

TECHNICAL MEMORANDUM

Clackamas County TSP

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Transportation Planning Strategies for Improving Health and Equity

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The following provides an overview of recommended strategies for maximizing a transportation system's ability to improve community health. A companion white paper describes in more detail the primary ways in which transportation systems impact health and what the associated health outcomes are.

Overview

Existing transportation systems in the US have been shaped by multiple policy inputs and decisions provided by planners, funding agencies and others at local, state, and national levels that have focused largely on building a system designed to move people and goods efficiently. An increasingly large body of research now shows that transportation decisions also directly and indirectly impact human health in multiple ways by influencing a wide range of physical, social, and environmental factors. According to the American Public Health Association, “[f]ifty percent of the leading causes of death and illness in the United States—traffic injuries, heart disease, cancer, diabetes, and respiratory illness—are preventable” because “[t]hese diseases have several risk factors that can be mitigated by transportation policies.”¹

Much of this research has also highlighted the fact that the benefits and burdens of transportation decisions has fallen unequally on different sub-groups within a community. In particular, the

negative health impacts stemming from transportation systems have disproportionately fallen on low income and minority groups, as well as others who lack access to cars or the resources to choose where they live. As a result, many transportation decisions to date have often inadvertently supported or exacerbated health inequities. Health inequities are unfair and avoidable differences between socio-economic groups in the presence of disease, injury, or other health outcomes. For the public health sector, addressing equity means prioritizing the elimination of health inequities by addressing the root causes of inequity and related health outcomes.

As a result of the increasing awareness of the connections between transportation systems, health, and equity, more and more planners and policy-makers recognize transportation system plans as providing an opportunity not just to improve mobility, but also to improve the health and well-being of all the members of the communities they are designed to serve. An increasing number of state, regional, and local transportation plans are acknowledging these connections by including goals that mention both health and equity. Locally, this trend is evident in the inclusion of health and equity goals in Metro's Regional Transportation Plan and in the Draft Transportation Goals for Clackamas County. Other local jurisdictions, including the cities of Portland and Gresham, are working on including similar goals into their comprehensive plan and transportation system plan updates.

In order to help policy makers and planners develop a transportation system plan that matches these goals, this white paper provides an overview of possible strategies for addressing these issues in a transportation system plan. A companion white paper also provides a summary of the primary ways that researchers have identified transportation systems as impacting health and equity.

Transportation Planning Strategies for Improving Health and Equity

There are five primary ways in which transportation system plans can directly and indirectly improve health and equity. They can:

- Reduce crash-related injuries and fatalities for bicyclists and pedestrians, as well as for motor vehicles
- Increase opportunities physical activity
- Decrease exposure to air pollutants
- Improve access to a wide variety of health supportive resources such as healthy food retail, employment, affordable housing, and parks and recreation facilities
- Reduce health inequities

The remainder of this paper will look at each of these issues in turn, summarizing strategies that public health and transportation experts have proposed for addressing them.

BICYCLE AND PEDESTRIAN INJURIES AND FATALITIES¹

Bicycle and pedestrian injuries and fatalities are primarily the result of bicyclists and pedestrians being struck by motor vehicles. There are four main strategies for minimizing the likelihood and severity of such crashes.

1. Plan for and develop well-connected networks of bicycle and pedestrian infrastructure

Infrastructure intentionally designed for bicyclists and pedestrians can contribute to lower traffic crash and injury rates for bicyclists and pedestrians in two ways. First, it can reduce opportunities for collisions, either through the provision of separate facilities for different modes, or through improved coordination of shared spaces such as crosswalks. Second, if well-connected and well-designed, it can encourage higher rates of walking and biking which have been correlated with lower crash rates for both modes. Although increased bicycle and pedestrian activity would increase people's exposure to motor vehicle accidents, numerous studies have shown that increased numbers of cyclists and pedestrians actually produce lower rates of accidents with motor vehicles as cyclists, pedestrians, and drivers grow more accustomed to regularly interacting with each other in public rights-of-way.ⁱⁱ

