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Why Complete Streets?
1-1. Problem Statement

Prior to World War II, traditional towns were built on a human scale and pedestrian-oriented. Because traditional towns were dense and compact, residents could easily walk from homes to shops, schools, jobs, and centers of business without the need to drive in a car. Several factors contributed to the demise of walkable environments in the United States. First, suburban home ownership became more convenient with Federal Housing Administration–backed loans coupled with Veterans Administration loan guaranties for veteran’s home ownership. Second, the passage of more stringent environmental regulations made development in outlying areas more expedient than urban renewal and redevelopment. Third, the financing of the interstate highway system promoted sprawling, car-oriented land use patterns. As a result, there have been fundamental changes in the way that land use is regulated, communities are designed, and the degree to which built environments are mobility-friendly and accessible.

In the past 50 years, decentralized and automobile-dependent development patterns have become the norm. While suburbia has become home for millions of Americans, it has altered land use–planning practices, the physical design of our communities, and modes of transportation. Many communities lack connectivity, non-motorized transportation choices, and walkable/bikable infrastructure. Transportation planning, policies, and investment strategies, have favored automobiles over other forms of travel. Compartmentalized, built environments have limited opportunities for active recreation, transportation options, and access to healthy foods. Inactivity and sedentary lifestyles have contributed to the rise of chronic obesity and related diseases. Strip malls and “big box” centers have diminished the economic vitality of many central business districts (CBDs), once the hub of economic activity. Sprawling development patterns have become costly and unsustainable.

1-2. Consequences of an Unbalanced Transportation System

Decades of auto-centric transportation investment, auto-oriented land-use policies, and sprawling development patterns have led to an unbalanced transportation system. Consequences of an unbalanced transportation system include segregated zoning uses, impacts to community livability, safety problems, issues of transportation equity, economic degradation, environmental concerns, and disconnected transportation networks, which are explored further in this section.
1-2-1. Continued Cycle of Automobile Dependency

Until the mid-20th century, traditional American towns and cities evolved from walkable, mixed-use neighborhoods that contained homes, stores, and places of employment. In the age of dominant suburbia, zoning regulations have become the primary strategy to regulate land use and separate residential uses from incompatible industrial and commercial land uses. This physical segregation of where people live and work, along with a preference for low-density suburban development, has created a dependency on the automobile as a primary means of travel. The below “Cycle of Automobile Dependency” illustrates this continuous pattern of increased vehicular travel, reduced travel options, and both transportation- and land-use policies that are more transportation-oriented (Victoria Transport Policy Institute [VTPI], 2010).

In addition to reinforcing automobile-oriented transportation and land use planning, segregated land-use patterns place a strain on the transportation infrastructure and limit mobility options for residents. Dispersed suburban-development patterns have increased automobile ownership and reduced the use of other transportation options (VTPI, 2010). Because more people are driving to daily destinations that are no longer within walking distance, many local government land-use plans and policies have been adopted that unintentionally support an auto-based culture and sprawl. Local ordinances often favor low-density development, discourage walkability, and impede the development of transit- and pedestrian-friendly environments (Maryland Office of Smart Growth, 2005). As a result, this cycle of automobile dependence has led to a transportation system that is increasingly unbalanced, costly, and promotes inaccessible and dispersed land-use patterns.
1-2-2. Lack of Transportation Choice

Prior to auto-centric land-use patterns, people had the ability and tendency to walk. However, after decades of building car-oriented roadway networks, many streets lack connectivity and do not safely accommodate pedestrians or bicyclists. According to a 2010 Future of National Transportation survey, the vast majority of American voters polled (82 percent) would like an expanded and improved transportation system that includes access to public transportation, safe walking, and biking opportunities. In addition, nearly three-fourths of those polled (73 percent) feel that they have no choice other than driving, and 78 percent of them (57 percent of all survey respondents) would rather spend less time in a car. Finally, most survey respondents (59 percent) feel that providing more transportation options will make it easier to take public transportation, walk, and/or bike—thereby helping to reduce traffic congestion (Transportation for America, 2010). Developing a balanced transportation system, with a variety of safe and non-motorized options, can alleviate barriers to transportation choice.

