorous physical activity.**

- **Moderate-intensity physical activity:** you can talk, but not sing, during the activity. You're working hard enough to raise your heart rate. Some examples include walking or pushing a baby stroller.
- **Vigorous-intensity physical activity:** you will not be able to say more than a few words without pausing for a breath. Your heart rate has gone up quite a bit.<sup>1</sup> Some examples include playing soccer or dancing.

6. Where do you usually exercise? (check all that apply)  
 Park     Home     Private club     Community center

1 - Canadian Physical Activity Guidelines, Canadian Sedentary Behaviour Guidelines, Your Plan to Get Active Every Day

- Exercise room in building  Other public spaces such as seawall or sidewalks  
 I don't usually exercise
7. What is your estimated total length of your physical activities/exercises for one typical week?  
 Less than 30 minutes  Between 31 and 60 minutes  
 Between 61 (1 hour) and 90 minutes (1.5 hours)  Between 91 (1.5 hours) and 150 minutes (2.5 hours)  More than 151 minutes (2.5 hours)
8. Have you ever visited Sunrise Park?  
 Yes → Continue with the next question  
 No, please explain why you don't use this park \_\_\_\_\_  
 If no, please explain what you would like to see in this park to use it \_\_\_\_\_  
 No → Please answer question # 18 and then you are done with this survey
9. How frequently do you use Sunrise Park in warm and dry weather?  
 Never  Less than once a month  1 to 3 times a month  
 1 to 3 times a week  4 to 5 times a week  Daily or almost daily
10. How frequently do you use Sunrise Park in cold and wet weather?  
 Never  Less than once a month  1 to 3 times a month  
 1 to 3 times a week  4 to 5 times a week  Daily or almost daily
11. How do you usually get to the park? (Check all that apply)  
 Walk  Bus or other public transport  Car  
 Bike  Other \_\_\_\_\_
12. What do you usually do in this park? (Check all that apply)  
 Baseball/softball  Sit or relax  Playground or play with a child  
 Meet friends  Walk without a dog  Celebrations, picnics  
 Walk the dog  Soccer  Other \_\_\_\_\_  
 Other group sports or physical activity, please specify \_\_\_\_\_  
 Other individual sports or physical activity, please specify \_\_\_\_\_

**Section 3: Safety and Aesthetic Features in the Park**

13. In general, how safe do you feel the park is? (Check one)
- Very safe       Not very safe       Safe       Not safe at all
14. Which of the following nuisance or safety concerns do you have about Sunrise Park? (check all that apply)
- Poor lighting       Too many people       Too few people
- Graffiti (e.g., markings or paintings that reduce the visual quality of the area)
- Vandalism (e.g., damaged signs, buildings, equipment, etc.)
- Excessive litter (e.g., noticeable amounts of trash, broken glass, etc.)
- Excessive animal waste (e.g., noticeable amounts of dog waste)
- Excessive noise (e.g., noticeable sounds that are unpleasant or annoying)
- Poor maintenance (e.g., overgrown grass/weeds/bushes or lack of grass in green areas)
- Evidence of threatening behavior or persons (e.g., gangs, alcohol/drug use)
- Dangerous spots in the park (e.g., abandoned building, pit/hole)
- Other \_\_\_\_\_       None present

**Section Four: Park Features and Park Conditions**

15. Below are some features that exist in Sunrise Park, please evaluate the importance of each that might encourage you to use this park for physical activities/exercises.

| Park Features                         | Not Important | Important | Very Important |
|---------------------------------------|---------------|-----------|----------------|
| Playground equipment                  |               |           |                |
| Baseball Diamonds                     |               |           |                |
| Field House                           |               |           |                |
| Open areas                            |               |           |                |
| Scenic views to areas beyond the park |               |           |                |
| Wading Pool                           |               |           |                |
| Benches and other seating             |               |           |                |
| Toilets                               |               |           |                |
| Soccer fields                         |               |           |                |
| Trees throughout the park             |               |           |                |

|                                |  |  |  |
|--------------------------------|--|--|--|
| Dog- off-leash Areas           |  |  |  |
| Areas without trails and paths |  |  |  |

16. Below are some features that may not exist in Sunrise Park. Please evaluate the importance of the presence of the following features in Sunrise Park that may encourage you to use this park for physical activities/exercise.

