

St. Catherine University

SOPHIA

Doctor of Occupational Therapy Doctoral
Project

Occupational Therapy

12-2016

Physical Activity and the Urban Environment: An Evaluation of Chinatown, New York City

Elza Guzman
St. Catherine University

Follow this and additional works at: https://sophia.stkate.edu/otd_projects

Recommended Citation

Guzman, Elza. (2016). Physical Activity and the Urban Environment: An Evaluation of Chinatown, New York City. Retrieved from Sophia, the St. Catherine University repository website:
https://sophia.stkate.edu/otd_projects/5

This Doctoral Project is brought to you for free and open access by the Occupational Therapy at SOPHIA. It has been accepted for inclusion in Doctor of Occupational Therapy Doctoral Project by an authorized administrator of SOPHIA. For more information, please contact amshaw@stkate.edu.

**Physical Activity and the Urban Environment:
An Evaluation of Chinatown, New York City**

Elza Guzman

A doctoral project submitted in partial fulfillment of the requirements for the degree of
Doctor of Occupational Therapy,
St. Catherine University, St. Paul, Minnesota

December 16, 2016

Doctoral Advisor: Julie D. Bass, Ph.D., OTR/L, FAOTA
Doctoral Committee Members: Jim Hinojosa, Ph.D., OT, FAOTA,
John D. Fleming, Ed.D., OTR/L

**St. Catherine University
Doctor of Occupational Therapy**

Certification of Successful Doctoral Project

We, the undersigned, certify that

Elza Guzman

Student Name

has successfully completed the clinical doctoral project titled

Physical Activity and the Urban Environment: An Evaluation of Chinatown

Julie D. Bass

Doctoral Advisor

December 19, 2016

Date

Jim Hinojosa

Doctoral Committee Member

December 19, 2016

Date

John Fleming

Doctoral Committee Member

December 19, 2016

Date

Certification of Approval for Final Copy of Doctoral Project

I, the undersigned, approve the final copy of the doctoral project by

Elza Guzman

Student name

Julie D. Bass

Doctoral Advisor

January 6, 2017

Date

Dedication and Acknowledgments

I would like to thank St. Catherine's University for giving me the opportunity to expand my knowledge and help me gain new perspectives in my profession.

To the wonderful and amazing Doctor of Occupational Therapy faculty, thank you very much for all the support and wisdom you have taught me.

I would like to acknowledge my mentor and my advisor, Dr. Julie Bass, who has been my pillar throughout this project. Her advice, her helpful criticisms and her words of encouragement has helped me tremendously.

To my family, thank you for supporting me throughout the three years of my journey. I love you.

Abstract

There is an intricate relationship between participation in occupations that involve physical activity and overall health and well-being. Occupational therapy emphasizes the physical environment as a critical factor that serves as a support or barrier to occupational performance. However, there are few evaluations of densely populated urban neighborhoods for the features that promote physical activity. Chinatown, New York City, was selected as a case study for an environmental evaluation because it has defined boundaries and recent studies have identified chronic conditions of Chinatown residents that may be prevented or managed through physical activity.

This project used an occupational therapy perspective to analyze the natural and built structures within a neighborhood and identify environmental supports and barriers to physical activity. The following are the aims of this project: 1) compare environment assessments of the physical environment 2) evaluate and analyze the natural and built environment of Chinatown for its supports and barriers to physical activity for the residents using an environmental assessment, photography and mapping 3) obtain feedback on the evaluation findings from key stakeholders living in Chinatown

Five environmental assessment tools were piloted on two segments of Chinatown. The Irvine Minnesota Inventory Checklist and photography were selected and used to analyze and describe the built-in and natural physical environment of Chinatown. A summary of the findings and results of the assessment were shared with the Chinese-American Planning Council, Inc., an organization serving immigrants and low-income communities and families in New York City. A feedback form was also sent with the summary.

The Irvine Minnesota Inventory Checklist was the most appropriate tool to evaluate an urban and densely populated community such as Chinatown. The result of this project showed that there are more opportunities for improvement in the built-in environment, most specifically in the domains of pleasurability, accessibility, and perceived safety from crime.

An occupational therapy perspective in analyzing the natural and built environment can be helpful in identifying the assets and barriers to performance of physical activity. Occupational therapy can make recommendations to strengthen the features of the physical environment and support programs that promote community health

Keywords: physical activity, walking, built environment, urban, occupational therapy, environmental assessment

Table of Contents

Abstract	iii
Introduction.....	1
Literature Review.....	
Relationship between Physical Activity and Health.....	8
Physical Activity Recommendations.....	12
Physical Activity and the Physical Environment.....	15
Urban Physical Environments.....	18
Evaluation of Urban Environments: Chinatown, New York City.....	19
Methods.....	
Comparisons of Physical Environment Assessments.....	23
Evaluation of the Physical Environment in Chinatown.....	27
Results.....	
Comparisons of Physical Environment Assessments	31
Evaluation of the Physical Environment in Chinatown.....	36
Stakeholder Feedback on Evaluation Chinatown.....	73
Discussion.....	
Comparisons of Physical Environment Assessments	74
Evaluation of the Physical Environment in Chinatown.....	76
Implications for Occupational Therapy Practice.....	79
Project Limitations and Challenges.....	80

Conclusion.....	82
Literature Cited and References.....	83
Appendices.....	
Appendix A Methods.....	
A.1 Summary of Items by Domain on the Irvine Minnesota Inventory	
A.2 IRB	
A.3 Doctoral Project Proposal	

Introduction

Participation in physical activity is a critical component of all health and wellness recommendations. The physical and natural environment such as streets, trees, pavements, buildings and or houses surrounding the person can have a direct influence on a person's ability to participate in physical activities. For instance, a community with unpaved streets, run-down buildings and houses, absence of natural parks and poor lighting can discourage a person from walking and biking; while a community with plush parks, wide streets and beautifully decorated buildings and homes can inspire people to participate in physical activity.

Many occupational therapy models emphasize the relationships among person, environment, occupations and participation. Environment, in its broadest context, encompasses the social, cultural and physical environment of the person. This doctoral project examined the assets and barriers to physical activity in the natural and built environments of an urban community. The community focus of this project was the Lower East Side of Manhattan, Chinatown, where most of the New York City Chinese immigrants call home. According to New York City census bureau in 2000 and Asian American Federation of New York City, almost one third of Chinatown residents (31%) live below the poverty line compared to 21% of all other city residents (AAF, 2003). This project evaluated a poor, low-income urban community, using a community assessment tool, and recorded how the physical and natural built environment encouraged or discouraged a person's ability to participate in physical activities such as walking, biking, and cycling.

Literature Review

The literature review for this doctoral project will explore the relationships among physical activity, the built and natural environment and health and wellness. An overview of current physical activity guidelines and the community of Chinatown New York City will be also be included.

Relationship between Physical Activity and Health

There is extraordinary evidence linking physical activity to the prevention and management of severe chronic diseases such as cardiovascular disease, diabetes, cancer, stroke, hypertension, obesity, and depression. Physical inactivity is a major risk factor for the development of these chronic diseases, which can lead to premature deaths. Physical activity has been strongly recommended by most public health initiatives in the prevention and management of these chronic diseases.

Participation in physical activity is associated with reduced rates of cardiovascular disease. Cardiovascular disease (CVD) is the leading cause of death in the US, with more than one in three American adults having one or more types of CVD (Wong, Dixon, Gilbride, Chin, & Kwan, 2011, p.446). Individuals who engaged in physical activity with an increased expenditure of 1 MET were found to have a mortality benefit of 20% (Warbuton, Nicol, & Bredin, 2006). Physical activity was also associated with a 50% reduction in cardiovascular-related death for men (Myers et al., 2004). For women, a systematic review concluded that “there is a dose–response relationship between physical activity and reduced risk of cardiovascular disease among women” (Oguma & Shinoda-Tagawa, 2004, p. 410). A cohort study of registered nurses ($n=121,700$) with a 24-year follow-up found that high levels

of physical activity is beneficial for all BMI levels, however it did not eliminate the higher risk of mortality with obesity (Hu et al., 2004). Hu's study stated that physical inactivity in combination with excess body mass or weight, accounts for 31% premature deaths and 59% deaths from cardiovascular disease (Hu et al., 2004). Physical activity in cardiac rehabilitation programs may also be helpful in the management of cardiovascular disease. A meta-analysis of 48 clinical trials found that cardiac rehabilitation significantly reduced cardiac mortality and supported reductions in cholesterol level and triglyceride level, high blood pressure, and rates of self-reported smoking (Taylor et al. 2004).

Regular physical activity is important in diabetes prevention and management. The incidence of diabetes in the United States is increasing sharply, with 1.3 million new cases each year (Bassuk & Manson, 2005, p.1). In the Kuipio Ischemic Heart Disease Risk Factory Study ($n=87$ men, mean = 51 years), moderate participation in physical activity was protective against the development of type 2 Diabetes in middle-aged men particularly among those men who were at high risk of diabetes (Lynch et al., 1996, p. 309). Men who participated in physical activity for at least 40 minutes per week were 56% less likely to develop diabetes than those who did not participate in any physical activity (Lynch et al., 1996). A more recent study, the Aerobics Center Longitudinal Study (ACLS) ($n= 23, 444$ men, mean = 53 years), found that men who participated in walking/jogging/running (WJR) and sports and fitness had a 56% and 40% lower risk of developing diabetes as compared to men who were sedentary (Sieverdes et al., 2010, p. 240). A systematic review of 10 prospective cohort studies examined the relationship between moderate physical activity and type 2 diabetes (Jeon, Lokken, Hu, and Van Dam, 2007). The review concluded that people who engaged in moderate physical activity had a 30% lower risk of diabetes as compared to

people who did not participate in physical activity (Jeon et al., 2007). A similar trend was also found in a cohort study of women ($n=70,000$, mean = 53 years); physically active women had a 56% reduction in the incidence of diabetes compared to sedentary women and an associated 25% decrease risk of diabetes over an eight-year follow-up (Hu et al., 1999). The Women's Health Study ($n= 38,000$, mean = 45 years) showed that women who participated in active walking for two to three hours per week were 34% less likely to develop diabetes (Weinstein et al., 2004). A similar cohort study of 4,369 women who cycled at least 30 minutes a day experienced a 36% reduction in the incidence of diabetes as compared to participants who did not engage in physical exercise (Hu et al., 2003).

Research has shown that engagement in physical activities can decrease the incidence of stroke. Stroke is one of the leading causes of death in the United States (Lee, Folsom, & Blair, 2003, p. 2475). Factors that increase the risk for stroke include hypertension and cardiovascular diseases (Lee et al., 2003). A meta-analysis of 23 studies (18 cohorts and 5 case-control) found that moderate and high levels of physical activity reduced the risk and mortality rates for stroke (Lee et al., 2003, p. 2474). Individuals who had engaged in high levels of physical activity had 25-64% lower incidence of stroke than those with lower fitness levels (Lee et al., 2003, p. 2474). Similar findings were also found in a prospective cohort study of Harvard alumni ($n=11,130$, mean=58 years) (Lee & Paffenbarger, 1998). Follow-up surveys conducted 11 years after the baseline showed that climbing stairs and walking with moderate intensity were associated with a significant decrease in the risk of stroke.

Research on cancer has found that active participation in physical activity can reduce the mortality and incidence of cancer. A prospective cohort study of 74,171 (including $n=1780$ for newly diagnosed breast cancer) postmenopausal women with a mean age of 65

years, were recruited from 40 US clinical centers from 1993 through 1998 (McTiernan, Kooperberg, White, & Vogel, 2003). During a 4.7-year follow-up, women who engaged in vigorous physical activity had a 14% decreased risk of breast cancer and women who participated between 1.25 to 2.5 hours per week of brisk walking had a reduction of risk from breast cancer by 18% (McTiernan et al., 2003).

Physical activity levels have also been examined for mental disorders and mental well-being. Cohort studies have consistently associated regular exercise with low depression in adolescents (Morris, Steinberg, Sykes, & Salmon, 1990) and also with older adults (Ruuskanen and Ruoppila, 1995). A large cohort study ($n=2223$ boys $n=2838$ girls) found that participation in vigorous exercises by these adolescents was related to lower emotional distress (Steptoe and Butler, 1996). Emotional wellbeing was assessed by the use of malaise inventory and the 12-item general health questionnaire (GHQ) (Steptoe and Butler, 1996). In a separate study, Steptoe et al. examined the prevalence of physical activity among adolescents ($n=7302$ male and $n=9181$ female) to analyze its relation to health-related behaviors and emotional well-being. The study noted that there was a positive correlation between beliefs of healthy behavior and engagement of healthier lifestyle with participation in physical activity and exercise (Steptoe et al., 1997). A cross-sectional and prospective longitudinal epidemiological study ($n=2548$ mean of age of 19 years) concluded that subjects with regular physical activity had a substantially lower incidence of anxiety, somatoform and dysthymic disorder (Strohle et al., 2007). A 2014 investigated the effectiveness of physical exercise in reducing symptoms of depression (Josefsson, Lindwall, & Archer, 2014). A meta-analysis of 14 studies indicate that exercise has a moderate to large antidepressant effect (Josefsson, Lindwall, & Archer, 2014).

Physical Activity Recommendations

Regular, moderate-intensity physical activity provides substantial health benefits. The Centers for Disease Control and Prevention (CDC) and the American College of Sports Medicine (ACSM) provided clear recommendations on the types and amounts of physical activity needed by healthy adults to improve and maintain health (health.gov). The guideline provides a science-based guidance to help Americans aged 6 and older improve their health through physical activity (health.gov):

1. To promote and maintain health, all healthy adults aged 18-65 years need a moderate-intensity aerobic physical activity for a minimum of 30 minutes five days each week or high-intensity aerobic activity for a minimum of 20 minutes three days each week (Haskell et al., 2007, p.1083).
2. To promote and maintain good health and physical independence, adults aged 18-65 years will benefit from performing activities that maintain or increase muscular strength and endurance for a minimum of two days each week (Haskell et al., 2007, p. 1084).
3. Participation in aerobic and muscle-strengthening physical activities above the minimum recommended amounts can give added health benefits and results in higher levels of physical fitness (Haskell et al., 2007, p. 1084).

Intermittent physical activity also is beneficial. The recommended 30 minutes of activity can be accumulated by performing short bouts of activity such as walking up the stairs instead of elevators, walking to work and or school instead of driving or taking public transportation (Haskel et al., 2007). Light-intensity activities are the activities frequently performed during daily life (self-care, home management tasks) or activities with short

durations such as taking out the trash, walking to a parking lot or walking to a store (Haskell et al., 2007). Other home management tasks such as gardening, housework, raking leaves and leisure activities such as dancing, and playing with children can also contribute to the 30 minute per day if performed at an intensity corresponding to brisk walking (Pate et al., 1995).

Physical activity is part of a variety of daily occupations that are carried out by individuals within the context of their environment (See Table 1). The American Occupational Therapy Association (AOTA) Practice Framework: Domain and Process, 3rd edition, provides a foundation for understanding the types of everyday occupations that involve physical activity and the environment in which they occur (AOTA, 2014). Helping people to achieve “health, well-being, and participation in life through engagement in occupation” is the foundation of occupational therapy practice (AOTA, 2014, p. S4). Occupation is defined as the daily purposeful activity in which people engage. A person participates in their occupations within a context/environment that are influenced by their client factors, performance skills, and performance patterns (AOTA, 2014).

