

**L-009-001**

Thank you for taking the time to submit your comments on the I-5 CRC DEIS.

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**L-009-001** Attached is Multnomah County Health Department's response to the Draft Environmental Impact Statement for the Columbia River Crossing project. We are submitting a number of recommendations for further analysis and look forward to your response. We appreciate the challenge of balancing environmental, economic and safety considerations in designing an alternative to the current I-5 bridge and commend the inclusion of those characteristics that support the health of our communities.

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June 9, 2008

Mr. Doug Ficco, Co-Director  
Mr. John Osborn, Co-Director  
Columbia River Crossing  
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Dear Mr. Ficco and Mr. Osborn:

This letter provides Multnomah County Health Department's response to the Columbia River Crossing (CRC) Draft Environmental Impact Statement (DEIS) issued on May 2, 2008. We are submitting a number of recommendations for further analysis and look forward to your response.

As an agency committed to improving the health and well-being of our residents, Multnomah County Health Department (MCHD) has an interest in promoting those bridge and highway improvement features that enhance the health of our communities and avoid or mitigate negative health impacts. We believe that all of the proposed options for the I-5 bridge expansion (both "build" and "no-build" options) have significant potential to affect the health of residents of both Multnomah and Clark Counties. Consequently, we have examined the draft Environmental Impact Statement (DEIS) for this project through a public health lens to understand the scope and magnitude of these potential health effects.

It appears that the DEIS has been crafted to meet federal standards outlined in the National Environmental Policy Act (NEPA) of 1969, which requires a DEIS to "promote efforts that will prevent or eliminate damage to the environment and biosphere, and stimulate the health and welfare of man." To satisfy NEPA requirements, the CRC project has focused on meeting minimum standards set by federal and state governments for air quality and noise. We believe CRC staff has an opportunity to not simply meet minimum standards, but to plan a project to maximize positive impacts on regional health. This will require project staff to go beyond the health scope of DEIS precedents, examine current scientific literature, and, in some instances, to set standards that are stricter than current federal and state requirements when they do not adequately safeguard the public's health.



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## L-009-002

Human health issues are not new to the NEPA process or NEPA documentation. They are embedded in the National Environmental Policy Act's intent and in its implementation (NEPA 42 USC 4321-4347, as amended (Sec 2 [42 USC § 4321])). It was a stated purpose in the original Act of 1969 and it has been reflected in CEQ NEPA regulations (40 CFR 1508.8), FHWA NEPA regulations (23 CFR 771), and in environmental impact statement analyses and documents since then. Scientific knowledge of the interactions between people and the environment has increased since the Act was first passed, and these advancements have been reflected in the evolution of the scope and analyses of impacts that are included in EISs.

While there is rarely a section entitled "Human Health Impacts" in an EIS, evaluating and protecting human health is the primary driver behind many of the studies conducted in the preparation of an EIS. To the best of our knowledge, the analyses conducted for the Columbia River Crossing DEIS, and further updates in the FEIS, address all potentially significant human health impacts that could reasonably result from the proposed action.

The CRC Draft EIS included numerous studies that either directly or indirectly address human health issues and the project's impacts (both adverse and beneficial) on human health. Many of the standards (including air quality, noise, vibration, electromagnetic fields, water quality, and hazardous materials) referenced in these studies have been established by federal, state or local government, or other organizations, for the primary purpose of protecting human health.

The analyses conducted found that the project is expected to have an overall substantial beneficial impact on human health. There are potential adverse effects as well, but these can be either avoided or reduced through mitigation. Project design and analysis for the Final

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It is our hope that after considering our remarks the Columbia River Crossing (CRC) staff, members of the public, and all decision-making entities will give public health effects significant weight in evaluating the relative merits of the bridge alternatives. We also hope that health impact will be used as an evaluation criterion in other transportation projects in our county. The primary goal of this work is to ensure that public health is a priority concern in the DEIS process.

L-009-004

This memo is divided into two major sections. The first addresses potential health impacts of the proposed I-5 bridge alternatives. The second outlines our recommendations for improving the health impacts associated with the CRC project. Within each section, transportation, safety, air quality, noise and environmental justice issues are addressed.

L-009-005

#### 1) Potential health impacts of proposed I-5 bridge alternatives

##### a) Transportation

- i) *Traffic volumes in 2030 and beyond are likely to affect human health through air quality, noise pollution, obesity, and unsafe conditions.*

The population growth in the region and the demand for use of the I-5 bridge are likely to continue beyond 2030. It will only be a matter of time before an expanded highway bridge again reaches capacity and congested conditions occur. According to the DEIS the traffic volumes that the replacement bridge will accommodate are 26% higher during AM peak hours and 39% higher during the PM peak hours than present day conditions. If population growth in the region continues at a similar rate beyond 2030, we can expect 30,240 vehicles attempting to cross the bridge southbound during the AM peak, and almost 40,000 northbound during the PM peak by the year 2055. The motor vehicle congestion that the CRC project is designed to address will be alleviated only temporarily during the lifespan of the new bridge. With an increase in the volume of vehicles in the bridge area, congested conditions are likely to yield more severe health impacts from air pollution, noise, and motor vehicle collisions than the present day conditions.

Increasing incentives and capacity for single occupancy vehicle (SOV) use may contribute to the problem of obesity in the region. Public health research shows that the amount of time spent in cars has an inverse relationship with physical activity and a direct relationship with obesity. In one study, every extra 30 minutes of commuting time per day was associated with a 3% greater likelihood of obesity.<sup>2</sup> In another study, each additional hour spent in a car per day was associated with a 6% increase in the likelihood of obesity.<sup>3</sup>

- ii) *Bridge alternatives that encourage the use of mass transit or bicycles instead of cars will have a positive effect on health by increasing physical activity and reducing obesity.*

EIS considered additional ways to further minimize any adverse effects and increase the overall benefits associated with the project. In many of the ongoing design refinements, project staff and stakeholders are sincerely attempting to find the best solutions, not simply meet federal standards. The world-class bike and pedestrian facilities are a good example of greatly surpassing minimum requirements. Similarly, the project is making commitments in its Sustainability Plan and in the Final Mitigation Plan to manage many potential impacts to a degree higher than that which is required by law.

