Creating Cultural Change through the Theory of Planned Behavior and Cultural Interpretation: A Project to Promote the Use and Safety of Bicycling for Transportation

by

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A Project

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Increasing utilitarian cycling has the potential to be instrumental in addressing current public health, transportation, and environmental issues. These include traffic congestion, pollution, rising obesity rates, and non-renewable energy consumption. This project contributes to the progression of creating a modal shift by utilizing the Theory of Planned Behavior and principles of heritage interpretation to target and affect beliefs and behaviors related to cycling for transportation. It is comprised of a series of exhibits and a website designed to (1) promote awareness of cycling as a viable and socially acceptable means of transportation; (2) aid in the reduction of barriers to participation and promote efficacy; (3) promote safety; (4) and to provide cyclists and motorists with information. This paper also provides an overview of research on the personal and societal benefits of bike commuting, constraints, promotion strategies, and the Theory of Planned Behavior.
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Chapter 1: Introduction and Statement of the Problem

Introduction

Increasing utilitarian cycling has the potential to be instrumental in addressing current public health, transportation, and environmental issues. It could help reduce traffic congestion, address lack of urban parking, and decrease air pollution and energy consumption (Hanson & Young, 2008; Ogilve, Hamilton, & Petticrew, 2004). There is direct evidence showing substantial health benefits related to cycling (Ogilve et al; Ojoa, Vuori, & Petticrew, 1998; Pucher, Komanoff & Schimek, 1999). Active commuting also allows people to incorporate physical activity into their lives instead of having to designate a separate time to exercise. A notable modal shift has already been realized in many European nations. North America, Australia, and the United Kingdom are now making significant efforts to utilize the lessons learned in Europe.

Consider the following statistics:

- The obesity epidemic claims 400,000 lives and costs $117 billion in health related expenses each year. In 2003, the obesity rate for American adults was 20.9%, it is now almost 70% (Rails-to-Trails, 2010).
- In 2009, 13% of traffic fatalities were cyclists and pedestrians, yet these groups received less than 1% of federal safety funding (America Bikes, 2010).
- One mile of four-lane urban highway costs approximately $50 million. That same amount could provide an entire network of active transportation facilities in a mid-sized town (Gotschi, Thomas, & Mills, 2008).
- In just one generation, the percentage of American children who walk or
bike to school has dropped from 50% to 15%. Childhood obesity has tripled (Bikes Belong, n.d.). Almost 20% of 4 year olds are obese (Anderson & Whitaker, 2009).

- Americans who commute by car during rush hour spend an average of 36 hours a year stuck in traffic (Texas Transportation Institute).
- Cyclists live an average of two years longer than non-cyclists and take 15% fewer days off work due to illness (CTC, n.d.). Bicycling for transportation can reduce mortality by 35-40% (Cavill, 2007; Mathews et al., 2007). The health benefits of cycling outweigh the safety risks by a factor of twenty to one (Hillman, 1992).
- 71% of Americans surveyed in 2008 indicated a desire to bicycle more (Royal & Miller-Steiger, 2008) while 89% “believe that transportation investments should support the goals of reducing energy use (National Association of Realtors and Transportation for America, 2009).
- A 3% drop in vehicle miles travelled translates to an almost 30% reduction in peak hour congestion (INTRIX National Traffic Scorecard, 2009).
- Approximately 3.8 billion gallons of gas a year would be saved by increasing the percentage of trips made by walking and bicycling from 10% to 13% (Gotschi & Mills, 2008).

The U.S. lacks a tradition of utilitarian cycling (Pucher et al., 1999) and commuting has yet to become accepted as mainstream in most areas and continues to occupy “marginal legal, cultural, and infrastructure status” (Pucher et al., 1999, p. 625). Attitudes about such riders are generally negative - they have a public image of being “anti-car,” environmental extremists, renegade, eccentric, or just plain crazy and are widely considered “an alien presence on roads intended for cars” (Pucher et al., 1999, p. 645). The majority (76%) of bike commuters are affluent white males (Lea, 2004; Pucher et al., 1999; Shepard, 2008). “For many
people, especially women, cycling is something that other people do, people unlike themselves” (Gatersleben & Appleton, 2006, p. 309).

Utilitarian cycling has increased over the last decade, and especially the last several years, as environmental and economic crises have come to a head. Still, the latest research shows only 1% of urban trips are made by bike despite 28% of trips being less than one mile and 48% under three miles (Pucher et al., 1999; Wardman, Tight, & Page, 2007). As Pucher et al. (1999) noted, “culture, custom, and habit are important,” as well as self-perpetuating (p. 626). Danger, both real and perceived, is by far the greatest deterrent to potential cyclists (Ojoa et al., 1998; Unwin, 1995; Wardman, Tight, & Page, 2007; Wood, Lacherez, Marszalek, & King, 2009). Awareness and education is needed for both cyclists and drivers (Pucher et al., 1999).

Realizing a significant modal shift in the U.S. requires cultural change (Gatersleben & Appleton, 2007; Pucher et al, 1999) and is dependent on numerous, complex, interrelated variables across cultural, political, and physical realms. Even so, various nations worldwide, as well as select American cities, have already realized a significant modal shift through the use of multi-faceted and integrated strategies. Research and industry reports demonstrate a marked increase of interest in and use of utilitarian cycling in response to rising societal and environmental issues. The Theory of Planned Behavior (TPB) provides a theoretical framework for understanding and influencing the beliefs that determine intentions and behavior. Interpretation is “a mission-based communication process that forges emotional and intellectual connections between the interests of the
audience and meanings inherent in the resource” (National Association for Interpretation, 2006). Beck and Cable (2002) describe it as “a process that can help people see beyond their capabilities” (p. 3). The implementation of an interpretive trail based on the TPB could contribute to this progression by “lighting the spark” of personal and cultural change through provocation, information, and the promotion of efficacy.

**Statement of the Problem**

The purpose of this project is to promote the safety and use of utilitarian bicycling through the creation of a series of interpretive signs. It also incorporates an associated website to provide links to additional information and resources. This project will be developed and guided by the following objectives:

1. To increase awareness of cycling as a feasible and desirable means of transportation.
2. To promote a modal shift as a component in addressing environmental and societal issues, specifically those related to obesity, transportation, pollution, and use of petroleum products.
3. To increase drivers’ awareness, understanding, and empathy related to cyclists and applicable laws, thereby promoting the safety and social acceptability of cycling.
4. To provide cyclists and drivers with an easily accessible source of information.
5. To aid in the reduction of barriers to participation.
6. To utilize interpretive exhibits and the Theory of Planned Behavior as a means to achieve the above objectives.

**Delimitations**

The scope of this project is delimited to the general public in Ithaca, New York who engage with the signs and exhibits. The exhibits in this project will not be located at intervals on a specific, physical trail. Rather, they will be installed throughout downtown Ithaca, with the content of each being interdependent with their particular location. Each exhibit will communicate information pertaining to motorists, current/potential cyclists, or both. Examples of possible locations include parking garages, outside the public library, and alongside roadways with high traffic congestion (e.g., idling).

The website will be very basic, largely featuring links to resources with relevant information for motorists and cyclists. Profiles of local utilitarian cyclists will also be featured to contribute to the social norming of cycling, to help dispel the sense of otherness through identification (“that person is like me and they do it, so maybe I could too”), and to inspire potential riders. The website address will be prominently featured on each exhibit.

**Limitations**

The implementation of this project is dependent on: 1) access to funding and resources needed to construct the interpretive exhibits; and 2) acquiring the necessary permits, permissions, and or approvals to install the exhibits on public and/or private property.
Other limitations include the lack of personal contact with exhibit participants. Implementation of this project in other locales would require modifications/considerations, such as site selection and editing of the website links/resources and commuter profiles.

This project focuses on addressing some of the informational, physical, and cultural factors related to cycling. Therefore, while designed to produce impacts, this project is only one segment of the programming, infrastructure, and policy required to instigate a substantial modal shift, increase the safety of cycling, and change attitudes towards cycling.

**Definition of Terms**

The following terms used in this project are defined as follows:

1. Utilitarian Cycling/Bicycling - The use of a bicycle for transportation purposes.
2. Active commuting - Traveling to and from work using walking, cycling, or other forms of human powered transportation.
3. Modal Shift - The transfer of transportation mode from motor vehicles to other forms of transportation, including walking, cycling and public transport.
4. Commuters - In the context of this study, this term refers to people who use cycling as transportation. Also referred to as utilitarian cyclists.
5. Interpretation - A form of communication that presents information in such a way as to create emotional and intellectual connections between the audience and the subject, relate the subject to the personality or
experience of the individuals, reveal meanings and relationships, create provocation, and inspire action (Beck & Cable, 2002; National Association for Interpretation; Tilden, 2007). It is traditionally utilized at heritage/historical and natural resource sites.

(6) Exhibit- An organized arrangement of art, graphics, and objects that communicate a message or theme. Outside exhibits are often called waysides and may include interpretive signs, kiosks, or other presentation methods developed for use in the outdoors (National Association of Interpretation).

(7) Impacts- The collective effects, achievements, benefits or changes brought about by an interpretive or education program on its intended audience or on the environment. Impacts often embody lasting changes such as improved environmental conditions and changes in the way people think and live (National Association of Interpretation).
Chapter 2: Review of Literature

This chapter reviews literature related to the use of bicycling as a means to address social issues, particularly population health, environmental degradation, and transportation, such as traffic congestion. The barriers preventing people from cycling and promotional methods are also examined. The following sections are included: (1) value and benefits of cycling; (2) brief history and current conditions; (3) comparison with European conditions; (4) demographics- who rides and why; (5) barriers; (6) cycling promotion and safety measures; and (7) summary.

The value and benefits of cycling

Singh wrote, “Only a society so modern that it can organize itself around the bicycle can evolve a habitat which is both humanized and habitable” (Unwin, 1995, p.44). Increasing utilitarian cycling is instrumental in addressing current public health, transportation, and environmental issues. It decreases obesity, reduces traffic congestion, decreases air pollution and energy consumption, and increases health throughout the lifespan (Hanson & Young, 2008; Ogilve et. al, 2004; Pucher & Buehler, 2008).

Health Benefits.

The obesity epidemic in this country is no secret: almost 70% of adult Americans and one third of children are now overweight or obese (Flegal, Carroll, Ogden, & Curtin, 2010). A number of health problems are on the rise as a result, including cardiovascular disease, Type II diabetes, hypertension, and stroke. It is
not only an individual problem, but affects our society as a whole through lost productivity, financial costs, and decreased quality of life (Center for Disease Control, n.d.; U.S. Department of Health and Human Services, 2001). There is a large body of research linking obesity and health problems with lack of physical activity. Less than one-third of American adults fail to meet the minimum recommendations of thirty minutes of moderate activity most days of the week, while 40% fail to engage in any physical activity (Surgeon General, n.d.). Likewise, only 42% of children ages 6-11, 8% of those ages 12-15, and 7.6% of youth ages 16-19 meet minimum levels of physical activity to meet public health recommendations (Toriano, Berrigan, Dodd, Masse, Tilert, & McDowell, 2008).

Active commuting allows people to incorporate physical activity into their lives instead of having to designate a separate time to exercise (National Public Health Partnership, 2001; World Health Organization, 2002). This is a significant benefit since “lack of time” is the most commonly reported reason for not engaging in physical activity (Hillman, Boyd, & Tuxworth, 1999). Likewise, people who are dependent on cars are less likely to achieve these minimum recommendations (Merom, Miller, van der Ploeg, & Bauman, 2008).

Cycling, especially commuting, has the potential to play an important role in finding solutions for current health issues. It increases personal health and does not have a negative impact on the health of others (Gatersleben & Appleton, 2006). Unlike walking, it produces cardiovascular benefits even in young fit adults (Shepard, 2008). Active commuting can help older adults maintain and increase levels of physical functioning (French, 2003). One of the major deterrents to
cycling in this country is risk of a collision. However, the British Medical Association found the cardiovascular gains to longevity from cycling far outweigh the risk of a collision. While widely reported in Europe, this finding is virtually unknown in the U.S. (Pucher et al., 1999). A related study also determined “the estimated health benefits of cycling were substantially larger than the risks relative to car driving for individuals shifting mode of transport” (de Hartog, Boogaard, Nijland, & Hoek, 2010).

There is direct evidence showing substantial health benefits related to cycling (DeGues, Van Hoof, Aerts, & Meeusen, 2008; Ogilve, Hamilton, & Petticrew, 2004; Ojoa, Vuori, & Paronen, 1998; Pucher et al., 1999; Wen & Rissel, 2008). Ojoa, Vuori, and Paronen’s (1998) ten-week active commuting intervention produced increased VO2max (maximum oxygen uptake and absorption), increased treadmill time, increased HDL cholesterol, decreased heart rate and decreased blood lactate at the same workload. Cyclists experienced significantly more gains than those who walked. Another study of male civil servants in the United Kingdom determined those who ride a minimum 25 miles per week have less than half the coronary attack rate of non-cyclists (Unwin, 1995). An Australian study found 39.8% of men who commuted to work by bike were overweight or obese versus 60.8% of those who used private cars for commuting (Wen & Rissel, 2008). Likewise, another study concluded,

Walking and bicycling are far more common in European countries than in the United States, Australia, and Canada. Active transportation is inversely related to obesity in these countries. Although the results do not proved causality, they suggest that active transportation could be one of the factors that explain international
differences in obesity rates. (Bassett, Pucher, Buehler, Thompson, & Crouter, 2008, p. 795)

**Environmental Impact.**

Increasing use of private cars plays a significant role in a variety of types of environmental degradation (Bamberg et al., 2003; Pucher & Buehler, 2008). This is one of the factors generating governmental efforts across nations to create more sustainable forms of transportation. For example, numerous studies have shown the likely benefits of increased use of public transportation and efforts in a variety of municipalities to this end (Bamberg et al., 2003). Cycling is a highly environmentally friendly, sustainable form of transport. It is powered by human energy, which provides health benefits to the user. It generates no noise or air pollution and consumes few non-renewable resources. Facilities also require less materials and resources than those for cars (Pucher & Buehler, 2008). For example, 100 bikes can be parked in the space needed for five cars (University of York, n.d.).

**Benefits Relating to Transportation Issues.**

There are a number of transportation issues confronting even small urban areas. These include traffic congestion, lack of parking, and cost of infrastructure. Transportation in the United States accounts for 70% of U.S. and 10% of global oil production as well as 30% of U.S. greenhouse gas emissions (Energy Information Administration, 2009). For the cost of building one mile of a four-lane urban highway, an entire network of active transportation facilities in a mid-size town could be created (America Bikes, 2010). Bikes are a reliable form of transport and fairly fast over short distances (Gatersleben & Appleton, 2006) as well as using
significantly less space than cars in terms of both travel lanes and parking. Finally, these issues influence quality of life.

**Economic Benefits.**

Cycling is one of the most equitable forms of transportation and affordable to the majority. The costs of maintaining a bicycle are minimal. America Bikes (2010) reports the average annual cost of owning and operating a car is $8229, versus $308 per year for a bike. Likewise, the average American spends 18% of their income on transportation (U.S. Bureau of Transportation Statistics, 2009). The summer of 2008 witnessed an enormous increase in gas prices. This created a significant increase in cycling, with sales of commuter and comfort type road bikes skyrocketing. For example, a survey of over 150 bicycle retailers reported 73% of shops sold more bikes than the previous year, 84% sold more accessories and 88% experienced an increase in repair services. Customers citing high gas prices was reported by 95% of the retailers while 89% indicated gas prices contributed to their increase in service sales (Bikes Belong, n.d.). Gas prices have since dropped considerably, however, it seems many have continued to commute by bike and interest is still rising. Current economic conditions are causing even more people to reconsider their expenses, whether out of necessity or preparedness. Another cause for consideration is our dependence on foreign oil and the multiple, complex ramifications of this dependence (Komenoff, 2002). These situations have created an ideal time to instigate a more economic and environmental modal shift.
Recreation and Leisure.

Cycling has value as recreation and leisure, even when done for transportation. Mayes, Halliday, & Hatch (1996) note,

What is more, for many respondents, a journey that might normally be regarded as a chore, had become a leisure pursuit or a sport. For sporty and non-sporty people alike, taking up cycling for short or longer trips had introduced an element of activity which led to increased fitness and all the associated benefits. As far as leisure is concerned, in addition to specific cycle rides taken as a leisure pursuit, it was felt that mundane trips could be tailored, with routes chosen to encompass interesting or scenic outlooks. (p. 5)

Cycling is an activity that can be enjoyed throughout the lifespan, either alone or with others. It also takes place in the outdoors, which offers a whole other set of benefits and enjoyment.

Definitions and perceptions of the terms recreation and leisure are varied. Discourse regarding these concepts is beyond the scope of this paper, however, the presentation of definitions and a brief discussion is warranted. Moore and Driver (2005) describe leisure as,

A state of being…in which a person is relatively free to engage in activities of their choosing…Therefore, leisure is a precondition for all recreational engagements and is the state or condition where recreation becomes possible…The leisure condition is characterized by relative freedom from obligations and other constraints. But most importantly, this state of leisure is one of opportunity and potential. It allows each of us to choose activities and experiences and ways of living that we find rewarding, satisfying, and worthwhile. (p. 8)

They go on to define recreation as “an intrinsically rewarding experience that finds its source in voluntary engagements during non-obligated time [sic]“ (p. 9), emphasizing recreation activities as vehicles for obtaining
particular physiological and psychological experience and/or outcome rather than simply being an activity itself. Outdoor recreation can be defined as “recreation experiences that result from recreation activities that occur in and depend on the natural environment” (Moore & Driver, 2005, p. 11). Iso-Ahola (1980) reminds us,

Since people evaluate leisure activities primarily in terms of intrinsic rewards which they are expected to provide, it is therefore important for the practitioners to know what individuals are expecting...[and] should emphasize and highlight those aspects of the program that provide opportunities [to realize those needs]. (p. 261)

Recreation and leisure, as well as outdoor recreation in particular, are vital aspects for achieving a high quality of life for both individuals and communities (Jackson, 2000; Moore & Driver, 2005). Research on leisure was scarce before 1960. However, it has become a growing field resulting in substantial empirical evidence demonstrating its benefits and importance. The beneficial outcomes approach to leisure (BOAL) outlines three types of leisure benefits: (1) a change in a condition or state viewed as more desirable than a previous one, (2) maintenance of a desired condition and prevention of an unwanted condition, and (3) realization of a satisfying recreation experience (Moore & Driver, 2005, p. 23). Over 140 specific benefits have been identified. These are categorized as psychological (personal growth, mental health, personal satisfaction), psychophysiological, social/cultural, environmental, and economic. Participation rates and benefits received from outdoor recreation have been demonstrated by a number of surveys, including the 1994-1995 National Survey on Recreation and the Environment,

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1 For a comprehensive listing of scientifically supported benefits of leisure, see Moore & Driver, 2005, p. 29.

The national Roper Starch survey, *Outdoor Recreation in America 2000: Addressing Key Societal Concerns*, reported that the majority of Americans believe outdoor recreation not only provides personal and economic benefits, but also plays an important role in addressing issues such as environmental stewardship, underage drinking, illegal drug use, juvenile crime, educational quality, and childhood obesity (Moore & Driver, 2005). Similarly, the power of certain recreation and leisure activities as means of resistance, empowerment, and cultural change has been evident throughout history (Ehrenreich, 2006). Shaw (2007) contends this is “because leisure activities can facilitate activities that challenge constraints and constraining belief systems” (p. 28) as well as the definition of leisure itself being rooted in the idea of self-determination and choice (Shaw, 1994). She writes,

> In addition, most leisure activities are social in nature, so new ideas and challenges to traditional ways of thinking can spread to family members, friends, and other acquaintances. In this way, through many small acts of resistance, societal beliefs can be influenced and changed. It should be noted, though, that social leisure can also act to reinforce (or reproduce) dominant perspectives and beliefs, as well as challenging and changing them. (Shaw, 2007, p. 28)

**Brief history and current condition of cycling**

**Cycling conditions in the United States.**

Cycling in the U.S. occupies “marginal legal, cultural, and infrastructure status” (Pucher et al., 1999, p.625). There has been progress over the last decade, and especially the last several years, as environmental and economic crises have
come to a head. Still, the latest research shows only 1% of urban trips are made by bike despite 28% of trips being less than one mile and 48% under three miles (Pucher et al., 1999). The factors contributing to the current condition include tradition, cultural values and attitudes, and the political climate. As Pucher et al. (1999) noted, “culture, custom, and habit are important” as well as self-perpetuating (p. 626). Of course, there are variations between regions. Regional location, density, household incomes, education levels, and population characteristics (i.e. percentages of immigrants, Democratic voters, college students) influence urban transit choices (Hanson & Young, 2008). Following is a description of the most common and overriding characteristics regarding cycling in this country.

According to Hanson & Young (2008), biking in the early 1970’s was largely:

…a neighborhood-based activity for kids. Bike trails were not a major component of parks or recreational planning and programming. Bikeways were not part of transportation planning and development. Bike commuting was limited to a few daring riders, who were regarded as menaces by most drivers. (p. 387)

The 1972 Federal Highway Act was the first to authorize funding specifically for bike facilities (Hanson & Young, 2008). The gas crisis of the following year led to increased interest in sustainable transport and the Federal-Aid Highway Act of 1973. This act also allocated portions of highway funding to be used for cycling facilities, but few municipalities took advantage of this except a few college towns (Pucher et al., 1999). Dependence on cars has continued largely unabated, along with low-density urban sprawl, and has only recently begun to be reconsidered in more than isolated areas. As such, cycling has remained largely on the fringe.
There were numerous legislative acts during the 1990’s which dramatically increased spending on cycling related facilities and promotion. “The catalyst was the 1991 Intermodal Surface Transportation Efficiency Act. ISTEA compelled states and metropolitan planning organizations to include cycling and walking in their transportation plans, required states to designate bicycling coordinators, and earmarked federal transportation funds for ‘enhancements’ restricted to non-traditional transportation projects” (Pucher et al., 1999, p.633). However, many local governments are merely paying lip service to these provisions and finding ways to meet the requirements without actually providing services or improving facilities. The trickle down effect and implementation has been slow, but progress is being made. The rail trail program, funded in part by ISTEA, has been particularly successful: the number of trails went from 100 in 1985 to 982 in 1998 (Pucher et al., 1999, p. 634). These pathways have played a significant role in encouraging people to ride for health, leisure, and, in some areas, transportation.

The majority of cycling is currently recreational in nature, with less than half of trips by bike being for utilitarian purposes (Pucher et al., 1999). It is commonly associated with sports, fitness, and health. The prevalence of facilities such as bike paths being located along parks, rivers, lakes, and in rural areas rather than along urban transit routes reflects these interests (Pucher & Buehler, 2008).

Americans love their cars. They are considered important symbols of status and identity; this nation has been built around these symbols of freedom, speed, convenience, and independence. David Shi quotes William Faulkner’s 1948

He goes on to write,

America’s love affair with the car has matured into a marriage—and an addiction….As a popular bumper sticker resolutely declares, ‘You’ll get me out of my car when you pry my cold, dead foot from the accelerator.’

The automobile retains its firm hold over our psyche because it continues to represent a metaphor for what Americans have always prized: the seductive ideal of private freedom, personal mobility, and empowered spontaneity.

Our solution to rush hour gridlock is not to demand public transportation but to transform our immobile automobile into a temporary office, bank, restaurant, bathroom, and stereo system. We talk on the phone, eat meals, don makeup, cash checks and listen to music and audio books in them. (p.2)

With 250 million cars for 300 million people, the United States comprises 5% of the world population and contains 30% of its cars, along with producing 45% of world automotive carbon dioxide emissions (National Public Radio, 2007).

Therefore, it comes as no surprise that, as noted above, only 1% of urban journeys are made by bike and 0.3% of all journeys to work are by bike (Wardman, Tight, & Page, 2007). The U.S. lacks a tradition of utilitarian cycling (Pucher et al., 1999) and commuting has yet to become accepted as mainstream in most areas. Attitudes about such riders are generally negative— they have a public image of being “anti-car”, environmental extremists, renegade, eccentric, or just plain crazy and are widely considered “an alien presence on roads intended for cars” (Pucher et al., 1999, p. 645). New York City is a good example of the antipathy towards cyclists (Komanoff & Smith, 2000), which is inflamed and perpetuated by bike messengers. Their typically aggressive riding is seen to cause endangerment, invokes anger, and contributes to political marginalization of cycling (Pucher et al., 1999, p. 638).
This renegade image is applied to all cyclists rather than being isolated to messengers in particular.

Cycling is one of the most equitable forms of transportation. Yet it is rarely seen as a viable option, even by the poor. In fact, the majority of commuters are affluent white males (Shepard, 2008; Lea, 2004). This supports the cultural image of cycling being for young, vigorous, fit males and confirms its “otherness” for most people- that is, not for people “like me” (Unwin, 1995). A study by Pucher et al. (1999) examined the efforts and new policies to promote cycling during the late 1990’s. They concluded there will not be a significant modal shift as long as auto use remains relatively cheap and favored by policy.

The danger of cycling is a major limiting factor. The U.S. has the lowest rate of use among industrialized, democratic nations yet the highest rates for both fatalities and injury (Pucher & Buehler, 2008). Interestingly,

The elevated risks of cycling appear to be magnified by cultural attitudes that attribute cycling accidents to the supposedly intrinsic perils of bicycles. In contrast, motorist casualties are not ordinarily associated with the idea that driving is dangerous. (Pucher et al., 1999, p. 647)

Most safety promotion efforts focus on bike paths or lanes and helmets. Yet it seems ignorance and lack of skill on the part of both riders and motorists are major factors in collisions. Unpredictable riding due to lack of skill increases the risk of accidents with motor vehicles (Kifer, n.d.; Komanoff & Smith, 2000) and contributes to motorists’ negative attitudes towards cyclists. Education programs do exist and are increasing in both number and quality. There are several organizations that offer bike skill and safety instructor certifications, including the American
League of Bicyclists. As with other interventions, these programs are often difficult to locate and used in isolation. For example, there is an excellent workshop series taught at Cornell University each year but few people are aware of it. The main source of promotion seems to be through the local cycling club, whose riders are in need of it least.

There is a lack of a societal consensus and commitment to protect cyclists’ right of way (Pucher et al., 1999). Motorists, and even many police officers, are unaware of the laws. Motorists are rarely ticketed for aggressive actions towards cyclists. For example, Komanoff and Smith (2000), report that for seventy-one motor vehicle accidents resulting in cycling fatalities in New York City, eighteen of the motorists involved received summons for infractions such as being unlicensed, leaving the scene, and speeding; only two were charged with anything related to the cyclists being killed and those citations were for dooring. Despite New York state law explicitly protecting cyclists’ right of way, there is not a single record of drivers in NYC being cited for violating them. When cycling fatalities caused by vehicles doubled in 1999, the New York City Police Department blamed the cyclists in almost 75% of the cases despite evidence to the contrary (Komanoff & Smith, 2000). Contrast this with Toronto, for example, which has used high profile traffic enforcement events with success to increase awareness of and compliance with laws, thus improving safety.

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2 Dooring is a term used to describe the opening of a vehicle door, whether intentional or not, in the path of a cyclist, resulting in the cyclist colliding with and/or flipping over the door. Another related and common form of collision occurs when a cyclists swerves into traffic to avoid the opening door from a parked vehicle.
The last decade, especially the last two years, have seen dramatic changes in light of the current environmental, population health, and economic conditions. There is still much resistance to efforts discouraging the use of private cars in particular, and therefore such measures are generally considered politically unviable (Shepard, 2008). Still, many cities are instituting urban renewal programs, leading downtown living to become a fashionable and desirable alternative to the suburbs thus making commuting more possible. There has also been a dramatic increase in groups advocating cycling. These include cycling specific organizations such as Bikes Belong and the American League of Bicyclists as well as various environmental organizations, health/fitness professionals, urban planners and others (Pucher et al., 1999).

**Comparison with cycling in European nations.**

Cycling conditions in Europe are vastly different from those in the United States. An examination of Denmark, Germany, and the Netherlands is especially useful. Like the U.S., these countries are democratic, capitalist, and affluent, demonstrating that utilitarian cycling is not dependent on poverty, dictatorial regimes, or lack of motorized transport (Pucher & Buehler, 2008). They also demonstrate the possibility and means of promoting cycling.

Cycling rates fell drastically between 1950 and 1975 in the U.S., U.K., Denmark, Germany, and the Netherlands. Rates have yet to recover in the first two. The latter three countries “instituted a successful revival through a comprehensive, multi-faceted campaign in order to meet rising mobility demands while curbing the social and environmental costs of excessive car use” (Pucher et al., 1999, p. 626).
Extensive legislation was created and implemented during the late 1970’s to favor walking, cycling, and public transport instead of private cars. As a result, they boast rates of use ten times that of the U.S., and cycling is a normal, safe, convenient way to get around (Pucher et al., 1999, Pucher & Buehler, 2008). It is accessible to everyone, rather than being perceived as elitist and requiring special bikes, expensive equipment, special clothing, high levels of fitness, and advanced training (Pucher & Buehler, 2008).