Table 1

A Sample of Everyday Occupations that Promote Physical Activity and Health

Everyday Occupation	Definition in AOTA Practice Framework (AOTA, 2014)
Driving and community mobility	“Planning and moving around in the community and using public or private transportation, such as driving, walking, bicycling, or accessing and riding buses, taxi cabs, or other transportation systems” (p.19)
Health management and maintenance	“Developing, managing, and maintaining routines for health and wellness promotion, such as physical fitness, nutrition, decreased health risk behaviors, and medication routines” (p.19)
Home establishment and management	“Obtaining and maintaining personal and household possessions and environment (e.g. yard, home, garden, appliances, vehicles), including maintaining and repairing personal possessions and knowing and knowing how to seek help or whom to contact” (p.19)

Shopping	“Preparing shopping lists; selecting, purchasing, and transporting items; selecting method of payment; and completing money transactions...” (p. 19)
Leisure participation	“Planning and participating in appropriate leisure activities; maintaining a balance of leisure activities with other occupations; and obtaining, using, and maintaining equipment and supplies appropriate” (p.21)
Social participation within the community	“Engaging in activities that result in successful interaction at the community level (e.g. neighborhood, organization, workplace, school, religious or spiritual group) (p.21)

Physical Activity and the Physical Environment

The physical environment includes both the natural and built environment. The Occupational Therapy Practice Framework, 3rd edition, defines physical environment as the "natural and built nonhuman surroundings and the objects in them. The natural environment includes geographic terrain, plants, and animals, as well as the sensory qualities of the surroundings" (American Occupational Therapy Association [AOTA], 2014, p. 28), while the built environment includes buildings, furniture, tools and devices (AOTA, 2014, p. 28).

The International Classification of Functioning, Disability and Health (WHO, 2001) defines environment as "animate and inanimate elements of the natural or physical environment, and components of that environment that have been modified by people, as well as characteristics of human populations within that environment which includes: physical geography, flora and fauna, light, sound, air quality" (WHO, 2001, e2). Built- in environment as defined by ICF is the "design, construction and building products and technology of buildings for public use". "Products and technology that constitute an individual's indoor and outdoor human-made environment that is planned, designed and constructed for public use, including those adapted or specially designed" (WHO, 2001, e150).

There is evidence regarding the strong relationship between the characteristics of the physical environment and engagement in physical activity such as jogging, walking and running. Specific features of buildings and the immediate surroundings such as stairs and sidewalks may serve as supports or barriers to physical activity. Other features of the physical environment that support physical activity can include street connectivity, accessibility, and availability of fitness equipment or recreational facilities, aesthetics and perceived safety. A systematic review of 20 cross-sectional and 13 quasi-experimental studies examined the relationship between the built environment and physical activity among adults (McCormack & Shiell, 2011). The environmental factors that may have an effect on physical activity include land use mix, connectivity, population density, and overall neighborhood design (McCormack & Shiell, 2011). Weather and perceived safety were found as additional environmental factors that influence physical activity (Humpel, Owen, & Leslie, 2002). The activity of walking and its relationship with environmental structures was the focus of some studies in the literature. A literature review of eighteen studies identified

the following attributes of the environment that were associated with purposeful walking to get to and from places: aesthetics, the convenience of facilities for walking, accessibility of destination, perceptions about traffic and busy roads (Owen, Humpel, Leslie, Bauman, & Sallis, 2004). Walking as a means of transportation (walking to get to and from places) also had a positive link with the built-in environment where density, distance to destination, land use mix, parks and open space, and personal safety were the major determinants (Saelens & Handy, 2008).

Environmental evaluations are used to determine how a specific physical environment supports or limits physical activity and other healthy lifestyle occupations. There are a variety of assessment tools that may be used to evaluate the physical characteristics of communities and neighborhoods. There are three primary sources of data that have been used to develop high-quality environmental assessment tools: (1) perceived measures such as surveys, questionnaires, and interviews; (2) objective assessments based on observational methods and (3) already existing records that are analyzed through Geographic Information System (GIS) (Brownson et al., 2009). Perceived measures examine the person's perception regarding environmental barriers and supports to physical activity, opportunities for recreation, land use, and transportation environments. Observational measurements and or analytic audits tools measure the characteristics and attributes of the environments. GIS is defined as the "integration of software, hardware, and data capturing, storing, analyzing and displaying all forms of geographically referenced information" (Brownson, Hoehner, Day, Forsyth, & Sallis, 2009, p. 7). GIS-based measures refer to measures of built-in environment derived from already existing data sources with noted spatial and geographical figures (Brownson et al., 2009).

Urban Physical Environments and Socioeconomic Status

Ethnicity and low socioeconomic status have been associated with barriers to physical activity. Differences in accessibility to recreational resources for physical activity can vary among neighborhoods by socioeconomic or social context (Eastbrooks, Lee, & Gyurcisk, 2003). It was suggested that decreased accessibility to physical activity resources might limit physical activity which then influence behavior and attitudes towards participation in physical activity (Eastbrooks et al., 2003)

Urban communities and the characteristics of the physical environment may serve as assets or barriers to engagement in physical activity. People living in disadvantaged neighborhoods often lack access to safe and pleasant green areas, and therefore individuals are less likely to participate in physical activities than those in more affluent neighborhoods (Gelormino, Melis, Marietta, & Costa, 2015). There are differences in the availability of community-level physical activity factors such as sports facilities, parks and green spaces, and the presence of bike paths by socioeconomic status, race, and ethnicity (Powell, Slater, & Chaloupka, 2004). The proximity of green spaces in disadvantaged neighborhoods is of particular importance to support physical activity (Watts et al., 2013). Geographic Information System (GIS) have been used to examine densities of resources and available recreational facilities in minority and low-income areas in North Carolina, New York, and Maryland (Moore, Roux, Evenson, McGinn, & Brines, 2008). This study found that minority neighborhoods were significantly more likely than white communities not to have recreational facilities and low-income neighborhoods were 4.5 times more likely to not have facilities than high-income areas (Moore et al., 2008).

Evaluation of Urban Environments: Chinatown, New York City

The Chinese presence in New York City started around the mid-19th century, more specifically during the 1870s (Tseng and Waldinger, 1992). By 1900, there were 6,321 Chinese in New York City which was almost double from the early 1870s. Natural growth and immigration after World War II boosted the Chinese population to 33,000 in 1960. Most of the Chinese immigrants were employed in trade, most specifically in restaurants and the laundry business. With the population growth in the 1980s, most of the Chinese immigrant settled around the lower east side of the New York City, where houses were originally built by European immigrants 100 years before (Tseng and Waldinger, 1992). There was a definite overcrowding in Chinatown where the new Chinese immigrants were sheltered and crowded in a one room apartment called “gong si fong”, a traditional public room where 3-4 tenants share a room (Tseng and Waldinger, 1992).

Currently, New York City Chinatown is the largest Chinese community in the United States. (please refer to Figure 1 for area map of Chinatown). The United States Census Bureau of 2015 estimates the Chinese American Population in the nation to be about 4.7 million, of which 474,783 live in New York City alone (US Census, 2015). The 2013 Asian American Federation (AAF) census information found that the median household income for NYC Chinese to be \$47,131(Asian American Federation [AAF], 2013), which is lower than the city average of \$55,434 with the mean household size is 3.12 person, which is slightly higher compared to the city average of 2.63 persons (AAF, 2013). Seven out of ten Chinese living in New York City were foreign born with 95% speaking a language other than English at home, with 32% Cantonese speaking only and 25% speak Mandarin only. Regarding education, 51% have less than a high school education, 13% with some college education and

21% are college graduates (Ahn, Abesamis-Mendoza, Le, & Ho-Asjoe, 2007, p. 5). Poverty for both working age and senior citizen Chinese is high, with an overall rate of 20.7% compared to 20.1% city average (AAF, 2013). Chinese senior citizens have a 30.5% incidence of poverty as compared to the city average of 18.2% (AAF, 2013).

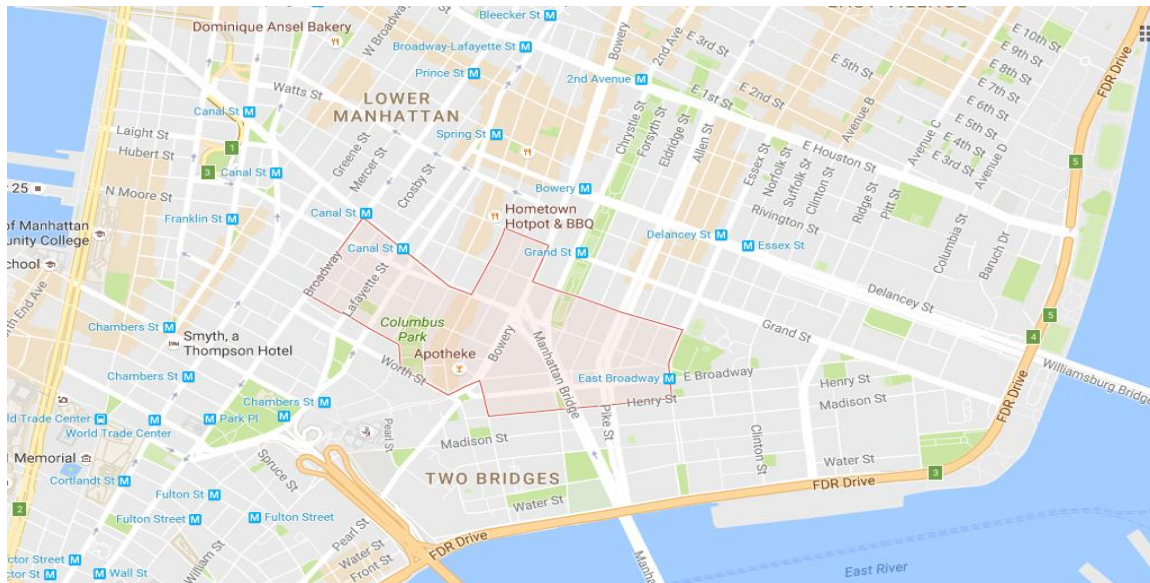


Figure 1. Map of Chinatown in New York City. Shaded area of the map is Chinatown in New York City. It is in the lower east side of Manhattan and it is approximately two square miles. Retrieved from google maps <https://www.google.com/maps/@40.7160814,-74.0056357,15z>

Studies of Chinese Americans have documented health conditions and needs that can be prevented or managed through lifestyle interventions, including physical activity. The top health concerns of the Chinese community living in New York City have been reported as cardiovascular disease, respiratory problems, cancer and diabetes (Ahn et al., 2007).

To better understand the risk of cardiovascular disease mortality among Chinese immigrants in New York City, Fang, Madhavan and Alderman (1999) examined New York City death records from 1988 to 1992. Both male and female Chinese residents had an

overall lower mortality rate for cardiovascular diseases as compared to whites living in New York City (Fang et al., 1999) and were less likely to be obese, drink alcohol or smoke. However, New York City Chinese immigrants had higher hemorrhagic stroke deaths than whites and were more likely to have a history of diabetes, hypertension, complications from stroke and left ventricular hypertrophy (Fang, Foo, & Jeng, 2004, p. 379).

Diabetes was also one of the health concerns of Chinese immigrants. A cross-sectional epidemiology study examined the prevalence of diabetes and impaired fasting glucose (IFG) among Chinese immigrants living in New York City and found that the prevalence of diabetes and IFG was 38.3%, which was high among Asian standards (Rajpathak & Wylie-Rosett, 2011).

Chinese Americans also have higher rates of colorectal, liver, and lung cancer as compared with other Asian ethnic groups (McCracken et al., 2007). Chinese males had one of the highest incidence and mortality rates for colorectal cancer as compared to other ethnic groups (McCracken et al., 2007). Liver cancer among Chinese men is more than twice as high than any other Asian minority group (McCracken et al., 2007).

Increasing physical activity is a health priority for this population because of the rise of chronic diseases and with the recommendations of both CDC and ACSM. Participation in physical activity may help prevent and manage these chronic diseases. The built-in and natural environment can serve as a support or barrier to physical activity. The uniqueness of Chinatown's built environment can be both a support and or a barrier to participation in physical activity. Chinatown is a very dense urban community, and thus the physical environment can play a role in the ability to get recommended levels of physical activity.

Environmental evaluation is an important first step to address these health concerns and identify the opportunities for participation in physical activity in this community.

The objective of this project was to analyze the natural and built environment of Chinatown and analyze its influence on physical activity. The long-term goals of this project were to provide an occupational therapy perspective on the natural and built structures within a neighborhood to help identify environmental supports and barriers to physical activity.

The specific aims of this project were as follows:

1. To analyze assessments that would help evaluate the natural and built environment of Chinatown for its influence on physical activity.
2. To evaluate and analyze the natural and built environment of Chinatown for its supports and barriers to physical activity for the residents using an environmental assessment, photography and mapping.
3. To receive feedback on the evaluations findings from key stakeholders living in Chinatown.

Methods

Comparisons of Physical Environment Assessments

There were several frameworks and or assessments used to assess and analyze the natural and built physical environment and how it will likely affect a person's physical activity. There was a myriad of assessment tools currently being used, however to help narrow down to five assessments, the following domains were considered: format of assessments, easiness of tool and variables analyzed such as streets, presence of sidewalks, aesthetics of neighborhood, and safety. After searching and analyzing several tools, the five assessments selected were the following: Analytic Audit Tool and Checklist Audit Tool (Brownson, Brennan, Ramirez, Hoehner, and Cook, 2003), The Irvine Minnesota Inventory (Day, Boarnet, Alfonzo, and Forsyth, 2005), The Pedestrian Environment Data Scan (PEDS) (Clifton, Livi and Rodriguez, 2004), The Systematic Pedestrian and Cycling Environmental Scan (SPACES) (Pikora, Giles-Corti, Bull, Knuiman, Konrad and Donovan, 2000), and Walking and Bicycling Suitability Assessment (WABSA) (Emery, Crump and Bors, 1998).

Analytic Audit Tool and Checklist Audit Tool is used to understand the relationships between street-scale environments and rates of physical activity. The different features that it assesses include types of destinations, sidewalk quality, presence of litter and graffiti, presence of trees, availability of public transit, and types of recreational destinations (Brownson et al. 2003). The instrument is a 27-item open ended questionnaire with consists of 6 major domains—transportation environment, land-use environment, recreational facilities, physical disorder (aesthetics), signage, and social environment. (Brownson, p. 1).

The Irvine Minnesota Inventory is designed to measure a wide range of built environment features that were potentially linked to active living, especially walking. It

has 160 closed-ended questions, which covers four domains: accessibility, pleasurable, perceived safety from traffic, and perceived safety from crime (Day et al., 2005). This instrument was checked for inter-rater reliability in Southern California and St. Paul Minnesota and results showed that 77 items showed 80% or more in reliability tests (Day et al., 2005).

