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Encouraging Active Transportation: Highlighting the Benefits of Active Transportation

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Abstract

Active transportation refers to any form of human-powered transportation, such as walking, cycling, or using a skateboard or scooter. It is a relatively new term but one that has been gaining support over the past decade as an alternative to "-motorized transport" (MT). Active transport is not only healthy on the individual level but also carbon-neutral, cheap and more space-saving than other modes of transport. Despite its advantage, the share of active transportation in the modal split remains low, and it is paramount to increase active transportation to achieve a higher quality of life. Active transportation can solve the problem of physical inactivity and improve mental fitness. All-cause mortality and cardiovascular risk are lower among groups who use active transportation. Shifting travel to active modes provides relatively large pollution reduction benefits because it reduces short urban trips with relatively high emission rates. Active transport can provide relatively large energy savings if used for short urban trips that have high emission rates per mile due to cold starts and congestion.

Keywords: *Active Transportation, Physical Activity, Health benefits, Pollution)*

1. Introduction

Road planning and design that cater to motorized vehicles have detrimentally impacted air quality, greenhouse gas emissions (GHGs), road injuries and fatalities, congestion, and equity. These problems will only be exacerbated if a meaningful shift to sustainable transport is achieved. Active mobility—which refers to walking, cycling, wheelchair users or other light device users, and other modes such as scooters and e-bikes— provides the lowest emissions of all forms of transport. These modes equip people with active lives that bring health, social, and economic benefits. However, walkers and cyclists are the most vulnerable to road injuries, given the lack of safe infrastructure and speed management protecting them from motor vehicles (12).

As urbanization continues to increase rapidly, cities will face numerous challenges regarding transportation and sustainability. One key solution gaining momentum is the integration of active transportation into urban planning (11).

Promoting active mobility is becoming a popular policy measure at the urban level across Europe. The take-up is – however- not as fast as transport and urban planners would hope. The resistance of the 'private car' mobility paradigm, the preference for using private cars even for short trips, is still strong (13**).**

1.2 Problem Statement

Active mobility, that is. walking and cycling have the potential to tackle several societal challenges regarding quality of life effectively **(**14). Both non-motorized forms of transport are not only healthy on the individual level, as the WHO's Health Economic Assessment Tool demonstrates (14). They are also carbon-neutral, cheap and more space-saving than other modes of transport **(**14). Still, the share of walking and cycling in the modal split of many cities is comparatively low, and it is paramount to increase active mobility to reach climate goals and achieve a higher quality of life in cities **(**14**).**

Despite the numerous benefits, integrating active transportation into urban planning has its fair share of challenges. Some of these challenges include:

Infrastructure Gap: Many cities lack proper cycling infrastructure and accessible pedestrian routes. This discourages individuals from using active transportation modes for daily commuting.

Safety Concerns: Safety is significant for pedestrians and cyclists, particularly in areas with high traffic volumes and inadequate infrastructure. Addressing safety concerns is crucial to reduce accidents and build trust among users.

Resistance to Change: Shifting from a car-centric mindset to one that prioritizes active transportation can be met with resistance from some community members or businesses, who may perceive it as a threat to their interests **(**11**).**

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Highlighting the benefits of this mode of transport can encourage individuals to switch to its usage and authorities to develop strategies to promote its use.

2. Literature Review

Active transport is a relatively new term that has gained support over the past decade as an alternative to "non-motorized transport" (NMT). Walking and cycling are the main transport modes within the active transport cluster. However, this paper focuses on articles, journals, publications, and reports thatassess the benefits of using active transportation, policy outcomes and benefits related to these travel modes (15).
Transport significantly impacts population health–it directly affects injury rates and air pollution and indirectly influences physical activity and health impacts from climate change. Reducing car use and increasing active transport is expected to improve health at the city level, nationally, and internationally. Transport is a necessary part of urban citizens' everyday life. Walking, cycling, and public transportation are easy, popular, and feasible approaches for promoting physical activity. Active transportation requires urban citizens to engage in physical activity and be mobile to reach their destination. The energy expenditure of active transport was estimated to be 3.5–6.8 metabolic equivalents of task (METs). Compared to active transportation, citizens who engage in inactive transportation might have lower levels of physical activity and longer SB, including driving a car, riding in a private car, and riding a motorcycle (5).

2.1 Research Objectives

This study aims to assess the various advantages of active transportation at the individual, societal and community levels.

2.2 Research Questions

The following research questions guided this study:

1. What are the health advantages of active transportation for individuals across different age groups and demographic backgrounds?
2. How can Active transportation solve the environmental problem of vehicular emissions?
3. What are the economic benefits of active transportation?