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See below for responses to specific comments.

#### L-009-005

The DEIS and FEIS analyses of impacts to air quality, noise, electromagnetic fields, and other factors that can affect human health, are based on comparing the project's impacts to specific standards that have been established to protect public health. Ensuring the project will meet or better these standards is used as a method to determine whether the project will have an adverse effect on human health. The criteria used in the DEIS and the FEIS are based on government regulatory standards where they have been established (such as for criteria air pollutants). Where regulatory standards do not exist, then the criteria are based on government agency guidelines or thresholds established by public health and safety professionals.

Modeling conducted for the DEIS and FEIS indicate that air emissions from I-5 traffic will be significantly lower by 2030 than they are today, and will be well below established regulatory standards designed to protect human health (see Section 3.10 of the DEIS and Section 3.10 of the FEIS). Noise impacts from I-5 traffic, with the mitigation proposed for the CRC project, will also be substantially lower than today. Noise from the light rail can be mitigated below FTA's noise impact criteria as well (see

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Obesity and related conditions are a serious problem in the United States and have reached epidemic proportions. In the Portland-Vancouver Metropolitan Area, 24% of residents are obese, and an additional 37% are overweight. Physical activity can contribute to a decreased risk of obesity, heart disease, high blood pressure, diabetes, and some types of cancer.<sup>4</sup>

A growing body of research shows that certain features in the built environment can help people attain the daily minimum requirements for physical activity by encouraging participation in active modes of transportation including cycling, walking, and using mass transit.<sup>5-8</sup> The Centers for Disease Control's (CDC) Guide to Community Preventive Services states that improving access to non-motor vehicle transportation can increase the number of people who are physically active 3 times a week by 25%.<sup>4</sup> Walking to public transit also helps people meet physical activity recommendations.<sup>8</sup> In the US walking and bicycling levels fell 67% between 1960 and 2000, while obesity levels increased 241%.<sup>9</sup> States with the highest levels of cycling and walking have a greater percentage of the population meeting the recommended 30-plus minutes a day of physical activity.

MCHD commends CRC staff for including options that expand the transportation alternatives available to commuters traveling between Washington and Oregon to include light rail or bus rapid transit. We are also pleased to note the inclusion of options for safer bike and pedestrian facilities that will also encourage physical activity and provide health benefits.

*iii) The inclusion of increased options for public transportation will improve the mobility of vulnerable populations.*

Public transportation is a preferable alternative to SOV trips. In addition to alleviating traffic congestion and counteracting the problem of overweight and obesity, public transportation plays a significant role in the lives of many vulnerable groups including the elderly, people with disabilities, and members of our community who cannot afford or do not have access to a car. The provision of accessible, safe public transportation options is necessary to provide equitable access to regional resources for all segments of the population. From the perspective of providing greater access to an array of public transportation options for vulnerable populations all of the "build" alternatives of the CRC project are laudable as they all expand mass transit options.

*iv) The introduction of a toll on the I-5 bridge together with quality public transportation will have a beneficial impact on health to the extent that a toll would encourage travelers to shift from using SOVs to public transportation.*

The health benefits of using public transportation including increasing physical activity and reducing obesity have been discussed above. The institution of a toll or any commuter trip reduction policy that creates an incentive for travelers to use

The DEIS did not explicitly evaluate potential effects on physical activity or obesity. However, the DEIS and FEIS both discuss how the project could affect the surrounding urban form that would increase opportunities for physical activity, including: improved bicycle and pedestrian facilities crossing the river; improved connections between existing and new bike and pedestrian paths and across I-5; the LRT extension and transit stations that support increased pedestrian-oriented development; improved sidewalks in Vancouver; and new pedestrian and bicycle connections crossing I-5. The project would also reduce daily hours of congestion on I-5 compared to the No-Build and provide greatly improved transit service, both of which decrease the amount of time travelers spend in cars, thus further promoting physical activity.

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public transportation options rather than motor vehicles will result in better health for our communities.

- v) *Light Rail Transit (LRT) is substantially more beneficial to health than Bus Rapid Transit (BRT).*

We strongly support the addition of LRT over BRT. LRT has the potential to be more convenient and accessible, and have greater overall health benefits. LRT produces less air pollution and noise than BRT, and is less subject to congestion problems. In addition, the benefits that use of public transportation may have on overall physical activity rates could be maximized due to the speed and higher capacity of LRT (7,250 daily users in the Replacement option as compared with 6,100 on BRT), which would likely increase attractiveness and encourage higher rates of use. The DEIS also indicates that safety concerns with LRT have been successfully mitigated in Portland with simple improvements (traffic control, signage, etc.).

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**b) Safety**

- i) *Bridge alternatives that provide opportunities for more cars to travel faster may increase the number and severity of collisions.*

Research has established that the severity of collisions increases with speed and volume, both of which will increase with the "build" alternatives. The probability of an injury versus a serious injury versus a fatality can be calculated based on the speed of travel. Reduction in speeds of 2 to 9 mph has reduced the number of fatalities between 6 and 34%, and in a crash with an impact speed of 50 mph, the likelihood of death is 20 times greater than with an impact speed of 20 mph.<sup>10</sup>

Increases in speed also increase the likelihood of collisions. A meta-analysis found a 2% decrease in the number of crashes for every 1km/h (0.6 mph) reduction in average speed at levels above 50km/h (31 mph), and that the risk of crash at least doubles for each 5km/h (3 mph) increase over 60 km/h (37 mph).<sup>10</sup> Interstate highways, with faster speeds, comprise 1% of all road nationally but contribute a disproportionate 14% of all road fatalities.<sup>11</sup>

The DEIS analysis of safety considers only the frequency of collisions. It shows that during the study period (2002-2006), the crash rates in the project area were twice the rate of average collisions on other urban interstate highways. While the frequency of crashes is expected to decline with the proposed bridge alternatives, the severity of the crashes may increase given the higher speeds of travel projected.