Cycling in continental Europe is highly utilitarian. Nearly 30% of urban trips in the Netherlands are made by bike (Wardman, Tight, & Page, 2007). Commuting to work or school in the U.S. accounts for only 11% of all bike trips. In the Netherlands that number is 32%, 28% in Germany, and 35% in Denmark (Pucher & Buehler, 2008). These countries all have high levels of car ownership, suggesting the availability of cars “does not preclude cycling” (Pucher & Buehler).

There is even social distribution of cycling in Europe; riders occupy all age, economic, and social classes. Forty-five to fifty-five percent of riders are women versus only 24% in the U.S. and 28% in the U.K. An astounding 12% of trips made by Danish 70-75 year olds are made by bike, a rate sixty times that in the U.S. for the same age group. In the Netherlands, 24% of elderly persons travel by bike, versus .4% of Americans over 40 years. Germany and the Netherlands both have extensive, mandated bike education programs for children that are part of the elementary school curriculum (Pucher et al., 1999). People with lower incomes ride only slightly more than the affluent (Pucher & Buehler, 2008).
The Netherlands has the highest rate of utilitarian cycling, yet the lowest incidence of fatalities and injuries. In contrast, the United States has the lowest use rate but thirty times the fatalities and injuries of Denmark and the Netherlands and eight times that of Germany. “This relationship, of course, does not prove causation, but there is every reason to believe that increased safety is a key to promoting more cycling.” (Pucher & Buehler, 2008, p.508). One of the factors increasing safety in these European nations is drivers being held legally accountable. They are always held liable for collisions with children and elderly people, regardless who is actually at fault, as well as in the vast majority of cases with people in other groups. This puts drivers on the defensive and encourages more cautious driving (Pucher et al., 1999). On the other hand, American drivers are rarely ticketed or convicted for aggressiveness/endangerment, injuring, or even fatal collisions with cyclists (Pucher et al., 1999).

Looking to certain European nations provides us with concrete evidence of the benefits and possibility of increased cycling to create more habitable urban environments and improved public health. Their programs provide information regarding best practices and the elements necessary to both create a significant modal shift and increase the safety of cycling. American cities such as Portland, Oregon; Davis, California; and Arlington, Virginia demonstrate it is possible to apply these lessons in the United States. Portland, for example, has one of the highest use rates in the country with cycling comprising 4% of work trips. They achieved this by expanding bikeways and bike parking facilities, integrated routes
with bus and rail systems, land use reforms, reduced car parking in the city center, improved public transport, and education programs (Pucher & Buehler, 2008).

**Recipe for Success: Characteristics of Cities with High Cycling Rates.**

An examination of cities and regions that have been successful in becoming “bike-friendly” and realizing a significant modal shift reveals a pattern of common characteristics. These include:

- Master Bicycling Plans or significant inclusion of bicycling within Master Transportation Plans
- Political support for legislation and infrastructure by governmental officials
- Advisory Boards and advocacy organizations
- Integration with public transportation systems (i.e. bike racks on buses and trains, secure bike parking at rail and bus stations)
- Bike skills education programming
- Progressive cultural climate
- Bike friendly culture/social norms (e.g. cycling perceived/accepted as a normal activity)
- Network of segregated bikeways connecting residential areas, business districts, shopping areas, and other destinations; other supportive infrastructure
- Support within the business sector
- Urban, mixed land use
- Funding

Minneapolis provides an excellent illustration of this: despite its harsh climate and urban sprawl, it has been ranked as the second best city for cycling in the country.
by the U.S. Census Bureau\(^3\) \((\text{City of Minneapolis, 2010a})\), designated as the number one cycling city by Bicycling Magazine \((\text{Emery, 2010})\), and is the recipient of the League of American Bicyclists’ Silver Level Bicycle Friendly Community Award for its bicycle culture and bikeway infrastructure \((\text{City of Minneapolis})\). Between 2006 and 2007 alone, the bicycle modal share increased from 2.5\% (4,840 people) to 3.8\% (7,200 people), second only to Portland’s 3.9\%. In 2008, those numbers had risen to 4.3\% for Minneapolis and 5.9\% for Portland; it is estimated 8,200 Minneapolis residents ride to work, with that number dropping to roughly 4,000 in winter \((\text{Emery, 2010})\). Cyclist counts at nine downtown locations revealed a 51\% increase between 2003 and 2007. Minneapolis is also ranked highly for public transport mode share (13.4\%, or 25,330 people), while 12,170 residents (6.4\%) walk to work.

The Traffic and Parking Services Division of the Public Works Department operates the City of Minneapolis Bicycle Program \((\text{CMBP})\). Features of the program, current infrastructure, and other cycling supports include:

- A Master Bicycle Plan, which guides projects and provides a comprehensive, city wide plan
- Bicycle Advisory Committee, which meets monthly and serves to guide the CMBP
- 40 miles of streets with dedicated bicycle lanes and 82 miles of off-street bike paths, including the Midtown Greenway, a 5.7 mile bike trail spanning the width of the city, featuring volunteer vigilante night rides to increase its safety, and is one of the first areas to be plowed after snowfalls.

\(^3\) This ranking is based on the 2007 American Community Survey of the 50 cities with the most workers. Neighboring city St. Paul also experienced a significant modal shift, but was excluded from this particular list due to population size.
- Guaranteed Ride Home Program- provides two coupons every six months for a free transit ride or cab fare up to $25 to participants who bike to school or work at least three days a week for emergency situations or in case of unsafe conditions (City of Minneapolis, 2010b)
- Nice Ride Minnesota- a bike sharing program consisting of 600 bicycles housed at solar-powered kiosks in 65 locations
- Advocacy organizations, such as the Bike Walk Ambassadors
- An extensive array of bike and riding related workshops and classes offered by a number of agencies and bike shops
- Freewheel Midtown Bike Center- “a joint effort of Allina Health Systems and the City of Minneapolis to provide the Midtown and larger Twin Cities community a full service bike transportation station.” (Freewheel Bike, 2010). The facility features long and short term bike storage, lockers, bike rentals, a café, repair classes, full and self-service repair shops, public restrooms, low cost showers, and a bus rack simulator for teaching and practicing loading and unloading bikes.
- Community organizations and community generated support including a group that builds free bikes for children, a grocery store that provides a free bike repair station complete with tools, a non-profit repair shop, and an online discussion forum and information source
- Legislation requiring all office buildings to provide bicycle storage; the city funds half the cost of bike racks installed by businesses

Minneapolis is known as having a high quality of life, being community-minded, and politically progressive. As one resident describes, the popularity of cycling may be because,

It’s always been an outdoorsy, Nordic, get-out-and-do-it kind of town. And there’s that Scandinavian mentality, that ‘What doesn’t freeze us makes us stronger’ thing…The cool thing about our community of cycling is everyone helps each other out. (Emery, 2010, p.3)
Another resident attributes it to “the liberal Northern attitude. Civil rights, hippies, that stuff” (Emery, p. 8) while a journalist concludes,

That’s when the Grand Unified Theory of Minneapolis Cycling reveals itself. Here is a woman who commutes 20 [sic] miles round-trip four days a week, at least five months a year, yet does not consider herself a ‘serious cyclist.’ Maybe that’s the secret. Maybe-along with decades of legislative support and a responsive government and friendly landscape and a cheerful community of cyclists-the Grand Unified Theory hinges on something essentially and particularly indigenous to the Midwest. Other cities might get more publicity, might brag about their famous hill and their local legends. In Minneapolis, cyclists…don’t talk as much about cycling as they do it, through ice skids, along snowy bike superhighways, in the dead of winter and every other season. In Minneapolis, people ride and don’t consider it that big a deal. (Emery, p.9)

It should be clear from this case study that increasing cycling rates is dependent on legislation, infrastructure, and culture.

**Demographics: who rides and why**

Understanding who rides, and why, is important in developing effective programs to promote cycling and safety. It aids in determining motivations, barriers, what means may be most effective, and in using targeted promotional strategies. For example, Merom et al. (2008) found active commuting rates are related to high active commuting self-efficacy and influenced by people’s perceptions of the importance of health, cost savings and air quality.

Leisure research indicates the influence of social groups (including socioeconomic and demographic) on recreation participation, as well the socialization into particular forms of recreation by both social groups and broader social contacts (Manning, 1999). The theory of status group dynamics is based on Veblen’s (1912) concept of a trickle-down effect in recreation.
This theory suggests that participation in recreation, particularly in “faddish” activities, is diffused through the population on a social class basis…upper-class styles of leisure, as well as more general taste and consumptive behavior, are often emulated and adopted by those of the lower classes as a means of status mobility. (Manning, 1999, p. 35)

Several outdoor recreation studies have used this theory to predict and explain participation patterns and found several activities, including bicycling, to be following this pattern of diffusion (Manning, 1999).

In 1962, the Outdoor Recreation Resources Review Commission reported its findings from the National Recreation Survey. Research since has continued to confirm outdoor recreation participation is significantly lower in minority populations than among whites (see Manning, 1999, p. 37). Consistent patterns of recreation preferences between subcultural groups are also evident. There are three primary theories that seek to explain racial and ethnic differences in participation4. These are: (1) Washburne’s (1978) theory of marginality, which proposes historic discrimination has led to economic and other disadvantages that inhibit participation; (2) Washburne’s (1978) theory of ethnicity stipulating it is caused by differing values between populations; and (3) West’s theory focusing “on racism or interracial relations” and suggesting “that minority subcultural groups may experience personal or institutional forms of discrimination that inhibit their participation in selected recreation activities” (West, 1989; West, 1993). While wrought with theoretical and methodological issues (Manning, 1999; Shinew, Floyd, & Parry, 2004), this area of research has important implications for understanding participation and the development of programs for the purpose of

4 See Manning, 1999, p. 38 for an overview of the topic
creating cultural and behavioral change. The profound influence of culture and socialization is illustrated by Hiu-lun Tsai and Coleman’s (2009) report that while 43% of Australian adults participate in active recreation at least three times a week, only 16% of adults in Hong Kong do.

The vast majority of cyclists (76%) are young, white males (Lea, 2003, Pucher et al., 1999). As will be discussed in a later section, women, the elderly and minorities experience more barriers. Women also tend to ride shorter distances and be less likely to try cycling than men. One study showed families with children in both cyclist and non-cyclist groups, so the need to transport children is not necessarily a significant obstacle (Gatersleben & Appleton, 2006).

Biking has traditionally been popular with children, but usage among youth seems to be on the decline. This is due to an increasingly sedentary lifestyle and safety issues (see Louv, 2008). Inactive older adults aged 46-65 years are least likely to commute, even for a single-day promotional event (Merom, Miller, van der Ploeg, & Bauman, 2008).

Gatersleben and Appleton (2006) categorized commuters into four groups: regular cyclists who rode year round, summer only riders, infrequent, and never-ever. They then analyzed each based on the Stages of Change Model of behavior modification. This model ascertains people go through a series of stages as they move towards the adoption of a new behavior. These stages are pre-contemplation, contemplation, preparing for action, action, and maintenance. It is suggested programming for various types of change need to be tailored in consideration of the stage being experienced by individuals in the target audience in order to be
effective. The study’s results are listed below in Table 2.1. The “maintenance” group was comprised of people who already used cycling for transportation on a regular basis. They demonstrated a positive attitude about riding and were the most likely to agree changes in parking and other end facilities need to be made. Those who rode occasionally were in the action phase. This group rated structural barriers as a significant concern, especially lack of lanes, and, like the maintenance group, did not feel constrained by the personal barriers listed on the survey. The “prepared for action” group was composed of infrequent riders; they generally had a positive attitude towards cycling, low perception of personal barriers, and reported high levels of structural barriers. This group had the highest percentage of people who walk to work, despite the highest percentage of car ownership. Those in the contemplation stage indicated cycling as healthy and good for the environment, but a smaller percentage indicated liking cycling. They also perceived relatively high levels of both personal and structural barriers.
Table 2.1 Summary of data from the Gatersleben and Appleton (2006) study

<table>
<thead>
<tr>
<th></th>
<th>Pre-contemplation</th>
<th>Contemplation</th>
<th>Prepared for action</th>
<th>Action</th>
<th>Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=</td>
<td>68</td>
<td>42</td>
<td>28</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td>% women</td>
<td>63</td>
<td>44</td>
<td>55</td>
<td>36</td>
<td>24</td>
</tr>
<tr>
<td>% who have children</td>
<td>26</td>
<td>33</td>
<td>28</td>
<td>27</td>
<td>35</td>
</tr>
<tr>
<td>Avg. age</td>
<td>42</td>
<td>40</td>
<td>42</td>
<td>43</td>
<td>38</td>
</tr>
<tr>
<td>% own a car</td>
<td>75</td>
<td>78</td>
<td>89</td>
<td>87</td>
<td>64</td>
</tr>
<tr>
<td>% own a bike</td>
<td>43</td>
<td>66</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Travel to work by:</td>
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<td></td>
<td></td>
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<tr>
<td>Car</td>
<td>39</td>
<td>48</td>
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<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Bike</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td>Public transport</td>
<td>19</td>
<td>19</td>
<td>11</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Walk</td>
<td>43</td>
<td>33</td>
<td>63</td>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td># trips made by bike/month</td>
<td>0.59</td>
<td>3.98</td>
<td>5.34</td>
<td>28.40</td>
<td>54.35</td>
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<td>Attitudes:</td>
<td></td>
<td></td>
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<tr>
<td>Like cycling</td>
<td>32</td>
<td>56</td>
<td>76</td>
<td>82</td>
<td>100</td>
</tr>
<tr>
<td>Don’t want to</td>
<td>34</td>
<td>36</td>
<td>35</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Good for the environment</td>
<td>82</td>
<td>96</td>
<td>93</td>
<td>91</td>
<td>100</td>
</tr>
<tr>
<td>Healthy</td>
<td>78</td>
<td>80</td>
<td>86</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Personal barriers:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of fitness</td>
<td>31</td>
<td>11</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Uncomfortable</td>
<td>49</td>
<td>24</td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Uncharacteristic</td>
<td>38</td>
<td>18</td>
<td>7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Structural barriers:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unsafe</td>
<td>66</td>
<td>71</td>
<td>62</td>
<td>64</td>
<td>62</td>
</tr>
<tr>
<td>No lanes</td>
<td>67</td>
<td>82</td>
<td>86</td>
<td>100</td>
<td>69</td>
</tr>
<tr>
<td>Parking</td>
<td>36</td>
<td>47</td>
<td>48</td>
<td>36</td>
<td>52</td>
</tr>
<tr>
<td>Showers</td>
<td>21</td>
<td>27</td>
<td>31</td>
<td>18</td>
<td>27</td>
</tr>
</tbody>
</table>

The “never-evers” (pre-contemplation stage) perceived significantly more personal barriers than other groups. Personal barriers include lack of fitness, cycling being uncharacteristic, concerns of discomfort, and social acceptability. The percentage of women in each group decreased significantly from the pre-
contemplation stage to maintenance. The highest percentage of participants with children were those in the maintenance stage, suggesting that having children does not preclude cycling for transportation (at least for men). The second part of the study involved inviting the never-ever and contemplation groups to participate in a ten-week commuting program. Half of those who participated said they did so in hopes it would help get them started doing the activity. Other reasons included convenience (40%), fitness (37%), and the environment (37%). This study is biased by the sample being comprised of people who work at a prestigious university. Still, its findings afford important implications that warrant further investigation.

The most common reasons for commuting by bike are health/fitness, cost, convenience, and enjoyment (Merom, Miller, van der Ploeg, & Bauman, 2008; Ojoa et al., 1998; Pucher et al., 1999; Unwin, 1995). Convenience includes not having to wait for a bus, easier parking, independence, proximity to the workplace, etc. The enjoyment category includes fresh air, quiet routes, nice weather, the fun of going fast, and passing slow traffic. Another reason frequently cited was decreased stress during travel (Merom, Miller, van der Ploeg, & Bauman). A study by the Greater London Council, with a random sample of 1000 people, determined the top reasons for commuting as enjoyment (88%), health (55%), independence (48%), and low cost (43%) (Unwin, 1995).

One Australian study provides valuable insight into women’s attitudes towards and reasons for engaging in cycling. Garrard and Hakman (n.d.) write, Motivating factors for commencing cycling…included health and fitness; relaxation and stress reductions; the opportunity to acquire new skills; training for mass participation cycling events; encouragement from family, friends or work colleagues; cycling
with the family; an ideal activity for ‘non-sporty’ types; the need to swap to a low-impact type of physical activity; coming from, or having lived in a ‘cycling’ country (usually in Europe); concern for environmental issues; and ‘time for self’ after a long period of family commitments. (p.5)

“Sustaining factors” cited by participants included,

…Social interaction; setting personal goals and gaining satisfaction from achieving them; learning new skills in a safe and supportive environment; and receiving positive feedback and recognition from others…Women also frequently spoke of their enjoyment of training sessions and events; a sense of fun and independence associated with cycling as a form of mobility; pride in doing something ‘different’; being able to incorporate activity into their daily lives (not having to find time to ‘go to the gym’); contact with the environment; and increased self-confidence through learning new skills and achieving their goals. (p. 5)

**Barriers to participation**

**Constraints theory.**

Research on constraints to recreation and leisure participation originated with the ORRC reports in the 1960’s. However, this early research was descriptive in nature; it wasn’t until the 1980’s that the topic began receiving significant theoretical and empirical attention, along with consideration of multidimensional factors (Hiu-lun Tsai & Coleman, 2009; Jackson, 2000; White, 2008). Constraints were originally conceived of as barriers, which were assumed to be insurmountable and therefore prevented participation. While it is generally agreed that constraints have a negative impact on participation, some studies suggest encountering constraints promotes increased negotiation efforts and therefore actually increases participation (Hiu-lun Tsai & Coleman). Despite other studies contradicting this, “it has become increasingly clear that constraints are not necessarily fixed barriers that
result in nonparticipation; rather, constraints once encountered might be overcome or negotiated” (White, p. 345). It has also been found that constraints not only affect participation, but also play a role in the development of leisure activity preferences and interests (Crawford & Godbey, 1987; White), which in turn relate to motivation. Perhaps this explains findings that participants actually perceive more constraints than non-participants (see Hiu-lun Tsai & Coleman, p. 366). Self-efficacy constructs have been found to affect interest, negotiation of constraints, and actual participation (Hiu-lun Tsai & Coleman; White). Certainly, the relationship between constraints and leisure participation is comprised of a complex web of factors that is only recently beginning to be untangled. Jackson (2000) takes these, and other, considerations into account in his definition of leisure constraints being “factors that are assumed by researchers and/or perceived or experienced by individuals to limit the formation of leisure preferences and/or to inhibit or prohibit participation and enjoyment in leisure” (p. 62).

The purpose of leisure constraint theory is to explain how constraints inhibit leisure interests and participation (Hiu-lun Tsai & Coleman, 2009). It is generally accepted that the three general categories of constraints are intrapersonal, interpersonal, and structural. Intrapersonal refers to psychological states and socioeconomic conditions such as self-efficacy, stress, family structure, perceptions of skill, religion, and feelings of social inappropriateness (Hiu-lun Tsai & Coleman). Constraints related to the influences of and interactions with others comprise the interpersonal category. These include lack of an activity partner, gender expectations of parents, and lack of time. Structural barriers are those
beyond the control of an individual, such as lack of facilities and program funding, time, and money. It should be obvious from the examples that the categories overlap and inform each other. These classifications form the basis of the two primary models currently used in the field, the hierarchal model of leisure constraints and the integrated model. Developers of the former (Crawford, Jackson, & Godbey, 1991) propose individuals confront constraints in a hierarchal order, moving from interpersonal to intrapersonal to structural. On the other hand, supporters of the latter stipulate the categories are not ordered systemically (Hiu-lun Tsai & Coleman) and emphasize the interplay between them. Godbey, Crawford, and Shen (2010) present the model as being circular and provide the example of a squash player moving to a small town that doesn’t have courts. This initially structurally constraint, over time, could lead to intrapersonal constraints such as giving up looking for opportunities to play or becoming interested in a new sport instead. Likewise, culture has a strong influence on the development of personal beliefs, attitudes and interests as well as social relationships. Findings presented by Hiu-lun Tsai and Coleman suggest “that intrapersonal constraints block personal preference or interest in leisure whereas interpersonal and structural constraints inhibit participation after a preference has been established” (p. 377). This is supported by Crawford et al. (1991) as well. Godbey et al. note,

Rather than culture being ‘inconspicuously spread out’ among all three constraint categories, we believe it is more accurate to say culture determines the very operational definitions of each category. Interpersonal constraints, for example, must be operationalized within a specific culture. In one culture, religion may play a central role in determining who can participate in a leisure activity. In another, it may play no role. In one culture, “lack of facilities” may prevent adult males from playing soccer; in another, they will play
in the street. While our constraint categories are conceived at an individual level, they are understood to be profoundly shaped by culture. (p. 121)

The strength and importance of various constraints varies greatly between individuals and social groups, and across time (i.e. age, stage of life). Still, the dimensions of time, cost, availability and quality of facilities, personal skills/abilities, and isolation (social and geographical) consistently emerge as the most commonly indicated barriers to participation (Jackson, 2000). Time and cost are indicated the most often and most likely to be rated as intensely experienced. Lack of time, both real and perceived, seems to be a hallmark of the American lifestyle. As Jackson laments, “What can be done to reduce the extraordinary extent to which [North] Americans feel rushed?” (p. 63) There are actually indications that leisure time appears to be increasing (Henderson & Bialeschki, 2005; Robinson & Godbey, 1999). Henderson and Bialeschki observe, “The average American continues to spend more than twenty hours a week watching television but still feels under tremendous time pressure” (p. 360).

There is substantial evidence that socio-demographic characteristics such as ethnicity/race, gender, class, and family size/structure are strong modifiers of personal perceptions and experiences of leisure constraints (Godbey, Crawford, & Shen, 2010; Jackson, 2000) as well as leisure preferences and actual participation (Manning, 1999). As Jackson writes,

The experience of constraints varies among individuals and groups: so no sub-group of the population is entirely free from constraints, and each group is characterized not only by varying intensities of the experience of each type of constraint, but also by a unique combination of constraints. (p. 64)
For example, research has shown women are “more constrained in their physical activity than men irrespective of age” (Son, Kerstetter, & Mowen, 2008, p. 270), while older adults are consistently found to have significantly lower levels of participation in active leisure pursuits (Son, Kerstetter, & Mowen). Constraints also affect those within a social group differently. For instance, they affect white middle-class married women differently than women who are single mothers, minorities, low income, and/or employment status (Shaw, 1994). Still, it is well documented that women across socio-demographical groups experience more and higher levels of constraints to leisure than men, especially those in the interpersonal category (Godbey, Crawford, & Shen, 2010; Manning, 1999; Shaw, 1994; Son, Kerstetter, & Mowen). Women also have lower participation rates in a number of outdoor recreation activities, especially those traditionally considered masculine (Manning, 1999). One of the constraints specific to women is due to what is referred to as the “ethic of care,” which is the common occurrence of women providing for the needs of others first and neglecting their own. Shaw (1994) cites a number of studies demonstrating this creates a lack of sense of entitlement to leisure and recreation (p. 11). Other constraints largely specific to women include fear of violence and those related to the ‘beauty myth,’ such as body image issues and concern over physical appearance (Shaw).

**Constraints to cycling.**

Research regarding barriers to cycling has produced fairly consistent findings. As leisure constraints in general, they may be categorized as intrapersonal, social, cultural, environmental/structural, and related to safety.
One study regarding the utility of active commuting for health benefits found 61% of the random sample agreed bad weather was a barrier, 54% had lack of interest, 50% lack of time, 40% cited lack of or poor conditions of routes, and 30% felt it was unsafe (Ojoa et al., 1998). Lack of end facilities (i.e., showers/ wash up facilities, secure bike parking, lockers); heavy, inconsiderate and/or fast traffic; work dress code; urban design and social pressure are other major deterents (Lea, 2003; Ojoa et al., 1998; Pucher et al., 1999; Shepard, 2008).

Gatersleben and Appleton (2006) reported the most mentioned barriers to commuting as safety, heavy traffic, inconsiderate drivers, lack of fitness and social pressure. Negative experiences in their two-week intervention program mentioned the most often were bad weather, darkness, feeling tired, the hills being too hard or it taking too much effort and soreness. Cited less often, but still significant, were traffic, unsafe roads, and fumes. Bike related problems, such as flat tires, were reported the least. Bad weather and traffic were reported less often through time. Rankings for soreness and tiredness remained constant, although this is probably due to the short duration of the program. Positive experiences included good weather, sense of achievement (especially when climbing hills), and the “thrill” of going fast.

Stangeby, Ingunn, and Norheim (2002) surveyed 392 people who lived less than five kilometers from work or school and physically able to walk or ride the distance. Two out of three respondents indicated their reasons for using a car were perceptions it takes less time, need to take children, need for a car at work, and need to do errands/ shopping during the day. They also found “the drivers’ opinion
about barriers for walking and cycling is not in harmony with their reasons for using a car.”

Perceptions of danger are by far the greatest deterrent to potential cyclists (Ojoa et al., 1998; Unwin, 1995; Wardman, Tight, & Page, 2007; Wood et al., 2009). This danger is in many senses very real, as indicated by collision data. Aggressiveness of drivers and accident rates also vary by geographical location. On the other hand, the actual risk of a collision is not nearly as high as it is often perceived. This risk also decreases significantly with increases in skill; just as it is difficult to avoid another car that is driven erratically, it is harder for drivers to avoid cyclists who are not riding in a safe, predictable manner. Perception of risk varies across demographics, with women and minorities experiencing safety barriers at higher levels (Lea, 2003). The majority of safety efforts in this country are related to helmet wearing and bike lanes. Research actually demonstrates helmet laws and wearing a helmet decreases participation (Unwin, 1995). The actual safety of bike lanes is a highly debated topic beyond the scope of this paper. At any rate, addressing safety issues are integral to promoting cycling and reducing injuries.

Interpersonal barriers include lack of fitness, skill, and social support, the importance given to appearance, health problems, and need to carry passengers or heavy loads (Lea, 2003). Research examining behavioral change confirms the importance of social support when starting new activities and instigating lifestyle changes.

Urban and public transport design, riding and end facilities, weather, and
topography are structural/environmental barriers. Bike theft falls into this category as well and is often mentioned as a concern of respondents. Lack of paths and lanes is consistently reported as being a significant deterrent, likely due to safety issues and self-efficacy. Climate certainly plays a role, although not always as much as one would think- with other supports in place it becomes significantly more negligible. A Canadian study (Winters, Friesen, Koehoorn, & Teschke, 2006) found lower cycling rates in cities with more days of precipitation or temperatures below freezing. Heat and wind did not have a statistically significant effect. Yet the Canadian cycling rate is three times that of the U.S. despite colder temperatures and Minneapolis is considered the second best U.S. city for cyclists. Terrain is certainly a factor for many, especially if they are unfit. Still, there are many examples of cities with less than ideal weather and challenging topography with high rates of cycling, suggesting climate and topography are factors but do not explain rate differences (Pucher et al., 1999).

Cultural norms and attitudes can be a powerful obstacle to an activity. One study sponsored by the Newcastle Medical School in the United Kingdom reported that many adults see cycling as a childhood activity, and that giving it up as part of growing up. Young men said they preferred motor vehicles to keep up with their peers and attract women while young women generally saw it as unattractive and unsophisticated. As in this country, many respondents indicated they would feel self-conscious in cycling clothes and don’t ride because it is not socially acceptable (Unwin, 1995). Other research has indicated this as well (Lea, 2003; Pucher et al., 1999).
As with leisure and recreation in general, barriers to commuting seem to impact women more than men (Lea, 2003; Ojoa et al., 1998). For example, one study reported 30% of women have a fear of accidents compared with only 14% of the men surveyed (Ojoa et al.). Barriers also have a disproportionate effect on children and elderly persons. According to Son et al. (2008), “Research in the public health field indicates that participation in physically active leisure differs depending on age and gender; older adults and women tend to have lower levels of physical activity (see Rhodes et al. 1999)” (p. 269).

Garrard and Hakman (n.d.) report barriers to cycling cited by women include concern with keeping up with riding partners or slowing them down, low fitness level, lack of confidence, lack of technical knowledge, low bike handling and skill self-efficacy, and lack of knowledge of road rules and etiquette (“e.g. ‘acceptable’ bicycles and cycling clothing, riding in groups, passing other cyclists…”) (p. 7). Many women also indicated bicycle stores are…very ‘blokey’ environments, staffed principally by men, stocking bicycle equipment and clothes suitable mainly for men, and talking a (technical bicycle) language somewhat foreign to women. Women were not confident that their needs were understood, or could be satisfactorily met in this environment. (p. 7)

Issues related to clothing, such as feeling self-conscious in cycling clothes and cost of specialized gear, were also frequently reported, especially by commuters. The researchers quote one woman as saying “I’ve had to modify my clothing because I was getting harassed every single day and it was really starting to get me down. So

5 “Bloke” is a British slang term used in the United Kingdom, Australia, and select other countries, meaning “man” or “guy.”
now I ride in really daggy clothing and I find it makes a really big difference” (p. 7).

