

Humboldt County General Plan Update Health Impact Assessment: A Case Study

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ABSTRACT

As a tool for deliberately planning for and optimizing the ways in which we design our environments, Health Impact Assessment (HIA) holds promise for achieving environmental justice and health equity. This case study describes the application of HIA to updating a rural county's General Plan. Humboldt County, California is currently considering three development plans to accommodate future population growth, and the described HIA process successfully identified and analyzed potential health outcomes associated with each. Although the General Plan Update process is not yet complete as of this writing, the HIA has already accomplished one of its initial goals, which was to build awareness of health impacts related to planning decisions among county agencies, project decision-makers, participating community members, and the general public. Another noteworthy outcome of this process, which is intended to aid in planning future equitable and just communities, was the development of the "Rural Healthy Development Measurement Tool," a tool for considering health in rural development decisions.

INTRODUCTION

THROUGHOUT THE PAST 60 years, development in non-urban areas of the United States has turned many forests, wilderness areas, and open spaces into suburbs, exurbs, and highways. This growth pattern has both necessitated and been fueled by the building of vast amounts of public infrastructure, including roadways, sewer and water systems, schools, and parks. While these are important resources for our modern world, unfortunate impacts of unrestrained development include loss of agricultural and timberlands, increased reliance on cars, impractical and/or unsafe environments for physical activity, inaccessibility of healthy food within urban areas,

concentration of polluting industries in inner-city neighborhoods, increased social isolation, and segregation by class and/or race. These development trends have been intrinsically linked to environmental injustice: low-income and minority populations disproportionately face negative consequences.¹

Changes in patterns of health and disease have also occurred during the last 30 years. Chronic diseases such as diabetes, cardiovascular disease, and obesity have become more prevalent, environment-related illnesses such as asthma are on the rise, and health disparities between

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¹Manuel Pastor, James Sadd, and Rachel Morello-Frosch, *Still Toxic After All These Years: Air Quality and Environmental Justice in the San Francisco Bay Area*, Prepared for the Bay Area Environmental Health Collaborative (Center for Justice, Tolerance & Community, University of California, Santa Cruz, February 2007); Howard Frumkin, Lawrence Frank, and Richard Jackson. *Urban Sprawl and Public Health: Designing, Planning and Building for Healthy Communities* (Island Press, 2004), 13–107; US Environmental Protection Agency, Development, Community, and Environment Division. *Our Built and Natural Environments: A Technical Review of the Interactions between Land Use, Transportation, and Environmental Quality* (2001).

different classes and races, including the life-expectancy gap, have widened.²

Many argue that suburban and exurban growth patterns contribute to changing patterns of health and disease. For example, routine physical activity is facilitated by availability of walkable, bikable streets that connect homes, schools, parks, jobs, and shopping areas. Yet new neighborhood developments are often isolated from jobs, schools, and services and require the use of private automobiles for most or all trips. Non-urban development often happens without sufficient infrastructure development; one example of this is the construction of roads without shoulders or bike lanes in areas where public transit is not practical. These trends contribute to a lack of physical activity, and physical activity can prevent obesity, diabetes, and heart disease; reduce stress; improve mental health; and promote longevity.³

Despite potential impacts on health, decisions about city, county, regional, or statewide land use plans are frequently made without regard for their health consequences. To improve health outcomes, impacts on health need to be taken into account as land use plans and decisions are made.

Health Impact Assessment (HIA) systematically identifies and analyzes impacts of specific policies and projects on population health, and proposes mitigations that would improve health outcomes. HIA findings and recommendations enable decision-makers to reach informed decisions to improve population health and reduce health disparities. This case study describes the application of HIA to updating a General Plan in Humboldt County, a rural county in Northern California. The HIA analyzed potential health outcomes associated with three development alternatives being considered in the General Plan, and gave particular focus to reducing health disparities for populations vulnerable to changes in land-use development patterns. The HIA was conducted with the intent of using a framework of participatory democracy for informing the decision-making process and, in turn, improving health outcomes in the county.