Motor vehicle accidents are a serious public health concern as they comprise the leading cause of death in people ages 1-44 in the United States.<sup>12</sup> In 2003, there were 42,643 fatalities and almost 3 million injuries on roads in the United States,<sup>13</sup> and the number has increased in recent years. There are 500,000 hospitalizations and four million emergency department visits each year due to motor vehicle crashes. The economic burden of motor vehicle-related injuries and fatalities costs the United

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As described in the project's Purpose and Need Statement, improving safety for all users of the corridor is one of the principal reasons for undertaking the project. As described in the EIS, many aspects of the existing corridor are deficient in ways that are detrimental to safety. For example, the existing facilities for bicyclists and pedestrians on the existing Interstate Bridge across the Columbia River are substandard in width and lack standard rails. The existing Interstate and related street network also have serious deficiencies that are detrimental to safety. The lift-span bridge causes stoppages on the freeway that have been shown to significantly increase crashes during bridge lifts. The absence of safety shoulders on many sections of I-5, particularly in Oregon, do not provide locations where disabled vehicles can be removed from travel lanes or allow vehicles to correct for small errors or obstacles within the travel way. Relative to current design standards, the existing facility has substandard shoulders, substandard distances for weaving and merging maneuvers, substandard clear zones adjacent to the travel lanes, substandard sight distance, and substandard designs for many ramps. Finally, the occurrences of crashes in the corridor increase during periods of high congestion.

The project is designed to eliminate or reduce many of the existing deficiencies. Improved facilities for bicyclists and pedestrians will provide a modern world class facility and more pleasant environment, leading to more users and a safer system for their use. Key features of the new facility include replacement of the existing lift-span bridge with a higher fixed bridge that will avoid unexpected stoppages due to river traffic. The new facility will provide additional capacity that reduces the number of hours of congestion that have a high correlation with the occurrence of crashes. The project will significantly improve roadway geometry, which will help reduce run-off-the-road and sideswipe crashes, for example. Safety shoulders will give places where disabled vehicles can be removed from travel lanes. Increasing the lengths of weave and merge



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States over \$150 billion each year.<sup>12</sup> The National Traffic Safety Administration (NHTSA) calculates the economic impact of motor vehicle crashes in 2000 at \$230.6 billion. This includes \$61 billion for loss of productivity, \$59 billion for property damage, \$32.6 billion for medical expenses, and \$25.6 billion travel delay.<sup>14</sup>

- ii) *Wider bicycle and pedestrian paths separated from the freeway, adequate signage and lighting, and increased connectivity of routes in the project area will decrease the number of crashes involving cyclists and pedestrians.*

Bikes and pedestrians suffer a disproportionate amount of injury and fatality due to crashes with motor vehicles. This is evidenced in the project area, where 100% of the fatalities in the study period were to cyclists and pedestrians. Nationally, 12.6% of traffic fatalities were pedestrians.<sup>15</sup> Above 35 mph, most crashes resulting in pedestrian injury are fatal.<sup>16</sup> Pedestrians involved in a motor vehicle crash have an 80% risk of being killed at 31 mph, and a 10% risk at 19 mph.<sup>10</sup>

Roadway width and design affect the risk of injury to pedestrians.<sup>15</sup> Given the potentially disastrous consequences of crashes with motorists, the Health Department supports the widening of bicycle and pedestrian routes across all of the bridge alternatives to a minimum of 20' per route as recommended by the Bicycle Transportation Alliance. We also support physical separation from motorists on the road and specific plans for better signage, lighting and access to the bridge from local streets.

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c) *Air quality*

- i) *Air pollution has the potential to affect a large proportion of the population in the project area and should be a major criterion in the final selection of the bridge.*

Approximately 77% of air pollution in Multnomah County comes from mobile sources.<sup>17</sup> In terms of illness and premature death, the toll of increased exposure to traffic-related air toxics is of concern for residents of the Portland-Vancouver area, for the families of those who are affected, and for the economy of the area.

Based on the Federal Highway Administration (FHWA) guidance the DEIS states that there will be a reduction of 30 to 90% in emissions associated with gas or diesel engines in the study area due to cleaner fuels and new combustion and emission control technology by 2030. However, a recent report by the Health Effects Institute (HEI) cautions that the alternative fuels and emissions control technology being adopted may themselves contribute to increases in other mobile source air toxics (MSATs) and particulate matter.<sup>18</sup> For example, the report states that it is likely that acetaldehyde concentrations will rise as a result of increased use of ethanol. Another example is provided by the increase in ambient levels of formaldehyde associated with an increase in the number of vehicles fuelled by compressed natural gas.

areas will make these maneuvers safer and reduce the speed differential between through traffic and vehicles entering or exiting the Interstate facility. Finally, by providing more capacity for higher-speed, longer-distance travelers on the Interstate facility, diversion to alternative routes, where pedestrians and bicyclists are expected in greater numbers, will be reduced.

The Health Department raises the issue of speed in relation to a possible increase in the severity of crashes and seriousness of injury or fatalities. The comment suggests “the severity of the crashes may increase given the higher speeds of travel projected.” After reviewing the materials referenced in the comments, we think that the data and conclusions of these studies are not particularly relevant to the CRC project. Most studies cited do not fully account for differences in facility types (freeway, highway, or street), urban-rural differences, or facility design standards. Considering the large portion of this project is a freeway the relationship between speed and severity cited in the referenced materials does not appear to be applicable to this project.