| Park Features   | Not Important | Important | Very Important |
|---|---------------|-----------|----------------|
| Play equipment  |               |           |                |
| Jogging/walking/exercise trail  |               |           |                |
| Lights  |               |           |                |
| Varied plant and animal life  |               |           |                |
| Sign posting and information  |               |           |                |
| Many benches and other seating  |               |           |                |
| Evidence of landscaping (e.g., flower beds, pruned bushes)                  |               |           |                |
| Artistic features (e.g., statue, sculpture, gazebo, fountain)               |               |           |                |
| Historical or educational feature (e.g., monument, educational signs, etc.) |               |           |                |
| Flattening the slopes in the park   |               |           |                |
| Water feature   |               |           |                |
| Meadow (e.g. tall grassy area)  |               |           |                |
| BBQ area  |               |           |                |

17. Please rate the condition of different areas of Sunrise Park?

*Note: Good condition in this research means looks clean and well-maintained (e.g., minimal rust, no graffiti, no broken parts, even surface, etc.)*

| Activity Area       | Good Condition |    |
|---------------------|----------------|----|
|                     | Yes            | No |
| Playground          |                |    |
| Baseball Diamonds   |                |    |
| Dog Off-leash Areas |                |    |
| Field House         |                |    |
| Soccer Fields       |                |    |
| Wading Pool         |                |    |
| Toilets             |                |    |

**Section Five: Comparison with other Parks and Park Improvement**

18. How often do you go to other parks? (Check one)

- Daily     Monthly     Few times a week     Few times a year  
 Once per week     Never     Couple of times per month

(a) Which other city or regional park(s) do you go to most often?

\_\_\_\_\_

(b) Please explain why do you go to this park(s)?

\_\_\_\_\_

19. I would like to know how Sunrise Park can be improved. What additional activities, programs, or facilities would you like to see in Sunrise Park that would cause you to use this park more for physical activities?

- Bicycle paths     Walking paths or trails     Adult sports leagues  
 Adult dance classes     More fitness classes     More youth sports leagues  
 Park events     Providing competitions in the park  
 Park concerts/dances     More trees/different landscaping  
 Community gardens     Improved children area     Off-leash dog area  
 Providing part-time staffing     Other  
 Other supervised, organized activities (specifically: \_\_\_\_\_)

20. What are issues existing in Sunrise Park that prevent you from using this park to its fullest for physical activities?

\_\_\_\_\_

21. Please specify below any additional comments about Sunrise Park.

\_\_\_\_\_

22. Can I contact you with any follow up questions?

- Yes, please provide your email address: \_\_\_\_\_     No

*Thank you for your participation*

# Appendix B.

## Park Users' Interview Questions

### Contribution of Neighbourhood Parks to Physical Activity: A Case Study of Sunrise Park, East Vancouver

1. How would you categorize your gender?  
 Female     Male     Prefer not to say
2. Where do you usually exercise? (check all that apply)  
 Park     Home     Private club     Community center  
 Exercise room in building     Other public spaces such as seawall or sidewalks     I don't usually exercise
1. How frequently do you use Sunrise Park in warm and dry weather?  
 Never     Less than once a month     1 to 3 times a month  
 1 to 3 times a week     4 to 5 times a week     Daily or almost daily
2. How frequently do you use Sunrise Park in cold and wet weather?  
 Never     Less than once a month     1 to 3 times a month  
 1 to 3 times a week     4 to 5 times a week     Daily or almost daily
3. How do you usually get to the park? (Check all that apply)  
 Walk     Bus or other public transport     Car  
 Bike     Other \_\_\_\_\_
4. What do you usually do in this park? (Check all that apply)  
 Baseball/softball     Sit or relax     Playground or play with a child  
 Meet friends     Walk without a dog     Celebrations, picnics  
 Walk the dog     Soccer     Other \_\_\_\_\_  
 Other group sports or physical activity, please specify \_\_\_\_\_  
 Other individual sports or physical activity, please specify \_\_\_\_\_
5. How often do you go to other parks? (Check one)  
 Daily     Monthly     Few times a week     Few times a year  
 Once per week     Never     Couple of times per month
- (a) Which other city or regional park do you go to most often?  
\_\_\_\_\_
- (b) Please explain why do you go to this park?  
\_\_\_\_\_
6. I would like to know how Sunrise Park can be improved. What additional activities, programs, or facilities would you like to see in Sunrise Park that would cause you to use this park more for physical activities?  
 Bicycle paths     Walking paths or trails     Adult sports leagues  
 Adult dance classes     More fitness classes     More youth sports leagues  
 Park events     Providing competitions in the park  
 Park concerts/dances     More trees/different landscaping  
 Community gardens     Improved children area  
 Other supervised, organized activities (specifically: \_\_\_\_\_)  
 Off-leash dog area     Other \_\_\_\_\_
7. What are issues existing in Sunrise Park that prevent you from using this park to its fullest for physical activities?
8. Please specify below any additional comments about Sunrise Park.

