

ABSTRACT

Transportation affects public health in complex ways. Quantitative indicators are frequently used to model this relationship and are particularly useful to state agencies for analysis and decision-making. The objective of this study was to identify effective and accurate indicators of transportation’s effects on health for usage in state health initiatives. A robust process for developing indicators is necessary for ensuring their effectiveness, and effective indicators are necessary for guiding public policy and preventing negative health outcomes. This study analyzed five “domains” of the relationship between transportation and health and recommended two potential indicators for each domain. This research may be replicated by other states’ agencies in selecting indicators for transportation and health. The five domains are detailed below.

MOTIVATION

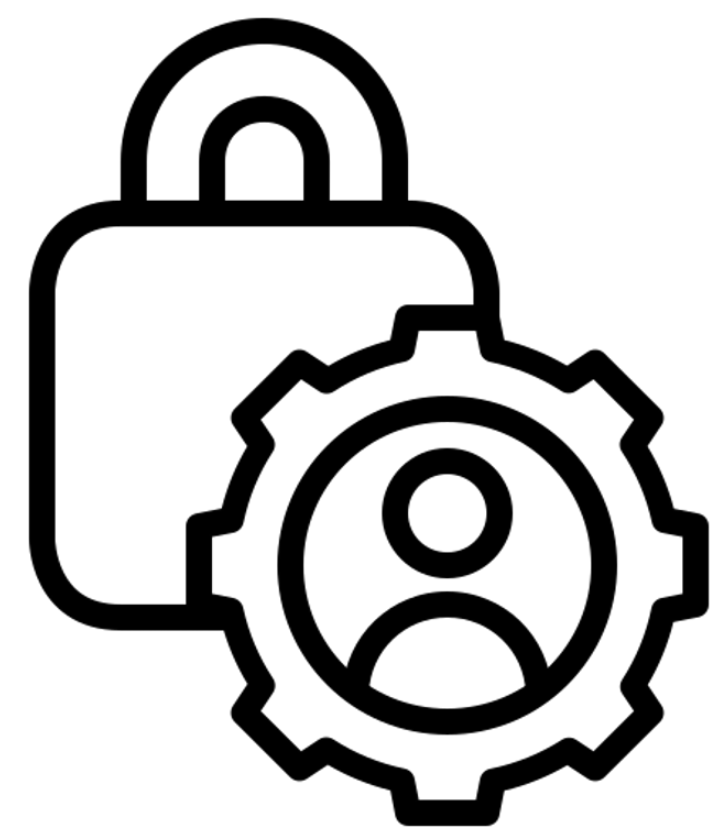
The motivation of this study was to characterize the relationship between transportation and health in the U.S. and identify indicators to support the work of three separate Tennessee Department of Health (TDH) transportation-related projects.

- TDH published “The State of Health in Tennessee” which examined the relationship of health and transportation using five transportation-related indicators.
- The TN Livability Collaborative, a working group of 20+ state agencies led by TDH, is including five transportation-related indicators in the upcoming TN Livability Index.
- TDH’s Vitality Toolkit provides transportation-based information to support the County Health Councils.

METHODOLOGY

- Conducted literature review of existing research and methods on indicator development and usage in peer states
- Collected indicators and organized into 5 “domains”
- Selected specific example indicators in each domain for potential usage by agencies in Tennessee

ACCESS



Transportation directly affects one’s ability to reach basic needs and services, including food, healthcare, education, and employment. Transportation-related difficulties or disadvantages may lead to food insecurity, delayed or missed medical care, and/or decreased access to education and employment opportunities. Access is both economic and spatial in nature, so an appropriate indicator will incorporate these aspects.

Recommended Indicators

Transportation Costs as a Percentage of Income

Percent of Households Without a Vehicle

PHYSICAL ACTIVITY



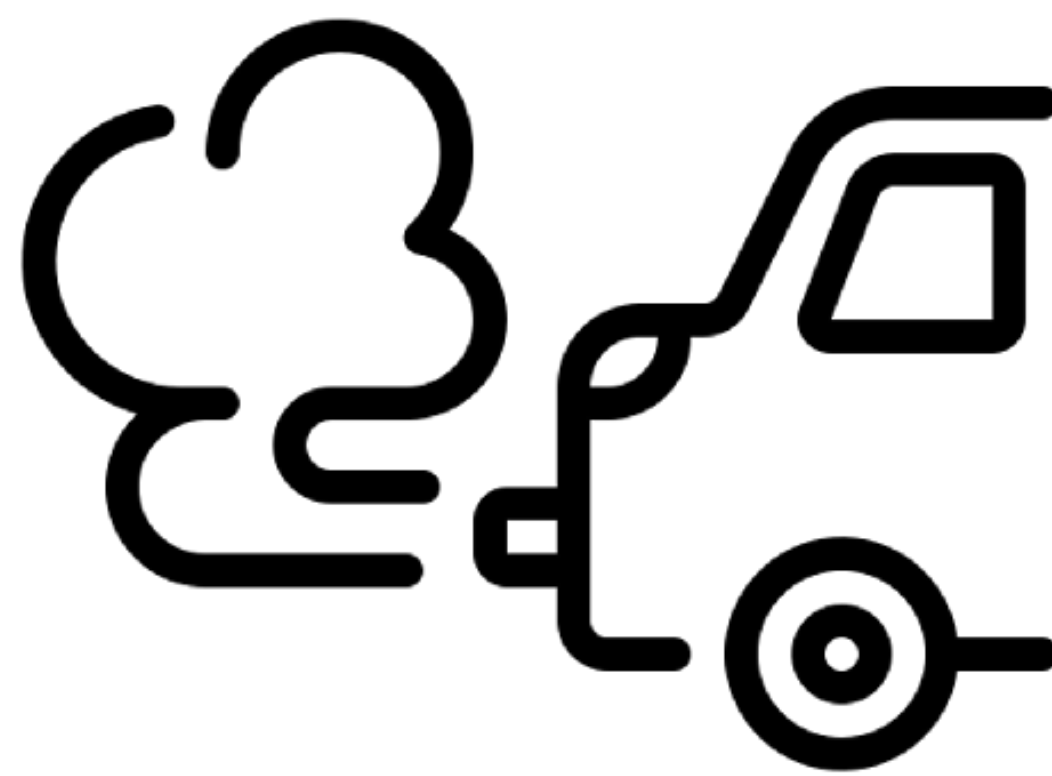
Use of cars as a primary mode of transportation is associated with a greater prevalence of sedentary behavior and decreased likelihood of meeting physical activity guidelines, leading to associated health detriments. Conversely, active transportation and use of public transit increase physical activity and the likelihood of meeting activity guidelines, resulting in subsequent health benefits.