It's also important to consider how the data for these other studies was gathered, used, and defined. “Speed” is one variable that deserves some clarification. Some of the referenced documents cited by the Health Department tie crash severity to “impact speed,” which is not necessarily directly related to the operating speed on a modern freeway. There are several aspects of the CRC project that can be expected to reduce impact speed even if operating speed were to increase slightly. For example, the project proposes removal of barriers adjacent to the roadway and creation of clear zones. These are expected to not only reduce the frequency of crashes, but also reduce the severity because of additional deceleration that will occur before a vehicle that leaves the travelled way impacts a fixed object. In multi-vehicle crashes, the difference in speed between the vehicles is an important factor and adding auxiliary lanes and improving areas with high weaving and

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While new fuels and emission control technologies will greatly reduce particulate matter in newer engines, older diesel vehicles will continue to pose a health risk until they are phased out. The HEI report urges readers to evaluate the exhaust from the newer engines "in particular to ensure that possible new emission species will not cause new adverse effects on human health".<sup>18</sup>

Given that any new bridge alternative will be designed to last several decades, we urge the CRC staff to consider the potential environmental and health effects of alternative fuels beyond 2030. This particularly supports alternatives that maximize the use of LRT.

- ii) Significant improvements in health are possible if air pollution levels are reduced well below the National Ambient Air Quality Standards. Project alternatives that lower air toxics below the federal standards should be given greater consideration.*

The DEIS projects that none of the bridge alternatives will result in a violation of National Ambient Air Quality Standards and that air toxics that meet the maximum levels allowed by state and federal law (NAAQS) need not be examined further. However, peer reviewed scientific articles indicate that even a small reduction in certain air toxic levels below the federally set maximum allowable levels results in a significant decrease in premature mortality and illness associated with air pollution. Even at levels below federal standards, higher levels of air pollution lead to increasingly adverse health risks. Specifically, a reduction in the NAAQS for particulate matter (PM 2.5) from 15 to 14  $\mu\text{g}/\text{m}^3$  is estimated to result in 1,900 fewer premature deaths, 3,700 fewer non-fatal heart attacks, and 2,000 fewer emergency room visits for asthma per year.<sup>19</sup> We ask CRC staff to examine such evidence and use standards for emissions that are more stringent than federal or state requirements in determining which of the proposed alternatives has the least harmful impact on human health. In addition, The DEIS states that federal maximum acceptable levels have not been set for MSATs. However, the state of Oregon Department of Environmental Quality has Ambient Benchmark Concentrations for MSATs. These can be used as a guideline in the absence of federal standards.

- iii) The cumulative effect of criteria pollutant and mobile source air toxics has the potential to cause health problems for community members.*

Clearly, residents of urban areas are exposed to multiple air pollutants simultaneously rather than a single air pollutant. Thus, health risks are a result of exposure to the total air toxics level in any given area. Further, the bridge influence area in Portland includes industrial and airport emissions in addition to pollution from mobile sources. Bridge alternatives that raise cumulative ambient levels of air toxics will increase the risks posed to human health. Considering the impacts of the CRC project in isolation does not take into account the contribution the project makes to the overall levels of air toxics already present. Conversely, options which minimize air toxics will have positive impacts on human health.

merging volumes will help to reduce speed differentials. In conclusion, all of the safety benefits cited above can be expected to more than offset a possible increase in severity that could be attributed to a modest increase in operating speed on the proposed facility.

Safety of bicyclists and pedestrians will also be significantly improved. The river crossing will feature a wide, separated facility of modern design for bicyclists and pedestrians that meets or exceeds all design standards. Several existing at-grade crossings of high-volume streets will be eliminated and improved connections with the network of paths, sidewalks, and on-street bike lanes will be provided.

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Emissions with and without the CRC project are derived from the EPA MOBILE 6 program, which includes estimates of future emission levels and the phasing in and out of newer and older vehicles over time. This represents EPA's best estimate of MSAT emissions in the future. The CRC project would not influence fuel blends or alternative fuel make-up, but it would influence travel behavior, including improving traffic flow in the I-5 corridor and decreasing auto trips across the river. These changes would reduce the regional MSATs compared to the No-Build alternative, regardless of the fuel mixtures used.

Care should be exercised when interpreting the HEI report. The report suggests that by switching to alternative fuels, emissions from some MSATs could increase, based on studies in Brazil and Mexico where more alternative fuels are used. Under their key conclusions for acetaldehyde, HEI states:

"Urban concentrations of acetaldehyde measured in Brazil, where ethanol is widely used in motor vehicles as an alternative to conventional fuels, suggest that acetaldehyde concentrations elsewhere might increase in the future if the use of alcohols in fuels increases." (emphasis

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**d) Noise**

- i) *Harmful noise levels from traffic are associated with increases in chronic diseases and cognitive functioning. Bridge options and mitigation strategies that decrease the number of residents exposed to transportation noise as well as the level of noise will avoid these adverse health outcomes.*

Thirty million people in the United States are exposed to harmful noise levels daily.<sup>20</sup> Of particular concern is the finding that increases in transportation noise are associated with increases in hypertension and cardiovascular disease.<sup>21-24</sup> Noise is of particular concern where children are present, as it interferes with children's concentration, cognitive development, learning, and reading comprehension.<sup>25-28</sup> Other common complaints from noise include sleep disturbances and annoyance.<sup>29-32</sup>

The FHWA noise abatement criteria require mitigation for highway project noise impacts that exceed 67 dBA in sensitive areas outdoors (residences, parks, and schools), and 72 dBA for developed areas, such as commercial centers. According to the DEIS there are 234 locations in the CRC study area that exceed acceptable noise thresholds. With the "no build" alternative, this increases to 268. With the "build" alternatives, this increases to 329-334 without mitigation. With the inclusion of sound walls and residential improvements, the "build" alternatives potentially reduce the unacceptable noise impacts to 52 locations.