Pedestrian Environment Data Scan (PEDS) is an observational instrument, which reviews the built and natural environment with focus on pedestrian walking activity. It looks at how environmental features can influence walking in varied environments (Clifton et al., 2004). The audit tool is composed of a 35-item questionnaire with close-ended questions using a Likert scale (Clifton et al., 2004). The different features it analyzes are walking and cycling environments such as lighting of roads, shades, cleanliness of roads, conditions of roads and road attributes/amenities such as number of lanes, posted speed limit, presence of crosswalks and crossing aids. Using Kappa, the authors of the instrument tested the reliability of the assessment in the city of College Park, MD where a large number of residents were college students (Clifton, Livi-Smith, and Rodriguez, 2006). The instrument had an 89% of the variables tested with 80% agreement among the raters (Clifton et al., 2006).

Systematic Pedestrian and Cycling Environmental Scan (SPACES) was an assessment that measured the physical environmental factors that influence walking and cycling in local neighborhoods (Pikora et al., 2000). It had a 37-item checklist, which looked at both sides of the street. The domains that were looked are as follows: conditions of roads, presence of sidewalks, aesthetic of the environments, cleanliness and lighting. The reliability of the instrument was assessed using Kappa. The results of the inter-rater reliabilities indicate that

21 items in the assessment showed excellent reliability ($>.75$), 27 items showed fair-good reliability (between .4 and .75) and 19 items showed poor reliability (Kappa values $<.4$) (Pikora, Bull, Jamrozik, Knuminan, Giles-Cortin and Donovan, 2002, p.189).

Walking and Bicycling Suitability Assessment (WABSA) This tool is comprised of two assessments that looks at the environment and how it influences a person's ability for walking and biking. The walking assessment tool is an 11-item open-ended questionnaire and the bicycling assessment tool is a 27-item open-ended questionnaire. The characteristics of the environment assessed are as follows: presence of sidewalk, posted speed, sidewalk condition, sidewalk width curbs, presence of street lights, type of road and intersections. Pearson correlations were used to assess the reliability between the Walking Suitability assessment and Bicycling Suitability Assessment. Validity correlations for walking was $r = .58$ and for bicycling was $r = .62$ (Emery, Crump and Bors, 2003) and the interrater reliability for walking assessment was $r = .79$ and bicycling $r = .90$ (Emery et al., 2003). "With these instruments, community members and professionals can compile data on the walking and bicycling environment and use those data to identify areas for improvement that will ultimately create supportive environments for more physically active lifestyles" (Emery, Crump, and Bors, 2003, p. 5).

The five assessments were piloted by analyzing two street segments in Chinatown (please see Figure #2). Segments 1 and 2 were composed of a mixture of both residential and commercial buildings in Chinatown. Each segment was two blocks length; Segment 1 from Mott Street going north towards Grand Street which was approximately 879.23 feet (267.99 m) and Segment 2 from Mott Street going east to Bowery which was approximately 495.49

feet (151.02 m). Both streets were considered “local” streets because there were fewer tourists within these street blocks and more locals crowding within the area.



Figure 2. Above map shows the two segments used to pilot the five assessment tools. Segment 1 goes north from Canal towards Canal Street and Segment 2 goes East from Mott Street towards Bowery.

Tools used during the assessment of segments 1 and 2 were the following: clipboard, measuring tape, camera to take pictures of each segment and pen and pencil to record data. Each segment was performed on two different weekend days on January and February of 2016. Segment 1 was performed on Saturday morning between the times of 7 a.m. and 11p.m. while Segment 2 was performed on a Sunday afternoon between the times of 12 p.m. and 3 p.m. The actual walking of each segment took approximately 45 to 60 minutes, which included taking photos and filling out all five assessment tools. After each segment, approximately 10-15 minutes were spent taking down observational notes.

Photos that were taken were focused on the built and natural environment that could affect physical activity such as streets, sidewalks, traffic safety, access to any public parks and or recreational areas and aesthetically pleasing structures. In addition, to help determine the most appropriate tool from the five above assessments, a table was created to compare their features and domains they measured.

Assessment of the Physical Environment in Chinatown

Chinatown New York City has the largest concentration of Chinese immigrants in the Western Hemisphere and one of the busiest tourist attractions in New York City (AAF, 2013). It is located on the Lower East Side of Manhattan with an area covering two square miles. Chinatown boasts very attractive landmarks, restaurants with authentic cuisines, specialty stores and open markets. Also in this neighborhood are permanent residents living in both high-rise apartments and or walk-up apartments located above all commercial stores. Chinatown is home to a resident population estimated at 150,000 (AAF, 2013).

Chinatown was divided into three sections, with different segments within each section (please refer to Table 2). Each segment was analyzed using the Irving Minnesota Inventory and photography. For each street segment, two to three pictures were selected that best represented the barriers and supports for physical activity.

Section 1, which was composed of 14 segments, was the “West” side of Chinatown; Section 2, composed of 6 segments was the “North” side of Chinatown and Section 3, composed of 11 segments was located towards the “East” of Chinatown. Each section was assessed during different times of the year. Section 2 was performed during January and February of 2016, Section 1 was around July and August of 2016 and Section 3 was assessed around September and October of 2016.

Table 2

This table is the breakdown of Chinatown into Sections 1 through 3 and into the different street segments

Section 1	Section 2	Section 3
Segment 1- Broadway btw Canal St. and Leonard St.	Segment 10 – Mott Street btw Grand Street and Canal Street	Segment 13 – Hester Street btw Bowery Street and Rutgers
Segment 2 – Cortland Alley btw Canal St. and Franklin St. Benson St. btw Franklin St. and Leonard St.	Segment 11 – Elizabeth St. btw Grand St. and Canal St.	Segment 14 – Canal St. btw Bowery and Rutgers
Segment 3 - Lafayette btw Canal St. and Leonard St.	Segment 12 – Bowery St. btw Grand St. and Canal St.	Segment 15 – Division St. btw Bowery St. and Canal St.
Segment 4 - Centre St. btw Canal St. and Leonard St.	Segment 23 - Grand St. btw Mott St. and Bowery St.	Segment 16 – East Broadway btw Catherine St. and Rutgers St.
Segment 5 – Baxter btw Canal St. and Leonard St.	Segment 24 -Hester St. btw Mott St. and Bowery St.	Segment 17 – Henry St. btw Catherine St. and Rutgers St.
Segment 6 – Mulberry St. btw Canal St. and Worth St.	Segment 25 - Canal St. btw Mott St. and Bowery St.	Segment 26 – Chrystie St. btw Hester St. and Canal St.
Segment 7 – Mott St. btw Canal St. and Worth St.		Segment 27 – Forsythe St. btw Hester St. and Canal St.
Segment 8 – Elizabeth St. btw Canal St. and Bayard St.		Segment 28 – Eldridge St. btw Hester St. and East Broadway
Segment 9 – Bowery St. btw Canal St. and Worth St.		Segment 29 – Pike St. btw Hester St. and Henry St.
Segment 18 – Canal St. Broadway and Mott St.		Segment 30 – Allen St. btw Hester St. and Henry St.
Segment 19 – Walker St. btw Broadway and Canal St.		Segment 31 – Rutgers St. btw Hester St. and Henry St.
Segment 20 - White St. btw Broadway and Baxter St.		
Segment 21 – Franklin St. btw Broadway and Centre St.		
Segment 22 - Leonard St. btw Broadway and Baxter St.		

Section 2 was assessed in the middle of winter. The assessment was performed for all six segments within two weekend days. There was one day when it had snowed the night before so during the assessment, there was still some snow on the ground, which was an interesting factor that affected the walking patterns of people within those segments.

Section 1 was assessed during the summer, where Chinatown was busier with tourists as compared to winter months. It was more difficult to assess each segment within this section because of the density of pedestrians and vehicle traffic.

The Irvine Minnesota Inventory is a 160-item tool. During the process of assessing each segment, a clipboard and pen were utilized to collect data and an SLR camera was used to take photos of the built-in environment. Each segment was assessed from one end to the other end; starting from one side of the street and walking back on the other side. Depending on the length of the segment and pedestrian traffic, each segment took approximately 20-30 minutes to walk through including data collection and photography.

The main photos taken during the assessment were the natural and built-in environment that had the potential to be a barrier and or support for physical activity. Photographs were important in this project for it provided an important link within the project and it could provide a visual perspective regarding the barriers and support for physical activity. Important variables that were important for photography were the following: Streets, presence of bicycle lanes, building structures, presence of trees, lights, opportunities for recreation and access to public spaces and overall aesthetics.

Results

Comparisons of Physical Environment Assessments

The initial search of the environmental assessment tools was through performing a literature review through google scholar using the words: physical activity, environment, and assessment tools. The five tools that were picked were measuring the following domains: accessibility, aesthetics or pleasurability of the environment, perceived safety from crime and traffic safety. The most important aspect in determining the tools besides the domains and variables assessed was the feasibility of usage in an urban environment. Please refer to Table # 3 for the comparison of each assessment tool and the variables it assesses.

The five assessment tools were similar with the domains and variables they measure but different with the details measured and the length of the assessments. In addition, all five measurements also had good to excellent interrater reliability scores. PEDS assessment tool mostly focused on the physical attributes of the environment that affects walking and cycling such as street and sidewalk attributes with only 11 questions focused on environmental attributes such as aesthetics, building designs and cleanliness. WABSA was a tool for an urbanized setting however the variables assessed focused only on street attributes/road segments and how it affected walking and cycling. All five assessments were easy to use with only one assessment tool requiring an extra tool, which was a tape measure.

Besides looking at the psychometric measures and the variables that each tool assessed, all five assessment tools were trialed in two segment streets in Chinatown, New York City. The trial of assessment tool was performed in the morning, in two separate weekend days. One important factor that was vital for choosing an appropriate tool was the feasibility for use in an urban environment, most particularly New York City.

Overall, the Irvine Minnesota Inventory was the most detailed assessment tool that looked at the four important domains that affect participation in physical activity. It was more detailed in measuring the physical environment and it suited the urban community of Chinatown New York City.

Table 3

Comparison of Assessment Tools

Tool	SPACES	Analytic Audit Tool	Irvine-Minnesota Inventory	WABSA	PEDS
Main concepts measured	Types of buildings, walking and cycling paths, street assessment	Land use, transportation, aesthetics, signage	Accessibility, perceived safety from traffic, perceived safety from crime	Walkability and bike-ability of urban streets	Environment, pedestrian facilities, road attributes, walking/cycling, environment
Land Use					
Presence of recreational spaces		Y	Y		
Presence of commercial buildings	Y	Y	Y		
Types of nature present					
Presence, types of public/civil buildings		Y	Y		
Presence of commercial/retail buildings	Y	Y	Y		
Presence of transportation facilities	Y	Y	Y		
Presence of office buildings	Y		Y		
Street/Traffic					
Number of vehicle lanes	Y		Y		Y
Traffic volume				Y	Y
Posted speed limit		Y	Y		Y
Road condition	Y			Y	Y
Presence of parking					
Type of intersections	Y	Y	Y	Y	Y
Presence of traffic and pedestrian signal	Y	Y	Y	Y	Y
Presence/types of street markings for pedestrian street crossings		Y	Y	Y	
Presence of alley			Y		
Perceived safety for pedestrian crossing			Y		
Perceived convenience for pedestrian crossing			Y		

Tool	SPACES	Analytic Audit Tool	Irvine-Minnesota Inventory	WABSA	PEDS
Sidewalks					
Presence of sidewalks	Y	Y	Y		Y
Completeness of sidewalks		Y	Y		Y
Maintenance of sidewalks /condition	Y	Y	Y	Y	Y
Sidewalk width			Y		
Sidewalk connectivity					Y
Location of sidewalk	Y				Y
Sidewalk aesthetics/quality of sidewalks	Y		Y		Y
Sidewalk condition	Y			Y	Y
Sidewalk obstacles	Y	Y			Y
Presence of sun/rain/sun protections on sidewalks			Y		
Presences of alternative paths besides sidewalks	Y	Y	Y		Y
Width of alternative paths		Y			
Obstruction in sidewalks		Y			
Sidewalk material				Y	
Bicycle Paths					
Availability of bicycle facilities		Y			
Presence of bicycle lanes		Y	Y	Y	Y
Location or demarcation of bicycle lanes	Y	Y	Y		Y
Condition of bicycle lanes		Y			
Obstruction in bicycle lanes		Y			
Continuity of bicycle routes	Y	Y			
Presence of bicycle facilities	Y	Y	Y		Y
Presence of curbs				Y	
Presence of drains				Y	
Views/Enclosure					
Presence of open views, long sight lines			Y		
Types of views	Y				
Attractiveness of views			Y		
Degree of enclosure					Y
Public Space/Public Life					
Types of public spaces, active uses			Y		
Accessibility of public spaces to public			Y		

Tool	SPACES	Analytic Audit Tool	Irvine-Minnesota Inventory	WABSA	PEDS
Amenities					
Presence of outdoor dining areas		Y		Y	
Presence of number of street and furniture/outdoor amenities		Y	Y		
Presence, quality of bus stops		Y			
Presence of public restrooms		Y	Y		
Presence of playground, sports equipment		Y			
Presence of public telephones		Y			
Street Trees/Landscaping					
Amount of street trees	Y		Y		Y
Height of trees	Y				
Amount of shade from street trees			Y		Y
Building Characteristics					
Presence, number of buildings			Y		
Building height			Y		Y
Proportion of windows/blank walls at street level			Y		
Presence of front porches			Y		
Attractiveness of environment	Y	Y	Y		
Comfort of environment		Y			
Presence of historic buildings			Y		
Number of building with identifiers					
Presence of interesting architecture design	Y		Y		
Building shapes					Y
Parking and Driveways					
Presence of parking structures	Y	Y	Y		
Presence of driveways	Y	Y	Y		Y
Need to walk through parking lots			Y		Y
Maintenance/Appearance					
Maintenance of buildings	Y		Y		
Presence of abandoned buildings		Y			
Amount of litter	Y	Y	Y		
Visibility of dumpsters			Y		
Presence of billboards		Y	Y		
Presence and types of signs		Y			

Tool	SPACES	Analytic Audit Tool	Irvine-Minnesota Inventory	WABSA	PEDS
Presence of overhead wiring			Y		
Safety Concerns					
Presence of bars, adult shops, etc.			Y		
Presence of abandoned building and or lots			Y		
Presence of bars on windows, broken windows		Y	Y		
Amount of graffiti		Y			
Presence of neighborhood watch signs		Y			
Perceived safety while walking and or bicycling			Y		
Lighting					
Presence and location of outdoor lighting	Y	Y	Y	Y	
People Traffic					
Number of people and or pedestrians		Y			
Presence of people interacting		Y			
Presence of people acting hostile		Y			
Presence of aggressive drivers		Y			
Smell/Pollution					
Presence of unpleasant smell			Y		
Health Support					
Physical activity messages/billboards		Y			
Tobacco billboard		Y			
Fast food billboard		Y			
Walking Quality					
Attractiveness for walking					Y
Difficulty for walking	Y				
Cycling Quality					
Attractive for cycling	Y				Y
Difficulty for cycling	Y				

Note: The left side of the column is a compilation of all the variables assessed in all five assessment tools

Evaluation of the Physical Environment in Chinatown

Analysis of Chinatown was broken down into three sections. Each section was composed of segments (streets). Each segment was then assessed using the Irvine Minnesota Inventory. The assessment is categorized into four environmental domains that influences physical activity. The four environmental factors that will be highlighted in the assessment of Chinatown are the following: Perceived Safety from Crime, Perceived Safety from Traffic, Accessibility, and Pleasurability.