Recommended Indicators

Modal Share

Miles of Sidewalks & Bike Lanes Per 10,000 People

POLLUTION



Certain transportation modes emit a multitude of pollutants that have a profound effect on the health of both the public and the environment. Transportation related air pollution (TRAP) has a significant effect on health, with some estimates showing TRAP causes a similar number of premature deaths as traffic crashes. The resulting global warming from TRAP can also have a vast range of subsequent health effects.

Recommended Indicators

Percent of Population Living Near Major Roads

Vehicle Miles Traveled Per Capita

TRAFFIC CASUALTIES



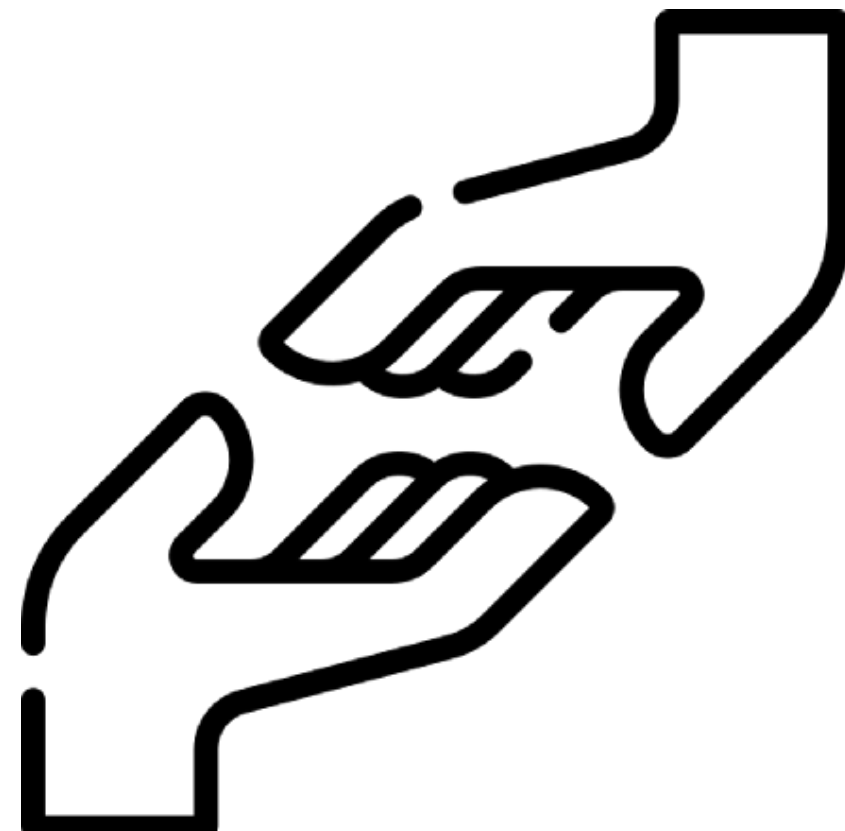
In 2022, an estimated 42,795 people died from motor vehicle traffic crashes in the US, and in 2021 approximately 2.5 million were injured. Though often overlooked in comparison to traffic deaths, traffic injuries lead to many short-term and long-term health consequences. Passenger vehicles are by far the most dangerous motorized transportation mode when compared to public transit and active transportation.

Recommended Indicators

Traffic Casualties Per Capita

Annual Traffic Deaths Relative to Peak Year

SOCIAL EQUITY



Social equity in terms of transportation and health refers to the ways in which transportation can improve and/or impair the health of populations in relation to socioeconomic status. Negative effects seen in other domains will typically disproportionately effect disadvantaged communities, augmenting the negative effects and minimizing the negative effects of transportation’s role in health.

Recommended Indicators

Percent of Transportation-Disadvantaged Tracts

Percent of Budget For Active Transportation