The health risks of noise occur at lower levels than the FHWA thresholds. While the FHWA recommends mitigation for residences, schools and parks above 67 dBA, the thresholds at which health effects occur are actually much lower. In a review of the state of the existing evidence of noise impacts on health around the world, the World Health Organization (WHO)<sup>22,26</sup> estimated that sleep disturbances occur over 30dB, annoyance is associated with 50dB, heart disease and hypertension are associated with noise in the 65-70 dB range, and hearing impairment over 75 dB. The WHO recommended outdoor acceptable noise level for health is 55 dB. This is substantially lower than the FHWA guidelines used in this project (67 dBA). Using the lower noise threshold would result in identification of a greater number of areas at unacceptable noise levels that increase the risk of adverse health impacts on area residents.

Providing alternatives to motor vehicle use, such as public transportation or safe and accessible bike and pedestrian facilities have been examined in depth in the DEIS and provide an alternative to driving for a significant number of people. Tolling would also reduce the incentives to drive and thus reduce motor vehicle volumes. All alternatives that decrease motor vehicles on the highway and local streets could reduce noise and avoid negative health impacts.

**e) Environmental justice**

The CRC project poses the potential for disproportionate adverse health impacts on susceptible populations as a result of all of the concerns stated above. The CRC

added)

The report later states:

"Indeed, the widespread introduction of ethanol and compressed natural gas as vehicle fuels in some regions of the world that have less advanced engine and emission control technologies than the U.S. has already led to increases in ambient concentrations of aldehydes in these regions. Whether or not the same increases will be seen in the U.S. as alternative-fuel use increases is unknown."

Thus, to conclude that U.S. MSAT emissions will increase due to alternative fuels is premature. Since the current emission models predict future emission reductions in aldehydes, it is not clear that phased-in implementation of alternative fuels will automatically result in future increases of aldehydes emissions as inferred by HEI.

The HEI report also concludes:

"There is no evidence to suggest that current ambient concentrations of acetaldehyde adversely affect human health."

Similar conclusions were cited for formaldehyde and naphthalene.

Conformity rules state that the project must not cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS). Thus, the NAAQS are the standards by which the project's impacts on air quality are measured. The project cannot unilaterally set its own "standards" under the current regulatory environment. Furthermore, the DEIS evaluated the regional impacts for the pollutants, showing reductions in emissions in the future years. By improving traffic flow in the I-5 corridor, the regional criteria pollutant levels will be reduced from current year and the future No-Build Alternative. It is not clear how



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project area includes neighborhoods with high proportions of populations of color, low income residents, and populations with disabilities. Therefore, it is possible that the health impacts due to air pollution and excessive noise will be felt most acutely by these susceptible populations.

Previous regional studies have shown that the air and noise pollution in these neighborhoods are directly attributable to traffic on I-5.<sup>33-34</sup> Although the CRC project has conducted extensive public outreach with stakeholders, and has engaged a Community and Environmental Justice advisory group and tribal liaisons to assist with the analysis, some concerns remain.

*i) Air pollution*

In the Portland Neighborhood Survey, 32% of North and Northeast Portland residents reported that the air quality in their neighborhoods was sometimes or always bad.<sup>35</sup> The Portland Air Toxics Assessment (PATA) report issued in 2006 suggests that the health effects of certain criteria air pollutants and MSATs disproportionately affect communities in the I-5 corridor in North and Northeast Portland.<sup>33</sup> These areas include higher percentages of low-income residents and populations of color. The pattern of distribution clearly showed that the higher concentrations of these toxics were attributable to pollution from I-5. Although levels of certain air toxics from motor vehicles may decline by 30 to 90% in the coming years, concerns about the negative health impact of other air pollutants are warranted as outlined in the air quality section above (part c). These air pollutants are likely to have the same disproportionate impact on communities in North and Northeast Portland that is described in PATA. The subarea analysis in the DEIS was not sensitive enough to uncover the neighborhood variations in air toxics in the project area found in the PATA report. We, therefore, request that you consider the PATA report in your analyses.

*ii) Noise*

The larger 23-mile geographic area examined in the Transportation section of the DEIS includes several Environmental Justice populations that currently bear the unequal impact of noise from the I-5 corridor, but are not included in the noise analysis. In the North Portland Noise Study, the City of Portland examined noise impacts in 21 neighborhoods in North and Northeast Portland.<sup>36</sup> These neighborhoods currently experience excess noise from I-5, as well as from the Portland International Raceway and railways. Thus, the cumulative effects of environmental noise in these neighborhoods are large. Although the CRC project is not responsible for mitigating noise impacts from other sources, CRC staff should consider the portion of the overall noise levels that is attributable to the new bridge and how this contributes to human health.

In addition to noise measurements, a survey was conducted in North and Northeast Portland neighborhoods in 2006. The four Portland neighborhoods in the CRC project area that were included in the survey (Kenton, Bridgeton, Hayden Island, and East

arbitrarily lowering a standard provides any additional information to the public for evaluating the alternatives presented.

Oregon has ambient benchmarks for many air toxics. Benchmarks are not intended to be standards but rather are intended to be planning targets. There are a few MSATs, like benzene and diesel particulate matter, which are over their applicable benchmarks. These pollutants are being evaluated by Oregon DEQ in the Portland Air Toxics Solution (PATS) process. The PATS MSAT impacts are now reported in the FEIS. Through this process, ODEQ will develop strategies for reducing these MSATs within the Portland area. Regardless, I-5 is an existing condition and it will continue to contribute to MSATs whether the CRC project is built or not. Thus, the CRC MSAT analysis is intended to provide information to the public for evaluating the air quality advantages and disadvantages of the various alternatives. Like the criteria pollutants, the DEIS and FEIS show that future MSAT emissions will be lower with or without the project, thus improving air quality in the project area.