BACKGROUND

Humboldt County is conducting a General Plan Update (GPU) to guide future building and growth. The following three development alternatives are being considered:

- *Plan Alternative A* proposes “focused growth.” Six thousand new residential units—the future housing need based on state projections—would be built over the course of 25 years in areas already supported by public sewage and utilities. In other words, higher residential density and infill development would be encouraged.
- *Plan Alternative B* is a middle ground between Alternatives A and C, proposing 6,000 units within urban centers that have an existing network of utilities, sewage, and transit, as well as 6,000 units in areas outside city boundaries that do not already have this infrastructure.

- *Plan Alternative C* allows the most unrestricted growth with an “expanded development pattern.” It would allow construction of 6,000 units within existing municipal boundaries and 12,000 outside of those boundaries.

DISCUSSION

Although HIA can be composed of diverse research methods, analyze a wide variety of issues, and be used in different ways to influence a project, the same five steps are typically included: *screening, scoping, analysis, reporting, and evaluation/monitoring*. This case study is chronologically presented in terms of these steps.

The *screening* stage of the HIA, which involves determining whether an HIA is warranted and how it can be used, was conducted informally by various stakeholders. See Table 1 for a complete list of stakeholders composing the “Project Team.”

Humboldt County Public Health Branch and Human Impact Partners staff, along with members of the physical activity advocacy group Humboldt Partnership for Active Living (HumPAL), recognized the important and overlooked connections between the built environment, health opportunities, and health disparities in Humboldt County. Because of the profound and well-documented influences of the built environment on health, the GPU represents a clearly defined decision that would have broad impact on the health and wellbeing of county residents. Through a series of discussions, these groups anticipated that an HIA would help create awareness among GPU decision-makers and the general public of the importance of planning a healthy built environment, and would offer specific recommendations for optimizing potential health outcomes

²Centers for Disease Control and Prevention. Chronic Disease Prevention: Diabetes—Disabling Disease to Double by 2050—At-a-Glance 2008. <<http://www.cdc.gov/nccdphp/publications/aag/ddt.htm>>. (Last accessed on June 25, 2008); Centers for Disease Control and Prevention. Physical Activity and Good Nutrition: Essential Elements to Prevent Chronic Diseases and Obesity—At-a-Glance 2008. <<http://www.cdc.gov/nccdphp/publications/aag/dnpa.htm>>. (Last accessed on June 25, 2008); Jeanne E. Moorman, Rose Anne Rudd, Carol A. Johnson, Michael King, Patrick Minor, Cathy Bailey, Marissa R. Scalia, Lara J. Akinbami. *National Surveillance for Asthma—United States, 1980–2004*. 2007, CDC MMWR Surveillance Summaries, 56 (Oct 19): 1–14, 18–54; Julie C. Bolen, Luann Rhodes, Eve E. Powell-Griner, Shayne D. Bland, Deborah Holtzman. *State-specific prevalence of selected health behaviors, by race and ethnicity—Behavioral Risk Factor Surveillance System, 1997*. 2000, CDC MMWR Surveillance Summaries, 49 (Mar 24): 1–60.

³Lawrence D. Frank and Peter Engelke. *How land use and transportation systems impact public health: A literature review of the relationship between physical activity and the built form*. Active Community Environments Initiative Working Paper #1, 38–87; Humboldt Partnership for Active Living, *Defining Healthy Design in Humboldt County: A Policy ‘Charrette.’* <http://www.nrsrcaa.org/humpal/Resources/HumPAL_PolicyCharretteRpt10_07.pdf>. (Last accessed on June 25, 2008); PolicyLink, *Regional Development and Physical Activity: Issues and Strategies for Promoting Health Equity, A PolicyLink Report* (November 2002), 9.