As a lady cyclist I am always looking for events that cater to me. Some examples of why I moved from Southern CA to Minneapolis and stayed: Babes in Bikeland, a huge all female alley cat—the highlight of the summer; Girls Gone Grumpy Ride, a casual ride for ladies at which men who attend have to wear a skirt; Grease Rag, a free, open-shop night twice a month, for ladies, by ladies. (Emery, 2010, pp.4-5)

It is clear that different populations have different needs, physical abilities, and experiences of constraints; these differences need to be considered when developing promotional programming. “As Jackson et al. (1993) proposed, leisure participation is dependent not on the absence of constraints but rather an ability to negotiate through them” (Hui-lun Tsai & Coleman, 2009, p. 378). Son et al. concur, noting that understanding negotiation strategies is crucial in the development of best practices for active recreation programming and in helping people overcome constraints to participation in active leisure pursuits.

**Research Regarding Promotion and Safety Measures**

The coordination of multi-faceted efforts, with different means reinforcing each other, has been the key to success in Europe (Pucher & Buehler, 2008). This method has also proven successful in select American cities. Reducing barriers and increasing its attractions and benefits can improve cycling rates. It is also pertinent to utilize behavior change and learning models. Finally, it should be noted, “neither

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6 “Daggy” is an Australian slang term meaning unstylish or unclean. It originates from the colloquial term “dag” (the fleece on a sheep’s hindquarters being matted with feces). This is prevented by keeping the area shorn, therefore it has the connotation of neglect or being uncared for (Urban Dictionary, n.d.)
all cyclists nor all non-cyclists are the same, which may have important implications for targeting cycling policies” (Pucher et al., 1999, p.309).

Promotional means may be categorized as pertaining to facilities/infrastructure, policy, education, commuting specific, health promotion, behavior change/social support, and safety.

Pucher et al. (1999) determine the means to increase cycling in North America are to clarify cyclists’ legal rights, establish motorists’ accountability towards cyclists, expand facilities, hold special promotional events, increase the cost of car use, make most roads bikeable, link cycling with wellness, and to broaden and increase political action. Bike skill and safety education may also be added, particularly for youth, as means to promote a shift in cultural attitudes towards cycling.

The New York City government conducted research in 1990 (Pucher et al., 1999). The sample included 700 office workers who lived within ten miles of their workplace and 1600 others with a commute greater than ten miles. Half of the office workers and one-fifth of the latter group indicated they would be interested in commuting by bike if there were safe lanes, secure parking, and wash-up facilities.

Gatersleben and Appleton (2006) asked respondents under what conditions they would commute by bike. The researchers then categorized the results according to what stage of change the individuals occupied. Nineteen percent of the pre-contemplation group indicated there were no conditions that would cause them to ride while 45% said they would if there were better and safer facilities. The
contemplation, preparing, and active groups were fairly similar, while 24-29% indicated they would be encouraged by better weather and easier terrain and 20-21% were hindered by work and family commitments. Rates of needing safer and better facilities fell significantly as the stages progressed towards maintenance: 73% for the contemplation group, 59% for the preparing group, and only 36% of the action group. Only twenty-eight percent of the maintenance group (those already cycling consistently throughout the year) reported a need for safer and better facilities. These findings have important implications for understanding barriers, motivations, and needs as they relate to specific populations.

**Safety.**
As discussed earlier, the issue of safety is the single largest barrier to cycling. Therefore, implementing measures to decrease both actual and perceived risk has a significant impact on cycling usage. These efforts can be either individual solutions, such as training and helmet laws, or systemic, such as bikeways, motorist training, or ticketing for violations. Bikeways, intersection modifications, and traffic calming contribute to safety but will be discussed in the infrastructure section.

One consideration is that “research…suggests that support for safety measures has less to do with the solution being proposed than with the individuals’ perception of the riskiness of the activity” (Lea, 2003, p. 7). The statistics from the stages of change study, discussed in the demographics section, clearly demonstrate different people have different needs and perspectives, and therefore support different means of interventions. For example, many experienced cyclists vehemently oppose bike lanes, whereas many beginners will not ride without them
due to the perceived (but empirically questionable) safety they provide. Iso-Ahola and Mannell (1984) report that perceptions of competence and therefore activity engagement are enhanced when facilities provide for a range of skills and experience.

There are several perspectives regarding safety. Lea (2003) describes two of these. The individual responsibility model presents cycling as an individual choice, therefore safety is an individual responsibility. In order to obtain equal status, bicycles should be treated the same as motor vehicles. The social responsibility model ascertains cycling as determined by social and physical conditions and safety as a social responsibility. It advocates separate consideration and design for different travel modes, with preferential treatment for cycling and walking since they are the most beneficial, least dangerous, and most vulnerable. John Forester developed a concept similar to the former model called “vehicular cycling.” This is the idea cyclists should follow traffic laws, be treated as valid traffic by drivers, and that all modes should be ticketed for traffic violations. He also emphasizes education for motorists as well as cyclists. Critics of this idea maintain that few people are interested in this approach and most people will not ride unless there are bike lanes or separate paths (Pucher et al., 1999).

Most of the safety campaigns in this country focus on helmet use and laws, especially for children (Pucher et al., 1999; Pucher & Buehler, 2008). However, helmets cannot be credited for the low fatality and injury rate of cyclists in Europe: they are worn by less than 1% of adults and only 3-5% of children (Pucher & Buehler). Helmet wearing has been shown to actually discourage riding in a
number of countries, including the United States and Australia, by making it less convenient, comfortable and socially acceptable; respondents have cited helmet hair, sweating, “no one else does,” and not wanting to look like a “nerd” as reasons for not wearing them (Carpenter & Stehr, 2010; Pucher & Buehler; Villamor, Hammer, & Martinwz-Olaizola, 2008). Social norms are powerful; one study revealed 4-5% reductions in the number of children 5-15 years old who bicycled following the instigation of helmet laws (Carpenter & Stehr), while reductions as high as 30% have been reported in adult populations (Enchin, 2010; Shepherd, 1991). Several researchers have noted claims of dramatic reductions in head injury and fatality rates do not reflect decreases in ridership, and therefore may actually indicate a proportionate increase in injuries to those who continue riding (Carpenter & Stehr; Ivers, 2007). According to Dutch cycling experts, “helmets give riders a false sense of security and increase risky behavior” (Pucher & Buehler, p. 509). It may also reduce the consideration motorists give cyclists because it makes them seem less vulnerable (Pucher & Buehler; Walker, 2007). Conversely, wearing a helmet may give a new rider the courage and security to start riding. Research also shows helmets reduce fatalities and severity of injury from collisions and falls. Still, helmets do not prevent collisions and crashes.

According to Walker (2007), research indicates collisions occurring as motorists pass bicyclists “seem to be disproportionately dangerous” (p. 417), although less common (and understood) than collisions at intersections. The researcher’s data, derived from 2,320 overtaking events, revealed several significant correlations between various attributes of cyclists and motor vehicles
and motorist behavior when passing, specifically the distance maintained from the cyclist. First, “a rider is more likely to experience particularly tight passing events when wearing a helmet, and…this effect increases as riding position moves from the edge of the road towards the centre [sic]” (p. 423). The researcher speculates this may be due to (1) motorists having an increased perception of the rider’s safety leading to higher risk taking; and/or (2) riders wearing helmets being perceived as “more serious, sensible, and predictable road-users than bicyclists without helmets” (p.422), and therefore less likely to ride erratically (p.423). Of course, as Walker notes, this latter attitude does not take into account a cyclist’s needing to swerve to avoid a pothole, an automobile door opening, or other obstruction. Secondly, this study demonstrated buses and other large commercial vehicles consistently pass cyclists at closer distances than other types of vehicles, such as smaller commercial vehicles and cars. In fact, the researcher was hit twice by this type of vehicle during data collection. Third, motorists pass at greater distances when they believe the cyclist is a woman. Walker recommends developing interventions that target the specific beliefs among subgroups of drivers towards rider characteristics. For example, professional drivers could engage in a simulation demonstrating the effects of wind draft and the increase in time needed to pass safely in a large vehicle. Clearly, more research is needed in the area of understanding motorist behavior towards cyclists in order to target specific beliefs and therefore develop effective intervention strategies. Walker writes,

As drivers have demonstrated that they alter their behaviour [sic] in relatively specific ways, specific interventions based on the needs of particular subgroups of non-drivers can be developed with a good likelihood of success. Another factor which could profitably be
explored in the future is bicyclists’ perceptions of motorists’ overtaking behaviours. If we are to promote safer overtaking to motorists, it would be useful to know what leeways bicyclists feel comfortable with….It would also be useful better to understand the phenomenology of bicyclists being overtaken too closely, as this may well impact upon efforts to promote bicycle use, particularly in cities. (p. 424)

One major cause of crashes is drivers’ failing to see cyclists in time to avoid a collision (Wood et al., 2009). Issues of late detection and “looked but failed to see” can be addressed with visibility aids and driver education/ awareness, such as teaching drivers to scan for bikes instead of only for cars. Almost half of 838 respondents in this Australian survey reported having had a crash or near miss. Furthermore, 88% of cyclists and 60% of drivers agreed “drivers do not look for cyclists; 77% drivers and 57% cyclists agree “cyclists are difficult to see in traffic.” Two thirds of drivers cited visibility as the cause of a collision. The researchers suggest this may not only be due to visibility factors but an effort to reduce blame and personal responsibility. Regardless, research does show increased use of visibility aids may increase driver recognition, thereby increasing their ability to avoid a collision. Interestingly, drivers and riders demonstrate varying perspectives on what aids are most effective. Cyclists also perceive themselves as being visible at twice the distance drivers do (Kwan & Mapstone, 2004). The researcher concludes both drivers and riders need to be educated about the use of aids and visibility and the need for more empirical data on what aids are most effective.

More people ride as conditions become safer, which in itself makes riding safer. Pucher and Buehler (2008) write,

The phenomenon of ‘safety in numbers’ has consistently been found to hold over time and across cities and countries. Fatality rates per
trip and per kilometer are much lower for countries and cities with high bicycling shares of total travel, and fatality rates fall for any given country or city as cycling levels rise. (p.508)

Policy.

While history, culture, topography and climate are important, they do not necessarily determine the fate of cycling. Government policies are at least as important: transport policies, land-use policies, urban development policies, housing policies, taxation policies, and parking policies. In many respects the UK and USA have given the green light to the private car, almost regardless of its economic, social and environmental costs…Instead of catering to ever more motor vehicles by expanding roadways and parking facilities, Dutch, German, and Danish cities have focused on serving people, making their cities people-friendly rather than car-friendly, and thus more livable and more sustainable than American and British cities. (Pucher and Buehler, 2008, p.496)

Gatersleben and Appleton (2007) also noted, “cycling is never going to be taken seriously by individual mode users if it is not also perceived to be taken seriously by transport planners.” They emphasize a cultural change is needed to create more equitable, safe, and sustainable transportation systems. Legislation and policy have the potential to produce behavioral, and ultimately cultural, change. However, certain behaviors cannot be forced, nor is such an approach desirable. Various levels of government (federal, state, local) and institutions such as universities, businesses, and insurance companies are all in a position to implement policies that encourage pro-social changes. As with other means, policy needs to be coupled with supporting interventions, especially awareness and education campaigns, in order to be affective.

Germany, Denmark and the Netherlands all have National Bicycling Master Plans. These plans are comprised of goals, strategies, best practice information, and
research. Most policies and programs are carried out on the municipal level and designed for their specific location. State and regional governments also provide guidance, coordination and funding as well as facilities in rural areas or links between municipalities. The Federal governments fund facilities along national highways and routes that cross national borders (Pucher & Buehler, 2008). Car use is discouraged through taxes on gas and new car purchases, import tariffs, driver training, license fees, and parking fees: the cost of car ownership in Europe is two to three times that in the U.S. (Pucher & Buehler, 2008).

A review of other related research reveals consistent recommendations. Pressure and advocacy from local organized groups is needed, along with liaisons between these groups and the government (Pucher et al., 1999). A cycling committee, or at least a coordinator, is needed at various governmental levels. Efforts are more effective when agencies coordinate rather than working in isolation (Merom et al., 2008).

Governments need to recognize the potential of cycling as a solution for various issues and part of overall objectives. This will lead to its inclusion in master planning. Dill (2009) writes,

The bicycle infrastructure in Portland appears to work, in part, because of the land use and street network structure. The areas within Portland where the highest levels of bicycling occur also have a well-connected street grid and mix of land uses…The older parts of many US cities have this same supportive structure. For new development, street connectivity standards and zoning that allows or even mandates a mix of land uses can create such an environment. (p.S106)

While beyond the scope of this paper, it should be noted there is a significant body of research pertaining to land use policy, the built environment, and other related
topics and their effect on transportation patterns, active commuting, population health, etc. Bergman et al. (2010) write, “The advantage of this approach is that a change in the physical environment would have long-term effects and may reach many in society” (p. 171). Progress is being made in this realm through the revision of policies. For example, when roads are built or rebuilt in Oregon, there is a state mandate requiring the inclusion of cycling and pedestrian infrastructure. In addition, a certain percentage of transportation funds at state, county, and city levels is designated specifically for the development of infrastructure for non-motorized traffic (Dill, 2009).

Universities and public school districts are another source of policies that support active transportation. As discussed below, some colleges and universities are developing bike share and other programs and policies to decrease the number of cars brought to campus. Parking at Cornell University being extremely expensive, limited, and inconvenient is likely a major contributor to the unusually high rates of active and public transport use in Ithaca, New York, since they are the area’s major employer. Another example is school districts only providing transportation to students living beyond a certain distance from the school. However, while a number of studies have been conducted to determine the barriers that prevent children from walking or biking to school and interventions to promote the behavior, research is needed to determine the effects of such policies. A systematic review of research regarding attitudes to walking and cycling to school reports,

The synthesis of views described a culture of car use, fed by a fear and dislike of local environments and parental responses that
emphasized children’s safety at the expense of developing their independence, despite children expressing responsible attitudes towards transport choices. Comparison with effectiveness literature found that most evaluated interventions targeted only the public’s fear and dislike of local environments. (Lorenc, et al., 2008, p. 852).

The researchers suggest “Interventions need to address pedestrian and cyclist safety, perceptions of risk, and parental norms regarding children’s independence” (p. 852). Belle Sherman Elementary School in Ithaca, New York, provides an illustration of the need for multi-faceted interventions, albeit anecdotal. The city school district does not provide bus transportation to students living within a mile of their school. Belle Sherman is located in an affluent, safe neighborhood and the majority of surrounding roads are quiet residential streets with sidewalks. The two throughways near the school are two-lanes, have speed limits of 30-35 mph, and are staffed by crossing guards during school starting and dismissal periods. While a number of children can be seen walking to school (the majority of whom are with parents), there is only one child who rides their bike to school (as evidenced by the school’s bike rack. It should also be noted that the bike rack has been rendered inaccessible rather than relocated during a major construction project that started in September of 2010 and is not due to be completed until the following year). The roads adjacent to the school are chaotic and nearly gridlocked every morning with parents dropping their children off by car, despite a new parking lot and pull-out for drop offs being installed the summer of 2010. The national Safe Routes to School program is one of several sources and programs that could be used to promote active commuting to school.

As mentioned earlier in this chapter, businesses in Minneapolis are required
to provide bike parking, which the city helps to fund, while several European nations have levied a variety of taxes and fees that increase the cost of purchasing and using automobiles and thus encourage other forms of transportation.

Businesses in Portland, Oregon reversed their initial resistance and preference for paying fines rather than lose vehicle parking space for the installation of bike racks: after several businesses saw an increase in customer volume due to bicycle traffic and parking, the city’s bike rack funding assistance program suddenly became incredibly popular as businesses started clamoring for racks (Birk, 2010).

A study in Sweden reports that a trial congestion tax, collected by toll-booths on all roads leading into Stockholm, resulted in a 25% reduction of cars (equal to 100,000 vehicles) in the city (Bergman et al., 2010). The 6% increase in trips made by public transportation still left 60,000 daily trips unaccounted for. Data collected by the city reveal there was a reduction in trips to work and school but no reduction in trips related to shopping and socio-cultural events. The researchers collected data on activity levels of residents in Stockholm and a control city during the time the congestion tax was in effect. Respondents reported an increase in moderate intensity activity levels and overall physical activity and a decrease in the amount of time spent sitting. Limitations of the study include the sample size, the baseline data being from two and a half years prior, and the possibility of the changes in activity levels being due to other influences. The researchers conclude, “The results from this study on the influence of a congestion road tax on levels of physical activity are inconclusive…On the other hand, the overall pattern of [increased physical activity] among the exposed suggest some
change in behavior and is encouraging” (p. 176). Handy, Weston, and Mokhtarian (2004) conducted research on the distinction between driving by necessity and choice and its implications for the development of policies to reduce driving. They recommend policies that address issues of concern on individual and community levels depending on the type of motorists being targeted and desired outcomes (see Table 2 below).

Table 2.2 Possible policy interventions based on types of drivers (Handy, Weston, & Mokhtarian, 2004).

<table>
<thead>
<tr>
<th>Categories of Motorists</th>
<th>Policies</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Not driving more than they need, but more than they want to”</td>
<td>- bike and pedestrian infrastructure</td>
<td>- reduce need for driving</td>
</tr>
<tr>
<td></td>
<td>- improved transit services</td>
<td>- provide feasible alternatives</td>
</tr>
<tr>
<td></td>
<td>- land use policies</td>
<td></td>
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<tr>
<td></td>
<td>- voluntary travel behavior support programs</td>
<td></td>
</tr>
<tr>
<td>“not driving more than they need or want to”</td>
<td>- land use policies</td>
<td>- reduce necessary distances</td>
</tr>
<tr>
<td></td>
<td>- encourage use of alternatives</td>
<td>- provide alternatives</td>
</tr>
<tr>
<td></td>
<td>- pricing policies</td>
<td>- discourage car use</td>
</tr>
</tbody>
</table>

A dislike for driving in congested traffic is common to all categories of motorists, even those who drive for pleasure rather than necessity (Handy et al.). This implies an effective means to promote sustainable transportation is to make driving less convenient and pleasurable. For example, “if cul-de-sacs are interconnected by sidewalks or bikeways, walking and bicycling routes can be far more efficient than automobile routes that are blocked by the cul-de-sacs.” Likewise, policies could change the response to traffic congestion from the widening of roads to the development of other transportation modes.

Lastly, traffic laws for both cyclists and motorists need to be known and
enforced (Pucher & Buehler, 2008). Many law enforcement officers are unaware of laws pertaining to cycling and/or are biased against cyclists. Cyclists are significantly more likely to be ticketed and prosecuted for traffic infractions than motorists. Likewise, the majority of motorists involved in accidents with cyclists are not prosecuted, regardless of fault, even if the accident resulted in injury or death to the rider.

**Education.**

Lack of riding skill is both a personal barrier and a factor in safety. There is relatively little on-road training for either children or adults and some programs actually teach dangerous practices, such as riding against traffic (Pucher et al., 1999).

Toronto was one of the coldest cities in Pucher’s 1999 case studies, yet it has one of the highest cycling rates in North America. The researchers attribute much of the city’s success to their substantial education program. Graduates of the program, public service announcements, and posters/flyers also spread knowledge. High profile traffic enforcement events and a Bike Friendly Business designation program augment efforts.

Training is needed not only for cyclists, but also motorists. There is currently little motorist education except in a few isolated locations and even fewer municipalities include questions related to cyclists on driver license examinations. Driver education regarding both laws and safe road sharing techniques increases driver awareness of cyclists and promotes more respect towards them on the roads (Pucher et al., 1999).
Facilities and Infrastructure.

Taylor (2009) confirms there is increasing research demonstrating facilities, or lack of, effects activity levels across age groups. The creation and use of traffic calming, car-free zones, intersection modifications, bicycle streets, “green wave” lights, and bike parking in Europe and select American cities have been highly successful (Pucher & Buehler, 2008). Coordination with public transport, such as secure bike parking platforms in train stations and “commuter stores,” has also made commuting more convenient and desirable.

One British review (Ogilve et al., 2004) concluded infrastructure engineering, such as traffic restraint, was not effective in creating modal shift. They add that increased connectivity of bikeways and routes has been shown to increase cycling rates in areas where it is already popular. This study contradicts evidence found by a number of other studies. One should note, the sample size was very small due to limiting criteria. As the authors themselves mention, it is very difficult to compare data across different studies because few measure cycling directly and there is wide variance between types of measurements and criteria.

The merits of riding facilities such as bike paths and lanes is a highly debated issue among experienced cyclists in the United States. However, these provisions have been integral to the success of cycling in Europe (Pucher & Buehler, 2008). When appropriately designed, they enable a wide spectrum of the population to ride, including children and the elderly, as well as increasing safety. According to Dill (2009), “A network of different types of infrastructure appears necessary to attract new people to bicycling. Simply adding bike lanes to all new
major roads in unlikely to achieve high rates of bicycling” (pS106). Unfortunately, the ways many lanes are constructed in this country have a negative impact on safety, motorist behavior, and utility. For example, many of the bike lanes on Cornell University roadways are less than three feet wide, obstructed by a number of manhole covers and grates, and frequently rendered unusable due to snow, gravel, or other debris. Bike lanes also tend to be used in isolation and seen as a complete solution, rather than a part of a comprehensive program. The majority of lanes in continental Europe are significantly wider and more protected from traffic than those in the United States.

Lack of infrastructure affects women more than men. A study in Portland demonstrated that while men are more likely to use on-street bike lanes and the shortest route to their destination, women tend to go out of their way to use bike boulevards (Baker, 2009). Research in New York City confirms that while male bike commuters outnumber women three to one, 44% of riders on a Central Park bike path were women (Baker). Baker writes,

Women are considered an ‘indicator species’ for bike-friendly cities for several reasons. First, studies across disciplines as disparate as criminology and child rearing have shown that women are more averse to risk than men. In the cycling arena, that risk aversion translates into increased demand for safe bike infrastructure as a prerequisite for riding. Women also do most of the childcare and household shopping, which means these bike routes need to be organized around practical urban destinations to make a difference. (p.1)

Integrating cycling with public transport improves use of cycling (Hanson & Young, 2008; Pucher & Buehler, 2008). Many American cities have adopted the use of bike racks on buses and increased availability of secure bike parking at bus
and train stations. Limited numbers of trains allow bikes on board, usually for an extra fee.

Infrastructure can be used to decrease a variety of other barriers as well. For example, Winters (2006) suggests clearing and salting cycling routes, creating dedicated bike lanes, and increasing bike friendly public transit can be used to counter inhibition due to precipitation and cold. She also recommends providing education about riding safely in bad weather.

Infrastructure alone is not enough to encourage riding and increase safety. It must be combined with other measures to be effective. For example, “sharrows” have been used successfully in an increasing number of U.S. cities. These road markings, large arrows with bike symbols underneath, indicate where cyclists need to ride in the road for optimum safety. They also demonstrate to motorists that bikes belong on the road. The city of Ithaca, NY installed them on a through-fare that traverses the length of downtown. While their meaning should be apparent, understanding should not be taken for granted. This illustrates the need for individual measures to be coupled with education, public service campaigns, or other means in order to be effective. Several years ago a cycling map of Ithaca and the surrounding area was produced. It indicates direction and size of hills, levels of traffic and other pertinent information such as links to resources and instructions on loading a bike onto the buses. This is a very useful tool but its distribution is limited. Lastly, infrastructure is less likely to be used by significant numbers of people unless bicycling is socially acceptable. A notable modal shift requires the
use of several different means that are integrated, comprehensive and accessible to their target populations.

**Bike Share Programs.**

The first successful bike-share program originated in the city of Copenhagen in 1995 (DeMaio & Gifford, 2004). Since then, numerous cities worldwide and almost ninety American universities have implemented a variety of bike-sharing systems as technological advances improve their convenience and decrease problems such as theft. While often instigated by universities and colleges in response to campus parking issues, they are also the result of increasing interest in sustainability and student demand (Tang, 2010), and thereby possibly reflect cultural changes. Since 2008, the University of New England has given away 530 bikes to freshman agreeing not to bring a car to campus, resulting in one of the parking lots being converted to a basketball court and event venue.

The State University of New York College at Cortland’s Community Bike Program conducted several surveys regarding its bike-share program in order to gauge its success and improve services (Brown, Anderson, Hill & VanSickle, 2010). Over 80% of students agreed with the statement “The community bike program makes me feel proud of the shared community spirit at SUNY Cortland.” Over 80% “strongly agreed” they would like more community bikes on campus while 90% indicated they “definitely want to see the program continue.” Sixty-two percent of respondents agreed they would be willing to leave their car off campus and over half indicated they would be willing to rent a bike for a semester.
Bike-share programs, especially those on college campuses, provide an ideal opportunity for the encouragement and modeling of utilitarian cycling, and therefore of generating changes in attitudes and behavior regarding cycling. As noted by DeMaio and Gifford (2004), there is very little research on bike-sharing. Investigations on best practices and the effects of such programs on cycling rates is certainly warranted.

**Commuting.**

Transit choice involves factors of cost, convenience, time (access time, wait time, travel time), uncertainty (schedule adherence, safety, etc.) and utility (Merom et al., 2008; Stangeby, Ingunn, & Norheim, 2002; Taylor, Miller, Iseki, & Fink, 2009). Stangeby, Ingunn and Norheim (2002) also noted different mode users have different perspectives of the other modes. For example, cycling less than five kilometers does not take significantly more time than travel by car, and in many circumstances takes less. It can take even less when one considers level of traffic and proximity of parking to the destination. Yet an overwhelming number of drivers reported “lack of time” as being a major reason for driving a car.

The utility, or lack thereof, of different transportation modes varies between people and situations. Many see commuting time as an opportunity for multitasking (Merom et al., 2008). This suggests it may be useful for promotional efforts to frame bicycle commuting as an occasion for exercise (or recreation) instead of having to allocate separate time for it.

Anable & Gatersleben (2004) examined the role of instrumental and affective factors in trips by different modes. They found people seem to give
instrumental aspects, especially convenience, greater importance for work journeys, although the affective factors of control, lack of stress and freedom were also highly rated. Instrumental and affective factors rated as equally important for leisure trips. Walking and cycling were shown to be perceived as highly satisfying, especially on factors such as flexibility, cost, freedom, health, environment, and excitement by users of all modes, including drivers and rated even higher than cars in many cases. However, drivers seemed to attach more importance to convenience and flexibility and reported alternative transport as lacking in these factors.

Pucher and Bueler (2008) described the detailed cycling maps and Internet route planning in some European cities. These Internet sites operate similar to MapQuest, providing the best route between destinations taking traffic levels and other considerations into account. They also provide average speed and time for the route, location of parking facilities near the destination, and public transport connection information.

Merom et al. (2008) conclude active commuting is best promoted by limiting the convenience of traveling by car. This can be achieved by limiting the availability of parking and increasing its cost, reconfiguration of throughways through city centers, and increasing costs of car use through gas taxes, registration, and other means. They also recommend emphasizing health benefits and programs designed to specifically target the sedentary population.

Finally, businesses can also play a role in promoting commuting to work through incentive programs, providing end facilities such as secure bike parking, lockers or showers, “guaranteed ride home” programs for emergencies, and bike-
buddy matching programs (Mozer, n.d.). Such efforts need not be complex and/or costly to be effective. For example, one bike commuter relates a story of how he used to keep his bicycle in a storage shed at work until it was converted into additional office space. He encouraged his employer to provide covered bike parking for more than just his own bike; the availability of parking and a role model resulted in a number of other employees riding to work on a regular basis (Loginov, 2010). The number of employers offering various incentives to employees for bicycling to work should increase with recognition of the benefits of active transportation, such as increased health of employees, which promotes increased productivity, fewer sick days, etc. The Bicycle Benefits program is another way in which, along with providing bike parking as discussed earlier, businesses can promote commuting. To participate in this program, cyclists simply purchase a Bicycle Benefits sticker (currently $5) and member businesses give a discount to customers who come in with the sticker on their bicycle helmet. A number of cities, including Ithaca, in seventeen states, plus Washington, D.C. and British Columbia, participate in this national incentive (Bicycle Benefits, 2010).

**Health and Wellness based approaches.**

Respondents in several studies have indicated health benefits as motivation for riding. Therefore one approach is to promote its role in wellness and a healthy lifestyle. There is a small body of research regarding encouraging children to walk or bike to school but even less on promoting cycling to adults as a means of increasing health.
Ogilvie et al. (2004) did a systematic review of 23 studies of promoting active commuting. They conclude there is little valid evidence that general publicity or school travel campaigns are effective. They did find evidence supporting the effectiveness of programs targeted to people who were ready to make changes. Their sample was limited and they themselves note the generally poor quality of research on the topic.

Some suggest the workplace as a good setting to promote physical activity due to the availability of social networks and means of communication. Oja, Vuori, and Paronen (1998) instigated a six-month work based promotion program. Efforts focused on providing information about the benefits and possibilities for active commuting through bulletins, leaflets, and diaries. They also utilized physical fitness diaries, lottery incentives, fitness testing, and made improvements to shower and bike parking facilities. Ninety percent of respondents noticed the program and 43% thought it was important. Half agreed employers should support and motivate for active commuting while 16% indicated it was not an employer’s responsibility. The program resulted in 19% of respondents increasing their leisure time activity and 7% increased their active commuting. The researchers cite several limitations to the study. One was the people responsible for implementing the program had limited time to commit to it. It was also interrupted by summer, and not strongly reinitiated in the fall. The city being slow to correct safety problems was another contributor. The program did however result in positive improvements and bring important factors to light. Oja, Vuori, and Paronen conclude that while worksite promotion is useful, other sectors need to be involved as well. Merom (2006)
concerns on this, encouraging the coordination of health and transport agencies. For example, health departments can lobby for better bikeways and facilities, promote a positive image of cycling and its use for healthy transport, and help organize special high media events (Unwin, 1995).

