INTEGRATING WALKING FOR TRANSPORTATION AND PHYSICAL ACTIVITY FOR SEDENTARY OFFICE WORKERS IN TEXAS

A Dissertation

by

KATHLEEN MEGHAN WIETERS

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

August 2009

Major Subject: Urban and Regional Sciences

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Approved by:

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ABSTRACT

Integrating Walking for Transportation and Physical Activity for Sedentary Office Workers in Texas. (August 2009)

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The workplace is considered a strategic location for health promotion. According to the Texas Workforce Commission, office workers represent up to 40% of the workforce in Texas and the general nature of the type of work is sedentary. Additional study is needed on how the built environment near the worksite area impacts walking behaviors and to determine interventions effective in increasing walking as part of daily routines among office workers.

The two aims of this dissertation were: 1) investigate the differences that urban and suburban settings may have on walking behavior (walk trips, walk duration, total step count) of office workers in Texas and 2) to examine the impact of a simple intervention in increasing walking within the respective land use settings. This study utilized on-line survey and travel diary, pedometer, and Geographic Information System to capture the study variables, which included personal, social and cultural, organizational, and built environmental factors.

Results showed that urban office workers walk, on average, 600 steps more per day than the suburban office workers. Office workers in both land use settings on

average have not met the recommended level of walking steps per day of 10,000 steps per day (Urban Mean=4,932 steps per day, Suburban Mean=4,347 steps per day). Post-intervention step count averaged 5,734 steps per day for urban office workers in contrast to 4,257 steps per day for suburban office workers. This translated to a 16% increase and 2% decrease in walking steps for urban and suburban office workers, respectively.

The built environment in terms of land use setting, urban versus suburban, and availability of land use destinations showed associations with walking behavior for office workers. Destinations positively associated with the number of walking trips, including access to bookstores and coffee shops. Access to convenience stores and food establishments for suburban office workers were more relevant for walking duration. Significant destinations for the urban office workers' walking duration per week included the number of banks and food establishments within ¼ mile from their office building.

The results for the second aim, testing the tailored information intervention, were informative, though not significant. The intervention did not yield a significant change in walking step count, but provided insight on opportunities for future studies.

DEDICATION

I have had the great fortune of support from family (furry and non-furry alike) and friends while pursuing this research. I dedicate my completion of this work to my very best friend of all time, Curie. She knows all the feelings, words, and hugs I would like to share with her.

ACKNOWLEDGEMENTS

As with all significant work, support from my community of family, friends, and colleagues had helped me complete this research and degree. My Uncle Mike and Aunt Jill Bradley have been generous with their support while managing superhero efforts in their own lives. My mom and dad (Dr. C. David and Joanne B. Wieters) have been cheerleaders throughout the process and helped make sure that I was always able to pay rent. Many thanks to Tim B. Shepherd who has been a kind support of which words do not describe adequately. My many friends that have pitched in when needed include: Nancy Debono, Kim Galindo, Belita Gopal, and Dawn Marshall.

I would like to thank my committee chairs, Dr. Chanam Lee and Dr. Walter Gillis Peacock, and my committee members, Dr. James Varni and Dr. Marcia Ory, for their guidance, good humor, support, and continued interest in my work.

I sincerely thank Dr. John R.Moore, Mr. Sam Echevarria-Cruz, and Dr. Connie Deutsch from The University of Texas at Austin Human Resources, and Wesley A. Wynn and DeAnna White from Texas A&M University Human Resources for their warm and informative support of this study. Both universities were wonderful in providing access and enthusiasm for promoting this study and the health of their employees.

I also want to extend my gratitude to the Robert Wood Johnson Active Living Research Foundation, which provided funding for this project, and to all the office workers at Texas A&M University and The University of Texas at Austin who were

willing to participate in the study and even sent emails and phone calls cheering me on during and after the study.

NOMENCLATURE

B/CS	Bryan/College Station
TAMU	Texas A&M University
UT Austin	University of Texas at Austin
CDC	Center for Disease Control
RWJF	Robert Wood Johnson Foundation
ALR	Active Living Research
Mode	A method or means of traveling from one point to another.
Trip	Travel in one direction from one origin to one destination
Steps	Measurement of amount of walking accomplished typically measured objectively through the use of a device like a pedometer
Sedentary	Mostly sitting for the work day and not involving physical labor on any regular basis
Office Worker	A person with a job that is in an office environment (not a laboratory), non-faculty, indoor-environment and work is mostly done while sitting.
BMI	Body Mass Index
Walking distance	Within a ¼ mile distance; able to walk within 10 minutes at approximately 3 miles/hr

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1. INTRODUCTION: WALKING FOR TRANSPORTATION AND PHYSICAL ACTIVITY

Two growing issues that impact U.S. communities of every size are health related illness due to inactivity and rising transportation costs. A meta-analysis of adults internationally reported relative increased risk for coronary artery disease, stroke, hypertension, colon cancer, breast cancer, Type 2 diabetes, and osteoporosis due to inactivity or low activity lifestyles (1). The U.S. Surgeon General's Report on Physical Activity and Health confirms a majority of these findings, though it indicates stroke and breast cancer associations may be inconclusive (2). The Report adds that there are other associated benefits with increased activity such as a reduction in falling for older adults, benefits for joint health and reducing arthritis, reduction in obesity, relief from symptoms of depression and anxiety, and improvement in overall well-being (2). Sedentary lifestyles and the associated health outcomes has become an international health issue for the 21st Century.

The cost of transportation includes direct costs, indirect costs and negative externalities. For the individual direct transportation costs include fuel, vehicle purchase, insurance and registration. Indirect costs for transportation include amount of time spent in transportation activity rather than for work productivity or recreational activities. Indirect and direct transportation costs are increased with increased sprawling

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This dissertation follows the style of *American Journal of Public Health*.

land use patterns with housing locations far from worksites and distances between other land uses require travel via the car. Air pollution is a negative externality from increased transportation and vehicle emissions which impacts users and non-users of the transportation system alike. The cost of fossil fuels continues to rise as the availability of easily extracted oil diminishes. Transportation costs in terms of fuel and vehicle related costs have risen 13.4% between 2000-2005 with income rising much less at 10.3% (3). Further, our land use patterns continue to feed the continued use or need of the car with suburbanization rates rising from 55.1 % in 1970 to 62.1% in 1996 (3) . Time spent in traffic has steadily increased from 11 annual hours per year in 1986 to 53 annual hours per year in 1999 (4). The increase in transportation also relates to increased greenhouse gases which have increased 47% between 1999-2006 (5). The impact of transportation choices can impact health through decreases in air quality, less income for medical care, and more time spent driving or sitting versus more active activities.

People that work in office settings also face these national issues and typically have an inactive or sedentary type job that may further put this population at risk. In 2008, estimates of occupational employment the Bureau of Labor Statistics indicated approximately 43% of jobs in the U.S. were in positions that are typically 'office' work, where most activity is done behind a desk using a computer for most of the day (6). According to the Texas Workforce Commission, 42% of Texans hold office-type jobs consistent with the national statistics (7). The general profile of an office-type job involves mostly sitting for 8 hours or more in a day on most days of the week. This

means for an individual to achieve recommended levels of physical activity for general health, it is assumed to be done before work, after work, or on the weekends. For many individuals, time is a very limited resource, so physical activity, such as going to the gym several times a week, may not be feasible let alone not desirable. If physical activity can be integrated into daily routines, reducing time needed to accomplish this healthy activity, the likelihood of it becoming a daily habit is increased (8-10). Addressing daily needs through active transportation may also decrease an individual's transportation costs and if enough people replace automobile trips with walking or biking, environmental benefits are also possible. This study investigates existing daily, non-commute travel patterns and physical activity levels for office workers in two environmental settings, urban and suburban. This study further tests a low-cost intervention to determine the impact of providing targeted information about access to nearby land uses or destinations, health benefits of walking and environmental impacts from replacing short drive trips with walking trips.

This dissertation is organized to first discuss the primary and secondary aims of the study within the conceptual framework. Second, a review of the literature supports this investigation and is followed by the third section describing the methodology of the study. Fourth, the discussion addresses the analysis and reporting of the results. The final section presents the conclusions from the study.

1.1 Primary and Secondary Aims

There are many factors that impact travel and mode of travel behavior. In this study, Primary Aim 1 is to assess daily walking behavior of office workers in urban and

suburban settings in Texas. This research will identify correlates of walking among office workers as a specific sedentary population. Land use patterns, type of employment, length of employment, and demographic influences are also included in the investigation to provide a more complete profile of the walking of office workers. The supporting hypothesis for Primary Aim 1 is as follows:

- **Hypothesis 1: Land use destinations and pedestrian supportive infrastructure near the worksite are positively associated with daily walking behavior (walk trips, walk duration, step count) for office workers.**

In addition to understanding the current walking behavior, Primary Aim 2 is to test the impact of information sent via email on increasing walking. Information used for the intervention included 1) targeted messages with maps to daily services from the office building of the participant, 2) tips on the health benefits of walking, such as estimated calories burned from a short walk trip, and 3) information about air quality benefits from reduced car usage. The corresponding hypothesis for this aim is:

- **Hypothesis 2: Office workers will increase walking if exposed to tailored information regarding health benefits of walking, access to walkable destinations, and air quality benefits from reduced car usage.**

A variety of tools such as surveys, phone interviews, and diaries allow the researcher to assess travel behavior and physical activity. Most of these methods suffer from difficulties related to recall and the resulting inaccuracy in the data collected,

particularly for short walk trips. The Secondary Aim explores the feasibility and effectiveness of collecting travel data electronically via an online website as a means to improve recall and accuracy of data for walking trips.

1.2 Definition of Terms

For clarity, this section will provide a few definitions of terms due to the interdisciplinary nature of this study. In transportation planning and engineering, several terms are used as standard practice related to travel behavior. The first term for definition is “mode” or “travel mode” which means a method or means of moving from point A to point B. Travel modes generally are car, transit, bicycle and walking. The second the term, “trip”, is used to define one-way travel movement from point A to point B (11) . Traveling from home to the park area is one trip. For a return trip home from the park, is a second trip. The third term for clarification is “steps”, which refers to the physical body movement from walking objectively measured typically by a pedometer. The standard step count goal per day for health benefits is often set at 10,000 steps based on a pedometer reading (12). The fourth term, “sedentary”, is defined as being mostly sitting for the work day and not involving physical labor on any regular basis. According to Pate et al., “sedentary behavior refers to activities that do not increase energy expenditure substantially above the resting level and includes activities such as sleeping, sitting, lying down, and watching television, and other forms of screen-based entertainment” (13). And the last term for clarification is ‘office worker’, which is being defined as a person with a job that is in an office environment (not a laboratory), non-faculty, indoor-environment and work is mostly done while sitting.

1.3 Conceptual Framework

Walking behavior for transportation, recreation or exercise purposes is influenced by a wide variety of factors. Following basic concepts of the social ecological model this research recognizes the impact of physical, social, organizational, political and built environments (14). This model has emerged as a bridge between the public health and planning disciplines, providing a conceptual framework for studying physical activity and walking behaviors (15). McLeroy outlines that the social ecological model with the following elements that influence behavior:

- Intrapersonal or individual characteristics
- Interpersonal or social networks or connections with others (family, friends, or co-workers)
- Institutional factors (organization with rules, regulations, and customs)
- Community factors (connections between organizations, and other social networks)
- Public policy (14)

This model acknowledges the interaction and elements beyond the individual factors and planners add to the social ecological model the role of the built environment as a distinct and important factor within framework.

For this study, the focus is on the various influences for office workers and walking. In this population, following the structure of the social ecological model, the individual's attitude toward walking is modified by personal correlates (intrapersonal), social and cultural correlates (interpersonal and community), organizational or office

correlates (institutional), and the built environment. For the individual, measures of personal characteristics linked to walking behavior include variables such as age, gender, race, and attitudes about walking and transportation mode choices. Walking behavior is further influenced by social and cultural correlates such as presence of social support, participation in religious groups, and household size. The correlates within the office setting or related to the organization are also important for consideration. Elements of the organization or work environment that contribute to or detract from walking activity can include job responsibilities, ranking or seniority within the department, supervisor versus non-supervisor, as well as attitudes held about health outcomes for employees. The final element within the conceptual framework is the built environment. Correlates of walking and the built environment include perception of access or actual access to land uses, diversity of types of destinations, infrastructure and/or design that may be supportive of physical activity.

Notably, variables that influence walking behavior can overlap or interact between personal, social and cultural, organizational and the built environment layers. This is consistent with the social ecological model which suggests that factors that influence behaviors are interacting, mediating or moderating the outcome of walking behavior.

A diagram of the key concepts of the conceptual model for this study is illustrated in Figure 1 showing the interaction between the elements through the use of gears to symbolically indicate movement of the flow of influences on walking behavior. The conceptual model also illustrates individuals that walk as part of daily life could also have a reverse causal relationship, with the other elements particularly with the built environment. Individuals that walk more may choose to live and/or work in environments that have pedestrian-supportive infrastructure and a high mix of land uses. However, controlling for influence of self-selection of built environment and walking is rather challenging.

The intervention used within this study attempts to target the personal (intrapersonal) component with links to the built environment (community). Ideally addressing all the layers of influence on behavior might be recommended to include approaches that address co-workers, supervisors and organizational programs (interpersonal, institutional); however, this is beyond the scope of this study. The two key Hypotheses, 1 and 2, for this study integrate the important correlates for this conceptual framework to understand the impact of the built environment on walking habits and opportunities for office workers.

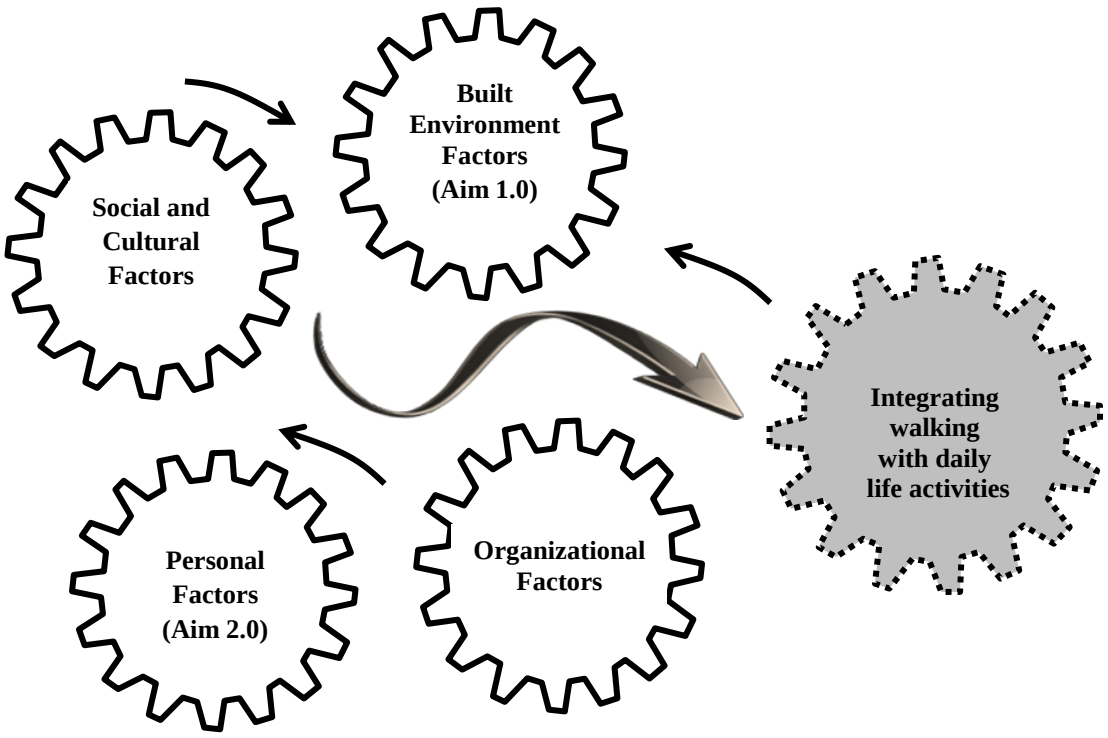

Figure 1 – Conceptual Framework

2. LITERATURE REVIEW

2.1 Correlates of Walking Behavior

The correlates that influence walking or physical activity following the social ecological model include: 1) personal correlates, 2) social and cultural correlates, 3) organizational, and 4) built environment correlates.

2.1.1 Personal Correlates

In Table 1, directional relationship of walking with these personal correlates is noted based on the dominant findings in the literature:

Table 1 – Personal Correlates of Walking

Variable	Relationship with walking	References
Age	+	(16-34)
Gender	- (female)	(16, 18, 20, 22, 24, 28, 30, 31, 34-38)
Income	+	(16, 17, 20, 29, 30, 34, 39)
Education	+	(16-18, 20, 29-32, 34, 39-42)
Race / Ethnicity	- (Black, Hispanic)	(16, 19, 24, 25, 28, 31, 34-36, 40, 41, 43, 44)
General Perceived Health Status	+	(34, 45, 46)
Body Mass Index or Weight	-	(18, 21, 22, 30, 33, 37, 38, 45)

+ = increase in walking - = decrease in walking

Table 1 – (Continued)

Variable	Relationship with walking	References
Car Ownership	-	(25, 28, 29, 47)
Vehicle Miles Traveled/Year	-	(29, 47)
Bicycle Ownership	+	(48, 49)
Hours Watching TV, Computer	-	(50-56)
Exercise Equipment at Home	+	(48, 57)
Transportation Walking or Bicycling	+	(15, 28, 30)
Recreation Walking or Bicycling	+	(15, 28, 30)
Vigorous or Moderate Physical Activity	+	(29, 30, 34, 37, 48, 58)
Knowledge about Physical Activity	+	(28)
Attitudes about Transportation Mode Choices	+	(28)
Attitudes about Air Quality Issues	+	(28, 29)
Self-Efficacy	+	(32, 45)
Meals Away from Home / Office	varies	(38)
Servings of Vegetables / Day	+	(38, 59, 60)
Transit Usage	+	(29)
Trip Purpose	varies	(61)
Attitudes about Trip Mode	varies	(62)

Personal variables have been noted to influence the magnitude of physical activity and walking outcomes as moderators, such as age and gender (16-19, 21, 23, 63, 64). First, age may influence the frequency, duration, and intensity of physical activity.

According to American College of Sports Medicine (ACSM) and American Heart Association (AHA), seniors have similar recommendations of physical activity level of 30 minutes of moderate-intensity approximately 5 times per week (65). However, seniors may adjust the intensity of physical activity due to decreased mobility, range of motion or possible health conditions or status. Children and young adults typically have or should have more energy and ability to engage in regular physical activity at higher intensity levels compared to seniors. Notably, the current trend in the U.S. for actual levels of physical activity in children has been noted as insufficient for health "61.5% of children 9-13 years do not participate in any organized physical activity during their nonschool hours and that 22.6% do not engage in any free-time physical activity" (66). Therefore, while age may have an impact on physical activity, the trends for specific age groups may be changing as a result of other factors within the environment. Increasingly interventions ranging from exercise and nutrition programs to television public services announcements have been targeted to the youth in order to promote healthier living practices and avert current obesity trends for children, adolescents, and adults.

Gender also influences physical activity levels (67, 68). Most studies control for standard demographic variables of age, gender, income and education because these attributes of an individual can have significant impact on decisions, behavior, access to opportunities, and attitudes (38). Gender is particularly important to control for in studies about transportation or physical activity due to longstanding roles women and men take within the household. Despite changes over history with women entering the workforce, women still retain the dominant responsibility for caring of the children and

the household, even when working outside the home. These roles within the household can result in different travel patterns from increased trips for child-related activities or family-related needs. Levels of physical activity can also decrease with the addition of children to a family unit, particularly for women, potentially due to less personal time (69). Gender differences in physical activity related to trip purpose may also be a factor and is relevant to this study. According to Lee and Moudon, increased frequency of walking trips for a transportation trip was positively associated with males, while walking frequency or duration for recreation trips was positively associated with females (28). Gender differences in achieving daily physical activity recommendations appear to show women lagging behind men (47).

Correlates, such as Body Mass Index (BMI), weight, and genetic factors may have strong correlations with predispositions toward physical activity (23). These correlations are particularly problematic for studies where non-randomly selected volunteers are used with worksite employees and self-selection biases creep into the study design. BMI is a general indicator of health status (21, 30, 33, 37, 38, 45, 48, 70). Notably there may be some discrepancies with BMI and healthy individuals, such as certain athletes, but generally, it provides an objective measure to evaluate meaningful improvements in health over time. Health screenings by a professional who then measures BMI objectively would reduce self-report bias and is used in larger health promotion programs. Using BMI combined with more subjective measures such as self-report of health status (e.g., My overall health is: Excellent, Very Good , Good, Fair, or

Poor) can establish an effective baseline assessment for studying outcomes of physical activity over time (71).

The relationship between race/ethnicity and walking or physical activity has also been identified in the literature. According to the National Health and Nutrition Examination Survey (NHANES), Blacks and Mexican-Americans spend 10-20% less time engaged in physical activity during leisure time (36, 44). This is also confirmed by the Center for Disease Control (CDC) for Texas specifically. In Table 2, Blacks and Hispanics do not achieve the same levels of physical activity as Whites.

Table 2 – Physical Activity Levels by Race in Texas, 2007

	White	Black	Hispanic	Other
Recommended	51.1%	40.6%	42.6%	39.4%
Insufficient	37.5%	35.2%	39.5%	39.5%
Inactive	11.4%	24.2%	17.9%	21.1%
No Leisure-Time Physical Activity	22.5%	34.1%	35.7%	30.5%

Content source: Division of Nutrition, Physical Activity and Obesity, National Center for Chronic Disease Prevention and Health Promotion (72)

'Recommended levels of physical activity' are defined as completing 30 minutes of moderate intensity activity at least 5 times a week on most days of the week (72). 'Insufficient physical activity' for health benefits is defined as performing some activity but not enough to meet recommended levels (73). Table 2 indicates that consistently Blacks and Hispanics are more frequently sedentary with high rates of inactivity and no leisure time physical activity achieved (71). Lack of physical activity is compounded by poor diet choices and weight issues. Several studies have noted a trend toward obesity

for minorities and particularly for women minorities related to food choices (38, 74).

The interaction between race and gender on physical activity has found that along with diet, women minorities are particularly at risk of not accomplishing recommended levels of physical activity, which is also associated with lower self-perception of health status (73).

Along with race and ethnicity, economic status and education levels may impact walking. Most studies generally have found a positive relationship between increased walking habits and physical activity and socio-economic status, though exceptions can be found (75). Lower income populations may have lower physical activity levels but some findings indicate that walking activity may be comparable with higher incomes (76, 77). This may be out of necessity given lower income individuals may not have access to a vehicle or the cost of gas is prohibitive (78). Higher income individuals may walk less because discretionary income allows for driving as well as socially the expectation of driving is the norm, though this income level may have increased recreational walking (79-81).

Transportation options, including characteristics such as car or bicycle ownership and attitudes about mode choice, are also a part of personal characteristics influencing walking. Private automobiles make up 86.3 % of all trips (commute and non-commute trips) in the US, contrasting to only 1.6% for transit, and 8.6% for walking and biking (82). The number of cars owned, bicycles owned, transit usage, and vehicle miles traveled are indicators of attitudes and choices regard physical activity and active

transportation (47). Access to a vehicle can easily sway an individual to choose to drive rather than walk for speed, convenience and comfort.

2.1.2 Social and Cultural Correlates

Social support for walking or companionship can influence walking levels. An Australian study of homemakers and workers (N=1803) found that the odds of achieving recommended levels of walking per day were increased as the number of companions that walked with the individual over previous 3 months increased (1 companion: Odds Ratio [OR]=1.81, 95% Confidence Interval [CI]=1.30-2.52, p<.001; 2 companions: OR=2.05, CI=1.36-3.09, p<001; 3 companions: OR=1.48 CI=0.75-2.93, not significant; 4 or more companions: OR=3.42, CI=1.14-10.2, p<.05) (20, 83). Additionally, this study noted that the odds of walking the recommended daily level were 58% higher for those owning a dog (83).

Social support extends from family and friends to community groups such as religious groups. Religious groups can also serve as an important cultural influence on physical activity and walking. In Eyler et al., those who attended religious services regularly were more likely to do some physical activity (73). A study on Amish and Mennonite communities found a general lifestyle that resulted in higher levels of physical activity, walking and lower incidences of obesity for both adults and children compared to other communities (84). In Kanu et al., church-based social support was explored in rural communities of Missouri, Arkansas, and Tennessee (N=1625) (85). Two types of social support related to church activities were studied including direct information about improving physical activity distributed by a church leader

(informational social support) or facilitating physical activity through sponsored activities (instrumental social support) (85). The findings of this study showed individuals had greater odds of performing some activity from informational social support measures (postings on church bulletin and in newsletter) though this change in behavior was not sustained over time (OR=1.39, CI= 1.03-1.87) (85).

Social support is an asset to improving interventions that promote physical activity, walking and quality of life. In a study of sedentary, older adults (Age Mean=65.5, N=174) , McAuley et al. found that social support during an exercise program intervention was associated with increased satisfaction with life and reductions in loneliness (27). A study on obese outpatients (N=42) examined two different levels of social support in the form of frequency of group meetings to promote walking. The study found the number of steps walked increased with increased frequency of group meetings. It noted that social support aided by the reinforcement of a pedometer was an effective intervention (86).

Other social correlates that may impact walking include household size and responsibilities. A household with children may actually have parents with lower physical activity levels, particularly if children in elementary school or younger (69). This may be due to less discretionary personal time and more time constraints for providing care and transportation for others.

Along with social correlates, cultural correlates can play a role in walking and physical activity levels. Eyler et al., found in a study of Native American, African American, Hispanic, and White women in rural and urban settings that social roles and

community issues were raised as important issues for physical activity in qualitative focus groups, though did not prove significant in the quantitative study (73). This study further identified that knowing others who exercised were positively related to physical activity (73). This is also confirmed by a study of rural adults (N=1194) where the odds of being a more regular walker were greater (OR=2.66, CI= 1.67-4.25) than not walking at all, if people in the neighborhood were viewed as physically active (31).

Other cultural correlates can include ethnicity as a cultural component of race. A study of Korean Americans in California (N=2,830) found this group walked less than majority groups but participated in vigorous physical activity on comparably with Whites (87). A study on Hispanics adults (N~5,000) from the National Health Interview Survey developed an index of acculturation level, scored based on language usage and comprehension (88). This study found that individuals with higher levels of acculturation were more likely to meet recommended physical activity levels than those with lower acculturation scores (OR=1.97) (88). African American women were studied to determine how cultural-based values may impact the design of interventions to promote physical activity (89). Cultural barriers for different groups can impact walking based on past experience or exposure to exercise or lack of community support (90). Therefore, attention to details on language or access to information is important to development of interventions for these populations.

Social and cultural variables that are addressed within this study and the relationship with walking are included in Table 3.

Table 3 – Social and Cultural Correlates of Walking

Variable	Relationship with walking	References
Social Support	+	(29, 36, 85, 91)
Household size (Number of adults, Number of children)	varies	(16, 17, 20, 25, 30, 69, 85)
Dog Ownership	varies	(28, 48, 91-101)
Marital Status	+	(16, 17, 20, 28, 50, 85, 102, 103)
Childcare Responsibility	-	(69)

+ = increase in walking - = decrease in walking

2.1.3 Organizational Correlates

The organizational correlates or institutional correlates that may influence walking can include rules, regulations and policies within the work setting. These policies may range from informal expectations or formal policies which can be barriers or facilitators for walking and physical activity. In some office settings the management policies may formally or informally influence sedentary behavior. The expectation of an individual to be at their desk because that visually indicates they are working and productive may dissuade some individuals from taking a walk break or emailing versus face-to-face contact for work-related activities. Further, organizational or community values may view office work or sedentary work as a sign of status, where physical activity or labor is a indicator of lower status (104). Additional organizational

issues such as workload, time pressure, job stress, lack of control over job tasks, and lack of social support also contribute to physical and mental health issues for workers and may influence physical activity (105). Walking may provide the employee an opportunity to stretch and contemplate an issue which in turn may improve productivity throughout the day.

Organizational correlates that facilitate physical activity, walking, and general employee health can include: 1) worksite health programs, 2) infrastructure such as on-site showers or gym equipment, and 3) informal policies to promote physical activity. A study of 977 adults in Missouri, Arkansas, and Tennessee noted how these types of organizational facilitators at the worksite, such as gym equipment, accessible stairways, or breaks during the day for exercise, contributed toward employees meeting moderate to vigorous physical activity recommendations (106). This study showed that employees were more likely to meet physical activity requirements if more than one of the policies or facilitators were in place. Notably sites with accessible staircases had employees with higher odds for meeting physical activity requirements (OR=1.4, CI= 1.0-1.9) (106).

Organizational factors contain elements of social support from co-workers and institutional elements from worksite policies about health promotion. A few studies controlled for supervisory status, though impact of supervisory or non-supervisory status was not explored as a correlate for walking further (107-109). The role of an influential supervisor or leader within an organization to promote physical activity may impact walking levels during the workday. Flexibility in work schedules for supervisors versus

non-supervisors may differ, which also has not been investigated sufficiently as it relates to walking.

In Table 4, the correlates of walking and relationship with walking used for this study are illustrated. Variables such as Supervisory Status and Longevity are used to evaluate the impact on walking within this study further given these variables have not been tested widely.

Table 4 – Organizational Correlates of Walking

Variable	Relationship with walking	References
Sedentary Nature of Job (eligibility requirement)	-	(110)
Supervisory Status	+	(107-109)
Longevity within the Department	+	(111)
Longevity within the Overall Organization (university)	+	(111)
Distance of Parking to Office Entrance	+	(112)
Cost of Parking	varies	(113, 114)

+ = increase in walking - = decrease in walking

2.1.4 Built Environmental Correlates

The connection between physical activity and the built environment has been established by many studies. There are six key areas of research linking physical activity levels and walking with the elements of the built environment including: 1) urban sprawl, 2) land use mix, 3) density, 4) design 5)pedestrian-supportive

infrastructure, 6) access or proximity to recreation or park facilities, and 7) perceptions about the built environment experienced by individuals.

How land uses are spatially arranged can be a predictor of physical activity (63, 115). Access or spatial access is how geographically land uses and infrastructure link together to provide a system of connections between individuals and land use destinations (116). Moderators of spatial access with physical activity may include convenience issues, which can include comfort, items that need to be carried, or availability of pedestrian infrastructure (25, 63, 117-124).

Residential density and land use mix have been tested in comparison with BMI and leisure time physical activity with some associations being identified (118, 125-127). In Ewing et al., adults in 448 U.S. counties were evaluated between a sprawl index and walking levels and found that adults living in higher sprawling counties walked less than metropolitan areas (County Sprawl Index and Minutes Walked β=0.275, p=.004) (125). Lee and Moudon evaluated spatial data with surveys from households in the city (Seattle) and suburban areas (127). In this study (N=608), they found that land uses such as grocery stores, banks and restaurants were correlated with increased odds for walking (127). Both perceived and actual access to land uses within walking distance have been found to have a significant impact on walking activity, particularly for transportation purposes (28, 128). In Saelens et al., they found that highly walkable neighborhoods, have increased walking for errand-type trips (129). Errands are considered discretionary trips as opposed to mandatory trips such as commuting to work or school which have

specific time constraints. A discretionary trip may have a higher potential for walking or biking if needed or desired land uses is available within walking distance.

In addition to land uses, elements of the built environment such as street connectivity and street width may also contribute to walking and physical activity when designed to address comfort of crossings and safety concerns (129, 130). Street connectivity or width can determine how easily an individual can navigate the built environment on foot. The directness of paths may influence how far destinations are located and influence mode choice to promote or deter active transportation modes, like walking and biking (130).

The literature on the built environment has focused on elements within the neighborhood or household areas, rather than the vicinity of the worksite. With a majority of a worker's time spent at the office, the opportunities within the built environment near the office may help support walking as a part of daily routines. The built environment can act as an important moderator to physical activity and can have dramatic impacts on a variety of interventions.

The key variables for the built environment for this study are shown in Table 5.

Table 5 – Built Environmental Correlates of Walking

Variable	Relationship with walking	References
Sidewalks	+	(29, 32, 48, 83)
Crosswalks	+	
Interesting Places to Walk to / Interesting Architecture	+	(29, 32, 48)
Lighting	+	(31, 48)
Shade / Trees	+	(29)
Hills / Steepness of Slopes	-	(48)
Unattended Dogs in Neighborhood/ Environment	-	(48)
Specific Land Uses (Farmers Market, Fruit/Vegetable Market, Supermarket, Convenience Store, Fast Food restaurant, Non-Fast Food restaurant, Pub/ Bar, Café , Clothing Store, Pharmacy / Drug Store, Laundry/Dry Cleaners, Office supply, Hardware, Shopping Center, Bank/Credit Union, Post Office, Video store, Salon/Barbershop, Religious, Daycare, Community Center, Gym / Healthclub, Park, Transit stop, Other Offices)	varies	(30, 32, 127)
Distance to Specific Land Use / Distance to Closest Land Use	+	(29, 30)
Perceptions about Safety/ Crime within the Environment	-	(15, 32, 48, 128)
Traffic Level / Speed	-	(28, 32, 48)
Travel Time	-	(61)
Access to Transit	+	(128)
House Location Selection (Housing affordability, quality of neighborhood, good school, close to school, good neighbors, close to work, close to family, close to open space, close to recreation, easy access to retail, easy access to transit, safe neighborhood, allow pets)	varies	(29, 32)

+ = increase in walking - = decrease in walking

2.2 Walking and Travel Behavior for Office Workers

Obesity rates in the U.S. for adults and children are on the rise due to unhealthy diet and lack of exercise. According to the Centers for Disease Control and Prevention, the trend in adult obesity has gone from about 12% in 1991 to over 30% in 2000 (131). In roughly that same time period from 1990 to 2000, walking as a percentage of work trips decreased from 3.9% to 2.9% (132). Even worse, the percentage of walk trips overall in the U.S. in 1960 was 10.3% compared to 2.9% in 2003 (133). Vehicle miles traveled per year continues to increase with households owning more cars than available drivers (47). Medical costs in 2000 in the U.S. were 76 billion dollars with up to 300,000 deaths associated with inactivity (47). Brownson et al., noted that 42.6% of the U.S. population were employed in low-activity occupations (47). Reversing this pattern is critical to the overall health of the population. Traffic congestion and vehicle miles traveled continue to skyrocket as walking as a travel mode declines. However, most trips are associated with errands (45%) or social and recreational (27%) trip purposes rather than commuting (15%) (47). These discretionary trips are the types of trip purposes that are the most relevant for office workers to address as possible trips for shifting from car to walking. Promoting walking as a travel mode begins to intertwine physical activity and transportation goals.

2.2.1 Physical Activity of Office Workers

Office workers by the very nature of their jobs spend a majority of their day sitting or in a sedentary state. "Globally, 60% of the world's population is accessible directly or indirectly through the workplace and 60% of our waking hours are spent in

the workplace"(134). Because we spend so much of our lives at work, addressing our physical activity issues and health within the work setting is important and strategic. Individuals working in an office setting typically have few opportunities for physical activity in an eight-hour or longer period (135). This sitting inactivity impacts health and productivity at work:

> Sitting at a desk for hours on end decreases mental acuity, not only because of reduced blood flow to the brain but for other biochemical reasons as well. Physical exercise induces the body to produce an array of chemicals that the brain loves, including endorphins, serotonin, dopamine, epinephrine, and norepinephrine, as a well as two recently discovered compounds, brain-derived neurotrophic factor (BDNF) and nerve growth factor (NGF). . . [both] promote cell health and development in the brain, stave off the ravages of aging and stress. . .(136)

The human body is not designed to be sedentary and still maintain good health. Addressing organizational values regarding integrating physical activity as part of the work day is important to consider for successfully improving the health of office workers. Often individuals in these office environments do not realize how little walking or movement they do or the impacts on their health, stress and well-being from this inactivity (137). Stone studied corporate executive office workers where the sedentary control group burned far fewer calories from physical activity (MANOVA $F=13.419$, 479.6 kcal/week, $p<.001$) compared to the intervention group (2861 kcal/week) (108). In Australia, office workers, those classified as professionals, managers and administrative workers, were found to have the greatest number of hours sitting per day and lowest number of steps (using a pedometer) per day compared to technicians and other blue collar workers (138, 139). Additionally, the Australian study

found correlations with sitting time and overweight and obese employees (139). This pattern is likely to be seen in the United States as well. A study by Uusi-Rasi et al. compared women in active occupations with sedentary office workers. In this study, office workers walked significantly less (1895 meters/day) compared to the active workers (5926 meters/day) (140). Additional considerations for office workers are prolonged use of awkward postures, repetitive movements, and localized mechanical stress (105, 141). The sedentary habits of office workers can lead to worksite injuries and a decline in health because of the very nature of job requirements to be at their desk sitting for long periods of time.

The connection between the built environment and the neighborhood has been assessed using a variety of audit tools (127, 142). Assessing how the built environment near the workplace is associated with walking, similar to studies done for the neighborhood environment, is beginning to be researched. In 2005, an audit tool was developed to evaluate the walkability of the routes near the workplace (143). In Dannenberg et al., 79 walking routes were evaluated near 10 organizations (Federal campuses) based on ratings of Good, Fair, and Poor (143). The audit tool places more emphasis on infrastructure needs relevant to workers such as shade, pedestrian facilities or conflicts, crosswalks, and general aesthetics. The tool is for qualitative assessment for walkability that yielded similar results with independent field assessors using the tool (143) . It was not tested with an outcome variable such as amount of people walking on a particular route. This tool did not include measures for land use destinations within walking distance of the office locations.

The gap in the literature for office workers and walking levels includes understanding the specific walking levels of office workers in different regions of the United States, the role of supervisory status on walking, comparison between office land use settings, destinations within walking distance of office site, and pedestrian-supportive infrastructure as a facilitator for walking.

2.2.2 Workplace Interventions

Addressing health issues and lifestyle patterns in the workplace is not a new concept. Research on interventions within the workplace and their impact on health outcomes continue to be relevant to improve the health of individuals, increase productivity at work, and lower health costs for company insurance rates. Many intervention programs from ergonomic desks, walking or treadmill desks, health and body safety education programs, and medical consultations and screenings have been used within the workplace to improve health and reduce injuries and stress (104, 109, 144-154). There are difficulties in researching worksite interventions programs due to the need for employees and the organization to collaborate on the program content, thus effectively eliminating an unbiased control group. Additional issues include reluctant participation in control groups as well as cross-contamination from interaction with other employees (107). However, due to the high accessibility to a large population through the workplace, health promotion activities have been prevalent since the 1970s at the worksite. The worksite continues to be a logical location to disseminate health promotion programs.

Workplace interventions that have included comprehensive, long-term programs addressing multiple layers within the social ecological model with individualized tailoring of programs (interpersonal), social support through teams or partners within the workplace (intrapersonal), and incentives and policies (organizational or community) have been the most effective interventions in reducing health risk factors and increasing physical activity levels for workers (146, 150, 155, 156). Blair et al., studied the impact on employees in a company with health screening and a health promotion program (N=2,600) and compared with comparable employees at companies that did not have these programs (N=1700) (109). The employees with access to the health promotion materials, screenings and activities had higher energy expenditures and showed significant reduction in some of the coronary heart disease risk factors compared to the non-exposed employees (109). The comprehensive health promotion program, like this one, is often an expensive program that involves personal counselors (nurses, physiotherapists, etc), annual health screenings, and often include some capital investments such as onsite gym equipment (109, 155). Despite the costs, these multi-faceted health promotion programs at the worksite have been successful. A longitudinal study (1985-1986) of 1200 General Mills' field sales employees at a diverse set of satellite offices investigated voluntary health promotion program and found that the intervention reduced absenteeism for participants (Mean=2.58 days/year) as compared with non-participants (Mean=4.32 days/year) (157). Wood et al., found that this health promotion program was effective in increasing the number of employees exercising at least three times a week (Baseline: 48% of participants exercised three times per week

Second Appraisal: 71% of participants exercised three times per week). A limitation to this study was a lack of a control group, and participants and non-participants worked with each other daily (157).

A meta-analysis of twenty-six international studies evaluated the scientific quality of the research on interventions in workplace settings. Employees in the evaluated studies included factory workers, firefighters, clerical, automotive maintenance, ambulance service employees, and general sedentary employees (146). A major limitation noted by this meta-analysis was that worksite intervention research design contained few studies using randomized control groups that were comparable to the intervention group and relied on voluntary participation in the health promotion programs. Additional limitations included lack of incentives in several of the studies, and self-monitoring or self-report with little or no objective measurements (146). The studies evaluated occurred from 1972 to 1995 and therefore more recent improved research design methods were not evaluated.