TABLE 1. ORGANIZATIONS INVOLVED IN THE HUMBOLDT COUNTY GENERAL PLAN UPDATE HEALTH IMPACT ASSESSMENT AND THEIR ROLES

<i>Organization</i>	<i>Roles</i>
Humboldt County Public Health Branch (PHB)	Oversee the HIA process Coordinate partners Participate in decision about final set of indicators Contribute to research and analysis Contribute baseline data Edit report Develop presentation of findings Communicate results to decision-makers
Humboldt County Community Development Services Planning Division (Planning Division)	Contribute baseline data Participate in focus groups Review and edit report Incorporate HIA results and analyses into EIR
Humboldt Partnership for Active Living (HumPAL)	Organize focus groups with community representatives Participate in decision about final set of indicators Contribute baseline data Edit report Help PHB develop presentation of findings Provide website host for HDMT and HIA
Human Impact Partners (HIP)	Facilitate the HIA process Plan agenda and conduct the focus groups Participate in decision about final set of indicators Coordinate research Conduct majority of research and analysis Research baseline data Write draft report

associated with the General Plan's guidance of future development in the county.

The lead decision-making agency for the GPU, the county Planning Division, was open to incorporating a health analysis into the process, and welcomed contributions by the Public Health Branch. The Project Team represented a rare opportunity for interdisciplinary collaboration among rural public health and planning agencies, and all parties saw value in working together on the HIA.

Scoping an HIA involves determining health impacts to evaluate, research questions, methods for analysis, and stakeholder roles.

During the scoping phase, the Project Team analyzed and compared the three alternatives based on a series of health indicators. Health indicators are ways to measure environmental, built environment, or social conditions that impact health status. For example, how much people drive can be an indicator of air quality, physical activity, and collisions; these in turn influence asthma, other respiratory diseases, obesity, chronic diseases, injury, and death.

The Project Team chose from over 100 health indicators for healthy planning contained in the San Francisco Department of Public Health's Healthy Development Measurement Tool (HDMT),⁴ and then refined indicators to reflect Humboldt County's rural environment. Four focus

groups conducted throughout the county were attended by over 50 people representing a wide range of populations and interest groups (e.g., seniors, Native Americans, environmentalists, planners, homeless advocates, advocates for active transportation, health professionals, and elected officials). These community stakeholders helped narrow and modify the HIA scope to 35 indicators specific to Humboldt County (Table 2). How these indicators would be affected by the three General Plan alternatives became the HIA's research questions, which the *Assessment* phase sought to answer through research and analysis.

Two example analyses included in the HIA are summarized below. In both cases, existing data combined with qualitative and quantitative analytical methods predicted the GPU's impact on public health, including health opportunities and disparities. Each example is summarized through the presentation of:

- a review of literature documenting the indicator's influence on health outcomes;
- existing conditions information related to the indicator;

⁴San Francisco Department of Public Health. HDMT—The Healthy Development Measurement Tool. <<http://thehdmt.org>>. (Last accessed on March 25, 2009).