It is useful to consider research in other areas regarding general health promotion strategies for application to this topic. Similar to leisure constraint theory, the categories of interpersonal, intrapersonal, institutional, community, and public policy have been proposed as constructs that affect participation or abstinence in healthy behaviors such as physical activity (Henderson & Bialeschki, 2005). For example, Henderson and Bialeschki write,

> Although physical activity is a benefit of trail use, a benefit segmentation study of trail users by Bichis-Lupas and Moisey (2001) found that only 4% of trail users were concerned solely with fitness, a quarter were concerned with fitness and nature equally, and almost half of the users were interested in the amalgam of benefits (social, spiritual, physical) they received from trail use. One important area for leisure, parks and recreation researchers for the future includes the articulation and documentation of the benefits of parks and trails in helping citizens become more physically healthy within this holistic context. (p. 359)

As noted earlier, Garrard and Hakman (n.d.) found that while health and fitness were important motivators to women in commencing bicycling, participants rated social interaction, increased self confidence, independence, satisfaction, and positive feedback from significant others as more valued factors in sustaining the activity. Certainly, simply promoting behavior on the basis of health benefits alone is not the most effective strategy, especially when constraints research is considered. Common knowledge dictates the fact regular physical activity is important to one’s health, yet the population is still overwhelmingly sedentary-
even among people who are motivated, interested in, and/or value active recreation. Hiu-lun Tsai and Coleman (2009) respond to this by calling for more research on the psycho-social antecedents of engagement since even planning to engage in active recreation on a regular basis is also not sufficient for participation to manifest. Consider the number of people who make New Year’s resolutions to “get fit.” So, while an individual’s interests in and intention to partake in physical activity are a necessary precursor to action, other strategies must be employed to facilitate this. According to Hiu-lun Tsai and Coleman, efforts towards “kindling and maintaining intrinsic interest” should be augmented with “helping people to develop and implement effective plans to incorporate active pursuits into their lives,” such as time management skills (p. 380). Son et al. (2008) recommend promotion programs that teach negotiation strategies and reinforce benefit-based motivations throughout the stages of change.

Research investigating how to motivate people to become more physically active and adopt healthier lifestyles has grown dramatically across numerous fields since the millennium in response to the obesity epidemic and prevalence of related health problems. Collaboration between fields would be highly beneficial to this end.

Cultural Attitudes and Social Support.

Social support and cultural attitudes play a significant role in determinants of behavior and therefore are a means to create changes in behaviors, beliefs, and attitudes. Henderson and Bialeschki (2005) write,

Most people’s behaviors are deeply influenced by others around them. Interdependence is the reality of today’s world and a cultural
approach includes the social contexts of people’s lives. What an individual does is shaped by the cultural meanings of activities as well as social interactions (e.g., family, peers, and colleagues). Thus, when physical activity occurs, the social context of relationships, roles, and cultural meanings come into play. The contributions that leisure researchers make concerning how recreation promotes social cohesiveness have implications for people working and playing together and encouraging one another to be physically active. The role of families, especially for women and in many minority communities is an area that leisure researchers have studied that may help to understand more about active living (e.g., Shaw, 1992). (p. 360)

According to De Geus, Bourdeaudhuji, and Meeusen (2008), choosing to commute by bike is a combination of psychosocial and environmental variables. They suggest focusing promotion on creating social support, such as encouraging riding with a partner. Six American cities have mentor programs. They seem to be well received according to anecdotal evidence; empirical research on their effectiveness has yet to be conducted. Likewise, Garrard and Hakman (n.d.) write,

Many women reported that on-going support in the form of cycling with family or friends, or joining a cycling group or club was important for maintaining cycling after completing a course or program. As well as cycling with other people, the verbal and practical support of partners, family, friends and work colleagues were also important. (p. 5)

Ogilve et al. (2004) concluded programs aimed at behavior change seem to be effective in creating modal shift when they are targeted to specific, rather than entire, populations, while Gatersleben and Appleton (2006) emphasized the need to promote a more positive image of cycling. As discussed earlier, it is often seen as something only done by young, fit males, renegades, and extremists. They go on to state, “For many people, especially women, cycling is something that other people
do, people unlike themselves” (p.309). They concluded promotion should be focused on children and students in order to create cultural change.

**The Theory of Planned Behavior.**

The Theory of Planned Behavior (TPB) provides a framework to better understand the factors involved with behavior as a means to formulate more effective interventions (Fishbein, 2008). It postulates that salient beliefs generate behavioral intentions, which in turn determine actual behavior. These beliefs specifically refer to behavioral, normative, and control beliefs. Intention is defined as “an indication of a person’s readiness to perform a given behavior, and it is considered to be the immediate antecedent of behavior” (Ajzen, 2006a, p. 1). Ajzen (1991) writes, they “are assumed to capture the motivational factors that influence a behavior; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior” (p. 181). In this context, the term “beliefs” refers to those relevant to the behavior in question (Ajzen, 1991), rather than general or global beliefs an individual may hold; the principle of specificity is important (Fishbein, 2008; Scott, Eves, Fren, & Hoppe, 2009). The creation of beliefs is informed by external information (e.g. media, other people), direct experience, and logical inferences (Iso-Ahola, 1980, 1984).
Behavioral beliefs refer to the evaluation of the likely consequences of a behavior and are the foundation of a person’s attitude towards the behavior. In other words, if someone perceives the likely outcome of an act positively, they will have a positive attitude towards it. Likewise, a negative attitude is formed when the act is associated with negative consequences (Ajzen, 2006). The stronger the belief and more positive or negative the expected outcome, the stronger it will impact the attitude (Ajzen, 1991). Iso-Ahola (1980) points out beliefs can either be about an object itself or the characteristics attributed to it and both are subject to change. He
provides the example of a crowded swimming pool: the pool is actually crowded, however attitudes about the characteristics of “crowded” can be reevaluated. For example, rather than being negative, crowding is an advantage because it increases the chances of meeting someone attractive.

Attitudes are closely related to motivation/intention and, ultimately, behavior. Son, Kerstetter, and Mowen (2008) confirm that “maintaining motivation levels is an important goal for effective leisure education and health promotion programs” (p.282). Their study demonstrated,

…high levels of motivation to participate in physically active leisure for enjoyment and health benefits led to increased engagement in self-directed negotiation strategies, which increased the levels of overall physically active leisure, particularly in the case of frequency of participation. (p.282)

Fortier et al. (2009) present attitudes as the strongest and most consistent variable associated with intentions (p. 63). White (2008) describes the concept of motivation being the desire for satisfying experiences. His research revealed motivation as the strongest predictor of outdoor recreation participation, along with having a significant effect on the use of constraint negotiation strategies, negotiation-efficacy, and perceived constraints.

Normative beliefs are based upon what a person thinks relevant others believe about a behavior and their motivation to comply with those social norms. This produces a subjective norm, “the perceived social pressure to engage or not engage in a behavior” (Ajzen, 2006, p. 1). Interpersonal influences are more flexible, while perceptions of social norms and obligations are relatively constant and more resistant to change (Iso-Ahola, 1984). One intervention to reduce private
car use revealed the subjective norm and social support were the strongest influences on intention, rather than attitude, at least for that sample of college students (Bamberg & Schmidt, 2001).

Beliefs concerning barriers to and facilitators of the behavior are referred to as control beliefs. They in turn produce perceived behavioral control, which is “people’s perceptions of their ability to perform a given behavior” (Ajzen, 2006, p. 1). Perceived behavioral control has been confirmed as a key determinant of actual behavior (Darker et al., 2010). According to Ajzen (1991), “The more resources and opportunities individuals believe they possess, and the fewer obstacles or impediments they anticipate, the greater should be their perceived control over the behavior” and the greater the likelihood they will perform the target behavior (p. 196). Unlike the locus of control, it varies across situations and actions (Ajzen, 1991, p. 183). The construct of control beliefs is informed by Bandura’s theory of self-efficacy (Ajzen, 1991; Darker et al., 2010; Fishbein & Ajzen, Jan 2005), which proposes “changing self-efficacy is a necessary precursor to changing behavior” (White, 2008, p.347).

Control beliefs consist of three factors: perceived control, perceived confidence, and perceived difficulty (Darker et al., 2010). It is here that perceptions of constraints and various forms of efficacy come into play. According to Darker et al., empirical data demonstrate perceived confidence is the key determinant of participation in leisure activities. It follows from this that lack of personal control, low self-esteem and sense of incompetence are the greatest barriers to participation (Iso-Ahola, 1984). Research also indicates self-efficacy has a stronger influence on
active recreation participation than do perceived constraints (Hui-lun Tsai & Coleman, 2009). Understanding what contributes to the development of people feeling incapable is important for the development of effective and appropriate promotional programming. According to Iso-Ahola (1984), perceptions of incompetence are created by: “(1) individual differences, especially in terms of locus of control, (2) exposure to failures and uncontrollable events, (3) modeled failures, (4) social judgments and labeling, (5) relinquishing personal control, and (6) environmental constraints” (p. 118). It is possible that perceptions of lack of control contribute to low rates of cycling, as there are many elements (such as infrastructure, traffic, and topography) that are not within the control of individuals.

There is substantial empirical support for the Theory of Planned Behavior and its accuracy in predicting behavior from intentions when there are no “serious problems of control” (Ajzen, 1991, p.186). A meta-analytic review by Hagger & Chatzisarantis (2005) confirms the theory’s predictive validity has been demonstrated across various domains. The TPB has been frequently applied and its predictive utility confirmed in the area of health related behaviors as well (Ajzen; Darker, French, Eves, & Snihotta, 2010; Fishbein, 2008). As Michie et al. (2008) note, behavior change is the “key to improving health” since half of all deaths in the U.S. are the result of modifiable actions including smoking, obesity, physical inactivity, etc. (p. 26). Several studies have shown the TPB to also be highly applicable in understanding and influencing choice of travel mode (Bamberg, Ajzen, and Schmidt, 2003; Bamberg & Schmidt, 2001). According to Conner (2005),
A useful outcome of using social cognitive models such as the TPB is the identification of the (behavior-specific) cognitions that distinguish individuals who do and do not perform the target behavior…Applications of the TPB can in this way identify key beliefs…that clearly distinguish actors from abstainers. (p. 24)

Persuasive communication is a commonly applied strategy for interventions based on the TPB (Ajzen, 2003; Chatzisarantis & Hagger, 2005). Research has shown “a persuasive message that attacks beliefs about an object is typically found to produce changes in attitude toward the object” (Ajzen, 1991, p. 198). These messages need to target the behavioral, normative, and control beliefs underlying perceived behavioral control, subjective norms and attitudes in order to be effective (Chatzisarantis & Hagger, 2005).

Ajzen (1991) writes,

Intentions, attitude toward the behavior, and subjective norm each reveal a different aspect of the behavior, and each can serve as a point of attack in attempts to change it. The underlying foundation of beliefs provides the detailed descriptions needed to gain substantive information about a behavior’s determinates. It is at the level of beliefs that we can learn about the unique factors that induce one person to engage in the behavior of interest and to prompt another to follow a different course of action. (p. 207)

Fortier et al. (2009) provide several suggestions for the application of this information regarding encouraging women to exercise. For example, “perceived behavioral control could be enhanced by focusing on strategies to increase physical activity levels, such as goal setting and time management” (p. 63) while “subjective norms could be optimized by encouraging significant others to vocalize positive expectations regarding regular involvement in physical activity” (p. 64). Finally, they advise positive attitudes could be fostered “by focusing on salient physical and
mental health benefits of regular physical activity participation, by relating it to their life goals, and by allowing them to experience the benefits of physical activity” (p. 63).

One of the greatest sources of contention with and limitations of the TPB is that, while it contributes to the understanding of human behavior, it focuses on intentions and explaining behavior rather than postulating what kind of interventions are most effective for changing it (Ajzen, 2006; Ajzen, 1991; Chatzisarantis & Hagger, 2005; Hobbis & Sutton, 2005; Norman & Conner, 2005). This is a valid critique and certainly more research is needed in this area, as noted by a majority of researchers investigating the topic. Conversely, the theory’s open-endedness may also be its greatest asset; it is a framework that can be adjusted and applied in a variety of applications beyond merely predicting intentions. Ajzen (2002) does provide a detailed protocol based on belief-elicitation studies for developing interventions rooted in the TPB. Kirk and Rhodes (2010) applied this protocol, resulting in greater understanding of physical activity beliefs and constraints, and therefore what promotional programs should address.

The gap between intentions and behavior is the object of much research and consideration across numerous fields. As Darker et al. (2010) write,

Altering intentions may not be sufficient to alter actual walking behavior, as there is a ‘gap’ between intentions and actions for many behaviors (Orbell & Sheeran, 1998). Relatedly, Scott et al. (2007) found that the TPB predicted self-reported intention to walk but failed to predict objectively measured behavior. Thus, motivating people to walk more may be a necessary, but probably not a sufficient, condition for behavior change. (p. 72)
Chatzisarantis and Hagger (2005), amongst others, also reported persuasive communication that targeted salient beliefs was effective in changing attitudes and intentions, but failed to produce actual changes in physical activity. They attribute the disparity in their study, in part, to the exclusion of interventions targeted at perceived behavior control and the possible stronger influence of important and idiosyncratic beliefs rather than salient modal beliefs.

The TPB needs to be combined with other strategies and types of interventions when the goal is to generate changes in actual behavior (Chatzisarantis & Hagger, 2005). For example, the teaching of facilitated planning strategies has been found to reduce the disparity between intention and action (Darker et al., 2010). Several studies by Gollwitzer, Sheeran, and their colleagues confirm, “forming an implementation intention increases the likelihood of attaining one’s objectives compared to the formation of a goal intention on its own (Sheeran, Webb, & Gollwitzer, 2005). Darker et al. emphasize targeting perceived behavioral control, since physical activity in particular seems to be highly influenced by this construct. They stipulate that interventions should include specifying when, where, and how to act (action planning), the identification of facilitators (facilitative planning), and the development of strategies for coping and overcoming barriers (coping planning). Others suggest the need to address all three constructs of the theory in interventions seeking behavioral change in order to maximize their effectiveness (Ajzen, 1991, 2003; Chatzisarantis & Hagger).
Interpretation.

Interpretation is a means of communicating ideas and feelings which help people to understand more about themselves and their environment. (Interpretation Australia, 2004, in Moscardo, Ballantyne, & Hughes, 2007)

Ogilve et al. (2004) stated “interventions that engage people in a participative process and address factors of personal relevance may be more effective than those that simply aim to raise awareness or impose changes in the physical and economic environments” (p. 4). This idea is at the heart of interpretation and echoes Freeman Tilden’s principles, especially those pertaining to creating a connection between the subject and audience and provocation (Tilden, 2007). When done effectively, it “leave[s] people moved, their assumptions challenged, and their interest in learning stimulated (McArthur, 1998, p. 63). Similar to the TPB, interpretation is concerned with beliefs, ideas, and provoking change.

Interpretation is primarily applied at environmental and heritage sites such as parks, trails, and visitor centers. Interpretive signs are common elements at these sites due to advantages such as cost and accessibility as well as their popularity with visitors (Moscardo et al., 2007). Survey participants in Australian parks indicated interpretive signs were ranked third in importance after trails and bathrooms and above picnic facilities, boardwalks, and grills (Moscardo et al., 2007). Research employing previously unused observation methods has challenged the traditional assumption that people do not read signs and indicated “most visitors read something, but very few read everything,” (Moscardo et al., 2007, p. 24).

Freeman Tilden is considered to be the founding father of the field of interpretation.
Signs have been found to improve visitor knowledge, promote positive environmental attitudes, and encourage engagement/participation (Moscardo et al., 2007).

Interpretation has been shown to be an effective means of not only providing information, but also affecting behavior change. Researchers have demonstrated increased effectiveness of interpretive programming through the application of TPB and select other models, including the Theory of Reasoned Action and the Environmental Interpretation Behavior Change Model (Knapp, 1996; Madin & Fenton, 2002). For example, Khol (2005) writes,

…through the Theory of Planned Behavior, interpretation can influence beliefs (of all kinds described in the theory) and attitudes affecting the intention to act and the behavior itself. This is a long journey but one that is fairly well mapped and one that parks have made. (p. 38)

**Summary**

There is a lack of research directly related to cycling for transportation. Convenience sampling, small samples, low generalization ability, low response rates and general lack of robustness plagues many of the studies (De Geus et al., 2008; Ogilve et al., 2004; Pucher et al., 1999; Shepard, 2008; Winters et al., 2006). In addition, data on cycling are frequently nested within larger transportation studies or not included as a separate variable. However, questions regarding related issues (i.e. how to decrease the current rate of obesity) have been receiving considerable attention by researchers in a variety of fields during the last few decades.

It is interesting to note the vast majority of cycling related research has been conducted in Europe. The United Kingdom and Australia have increased their
inquiry the last several years, hoping to play “catch up” with European nations in the utilization of cycling for public issues. The majority of cycling research in the U.S. focuses on helmet use and physiology, with a few studies concerned with encouraging children to walk or bike to school. There is a wide array of cycling education programs across the country but apparently a lack of empirical research as to the effects of these programs.

Pucher et al. (1999) questioned whether it is infrastructure which impacts cycling levels or whether the reverse is more often true- that increased cycling leads to interest in and the creation of facilities. Likewise, Wardman et al. (2007) called for more research on the actual effects of improved and new facilities. This begs an important question, particularly for this project: is it possible to increase cycling use without infrastructure and policy support to begin with?

Wood, Lacherez, & Marszalek (2009) made a crucial point, noting the fact there can be great variation between information regarding activity participation reported by respondents and actual measurements. They recommended further quantitative studies that measure actual behaviors, such as distance ridden in a given period of time, instead of only measuring beliefs and intentions.

Despite the gaps and quality of research concerning utilitarian cycling, there is sufficient evidence to confirm its role in addressing social issues and validate its feasibility. Examining research in related fields can help augment understanding of the factors involved and inform the development of effective means to promote individual and cultural change.
Chapter 3: Methods/Procedures

Introduction

This project involves the design of a series of interpretive signs and exhibits, along with an associated website, in order to promote cycling for transportation. The U.S. has the lowest rate of use among industrialized, democratic nations, yet the highest rates of both fatalities and injuries (Pucher & Buehler, 2008). Therefore, increasing real and perceived safety is a crucial element in promoting cycling: safer conditions lead to more riding and more riding leads to safer conditions. The majority of cycling promotion and safety efforts in the U.S. have focused on helmet use and bike lanes, supplemented by scattered skill education programs, some of which actually teach dangerous practices. Creating a significant modal shift requires multifaceted, interrelated changes in policy, infrastructure, and cultural beliefs/norms. This project addresses the latter component.

There is significant empirical support for the Theory of Planned Behavior (TPB), which posits behavior is the result of intentions created by three types of beliefs: normative, behavioral, and control. This suggests that beliefs need to be addressed in intervention strategies in order to instigate actual behavioral change. While a variety of techniques can be applied within the TPB, two of the most commonly used intervention methods used with the model are persuasion and

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8 Modal shift is the transfer of transportation mode from motor vehicles to other forms of transportation, including walking, cycling and public transport.
providing information. Targeting beliefs specific to a particular activity and environment has been shown to increase effectiveness of behavior change interventions.

Interpretation is generally defined as “a mission-based communication process that forges emotional and intellectual connections between the interests of the audience and meanings inherent in the resource” (National Association for Interpretation, n.d.). Teaching information and fostering understanding of the resource are important components, but it is the ways in which information is presented and its underlying goals that distinguish interpretation from other forms of educational communication. As Beck and Cable (2002) write, interpretation is “a process that can help people see beyond their capabilities” (p.3). Research has shown interpretation to be effective not only for transmitting information, but also in influencing beliefs, thereby producing behavior change (Kohl, 2005). Examples of this include decreasing littering on trails and increasing the use of Leave No Trace practices. While developed for use in natural and cultural sites such as parks, forests, museums, and heritage sites, interpretation has great potential to be utilized in a range of applications seeking to realize inspiration and provocation in an audience. As such, interpretation is an ideal, if atypical, foundation for this type of project. The content of the exhibits and signage will be based on Tilden’s original principles of interpretation, along with current best practices in the field, such as the National Association for Interpretation program development guidelines.

This project is based upon both interpretation and the Theory of Planned Behavior. It involves the design of a series of posters and freestanding exhibits to
be installed in Ithaca, New York as means to effect changes in attitudes, beliefs, and behaviors. An associated website will also be created to provide participants with an easily accessible, cohesive resource for further information and support in their efforts to alter their mode of transportation.

**Project Description**

The goal of this project is to promote the safety and use of utilitarian bicycling as a means to address health, environmental, social, political and transportation issues confronting contemporary American society. This will be achieved by targeting beliefs held by adult motorists and current cyclists via a social marketing campaign. The objective of this project is to utilize interpretive exhibits and the Theory of Planned Behavior as a means to promote the following goals:

1. Awareness of cycling as a feasible and desirable means of transportation.
2. Drivers’ awareness, understanding, and empathy related to cyclists and applicable laws, thereby promoting the safety and social acceptability of cycling.
3. To provide cyclists and drivers with an easily accessible source of information.
4. To promote the social acceptability and efficacy of cycling.
5. To aid in the reduction of barriers to participation.

As noted above, this project involves the development of interpretive signs and freestanding exhibits specifically designed to meet these objectives. Some will feature content designed to increase motorists’ awareness, perceptions, and understanding of and empathy towards cyclists, thereby promoting safety. The
remainder will serve to promote cycling as a viable means of transportation by addressing beliefs/attitudes, information, and other barriers to participation. All signage will include the internet address of the project website. This site will feature links, information, profiles of local bike commuters, and a survey to evaluate the effectiveness of the exhibits.

**Background of Participating Agencies**

Participating agencies include the City of Ithaca Department of Planning and Development and the Ithaca-Tompkins County Transportation Council.

The Ithaca-Tompkins County Transportation Council is the local MOP (agency that holds and distributes federal transportation funds). They also develop and aid in the implementation of the city’s Master Transportation Plan and enable the collaboration of the municipalities within the county regarding projects, scheduling, etc. The current director, Fernando de Aragon, is a strong advocate for the promotion of utilitarian cycling and the inclusion of active transportation in transportation plans and infrastructure.

The City of Ithaca Department of Planning and Development provides a range of services including those related to economic development, information management/mapping, neighborhood planning, transportation and parking, recreation, environmental management, long range planning, historic preservation, community development, and grants development/administration. In 2008 the transportation division issued the following statement regarding the development of a transportation plan for Ithaca:

The City of Ithaca will have a transportation system that consistently offers a safe, convenient and attractive environment in which all travel modes are
accommodated, with a special emphasis on continually improving conditions for pedestrians, bicyclists, transit, and other modes that are non- or minimally polluting. Our system will ensure a high quality of life in our residential neighborhoods, will enhance the vitality of our commercial districts, and will join the City of Ithaca to the state and national transportation network. Sufficient funding will be committed to maintain and to preserve our existing transportation infrastructure assets in addition to provide needed infrastructure enhancements. Infrastructure will be designed, constructed and maintained in such a way so as to most appropriately address social equity issues, environmental impacts, and economic considerations. The transportation infrastructure will provide for safe access and mobility as well as create beautiful public spaces that invite community interactions and gatherings. The public will have strong confidence in the City’s management of the transportation system and will be actively involved in the decision-making process. (City of Ithaca, 2008)

The proposal goes on to list several transportation goals, including a category titled “Promote desired travel model split.” Under this is listed the sub goal to “Get oodles [sic] of people out riding bicycles- bicycling is our city’s most undeveloped travel mode and has a great potential for growth” (City of Ithaca, 2008). It should be obvious by this that the City is highly interested in promoting bicycle use despite the controversies and issues it conjures. For example, Junior Transportation Engineer Kent Johnson actively promotes conversations and involvement with the local cycling community in the department’s efforts to improve cycling conditions and increase ridership.

**Target Population**

The target population of this project is adults who drive motor vehicles in and around Ithaca, New York, and are not experienced cyclists. First of all, the knowledge, attitudes, and behavior of drivers on the road affect the safety and road use of cyclists. Secondly, the purpose of the project is to promote a modal shift. In other words, motorists are potential utilitarian cyclists. The project is designed to
reach people who are underserved, not knowledgeable about cycling and/or do not know where to access information.

**Ithaca Demographics**

It is important to consider the specific target audience and demographics when developing interpretive signs and exhibits; there is no such thing as a “general audience.” Interpretation itself is rooted in and defined by tenets of creating a connection with the audience and relevance to their needs and interests. Consideration of these factors is also necessary to determine whether the location is appropriate for a given type of intervention program as well as the likelihood of its success. Ithaca is located in the Finger Lakes region of New York. Home to Cornell University and Ithaca College, it is often described with words such as vibrant, lively, sophisticated, and progressive. It is also known as a destination for and home to “foodies,” vegetarians, outdoor recreation enthusiasts, academics/intellectuals, artists, and social/political activists. Predominant values include community, sustainability, and buying local (Tompkins County Chamber of Commerce, 2010). Ithaca has been included in a wide range of “Top 10” listings including Outside magazine’s “20 Best Towns in America,” the Farmers Insurance “Most Secure Places to Live” list, Country Home’s “Best Green Places to Live,” “Best Places to Live for gays and lesbians” by The Advocate magazine, and Mother Earth News’ “12 Great Places You’ve Never Heard Of,” amongst others (Tompkins County Chamber of Commerce). The city of Ithaca had a population of 29,287 in 2007 (Visit Ithaca, n.d.), almost equally divided between males and females, while the county is expected to reach a population of 102,000 by the year
2010 (Tompkins County Chamber of Commerce). There are also approximately 30,000 college students residing in the area during the academic year. Following is demographical data for Ithaca:

- 74% white, 13.7% Asian, 6.7% African American, and 16% foreign born (U.S. Census Bureau, 2000)
- 26% home ownership rate (U.S. Census Bureau, 2000)
- 64.2% Democrat, 33% Republican (Yahoo Real Estate, n.d.), 2.7 Independent
- 7.8% of households are families with children (Yahoo Real Estate, n.d.)
- Median age is 24 years (Yahoo Real Estate)
- 73.8% are single, 26.1% married (Yahoo Real Estate)
- 90.3% are high school graduates, 27.8% hold a Bachelor’s degree, and 32.2% have a graduate degree (Yahoo Real Estate). In contrast, 10% of the national population 25 years and older hold advanced degrees (U.S. Census Bureau, 2009)
- 71.07% are employed in white collar occupations, 12.91% in blue collar, and 16.02% in the service or farm industries (Tompkins County Chamber of Commerce)
- 42.7% spend less than 15 minutes commuting to work, 42.4% 15-29 minutes, 9.4% 30-44 minutes, and 5.6% over 45 minutes (Tompkins County Chamber of Commerce)
- 4.7% use public transportation to get to work, 16.6 % walk, .85% bicycle, 12.2% car pool, and 59.9% drive alone (Tompkins County Chamber of Commerce)
- In 2006, over 1,000 people in Tompkins County traveled to work by bicycle. (U.S. Census Bureau, 2006)
This information confirms Ithaca shares a number of characteristics with other cities that have been successful in the promotion of utilitarian bicycling:

- Relatively compact, urban area
- Some existing support in governmental offices and the Transportation Council
- Generally supportive cultural environment; overall population characterized by high interest in health, sustainability, safety, livability, and other related issues
- Advocacy groups and an Advisory Council
- Some existing infrastructure and supports (bike racks, off street trails, a bike boulevard, limited bike lanes, a bike map)
- An annual bike skills education program

**Procedures for Project Completion**

The first step was the completion of a literature review in order to obtain background and other information regarding relevant and current methods/best practices and design. An evaluation regarding the interests, specific issues, and prevalent beliefs/attitudes (re: target population) of the particular geographical location was conducted as well. This information was used to develop the interpretive exhibits and website as outlined below.

**Interpretive Exhibit Development.**

The procedure for developing the exhibits were as follows:

1. Evaluate potential sites and select
2. Develop the theme of the trail
3. Develop the specific content for each sign and exhibit
4. Design individual exhibits (graphics, fonts, layout, color, form, etc.)

5. Analyze with project committee

6. Revise designs

7. Produce prototypes/mockups

8. Analyze with project committee and revise if needed

9. Identify pilot test participants and conduct pilot test

10. Finalize designs

Site Evaluation and Selection.

The first step in development of the exhibits is the evaluation and selection of installation sites for the signs and exhibits, since this is integral to the content.