3. Methodology

This paper examines the benefits of active transportation. Key terms such as active mobility, transportation, benefits of active transport, pollution, and congestion were used to identify the relevant information needed for the paper. Databases such as Google Scholar, PubMed and Web of Science were used to retrieve the necessary information.

4. Results

Below is a narrative approach to summarize the findings in the literature-related work in this area. The findings were categorized into health, environmental and economic benefits.

4.1 Health benefits

The 1996 US Surgeon General's Report represented a shift in thinking about the health benefits of physical activity. Its recommendations highlighted the need for an adequate amount of exercise rather than focusing on the intensity of physical activity. The report concluded that 30 minutes of moderate activity most days of the week, even if completed in 2-3 bouts of activity per day, was sufficient to achieve significant health benefits. This recommendation paved the way for the promotion of active transportation. Active transportation allows individuals to incorporate moderate-intensity activities (such as brisk walking or cycling) into their daily routines. It is a more sustainable long-term than structured activity programs (e.g., running or going to the gym), yet with similar health benefits **(**1).
All-cause mortality, disease-specific mortality, and cardiovascular risk are lower among active transportation groups (1, 2**).** Woodcock and colleagues modelled the public health impact of significant increases in active transportation in London and Delhi by 2030 (the future scenario analysed considered twice as much walking and eight times as much cycling as now). They estimated that premature deaths in London would decrease by 528 per million people due to the health benefits of active transportation, which corresponds to a reduction of 5,496 years of life lost per million population (1).
In addition to mortality, PA also reduces the incidence of a wide range of morbidity endpoints, especially coronary heart disease, stroke, hypertension, and type 2 diabetes; physical activity is also associated with significantly lower rates of colon and breast cancer, as well as improved mental health **(**4**).**
Active transportation is essential for children's physical and social development **(**5**).** Children are particularly vulnerable to vehicle pollution illnesses and traffic crash injuries. An increasing portion of children are overweight and insufficiently active.
Walking and cycling give children independence that contributes to their social and psychological development, and children's travel patterns can create lifelong habits: children who walk and bicycle are more likely to use these modes as adults. Also, physical activity improves learning in children, and bicycle commuting is linked to higher levels of mental health in commuters compared with their colleagues commuting by car (16). According to a report in 2016 on the Economic and Health Benefits of Bicycling and Walking, a 10% increase in bicycling and walking would prevent an additional 30-40 deaths per year and lead to $258-$387M in annual health savings to the state while a 30% increase could equal up to $2 billion in health savings to the state (16).
Therefore, switching short trips to walking and cycling would have positive health impacts, reduce healthcare costs, and reduce greenhouse gas emissions **(**9**).**

4.2 Environmental Benefits

The share of the global CO2 emissions attributable to the transport sector is increasing steadily while the level of motorization is rising rapidly in developing countries **(**3**).**

Motor vehicles are major contributors to air, noise and water pollution. Such emissions probably cause a similar number of premature deaths as traffic crashes. Shifting travel to non-motorized modes provides relatively large pollution reduction benefits because it tends to reduce short urban trips, which have relatively high emission rates, so each 1% of automobile travel replaced by walking and cycling is estimated to reduce motor vehicle emissions by 2% to 4% **(**5**,** 7, 10**).**

Motor vehicles produce and consume large amounts of natural resources, particularly energy such as petroleum and coal. This consumption imposes various external costs, including economic and national security impacts from dependence on imported petroleum, plus environmental and health damages from pollution. As a result, resource conservation can provide various benefits. Active transport can provide relatively significant energy savings if it substitutes for short urban trips with high emission rates per mile due to cold starts (engines are inefficient during the first few minutes of operation) and congestion. As a result, each 1% shift from automobile to active travel typically reduces fuel consumption by 2-4%. In addition, active transport tends to have leverage effects, so comprehensive programs to improve walking and cycling can provide additional energy conservation benefits. Petroleum consumption external costs are estimated to be 1-4¢ per vehicle mile, although possiblymore to account for all environmental costs associated with petroleum extraction. Relatively high values are justified because non-motorized travel substitutes for short urban trips in which motor vehicles are fuel inefficient due to cold starts andcongestion (7).