TABLE 2. SUMMARY OF FINDINGS FOR EACH INDICATOR ANALYZED

<i>Indicator</i>	<i>Description</i>	<i>Plan Alternative A Impact</i>	<i>Plan Alternative B Impact</i>	<i>Plan Alternative C Impact</i>
<i>SUSTAINABLE AND SAFE TRANSPORTATION</i>				
ST.1.b	Average vehicle miles traveled by Humboldt residents per day	+	–	–
ST.1.e	Average minutes traveled to work by zip code	+	~	–
ST.2.a	Proportion of commute trips made by public transit	+	~	–
ST.2.b	Proportion of households with ¼-mile access to local bus	+	~	–
ST.2.c	Proportion of average income spent on transportation expense	+	~	–
ST.3.a	Ratio of miles of bike lanes/pedestrian facilities to road miles	+	–	–
ST.3.b	Proportion of commute trips and trips to school made by walking or biking	+	~	–
ST.3.c	Number and rate of bicycle/pedestrian injury collisions	TBD	TBD	–
ST.3.e	Proportion of population living on residential streets with <35 mph speed limits	+	~	–
ST.3.f	Percent of population who have access to pedestrian facilities	+	~	–
<i>HEALTHY HOUSING</i>				
HH.1.a	Proportion of housing production to housing need by income category	+	~	–
HH.1.b	Proportion of households paying greater than 30% & 50% of their income on their homes	+	~	–
HH.2.a	Homeless population	+	~	–
<i>PUBLIC INFRASTRUCTURE</i>				
PI.1.d	Proportion of zip codes without childcare facilities	–	~	+
PI.2.a	Proportion of residents within ½ mile of a grocery store	+	~	–
PI.2.b	Proportion of households within ½ mile of a public elementary school	+	~	–
PI.2.d	Fast food establishments within ½ mile of high schools and middle schools	~	–	–
PI.3.a	Proportion of population within ¼ mile of open public parks	+	~	–
PI.4.d	Percentage of population within 2 miles of a medical center	+	~	–
PI.5.a	Percentage of seniors within ½ mile of senior center	+	~	–
PI.6.a	Residential density	+	~	–
<i>PUBLIC SAFETY AND SOCIAL COHESION</i>				
SC.1.c	Rates of driving under the influence (DUI)	TBD	TBD	TBD
SC.2.a	First responder response times—Fire response times	+	~	–
SC.2.b	Emergency preparedness sites/training for citizens	+	~	–
SC.4.a	Isolation index	+	~	–
<i>HEALTHY ECONOMY</i>				
HE.1.a	Proportion of jobs paying a living wage	TBD	TBD	TBD
HE.2.a	Proportion of jobs that provide health insurance	TBD	TBD	TBD

(continued)

TABLE 2. (CONTINUED)

Indicator	Description	Plan Alternative A Impact	Plan Alternative B Impact	Plan Alternative C Impact
HE.2.c	Number of jobs available with appropriate educational requirements	TBD	TBD	TBD
<i>ENVIRONMENTAL STEWARDSHIP</i>				
ES.1.b	Residential electricity use (kWH) per capita	+	~	-
ES.2.a	Acres of public open space per 1,000 population in urban areas	-	-	-
ES.3.a	Proportion of county land area retained for active farming uses	~	-	-
ES.3.b	Proportion of county land area retained for timber production	~	-	-
ES.3.c	Percent of food consumption from local sources	~	-	-
ES.5.a	Total impervious area in county	~	-	-
ES.5.c	Percent of households using municipal water system	+	~	-

Notes:

+ = Indicator would change in a positive way for that Plan Alternative, and, therefore, health outcomes related to that indicator are expected to improve.

~ = Indicator and related health outcomes would not be affected significantly by the choice of Plan Alternatives.

- = Both the indicator and health would be negatively affected by that Plan Alternative.

TBD = To Be Determined. Not enough information is currently available to evaluate how the indicator and health would change in response to the Plan Alternatives.

- a quantitative analysis predicting health-related outcomes of each Plan Alternative;
 - qualitative data reflecting community views and priorities;
 - an analysis of health disparities;
 - conclusions; and
 - health-promoting mitigations relevant to each indicator.
- b. Areas with higher vehicle volume tend to have higher fatality rates.⁶
 - c. VMT has a direct relationship with an individual's amount of walking.⁷
 - d. VMT correlates with obesity.⁸
 - e. Because driving is associated with expenses such as the cost of purchasing the vehicle, gasoline, car insurance, and maintenance, one's amount of driving

Health indicator: Vehicle miles traveled by Humboldt County residents

Literature review. Vehicle miles traveled (VMT) is related to many health outcomes:

- a. Vehicle travel generates ambient air pollutants such as carbon monoxide, particulate matter, nitrogen oxides, volatile organic compounds, and ozone. Human exposure to these pollutants is associated with increased mortality, respiratory disease, impaired cardiovascular functions, and increased cancer risk. Greenhouse gases emitted by vehicles, such as carbon dioxide and ozone, contribute to climate change, which may increase heat-related illness and death, health effects related to extreme weather events, health effects related to air pollution, water- and food-borne disease, and vector- and rodent-borne disease. With approximation that vehicle mix and speeds are equivalent across the three alternatives, VMT can be considered a direct measure of human exposures to ambient air pollutants and greenhouse gas emissions.⁵