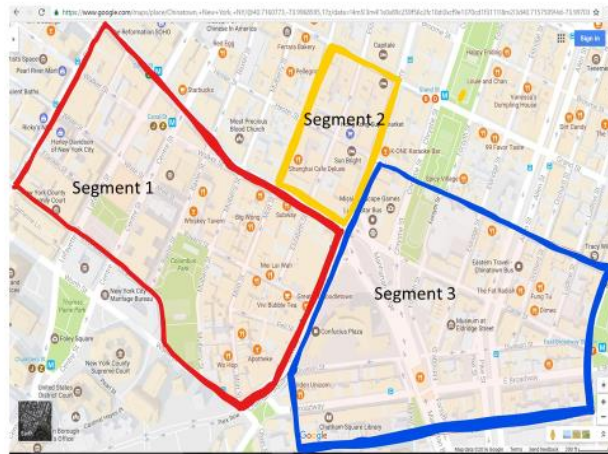


Figure 3. The map above is how Chinatown was organized into three sections. Each section has different street segments. Each street segments were then assessed using the Irvine Minnesota Inventory and photos were also organized into the different sections and domains.

Perceived Safety from Crime. For the domain of perceived safety from crime, all three sections appear to be safe. Section one has more presence of bars and liquor stores as compared to section two and three but not enough to deem a section one a

higher risk of crime versus the others. Out of 16 street segments, 14 (88%) had garbage and dumpsters apparent on sidewalks and streets. All of the street segments in each section had outdoor lighting such as street lamps however wiring from lamp posts were also visible 100% in all sections. The general maintenance of the buildings were poor (42%) with some building walls covered with graffiti or covered with commercial posters on store windows or walls. There were abandoned stores which added to the unattractiveness of some segments within this section. Table 3 is the analysis of each section using the domain – perceive safety from crime.

Presence of graffiti on this segment was 63% and visible litter and dumpsters were 88%. As seen on Figure # 3 and # 4, there were street corners where homeless people found shelter and abandoned storefronts and buildings make up some of the alleys and or streets in section 1.

Table 4

Domain: Perceived Safety from Crime in 3 Geographic Areas of Chinatown

Item *	Section 1 ** n (%)	Section 2 ** n (%)	Section 3 ** n (%)
14. Presence of bars/night clubs	3 (19)	0 (0)	1 (9)
14. Presence of adult uses	0 (0)	0 (0)	0 (0)
14. Presence of check cashing/pawn shops, bail bond	4 (25)	0 (0)	0 (0)
14. Presence of liquor stores	2 (13)	0 (0)	2 (18)
28. Are there abandoned buildings or lots on this segment?	9 (56)	6 (100)	2 (18)
29. Does at least 50% of the segment have buildings?	Yes=16 (100)	Yes=6 (100)	Yes=11 (100)
30. How many buildings on this segment have windows with bars?	0 (0)	0 (0)	0 (0)
36. Describe the general maintenance of the buildings on this segment			
Attractive	2 (12%)	0 (0)	0 (0)
Neutral	9 (56)	6 (100)	11 (100)
Unattractive	5 (42)	0 (0)	0 (0)
37. How much graffiti is apparent on this segment?	10 (63)	3 (50)	3 (27)
38. How much litter is apparent in this segment?	14 (88)	4 (25)	6 (100)
39. Are there dumpsters visible on this segment?	14 (88)	4 (25)	6 (100)
41. Is there outdoor lighting on the segment? (Include lighting that is intended to light public paths and public spaces)	Yes=16 (100)	Yes=6 (100)	Yes=11 (100)
52. How safe do you feel walking on this segment?			
Safe	14 (88)	6 (100)	10 (91)
Unsafe	0 (0)	0 (0)	1 (9)
53. Are there any loose / unsupervised / barking dogs on this segment that seem menacing?	0 (0)	0 (0)	0 (0)

Note. * Items are from the Perceived Safety from Crime Domain on the Irvine Minnesota Inventory Tool. ** Each geographic area is made up of different segments or streets. The number of segments in Section are: 1 (n=16); 2 (n=6); 3 (n=11)

Street Photography: Perceived Safety from Crime, Section 1

Figure 4. Presence of bars and bail bonds in neighborhood can increase the perception of crime in a neighborhood.



Figure 5. Presence of graffiti, litter and homeless people living in the streets also added to the perception of crime in this segment



Figure 6. Another example of abandoned storefronts, graffiti and presence of garbage/litter in Section 1



Figure 7. Graffiti and abandoned storefronts on the streets of Chinatown, New York City

Street Photography: Perceived Safety from Crime, Section 2

Figure 8. Above pictures are examples of people walking through with garbage and litter scattered throughout the sidewalks



Figure 9. Above is a picture of a row of storefront buildings and apartments. The second picture is another example of “people traffic” and garbage on sidewalks

Street Photography: Perceived Safety from Crime, Section 3



Figure 10. The picture on the left is an example of an artistic graffiti on building wall while the picture on the right is an example of an unattractive apartment door



Figure 11. The presence of bars and liquor store in this street segment increase the perception of crime within this section of Chinatown

Perceived Safety from Traffic. For the Perceived Safety from Traffic domain, all segments within all three sections of Chinatown had places that are marked for pedestrian crossings. These cross-streets and crosswalks had markings of traffic signals (100%) and or zebra stripping (100%). Sections 1 and Sections 2 had streets that were convenient to cross (100%) except for Section 3 where there were streets that were under repair and the zebra marking was absent (81%). Most of the segments in Chinatown were mainly composed of one-way streets except for Section 3 where there was a couple of segments with two-lane streets (27%). There were no posted speed limits throughout all sections (100%) with absent street demarcations that could slow down traffic such as speed bumps.

All segments had sidewalks on each street (100%) however there were street sidewalks that were under repair, which was semi-enclosed off for pedestrians. The “completeness of sidewalks” was categorized under pleasurability domain so details regarding this item will be discussed under the pleasurability domain.

Table 5

Domain: Perceived safety from Traffic in 3 Geographic Areas in Chinatown

Item *	Section 1 ** n (%)	Section 2 **n (%)	Section 3 **n (%)
1. Are there monuments or markers including the neighborhood entry signs that indicate that one is entering a special district or area? (BEGINNING OF SEGMENT)	0 (0)	0(0)	0(0)
2a. Consider the places on the segment that are intended for pedestrians to cross the street. Are these places marked for pedestrian crossing?	Yes = 16 (100)	Yes = 6(100)	Yes= 11(100)

2b. What type of marking do the crosswalks have? Mark all that apply

Traffic signal	16 (100)	6 (100)	11 (100)
Colored painted lines	0 (0)	0 (0)	0 (0)
Zebra striping	16 (100)	6 (100)	11 (100)
Different road surface or paving	0 (0)	0 (0)	0(0)
Other	0 (0)	0 (0)	0(0)

3. Are there curb cuts at all places where crossing is expected to occur?

Yes=	Yes=	Yes=
16 (100)	6 (100)	11(100)

4. What type of traffic/pedestrian signal systems are provided. Mark all that apply

Traffic Signal	16 (100)	6 (100)	11 (100)
Stop sign	3 (19)	0 (0)	2 (18)
Yield sign	0 (0)	0 (0)	0 (0)
Pedestrian activated signal	0 (0)	0 (0)	0 (0)
Pedestrian crossing sign	16 (100)	6 (100)	11(100)
Pedestrian overpass/ underpass/bridge	0 (0)	0 (0)	0 (0)

5. For an individual who is on this segment, how safe (traffic wise) do you think it is to cross the street from this segment?

Safe=	Safe=	Safe=
16 (100)	6 (83)	9(81)
Unsafe=	Unsafe=	Unsafe=
0 (0)	0(0)	2(18)

6. For an individual who is on this segment, how convenient (traffic wise) do you think it is to cross the street from this segment?

Convenient = 16 (100)	Convenient= 6 (100)	Convenient= 9(81)
Inconvenient = 0 (0)	Inconvenient =0 (0)	Inconvenient =2(18)

10. How many vehicle lanes are there for cars?

Six = 0 (0)	Six = 0 (0)	Six = 0 (0)
Five = 0 (0)	Five = 0 (0)	Five = 0 (0)
Four = 0 (0)	Four = 0 (0)	Four = 0 (0)

	Three =	Three =	Three =
	0 (0)	0 (0)	0 (0)
	Two = 0(0)	Two = 0 (0)	Two = 3 (27)
	One=	One=	One=
	16 (100)	6(100)	11(100)
18a. How many sides of the street have sidewalks?	1= 0 (0)	1=0 (0)	1=0(0)
	2=16 (100)	2=6 (100)	2= 11(100)
21a. Is there marked mid-block crosswalk for pedestrians?	Yes = 1 (6)	Yes= 0(0)	Yes= 1 (9)
	No = 15 (93)	No= 0(0)	No= 10 (90)
21b. What type of marking does the crosswalk have? Mark all that apply			
White painted lines	1(6)	0(0)	1 (9)
Colored painted lines	0 (0)	0(0)	0 (0)
Zebra stripping	1(6)	0(0)	1 (9)
Different road surface or paving (e.g. tiles, colored concrete, marble, etc.)	0 (0)	0(0)	0(0)
Other	0 (0)	0(0)	0(0)
43. What is the posted speed limit on this segment? Only include those on the segment itself	Not posted = 16 (100)	Not posted = 6 (100)	Not posted= 11(100)
45a. Is there a cul-de-sac or permanent street closing on this segment?	Yes = 0 (0)	Yes = 0 (0)	Yes = 0 (0)
	No = 16 (100)	No = 6 (100)	No = 11(100)
45b. Is there a pedestrian access point or cut through point that allows pedestrians to go from one segment to another (even though vehicular traffic may not be able to?)	Yes = 0 (0)	Yes = 0 (0)	Yes = 0 (0)
	No = 16 (100)	No = 6(100)	No = (100)
1. Are there monuments or makers including the neighborhood entry signs that indicate that one is entering a	0 (0)	0(0)	0(0)

special district or area? (OTHER END OF SEGMENT)

2a. Consider the places on the segment that are intended for pedestrians to cross the street. Are these places marked for pedestrian crossing?	Yes = 16 (100)	Yes= 6(100)	Yes= 11(100)
--	-------------------	----------------	-----------------

2b. What type of marking do the crosswalks have? Mark all that apply

Traffic signal	16 (100)	6 (100)	11(100)
Colored painted lines	0 (0)	0 (0)	0 (0)
Zebra striping	16 (100)	6 (100)	11 (100)
Different road surface or paving	0 (0)	0 (0)	0 (0)
Other	0 (0)	0(0)	0 (0)

3. Are there curb cuts at all places where crossing is expected to occur?	Yes = 16 (100)	Yes= 6 (100)	Yes= 11(100)
---	-------------------	-----------------	-----------------

4. What type of traffic/pedestrian signal systems are provided. Mark all that apply

Traffic Signal	16 (100)	6 (100)	11 (100)
Stop sign	0 (0)	0 (0)	2 (18)
Yield sign	0 (0)	0 (0)	0 (0)
Pedestrian activated signal	0 (0)	0 (0)	0 (0)
Pedestrian crossing sign	16 (100)	6 (100)	11 (100)
Pedestrian overpass/ underpass/bridge	0 (0)	0(0)	

5. For an individual who is on this segment, how safe (traffic wise) do you think it is to cross the street from this segment?	Safe = 16 (100)	Safe= 6 (100)	Safe= 11(100)
	Unsafe = 0 (0)	Unsafe= 0(0)	Unsafe= 0(0)

6. For an individual who is on this segment, how convenient (traffic wise)	Convenient= 16 (100%)	Convenient= 6 (100%)	Convenient= 11(100%)
--	--------------------------	-------------------------	-------------------------

do you think it is to cross the street from this segment?	Inconvenient = 0 (0)	Inconvenient = 0 (0)	Inconvenient = (0)
--	-------------------------	-------------------------	-----------------------

Note. * Items are from the Perceived Safety from traffic Domain on the Irvine Minnesota Inventory Tool. ** Each geographic area is made up of different segments or streets. The number of segments in each area is represented by *n*

Street Photography: Perceived Safety from Traffic, Section 1



Figure 12. Presence of cross streets with zebra stripping and cross signals add to the perception of safety from traffic



Figure 13. Above picture is another example of presence of zebra striping and unobstructed crosswalks

Street Photography: Perceived Safety from Traffic, Section 2



Figure 14. The picture above is an example of cars and or cabs crowding and are stopped on the crosswalk, making it unsafe to cross the street. The picture on the right is an obstructed curb cut with garbage/litter



Figure 15. Picture on the left is an example of bike lane and presence of crosswalks and cross signals

Street Photography: Perceived Safety from Traffic, Section 3



Figure 16. An example of street under repair with missing zebra stripes. And an example of an obstructed sidewalk and cross walk because of construction.



Figure 17. An example of a clean and unobstructed crosswalk in Section 3. The picture on the right is of a cyclist and skateboarder waiting for street signal to go green

Accessibility. For the accessibility domain, the focus of the analysis was on the support and barriers for physical activity. There were definite recreational opportunities scattered throughout each street segments in Chinatown that supported physical activity. There were at least four to five parks within Chinatown that can provide opportunities for sporting recreation, play, and physical activities such as walking, jogging and cycling. Figure 18 is a map showing the different parks located within or nearby Chinatown.

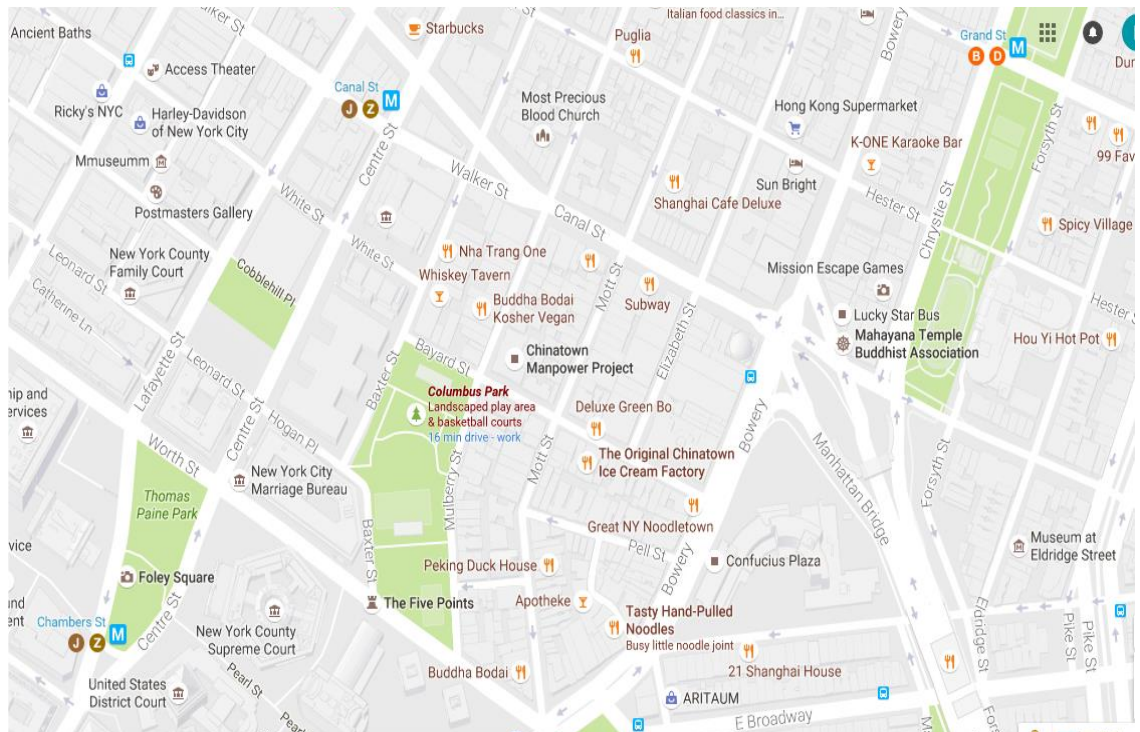


Figure 18. Above is a map that shows the different public parks located within Chinatown. Retrieved from <https://www.google.com/maps/@40.7156618,-74.0021848,17z>

Multiple segments and or streets can lead to different parks. In section 1, there were at least 5 segments that lead towards Columbus Park and two to three segments that lead to Thomas Park. In section 3, four segments had straight access to Seward Park. The public parks were inviting with open grass field for sports, separate playgrounds, scattered, basketball courts, soccer fields and benches throughout the whole park. There were different groups of adults performing Tai Chi in the morning and some people just enjoying sitting on the park benches and enjoying the open air and weather. Playgrounds were full of children playing and others were playing basketball on the courts.