Notable downsides of health promotion programs at work are related to participation and drop-out rates. Researchers doing meta-analysis on workplace interventions have noted that potentially good programs suffer from low participation rates (107, 155). Some worksites have addressed this issue with attendance requirements for education programs or physical activity being a condition of employment (107). This may not have wide applicability or acceptance in many workplaces. Studies also have noted that drop-out rates can be skewed with more women leaving workplace health or physical activity programs than men (158).

Successful programs with low drop-out rates provided long term support and addressed a comprehensive menu of health issues including healthy food choices, exercise and stress reducing activities and often included is a competitive component or incentives (149). Generally, workplace interventions continue to be a useful location to address larger populations to increase health outcomes and reduce health costs and continued work to understand the most effective methods for interventions rests in understanding the correlates of workers with physical activity and health behaviors.

Several studies at the workplace have included interventions with email-based information, online chat rooms, and computer programs with success in increasing awareness about healthy choices and behavior (103, 147, 159). Egawa et al., studied male office workers in Japan (N=38) using an intervention involving 3 counseling sessions and emailed advice (147). The intervention group was given information about daily exercise and eating behavior. The intervention group reduced their BMI values, abdominal circumferences, serum insulin levels, HDL and LDL cholesterol levels (147). Limitations noted about this study included cross-contamination of participants with control group (147). Additional limitations include small sample size and only Japanese males were studied. However, despite these limitations, success in improving health using the lower-cost, and online approaches suggests wider impacts may be realized (147).

Another lower cost intervention included a promotional campaign for walking in Rhode Island. A study of two Rhode Island worksites (N=6300) using promotional messages of the health benefits of walking was evaluated using the Path to Health

program (160). Counts of people walking along predetermined routes were performed for a baseline, during the promotional campaign, and post-promotional campaign. An informational booth survey assessment was used to survey individuals to determine if they were familiar with the messages of the campaign and included questions to assess what stage of change the individual may have been in related to walking behavior. Survey questions at the informational booth assessed recognition of the Path to Health signs shifted from 50% recognition to 65% recognition during the full campaign (157). Point estimates of users of the walk paths were assessed at a baseline point and during two other phases of the campaign. Walking frequencies increased three and half times the baseline along the walking path locations (Baseline Point Estimate=5.25, CI= 2.05-13.45, Final Phase Point Estimate=18.99, CI= 7.03-51.02) (157). Limitations to this study included no control group and imprecise measurement of effect of the campaign using the informational booth (160). This intervention looked at one element, a walking path, of how the built environment influenced walking. Matson-Koffman reviewed 64 studies about physical activity and cardiovascular health with campaigns within the workplace to encourage stair usage and indicated promising impacts on physical activity levels from these types of campaigns(161). A study by Webb and Eves found that both the design of staircases and promotional messages to promote usage of stairs in a shopping mall (N=81,948 pedestrians ascending or descending staircases) was correlated with increased climbing stairs (162). Notably the message increased climbing the stairs at a specifically targeted staircase for the intervention as well as at a non-targeted staircase (OR=2.90, CI= 2.55-3.29) (162).

Cost as well as access to health promotion programs is a relevant concern for small businesses. A Japanese study evaluated options for health promotion in small businesses through a mailed survey (N=1649) and found that employees in small businesses worked longer work hours, got less sleep, had higher injury rates and more illnesses than larger businesses (154). This is relevant when considering development of interventions for worksites and identifying applications that may be generalizable for multiple worksite sizes. Erfurt and Hoityn in a 1991 study evaluated wellness programs for small businesses and noted that participation rates were decreased at least 50% due to co-payment requirements to participate in the screenings or program in general (155). This study did not offer statistical analysis of the findings.

Physical activity components of the health promotion programs at the workplace may assist in decreasing health costs and workplace injuries, but physical activity may also address other factors that are not easily measured such as reduction in stress, increased energy to perform work tasks, or ability to focus thoughts after short breaks (107, 150). Findings have been reported that physical activity can reduce the effects of Attention Deficit Trait (ADT), a condition exacerbated by the multi-tasking, high-paced atmosphere of many workplaces, by adding small breaks to walk or climb a set of stairs as a mild intervention to assist in productivity (136). This allows for a mental break which in turn promotes better focus when returning to work. Associations with psychosocial factors and physical activity or exercise programs have also been noted in terms of increased job satisfaction and increased subjective well-being status (150, 163). Addressing good health behaviors on a daily and more integrative basis has implications

on work productivity, which is an additional reason businesses are interested in increasing the health of their employees.

Walking is a low-cost activity that could be easily integrated in the daily lives of office workers. Walking has been shown to be as effective as vigorous exercises in reducing coronary heart disease risks (15, 164-166). This type of exercise is more easily adopted by those with sedentary habits which may integrate more effectively with the lifestyles of many office workers (167, 168). Some research has found for women that, combined with diet, walking as the method of physical activity resulted in the similar weight loss as compared to exercise of different durations and intensities (169). A European study tested a worksite walking program for sedentary workers (N=37) (170). The findings showed the walking group improving systolic blood pressure and maintaining body fat levels (170). Additionally, walking groups walked more by being given a 'prescription' to walk (Mean=9303 steps ±2665) compared with rest days (Mean=5803 steps ±2749, $p < .001$). Integrated lifestyle changes to physical activity as compared with structured exercise programs have similar results in terms of health benefits (171). A study of 206 employees at two state agencies tested the impact of a pedometer and email messages on walking (172). In this study, Faghri et al., recruited volunteers for their health promotion program with 56% rate of completion the study (172). Emails sent contained messages that focused on motivating walking and overcoming barriers to walking and were centered around the Transtheoretical Model (TTM) (172). For the 10-week program, the average steps per day at the baseline was 4,185 ±174 steps with the plateau walking level reached for the participants being an

average of 5,300 ±356 steps (172). This study found that emails versus basic internet programs for health promotion could be effective in increasing walking for sedentary employees (172). Limitations of this study included the lack of a comparison or control group and the participants were not randomly selected for the program.

Walking is an easily adopted lifestyle change for many as compared with setting aside money and time for exercise. Promoting low-intensity physical activity, particularly for changing the habits of sedentary individuals, has been noted to have meaningful health benefits (76, 152, 173). This has been incorporated into many worksite interventions with walking and fitness challenges as well as low intensity (no sweating to avoid issues of changing clothes during work day) midday workouts with positive results for key risk factors (152, 174). Due to the nature of office work being particularly sedentary, the impact of increasing physical activity even once a week can result in lower body fat and thus some health benefits compared to no physical activity (173). Walking may fit well into the office setting to address increasing physical activity.

Limitations of interventions that have been tested with office workers are: 1) cost to deploy the comprehensive programs involving regular health screenings, prompts, classes, and counseling, 2) integrating transportation options with physical activity, 3) connecting air quality issues with health and transportation choices, 4) voluntary-based interventions with no comparable control groups, 5) small sample sizes, and 6) short-duration of intervention period.

2.3 Measurement Tools

2.3.1 Travel Diaries

Personal measures can be captured through self-report and objective instruments. Surveys are the most commonly used to obtain self-reported information on physical activity (types, levels of intensity, duration, and frequency) and its correlates (20, 31, 68, 76, 83, 175-178). There are the standard issues related to self-reported data, particularly for reporting physical activity, such as social desirability, recall problems, and survey design (100, 179-181). Travel diaries attempt to increase the objectivity of self-reported behaviors by requiring participants to log all daily trips with data about mode choice, trip departure and arrival times, trip origins and destinations, and trip purpose, with little to no questions about perception (182-185). These diaries are not free from the self-report problems of inaccuracy and incompleteness of the data collected. Frequently found problems include errors in the times of trips reported, omission or addition of trips, delayed completion of diary compromising recall quality, and lack of information about the route or path choices, as only the origins and destinations are reported. Additionally, travel diaries are labor-intensive for the user, and accuracy and completeness of the diary for longer studies are even more questionable. However, travel diaries generally provide needed information on trip data which is useful for evaluating transportation behavior and ultimately what opportunities exist to replace trips with active transportation modes, such as walking and biking.

2.3.2 Internet-based Surveying and Information

Internet based travel surveys, or travel diaries, began as early as 1999 where Resource Systems Group performed research for USDOT to evaluate and identify approaches that improve the quality of the data and the cost of the data collection (186). Additional findings have indicated that internet-based surveys for travel diaries result in fewer missing responses and can be presented in a more flexible manner or format that is easily used by the participant compared to paper survey formats (178, 187).

People typically shop around for airfare tickets, times and pick airlines and route options based on their preferences because with the internet more information is available for comparison. While some barriers to walking such as land use patterns may take time to remedy, providing additional information to the user can be done with relative ease and in the short term. Some studies have been done to evaluate how travelers use information from the radio or television broadcasts and internet information to determine route and time for travel (184, 188). The primary findings are related to how travelers use information about traffic congestion regarding routes to take for commute trips rather than changing modes. Peirce and Lappin found that 37% of those using information for their trips changed their travel behavior in some way as a result of the information they received (188). Targa, Khattak and Yim investigated the levels of information people had access to and used for trip modifications (184). They had similar results of approximately 33.1 % of trips were modified as a result of transportation-related information. Further, Targa et al., also noted that 50.4% of respondents with 'dynamic travel information' changed their travel behavior as a result of the information

received. Regarding how walk trips may have been impacted by information from the respective sources, Peirce and Lappin reported that only 1.5% of respondents to their survey used information for their walk trip (188). However, they equally noted that the focus of the literature to date, as well as their survey, has not concentrated on non-commute trips and even less on transit and walking trips (188). This is an opportunity to provide individuals with real-time information on walking options to improve physical activity opportunities and reduce automobile usage.

Research has also begun to identify the impact of providing information via electronic messages on health and physical activity as a method to increase physical activity levels (189, 190). In both studies, tailored information appeared to yield better results for increasing physical activity. Ranieri studied the effect of encouraging physical activity with emails. Participants expressed that the emails "served as reminders, motivators, or calls to action" (191). Frequent reminders or prompts via emails or phone calls was associated with higher physical activity and walking levels (21). Office-based interventions via the internet have included providing information on nutrition and posture as well as programs on physical activity using chat rooms and other computer programs with successful outcomes in improved health and adoption of healthier behaviors (147, 150, 159, 192).

2.3.3 Physical Activity Measurement Tools

Combined with online tools, other measures are needed to assess physical activity. To help overcome some of the limitations of self-reported data from surveys and travel diaries, many recent studies have included objective measures of physical

activity by using pedometers and accelerometers to measure more accurately and reliably the quantity and intensity of physical activity (193-199). These tools help reduce recall problems and self-report bias. This study utilized pedometers to measure walking steps as an objective measure and a cost-effective tool.

2.3.3.1 Pedometers

Pedometers provide a step count based on the "vertical acceleration" of an individual or the "up-and-down motion . . .of the hips"(200). Internal to the device is a lever that moves during ambulation and the deflections are recorded via an electronic circuit (200). Generally pedometers can provide accurate step counts and units such as the Yamax, Kenz Lifecorder, and New-Lifestyles have been validated with high accuracy (196, 198, 201). Pedometers are small and light, and involve minimal intrusion for the user. Cost for pedometers that provide step count, estimated mileage (based on inputted stride length), and estimated calories burned (based on inputted weight and height), are typically inexpensive, ranging from $5 to $35. Pedometers are convenient tools for obtaining objective measures for walking. However, they have had measurement issues related to placement of the device, type of clothing worn by user, weight of user, types of walking paces or gaits, and miscounts for movement while seated (193-197, 199). Additionally, users are able to get feedback from the unit, such as number of steps taken. The simple act of wearing a pedometer has been shown to increase walking activity in general (202-205). This can be useful as an intervention to facilitate increasing walking in daily activities, but is a limitation for other research requiring objective measurements of physical activity. Some pedometers allow for a

researcher to download data from the pedometer that includes time stamps along with the step counts. This type of data allows for calculating steps per minute or per hour to assess the intensity of the physical activity. These pedometers, like the New-Lifestyles Lifecorder, include a memory that will hold from 60 to 200 days of data can be stored and downloaded via USB ports as well as uploaded to the web fairly easily (206). These types of pedometers do not include record routes or paths used by the user. These types of pedometers that include software and download capabilities range in price from $130 to $600 which may make these unit impractical for many research applications (206).

2.3.3.2 Accelerometers

While pedometers are useful in encouraging walking and are attractive measurement tools in terms of cost and ease of usage, they do not measure the intensity of activity. Accelerometers can be equally small and light as pedometers, but usually do not provide feedback to the user. Accelerometers operate differently than pedometers by measuring "the average amplitude of body accelerations during a defined period" which has been used to quantify energy expenditure from various physical activities (207-209). While typically the best placement for a pedometer is at the hip in line with the knee, accelerometers are also effective at the waist and ankle (210). Research with accelerometers has also developed 'cut points' in the data collected by the accelerometer which can translate to activity type, duration and intensity (200). Accelerometers are noted for recording intensity or energy expenditure better than pedometers. However, some findings suggest that recording physical activity in uphill or downhill walking

conditions with accelerometers may have significant errors in predicting energy expenditure (211). Accelerometers are significantly more expensive than pedometers ranging in price from $350 to $500 (212). This may be cost-prohibitive for many studies or may preclude desired sample sizes.

2.3.3.3 Global Positioning Systems (GPS)

Both pedometers and accelerometers have contributed significantly to reducing measurement errors and improving the data precision. GPS technology was developed by the Department of Defense and has been in use by researchers in public health and physical activity for about ten years (198, 213-215). Pedometers and accelerometers give us objective data about behavior, but do not address how that behavior is linked to route choice and thus the built environment. GPS allows route analysis at a disaggregate level thus improving our ability to understand the route and location choices for physical activity. This is useful both in identifying characteristics of the built environment that facilitate walking and biking but also in policy decisions for transportation investments (216). There are some initial studies, such as those done by Rodriquez and Troped, on the accuracy and potential contribution of GPS to built environment-physical activity research, but there remains work to be done, including assessment of: 1) variety of units' accuracy and 2) usability for different populations (215, 217). GPS units remain fairly expensive ($70-$200) and slightly bulky for wearing long periods of time. The technology is advancing rather quickly and likely within 1-2 years smaller and cost-effective units with high accuracy will be available for research.

2.3.4 Significance

This study contributes to the literature in several ways. First, as noted in some of the studies, worksite intervention research often does not include a control group to determine if the effect was in fact due to the intervention. This study uses a control group for both land use settings. The intervention group was randomly selected from the participants in the study. Second, variables for supervisory status as well as longevity of employment were included in this study which seem to have had limited inclusion in other studies as potential correlates with walking for office workers. Conceptually, an employee that has worked at the university longer should be more aware of destinations within the area, though knowledge of walkable routes may not be associated with longevity or walking levels. A newer employee may be more adventurous and thus more receptive to an intervention to explore walking options to destinations. Supervisors may have more discretion in their work schedules which could allow more time for walking or the authority to allow or promote walking activities during the work day. These potential work or organizational correlates will be investigated in this study. This study further explores how land use destinations, land use mix, and pedestrian-supportive infrastructure correlates with walking. These factors have been studied

within the neighborhood environment, but similar evaluations of the built environment should be evaluated for the worksite. This research further contributes to the literature by testing email messages that integrate transportation, land use and air quality impacts, and health benefits of walking as a low-cost health promotion intervention. Lastly, this study uses a moderately sized, rather than small, sample to facilitate arriving at better statistical inferences.

3. METHODOLOGY

As noted previously, a significant portion of the U.S. population holds employment in an office setting and performs work that is predominantly sedentary. Understanding correlations between walking, office workers, and the built environment may allow researchers to identify opportunities for increased physical activity as a part of daily routines.

3.1 Study Settings

This study targets office workers within urban and suburban environments. Offices within an urban environment, University of Texas at Austin offices, will be compared with similar offices in a suburban environment at Texas A&M University, College Station.

The urban environment includes elements such as shorter distances to land uses and multiple walking paths to a variety of destinations. Additionally, signage, benches, trees, and pedestrian social areas are designed at a human scale in urban settings. Buildings, both offices buildings and nearby commercial buildings, are set closer together and closer to the street.

The suburban environment includes wider, open spaces and greater distances between buildings. It features greater setbacks and lower density of land uses. Because the built environment is an important factor within the framework of this study, having participants in two settings was a useful comparison.

For the urban environment, the University of Texas at Austin (UT Austin) was selected and for the suburban environment, Texas A&M University was selected. Employees from these two comparably-sized state universities in Austin and College Station, Texas were selected. Those eligible for the study have predominantly sedentary jobs, office-based work.

UT Austin is located in Austin, Texas in the Central Texas region. College Station is approximately 100 miles east of Austin (218, 219). Both universities have a comparable student-body with the University of Texas reported enrollment in 2006 at 49,696 and Texas A&M reported enrollment in 2006 at 41,716 (218, 219). There are approximately 4,000 employees at UT Austin and 3,700 employees at Texas A&M University that are non-faculty, administrative-type or office-based jobs (220, 221).

The University of Texas at Austin is set near the Central Business District. Dense housing for students surrounds the campus. The campus itself is compact with the entire campus being within a 10-15 minute walk. The campus is on 850 total acres (222). The transit authority, Capital Metropolitan Transportation Authority, provides transit on and off campus and carries 140,000 passengers per day (223). The campus is just north of downtown businesses and the city atmosphere carries over into university life. West campus abuts a commercial corridor known as "The Drag" where clothing shops, restaurants, printing services, bookstores and other useful businesses are within walking distance for approximately 26 campus office buildings. On East campus, a smaller node of shopping and restaurants are within walking distance of the law school

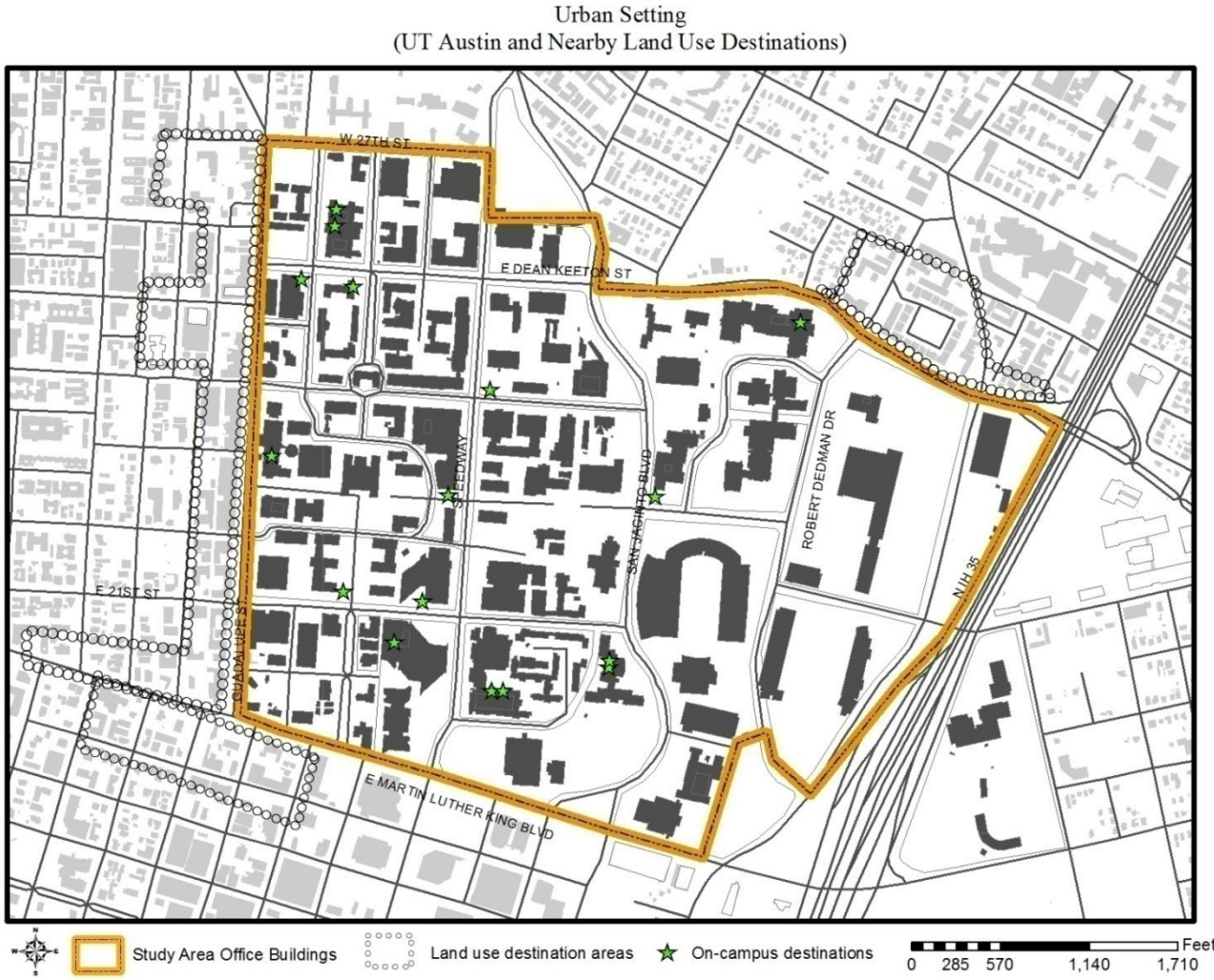

Figure 2 – Study Area Map1: Urban (The University of Texas at Austin)

and public policy school. Cafés, small cafeterias, and portable vendors are also scattered across the campus. Figure 2 shows where land use destinations are located near UT Austin office buildings. Internal campus sites are located within various campus buildings and were included in the analysis and maps for the intervention. For confidentiality purposes, participant locations are not included on the maps.

The Texas A&M campus is often considered the heart of the College Station, Texas because there is no other well-defined downtown or Central Business District for the city. The housing near the campus is spread out and is fairly low density. Commercial and residential buildings include large setbacks from the road and little pedestrian infrastructure beyond basic sidewalks are available. The topography is very flat and easy for walking purposes but land uses are spread out with wide roads and vast parking lots separating land uses. The entire campus is on 5,200 acres and is the land grant college for Texas (222). The university-operated transit services, Transportation Services, has a daily ridership of 28,440 passengers both on and off campus combined (224). Brazos Valley Transit provides some transit service in the Bryan-College Station area with an average daily ridership of 1,500 passengers per day (225). North campus abuts a commercial corridor known as Northgate that primarily has bars but slowly has been developing some restaurants, banking, and printing services. Northgate is in walking distance of approximately 18 campus office buildings. A small corridor of shops and restaurants also is along the south side of campus, however only four campus office buildings are within walking distance of the commercial area. West campus is located across railroad tracks and there are a few destinations and campus buildings,

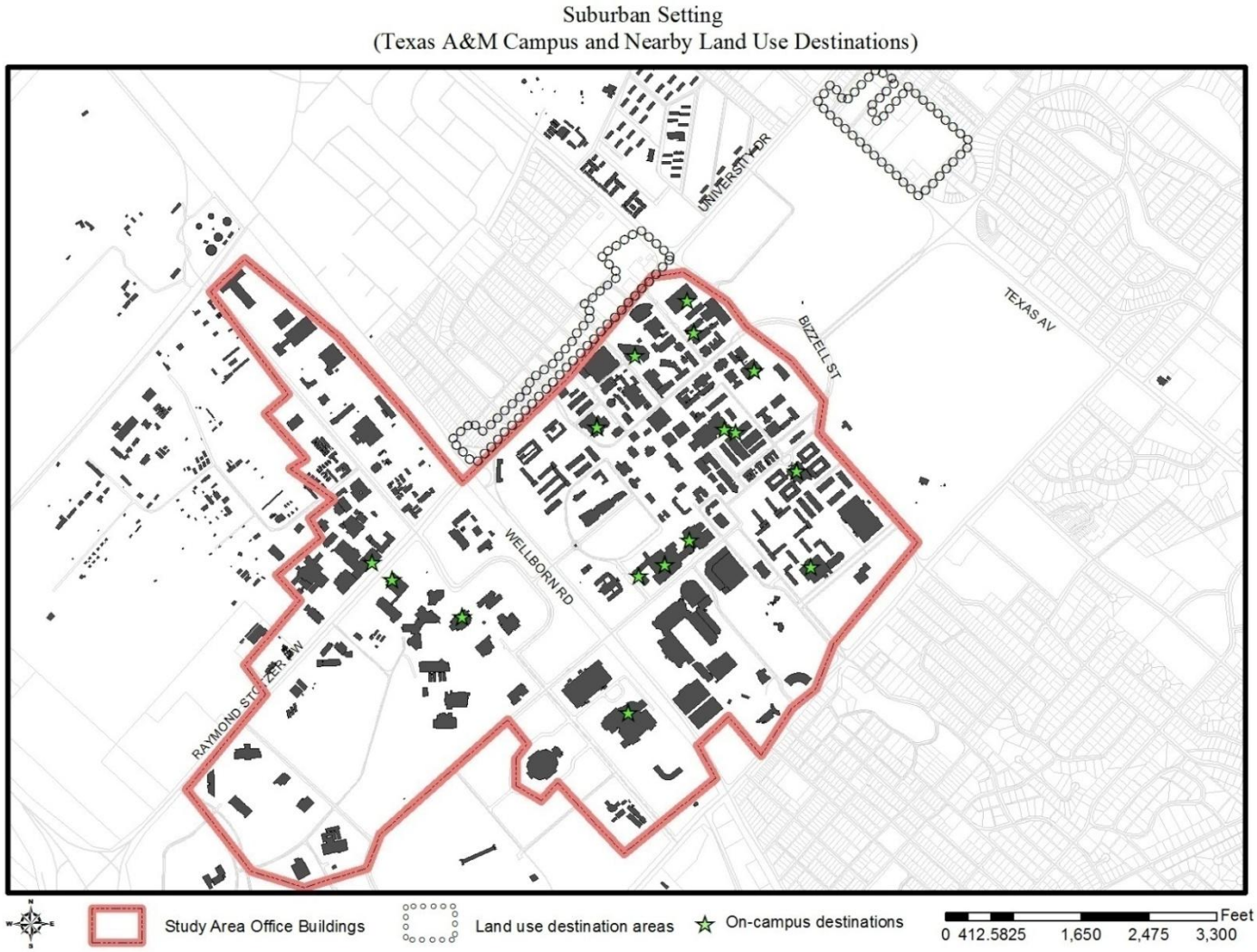

Figure 3 – Study Area Map 2: Suburban (Texas A&M University, College Station)

beyond the tracks, such as the recreation center and 2-3 coffee shops. East campus abuts a large golf course which provides a buffer to the main arterial of the city, Texas Ave. Along Texas Avenue is a commercial corridor of big-box retails, restaurants, offices and other retail. However, the distance from the office buildings includes walking an 18-hole golf course, across a four-lane arterial, and then through large parking lots which make this node of destinations unlikely for walking trips. Figure 3 is a map of land use destinations near Texas A&M. Similarly, internal destinations were included in analysis and used for the intervention.

3.2 Research Process

The primary focus of this study is on short trips or non-commute trips that office workers may need to do during their work day, such as pick-up dry cleaning, go out to lunch, go to the bank, have a meeting in a nearby office building, go out for coffee or other trips near their workplace. Potential walking trips will be defined as trips that could be made to desirable land uses within a distance of ¼ mile (3 miles/hr speed).

There were four steps to the process of this study. The first step involved a brief pilot study to test out the online survey, travel diary, pedometers and hold a focus group to discuss aspects useful for improvement for the actual study. The second step involved recruiting and collecting baseline surveys online. The third step was to track a sample of office workers' actual transportation trips for all modes of travel and use pedometers to track walking steps. The fourth step was data analysis and documentation of the results. Figure 4 illustrates the steps of the overall research process:

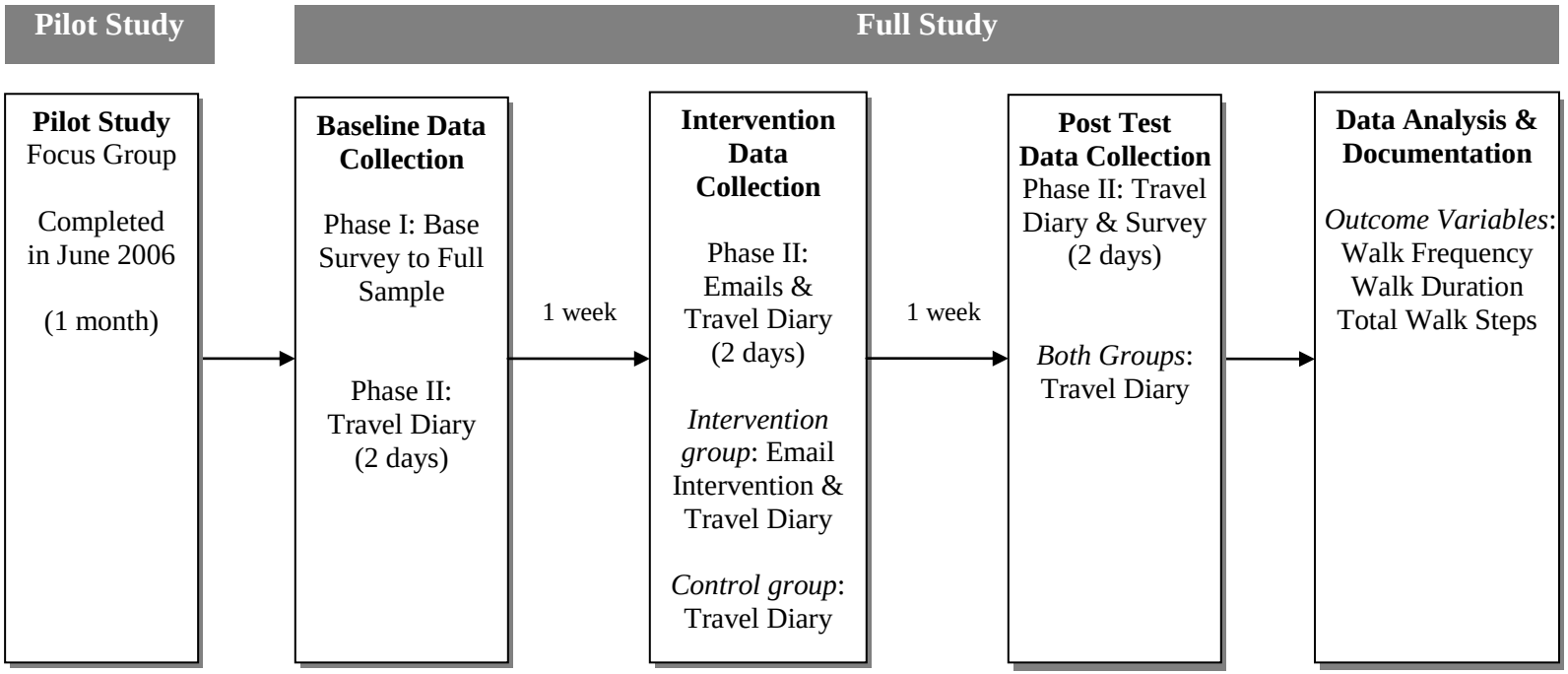

Figure 4 – Overview of Research Process

3.3 Pilot Study

A small pilot study was conducted in June 2006 to explore characteristics of walking behaviors for office workers as well as validate survey questions used in the travel diary for the study. Participants were asked to fill out their travel trips for one day only, including recording the number of steps taken that day using a pedometer. This was followed by a focus group to discuss with the participants the tools being used in this study (pedometer, online travel diary, survey questions) as well as general issues related to walking. This pilot study served to enhance the travel diary format, survey questions and identify issues related to walking for office workers. The key benefits of the pilot study were to eliminate some of the technical problems with the online survey and travel diary, assess the time required to fill out the survey and travel diary, and received some anecdotal information about perceived barriers to walking by office workers. In the latter point, the only new factor raised during the focus group in the pilot study was having the 'right' shoes for walking available, particularly for women, influenced their decision to walk to a destination. The implication was that professional shoes, such as heels, were not comfortable for walking during the work day.

Institute for Research Board (IRB) approved protocols the pilot study and the full study separately and both universities. A new protocol for the full study was submitted and approved for the full study at both Texas A&M University and UT Austin. The protocol included the steps of the overall research process illustrated in Figure 3. In Appendix A, the consent form used for the Full Study is included. The protocol allowed for the consent form/information form to be reviewed online and participant to mark a

box in the affirmative to indicate that the participant has been informed about the study and who to contact in the event of a problem.

3.4 Full Study

The full study involves two phases, the first being a baseline survey that was completed online and the second phase using an online travel diary and pedometer to record travel behavior and step count.

3.4.1 Sampling Design

This longitudinal study utilized a case-control design with participants in both urban (UT Austin) and suburban (Texas A&M) settings. Based on a overall population of office workers in both land use settings totaling less than 8,000 employees, a sample size of 98 per group (1 intervention group per land use setting and 1 control group per land use setting) for a total of 392 employees were targeted. This was based on a Florida study that suggests that a sampling design can be developed using a sample size based on a binomial distribution with a proportional odds of 50/50 being the most conservative (larger sample) (226). Using the approach of the Florida study, a similar general binomial distribution for a proportion of people the increased walking versus no increase in walking established the sample size. The statistician from this study recommended establishing a sample of 98 for each subgroup (intervention and control, for each land use setting) with an estimated precision level of ±10%, for a population of 8,000 for a binomial distribution (226). The intent of this sampling design was to have a sample that was satisfactory in size to detect if increased walking occurred and also stay within budget parameters. Phase I of the study involved completion of the base survey. Those

participants completing Phase I, were asked if they would be willing to participate in Phase II which involved completing the travel diary with a pedometer over the course of a month. For the sample design, the goal of approximately 400 participants in Phase II was broken into subgroups based on exposure and non-exposure to the intervention and the two land use settings: urban and suburban. Table 6 shows how each subgroup was designed to have 98 participants, equal proportions for each group, randomly selected from the pool of willing participants for Phase II.

Table 6 – Target Sample Size

Land Use Setting	Exposed to Intervention	Not Exposed to Intervention
Urban (UT Austin)	98 participants	98 participants
Suburban (Texas A&M University)	98 participants	98 participants
Total	196 participants	196 participants

Participants receiving the intervention were randomly selected. The researcher reviewed the distribution of participants by building to determine potential amount of exposure the control group may have to the intervention group based on the building locations of all participants. One building on each campus had some potential for cross-contamination with a few participants from both the intervention and control groups in the same building. Rather than sacrificing randomized selection method, participants were asked to refrain from discussing the intervention with others until the completion of the study to further assist in avoiding 'cross-contamination'. While this may not address

all concerns in the area, research outside of the laboratory does require some flexibility in order to observe real world conditions.

Initial eligibility for both phases required participants to be over 18 years of age, have access to a computer as part of their daily work, have access to email and the internet daily, spend most of their work day sitting to perform their work functions, non-faculty/non-student, and have no physical disabilities that prevent walking at least 10 minutes. Oversampling was performed to recruit the target sample size. Approximately 1,000 randomly selected employees at each university received an initial recruitment letter. The expected response rate based on the experience of the staff in Human Resources was estimated to be 20%. The sample frame was further defined by those who work in buildings that are no further than ½ mile to at least one destination such as restaurants, banks, post offices, coffee shops and other daily needs.

3.4.2 Recruitment

Based on discussions during pilot study, obtaining willing participants also requires employers that are interested in improving the health of their employees to allow or not be an obstacle for employees to participate in a research study during work hours. The first step in the data collection process was to approach the human resource departments for assistance in obtaining employee names, job titles, email addresses, and campus mail addressed. The respective Human Resource Departments assisted in identifying job classifications that were non-student, non-faculty and non-labor-intensive (e.g., custodial, physical plant). In Appendices B and C, a chart listing all the job titles that are categorized as Administrative, Non-Faculty and Non-Student is shown along

with additional exclusions for job titles deemed to be inappropriate for this study. The rationale for the exclusion of a particular job title is listed in the charts as well. Typical exclusions included job titles indicating higher physical activity levels (e.g., Assistant Coach), prevalent standing during the work day (e.g., Lab Technician), or worked off-campus. After establishing the desired job titles, staff from each of the respective Human Resources downloaded lists of employees with name, email address, job title, department and campus mailing address. Using SPSS, the researcher selected a random sample of 1000 employees from a total list of employees with the selected job titles provided by Texas A&M University. The staff from UT Austin Human Resource Department assembled the list of employees with the selected job titles and randomly selected 1,000 employees and provided that list for the study. With the compiled mailing lists, a few additional names were eliminated due to 1) office location being outside of the respective campuses or cities 2) no email address provided and no publicly accessible email available, 3) additional names identified as faculty or students were removed during this final stage of refinement of the lists. The total number of letter mailed for recruitment was 1953.

The recruitment letter (Appendix D) was sent on Texas A&M University letterhead, explaining the study, contact information, and letting the prospective participant know about a follow-up email that would be sent within one week of the letter. The letter and follow-up email asked if the respondent was interested in participating in the study and determining and contained a link to the online survey. The initial questions of the survey were to assess the eligibility and explain the study in

more detail. Those that were not eligible were informed they did not meet the study criteria and thanked for their willingness to participate. Emails with a link to the base survey were sent out via online survey software, Surveymonkey. Surveymonkey was selected for the ease of use and consistent policy of allowing individuals to opt out of receiving surveys altogether.

For those eligible for the study were then asked if they would be willing to complete the survey with a 20-30 minute time estimate for completion of this phase. They were allowed to select an option to fill in the survey later if desired. For those that did not want to participate in the study or the survey, they were asked if they would be willing to fill out a brief exit survey in order for some assessment of non-response bias, by comparing the profile of 'drop-outs' with that of the participants.

After the completion of the base survey, a description of Phase II was outlined for the participants to request their participation in the travel diary portion of the study. Phase II involved volunteers recording all transportation trips and walking steps for a total of 6 days over the course of a month. Two weekdays per week were selected for the data collection duration to manage the amount of data entry work but also to approach the recommendation of 3 days of data of transportation and physical activity behavior (227). The description of Phase II for recruitment stipulated that the participants would receive a pedometer and a $25 gift certificate for completing of this phase of the study.

In all correspondence, participants were informed that they may drop out for any reason and at any point during the study to comply with IRB protocol. A schedule of percentage of payment for partial completion of the study was outlined in the consent form.

3.4.3 Measurement

For this study four major tools were used to measure travel and physical activity behavior: 1) online baseline survey, 2) online travel diary, 3) pedometer, and 4) built environment audit. Variable names will be capitalized for the remainder of the dissertation for clarity. Appendix H has a full listing of all variables used within the study. The personal correlates used 40 variables including Age, Gender, Education, Income, Race/Ethnicity, BMI, General Perceived Health Status, and Car Ownership. Of those 40 variables for personal factors, 17 variables were assessing attitudes about walking, biking, transit, driving, and air quality concerns. Seven of the 40 variables were barriers and motivators to walking for the individual that included variables such as Lack of Time or Lack of Energy to Walk. The base survey was the primary instrument for obtaining the personal correlates. There are 10 variables used for assessing social and cultural aspects including social support variables such as Walk With (Alone, With Others) or No Dog to Walk With. Other social and cultural variables included Marital Status, Number of Children in Household, and Number of Adults in Household. The social and cultural variables were assessed through the base survey. There were six key variables for organizational correlates for walking in this study also collected as part of the base survey. These variables included Supervise (yes or no), Number of Employees

supervised, Longevity in Department, and Pay for Parking. There are 115 variables assessing correlations of walking with the built environment. These variables were assessed through the base survey, travel diary and field audits. Of the 115, 19 variables are barriers within the built environment such as No Crosswalks or Pedestrian Signals, Not Enough Lighting at Night, No Interesting Architecture or Landscape to Look At, and No Trees or Shade. There were 26 of the 115 built environment variables that assess the perception of the participant of various land uses within a 10 minute walking distance such as Farmer's Market, Convenience Store, Non-Fast or Fast Food Restaurants, Coffee Shops, Drug Stores, and Hair Salon/Barber Shop. Variables based on field work and using the GIS extension Walkable Bikeble Communities (WBC) analyst were created to assess objectively accessibility to destinations from office sites. The WBC analyst is a program developed by the University of Washington developed to work with ArcView GIS 3.2 (228). This program computes three categories of variables, Count, Proximity to Closest (Street Network) and Proximity to Closest (Airline). The Count variable identifies the total number of a particular land use within the user-defined buffer area. For this study a buffer of ¼ mile, the distance considered comfortable walking distance, was defined. This buffer was applied for each and every participant. The buffer for the Proximity variables was defined as 2 miles being the maximum search distance for each land use destination. Airline estimations of the closest land use is assuming essentially 'as the crow flies' distance. Airline variables may show some indication of a lack of street connectivity or scale as well as paths may be created through buildings or across properties instead of following the street network.