⁵Reid Ewing and Richard Kreutzer. *Understanding the relationship between public health and the built environment: A report to the LEED-ND Core Committee*. May 2006, 10–12; California Environmental Protection Agency Air Resources Board and American Lung Association, *Recent research findings: Health effects of particulate matter and ozone air pollution*, January 2004; Kim Knowlton, Barry Lynn, Richard A. Goldberg, Cynthia Rosenzweig, Christian Hogrefe, Joyce Klein Rosenthal, and Patrick L. Kinney, "Projecting heat-related mortality impacts under a changing climate in the New York City region," *American Journal of Public Health* 97 (November 2007): 2028–2034; Canadian Public Health Association. Health effects of climate change and air pollution. <<http://www.ccah.cpha.ca/effects.htm>>. (Last accessed on January 21, 2008).

⁶Howard Frumkin, Lawrence Frank, and Richard Jackson. *Urban Sprawl and Public Health: Designing, Planning and Building for Healthy Communities* (Island Press, 2004), 117.

⁷Lawrence Douglas Frank, Brian E Saelens, Ken E Powell, and James E Chapman, "Stepping towards causation: do built environments or neighborhood and travel preferences explain physical activity, driving, and obesity?" *Social Science and Medicine* 65 (November 2007): 1898–1914.

⁸Javier Lopez-Zetina, Howard Lee, and Robert Friis, "The link between obesity and the built environment. Evidence from an ecological analysis of obesity and vehicle miles of travel in California." *Health & Place* 12 (Dec 2006): 656–664.

logically has an impact on the amount of money available for resources needed for health, such as nutritious food and health care.⁹

Existing conditions. In 2006, Humboldt residents traveled 27 vehicle miles per capita per day. In California in 2001, per capita VMT was 2.7 times higher in rural areas as compared with urban areas (58.8 daily vehicle miles traveled per capita versus 21.8).¹⁰

Quantitative analysis. Using the vehicle travel data above, current populations in urban and non-urban areas, and the expected change in these populations, it was calculated that using Plan Alternative A as a baseline, Plan Alternative B would generate 16% (corresponding to over 200 million miles) more VMT annually in the county, and Plan Alternative C would generate 32% (corresponding to over 400 million miles) more VMT annually.

Qualitative data. Participants of HIA focus groups and a previous policy charrette raised the issues of walkability and bikability numerous times, and expressed their desire to minimize VMT.¹¹

Health disparities analysis. An analysis of how each Plan Alternative would impact vulnerable populations was conducted for each indicator. Land use patterns likely to increase VMT the most in the county (i.e., sprawling development) would make some resources inaccessible to approximately 30% of the population who do not drive (including some seniors, youth, low-income, and disabled residents).¹² Higher VMT leads to increased expenditures associated with driving, which represent a larger proportion of household income for low-income populations.

Conclusions. Based on the VMT analysis, Plan Alternative A would be best for health and Plan Alternative C would have the most negative impacts on health. Taking into account published research evidence, health benefits of Plan A may include fewer injuries from accidents, lower cardiovascular disease, respiratory disease, and cancer rates, less obesity, and fewer health hazards related to climate change.

Health-promoting mitigations. Mitigations identified for reducing VMT include, for example, encouraging large employers to adopt transportation demand management programs; increasing public education about public transit options; and designing multi-modal transit hubs with co-located businesses and housing.

Health indicator: Proportion of households within a half-mile of a public elementary school

Literature review. Proximity to a school is related to many health outcomes:

- a. When schools are located closer to home, vehicle pollution emissions fall as a result of more children walking and/or bicycling to school.¹³

- b. Walking to and from school can be an important source of exercise for children. However, many children are not currently getting enough exercise: nationally, only 13% of children aged 5 to 15 walk to school.¹⁴
- c. Walking to school is safer when schools are close to home. The more children are exposed to traffic on their way to school, as measured by the number of intersections they have to cross, the higher their risk of being hit by a car.¹⁵

Existing conditions. Geographic information systems (GIS) analysis showed that approximately 35% of Humboldt County households are within a half-mile of one of the 48 public elementary schools in the county. In urban zip codes, approximately 41% of households are within a half-mile of a public elementary school, while in non-urban zip codes, about 24% of households are.

