3 Health Effects of Land Use and Transportation

Walkable communities offer opportunities for a much healthier lifestyle than automobile-oriented developments. The air is less polluted, the accident rate is lower, and people living in walkable communities maintain a higher degree of physical fitness simply because they can get around on foot or bicycle. Living in automobile-oriented communities denies people the most basic form of exercise.

The social health of communities is no less a concern than the physical and mental health of individuals. A general lack of sense of community is one of the most common complaints people have about the automobile-oriented pattern of development. Typical suburban residential zoning segregates people into homogenous neighborhoods with little intermingling of classes or age groups. The result is that many of us do not understand, or even fear, people only slightly different from ourselves. The lack of a physical focus in suburban areas contributes to this lack of community. Main streets and town squares are essential to the function of communities. Shopping malls and supermarkets have replaced the commercial functions of the town center, but important kinds of social interaction no longer occur.

3.1 Heart disease

Coronary heart disease is the leading cause of death in developed Western countries. Regular exercise, along with a balanced diet and not smoking, is known to prevent heart disease. Walking is the most accessible form of exercise and benefits people of all ages. Regular exercise increases fitness in the short term, and in the long term it limits obesity, strengthens the heart muscle, reduces blood pressure, reduces circulating LDL cholesterol, and improves insulin sensitivity (Morris and Hardman, 1997; cited in McCarthy, 1999).

The protective effects of regular moderate exercise have been well documented. For example, one study of men in the 56–75 age range related the amount of time each walked every day to the risk of death after four years. The risk for a man who did not walk at all was set at 1.00, and the results were adjusted for average life expectancy for the ages of the subjects. The table below illustrates how risk decreased as the amount of exercise increased (Wanamethee et al., 1998; cited in McCarthy, 1999).

Exercise limits the progression of osteoporosis (loss of bone density, which leads to hip and arm fractures, especially in older women). Considered at the population level, regular exercise is probably more effective than expensive drug therapies in protecting against osteoporosis.

Daily Walking and Risk of Death in Older Men

Regular daily walking (min/day)	Age-adjusted relative risk* (men >60 years of age)
0	1.00
<20	0.99
21–40	0.85
41–60	0.76
>60	0.52

* Relative risk (RR) measures the strength of association between exposure and outcome. The further RR is from 1, the stronger the association. Here, men who didn't walk at all were not protected at all (RR=1.00), while the risk for those who walked decreased (RR<1.00) as the amount they walked increased. In this population, men over 60 who walked >1 hr every day were nearly half as likely to die four years later.

Sitting in heavy traffic would have the opposite effects. Not only are the benefits of walking foregone, but increased commuting times reduce time available after work for recreational activities. Blood pressure increases from activation of the sympathetic nervous system (the "fight-or-flight" response, grossly apparent in episodes of road rage). We have barely begun to assess the long-term impacts of daily exposure to this risk-promoting situation, but significantly increased morbidity and mortality from heart disease is one probable outcome.

We do have strong evidence of an alarming upward trend in obesity among Americans that cannot be accounted for by increased food and calories alone. Americans are also getting less exercise than they need. Car-dependent lifestyles may be responsible, and the Centers for Disease Control is planning a scientific study of this relationship. A strong correlation will provide yet another reason for urban design and transportation planning to include alternatives to automobile-dependent lifestyles (Montgomery, 2001).

3.2 Mental health

Exercise benefits mental health by stimulating mental activity (the "mind–body connection") and relieving depression. Recent studies have shown that for some patients regular exercise is as effective as antidepressant medication. Traffic tends to separate parts of the community from one another. Streets with less traffic are conducive a better quality of life for their residents.

A gradient in social contacts was found for people living in a single San Francisco neighborhood with different traffic intensities: as traffic increased, social contacts decreased (British Medical Association, 1997, cited in McCarthy, 1999). While social contacts may seem inconsequential, they can have important effects on mental health and mortality (House, 1988). A U.S. study found a link between high levels of social contact and low mortality rates in people aged 50–59 (Berkman and Syme, 1979, cited in McCarthy, 1999). Face-to-face contact is a prerequisite for mental health, yet car dependence severely limits chance encounters.

3.3 Respiratory disease

Vehicle emissions contain a variety of pollutants. Many are damaging to human health, notably nitrogen oxides, sulfur dioxide, carbon monoxide, and hydrocarbons. These pollutants have been linked to a variety of respiratory conditions, including increased sensitivity to allergens and bacteria, reductions in lung function, exacerbation of asthma, and lung cancer. According to Mark Delucchi, associate research ecologist with the Institute of Transportation Standards at the University of California at Davis, vehicle-related air pollutants cause 20,000–40,000 cases of chronic respiratory illness and 50–70 million respiratory-related restricted activity days annually.

Ozone is formed when nitrogen oxides and hydrocarbons react in the presence of sunlight. Vehicle emissions are the primary emitters of these source compounds. Changes in pulmonary function and various respiratory symptoms have been documented in healthy individuals engaging in normal exercise and activities during times of peak ambient ozone concentrations.

Those who are particularly sensitive to ozone toxicity are at greater risk, including children (who breathe more air per unit of body weight than adults), the elderly, and asthmatics. The American Lung Association rates the Raleigh/Durham/Chapel Hill metropolitan area as 11th worst in the nation for ozone pollution, despite being only the 44th most populous metropolitan area (American Lung Association, 2001).

3.4 Accidents

Driving itself can be a serious health hazard. Approximately 45,000 people die in cars on America's roads each year, or one out of every 50 deaths. In the 15–24 age group, about 1 in 3 deaths is a road death (National Vital Statistics Reports, 2001). In automobile-dependent areas, the few people who attempt to walk someplace put themselves at great risk, as these areas are designed with little concern for pedestrian safety. Risk to pedestrians rises exponentially as vehicular traffic speed increases: nearly 85% of pedestrian deaths involve collisions where the vehicle was travelling more than 30 mph (Finch et al., 1994, cited in McCarthy, 1999). Walking, cycling, and public transit are inherently safer forms of transportation; promoting them and reducing car use will reduce accident rates.

3.5 Conclusion

Transit policy can promote health by giving the highest priority to walking, cycling, and public transport. These modes promote health, reduce risks, and are sustainable. From a public health perspective, cars are our fourth addiction, after smoking, alcohol, and drugs (McCarthy, 1993, cited in McCarthy, 1999). A transportation system based on cars alone is detrimental to public health. The transition to a car-free society, or at least car-free urban regions, is likely to be a protracted process, much like the battle over cigarette addiction and use.

Change must take place in four areas:

- People must be informed of the health impacts of transportation policy;
- National and state boards of transportation and boards of health must work together more closely;
- Local governments must implement healthy transit policies as part of an integrated, multifaceted approach to planning the entire infrastructure of communities; and
- Local health departments must be involved in transportation planning in order to protect the public's health, especially the health of the more vulnerable elements of society.

When given a choice, people will opt to live in communities that preserve open space and promote alternatives to automobile transportation. Compact cities that minimize vehicle travel and encourage walking, cycling and public transit are healthy and desirable places to live.

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NC 54 at Glen Lennox, Chapel Hill, North Carolina