Network variables are following the formal street centerline to the closest land use destination. There are 52 variables created with the use of the WBC analyst which include variables that assess the distance or proximity of the closest land use to the participant as well as variables that count how many of particular land use is within ¼ mile.

3.4.3.1 Survey Development

The questions for the survey instrument were derived from Behavioral Risk Factor Surveillance System Survey, Walkable and Bikeable Communities (WBC) Survey, Neighborhood Environment Walkability Scale (NEWS) and Healthy Aging Network Environmental Audit Tool (49, 129, 229, 230). Questions selected were to address personal behavior regarding current physical activity, attitudes about transportation mode choices and air quality, perceptions about barriers and motivators to walking and understanding about access to land use destinations in the immediate area. The survey was tested during the pilot study and adjustments were made based on results of the survey and discussions during the focus group. Final survey instrument is included in Appendix E.

The dependent variables investigated in the base survey include number of walking trips per week (Walk Frequency) and minutes spent walking per week (Walk Duration). Independent variables followed the conceptual framework and are listed in Table 7. Variables assessing barriers and motivators to walking were also re-assessed in Phase II through the travel diary for all trips recorded.

3.4.3.2 Travel Diary Development

The travel diary included departure time and arrival time, trip mode choice, and trip purpose for each trip (231). Added to the standard travel diary was a step count (pedometer) recording and perception questions on the barriers and motivators to walking for each trip. Appendix F contains a copy of the questions in online travel diary. The travel diary was tested during the pilot testing and adjusted primarily in format for ease of use online.

The pedometer step count, recorded in the travel diary, was the measurement tool for the dependent variable Total Step Count. Additional step count readings were recorded before lunch (AM Step Count) and after lunch (PM Step Count) in order to know what time of day most walking occurred.

A guidebook was mailed to each of the participants in Phase II. The guidebook provided images and instructions on where to wear the pedometers and also included instruction on how to record data in the travel diary. The guidebook also served as a back-up travel diary for those that did not feel comfortable recording their travel data online or needed to keep notes during the day. Approximately 10 participants mailed in the travel diary hardcopy component of the guidebook instead of recording online. This data was hand-entered by the researcher.

3.4.3.3 Pedometer

The pedometer used for this study was the Walk4Life (W4L) Classic. It was selected for its size, cost, and relative accuracy and validity for the price (232). Each participant was allowed to keep the pedometer at the close of the study. Approximately

3.5% of the participants required a replacement pedometer due to inaccurate readings. At the conclusion of the study, a few questions were asked as a qualitative assessment of the pedometer used in the study. A few participants indicated they had some difficulties with pedometers in terms of proper placement, inconsistent readings, or forgetting the pedometer at home on a testing day. More expensive pedometers or accelerometers may have been able to address some of these issues; however, the data for the study appears to be consistent and accurate as an objective measure for walking behavior during the study.

3.4.3.4 GIS / Built Environment Audit

The built environment was measured using existing Geographic Information Systems (GIS) with existing data layers as well as field audit data. The existing layers were obtained from the City of College Station and Texas A&M University for the suburban setting and the City of Austin for the urban setting and included existing land use, zoning, streets, sidewalks, trees, shrubs, buildings, contours, and water features. The field audit refined the existing land use data by recording on paper maps the name of the businesses along the surrounding corridors near office buildings, locating shade and trees cover, identifying temporary obstacles (newspapers stands, poles, etc), mapping the continuity of sidewalk/pedestrian paths, and noting on-campus destinations such as small coffee shops that may not be within the land use database at the local jurisdiction level. This data were then coded with three letter codes for use in the WBC analyst which then creates variables for each participant including the number of

particular land uses within ¼ mile walking distance as well as the distance in feet to the closest land use of a particular category.

Additionally, qualitative analysis of key walking corridors to major destination areas was observed in both environments. Observations included watching pedestrian flow, types of people (visually estimated: student, non-student, faculty), noting footwear (e.g. businesswomen wearing athletic tennis shoes and walking) and taking photos. Observations also noted cluster areas where individuals would briefly talk with others before continuing to their destinations. These observations occurred several months prior to the study as part of the field audit and were done during peak activity times midday.

Potential confounding variables for the study could include walking "clubs" or groups that may influence individuals to walk more independent of this study, or exceptionally active office workers that are selected and participate in the study and thus influence the results. There were two clearly identifiable participants that walked far above typical walk patterns (one walking for commuting purposes over 5 miles one-way) and they were excluded from the results as outliers.

3.4.3.5 Statistical Procedures

For this study, there were three primary outcome variables: walk trips per week (Walk Frequency), duration in minutes spent walking per week (Walk Duration) and total step count/day (Total Step Count). The initial step in the preparation for analysis was to examine the distributions for all the variables. Frequencies were run in SPSS for all variables and each variable was re-categorized or dichotomized based on the

distribution of the data. Outliers were reviewed for data entry errors and where appropriate, edited based on rechecking online survey or diary. Three participants in the suburban data had Total Step Counts that were likely to be data errors. In all three cases the problematic data were for travel diary days after the baseline week. One participant reported over 10,000 steps during the lunch hour which seemed unlikely and not representative of other days in the travel diary. The other two may have had pedometer issues with readings over 30,000 steps which were also inconsistent with other day readings. These three participants were removed only from analysis related to change in step count from the intervention. The data for these participants could be used for the Total Step Count model that only utilized the baseline week step count.

Both Walk Frequency and Walk Duration variables required re-categorization to improve the distributions of the data needed for multivariate statistical modeling. For walk trips, the two land use settings had slightly different categories that were necessary to address their distinctively different distribution problems. The suburban office workers categories for Walk Frequency are: 0 walk trips, 1-2 walk trips, 3-5 walk trips, and 6+ walk trips. The urban office workers categories are: 0-2 walk trips, 3-6 walk trips, and 7+ walk trips. The re-categorization for Walk Duration for the two land use settings were comparable with a separate category for 0 minutes walking per week followed by thirty minute intervals up to 150 minutes per week. The statistical methods appropriate for this type of categorical outcome variable are ordinal logistic or multinomial logistic regression. Total Step Count is a continuous variable, and is normally distributed; therefore, linear regression model estimation was used.

Before running the multivariate statistical analyses, bivariate analyses were performed using the crosstabs procedure with SPSS. Pearson's Chi-Square, Phi and Cramer's and Kendall tau tests were run between the independent variables and their respective outcome variables, Walk Frequency and Walk Duration. Independent variables with significant bivariate associations with the outcome variables were identified for use in the regression analysis along with key theoretically significant variables of Age, Gender, Education and Income, which were included regardless of statistical significance to control for these influences within the models.

The modeling process undertaken for the data analysis was based on the conceptual framework where personal, social and cultural, organizational, and built environment variables were anticipated to influence walking behavior based on the literature. The survey and travel diary instruments provided multiple methods or questions that assessed aspects of each of the elements of the conceptual framework. For example, assessing social support as component of social and cultural factors, included questions about if the participant typically: 1) walks with others or alone, 2) often has someone to exercise with during the week, 3) perceives a barrier to walking being having no one (person or dog) to walk with or 4) is motivated to walk because they have a companion. Another example of multiple methods of assessment would be related to the built environment. There are a variety of aspects shown in the literature that can influence walking such as pedestrian-supportive infrastructure (trees or shade, continuous sidewalks, benches, lighting, etc), land use density, and available land use destinations within walking distance. Questions were asked as well as field audits

performed to assess how these built environment elements acted as barriers or motivators to walking. Accessibility to land use destinations was also an important portion of this element of the conceptual framework. This included perceived access to nearby land uses as well as objective distance assessments.

After creating the base model with the relevant personal correlates, variables were tested within the models based on their role within the conceptual framework and indications of correlation with walking behavior from the bivariate analysis. Within the modeling process, variables were kept or removed based on the statistical significance within the model balanced by relevance to the conceptual framework. A test of the interaction between possibly correlated independent variables was performed to determine logical usage of particular variables and only one variable was selected when two are strongly correlated. Final models, with associated descriptive statistics, were outputted and are discussed in the results section.

Regression analysis procedures were dictated by the distribution of the outcome variables and adding the potentially significant variables from the bivariate analysis. Both Walk Frequency and Walk Duration outcome variables were tested under ordinal logistic regression. However, for Walk Frequency, the null hypothesis of parallel lines was rejected and therefore multinomial regression was applied. Walk Duration was estimated using ordinal logistic regression because the parallel slope assumption was not rejected. Total Step Count was estimated using standard multivariate linear regression. Initially, step-wise method in SPSS was used to identify potentially significant variables to the model.

Models were tested with pooled data with a dummy variable for urban versus suburban land use setting. However, models from the pooled data showed two separate linear residual patterns. This generally suggested that a good model fit with the urban and suburban participant data pooled was unlikely. This may be explained by the differences in behavioral characteristics of urban and suburban office workers. Therefore, the decision was made to models for each of the outcome variables were developed for the urban and suburban participants separately.

4. RESULTS

4.1 Response Rate

The response rate was calculated using the American Association of Public Opinion Research Outcome Rate Calculator using the method that counts partial responses in the calculations (233). The response rate for this study was calculated to be 34.9% using this calculator, which has accounts for non-responses, refusals, and ineligible participants.

The total number of letters mailed was 1953. Respondents that were ineligible due to physical disability, additional faculty or student employees not filtered prior to mailing out letters, or nature of their work was 'mostly walking' or heavy labor were excluded from the study and totaled 94. This reduces the pool of possible participants to 1859. There were 168 partially completed surveys and 507 fully completed surveys. A mini-exit survey was provided to those that did not wish to participate. There were 65 respondents that were willing to fill out the exit survey.

For Phase II, 540 participants who completed the base survey indicated willingness to participate in the travel diary portion of the study. Due to the intensive nature of recording every trip for a total of six days, a high dropout rate was expected. Total completion of all six days with usable data was 320. The goal to maintain at least 100 participants from each land use setting through Phase II was still achieved.

4.2 Hypothesis 1

Hypothesis 1: Land use destinations and pedestrian supportive infrastructure near the worksite are positively associated with daily walking behavior (walk trips, walk duration, step count) for office workers. The null hypothesis that land use destinations and pedestrian supportive infrastructure have no effect on walking behavior for office workers is rejected based on the findings from this study that indicate land use setting (urban versus suburban) and land use destinations (e.g. proximity of bookstores, coffee shops or food establishments) can positively increase walking behavior for office workers and were significant correlates for walking.

The summary findings for Hypothesis 1 include:

- Urban and suburban office workers reported similar number of walk trips in the travel diaries per day (Urban: Mean=2.17, Suburban: Mean=2.12).

- Urban office workers are more likely to have 3 or more walk trips per day than suburban office workers from the base survey (Urban 3-7+walk trips/day=69.7%, Suburban 3-6+walk trips/day=56.8%).

- Associations between walking frequency and the following variables: moderate-level activity performed in last 7 days, vigorous-level activity performed in last 7 days, attitudes about transportation mode choice, and social support were significant for both land use settings (bivariate).

- More variables for built environment and land uses had significant correlations with walking frequency for urban office workers than for the suburban office workers (bivariate).

- Associations between walk duration per week and the following independent variables: knowledge of how to get to destination on foot, safe places to walk nearby, and social support were significant for both land use settings. (bivariate)

- Suburban office workers are more likely than urban office workers to have at least 1 dog in their household (Suburban=146, Urban=98, Pearson Chi-Square=.001, $p<.001$).

- Suburban office workers are more likely than urban office workers to have 3 or more cars (Suburban=52, Urban=30, Pearson Chi-Square=.002, $p<.05$).

- Suburban office workers eat out more times a week than urban office workers (Pearson Chi-Square=.000, $p<.001$).

- Urban office workers consider air pollution a serious problem for the city as compared with suburban office workers(Urban: Strongly Agree=78, Agree=106, Suburban: Strongly Agree=19, Agree=39; Pearson Chi-Square=.000, $p<.001$).

- Urban office workers feel more strongly than suburban office workers that there are many destinations near the worksite to satisfy their daily needs (Urban:

Strongly Agree=54, Agree=86, Suburban: Strongly Agree=30, Agree=65; Pearson Chi-Square=.000, p<.001).

- Multivariate analysis estimating walking frequency for urban office workers found the following variables to be significant included independent variables: Age, Gender, General Health Status, Education, Income, Transportation Mode Choice, and Proximity to Closest Bookstore (Nagelkerke Pseudo R-Square=.342) (multinomial logistic).

- Logistic regression for suburban office workers and walking frequency included the following significant independent variables: Age, Gender, Education, Income, Minutes spent in moderate level activity/week, Social Support, Barrier: No Safe Places to Walk, Park (within walking distance), Proximity to Closest Bookstore, and Proximity to Closest Coffee shop (Nagelkerke Pseudo R-Square=.485) (multinomial logistic).

- Logistic regression for urban workers and walking duration per week included the following significant variables: Age, Education, Income, Gender, Vigorous-level Activity Performed in last 7 Days, Number of Banks within ¼ mile, and Number of Food Establishments within ¼ mile (Nagelkerke Pseudo R-Square=.229) (ordinal logistic).

- Logistic regression for suburban workers and walking duration per week included the following variables: Age, Education, Income, Gender, Social

Support, Barrier: Crosswalks too Short of Signals, Barrier: No Interesting Architecture to Look At, Barrier: No Interesting Places to Walk to, Proximity of Closest Convenience Store, Proximity of Closest Food Establishment (Nagelkerke Pseudo R-Square=.223) (ordinal logistic).

- Model estimation for urban office workers for total step count/day identified the following significant variables: Age, Education, Gender, BMI, Number of Adults in Household, Hours of TV/week, Attitude about Air Quality, Barrier: Distances to Locations too Great, Proximity to Closest Dry Cleaners, Proximity to Closest Convenience Store (R^2=.576) (linear regression).

- Model estimation for suburban office workers for total step count/day included Age, Education, Gender, BMI, Number of Cars in Household, Barrier: Lack of energy, Number of Coffee shops within ¼ mile Store (R^2=.252) (linear regression).

4.2.1 Descriptive Statistics

For the personal correlates, the study group was fairly well educated with most participants having had some amount of college education. The Age distribution seemed to provide fair representation of all age ranges. While the sample has more females than males, the distribution for Gender seemed more balanced that expected with approximately 27% males and 73% females in both land use settings (urban: males=27.5% female=72.5%, suburban: male=26.9% female=73.1%). However, due to the insufficient amount of males in the sample may be a contributing reason for the lack

of statistical significance this variable plays in models discussed later in this section. The sample from both land use settings has comparable percentages for Education, Race, Income and Health Status. The suburban sample has slightly elevated BMI values compared to urban participants. Table 7 illustrates some of the personal variables descriptive statistics for the sample.

Table 7– Descriptive Statistics – Personal Variables

		Urban		Suburban	
Personal Variables		Count	%	Count	%
Age	18-24	6	2.8	11	4.2
	25-34	60	28.4	47	17.8
	35-44	55	26.1	72	27.3
	45-54	55	26.1	86	32.6
	Over 55	33	15.6	43	16.3
Gender	Male	58	27.5	71	26.9
	Female	153	72.5	193	73.1
Education	Grade 12 or GED	7	3.3	28	10.6
	College 1-3 years	35	16.6	62	23.5
	College 4 years or more	84	39.8	90	34.1
	Graduate School or more	83	39.3	77	29.2
Income	$25,000-34,999	25	11.8	28	10.6
	35,000-49,999	41	19.4	35	13.3
	50,000- 74,999	48	22.7	64	24.2
	75,000-99,999	33	15.6	40	15.2
	100,000-149,999	29	13.7	43	16.3
	Over 150,000	19	9	17	6.4
Race/ Ethnicity	Non-White	42	19.9	51	19.3
	White, non-Hispanic	162	76.8	204	77.3
BMI	Normal / Underweight (BMI <25)	82	38.9	83	31.4
	Overweight (BMI =25-30)	72	34.1	83	31.4
	Obese (BMI>30)	53	25.1	81	30.7
General Health Status	Excellent	27	12.8	33	12.5
	Very Good	81	38.4	93	35.2
	Good	77	36.5	105	39.8
	Fair or Poor	24	11.4	26	9.8

Table 7– (Continued)

	Urban				Suburban			
	Mean	S.D.	Min.	Max.	Mean	S.D.	Min.	Max.
Hours spent watching TV, using computer, reading	33.99	21.78	0	84	37.21	21.75	3	84

In Table 8, the social and cultural variables are shown. The descriptive statistics for the social and cultural variables seem to indicate the urban participants are less likely to be married, live with someone, or have children as compared with the suburban participants. Suburban participants, as might be expected, own more cars with 68% owning 2+ cars versus 57.3% of urban participants. Social support or participation in physical activity or walking with others seemed to play a role in both settings. The suburban participants reported watching television, working on a computer or sitting-based activity an additional 3 hours/week than the urban participants.

Table 8 – Descriptive Statistics – Social and Cultural Variables

		Urban		Suburban	
Social and Cultural Variables		Count	%	Count	%
Number of Children in Household	No children	144	68.2	159	60.2
	1 or more children	62	29.4	98	60.2
Number of Adults in Household	1 adult	57	26.5	56	37.1
	2 adults	132	62.6	172	21.2
	3 or more adults	20	9.5	31	65.2
Marital Status	Not living with someone	76	36.0	78	11.7
	Living with someone	133	63.0	181	29.5
Car Ownership	0 cars	5	2.4	0	68.6
	1 car	81	38.4	78	29.5
	2 cars	96	45.5	129	48.9
	3 or more cars	25	11.8	52	19.7

Table 8 –(Continued)

		Urban		Suburban	
		Count	%	Count	%
Dog Ownership	No dogs	110	52.1	102	38.6
	1 or more dogs	87	41.2	146	55.3
Walk With	Alone	142	67.3	137	51.9
	With others (friends, family, etc)	62	29.4	109	41.3
Exercise with Others	No	139	65.9	172	65.2
	Yes	67	31.8	90	34.1
Someone to Walk with	Not Selected	101	47.9	114	43.2
	Selected	110	52.1	150	56.8
Barriers					
No One to Walk with Me	Not Selected	186	88.2	228	86.4
	Selected	25	11.8	36	13.6
No Dog to Walk with Me	Not Selected	201	95.3	255	96.6
	Selected	10	4.7	9	3.4
Childcare Responsibility	Not Selected	185	87.7	223	84.5
	Selected	26	12.3	41	15.5

Organizational variables descriptive statistics from the sample show the suburban group having more supervisors as compared with the urban group. A majority of the participants in both settings are required to pay for parking however, 12.3% of the urban participants did not have to pay for parking as compared with 7.2% of the suburban group. The mean cost for parking was similar for both groups with the suburban average being $310/year and the urban being $304/year. Longevity within the organization for employees in the urban setting averaged in the 3-5 year category while the suburban employees averaged within the 6-10 year category. For those participants that did

supervise others, the urban group supervised more subordinates than the suburban counterparts (Urban: Mean=3.94 SD=3.43 Suburban: Mean 1.71, SD=2.76) (Table 9).

Table 9 – Descriptive Statistics – Organizational Variables

		Urban		Suburban	
Organizational Variables		Count	%	Count	%
Supervise	No	125	59.2	133	50.4
	Yes	85	40.3	125	47.3
Pay for Parking	No	26	12.3	19	7.2
	Yes	144	68.2	216	81.8

	Urban				Suburban			
	Mean	S.D.	Min.	Max.	Mean	S.D.	Min.	Max.
Cost of parking	304.20	195.88	0.00	1,540	310.65	106.30	85.00	600.00
Longevity in Department (1-2 years, 3-5 years, 6-10 years, 10+ years)	2.31	1.17	1.00	4.00	2.71	1.04	1.00	4.00
Longevity in Organization (1-2 years, 3-5 years, 6-10 years, 10+ years)	2.78	1.15	1.00	4.00	3.13	1.02	1.00	4.00
Number of employees (1-2, 3-5, 6-10, 10+.)	3.94	3.43	1.00	10.00	1.71	2.76	0.00	10.00

From the base survey, urban participants also spent more time per week walking than the suburban participants (Urban: Mean=12.38, SD=3.85; Suburban: Mean=11.212, SD=5.0565) (Table 10). The means for total step count for both settings were comparable (Urban: Mean=4,932 steps, SD=2,494 Suburban: Mean=4,348 steps, SD=2,398).

Table 10 – Descriptive Statistics – Dependent Variables

	Urban				Suburban			
	Mean	S.D.	Min.	Max.	Mean	S.D.	Min.	Max.
Travel Survey Walk Duration (average Day1 & 2)	13.91	16.84	.20	116.96	14.77	20.16	0.00	108.33
Trip Duration (average Day1 & 2)	6.047	6.43	0.00	53.57	7.17	10.01	0.00	68.13
Total Step Count (per day)	4,932	2,494	214	12,314	4,348	2,398	117	11,319
Baseline Survey Walk Duration	12.38	3.85	0.0	16.00	11.21	5.06	0.00	16.00

	Urban			Suburban		
		Count	%		Count	%
Walk Frequency	0-2 trips/week	64	30.3	0 trips/week	44	16.7
	3-6 trips/week	88	41.7	1-2 trips/week	70	26.5
	7+ trips/week	59	28.0	3-5 trips/week	83	31.4
				6+ trips/week	67	25.4

Comparing the sample settings for the variables related to transportation mode choice and usage is also interesting (Table 11). According to the travel diary, both settings yield similar average walk trips/day (urban: 2.17 walk trips/day, suburban: 2.12 walk trips/day). However, in the base survey the walking frequency was reported with urban participants more likely to have high frequency of walk trips (high frequency walk trips: urban = 69.7%, suburban=56.8%). The urban sample reported higher biking, transit usage and drove their cars for fewer trips compared with the suburban participants.

Table 11– Descriptive Statistics – Transportation Variables

Travel Diary Data	Urban				Suburban			
	Mean	S.D.	Min.	Max.	Mean	S.D.	Min.	Max.
Total Walk Trips	2.18	2.12	0.00	9.00	2.13	2.18	0.00	9.50
Total Bike Trips	1.74	1.52	0.00	7.00	.048	.310	0.00	9.50
Total Car Trips	12.38	3.85	0.00	3.00	2.49	1.83	0.00	16.0
Total Transit Trips	13.91	16.84	.200	116.96	.019	.213	0.00	108.33

4.2.2 Non-Response Bias

To compare those not wishing to participate in the study with those completing the full survey, respondents were asked if they would be willing to complete a shorter version of the survey to identify any possible trends between those participating and those not participating. There were 65 respondents completed the mini-survey with two surveys having missing data. The respondents to the mini-survey had more men than women as compared with the sample population. Similar percentages of men and women completed the mini-survey in the suburban setting. The respondents were comparable in education levels, income levels and supervisory status with the study sample. Car ownership was also very similar with urban respondents owning fewer cars than suburban respondents. There were more suburban respondents to the mini-survey (35 respondents) than there were urban respondents (28 respondents). Self-reported frequency was very similar between the refusal group and the study group and raised no flags on a bias for different walking trends. No substantial bias was identified in the refusal group compared with the study group's descriptive statistics.

4.2.3 Bivariate Analysis

The list of significant variables from the bivariate analysis comparing each individual independent variable with Walk Frequency is contained in Table 12. These variables were evaluated for significance within a multinomial logistic model discussed later in this results section.

For the urban office workers, bivariate correlations between Walk Frequency and 19 personal correlates were significant and included variables such as Education, Vigorous-level Activity within Last 7 Days, and attitudes about transportation mode choice. The personal correlates that have significant bivariate correlations with Walk Frequency for the suburban office workers included 12 variables such as Age, BMI, and time spent walking for recreation.

For bivariate correlations between Walk Frequency and social and cultural variables, urban office workers had 3 significant variables and suburban office workers had 5 significant variables. Both sets of office workers had significant correlations with social support variables such as Exercise with Others.

There are 29 variables with significant bivariate correlations between built environment variables and Walk Frequency for urban office workers. There are 11 significant built environment variables that are significant for the suburban office workers. Very few built environment variables were significant for both groups of office workers. Proximity to Closest Banks, Proximity to Closest Coffee Shops, and Proximity to Other Offices were the significant built environment variables for both office worker groups.

A t-test was performed between the Walk Duration variable and Urban versus Suburban land use settings. Equal variances were assumed ($F=11.741$, $p<.001$) and a significant difference between the two means was significant (Urban Mean Walk Duration= 12.38 (12=31-60 minutes/day), Suburban Mean Walk Duration=11.21 (11=1-30 minutes/day), $p<.05$).

Table 12 - Bivariate Correlations between Walk Frequency and Independent Variables

	Urban		Suburban	
Personal Correlates				
Age	Not Sig.		0.053	*
Education	0.013	**	Not Sig.	
Income	Not Sig.		0.049	**
BMI	0.011	**	Not Sig.	
General Health Status	Not Sig.		0.068	*
Exercise Equipment	Not Sig.		0.035	**
Moderate-level Activity within last 7 Days	0.032	**	0.016	**
Vigorous-level Activity within last 7 Days	0.000	***	0.008	**
Walk Speed	0.025	**	Not Sig.	
Times Bought Groceries/Week	0.088	*	Not Sig.	
Servings of Vegetables/Week	0.008	*	Not Sig.	
Total Minutes Spent Walking for Recreation/Week	0.000	***	0.000	***
Total Minutes Spent Walking for Transportation/Week	0.000	***	0.000	***
Total Duration Spent doing Vigorous Activity	0.002	**	Not Sig.	
Total Duration Spent doing Moderate Activity	0.059	*	0.003	**
Barrier: Lack of Energy or Lazy	0.001	***	Not Sig.	
Lack of Knowledge about Benefit of Walking and/or Physical Activity	Not Sig.		0.057	*
Walking is a Good Way of Getting Physical Activity	0.042	**	Not Sig.	
Public Transit is for Those Who do not Own a Car	0.016	**	0.094	*
Walking is for Recreation Purposes, rather than Transportation	0.088	*	Not Sig.	
Biking is for Recreation Purposes, rather than Transportation	0.000	***	Not Sig.	
Public Transportation is Necessary to Worksite.	0.003	**	Not Sig.	
Increasing Physical Activity during the Day is Important to Me.	0.084	*	Not Sig.	
***p<.001, **p<.05, *p<.10; Pearson Chi-Square				

Table 12 – (Continued)

	Urban		Suburban	
People Drive too Fast in the Vicinity near my Office.	0.103	*	Not Sig.	
Physical Activities are Important for Me to Keep Healthy.	Not Sig.		0.007	**
Social and Cultural Correlates				
Number of Children	Not Sig.		0.009	**
Marital Status	Not Sig.		0.015	**
Walk with	0.013	**	Not Sig.	
Exercise with Others	0.076	*	0.006	**
Barrier: No One to Walk with Me	0.002	**	0.104	*
Childcare Responsibility	Not Sig.		0.004	**
Built Environment Correlates				
Barrier: Crosswalk Signals are too Short	Not Sig.		0.064	*
Barrier: No Safe Places to Walk Nearby	Not Sig.		0.024	**
Barrier: No Interesting Architecture or Landscape to Look at	Not Sig.		0.06	*
Bank / Credit Union (within walking distance of 10 min or less)	Not Sig.		0.088	*
Convenience Store (within walking distance of 10 min or less)	0.036	**	Not Sig.	
Fast food restaurant (within walking distance of 10 min or less)	0.035	**	Not Sig.	
Park (within walking distance of 10 min or less)	Not Sig.		0.07	*
Pub or Bar(within walking distance of 10 min or less)	0.095	*	Not Sig.	
Gym / Health Club (within walking distance of 10 min or less)	0.056	*	Not Sig.	
Other Offices near Campus (within walking distance of 10 min or less)	0.093	*	Not Sig.	
Distance from Parking to Office Entrance	0.001	***	Not Sig.	
Close to Family	0.018	**	Not Sig.	
Good School	Not Sig.		0.105	*
Close to School	Not Sig.		0.022	**
Close to Work	Not Sig.		0.101	*

***p<.001, **p<.05, *p<.10; Pearson Chi-Square

Table 12 - (Continued)

	Urban		Suburban	
Count to Airline Convenience Store	0.105	*	Not Sig.	
Count Network Banks	0.052	*	Not Sig.	
Count Network Café	0.056	*	Not Sig.	
Count Network Dry Cleaners	0.058	*	Not Sig.	
Proximity to Closest Banks (Airline)	0.018	**	Kendall tau-b= 0.073	*
Proximity to Closest Bookstores (Airline)	0.108	*	Not Sig.	
Proximity to Closest Café (Airline)	0.045	**	Kendall tau-b= 0.01	**
Proximity to Closest Clothing Store (Airline)	0.031	*	Not Sig.	
Proximity to Closest Convenience Store (Airline)	0.007	**	Not Sig.	
Proximity to Closest Dry Cleaners (Airline)	0.008	**	Not Sig.	
Proximity to Closest Hair salon/Barbershop (Airline)	0.023	**	Not Sig.	
Proximity to Closest Office (Airline)	0.028	**	0.107	*
Proximity to Closest Pharmacy / Drugstore (Airline)	0.096	*	Not Sig.	
Proximity to Closest Banks (Network)	0.058	*	Not Sig.	
Proximity to Closest Café (Network)	0.057	*	Not Sig.	
Proximity to Closest Religious Institution (Network)	0.017	**	Not Sig.	
Proximity to Closest Convenience Stores (Network)	0.007	**	Not Sig.	
Proximity to Closest Dry Cleaners (Network)	0.049	**	Not Sig.	
Proximity to Closest Food Establishments (Network)	0.048	**	Not Sig.	
Proximity to Closest Hair salon/Barbershop (Network)	0.027	**	Not Sig.	
Proximity to Closest Pharmacy/Drugstore (Network)	0.053	**	Not Sig.	
Proximity to Closest Phone/Cell Phone (Network)	0.018	**	Not Sig.	

***p<.001, **p<.05, *p<.10; Pearson Chi-Square

In Table 13, the bivariate significant correlations between the independent variables and Walk Duration are noted. There are 19 personal correlates that were significant with Walk Duration for urban office workers and 10 personal correlates for the suburban office workers. Education, Moderate and Vigorous-level Activity within

the last 7 Days, attitudes about safety of areas near worksite had significant bivariate correlations for both office worker groups.

The significant social and cultural correlate with Walk Duration for both office workers included the social support variable Exercise with Others. Only one organizational correlate was significant, and only for the suburban office workers, which is the Cost of Parking.

Bivariate correlations with the built environment and Walk Duration included 14 variables for urban office workers and 12 variables for suburban office workers. Several Barriers to Walking were significant with Walk Duration such as Distances to Places are too Great, No Trees or Shade, No Benches and Other Places to Rest, Lack of Energy or Lazy, No Safe Places to Walk for urban office workers. Number of banks, coffee shops, convenience stores, other office sites, and food establishments were significant for suburban office workers.

These significant variables from this bivariate analysis were tested in an ordinal logistic model and are discussed later in this section.

Table 13 - Bivariate Correlations between Walk Duration and Independent Variables

	Urban		Suburban	
Personal Correlates				
Age	Not Sig.		Kendall tau-b= .033	**
Education	Kendall tau-b= .024	**	0.039	**
Income	Not Sig.		Kendall tau-b= .010	
Walk Speed	Not Sig.		0.109	*
Vigorous-level Activity within last 7 Days	0.006	**	Not Sig.	
Number of Cars in the Household	Kendall tau-b= .069	**	Not Sig.	
Meals Away from Home	Kendall tau-b= .032	**	Not Sig.	
Times Bought Groceries/Week	0.086	*	Not Sig.	
Total Minutes spent Walking for Recreation/Week	0.000	***	Not Sig.	
Total Minutes spent Walking for Transportation/Week	0.032	**	Not Sig.	
Total Duration spent doing Vigorous Activity	0.064	*	Kendall tau-b= .000	***
Total Dduration spent doing Moderate Activity	0.089	*	Kendall tau-b= .005	**
Walking is a Good Way of Getting Physical Activity	0.104	*	Not Sig.	
Driving is Expensive.	Not Sig.		0.109	*
Biking is a Good Way of Getting Physical Activity.	Not Sig.		0.09	*
Biking is for Recreation Purposes, Rather than Transportation	0.045	**	Not Sig.	
Public Transportation is Necessary to Worksite.	0.002	**	Not Sig.	
Increasing Physical Activity during the day is Important to Me.	0.003	**	Not Sig.	
People Drive too Fast in the Vicinity near my Office.	Not Sig.		0.013	**
Physical Activities are Important for me to Keep Healthy.	0.058	*	Not Sig.	
Air Pollution is a Serious Problem for our City.	0.020	**	Not Sig.	
Walking will Help to Reduce Air Pollution for our City.	0.063	*	Not Sig.	
If I Knew How to Get a Destination By Walking I Am More Likely to Walk to it.	0.034	**	0.084	*
I Feel Safe Walking to Locations Near My Office.	0.018	**	0.014	**
Times/Week Bike for Commute	0.063	*	Not Sig.	

***p<.001, **p<.05, *p<.10; Pearson Chi-Square

Table 13 - (Continued)

	Urban		Suburban	
Social and Cultural Correlates				
Exercise with Others	0.006	**	0.002	**
Drug-related Activity in the areas Where I Would Walk	0.082	*	Not Sig.	
Childcare Responsibility	0.080	*	Not Sig.	
Organizational Correlates				
Cost of Parking	Not Sig.		0.046	**
Built Environment				
Distances to Places are too Great	0.002	**	Not Sig.	
No Trees or Shade	0.041	**	Not Sig.	
No Benches and Other Places to Rest	0.068	*	Not Sig.	
Lack of Energy or Lazy	0.060	*	Not Sig.	
No Safe Places to Walk	0.027	**	0.054	*
Fear of Being Robbed or Attacked	Not Sig.		0.019	**
Distance from Parking to Office Entrance	Not Sig.		Not Sig.	
Close to Family	0.002	**	Not Sig.	
Count Airline Bank	0.051	*	Kendall tau-b=.088†	*
Count Airline Café	Not Sig.		Kendall tau-b=.069†	*
Count Airline Convenience Store	Not Sig.		Kendall tau-b=.062†	*
Count Airline Food	Not Sig.		Kendall tau-b=.088†	*
Count Airline Office	Not Sig.		Kendall tau-b=.058†	*
Count Network Banks	Kendall tau-b= .021†	**	Not Sig.	
Count Network Café	Kendall tau-b= .010†	**	Not Sig.	
Count Network Clothing Store	0.084	*	Not Sig.	
Count Network Dry Cleaners	0.068	*	Not Sig.	
Count Network Hair salon/ Barbershop	Kendall tau-b= .028†	**	Not Sig.	
Count Network Bookstore	0.097	*	Not Sig.	
Count Network Religious Institution	0.102	*	Not Sig.	
Proximity to Closest Banks (Airline)	Not Sig.		Kendall tau-b=.022†	**
Proximity to Closest Café (Airline)	Not Sig.		Kendall tau-b=.009†	**
Proximity to Closest Food (Airline)	Not Sig.		Kendall tau-b=.021†	**
Proximity to Closest Destination Land Uses (Airline)			Kendall tau-b=.021†	**
Proximity to Closest Office (Airline)	Not Sig.		Kendall tau-b=.026†	**

***p<.001, **p<.05, *p<.10; Pearson Chi-Square, † Not significant Chi-Square

Table 14 shows the bivariate correlations between the two land use setting. The significant variables identified from this analysis were useful for the testing with the linear regression model for Total Step Count. Personal correlates that were significant between the two land use settings included Age, Education, Number of Cars per Household, Servings of Vegetables per Day, and the factor variable including survey questions related to attitudes about transportation mode choice. Social and cultural variables that were significant between the two land use settings included Number of Children in the Household and Number of Dogs in the Household. Organizational variables that were significant between the two land uses included Longevity at the Department, Supervisor Status, Pay for parking, and Longevity at University. Built environmental variables that were significant between the two land uses included Crosswalk Signals Are Too Short, Too Much Traffic, No Safe Places to Walk To, Distance from Parking to Office Entrance and knowledge of how to get to a destination on foot.

The t-test comparison between Total Step Count and Urban versus Suburban land use settings did not have equal variances assumed but the means were significantly different at $p<.10$ (Urban Mean Total Step Count=4,932 steps per day, Suburban Mean Total Step Count=4,347 steps per day).

