

Public Health and Transportation

By

Walter H Kraft, D.Eng.Sc.,P.E.
Senior Vice President, PB Farradyne, Inc.

Public health and transportation are topics not usually discussed together by transportation professionals. On January 12, 2004, I attended the Matson luncheon during the Transportation Board Meeting in Washington, D.C. The Distinguished Speaker was Dr. Howard Frumkin who is the Professor and Chair of the Department of Environmental and Occupational Health at the Rollins School of Public Health of Emory University and Professor of Medicine at Emory Medical School. The topic of his presentation was "Active Living and Transportation Impacts".

Dr. Frumkin identified a number of areas where the decisions we make while planning, designing, constructing and operating our transportation systems affect public health. For example, noise pollution caused by freeways can cause stress, which in turn can cause high blood pressure and heart problems. Stress is also caused by traffic congestion. Freeway air pollution can cause respiratory problems such as asthma.

Dr. Frumkin's presentation made me think of the work that we do with Intelligent Transportation Systems (ITS) and in operating these systems. While there are many planning and design considerations that could be discussed, I prefer to concentrate on considerations during construction and operation.

Consider a freeway without ITS. There are no detectors to provide information on traffic flow. Incidents are identified when someone calls 911. Response is dispatched after police verify the incident and determine the type of response that is needed. Motorists do not get any information on the reason for the unusual slowdown of traffic and are not given alternative routing information. In such a situation, freeway travelers would be more stressed and subjected to increased air pollution. Those residents living near the incident would also be subjected to increased air pollution. It does not matter whether the incident was in a construction zone or not. The effect would be similar although it might be more severe in a construction zone because of reduced roadway facilities.

Now consider a freeway with ITS. Detectors would help identify incidents and Closed Circuit Television (CCTV) would be used to verify incidents. Response would be dispatched quickly and not have to rely on on-site verification. The amount of time that motorists and surrounding residents would be subjected to stress and increased air pollution would be significantly reduced.

The World Health Organization (WHO) through its Regional Office for Europe recently prepared a report on "Transport, Environment and Health".¹ The report discussed the effects of noise, accidents and injuries, and air pollution on mental health and well-being.

Noise can be defined as unwanted sound. At low travel speeds, engine sounds are heard. At high speeds, tires and the roadway surface are the predominant cause of noise. The effects of noise on health were identified as impaired communication, disturbed sleep, difficulties with performance, annoyance, increased aggression, heart disease and hypertension, and hearing impairment.

Traffic emits significant quantities of airborne pollutants from motor exhaust gases as well as from tires, brakes and the roadway. The effects of air pollution include discomfort from unpleasant smells, respiratory inflammation, breathlessness, heart and circulatory problems, and lung diseases and cancer. A recent report estimated that there were 80,000 deaths per year in European cities related to long term exposure to traffic related air pollution.²

In 2002 there were about 40,000 motor vehicle related fatalities in the United States.³ In 1999, there were about 120,000 motor vehicle related fatalities in the WHO European Region.² These are unacceptably high numbers of fatalities. While accidents may not be able to be eliminated, they can be reduced. About one third of freeway accidents are secondary accidents, which are often more severe than the primary accident. Minimizing the times it takes to detect, verify, respond, clear and recover from an incident can reduce secondary accidents. The use of ITS and improved operations can significantly reduce secondary accidents and improve public health.

In general the effects of transportation on mental health and well-being include posttraumatic stress from accidents, aggression and nervousness, reduced social life, and constraints on child development. One of the functions of government is to promote the public health, safety, and welfare. Those agencies with active ITS and operations programs are ones that partially fulfill that function. Those that do not, should be made aware of the societal benefits of active ITS and operations programs. Use of ITS and active operations of these systems are steps in the right direction towards improving public health.

¹ Transport, environment and health/edited by Carlos Dora and Margaret Phillips, WHO regional publications, European series; No. 89, 2000.

² Charter on Transport, Environment and Health, EUR/ICP/EHCO 02 02 05/9 Rev. 4, 16 June 1999

³ National Overview of Recent Highway Safety Data, National Highway Traffic Safety Administration, DOT HS 809 482