Figure 19. Columbus park is just one of the four parks located in Chinatown. It has a main plaza or square with surrounding playgrounds, ball fields, open spaces, small gardens and benches.



Figure 20. Picture on the left are local's practicing Tai Chi on the basketball courts of Columbus Park while the picture on the right is an open field



Figure 21. More pictures of locals practicing Tai Chi in Columbus Park



Figure 22. On the left is Columbus park's main square and on the right, is a picture of playground in the same park



Figure 23. Thomas Park



Figure 24. Seward Park



Figure 25. Race track field and basketball courts in Sara D. Roosevelt Park



Figure 26. Beautiful tree lined path in Sara D. Roosevelt Park and access to public basketball courts

Although there were four accessible public parks in Chinatown, there were no access to gym or fitness centers. There were no available community centers such as a YMCA for access to any indoor fitness and sports activity.

Some of the street segments had marked bicycle lanes for both recreation and transport purposes with section 1 (13%), section 2 (33%) and section 3 (27%). Painted bike lanes with some physical separation demarcated the bike lanes. Each side of the streets had sidewalks, which could present as an opportunity for walking however a good portion of the street segments was incomplete due to construction, 44% in section 1 had incomplete sidewalks, 33% in section 2 and 19% on section 3. Street vendors who take up most of the space of sidewalks are definite barriers for physical activity for walking and jogging/running.

Table 5

Domain: Accessibility in 3 Geographic Areas in Chinatown

Item *	Area 1 ** (n=16) n (%)	Area 2 ** (n=6) n (%)	Area 3 ** (n=11) n (%)
12a. What types of land uses are present on this area? Mark that all apply			
Residential			
Single family home-detached	0 (0)	0(0)	0(0)
Single family home/duplex attached	0 (0)	0(0)	0(0)
Town home/condo/apartment housing	16(100)	6 (100)	11(100)
Mobile homes (includes manufactured homes)	0 (0)	0(0)	0 (0)
Residential, other	0 (0)	0(0)	0 (0)
School			
Elementary, middle or junior high	1 (6)	0(0)	1 (9)

High school	0	0(0)	0 (0)
University or college	0	0(0)	0 (0)
School	0	0(0)	0 (0)
Public Space			
Plaza, square, park, playground, landscaped open place, playing fields, garden	6 (38)	0(0)	4(36)
Public space, other	0 (0)	0(0)	0 (0)
Recreational/leisure/fitness			
Gym/fitness center (also includes yoga/pilates studios, etc.	0 (0)	0(0)	0(0)
Movie theater	0 (0)	0(0)	0(0)
Recreational, other	0 (0)	0(0)	0(0)
Public/civic building			
Community center or library	4 (25)	0(0)	0 (0)
Museum, auditorium, concert hall, theater	0(0)	0(0)	0 (0)
Post office, police station, courthouse, DMV	4 (25)	1 (17)	2(18)
Public building	5 (31)	0(0)	0(0)
Institutional			
Religious institution (church, temple, mosque)	2 (13)	1 (17)	3 (27)
Hospital, medical facility, health clinic	2 (13)	0(0)	0 (0)
Institutional, other	0 (0)	0(0)	0 (0)
Commercial			
Retail stores/restaurant	14 (88)	6 (100)	11 (100)
Bank/financial service	5 (31)	1(17)	3 (27)
Hotel/hospitality	0 (0)	1 (17)	2 (18)
Car dealership	0 (0)	0(0)	0(0)
Gas/service station	0 (0)	0(0)	0(0)
Commercial, other	0 (0)	0(0)	0(0)
Office/service			
Offices	4 (25)	0(0)	0(0)
Service facilities (includes insurance offices, funeral	3 (19)	0(0)	0(0)

homes, dry cleaning, Laundromats, etc.)			
Office/service, other	0 (0)	0(0)	0(0)
Industrial/manufacturing			
Light industrial (e.g. auto paint, auto body repair, etc.)	0 (0)	0(0)	0(0)
Medium or heavy industrial (e.g. chemical plants, oil wells, etc.)	0 (0)	0(0)	0(0)
Industrial, other	0(0)	0(0)	0(0)
Transportation center			
Harbor/marina	0(0)	0 (0)	0 (0)
Other			
Undeveloped land	0 (0)	0 (0)	0 (0)
Agricultural land, ranch, farming	0 (0)	0 (0)	0 (0)
Nature feature	0 (0)	0 (0)	0 (0)
Other	0 (0)	0 (0)	0 (0)
12b. How many of the buildings in this segment contain vertical-mixed use, that is, the building has different land uses on different floors of the building?	A lot = 16 (100) Few = 0 (0) None = 0 (0)	A lot = 6 (100) Few = 0 (0) None= 0 (0)	A lot= 11 (100) Few= 0 (0) None= 0 (0)
12c. Determine whether any of these distinctive retail types are present			
Big box shops (super stores, warehouse stores)	0 (0)	0 (0)	0 (0)
Shopping mall	0 (0)	0 (0)	0 (0)
Strip mall/row of shops	0 (0)	0 (0)	0 (0)
Drive through	0 (0)	0 (0)	0 (0)
17. Are the following barriers present on this segment? Check all that apply, and whether barrier can be overcome (e.g. pedestrian bridge)			
Highway	0 (0)	0 (0)	0 (0)
Railroad track	0 (0)	0 (0)	0 (0)

Impassable land use (e.g. gated community, major industrial complex, etc.)	0 (0)	0 (0)	0 (0)
River	0 (0)	0 (0)	0 (0)
Drainage ditches	0(0)	0(0)	0(0)
Road with 6 or more lanes	0 (0)	0 (0)	0 (0)
Other	0 (0)	0 (0)	0 (0)
18a. How many sides of the street have sidewalks	1= 0(0) 2= 16 (100)	1= (0) 2=16 (100)	1= (0) 2= 16(100)
18b. Is the sidewalk complete on one or both sides?	Yes= 9 (56) No= 7 (44)	Yes=4 (67) No= 2 (33)	Yes= 8 (73) No= 3 (19)
19. Are there sidewalks/greenbelts/paths other than sidewalks along street?	Yes= 0 (0) No=16(100)	Yes= 0(0) No= 6(100)	Yes= 1(9) No=10(90)
20a. Are there bicycle lanes on the segment	Yes= 2 (13) No= 14 (88)	Yes= 2 (33) No= 4 (67)	Yes= 3 (27) No= 8 (73)
20b. How are the bicycle lanes demarcated?	Painted= 2 (13) Physical separation= 0 (0) Off road= 0(0)	Painted= 2(33) Physical separation= 0(0) Off road= 0(0)	Painted= 2(18) Physical separation= 1(9) Off road= 0(0)
42. Is there a freeway overpass/underpass connected to this segment?	Yes= 0(0) No=16(100)	Yes= 0(0) No=6(100)	Yes= 0(0) No=11(100)
44. Are there measures on this segment that could slow down traffic? Mark all that apply			
Speed bump/speed hump/raised crosswalk; or dips	0(0)	0(0)	0(0)
Rumble strips or bumps (reflectors, raised concrete strips, etc.)	0(0)	0(0)	0(0)
Curb bulb out/curb extension	0(0)	0(0)	0(0)

Median	0(0)	0(0)	0(0)
Angled/On-street parking	0(0)	0(0)	0(0)

Note. * Items are from the Accessibility domain on the Irvine Minnesota Inventory Tool.

** Each geographic area is made up of different segments or streets. The number of segments in each area is represented by n

Street Photography: Accessibility, Section 1



Figure 27. Presence of bike lanes on street which gives access to participate in cycling around the neighborhood. The picture on the right is an example of street vendors and construction obstructing sidewalks



Figure 28. Picture on the left is another example of street vendors taking over sidewalks and the picture on the right is a “detoured” sidewalk because of construction

Street Photography: Accessibility, Section 2



Figure 29. Presence of colored bike lanes in section of 2 of Chinatown



Figure 30. Above picture is a sidewalk under construction that limits walkability around that street segment

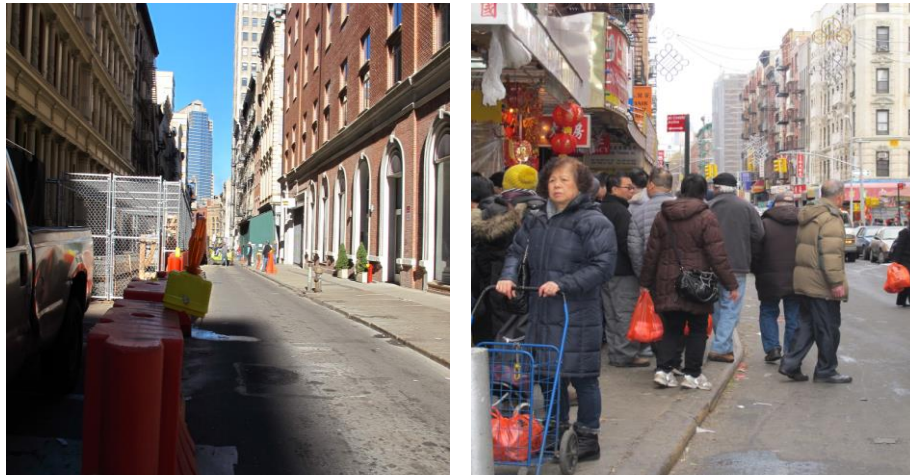


Figure 31. Sidewalk construction that takes over the whole sidewalk and street vendors and shoppers crowded in one sidewalk. Notice that there is no space to walk but through the street



Figure 32. Another example of overcrowding in street between vendors and shoppers

Street Photography: Accessibility, Section 3



Figure 33. Presence of bike lanes in section 3 of Chinatown.



Figure 34. Bike lanes and running path towards Manhattan Bridge

Pleasurability is defined as the feeling of “likeness” or enjoyment in one’s activity. This domain attempts to look at the factors within the environment that adds to the pleasurability of performing an activity within the community. Chinatown is a very dense neighborhood. Just like any other neighborhoods within the city, it is composed of 3 stories or more buildings, which is comprised of apartments, retail stores, restaurants and other service facilities. Because of the height and overcrowding of buildings, there were no significant open views in each section that were appealing and or eye catching. There were a few buildings with some interesting architectural features that made it more interesting to walk through the streets. However, most of the streets were made up of corner stores, local street vendors that sell vegetables and meat produce, souvenirs, and local restaurants that busily cater to tourists and locals alike. There were mixtures of apartment buildings that were newly built with streamlined features that are made up of

glass and iron while some buildings appear to be built during the pre-war era. Some of the sidewalks have some trees but scattered throughout each segment but were not able to provide full shade from the sun or rain. Benches, porches and or ledges were scarce throughout each segment; therefore, there were no opportunities to rest during walks. Tourists would have had a pleasurable walk through the hustle and bustle of Chinatown, however a walk that was intended for physical activity would have been difficult.

Table 6

Domain of Pleasurability in 3 Geographic Areas in Chinatown

Item *	Section 1 ** (n=16) n (%)	Section 2 ** (n=6) n (%)	Section 3 ** (n=11) n (%)
7. Does the segment have banners that identify the neighborhood?	Yes= 0(0) No=16(100)	Yes= 0(0) No= 6(100)	Yes= (0) No= 11(100)
11a. Is this segment characterized by having a significant open view of an object or scene that is not on the segment? The view must be a prominent one.	Yes= 0(0) No=16(100)	Yes=0(0) No=16(100)	Yes=0(0) No=16(100)
11b. How attractive is the open view?	No open view	No open view	No open view
13a. Mark off all types of public spaces on this area and how attractive it is			
Park/playground	Attractive= 3(19) Neutral=1(6) Unattractive= 2(13) No Space= 10(69)	Attractive= 0(0) Neutral= 0(0) Unattractive= 0(0) No Space= 6(100)	Attractive= 2(18%) Neutral=0(0) Unattractive= 0(0) No Space= 9(81)
Playing or sport field	Attractive= 2(13)	Attractive= 0(0)	Attractive= 1(9) Neutral= 0(0)

	Neutral=0(0) Unattractive= 0(0) No Space=14(88)	Neutral=0(0) Unattractive= 0(0) No Space= 6(100)	Unattractive= (0) No Space=10(90)
Plaza/square/courtyard	Attractive=3(19) Neutral=0(0) Unattractive=2(13) No Space=11(69)	Attractive=0(0) Neutral=0(0) Unattractive= 0(0) No Space=0(0)	Attractive=2(18) Neutral= 0(0) Unattractive= 0(0) No Space = 9 (81)
Public garden	No Space=0(0)	No Space=0(0)	No Space=0(0)
Beach	No Space=0(0)	No Space=0(0)	No Space=0(0)
Other	0(0)	0(0)	0(0)
13b. Is it possible for the general public to use the public spaces?	Yes= 4 (25)	No public space	Yes= 2(18)
15. How many of the following gathering places are on this segment?			
Restaurants	14 (88)	6	11 (100)
Coffee shops	11 (69)	4	2 (18)
Libraries/bookstores	0(0)	0(0)	0(0)
Corner store	13(81)	6 (100)	10 (91)
Art or craft galleries	0(0)	0(0)	1(6)
Farmer's market	0(0)	0(0)	0(0)
16. Are these nature features present on this segment?			
Open field/golf course	0(0)	0(0)	0(0)
Lake/pond	0(0)	0(0)	0(0)
Fountain/reflecting pool	0(0)	0(0)	0(0)
Stream/river/canal/creek	0(0)	0(0)	0(0)
Forest or woods	0(0)	0(0)	0(0)
Mountain or hills	0(0)	0(0)	0(0)
Ocean	0(0)	0(0)	0(0)
Desert	0(0)	0(0)	0(0)
18b. Is the sidewalk complete on both sides?	Yes=12 (75) No=4 (25)	Yes= 4 (67) No= 2 (33)	Yes= 9 (82) No= 2 (18)