## Appendix C.

### Interview Questions for VPB Key Planners

1. Does Vancouver Park Board have any specific planning to improve the usage of parks for physical activities? (What are they?)
2. If yes, what kind of parks are the targets? Does it include neighbourhood parks as well?
3. What are the purposes for creating Sunrise Park's Recreational Facilities?
4. Has Sunrise Park been created with a specific group of people in mind?
5. What is your perception of the usage of Sunrise Park in general?
6. What is your perception of the usage of Sunrise Park for physical activities?
7. Is the Park Board considering any change to Sunrise Park in the future?
8. Are there any specific outdoor programs in this park?
9. Do you think these programs (if any), may encourage the usage of this park in general?
10. How do you think the usage of neighbourhood parks can be improved for physical activity?

## Appendix D.

### Figures From Chapter Four

This section illustrates some Figures and Tables from Chapter Four of this thesis. Below is the Table summarizing the level of importance of each Sunrise Park's features that can be effective in the increase of usage of this park for physical activity based on the residents' opinions.

**Table D1. Comparison of level of importance of Sunrise Park features for being involved in physical activity**

| Sunrise Park Features                 | Level of Importance for Being Involved in Physical Activity |           |               |
|---------------------------------------|---|-----------|---------------|
|                                       | Very Important  | Important | Not Important |
| Playground                            | 38.71%  | 41.94%    | 19.35%        |
| Baseball diamonds                     | 16.67%  | 43.33%    | 40%           |
| Field house                           | 20%   | 30%       | 50%           |
| Open areas                            | 62.50%  | 37.50%    | 0%            |
| Scenic views to areas beyond the park | 65.63%  | 34.38%    | 0%            |
| Wading pool                           | 9.38%   | 43.75%    | 46.88%        |
| Benches and other seating areas       | 56.25%  | 37.50%    | 6.25%         |
| Toilets                               | 43.75%  | 56.25%    | 0%            |
| Soccer field                          | 29.03%  | 29.03%    | 41.94%        |
| Trees throughout the park             | 41.94%  | 54.84%    | 3.29%         |
| Dog off-leash areas                   | 16.13%  | 41.94%    | 41.94%        |
| Areas without trees                   | 6.67%   | 60%       | 33.33%        |

Below is the Table demonstrating the level of importance of features that might not exist in Sunrise Park, but might otherwise encourage residents to be involved in more physical activity.

**Table D2. Comparison of level of importance of other features do not exist in Sunrise Park for being involved in physical activity**

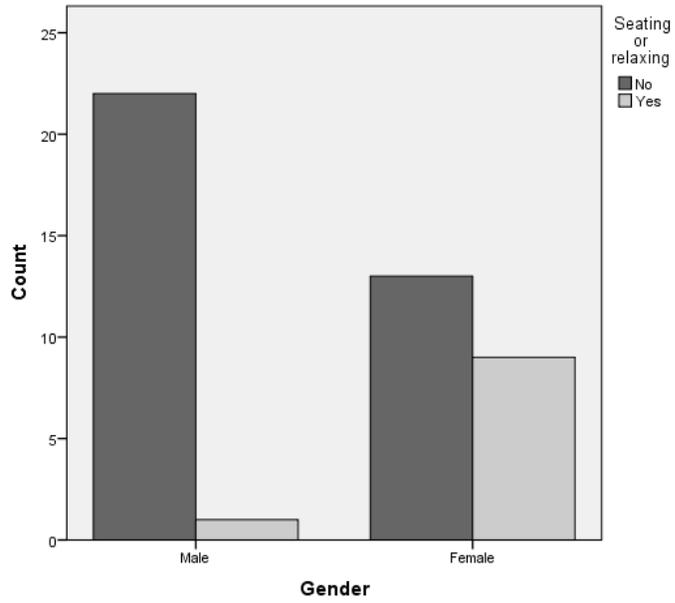
| Other Features                     | Level of Importance for Being Involved in Physical Activity |           |               |
|------------------------------------|---|-----------|---------------|
|                                    | Very Important  | Important | Not Important |
| Jogging/walking/exercise trails    | 60.00%  | 20.00%    | 20.00%        |
| Lights                             | 58.06%  | 35.48%    | 6.45%         |
| Plant and animal life              | 13.79%  | 31.03%    | 55.17%        |
| Sing posting and information       | 38.71%  | 54.84%    | 6.45%         |
| More benches and seating areas     | 40.63%  | 43.75%    | 15.63%        |
| Landscaping and more flowers       | 36.67%  | 36.67%    | 26.67%        |
| Artistic features                  | 10.34%  | 37.93%    | 51.72%        |
| Historical or educational features | 0.00%   | 34.48%    | 65.52%        |
| Flattening the slope areas         | 6.67%   | 36.67%    | 56.67%        |
| Water features                     | 6.67%   | 40.00%    | 53.33%        |
| Meadow/tall grassy areas           | 3.33%   | 23.33%    | 73.33%        |
| BBQ areas                          | 17.24%  | 24.14%    | 58.62%        |

Table below is related to the level of condition of each area in Sunrise Park.