2. Slow traffic down

Infrastructure designed to slow vehicular traffic has been shown reduce the severity of pedestrian and bicycle injuries resulting from crashes. When struck at speeds less than 20 mph, bicyclists and pedestrians are much less likely to die and less likely to suffer from permanent disabilities.ⁱⁱⁱ

3. Support bicycling and pedestrian encouragement and education programs such as Safe Routes to School

By pairing encouragement and education efforts with enforcement and engineering improvements, the national Safe Routes to School program has provided a travel demand management program

¹ Transportation planners and engineers have been successfully improving safety for motor vehicle users for years. While motor vehicle-only crash rates remain a primary public health concern, this section addresses only bicycle and pedestrian safety because of their relative neglect by safety researchers and engineers.

model that has proven successful in increasing bicycling and pedestrian rates. As previously noted, increased rates of walking and biking typically lead to reduced rates of crashes for people who choose these modes.

4. Establish performance-based benchmarks and goals, and collect necessary data for evaluating progress

Measurable goals such as specific reductions in crash rates for all modes or miles of bicycle and pedestrian infrastructure built can help ensure that specific system plan elements and actions are improving crash safety for bicyclists and pedestrians, and identify where changes or additional improvements might be necessary. Possible metrics include mode splits, miles of infrastructure built, mode-specific crash rates, average speed limits, and participation levels in bicycle and pedestrian travel demand management programs.

OPPORTUNITIES FOR PHYSICAL ACTIVITY

Because of the increasing awareness of the importance of physical activity for reducing multiple health risks, and because of the ability of walking and biking to significantly increase physical activity levels, an increasing body of research has examined features of the built environment that encourage and support these activities. In addition to the four recommended strategies for improving bicycle and pedestrian safety listed above, the following transportation planning strategies are likely to improve bicycle and pedestrian rates and increase other opportunities for physical activity.

1. Prioritize bicycle and pedestrian infrastructure networks that serve heavily used destinations such as schools, retail and employment centers, parks, transit centers, and relatively dense residential neighborhoods.

Neighborhoods with well-connected bicycle and pedestrian infrastructure and attractive destinations typically have higher walking and biking rates than neighborhoods without these features. When transportation options for popular destinations are provided, some people will use them and get some physical exercise as a result. In addition, certain destinations such as parks and schools often offer additional opportunities for getting physical activity. Improving access to such places by increasing transportation options can also help boost physical activity levels in a community, particularly for people without access to cars such as low-income individuals, youth, and seniors.

2. Design for transit

Recent research has demonstrated that walking to and from transit provides a significant amount of physical activity. According to a recent analysis of the 2001 National Household Travel Survey 29% of all transit users got all of their recommended daily physical activity (≥ 30 minutes/weekday) solely by walking to and from transit, and the median amount of time spent walking for all transit users was 19 minutes. The median amount of time that non-transit users spend exercising is six minutes.^{iv} Transit-specific infrastructure can help increase the level of service provided by transit agencies, and thus attract more riders.

3. Coordinate transportation plans with land use plans to maximize the potential for people to reach their daily destinations by bike and foot.

Communities with a mix of nearby uses typically have higher rates of walking and biking. While appropriate transportation infrastructure can facilitate this, it is also necessary to have zoning policies that encourage mixed uses and discourage excessive separation of uses such as residential and retail.

4. Work with local public health agencies to collect data useful for assessing trends in physical activity levels, as well as active transportation's contributions to these trends

Not only would such data be useful for determining a transportation systems plan's ability to improve public health, but it would also help strengthen applications for competitive funds that are targeted towards addressing public health through transportation planning, policies, and projects, and thus increase the potential for building additional bicycle, pedestrian, and transit infrastructure.

EXPOSURE TO AIR TOXICS

There are three main variables that help determine the impact of air pollutants on health: the types of pollutants present in the air, the concentrations levels of the particular pollutants, and the amount of time people are exposed to particular pollutants. Transportation planning impacts all three variables. Freight routes produce higher levels of pollutants produced by diesel engines; overall levels of vehicle use impact ambient levels of pollutants; the location of high traffic routes determines where pollutants are concentrated as well as who and how many people are exposed to them; and the location of walking and biking networks determines how many bicyclists and pedestrians are exposed to the concentrated pollutants associated with high-traffic roadways.