18c. What is the condition or maintenance of the sidewalk?	Under repair= 5(31) Good= 9(56) Poor=2 (13)	Under repair= 2 (33%) Good=4 (67) Poor= 0(0)	Under repair= 2 (18) Good=9 (82) Poor= 0(0)
18d. Is there a decorative or unique paving that covers most or all of the sidewalk on the segment? (e.g. bricks, tile, etc.)	0(0)	0(0)	0(0)
18e. Determine how much of the sidewalk is covered by these features that provide protection from sun, rain, and/or snow			
Arcades	0(0)	0(0)	0(0)
Awnings	0(0)	0(0)	0(0)
Other	0(0)	0(0)	0(0)
18f. Is there a buffer (for example parked cars, landscape “buffer” strip, etc.) between sidewalks or street	Yes=16(100) No= 0(0)	Yes= 6 (100) No= 0(0)	Yes= 11 (100) No= 0(0)
22. How steep or hilly is this segment?	Gentle slope	Gentle slope	Gentle slope
23. Are there outdoor dining areas (e.g. cafes, outdoor tables at coffee shops, or plazas, etc)	Yes= 0(0) No = 16 (100)	Yes= (0) No = 6 (100)	Yes= 0(0) No= 11(100)
24a. Indicate how many of each of the following street furniture/sidewalk amenities is/are present on the segment			
Benches, chairs and or ledges for sitting	0(0)	0(0)	0(0)
Bus stops with seating	0(0)	0(0)	0(0)
Heat lamps	0(0)	0(0)	0(0)
Bike racks	0(0)	0(0)	0(0)
25. Are there obvious public restrooms on this segment that are clearly open to the public?	No public restrooms	No public restrooms	No public restrooms
26a. How many street trees are on this segment?	Few	None	Few

26b. Is the sidewalk shaded by trees?	No= 16(100)	No=6(100)	No=11(100)
27. How many stories are most buildings on the segment?	>3 =16(100)	>3 = 6(100)	>3 = 11 (100)
31. How many buildings on this segment have front porches? (porches you can sit on)	0(0)	0(0)	0(0)
32. How much of the segment has blank walls or buildings with blank walls?	0(0)	0(0)	0(0)
33a. How many buildings have garage doors facing the street?	0(0)	0(0)	0(0)
33b. How prominent are most garage doors when looking at the front of the buildings?	0(0)	0(0)	0(0)
34a. Is there a parking structure visible on this segment	1 (6)	0(0)	2 (18)
34b. Looking at the front of the parking structure on the street level floor, what is the predominant use that is visible to you?	Parking	0(0)	0(0)
35. How many driveways are visible on the segment?	0(0)	0(0)	0(0)
46. Rate the attractiveness of the segment (design and maintenance)	Attractive= 2 (13) Neutral= 12 (75) Unattractive= 2 (13)	Attractive= 0 (0) Neutral= 6 (100%) Unattractive= 0 (0)	Attractive= 3 (27%) Neutral= 7 (64) Unattractive= 1 (9)
47. Does the segment have buildings that appear to be historic (old and detailed)	3 (19)	0(0)	2(18)
48. How interesting is the architecture/urban design of this segment?	3 (19)	1(16)	2 (18)
49. How many street vendors or stalls are on this segment?	9(56)	6(100)	4(36)
50. Is there public art that is visible on this segment?	0(0)	0(0)	0(0)

51. Are there billboards present on this segment?	0(0)	1(16%)	0(0)
54. Is the dominant smell unpleasant?	No= 16(100)	No= 6(100)	No= 11(100)

Note. * Items are from the Pleasurability domain from the Irvine Minnesota Inventory Tool.

** Each geographic area is made up of different segments or streets. The number of segments in each area is represented by n

Street Photography: Pleasurability, Section 1



Figure 35. An interesting contrast between an old architectural building and an abandoned storefront.

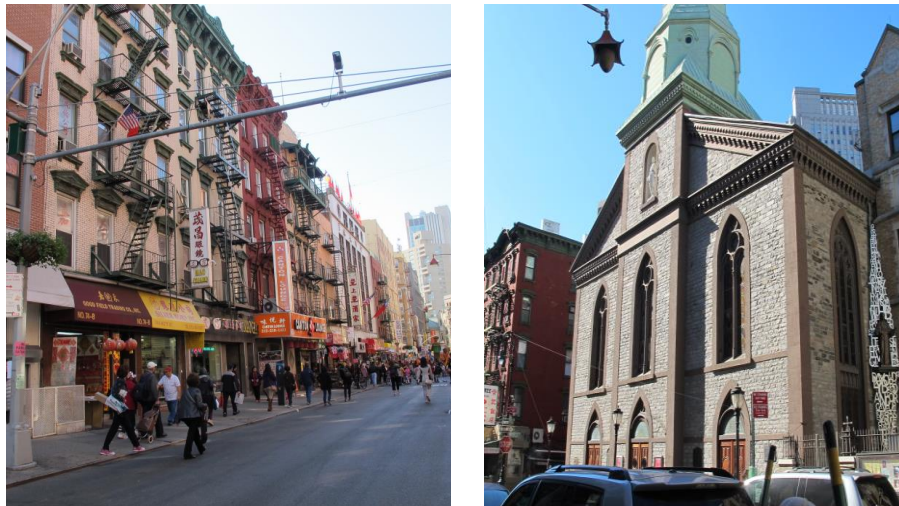


Figure 36. Apartment buildings with storefront restaurants and an old church in the middle of Chinatown

Street Photography: Pleasurability, Section 2



Figure 37 Vendors taking over sidewalks and overcrowding of people between people and vendors



Figure 38. The picture above was taken during the winter season of uncleared snow and garbage. The picture on the right is of overcrowding of street vendors and shoppers



Figure 39. Colorful buildings that seem built during the pre-war era but very crowded and with no open views

Domain: Pleasurability, Section 3

Figure 40. Apartment buildings with contrasting colors and another interesting architecture; an archway leading to Manhattan Bridge



Figure 41. An interesting architectural design and colorful awnings



Figure 42. Amid the crowded streets and apartment buildings, one can see an open view of the financial district in downtown New York

Stakeholder Feedback on Evaluation Chinatown

Charles B. Wang Community Health Center is in Chinatown, New York City. I had an opportunity to speak with the director of research in the community center, Dr. Naomi Feldman. An abstract and summary of the project was emailed to her, with an accompanying power point presentation prior to having a discussion over the phone.

The feedback on the project was positive and noted it to be interesting and beneficial for the community, more specifically for the elderly. Unfortunately, the community center's focus was towards the medical needs of the community. One of her suggestions was to forward my information to the Manhattan Community Board where their main role was to deal with land use, zoning issues, and community welfare. This

information could be presented to their monthly meeting where city and land issues are discussed.

Discussion

This study demonstrated how environmental evaluations may be used to analyze the assets and barriers in the natural and built environment. Understanding the features of a densely populated urban neighborhood was an important step in designing health promotion programs that are targeted toward increasing physical activity levels to prevent and management chronic conditions. Chinatown was an ideal geographic setting for this study because of recent concerns regarding chronic conditions in the neighborhood's population and its distinct geographic boundaries.

Comparison of Physical Environmental Assessments in a Densely Populated Urban Neighborhood

There were several physical environment assessments that are currently used for city planning and qualitative research in public health and wellness. Selecting a specific assessment that was best suited for my focus community with its environmental complexity was important. Also, another important factor was the ease of use. The five assessment tools that were used for comparison were the following: The Systematic Pedestrian and Cycling Environmental Scan (SPACES), Analytic Audit Tool, Irvine-Minnesota Inventory, Walking and Bicycling Suitability Assessment (WABSA) and The Pedestrian Environment Data Scan (PEDS). There were key important features and variables in choosing the right assessment: the domains or main concepts measured, the suitability and or flexibility of use in an urban setting, the ease of use for novice investigators and its standardization. A comparison of each concepts measured by the assessment was arranged in a table format and each assessment tool was also trialed in

two street segments in Chinatown. The methodology of organizing the five different assessment tools in table format was very important. It helped to visualize the different concepts measured and organize and conceptualize the environmental features in Chinatown that would be observed and analyzed. In the selection of the assessment, occupational therapy knowledge of the environmental features that could help support or limit physical activity were considered. For example, the evenness of the sidewalk or pavement for ease of walking, the width of the sidewalk, the density and people traffic, and the openness of crosswalks were features that were important for walking and jogging. The trial of each assessment in street segments of Chinatown helped to select a suitable and flexible assessment for this urban setting.

Irvine Minnesota Inventory is a 160 closed-ended questionnaire which covered four domains: accessibility, pleasurability, perceived safety from traffic and perceived safety from crime. It was also an assessment trialed in two urbanized settings, Southern California and St. Paul Minnesota, for inter-rater reliability and it showed 80% or more in reliability tests (Day et al., 2005). This assessment was the most comprehensive and it had the most flexibility in assessing all the nuances of a complicated, urbanized environment such as New York City. The assessment tool was easy to use and it did not need any extra device such as tape measure. However, one aspect that could have helped with the data collection would have been the organization of the different variables assessed into the four different domains (Please see highlighted Irvine Minnesota Inventory Tool in Appendix section).

Evaluation of the Physical Environment in Chinatown

From the data collected, there were both positive and negative factors that affected physical activity and some definite assets in neighborhood to support physical activity.

Environmental assets to physical activity

There were positive variables in Chinatown that supported physical activity. A strength noted was the availability of sites for recreational activities. There were 3-5 parks available in the community and these resources were free and accessible. The accessibility to public parks were seen more in sections 1 and 3. There were no easy access to a public park in section 2 however, one could still access the other surrounding parks but may have to walk further to get there. The parks were for public use and free. The parks were convenient and the ambiance was inviting. There were benches located throughout the park where people could rest and relax after a walk or run or it is another place to participate in other leisurely activities. The park had facilities that supported sport activities as well such as basketball courts, track and field, and soccer field. During the observation days, the grounds were used by the elderly performing tai chi, teenagers playing basketball and or soccer and children playing in the playgrounds.

Another positive aspect of the environment was the presence of bike lanes. Having separate bike lanes increased comfort and safety when riding bikes on streets therefore increasing chances of participating in physical activity. However, in this study,

there were only about 3 to 4 streets where bike lanes were present. All 3 sections of Chinatown had at least one street with bike lanes but not all streets had one.

Barriers to physical activity.

Pleasurability, or the enjoyment in participating in a task, is an important factor in participation in physical activity. One negative aspect of this community was the lack of the overall pleasurable ambiance of the neighborhood. There were an extraordinary amount of garbage/litter on streets and sidewalks that it was very unpleasant to walk through. Some of the buildings were poorly managed as evidenced by graffiti present throughout the community. There were also some corners where homeless people were living. These negative variables within this community may affect a person's enthusiasm and motivation for participating in physical activity. The accumulation of trash in corners and on sidewalks blocked some intersections and or crosswalks creating a barrier for crossing the street. The presence of litter and garbage were predominant throughout all three sections of Chinatown.

The people density or people traffic of the neighborhood was also a limiting factor for physical activity. There was definite crowding on some sidewalks that made it difficult for pedestrians to walk through or navigate in the sidewalks. Some of the sidewalk vendors were encroaching over most of the width of the sidewalks while others were in construction. This environmental variable in the community would be hard to change or modify because Chinatown is one of the most popular tourist spots in New York City. Another reason for crowding in sidewalks were simply from the lack of space in New York City. This was one of the most predominant issues and could be one of the

most significant barriers to physical activity and environmental modification. Some of the larger crowds walked on streets rather than sidewalks, which had a ripple effect on vehicular traffic, which then caused barriers for cycling, walking and or jogging.

The environment is just a small element of a bigger systems issue that affects population health. Addressing these environmental variables that limit physical activity can be both addressed within the community by speaking to stakeholders of the community, or in a larger scale; addressing these environmental needs through different governmental and non-governmental agencies. As discussed earlier in this project, health and wellness could be achieved through the participation in physical activity. There are definite opportunities to address overall health and wellness in a low-income neighborhood, most specifically Chinatown New York City.

The overall physical environment of Chinatown does not fully support participation in physical activity. There were some noted positive aspects in the community such as the presence of parks and some noted bike lanes that support participation in physical activity. However, these positive aspects could be strengthened by adding more bike lanes throughout the community and by increasing community awareness of the usage of public parks through community incentives and physical activity and health wellness promotions.

The negative aspects of the physical environment were more dominant throughout the community. These barriers such as lack of pleasurable ambiance, lack of bike lanes and sidewalk encroachment does not support participation in physical activity.

Environment is an important aspect in both individual and community participation in

any meaningful occupations and tasks, not just physical activity. An individual will most likely participate in an activity when the environment is supportive and meaningful.

The theme that resonated throughout the project was how the environment may be a critical support or barrier to health and wellness. When people cannot participate in meaningful occupations such as walking, jogging or bicycling because of environmental limitations, they may be vulnerable to chronic conditions. Participation in meaningful occupations completes a person, which in turn supports health and wellness. Information collected from this study could be of help with the ongoing incentives for increasing physical activity for the reduction and prevention of chronic diseases. Simple improvements in the environment such as clearing garbage and litter could help improve ambiance. Adding more bike lanes could improve accessibility. Improving accessibility in sidewalks and walkways by possibly setting limitations with “sidewalk space” with street vendors. Simple changes in the environment could let to increase participation in physical activity which then can improve overall health and wellness of the community.

Implications for Occupational Therapy Practice

Many occupational therapy models emphasize the relationships among person, environment, occupations and participation. Environment, in its broadest context, encompasses the social, cultural and physical environment of the person. This doctoral project examined the assets and barriers to physical activity in the natural and built environments of an urban community. Occupational therapy practitioners have a good understanding of the intricate relationship of person, participation in meaningful activities (physical activity) and environment. The main goal of occupational therapy is to help

individuals achieve health and well-being through the participation and engagement in meaningful occupations and activities. Occupational therapy at a community level may focus on intervention programs that address environmental modifications to support participation in physical activity.

Occupational therapy may have a supportive role in public and population health to prevent and manage chronic diseases. There are different approaches and interventions, from an Occupational therapy perspective, that can help support population and or community health: 1) Education - occupational therapy can provide education both in an individual and community level regarding community modifications that can support physical activity. Empowering community members to play an active role in community advocacy for health promotion and physical activity. Educating stakeholders and community leaders regarding strategies in increasing accessibility for the community such as bike lanes and walking paths or sidewalks; 2) Advocacy – collaborating with community organizations and governmental agencies for promotion of health and wellness activities and 3.) Creating a health promotion class for the community to help increase awareness of the implications of physical activity in chronic diseases and empowering community members to actively participate in physical activity.