Quantitative analysis. Assuming existing residents will remain in urban and non-urban areas at current proportions, new housing will be built at similar distances from schools within each zip code, and based on the expected number and locations of households associated with each Plan Alternative, it was calculated that Plan Alternative A would lead to nearly 36% of total households in the county being within a half-mile of a public elementary school. Using a similar analysis, it was determined that for Plan Alternative B, just under 35% of total households in the county would be within a half-mile of an elementary school, and if Plan Alternative C was adopted, 34% of total households would be. The number of total future households associated with these three alternatives ranges from 57,238 to 69,238. Thus, a difference of just one percentage point in the number of households within a half-mile of a public elementary

⁹Barbara J Lipman, Center for Housing Policy, "Something's Gotta Give: Working Families and the Cost of Housing." *New Century Housing* 5 (April 2005): 7-8.

¹⁰California Department of Transportation, Division of Transportation System Information. *California Motor Vehicle Stock, Travel and Fuel Forecast (MVSTAFF)* (2006), 35; US Department of Transportation Federal Highway Administration, Selected Measures for Identifying Peer Status—2000—Federal—AID Highways—Table PS-1R (Revised). <<http://www.fhwa.dot.gov/ohim/hs00/ps1r.htm>>. (Last accessed on March 25, 2009).

¹¹Humboldt Partnership for Active Living, "Defining Healthy Design in Humboldt County: A Policy 'Charrette' Including Methods, Outcomes and Lessons Learned." October 2007.

¹²Redwood Community Action Agency, Natural Resources Services, "Humboldt County Transportation-Disadvantaged Populations Report." May 2006, 4.

¹³Reid Ewing, Christopher V. Forinash, and William Schroerer, "Neighborhood Schools and Sidewalk Connections: What are the impacts on travel mode choice and vehicle emissions?" *TR News* 237 (April-May 2005): 4-10.

¹⁴A. Dellinger and C. Staunton. *Barriers to Children Walking and Bicycling to School*—United States, 1999. 2002, CDC Morbidity and Mortality Weekly Report, 51 (August 16): 701-704.

¹⁵A. Macpherson, I. Roberts, and B. Pless, "Children's exposure to traffic and pedestrian injuries." *American Journal of Public Health* 88 (Dec 1998): 1840-1845.

school amounts to between 572 and 692 households; this is not insignificant, given that some households include multiple school-age children.

Qualitative data. Accessible childcare and schools were brought up in every focus group as a priority concern for Humboldt residents.

Health disparities analysis. Consideration of health disparities inherent to this analysis determined that very rural populations, including Native American tribes and others, would likely not see a change in their proximity to schools.

Conclusions. Based on analysis of this indicator, Plan Alternative A is the healthiest option. Taking into account several assumptions, Plan Alternative A would result in the highest percentage of children living in close proximity to their elementary school, which would encourage higher levels of physical activity and social interaction due to walking to school and using schoolyards for off-hours activities. It may also result in less school-related driving and consequent air pollution. In contrast, Plan Alternative C would result in reducing the percentage of children gaining these health benefits.

Health-promoting mitigations. A potential health-promoting mitigation identified for this indicator was to ensure that all new large communities include a public elementary school by requiring developers to contribute fees for its construction.

Analyses of all 35 indicators concluded that Plan Alternative A would offer the greatest number of positive potential health outcomes, while Plan Alternative C would contribute the most negative potential health outcomes. Table 2 summarizes the HIA analysis for all 35 indicators, listing whether each alternative would lead to positive health outcomes, no significant change in health outcomes, or negative health outcomes.

It is important to note, however, that Plan Alternative A may not lead to the construction of enough affordable housing to meet future demand, and that an important mitigation to consider is the development of more housing (e.g., 12,000 rather than 6,000 units) in urban areas.