1-2-3. Increasing Prevalence of Obesity

Obesity is both a nationwide issue and a problem affecting the health of the next generation of Delawareans (Rodriguez, 2009). According to the Centers for Disease Control and Prevention (CDC), over one-third of the U.S. adult population and 17 percent of American children are now obese (CDC, n.d.). According to the Delaware Division of Public Health, approximately 36 percent of Delaware adults are overweight, but combined with obesity, about 63.8 percent of Delaware adults are either overweight or obese. In addition, about 52 percent of adult Delawareans have insufficient or no physical activity (Rattay 2010, 13). Childhood obesity in Delaware is on the rise—approximately 37 of Delaware children are obese (Nemours, 2010). A neglect of community-design principles, lack of walkable or bikable infrastructure, and compartmentalized built environments have led to less active lifestyles and automobile dependency.

Lack of walking is contributing to increased risk of obesity (I-Min Lee, 2008). A recent study suggests that neighborhood socioeconomic conditions and unfavorable built environments can increase the odds of childhood obesity. Contributing factors that were cited include unsafe surroundings; poor housing; and no access to sidewalks, parks, and recreation centers (Singh et al., 2010). Yet another issue is the decline in the numbers of children walking to school—from 50 percent in 1969 to 13 percent in 2004 (Zick, 2009). Researchers now believe that efforts to improve aspects of the built environment, including transportation choice, will positively influence physical activity levels and community livability, which will lessen obesity.

1-2-3. Unsafe Roadways

The American Association of State Highway and Transportation Officials (AASHTO, 2010) published its first “Green Book” on roadway design in the late 1930s. With the growth of America’s interstate highway system, transportation engineers embraced a “bigger is better” philosophy—equating wider roads with better roadway safety. While the intent of the Green Book was to provide flexible road-design guidelines, many engineers narrowly interpreted
the document as a manual that set forth rigid national standards for all road widths, alignments and other traffic safety features (Federal Highway Administration 2004, 27-29).

The lack of safe and convenient travel choices has made roads unsafe for pedestrians and bicyclists. Developing a pedestrian- and bicycle-friendly environment underscores the need to design, engineer, operate, and maintain safe infrastructure for non-motorized transportation. According to the National Complete Streets Coalition, “Streets without safe places to walk, cross, catch a bus, or bicycle put people at risk. Over 5,000 pedestrians and bicyclists died on U.S. roads in 2008, and more than 120,000 were injured. Pedestrian crashes are more than twice as likely to occur in places without sidewalks; streets with sidewalks on both sides have the fewest crashes. While the absolute numbers of bicyclists and pedestrians killed has been in decline for the decade, experts attribute this in part to a decline in the total number of people bicycling and walking” (National Complete Streets Coalition, 2010).

According to a Dangerous by Design 2011: Delaware report, 171 pedestrians were killed on Delaware roadways between 2000 and 2009. Most of these fatalities occurred on roadways that are dangerous by design—engineered to move more vehicles more quickly with little regard for the safe transportation of pedestrians, bicyclists, persons with mobility impairments, or transit users (Transportation for America, 2011). In 2009 pedestrian deaths accounted for 12 percent of all traffic fatalities nationwide. Delaware ranked 15 among states for the highest percentage of pedestrian fatalities in traffic crashes in 2009—an improvement from its 8th-place ranking in 2003 (NHTSA, 2009).

Most roadways lack special on-street facilities for bicycling. In addition to conflicts with drivers, hazardous conditions for bicyclists include poor road maintenance and surface irregularities, such as drainage grates, railroad tracks, potholes, utility covers, gravel, wet leaves, and uneven pavement joints (Pedestrian and Bicycle Information Center, n.d.) Nationwide, bicyclists account for about two percent of all traffic fatalities (NHTSA, 2009). Delaware’s rate of bicyclist fatalities, unfortunately, is the highest among all 50 states, Washington, D.C., and Puerto Rico. Pedacyclist fatalities in Delaware accounted for 5.2 percent of all traffic fatalities in 2009 (NHTSA, 2009). Implementation of complete streets strategies may help to lessen the rate of pedestrian and bicyclist traffic injuries nationwide and in Delaware.

**1-2-4. Lack of Transportation Equity**

Nearly one-third of Americans do not drive. This includes 21 percent of Americans over 65 years old, youth under the age of 16, and individuals who do not own cars or are unable to drive. Mobility-constrained and special-needs populations—including the elderly, those with disabilities, zero-car households, low-income, minority, and low-literacy—face substantial challenges and transportation inequities in a car-dominated culture. WILMAPCO’s 2009 Transportation Equity Report notes, “Weak transit and non-motorized funding (in step with decades of highway-favorable land-use decisions) has resulted in a transportation system that all too often does not meet the needs of environmental justice residents” (WILMAPCO 2009, 10).