Table 14 - Bivariate Correlations between Land Use Setting and Independent Variables

		Urban	Suburban	Pearson's Chi-Square	Fisher's Exact Test
Personal Correlates					
Age (N=497)	18-24	6 (2.5%)	11(4.2%)	0.042	**
	25-34	70 (29.4%)	47 (18.1%)		
	35-44	61 (25.6%)	72 (27.8%)		
	45-54	63(26.5%)	86 (33.2%)		
	Over 55	38 (16.0%)	43 (16.6%)		
Education (N=494)	Grade 12 or GED	7 (3.0%)	28 (10.9%)	0.001	***
	College 1-3 years	40 (16.9%)	62 (24%)		
	College 4 years or more	97(41.1%)	90 (34.9%)		
	Graduate School or more	92(39.0%)	77 (29.8%)		
	Other	0 (0%)	1 (0.4%)		
Biking per Week (N=474)	None	185(80.8%)	219 (89.4%)	0.000	***
	1-2 times/week	24(10.5%)	20 (8.2%)		
	5-6 times/week	11(4.8%)	2 (0.8%)		
	7+ times/week	9(3.9%)	4 (1.6%)		
Number of Cars in Household (N=497)	0	6(2.5%)	0 (0%)	0.002	**
	1 car	94 (39.5%)	78 (30.1%)		
	2 cars	108(45.4%)	129 (49.8%)		
	3 or more cars	30 (12.6%)	52 (20.1%)		
Servings of Vegetables/ Day (N=497)	0	9 (3.8%)	0 (0%)	0.000	***
	1 serving/day	90(37.7%)	131(50.8%)		
	2 servings/day	91(38.1%)	83 (32.2%)		
	3 servings/day	17(7.1%)	44 (17.1%)		
	4-5 servings/day	19(7.9%)	0 (0%)		
	6-7 servings/day	6(2.5%)	0 (0%)		
	8-10 servings/day	6(2.5%)	0 (0%)		
	Over 10 servings	1(0.4%)	0 (0%)		
Meals Away from Home/Week (N=497)	I do not eat meals away from work or home	10 (4.2%)	15 (5.8%)	0.000	***
	1 time/week	36(15.1%)	39 (15.1%)		
	2 times/week	44(18.4%)	43 (16.7%)		
	3 times/week	34(14.2%)	37 (14.3%)		
	4-5 times/week	58(24.3%)	27 (10.5%)		
	6-7 times/week	29(12.1%)	32 (12.4%)		
	8-9 times/week	13(5.4%)	13 (5.0%)		
	10-12 times/week	10 (4.2%)	18 (7.0%)		
	Over 12 times/week	5 (2.1%)	34 (13.2%)		

***p<.001, **p<.05, *p<.10

Table 14 - (Continued)

		Urban	Suburban	Pearson's Chi-Square		Fisher's Exact Test	
Lack of Knowledge about Benefits of Walking (N=507)	Not Selected	241 (99.2%)	256 (97.0%)			0.109	*
	Selected	2 (0.8%)	8 (3.0%)				
Having to Carry Heavy Items (N=507	Not Selected	225 (92.6%)	256 (97.0%)			0.028	**
	Selected	18 (7.4%)	8 (3.0%)				
Need Car at or After Work (N=507)	Not Selected	149 (61.3%)	182 (68.9%)			0.077	**
	Selected	94 (38.7%)	82 (31.1%)				
Total Walking for Recreation (N=507)	None	79 (32.5%)	80 (30.3%)	0.058	*		
	1-60 minutes	69 (28.4%)	88 (33.3%)				
	61-120 minutes	51 (21.0%)	52 (19.7%)				
	121-180 minutes	15 (6.2%)	28 (10.6%)				
	181+ minutes	29 (11.9%)	16 (6.1%)				
Total Walking for Transportation (N=507)	None	44 (18.1%)	78 (29.5%)	0.000	***		
	1-30 minutes	59 (24.3%)	95 (36.0%)				
	31-60 minutes	60 (24.7%)	52(19.7%)				
	61+ minutes	80 (32.9%)	39 (14.8%)				
Walking is an Effective Means of Exercise. (N=493)	Strongly Agree	160 (68.2%)	163 (63.9%)	0.029	**		
	Agree	74 (31.1%)	74 (29.0%)				
	Neutral	3 (1.3%)	6 (2.4%)				
	Disagree	0 (0%)	10 (3.9%)				
	Strongly Disagree	1 (0.4%)	2 (0.8%)				
Increasing Physical Activity During the Day is Important to Me. (N=497)	Strongly Agree	108 (45.0%)	88 (34.2%)	0.065	*		
	Agree	108 (45.0%)	129 (50.2%)				
	Neutral	21 (8.8%)	31 (12.1%)				
	Disagree	3 (1.3%)	7 (2.7%)				
	Strongly Disagree	0 (0%)	2 (0.8%)				

***p<.001, **p<.05, *p<.10

Table 14 - (Continued)

		Urban	Suburban	Pearson's Chi-Square		Fisher's Exact Test
Public Transit is for Those Who do not Own a Car. (N=497)	Strongly Agree	4 (1.7%)	11 (4.3%)	0.000	***	
	Agree	15 (6.3%)	38 (14.8%)			
	Neutral	38 (15.8%)	80 (31.1%)			
	Disagree	111 (46.3%)	90 (35.0%)			
	Strongly Disagree	72 (30.0%)	38 (14.8%)			
Public Transportation is Necessary to Worksite. (N=495)	Strongly Agree	61 (25.5%)	25 (9.8%)	0.000	***	
	Agree	73 (30.5%)	54 (21.1%)			
	Neutral	64 (26.8%)	108 (42.2%)			
	Disagree	32 (13.4%)	51 (19.9%)			
	Strongly Disagree	9 (3.8%)	18 (7.0%)			
Walking is for Recreation Purposes, rather than Transportation. (N=498)	Strongly Agree	6 (2.5%)	15 (5.8%)	0.010	**	
	Agree	33 (13.8%)	58 (22.5%)			
	Neutral	58 (24.2%)	64 (24.8%)			
	Disagree	111 (46.3%)	100 (38.8%)			
	Strongly Disagree	32 (13.3%)	21 (8.1%)			
Biking is for Recreation Purposes, rather than Transportation. (N=494)	Strongly Agree	5 (2.1%)	15 (5.9%)	0.013	**	
	Agree	35 (14.6%)	51 (20.0%)			
	Neutral	53 (22.2%)	62 (24.3%)			
	Disagree	109 (45.6%)	106 (41.6%)			
	Strongly Disagree	37 (15.5%)	21 (8.2%)			
Air Pollution is a Serious Problem for our City. (N=494)	Strongly Agree	78 (32.8%)	19 (7.4%)	0.000	***	
	Agree	106 (44.5%)	39 (15.2%)			
	Neutral	37 (15.5%)	87 (34.0%)			
	Disagree	14 (5.9%)	86 (33.6%)			
	Strongly Disagree	3 (1.3%)	25 (9.8%)			

***p<.001, **p<.05, *p<.10

Table 14 - (Continued)

		Urban	Suburban	Pearson's Chi-Square		Fisher's Exact Test	
Walking will help to Reduce Air Pollution for Our City. (N=497)	Strongly Agree	97 (40.4%)	55 (21.4%)	0.000	***		
	Agree	100 (41.7%)	109 (42.4%)				
	Neutral	30 (12.5%)	71 (27.6%)				
	Disagree	11 (4.6%)	17 (6.6%)				
	Strongly Disagree	2 (0.8%)	5 (1.9%)				
People Drive Too Fast in the Vicinity of My Office. (N=497)	Strongly Agree	32 (13.3%)	31 (12.1%)	0.104	*		
	Agree	70 (29.2%)	63 (24.5%)				
	Neutral	74 (30.8%)	70 (27.2%)				
	Disagree	62 (25.8%)	84 (32.7%)				
	Strongly Disagree	2 (0.8%)	9 (3.5%)				
	Social and Cultural Correlates						
Number of Children In Household (N=492)	No children	167 (71%)	159 (61.9%)			0.036	**
	1 or more children	68 (28.9%)	98 (38.1%)				
Number of Dogs in Household (N=472)	No dogs	126 (56.3%)	102 (41.1%)	0.001	***		
	1 or more dogs	98 (43.8%)	146 (58.9%)				
	Organizational Correlates						
Pay for Parking (N=431)	No	33 (16.8%)	19 (8.1%)			0.007	***
	Yes	163 (83.2%)	216 (91.9%)				
Supervise (N=495)	No	141 (59.5%)	133 (51.6%)			0.086	*
	Yes	96 (40.5%)	125 (48.1%)				
Longevity at University (N=491)	1-2 years	50 (21.4%)	28 (10.9%)	0.004	**		
	3-5 years	30 (12.8%)	39 (15.2%)				
	6-10 years	71 (30.3%)	69 (26.8%)				
	Over 10 years	83 (35.5%)	121 (47.1%)				
Longevity in Department (N=491)	1-2 years	88 (37.3%)	36 (13.6%)	0.000	***		
	3-5 years	42 (17.8%)	78 (29.5%)				
	6-10 years	55 (23.3%)	80 (30.3%)				
	Over 10 years	51 (21.6%)	70 (26.5%)				

***p<.001, **p<.05, *p<.10

Table 14 - (Continued)

		Urban	Suburban	Pearson's Chi-Square		Fisher's Exact Test	
Built Environmental Correlates							
Distance from Parking to Office Entrance. (N=420)	Less than 5 minutes	93 (49.7%)	186 (79.8%)			0.000	***
	6-10 min.	50 (36.7%)	40 (17.2%)				
	11-15 min.	44 (23.5%)	7 (3.0%)				
Crosswalk Signals are Too Short. (N=507)	Not Selected	239 (98.4%)	252 (95.5%)			0.076	*
	Selected	4 (1.6%)	12 (4.5%)				
Too Much Traffic (N=507)	Not Selected	187 (77.0%)	219 (83.0%)			0.096	*
	Selected	56 (23.0%)	45 (17.0%)				
No Safe Places to Walk Nearby	Not Selected	219 (90.1%)	225 (85.2%)			0.107	*
	Selected	24 (9.9%)	39 (14.8%)				
If I Knew How to Get to a Destination by Walking I Am More Likely to Walk to it. (N=495)	Strongly Agree	54 (22.6%)	30 (11.7%)	0.000	***		
	Agree	86 (36.0%)	65 (25.4%)				
	Neutral	57 (23.8%)	79 (30.9%)				
	Disagree	38 (15.9%)	68 (26.6%)				
	Strongly Disagree	4 (1.7%)	14 (5.5%)				
There are Many Locations Nearby My Office that I Can Walk to for My Daily Needs. (N=496)	Strongly Agree	73 (30.4%)	46 (18.0%)	0.000	***		
	Agree	91 (37.9%)	57 (22.3%)				
	Neutral	31 (12.9%)	30 (11.7%)				
	Disagree	33 (13.8%)	83 (32.4%)				
	Strongly Disagree	12 (5.0%)	40 (15.6%)				
Housing Affordability (N=507)	Not Selected	61 (25.1%)	98 (37.1%)			0.004	**
	Selected	182 (74.9%)	166 (62.9%)				
Easy access to transit (N=507)	Not Selected	212 (87.2%)	246 (93.2%)			0.025	**
	Selected	31 (12.8%)	18 (6.8%)				

***p<.001, **p<.05, *p<.10

4.2.4 Multivariate Analysis

4.2.4.1 Frequency of Walking

Tables 15 and 16 show the full models for the urban and suburban settings. The model estimation for the frequency of walking in the urban setting, using multinomial logistic regression, resulted in seven variables associated with walking frequency (Table 15). The Nagelkerke Pseudo R-Square for this model was .342. The comparison categories for the urban model are low frequency walkers (0-2 trips/week), moderate frequency walkers (3-6 trips/week), and high frequency walkers (7+/week). The odds of being a high frequency walk are increased with Age (Odds Ratio [OR]=.536, 95% Confidence Interval [CI]=.330-.871, $p<.05$) and Health Status (Excellent: OR=35.739, CI= 3.173-402.506, $p<.05$; Very Good: OR=7.212, CI= 1.120-46.443, $p<.05$). High frequency walkers compared to low frequency walkers also carried positive attitudes about transportation mode choice being important within their community (OR=2.952, CI=1.639-5.315, $p<.001$). Moderate walkers compared to low frequency walkers were also influenced by perceived health status (Excellent: OR=8.199, CI= 1.158-58.065, $p<.05$) and income (OR=.641, CI= .469-.876, $p<.05$).

The urban setting has more transportation options available with an extensive transit system, widely available bike routes and lanes, and trail system for walking and biking. The availability of these choices may suggest why this attitude is prevalent and correlated with walking in the urban setting. The significant built environment variable within the model was Proximity to the Closest Bookstore (Network), which was only

significant for the comparison between high and low frequency walkers (OR=.731, CI= .519-1.031, p<.10).

The suburban model resulted in 10 variables associated with walking frequency (Table 16). The Nagelkerke Pseudo R-Square for this model was .485. The categories for walking frequency in the suburban setting were non-walkers (0 walk trips/week), low frequency walkers (1-2/week), moderate frequency walkers (3-5/week) and high frequency walkers (6+/week). Age was significant for moderate and high frequency walkers (Moderate: OR=1.874, CI= 1.044-3.364, p<.05; High: OR=3.104, CI= 1.635-5.893, p<.001). The demographic variable that was significant for low frequency walkers was Income (OR=1.598, CI= .993-2.572, p<.10). In the suburban model, social support variable Exercise with Others was significant for moderate and high frequency walkers (Moderate: OR= .112, CI= .024-.533, p<.05; High: OR=.263. CI= .052-1.325, p<.10). This negative relationship, where Exercise with Others results in less of a chance of walk trips, may be due to a variety of possible reasons, such as time constraints or the social aspect of the activity taking a more dominant role than the physical activity.

The built environment variables that were significant in the suburban model included: access to Parks, Proximity of Closest Bookstore and Proximity of Closest Café/Coffee Shops (Network). Low frequency walkers and high frequency walkers were more likely to have increased walk trips if a park was perceived to be within walking distance (1/4 mile) of the participants' office (Low: OR=6.596, CI= 1.031-42.186, $p<.05$; High: OR=7.496, CI= 1.067-52.638, $p<.05$). The proximity of the closest land use, in this model the land uses being Bookstores and Cafés, is based on a 2 mile buffer around each participant's office location. This distance in feet to the closest land use in that category is recorded for this variable in feet. The odds ratio for Café/Coffee Shop seems to suggest a counterintuitive negative relationship with walking (Moderate: OR=.050, CI= .007-.368, $p<.05$; High: OR=.147, CI= .022-.969, $p<.05$). The proximity to Bookstores is significant for moderate frequency walkers only (OR=11.28, CI= 1.661-76.996, $p<.05$). Suburban office workers that identified a barrier to walking being No Safe Places to Walk Nearby, walked more for low, moderate and high frequency walkers compared to non-walkers. This result is a counterintuitive finding.

Table 15 - Walk Frequency Multivariate Logistic Model - Urban

(N=151)	Mean	S.D.	Walk 3-6 trips per week vs. Only walking 0-2 trips per week				Walk 7 or more trips per week vs. Only walking 0-2 trips per week			
					95% CI				95% CI	
			Odds Ratio		Lower Bound	Upper Bound	Odds Ratio		Lower Bound	Upper Bound
Personal Correlates										
Age 18-24 yrs, 25-34, 35-44, 45-54, Over 55	13.17	1.11	0.76		0.51	1.14	0.54	**	0.33	0.87
Gender (0=Male,ref cat:Female=1)	0.74	0.44	2.13		0.77	5.89	1.26		0.37	4.29
General Health - Excellent	32.44	0.88	8.20	**	1.16	58.07	35.74	**	3.173	402.506
General Health -Very Good			2.81		0.74	10.74	7.21	**	1.12	46.44
General Health - Good (ref cat: Fair or Poor)			1.94		0.54	6.98	3.01		0.46	19.65
Education Grade 12 or GED, College 1 year to 3 years, College 4 years or more, Graduate school or more	16.11	0.83	1.18		0.69	2.01	1.07		0.57	2.01
Income 25,000-34,000, 35,000-49,999, 50,000-74,999, 75,000-99,999, 100,000-149,999, Over 150,000	24.24	1.44	0.64	**	0.47	0.88	0.79		0.55	1.13
Factor: Transportation Mode Choice	-0.002	1.01	1.61	**	1.03	2.51	2.95	***	1.64	5.32
Built Environment										
Proximity of Closest Bookstore (Network) 1/8 or less, 1/8- 1/4, 1/4-1/23, /2-3/4, 3/4-1, 1-11/8, 11/8-11/4, 11/4-11/2, 11/2-13/4, 13/4-2	13.42	1.64	0.99		0.78	1.28	0.73	*	0.52	1.03

***p<.001, **p<.05, *p<.10

Table 16 - Walk Frequency Multivariate Logistic Model - Suburban

(N=134)	Mean	S.D.	Walk 1-2 trips per week vs. Not walking at all				Walk 3-5 trips per week vs. Not walking at all				Walk 6 or more trips per week vs. Not walking at all			
			Odds Ratio		95% CI Lower Bound	95% CI Upper Bound	Odds Ratio		95% CI Lower Bound	95% CI Upper Bound	Odds Ratio		95% CI Lower Bound	95% CI Upper Bound
Personal														
Age 18-24 yrs, 25-34, 35-44, 45-54, Over 55	13.43	1.07	1.05		0.61	1.79	1.87	**	1.04	3.36	3.10	***	1.64	5.89
Gender (0=Male, ref cat:Female=1)	0.65	0.48	0.67		0.17	2.70	0.86		0.19	3.82	1.18		0.27	5.18
Education Grade 12 or GED, College 1 year to 3 years, College 4 years or more, Graduate school or more	15.96	0.91	0.56		0.27	1.19	0.56		0.25	1.24	0.97		0.42	2.22
Income 25,000-34,000, 35,000-49,999, 50,000-74,999, 75,000-99,999, 100,000-149,999, Over 150,000	24.60	1.45	1.60	*	0.99	2.57	1.07		0.65	1.73	1.14		0.68	1.89

***p<.001, **p<.05, *p<.10

Table 16 - (Continued)

(N=134)	Mean	S.D.	Walk 1-2 trips per week vs. Not walking at all				Walk 3-5 trips per week vs. Not walking at all				Walk 6 or more trips per week vs. Not walking at all			
			Odds Ratio		95% CI Lower Bound	95% CI Upper Bound	Odds Ratio		95% CI Lower Bound	95% CI Upper Bound	Odds Ratio		95% CI Lower Bound	95% CI Upper Bound
Minutes spent in Moderate Activity/week 1-60 min, 61-120 min, 13=121-180 min, 181-240 min, 241-300 min, 301-361 min, 361-420 min, 421-480 min, 481-540 min, 541-600 min, 601-660 min, 661-720 min, 721-780 min, 781-840 min	12.04	3.99	1.06		0.94	1.21	1.15	*	0.99	1.34	1.20	**	1.03	1.40
Social & Cultural Exercise with Others 0=No ref cat:1=Yes	0.38	0.49	0.56		0.12	2.58	0.11	**	0.02	0.53	0.26	*	0.05	1.33
Built Environment Barrier: No safe places to walk nearby 1=Selected, ref cat: 0=Not Selected	0.09	0.29	4.88	**	1.16	20.60	5.12	**	1.17	22.50	13.49	**	2.34	77.81
Park Within walking distance, ref cat: Not in walking distance	16.32	3.79	6.60	**	1.03	42.19	4.87		0.70	34.01	7.50	**	1.07	52.64

***p<.001, **p<.05, *p<.10

Table 16 - (Continued)

(N=134)	Mean	S.D.	Walk 1-2 trips per week vs. Not walking at all			Walk 3-5 trips per week vs. Not walking at all				Walk 6 or more trips per week vs. Not walking at all			
				95% CI				95% CI					
			Odds Ratio	Lower Bound	Upper Bound	Odds Ratio		Lower Bound	Upper Bound	Odds Ratio		Lower Bound	Upper Bound
Proximity of Closest Bookstore (Network) 1/8 or less, 1/8- 1/4, 1/4-1/23, /2-3/4, 3/4-1, 1-11/8, 11/8-11/4, 11/4-11/2, 11/2-13/4, 13/4-2	14.86	10.45	1.74	0.41	7.39	11.29	**	1.66	76.70	4.02		0.67	24.17
Proximity of Closest Café / Coffee shop (Network) 1/8 or less, 1/8- 1/4, 1/4-1/23, /2-3/4, 3/4-1, 1-11/8, 11/8-11/4, 11/4-11/2, 11/2-13/4, 13/4-2	14.90	10.45	0.56	0.13	2.40	0.05	**	0.01	0.37	0.15	**	0.02	0.97

***p<.001, **p<.05, *p<.10

4.2.4.2 Duration of Walking

The amount of walking reported in the base survey in each land use setting was analyzed. While walk trips are particularly useful in assessing transportation choices and general inclination toward active transportation, duration of walking is a better indicator of physical activity as it contributes to health benefits.

Tables 17 and 18 show the full models for both land use settings. An ordinal logistic model was fitted for the urban group using seven independent variables and maintaining assumed parallel lines (null hypothesis of same slopes= not rejected) (Table 17). The Nagelkerke Pseudo R-Square for this model was .229. The odds ratio for an ordinal logistic model allocates proportional odds between the categories of the dependent variable (Walk Duration= None, 1-30 min, 31-60 min, 61-90 min, 91-120 min, 121-150 min, 150+ min). Thus the odds are compared between 150+ minutes compared with 121-150 minutes, then the odds between 121-150 minutes and 91-120 minutes and so on. The significant variables in the urban model estimation were Education, Vigorous Activity in last 7 Days, Number of Banks/Credit Unions within ¼ mile, and Number of Food Establishments within ¼ mile. Increased education level indicated increased odds of spending more time walking per week (OR=1.842, CI= .180-1.041, $p<.05$). Participants indicating they performed some amount of vigorous activity in the last seven days were less likely to walk longer (OR=.340, CI= -1.795 to -.0362, $P<.05$). Higher number of banks and food establishments within ¼ mile indicated more walking time, though the Food variable has a slightly negative relationship (Banks: OR=3.949, CI= .445-2.303, $p<.05$; Food: OR=.913, CI= -.200-.018, $p<.10$).

The suburban ordinal logistic model resulted in 10 variables being associated with walk duration (Table 18). The Nagelkerke Pseudo R-Square for this model was .223. The personal correlate of Income was significant in the model with higher incomes having higher odds of walking longer durations per week (OR=1.217, CI= -.003-.396, p<.05). Social support was significant again as it was in the Walk Frequency MNL model with the variable Exercise with Others having a similar negative relationship for walk duration (OR=.340, CI= -1.668 to -.489, p<.001). All five built environment variables in the model were significant. Generally when an individual identified a specific barrier to walking in the survey the relationship with walking was expected to influence walking negatively. Variables for No Interesting Places To Walk To and Crosswalk Signals Too Short follow this assumption (No interesting places: OR=.439, CI= -1.659-.010, p<.05; Crosswalk: OR=.199, CI= -2.953- -.278, p<.05). The barrier of No Interesting Architecture or Landscape to Look at, seems to have a counterintuitive relationship with walking duration. Those selecting this as a barrier to walking in fact walked longer durations (OR=3.311, CI= .155-2.240, p<.05). Perhaps this is explained by participants who walk longer distances might be more observant or critical of their surroundings or have been exposed to other cities with more interesting architecture, but as individuals simply walk more despite the barrier. Proximity to the Closest Convenience Store (Airline) indicated increased walking duration (1.970, CI= -.063 – 1.419, p<.10).

Table 17 - Walk Duration Multivariate Logistic Model - Urban

(N=108)	Total Minutes of Walking / Week					
	Mean	S.D.	Odds Ratio		95% CI Lower Bound	95% CI Upper Bound
Personal Correlates						
Age 18-24 yrs, 25-34, 35-44, 45-54, Over 55	13.32	1.10	1.04		-0.27	0.36
Education Grade 12 or GED, College 1 year to 3 years, College 4 years or more, Graduate school or more	16.17	0.84	1.84	**	0.18	1.04
Income $25,000-34,000, 35,000-49,999, 50,000-74,999, 75,000-99,999, 100,000-149,999, Over 150,000	24.32	1.44	0.89		-0.36	0.13
Gender 0=Male, ref cat. 1=Female	0.73	0.45	0.71		-1.15	0.46
Vigorous-level Activity in last 7 Days (0=No, ref cat.1=Yes)	0.50	0.50	0.34	**	-1.76	-0.36
Built Environmental Correlates						
Count of Banks within ¼ mile (Network)	0.63	0.49	3.95	**	0.45	2.30
Count of Food/Restaurants within ¼ mile (Network)	3.08	3.92	0.91	*	-0.20	0.02

***p<.001, **p<.05, *p<.10

Table 18 - Walk Duration Multivariate Logistic Model - Suburban

(N=157)	Total Minutes of Walking / Week					
	Mean	S.D.	Odds Ratio		95% CI Lower Bound	95% CI Upper Bound
Personal Correlates						
Age 18-24 yrs, 25-34, 35-44, 45-54, Over 55	13.52	1.05	1.20		-0.07	0.44
Education Grade 12 or GED, College 1 year to 3 years, College 4 years or more, Graduate school or more	15.98	0.92	1.11		-0.22	0.43
Income $25,000-34,000, 35,000-49,999, 50,000-74,999, 75,000-99,999, 100,000-149,999, Over 150,000	24.60	1.44	1.22	**	-0.003	0.40
Gender 0=Male, ref cat. 1=Female	0.68	0.47	1.05		-0.571	0.66
Social & Cultural Correlates						
Exercise with Others 0=No 1=Yes	0.37	0.48	0.34	***	-1.67	-0.49
Built Environmental Correlates						
Barrier: Crosswalk signals are Too Short 1=Selected 0=Not Selected	0.06	0.23	0.19	**	-2.95	-.028
Barrier: No Interesting Architecture or Landscape to Look at 1=Selected 0=Not Selected	0.07	0.26	3.31	**	0.16	2.24
No Interesting Places to Walk to 1=Selected 0=Not Selected	0.16	0.37	0.44	**	-1.66	0.01

***p<.001, **p<.05, *p<.10

Table 18 – (Continued)

(N=157)	Total Minutes of Walking / Week				95% CI	
	Mean	S.D.	Odds Ratio		Lower Bound	Upper Bound
Proximity of Convenience Store (Airline) 11=1/8 mile, 12=1/8-1/4, 13=1/4-1/2, 14=1/2-3/4, 15=3/4-1, 16=1-11/8,17=11/8-11/4, 18=11/4-11/8	13.27	1.11	1.97	*	-0.06	1.42
Proximity of Food/Restaurant (Airline) 11=1/8 mile, 12=1/8-1/4, 13=1/4-1/2, 14=1/2-3/4, 15=3/4-1, 16=1-11/8,17=11/8-11/4, 18=11/4-11/8	13.08	1.08	0.403	**	-1.67	-0.15

***p<.001, **p<.05, *p<.10

The final significant variable in this suburban model was the Proximity of Food Establishments (Airline) to the participant's office (OR=.403, CI= -1.669-.147, p<.05). It is not clear why a negative relationship exists here with increased distance in feet to a restaurant equals increased walking duration, unless we possibly assume that the draw to a particular food location may supersede concerns about walking distance.

4.2.4.3 Walking Step Count

The final model estimated was for the objective data collected in Phase II, Total Step Count. Total Step Count was derived from steps entered from pedometer readings and entered in the online travel diary. Total Step Count for Days 1 and 2 were averaged to provide an average daily step count. The same was done for Days 3 and 4 together and Days 5 and 6 together. Days 1 and 2 were the Baseline Days of the study. Days 3 and 4 were the Intervention Days of the study. And Days 5 and 6 were the Post-Test Days of the study. The purpose of averaging the two days was to smooth the data and address outlier data to use a more typical step count for the model. Tables 19 and 20 show the full models for each of the land use settings.

For the urban model, 11 independent variables were included in the model (Table 19). The R^2 for this model was .576 (Adjusted R^2= .483). All of the key theoretically significant variables (Age, Income, Gender, and Education) were included in this model. In the urban model, females were estimated to walk less, younger participants walked more, and those with larger households walked less. Watching more television or using the computer meant walking less as well. The factor variable for air quality attitudes

included the following questions in the cluster (Responses: Strongly Agree, Agree, Neutral, Disagree, or Strongly Disagree):

- Air pollution is a serious problem for our city.
- Walking will help to reduce air pollution for our city.

Attitudes about air quality played a role in the Total Step Count model for the urban setting ($\beta = -475.70$, $p < .05$). The Austin area currently is struggling with potential non-attainment status, primarily due to mobile sources (vehicle traffic emissions). The community is exposed to more information about air pollution and direct pollution impacts in the Austin area, which may account for the presence of this variable in this model. College Station/Bryan area currently does not have an immediate concern about non-attainment status or specific air quality issues.

Built environment variables within this urban model include Proximity to Dry Cleaners, Religious Institution, and Convenience Stores. All three of these land uses are found on the primary commercial corridor with several choices for selection. Convenience Stores or small markets are also on campus with access for the general public as well as for university-based individuals.

Table 19- Total Step Count Mulivariate Linear Regression Model - Urban

	Total Walk Steps			
(N=68)	Mean	S.D.	β	
Total Walk Steps	5,020	2,607	----	
Personal				
Age 18-24 yrs, 25-34, 35-44, 145-54, Over 55	13.40	1.07	-829.26	**
Education Grade 12 or GED, College 1 year to 3 years, College 4 years or more, Graduate school or more	16.19	0.76	223.33	
Gender 0=Male, 1=Female	0.71	0.46	-1,173.86	**
Income $25,000-34,000, 35,000-49,999, 50,000-74,999, 75,000-99,999, 100,000-149,999, Over 150,000	24.35	1.48	45.51	
BMI Normal Weight/Underweight, Overweight, Obese	12.81	0.80	-1,179.87	***
Number of adults in household 1adult, 2 adults, 3+adults	1.82	0.57	-925.65	*
Hours TV, Computer, Sitting	36.46	20.59	-27.61	**
Factor: Attitude toward air quality issues	0.12	1.15	-475.70	**
Built Environment				
Barrier: Distances to places are too great 0=Not Selected, 1=Selected	0.53	0.50	-1,832.09	***
Proximity of Closest Dry Cleaners (Network) 1/8 or less, 1/8- 1/4, 1/4-1/23, 1/2-3/4, 3/4-1, 1-11/8, 11/8-11/4, 11/4-11/2, 11/2=13/4, 13/4-2	13.94	1.52	993.33	**
Proximity of Closest Religious Institution (Network) 1/8 or less, 1/8- 1/4, 1/4-1/23, 1/2-3/4, 3/4-1, 1-11/8, 11/8-11/4, 11/4-11/2, 11/2=13/4, 13/4-2	14.24	1.83	-2,632.64	***
Proximity of Closest Convenience Store (Network) 1/8 or less, 1/8- 1/4, 1/4-1/23, 1/2-3/4, 3/4-1, 1-11/8, 11/8-11/4, 11/4-11/2, 11/2=13/4, 13/4-2	12.65	1.29	2,348.50	***

***p<.001, **p<.05, *p<.10

The multivariate linear regression model for suburban participants and Total Walk Steps identified eight independent variables for the suburban model (Table 20). The R^2 for this model was .252 (Adjusted R^2= .186). Gender, while insignificant, was kept in the model for theoretical value. Older participants walked more steps per day (β=556, $p<.05$) as did those with more Education (β =704, $p<.05$). Increased income was negatively associated with total walking steps (β = -358, p=<.10). Tendency toward a BMI in the obesity or overweight category meant fewer walking steps per day (β =491, p< .10). Participants who owned more cars in the suburban model were estimated to walk more steps per day, which is a counterintuitive finding (β=795, $p<.05$). If a participant felt that a Lack of Energy or Feeling Lazy was a barrier to walking they, as expected, were estimated to walk less (β = -1,150, $p<.05$). The significant variable within the built environment was Number of Cafés within a ¼ mile of the participants' offices (β=1,522, $p<.05$).

Table 20 - Total Step Count Mulitivariate Linear Regression Model - Suburban

	Total Walk Steps			
(N=101)	Mean	S.D.	β	
Total Walk Steps	4,440	2,434	-----	
Personal				
Age 18-24 yrs, 25-34, 35-44, 145-54, Over 55	13.40	1.14	556	**
Education Grade 12 or GED, College 1 year to 3 years, College 4 years or more, Graduate school or more	15.97	0.92	704	**
Gender 0=Male, 1=Female	0.65	0.48	-135	
Income $25,000-34,000, 35,000-49,999, 50,000-74,999, 75,000-99,999, 100,000-149,999, Over 150,000	24.38	1.57	-358	*
BMI Normal Weight/Underweight, Overweight, Obese	13.02	0.82	491	*
Number of cars in household 1car, 2 cars, 3+ cars	1.83	0.69	795	**
Barrier: Lack of energy or lazy 0=Not Selected, 1=Selected	0.41	0.49	-1,150	**
Built Environment				
Count of Cafe/ Coffee shops within ¼ mile (Airline)	0.16	0.37	1,522	**

***p<.001, **p<.05, *p<.10

4.3 Hypothesis 2

Hypothesis 2: Office workers will increase walking if exposed to tailored information regarding health benefits of walking, access to walkable destinations, and air quality benefits from reduced car usage. The null hypothesis that tailored emailed message intervention used in this study had no effect cannot be rejected. Interesting findings were noted about walking behavior of office workers, but the change in step count between the baseline and post-test was not significant. Further study on what types of information and delivery methods (e.g., via cell phone) are recommended. The summary of the findings for Hypothesis 2 include the following:

- Total Step Count for Baseline Week shows urban office workers with a higher average steps per day than suburban office workers (Urban: Mean=4,932 steps per day, Suburban: Mean=4,347 steps per day) (descriptive statistics).

- Overall change in steps for urban office worker for the combined intervention and control groups shows increased 489 steps per day from Baseline Week to Post-Test Week (descriptive statistics).

- Overall change in steps for suburban office workers, for the combined intervention and control groups shows increased 141 steps per day from Baseline Week to Post-Test Week (descriptive statistics).

- The change in step count for urban office workers between Baseline Week and the Intervention Week (Intervention Group Mean=754 steps per day, Control Group Mean=458 steps per day) and between the Baseline Week and the Post-

Test Week (Intervention Group Mean=360 steps per day, Control Group Mean=593 steps per day) was not significant (t-test).

- The change in step count for suburban office workers between Baseline Week and Intervention Week was statistically significant ($p < .10$), however it showed that the intervention group actually walked less during the Intervention Week as compared with the Baseline Week (Intervention Group Mean= -2,459 steps per day Control Group Mean = -1700 steps per day) (t-test).

- Change in step count for suburban office workers between Baseline Week and Post-Test Week showed the intervention group increasing 802 steps per day and the Control Group average decreasing -157 steps per day ($p < .10$) (t-test).

- Based on the literature, approximately 800 steps per day increase in walking could be attributed to the use of the pedometer alone (103).

- Short car trips for non-commute trip purposes are potentially trips that could be replaced by walking (replaceable trips). Urban office workers had more replaceable trips than suburban office workers for the Baseline Week (Urban Mean=.0383 replaceable trips/day, Suburban Mean= .0284 replaceable trips/day).

- Urban office workers had more walk trips for non-commute trips purposes for the Baseline week than suburban office workers (Urban Mean=.506 comparable walk trips/day, Suburban Mean =.325 comparable walk trips/day).

- The change of replaceable trips for urban office workers between Baseline Week and Intervention Week or Baseline Week and Post-Test week were not statistically significant. The relationship in fact showed a decrease in these targeted trips for walking in the control group, rather than the intervention group (Intervention Group Post-Test-Baseline Mean= .011, Control Group Post-Test-Baseline Mean= -.013).

- The change of replaceable trips for suburban office workers increased slightly for the intervention group compared with the control group between the Baseline Week and Post-Test Week, though this was not statistically significant.

- Replaceable trips for suburban office workers did decline as desired between the Intervention Week and Baseline week for the intervention group (Intervention Group Mean= -.0316, Control Group Mean = .0104, Equal Variances Not Assumed, $p < .10$).

- Comparable walk trips increased for suburban office workers as desired between the Intervention Week and Baseline Week for the intervention group, but this was not statistically significant. (Intervention Group Mean=.0127, Control Group Mean = -.0799).

- Comparable walk trips decreased for suburban office workers for both the intervention and control groups, between the Baseline Week and Post-Test

Week, but this was not statistically significant (Intervention Group Mean= -.032, Control Group Mean=-.042).

4.3.1 Effect of Intervention

The mean total steps each week of the testing was consistently higher for the urban office workers than the suburban office workers (Tables 21 and 22).

Tables 21 - Descriptive Statistics for Total Step Counts: Baseline, Intervention and Post-Test Weeks - Urban

	N	Mean	S.D.	Min.	Max.
Average Day 1 & 2 Total Steps	115	4,932.00	2,494.49	214.00	12,314.00
Average Day 3 & 4 Total Steps	113	5,645.95	2,847.40	236.00	13,134.50
Average Day 5 & 6 Total Steps	115	5,734.01	2,921.52	239.00	14,947.00
Change in Steps: Intervention – Baseline Week	93	566.44	1,891.94	-5,004.00	6,932.00
Change in Steps: Post-Test – Baseline Week	96	488.90	2,404.84	-5,138.00	9,611.00

***p<.001, **p<.05, *p<.10

Tables 22 - Descriptive Statistics for Total Step Counts: Baseline, Intervention and Post-Test Weeks - Suburban

	N	Mean	S.D.	Min.	Max.
Average Day 1 & 2 Total Steps	133	4,347.75	2,397.95	116.50	11,319.00
Average Day 3 & 4 Total Steps	152	2,225.21	1,435.67	202.50	9,601.00
Average Day 5 & 6 Total Steps	132	4,257.91	2,434.28	208.00	12,821.00
Change in Steps from Intervention – Baseline Week	111	-1,894.45	1,866.07	-7,776.50	5,283.50
Change in Steps from Post-Test – Baseline Week	100	140.93	2,229.33	-5,656.00	8,932.50

***p<.001, **p<.05, *p<.10

The change in Total Step Count between the intervention groups and control groups did not yield significant results (Tables 23 and 24). The Baseline Week (Days 1 and 2 averaged) was compared with the Intervention Week (Days 3 and 4 averaged) and also compared with the Post-Test Week (Days 5 and 6 averaged) separately. Mild significance ($p<.10$) for the suburban office workers for the post-test intervention group suggested a possible increase of 800 steps per day ($F=2.241$, $p<.10$) (Table 24).

Table 23 - Significance of Change Variables between Intervention Groups and Control Groups - Urban

Variable	Participant Group	N	Mean	S.D.
Change in Steps from Intervention Week – Baseline Week	Intervention	37	754.09	2,267.46
	Control	55	458.00	1,617.67
F=1.953, Not Significant				
Change in Steps from Post-Test – Baseline Week	Intervention	39	359.73	2,466.70
	Control	56	593.83	2,397.82
F=0.174, Not Significant				

Table 24 - Significance of Change Variables between Intervention Groups and Control Groups - Suburban

Variable	Participant Group	N	Mean		S.D.
Change in Steps from Intervention Week – Baseline Week	Intervention	29	802.86	*	2,801.99
	Control	60	-157.62		1,925.15
F=2.241, p<.10					
Change in Steps from Post-Test – Baseline Week	Intervention	32	-2,459.20	*	1,909.38
	Control	65	-1,700.70		1,804.34
F=0.078, p<.10					

Some exploration of the travel data was also performed related to the potential impact of the intervention on transportation trips in the car versus walking. In order to have a fair comparison, trips that were equal or less than 5 minutes in duration and were made in a car alone were separated out for analysis. The general idea would be that a short car trip of less than 5 minutes may be a trip that is within walking distance. Second, based on the literature the bulk of our trips are associated with running errands, visiting friends or family rather than commute trips. Therefore, trips were selected meeting all the following criteria: time duration (5 minutes or less) AND car mode AND non-commute trips (medical appointment trips were excluded). These were considered trips that had a potential for being replaced by walking or thus categorized as "Replaceable Trips". In order to compare these trips, walk trips for the same days were selected that were done for the same trip purposes regardless of the time duration. These were considered "Comparable Trips" in the sense that some of the participants chose to walk for the same trip purposes.

The analysis of Replaceable Trips in fact shows that the urban participants have slightly more possible trips that could shift to walking (Tables 25 and 26: Baseline Urban: Mean=0.0383 trips/day, S.D. =0.187; Baseline Suburban: Mean=0.0284 trips/day, S.D.= 0.131). As found earlier, urban participant have higher walk trips and Tables 25 and 26 for the Baseline week shows a higher number of walk trips performed for the target discretionary trips (Baseline Urban: Mean=0.05064 trips/day, S.D. =0.739; Baseline Suburban: Mean=0.3258 trips/day, S.D.=0.595).

Table 25 - Descriptive Statistics for Replaceable Car Trips and Comparable Walk Trips - Urban

(N=235)	Mean	S.D.	Min.	Max.
Baseline Replaceable Trips	0.038	0.187	0.00	2.00
Intervention Week Replaceable Trips	0.034	0.193	0.00	2.50
Post-Test Replaceable Trips	0.026	0.171	0.00	2.00
Baseline Comparable Walk Trips	0.506	0.739	0.00	4.50
Intervention Week Comparable Walk Trips	0.383	0.783	0.00	5.50
Post-Test Comparable Walk Trips	0.345	0.689	0.00	3.50
Change in Replaceable Trips (Post-Base)	-0.013	0.240	-2.00	1.50
Change in Replaceable Trips (Intervention-Base)	-0.004	0.270	-2.00	2.50
Change in Comparable Walk Trips (Post-Base)	-0.162	0.690	-3.00	2.00
Change in Comparable Walk Trips (Intervention-Base)	-0.123	0.759	-4.50	3.50

Table 26 -Descriptive Statistics for Replaceable Car Trips and Comparable Walk Trips - Suburban

(N=264)	Mean	S.D.	Min.	Max.
Baseline Replaceable Trips	0.028	0.131	0.00	1.00
Intervention Week Replaceable Trips	0.028	0.164	0.00	1.50
Post-Test Replaceable Trips	0.036	0.179	0.00	1.50
Baseline Comparable Walk Trips	0.326	0.595	0.00	5.00
Intervention Week Comparable Walk Trips	0.277	0.659	0.00	4.00
Post-Test Comparable Walk Trips	0.280	0.687	0.00	4.00
Change in Replaceable Trips (Post-Base)	0.008	0.200	-1.00	1.50
Change in Replaceable Trips (Intervention-Base)	0.000	0.185	-1.00	1.00
Change in Comparable Walk Trips (Post-Base)	-0.046	0.699	-4.00	3.50
Change in Comparable Walk Trips (Intervention-Base)	-0.049	0.700	-3.00	3.00

The analysis of the impact of the intervention on these Replaceable or Comparable Trips was not expected. In Tables 27 and 28, the significance of the change in Replacement Trips and Comparable Trips is shown. The expected outcome would be a decrease in Replaceable Trips and an increase in Comparable Trips between the Post-Test week and Baseline. In fact, in the urban setting Replaceable Trips increased (Table 27) and the Comparable Trips decreased for the intervention group, though only the Comparable Trips change was significant (Table 28).

The findings for the suburban settings also resulted in increased Replaceable Trips between the Post-Test and Baseline weeks (Table 29). A decrease in these trips did occur during the Intervention Week which was significant to the $p<.10$ level. Walk Trips or Comparable Trips also increased for the Intervention Week, though this was not significant (Table 30).

The value of reviewing the types of trips made by individuals begins to uncover what obstacles and opportunities are available within the day of most office workers for some amount of walking or physical activity. Collecting an additional day of data each week, possibly including a weekend day, and reassessing trips 3-5 months after initial testing may be advisable for linking transportation walking opportunities more clearly.