VMT is projected to grow because population and employment are projected to grow. The VMT growth is not due to the proposed project. In fact, within the study area, VMT is projected to be slightly lower with the LPA than with the no build. The DEIS demonstrates that, in spite of population growth, future emissions from I-5 will be lower than today, due to the current regulations on vehicle emissions and fuels, resulting in better air quality for the region and local areas, regardless of the alternative selected. Although the difference in current-to-future year emissions is large, the differences in emissions between build and no build are so small that they are essentially insignificant. Although some stakeholders in the Portland-Vancouver region have requested that CRC seek methods to further improve air quality, the magnitude of the benefits between alternatives would likely be minor compared to the overall benefit in vehicle emission reductions. Given this, a quantitative

L-009-010

Columbia) reported that they were more affected by noise than residents of other study neighborhoods. Overall, 45% of residents said they were affected by noise, and 37% said they were most aware of it when they were outdoors. Further, 75% of residents said that they spend at least a couple of days a week outdoors in their yard.<sup>34</sup>

The locations that do not meet criteria for mitigation of noise impacts in the “build” alternatives include 36 residences, apartment buildings and a hotel in downtown Vancouver, and a hotel in Portland that all house low income and minority residents.

L-009-011

## 2) Recommendations for improving the health impacts of the Columbia River Crossing project

In making our recommendations to the CRC project staff and the decision-making agencies, the goal of this Health Department is to encourage the development of bridge characteristics that improve the health of our residents while simultaneously minimizing the potential for harmful health consequences. Based on our assessment of the health impacts of the proposed bridge alternatives Multnomah County Health Department makes the following recommendations to the CRC project staff and decision-making agencies:

L-009-012

### Support the following project components:

- Maximize use of Light Rail Transit
- Transit alignments that serve low income and minority populations without severing community cohesion
- Roadway and interchange improvements that increase safety
- Safe and accessible bike and pedestrian facilities
- Tolling to discourage motor vehicle use, particularly single occupancy motor vehicle use
- Alternatives that do not increase SOV capacity on the roadway, especially during peak periods

L-009-013

L-009-014

L-009-015

L-009-016

L-009-017

### Conduct additional analysis in the following areas:

#### a) Transportation

- i) *Use population and freight traffic projections well beyond 2030 in forecasting the number of trips across the I-5 bridge, duration of travel, length of peak congestion periods, etc.*

Conducting such analysis is likely to reveal significant information on how long it will be before the new bridge no longer meets the CRC goals of alleviating traffic congestion and safety problems and facilitating the efficient movement of freight along I-5. It will also allow the selection of a locally preferred alternative with a clearer understanding of the long term needs of our community.

cumulative analysis would also show minimal differences between alternatives, and would not provide the public with new, useful information, beyond that which has already been provided.

## L-009-008

Potential noise and vibration impacts that would result from the CRC project were disclosed in the Chapter 3 (Section 3.11) of the DEIS, and have been updated in Chapter 3 (Section 3.11) of the FEIS.

The FHWA with input from the DOT's set the traffic noise abatement criteria for highway noise, which are implemented by the state DOT's. Noise walls, to the extent that they are effective at reducing noise and can be constructed at a reasonable cost, are the most common type of mitigation for highway noise when project related noise levels exceed the abatement criteria. The DEIS proposed potential locations for new or replacement noise walls that are preliminarily considered reasonable and feasible by state criteria. Information on the noise walls used to mitigate project related highway noise impacts can be found in the DEIS (pages 3-301 through 3-305). The analysis performed for the FEIS is based on more refined designs and updated traffic modeling (Chapter 3 Section 3.11).

The criteria in the FTA Guidance Manual for Transit Noise and Vibration Impact Assessment are based on documented research on community reaction to noise. The amount that the transit project is allowed to change the overall noise environment is reduced with increasing levels of existing noise. There are two levels of impact included in the FTA criteria; moderate impact and severe impact. The criterion for moderate impact varies according to the existing noise level, the predicted project noise level, and the percentage of people highly annoyed by the project noise. The severe impact also varies according to the existing and projected noise levels, but is set at levels where a higher percentage of people would be highly annoyed by the project noise. Project noise in the

L-009-018

**h) Safety**

- i) *Include analysis of predicted collision rates and the impact of increased speed and volume on collision severity and associated injuries.*
- ii) *Ensure that routes through North Portland and downtown Vancouver on local streets are well connected, accessible and safe.*

L-009-019

Adequate accessibility to the bridge by bike or foot involves safe connections to the bridge from local neighborhoods in Portland and Vancouver. The Bike and Pedestrian Advisory Committee has identified problem areas for the connectivity of routes.

- iii) *Widen bridge bicycle and pedestrian paths beyond the dimensions presented in the proposed alternatives and incorporate better separation of these from motorized vehicles and High Capacity Transit.*

L-009-020

**c) Air Quality**

- i) *Include analysis of possible unanticipated increase of air toxics that have not been considered in the air quality analysis of the DEIS.*

We urge the CRC staff to follow the recommendations of the Health Effects Institute by considering the effects on air quality and on human health of alternative fuels and emission control technologies that are likely to be implemented in the coming decades. We encourage CRC staff to take a proactive approach in analyzing the impacts on air quality instead of focusing solely on air toxics that are of current concern.

- ii) *Include analysis of the health impacts of cumulative exposure to air toxics emitted by vehicles.*

We strongly recommend a more complete analysis of the project's impact on human health which requires a higher standard than merely an examination of whether individual federal and state air quality standards will be met. This is particularly important in the areas identified to currently experience unsafe levels of air pollution.

L-009-021

**d) Noise**

- i) *Analyze the impacts of traffic noise of the proposed bridge alternatives using a lower threshold for noise levels than the current federal standard.*

Health consequences of noise including heart disease and hypertension occur at noise levels that are lower than the federal threshold. We recommend an analysis of the effects of noise using the WHO recommended outdoor noise threshold of 55 dBA.

no impact range is not likely to be annoying to most people. While the FTA recommends mitigation be considered for all impacts, impacts in the severe category should be avoided or, if no other alternative exists, then mitigation should be implemented. Based on the analysis performed for the DEIS and updated in the FEIS, light rail operations are predicted to result in several moderate noise impacts, depending on the alternative, however no severe noise impacts were identified under the Clark College terminus (page 3-294). As identified in FEIS Chapter 3 (Section 3.11) these impacts could be mitigated by providing interior sound insulation to residences along the transit alignments and/or sound walls in some locations.