Sidewalk design and maintenance that is not compliant with American with Disabilities Act
of 1990 (ADA), is especially problematic for special-needs populations, including older adults and persons with disabilities. Specialized transportation options, such as paratransit, may be available but are often costly to operate and/or have service limitations due to policy constraints. Low-income-household car owners also face additional financial hardships because they pay proportionally more for car-related expenses and maintenance (Littman, 2010). Transportation-equity issues may be addressed by developing transportation policies and financing a balanced transportation system that increase investment in public transit and non-motorized-transportation options, and promote land-use practices that encourage compact, mixed-use development.

Even when multimodal transportation options are available or appropriate infrastructure exists, poorly maintained transportation infrastructure may also cause transportation-equity issues. Incomplete, inaccessible, or improperly maintained sidewalks (including curb cuts), bike lanes, and transit shelters/stops can prevent or limit use by non-motorized travelers. Overgrown vegetation, uneven surfacing, obstructions, debris, improper snow and ice removal, and lack of access in construction zones can all limit mobility by pedestrians and bicyclists.

1-2-5. Poor Air Quality

Scientific evidence points to the emissions of carbon dioxide and other greenhouse gases (GHG) from human activities as a major cause of environmental problems and global warming. In the United States alone, 28 percent of GHG emissions are attributed to motorized transportation (National Complete Streets Coalition, 2010). This number will continue to rise unless other means of transportation are viable and accessible. Among the strategies to lower transportation-related emissions is to promote the modal shift away from short, local car trips to travel by foot, bicycle, or public transit. These environmentally friendly, alternative modes of transportation could substantially decrease greenhouse gases and substantially reduce pollution.

1-2-6. Sprawling Development Patterns

Sprawling development is costly and unsustainable. Sprawl is characterized by low-density development, dispersed land-use patterns, and automobile-dependent travel. Negative consequences of sprawl include increased travel time, greater travel distances, and more traffic congestion. According to the 2010 Urban Mobility Report, traffic congestion is a problem that continues to grow. While the economic recession resulted in a slight two-year decline in overall traffic congestion, this trend was short-lived. Congestion continued to increase as the economy improved in 2009. Costs of congestion also continue to grow. In 2009 urban Americans traveled 4.8 billion hours more and wasted 3.9 billion gallons of fuel.
sitting in traffic at a congestion cost of $115 billion. Traffic congestion also cost commuters an average of $808 and over 34 hours in traffic delays. In the Philadelphia metropolitan area (Pa.-N.J.-Del.-Md.), each commuter in 2009 experienced an average of 39 hours in traffic delays and wasted 30 gallons of fuel at a congestion cost of $919 (Schrank and Lomax, 2010).

The report recommends several balanced and diversified approaches to reduce congestion. Among the potential congestion-reducing strategies suggested, which are compatible with the complete-streets philosophy, are providing greater transportation choices and diversifying development patterns. The report states that gains in mobility, economic activity, and quality of life can be achieved in part through “denser developments with a mix of jobs, shops and homes, so that more people can walk, bike or take transit to more, and closer, destinations (Schrank and Lomax, 2010, p. 11).

1-2-7. Disconnected Social and Transportation Networks

Healthy, active communities provide built environments that support social interaction and daily physical activity. The layout and design of streets has a major impact of the walkability of a community. Traditionally, streets were designed follow a pattern of grids and blocks with multiple points of entry and connections. Traditional grid street layouts provide short and convenient walking distances between a point of origin (A) and destination (B), as illustrated in the left side of the figure below.

The layout of contemporary streets in a typical suburban community is quite different. As illustrated in the right side of the figure below, contemporary street layouts are often curvilinear, contain single or very few points of entry, and have dead-end cul-de-sacs. Simple trips are no longer within walking distance and now require an automobile trip to travel between a point of origin (A) and destination (B) in a suburban community. The disconnected, sprawling nature of streets and communities makes walking, biking, and using public transit inconvenient, inefficient, and impractical. Research suggests that not only does better roadway connectivity improve accessibility and reduce vehicle travel distances, it also serves an important predictor of the choice to walk (VTPI, 2011). In addition, a growing body of health and policy research indicates that street connectivity, along with neighborhood density, affect walking behavior and degree of physical activity (Oakes et al., 2007).