Limitations

A limitation to this project was the researcher's bias. The researcher's perception of "unattractive" or unpleasurable could vary from another researcher's perception. For example, graffiti maybe unattractive to one person however it could have been a "unique" form of art from another observer's perspective. Another occupational therapy

perspective in analyzing the natural and built environment can be helpful in identifying the assets and barriers to performance of physical activity. Occupational Therapy can make recommendations to strengthen the features of the physical environment that support programs that promote community health

Photography was used for this project to provide a visual image of the physical environment, however using photography has its strengths and weaknesses. A visual image conveys details about the physical attributes of the environment that could limit and support physical activity. Images can communicate powerful perspectives in the environment, which words cannot best describe. However, photography is not an objective source. Pictures taken are from the perspective of the photographer: choice of pictures, timing and theme. A bias regarding the pictures that were identified as “inviting” versus “limiting” or “unattractive” versus “unattractive” could vary from one observer to another. The timing of the assessment of the environment could also have affected the overall assessment. Garbage and litter were a negative aspect within the environment, however the timing of the observation may have also coincided with days when garbage was not picked up.

Recommendations for Future Research

This project was limited to observation of the environment and photography. A survey regarding the community’s perception on physical activity, motivational incentives and their own perceptions on the environment would be a great addition to this project. Environment, in an occupational therapist perspective also involves the social

and cultural aspect of the person. Getting knowledge about the community's social and cultural perspective on physical activity would only enhance the findings in this project.

Conclusion

There is an intricate relationship between participation in occupation such as roles, work/professional tasks and leisure activities and health and well-being. Lack of participation in physical activity may lead decreased health and well-being. Occupational therapy emphasizes the physical environment as a critical factor that serves as a support or barrier to occupational performance. An occupational therapy perspective in analyzing the natural and built environment can be helpful in identifying the assets and barriers to performance of physical activity. Occupational Therapy can make recommendations to strengthen the features of the physical environment that support programs that promote community health

Literature Cited and References

- Ahn, J., Abesamis-Mendoza, N., Le, D., & Ho-Asjoe, H. (2007). Community Health Needs and Resource Assessment: An Exploratory Study of Chinese in NYC. *Center for the Study of Asian American Health. NYU School of Medicine & Institute of Community Health and Research.*
- American Occupational Therapy Association (AOTA). OCCUPATIONAL THERAPY PRACTICE FRAMEWORK: Domain & Process, 3rd Edition. (2014). *American Journal of Occupational Therapy*, S1-S48.
- Asian American Federation (AAF) (2013). Retrieved from <http://www.aafny.org/cic/briefs/chinese2013.pdf>
- Bassuk S. & Manson, J. (2005). Epidemiological evidence for the role of physical activity in reducing the risk of type 2 diabetes and cardiovascular disease. *Journal of Applied Physiology*, 99(3) 1193-1204.
- Boarnet, M. G., Day, K., Alfonzo, M., Forsyth, A., & Oakes, M. (2006). The Irvine–Minnesota inventory to measure built environments: reliability tests. *American Journal of Preventive Medicine*, 30(2), 153-159.
- Brownson, R. C., Hoehner, C. M., Brennan, L. K., Cook, R. A., Elliott, M. B., & McMullen, K. M. (2004). Reliability of 2 instruments for auditing the environment for physical activity. *J Phys Act Health*, 1, 191-208.

- Brownson, R. C., Hoehner, C. M., Day, K., Forsyth, A., & Sallis, J. F. (2009). Measuring the built environment for physical activity: state of the science. *American Journal of Preventive Medicine*, 36(4), S99-S123.
- Clifton, K. J., Smith, A. D. L., & Rodriguez, D. (2007). The development and testing of an audit for the pedestrian environment. *Landscape and Urban Planning*, 80(1), 95-110.
- Emery, J., Crump, C., & Bors, P. (2003). Reliability and validity of two instruments designed to assess the walking and bicycling suitability of sidewalks and roads. *American Journal of Health Promotion*, 18(1), 38-46.
- Fang, J., Madhavan, S., & Alderman, M. H. (1999). Cardiovascular mortality of Chinese in New York City. *Journal of Urban Health*, 76(1), 51-61.
- Fang, J., Foo, S. H., Jeng, J. S., Yip, P. K., & Alderman, M. H. (2004). Clinical characteristics of stroke among Chinese in New York City. *Ethnicity and Disease*, 14(3), 378-383.
- Gelormino, E., Melis, G., Marietta, C., & Costa, G. (2015). From built environment to health inequalities: An explanatory framework based on evidence. *Preventive Medicine Reports*, 2, 737-745.
- Haskell, W. L., Lee, I. M., Pate, R. R., Powell, K. E., Blair, S. N., Franklin, B. A., ... & Bauman, A. (2007). Physical activity and public health: updated recommendation for adults from the American College of Sports Medicine and the American Heart Association. *Circulation*, 116(9), 1081.

Hu, F.B, Rich-Edwards, J.W., Colditz, G.A, Solomon, C.G., Willett, W.C., Speizer, F.E. and Manson, J.E. (1999). Walking compared with vigorous physical activity and risk of type 2 diabetes in women: A prospective study. *Journal of the American Medicine Association*, 282, 1433-1439.

Hu, F. B., Willett, W. C., Li, T., Stampfer, M. J., Colditz, G. A., & Manson, J. E. (2004). Adiposity as compared with physical activity in predicting mortality among women. *New England Journal of Medicine*, 351(26), 2694-2703.

Hu, G., Eriksson, J., Barengo, N. C., Lakka, T. A., Valle, T. T., Nissinen, A., ... & Tuomilehto, J. (2004). Occupational, commuting, and leisure-time physical activity in relation to total and cardiovascular mortality among Finnish subjects with type 2 diabetes. *Circulation*, 110(6), 666-673.

Humpel, N., Owen, N., & Leslie, E. (2002). Environmental factors associated with adults' participation in physical activity: a review. *American Journal of Preventive Medicine*, 22(3), 188-199.

Jeon, C. Y., Lokken, R. P., Hu, F. B., & Van Dam, R. M. (2007). Physical activity of moderate intensity and risk of type 2 diabetes a systematic review. *Diabetes Care*, 30(3), 744-752.

Josefsson, T., Lindwall, M., & Archer, T. (2014). Physical exercise intervention in depressive disorders: Meta- analysis and systematic review. *Scandinavian Journal of Medicine & Science in Sports*, 24(2), 259-272.

- Lee, C.D., Folsom, A.R. and Blair, S.N. (2003). Physical activity and stroke risk: A meta-analysis. *Stroke*, 34,2475-2481.
- Lee, I.M. and Paffenbarger, R.S. (1998). Physical activity and stroke incidence the Harvard alumni health study. *Stroke*, 29, 2049-2054.
- Lynch, J., Helmrich, S. P., Lakka, T. A., Kaplan, G. A., Cohen, R. D., Salonen, R., & Salonen, J. T. (1996). Moderately intense physical activities and high levels of cardiorespiratory fitness reduce the risk of non-insulin-dependent diabetes mellitus in middle-aged men. *Archives of Internal Medicine*, 156(12), 1307-1314.
- McCormack, G. R., & Shiell, A. (2011). In search of causality: a systematic review of the relationship between the built environment and physical activity among adults. *International Journal of Behavioral Nutrition and Physical Activity*, 8(1), 1.
- McCracken, M., Olsen, M., Chen, M. S., Jemal, A., Thun, M., Cokkinides, V., ... & Ward, E. (2007). Cancer incidence, mortality, and associated risk factors among Asian Americans of Chinese, Filipino, Vietnamese, Korean, and Japanese ethnicities. *CA: A Cancer Journal for Clinicians*, 57(4), 190-205.
- McTiernan, A., Kooperberg, C., White, J. E., & Vogel, V. G. (2004). Recreational physical activity and the risk of breast cancer in postmenopausal women. *Breast Diseases*, 15(1), 25-26.
- Moore, L. V., Roux, A. V. D., Evenson, K. R., McGinn, A. P., & Brines, S. J. (2008). Availability of recreational resources in minority and low socioeconomic status areas. *American Journal of Preventive Medicine*, 34(1), 16-22.

- Morris, M., Steinberg, H., Sykes, E.A., and Salmon, P. (1990). Effects of temporary withdrawal from regular running. *Journal of Psychosomatic Research*, 34(5), 493-500.
- Myers, J., Kaykha, A., George, S., Abella, J., Zaheer, N., Lear, S., ... & Froelicher, V. (2004). Fitness versus physical activity patterns in predicting mortality in men. *The American Journal of Medicine*, 117(12), 912-918.
- Oguma, Y., & Shinoda-Tagawa, T. (2004). Physical activity decreases cardiovascular disease risk in women: review and meta-analysis. *American Journal of Preventive Medicine*, 26(5), 407.
- Owen, N., Humpel, N., Leslie, E., Bauman, A., & Sallis, J. F. (2004). Understanding environmental influences on walking: review and research agenda. *American Journal of Preventive Medicine*, 27(1), 67-76.
- Pikora, T. J., Bull, F. C., Jamrozik, K., Knuiman, M., Giles-Corti, B., & Donovan, R. J. (2002). Developing a reliable audit instrument to measure the physical environment for physical activity. *American Journal of Preventive Medicine*, 23(3), 187-194.
- Pate, R. R., Pratt, M., Blair, S. N., Haskell, W. L., Macera, C. A., Bouchard, C., ... & Kriska, A. (1995). Physical activity and public health: a recommendation from the Centers for Disease Control and Prevention and the American College of Sports Medicine. *Journal of American Medical Association*, 273(5), 402-407.

- Powell, L. M., Slater, S., & Chaloupka, F. J. (2004). The relationship between community physical activity settings and race, ethnicity and socioeconomic status. *Evidence-Based Preventive Medicine*, 1(2), 135-44.
- Rajpathak, S. N., & Wylie-Rosett, J. (2011). High prevalence of diabetes and impaired fasting glucose among Chinese immigrants in New York City. *Journal of Immigrant and Minority Health*, 13(1), 181-183.
- Ruuskanen, J. M., & Ruoppila, I. (1995). Physical activity and psychological well-being among people aged 65 to 84 years. *Age and ageing*, 24(4), 292-296.
- Saelens, B. E., & Handy, S. L. (2008). Built environment correlates of walking: a review. *Medicine and Science in sports and Exercise*, 40(7 Suppl), S550-S566.
- Sieverdes, J. C., Sui, X., Lee, D. C., Church, T. S., McClain, A., Hand, G. A., & Blair, S. N. (2010). Physical activity, cardiorespiratory fitness and the incidence of type 2 diabetes in a prospective study of men. *British Journal of Sports Medicine*, 44(4), 238-244.
- Steptoe A. and Butler, N. (1996). Sports participation and emotional well-being in adolescents. *Lancet*, 347, 1789-1792.
- Ströhle, A., Höfler, M., Pfister, H., Müller, A. G., Hoyer, J., Wittchen, H. U., & Lieb, R. (2007). Physical activity and prevalence and incidence of mental disorders in adolescents and young adults. *Psychological medicine*, 37(11), 1657-1666.
- Taylor, R. S., Brown, A., Ebrahim, S., Jolliffe, J., Noorani, H., Rees, K., ... & Oldridge, N. (2004). Exercise-based rehabilitation for patients with coronary heart disease:

systematic review and meta-analysis of randomized controlled trials. *The American journal of medicine*, 116(10), 682-692.

United States Census Bureau (2016) Retrieved from

<https://www.census.gov/newsroom/facts-for-features/2016/cb16-ff07.html>

Waldinger, R., & Tseng, Y. (1992). Divergent diasporas: the Chinese communities of New York and Los Angeles compared. *Revue Européenne des Migrations Internationales*, 8(3), 91-115.

Warburton, D. E., Nicol, C. W., & Bredin, S. S. (2006). Health benefits of physical activity: the evidence. *Canadian Medical Association Journal*, 174(6), 801-809.

Watts, P., Phillips, G., Petticrew, M., Hayes, R., Bottomley, C., Yu, G., ... & Lock, K. (2013). Physical activity in deprived communities in London: examining individual and neighbourhood-level factors. *PloS one*, 8(7), e69472.

Weinstein, A. R., Sesso, H. D., Lee, I. M., Cook, N. R., Manson, J. E., Buring, J. E., & Gaziano, J. M. (2004). Relationship of physical activity vs body mass index with type 2 diabetes in women. *Jama*, 292(10), 1188-1194.

Wong, S. S., Dixon, L. B., Gilbride, J. A., Chin, W. W., & Kwan, T. W. (2011). Diet, physical activity, and cardiovascular disease risk factors among older Chinese Americans living in New York City. *Journal of Community Health*, 36(3), 446-455.

World Health Organization. (2001). *International Classification of Functioning, Disability and Health: ICF*. World Health Organization. Retrieved September 18, 2016 from <http://apps.who.int/classifications/icfbrowser/>

Appendix A.1

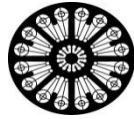
Table 7

Summary of Items by Domain on the Irvine Minnesota Inventory

Accessibility	Domains on the Irvine Minnesota Inventory		
	Perceived safety from crime	Pleasurability	Perceived safety from traffic
Pedestrianized street	Bars/clubs	Banners	Monuments/markers
Street direction	Adult use	Presence of alley	Crosswalk
Single family home detached	Check cashing store	Open view	White line
Single family home attached	Liquor store	Attractiveness of the view	Colored line
Town home	Abandoned buildings	Park/playground	Zebra striping
Mobile home	Percent of segment with buildings	Playing or sports field	Different road surface
Other type of residential use	Bars on windows	Plaza/square	Other type of traffic calming
School	Maintenance of buildings	Public garden	Curb cut
High school	Landscaping	Beach	Traffic signal
College	Landscaping maintenance	Other type of public space	Stop sign
Other type of school	Graffiti	Public space accessibility	Yield sign
Public space	Litter	Restaurant	Pedestrian activated signal
Other type of public space	Visible dumpster	Coffee shop	Pedestrian crossing sign
Gym/fitness center	Outdoor lighting	Library/bookstore	Pedestrian overpass/underpass/bridge
Movie theater	How safe you feel walking	Corner store	How safe is it to cross
Post office, police station, courthouse, DMV	Dogs	Art gallery	How convenient it is to cross segment
Other type of public/civic space		Farmer's market	Number of vehicle lanes
Religious institution		Lake/pond	Midblock crossing
Medical facility		Open field/golf course	Midblock crossing – white line
Other type of institutional		Fountain	Midblock crossing – colored line
Retail		Stream/river	Midblock crossing – zebra striping
stores/restaurants		Ocean	Midblock crossing – different road surface
Financial institution		Forest	Midblock crossing – other
Hotel/hospitality use		Mountain	Speed limit
Car dealership		Desert	Speed bump
Gasoline/service use		Condition of sidewalk	Rumble strip
Other type of commercial use		Decorative/unique sidewalk paving	Curb bulb out
Offices		Arcades	Traffic circle
		Awnings	Median
			Traffic calming – parking

Service	Other type of	Cul de sac
Other type of	sidewalk protection	
office/service	Sidewalk buffer	
Light industrial use	Flat/gentle slope	
Medium/Heavy	Moderate slope	
industrial uses	Steep slope	
Other type of	Outdoor dining area	
industrial	Benches	
Harbor/marina	Bus stops	
Undeveloped land	Heat lamps	
Agricultural land	Bike racks	
Nature feature	Public restroom	
Other land use	Street trees	
Vertical mixed use	Sidewalk shade	
Big Box store	Building height	
Shopping mall	Front porch	
Strip mall/strip store	Percentage of	
Drive thru	segment with blank	
Highway	walls	
Railroad	Number of buildings	
Impassable land use	with garages	
River	Prominence of	
Drainage ditch	garages	
Six lane road	Parking structure	
Other type of barrier	Predominant us of	
Sidewalk	first floor of parking	
Completeness of	structure	
sidewalk network	Parking lot	
Path other than	Prominence of	
sidewalk	driveways	
Bike lane	Attractiveness of	
Type of bike lane	segment	
Presence of freeway	Historic buildings	
Pedestrian access	How interesting the	
point	segment is	
	Street vendors	
	Public art	
	Billboard	
	Dominant smell	

Note. The Irvine Minnesota Inventory is available on the Active Living Research website (<http://activelivingresearch.org/irvine-minnesota-inventory>). Resources include the inventory (in paper or Microsoft Access versions), the codebook, and training protocol. The Active Living Research website also provides a proper use disclaimer for the inventory (http://activelivingresearch.org/files/ProperUseDisclaimer_0.pdf)

Appendix A.2 IRB**ST. CATHERINE
UNIVERSITY****ST. CATHERINE UNIVERSITY REQUEST FOR APPROVAL****FOR THE USE OF HUMAN SUBJECTS IN RESEARCH APPLICATION****Protocol ID:** _____

Complete the following application in its entirety. You may excerpt material from your thesis or grant proposal, but your application should be relatively concise. Consent forms and additional supporting documents may be uploaded to separately; see [Mentor IRB Directions](#). For questions, contact the IRB Assistant at 651-690-6204 or irb@stkate.edu.