As described in the DEIS and FEIS, the FTA has also developed impact criteria for acceptable levels of ground-borne vibration. Light rail operations could result in some vibration impacts along 17th Street and Washington Street, all of which could be mitigated by installing vibration isolation between the rails and ground. This too has been updated for the FEIS in Chapter 3 (Section 3.11).

Mitigation would occur during project construction.

**L-009-010**

Modeled concentrations from the Portland Air Toxics Solutions (PATS), as well air toxics monitoring data were added to the FEIS. Results from PATS indicated elevated concentrations along freeway corridors. However, this does not mean that CRC would be a cause of higher-than-average levels of pollutants, as the CRC project does not "cause" I-5. I-5 is an existing condition, and will continue to operate whether the CRC project is built or not. The analysis in the DEIS showed, and the FEIS confirmed, that criteria pollutants and MSAT emissions from I-5 through north Portland will be substantially lower in the future with or without the project. It also shows that future emissions in north Portland will be further lowered, slightly, with the CRC project.

L-009-021

- ii) *Re-examine mitigation measures for 35 locations that will not meet noise standards with the build alternatives as a way of protecting the health of residents in these areas.*

L-009-022

**e) Environmental Justice**

- i) *Analyze the effects of noise, air quality, and safety in the area of impact used for the transportation analysis.*

The populations in the 23-mile project area used in the transportation analysis will experience air quality and noise impacts from both the I-5 and the increased vehicles on local streets accessing the bridge. The health and safety of bikes and pedestrians on local streets will also be impacted by this traffic. The air quality, noise, and safety analyses should use this expanded area of analysis. Otherwise, environmental justice populations are not consistently considered throughout the DEIS.

L-009-023

**f) Establishing health-based standards for the CRC project**

- g) *In evaluating the merits of proposed bridge alternatives set standards (e.g. for acceptable air toxic and noise levels) that are more stringent than federal or state standards where there is scientific evidence that this is necessary to protect the health of the public.*

As we have pointed out in the air quality and noise sections some federal standards do not protect human health adequately. We urge the CRC staff to examine available peer-reviewed literature to determine whether stricter standards are necessary to prevent harmful health impacts in our community rather than simply following NEPA requirements.

L-009-024

In closing, Multnomah County Health Department recognizes that the CRC project staff is facing a considerable challenge in balancing environmental, economic, and health and safety considerations in designing an alternative to the current I-5 bridge. Once again, we commend the inclusion in the proposed bridge alternatives of those characteristics that support the health of our communities. The protection of public health is at the heart of the law that requires this environmental assessment and we encourage you to incorporate our suggestions as the project moves forward.

Sincerely,



Lillian Shirley, BSN, MPH, MPA  
Director



Gary Oxman, MD, MPH  
Health Officer

cc: Columbia River Crossing Task Force  
Sustainable Development Commission

AN EQUAL OPPORTUNITY EMPLOYER  
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Although the area along I-5 has higher MSAT concentrations, on-going reductions in MSATs under current vehicle emission regulations will reduce MSAT emissions in the corridor. The project by itself is not expected to result in any high and adverse air quality impacts in north Portland, or any other part of the project area. See the FEIS Air Quality section. The latest result from the 2005 PATS/PATA model runs are incorporated into the FEIS.

The DEIS and FEIS noise analyses estimate the effect of future traffic and light rail operations on noise levels at receivers near the proposed facilities. They incorporate measurements of ambient noise levels in these areas, and thereby account for noise generated by all existing sources, as well as projected traffic noise. With proposed sound walls, future noise impacts can be much lower with the project than they are today and much lower than no-build. However, sound walls would not be cost effective or feasible for all receivers, including the taller apartment buildings. As noted in the DEIS and FEIS, some of these buildings provide housing to lower income populations. Alternate mitigation is under consideration.

**L-009-011**

These goals are consistent with the project goals. Please see responses below.

**L-009-012**

The LPA has been selected by local agencies, and it includes the extension of light rail into Vancouver. It will serve neighborhoods with proportionately high levels of minorities and low income households. Certain adverse impacts have been avoided with the selection of the LPA. For example, the Wellness Project, which was identified in the DEIS as a resource for low income persons suffering from mental illness, will not be displaced. The project staff have met with the residents and managers of subsidized housing



L-009-024

*Analysis conducted by: Nancy Goff, Maya Bhat, and Sandy Johnson  
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developments and social service agencies. These discussions will continue as the project refines construction staging plans so as to have the least impact on these vulnerable communities.

The project was able to be particularly well informed about neighborhood cohesion as a result of the Vancouver and Portland Cities' commitments to the development of neighborhood plans. Neighborhoods often define themselves and strengthen their identities through the development of neighborhood plans, which is why they are discussed in Chapter 3 (Section 3.5) of the DEIS and FEIS and in the Neighborhoods and Population Technical Report.

While some plan goals may be unique to a certain neighborhood, other goals are common to many communities. These plans have been reviewed to determine community resources and the priorities of different communities. Neighborhood plans were also used in the determination of light rail as the preferred transit mode. The plans have also provided the project team with guidance throughout the refinement of final design as described in Chapter 3 (Section 3.5) of the FEIS.

#### L-009-013

As described in Chapter 3 (Section 3.1) of the DEIS, ODOT's Safety Priority Index System (SPIS) ranked two locations within the CRC project area, the Hayden Island Interchange and the North Portland Harbor Bridge, within the top 5% of the highest scored sites or, high crash locations, in the state for 2004 to 2006. Within Washington, five locations along I-5 in the project area have been categorized by WSDOT as high accident locations, as reported in the DEIS.