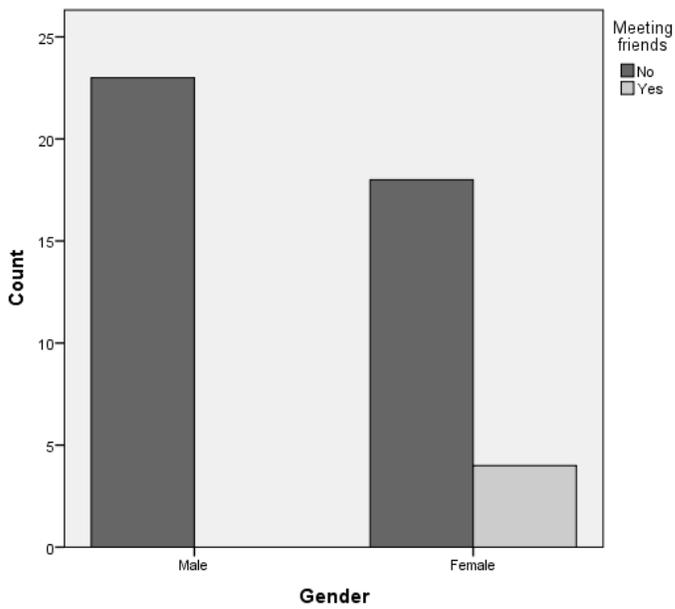
**Table D3. Comparison of level of condition of different areas in Sunrise Park**

| Areas in Sunrise Park | Level of Condition |                         |                   |
|-----------------------|--------------------|-------------------------|-------------------|
|                       | I do not know      | Not in a good condition | In good condition |
| Playground            | 0.00%              | 31.25%                  | 68.75%            |
| Baseball diamonds     | 3.13%              | 9.38%                   | 87.50%            |
| Dog off-leash areas   | 3.23%              | 29.03%                  | 67.74%            |
| Field house           | 19.35%             | 41.94%                  | 38.71%            |
| Soccer field          | 0.00%              | 15.63%                  | 84.38%            |
| Wading pool           | 3.23%              | 51.61%                  | 45.16%            |
| Toilets               | 6.45%              | 61.29%                  | 32.26%            |

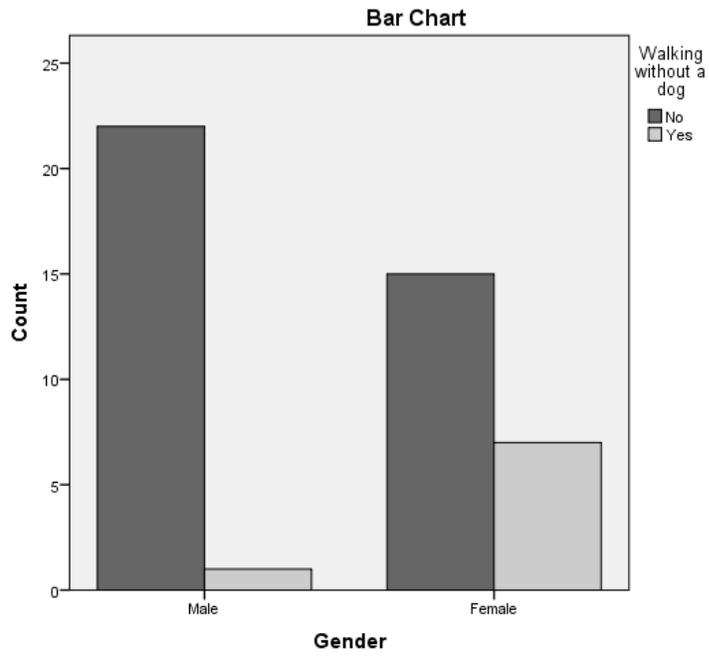
Below are Figures regarding the relation between gender and different activities in Sunrise Park from data from park users' interviews.



**Figure D1. Gender and sitting/relaxing in Sunrise Park bar chart**



**Figure D2. Gender and meeting friends in Sunrise Park bar chart**



**Figure D3. Gender and walking without a dog in Sunrise Park bar chart**