Table 27 - Significance of Change in Replaceable Car Trips - Urban

Variable	Participant Group	N	Mean	S.D.
Change in Replaceable Car Trips (Post-Base)	Intervention	87	0.011	0.170
	Control	120	-0.029	0.299
Equal Variances Not Assumed, Not. Significant				
Change in Replaceable Car Trips (Intervention-Base)	Intervention	87	0.011	0.152
	Control	120	-0.013	0.352
Equal Variances Not Assumed, Not. Significant				

Table 28 - Significance of Change in Comparable Walk Trips - Urban

Variable	Participant Group	N	Mean	S.D.
Change in Comparable Walk Trips (Post-Base)	Intervention	87	-0.017	0.640
	Control	120	-0.250	0.756
$F=4.508$, $p<.05$				
Change in Comparable Walk Trips (Intervention-Base)	Intervention	87	-0.006	0.573
	Control	120	-0.188	0.919
$F=10.166$, $p<.10$				

Table 29 - Significance of Change in Replaceable Car Trips - Suburban

Variable	Participant Group	N	Mean	S.D.
Change in Replaceable Car Trips (Post-Base)	Intervention	79	0.019	0.271
	Control	144	0.007	0.178
Equal Variances Not Assumed, Not. Significant				
Change in Replaceable Car Trips (Intervention-Base)	Intervention	79	-0.032	0.167
	Control	144	0.010	0.191
Equal Variances Not Assumed, p<.10				

Table 30 Significance of Change in Comparable Walk Trips - Suburban

Variable	Participant Group	N	Mean	S.D.
Change in Comparable Walk Trips (Post-Base)	Intervention	79	-0.032	0.790
	Control	144	-0.042	0.607
F=2.856, Not Significant				
Change in Comparable Walk Trips (Intervention-Base)	Intervention	79	0.013	0.820
	Control	144	-0.080	0.625
Equal Variances Not Assumed, Not Significant				

The impact of the intervention was at best negligible but most likely only played a role for a select few participants. Improvements to the intervention to include organizational elements such as policies that facilitate and support physical activity at the workplace could improve the intervention. Despite the lack of significance of the findings for the intervention, providing information on destinations in combination with other health promotion activities still may have potential. With growing technology

options for way-finding that currently has been targeted for vehicular travel, the opportunity to use this data delivery system for physical activity is a new and exciting option. Ideally, in the near future information can also be used to promote physical activity through active transportation by providing directions and tips for accessing land uses on foot with associated calories burned. Providing real-time information about options that allow an office worker to accomplish a daily task while utilizing walking as the mode of travel through travel time assessments, directions, and other benefits may be worth investigating in the near future.

4.4 Secondary Aim

Secondary Aim: Explore benefits of using online survey and travel diary methods versus traditional paper versions.

4.4.1 Use of Electronic Data Collection

This study utilized an online survey and online travel diary in order to improve the accuracy of recall, efficiency of obtaining data, and the ability to prompt participants to complete the travel diary within 24-hour period. The benefits of online surveys and travel diaries include:

- Lower cost
- Reduce loss of materials (paper diary or survey) by participant
- Real-time assessment by researcher for completion of survey or travel diary
- Ability to adjust or add questions, explanation or instructions as needed
- Ability to send reminders to selected participants who have not completed the materials

- Reduce data entry time for researcher

Approximately 12 participants were uncomfortable using the online travel diary in Phase II and therefore opted to use the paper travel diary provided to all participants for note-taking as desired. These participants primarily mailed their completed pages back to the researcher, though two participants scanned and emailed their pages.

The benefits of using an online method allowed the researcher to send a follow-up email only to those who had not responded to the base survey (to assist in response rate), able to prompt participants to complete their travel diaries in a timely fashion, to review the data as it was entered daily, and make small adjustments to ease the use of the travel diary were all realized through this study. The online method allowed for the researcher to manage a larger sample than would likely be possible utilizing only paper survey and travel diaries. The online survey software also provided an ability to manage the participants and keep track of those who wished to drop out as well as send out comprehensive communications throughout the study.

Data entry time was reduced; however, data cleaning and processing time was still extensive. The base survey was fairly straightforward for data cleaning or processing for analysis though there were some consistent problems that increased data processing time:

- Duplicate surveys submitted
- Errors on skip routine
- Online traffic causing delays or booting participant from website

The survey software used allowed for sending a link tied to a participant which minimized duplicate surveys. However, an option to fill out the survey later was provided and in these cases two entries often were in the database; the incomplete one needed to be removed. Similar errors occurred if a participant skipped questions without responding. Per IRB protocol, questions could not be required or mandatory to complete in order to proceed with the online survey or travel diary. In some instances the amount of skipped questions resulted in non-usable surveys.

Online traffic delays for Surveymonkey or problems primarily were noted with the travel diary but may have been an issue for the base survey as well. However, in general this survey software performed well and delay periods appeared to only last a few minutes and simply required the participant to refresh their browser. The largest issue with data processing was associated with the travel diary. This was due to two primary reasons: 1) adjustments made per request of participants after Day 1& 2 meant that data had to be processed separately and matched up 2) the irregular nature of participants have varying number of trips. In order to be responsive to the participants, the researcher worked to improve the travel diary prior to Day 3 to address issues in the flow of the online travel diary. The pilot sample did not have issues with the flow of the questions, but the diversity and size of the full study sample suggested needed changes in format and flow. In the end, this was not advisable as it made processing the data very tedious to insure that all trips matched with the proper participant for all the days for the travel diary. Participants, as expected, have varying number of trips per day. Some participants also recorded their trips out of order for unknown reasons which

caused some confusion in the data processing and determining step counts for the morning, afternoon, and evening.

Despite some of the quirks of online surveying and travel diaries, this is a good option for research. The prevalence of computers and access to email is also making using online surveying and interventions possible with many types of populations. Caution should be used to make skip routines within the survey as simple as possible for the stability of the survey, even if the participant is unaware of the sequencing of the questions based on responses. Testing the format of how data is exported should also be explored when using online survey software to improve the efficiency of accessing and processing the data.

5. CONCLUSIONS

5.1 Summary

Land use settings can have an impact on walking for office workers. When locating and designing an office setting, attention to the land uses that exist and proposed may facilitate opportunities to reduce transportation by car and increase active transportation for this sedentary population. Efforts to continue to look for interventions that are low-cost, easy to implement as well as being comprehensive and addressing the various levels of the social ecological model.

5.2 Findings

The workplace has been identified as a strategic location to promote improved health behaviors. Office workers represent up to 40% of the workforce in Texas and the general nature of the type of work is sedentary (7). Additional study on the built environmental impacts near the worksite area needs additional research to determine correlates relevant to increasing walking as part of a lifestyle change for office workers. This study investigates the differences that urban and suburban settings may have on walking behavior (walk trips, walk duration, and total step count) of office workers in Texas.

5.2.1 Personal Correlates

In the urban environment, personal correlates that influenced the frequency of walking included Age, Health Status, and Attitudes about Transportation Mode Choice. Older office workers in the urban environment had reduced odds of being a high frequency walker (walking 7+ trips per week) compared with a low frequency walker

(Urban low frequency walker =walking 0-2 trips per week) (Table 15: OR=.54, CI= 0.33-0.87), while the reverse was true for the suburban office workers. Suburban office workers had increased odds of being a moderate or high frequency walker in older age groups and compared with a non-walker (0 walk trips per week) (Table 16: Moderate Walker=OR=1.87 CI=1.04-3.36, High=OR=3.10 CI=1.64-5.89).

Age and BMI were significant in both the urban and suburban models for Total Step Count. Gender was significant for the urban model where female were predicted to walk less than males, consistent with the literature (β-1,173.85, p<05). For the suburban model, Gender was not significant but females were estimated to walk less than males as well (Urban: R^2=.576; Suburban: R^2=.252).

Other relevant personal correlates included Income and Education. Income was significant in increased odds of more walk trips per week and increased walking minutes per week for suburban office workers (Table 16: OR=1.60 CI=0.99-2.57 and Table 18: OR=1.22 CI=-0.003-0.40). Education was more influential for urban office workers than Income. Increased Education has almost two times increased odds for urban office workers to walk more minutes per week (Table 17 OR=1.84 CI=0.18-1.04).

5.2.2 Social and Cultural Correlates

The association of social support, as noted in the literature as a significant for walking levels, was identified as significant for suburban office workers rather than urban office workers both for walking frequency and for duration dependent variables. The absence of a companion when exercising was significant for reduced odds for walk trips (moderate or high frequency walker) and for minutes spent walking per week

(Table 16: Moderate Walker =OR=0.11 CI=0.02-0.53 High=OR=0.26 CI=0.05-1.33 and Table 18: OR=0.34 CI=-1.67- -0.49).

Overall, urban office workers were more likely to walk more frequently per week if they had a positive perceived health status, higher income, and positive attitude about the transportation mode choice (Walk Frequency model: Nagelkerke R-Square=.342). The odds increased for walking more minutes per week with Education, Vigorous-level Activity within last 7 Days and the number of banks and restaurants within ¼ mile for urban office workers (Walk Duration Model: Nagelkerke Pseudo R-Square=.229).

Overall, suburban office workers increased their walk trips with higher incomes, available social support of others to exercise with, perceived access to park areas within walking distance of a ¼ mile and generally felt locations nearby were safe for walking (Walk Frequency model: Nagelkerke Pseudo R-Square=.485). The odds for walking more minutes per week were increased with income and social support. The odds are reduced for walking more minutes with the barrier of No Interesting Places to Walk to and with increased distances to and food establishments (Walk Duration Model: Nagelkerke Pseudo R-Square =.223).

5.2.3 Built Environment Correlates

From the objective measure of pedometer step counts, generally urban office workers walking on average 600 steps more per day than the suburban office workers. Office workers in both land use settings on average are not meeting the recommended levels of walking steps per day of 10,000 steps (Urban Mean=4,932 steps per day, Suburban Mean=4,347 steps per day) (2, 12). If 10,000 steps is the equivalent of about 5

miles, the average steps from this study are the equivalent of 2.5 miles/day (4023 meters/day). Based on the Uusi-Rasi study, this study's group of office workers is generally more active than the women office workers in Uusi-Rasi study with a baseline of walking 1895 meters per day (140). Comparing the Post-Test step count after the intervention an average of 5,734 steps per day for urban office workers and 4,257 steps per day for suburban office workers was observed (Table 21 and 22). This translates to a 16% increase for urban office workers and 2% decrease for suburban office workers in walking steps. The similar study using email motivations and a pedometer by Faghri et al., reported a 27% increase in steps over a 10 week walking program (172).

The null hypothesis that land use destinations and pedestrian supportive infrastructure have no effect on walking behavior for office workers is rejected based on the findings from this study that indicate land use setting (urban versus suburban) and land use destinations (e.g. proximity of bookstores, coffee shops or food establishments) can positively increase walking behavior for office workers and were significant correlates for walking. Land use variables for the suburban office workers included access to bookstores and coffee shops as significant in relation to increasing walk trips. Access to convenience stores and food establishments for suburban office workers were more relevant for the walking duration dependent variable. Land use variables for the urban office workers that were associated with walking duration included the number of banks and food establishments within ¼ mile. Access to bookstores was associated with walking frequency. Bookstore and coffee shops may be destinations that are frequent but are closer by and therefore have an impact on number of walk trips, rather that

amount of time spent walking. The amount of choice of bookstores and coffee shops may also be high enough that the closest location will satisfy the individual's needs. However, a convenience store, food establishment or bank may require more specificity for the individual. Therefore, if walking option was selected, the distance may be somewhat irrelevant or the individual is more willing to walk further for the specific bank, restaurant or store desired.

5.2.4 Effect of Intervention

The intervention used for this study utilized information in the form of tailored messages and maps emailed to participants. The null hypothesis that tailored emailed message intervention used in this study had no effect cannot be rejected. Interesting findings were noted about walking behavior of office workers, but the change in step count between the baseline and post-test was not significant. Further study on what types of information and delivery methods (e.g., via cell phone) are recommended. The intervention did not yield a significant change in walking step count, but provided insight on opportunities for future studies. Combining spatial information with health benefits information for walking and other incentives may still be a useful tool for health promotion in the office setting.

5.2.5 Secondary Aim

The use of online surveys and travel diaries is a significant asset to researchers in being able to reach more participants, increase prompting and reminders for improved accuracy of data, and reduction in data entry time. Access to computers is fairly widespread, though some fragile populations such as new immigrants and the poor may

be excluded from studies using only online measurement tools. The feasibility of using online tools was explored in this study and the findings show that this technology will continue to improve and be a key resource for researchers in planning and public health.

5.3 Limitations

The limitations of this study include the duration of the data collection, duration of the intervention, and the narrowness of the intervention. Ideally, travel data is recommended for 3 days and in this study only 2 days each week were studied. The amount of work required to complete 1 day of a travel diary was discussed with the pilot group and with the goal to have detailed information about the walk trips, limiting to 2 days (Tuesday and Wednesday) was selected. The duration of the intervention was relatively short and therefore the expected or potential impact on walking was also small. With little significance in the change of walking step count from the baseline to the post-test when the intervention was fresh in the minds of the participants, testing several months after the study would not likely yield a significant walk increase.

For personal variables, the sample did not have adequate representation of minorities or men. The former is due to a fairly low diversity level of total office employees in both land use settings.

5.4 Recommendations

Further investigations for interventions that facilitate walking for office employees that are low-cost, and easy to implement are needed. Using maps of walking distances to nearby land uses in conjunction with office policies that encourage walking through incentives like “walking breaks” instead of “smoke breaks”, gift certificates or

coupons for those walking to a particular nearby location may make this initial study intervention more effective and complete. Additional assessment about the organization and "corporate culture" about walking would also be useful. Questions to include in a future survey on office workers could include:

- Is there a person you respect in your department that walks or promotes walking frequently?
- Does your supervisor promote walking to lunch? Walking to nearby meetings? Walking to complete various errands?
- Does your department/organization provide any of the following:

    Showers

    Changing room

    Lockers

    Office space to exercise

    Gym membership

    Days off for being healthy

    Walking contests

    Fitness challenges

    Pedometer

For future studies, oversampling for gender and race in the office environment would assist in identifying how these specific personal and cultural correlates may influence walking behavior for office workers. Additional qualitative interviewing to investigate aspects of corporate attitudes about walking and key personnel that might

serve as leaders or key adopters as role models could offer additional insight on walking behavior for office workers.

This study suggests that site location of office environments near land use destinations, particularly food establishments, banks, coffee shops, or bookstores, may be a useful consideration when planning for new locations. Office locations in isolation from other land uses, such as office parks, may have to work harder to promote walking as a part of healthy and productive work day activity. Allowing for daily needs to be satisfied along with physical activity benefits can assist in physical and mental health as well as address transportation and air quality concerns. Research to increase walking as part of a lifestyle change remains an important focus for improving the quality of life and health of sedentary groups like office workers. This study builds on other workplace analysis and suggests future avenues to use technology, like emails, not to increase sitting behind a computer but to get out and take a walk.

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APPENDIX A

CONSENT FORM

PLEASE NOTE THAT THIS FORM WAS ONLINE

Integrating Walking for Transportation and Physical Activity for Sedentary Office Workers in Texas

You have been asked to participate in the research of K. Meghan Wieters of the Landscape and Urban Planning Department at Texas A&M University on the walking behavior for office workers. You have been asked to participate in a research study on transportation, physical activity and quality of life in the office workers. You were selected to be a possible participant in this study at random from office workers at University of Texas at Austin and Texas A&M University. Approximately 400 people will be asked to participate in the survey portion of this project.

If you agree to be in this study, you will be asked to answer a survey, record your travel trips, and carry a small pedometer. Your participation will involve filling out a survey that may take 30-40 minutes. The travel diary is where you record your travel trips on 6 days (over approximately a month time period). The pedometer will help you record on the travel diary the number steps you walk in a day. If you decide to participate, you are free to refuse to answer any of the questions that may make you uncomfortable. You can withdraw from the survey or study at any time for any reason. In the event you need to leave the study we would like to ask you to fill out a shorter exit survey.

If you agree to be in this part of the study you will be given a gift certificate for your participation and the pedometer to keep at the end of study. Ideally you will complete the full study. The gift certificate will be given in the following amounts based on completion of the number of days in the study:

Completion /Participation	**Total gift certificate that will be given to participant***
Completion of online survey and 4 days of online travel diary	$10
Completion of online survey and all 6 days of the online travel diary	$25

*The maximum gift certificate will be $25 for completion of the full study.

The information provided to K. Meghan Wieters is for scholarly research and educational purposes. Your participation is voluntary and you may decline to answer any question at any time. Duplication and publication rights will belong to K. Meghan Wieters. This study is confidential and the researcher will assign a pseudonym or a code name for your responses. The records will be kept confidential. No identifiers linking you to the study will be included in any report published. Research records will be stored securely and only the four main researchers will have access to the records. You

also can refuse to fill this out as well. You can contact **Meghan Wieters at (979)XXX-XXXX** for additional information.

This research study has been reviewed by the Institutional Review Board – Human Subjects in Research, Texas A&M University. For research-related problems or questions regarding subjects' rights, you can contact the Institutional Review Board through Ms. Melissa McIlhaney, IRB Program Coordinator, Office of Research Compliance, (979) 458-4067, mcilhaney@tamu.edu.

By clicking yes on this online form, you consent to participate in the study.

K. Meghan Wieters, AICP, Principle Investigator
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APPENDIX B

THE UNIVERSITY OF TEXAS AT AUSTIN JOB TITLES

UT Austin Administrative and Professional Titles (faculty and students removed)

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
0052	UT ELEMENTARY SCHOOL TEACHER	Y	Standing, Physical Activity, Non-Standard Office Work Schedule
0053	TEACHER'S AIDE-UT ELEMENTARY SCHOOL	Y	Standing, Physical Activity, Non-Standard Office Work Schedule
0080	PROFESSIONAL LIBRARIAN	N	
0102	ASSOCIATE COUNSEL	N	
0103	LAW LIBRARIAN	N	
0104	ASSOCIATE LAW LIBRARIAN	N	
0300	PRESIDENT	N	
0301	PRESIDENT AD INTERIM	N	
0302	PRESIDENT EMERITUS	N	
0303	COUNSEL TO THE PRESIDENT AND VICE PROVOST	N	
0304	VICE PRESIDENT FOR RESEARCH	N	
0305	EXECUTIVE VICE-PRESIDENT AND PROVOST	N	
0306	ASSISTANT TO THE PRESIDENT FOR COMMUNICATIONS	N	
0307	SPECIAL ASSISTANT TO THE PRESIDENT	N	
0308	VICE PRESIDENT	N	
0309	SENIOR VICE PRESIDENT EMERITUS	N	
0310	ACTING VICE PRESIDENT	N	
0311	ASSOC VICE PRESIDENT FOR GOVERNMENTAL RELATIONS	N	
0312	ASSOCIATE VICE-PRESIDENT FOR STUDENT AFFAIRS	N	
0313	ASSISTANT VICE-PRESIDENT	N	
0314	SENIOR ASSOCIATE VICE PRESIDENT AND DEAN OF STUDENTS	N	
0315	VICE PRESIDENT FOR COMMUNITY AND SCHOOL RELATIONS	N	
0316	VICE PRESIDENT FOR RESOURCE DEVELOPMENT	N	
0317	ASSOCIATE VICE PRESIDENT	N	
0318	EXECUTIVE VICE PROVOST	N	
0319	VICE PROVOST	N	
0320	VICE PRESIDENT FOR STUDENT AFFAIRS	N	
0321	ASSOCIATE VICE PROVOST	N	
0322	ASSOCIATE VICE-PRESIDENT FOR RESEARCH	N	
0323	ASSISTANT VICE PROVOST	N	
0324	PRESIDENT DESIGNATE	N	
0325	VICE PRESIDENT FOR DIVERSITY AND COMMUNITY ENGAGEMENT	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
0327	SENIOR EXECUTIVE ASSOCIATE AND DIRECTOR, OFFICE OF THE PRESIDENT	N	
0328	VICE PRESIDENT FOR PUBLIC AFFAIRS	N	
0329	EXECUTIVE ASSISTANT TO THE PRESIDENT	N	
0330	DEAN OF STUDENTS AND ASSOCIATE VICE-PRESIDENT FOR STUDENT AFFAIRS	N	
0331	DEAN, RED MCCOMBS SCHOOL OF BUSINESS	N	
0332	INTERIM PROVOST DESIGNATE	N	
0333	ASSOCIATE DEAN FOR HEALTH PROFESSIONS	N	
0334	ASSOCIATE DEAN OF STUDENTS	N	
0335	DEAN	N	
0336	DEPARTMENT CHAIR	N	
0337	VICE PRESIDENT AND CHIEF FINANCIAL OFFICER	N	
0338	INTERIM DEAN	N	
0339	ASSOCIATE VICE PRESIDENT AND CONTROLLER	N	
0340	INTERIM PROVOST	N	
0341	CHIEF SPEECHWRITER, OFFICE OF THE PRESIDENT	N	
0342	DIRECTOR AND ASSOCIATE VICE-PRESIDENT FOR STUDENT AFFAIRS	N	
0343	REGISTRAR	N	
0344	ASSOCIATE REGISTRAR	N	
0345	DEPUTY TO THE VICE PRESIDENT	N	
0346	VICE PRESIDENT FOR INSTITUTIONAL RELATIONS AND LEGAL AFFAIRS	N	
0347	ASSOCIATE DEAN FOR ACADEMIC AFFAIRS	N	
0348	ASSOCIATE DEAN FOR RESEARCH	N	
0349	ASSOCIATE DIRECTOR OF ADMISSIONS	N	
0350	ASSISTANT DEAN OF STUDENTS	N	
0351	ASSISTANT DEAN	N	
0352	ASSISTANT CONTROLLER	N	
0353	DIRECTOR, PUBLIC AFFAIRS	N	
0354	ACTING DEAN	N	
0355	ASSOCIATE VICE PRESIDENT FOR HUMAN RESOURCES	N	
0356	ASSISTANT REGISTRAR	N	
0357	ACTING ASSISTANT DEAN	N	
0358	INTERIM ASSOCIATE VICE PRESIDENT	N	
0359	ASSISTANT TO THE PRESIDENT	N	
0360	DIRECTOR OF PLACEMENT	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
0361	PROJECT MANAGER	N	
0363	ASSISTANT DIRECTOR FOR RESEARCH RELATIONS	N	
0365	DIRECTOR OF LEARNING CENTER	N	
0367	PROGRAM MANAGER	N	
0368	ASSISTANT TO THE VICE- PRESIDENT FOR STUDENT AFFAIRS	N	
0370	ACTING ASSOCIATE DEAN	N	
0371	PROJECT DIRECTOR	N	
0372	SENIOR VICE PRESIDENT AND SPECIAL ASSISTANT TO THE PRESIDENT	N	
0373	ASSOCIATE VICE PRESIDENT FOR INSTITUTIONAL RELATIONS	N	
0374	SENIOR VICE PRESIDENT	N	
0375	ASSISTANT DIRECTOR FOR SPONSORED PROJECTS	N	
0376	ASSISTANT TO THE VICE-PRESIDENT	N	
0377	DIRECTOR OF RECREATIONAL SPORTS AND ASSOCIATE VICE PRESIDENT FOR STUDENT AFFAIRS	N	
0378	CAMPUS DIRECTOR OF REAL ESTATE	N	
0379	DIRECTOR	N	
0380	ASSISTANT TO THE VICE PRESIDENT FOR ADMINISTRATION AND LEGAL AFFAIRS	N	
0381	PROGRAM DIRECTOR	N	
0382	DIRECTOR	N	
0383	ASSOCIATE VICE PRESIDENT FOR LEGAL AFFAIRS	N	
0384	SENIOR ASSOCIATE VICE PRESIDENT	N	
0385	ASSOCIATE DIRECTOR	N	
0386	DEPUTY DIRECTOR	N	
0390	CONTINUING EDUCATION (FACULTY)	N	
0391	DEPUTY PRODUCER	N	
0392	ACADEMIC BUDGET OFFICER	N	
0395	ASSISTANT DIRECTOR	N	
0396	SPECIAL ASSISTANT	N	
0399	ASSISTANT DIRECTOR OF ADMISSIONS	N	
0400	ASSISTANT DEAN OF GRADUATE STUDIES	N	
0406	CHIEF, UNIVERSITY POLICE	N	
0407	FINANCIAL OFFICER	N	
0409	DIRECTOR OF CONTINUING EDUCATION	N	
0410	BUSINESS MANAGER, ERWIN CENTER	N	
0411	REAL ESTATE OFFICER	N	
0413	EXCHANGE FELLOW	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
0415	SUPERINTENDENT, MCDONALD OBSERVATORY	N	
0416	FACILITY MANAGER	N	
0417	ASSOCIATE DIRECTOR OF ADMISSIONS AND ASSISTANT DEAN OF GRADUATE STUDIES	N	
0418	MANAGER	N	
0423	HUB STAFF ASSOCIATE	N	
0424	COORDINATOR/DIRECTOR-HUB PROGRAM	N	
0426	COORDINATOR	N	
0427	COUNSELOR	N	
0429	DIRECTOR OF SPECIAL PROJECTS	N	
0430	COMMUNITY RELATIONS SPECIALIST	N	
0431	INTERSCHOLASTIC LEAGUE WAIVER OFFICER	N	
0432	INTERIM DIRECTOR	N	
0433	ASSOCIATE VICE-PRESIDENT AND DIRECTOR	N	
0434	EXECUTIVE DIRECTOR FOR DEVELOPMENT	N	
0435	DIRECTOR OF STUDENT AND ALUMNI PROGRAMS	N	
0436	ASSOCIATE VICE-PRESIDENT AND BUDGET DIRECTOR	N	
0437	DIRECTOR OF DEVELOPMENT	N	
0438	CAREER DEVELOPMENT COORDINATOR	N	
0439	DEVELOPMENT OFFICER	N	
0442	PROGRAM COORDINATOR	N	
0445	TECHNOLOGY LICENSING SPECIALIST	N	
0446	SENIOR TECHNOLOGY LICENSING SPECIALIST	N	
0448	ASSISTANT TO THE DIRECTOR	N	
0449	ASSISTANT PROGRAM COORDINATOR	N	
0452	DIRECTOR OF CORPORATE RELATIONS AND PLACEMENT	N	
0453	ASSOCIATE DEAN	N	
0454	ASSISTANT TO THE DEAN	N	
0455	SPECIAL ASSISTANT TO THE DIRECTOR	N	
0456	ACTING DIRECTOR	N	
0457	EXECUTIVE DIRECTOR	N	
0461	EXECUTIVE ASSOCIATE	N	
0463	ASSOCIATE BUSINESS CONTRACT ADMINISTRATOR	N	
0464	DIRECTOR, LEGAL SERVICES FOR STUDENTS	N	
0465	ATTORNEY	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
0466	PRINCIPAL OF THE ELEMENTARY SCHOOL AND CEO	N	
0467	TRAINING SPECIALIST	Y	Physical Activity
0468	ASSISTANT CHIEF OF POLICE	Y	Physical Activity
0469	SUPERINTENDENT	N	
0470	ENGINEER	N	
0471	ARCHITECT	N	
0472	ASSISTANT MANAGER	N	
0474	PHYSICAL THERAPIST/ ATHLETIC TRAINER	Y	Physical Activity
0475	ASSISTANT DIRECTOR AND FINANCIAL OFFICER	N	
0477	DIRECTOR OF MUSEUM OPERATIONS	N	
0478	ASSISTANT SUPERINTENDENT FOR TELECOMMUNICATIONS	N	
0479	ASSISTANT VICE PRESIDENT FOR RESOURCE DEVELOPMENT	N	
0480	ASSOCIATE VICE PRESIDENT FOR CAMPUS PLANNING AND CAPITAL PROJECTS	N	
0482	BUSINESS CONTRACTS ADMINISTRATOR	N	
0485	CONSULTANT	N	
0488	CAREER DEVELOPMENT SPECIALIST	N	
0489	PROJECT COORDINATOR	N	
0493	GUEST LECTURER	Y	Faculty based, Standing
0494	DEAN DESIGNATE	N	
0497	DIRECTOR EMERITUS	N	
0498	SECRETARY TO GENERAL FACULTY	N	
0499	FACULTY DEVELOPMENT SPECIALIST	N	
0500	VICE PRESIDENT FOR EMPLOYEE AND CAMPUS SERVICES	N	
0501	PHYSICIAN	Y	Standing, Physical Activity
0502	DEPUTY TO THE PRESIDENT	N	
0510	PHYSICIAN-SPECIALIST- PSYCHIATRY	N	
0513	DIRECTOR, STUDENT HEALTH CENTER	N	
0520	A&P HOURLY EMPLOYMENT	?	Part-Time?
0522	DIRECTOR OF ATHLETIC MEDICINE	N	
0523	INTERN	Y	Student
0524	ASSISTANT DIRECTOR, NURSING SERVICE	Y	Standing, Physical Activity
0525	HEALTH EDUCATION MANAGER	N	
0526	CONSULTANT, PHYSICAL REHABILITATION	Y	Standing, Physical Activity
0530	VETERINARIAN	Y	Standing, Physical Activity
0602	ASSISTANT CURATOR	N	
0604	CHIEF CURATOR	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
0605	SENIOR CURATOR	N	
0606	CURATOR	N	
0607	CONSERVATOR	N	
0611	SENIOR CONSERVATOR (PHOTOGRAPHY)	N	
0612	VISUAL ARTS CURATOR	N	
0614	SENIOR CONSERVATOR	N	
0615	PIANO TECHNICIAN	Y	Standing, Physical Activity
0701	SENIOR RESEARCH SCIENTIST	N	
0702	RESEARCH SCIENTIST	N	
0703	SENIOR RESEARCH ENGINEER	N	
0704	RESEARCH ENGINEER	N	
0705	SENIOR RESEARCH FELLOW	N	
0706	RESEARCH FELLOW	N	
0707	SENIOR ENGINEERING SCIENTIST	N	
0708	RESEARCH ASSOCIATE	N	
0709	HARRINGTON FELLOW	Y	Faculty based
0712	POSTDOCTORAL FELLOW	Y	Faculty based
0713	RESEARCH PROFESSOR	Y	Faculty based
0714	RESEARCH ASSOCIATE PROFESSOR	Y	Faculty based
0715	RESEARCH ASSISTANT PROFESSOR	Y	Faculty based
0802	ASSISTANT ATHLETIC DIRECTOR	Y	Physical Activity
0804	ATHLETIC DIRECTOR	Y	Physical Activity
0805	DIRECTOR OF EVENTS	N	
0806	HEAD COACH	Y	Physical Activity
0807	ASSISTANT COACH	Y	Physical Activity
0809	ASSOCIATE DIRECTOR FOR DEVELOPMENT	N	
0810	ASSISTANT TO THE ATHLETIC DIRECTOR	Y	Physical Activity
0811	CERTIFICATION ADMINISTRATOR	N	
0812	ASSOCIATE VICE PRESIDENT FOR FACILITIES MANAGEMENT	N	
0814	ASSISTANT DIRECTOR FOR DEVELOPMENT	N	
0824	ATHLETICS PUBLICATIONS SUPERVISOR	N	
0825	ASSISTANT SPORTS INFORMATION DIRECTOR	N	
0826	SPORTS INFORMATION DIRECTOR	N	
0827	SENIOR ASSOCIATE ATHLETIC DIRECTOR	N	
0828	INTERSCHOLASTIC LEAGUE PROGRAM DIRECTOR	N	
0829	INTERSCHOLASTIC LEAGUE PROGRAM ADMINISTRATOR	N	
0831	ASSOCIATE ATHLETIC DIRECTOR	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
0833	CAREER COUNSELING AND PLACEMENT COORDINATOR	N	
0839	ATHLETIC TRAINER	Y	Physical Activity
0840	ASSISTANT ATHLETIC TRAINER	Y	Physical Activity
0844	DEVELOPMENT MANAGER FOR ATHLETICS	N	
0847	COMPLIANCE COORDINATOR	N	
0848	SUPERVISOR OF ATHLETICS FACILITIES, EQUIPMENT, AND MAINTENANCE	N	
0849	SPORTS VIDEO SPECIALIST	N	
0855	ASSISTANT ACADEMIC COUNSELOR	N	
0856	ACADEMIC COUNSELOR	N	
0857	CHEERLEADER COORDINATOR	Y	Physical Activity
0858	ASSISTANT CHEERLEADER COORDINATOR	N	
0909	OMBUDSPERSON (FACULTY)	N	
0910	OMBUDSPERSON (STUDENT)	N	
0912	STUDENTS' ASSOCIATION PRESIDENT	N	
0917	EDITOR	N	
0922	COMMUNICATIONS COORDINATOR	N	
0923	CHAIRPERSON, TEXAS UNION BOARD OF DIRECTORS	N	
0925	STUDENT PUBLICATIONS STAFF	N	
0928	ADVERTISING SALESPERSON	N	
0930	MARKETING MANAGER	N	
0934	ACQUISITIONS EDITOR	N	
0935	JOURNALS MANAGER, UNIVERSITY OF TEXAS PRESS	N	
0937	SENIOR HOST/PRODUCER	Y	Standing, Physical Activity
0938	SENIOR PRODUCER AND CORRESPONDENT	N	
0939	RIGHTS AND PERMISSIONS MANAGER	N	
0940	TRADE SALES MANAGER	N	
0941	OUTSIDE SALESPERSON	N	
0942	SPECIAL PROJECTS COORDINATOR	N	
0943	INFORMAL CLASS INSTRUCTOR	Y	Part-Time

APPENDIX C

TEXAS A&M UNIVERSITY, COLLEGE STATION JOB TITLES

Texas A&M University Administrative and Professional Titles (faculty and students removed)			
Job Code	**Job Title**	**Exclude Y or N**	**Rationale for Exclusion**
7027	PROFESSOR AND DIRECTOR	Y	Faculty
7050	PROFESSOR AND HEAD	Y	Faculty
7053	PROFESSOR AND INTERIM HEAD	Y	Faculty
7054	PROFESSOR & ASSOCIATE DEPARTMENT HEAD	Y	Faculty
7064	DISTINGUISHED PROFESSOR AND INTERIM HEAD	Y	Faculty
7102	PROFESSOR AND ASSOCIATE DEAN	Y	Faculty
7150	PROFESSOR AND ASSISTANT DEPARTMENT HEAD	Y	Faculty
7203	ASSOCIATE PROFESSOR AND HEAD	Y	Faculty
7204	ASSOCIATE PROFESSOR & DIRECTOR	Y	Faculty
7206	ASSOCIATE PROFESSOR AND ASSOCIATE DEPARTMENT HEAD	Y	Faculty
7270	ASSOCIATE PROFESSOR AND INTERIM HEAD	Y	Faculty
7610	DIRECTOR	N	
7611	DIRECTOR	N	
7655	DIRECTOR, COMPARATIVE MEDICINE PROGRAM	N	
7658	DIRECTOR, VETERINARY MEDICAL PARK	N	
7906	COMMANDANT	Y	Physical Activity
8171	VICE PRESIDENT FOR GOVERNMENTAL AFFAIRS	N	
8510	PROJECT DIRECTOR FOR ENTERPRISE INFO SYSTEMS	N	
8531	EXECUTIVE DIRECTOR OF REAL ESTATE DEVELOPMENT	N	
8534	CLINICAL VETERINARIAN	Y	Standing
8541	SR ASSOCIATE ATHLETIC DIRECTOR & ATHLETICS CFO	Y	Physical Activity
8589	VICE PRESIDENT & ASSOCIATE PROVOST FOR INFO TECHNO	N	
8593	ASSOCIATE DIRECTOR, EIS	N	
8598	SENIOR ASSOCIATE VICE PRESIDENT	N	
8618	DIRECTOR OF RECRUITMENT	N	
8627	ASSISTANT DIRECTOR, CORPS RECRUITING	Y	Physical Activity
8628	ASSISTANT COMMANDANT	Y	Physical Activity

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
8635	ASSISTANT DIRECTOR FOR RESOURCE MANAGEMENT	N	
8638	ASSISTANT DIRECTOR FOR TELECOMMUNICATIONS	N	
8648	ASSISTANT CHILD CARE CENTER DIRECTOR	N	
8671	DIRECTOR OF CORPS CENTER & EXTERNAL SUPPORT	N	
8680	DIRECTOR, PRESIDENTIAL CONFERENCE CENTER	N	
8695	ASSISTANT PROVOST FOR ENROLLMENT	N	
8737	DIRECTOR, MILITARY PROPERTY WAREHOUSE	Y	Standing
8745	ASSOCIATE DIRECTOR OF COUNSELING	N	
8760	MANAGING EDITOR	N	
8764	ASSISTANT DIRECTOR FOR UTILITIES	N	
8766	CHIEF OF POLICE	Y	Physical Activity
8782	CHILD CARE CENTER DIRECTOR	N	
8800	VICE PRES FOR COMMUNICATIONS & CHIEF MKTG OFFICER	N	
8802	DIRECTOR, HUB	N	
8805	VICE PRESIDENT AND CEO	N	
8806	EXECUTIVE DIRECTOR FOR ADMINISTRATIVE SERVICES	N	
8807	ASSOCIATE VICE PRESIDENT & CHIEF HR OFFICER	N	
8818	ASSOCIATE EXECUTIVE VICE PRESIDENT	N	
8819	VICE PRES & ASSOC PROV INSTIT ASSESSMT & DIVERSITY	N	
8822	DEAN OF UNDERGRAD PROGS & ASSOC PROV FOR ACAD SERV	N	
8826	ASSOCIATE VICE PRESIDENT FOR FINANCE & CONTROLLER	N	
8832	CHIEF OF STAFF, OFFICE OF THE COMMANDANT	Y	Physical Activity
8833	DIRECTOR OF COMPUTING OPERATIONS, QATAR	N	
8839	DIRECTOR OF STUDENT LIFE PROGRAMS	N	
8840	DIRECTOR OF BASKETBALL/VOLLEYBALL BANDS	Y	Physical Activity