Table 3.1 lists potential installation locations:

<table>
<thead>
<tr>
<th>Location</th>
<th>Type</th>
<th>Target Aud.</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parking garages-elevators/stairwells</td>
<td>Posters</td>
<td>Motorists, potential cyclists</td>
<td>Highly used by target audience, can rotate messages</td>
</tr>
<tr>
<td>Parking garages-sidewalk</td>
<td>Exhibits</td>
<td>Motorists, potential cyclists</td>
<td>High pedestrian traffic, can include more info than on posters</td>
</tr>
<tr>
<td>Community centers (GIAC, Southside, Women’s Center, etc.), DSS</td>
<td>Posters</td>
<td>Motorists, potential cyclists</td>
<td>Likely to broaden the demographic of viewers. Need to take possible cultural differences into account regarding content and design.</td>
</tr>
<tr>
<td>Parks (Stewart, DeWitt, Cass)</td>
<td>Posters, exhibits</td>
<td>Potential and current cyclists</td>
<td>DeWitt park is centrally located downtown, high volume of pedestrians, hosts farmers markets. Stewart &amp; Cass popular recreation areas &amp; host many events. Cass has recreation path, athletic facilities, dog park, and playgrounds. Stewart Park has picnic pavilions, a short recreation path, event venue, and playground.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Public Access Restrooms (library, DeWitt mall, Center Ithaca…)</td>
<td>Posters</td>
<td>Motorists, potential cyclists</td>
<td>High traffic areas</td>
</tr>
<tr>
<td>Farmer’s Market/Steamboat Landing</td>
<td>Exhibit</td>
<td>all</td>
<td>Targets potential riders likely to be predisposed/likely to change. Parking an issue. Popular social sitting area. Used for recreation when market not in session</td>
</tr>
<tr>
<td>The Commons</td>
<td>Exhibits</td>
<td>all</td>
<td>High pedestrian volume, popular meeting place, seating areas, playground, hosts events</td>
</tr>
<tr>
<td>Medians/ right of ways (Octopus, Rte. 79, Green St.)</td>
<td>Freestanding signs</td>
<td>Motorists, potential cyclists</td>
<td>Areas high in idling traffic- targets those stuck in traffic. Resistance by city to add to sign “clutter,” challenging location to implement due to permit process</td>
</tr>
<tr>
<td>Bike racks</td>
<td>Signs</td>
<td>Current cyclists</td>
<td>Message also available to passing pedestrians</td>
</tr>
<tr>
<td>TCAT buses-int. &amp; exterior</td>
<td>Posters</td>
<td>all</td>
<td>Reaches wide geographic area. Back of bus ideal for messages targeting motorists.</td>
</tr>
<tr>
<td>Library (outside)</td>
<td>Exhibits</td>
<td>all</td>
<td>High pedestrian volume, standing (waiting for buses or traffic light), wide demographic</td>
</tr>
<tr>
<td>The Breezeway</td>
<td>Exhibit</td>
<td>all</td>
<td>High volume of pedestrian traffic, location (next to a movie theatre, central) and benches create a natural meeting spot</td>
</tr>
</tbody>
</table>

**Content Development and Considerations.**

The first step in interpretive planning is to determine the theme. An appropriate theme is essential because it gives cohesiveness to the program, helps ensure the overriding message/objectives are met, and guides the development of the program (Beck & Cable, 2007; Moscardo, Ballantyne, & Hughes, 2007). A
A strong theme is especially important for this project since it is the theme and graphic elements, rather than a physical location such as a bikeway, which will create cohesiveness and make project installations recognizable as such. The title of the project, “Recreate Your Commute,” reflects the primary theme. A secondary theme is that bikes are vehicles and belong on the road.

Poster style signs are easily reproduced and distributed and relatively inexpensive to produce (it is also possible printing may be donated by a local business). They will need to be laminated to make them more durable and less susceptible to damage by vandalism. They also need to be short, direct, and “punchy” by using powerful illustrations and minimal text.

The freestanding exhibits must be able to withstand the climate, be somewhat permanently installed to prevent possible theft/removal, and be cohesive/consistent in form (adhere to a visual theme, so to speak). Sculptural style exhibits and/or elements, particularly if kinetic, could increase interest and encourage interaction by passer-bys. Location is a key consideration in content. For example, signs along roadways need to be large, feature predominant illustrations, and very short text. Exhibits with more information need to utilize a layered format and be located in an area where people are more likely to invest their time in them.

Development of the Website.

The primary purpose of the website is to provide exhibit viewers with an easily accessible source of additional information and promote further action. The secondary purpose is to provide a means of evaluating the trail via an online, anonymous survey. In addition to the survey, it largely features links to local and
informational resources and profiles of local bike commuters. The purpose of the profiles is to promote the self-efficacy of potential riders by giving them examples and role models like themselves who are successfully doing the target behavior. For example, women in Garrard and Hakman’s (n.d.) study indicated a desire for and the positive influence of role models similar to themselves. The profiles may also contribute to fostering a more personal connection and sense of place. The procedure for developing the website was as follows:

1. Research potential links and resources
2. Evaluate information and determine what to include on the site
3. Identify and contact local commuters
4. Write profiles and photograph profile participants (and obtain written consent)
5. Decide on style, graphics, layout, etc.
6. Design the individual pages
7. Consult with committee throughout process and revise as needed

**Needs Assessment**

As noted earlier, research and industry reports demonstrate a marked increase of interest in and use of utilitarian cycling in response to rising societal and environmental issues. Three of the greatest barriers to participation are danger (real and perceived), lack of information, and cultural norms/beliefs. Interpretation has been shown to be an effective means of influencing behavior and beliefs, especially when applied within the framework of the Theory of Planned Behavior. Therefore, this project provides a means to address the issues above.
Funding Sources

The implementation of this project requires funding for the production and installation of the posters and exhibits, as well as costs related to publishing the website. Possible sources include:

- Local and state grants through ISTEA fund allocations
- Funding from local and national bicycling advocacy groups, such as Bikes Belong and the Finger Lakes Cycling Club
- Sustainable Tompkins “neighborhood mini-grants” (http://sustainabletompkins.org/programs/mini-grants/mini-grant-details/)
- Governor’s Traffic Safety Committee Grants
- Local businesses interested in cycling and/or sustainability, community development, and health promotion

One possible approach is to sell sponsorship for each particular exhibit and sign, which would cover the production costs of that individual installation. Rates would be determined by cost of production (i.e. laminated posters, freestanding exhibition mounted on pressed polymer) and amount of exposure (i.e. bus billboard, single exhibit, poster in multiple locations). Funding will be discussed in further detail in Chapter 4.

Evaluation Plan

The success of the program will be measured by modal share data, counts of bikes in downtown racks during weekdays, an online survey, and data from the
website. Data from the website will include counts of visits to the site, visits to particular pages, and qualitative data collected from the discussion forums. Since the website address is largely only be available on the exhibits themselves and through internet search engines, access counts will provide an estimate of the number of people engaging with the exhibits. A simple quiz box asking users what led them to the site could be also be used to determine the approximate percentage of users that were led to the site by the exhibits. The online survey (see page 209) will be available through the project website. Either postcards or business cards featuring the link to the survey and an invitation to participate will be distributed to bikes parked downtown following implementation of the exhibits.
Chapter 4: The Project

This project resulted in the creation of a social marketing campaign based on the principles of cultural interpretation and the Theory of Planned Behavior. According to the theory, behavior is the result of intentions generated by six constructs (behavioral beliefs, attitude towards the behavior, normative beliefs, subjective norm, control beliefs, and perceived behavioral control). This implies behavior can be altered by changing/influencing one or more of the constructs. While the TPB provided the framework, the principles of interpretation were applied to ensure the effectiveness of the messages generated. The project resulted in twenty-two interpretive exhibits variously targeted at potential cyclists, current cyclists, and motorists. A website was also developed to fill the gap between intention and behavior by providing further information, profiles of local commuters, and a venue for asking questions and exchanging information.

The Recreate Your Commute: Project Description and Implementation Manual that follows includes a brief introduction to the project, the exhibit designs and descriptions, website concept map and page reproductions, implementation plan, and appendices.
Recreate Your Commute

Project Description and Implementation Manual

Prepared by Hobit Lafaye

M.S. Outdoor Recreation Education
SUNY Cortland- Parks, Recreation & Leisure Studies Department

WHERE WOULD YOU RATHER COMMUTE?

IN THE... FAT LANE

OR THE... FAST LANE

Learn more at www.RecreateYourCommute.com
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<th>Page</th>
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</table>
Increasing utilitarian cycling has been shown to be instrumental in addressing current public health, transportation, economic, and environmental issues, such as traffic congestion, pollution, the obesity epidemic, and energy consumption. “Culture, custom, and habit are important,” as well as self-perpetuating (Pucher, Komanoff, & Schimek, 1999, p. 626). While typically applied to predict behavior, the Theory of Planned Behavior (TPB) provides a framework for identifying and affecting the antecedents of behavior as a means to produce behavior change, while heritage interpretation presents a vehicle for its application. When done effectively, interpretation goes beyond transmitting information; it “leave[s] people moved, their assumptions challenged, and their interest in learning stimulated” (McArthur, 1998, p.63). Research has shown it to be effective for influencing beliefs, thereby producing changes in behavior (Kohl, 2005). This project expands current practices by addressing beliefs and attitudes related to utilitarian cycling, rather than focusing on infrastructure and policy.

This project is a comprised of a social marketing campaign and a website. The twenty-two research based interpretive signs and exhibits are variously targeted at potential riders, current riders, and motorists, as well as a website. They are specifically designed to (1) promote awareness of cycling as a feasible means of transportation; (2) promote motorists’ awareness, understanding, and empathy related to cyclists; (3) promote the safety and social acceptability of cycling; (4) provide easily accessible information; and (5) aid in the reduction of barriers to
participation and increased efficacy. Implementation of the project will result in the installation of ten permanent freestanding and wall signs throughout Ithaca, eight signs on or adjacent to existing bike racks, posters distributed to community centers, a four month bus billboard advertising campaign, and rotating signs displayed in sign holders in the parking garage elevators.

This manual outlines the process and considerations needed to implement the project, in addition to the project itself. The first section contains the project exhibits. The second section provides the process for implementing the project in Ithaca, New York. Considerations related to the replication of this project in other cities are included throughout.
This section contains the twenty-two interpretive signs of which the project is primarily comprised. Table 1 provides a summary of the designs including the title, target audience, subject(s), and targeted Theory of Planned Behavior construct. This is followed by a brief discussion of each exhibit, followed by the exhibit designs.

All of the designs addressed behavioral beliefs and/or attitudes towards the behavior, since a positive association (with the perceived benefits outweighing the assumed negatives) is more likely to produce participation in the behavior. Subjective norms and/or normative beliefs were targeted in twelve of the designs. Locations that are characterized by a negative attitude towards cyclists or have a high level of car dependence will need to emphasize the normative constructs more than is needed in Ithaca. Perceived behavioral control is targeted in seven of the designs, while control beliefs are targeted in four. As discussed in Chapter 2, efficacy is a crucial element of engaging in a particular behavior.
Table 4.1 Exhibit Designs, Characteristics, & Locations

<table>
<thead>
<tr>
<th>Title</th>
<th>Target Audience</th>
<th>Subject(s)</th>
<th>Format</th>
<th>Appropriate Locations</th>
<th>TPB Construct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don’t Be A Squirrel</td>
<td>Current cyclists</td>
<td>Bikes as vehicles, skill, safety</td>
<td>Poster, sign, banner</td>
<td>Bike rack</td>
<td>Behavioral beliefs, PBC</td>
</tr>
<tr>
<td>Commuting is Swell/Hell</td>
<td>Potential cyclists</td>
<td>Benefits</td>
<td>Bus billboard, poster, banner</td>
<td>Bus, library, parking garage</td>
<td>Attitude towards behavior</td>
</tr>
<tr>
<td>Avoid Gas Pains</td>
<td>Potential cyclists</td>
<td>Benefits, gas usage</td>
<td>Billboard &amp; poster</td>
<td>Bus (rear) &amp; community centers</td>
<td>Attitude towards the behavior</td>
</tr>
<tr>
<td>Fast Lane/Fat Lane</td>
<td>Potential cyclists</td>
<td>Benefits, barriers, bikes as vehicles</td>
<td>Billboard, banner</td>
<td>Bus (rear), building</td>
<td>Attitude towards the behavior</td>
</tr>
<tr>
<td>He Said/She Said</td>
<td>All</td>
<td>Safety, skills, bikes as vehicles, attitudes</td>
<td>Kiosk, posters</td>
<td>Breezeway of Commons</td>
<td>Attitude, PBC, Subjective norms</td>
</tr>
<tr>
<td>Be King or Queen</td>
<td>Potential cyclists</td>
<td>Efficacy, skills, barriers</td>
<td>Kiosk, posters</td>
<td>Collegetown, Library, Com. Centers</td>
<td>PBC, Attitude</td>
</tr>
<tr>
<td>Tired Taxi</td>
<td>Parents, youth</td>
<td>Safety, skills, norming, benefits</td>
<td>Posters, kiosk</td>
<td>Parking garages &amp; Cass Park</td>
<td>Normative &amp; Control beliefs</td>
</tr>
<tr>
<td>Embarrassing Drop Offs</td>
<td>Youth</td>
<td>Benefits</td>
<td>Posters &amp; kiosk</td>
<td>Community centers, Cass Park</td>
<td>Attention, Subjective Norm</td>
</tr>
<tr>
<td>Wheel w/ a View</td>
<td>Motorists</td>
<td>Safety, empathy</td>
<td>Kiosk, banner</td>
<td>Commons</td>
<td>Behavioral beliefs, Attitude</td>
</tr>
<tr>
<td>Size Matters</td>
<td>Current &amp; potential cyclists</td>
<td>Skills, barriers</td>
<td>Posters, sign</td>
<td>Parking garages &amp; bike racks</td>
<td>PBC, Behavioral beliefs</td>
</tr>
<tr>
<td>Choose Your Path</td>
<td>Potential cyclists</td>
<td>Women, barriers, benefits, skills</td>
<td>Posters, kiosk, banner</td>
<td>Parking garages, com. centers, Cass Park</td>
<td>Attention, Control, &amp; Normative beliefs</td>
</tr>
<tr>
<td>What’s Your Style</td>
<td>Potential cyclists</td>
<td>Women, barriers, attitudes</td>
<td>posters &amp; kiosk</td>
<td>Parking garages, community centers, Cass Park</td>
<td>Behavioral beliefs, Subjective norm, Normative beliefs</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Title</th>
<th>Target Audience</th>
<th>Subject(s)</th>
<th>Format</th>
<th>Location</th>
<th>TPB Construct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sharrows</td>
<td>All</td>
<td>Skills, attitudes, safety, bikes as vehicles</td>
<td>Posters, banner</td>
<td>Parking garages, bike racks</td>
<td>Subjective norm, behavioral beliefs</td>
</tr>
<tr>
<td>Avoid the Knockout</td>
<td>Motorists &amp; cyclists</td>
<td>Skills, safety, knowledge, bikes as vehicles</td>
<td>posters &amp; kiosk</td>
<td>Bike racks, garage entrance</td>
<td>Behavior, &amp;control beliefs, subjective norm</td>
</tr>
<tr>
<td>No Lycra, No Problem</td>
<td>Potential &amp; current cyclists</td>
<td>Skills, barriers, women, attitudes</td>
<td>Kiosk, poster</td>
<td>Commons, parking garages, com. centers</td>
<td>Subjective norm, behavioral beliefs, PBC</td>
</tr>
<tr>
<td>Jive with 5</td>
<td>Motorists</td>
<td>Empathy, attitudes, knowledge, bikes as vehicles</td>
<td>Billboard, kiosk, banner</td>
<td>Bus (rear), garage entrance</td>
<td>Behavioral beliefs, subjective norm</td>
</tr>
<tr>
<td>Take It w/ You</td>
<td>Potential &amp; current cyclists</td>
<td>Skills, barriers</td>
<td>Posters &amp; Kiosk</td>
<td>Parking garages, Cass park</td>
<td>Behavioral beliefs, control beliefs</td>
</tr>
<tr>
<td>Road Rules</td>
<td>All</td>
<td>Skills, safety, bikes as vehicles</td>
<td>Kiosk, poster</td>
<td>Commons, com. Centers, DMV</td>
<td>Behavioral beliefs, subjective norm, PBC</td>
</tr>
<tr>
<td>Park &amp; Ride</td>
<td>Potential cyclists</td>
<td>Skills, benefits, barriers</td>
<td>11x14 &amp; 16x20 signs</td>
<td>Parking garages, bike racks</td>
<td>Behavioral beliefs, attitude</td>
</tr>
<tr>
<td>Think Cycling is</td>
<td>Potential cyclists</td>
<td>Skills, benefits, barriers,</td>
<td>Kiosk, posters</td>
<td>Garage entrance, Collegetown</td>
<td>Behavioral &amp; normative beliefs, Attitude</td>
</tr>
<tr>
<td>Dangerous?</td>
<td></td>
<td>attitudes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rolling Stops</td>
<td>All</td>
<td>Skills, safety</td>
<td>Posters, banner</td>
<td>Bike racks, DMV</td>
<td>Subj. norm, behavioral beliefs</td>
</tr>
<tr>
<td>Urban Legends</td>
<td>Current &amp; potential cyclists</td>
<td>Safety</td>
<td>Posters, kiosk</td>
<td>Bike racks, com. centers, commons, Collegetown</td>
<td>Behavioral beliefs, subjective norm, PBC</td>
</tr>
</tbody>
</table>
Don’t Be a Squirrel

This exhibit (see Figure 4.1) targets the behavioral and normative beliefs of current cyclists. It reinforces the idea of bikes being vehicles and cyclists’ responsibility in their own safety. Bike racks are an ideal location for this message.

Commuting is Hell/Commuting is Swell

This exhibit is designed to challenge motorists’ perceptions of two different commuting modes, by contrasting the negative characteristics of driving with the benefits of commuting by bike (see Figure 4.2). Ideal locations include signs in parking garages and bus billboards.

Avoid Gas Pains

Messages regarding gas usage and the financial benefits of bike commuting are portrayed in “Avoid Gas Pains” (see Figure 4.3). Its target audience of potential cyclists is best reached through bus billboards and posters in community centers and agencies.

Fast Lane/Fat Lane

The simple but powerful content of this exhibit (see Figure 4.4) is well suited for being on a bus billboard. It seeks to address attitudes towards cycling by presenting it as a beneficial transportation option, especially regarding health and
time. It also has a secondary function of reinforcing the idea that bikes are vehicles and belong on the road.

**He Said/She Said**

This is a physically interactive exhibit targeting motorists, potential cyclists, and current cyclists and the Theory of Planned Behavior constructs of attitude towards the behavior, perceived behavioral control, and subjective norms. It will feature rotating circular panels, with the motorist viewpoint on one side and the cyclist viewpoint on the other to emphasize the similarities between them and being two sides of the same coin so to speak (see Figures 4.5a-4.5b). The subjects presented include safety, bike handling skills and behavior, motorist behavior and attitudes towards cyclists, and empathy. It also serves to reinforce cyclists’ responsibilities and the norming of bikes as vehicular traffic. It is to be located in the “breezeway” of The Commons (see Figures 4.25-4.28). Protected under a parking garage and adjacent to parking meters, a parking lot, and movie theatre and featuring benches, the breezeway is a major pedestrian throughway to the Commons. Passersby, movie theatre patrons, and those using the seating area are likely to stop to read signage in this area.

**Be King or Queen of the Hill**

This exhibit, represented in Figure 6, will be housed on a kiosk (freestanding) sign in front of the library (see Figures 4.60-4.62) and in Collegetown (see Figures 4.52-4.53). As noted earlier, the hilly terrain is one of the most significant obstacles to cycling in Ithaca. “Be King or Queen” promotes
efficacy by providing a number of strategies potential and current cyclists can use to overcome this barrier.

**Tired Taxi**

“Tired Taxi” speaks to the many parents who spend large amounts of time each week transporting their children to and from school and activities, such as sports practices (see Figure 4.7). Targeting the constructs of attitudes, behavioral beliefs and control beliefs, it challenges perceptions of children’s dependence and abilities, as well as safety. Being a popular destination of children, the entrance to the multi-purpose rink and pool at Cass Park is an ideal location for this design (see Figures 4.49-4.50). The parking garages are another suitable location since there are many activities and destinations for children downtown as well.

**Embarrassing Drop Offs**

“Embarrassing Drop Offs” is primarily designed to encourage youth to use bicycles for transportation. It serves a secondary function of promoting parents’ perceptions of youth taking responsibility for their own transportation as being normal and desirable (see Figure 4.8). Several respondents in the pilot questioned the use of the word “driven” instead of “ridden”. The word “driven” was used for two reasons. First, it emphasizes bikes being vehicles and the need to follow the rules of the road. Secondly, unexpected word usage attracts attention and promotes engagement. Posters in community centers and a kiosk in Cass Park (Figures 4.49-4.50) are potential sites for this exhibit.
Wheel with a View

“Wheel with a View,” in Figure 4.9, provides motorists with a view of the road from a cyclist’s perspective. Designed for a kiosk on the Commons (see Figures 4.20-4.37) or parking garage entrance (see Figures 4.40-4.45), it educates motorists regarding cyclist behavior in order to promote understanding and empathy, as well as encourage safer motorist behavior when encountering cyclists on the road.

Size Matters

Created as a sign to be displayed on bike racks (see Figure 4.31) and in parking garages, “Size Matters” targets perceived behavioral control and behavioral beliefs by challenging the perception that bicycling is uncomfortable and/or painful. It provides information on how to ensure proper bicycle fit and alleviate this barrier (see Figure 4.10).

Choose Your Own Path

As discussed extensively in Chapter 2, the majority of bike commuters are male, and women experience higher levels of and slightly different constraints to participation. “Choose Your Own Path,” in Figure 4.11, addresses some of these constraints, as well as benefits, of particular interest to women. Posters in community centers and a kiosk at the Cass Park playground (Figure 4.48), Stewart Park playground (Figure 4.54) or Children’s Garden (see Figure 4.51) are the potential locations for this exhibit.
What’s Your Style?

Targeted towards women, “What’s Your Style?” in Figure 4.12 addresses the stereotype of cycling being for athletic or sporty types of people, males, and similar images of cycling that create barriers to participation. Parking garages, community centers, and a kiosk at Cass Park or other playgrounds are likely the best locations for this exhibit.

Sharrows

Designed for display on bike racks and in parking garages, the purpose of this exhibit is to educate motorists and both current and potential cyclists regarding road markings called sharrows, thereby promoting both use and safe behavior. Sharrows used in a number of locations across the country to indicate bike boulevards. However, they are still very new and most people have not heard of or seen them, as indicated in the pilot. Illustrated in Figure 4.13, this exhibit also serves to influence the subjective norm by affirming bicycles being vehicles and belonging on the road. It should be used on bike racks and posters in the Department of Motor Vehicles and other public areas. A banner on one of the buildings along Cayuga Street should be considered.

Avoid the Knockout

The behavioral and control beliefs of both motorists and current cyclists are addressed in “Avoid the Knockout” (see Figure 4.14). “Left hooks” and “right hooks” are among the most common causes of car-bike collisions. Therefore, this exhibit promotes safety by increasing awareness of and behavior/skills related to
avoiding these types of collisions. A secondary message is that of bicycles being vehicles and belonging on the road. The target audiences for this exhibit can be reached through signs on bike racks and parking garage entrances.

No Lycra, No Problem

Best suited for a kiosk on the Commons (Figures 4.29-4.39) or in DeWitt Park (Figures 4.46-4.47), this exhibit (Figure 4.15) serves to address the preconception that cycling requires special clothes and equipment. As such, it challenges cultural norms regarding cycling as well as providing logistical information to current and potential cyclists.

Jive With Five

This exhibit (Figure 4.16) is concerned with the behavioral beliefs and subjective norms of motorists. It serves to promote safe driving behavior as well as the social acceptance of bikes being vehicles. New York, along with other, state laws dictate motorists pass cyclists at “a safe distance.” However, such legal language is ambiguous and fails to define what “safe passing distance” actually means. “Jive with Five” provides guidelines, visual cues, and the reasoning for the presented distances to motorists, thereby enabling them to make more accurate judgments when passing cyclists on the road. A garage entrance kiosk is an ideal location to reach the target audience. A simplified version could also be used on rear bus billboards.
Take It With You

Displayed in Figure 4.17, this exhibit provides potential and current cyclists with the means to overcome the barrier of needing to transport children and/or cargo. Featuring (primarily local) cyclists in street clothes, it also contributes to the social acceptance of cycling for transportation and counters the stereotype of needing special clothing or being athletic. The target audience will be reached by signs in parking garages and a kiosk at playgrounds, such as at Steward or Cass Parks.

Road Rules

“Road Rules,” illustrated in Figure 4.18, is directed at the behavioral beliefs, subjective norm, and perceived behavioral control of all three target audiences (motorists, current cyclists, and potential cyclists). Providing information regarding road rules and safety, it confirms bicycles as being vehicles. It also addresses the barrier of efficacy by demonstrating to non-cyclists that, as motorists, they already know the rules of the road and are capable of navigating traffic. It is designed for a kiosk on the Commons, preferably near a bike rack, such as in “bank alley.”

Park and Ride

“Park and Ride” conveys some of the benefits of commuting, along with the idea that cycling for transportation is not an “all-or-nothing” proposition (see Figure 4.19). There are two main reasons the latter is important. First of all, as with many other types of activities, starting with small steps is less daunting and
more likely to lead to success. Secondly, a significant number of people commute to Ithaca from outlying areas for work, shopping, and entertainment. This exhibit addresses the barrier of distance (and/or terrain) by offering a “hybrid” solution for this population. Parking garages and bike racks are suitable locations for this message.

**Think Cycling is Dangerous?**

As discussed at length in Chapter 2, perceptions and actual danger of cycling is the single greatest barrier to its use for transportation. This exhibit (see Figure 4.20) takes a humorous approach at revealing various perceptions related to risk coupled with actual statistics. Increasing perceived behavioral control in regards to safety is an important element of increasing cycling. This exhibit notes that the chance of a collision is greatly decreased by avoiding certain riding practices. Likewise, it implies the need for cyclists to take responsibility for their own safety; they are not merely at the mercy of motor vehicles. Parking garage entrances and Collegetown (Figures 4.52-4.53) are potential locations for this exhibit.

**Rolling Stops**

The “Rolling Stops” exhibit (see Figure 4.21) is a revised section of “He Said/She Said.” As a sign to be displayed on bike racks, it emphasizes the need for cyclists to obey traffic rules in general, and regarding stop signs and lights in particular. This message should be reemphasized to current cyclists since this behavior is not only dangerous, but as one of the greatest complaints motorists have
about cyclists, it fosters animosity from motorists. While road rage generated from the behavior of other motorists tends to be isolated towards that particular driver and incident, there seems to be a tendency of motorists who have a negative experience with a cyclist to apply their road rage to all future encounters with all or most other cyclists. In addition, respect begets more respect than aggressiveness; it is important for cyclists to not only take responsibility for their own safety, but also to understand responsible behavior is needed if cycling is to becoming an accepted form of vehicular transportation. The pilot confirmed this need (see Appendix 1 for the raw data set).

**Urban Legends**

This exhibit (see Figure 4.22) addresses the very common, dangerous, and illegal practices of bicycling on sidewalks and against traffic flow. The belief that these practices are safer than riding with traffic in the road is very pervasive. Riding against traffic was, and still is in many places, taught as being the safer and correct option. This exhibit uses humor to encourage viewers to visit the website to get more information regarding the reasoning and facts. The proposed locations are bike racks, posters, and a kiosk.
DON’T BE A SQUIRREL!

Riding squirrley:

 Increases your chances of a collision

 Increases road rage towards bicyclists

Help motorists safely avoid you!

• Your bike is a vehicle—drive it like one
• Be visible • Be predictable

Learn more at www.RecreateYourCommute.com

Figure 4.1 Don’t Be a Squirrel
Figure 4.2 Commuting is Hell/Commuting is Swell

Learn more at www.RecreateYourCommute.com
Figure 4.3 Avoid Gas Pains
Figure 4.4 Fast Lane/Fat Lane
He said/She Said: Same road, same rights

We all have places to go, things to do, and the right to use the road to get there.

**Cyclists:**
- Show appreciation of courtesy with wave and a smile.
- Be courteous by indicating when it is safe for waiting cars to pass you.
- Kindness begets kindness.

**Motorists:**
- Going slow, being inexperienced or even inconsiderate isn’t a reason to drive a motorist off the road — neither is being a cyclist.
- Cyclists usually move into the lane to avoid road hazards, to turn, to be visible, or from lack of skill.
- Give cyclists 1-3 arm lengths of room.

Learn more at [www.RecreateYourCommute.com](http://www.RecreateYourCommute.com)

Figure 4.5a He said/She Said: Same road, same rights
**He Said/She Said: Fear of the Unknown**

**Cyclists:**
- Be predictable—this increases safety and helps motorists be comfortable and courteous.
- Drive your bike like you would a car—the rules of the road are the same.
- Only 3% of collisions happen during passing and 2/3 of those are at night.
- Use your turn signals

**Motorists:**
- Be patient—wait until it’s safe to pass.
- Give riders 3–5 feet of room when passing.
- Treat bikes like other traffic—drive normally but be cautious and prepared.

Learn more at www.RecreateYourCommute.com

Figure 4.5b He Said/She Said: Fear of the Unknown
Figure 4.6 King or Queen of the Hill
TIRED OF BEING A TAXI?

Bikes = freedom!

With a qualified instructor:
• 7-8 year olds can learn to ride safely on quiet residential streets
• 10 year olds can handle moderate traffic • 12 year olds can ride on almost any street

Don’t be a helicopter parent! Getting themselves around by bike will help your children:
• Become safe motorists • Stay healthy • Gain independence • Learn responsibility

For safer riding:
• Show them low traffic routes that get them where they want to go
• Teach them the rules of the road and safe riding skills

“I like riding my bike to school because it’s fun and fast.”
— Jacob, Belle Sherman

Learn more at www.RecreateYourCommute.com

Figure 4.7 Tired Taxi
Figure 4.8 Embarrassing Drop Offs
Figure 4.9 Wheel with a View
Figure 4.10 Size Matters

Riding a bike shouldn’t be a pain in the rear, or anywhere else!