The HIA intended to reach decision-makers and bring the GPU into public discussion, as well as frame that discussion around health and wellness. *Reporting* for this HIA included informal meetings with county staff, written reports, public testimony, and training materials with which to educate the general public. The HIA report was reviewed and used by the Planning Division. HIA results were also presented to the Humboldt County Planning Commission, the Board of Supervisors, several city councils, and community groups throughout the county. The HIA was discussed in local newspapers, in one case referencing the HIA as rationale in support of Alternative A.¹⁶

Evaluation of an HIA examines the process of conducting the HIA (Process Evaluation) as well as ultimate impacts on project outcomes (Outcome Evaluation). This HIA

process was successful in asking research questions highly relevant to the project, using quantitative and qualitative data and analyses to inform a decision having broad impact, and engaging strategic stakeholders to ensure use of the report. HIA reporting effectively reached decision-makers and the general public, framing discussions of both audiences around health and wellness. Although a Plan Alternative has not been selected to date, many of the HIA findings and recommendations have been incorporated into the most recent draft General Plan. Other benefits of the HIA process are described below.

Members of the Project Team have reported an increased understanding of the relationship between the built environment, health, and climate change. The HIA process developed capacity and rapport among county staff and community members, and set the stage for future collaboration between the Public Health Branch, the Planning Division, and community groups. As a result of their working relationship during this project, the Health Officer was invited to contribute health-promoting concepts and policies to the Circulation Element of the GPU. For example, a new policy in the draft Circulation Element states that the county public works, health and human services, and planning agencies are to coordinate with one another to implement circulation policy and encourage public transit, biking and walking in new areas of development. The inclusion of public health input on a County General Plan presents tremendous opportunities for equitable land use development, and ultimately, environmental justice.

Engagement with members of the Humboldt County community during all stages of this HIA helped the Project Team understand concerns and needs of those who will be impacted by the General Plan Update. Community members helped prioritize relevant health indicators to analyze and contributed data to the assessment. The HIA invigorated the general public in framing the GPU around health and wellness: since the release of the HIA report, many Humboldt County residents have cited the HIA in their advocacy for healthy development at public hearings and in public comment letters.

At various statewide meetings and conventions, the Health Officer presented HIA findings to California medical and public health communities. Following a presentation to the local medical community, the Humboldt-Del Norte County Medical Society formally endorsed the consideration of health impacts in planning decisions.

Adapting the HDMT to the unique needs of a rural setting was crucial for conducting analyses relevant to the Humboldt County population. The "Rural Healthy Development Measurement Tool" includes 73 health indicators suitable to a rural context and can be used for incorporating health analysis into built environment

¹⁶Editorial, "Good Times, Bad Times," *Times-Standard*, March 23, 2008; Carol Harrison, "Humboldt County becomes the first to make health impact assessment part of planning," *The Eureka Reporter*, April 8, 2008; Jon Beslow, "No sprawl behind the redwood curtain," *Times-Standard*, May 6, 2008.

projects in other rural locations in the future.¹⁷ For example, the Humboldt Bay Harbor Recreation and Conservation District has incorporated performance of an HIA into their proposed port development project.

CONCLUSION

This HIA was the first HIA conducted on a General Plan Update in the country. The HIA process was effective in analyzing various development alternatives for Humboldt County using health-based criteria of high priority to residents, and its findings point to clear differences in health impacts of those Alternatives. The HIA has built awareness among participating groups and the general public about how the Humboldt County GPU is likely to impact health. The HIA is currently being considered in the decision-making process and used to develop the General Plan language; however, its effect on the final decision remains unknown.

Moving forward, public health and planning agencies in Humboldt County plan to collaborate on other built environment decisions, with the goal of decreasing health

disparities. Both agencies support a legal requirement for county developers to commission and fund HIAs in an early phase of land-use planning projects. By striving to create a built environment that provides fair access to health-promoting resources and incorporating community voices in decision making, this HIA has incorporated principles of environmental justice within a planning process otherwise dominated by government officials.

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¹⁷Humboldt Partnership for Active Living, Humboldt County Healthy Development Measurement Tool. <<http://www.humpal.org/hdmt>>. (Last accessed on March 25, 2009).