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
8852	DEAN & CEO, QATAR	Y	Out of the Country
8858	DIRECTOR, ADULT LITERACY CLEARINGHOUSE PROJECT	N	
8859	DIRECTOR OF THE HONOR SYSTEM	N	
8867	DEPUTY ATHLETIC DIRECTOR	Y	
8874	DIRECTOR, QATAR SUPPORT SERVICES	Y	
8881	DIRECTOR OF ADMISSIONS/REGISTRAR	N	
8893	DIRECTOR OF LOGISTICS	N	
8896	DIRECTOR, INTEGRATIVE CENTER FOR HOMELAND SECURITY	N	
8937	EXECUTIVE ASSOCIATE VICE PRESIDENT FOR RESEARCH	N	
8938	DIRECTOR OF COLLEGE RELATIONS	N	
8946	SPECIAL ADVISOR TO THE PRESIDENT	N	
8951	EDITOR-IN-CHIEF	N	
8966	DIRECTOR OF ACCOUNTING	N	
8968	DIRECTOR OF ACCOUNTING SERVICES	N	
8982	ASSOCIATE EXECUTIVE DIRECTOR	N	
8989	DIRECTOR OF SPECIAL PROJECTS	N	
9003	INTERIM PRESIDENT	N	
9075	ASSISTANT DEPUTY VICE CHANCELLOR	N	
9086	CHIEF OF STAFF	N	
9102	EXECUTIVE VICE PRESIDENT AND PROVOST	N	
9103	VICE PRESIDENT FOR DEVELOPMENT	N	
9106	DEAN	N	
9107	ASSOCIATE DEAN	N	
9108	ASSISTANT DEAN	N	
9110	ASSOCIATE DEAN AND DIRECTOR	N	
9117	VICE PRESIDENT FOR STUDENT AFFAIRS	N	
9120	VICE PRESIDENT FOR RESEARCH	N	
9133	EXECUTIVE DIRECTOR OF UNIVERSITY FOOD SERVICES	N	
9138	EXECUTIVE ASSOCIATE DEAN	N	
9141	ATHLETIC DIRECTOR	Y	
9142	ASSOCIATE ATHLETIC DIRECTOR	Y	
9149	ASSOCIATE DIRECTOR OF STUDENT ACTIVITIES	N	
9150	ASSISTANT DIRECTOR OF ADMISSIONS AND RECORDS	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
9155	REGISTRAR	N	
9156	DIRECTOR OF PURCHASING AND STORES	N	
9160	INTERIM DEAN	N	
9173	ASSISTANT VICE PRESIDENT FOR STUDENT AFFAIRS	N	
9175	DIRECTOR, STUDENT HEALTH CENTER	N	
9183	DIRECTOR FOR UTILITIES	N	
9184	ASSISTANT DIRECTOR FOR ENGINEERING & DESIGN SVCS	N	
9188	DIRECTOR OF STUDENT COUNSELING SERVICE	N	
9189	DIRECTOR, PLACEMENT	N	
9191	DIRECTOR FOR TELECOMMUNICATIONS	N	
9197	DEAN OF GRADUATE STUDIES	N	
9202	DIRECTOR, MARCHING AND CONCERT BANDS	Y	
9212	SENIOR ASSOCIATE DIRECTOR OF AGGIE BANDS	Y	
9223	DIRECTOR OF STUDENT FINANCIAL AID	N	
9224	ASSOCIATE REGISTRAR	N	
9225	ASSOCIATE DIRECTOR OF BANDS	Y	
9239	DIRECTOR OF AVIATION	N	
9245	ASSOCIATE DIRECTOR OF ADMISSIONS	N	
9248	DIRECTOR OF ADMISSIONS	N	
9250	ASSOCIATE DIRECTOR - STUDENT FINANCIAL AID	N	
9260	DIRECTOR, MULTICULTURAL SERVICES	N	
9276	ASSOCIATE DIRECTOR, SEA GRANT PROGRAM	Y	Galveston?
9280	ASSISTANT VICE PRESIDENT FOR PHYSICAL PLANT	N	
9281	ASSOCIATE VICE PRESIDENT	N	
9284	DEAN OF FACULTIES & ASSOCIATE PROVOST	N	
9288	DIRECTOR OF MSC AND UNIVERSITY CENTER COMPLEX	N	
9289	ASSOCIATE DIRECTOR OF STUDENT AFFAIRS	N	
9290	DIRECTOR OF STUDENT AFFAIRS	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
9291	ASSOCIATE VICE PRESIDENT FOR STUDENT AFFAIRS	N	
9292	ASSISTANT PROVOST	N	
9294	DIRECTOR, SEA GRANT PROGRAM	Y	Galveston?
9295	DIRECTOR, TEXAS A&M UNIVERSITY PRESS	N	
9298	ASSOCIATE VICE PRESIDENT & CHIEF OF STAFF	N	
9302	DEPUTY DIRECTOR	N	
9303	ASSISTANT DIRECTOR	N	
9304	ASSOCIATE DIRECTOR	N	
9314	SENIOR ACADEMIC BUSINESS ADMINISTRATOR II	N	
9315	DIRECTOR OF EXECUTIVE MBA PROGRAM	N	
9322	DIRECTOR & PROFESSOR	Y	Faculty
9410	EDITOR	N	
9443	ASSISTANT CHIEF OF POLICE	Y	
9467	SENIOR EDITOR-REAL ESTATE	N	
9469	CHIEF ECONOMIST	N	
9475	DEAN OF UNIVERSITY LIBRARIES	N	
9485	CHIEF INFORMATION OFFICER, QATAR	Y	
9491	DIRECTOR OF INTERNATIONAL SERVICES	N	
9505	INTERIM DIRECTOR	N	
9526	ASSOCIATE DIRECTOR OF HUMAN RESOURCES	N	
9528	ASSISTANT DIRECTOR OF HUMAN RESOURCES	N	
9530	EXECUTIVE DIRECTOR	N	
9538	DIRECTOR OF INFORMATION SYSTEMS	N	
9570	DIRECTOR FOR SPECIAL PROGRAMS	N	
9576	INTERIM ASSOCIATE DEAN	N	
9582	DIRECTOR OF TRANSPORTATION SERVICES	N	
9586	VICE PRESIDENT FOR ADMINISTRATION	N	
9587	ASSOCIATE VICE PRESIDENT FOR FINANCE	N	
9598	ASSISTANT VICE PRESIDENT	N	
9600	DIRECTOR OF ATHLETIC COMPLIANCE	N	
9602	ASSISTANT DIRECTOR OF FINANCIAL MANAGEMENT SVCS	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
9603	ASSISTANT DIRECTOR FOR ADMINISTRATION	N	
9605	ASSOCIATE DIRECTOR, CORPS RECRUITING	N	
9711	ASSISTANT DEPARTMENT HEAD	Y	Faculty
9889	SENIOR ASSOCIATE DIRECTOR	N	
9906	SENIOR VICE PRESIDENT AND CHIEF FINANCIAL OFFICER	N	
9927	ASSISTANT DIRECTOR OF ADMISSIONS	N	
9934	ASSISTANT DIRECTOR OF STUDENT FINANCIAL AID	N	
9950	SENIOR ASSOCIATE ATHLETIC DIRECTOR	N	
9953	ASSISTANT ATHLETIC DIRECTOR	N	
9955	ASSISTANT DIRECTOR FOR FISCAL OPERATIONS	N	
9958	ASSISTANT DIRECTOR, MEMORIAL STUDENT CENTER	N	
9959	ASSOCIATE DIRECTOR, MEMORIAL STUDENT CENTER	N	
9965	DIRECTOR, CENTER FOR EXECUTIVE DEVELOPMENT	N	
9968	ASSISTANT DIRECTOR OF PLACEMENT	N	
9969	ASSOCIATE DIRECTOR OF INSTITUTIONAL ANALYSIS	N	
9970	ASSOCIATE DIRECTOR, CIS	N	
9981	DIRECTOR OF RECREATIONAL SPORTS	N	
9982	ASSOCIATE DIRECTOR OF RECREATIONAL SPORTS	N	
9986	ASSISTANT DIRECTOR OF COOPERATIVE EDUCATION	N	
9989	ASSISTANT DIRECTOR FOR FACILITIES MAINTENANCE	N	
9994	ASSISTANT DIRECTOR OF RECREATIONAL SPORTS	N	
0035	LIBRARY ASSOCIATE II	N	
0219	LAB STRS&PROC OFC II	N	
0708	MAIL SERVICE MGR	Y	Physical Activity
1206	REGISTERED NURSE I	Y	Physical Activity
1207	REGISTERED NURSE II	Y	Physical Activity
3011	CONSTRUCTION INSPECTOR-PHYSICAL PLANT	Y	Physical Activity
3028	PLANNER-ESTIMATOR I	N	
3029	PLANNER-ESTIMATOR II	N	
4336	BOARD SERVICE MGR	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
4341	FOOD SERVICE MGR II	Y	Physical Activity
4365	ASST CASH FAC MGR	Y	Physical Activity
4366	CASH FACILITY MGR	Y	Physical Activity
4367	BOARD FACILITY MGR	N	
4368	ASST CATERING MGR	Y	Physical Activity
4378	SOUS CHEF	Y	Physical Activity
5007	DIAGNOSTIC LABORATORY SUPERVISOR	N	
5088	VET TECH IV	Y	Physical Activity
7153	RESEARCH CHEMIST	N	
7154	RESEARCH ENGINEER	N	
7156	RESEARCH SCIENTIST	N	
7159	RESEARCH ECONOMIST	N	
7252	ASSOCIATE RESEARCH SCIENTIST	N	
7255	ASSOCIATE RESEARCH ENGINEER	N	
7257	ASSOCIATE RESEARCH SOCIAL SCIENTIST	N	
7261	OPERATIONS CHIEF	N	
7351	ASSISTANT RESEARCH SCIENTIST	N	
7360	POSTDOCTORAL RESEARCH ASSOCIATE	Y	Faculty
7363	HEALTH PHYSICIST	N	
7415	ASSOCIATE RESEARCH SPECIALIST	N	
7416	ASSISTANT RESEARCH SPECIALIST	N	
7540	POSTDOCTORAL FELLOW	Y	Faculty
7601	TEES RESEARCH ENGINEERING ASSOCIATE I	N	
7615	COORDINATOR OF CONTINUING EDUCATION	N	
7656	CMP ANIMAL HEALTH SERVICES COORDINATOR	N	
7657	CMP AREA COORDINATOR	N	
7742	INFECTION CONTROL COORDINATOR	N	
7907	CADET TRAINING OFFICER	Y	Physical Activity
7911	CADET TRAINING OFFICER II	Y	Physical Activity
7912	CADET TRAINING OFFICER III	Y	Physical Activity
8010	ENGINNERING DATA ANALYSIS & COMMUNICATIONS SPEC	N	
8101	SUPERVISOR FOR UTILITIES ENVIRONMENTAL SERVICES	Y	Physical Activity
8105	SENIOR COORDINATOR FOR ENGINEERING GRAD STUDIES	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
8149	MARINE LOGISTICS COORDINATOR	Y	Physical Activity
8179	COMMUNICATIONS SPECIALIST	N	
8183	CONTRACT ADMINISTRATOR	N	
8184	INFORMATION SPECIALIST	N	
8233	EXTENSION MARINE BUSINESS MANAGEMENT SPECIALIST	N	
8281	PROJECT SUPERVISOR	N	
8438	IT POLICY & SECURITY PROGRAMS ADMINISTRATOR	N	
8440	LD IT POLICY & SECURITY PROGRAMS ADMINISTRATOR	N	
8443	DATABASE ADMINISTRATOR	N	
8444	SENIOR DATABASE ADMINISTRATOR	N	
8445	LEAD DATABASE ADMINISTRATOR	N	
8455	INFORMATION TECHNOLOGY TEAM LEADER	N	
8456	INFORMATION TECHNOLOGY MANAGER	N	
8457	SENIOR INFORMATION TECHNOLOGY MANAGER	N	
8458	SECURITY ANALYST	N	
8460	LEAD SECURITY ANALYST	N	
8461	SENIOR LEAD SECURITY ANALYST	N	
8462	CHIEF SECURITY ANALYST	N	
8463	NETWORK ENGINEER	N	
8464	SENIOR NETWORK ENGINEER	N	
8465	LEAD NETWORK ENGINEER	N	
8466	SENIOR LEAD NETWORK ENGINEER	N	
8467	CHIEF NETWORK ENGINEER	N	
8468	NETWORK ANALYST	N	
8473	MICROCOMPUTER/LAN ADMINISTRATOR	N	
8474	SENIOR MICROCOMPUTER/LAN ADMINISTRATOR	N	
8475	LEAD MICROCOMPUTER/LAN ADMINISTRATOR	N	
8478	INFORMATION TECHNOLOGY ASSOCIATE	N	
8479	SENIOR INFORMATION TECHNOLOGY ASSOCIATE	N	
8480	SOFTWARE APPLICATIONS DEVELOPER	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
8481	SENIOR SOFTWARE APPLICATIONS DEVELOPER	N	
8482	LEAD SOFTWARE APPLICATIONS DEVELOPER	N	
8483	SENIOR LEAD SOFTWARE APPLICATIONS DEVELOPER	N	
8484	CHIEF SOFTWARE APPLICATIONS DEVELOPER	N	
8485	CHIEF INFORMATION TECHNOLOGY CONSULTANT	N	
8487	LEAD INFORMATION TECHNOLOGY CONSULTANT	N	
8488	SENIOR INFORMATION TECHNOLOGY CONSULTANT	N	
8489	INFORMATION TECHNOLOGY CONSULTANT	N	
8490	WEBSITE DESIGNER	N	
8493	PROGRAM ASSISTANT	N	
8496	INFORMATION TECHNOLOGY/LAN ADMINISTRATOR	N	
8497	SENIOR INFORMATION TECHNOLOGY/LAN ADMINISTRATOR	N	
8499	CHIEF IT/TELECOM BUSINESS CONTINUITY CONSULTANT	N	
8506	RESEARCH DEVELOPMENT OFFICER	N	
8507	TEES TECHNICAL LABORATORY MANAGER	N	
8508	ELECTRICAL ENGINEER	N	
8511	UTILITIES BUSINESS ANALYST	N	
8524	AUTOMATED FABRICATION MANAGER	N	
8527	DINING SERVICES UNIT MANAGER	N	
8530	UTILITY PLANT OPERATIONS SPECIALIST	N	
8535	EIS FUNCTIONAL REPRESENTATIVE	N	
8536	EIS FUNCTIONAL ANALYST	N	
8537	EIS FUNCTIONAL ANALYST AND LIAISON	N	
8538	EIS FUNCTIONAL LEAD	N	
8539	WEB AND INFORMATION DESIGNER	N	
8540	ENERGY ENGINEER	N	
8543	DATABASE/APPLICATIONS DEVELOPER	N	
8544	ARCHITECTURE RANCH FACILITIES ADMINISTRATOR	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
8149	MARINE LOGISTICS COORDINATOR	Y	Physical Activity
8179	COMMUNICATIONS SPECIALIST	N	
8183	CONTRACT ADMINISTRATOR	N	
8184	INFORMATION SPECIALIST	N	
8233	EXTENSION MARINE BUSINESS MANAGEMENT SPECIALIST	N	
8281	PROJECT SUPERVISOR	N	
8438	IT POLICY & SECURITY PROGRAMS ADMINISTRATOR	N	
8440	LD IT POLICY & SECURITY PROGRAMS ADMINISTRATOR	N	
8443	DATABASE ADMINISTRATOR	N	
8444	SENIOR DATABASE ADMINISTRATOR	N	
8445	LEAD DATABASE ADMINISTRATOR	N	
8455	INFORMATION TECHNOLOGY TEAM LEADER	N	
8456	INFORMATION TECHNOLOGY MANAGER	N	
8457	SENIOR INFORMATION TECHNOLOGY MANAGER	N	
8458	SECURITY ANALYST	N	
8460	LEAD SECURITY ANALYST	N	
8461	SENIOR LEAD SECURITY ANALYST	N	
8462	CHIEF SECURITY ANALYST	N	
8463	NETWORK ENGINEER	N	
8464	SENIOR NETWORK ENGINEER	N	
8465	LEAD NETWORK ENGINEER	N	
8466	SENIOR LEAD NETWORK ENGINEER	N	
8467	CHIEF NETWORK ENGINEER	N	
8468	NETWORK ANALYST	N	
8473	MICROCOMPUTER/LAN ADMINISTRATOR	N	
8474	SENIOR MICROCOMPUTER/LAN ADMINISTRATOR	N	
8475	LEAD MICROCOMPUTER/LAN ADMINISTRATOR	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
8605	FINANCIAL MANAGEMENT SUPERVISOR I - UNIVERSITY	N	
8606	FINANCIAL MANAGEMENT SUPERVISOR II - UNIVERSITY	N	
8610	ASSISTANT FINANCIAL MANAGER - UNIVERSITY	N	
8611	FINANCIAL MANAGER - UNIVERSITY	N	
8615	UNDERGRADUATE COUNSELOR	N	
8620	STUDY ABROAD ADVISOR	N	
8621	SENIOR STUDY ABROAD ADVISOR	N	
8622	WEBSITE ADMINISTRATOR	N	
8623	ATHLETIC ACADEMIC CERTIFICATION SPECIALIST	Y	Physical Activity
8629	NEWS ADVISER	N	
8631	SENIOR VISUALIZATION SYSTEMS ADMINISTRATOR	N	
8633	SIMS LEAD SECURITY AND TRAINING COORDINATOR	N	
8636	SUPERVISOR FOR CONTRACTING & PROGRAMMING	N	
8640	CAREER SERVICES COORDINATOR	N	
8641	CREATIVE MANAGER/NEW MEDIA	N	
8642	ENVIRONMENTAL SAFETY MANAGER	N	
8643	ATHLETIC EQUIPMENT MANAGER	Y	Physical Activity
8644	ASSISTANT ATHLETIC EQUIPMENT MANAGER	Y	Physical Activity
8645	MARKETING MANAGER	N	
8646	MANAGER OF INFORMATION TECHNOLOGY & DATA SERVICES	N	
8647	EARLY CHILDHOOD LEAD TEACHER	N	
8658	SENIOR VISUALIZATION PRODUCTION SPECIALIST	N	
8672	SPECIAL ASSISTANT TO THE ATHLETIC DIRECTOR	N	
8673	MANAGER, LAN & WORKSTATION SUPPORT SERVICES	N	
8675	ATHLETIC BUSINESS MANAGER	Y	Physical Activity
8681	RECORDS & INFORMATION ANALYST	N	
8684	COMMUNITY DEVELOPMENT SPECIALIST	N	
8685	SENIOR COMMUNITY DEVELOPMENT SPECIALIST	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
8690	ASSISTANT MANAGER, CIS BUSINESS SUPPORT SERVICES	N	
8691	FOOD SERVICE WAREHOUSE OPERATIONS MANAGER	Y	Physical Activity
8696	ASSISTANT CURATOR OF VISUAL RESOURCES	N	
8700	ASSISTANT TO EXECUTIVE DIRECTOR	N	
8702	STAGE MANAGER	Y	Physical Activity
8704	PRE PRESS AND ELECTRONIC PUBLISHING MANAGER	N	
8705	ASSISTANT MANAGER, PRESIDENTIAL CONF CENTER	N	
8709	COUNSELING & DEVELOPMENT SPECIALIST III	N	
8710	COUNSELING & DEVELOPMENT SPECIALIST IV	N	
8711	PROFESSIONAL COUNSELOR I	N	
8712	PROFESSIONAL COUNSELOR II	N	
8714	PROFESSIONAL COUNSELOR IV	N	
8719	CHIEF PHARMACIST	Y	Physical Activity; Standing most of the day
8720	HEALTH CENTER PHARMACIST	Y	Physical Activity; Standing most of the day
8721	PHARMACIST	Y	Physical Activity; Standing most of the day
8723	ASSISTANT TO CHIEF OF STAFF	N	
8725	PSYCHOLOGIST I	N	
8726	PSYCHOLOGIST II	N	
8727	PSYCHOLOGIST III	N	
8728	PSYCHOLOGIST IV	N	
8729	PSYCHIATRIST	N	
8735	BUSINESS OPERATIONS MANAGER, TAMU PRESS	N	
8736	FINANCIAL MANAGER	N	
8739	CURATOR	N	
8743	PSYCHOLOGY INTERN	Y	Student/Faculty
8748	LEAD SYSTEMS ADMINISTRATOR	N	
8750	VISUALIZATION OPERATIONS MANAGER	N	
8752	SENIOR SYSTEMS ADMINISTRATOR	N	
8753	SYSTEMS ADMINISTRATOR	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
8758	CIS EMPLOYEE DEVELOPMENT COORDINATOR	N	
8759	ACQUISITIONS EDITOR	N	
8762	MANAGER FOR POWER DISTRIBUTION AND CONTROL SYSTEMS	N	
8763	UTILITIES PROJECT COORDINATOR	N	
8765	SENIOR LEAD SYSTEMS ENGINEER	N	
8768	COMPUTER SOFTWARE TRAINER I	N	
8769	COMPUTER SOFTWARE TRAINER II	N	
8770	COMPUTER SOFTWARE TRAINER III	N	
8773	TRAINING PROJECT LEADER I	N	
8781	CIVIL/STRUCTURAL ENGINEER	N	
8783	MANAGER OF APARTMENT FACILITIES	N	
8788	PROGRAM MANAGER	N	
8791	SPONSORED STUDENT ADVISOR	N	Faculty
8792	SENIOR SPONSORED STUDENT ADVISOR	N	Faculty
8793	ASSISTANT TO THE REGISTRAR	N	
8794	ASSISTANT TO THE ASSISTANT PROVOST	N	
8795	CHIEF SYSTEMS ENGINEER	N	
8796	REED ARENA EVENT COORDINATOR	Y	Physical Activity
8801	POSTDOCTORAL INTERN	Y	Student/Faculty
8804	AQUATICS MANAGER	Y	Physical Activity
8808	MANAGER OF TOOLS AND ANALYTICAL SERVICES	N	
8809	PRINT ACQUISITION CONSULTANT I	N	
8810	PRINT ACQUISITION CONSULTANT II	N	
8815	IODP SUPERVISOR OF MATERIALS SUPPORT	N	
8817	IODP MATERIALS SPECIALIST	N	
8821	OPERATIONS SUPERVISOR	N	
8824	FINANCIAL ANALYST	N	
8828	SENIOR FINANCIAL ANALYST	N	
8829	SHIPPING AND RECEIVING SPECIALIST	Y	Physical Activity
8838	ASSISTANT VIDEO COORDINATOR	Y	Physical Activity
8841	ASSISTANT ATHLETIC CONCESSIONS MANAGER	Y	Physical Activity
8843	UTILITY PLANT OPERATIONS COORDINATOR	Y	Physical Activity
8845	VIDEO COORDINATOR	Y	Physical Activity

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
8847	ATHLETIC CONCESSIONS MANAGER	Y	Physical Activity
8848	ATHLETIC ASSISTANT	Y	Physical Activity
8850	HEAD STRENGTH COACH	Y	Physical Activity
8851	COORDINATOR FOR ON-CAMPUS RECRUITING-FOOTBALL	N	
8853	REGIONAL FINANCIAL AID ADVISOR I	N	
8855	POLICY AND REVIEW COORDINATOR	N	
8856	RECRUITING SERVICES COORDINATOR	N	
8857	CAVALRY SITE MANAGER	Y	Physical Activity
8862	DIRECTOR OF PUBLIC AFFAIRS, QATAR	Y	Travel
8864	SENIOR SCHOLASTIC SUPERVISOR	N	
8865	PROPERTY AND INVENTORY SUPERVISOR	Y	Physical Activity
8866	SENIOR VIDEO/TELEVISION PRODUCTION MANAGER	Y	Physical Activity; Non-typical office work
8869	NUTRITIONIST	N	
8870	BUSINESS MANAGER	N	
8872	SENIOR INFORMATION COORDINATOR	N	
8873	EMPLOYEE DEVELOPMENT COORDINATOR	N	
8876	DIRECTOR, FACILITIES PLANNING-QATAR	Y	Travel
8886	COMPLIANCE COORDINATOR	N	
8891	HUB ADMINISTRATOR	N	
8894	ASSISTANT TO VICE PROVOST	N	
8895	ASSISTANT TO EXECUTIVE ASSOCIATE VICE PRESIDENT	N	
8900	GRADUATE HALL DIRECTOR	Y	Physical Activity
8906	BUSINESS ANALYST	N	
8907	NETWORK/SYSTEMS ENGINEER	N	
8908	NETWORK/SYSTEMS MANAGER	N	
8909	MANAGER EDUCATIONAL & COMMUNICATION RESOURCES	N	
8910	EXECUTIVE ASSISTANT TO VICE PRESIDENT	N	
8912	PRODUCTION EDITOR III	N	
8915	CHORAL ACTIVITIES DIRECTOR	Y	Physical Activity
8916	MANAGER FOR CONFERENCE SERVICES	Y	Physical Activity
8917	MANAGER	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
8924	WRITING CONSULTANT III	N	
8934	TEAM PHYSICIAN	Y	Physical Activity; Non-typical office work
8939	COLLEGE RELATIONS COORDINATOR	N	
8940	EXEC ASSISTANT TO EXEC VICE PRESIDENT & PROVOST	N	
8944	LANDSCAPE ARCHITECT	N	
8945	NURSE SPECIALIST-CARDIOVASCULAR SURGERY	Y	Physical Activity
8952	ASSOCIATE CURATOR	N	
8956	VIDEO NETWORK SPECIALIST II	Y	Physical Activity
9018	DIRECTOR OF COMMUNICATIONS AND PUBLIC RELATIONS	N	
9021	DIRECTOR, COMMUNICATIONS AND EXTERNAL RELATIONS	N	
9057	PLANNING & ESTIMATING SUPERVISOR	N	
9059	CONSTRUCTION PROJECT MANAGER	N	
9065	TECHNICAL MANAGER	N	
9077	EMPLOYEE RELATIONS SPECIALIST	N	
9079	CLASSIFICATION & COMPENSATION ANALYST	N	
9080	TEAM ADMINISTRATOR	N	
9082	ASSISTANT MUSIC COORDINATOR	N	
9083	STUDENT DEVELOPMENT SPECIALIST I	N	
9084	STUDENT DEVELOPMENT SPECIALIST II	N	
9085	STUDENT DEVELOPMENT SPECIALIST III	N	
9087	AUDIOVISUAL SPECIALIST	N	
9090	DESIGNER II	N	
9097	ASSISTANT MANAGER FOR ADMINISTRATIVE SERVICES	N	
9109	ASSISTANT TO DEAN	N	
9112	ASSISTANT TO EXECUTIVE ASSOCIATE DEAN	N	
	ASSISTANT TO THE EXECUTIVE ASSOCIATE DEAN	N	
9116	STUDENTS' ATTORNEY	N	
9118	EXECUTIVE ASSISTANT TO THE PRESIDENT	N	
9125	ATHLETIC COMPLIANCE EDUCATION COORDINATOR	Y	Physical Activity

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
9127	PHYSICAL THERAPIST	Y	Physical Activity
9131	TRANSPORTATION SERVICES MANAGER	N	
9134	MANAGER, ENGINEERING INTERNATIONAL PROGRAMS	N	
9143	COACH	Y	Physical Activity
9144	ASSISTANT COACH	Y	Physical Activity
9145	ATHLETIC TRAINER	Y	Physical Activity
9146	SCHOLASTIC SUPERVISOR	N	
9161	ADMISSIONS COUNSELING ADVISOR I	N	
9162	ADMISSIONS COUNSELING ADVISOR II	N	
9163	BUSINESS MANAGER, MEDICAL SCIENCES LIBRARY	N	
9167	ATHLETIC DINING MANAGER	Y	Physical Activity
9169	SENIOR ADMISSIONS COUNSELING ADVISOR	N	
9170	COACHING ASSISTANT	Y	Physical Activity
9176	BENEFITS ADMINISTRATOR	N	
9178	STAFF PHYSICIAN	Y	Physical Activity; Non-typical office work
9179	MANAGER OF CUSTODIAL SERVICES	Y	Physical Activity
9180	GRADUATE ASSISTANT, NON-TEACHING	Y	Student
9181	PROGRAM COORDINATOR	N	
9194	MANAGER, HR & PAYROLL SERVICES	N	
9199	QUALITY ASSURANCE & PROF DEV COORDINATOR	N	
9200	ASSISTANT TO ASSOCIATE PROVOST	N	
9204	MANAGER, SPECIAL PROJECTS	N	
9205	LANDSCAPE & PAVING MAINTENANCE SUPERINTENDENT	Y	Physical Activity
9207	MANAGER, CIS BUSINESS SUPPORT SERVICES	N	
9208	FM STATION MANAGER	N	
9210	GIS SPECIALIST	N	
9214	PUBLICATIONS COORDINATOR	N	
9215	SENIOR EMPLOYEE DEVELOPMENT SPECIALIST	N	
9219	SENIOR SCIENTIST	N	
9220	RESEARCH ASSOCIATE	N	
9221	GRADUATE ASSISTANT - RESEARCH	Y	Student

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
9222	SENIOR RESEARCH ASSOCIATE	N	
9226	DATA ANALYST	N	
9227	BUSINESS COORDINATOR I	N	
9228	EMPLOYEE RELATIONS REPRESENTATIVE	N	
9230	ASSISTANT PROCUREMENT & DISTRIBUTION MANAGER	N	
9231	FOOD PRO ADMINISTRATOR	Y	Physical Activity
9234	BENEFITS SERVICES COORDINATOR	N	
9237	PROMOTION MANAGER	N	
9238	HEAD GOLF PRO/PRO SHOP MANAGER	Y	Physical Activity
9241	TECHNICAL LABORATORY COORDINATOR	N	
9246	MARKETING MANAGER, TAMU PRESS	N	
9247	RESEARCH ASSISTANT	N	
9254	BUSINESS COORDINATOR II	N	
9255	GRAPHICS DESIGNER	N	
9258	MUSIC ACCOMPANIST	N	
9263	LABORATORY MANAGER	N	
9266	TESTING SERVICES ADMINISTRATOR	N	
9267	ASSISTANT TO VICE PRESIDENT	N	
9273	MARICULTURE SPECIALIST	N	
9275	TV STATION MANAGER	Y	Physical Activity; Non-typical office work
9278	EDITORIAL ASSISTANT	N	
9285	BUSINESS COORDINATOR III	N	
9287	IMAGING AND ELECTRONIC RECORDS SPECIALIST	N	
9293	ADMINISTRATIVE ASSISTANT	N	
9296	DESIGN MANAGER, TAMU PRESS	N	
9306	ACADEMIC BUSINESS ADMINISTRATOR I	N	
9307	ACADEMIC BUSINESS ADMINISTRATOR II	N	
9310	STAFF ACCOUNTANT	N	
9311	SENIOR STAFF ACCOUNTANT	N	
9316	MANAGEMENT ADVISOR	N	
9321	BUYER I	N	
9323	BUYER II	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
9327	ENVIRONMENTAL SAFETY SUPERVISOR	N	
9328	ENVIRONMENTAL SAFETY SUPERVISOR, UTILITIES	N	
9329	ENVIRONMENTAL SAFETY ASSISTANT MANAGER	N	
9346	SUPERINTENDENT BUILDING MAINTENANCE	Y	Physical Activity
9347	SUPERINTENDENT UTILITIES MAINTENANCE	Y	Physical Activity
9361	PROGRAM COORDINATOR III	N	
9362	ASSOCIATE EDITOR	N	
9363	ASSISTANT EDITOR	N	
9365	INFORMATION REPRESENTATIVE I	N	
9366	BUSINESS ADMINISTRATOR I	N	
9367	ASSOCIATE EDITOR - REAL ESTATE	N	
9368	ASSISTANT EDITOR-REAL ESTATE	N	
9371	BUSINESS ADMINISTRATOR II	N	
9373	ASSOCIATE EDITOR, UNIVERSITY PRESS	N	
9378	ACADEMIC ADVISOR I	N	
9380	BUSINESS MANAGER, SEA GRANT PROGRAM	N	
9385	REGISTERED HEALTH INFORMATION ADMINISTRATOR	N	
9386	SENIOR STAGE MANAGER	Y	Physical Activity
9394	COMMUNICATIONS MANAGER	N	
9397	ASSISTANT HOSPITAL ADMINISTRATOR	N	
9403	DIRECTOR OF HUMAN RESOURCE SERVICES, QATAR	Y	Out of Country
9406	BUSINESS MANAGER, VTH	N	
9408	MEDICAL LABORATORY SUPERVISOR	N	
9409	LARGE ANIMAL CLINIC MANAGER	N	
9411	ASSISTANT TO DIRECTOR	N	
9422	ARCHITECT I	N	
9423	ARCHITECT II	N	
9434	PAYROLL SERVICES SUPERVISOR	N	
9435	PERSONNEL ADMINISTRATOR	N	
9437	HUMAN RESOURCES REPRESENTATIVE	N	
9441	SENIOR POLICY & REVIEW SPECIALIST	N	
9444	NURSE PRACTITIONER	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
9447	INFORMATION REPRESENTATIVE II	N	
9452	MANAGEMENT ANALYST	N	
9462	COMPUTER SYSTEMS SOFTWARE SPECIALIST	N	
9463	SYSTEMS SUPPORT SPECIALIST	N	
9464	ENERGY ANALYST	N	
9465	SENIOR ENERGY ANALYST	N	
9466	RADIOLOGY LABORATORY SUPERVISOR	N	
9467	SENIOR DATABASE/SYSTEMS ADMINISTRATOR I	N	
9468	ENERGY COORDINATOR	N	
9472	MECHANICAL SYSTEMS SPECIALIST	N	
9476	MANAGER FOR TECHNICAL SERVICES	N	
9477	ENERGY MANAGER	N	
9481	COORDINATOR OF LEARNING RESOURCES	N	
9482	HEALTH EDUCATION COORDINATOR	N	
9494	MICROCOMPUTER SPECIALIST	N	
9507	ATHLETIC FINANCIAL MANAGER	N	
9512	COMPUTER SYSTEMS GROUP MANAGER	N	
9542	SENIOR IMMIGRATION SPECIALIST	N	
9550	GENERAL MANAGER, STUDENT MEDIA	N	
9551	ASSISTANT GENERAL MANAGER, STUDENT MEDIA	N	
9556	IMMIGRATION ASSISTANT	N	
9557	IMMIGRATION SPECIALIST	N	
9567	ATHLETIC COMPLIANCE MONITORING COORDINATOR	Y	Physical Activity
9569	SENIOR CLASSIFICATION & COMPENSATION ANALYST	N	
9575	CHIEF PHYSICAL THERAPIST	Y	Physical Activity
9580	MICROCOMPUTER COORDINATOR	N	
9590	FACILITIES COORDINATOR	N	
9591	PARKING SERVICES MANAGER	N	
9609	PROJECT SPECIALIST	N	
9611	ASSISTANT MANAGER FOR CUSTODIAL ADMINISTRATION	Y	Physical Activity
9629	TRAINING SPECIALIST	N	
9636	INSTRUCTIONAL MATERIALS SPECIALIST	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
9690	MANAGER FOR UTILITIES ADMINISTRATION	N	
9693	PUBLICATIONS MANAGER	N	
9694	SENIOR PRODUCTION EDITOR	N	
9695	PRODUCTION EDITOR II	N	
9696	SENIOR IMAGING SPECIALIST	N	
9697	IMAGING SPECIALIST	N	
9720	CURRICULUM DESIGNER	N	
9739	INSTRUCTIONAL DESIGN SPECIALIST	N	
9745	ADMISSIONS COORDINATOR	N	
9746	PUBLICATIONS SPECIALIST	N	
9757	RESEARCH SPECIALIST	N	
9760	CUSTOMER SERVICE REPRESENTATIVE	N	
9763	UTILITY PLANT DESIGN COORDINATOR	Y	Physical Activity
9764	SUPERVISOR FOR UTILITIES PLANNING & DESIGN	N	
9789	PROJECT COORDINATOR	N	
9792	MANAGER, ENGINEERING FACULTY SERVICES	N	
9793	MANAGER, ENGINEERING ACADEMIC PROGRAM SERVICES	N	
9794	MANAGER, PHYSICS OBSERVATORY	N	
9824	MARKETING & SALES ASSISTANT	N	
9839	DESIGN COORDINATOR	N	
9840	SENIOR POLICY ADMINISTRATOR	N	
9855	PROJECT MANAGER	N	
9856	MARKETING COORDINATOR	N	
9870	IODP DATABASE ADMINISTRATOR	N	
9871	NETWORK/SYSTEM ADMINISTRATOR	N	
9872	APPLICATIONS DEVELOPMENT ADMINISTRATOR	N	
9873	STUDENT DEVELOPMENT SPECIALIST IV	N	
9878	ATHLETIC FIELD MAINTENANCE MANAGER	N	
9880	TEMPORARY RESEARCH ASSISTANT	Y	Student/Faculty
9882	CLIENT/SERVER SYSTEMS ADMINISTRATOR	N	
9890	PHYSICAL PLANT TRAINING MANAGER	Y	Physical Activity
9891	SENIOR TRAINING SPECIALIST	N	
9892	PRODUCTION MANAGER, TAMU PRESS	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
9894	COMMUNICATIONS COORDINATOR	N	
9902	NETWORK ANALYST II	N	
	TEES NETWORKED SYSTEMS ADMINISTRATOR II	N	
9903	MECHANICAL ENGINEER	N	
9907	COORDINATOR OF DISTANCE LEARNING	N	
9908	NETWORK GROUP MANAGER	N	
9911	SENIOR MECHANICAL ENGINEER	N	
9912	PRODUCTION EDITOR	N	
9913	ACCELERATOR PHYSICIST	N	
9914	SENIOR SYSTEMS ANALYST II	N	
9915	SENIOR SYSTEMS ANALYST I	N	
9916	SYSTEMS ANALYST II	N	
9917	SYSTEMS ANALYST I	N	
9918	PROGRAMMER/ANALYST II	N	
9919	PROGRAMMER/ANALYST I	N	
9926	ASSISTANT REGISTRAR	N	
9930	SUPERINTENDENT FOR UTILITIES OPERATIONS	N	
9931	DIVISION PROPERTY ADMINISTRATOR	N	
9932	UTILITIES ENGINEER	Y	Physical Activity
9936	VISUAL RESOURCES CURATOR	N	
9937	ASSISTANT TO DEPARTMENT HEAD	Y	Faculty
9938	ASSISTANT MANAGER FOR TRADE SALES, TAMU PRESS	N	
9940	ADMINISTRATIVE COORDINATOR	N	
9941	COMPUTER SYSTEMS MANAGER	N	
9942	SENIOR ADMINISTRATIVE COORDINATOR	N	
9943	ACADEMIC ADVISOR II	N	
9944	SENIOR ACADEMIC ADVISOR I	N	
9945	SENIOR ACADEMIC ADVISOR II	N	
9947	AIRPORT SAFETY COORDINATOR	Y	Physical Activity/ Location off campus
9949	SENIOR INTERNATIONAL STUDENT ADVISOR	N	
9951	INTERNATIONAL STUDENT ADVISOR	N	
9957	PHYSICAL PLANT PROPERTY & INVENTORY SUPERVISOR	Y	Physical Activity
9961	FOOD SERVICES FACILITIES MANAGER	Y	Physical Activity
9971	SENIOR PRODUCER	Y	Physical Activity

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
9972	PRODUCTION MANAGER	Y	Physical Activity
9977	SENIOR VIDEO NETWORK SPECIALIST	N	
9983	INFORMATION SERVICES ASSISTANT	N	
9984	DEVELOPMENT RELATIONS COORDINATOR	N	
9987	RECRUITING COORDINATOR, ENGINEERING PROGRAM	N	
9990	EXECUTIVE CATERING CHEF	Y	Physical Activity
9995	DEVELOPMENT AND PROMOTION COORDINATOR	N	
9996	CHIEF RADIO/TV ENGINEER	Y	Physical Activity
9997	VIDEO NETWORK SPECIALIST I	N	
0004	CLERK III	N	
0009	SECRETARY	N	
0010	SENIOR SECRETARY	N	
0011	ADMIN SECRETARY	N	
0012	EXECUTIVE SECRETARY	N	
0014	TECHNICAL SECRETARY	N	
0024	MEDICAL TRANSCRIPTIONIST	N	
0025	SENIOR MEDICAL TRANSCRIPTIONIST	N	
0031	LIBRARY SPECIALIST I	N	
0032	LIBRARY SPECIALIST II	N	
0033	LIBRARY SPECIALIST III	N	
0034	LIBRARY ASSOCIATE I	N	
0036	RECORDS MANAGEMENT TECHNICIAN I	N	
0042	PLACEMENT SCHEDULING COORDINATOR	N	
0043	COMMUNICATIONS CENTER DISPATCHER I	N	
0044	COMMUNICATIONS CENTER SUPERVISOR	N	
0046	COMMUNICATIONS CENTER ASSISTANT SUPERVISOR	N	
0047	COMMUNICATIONS CENTER DISPATCHER II	N	
0052	OUTREACH WORKER I	Y	Physical Activity; Working in community

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0053	OUTREACH WORKER II	Y	Physical Activity; Working in community - surveying, etc
0054	OUTREACH WORKER III	Y	Physical Activity; Working in community - surveying, etc
0055	OFFICE ASSISTANT	N	
0056	SENIOR OFFICE ASSISTANT	N	
0057	LEAD OFFICE ASSISTANT	N	
0058	OFFICE ASSOCIATE	N	
0059	SENIOR OFFICE ASSOCIATE	N	
0060	LEAD OFFICE ASSOCIATE	N	
0061	CUSTOMER SERVICE ASSISTANT	N	
0062	SENIOR CUSTOMER SERVICE ASSISTANT	N	
0063	CUSTOMER SERVICE ASSOCIATE	N	
0101	ACCOUNTING ASSISTANT II	N	
0102	ACCOUNTING ASSISTANT III	N	
0110	BUSINESS ASSISTANT I	N	
0111	BUSINESS ASSISTANT II	N	
0112	BUSINESS ASSISTANT III	N	
0113	BUSINESS ASSOCIATE I	N	
0114	BUSINESS ASSOCIATE II	N	
0115	BUSINESS ASSOCIATE III	N	
0116	STAFF ASSISTANT	N	
0120	FINANCIAL ASSISTANT I - UNIVERSITY	N	
0121	FINANCIAL ASSISTANT II - UNIVERSITY	N	
0122	FINANCIAL ASSISTANT III - UNIVERSITY	N	
0123	FINANCIAL SPECIALIST I - UNIVERSITY	N	
0124	FINANCIAL SPECIALIST II - UNIVERSITY	N	
0125	FIN SPEC III - UNIV	N	
0126	PURCHASING ASSISTANT I - UNIVERSITY	N	
0127	PURCHASING ASSISTANT II - UNIVERSITY	N	
0205	STOREKEEPER I	Y	Physical Activity
0206	STOREKEEPER II	Y	Physical Activity