Date of application: November 1, 2015**Investigator name(s) and credentials (e.g., PhD, RN, etc.): (*List all co-investigators*)**

- Elza Guzman MS, OTR/L

Project Title:

- Linking Physical Activity and the Environment Through Occupational Therapy Lens: A Closer Look at Chinatown

Department:

Level of Review:

In the Mentor IRB system, you must select the Review Type; selecting Exempt and Expedited will prompt additional questions for you to fill out. The default level of review is Full if not selected. For more information on the levels of review, go to the IRB website:

<https://www2.stkate.edu/irb/levels-review>.

☒ **Exempt** ☐ **Expedited** ☐ **Full**

Has this research been reviewed by another IRB?

☐ **Yes** ☒ **No**

(If YES, please provide a copy of the letter of approval, or indicate the status of your application.)

Will this research be reviewed by another IRB?

☐ **Yes** ☒ **No**

(If YES, please indicate your plans for review)

Note: *In cases where a research protocol requires approval from outside institutions (e.g., a hospital IRB or other college/university) as well as St. Catherine University, it is expected that the SCU IRB application will be submitted and approved before the researcher applies to the outside organization. Requests for exceptions to this protocol may be submitted by an SCU faculty member on his/her own behalf, or by the research advisor on behalf of student researchers. Contact the IRB chair (John Schmitt, PT, PhD; jsschmitt@stkate.edu) with these requests.*

1. **RESEARCH SUMMARY:** *Complete each section in clear, easy to read language that can be understood by a person unfamiliar with your research and your field.*
 - a. **Purpose of the research:** *Provide a clear, concise statement of your purpose.*

The objective of this project is to analyze the natural and built physical environment of Chinatown and analyze its influence on physical activity of the residents. I will conduct an environmental assessment that consists of examining buildings, pavements, roads, and parks for their supports or barriers to physical activity of the residents.

The second purpose of this project is to share my findings about the physical environment with a small group of residents of the neighborhood for their critique and feedback. Their feedback will be included in my final results and will inform the recommendations provided.

- b. **Background:** *Provide a concise summary in 1 - 2 brief paragraphs to explain the importance of the research and how it fits with previous research.*

There is a relationship between lack of participation in meaningful occupations and health promoting behaviors and healthcare disparities. These healthcare disparities could be partially influenced by the opportunities or restrictions provided by the natural and built environment of the community. This project is important because it will analyze the natural and built environment of a vulnerable neighborhood and how it affects participation in health-promoting behaviors such as biking, running, and walking. Evaluation of the physical environment (natural and built) in a neighborhood with documented health disparities is an important step in identifying factors that may limit or support participation in health promoting occupations. Chinatown has documented health disparities, but its physical environment has not been evaluated. Occupational therapy can be an integral part in linking participation in physical activities that promote health and well being with the barriers and supports provided by the natural and built environment.

Although I will be using structured observation assessment tools in my analysis of the environment, results can be influenced by personal or cultural biases. Validating findings with key informants (who live in the neighborhood) is important for trustworthiness of the final results and recommendations.

- c. **Research Methods and Questions:** *Give a general description of the study design and specific methods you will use in your investigation. Specify all of your research questions and/or hypotheses. Reviewers will consider whether the information you are gathering is necessary to answer your research question(s), so this should be clear in your application.*

First step is to determine a tool that would help analyze the physical natural and built environment of Chinatown and its effects on physical activity. Once that is done, I will conduct the evaluation using the tool and supplementing the data with photos and mapping. A summary of findings will be shared with residents of Chinatown in a focus group format. The participants will discuss the findings and provide feedback about what they agree or disagree with. Key stakeholders from the community will be recruited for the focus group. Recruitment will be through community organizations such as church members, social groups/social events, and or recruitment through community centers.

- d. **Expectations of Participants:** *Give a step by step description of all procedures that you will have participants do. Attach any surveys, tests, instruments, interview questions, data collection forms, etc. that you will use with participants.*

Part of the project will be a group discussion about the members' perception of the findings of the summary. The summary of the project will be given to the subjects prior to the group discussion via email. In addition, a brief presentation of the summary of the project will be presented prior to the group discussion. The participants are expected to comment and give feedback regarding the findings of the summary.

- e. **Estimated Time Commitment for Participants:**

1 session in a group discussion format	Number of sessions for each participant
1 hour	Time commitment per session for each participant
1 hour	Total time commitment for each participant

- e. **Access to Existing Data:** *If you are analyzing existing data, records, or specimens, explain the source and type, means of access, and permission(s) to use them.*
N/A

2. **SUBJECTS:** *Provide your best estimates below.*

a. **Age Range of Subjects Included:** 25 years – 65 years old

b. **Number:**

_____ 2-4 _____ Male _____ 2-4 _____ Female _____ 4-8 _____ Total

c. **Target Population:** Describe your target population (the group you will be studying; e.g. seniors, children ages 9-12, healthy adults 18 or over, etc).

A group of leaders and members in the community of Chinatown ages 25 years to 65 years old.

d. **Specific Exclusions:** *If women and/or minorities are to be excluded from the study, a clear rationale should be provided in section “f” below.*

No exclusions

e. **Special Populations Included:** *Select any special population that will be the focus of your research.*

NOTE: *These groups require special consideration by federal regulatory agencies and by the IRB.*

☐ Minors (under age 18)

☐ HIV/AIDS patients

☐ St. Catherine Employees

☐ Economically disadvantaged

☐ Students

☐ Educationally disadvantaged

☐ Pregnant women

☐ Hospital patients or outpatients

☐ Elderly/aged persons

☐ Prisoners

☐ Cognitively impaired persons

☐ Minority group(s) and/or non-English speakers
(please specify) _____

☐ Other Special Characteristics and Special Populations
(please specify) _____

- f. Provide reasons for targeting or excluding any special populations listed above.

Since the focus of this project is the assessment of the natural and built environment of Chinatown and its positive and or negative effects on the community's physical activity, key members/stakeholder's of the community will be asked to join the discussion group to have an informative discussion of the findings of the project.

3. RECRUITMENT: LOCATION OF SUBJECTS *(Select all that apply) :*

<input type="checkbox"/>	St. Catherine University students	
<input type="checkbox"/>	School setting (PreK – 12)	
<input type="checkbox"/>	Hospital or clinic	
<input type="checkbox"/>	Other Institution <i>(Specify):</i>	_____
<input checked="" type="checkbox"/>	None of the above <i>(Describe location of subjects):</i>	Recruitment of subjects will be from the community of Chinatown

NOTE: *If subjects are recruited or research is conducted through an agency or institution other than St. Catherine University, submit either written or electronic documentation of approval and/or cooperation. An electronic version should be sent from the email system of that particular institution. The document should include the name and title of the appropriate administrator sending the approval.*

- a. **Recruitment Method:** *Describe how you will recruit your subjects? Attach a copy of any advertisement, flyer, letter, or statement that you will use for recruitment purposes.*

I will research the community support structures of the Chinatown neighborhood and contact a leader of one of those organizations to discuss my project. I will ask this leader for people viewed as key stakeholders in the Chinatown community who might be willing to hear about my findings. I will use a snowball sampling technique where I will get referrals from people who are interested.

I will email people who were referred as key stakeholders and introduce myself and invite them to come to the focus group to discuss my findings. I will share my email address and phone number if they would like to contact me for additional information.

(Elza, you will have to supply a sample email of what you will say to these people)

- b. **Incentives:** *Will the subjects be offered inducements for participation? If yes, explain.*

No incentives will be offered for participating in the discussion group

4. RISKS AND BENEFITS OF PARTICIPATION

- a. Select all that apply. Does the research involve:

- ☐ Use of private records (medical or educational records)
- ☐ Possible invasion of privacy of the subjects and/or their family
- ☐ Manipulation of psychological or social variables
- ☐ Probing for personal or sensitive information in surveys or interviews
- ☐ Use of deception
- ☐ Presentation of materials which subjects might consider offensive, threatening or degrading
- ☐ Risk of physical injury to subjects
- ☐ Other risks:

- b. **Risks:** *Briefly describe the risks of participation in your study, if any. Describe the precautions taken to minimize these risks.*

There will be no risks to subjects in participating in the discussion group

- c. **Benefits:** *List any anticipated direct benefits to your subjects. If none, state that here and in the consent form.*

1. **Direct Benefits:** *List any anticipated direct benefits to your subjects. If none, state that here*

and in the consent form.

No direct benefits anticipated to the subjects participating in the discussion group

2. **Other Benefits:** *List any potential benefits of this research to society, including your field of*

Study.

This project may lead to changes in the environment that improve access to physical activity and health of the residents.

- d. **Risk/Benefit Ratio:** *Justify the statement that the potential benefits (including direct and other benefits) of this research study outweigh any probable risks.*

The findings of my summary in conjunction with the community member's feedback will help gain more insight towards structures within the community that limit participation in physical activity. These findings can then be the groundwork for possibly modifying or changing structures within the community to support physical activity; which then will then have a positive change in the community's perception in health and well being.

- e. **Deception:** *The use of deception in research poses particular risks and should only be used if necessary to accomplish the research, and when risks are minimized as much as possible. The researcher should not use deception when it would affect the subject's willingness to participate in the study (e.g, physical risks, unpleasant emotional or physical experiences, etc).*

Will you be using deception in your research?

☐

Yes

☒

No

If yes, justify why the deceptive techniques are necessary in terms of study's scientific, educational or applied value. Explain what other alternatives were considered that do not use deception and why they would not meet the researcher's objective. Attach a copy of a debriefing statement explaining the deception to participants.

5. CONFIDENTIALITY OF DATA

a. Will your data be anonymous?

☐

Yes

☒

No

(Anonymous data means that the researcher cannot identify subjects from their data, while confidential data means that the researcher can identify a subject's response, but promises not to do so publicly.)

b. How will you maintain anonymity/confidentiality of the information obtained from your subjects?

Names of the group members will not be published in the summary of the report; but their quotes and reflections will be published using pseudonyms.

c. Data Storage: Where will the data be kept, and who will have access to it during that time?

Information gathered from the discussion group will be kept on a data drive and stored in the researcher's home. Only the primary researcher will have access to the information.

- d. **Data Destruction:** *How long will it be kept? What is the date when original data will be destroyed? (All studies must specify a date when original data that could be linked back to a subject's identity will be destroyed. Data that is stripped of all identifiers may be kept indefinitely).*

1 year

- e. **Availability of Data:** *Will data identifying subjects be made available to anyone other than you or your advisor? If yes, please explain who will receive the data, and justify the need.*

No

- f. **Official Records:** *Will the data become a part of the medical or school record? If yes, explain.*

No

6. INFORMED CONSENT

- a. **How will you gain consent?** *State what you will say to the subjects to explain your research.*

An email of the consent form will be emailed prior to discussion group for review. During the day of the discussion group, after people arrive to the focus group, I will begin the group with the consent process. I will read the consent form to them and emphasize that their participation is voluntary and that their identities will not be revealed in any publication or presentation of the findings. They are free to stop participation at any time without harming relationships with St Catherine University and the Chinatown community.

b. Consent Document: *Attach the consent or assent form or text of oral statement. A template is available in Mentor IRB.*

c. Timing of Consent Process: *Note: In studies with significant risk or volunteer burden, the IRB may require that subjects be given an interim period of 24 hours or more before agreeing to participate in a study*

a. Assurance of Participant Understanding: *How you will assess that the subject understands what they have been asked to do (Note: It is not sufficient to simply ask a yes/no question, such as “do you understand what you are being asked to do?”)*

To assess if the group members understand what was asked of them for the group discussion; I will ask each member of the group to repeat what was presented or discussed in their own words, “feedback” loop, to fully assess their understanding of what was asked of them.

7. ASSURANCES

By submitting this application, the researcher certifies that:

- The information furnished concerning the procedures to be taken for the protection of human subjects is correct.
- The investigator, to the best of his/her knowledge, is complying with Federal regulations governing human subjects in research.
- The investigator will seek and obtain prior written approval from the IRB for any substantive modification in the proposal, including, but not limited to changes in cooperating investigators, procedures and subject population.
- The investigator will promptly report in writing to the IRB any unexpected or otherwise significant adverse events that occur in the course of the study.
- The investigator will promptly report in writing to the IRB and to the subjects any significant findings which develop during the course of the study which may affect the risks and benefits to the subjects who participate in the study.

- The research will not be initiated until the IRB provides written approval.
- The term of approval will be for one year. To extend the study beyond that term, a new application must be submitted.
- The research, once approved, is subject to continuing review and approval by the IRB.
- The researcher will comply with all requests from the IRB to report on the status of the study and will maintain records of the research according to IRB guidelines.
- If these conditions are not met, approval of this research may be suspended.



**ST. CATHERINE UNIVERSITY REQUEST FOR APPROVAL
FOR THE USE OF HUMAN SUBJECTS IN RESEARCH APPLICATION**

IRB APPLICATION DOCUMENT CHECKLIST

The items listed below are the application, forms and supporting documents to be uploaded to Mentor IRB for your protocol/application submission. Consent forms and additional supporting documents may be uploaded to separately; see [Mentor IRB Directions](#). For questions, contact the IRB Assistant at 651-690-6204 or irb@stkate.edu.

- ☐ IRB Application
- ☐ PI Documentation for Investigator(s)*
- ☐ PI Documentation for Faculty Adviser (if applicable)*
- ☐ informed consent form
- ☐ child assent form (if applicable)
- ☐ recruiting materials (phone script, fliers, ads, etc)
- ☐ survey/questionnaire(s), focus group or interview questions (if applicable)
- ☐ conflict of interest/financial interest disclosure (if applicable)
- ☐ letter(s) of support (if you are conducting research at another agency, school, etc).

*PI Documentation is the completion report received for fulfilling the required Human Subjects Research education requirements in CITI Program. Each person will need to upload their PI Documentation to their individual Mentor IRB account. Directions are located in Mentor IRB.