Improving safety and mobility of cars and freight using the bridge and highway is a part of the CRC projects purpose and need. As described in Chapter 3 (page 3-50) of the DEIS, the replacement bridge and highway



L-009-024

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alignment, which was chosen as part of the LPA, includes a range of safety and design improvements.

#### L-009-014

As discussed in the DEIS, a replacement bridge over the Columbia River will include dramatically improved bicycle and pedestrian facilities by providing:

- A new 16 to 20 foot multi-use pathway over the Columbia River completely separated from vehicle traffic due to the design of the Stacked Transit Highway Bridge
- Protections from traffic noise, exhaust and debris for pedestrians and bicyclists on the river crossing
- More direct connections on each side of the river, consisting of stairs, ramps, and elevators, as well as pathway extensions that connect in with existing or planned facilities and public transit
- Many new or enhanced sidewalks, bike lanes, and crosswalks near the bridge and throughout the project area

Since the publication of the DEIS in May 2008, and the selection of the LPA in July 2008, the CRC project team has continued to work with the Pedestrian and Bicycle Advisory Committee and project partners to refine route and facility design. The updated design, as described in Chapter 2 (Section 2.2) of the FEIS, is the outcome of a long collaboration process.

#### L-009-015

The CRC project proposes to include a variable rate toll. The goal of variable-rate tolling is to reduce congestion and maximize the flow of traffic through this corridor. With a variable rate toll, a lower toll is charged when traffic demand is lower and a higher toll is charged when the corridor is at its highest demand. Because a toll is charged by time of

**L-009-024**

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day, variable-rate tolling gives travelers an incentive to change travel times, reduce optional trips, take an alternate route, or choose transit as an alternative to driving alone. Experiences in other cities in the U.S. and around the world have shown that these fees can help reduce congestion and improve the performance of the roadway.

**L-009-016**

The LPA would increase throughout on the crossing. The project has considered a variety of TSM/TDM measures to complement the infrastructure improvements. See Chapter 2 of this FEIS for a description of the TSM/TDM measures currently proposed as part of this project.

**L-009-017**

The twenty year planning horizon is used consistently throughout the Metro area and within the professional community of planners and engineers. There are many unknowns about longer-term transportation funding, behavior, and technologies. Modeling past 20 years becomes increasingly unreliable, and is more subject to differences of opinion and higher risk assumptions. However, it is reasonable to assume that as long as population and employment increase, congestion will increase. It is also reasonable to assume that congestion will continue to be lower with the project than without it.

**L-009-018**

The number of collisions has been predicted and is based on extrapolating the existing collision rate given the predicted increase in traffic volume. There has not been an analysis related to the changes in collision severity and associated injuries due to increased speed and volume. However with improved highway geometry the collision rate, severity, and associated injuries would be expected to decrease compared to the No-Build Alternative. The specific improvements include providing adequate horizontal and vertical stopping sight

distance on the I-5 mainline and the ramps, adequate acceleration and deceleration distances, improved weaving and merge distances, and illumination within the corridor.

The freeway and local roadway interface has been looked at in detail and in coordination with the local municipal agencies and advisory working groups to ensure a safe and improved system. New local street connections in downtown Vancouver and North Portland are proposed along with more visible and accessible bike and pedestrian routes. See Chapter 3 (Section 3.1) of the FEIS.

**L-009-019**

The CRC project team, in coordination with the CRC Pedestrian and Bicycle Advisory Committee, has developed improvements for east-west connections for bicycles and pedestrians at six interchanges in the project area, and at Evergreen Blvd, and the 29th and 33rd Street overpasses in Vancouver. A more detailed description of the facilities currently proposed can be found in Chapter 2 (Section 2.2) of the FEIS.

**L-009-020**

Please see response to L-009-007.

**L-009-021**

The World Health Organization's Guidelines for Community Noise (1999) do not assert that outdoor noise levels above 55 dBA are associated with heart disease, hypertension or other illnesses. Their guidelines suggest that outdoor noise levels exceeding 55 dBA for 16 hours or more per day would result in annoyance. FHWA's traffic noise abatement criteria are 57 dBA (exterior) for lands on which serenity and quiet are of extraordinary significance, and are 67dBA (exterior) for residential property. These criteria are the industry-standard for highway projects input analysis. The FHWA noise criteria are applied to the peak noise impact hour, rather than the sustained average noise level over a 16

hour period as WHO suggests.

Please see the FEIS, Section 3.11 and the Noise and Vibration technical report for a discussion of the federal noise impact criteria, how they are implemented by Oregon and Washington, and how and when mitigation is recommended.

Noise impacts have been remodeled for the FEIS and mitigation has been considered for all receivers that would be impacted. While noise impacts would be significantly lower with the project than they are under existing conditions or would be with No-build, not all impacts can be practicably mitigated.

**L-009-022**

The Environmental Justice Technical Report includes a robust analysis of potential air quality, noise, and other impacts. As stated in the FEIS, noise levels and air quality will actually improve with the construction of the LPA. This nearly eliminates the potential for disproportionate air quality and noise impacts to minorities and low income populations.

Similarly, the project improves traffic safety on the interstate and at many local intersections (see Section 3.01 of the FEIS). The bike and pedestrian river crossing will no longer include at-grade street crossings.

The Environmental Justice analysis looked at specific and localized impacts to low income housing sites and other social service institutions. The analysis also evaluates more broad, regional issues such as job creation and tolling.

**L-009-023**

For any given subject, there is always a range of research findings and professional opinions. The fact that there is not 100% consensus in the scientific community regarding air quality and human health thresholds is

not unusual, nor is it cause for the project to assume that the current federal and state standards are not adequate. Current federal and state ambient air quality standards and requirements, as well as current noise impact standards, have been established through lengthy processes of professional and stakeholder input, research, and review. See the response to comment L-009-007 for more information on air quality standards.

**L-009-024**

Thank you for your input. We have appreciated the assistance and coordination with your staff as we developed the Final EIS and refined the LPA.