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
0207	STORES SUPERVISOR	Y	Physical Activity
0215	ASSISTANT STORES MANAGER	Y	Physical Activity
0216	CENTRAL RECEIVING SUPERVISOR	Y	Physical Activity
0217	SURPLUS PROPERTY OFFICE SUPERVISOR	Y	Physical Activity
0236	EQUIPMENT MANAGER	Y	Physical Activity
0242	CASHIER III	N	
0244	DEPARTMENTAL PURCHASING SPECIALIST	N	
0245	SR DEPT PURCH SPEC	N	
0301	DATA ENTRY OPERATOR I	N	
0303	DATA ENTRY SUPERVISOR	N	
0332	OFFICE SOFTWARE ASSISTANT	N	
0333	OFFICE SOFTWARE ASSOCIATE	N	
0508	GRAD ADMISSNS SUPV	N	
	GRADUATE ADMISSIONS SUPERVISOR	N	
1001	TESTING ASSISTANT	N	
1002	TESTING SUPERVISOR	N	
1009	STUDENT FINANCIAL AID ASSISTANT I	N	
1010	STUDENT FINANCIAL AID ASSISTANT II	N	
1011	STUDENT FINANCIAL AID ASSISTANT III	N	
1012	STUDENT FINANCIAL AID TECHNICIAN I	N	
1013	STUDENT FINANCIAL AID TECHNICIAN II	N	
1014	STUDENT FINANCIAL AID TECHNICIAN III	N	
1015	STUDENT FINANCIAL AID ASSOCIATE I	N	
1016	STUDENT FINANCIAL AID ASSOCIATE II	N	
1017	STUDENT FINANCIAL AID ASSOCIATE III	N	
1021	TRANSCRIPT ANALYST I	N	
1022	SENIOR TRANSCRIPT ANALYST	N	
1023	TRANSCRIPT ANALYST II	N	
2317	WAREHOUSE AND SHIPPING MANAGER	Y	Physical Activity
3524	ADV OPER SUPV, ST MD	N	
3541	PHOTOCOMP KEYBOARD OPERATORII	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
4361	FOOD SERVICE CASHIER I	Y	Physical Activity
4362	FOOD SERVICE CASHIER II	Y	Physical Activity
4363	FOOD SERVICE STOREROOM SUPERVISOR	Y	Physical Activity
0315	COMPUTER OPERATIONS SPECIALIST III	N	
0317	COMPUTER SUPPORT SPECIALIST	N	
0318	SENIOR COMPUTER SUPPORT SPECIALIST	N	
0320	IT SUPERVISOR	N	
0321	SENIOR IT SUPERVISOR	N	
0322	SENIOR NETWORK TECHNICIAN I	N	
0323	SENIOR NETWORK TECHNICIAN II	N	
0324	NETWORK CONTROL SPECIALIST I	N	
0325	NETWORK CONTROL SPECIALIST II	N	
0328	TELECOMM, SECURITY, & SURVEILLANCE SYSTEMS TECH II	N	
0329	TELECOM, SECURITY, & SURVEILLANCE SYSTEMS TECH III	N	
0343	COMP EQ SUPV I	N	
0351	COMPUTER MAINTENANCE TECHNICIAN I	N	
0353	SM COMP OPS SUPV	N	
0355	COMPUTER MAINTENANCE TECHNICIAN II	N	
0371	PROGRAMMER I	N	
0372	PROGRAMMER II	N	
0375	NETWORK TECHNICIAN I	N	
0376	NETWORK TECHNICIAN II	N	
0377	NETWORK TECHNICIAN III	N	
0417	ENVIRONMENTAL SAFETY TECHNICIAN I	N	
0418	ENVIRONMENTAL SAFETY TECHNICIAN II	N	
0422	ENVIRONMENTAL SAFETY SPECIALIST	N	
0819	HUMAN RESOURCES ADVISOR I	N	
0820	HUMAN RESOURCES ADVISOR II	N	
1003	SIGN LANGUAGE INTERPRETER	Y	Physical Activity
1004	EARLY CHILDHOOD TEACHER	N	
1205	STAFF NURSE	Y	Physical Activity
1210	PHLEBOTOMIST	N	
1214	CLINICAL CODING SPEC	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
2202	PHOTOGRAPHER II	N	
2204	MEDICAL PHOTOGRAPHER II	N	
2211	RADIO/TV TECHNICIAN	Y	Physical Activity
2212	RADIO/TV/ENGINEER	Y	Physical Activity
2216	RADIO PROGRAM DIRECTOR	Y	Physical Activity
2217	RADIO TRAFFIC DIRECTOR	Y	Physical Activity
2221	TV TRAFFIC DIRECTOR	Y	Physical Activity
2223	AUDIOVISUAL TECHNICIAN	N	
2224	VIDEO NETWORK SCHEDULER	N	
3007	CAD TECHNICIAN	N	
3101	LABORATORY MECHANIC I	Y	Physical Activity
3102	LABORATORY MECHANIC II	Y	Physical Activity
3551	GRAPHIC ARTS TECH	N	
5003	TECHNICAL ASSISTANT I	N	
5004	TECHNICAL ASSISTANT II	N	
5005	TECHNICIAN I	N	
5006	TECHNICIAN II	N	
5012	VACUUM AND CRYOGENICS WELDER	N	
5016	ASSISTANT ANATOMICAL LABORATORY MANAGER	N	
5017	ANATOMICAL LABORATORY MANAGER	N	
5019	BIOWASTE FACILITY MANAGER	N	
5020	SCIENTIFIC INSTRUMENT MAKER I	N	
5021	SCIENTIFIC INSTRUMENT MAKER II	N	
5022	MASTER INSTRU MAKER	N	
5028	ELECTRONICS TECHNICIAN I	N	
5029	ELECTRONICS TECHNICIAN II	N	
5050	LAB DEMO SUPVR	N	
5054	ACCELERATOR TECH I	N	
5057	INSTRUMENT SHOP SUPERVISOR	N	
5060	VACUUM & CRYOGN TECH	N	
5063	CERTIFIED PHARMACY TECHNICIAN	N	
5065	VET TECH I	Y	Physical Activity
5066	VET TECH II	Y	Physical Activity
5067	CMP ASSISTANT LABORATORY ANIMAL TECHNICIAN	Y	Physical Activity
5068	CMP LABORATORY ANIMAL TECHNICIAN	Y	Physical Activity
5069	ANIMAL RESOURCES SUPERVISOR	Y	Physical Activity

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
5071	LABORATORY ANIMAL TECHNICIAN II	Y	Physical Activity
5072	VETERINARY RADIOLOGIC TECHNOLOGIST	N	
5073	MEDICAL TECHNOLOGIST	N	
5074	MEDICAL RADIOLOGICAL TECHNOLOGIST	Y	Physical Activity
5079	ANIMAL CLINIC SUPERVISOR	Y	Physical Activity
5081	CMP ASSISTANT TECHNICAL SERVICES SPECIALIST	N	
5084	CMP LABORATORY ANIMAL TECHNOLOGIST	Y	Physical Activity
5085	VET TECH III	Y	Physical Activity
5086	CMP TECHNICAL SERVICES SPECIALIST	N	
5087	CMP PROGRAM MANAGER	N	
5089	VETERINARY PHARMACY TECHNICIAN I	Y	Physical Activity
5093	VETERINARY PHARMACY TECHNICIAN II	Y	Physical Activity
5189	MEDICAL TECHNOLOGIST I	N	
5190	MEDICAL TECHNOLOGIST II	N	
5191	MEDICAL TECHNOLOGIST III	N	
7971	SENIOR MARINE INSTRUMENTATION SPECIALIST	N	
9820	RESEARCH INSTRUMENTATION SPECIALIST	N	
9821	SENIOR RESEARCH INSTRUMENTATION SPECIALIST	N	
0200	ASSISTANT BUYER	N	
0224	PROPERTY MANAGER	N	
0302	DATA ENTRY OPERATOR II	N	
0310	PROD CONTROL CLERK	N	
0331	WORD PROCESSING OPERATOR	N	
0619	CRAFTS FACIL SUPV	N	
0811	HUMAN RESOURCES ASST	N	
0812	BENEFITS ASSISTANT	N	
0813	SENIOR HUMAN RESOURCES ASSISTANT	N	
0814	HR ASSOCIATE	N	
0815	HR TECHNICIAN	N	
0816	SR HR TECHNICIAN	N	
3540	PHOTOCOMP KEYBOARD OPERATOR I	N	
4373	LEAD BOARD SERVICE MANAGER	N	
4381	ASSISTANT GENERAL MANAGER	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
5077	COORDINATOR OF VETERINARY MEDICAL SERVICES	N	
5080	COORDINATOR OF SURGICAL SERVICES	N	
7149	SENIOR RESEARCH ENGINEER	N	
7364	SENIOR HEALTH PHYSICIST	N	
7427	ENGINEERING RESEARCH ASSOCIATE	N	
7527	LIBRARIAN II	N	
7528	LIBRARIAN III	N	
7529	LIBRARIAN IV	N	
7602	TEES RESEARCH ENGINEERING ASSOCIATE II	N	
7603	TEES ENGINEERING RESEARCH ASSOCIATE III	N	
7604	TEES RESEARCH ENGINEERING ASSOCIATE IV	N	
7605	TEES RESEARCH ENGINEERING ASSOCIATE V	N	
8439	SR IT POLICY & SECURITY PROGRAMS ADMINISTRATOR	N	
8441	SR LD IT POLICY & SEC PROGRAMS ADMINISTRATOR	N	
8442	CHIEF IT POLICY & SEC PROGRAMS ADMINISTRATOR	N	
8446	SENIOR LEAD DATABASE ADMINISTRATOR	N	
8447	CHIEF DATABASE ADMINISTRATOR	N	
8459	SENIOR SECURITY ANALYST	N	
8470	LEAD NETWORK ANALYST	N	
8471	SENIOR LEAD NETWORK ANALYST	N	
8472	CHIEF NETWORK ANALYST	N	
8476	SENIOR LEAD MICROCOMPUTER/LAN ADMINISTRATOR	N	
8477	CHIEF MICROCOMPUTER/LAN ADMINISTRATOR	N	
8486	SENIOR LEAD INFORMATION TECHNOLOGY CONSULTANT	N	
8533	MANAGER FOR FACILITIES ADMINISTRATION	N	
8616	QUALITY ASSURANCE AND SAFETY MANAGER	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
8630	DEVELOPMENT RELATIONS SPECIALIST	N	
8632	ASSISTANT ATHLETIC TICKET MANAGER	N	
8639	MANAGER, INDUSTRIAL HYGIENIST	N	
8649	SAFETY & ENVIRONMENTAL COMPLIANCE MANAGER	N	
8650	ANALYTICAL CHEMIST I	N	
8653	CHIEF CHEMIST	N	
8654	DIAGNOSTIC ANALYTICAL CHEMIST	N	
8657	MANAGER, PARKING ADMINISTRATION	N	
8659	TRANSPORTATION SERVICES ASSISTANT MANAGER	N	
8668	MANAGER OF INTERNAL AUDIT	N	
8676	ASSISTANT MANAGER FOR SHUTTLE BUS OPERATIONS	N	
8677	PRESIDENTIAL CONFERENCE CENTER MANAGER	N	
8679	EMPLOYEE ASSISTANCE PROGRAM COORDINATOR	N	
8683	ASSISTANT COMMUNITY DEVELOPMENT SPECIALIST	N	
8732	MANAGER OF FAMIS SERVICES	N	
8738	HACCP ALLIANCE COORDINATOR	N	
8772	SENIOR SOFTWARE TRAINER II	N	
8774	TRAINING PROJECT LEADER II	N	
8776	PRACTICUM COORDINATOR	N	
8779	ASSOCIATE MUSIC DIRECTOR	N	
8780	UNIVERSITY RECORDS MANAGER	N	
8803	HUB MANAGER	N	
8811	BUSINESS DEVELOPMENT MANAGER	N	
8812	MANAGER, COMMERCIALIZATION SERVICES	N	
8823	SPECIAL ASSISTANT	N	
8863	EXECUTIVE OFFICER	N	
8871	BUSINESS MANAGER, HUMAN RESOURCES	N	
8889	MANAGER OF FACILITIES OPERATIONS & SUPPORT SERVICE	N	
8914	WRITING CONSULTANT I	N	
8923	WRITING CONSULTANT II	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
8932	PARKING ADMINISTRATOR	N	
8949	INFORMATION TECHNOLOGY COORDINATOR	N	
8950	SENIOR RECORDS AND INFORMATION ANALYST	N	
8973	SENIOR HUMAN RESOURCES REPRESENTATIVE	N	
9035	MANAGER OF FACULTY PROGRAMS AND SERVICES	N	
9047	STAFF ASSOCIATE	N	
9068	SENIOR CLASSIFICATION & COMPENSATION COORDINATOR	N	
9072	EMPLOYEE BENEFITS REPRESENTATIVE	N	
9074	ASSISTANT TO VICE CHANCELLOR	N	
9078	STAFFING SPECIALIST	N	
9089	DESIGNER I	N	
9098	DATA SYSTEMS ADMINISTRATOR	N	
9126	MANAGER, CLASSIFICATION & COMPENSATION	N	
9128	EMPLOYEE DEVELOPMENT REPRESENTATIVE	N	
9129	EMPLOYEE RELATIONS MANAGER	N	
9139	ASSISTANT TO PRESIDENT	N	
9147	EMPLOYEE BENEFITS MANAGER	N	
9148	LEAVE COORDINATOR	N	
9158	ASSISTANT TO THE PROVOST	N	
9164	EMPLOYEE ASSISTANCE PROGRAM MANAGER	N	
9172	SPECIAL ASST TO EXECUTIVE VICE PRES & PROVOST	N	
9203	SYSTEMS ANALYST	N	
9209	GIS MANAGER	N	
9233	BUSINESS MANAGER-PUBLIC POLICY RESEARCH INSTITUTE	N	
9236	PROJECT DIRECTOR	N	
9262	ASSISTANT MANAGER FOR PROMOTIONS	N	
9268	BENEFITS SERVICES CONSULTANT	N	
9271	SPECIAL ASSISTANT TO THE VICE PRESIDENT	N	
9300	ADMINISTRATIVE SERVICES OFFICER	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
9312	SUPERVISORY STAFF ACCOUNTANT	N	
9320	BUYER III	N	
9335	RESEARCH DEVELOPMENT COORDINATOR	N	
9358	RESEARCH TECHNICIAN	N	
9364	MEDIA RELATIONS COORDINATOR	N	
9372	ASSISTANT EDITOR, UNIVERSITY PRESS	N	
9379	SENIOR ACADEMIC ADVISOR	N	
9392	ASST COORDINATOR, CENTER FOR CONFLICT RESOLUTION	N	
9399	ADMINISTRATIVE RESEARCH OFFICER	N	
9402	HUMAN RESOURCES OFFICER	N	
9407	MEDICAL LABORATORY MANAGER	N	
9420	ASST TO ASST VICE CHAN EXT REL & AST VC UNV SYS RE	N	
9428	SENIOR MANAGEMENT ANALYST	N	
9433	PURCHASING MANAGER	N	
9439	PROGRAM DEVELOPMENT OFFICER	N	
9440	POLICY & REVIEW SPECIALIST	N	
9460	COMPUTER PROGRAMMER	N	
9470	BOOK PRODUCTION & DESIGN ASSISTANT	N	
9478	MANAGER OF BUSINESS AND FACILITIES OPERATIONS	N	
9486	TLO MGR, COMMUNICATION SERVICES	N	
9488	ASSISTANT MANAGER, BUDGET AND PAYROLL SERVICES	N	
9490	EXECUTIVE ASSISTANT TO THE AGENCY DIRECTOR	N	
9495	SENIOR FINANCIAL AID COUNSELOR	N	
9496	FINANCIAL AID COUNSELOR	N	
9510	SPECIAL ASSISTANT TO DEAN	N	
9514	WORKER'S COMPENSATION COORDINATOR	N	
9515	ASSISTANT OPERATIONS MANAGER	N	
9517	EDP FINANCIAL SYSTEMS MANAGER	N	
9531	ACTING EXECUTIVE DIRECTOR	N	
9543	EMPLOYEE DEVELOPMENT MANAGER	N	
9545	ASSISTANT TO FACULTY SENATE	N	
9560	PROPOSAL COORDINATOR	N	

Job Code	Job Title	Exclude Y or N	Rationale for Exclusion
9561	TLO LICENSING MANAGER	N	
9562	TLO SENIOR LICENSING MANAGER	N	
9563	SENIOR PROPOSAL DEVELOPMENT SPECIALIST	N	
9565	RESEARCH COMMERCIALIZATION MANAGER	N	
9568	SENIOR EMPLOYEE BENEFITS REPRESENTATIVE	N	
9571	THESIS COORDINATOR	N	
9573	STUDENT IMMIGRATION COORDINATOR	N	

APPENDIX D

RECRUITMENT LETTER

[Letterhead]

Date

Potential Participant Name
Campus Mail Address

Dear Mr./Ms. Potential Participant Name:

Howdy! I am writing to ask for your participation in a study about office workers and physical activity – specifically about walking habits. This study is an essential part of my research for my dissertation here at Texas A&M University. This study will assess how much walking is a part of the regular day of office workers and what opportunities are available to improve the health of office workers through walking. I hope that after you read a little bit about the study you will be interested in participating!

Why was I selected?
As an office worker at Texas A&M University, you were selected as a potential participant in this study. Approximately 1,000 employees at Texas A&M University that are non-faculty and primarily have office-based work were randomly selected for this initial letter with the hope that at least 200 employees will be interested in participating in the full study. I will be assessing eligibility of employees with the following criteria:

1. your willingness to participate,
2. you must be 18 years or older,
3. you are a non-faculty employee,
4. your work is primarily office work (the nature of your work does not include high level of physical activity),
5. you have the ability to walk up for at least 10 minutes,
6. your location on campus is in proximity to daily needs/destinations

You will be asked questions to assess your eligibility in the next step of the project. If you have questions or concerns about the criteria, you are always welcome to contact me directly.

What is the research study about?
A significant amount of our population works in offices with primarily sedentary jobs and fairly standard business schedules (for example: work schedules that are generally 8 am – 6 pm, 1 hour for lunch). The lack of physical activity in our daily life can cause health concerns such as increased weight, cardiovascular problems, and stress-related injuries or fatigue. My study will look at what opportunities there may be available for

office workers to integrate some physical activity and transportation as a part of their daily lives.

If I agree to participate, what will I be asked to do?
I will be sending an email to you within approximately 3 days asking whether or not you are willing to participate in this study. In this email I will ask you to go to a web link and initially there will be a few screening questions (less than 5 minutes) to determine if you are eligible for the study. Even if in the end you decide not to participate, it would be very helpful to me if you will go to the link and answer the initial screening questions and a mini-survey. However, you are not under any obligation to participate in the study or answer any of the questions in the study or the mini-survey. If you would like to proceed to this weblink now you may type this into your browser to complete the eligibility questions and let me know if you want to participate in the full study → _____

For those that are eligible and also indicate on the initial survey a willingness to participate, a longer online survey will be sent to you to fill out. Answering this survey is estimated to take approximately 30 minutes. The next part of the study will include recording online all of the various transportation trips you make. I will give you a research quality pedometer, which you will get to keep, and a web link to record all of your trips (even walking from your parking lot to your office is a trip!). You will be asked to record your trips for a total of 6 days over the course of about a month (2 days at a time). At the completion of the study you will be asked a few survey questions and be given a small gift certificate in the amount of $25 to express my gratitude for your participation in the study.

If at any point in the study you are uncomfortable, cannot or do not want to continue you may stop your participation. If you have concerns throughout the study you can contact me and I will try to address those issues as best as possible.

What happens next?
The next step will be the email that I will be sending you. It will have a link that I would like for you to open which will be a survey (surveymonkey is the online software). You will not need to load anything on your computer and your email address will not be sold or given to anyone for any reason. The first part of the survey will assess if you are eligible for the study and will ask if you are interested in participating in the full study. If you indicate you are not interested in participating, you will receive no further communication from me.

The email address I have for you is: XXXXXXXXXXXXXXXXXXX
If you would prefer that I contact you at a different email address please email me at kmwieters@tamu.edu to make that change as soon as possible.

If you have questions in the meantime, please feel free to call me at 979/XXX-XXXX or email me at kmwieters@tamu.edu .

Thank you so much for your time. I appreciate you considering participating in my study!

Sincerely,

K. Meghan Wieters, AICP
Ph.D Candidate
Texas A&M University
[Letterhead]

Date

Potential Participant Name
Campus Mail Address

Dear Mr./Ms. Potential Participant Name:

Hook 'em Horns! I am writing to ask for your participation in a study about office workers and physical activity – specifically about walking habits. This study is an essential part of my research for my dissertation and will assess how much walking is a part of the regular day of office workers and what opportunities are available to improve the health of office workers through walking. I hope that after you read a little bit about the study you will be interested in participating!

Why was I selected?
As an office worker at University of Texas at Austin, you were selected as a potential participant in this study. Approximately 1,000 employees at Texas A&M University that are non-faculty and primarily have office-based work were randomly selected for this initial letter with the hope that at least 200 employees will be interested in participating in the full study. I will be assessing eligibility of employees with the following criteria:

1. your willingness to participate,
2. you must be 18 years or older,
3. you are a non-faculty employee,
4. your work is primarily office work (the nature of your work does not include high level of physical activity),
5. you have the ability to walk up for at least 10 minutes,
6. your location on campus is in proximity to daily needs/destinations

You will be asked questions to assess your eligibility in the next step of the project. If you have questions or concerns about the criteria, you are always welcome to contact me directly.

What is the research study about?

A significant amount of our population works in offices with primarily sedentary jobs and fairly standard business schedules (for example: work schedules that are generally 8 am – 6 pm, 1 hour for lunch). The lack of physical activity in our daily life can cause health concerns such as increased weight, cardiovascular problems, and stress-related injuries or fatigue. My study will look at what opportunities there may be available for office workers to integrate some physical activity and transportation as a part of their daily lives.

If I agree to participate, what will I be asked to do?

I will be sending an email to you within approximately 3 days asking whether or not you are willing to participate in this study. In this email I will ask you to go to a web link and initially there will be a few screening questions (less than 5 minutes) to determine if you are eligible for the study. Even if in the end you decide not to participate, it would be very helpful to me if you will go to the link and answer the initial screening questions and a mini-survey. However, you are not under any obligation to participate in the study or answer any of the questions in the study or the mini-survey. If you would like to proceed to this weblink now you may type this into your browser to complete the eligibility questions and let me know if you want to participate in the full study → _____

For those that are eligible and also indicate on the initial survey a willingness to participate, a longer online survey will be sent to you to fill out. Answering this survey is estimated to take approximately 30 minutes. The next part of the study will include recording online all of the various transportation trips you make. I will give you a research quality pedometer, which you will get to keep, and a web link to record all of your trips (even walking from your parking lot to your office is a trip!). You will be asked to record your trips for a total of 6 days over the course of about a month (2 days at a time). At the completion of the study you will be asked a few survey questions and be given a small gift certificate in the amount of $25 to express my gratitude for your participation in the study.

If at any point in the study you are uncomfortable, cannot or do not want to continue you may stop your participation. If you have concerns throughout the study you can contact me and I will try to address those issues as best as possible.

What happens next?

The next step will be the email that I will be sending you. It will have a link that I would like for you to open which will be a survey (surveymonkey is the online software). You will not need to load anything on your computer and your email

address will not be sold or given to anyone for any reason. The first part of the survey will assess if you are eligible for the study and will ask if you are interested in participating in the full study. If you indicate you are not interested in participating, you will receive no further communication from me.

The email address I have for you is: XXXXXXXXXXXXXXXXXXX
If you would prefer that I contact you at a different email address please email me at kmwieters@tamu.edu to make that change as soon as possible.

If you have questions in the meantime, please feel free to call me at 979/XXX-XXXX or email me at kmwieters@tamu.edu .

Thank you so much for your time. I appreciate you considering participating in my study!

Sincerely,

K. Meghan Wieters, AICP
Ph.D Candidate
Texas A&M University

APPENDIX E

SURVEY INSTRUMENT

The purpose of this study is to understand daily walking activity and transportation trips done by OFFICE WORKERS.

There are a eight initial questions that I need to ask to determine 1) if you are eligible for this study and 2) if you are interested in participating. This initial portion should only take 5 minutes or less.

If you have any concerns or questions you may contact me, Meghan Wieters, at kmwieters@tamu.edu or telephone at 979/XXX-XXXX.

==========[ELIGIBILITY QUESTIONS]==========

Are you 18 years of age or over?
Yes
No

Are you
male
female

Do you have any physical conditions that prevent you from walking short distances (walking for at least 10 minutes)?
(Note: For this study I will be using pedometers to measure walking steps. That is the reason this question is being asked.)
Yes
No
Prefer Not to Say

Are you classified as:
Faculty / Non-Faculty
Staff
Faculty (instructor/tenure/non-tenure)
Student

When you are at work, which of the following best describes what you do? Would you say.
Mostly sitting
Mostly walking
Mostly heavy labor or physically demanding work
Don't know/ Not sure

Which university do you work at?
University of Texas at Austin
Texas A&M University

Please select the building where you work on campus most frequently on Tuesdays, Wednesdays and Thursdays:
(selected days of the week are related data collection days for the full study)(Drop down menu - alphabetical order of building name)

Do you typically have a regular lunch hour (for eating lunch, running errands, personal time, etc)?
Yes, it is regularly scheduled midday for about an hour.
No, I rarely get to take a full lunch hour.
Other (please specify)

Thank You! {not eligible}
Thank you for participating in this mini-survey. At this time you do not meet this particular study's criteria. I appreciate your time in filling out this survey.
If you have any questions you are welcome to contact me at kmwieters@tamu.edu.

THANK YOU – [eligible participants]
Thank you for filling out this initial screening survey. You are potentially eligible to participate in the study. The next part of this will describe what is involved in the study and ask you if you are willing to participate.

[REQUEST FOR PARTICIPATION IN THE BASELINE SURVEY – PHASE I]

All information obtained from this survey will be confidential and taking part in this survey is voluntary. If you are uncomfortable with a particular question you may skip that question and move on. If at any point you are uncomfortable you are always welcome to stop participating in the survey.

You will be given a consent form that indicates this is a voluntary study and you will not be coerced or pressured to participate in the study. This form will also give you contact phone numbers in event you have concerns about this study.

I really appreciate your help on this research!

--What is involved in the study--
If you agree to participate, there are two parts to this study.

Part one: You will complete an online survey which will follow these initial questions. You may choose to take the survey later if it is not convenient at this time.

Part two: You will be asked to fill out a travel diary for a total of 6 days over the course of about a month. This will involve inputting all the trips you make in a day in a survey just like this one.

You will also be asked to wear a pedometer (step counter) and record at a few times during the day how many steps you have walked.

You may be selected to receive an intervention related to health and walking.

All individuals participating will receive a research quality pedometer to keep (worth approximately $25) and receive a gift certificate up to $25 (based on level of completion of the study) as a small token of appreciation for your participation in the study.

Are you interested in participating in this study?
Yes
No
Unsure

If you are unsure about participating, please type any question, concern or clarification you would like and I will contact you before you continue.

Does not want to participate - ask for exit questions **[MINI-SURVEY]**

Thank you.

[MINI-SURVEY]
I understand that you do not want to or cannot participate in this study. It would be really helpful for me to ask you a few questions which will help in my final analysis. It should only take approximately 5-7 minutes to answer these questions.

Are you willing to fill out the "mini-survey"?
Yes
No

Thank you for agreeing to fill out the mini-survey.

The mini-survey should take about 5-7 minutes.
First a consent form will be next.
[MINI-SURVEY – CONSENT FORM]
This consent form outlines what you are agreeing to (just agreeing to answer the mini-survey) and who to contact in the event you have concerns about the project.

**********CONSENT FORM **********
Integrating Walking for Transportation and Physical Activity for Sedentary Office Workers in Texas

You have been asked to participate in the research of K. Meghan Wieters of the Landscape and Urban Planning Department at Texas A&M University on the walking behavior for office workers. You are only agreeing to answer this mini-survey and do not want to participate further in the study.

You understand that the information provided to K. Meghan Wieters is for scholarly research and educational purposes. Your participation is voluntary and you may decline to answer any question at any time. Duplication and publication rights will belong to K.Meghan Wieters. This study is confidential and we will assign a pseudonym or a code name for your responses. The records will be kept confidential. No identifiers linking you to the study will be included in any report published. Research records will be stored
securely and only the four main researchers will have access to the records. You also can refuse to fill this out as well. You can contact Meghan Wieters at (979)XXX-XXXX for additional information.

This research study has been reviewed by the Institutional Review Board – Human Subjects in Research, Texas A&M University. For research-related problems or questions regarding subjects' rights, you can contact the Institutional Review Board through Ms. Melissa McIlhaney, IRB Program Coordinator, Office of Research Compliance, (979) 458-4067, mcilhaney@tamu.edu.

Contact information for researcher:
K. Meghan Wieters, AICP, Principal Investigator
Landscape Architecture & Urban Planning
Texas A&M University, 77843
kmwieters@tamu.edu
alternate contact:
Chanam Lee, Ph.D
Landscape Architecture & Urban Planning
Texas A&M University, 77843
CLee@archmail.tamu.edu

Yes, I have read the information above and agree to participate in the mini-survey.

Other (please specify)

You have indicated "other" response for the consent form. I will review your response and contact you to provide any clarification I can.
Please type any questions you have. Thanks!

[MINI-SURVEY]
Thank you for continuing. This should only take 5-7 minutes of your time.

In what age group category do you belong:
18-24
25-34
35-44
45-54
55-64
65-74
75 or older

How many times during a usual week do you walk for recreation, exercise, to get to and from places, or for any other reason in your neighborhood?
Number of times per week below:

How many functional cars are in your household?
Number of functional cars:

In a week how many times do you commute to work by WALKING:
None
1-2 times per week
3-4 times per week
5 times or more per week
1-2 times per week
3-4 times per week
5 times or more per week

In a week how many times do you commute to work by BIKING:
None
1-2 times per week
3-4 times per week
5 times or more per week
1-2 times per week
3-4 times per week
5 times or more per week

In a week how many times do you commute to work by DRIVING CAR ALONE:
None
1-2 times per week
3-4 times per week
5 times or more per week
1-2 times per week
3-4 times per week
5 times or more per week

In a week how many times do you commute to work by DRIVING CAR with OTHERS (CARPOOL/VANPOOL):
None
1-2 times per week
3-4 times per week
5 times or more per week
1-2 times per week
3-4 times per week
5 times or more per week

Parking
Do you have to pay for parking?
Yes
No

If you pay for parking, how much do you pay per year?
(Please indicate 0 if you do not pay for parking.)
Dollar amount per year:

Taking Transit
In a week how many times do you commute to work by TAKING THE BUS/TRANSIT:
None
1-2 times per week
3-4 times per week
5 times or more per week

Where do you park your car?
When you do have to park your car, how far away is the parking area where you park?
Less than 5 minutes to the entrance of my building
Approximately 6-10 minutes to the entrance of my building
Approximately 11-15 minutes to the entrance of my building
I have to take a shuttle bus from my parking area
Don't Know/Not Sure
Other (please specify)

How many years have you worked at your university?
(years and months eg: # years: 2 and # months: 6 = 2 years and 6 months)

How long have you worked at your current department?
Do you supervise other staff?
Yes
No

If yes, then how many employees do you supervise?

What is the highest grade or year of school you completed?
Never attended school or only kindergarten
Grades 1-6th
Grades 7-8th
Grades 9 through 11 (Some high school
Grade 12 or GED (High School graduate)
College 1 year to 3 years (Some college or technical school)
College 4 years or more (College graduate)
Graduate school or more
Other (please specify)

Is your annual household income from all sources:
Under 24,999 per year
25,000 - 34,999
35,000 – 49,999
50,000 – 74,999
75,000 - 99,999
100,000 - 149,999
150,000 - 199,999
Over 200,000
Don't know/Not Sure
Other (please specify)

Do you have any questions or additional comments? Please type in the space below and include your email address (if desired).
Thanks!

==========[BASELINE SURVEY – PHASE I]==========
Beginning of Main Survey
for those agreeing to participate:

This is the main survey. It is estimated to take between 20-40 minutes to fill out.
Thank you so much for your help!!!

In the event that you need to stop at some point in the survey:

1) You can simply minimize it on your computer if that is acceptable to you so you can pick up from that point later.

2) You can click "Exit this Survey>>" that is in the upper right corner.
The software should allow you to use the exact same link that you received in the original email to pick up where you left off in the survey.

If you have any trouble I can send you a new link to the survey.
Just email me at: kmwieters@tamu.edu or call me at 979/XXX-XXXX if you have any trouble.

If you have questions or concerns you may type those below as well.

PHYSICAL ACTIVITY

In this section I will be asking you questions about the kinds of physical activity you do in your daily life.

This includes physical activity such as walking as a means of transportation or walking for recreation. It will also include other activity beyond just walking.

How many times during a usual week do you walk for recreation, exercise, to get to and from places, or for any other reason in your neighborhood?

Number of times I walk in a usual week:
None
1-2 times per week
3-4 times per week
5 times per week
6-7 times per week
8-9 times per week
10 times per week or more

When you walk, about how many minutes do you spend walking each time you walk?
Number of minutes:

When you walk, do you usually walk:
Alone
with friends
with spouse/partner
with children
with pets
with other family members/relatives
Don't know/Not sure

When you walk, do you usually walk:
briskly
at normal speed
at slow speed
Don’t know/not sure

Walk Activity for Exercise or Recreation
Examples of walking for exercise or recreation purposes:
You walk around the block with your dog and return home.
You walk at a park for an hour and your primary purpose is to relax and/or exercise.

How many times during a usual week do you walk for RECREATION OR EXERCISE?
None
1-2 times per week
3-4 times per week
5 times per week
6-7 times per week
8-9 times per week
10 times per week or more

When you walk for recreation or exercise, about how many minutes do you spend walking each time you walk?
Number of minutes:

Walking for Transportation Purposes
An example of walking as a means of transportation (compared with recreation or exercise):
When you are trying to get to some destination (shopping, visit a friend, work) and you choose to walk instead of drive.

How many times during a usual week do you walk for TRANSPORTATION purposes, such as walking to get to and from places (to visit friends, lunch, meetings in other buildings, etc)?
None
1-2 times per week
3-4 times per week
5 times or more per week

When you walk for TRANSPORTATION purposes, about how many minutes do you spend walking each time you walk?
Number of minutes:

In a usual week how many times do you commute to work by WALKING:
None
1-2 times per week
3-4 times per week
5 times or more per week

In a week how many times do you commute to work by BIKING:
None
1-2 times per week
3-4 times per week
5 times or more per week

How many functional cars are in your household?
Number of cars:

In a year, approximately how many miles do you drive with your primary car?
I don't own a car / I don't drive / I hardly ever drive.
5,000 - 8,999 miles per year
9,000 - 11,999 miles per year
12,000- 15,999 miles per year
16,000 - 18,999 miles per year
19,000 - 21,999 miles per year
Over 22,000 miles per year
Other (please specify)

In a usual week how many times do you commute to work by DRIVING CAR ALONE:
None
1-2 times per week
3-4 times per week
5 times or more per week

In a usual week how many times do you commute to work by DRIVING CAR with OTHERS (CARPOOL/VANPOOL):
None
1-2 times per week
3-4 times per week
5 times or more per week

Do you have to pay for parking?
Yes
No

If you pay for parking, how much do you pay per year?
(Please indicate 0 if you do not pay for parking.)
Dollar amount per year:

Where do you park your car?
When you do have to park your car, how far away is the parking area where you park?
Less than 5 minutes to the entrance of my building
Approximately 6-10 minutes to the entrance of my building
Approximately 11-15 minutes to the entrance of my building
I have to take a shuttle bus from my parking area
Don't Know/Not Sure
Other (please specify)

Taking Transit
In a week how many times do you commute to work by TAKING THE BUS/TRANSIT:
None
1-2 times per week
3-4 times per week
5 times or more per week

When you take transit, do you:
Transfer buses to get to office area
Walk from the bus stop to office area
Bike to office area from bus stop
Bike to bus stop near home
Walk to bus stop near home
Other (please specify)

Physical Activity - Motivators and Barriers
During a usual week, friends, co-workers or family exercised with me:
Yes No Don’t Know/ Not Sure

Which of following barriers keep you from walking or from walking more?
***** Check all that Apply: *****
Barriers to walking
**********Infrastructure Issues**********
Distances to places are too great
No sidewalks or no continuous sidewalks
No walking paths or trails nearby
Dangerous street-crossing conditions
No crosswalks or pedestrian signals
Crosswalk signals are too short

**********Safety issues**********
Too much traffic
Traffic is traveling too fast on roads I need to walk along
No safe places to walk nearby
Drug-related activity in the areas where I would walk
Fear of being robbed/attack/ assaulted
Not enough lighting at night

**********Land Use Issues**********
No interesting places to walk to
No interesting architecture or landscape to look at
No shopping locations nearby
No parks or recreations places to walk to

*****Physical aspects about the terrain or area***
Too many hills
No trees or shade
No benches and other places to rest

**********General Daily Issues**********
Lack of time
Lack of energy or lazy
Lack of knowledge about benefits of walking and/or physical activity
No one to walk with me
No dog to walk with me
Childcare responsibility
Having to carry heavy items
Need car at or after work

**********Temporary Issues**********
Bad weather
Unattended dogs

Don't know/Not sure
Other (please specify)

Motivators for walking
Which of the following are likely to motivate you to walk.
Please rank your top three (1 = highest 3= lowest motivators)
Someone to walk with □
Shopping nearby
Knowing how to get to destination on foot
Knowing how much time it would take to walk to destination
Good weather / Ability to have protection from bad weather
Sidewalks are available and in good condition
Trees or shade
Little car traffic
Fairly flat terrain to walk on (no steep slopes)
Enough time to walk

How do you feel about the following:
Strongly Agree Agree Neutral Disagree Strongly Disagree

Physical activities are important for me to keep healthy.
Walking is a good way of getting physical activity.
Biking is a good way of getting physical activity.
Driving is expensive.
Public transit is for those who do not own a car.
Walking is for recreation purposes, rather than transportation.
Biking is for recreation purposes, rather than transportation.
Public transportation is necessary to worksite.
Air pollution is a serious problem for our city.
Walking will help to reduce air pollution for our city.

Bicycling
Do you own a working bicycle?
Yes
No
Don't Know/Not Sure

How many times during a usual week do you bike?
None
1-2 times per week
3-4 times per week
5-6 times per week
7 or more times week
Other (please specify)

Types of Physical Activity

I am interested in two types of physical activity - vigorous and moderate. Vigorous activities cause large increases in breathing or heart rate while Moderate activities cause small increases in breathing or heart rate.

Examples of VIGOROUS activities are:
running
aerobics
heavy yard work
or any activity that causes large increases in breathing or heart rate

Examples of MODERATE Activities:
Vacuuming
Gardening
Biking
or activities that cause small increases in breathing or heart rate

Please answer even if you have included these activities in previous questions.
During the last seven days, did you do MODERATE activities for at least 10 minutes at a time, such as brisk walking, biking, vacuuming, gardening, or anything else that causes small increase in breathing or heart rate?
Yes
No
Don't Know/Not Sure

On those days you did MODERATE activities for at least 10 minutes at a time, how many total minutes per day did you spend doing these activities?
Total minutes per day:

During the last seven days, how many days did you do these MODERATE activities for at least 10 minutes at a time?
Number of days:

Vigorous Exercise
Examples of VIGOROUS activities are:
running
aerobics
heavy yard work
or any activity that causes large increases in breathing or heart rate

During the last seven days, did you do VIGOROUS activities for at least 10 minutes at a time, such as running, aerobics, heavy yard work, or anything else that causes large increases in breathing or heart rate?
Yes
No
Don't Know/Not Sure

On those days you did VIGOROUS activities for at least 10 minutes at a time, how many total minutes per day did you spend doing these activities?
Total minutes per day of VIGOROUS activity:

During the last seven days, how many days did you do these VIGOROUS activities for at least 10 minutes at a time?
Number of days:

General Physical Activity
How many hours in a usual week do you usually spend watching television, using a computer, reading, or playing video games, while sitting or lying down?

Do you have any exercise equipment in your home, yard, or apartment complex that you use regularly?
Yes
No
Don't Know/Not Sure

Please indicate which of the following are within walking distance of your OFFICE:
Not in vicinity of office
Within walking distance of 1-5 min
Within walking distance of 6-10 min
Within walking distance of 11-15 min
Within walking distance of 16 - 20 min
Within walking distance of 21 – 30 min
Within walking distance of 31 min or more
Don't Know / Unsure

Farmers market
Fruit/vegetable market
Supermarket
Convenience store
Fast food restaurant
Non-fast food restaurant
Pub or bar
Café or coffee shop
Clothing store
Pharmacy/ drug store
Laundry / dry cleaners
Office supply store
Hardware store
Shopping center or plaza
Bank / Credit Union
Post Office / Mailbox / Postal services
Video store
Salon / barber shop
Religious institution
Day care
Community Center
Elementary school
Bus / transit stop
Recreation center
Gym / Health club
Park
Other offices on campus
Other offices near campus

Satisfaction
Please indicate if you agree or disagree with the following statement about the area near your office:

Strongly Agree Agree Neutral Disagree Strongly Disagree
Walking is an effective means of exercise.
If I knew how to get to a destination by walking I am more likely to walk to it.
Increasing physical activity during the day is important to me.
People drive too fast in the vicinity near my office.
I feel safe walking to locations near my office.
There are many locations nearby my office that I can walk to for my daily needs.
Other

About You
Where do you buy your VEGETABLES ?
Check all that apply:
Grocery store in your neighborhood
Grocery store outside your neighborhood
Grocery store near your office
Farmer's market in your neighborhood
Convenience store in your neighborhood
Other (please specify)

Where do you buy your GROCERIES?
Check all that apply:
Grocery store in your neighborhood
Grocery store outside your neighborhood
Grocery store near your office
Farmer's market in your neighborhood
Convenience store in your neighborhood
Other (please specify)

How often do you buy groceries in a usual week?
Number of times per week:

Not counting carrots, potatoes, or salad, how many servings of vegetables does your household usually eat? (For example, a serving of vegetables at both lunch and dinner would be two servings.)
Number of servings per DAY:

How many meals do YOU buy away from home each week on average, including lunch?
Number of times per WEEK:

In what age group category do you belong:
18-24
25-34
35-44
45-54
55-64
65-74
75 or older

Which one of these groups would you say best represents your race?