- 1. Coordinate transportation and land use plans to minimize the proximity of high traffic roadways, particularly freight routes, to residential areas and land uses that serve vulnerable populations such as schools and retirement centers**

Recent research has demonstrated that areas near high traffic roadways—usually defined as areas within 300 meters of roads with more than 20,000 vehicles per day—have highly elevated levels of transportation-related air pollutants. Minimizing the number of people who live near such roads will lower the number of people who are exposed to elevated concentrations.

- 2. Reduce overall automobile use by facilitating the use of other modes**

Overall vehicle use, or vehicle miles travelled (VMT), determines the ambient concentration levels of air pollutants that all members of a community are exposed to. Developing a transportation system that facilitates replacing driving trips with walking or biking can help reduce VMT.

- 3. Develop bicycle and pedestrian networks that don't require travel on high traffic roadways**

In order to ensure that the health benefits of walking and biking aren't offset by increased exposure to high levels of transportation related air pollutants, bicycle and pedestrian networks should facilitate travel on low traffic roads.

- 4. Design high traffic rights-of-way to accommodate vegetative buffers**

Trees and shrubs can filter out air pollutants, thus reducing the amount of pollutants that spread out from high traffic roadways.

ACCESS TO HEALTH SUPPORTIVE RESOURCES

Good health requires access to resources such as healthy food retail, healthcare, employment, education, parks and recreation facilities, publicly accessible gathering spaces, and social services. Research has shown that a person's ability to conveniently access each of these resources can influence their health. A person's ability to access such resources is influenced by a variety of factors including a resource's location and cost, as well as the transportation infrastructure and travel options that a person has access to.

1. Coordinate land use and transportation planning to ensure that health supportive resources are served by multiple transportation options

Numerous studies have demonstrated that, because of the auto-oriented nature of most transportation systems, people without access to cars often have more difficulty accessing health-supportive resources and suffer poorer health as a result. Where additional options such as transit, walking, and biking are present, safe, and convenient, people are more able and likely to access such resources and less likely to be in poor health.

REDUCE HEALTH INEQUITIES

Health inequities are unfair and avoidable differences between socio-economic groups in the presence of disease, injury, or other health outcomes. In general, groups that have traditionally lacked economic and political resources, particularly low-income and minority groups, have experienced poorer health outcomes as result of living and working in environments that contain a disproportionate amount of health risks. As discussed in the companion white paper, transportation systems impact multiple risk factors for multiple health outcomes, and have, like other components of the social environment, adversely impacted the health of disadvantaged populations. As a result, transportation systems have helped exacerbate health inequities, but also offer the promise of reducing these inequities.

1. Increase transportation options

A primary issue facing many members of disadvantaged populations is the lack of vehicle ownership. Since most transportation systems were designed primarily for automobile use, not owning a car has meant restricted access to health supportive resources and increased exposure to unsafe conditions when travelling by bike or foot. Increased transportation options can help make travel by foot, bike, and transit more viable, safe, and attractive.

2. Ensure participation of under-represented communities in transportation decision-making processes

Participating in decision-making processes can help members of traditionally under-represented communities such as racial and ethnic groups ensure that transportation decisions benefit their constituents.

3. Collect data to ensure that transportation decisions are benefitting all communities

Tracking where investments are made and who benefits from particular investments or decisions can help ensure that the benefits of transportation decisions are being distributed equitably.

ⁱ American Public Health Association. (2009). *At The Intersection Of Public Health And Transportation*. Washington, DC: American Public Health Association.

ⁱⁱ Pucher, J., J. Dill, and S. Handy, (2009). "Infrastructure, programs, and policies to increase bicycling: An international review" *Preventive Medicine*, 50(1).

ⁱⁱⁱ Insurance Institute for Highway Safety, "Q&As: Speed and speed limits," available on-line at: http://www.iihs.org/research/qanda/speed_limits.html. Accessed 8/1/11

^{iv} Besser, LM, and AL Dannenberg (2005). "Walking to public transit: Steps to help meet physical activity recommendations," *American journal of Preventive Medicine*, 29(4).