Get a professional fitting at a bike shop or follow these tips and be friends with your bike again.

Feel the power:
• Adjust your seat height so there is only a small bend in your knee when the pedal is at the bottom

To & Fro:
• Try moving your seat forward and back to find what feels best for you

Sit up & Relax:
• Handlebars should be within easy reach (but not close!) and at a comfortable height

No Tipping:
• Be sure your seat is level

Avoid commitment:
• You’re not married to the seat your bike came with—get one that agrees with you

Learn more at www.RecreateYourCommute.com
Figure 4.11 Choose Your Own Path

Get your fun and get healthy just getting around.

Some tips:
- You pay taxes, too—don’t be afraid to take ownership of your fair share of the road.
- Have stuff? Load up a basket, rack, saddlebags or trailer.
- Don’t change clothes—use a leg strap or gaiters to keep your pants clean and out of your chain, or show off your legs with your favorite skirt.
- For a relaxing ride use the neighborhood streets that parallel the busy main roads and get in touch with your town.
- Have kids? Take them with you & share the joy—there’s lots of options. Or don’t, and enjoy some “me-time”.
- Save even more money at your favorite local businesses with the www.bicyclebenefits.org discount

What will YOU do with the extra time and cash?
Learn more at www.RecreateYourCommute.com
Figure 4.12 What’s Your Style?
Figure 4.13 Sharrows

**SHARRORS:**
- Are a marking used nationwide.
- Teach cyclists where to ride safely and avoid the “door zone”
- Indicate bicycle boulevards (good routes for cyclists)
- Remind motorists to be aware of cyclists
- Remind us all bicycles belong on the road!

Learn more at
www.RecreateYourCommute.com
Figure 4.14 Avoid the Knockout
No Lycra, No Problem
How to dress for success without changing your clothes

1. Use a thin scarf to prevent helmet hair
2. Synthetic fabrics stay cooler and dryer
3. Get a chain guard or use a strap to keep your pants out of your chain (gaiters work great in wet or wintry weather)
4. You can ride in most shoes, but a bit of tread helps
5. A-line or flowy skirts and dresses are easy to ride in
6. Step-through style bikes make riding in dresses even easier
7. Use a basket or pannier to avoid sweaty back syndrome
8. Slip on a pair of shorts or leggings under your dress
9. Long skirts can be gathered and held out of the way with a clip
10. Wear a light, wicky synthetic shirt as a base layer—take it off at your destination and voila! you are clean and dry

Think it’s too cold to ride in the winter?
Minneapolis and Toronto have two of the highest cycling rates in North America!

Learn how to enjoy the ride in all seasons at
www.RecreateYourCommute.com

Figure 4.15 No Lycra, No Problem
The law requires motorists to pass cyclists safely—but what does that mean?

**JIVE WITH FIVE!**
(Three-to-five feet, that is).

Cyclists need a minimum of 3' when being passed by a car, even when they're in a bike lane. Remember:
- Even small cars can create enough wind to push a bike around
- Cyclists need room to avoid road hazards & opening car doors
  - Courtesy matters! You don’t like it when a large vehicle crowds you, right?

**Five feet is needed:**
- With large vehicles
- When driving over 35 mph
- In windy or wet conditions
- On unimproved roads (uneven pavement, no shoulder, etc.)

Look back first:
Just like passing a car, wait until you see the cyclist in your rearview mirror before moving back into your lane.

Learn more at [www.RecreateYourCommute.com](http://www.RecreateYourCommute.com)

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**Figure 4.16 Jive with Five**
Figure 4.17 Take It With You
Figure 4.18 Road Rules
Figure 4.19 Park and Ride
Figure 4.20 Think Cycling is Dangerous?
**ROLLING STOPS**
Many do it...nobody should

**Motorists:**
- Be honest—how often do you REALLY come to a full stop?
- It takes more than a gas pedal to get a bike rolling again—consider being kind and waving them through.

**Cyclists:**
- Don’t blow through stoplights and stop signs! It’s dangerous and rude.
- You wouldn’t run a red light in a car—no excuses, just stop!
- Slow down before the intersection.
- If a driver waves you through a stop sign, check for other traffic, wave and go.

Learn more at [www.RecreateYourCommute.com](http://www.RecreateYourCommute.com)

Figure 4.21 Rolling Stops
Figure 4.22 Urban Legends

**Myth 1:** There are ALLIGATORS in the sewers!

**Myth 2:** You have inherited a MILLION DOLLARS from a Nigerian uncle!

**Myth 3:** It's safer to ride your bike AGAINST TRAFFIC or ON THE SIDEWALK.

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**The Reality:** There are NO sewer gators, you probably aren't an instant millionaire, and bicycling on sidewalks or the left side of the road is DANGEROUS AND ILLEGAL!

Don't go HEAD TO HEAD with PEDESTRIANS & CARS: somebody's liable to get hurt!

Don't become a legend! Get the facts at www.RecreateYourCommute.com
The Website

The goal of the exhibits is to provide basic information, challenge beliefs and perceptions, and generate interest in cycling for transportation. The website takes the campaign a step further by providing an easily accessible means of obtaining more information on the topics presented. This serves to help bridge the gap between interest/intentions and behavior. Being on the Internet will also allow the project to reach people beyond Ithaca. The website concept map and reproductions of sample pages are reproduced in Appendix 2.
The plan for implementing the project is outlined below, along with the approximate amount of time needed to complete each step. They are sequential, however in many cases more than one step can be worked on at a time. Detailed descriptions of each follow.

1. Develop exhibit designs (3-6 months)
2. Determine locations (1-2 months)
3. Pilot exhibits (3 weeks)
4. Determine budget (1 month)
5. Conduct fundraising (3-18 months)
6. Obtain permits (3-6 months)
7. Manufacture/produce the exhibits
8. Develop and publish website (1-2 months)
9. Install exhibits, sign holders, and banners; distribute posters and fill sign holders in parking garages (2 weeks)
10. Evaluate project impact and effectiveness (conducted at 3 and 6 months after implementation; 1-3 months to collect and analyze data)
11. Maintenance (duration of exhibit installations)

Development of the Exhibit Designs

Ithaca is an ideal location for the implementation of this project due to its demographics and characteristics. The exhibits and website were designed specifically for Ithaca in regards to population characteristics and the prevailing
barriers to participation. However, the project has the potential to be successfully applied in other municipalities.

The first step in the development of the exhibit designs was to determine the prevailing attitudes towards and barriers to cycling particular to Ithaca. Barriers related to both the specific location and attitudes common throughout the United States temper the high interest in and culturally acceptance of active transportation in Ithaca. Residents consistently report the hilly terrain and cold, wet climate as the greatest obstacles to commuting by bike. While the city has a compact urban core, a significant number of people commute to work from outlying areas, indicating distance and need to transport children as significant barriers. All city buses are equipped with bike racks. However, many riders note they cannot rely on the buses for transportation up the major hills or to outlying areas because the racks are often full, especially during the evening rush hour. Lack of infrastructure or knowledge of quiet, safe routes is also frequently reported. There are several rail-trails, which are popular commuting corridors as well as two segregated bikeways along the waterfront, however there is currently a lack of infrastructure (bike lanes, designated bike boulevards, etc.) in the downtown core and between schools, businesses, and shopping areas. Perceptions of cycling as dangerous are a prevailing obstacle as well. Drivers are most likely to cite cyclists riding against traffic, cutting them off, moving into travel lanes, being unpredictable, not using lights, and running stoplights/stop signs as creating animosity. Lastly, there is large and active cycling club. While in many regards this is an asset to the promotion of utilitarian cycling in the area, the “lycra-clad contingency” is detrimental in some
aspects. For example, negative attitudes towards cyclists are reinforced by groups of riders who ride abreast despite traffic/conditions, are otherwise overly aggressive in asserting their rights to the road, or fail to follow traffic rules. The large number of riders perceived as racers contributes to the marginalization of cycling by contributing to its image of being for athletes, men, etc. and requiring special clothing and equipment. Finally, there are a significant number of experienced riders who actively oppose the creation of bike lanes, segregated bikeways, and other infrastructure\(^9\). This perspective seems to be based on their own skill and traffic efficacy to the exclusion of empathy towards inexperienced riders and realization that research repeatedly demonstrates that the lack of lanes and paths is a major barrier to the majority.

The application of this project in other areas will require an assessment of the attitudes and barriers particular to that locale.\(^{10}\) New exhibits may need to be designed and/or some of the designs may need to be revised for the specific population. For example, most areas are likely to need more emphasis on the cultural attitudes towards cycling and its social acceptability than is needed in Ithaca. As an aside, one must be careful to avoid alienating potential supporters in the content of the designs. For example, one of the benefits of cycling for transportation is the ability to get exercise without going to a health club. However, stating or implying this in the designs is likely to prevent local health clubs, gyms and related businesses from becoming sponsors.

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10 For guidelines on conducting a belief elicitation study, see [http://www.people.umass.edu/aizen/pdf/tpb.measurement.pdf](http://www.people.umass.edu/aizen/pdf/tpb.measurement.pdf)
Determine locations

The installation locations chosen are integral to the project and its success. First of all, they must reach the target audience of each design. For example, messages intended for current cyclists are best suited for locations such as bike racks while motorists can be reached by installing signs and exhibits in and near parking garages. Secondly, the design and location must be compatible. Those with longer text need to be in locations with high volumes of pedestrians and where they are likely to take the time to stop, while image based signs with little or no text is needed for locations such as bus advertisements.

Ownership of intended locations is an important consideration. If installing on public property, the city zoning and planning committee and other agencies need to be involved early in the implementation process since permits will be required. For example, two of the designs in this project were originally intended to be installed adjacent to roadways with frequent traffic jams. Both the transportation council and the city planning and zoning director were vehemently against signs on roadways and hesitant about signs in general, citing a strong concern for the already large number of signs in the public domain. It was also found that the city owns two of the parking garages, however, the third is owned by a group of agencies. Any type of installation on public property requires determining the agency responsible for each proposed location and navigating the permit process. This process is avoided for installations on private property (i.e. businesses), bus billboards, and roadside billboards. It is likely to be easier to obtain permits from
the city and permission from building owners to hang banners than to install relatively permanent signs.

\[Image of downtown Ithaca\]

**City Buses**

Purchasing advertising on the city bus billboards (Figure 4.24) for project exhibits has numerous advantages. First of all, they reach large numbers of people traveling on the streets and sidewalks. Billboards on the rear of buses would be particularly effective in reaching motorists, since cars are often sitting in traffic behind buses. Secondly, the time-consuming and often challenging process of
acquiring permits to install exhibits on public property is completely avoided; installation is basically a matter of calling the advertising agency and purchasing space. Third, the size of the advertising spaces allows for a large display of sponsor logos. This, coupled with the bus’ high visibility, is likely to make these exhibits appealing to sponsors.

Color on bus billboards is an important consideration. The public buses in Ithaca are largely white, with swaths of light blue. Therefore bus exhibits need to use a contrasting pallet to be noticeable, such as an orange background. They also need to be visually based with minimal, “punchy” text. “Fast lane/fat lane” is a good example of an appropriate and effective style. Finally, careful consideration should be given to route choice.

Figure 4.24 Ithaca City TCAT bus side and rear billboards
The Commons

The Commons is a pedestrian mall located in the heart of downtown (see the area marked in red on Figure 4.23). It features numerous stores, galleries, restaurants, and cafes along with seating areas, pavilions, and a small playground. The upper levels of the buildings house apartments and offices. It hosts several festivals throughout the year (e.g. Ithacafest, Applefest, the Chili Cookoff, and an annual ice sculpting competition) as well as providing a venue for a variety of musical and theatrical performances during the summer, both scheduled and impromptu. It is sandwiched between the two major city bus hubs, which are on Green Street and Seneca Street. Bike riding is banned from the Commons itself, however bikes may be walked through it and there are bike racks at all of the entranceways.

The high pedestrian volume on the Commons makes it an ideal location to reach the target audience of this project. Since visits to the Commons are often leisurely and it is a popular area for socializing, there is a high likelihood people passing the exhibits will stop to read them. Especially during the warmer months, it is also a popular lunch spot for local businesspeople. Despite being near several parking garages, driving and parking in the area is commonly perceived as inconvenient; as such it is an ideal place to emphasize the benefits and ease of utilitarian bicycling.
Figure 4.25 Breezeway entrance (view from across Green Street)

Figure 4.26 Breezeway entrance
Figure 4.27 The Commons “breezeway” (alley to the Commons is in the background; parking lot is on the left; movie theatre, seating and parking garage elevator are on the right)

Figure 4.28 The Commons breezeway (alley leading to Center Ithaca and the Commons)
Figure 4.29 East (Aurora Street) end of the Commons

Figure 4.30 West (Cayuga Street) end of the Commons
Figure 4.31 The Commons- bike rack on east (Aurora Street) end

Figure 4.32 The Commons-seating  
Figure 4.33 The Commons-seating

Figure 4.34 The Commons-seating  
Figure 4.35 The Commons-seating
Figure 4.36 Playground on the Commons, view 1

Figure 4.37 Playground on the Commons, view 2
Figure 4.38 View of “Bank alley” on the Commons

Figure 4.39 View of “Bank alley” on the Commons
Parking Garages

There are three major parking garages downtown: on Green Street adjacent to the Commons (Figures 4.25 and 4.40), on Seneca Street (Figures 4.43-4.44), and on Cayuga Street (Figures 4.43-4.44). The latter provides access to a gorge-side walkway (leading to the city courthouse/police station, Mental Health department, library, one of the major bus hubs, high-rise apartment buildings, and the breezeway) via its rear stairway. As mentioned earlier, the ground floor of the Green Street garage includes a movie theatre, the breezeway, and a metered parking lot. The first several floors of the Seneca Street garage are designated for guests of the nearby Hilton Hotel, with the upper levels serving the general public. Street parking in the immediate area is metered and non-metered parking on nearby residential streets is highly competitive. Therefore, most people who park in the area daily for work take advantage of the monthly rate offered by the garages. Another somewhat common solution is to park on a more distant unmetered street or large business parking lot (such as a grocery or drug store) and ride a bike the rest of the way.

Joanne Cornish, head of the city Planning and Zoning department, and Kent Johnson, from the transportation department, suggested the parking garage elevators as good locations for project exhibits. Not only do they reach large numbers of the target audience, but the audience is also “captive” for the duration of the elevator ride and therefore likely to read the signs. The need to rotate the signs after a specified amount of time and for vandalism resistant sign holders was also discussed. They were highly interested in the installation of sign holders in the
elevators as these could be used by the city or rented to various agencies for public service announcements after being used for this project. Several of the garages have suitable spaces for hanging banners or using wall mounted signs.

Figure 4.40 Photo of the Green Street parking garage and lot side entrances (rear entrances of stores on the Commons are in the background, behind the white truck)
Figure 4.41 Photo of the Seneca Street parking garage entrance and bus stop

Figure 4.42 Seneca Street parking garage side entrance

Figure 4.43 Cayuga Street parking garage front entrance
Figure 4.44 Cayuga Street parking garage rear entrance, gorge walkway, and bridge to the city courthouse/ police station

Figure 4.45 Gorge walkway behind the library and Cayuga Street garage
DeWitt Park

DeWitt Park (Figures 4.46-4.47) is located at the corner of Cayuga and Buffalo Streets. It hosts a farmer’s market twice a week from spring until late fall and serves as a venue for several festivals and events during the summer. It is utilized on a regular basis for recreation/leisure, picnic lunches by downtown workers, and as a pedestrian throughway.

Figure 4.46 DeWitt Park, view 1
Cass Park

Cass Park features numerous facilities including a walking/biking path with fitness stations, boat launch, athletic fields, a children’s garden, restrooms, playgrounds, a dog park, tennis courts, and concession stands (see Figures 4.48-4.51). The main building serves as the entrance to the public outdoor pool and houses a hockey rink, concession stand, and locker rooms. The rink is used for hockey, public ice-skating, and ice-skating lessons in the winter. In the summer it hosts a day camp during the week and roller-skating on evenings and weekends. This building is suitable for the installation of either a banner or a kiosk. This popular park receives significant usage year round as a destination for recreation and the large number of sports events. The Children’s Garden hosts several annual
events as well as weekly gardening and other nature based programs. There are two playgrounds, one of which (Figure 4.48) is adjacent to a large picnic pavilion and barbeque pit available to rent by families and groups for parties.

Figure 4.48 Photo of the Cass Park playground
Figure 4.49 Photo of Cass Park rink and pool entrance-view 1

Figure 4.50 Photo of Cass Park rink and pool entrance-view 2
Collegetown

The area known as Collegetown is located adjacent to Cornell University. It features a wide variety of cafes, bars, and restaurants, as well as numerous shops, service related businesses (i.e. barbershops), and apartments. In addition to serving as a business district for students, it is also a popular lunch destination for faculty and staff at the university. Parking in or near campus is extremely limited and meters have a two-hour time limit. University parking lots are largely inconvenient due to their peripheral locations and the high cost of permits. Figures 4.52 and 4.53 illustrate a potential exhibit location site. This area receives a high volume of pedestrian traffic. There are several buildings in the area that are potential banner sites.
Figure 4.52 Potential site in Collegetown, view 1 (towards bridge and Cornell campus)

Figure 4.53 Potential site in Collegetown, view 2 (towards business & housing district)
Stewart Park

Stewart Park, located on Cayuga Lake, hosts a children’s summer day camp, several annual festivals and various types of events, and year round recreation. Facilities include a fully enclosed pavilion, picnic facilities, carousel, athletic fields, duck pond, spray pool, playground, golf course, and a bird sanctuary (see Figures 4.54-4.55).

Figure 4.54 Stewart park playground
Steamboat Landing, better known as the Farmer’s Market, features a pond, gardens, dock, large market pavilion, dock, and play/seating area on the water. It is also transected by the Waterfront Trail and home to a boat tour (see Figures 4.56-4.59). The nationally renowned Ithaca Farmer’s Market is held two to three days a week according to the season, and features up to 150 vendors. The venue is also available to rent and used for a variety of events and festivals. One of the most popular events is the annual Rutabaga Curling Championships, which reveals aspects of the market’s character:

The sport of Rutabaga Curling was born on a cold December 1996 Market day, the last market day of the season. The few vendors present (perhaps 25 or so this time of year and point in our history) huddled together for warmth and camaraderie waiting for an
occasional customer. Talk at some point in the day turned to unusual winter sports. Curling of course came up in conversation. None of us knew the rules; but before we knew it vendors' wares were being "hurled" or "curled" down the market's wooden floor. Potatoes, cinnamon rolls, cabbages, loaves of bread, and even frozen chickens were fair game in this impromptu outburst. There were no particular rules this day; we were going for style, distance, and laughs. But one of the vendors, Steve Sierigk (a middle-aged note card vendor with a sly smile) and currently the self-proclaimed "Most Esteemed Grand Commissioner of the International Rutabaga Curl", saw potential in the innocent play. The next market season Commissioner Steve codified rules and designed a court of play using market's wooden floor. In 1997 an early form of our sport was born which allowed contestants to throw most any projectile available at market, although rutabagas were supplied. Commissioner Steve astutely recognized the inequities of this first year of organized sport; to level the playing field the Commissioner declared "any projectile besides a rutabaga illegal". Hence the first official Rutabaga Curl was held in 1998. (Game History, n.d.)

Wildly popular with both residents and tourists alike, the market serves as a social gathering place. Impromptu drum circles and musical performances are common. Despite a large parking lot, finding parking can be a challenge and the lot can be difficult to navigate due to the large traffic volume; the market attracts as many as 5,000 people a day (History, n.d.). Some visitors arrive by canoe or kayak, docking among the roots of the shore-side “climbing tree.” The bike racks are often full, demonstrating there are a number of people who commute to the market by bike. However, it being located on the opposite side of State Route 13 from downtown is a barrier to many current and potential cyclists. This is an ideal location for exhibits and/or posters since the population at the market is likely to be predisposed to bike commuting and possibly more likely to participate in the behavior with informational and efficacy support.
Figure 4.56 Farmer’s Market, view 1

Figure 4.57 Farmer’s Market, view 2 (dock area)
Figure 4.58 Farmer’s Market, view 3 (back side of Market, Waterfront Trailhead, and seating. Picnic tables and bike racks in background)

Figure 4.59 Farmer’s Market, view 4 (play and seating area)
The Tompkins County Main Library (Figures 4.60-4.62) is located in the heart of downtown, adjacent to the Cayuga Street parking garage and one of the major city bus hubs and on a major intersection. It is witness to large volumes of pedestrian as well as vehicular traffic, making it an ideal location for a freestanding exhibit. The wide overhang providing shelter to the bike racks and bus stops lends itself to wall mounted signs. Two sides of the building would be ideal locations for banners.

The bi-annual Book Sale\textsuperscript{11}, operated by Friends of the Library volunteers, is the largest in the country with over 250,000 offerings at each sale. The Etsy Street warehouse which houses it is a potential site for a banner given the almost non-existent parking, large windowless exterior, and high attendance rate of the event.

11 See http://www.booksale.org/index.php
Figure 4.61 Library, view 2

Figure 4.62 Library, view 3
Pilot exhibits

An informal two-week pilot of the exhibits was conducted in order to get feedback and assist in determining the final revisions. The designs were posted on a dedicated Face Book™ page and “shared” via the author’s network; viewers could leave general comments on the page wall or add comments with each individual image. There were some technical problems with the page that prevented viewers from being able to leave feedback the first week of the pilot. Some, albeit limited, feedback was still received via the page and it received twenty-five “likes.” The page can be used in the future to serve as a forum and advertise the website. In addition, PDF of the designs was emailed to approximately fifteen people in the author’s academic, personal, and professional networks resulting in a number of emailed responses.

Responses were overwhelmingly positive regarding both the project in general and the exhibits, with the exception of two respondents. The comments may be read in Appendix 1. One of the most common critiques was that there was too much text. This was a valid critique, however, it should be noted that the proportions between and sizes of the text, subtitles, and illustrations are different in the reproductions than they will be when produced on the actual, larger signs; the illustrations and subtitles will be larger and the text segments smaller. This will allow viewers to get the main points quickly, but provide adequate information for those interested. Still, an editing and reduction in text improved the designs.
The sample was biased since all except two respondents already had a positive, or at least neutral, attitude towards cycling and cyclists or were cyclists themselves. Further research using a larger and random sample is warranted to determine the effects of the exhibits. This will be discussed further in Chapter 5. The pilot successfully fulfilled its purpose, by confirming the need for and interest in the project as well as guiding the editing of the exhibits.

**Develop project budget**

The project budget needs to be developed early in the implementation process in order to determine the amount of funds that need to be raised. The costs to develop the project itself included the illustrator/graphic designer, purchasing reproduction rights from the illustrator, and purchasing the domain name for the website. As noted earlier, implementing the project in other locations may require revising the existing designs and/or creating new ones in order to address the prevailing attitudes, behavior, and barriers of the particular locale. If this is the case, hiring a professional heritage or environmental interpreter is highly recommended. Exhibit and sign manufacturers specializing in interpretation usually offer this service (see Appendix 9 for resources).

Costs related to producing the project include printing, bus advertisements, sign holders, fabrication of the freestanding exhibits/kiosks, those related to publishing and maintaining the website, fundraising, and permits. Staffing costs need to be considered as well. The proposed budget is located in Table 2, while
bids for various components are in Appendices 5-7. Costs of the photographs on the designs are not included since the photographer donated his services.

This project could be implemented with a wide variety of budgets. For example, the freestanding exhibits can be elaborate and professionally fabricated, traditional laminate set in pre-fabricated metal framing, or built by a skilled carpenter and volunteer crew with donated lumber. Depending on the particular locations, wall mounts and/or banners could replace many of the freestanding ones to decrease expenses. It is better to overestimate costs than underestimate them for the purposes of fundraising.

Table 4.2 Proposed Budget

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Cost per Unit</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personnel</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administration</td>
<td>1</td>
<td>5%</td>
<td>3150</td>
</tr>
<tr>
<td>Staff (1 @ 20/hrs/wk and $19/hr. Quantity in months)</td>
<td>19</td>
<td>1360</td>
<td>25840</td>
</tr>
<tr>
<td>Total personnel costs</td>
<td></td>
<td></td>
<td>28,990</td>
</tr>
<tr>
<td><strong>Graphic designer/illustrator</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illustrations and graphic design services</td>
<td>1</td>
<td>5350</td>
<td>5350</td>
</tr>
<tr>
<td>Purchase of rights to illustrations</td>
<td>1</td>
<td>1508</td>
<td>1508</td>
</tr>
<tr>
<td>Total graphic design costs</td>
<td></td>
<td></td>
<td>6,858</td>
</tr>
<tr>
<td><strong>Website</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domain name (2 yrs)</td>
<td>1</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>Hosting/maintenance (2 yrs)</td>
<td>2</td>
<td>300</td>
<td>600</td>
</tr>
<tr>
<td><strong>Printing</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fundraising materials, business cards</td>
<td>1</td>
<td>125</td>
<td>125</td>
</tr>
<tr>
<td>Posters (60)</td>
<td>1</td>
<td>355</td>
<td>355</td>
</tr>
<tr>
<td>Postcards or brochures (1000)</td>
<td>1</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Total printing costs</td>
<td></td>
<td></td>
<td>680</td>
</tr>
<tr>
<td><strong>Exhibits and Signs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interior wall sign mounts (11x17)</td>
<td>9</td>
<td>120</td>
<td>1080</td>
</tr>
<tr>
<td>Exterior wall mount signs (36x28)</td>
<td>6</td>
<td>450</td>
<td>2,700</td>
</tr>
<tr>
<td>Large (28&quot; diameter) 2 sided freestanding signs</td>
<td>2</td>
<td>450</td>
<td>900</td>
</tr>
</tbody>
</table>
The costs for advertising on/in the TCAT busses are listed in Table 3 below.

There are four exhibits to be used on bus exteriors: Commuting is hell/Commuting is swell, Avoid Gas Pains, Fat Lane/Fast Lane, and a modified version of Jive with 5. Exhibits that would be appropriate for the interior bus ads are Park & Ride, Choose Your Own Path, Size Matters, and What’s Your Style. The advertising agency representative recommends advertisements run on at least three buses for a minimum of three months to achieve maximum effectiveness.

Table 4.3 Costs of advertising on TCAT buses

<table>
<thead>
<tr>
<th>Location</th>
<th>Size</th>
<th>Set-up Fee</th>
<th>Cost per bus per month</th>
<th>Total for 4 months-1st bus</th>
<th>4 months-each add’l bus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interior</td>
<td>17x28</td>
<td>$15</td>
<td>$15</td>
<td>$75</td>
<td>$60</td>
</tr>
<tr>
<td>Left (driver’s side) side</td>
<td>30x125</td>
<td>$100</td>
<td>$225</td>
<td>$1000</td>
<td>$900</td>
</tr>
<tr>
<td>Rear</td>
<td>17x70</td>
<td>$100</td>
<td>$200</td>
<td>$900</td>
<td>$800</td>
</tr>
<tr>
<td>Right side</td>
<td>30x88</td>
<td>$100</td>
<td>$200</td>
<td>$900</td>
<td>$800</td>
</tr>
</tbody>
</table>
Posters are a cost effective way to reach large numbers of the target audiences. They are inexpensive to reproduce and the same design can be posted in numerous locations in order to reach a wider variety of population segments. Suggested locations include the Department of Motor Vehicles, public bathrooms and other indoor facilities, the Department of Social Services, the Department of Motor Vehicles, and community centers such as the Greater Ithaca Activities Center, the Ithaca Youth Bureau, Southside Community Center, and the Women’s Community Center. The costs listed in the budget include:

- 11”x17” laminated posters- 4 each of 9 designs
- 8 ½”x11” laminated posters- 10 each of 10 designs
- 16”x20” posters- 6 each of 2 designs
- 11”x14” posters on cardstock (for the parking garage elevators)- 20 each of 10 designs

A simple tri-fold brochure, postcards, or “trading cards” featuring modified illustrations and text from a few key designs will be distributed with the posters and available in brochure holders on the freestanding exhibits. These will provide interested viewers with a means to remember the content (“tips”) and website address, thereby encouraging use of the site.

Wall-mount sign holders in the parking garage elevators and stairwells will be used to display ten of the designs. These are Fast/fat, No Lycra No Problem, Sharrows, Size Matters, Swell/Hell, Gas Pains, What’s Your Style, Wheel with a View, Park and Ride, and Take It With You. A total of twelve sign holders are
included in the budget; four for each of the three parking garages. The
manufacturers specifications of the wall mounted sign holders to be used in the
parking garages are located in Appendix 3. An example of this type is shown
below in Figure 4.63.

Figure 4.63 Wall mount sign holders (11x17) to be used in the parking garages

Wall mounts without removable inserts could be added or replace some of the
freestanding and bike rack signs. Potential locations for these include under the
library overhang by the bike racks and bus stop seating, the side entrance of the
Seneca Street parking garage, the Breezeway, and others. Several existing
examples of this type of sign are shown in Figures 4.64 and 4.65.
Figure 4.64 Wall mounted sign

Figure 4.65 Wall mounted signs
Designs appropriate for banners include Fast/fat Lane, Urban Legends, Park & Ride, Squirrel, Commuting is Swell, Wheel with a View, Park & Ride, and Sharrows. Banners come in a variety of sizes, are weather and (if hung high enough) vandalism resistant, and can be installed on both public and private buildings. They cost less time and money to produce and install than freestanding and most wall mounted signs. The Family Reading Partnership has successfully used this format throughout Ithaca in its campaign to encourage parents to read to their children.

