Health Consequences of an Inland Port, Change in Traffic Permitted on Legacy Parkway, and Related Expansion of the SLC Airport

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The proposed inland port and the conversion of the Legacy Parkway to an open freeway will have a profound negative effect on public health on the Wasatch Front, especially to residents in the affected areas. The Los Angeles Times states, "Experts are most concerned about people living near ports, warehouse distribution centers and other freight corridors. Asthma rates and cancer risk there can be so elevated that physicians have labeled it the 'diesel death zone.'"[43]

Numerous studies have established that people who live near freeways breathe substantially more pollution than residents who live further away. The zone of increased pollution along freeways is about two miles wide. People who live, work or travel within 300 to 500 meters of a major freeway are exposed to the most dangerous part of air pollution, ultrafine particulate matter (0.1 microns in size and smaller), at concentrations 25-30 times higher than the rest of the community.[15,38] For people who live near a freeway, the concentration of freeway generated ultra fine pollution inside their homes can be as high as 90% of the concentration of outdoor air along the freeway corridor.[16]

The medical literature is voluminous and definitive regarding the extensive adverse health impacts experienced by people who live near freeways. The list of diseases provoked by living near a freeway is almost identical to the list of diseases known to be caused by first and second hand cigarette exposure. People who live by freeways have shorter life spans,[1] and increased risk of premature death.[40] Traffic related air pollution causes DNA damage[46] including shortened telomeres (a critical part of chromosomes). Shortened telomeres are highly correlated with reduced life expectancy.[32] Through damage to germ cell DNA, air pollution can cause adverse health outcomes even if the only exposure is pre-conception,[47] i.e. it is a multi-generational health risk, and can cause harm to children not yet born to future parents.

Children exposed to heavy truck traffic have increased rates of asthma, respiratory symptoms, and hospitalization for asthma.[2,3,4] Lung function among children who live near truck traffic is more likely to be reduced.[5] Children who live within 500 meters of a major highway are not

only more likely to develop asthma and other respiratory diseases, but their lung development may also be stunted permanently.[20] Adults living near freeways have an increased of developed Chronic Obstructive Pulmonary Disease (COPD).[39]

Pregnant women who live near high traffic areas more likely to have premature and low birth weight babies, [6,24,25] pregnancy complications that adversely affect a person's life long susceptibility to a wide spectrum of impaired organ development and chronic disease. People directly exposed to more traffic related air pollution have more DNA damage, a trigger for multiple chronic diseases including cancer.[31] Exposure to carcinogenic benzene (a prominent component of traffic pollution) is greater for children living near high traffic areas.[9] Numerous studies have established that children living near busy roads are more likely to develop cancer.[7,8] Living within 100 meters of a freeway increases the risk of childhood leukemia 370%, living within 300 meters increases the risk 100%.[26] Women exposed to more traffic-related air pollution have higher rates of breast cancer and decreased survival if they get breast cancer. Background Wasatch Front levels correlate with an increase risk of about 125%, living near a freeway increases that much more.[27] Chronic exposure to traffic air pollution increases the risk of lung cancer. [28] High traffic air pollution exposure more than doubles the rate of cervical and brain cancer, and increases the risk of prostate cancer and stomach cancer. [29,30]

Proposed changes in the use of the Legacy Highway and the inland will both be marked by significant increases in the exposure of nearby populations to diesel exhaust. A recent study concluded that of all the different types of particulate pollution, "The highest toxicity score was obtained for diesel engine exhaust particles."[48]

California regulators have calculated that 80% of the cancer risk of air pollution stems from diesel particulates. The greatest health impacts from traffic pollution appear to be related to the volume of heavy-duty diesel powered vehicles.[49,50] A recent landmark study indicates that long term exposure to even low levels of diesel exhaust raises the risk of dying from lung cancer about 50% for residents who live near industrial operations, and about 300% for the workers.[51,52] In response to these studies, Joseph Fraumeni Jr., Director of the National Cancer Institute's Division of Cancer Epidemiology and Genetics, stated, "The findings suggest that the risks may extend to other workers exposed to diesel exhaust and to people living in urban areas where diesel exhaust levels are elevated." The national association of state and local air quality control officers conducted a health risk assessment of diesel emissions in its report *Cancer Risk from Diesel Particulate: National and Metropolitan Area Estimates for the United States.* They concluded that diesel emissions may be responsible for 125,000 cancer cases in the U.S.

annually.[37] Emissions from vehicles in total account for about 90% of the cancer risk from over all air pollution.[10]

Adults that live closer to heavily trafficked roads have higher blood pressure and more disease of small arteries.[44] The rate of progression of hardening of the arteries, the cause of strokes, heart attacks and generalized aging, is double for those living within 100 meters of a freeway.[14] Adults acutely exposed to traffic related air pollution experience a nearly immediate increase in their risk for a heart attack.[11] Chronic exposure increases blood pressure and the risk of hospitalization and death from heart attacks.[12,13]

Traffic generated air pollution is toxic to the adult brain, and brain development in children and babies in utero. Living within 1,000 ft of a freeway doubles the risk of a child being born with autism,[18] and is associated with higher rates of neurobehavioral disorders.[19] Children growing up with more traffic pollution have significantly lower IQs and impaired memory.[21] Pregnant mothers exposed to more air pollution, give birth to children with lower intelligence, and behavioral and attention deficit disorders, even if the children breathe clean air themselves.[22,23] Adults living near heavily trafficked roads have higher risks of dementia and impaired cognition.[41,42] In healthy human volunteers, exposure to diesel exhaust causes a stress pattern in their EEG measured brain waves within 30 minutes of exposure.[54]

Residential proximity to major roadways is associated with decreased kidney function.[33] Long term exposure to traffic-related air pollution is associated with insulin resistance in children and type II diabetes in adults. [34,35,36]

Carbon monoxide is often dismissed or forgotten in the discussion of community air pollution, but it is an important component of the pollution that heavily concentrates near freeways. There is no filter that will capture or reduce exposure to carbon monoxide in contrast to particulate matter. Chronic exposure during pregnancy to miniscule levels of carbon monoxide damages cells of the fetal brain, resulting in permanent impairment. Fetuses and young infants are more susceptible to CO exposure for several reasons: CO crosses the placenta; fetal hemoglobin has greater affinity for CO than maternal hemoglobin; the half-life of COHb in fetal blood is three times longer than that of maternal blood, and the fetus and infants have a high rate of oxygen consumption and lower oxygen tension in the blood than adults.[17]

Little public discussion has emerged on the expansion of the Salt Lake City International

Airport, which, if an inland is developed, will host even greater air cargo and plane emissions. Recent studies indicate that as a source of air pollution, airports have been "seriously underestimated." In fact people who live in metropolitan areas near airports likely have most of their air pollution exposure come from airports, not from roadways. Airports have been shown to increase particulate pollution four times background levels up to 6 miles away.[45] The combination of increased truck, train, and plane cargo emissions related to an inland port will be a major new source of air pollution and a serious new threat to public health.

In summary, if Salt Lake City is forced to accommodate an inland port it will have real, long term health consequences to most of Utah's population. That is especially true for those living within a few miles of the increased truck, train, and airport emissions related to inland port activity.

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