

## **Appendix A:**

### **Active Transportation and Employee Productivity**

Health is an important aspect of everyday life. Without it, life's activities would be significantly limited or restricted (Schultz & Edington, 2007). One of these basic life activities is work. Employee health is a significant concern for employers. The presence of health risk factors among employees is not only costly to employers in terms of health insurance and benefits costs, but also for costs associated with reduction in productivity (Bopp, Kaczynski, & Campbell, 2013; Schultz & Edington, 2007). We will explore the relationship between employee productivity, health and work-related active transportation. Evidence-based strategies to increase the health of employees such as promotion of active commuting will be presented.

#### **Employee Health and Productivity**

Employee productivity is generally assessed by presenteeism and absenteeism (Burton, Conti, Chen, Schultz, & Edington 1999). Workplace absenteeism is an employee's intentional or habitual absence from work (Schultz & Edington, 2007). Unlike absenteeism, presenteeism is a relatively new concept in workplace health (Brown, Gilson, Burton, & Brown, 2011). Brown et al., (2013) define presenteeism as the extent to which physical and psychosocial symptoms and conditions adversely affect the work productivity of individuals. The impact of presenteeism is reflected in costs associated with reduced work output, errors on the job and failure to meet company standards (Schultz & Edington, 2007).

There are many health and well-being factors associated with employee productivity. Physical health conditions include hypertension, cardiovascular disease, stroke, diabetes, hypertension, breast cancer, colon cancer, respiratory tract infections and asthma (Chapman, 2005; Brown et al., 2013). Mental health status is also associated. Anxiety, depression, nervousness, panic attacks, decreased self-esteem, mood, happiness and satisfaction all impact employee productivity (Chapman, 2005; Ramanathan, O'Brien, Faulkner, & Stone, 2014). All of these conditions have been negatively associated with employee productivity (Chapman, 2005; Fonseca, Nobre, Pronk, & Santos, 2010; Brown et al., 2013). The impact of employee health and well-being on productivity demonstrates the need to address these factors.

#### **Health, Physical Activity and Active Transportation**

Physical activity has a well-established inverse association with many of the physical and mental health conditions listed above (Brown et al., 2013). Warburton et al., (2007) found that physical activity reduces the risk of over 25 chronic conditions, in particular, coronary heart disease, stroke, hypertension, breast cancer, colon cancer, diabetes, and osteoporosis. As well, there is increasing evidence to demonstrate the mental health benefits of physical activity (Cerin, Leslie, Sugiyama & Owen, 2009).

Active transportation, such as cycling, walking or using public transit may be an effective approach to integrate regular physical activity into daily lifestyles (Bopp et al., 2013). Incorporating active transportation helps individuals achieve the recommended 150 minutes per week of physical activity (Canadian Society for Exercise Physiology, 2014). Brockman & Fox (2011) found that approximately 70% of the active commuters in their study, which cycled or walked to work, accumulated 120 minutes of physical activity each week.

There is a large body of evidence indicating that people who are engaged in active transportation to work are healthier, happier, have better workplace attendance records and increased productivity (Wen, Kite, & Rissel, 2010; Kitchen, Williams & Chowhan, 2011; Bopp, Kaczynski & Campbell, 2013; Brown et al., 2013). Likewise, research completed by Humphreys et al., (2013) concluded that greater time spent actively transporting to and from work was associated with higher levels of mental wellbeing. Therefore, encouraging regular physical activity such as active transportation to and from work (e.g. cycling and walking) may be a useful strategy to decrease the use of passive travel modes, increase employee health and well-being and subsequently increase employee productivity (Fronseca et al., 2010; Brown et al., 2011, Kitchen, Williams, & Chowhan, 2011; Bopp, Kaczynski & Campbell, 2013).

### **Effective Workplace Strategies**

Workplaces can encourage active travel by implementing strategies to make it easier for employees to walk, cycle, or use public transit. One strategy to increase active transportation among employees is to make physical changes to the workplace (Wen et al., 2010). These include; providing secure, well-lit and sheltered bicycle parking, end-of-trip facilities (shower, changing and locker facilities), and limiting parking spaces (Wen et al., 2010; Kaczynski et al., 2010; Brockman & Fox, 2010).

It is clear that targeting individual behavior by changing infrastructure is not enough to increase active transportation alone. Interventions should also target organizational changes such as policy implementation in order to bring about a significant change in active transportation of employees (Wen et al., 2010). For example, offering tax breaks, health insurance premium reductions, car-sharing schemes, flexible work hours, flexible dress code, incentive programs or other financial incentives like subsidized bus passes may encourage active commuting among employees (Kaczynski et al., 2010; Wen et al., 2010 Brockman & Fox, 2011). Kaczynski et al., (2010) found that employees who reported more physical and cultural supports in the workplace for active transportation were more likely to use an active mode of travelling during the work week. Policies can increase awareness of active commuting and foster a supportive environment increasing employees' physical activity levels and overall health and well-being (Wen et al., 2010).

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