White, non-Hispanic
Hispanic or Latino
Black or African American
Asian
Native American or Other Pacific Islander
American Indian, Alaska Native
Other (please specify)

Are you:
Married
Divorced
Widowed
Separated
Never Married / Single
A member of an unmarried couple
Other (please specify)

How many children less than 18 years of age live in your household?
Number of children:

How many adults live in the household in total?
Number of people in total:

How many years have you worked at your university?
Please type years and months (e.g. # of years: 2 and # months: 6 would = 2 years and 6 months)
number of years
and number of months

How long have you worked at your current department?
number of years
and number of months

Do you supervise other staff?
Yes
No
If yes, then how many employees do you supervise?

What are the main factors that influenced where you chose to live?
Check top THREE influences:

Housing Affordability
Quality of neighborhood
Good School
Close to school
Good Neighbors
Close to work
Close to family, relatives or friends
Close to open spaces (i.e. parks)
Close to recreation facilities
Easy to walk to retails and services
Easy to access to transit services
Safe Neighborhood
Allowed pets
Other, please specify:
Don't Know / Not Sure
No Others
How many dogs are in your household?
Number of dogs:

Would you say that in general your health is:
Excellent
Very Good
Good
Fair
Poor
Don't Know/ Not Sure

How tall are you without shoes?
_____(feet and inches, or just inches – please indicate which)
Don’t Know/Not Sure

About much do you weigh without shoes?
_____Weight (pounds)
Don’t Know/ Not sure

What is the highest grade or year of school you completed?
Never attended school or only kindergarten
Grades 1-6th
Grades 7-8th
Grades 9 through 11 (Some high school
Grade 12 or GED (High School graduate)
College 1 year to 3 years (Some college or technical school)
College 4 years or more (College graduate)
Graduate school or more
Other, please specify: _____

Is your annual household income from all sources:
Under 24,999 per year
25,000 - 34,999
35,000 – 49,999
50,000 – 74,999
75,000 - 99,999
100,000 - 149,999
150,000 - 199,999
Over 200,000
Don't know/Not Sure
Other (please specify)

Thank you so much for your participation!!!
You have completed the survey portion of the study.
You will be contacted in a about a week about your pedometer and travel diary portion of the study.
Thanks so much for your help on my study! Please do not hesitate to contact me if you have a question or concern during the project: kmwieters@tamu.edu.

This concludes the survey and clicking DONE will exit you from the survey.
Thank you.
You have completed the survey!

APPENDIX F

TRAVEL DIARY

1. Please enter the date when the trips you are recording were made:
2. What is the weather like for DAY FIVE in your opinion?
Weather - DAY FIVE

MM DD YYYY
Date when this set of trips were made: / /

Poor (cold, rainy, uncomfortable to go outside)
Fair (might need a jacket,ok to go outside
Good (nice day to go outside)
Excellent (perfect day to be outside)

1. What Trip # do you need to record?
2. Where are you starting this trip? (origin of this trip)
Name of Place (Home, Office, etc) & Location: (Address or Intersection)
3. Where are you going to (destination)?
Name of Place (Home, Office, etc) & Location: (Address or Intersection)
4. Please record the time you started this trip and when you arrived at the end of this trip:
5. What was the purpose of your trip?
Recording Your Trips
Time you left your starting point for this trip:
Time you arrived at your destination:
Work-related (commuting to/from work, meetings off-site)
Family (e.g.visiting relatives, taking children to school, etc)
Lunch
Running Errands (dry-cleaning, banking,etc)
Grocery Shopping
Other Shopping
Exercise/Recreation
Other (please specify)
6. What mode of transportation did you use?
****
If you DID NOT WALK for this trip--> Skip to Question #9.
****
If you DID WALK for this trip ---> please enter you step count readings:
Step Count Before I left for this walking trip:
Step Count After I arrived at my destination:
8. If you DID WALK for this trip, what are the main reasons you chose to walk for this trip?
If you DID WALK for this trip--> Skip to Question #10
If you DID NOT WALK for this trip--> Please answer Question #9

Someone asked me to walk with them
Pleasant weather
I had enough time to walk to this destination
To improve my health
To reduce my stress
Walking is the only mode of transportation to get to this destination
Don't know/Not sure
Other (please specify)
Other
9. If you DID NOT WALK for this trip, what were the barriers that kept you from walking (CHECK ALL THAT
APPLY):
The option to record your step count Before & After lunch and your total step count for the day will be included at the end of each trip.
****You only need to fill it out once - it is repeated for your convenience so you can fill it in when you are ready. ***
No interesting places to walk to
I have heavy things to carry/transport
Lack of time
No sidewalks or they are incomplete/discontinuous
Lack of energy or feel lazy
I don't know the best route to walk to this destination
Too many hills
Too Far to walk
Too much traffic
No one to walk with me
No shade
Dogs off their leash/ running around (other people's dogs)
The weather is too hot or too humid
The weather is too cold or wet (raining)
I have other people to take to other destinations
Childcare responsibility
I don't like walking
None
Other (please specify)
10. BEFORE YOU GO TO LUNCH

Please enter the step count from your pedometer
(do not reset the pedometer):
(Please enter your step count at approximately 12 pm if you don't take a lunch/eat at your desk)
11. AFTER YOU COME BACK FROM LUNCH

Please enter the step count from your pedometer

(do not reset pedometer):
(Please enter your step count at approximately 1 pm if you do not take a lunch/eat at your desk)
12. Please enter the TOTAL WALKING STEPS you accomplished today:
13. Was this your last trip for the day? (Ideally your last trip means you have arrived home and do not plan to
leave until tomorrow)
Enter Number of Steps at the End of Your Workday:
(Optional) Enter Number of Steps before you get ready for bed:
Yes, this was my last trip.
No, I have additional trips to record.

APPENDIX G

SAMPLE INTERVENTION MESSAGES AND MAPS

Today's message is focusing on options available near your office that could be opportunities to integrate walking as part of a trip you need to make periodically.

Attached is a map and a today's message for the intervention.

Thanks!

Meghan

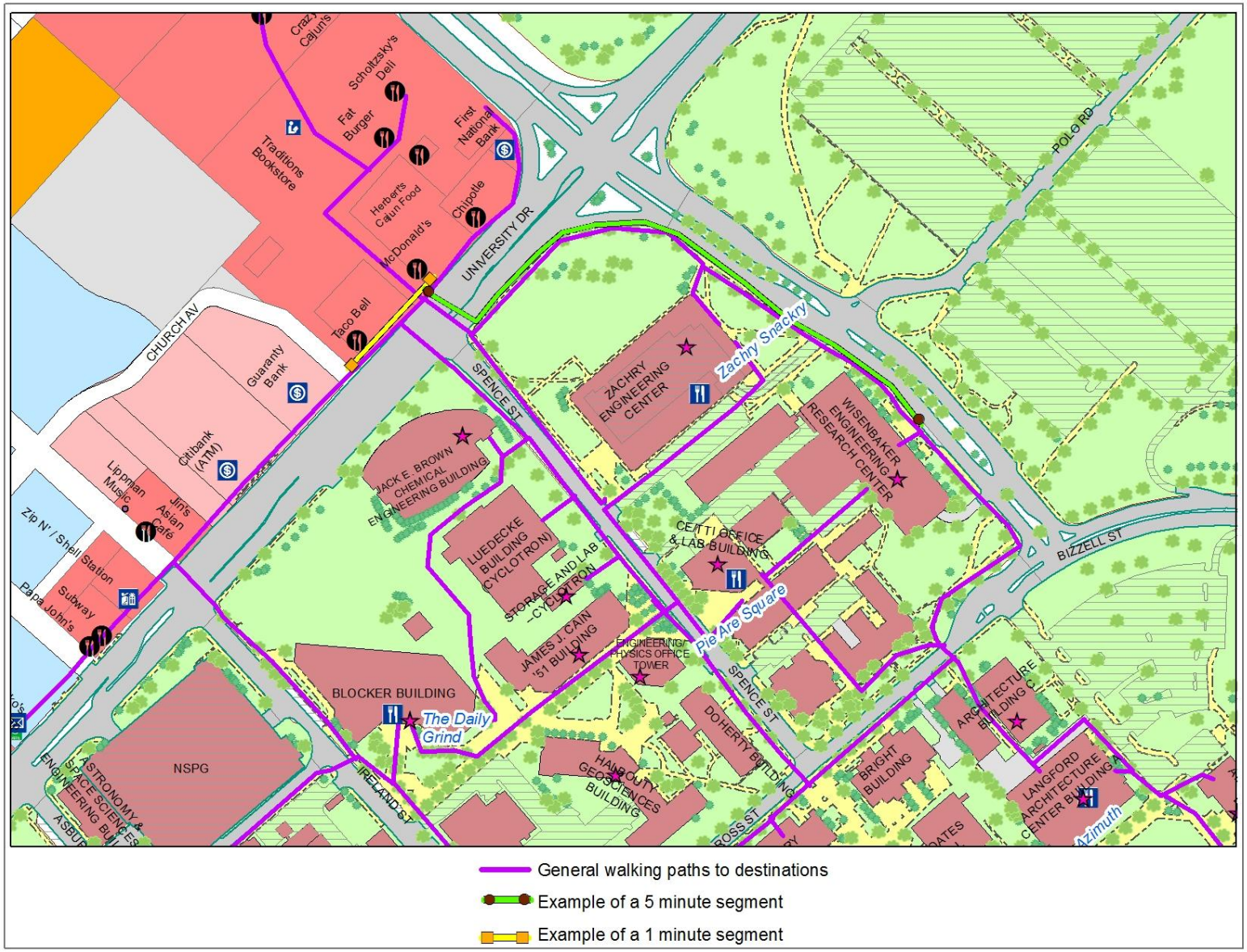
Walking for Transportation

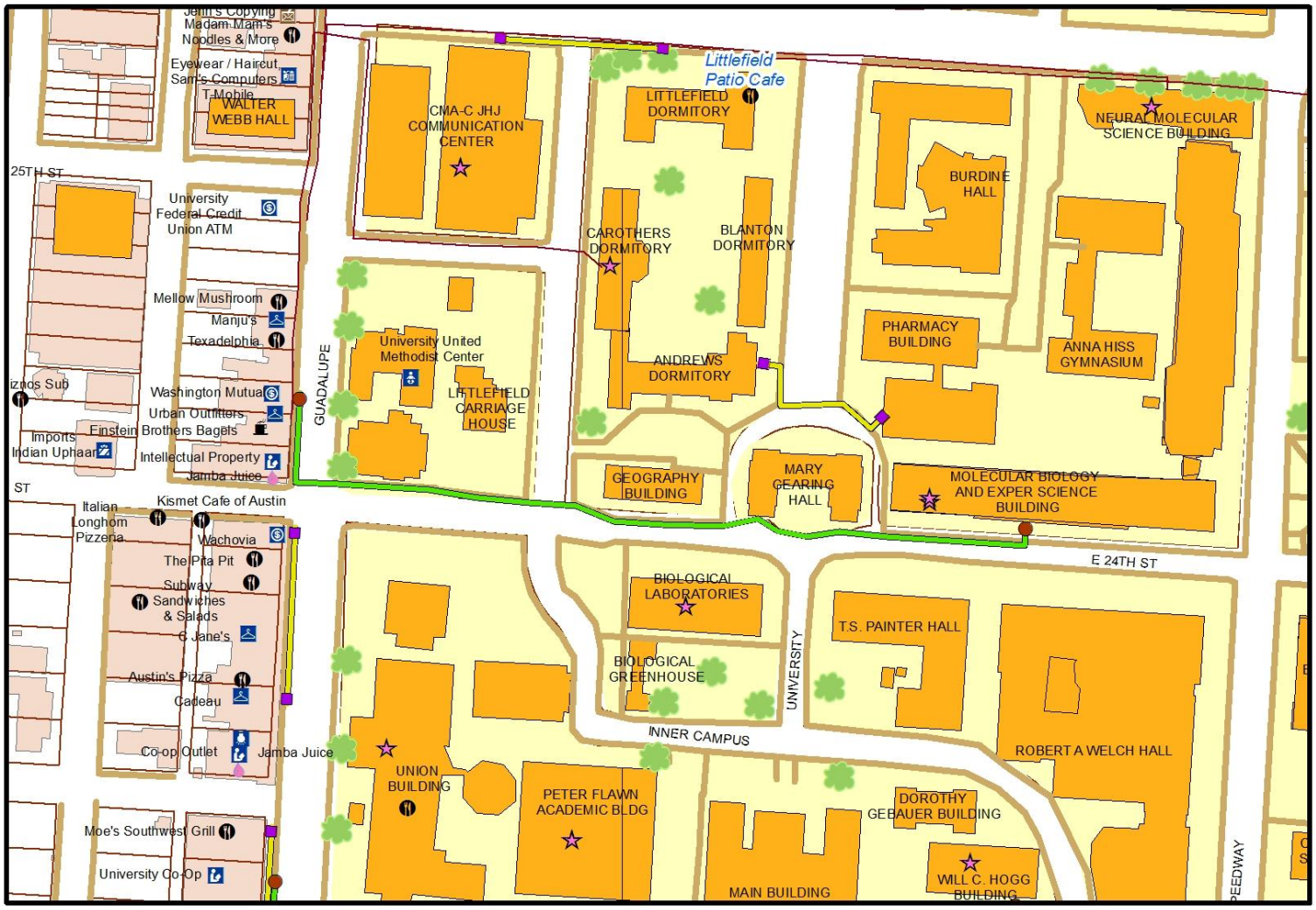
First, I would like to share some options that are available near your office building.

Attached is a map of your building and the variety of destinations within a short walk. Most, if not all, the destinations are within a 5 minute walk from your office, based on a moderate walking pace.

There may be locations that you haven't realized were quite close to your office. For many of these locations, driving may actually take more time than walking due to more direct pedestrian paths and no need to find parking for your vehicle.

The next time you need something (e.g. a service or product) from one of these destinations, please consider walking. When you walk to accomplish daily tasks you also manage increase your physical activity for the day. With our busy schedules, integrating physical activity as part of your daily life may fit in better than trying to set aside specific time for exercise.


Crazy Cajuns
Scholtzsky's Deli
Fat Burger
First National Bank
Traditions Bookstore
Herbert's Cajun Food
Chipotle
McDonald's
Taco Bell
UNIVERSITY DR
POLE RD
CHURCH AV
Guaranty Bank
Citibank (ATM)
SPENCE ST
Zachry Snackry
ZACHRY ENGINEERING CENTER
WISENBAKER ENGINEERING RESEARCH CENTER
JACK E. BROWN CHEMICAL ENGINEERING BUILDING
LUEDECKE BUILDING (CYCLOTRON)
STORAGE AND LAB - CYCLOTRON
CEATTI OFFICE & LAB BUILDING
BIZZELL ST
Lippman Music
Jin's Asian Cafe
Zip N' Shell Station
Subway
Papa John's
Pie Are Square
JAMES J. CAIN '51 BUILDING
ENGINEERING/ PHYSICS OFFICE TOWER
BLOCKER BUILDING
The Daily Grind
DOHERTY BUILDING
ARCHITECTURE BUILDING C
NSPG
ASTRONOMY & SPACE SCIENCES ENGINEERING BUILDING
IRELAND ST
HANCOCK GEOSCIENCES BUILDING
BRIGHT BUILDING
LANGFORD ARCHITECTURE CENTER BUILDING
Azimuth
ROSS ST
General walking paths to destinations
Example of a 5 minute segment
Example of a 1 minute segment


Jenn's Copying
Madam Mam's Noodles & More
Eyewear / Haircut
Sam's Computers
T-Mobile
WALTER WEBB HALL
CMA-C JHJ COMMUNICATION CENTER
Littlefield Patio Cafe
LITTLEFIELD DORMITORY
NEURAL MOLECULAR SCIENCE BUILDING
BURDINE HALL
25TH ST
University Federal Credit Union ATM
CAROTHERS DORMITORY
BLANTON DORMITORY
Mellow Mushroom
Manju's
Texadelphia
University United Methodist Center
PHARMACY BUILDING
ANNA HISS GYMNASIUM
GUADALUPE
ANDREWS DORMITORY
Izzios Sub
Washington Mutual
Urban Outfitters
Einstein Brothers Bagels
Imports
Indian Uphaar
Intellectual Property
Jamba Juice
LITTLEFIELD CARRIAGE HOUSE
GEOGRAPHY BUILDING
MARY GEARING HALL
MOLECULAR BIOLOGY AND EXPER SCIENCE BUILDING
ST
Kismet Cafe of Austin
Italian
Longhorn Pizzeria
Wachovia
The Pita Pit
Subway
Sandwiches & Salads
G Jane's
E 24TH ST
BIOLOGICAL LABORATORIES
T.S. PAINTER HALL
Austin's Pizza
Cadeau
BIOLOGICAL GREENHOUSE
UNIVERSITY
INNER CAMPUS
Co-op Outlet
Jamba Juice
ROBERT A WELCH HALL
UNION BUILDING
PETER FLAWN ACADEMIC BLDG
DOROTHY GEBAUER BUILDING
Moe's Southwest Grill
University Co-Op
MAIN BUILDING
WILL C. HOGG BUILDING
1 min walking segment
5 minute walking segment
General Walking Path

Today's attached message is highlighting some of benefits of walking for your health and the environment.

Health Benefits

Walking is a great way to improve your health and prevent health problems in the future. Extensive studies have shown that walking 3 hours or more a week (**just a half an hour a day!**) can **reduce your risk of a heart attack or other coronary event** (Nurse's Health Study notes the risk of coronary event is lowered by 35% in women). (AARP, MedicineNet, CDC)

Regular walking is also helpful in **lowering your risk of stroke, breast cancer, and Type 2 diabetes**. Regular walking also lowers your risk of gallstone surgery by 20-31% and can protect against hip fractures. Such a simple form of exercise can help keep you healthy! (AARP)

What about **stress and depression**? Walking can help you clear your head, give you a break from pressures at work or home. Going for a short walk gives you time to stretch which can help relieve arthritis and back pain from sitting at your computer too long. Regular daily walking has also been linked with improved sleep and elevated mood and sense of well-being. All this and you don't even have to break a sweat to get some health benefits!

Environmental Benefits

Are you concerned about the **environment**? Sometimes it seems like environmental problems too large for an individual's action to make an impact. Starting with smaller things that are easier to adopt can ultimately have a big impact. For example, by some accounts, the emissions derived from starting your car are higher than compared to when you are driving. When you replace a trip you normally make in your car, you reduce the emissions for the entire trip as well as the start up emissions. Depending your vehicle and the number of trips you make, by reducing one trip per week you could reduce your impact on the air by ½ pound or more of NOx (a key element in the creation of "bad" ozone).

Today's message is intended to give you an idea about how much walking is recommended for your health and how many calories you can burn by simply walking.

Walking & Your Health

The Surgeon General recommends that we reach 10,000 steps per day to help maintain our health. For some that is a challenge, while maybe not so for others.

If you find the 10,000 steps everyday challenging, try focusing on a smaller goal and gradually work your way up. Here are some suggestions for starting out:

- Walking for 10 minutes at lunch everyday for a month
- Walk to complete errands such as going to the bank or ATM, getting coffee, or picking up your dry cleaning.
- Walk to lunch instead of driving.
- Choosing the stairs instead of the elevator (burns 5 times more calories taking the stairs) (CDC)

Don't forget to reward yourself when making positive changes in your life. For an inexpensive, visual reinforcement, something as simple as using some gold stars to put on your calendar for each day you walk, can help measure your success. Remember new habits are best made if you don't overdo it at first.

Along these same lines, consider the positive benefits of walking to assist in losing weight or avoiding weight gain. Adding just 2,000 extra steps to your daily routine and choosing wise ways to eat 100 fewer calories each day can help you with this goal. (AmericanOnThe Move)

Calories

How many calories do I burn while walking?

How many calories you burn depends on your walking speed or pace and your weight. For a person that weighs 150 pounds and walks at a moderate pace (3 mph) for one hour, he/she can burn almost 240 calories (just about enough activity to burn the calories from 4 small chocolate chip cookies!).

Interested in finding out how many calories you might burn walking for an hour? Below is a table with a few more weight levels and walking speeds for you.

Calories burned per hour at different body weights

Walking	110 lbs	125 lbs.	150 lbs.	175 lbs.	200 lbs.
Strolling less than 2 mph, level	100	114	136	159	182
Moderate pace about 3 mph	175	199	239	278	318
Brisk pace about 3.5 mph	200	227	273	318	364

Adapted from: http://www.medicinenet.com/walking/page8.htm

APPENDIX H

STUDY VARIABLES AND MEASUREMENT INSTRUMENTS

Variable	Description	Type	Measurement Instrument
Outcome Variables			
Walk Duration	Minutes of walking per week	Categorical	Base Survey; Travel Diary
Walking Frequency	Number of walk trips per week	Categorical	Base Survey; Travel Diary
Total Step Count	Total step count for day via pedometer	Continuous	Pedometer, Travel Diary
Personal Correlates			
Age	18-24; 25-34; 35-44;45-54; Over 55	Ordinal	Base Survey
Gender	Male=0; Female=1	Dichotomous	Base Survey
Education	Never attended school; Grades 1-6th; Grades 7-8th; Grades 9 through 11;Grade 12 or GED; College 1 year to 3 years; College 4 years or more; Graduate school or more	Ordinal	Base Survey
Income	Under 24,999 per year 25,000 - 34,999 35,000 – 49,999 50,000 – 74,999 75,000 - 99,999 100,000 - 149,999 Over 150,000	Ordinal	Base Survey
Race / Ethnicity	White, non-Hispanic=1; Non-White=0	Dichotomous	Base Survey
BMI	Normal Weight or Underweight=12 (BMI<25), Overweight=13(BMI 25-30), Obese=14 (BMI>30)	Categorical	Base Survey
General Perceived Health Status	Excellent, Very Good, Good, Fair or Poor	Categorical	Base Survey
Car Ownership	1 car, 2 cars, 3 or more cars	Ordinal	Base Survey
Vehicle Miles Traveled/Year	5,000-8999; 9,000-11,999; 12,000-15,999; 16,000-18,999; Over 19,000	Ordinal	Base Survey
Bicycle Ownership	Yes=1 No=0	Dichotomous	Base Survey
Television viewing hours/day	Hours per day	Categorical	Base Survey
Exercise equipment at home	Yes=1 No=0	Dichotomous	Base Survey
Transportation walking or bicycling			Base Survey
Meals away from home / office	1 time/wk; 2 times/wk; 3 times/wk; 4-5 times/wk; 6-7 times/wk; 8-9 times/wk; 10-12 times/wk; over 12 times/wk	Ordinal	Base Survey
Servings of vegetables / day	0-1 servings/day; 2 servings/day; Over 3 servings/day	Ordinal	Base Survey
Trip purpose	Work-related=11, Family=12, Lunch=13, Running errands=14, Grocery Shopping=15, Other Shopping=16, Exercise/Recreation=17, Food=19, Doctor/Medical=20, Home=22	Categorical	Travel Diary
Trip mode	Walk=10; Bike=20, Transit=30; Drive Alone=40; Carpool=50; Motorcycle=60; Taxi=70, Other=99	Categorical	Base Survey; Travel Diary
Trip Duration	Duration of trips by mode choice	Continuous	Travel Diary
Attitudes			
Walking is a good way of getting physical activity.	Strongly Agree=11; Agree=12; Neutral=13; Disagree=14; Strongly Disagree=15	Categorical	Travel Diary
Biking is a good way of getting physical activity.	Strongly Agree=11; Agree=12; Neutral=13; Disagree=14; Strongly Disagree=15	Categorical	Travel Diary

Variable	Description	Type	Measurement Instrument
Driving is expensive.	Strongly Agree=11; Agree=12; Neutral=13; Disagree=14; Strongly Disagree=15	Categorical	Travel Diary
Public transit is for those who do not own a car.	Strongly Agree=11; Agree=12; Neutral=13; Disagree=14; Strongly Disagree=15	Categorical	Travel Diary
Walking is for recreation purposes, rather than transportation.	Strongly Agree=11; Agree=12; Neutral=13; Disagree=14; Strongly Disagree=15	Categorical	Travel Diary
Biking is for recreation purposes, rather than transportation.	Strongly Agree=11; Agree=12; Neutral=13; Disagree=14; Strongly Disagree=15	Categorical	Travel Diary
Public transportation is necessary to worksite.	Strongly Agree=11; Agree=12; Neutral=13; Disagree=14; Strongly Disagree=15	Categorical	Travel Diary
Air pollution is a serious problem for our city.	Strongly Agree=11; Agree=12; Neutral=13; Disagree=14; Strongly Disagree=15	Categorical	Travel Diary
Walking will help to reduce air pollution for our city.	Strongly Agree=11; Agree=12; Neutral=13; Disagree=14; Strongly Disagree=15	Categorical	Travel Diary
Walking is an effective means of exercise.	Strongly Agree=11; Agree=12; Neutral=13; Disagree=14; Strongly Disagree=15	Categorical	Travel Diary
People drive too fast in the vicinity near my office.	Strongly Agree=11; Agree=12; Neutral=13; Disagree=14; Strongly Disagree=15	Categorical	Travel Diary
I feel safe walking to locations near my office.	Strongly Agree=11; Agree=12; Neutral=13; Disagree=14; Strongly Disagree=15	Categorical	Travel Diary
Drug-related activity in the areas where I would walk	Selected=1; Not selected=0	Dichotomous	Base Survey
Fear of being robbed/attack/ assaulted	Selected=1; Not selected=0	Dichotomous	Base Survey
Increasing physical activity during the day is important to me.	Strongly Agree; Agree; Neutral; Disagree; Strongly Disagree	Categorical	Travel Diary
Physical activities are important for me to keep healthy.	Strongly Agree; Agree; Neutral; Disagree; Strongly Disagree	Categorical	Travel Diary
If I knew how to get to a destination by walking I am more likely to walk to it.	Strongly Agree; Agree; Neutral; Disagree; Strongly Disagree	Categorical	Travel Diary
Barriers			
Lack of time	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
Lack of energy or lazy	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
Lack of knowledge about benefits of walking and/or physical activity	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
Having to carry heavy items	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
Motivators			
Knowledge of time required to walk to destination	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
Enough time to walk to destination	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
Social Support			
Walk with	Walk alone; Walk with others	Dichotomous	Base Survey; Travel Diary
Marital Status	Not living with someone=0; Living with someone=1	Dichotomous	Base Survey
Exercise with others	Yes=1 No=0	Dichotomous	Base Survey
Barrier: No one to walk with	Yes=1 No=0	Dichotomous	Base Survey
Barrier: No Dog to walk with	Yes=1 No=0	Dichotomous	Base Survey
Motivator: Someone to walk with	Yes=1 No=0	Dichotomous	Base Survey
Childcare responsibility	Yes=1 No=0	Dichotomous	Base Survey

Variable	Description	Type	Measurement Instrument
Dog Ownership	Yes=1 No=0	Dichotomous	Base Survey
Number of Children in HH	1 or more children=1; No children=0	Dichotomous	Base Survey
Number of Adults in HH	1 adult, 2 adults, 3 or more adults	Ordinal	Base Survey
Organizational Correlates			
Supervise	Yes=1; No=0	Dichotomous	Base Survey
Number of employees supervised	1-2; 3-5; 6-9; Over 10 employees	Ordinal	Base Survey
Longevity in Department	Number of years	Ordinal	Base Survey
Longevity in Organization	Number of years	Ordinal	Base Survey
Pay for Parking	Yes=1; No=0	Dichotomous	Base Survey
Cost of parking	Dollars per year	Categorical	Base Survey
Built Environment Correlates			
Distance of parking to entrance of office building	>5min; 6-10 min; 11-15 min	Categorical	Base Survey
Barriers			
No sidewalks or no continuous sidewalks	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary / Built Env. Audit
No walking paths or trails nearby	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
No crosswalks or pedestrian signals	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
Crosswalk signals are too short	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
Dangerous street-crossing conditions	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
Too much traffic	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
Traffic is traveling too fast on roads I need to walk along	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
No safe places to walk nearby	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
Not enough lighting at night	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
No interesting places to walk to	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
No interesting architecture or landscape to look at	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
No shopping locations nearby	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
No parks or recreations places to walk to	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
Too many hills	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
No trees or shade	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary / Built Env. Audit
No benches and other places to rest	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
Need car at or after work	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
Bad weather	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
Unattended dogs	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
Land uses within walking distance			
Farmers Market	Not in Vicinity=0 Within walking distance of 10 min=11	Dichotomous	Base Survey; Built Env. Audit
Fruit/Vegetable Market	Not in Vicinity=0 Within walking distance of 10 min=11	Dichotomous	Base Survey; Built Env. Audit
Supermarket	Not in Vicinity=0 Within walking distance of 10 min=11	Dichotomous	Base Survey; Built Env. Audit
Convenience Store	Not in Vicinity=0 Within walking distance of 10 min=11	Dichotomous	Base Survey; Built Env. Audit

Variable	Description	Type	Measurement Instrument
Fast Food restaurant	Not in Vicinity=0 Within walking distance of 10 min=11	Dichotomous	Base Survey; Built Env. Audit
Non-Fast Food restaurant	Not in Vicinity=0, Within 1-5 min=11, Within 6-10 min=12, Within 11-15 min=13, Over 16 min=14	Categorical	Base Survey; Built Env. Audit
Pub/ Bar	Not in Vicinity=0 Within walking distance of 10 min=11	Dichotomous	Base Survey; Built Env. Audit
Café	Not in Vicinity=0 Within walking distance of 10 min=11	Dichotomous	Base Survey; Built Env. Audit
Clothing Store	Not in Vicinity=0 Within walking distance of 10 min=11	Dichotomous	Base Survey; Built Env. Audit
Pharmacy / Drug Store	Not in Vicinity=0 Within walking distance of 10 min=11	Dichotomous	Base Survey; Built Env. Audit
Laundry/Dry Cleaners	Not in Vicinity=0 Within walking distance of 10 min=11	Dichotomous	Base Survey; Built Env. Audit
Office supply	Not in Vicinity=0 Within walking distance of 10 min=11	Dichotomous	Base Survey; Built Env. Audit
Hardware	Not in Vicinity=0 Within walking distance of 10 min=11	Dichotomous	Base Survey; Built Env. Audit
Shopping Center	Not in Vicinity=0 Within walking distance of 10 min=11	Dichotomous	Base Survey; Built Env. Audit
Bank/Credit Union	Not in Vicinity=0, Within 1-5 min=11, Within 6-10 min=12, Within 11-15 min=13, Over 16 min=14	Categorical	Base Survey; Built Env. Audit
Post Office	Not in Vicinity=0 Within walking distance of 10 min=11	Dichotomous	Base Survey; Built Env. Audit
Video store	Not in Vicinity=0 Within walking distance of 10 min=11	Dichotomous	Base Survey; Built Env. Audit
Salon/Barbershop	Not in Vicinity=0 Within walking distance of 10 min=11	Dichotomous	Base Survey; Built Env. Audit
Religious	Not in Vicinity=0 Within walking distance of 10 min=11	Dichotomous	Base Survey; Built Env. Audit
Daycare	Not in Vicinity=0 Within walking distance of 10 min=11	Dichotomous	Base Survey; Built Env. Audit
Community Center	Not in Vicinity=0 Within walking distance of 10 min=11	Dichotomous	Base Survey; Built Env. Audit
Gym / Healthclub	Not in Vicinity=0 Within walking distance of 10 min=11	Dichotomous	Base Survey; Built Env. Audit
Recreation Center	Not in Vicinity=0, Within 1-5 min=11, Within 6-10 min=12, Within 11-15 min=13, Over 16 min=14	Categorical	
Park	Not in Vicinity=0 Within walking distance of 10 min=11	Dichotomous	Base Survey; Built Env. Audit
Transit stop	Not in Vicinity=0 Within walking distance of 10 min=11	Dichotomous	Base Survey; Built Env. Audit
Other Offices	Selected=1; Not selected=0 / Distance	Dichotomous	Base Survey; Built Env. Audit
Proximity Closest Airline Banks	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit
Proximity Closest Airline Bookstore	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit
Proximity Closest Airline Cafe/ Coffee shop	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit
Proximity Closest Airline Church	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit

Variable	Description	Type	Measurement Instrument
Proximity Closest Airline Clothing Store	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit
Proximity Closest Airline Convenience Store	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit
Proximity Closest Airline Dry Cleaners	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit
Proximity Closest Airline Food/Restaurant	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit
Proximity Closest Airline Hair Salon/Barbershop	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit
Proximity Closest Airline Land use parcels near campus	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit
Proximity Closest Airline Office	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit
Proximity Closest Airline Pharmacy / Drugstore	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit
Proximity Closest Airline Phone/Cell Phone store	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit
Proximity Closest Network Banks	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit
Proximity Closest Network Bookstore	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit
Proximity Closest Network Cafe/Coffee shop	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit
Proximity Closest Network Church	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit
Proximity Closest Network Clothing Store	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit
Proximity Closest Airline Convenience Store	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit
Proximity Closest Airline Dry Cleaners	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit

Variable	Description	Type	Measurement Instrument
Proximity Closest Network Food/Restaurant	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit
Proximity Closest Network Hair salon/ Barbershop	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit
Proximity Closest Network Land Uses near campus	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit
Proximity Closest Network Office	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit
Proximity Closest Network Pharmacy/Drug Store	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit
Proximity Closest Network Phone/Cell Phone store	1/8 or less=11,1/8- 1/4=12, 1/4-1/2=13, 1/2-3/4=14, 3/4-1=15, 1-11/8=16, 11/8-11/4=17, 11/4-11/2=18, 11/2=13/4=19, 13/4-2=20	Categorical	GIS/ WBC Analyst, Built Env. Audit
Count Airline Banks	None within ¼ mile=0, 1-3 within ¼ mile=1, 4-7 within ¼ mile=4	Continuous	GIS/ WBC Analyst, Built Env. Audit
Count Airline Bookstore	Number within ¼ mile of office locations	Continuous	GIS/ WBC Analyst, Built Env. Audit
Count Airline Cafe / Coffee shop	Number within ¼ mile of office locations	Continuous	GIS/ WBC Analyst, Built Env. Audit
Count Airline Church	Number within ¼ mile of office locations	Continuous	GIS/ WBC Analyst, Built Env. Audit
Count Airline Clothing Store	Number within ¼ mile of office locations	Continuous	GIS/ WBC Analyst, Built Env. Audit
Count Airline Convenience Store	None within ¼ mile=0, 1-2 within ¼ mile=1, 3-5 within ¼ mile=3	Continuous	GIS/ WBC Analyst, Built Env. Audit
Count Airline Dry Cleaners	Number within ¼ mile of office locations	Continuous	GIS/ WBC Analyst, Built Env. Audit
Count Airline Food/Restaurant	None within ¼ mile=0, 1=1, 2=2, 3=3-11 within ¼ mile, 12=12, 13-15 within ¼ mile=15, 16-18 within ¼ mile=16	Categorical	GIS/ WBC Analyst, Built Env. Audit
Count Airline Hair Salon/Barbershop	Number within ¼ mile of office locations	Continuous	GIS/ WBC Analyst, Built Env. Audit
Count Airline Land use parcels near campus	Number within ¼ mile of office locations	Continuous	GIS/ WBC Analyst, Built Env. Audit
Count Airline Office	Number within ¼ mile of office locations	Continuous	GIS/ WBC Analyst, Built Env. Audit
Count Airline Pharmacy / Drugstore	Number within ¼ mile of office locations	Continuous	GIS/ WBC Analyst, Built Env. Audit
Count Airline Phone/Cell Phone store	Number within ¼ mile of office locations	Continuous	GIS/ WBC Analyst, Built Env. Audit
Count Network Banks	Number within ¼ mile of office locations	Continuous	GIS/ WBC Analyst, Built Env. Audit
Count Network Bookstore	Number within ¼ mile of office locations	Continuous	GIS/ WBC Analyst, Built Env. Audit
Count Network Cafe/Coffee shop	Number within ¼ mile of office locations	Continuous	GIS/ WBC Analyst, Built Env. Audit
Count Network Church	Number within ¼ mile of office locations	Continuous	GIS/ WBC Analyst, Built Env. Audit

Variable	Description	Type	Measurement Instrument
Count Network Clothing Store	None within ¼ mile=0, 1-3 within ¼ mile=1, 4-6 within ¼ mile=4	Categorical	GIS/ WBC Analyst, Built Env. Audit
Count Network Convenience Store	Number within ¼ mile of office locations	Continuous	GIS/ WBC Analyst, Built Env. Audit
Count Network Dry Cleaners	Number within ¼ mile of office locations	Continuous	GIS/ WBC Analyst, Built Env. Audit
Count Network Food/Restaurant	None within ¼ mile=0, 1-5 within ¼ mile=1, 6-10 within ¼ mile=6, 11-15 within ¼ mile =11	Categorical	GIS/ WBC Analyst, Built Env. Audit
Count Network Hair salon/ Barbershop	None within ¼ mile=0, 1=1 within ¼ mile=1, 2-3 within ¼ mile=2	Categorical	GIS/ WBC Analyst, Built Env. Audit
Count Network Land Uses near campus	None within ¼ mile=0, 1-5 within ¼ mile=1, 6-16 within ¼ mile=6, 21-37 within ¼ mile =21, 40-42=40	Categorical	GIS/ WBC Analyst, Built Env. Audit
Count Network Offices	Number within ¼ mile of office locations	Continuous	GIS/ WBC Analyst, Built Env. Audit
Count Network Pharmacy / Drugstore	Number within ¼ mile of office locations	Continuous	GIS/ WBC Analyst, Built Env. Audit
Count Network Phone / Cell Phone Store	Number within ¼ mile of office locations	Continuous	GIS/ WBC Analyst, Built Env. Audit
Knowledge of how to walk to destination	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
Protection from weather	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
Flat terrain	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
Available sidewalks	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
Available shade	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
Little car traffic	Selected=1; Not selected=0	Dichotomous	Base Survey / Travel Diary
Housing site selection			
Housing Affordability	Selected=1; Not selected=0	Dichotomous	Base Survey
Quality of neighborhood	Selected=1; Not selected=0	Dichotomous	Base Survey
Good school	Selected=1; Not selected=0	Dichotomous	Base Survey
Close to school	Selected=1; Not selected=0	Dichotomous	Base Survey
Good neighbors	Selected=1; Not selected=0	Dichotomous	Base Survey
Close to work	Selected=1; Not selected=0	Dichotomous	Base Survey
Close to family	Selected=1; Not selected=0	Dichotomous	Base Survey
Close to open space	Selected=1; Not selected=0	Dichotomous	Base Survey
Close to recreation	Selected=1; Not selected=0	Dichotomous	Base Survey
Easy access to retail	Selected=1; Not selected=0	Dichotomous	Base Survey
Easy access to transit	Selected=1; Not selected=0	Dichotomous	Base Survey
Safe neighborhood	Selected=1; Not selected=0	Dichotomous	Base Survey
Allow pets	Selected=1; Not selected=0	Dichotomous	Base Survey
There are many locations nearby my office that I can walk to for my daily needs.	Strongly Agree; Agree; Neutral; Disagree; Strongly Disagree	Categorical	Travel Diary

VITA

Kathleen Meghan Wieters received her Bachelor of Arts degree in Philosophy, International Studies and Spanish from Trinity University in San Antonio, Texas in 1993. Ms. Wieters received her Master of Science in Community and Regional Planning at The University of Texas at Austin in 1995. She entered the Urban Regional Sciences program at Texas A&M University in September 2003 and received her Doctor of Philosophy degree in August 2009. Her research interests include transportation planning, sustainable transportation and land use planning, physical activity and public health integrated with planning, and community participation. She plans to publish articles on these topics, with continued interest and focus on interdisciplinary work to achieve efficient, sustainable and high quality life in cities, suburbs and rural communities. Ms. Wieters has accepted a position at the completion of this dissertation to join the faculty at University of Oklahoma as Assistant Professor in Environmental Planning.

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