Figure 4.66 Banner
The signs on bike racks can be produced as either single units with the design imbedded on the surface of the sign or with a “case” that houses signs printed on cardstock so the messages can be rotated across the different locations (see Appendix 3). There are ten designs to be used on the bike racks: Sharrows, Don’t Be A Squirrel, Size Matters, Park and Ride, Knockout, Road Rules, and Urban Legends.

The freestanding exhibits should be double sided to allow the display of two designs in each location. Obviously, the pairings and numbers of freestanding exhibits will vary according to the number of signs used and the characteristics of the city and locations where they are to be installed, and therefore effect costs. Resources for sign fabricators and the design options considered for the implementation of the project in Ithaca are located in Appendix 9. The environment of the exhibits must be taken into account, along with available funds, when choosing a presentation style; the exhibits should visually “fit” their locations and be visually inviting in order to encourage passerby to notice and read them. Examples of different types of freestanding signs and kiosks are in the Fabrication/manufacturing of the Exhibits section to follow.

The website is an important element of the project, serving to help bridge the gap between intention and action by providing visitors with additional information on overcoming barriers, skills, and other topics. Purchase of the domain name cost $44 for two years. Hosting and maintenance services will cost between $500-$700 per year.
Personnel expenses include administrative support and a temporary project coordinator. The former is to cover the time and costs related to administration by the sponsoring agency’s administration. The project coordinator will report to the agency director and be responsible for the general tasks needed to implement the project. A job description of this position is located in Appendix 8.

Conduct fundraising

The next step after preparing the budget is to identify potential sponsors and prepare a proposal package. Since increasing cycling for transportation provides benefits across such a wide variety of realms, funds can be sought through numerous entities including those related to health, transportation, sustainability/environment, urban renewal and live-ability, in addition to those directly related to cycling. Proposals, grant applications, and other materials will need to be adjusted according to the interests of the particular agency or business being approached. While large federal and foundation grants are a vital source of funding, local businesses can also be a powerful source of support\(^\text{12}\). Support can be monetary or in the form of donations of needed materials and services, such as printing, sign materials and construction, website hosting, etc. Logo space on the exhibits, posters and websites can be given to companies providing designated levels of sponsorship or donations. Getting press coverage regarding the project by issuing a press release can be used to support fundraising efforts as well.

\(^{12}\) See Birk, 2010, pp.53-58
Obtain Permits

The first step is to identify the agencies responsible for permits on public property, obtain information on the process and timing of meetings, etc., and develop relationships within those agencies. The permit process should be started as early as possible since it can be a lengthy process. If possible, it should also be timed so that fabrication of the exhibits can be done in early-mid spring, with installation being in late spring.

Fabrication/production of the exhibits and posters

The posters and laminated signs can be produced by most print shops, while either a good quality sign manufacturer or skilled carpenter is needed to produce the exhibits. There is a wide variety of types of freestanding exhibits including basic metal mounting systems, three or four sided “town center” kiosks, traditional trailhead type kiosks and sign holders, and custom sculptural type exhibits. Some feature panels that allow for inserts, while others are used to mount signs printed or imbedded on various types of polymers/fiberglass. As noted earlier, some sign fabrication companies who specialize in the fabrication of interpretive signs also offer content (text and illustrations) development, graphic design, and other services. There are numerous advantages to working with a single company from development through installation. Wall mounted signs and banners are less obtrusive and cost less than freestanding signs. Examples of types
of signs are shown in Figures 4.67-4.76 and a list of resources is located in Appendix 9 (p. 219).

Figure 4.67 Freestanding sign example  Figure 4.68 Custom freestanding sign
Figure 4.69 Custom, sculptural freestanding sign

Figure 4.70 Sculptural freestanding sign

Figure 4.71 Sign with metal mounting system

Figure 4.72 Sign with standard metal mounting system
Figure 4.73 Detail of four-sided kiosk

Figure 4.74 Large two-sided kiosk and small four-sided kiosk

Figure 4.75 Traditional trail-head kiosk

Figure 4.76 Freestanding sign on road-sign type metal posts
Careful consideration of available funds, the characteristics/style of the area, and the image sought for the project is needed when selecting the exhibit style. Ithaca has an urban, if casual, flavor despite being a small town. The Commons and surrounding downtown core is in the process of being “updated.” For example, a number of large murals have been painted on building exteriors and bridge underpasses; the Green Street parking garage has been updated and directionally color-coded by desired destinations; and a number of visitor information kiosks and wall mounted maps have been installed. There are plans to renovate the Commons itself in the early 2010’s. A prototype of the sign style being considered for the freestanding and bike rack exhibits is shown in Figure 4.77; manufacturing specs of the sign are located in Appendix 4 (p. 213).
The circular shape is conceptually appropriate and unusual, which will attract attention and distinguish the exhibits from other types of signs. They also have a clean, contemporary, urban look and are eye-catching without being obtrusive. Cost-wise they are more expensive than wall mounts, banners, and basic aluminum sign mounts, but significantly less than kiosks and custom sign designs. They will be two sided, with a different design on each side. The majority will be 22” in diameter, while two of the designs (King or Queen and Road Rules) will be produced on 26” diameter circles. The freestanding exhibits will be mounted using a base plate or imbedded in a concrete footer. A shorter post and custom clamp will be used to bolt 18” diameter signs to the top of bike racks.

The sign holders to be installed in the parking garage elevators and stairwells have a cover that can be removed using a suction cup to allow for the rotation of different designs at each location. This style is more resistant to vandalism than those with hinges and locks. They also are more flush with the wall.

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Develop and publish the website

As noted earlier, the purpose of the website is to provide easy access to the information needed by motorists in regards to sharing the road and by potential cyclists to help fill the gap between intention and action. Images of the exhibits are used as link buttons to provide visual cues and easy navigation of the site. There are six primary links/content areas on the homepage:
• “Get Going!” leads to information about bike handling skills and bikes/equipment
• “Why Ride” provides information of the benefits of cycling for transportation to individuals and communities
• “Safety Matters” leads to information about safe riding practices and laws
• “For Motorists” takes viewers to further information regarding sharing the road safely
• “Meet Local Commuters” goes to a page featuring profiles of local commuters to provide role models and inspiration
• “Questions?” leads to a forum where viewers can post or answer commuting related questions or email questions to an experienced commuter.

Other pages include About the Project (including contact information), Feedback, Evaluation Survey, Site Map, and a page for becoming a registered user.

Registered users will be able to upload a personal profile which will include a photo and how commuting has benefited their life. This information, along with the forum can be used to collect qualitative data regarding the effects of the project as well as help determine and guide future research and/or programming.

Install exhibits

Ideally, the exhibits and sign holders will be installed directly by the manufacturer. To ensure stability and prevent theft, freestanding exhibits will need to be attached to a base plate either bolted into the concrete of the existing concrete or into a poured concrete footer/foundation. The project coordinator will need to
install the posters in the parking garage wall mount sign holders, and possibly the bike rack sign holders depending on the design chosen.

**Conduct evaluation**

Evaluation is a crucial, but often overlooked element of any program in order to determine if the objectives are being met and where improvements or changes should be made. For this project, it consists of an online survey accessed through the website as well as a visitor count for each page (see Appendix 10). According to Ithaca Gorges Websites, most people will answer a 1-2 question survey, a few will answer more than 3-4 questions, and almost none will answer more than nine or ten. Obviously, this greatly limits the type and amount of data collected. However, postings in the website forum and the personal commuter profiles will provide qualitative data for that can be used to evaluate the effectiveness of the project as well as guide future research and programming. Also, bicyclist traffic counts can be conducted and compared to previous modal share data at certain time intervals following implementation.
Once installed, the maintenance of the project is minimal. It includes filling the brochure boxes on the exhibits, rotating the signs in the parking garages once a month, and quarterly inspection of the exhibits for vandalism or other problems. The maintenance of the website is the responsibility of the author and/or will be contracted out to the website host provider at little or no cost to the sponsoring agency.
As with any other type of product, the project requires promotion. Promotional means appropriate for this project include press releases to generate newspaper articles and radio spots, use of social networking sites such as Face Book™, the production and distribution of a short video, and ensuring the website rates high in related search results.

The exhibits were designed to be inherently engaging, however supplemental means should also be used to increase engagement and achieve the project’s objectives. As with promotion, social networking sites such as Face Book™ could be used as a forum for discussions, feedback, and generating interest. Trading cards of the designs could be produced and available in a brochure holder at their corresponding location, with local bike shops offering a discount to customers who bring in a designated number of different cards. Skills workshops, promotional events, women-only programs, and providing supportive facilities (e.g. arranging a shower/locker membership at downtown health clubs for commuters and utilizing existing spaces for covered, secure bike parking) need to be implemented to augment the project and maximize its effectiveness.
This project is a social marketing campaign comprised of research-based interpretive messages and a website. The signs have been specifically designed to promote changes in beliefs and actual behavior by addressing the constructs outlined in the Theory of Planned Behavior. While the project was developed for Ithaca, the barriers, beliefs, attitudes, and behaviors addressed in the designs are common throughout the United States. As such, it is widely applicable. As demonstrated in this chapter, it can also be implemented in a variety of ways depending on the characteristics of the particular location and funding available.
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Appendix 1: Pilot Data

I. General Comments

I really like your designs, the simpler ones seem the most powerful....blame my 32 years of teaching Jr. High and the k.i.s.s. factor.....but all are exceedingly attractive and informative. I learned a number of things, how to ride in a skirt, how to arrive unsweaty and how to shift on hills to name a few. Encouraging teens and kids to ride (safely) is very important and emphasizing independence is great way to do so. Most importantly your project is so very needed to promote biking safety, many automobile drivers are intolerant, aggressive and refuse to share the road. A big problem here in Idaho, even among motorcyclists, who would think since they get bullied by autos too! Also many bikers (even adults!!) ride on sidewalks, on the wrong side of the road and "squirrel" adding to automobile drivers' frustrations. Cyclists behaving badly frighten drivers and make them angry. Interestingly enough it's legal in Idaho for bikes to run stop signs (not lights and only if traffic allows)...lack of public education to this fact (who but me reads the driver manuals?) adds to the hostility of automobile drivers. Your emphasis on being friendly, smiling and thanking drivers for the right of way is an excellent approach. More power to you!

As a cyclist, I really like the He Said/She Said, Rolling Stops, and Same Road/Same Rules signs. I like that the signs are trying to increase the awareness of cyclists and imagining what it's like to be on a bike when any of the mentioned scenarios occur. And, even though the vast majority of cyclists also drive cars, we sometimes forgot how our behavior on a bike can appear to a car driver.

I'd probably stop and read any sign about cycling. Could newspaper ads be another medium?

Nice job!

I think I liked the Fat Lane/Fast Lane best from a promotional viewpoint. A couple of the others also were pretty decent on the quick message front. I had the feeling that most of the signs probably just had a bit too much content in them for a non-cycling-enthusiast to actually take the time to get through them.

You might want to check the source of the data on whether it is riskier to eat a hamburger than to ride a bike. As far as I could see, there are currently about 800
cycling fatalities a year in the US, whereas food-borne pathogens of all sorts, presumably mostly not carried by hamburgers, result in about 5000 fatalities. I didn't quickly find numbers for choking incidents for hamburgers, but for children it seems that choking on hotdogs is the biggest food-related choking cause of fatalities at about 17 per year. Choking risk of death seems to be a significant contributor to overall death risk only in the very old (well beyond my age of 67!) who probably aren't likely to be incorporated wholesale into the bicycle (or other) commuting community. And from a standpoint of risk assessment, there are sadly lots fewer bicycle riders than hamburger eaters in this country! In any case, I think you might want to be pretty sure of statistics on that one before putting out signs and having the beef industry descending on you with their lawyers.

My wife and I returned recently from a trip to New Zealand, and were quite impressed by a billboard advertising campaign there for safer driving. Just a few words, and limited graphics, on each sign, but at least to us very attention grabbing. Would have loved to get some photos of a few of them, but many of the roads there were pretty low on shoulders to pull off, and pretty high speed traffic, even if relatively low traffic density--it seemed a poor idea to risk adding to the accident toll by pulling partly off the road to get a picture of a clever sign! Sadly though great for most outdoor activities, much of NZ looked hazardous for cycling to us--narrow roads, often no shoulders to speak of, poor visibility around many curves, and relatively high speed traffic. And despite some nice signage about share the road (including some explicitly showing a 1.5 meter separation between bike and car), we heard a lot of agonizing on the radio about 5 bike fatalities in 5 days (for a country of 3 million) in the first week we were there, wondering what could be done to reduce the carnage. After that, the aftermath of a coal mine explosion distracted the media attention....

As a committed round-the-year cycle commuter for quite a few decades, I personally enjoyed looking through your sign creations! Good luck on the master's project!

I hope you want this feedback. There’s a lot of good information in the posters and they make a lot of good points. However, as I understand it, you wanted criticism? So here goes…

In general, I didn’t much like the “catchy titles” and I felt many posters had way too much info -- and could be made into many separate posters.

Also, I’ve been involved with some programs that used posters to change behavior
and have learned is that it is MUCH more effective to put on a positive twist
(“biking is cheap” instead of “cars are expensive”, “bikes and cars can share the
road” instead of “car drivers and cyclists are enemies”)

Nice work. I like them all.

- 'He said/She said' and associated graphics were probably the most striking.

- Walking on the street... I don't think many people would stop and read. But at a
store checkout, bus stop, newspaper ad - people would read.

- My perspective or behavior isn't changed, but I'm pretty experienced w/bikes.

comments.....
#1 & others - good to remind cyclists to follow rules of the road
#5 - should show helmets on
#15 - outside of Ithaca, don't know how common the term 'sharrow' is.

other info....
I commute when possible, but it's a 20 mile, hilly, narrow road - one that the
average person or even average cyclist wouldn't be too keen to do.

What I hear the most from potential commuters, is:
  - they need a safe route (bike lane is a minimum, a 'bike route/ rail-trail' is even
    better)
    - need decent weather
    - need a place to change clothes, shower, park the bike.
    - need to understand bikes and how to take care of them.

and gasoline prices will have to be much higher to change habits.

I just took a look at your poster collection. It’s apparent you’ve put a lot of thought
into this. Good going. I’d love to chat with you sometime if you’re interested. I
can’t quite get the focus and scope of your project from the FB site alone,
understandably. Here are a couple thoughts that came across as I looked through
them:

· Each sign/poster has a LOT of information on it. Any one of them
could end up being a theme and result in numerous elements. I’d guess it
unlikely that people would stop and read any one of them in their
entirety, which takes me to my next pondering;
· The thought is these will be on a kiosk? That makes sense, if the kiosk is strategically placed. These would not work as on the road signs, which takes me to;

· Check out Share the Road and be sure to go to the traffic safety campaign link listed.

· I expect you may know Jen Miller, so I won’t belabor the point beyond saying – she’s an excellent resource at Cortland. She’d likely have some similar comments as to what I would make pertaining to the educational content of the proposed messages. We’re both cycling instructors with the League of American Bicyclists.

· If you’re looking to get a traffic safety education campaign funded, the NYS Governor’s Traffic Safety Committee funds such endeavors. You need to be affiliated with a qualifying local agency. I’ve long thought that some sort of a traffic safety campaign through the City of Ithaca is long overdue. I’d be happy to help you get a better handle on that. I used to fund my position with GTSC grants.

All for now. Don’t hesitate to be in touch if I can be of any help, and thanks for taking some positive action!

--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Seems like an interesting project. Looking over the proposed "posters", I find that I generally like the message, but feel that some of the presentation graphics give an impression that the message is for children (the doggie thing, you know). On the other hand, these are generally well done in that they direct your attention to the major points in the graphic and are pretty succinct in the written portions. I did read them all and although I didn't really learn much there's a lot of people who could. Whether they would is another question....

More specifically, I think the bikes=independence is probably a bit of a stretch. The embarrassment factor isn't what's going to get kids to bike. For other ideas, I'd like to see a poster that talks about one way streets and maybe pedestrian etiquette as well.

Reading your summary, I think that the question of where these signs would be
posted is a big one. Bike racks are obvious. Bus stops, good. The DMV would be excellent.

WOOOOHHHOOOOoooo! Finally someone is addressing the need for promotion of alternative means of transportation. Thank you for your work.

II. Comments on Specific Exhibits

Squirrel

1. What about the sign do you find most striking? The squirrel with tire tracks
2. If you saw the sign while walking on the street, how likely would you be to stop and read it? Very likely
3. Has it changed your perspective or knowledge in any way? How? Yes: I never knew I was supposed to ride in a straight line or that it was to make me more predictable
4. How likely are you to change your behavior or take further action after viewing the sign(s)? Definitely will try to ride predictably now.

1. 1. What about the sign do you find most striking?
2. The road kill!
3. 2. If you saw the sign while walking on the street, how likely would you be to stop and read it?
4. Very
5. 3. Has it changed your perspective or knowledge in any way? How? Yes, makes me think about my role as a cyclist in accident prevention
6. 4. How likely are you to change your behavior or take further action after viewing the sign(s)?
7. Hmmm, about the same, but more sensitive to my own behavior

Squirrels… I don’t understand it and I don’t like the squished squirrel visual.

Commuting is Hell

1. What about the sign do you find most striking? Contrast between cartoon and photo
2. If you saw the sign while walking on the street, how likely would you be to stop and read it? Likely
3. Has it changed your perspective or knowledge in any way? How? Made me
smug about walking to work, which I call my commute.
4. How likely are you to change your behavior or take further action after viewing
the sign(s)? Not really.

1. What about the sign do you find most striking?
   The contrast
2. If you saw the sign while walking on the street, how likely would you be to stop
   and read it? VERY
3. Has it changed your perspective or knowledge in any way? How?
   MAKES ME RETHINK THE BENEFITS OF CYCLING
4. How likely are you to change your behavior or take further action after viewing
   the sign(s)?
   TRY HARDER TO RIDE MORE

Even in this day and age, “hell” limits the places you can put this poster (not in
school). Also, what do you mean “get satisfied…”? It seems like a motto from
another poster.

Gas Pains

1. What about the sign do you find most striking? The bike with money wheels
2. If you saw the sign while walking on the street, how likely would you be to stop
   and read it? Likely
3. Has it changed your perspective or knowledge in any way? How? I like that it
   encourages small change: adding bike commuting a couple days a week rather than
   a drastic lifestyle change. I think the speech bubbles are poorly aligned: they
   should either line right up or be more drastically separated left-to-right. It also
   made me a little annoyed because I always feel like cyclists are smug about what
   they do, and I spend even less for my walking commute: 1 pair of shoes every 3
   years and I own Yak Traks.
4. How likely are you to change your behavior or take further action after viewing
   the sign(s)? It annoyed me, so I don't really know.

1. What about the sign do you find most striking?
   THE ACTUAL COSTS!
2. If you saw the sign while walking on the street, how likely would you be to stop
   and read it? VERY
3. Has it changed your perspective or knowledge in any way? How?
   MAKES ME THINK HARDER ABOUT USING A CAR
4. How likely are you to change your behavior or take further action after viewing
   the sign(s)? RIDE MORE

...which means I don't have to work as much. Hence biking really is the lazier way
to get around!

Good points but I don’t like the title and the math might put people off…
He Said/She Said- fear of the unknown

1. What about the sign do you find most striking? I like the picture of hands as turn signals; I'd make them a little bigger/clearer
2. If you saw the sign while walking on the street, how likely would you be to stop and read it? Somewhat likely. It's a little wordy and it doesn't grab my attention
3. Has it changed your perspective or knowledge in any way? How? A little: good to be reminded that both cars and bikes are a little taken aback by an encounter
4. How likely are you to change your behavior or take further action after viewing the sign(s)? I'll be a little more careful of bikes when driving, though I already give them a lot of room when passing and treat them like a car.

I LIKE THIS ONE. IT IS THOUGHT PROVOKING.

I really like the message, but I don’t like the negative “fear of the unknown” or cyclist VS car driver

Embarrassing Drop Offs

1. What about the sign do you find most striking? The clear target audience of teens
2. If you saw the sign while walking on the street, how likely would you be to stop and read it? Likely
3. Has it changed your perspective or knowledge in any way? How? not really. Nice marketing to teens, but I'd change the word munchkin, it's something you say but it doesn't seem super common otherwise.
4. How likely are you to change your behavior or take further action after viewing the sign(s)? Might encourage teens I know to ride, but most of them do anyway.

DRIVEN SOUNDS FUNNY. MOST PEOPLE "RIDE" NOT DRIVE. OTHERWISE, IT IS EFFECTIVE.

Love this one. I can relate to the feeling of the girls. I wish my mom had let me ride my bike more often growing up. Friendly and inviting to look at.

I like it, but don’t most kids say ride a bike not drive a bike?

Fat lane/fast lane

1. What about the sign do you find most striking? Giant arrows
2. If you saw the sign while walking on the street, how likely would you be to stop and read it? not likely
3. Has it changed your perspective or knowledge in any way? How? The message I think you are aiming for is that biking can be faster than driving through bad
traffic, but the picture doesn't really convey that, it just looks like you are judging car drivers and labelling them (not fat so much as fat-cat rich people)

4. How likely are you to change your behavior or take further action after viewing the sign(s)? not at all

I LOVE THIS ONE! IT IS ONE OF MY FAVORITES AND MAKES A STRONG MESSAGE. THE CONTRAST POPS OUT (FAT VERSUS FAST)

I am immediately drawn to the fat lane arrow. This caused me to look at the entire advertisement and I got a good chuckle thinking to myself that I would much rather be in the fast lane!

I don’t understand the message, but I like how it looks.

**He/She- Same road, same rights**

1. What about the sign do you find most striking? the yellow arrows give a great idea of the two perspectives
2. If you saw the sign while walking on the street, how likely would you be to stop and read it? not very; too wordy. I really liked the older version of the sign with both sets of pictures and less words a lot better.
3. Has it changed your perspective or knowledge in any way? How? No, because I didn't read it. Maybe the layout of the text is the problem; graphically it looks like you want to preach at me about safety.
4. How likely are you to change your behavior or take further action after viewing the sign(s)? I won't.

THIS ONE IS GOOD, BUT LOTS OF WORDS. GIVEN ITS LOCATION, IT IS PROBABLY MORE THAN FINE.

I like the title “same road, same rights” but I still don’t like depicting cyclists and car drivers as enemies.

**Park and ride**

1. What about the sign do you find most striking? The neat carriers on the bike: look great -- functional and not dorky
2. If you saw the sign while walking on the street, how likely would you be to stop and read it? likely
3. Has it changed your perspective or knowledge in any way? How? park and ride always meant bus or train to me before, not bike.
4. How likely are you to change your behavior or take further action after viewing the sign(s)? not assume a biker is anti-car. Maybe. That's a deep-seated stertotype.

THE MOST STRIKING THING IS THE HAPPY DOG DOING ERRANDS. IT REALLY MAKES THE POINT WELL.
The Bike Rack in Collegetown had an ad that went:
FREE PARKING ON CAMPUS AND DOWNTOWN!!! then in tiny letters
underneath: (when you ride a bike)

I like “have fun getting where you’re going.”

Wheel with a view

1. What about the sign do you find most striking? graphics are great, text is
unnecessary
2. If you saw the sign while walking on the street, how likely would you be to stop
and read it? very likely
3. Has it changed your perspective or knowledge in any way? How? absolutely:
reminds me to think of the difference between big fat car tires that can take a
pothole no problem and little skinny bike tires.
4. How likely are you to change your behavior or take further action after viewing
the sign(s)? Not much because I already give bikes a lot of room and don't get mad
when they don't pull over
The layout on this one is much much better than the he said/she said ones.

CHECK YOUR CONSISTENCY IN CAPITALIZATION HERE.

My favorite.

Choose your own path

1. What about the sign do you find most striking? the layout. The top is a little
busy, but I happily read the text and liked the content.
2. If you saw the sign while walking on the street, how likely would you be to stop
and read it? fairly likely
3. Has it changed your perspective or knowledge in any way? How? calm tips
about how to solve common problems. Also a perspective of a cyclist as a stroller
through the neighborhood, rather than a speed demon.
4. How likely are you to change your behavior or take further action after viewing
the sign(s)?
again, starting to think of cyclists as normal people

MOST NOTICEABLE IS THE CONTRAST AGAIN. IT IS AN EFFECTIVE
STRATEGY.

Too much text. Too many messages on one poster.

Size matters

1. What about the sign do you find most striking? Very text-y, and doesn't feel
relevant to me
2. If you saw the sign while walking on the street, how likely would you be to stop and read it? not very likely
3. Has it changed your perspective or knowledge in any way? How? no. I think it should said "this one's too small" or "this bike's too small". but mainly it's a lot of technical information that I would expect a bike shop to provide or that I already know. So maybe this one needs a less generic location.
4. How likely are you to change your behavior or take further action after viewing the sign(s)? not likely.

THE THREE IMAGES REALLY MAKE THE POINT AND THE INFORMATION IS EDUCATIONAL

A little too much innuendo -- I’d give it another title and rephrase “pain in the rear”…. “be comfortable”?

Knee needs to be only very slightly bent, its too bent as shown (granted it’s a bit awkward with dogs)

**Jive with five**

1. What about the sign do you find most striking? graphics are excellent
2. If you saw the sign while walking on the street, how likely would you be to stop and read it? absolutely
3. Has it changed your perspective or knowledge in any way? How? makes me think about how it feels to be passed too close in a car (using a truck in the pic is really great), reminds me of what you told me before about the illusion of safety in a bike lane.
4. How likely are you to change your behavior or take further action after viewing the sign(s)? again, I already leave a lot of room, but it's good to point it out and say the rearview mirror bit. The two arms is great too: gives a sense of how far 3 feet is.

IS THE APOSTROPHE USED CORRECTLY HERE? I THINK YOU CAN ELIMINATE IT

Confusing; too complicated

**Rolling stops**

1. What about the sign do you find most striking? graphics are very nice
2. If you saw the sign while walking on the street, how likely would you be to stop and read it? likely
3. Has it changed your perspective or knowledge in any way? How? not really, gentle reminder (though not explicit) that bikes don't stop as easily as cars
4. How likely are you to change your behavior or take further action after viewing
the sign(s)? remember to fully stop.

“Everybody does it?” not really the message you want to send?

**What’s Your Style**

1. What about the sign do you find most striking? photos of people
2. If you saw the sign while walking on the street, how likely would you be to stop and read it? not very likely (but that's probably because I know so much about your study and know that you are profiling cyclists)
3. Has it changed your perspective or knowledge in any way? How? not really
4. How likely are you to change your behavior or take further action after viewing the sign(s)? might talk to bikers more

NOT SURE WHERE THE NAMES LINE UP. OR IS SOMETHING MISSING ABOUT ERIN?

Okay -- but again, less text.

**No lycra, no problem**

1. What about the sign do you find most striking? the cycling in winter: this is the first sign that made me want to follow up on the website
2. If you saw the sign while walking on the street, how likely would you be to stop and read it? likely
3. Has it changed your perspective or knowledge in any way? How? yeah: lots of tips I didn't know about clothes
4. How likely are you to change your behavior or take further action after viewing the sign(s)? will read the website (when it's up)

THIS ONE IS EFFECTIVE.

Make “too cold to ride” a separate poster? Also, title isn’t appealing to me.

Think its too cold…add “think again, Minneapolis…” This could be a whole separate idea if the cold weather is an issue

**Sharrows**

1. What about the sign do you find most striking? red cycle logos on road
2. If you saw the sign while walking on the street, how likely would you be to stop and read it? likely
3. Has it changed your perspective or knowledge in any way? How? not really - i already knew that stuff
4. How likely are you to change your behavior or take further action after viewing the sign(s)? not likely

ARE SHARROWS LIKE A BIKE LANE? I AM A CYCLIST AND THIS ISN'T A COMMON TERM. COULD YOU DEFINE IT, LIKE A SHORT LINE UNDER THE HEADER THAT SAYS: "PAVEMENT MARKINGS DESIGNATING POPULAR BIKE ROUTES" OR SOMETHING LIKE THAT.

What? I don’t understand this at all.

He said/she said see above: rolling stops

Rolling stops -- how about “beware bikes and cars rolling through -- and be careful not to roll yourself…”

Avoid the knockout

1. What about the sign do you find most striking? the title was confusing and that drew my attention
2. If you saw the sign while walking on the street, how likely would you be to stop and read it? maybe. It's pretty densely laid out: no white space, so not that appealing
3. Has it changed your perspective or knowledge in any way? How? yes: didn't think about turning problems
4. How likely are you to change your behavior or take further action after viewing the sign(s)? will think about it. the message wasn't super clear, so I'm not totally sure what I'm supposed to do

CUTE! I LIKE THIS EVEN IF IT HAS A LOT OF INFO

I like in this, and others, how you take both bikers' and cars' viewpoints - both make mistakes, and both need to be good drivers!

Show the right way and wrong way side by side?