In a similar), a high modal shift scenario modelled by the Institute for Transportation and Development Policy (ITDP) found that if urban passengers' use of bikes and e-bikes were to increase to 11 per cent by 2030 and 14 per cent in 2050, energy use and carbon emissions for urban transport would be reduced by seven per cent in 2030 and 11 per cent in 2050. Under this scenario, the high uptake of cycling and e-bike use would save the world USD 6 trillion between 2015 and 2030 and USD 24 trillion between 2015 and 2050. The enabling factor behind the feasibility of such striking changes in travel behaviour is that most trips made in urban areas are under ten kilometers, a distance quickly cycled, especially when safe infrastructure is present. Also, providing more pedestrian walkways to support and encourage active travel will reduce air pollution in urban centres. For instance, city centres in Spain have been pedestrianized since 1999, resulting in a 70% decrease in carbon dioxide emissions **(**6**).**

4.3 Economic benefits

Three major types of economic impact potentially arise from active transportation interventions.

1. The flow-through of health co-benefits through the broader economy reduced mortality and morbidity costs. Cavill et al. did a meta-review of active transportation economic evaluations and noted that most studies considered the value of and cost savings from population mortality reductions, but few considered morbidity reductions (2).

2. Nonhealthy impacts that arise from an intervention, e.g., reduced air pollution from reduced automobile trips due to mode shift away from the car to cycling and walking. Such benefits are not health co-benefits but are other effects of any means which deliver increased active transportation. Mode shift is often the largest provider of such benefits. Some of these non-health benefits have health co-benefits, e.g., reduced auto emissions, which deliver both climate change improvements and potential reductions in the millions who currently die worldwide due to air pollution **(**2**).**

Some of the major categories of economic benefits include motorized vehicle operating cost reductions, roadway congestion reduction (due to reduced number of automobiles on the roads), roadway cost savings (reduced wear and tear on infrastructure), parking cost savings, road safety impacts (reduced accidents from less vehicle traffic)

energy conservation (due to fewer vehicle- kilometers travelled), vehicular pollution reduction (e.g., lowered auto exhaust emissions and noise), climate change benefits (from lowered greenhouse gas emission.), increased personal security—perceived and actual amenity benefits (user appreciation and enjoyment from walking and cycling), increased accessibility (the range of locations and activities expands) and mobility increases (the ability to move around is expanded**) (**2**).**

3. Potential broader 'productivity' effects driven by improved health. For example, healthier workers may produce more per work hour than less healthy ones. Even after measuring intervention health co-benefits, monetized direct and indirect cost savings, and non-health benefits, there may still be additional effects on overall economic productivity, e.g., the increased labour productivity increases and more hours on the job due to reduced sick leave. This is a separate and additional benefit besides any reduced costs from sickness and disability. **(**2**).**

The table below shows that costs are heavily outweighed by the benefits of investing in active travel.

Table 1. Costs and benefits of an intervention to increase cycling and walking.

Cost	Health and injury benefit	CO2 reduction benefits
$15 million	$163.6 million	$2.6 million
$14.1 million	$153.1 million	$2.1 million

5. Discussions

According to the literature review, active transportation has numerous benefits, and they were grouped into three categories which are:

Health benefits. Under this category, Active transport such as walking and cycling, has been shown to have several health benefits, including reducing the risk of mortality and morbidity from various diseases. It is also crucial for children's physical and social development. Switching short trips to walking and cycling would have positive health impacts, reduce healthcare costs, and reduce greenhouse gas emissions.

Economic Benefit. Under this category, three major categories of economic benefit were identified, which are the flow- through of health co-benefits through the wider economy, especially reduced costs or mortality and morbidity, Potential broader 'productivity' effects driven by improved health and Nonhealthy impacts that arise from an intervention, e.g., reduced air pollution from reduced automobile trips due to mode shift away from the car to cycling and walking.

Other economic advantages identified are Reduced developmentand public service costs, Consumer transportation cost savings, Economies of agglomeration, and more efficient transportation.

Environmental benefit. Here, active transportation can conserve energy and reduce pollution and the emissions caused by the transportation sector if people can switch to active transportation for shorter trips

5. Limitations and Future Research

This paper has not systematically studied all works related to the benefits of active transportation. Also, the work could have said more about the socio-ecological model, which is a model that talks about factors that can influence the use of active and as such, future research is needed in this area and on the barriers of active transportation**.**

6. Practical implications

This work is set to guide individuals discouraged from using active transport modes. The study investigated some of the critical benefits of active transportation and from the findings, Individuals are encouraged to switch its usage as it is good for their health and the environment.

Conclusion

Transportation is a major contributor to physical inactivity due to high rates of motorization. Motorized form of transport leads to air pollution, congestion, high energy consumption, land use and Fatalities. Also, disabilities resulting from crashes or physical inactivity lead to less labour productivity. Some of these challenges can be mitigated if shorter trips can be undertaken using active transportation.

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