Teenager's Taxi

1. What about the sign do you find most striking? the picture is funny
2. If you saw the sign while walking on the street, how likely would you be to stop and read it? yes
3. Has it changed your perspective or knowledge in any way? How? yeah: thinking about young kids being safe on biking, nice to have hard numbers
4. How likely are you to change your behavior or take further action after viewing
the sign(s)? don’t have kids

explain what a helicopter parent is

DO YOU THINK IT SHOULD SAY "CHILDREN" OR "KID'S"? YOU TALK ABOUT YOUNGER CHILDREN IN THE MESSAGE BELOW.

What’s a helicopter parent?

**Take it with you**
1. What about the sign do you find most striking? the dog in the basket
2. If you saw the sign while walking on the street, how likely would you be to stop and read it? very
3. Has it changed your perspective or knowledge in any way? How? more options than I knew of for carrying stuff
4. How likely are you to change your behavior or take further action after viewing the sign(s)? it changed my thinking a little

**PUT THE & BETWEEN THE SECOND AND THIRD WORD IN EACH OF THESE?**

Nice poster, but depressing title.

**Think cycling is dangerous**

1. What about the sign do you find most striking? Despite being text-heavy it's interesting and I want to read it. Grammatical error: "the schools haven't moved and neither are our children" should be neither have our children. You're right that the message isn't that clear.
2. If you saw the sign while walking on the street, how likely would you be to stop and read it? very likely
3. Has it changed your perspective or knowledge in any way? How? not really because I've read all your research already, but otherwise it would
4. How likely are you to change your behavior or take further action after viewing the sign(s)?
good reminder to not sit around too much, makes me remember I want to borrow your healthy eating book.

**I LOVE THIS ONE! GREAT MESSAGE!**

No way! I'm really that safe?

Ugly picture doesn’t inspire me to go closer to read the whole thing.

The fatalities per million exposure hours is confusing in that living is more dangerous?? Qualify living. Is this tv watching, or inactive behavior???
Recreate Your Commute Site Map

Home Page

About

For Motorists

Sharing the road
- Information for everyone
- Information for drivers
- Information for cyclists

Understanding cyclist behavior

Cycling and the law

Understanding road signs and markings

Get Going

Choosing a bike and equipment
- Choosing a bike
- Size matters-getting the right fit
- Equipment

Conquering challenges
- Get and stay motivated
- Carrying cargo
- Conquering the hills
- Biking with kids
- Winter riding
- Special populations

Bike handling skills
- Articles on riding skills
- Riding skills videos
- Ithaca classes and groups
- Books

Riding in traffic
Commuting skills
  General resources
  Dressing for success
  Route planning
  Loading your bike on the bus
  Basic maintenance and repairs
  Beating the stink
  How to park your bike securely

For women

For parents and kids
  For parents
  For kids

Meet Local Commuters

Questions?
  Ask the commuter
  Discussion forums

Safety Matters
  Sharing the road (links to same page as under For Motorists)
  Get the facts
  Rules of the Road

Why Ride
  Good for you
  Good for economics
  Good for the environment
  Good for the community
  Why bike? video
  No more ridiculous car trips video
Local Resources

Finger Lakes Cycling Club

Bicycle Benefits program

Bike Ithaca

Skills classes

Local bike shops

Bicyclist Survey
Excerpt from the About page

About

About the Project

Recreate Your Commute is a research based educational campaign designed to increase the use and safety of cycling for transportation. It has been adopted by the Downtown Ithaca Alliance and funding is currently being sought to install the posters as permanent freestanding signs in Ithaca, NY in the summer of 2012.

The mission of the project is to:

1. Help give people the skills, knowledge and confidence they need to use a bike for transportation

2. Promote friendly, responsible road sharing by both motorists and cyclists

Click on the locations below to see full sized versions of each design in their future locations!

Meet the designers

Hobit Lafaye

Hobit’s passion for cycling and desire to serve the community led her to create this project as part of her Master’s in Outdoor Recreation Education at SUNY Cortland. She currently lives on East Hill with her two children, two cats, and nine bicycles.
Get Going! page
General Resources

American League of Bicyclists’ Tip for Commuters

Articles by Paul Dena, author of The Bike to Work Guide and his blog, which is loaded with useful information and tips

Basics of Going by Bike Video

The Let’s Go Ride a Bike how-to page

Getting started

Girl’s Guide to Bike Commuting

Urban Biking Tricks and Tips book

Dress for Success

Winter commuting with kids

Clothing tips and tricks diagram

A Woman’s Guide to dressing for winter commuting, including a video
Basic Maintenance and Repairs

How to change and fix a flat

- Changing a flat video
- Changing a tire video
- Fixing a flat video
- How to fix a puncture video
- Tire inflation and helmet safety tips video

General Maintenance & Repairs

- Bike maintenance tutorial videos
- Basic Maintenance video - how to care for your bike

Beating the Stink

(How to arrive fresh and clean up without a shower)
Meet Local Commuters

Caroline

Her commute: Lansing to Cornell

When: every day, year round

Her favorite gear: Helmet all year; cheap snow pants; bright yellow helmet cover ("keeps the punk out of my hair")

Why she rides: "It's beautiful, like a Monet picture, and amazing. I see deer, hawks, loons... It doesn't take any longer than driving and walking from the parking lot... It's normal to me now. I'm disappointed when I have to drive."

Her tips: 1. Take a bike safety class 2. Find the quietest route possible 3. Make eye contact with motorists

Elizabeth

Her commute: all over downtown

When: daily, year round

Her favorite gear: Studded tires in winter; good lights ("use on overcast days, not just at night so drivers can see you"); good panniers: "I love the panniers-you just jump in like you would a car and we can carry all the kids stuff in it."

Why she rides: "I get exercise, I'm just living life. It's more interactive. I often see people I know and stop to talk. My bike is my Facebook... I'm doing something about my beliefs and teaching my kids self-sufficiency and what they can do with their own power... but the #1 thing is quality time with my kids and we see more. For example, if we see a hawk or something we can stop and look. I'm in control of the pace of my life."

Her tips: 1. Always carry spare for cab fare just in case 2. Leave yourself enough time so you don't have to hurry, especially if you are also using buses or traveling with kids 3. Learn how to change a tire

Brian

Excerpt from the Meet Local Commuters page
Appendix 3: Details of Wall Mounted Sign Holder with Removable Inserts

Sample Layout for 11" wide x 17" high Paper Insert

First Floor

- Ambulatory Surgery Unit
- Bone Densitometry
- Cardiology
- EKG Testing
- Emergency Department
- Mammography
- Ultrasound
- Waiting Room

Visit our Burwell Bistro/Cafeteria
Take elevator to the Main Lobby

Artwork created exclusively for: Bassett Little Falls

USA-SIGN
(607) 734-2295 1-800-872-7446

Order #: 52826  Sales Person: Ron Gray Barb Michalko

Approved By:

Date: 5/24/10

Disk: Omega HD
Ithaca College

Date:

Designer: Mary McLaughlin
Appendix 4: Details of Freestanding Sign - Circular Design

16" Diameter, 125 Ga. Aluminum
Disk with .075" Footer
Painted PMS 187 Red Baked Enamel
Satin Finish PAINTED BOTH SIDES AND EDGES
with Antique White Non-reflective Vinyl
Applied to Face (COPY ON ONE SIDE) SINGLE FACED

97-609- 2" Square Post Cap
with Street Blade Holder - 5.5" wide
slot with (2) holes for Fasteners
Painted MAP Black Anodic Baked Enamel
Satin Finish

2" x 2" x 72" Aluminum Tube Post
Painted MP 25639 Clay Basket Brown
Baked Enamel Satin Finish

Stainless Steel Fasteners

to Secure Base Plates
Together

6" x 8" x .250 Base Plates
Welded to Posts
Painted MP 25639 Clay Basket Brown
Baked Enamel Satin Finish

2" x 2" x 36" Aluminum Tube
Below Grade secured in Concrete

NOTE: 2" CONCRETE REVEAL AROUND
ENTIRE PERIMETER OF BASE PLATE

Artwork created exclusively for: Cornell University - 911 Building Address Project

Order #: 48142  Sales Person: Ron Gray
Barb Michalko

APPROVED
By:
Date:

USA-SIGN
(607) 734-2295
1-800-872-7446

Drawing Notes:
Date: 4/13/10
Rev. CU Campus
Numbering Identifiers
## Appendix 5: Budget Detail - Sign Production and Installation

![Quotation Image]

#### Quotation

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**Installation of Items 1-5. There will have to be UFPO dig safety call in completed where applicable. Concrete supplied.**

**Total:** $23,180.00
Appendix 6: Budget Detail - Bus Billboards

2011 Proposal

DATE: Feb
AGENT: Martin Mash

CONTACT: Hobbit

AGENCY/CLIENT: RS Advertising/TC3
lafayeh@tc3.edu

ADVERTISER: tc3

ARTWORK/PRODUCTION: 31 Graphics

START: TBD END: TBD

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</table>

Signature: ______________________ Date: ______________________

Please sign and fax back to Donna @ 607-771-0644.
### Appendice 7: Budget Detail - Illustrations and Graphic Design

<table>
<thead>
<tr>
<th>Jim Houghton/The Graphic Touch</th>
<th>5 Deputron Hollow Road</th>
<th>Brooktondale, NY 14817</th>
<th>(607) 539-7871</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lafayette proposal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHASE I (completed 1/3/2011)</td>
<td>Illustration and design concepts for approximately 25 pages of Bicycle-related outreach materials, covering road safety, biking tips, motorist tips, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial design concepts in rough form, plus some completed illustrations (squirrel, commuting hell, fear of unknown, same road/rights), for use in Hobit Lafaye's thesis development, publication and presentation:</td>
<td></td>
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<td></td>
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<tr>
<td>Phase I total: $1500 (specific publication rights only)</td>
<td></td>
<td></td>
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<td>******************************************</td>
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</tr>
<tr>
<td>Development of finished, print-capable files for use in projects as described in thesis. Includes formatting, finalization of text and designs, preparation of finished illustrations and formatting of provided photos. Does not include any applicable licensing fees for photos obtained by Hobit Lafaye.</td>
<td></td>
<td></td>
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<tr>
<td>Finalizing remaining art: $2250</td>
<td></td>
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<td></td>
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<tr>
<td>Final design, text, formatting: $1600</td>
<td></td>
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<tr>
<td>Phase II total: $3850 (specific publication rights only)</td>
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<td></td>
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<tr>
<td>Phase II total: purchase of all rights, if desired: $4850, plus $508 (sales tax on phase I and II amounts, unless purchased by tax exempt organization)</td>
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</tbody>
</table>
Appendix 8: Job Description

Title: Program Coordinator

Reports to: Executive Director

Overall Responsibility: Coordinate and execute implementation of the Recreate Your Commute project. Develop and implement other agency projects under the direction of the Executive Director and Board of Trustees.

Key Responsibilities:
- Assist in attainment of installation permits
- Consult with various city councils and other agencies
- Facilitate production of exhibit fabrication, posters, and other components of the Recreate Your Commute project
- Responsible for communicating between the graphic designer and sign manufacturer; make recommendations for any needed changes to layout to the Executive Director
- Supervise installation of the exhibits and banners
- Distribute and install posters, signs, and other printed materials
- Collect and evaluate data collected regarding the project impact and effectiveness
- Provide short-term maintenance of the project (rotating changing exhibits, refilling brochure holders, etc.)
- Responsible for managing the project Face Book page and other promotional activities
- Assist with fundraising (identifying and applying for grants, procuring sponsorship with local businesses, etc.)
- Coordinate with and provide referrals to other related programs and agencies (local bike skills classes and workshops, Tompkins County Coordinated Transportation Planning Council, Cayuga Center for Healthy Living, Sustainable Tompkins, etc.)
- Manage the project website (routine updating, responding to questions from site visitors, communicating with server provider, etc.)

Qualifications:
- Bachelor’s degree in transportation, environmental interpretation, health promotion, or related field
- Project management experience
- Excellent problem-solving skills
- Superior written and oral communication skills
- Excellent interpersonal skills
• Creative
• Ability to work independently
• Willing and able to take initiative
• Successful business related experience with social media
• Proficiency with Microsoft Word, Excel, & Dreamweaver
• Passionate about cycling and knowledge of cycling related issues

Terms of Employment:
This is a part-time, temporary position from March 2011-October 2012 with the possibility of becoming full time and/or permanent.

Salary:
$22,000-$25,000 based on education/experience
Appendix 11: Resources for Interpretive Sign Manufacturers and Design Services

Artcraft Display Graphics (Port Coquitlam, B.C., Canada)
www.artcrft.com
Design and interpretive services, sustainable sign and exhibit fabrication

Ashworth Environmental Design (Nashville, TN)
www.ashworthenvironmental.com
Design services and custom interpretive sign fabrication

National Association for Interpretation
www.interpnet.com

Genesis Graphics Inc. (Escanaba, MI)
www.genesisgraphicsinc.com
Standard fiberglass interpretive signs and metal frames/posts

USA-Sign (Elmira, NY)
www.usa-sign.com
Variety of standard and custom sign fabrication
Appendix 12: Bicyclist Evaluation Survey

Ithaca Bicyclist Survey

The Downtown Ithaca Alliance wants to improve facilities, programs, and services for bicyclists. Please help us understand your needs by filling out this short survey. All responses are anonymous. Please return to the DIA, 171 E. State St., PMB#136 Center Ithaca, Ithaca, NY 14850 or fill out the online version at www.recreateyourcommute.com Thank you!

1. How long have you been using a bike for transportation?
   a. Less than 1 month
   b. 1-6 months
   c. 7-12 months
   d. 1-2 years
   e. 3-5 years
   f. over 5 years

2. How often do you ride?  What seasons do you ride?
   a. 1-2 times/month      a. spring
   b. 1-2 days/week        b. summer
   c. 3-4 days/week        c. fall
   d. 5-7 days/week        d. winter

3. Why did you start riding, or what encouraged you to start? (circle all that apply)
   a. Friends/family
   b. Health/fitness
   c. Save on gas
   d. Fun
   e. Environmentally friendly
   f. Convenience
   g. Transportation
   h. Lack of car parking
   i. Recreate Your Commute signs, brochures, and/or website
   j. Other: _____________________

4. Where have you seen Recreate Your Commute information? (circle all that apply)
   a. Street signs
   b. Website
   c. Bus billboards
   d. Brochures/postcards
   e. Haven’t seen

5. Did the content of the Recreate Your Commute…
   Not at all  Somewhat  Significantly
   a. Change your cycling behavior
   b. Increase the amount you ride
   c. Increase your skills
   d. Increase your knowledge
   e. Increase your safety when riding
   f. Inspire/encourage you
   g. Challenge your perceptions
   h. Meet your needs

6. How often Do you…(circle all that apply)
   Never  Occasionally  Always
   a. Ride on sidewalks
   b. Ride on major roads
   c. Ride on quiet streets downtown
   d. Avoid roads without bike lanes
e. Use recreation trails/bike paths 1 2 3 4 5
f. Ride against traffic 1 2 3 4 5
g. Roll through stop signs or traffic lights 1 2 3 4 5
h. Use head & tail lights in low light/at night 1 2 3 4 5

7. How often do you experience…
   a. Dangerous passing by cars 1 2 3 4 5
      Dangerous passing by pickups 1 2 3 4 5
      Dangerous passing by commercial vehicles 1 2 3 4 5
      Dangerous passing by buses 1 2 3 4 5
   b. Intentional sideswiping 1 2 3 4 5
   c. Other aggressive behaviors 1 2 3 4 5
   d. Verbal attacks from motorists 1 2 3 4 5
   e. Being cut off at intersections 1 2 3 4 5
   f. Courteous drivers 1 2 3 4 5

8. What barriers prevent you from riding more? (circle all that apply)
   a. Hills
   b. Weather
   c. Need to transport children
   d. Need to transport cargo (i.e. groceries)
   e. Lack of childcare
   f. Risk/safety concerns
   g. Traffic levels
   h. Aggressive drivers
   i. Lack of shower facilities
   j. Lack of secure, covered bike parking
   k. Lack of bike racks
   l. Lack of bike lanes
   m. Lack of bike boulevards/streets with sharrows
   n. Knowledge level (i.e. route planning)
   o. People to ride with
   p. Skill level
   q. Confidence
   r. Time
   s. Fitness level
   t. Distance to desired destination
   u. Lack of separate bike paths/trails to destinations.
      What destinations? ________________________________
   v. Other:

9. Additional comments regarding your cycling experiences or needs:

10. Please tell us a little about yourself:
    a. Gender ___ male     ___ female      ___ other
    b. Which of the following best describes your race/ethnicity?
       Other, please specify
       American Indian or Alaskan
       Asian or Pacific Islander
       Biracial or Multi racial
       Black - not Hispanic
       Biracial or Multi racial
       Hispanic or Latino/a
       Native
       White - not Hispanic
       Prefer not to respond
    c. Distance to your workplace ______ miles
    d. Education level _____ high school _____ some college _____ college grad _____ Masters or PhD
    e. Area you live in _____ urban (downtown) _____ suburban (1/2-4 miles from downtown)
       _____ rural (more than 4 miles from downtown)
       Name of neighborhood or town_____________________________

Thank you for your participation!
Chapter 5: Discussion

Sustainability is more than simply the wise use of resources to ensure future supply. Ideally, it goes beyond economics to encompass the health and well-being of individuals, communities, and both the natural and built environments. The extensive use of private cars for transportation has had significant detrimental effects on the environment, personal health, land use policies, economics, and quality of life in general. Increasing the use of cycling for transportation has been shown to be instrumental in addressing these issues. Another significant benefit is that it provides mobility and self-sufficiency to segments of the population who may otherwise not be able to meet their transportation needs due to finances, disabilities, or other limitations (e.g. low income families and elders). This project expands current practices for promoting utilitarian cycling by addressing beliefs and attitudes towards cycling, as well as barriers to participation, rather than focusing on infrastructure and policy. This was done through the development of twenty-two interpretive exhibits and a website (www.RecreateYourCommute.com). This chapter provides: 1) summary of procedures; 2) summary of outcomes; 3) conclusions; 4) discussion; and 5) recommendations for future research and application. (I accepted the track changes but don’t know how to remove the underlying and make all the text black)

Summary of Procedures

An extensive review of research related to cycling for transportation and the Theory of Planned Behavior (TPB) was conducted, confirming the need for this project
and to guide its development. Once the theme of the campaign was determined, the next step was the evaluation and selection of installation sites and exhibit formats, since these are integral to content. The topics chosen to address were determined by existing research, informal interviews with Ithaca residents, collaboration with several city councils and departments, and an evaluation of Ithaca’s physical and cultural characteristics. The principles of interpretation were used to create engaging, effective messages. Creation of the preliminary exhibit designs was followed by an evaluation of the concepts and content to ensure the TPB constructs were being targeted. A pilot of the preliminary designs was conducted via FaceBook and email in order to gauge reader reactions and guide final editing of the exhibits. The website and website evaluation survey were designed following the final editing of the exhibits. The procedures concluded with the development of the implementation plan and budget.

**Summary of Outcomes**

This project resulted in the creation of a social marketing campaign comprised of twenty-two interpretive exhibits and a website. The designs were variously targeted at three populations: current cyclists, potential cyclists, and motorists. Development of the material was based the Theory of Planned Behavior to meet the following objectives:

1. Promote awareness of cycling as a feasible means of transportation
2. Promote motorists’ awareness, understanding, and empathy related to cyclists
3. Promote the safety and social acceptability of cycling
4. Provide an easily accessible source of information
5. Aid in the reduction of barriers to participation and increase efficacy

A plan outlining the steps necessary to implement the project was provided, along with an evaluation survey to allow for basic assessment after installation of the exhibits.
The purpose of the website is to bridge the gap between interest/intentions and behavior by providing an easily accessible source of information and resources. The exhibit designs are used as visual cues to guide navigation through the site. The site features links to information by topic, profiles of local riders, a short evaluation survey, and a forum for asking questions and discussing issues related to commuting.

Agencies involved with the project and/or consulted include the Ithaca-Tompkins County Transportation Council (the local Metropolitan Planning Organization, or MPO), Tompkins County Coordinated Transportation Planning council, City of Ithaca Planning and Zoning Department, and the City of Ithaca Transportation Department. At the time of this writing, a sponsoring agency through which the project will be implemented is being sought. One potential agency is the Cornell Cooperative Extension’s “Way 2 Go” program, which is involved with helping residents meet their transportation needs. Others include the Urban Renewal Agency, Ithaca Neighborhood Housing Services, and Sustainable Tompkins.

Expenses related to the development of the project included hiring an illustrator/graphic designer, purchasing the domain name for the website, and hosting of the website. Potential sources of funds to install the project in Ithaca include grants from the Park Foundation, Community Foundation of Tompkins County, Governor’s Traffic Safety Commission grants, and the Alliance for Walking and Biking. Funding could also be sought via a variety of federal health and transportation grants, local businesses, and private sponsors.
Conclusions

The benefits of utilitarian cycling on health, the environment, economics, transportation issues, and quality of life have been well documented (Cavill, 2007; Hanson & Young, 2008; Hillman, 1992; Mathew et al., 2007; Ogilve, Hamilton, & Petticrew, 2004; Ojoa, Vuori, & Petticrew, 1998; Pucher, Komanoff, & Schimek, 1999; Rails-to-Trails, 2010). Providing cycling infrastructure and facilities, as well as adopting policies that discourage private car use and increase the safety of cycling, are necessary to generate a significant modal shift. However, research consistently demonstrates that people also need bike handling skills, basic bike maintenance skills, efficacy, social support, social/cultural acceptance, the ability to overcome related barriers, and to perceive cycling as being relatively safe (Birk, 2010; Gaterslaben & Appleton, 2007; Ojoa et. al, 1998; Pucher et. al, 1999; Unwin, 1995; Wardman et. al, 2007; Wood et. al, 2009). This knowledge determined the objectives of the project and guided the content of the exhibits.

Combining the Theory of Planned Behavior with cultural interpretation techniques provides a framework for the development of interventions designed to generate behavior change. Interpretation is a form of educational communication that goes beyond information by seeking to create a connection between the audience and the subject and inspire further engagement or action. The TPB provides a means of understanding the antecedents of behavior, and therefore reveals how it may be changed. It posits that behavioral beliefs, normative beliefs, and perceived behavioral control combine to create intention, which in turn produces actual behavior. As discussed in Chapter 2, one of the major limitations of the TPB concerns the gap between intentions
and behavior. This confirms the need to not only generate intentions, but also provide the target population with the assistance and means needed to engage in the new behavior. Interventions based on the TPB also need to include a belief elicitation study to ensure understanding and accuracy of the beliefs being targeted in a given population. Finally, while the TPB has been used extensively to understand and predict behavior, less is known on the effectiveness of its application to produce behavior change. More research is needed on this, along with the use of interpretation for such ends. This project is based on the assumption that the TPB and interpretation are in fact effective means to produce change. Whether the change, if any, produced is in attitudes, beliefs and intentions or in measurable behavior has yet to be confirmed through research following implementation of the project. Still, even if the project does not produce significant behavior change, it is likely to “sow the seed” so to speak, thereby increasing interest in and the effectiveness of other measures. The need for multi-faceted and integrated efforts has been emphasized throughout this paper. This project addresses particular aspects needed to instigate a modal shift and is not intended to be used in isolation. As noted above, a pilot of the exhibit designs was conducted to guide their revision and gauge initial responses. The overwhelmingly positive response to both the designs and the project in general demonstrate consensus about the need for such measures.

**Discussion and Implications**

This project firmly establishes the benefits of cycling for transportation and need for additional measures in order to increase use rates. Existing research has demonstrated that utilitarian cycling is instrumental in addressing current public health, transportation, and environmental issues. This is also evident in the numerous cities and nations that
have been successful in generating a significant modal shift. Increasing utilitarian cycling and decreasing use of private cars helps reduce traffic congestion, address lack of urban parking, and decrease air pollution and energy consumption (Hanson & Young, 2008; Ogilve, Hamilton, & Petticrew, 2004). There is direct evidence showing substantial health benefits related to cycling (Ogilve, Hamilton & Petticrew; Ojoa, Vuori, & Petticrew, 1998; Pucher, Komanoff & Schimek, 1999). In short, increasing cycling for transportation has been shown to significantly improve sustainability in all senses of the word, as well as quality of life for individuals and communities.

This project demonstrates the value of the Theory of Planned Behavior and principles of cultural interpretation in efforts to instigate both cultural and behavioral change. The utility and success of these models lie in their being rooted in ethnocentrism. The development of interventions based on the viewpoint of participants contrasts the more common practice of programs being rooted in the agency’s external perspective. This project also expands and augments current practices of promoting utilitarian cycling, which are largely focused on infrastructure. Finally, it provides an example of how the powerful tool of media can be used as a means to provide information and encourage action on certain complex social issues.

Social marketing has been highly successful in influencing cultural norms in efforts to change certain behaviors, such as smoking and drunk driving. Several countries throughout the world, especially Australia, are currently using this method to reduce cell phone use and texting while driving. While its tenets share certain qualities with interpretation and the Theory of Planned Behavior, it fails to fill the gap between beliefs/intention and actual behavior. While this gap is very small or even non-existent
for some behaviors, such as texting while driving or wearing seatbelts, it is gaping for others, including utilitarian cycling. The “Recreate Your Commute” project reveals means by which to fill the gap. Going beyond attitudes and social norms by addressing barriers, skills, and efficacy (re. constraint negotiation and implementation planning) greatly increases the chance of producing actual behavior change involving behaviors with complex factors.

This project is highly applicable to locations beyond Ithaca, New York. Chapter 2 provides a strong argument for doing so that can be used to generate support, while Chapter 4 serves as a handbook for implementation. Using largely permanent freestanding exhibits ensures the project will require little ongoing financial and staffing support while reaching large numbers of the target populations. The project’s ability to be replicated is enhanced by its ability to be implemented on a smaller scale, such as by using only posters, banners, and/or print advertisements instead of the more expensive relatively permanent freestanding exhibits.

Recommendations

Research suggests this project needs to be implemented in conjunction with related programming (e.g. basic bike repair workshops, commuting skills workshops, health promotion programs, shower and secure bike parking facilities, and transportation related services) in order to maximize its effectiveness. These should include workshops, group rides, and social support specifically for women. Efforts were made to consider underserved populations (e.g. non-Caucasians, low income families, and elders). For example, a dog was chosen as the project mascot in an attempt to keep the designs as gender and racially neutral as possible. However, more improvement is needed in this
area since various subcultures are likely to have beliefs and constraints not shared by the
general population, and therefore not addressed in this project. Finally, it is
recommended that programs for parents, children, and teenagers, such as Safe Routes to
School, as well as messages targeted at these populations, be developed since it has long
been recognized that most types of cultural change take at least one generation and it is
easier to change young minds than older ones.

While the project is highly replicable, the stages of change model, along with
other research, suggest it would be most effective in areas that already have a generally
more positive attitude toward cycling and/or high interest in sustainability (i.e. “green”
cities). This could be investigated from research comparing results between various
locations, including rural/urban/suburban areas around the country. When evaluating
research on a single location, an analyses should be conducted to determine if there are
significant correlations between responses and race/ethnicity, age, size of city, category
of residence (i.e. suburban, downtown, rural), and other possibly related factors.

The project includes an online evaluation survey. Ideally data would be collected
before and after installation of the exhibits, signs, and bus advertisements. A survey
could also be developed to evaluate the individual exhibits. This would provide feedback
on the effectiveness of specific messages, as well as not being dependent upon
implementation. It is well known that long surveys tend to be daunting and reduce
response rates. One way to approach such research would be to group the designs
according to their intended target audience (motorists, current cyclists, and potential
cyclists) and present with a maximum of five questions such as:

1. What is most striking about the sign?
2. Did it increase your knowledge? (use a likert scale)
3. Did it change your perceptions? (Likert scale)
4. How likely are you to take further action? (Likert scale)
5. What action(s) are you likely to take? (Possible choices: go to the website, start using your bike for transportation, ……)

An open-ended question or space for additional comments should be provided at the end of the survey or interview. Demographical information collected should include age, race/ethnicity, education level, gender, if they ever use cycling for transportation (with a follow-up question of how often and how far), and if they have any type of disability or other challenges. Research should also include measuring cycling rates before and after implementation.

Given that increasing the real and perceived safety of cycling is instrumental in increasing use, more research is needed on motorists’ attitudes and behavior. Use of Azjen’s format for belief elicitation studies is recommended. If negative attitudes and behavior of drivers are better understood, then programs are likely to be better equipped to address safety issues related to road sharing caused by these attitudes. Of particular interest to the author is whether these attitudes are consistent across cultures or specific to certain social characteristics. This could be studied by administering surveys in two or more nations, such as the United States and Australia. Another interest is to understand animosity towards cyclists and the development of cycling infrastructure. For example, while motorists’ road rage towards other drivers tends to be isolated to the particular situation, road rage towards cyclists tends to be applied towards all cyclists regardless of the current situation and the result of only one, or at least a limited number of, negative
incidents\textsuperscript{13}. No other form of transportation, or recreation for that matter, generates such vehement, and frequently enraged, responses.

References


Lorenc, T., Brunton, G., Oliver, S., Oliver, K., Oakley, A. Attitudes to walking and cycling among children, young people and parents: a systemic review. *Journal of Epidemiology & Community Health, 62*(10), pp.852-857.


