

Public Safety and Social Cohesion Indicators

SC.2.a First responder response time, specifically Fire response times by zip code

Health-Based Rationale

The geographic distribution of fire stations throughout a county impacts the rate at which firefighters and emergency responders may respond to fires and medical emergencies at the neighborhood level. Rapid response by firefighters can influence severity of injury and number of deaths from a fire or emergency.

The National Fire Protection Association (NFPA) establishes codes and standards to minimize the possibility and effects of fire and other hazards. NFPA 1710 is a *voluntary* standard for fire station and emergency responders that states that the first arriving unit should respond within 5 minutes for 90% of all fire suppression incidents. Emergency medical responders should also respond within 5 minutes for 90% of all emergency medical incidents.¹

An adequate number of fire stations geographically distributed can aid in ensuring rapid response and rescue. However, it is unclear exactly how important response times actually are. Based on *one* study that showed that survival rates are better if CPR is administered within 4 minutes of the cardiac arrest, all EMS services have adopted a < 8 minute response time as the standard for the industry.² A different study showed, though, that whether the first responders arrived before or after 8 minutes did not make a difference for survival rates for traumatic injury.³ And a study done in Helsinki determined that out of 72,000 “Category C” emergency responses by ambulances, 33% of the 73 pre-hospital deaths were potentially avoidable if there had been faster ambulance response.⁴ This is 0.0003 of the responses, i.e., a negligible amount, that could have been saved by faster response.

It is possible that a more useful measure might be how many Humboldt County paramedics are available vs. Emergency Medical Technicians (EMTs). A study looking at EMT vs. paramedic services in King County, WA, determined that while the annual incidence of heart attacks was similar in the EMT and paramedic areas, more lives of persons with heart attacks were saved in the paramedic area than in the EMT area. During this 17 month period, the reduction in community cardiac mortality was 8.4% in the paramedic area and 1.3% in the EMT area. These findings suggest that paramedic services have a small but measurable effect on community cardiac mortality.⁵

Insurance companies rate the risk of devastating fires to be lower in cities compared to unincorporated and less densely populated areas of the County. Fire insurance can cost up to twice as much in a high risk area. Recently, industry standards were changed so that structures more than 10 miles from a fire station are given the highest risk rating for insurance purposes.

¹ Appendix B, Page 1, SF Controller's Report: http://www.sfgov.org/site/controller_page.asp?id=24430.

² Eisenberg MS, Bergner L, Hallstrom A. 1979. Cardiac resuscitation in the community: Importance of rapid provision and implications for program planning. JAMA 241:1905-7.

³ Pons PT, Mardovchick VJ. 2002. Eight minutes or less: Does the ambulance response time guideline impact trauma patient outcome? Journal of Emergency Medicine 23(1):43-8.

⁴ Kuisma M, Holmstrom P, Repo J, Maatta T, Nousila-Wiik M, Boyd J. 2004. Prehospital mortality in an EMS system using medical priority dispatching: A community-based cohort study. Resuscitation 61(3):297-302.

⁵ Eisenberg M, Bergner L, Hallstrom A. 1979. Am J Public Health 69(1):39-42.

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Response times are just one aspect of overall fire risk in neighborhoods. Increased risk of fire increases the risk of fire-related injury or death. Between 1983 and 1990, an average of 74% of all fire deaths in the United States occurred in residential fires.⁶ Heating fires are more common in single family homes, particularly those with fire places, than in apartment buildings where heating systems are professionally maintained. However a higher proportion of smoke alarms did not operate in apartments than in one- and two-family homes.

Fire prevention methods such as use of smoke detectors, sprinkler systems, building code enforcement, and flame-retardant mattresses and materials have decreased the risk of fire. Only 60% of households where a fire death occurred were equipped with smoke alarms; of those, 39% did not operate. Smoke alarms contribute to saving lives.⁷

Existing conditions

Fire protection services. Humboldt County's fire protection services provide protection to the approximately 126,518 citizens residing in the County. Fire protection forces consist of 69 career and 689 volunteer firefighters, 120 engines, 55 fire stations, 18 ambulances, and 2 rescue squads.⁸ These are detailed in the table below.

Wildfire risk. Approximately 11% of Humboldt County residents live in areas that have been assessed as "high wildfire risk". These areas are broken down by "fire planning compartments" and they are: East Klamath, Trinity, Mattole-Lost Coast, and South Eel. These areas comprise most of South County and a large portion of the northeast.⁹

⁶ US Fire Administration. Fire in the United States. Available at <http://www.usfa.dhs.gov/statistics/reports/fius.shtml>. Accessed on February 2, 2008.

⁷ FEMA. A Profile of Fire in the U.S.: 1992-2001. October 2004. Available at <http://www.usfa.dhs.gov/downloads/pdf/publications/fa-293-508.pdf>. Accessed online on February 2, 2008.

⁸ Humboldt County Fire Safety Council. 2006. Humboldt County Master Fire Protection Plan. Chapter 4: Countywide Emergency Response. Available at http://co.humboldt.ca.us/planning/fire_safe_council/fsc_default.asp. Accessed on February 1, 2008.

⁹ FSC. Chapter 3: Risk Assessment and Mitigation Strategies (RAMS) Modeling for Wildland Fires. Fire Safe Council Draft Master Fire Plan. Humboldt County Community Development Services Dept. Available at http://co.humboldt.ca.us/planning/fire_safe_council/fsc_default.asp. Accessed on February 18, 2008.

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Table PS.1. Local Fire Department Staffing and Fire Engine and Station Capability.¹⁰

Arcata Fire Protection District	3	5	10	50
Beginnings Volunteer Fire Department	2	7	0	12
Blue Lake Fire Protection District	1	2	0	25
Carlotta Community Services District	2	4	0	14
County Service Area No. 4	1	1	6	0
Fieldbrook Community Services District	1	3	0	22
Eureka Fire Department	3	6	33	12
Ferndale Fire Protection District	1	3	0	34
Fortuna Fire Protection District	3	8	0	65
Fruitland Volunteer Fire Department	1	1	0	5
Garberville Fire Protection District	1	4	0	17
Honeydew Volunteer Fire Department	4	5	0	16
Hoopa Volunteer Fire Department	1	2	0	14
Humboldt Fire Protection District No. 1	2	4	18	14
Kneeland Fire Protection District	1	3	0	10
Korbel Fire Brigade	1	1	0	22
Loleta Fire Protection District	1	5	0	24
Maple Creek Volunteer Fire Department	1	1	0	9
Miranda Community Services District	1	2	0	10
Myers Flat Fire Protection District	1	2	0	6
Orick Community Services District	1	4	0	9
Orleans Volunteer Fire Department	1	4	0	8
Palo Verde Volunteer Fire Department	1	1	0	33
Petrolia Fire Protection District	1	4	0	10
Phillipsville Volunteer Fire Department	1	3	0	5
Prosper Ridge Volunteer Fire Department	0	1	0	9
Redcrest Volunteer Fire Department	1	1	0	2
Redway Fire Protection District	1	4	0	20
Rio Dell Fire Protection District	1	3	0	25
Salmon Creek Volunteer Fire Department	1	1	0	8
Samoa Fire Protection District	2	3	0	12
Scotia Volunteer Fire Department	1	3	0	30
Shelter Cove Fire Department	1	4	2	10
Sprowel Creek Volunteer Fire Department	2	2	0	30
Telegraph Ridge Fire Protection District	1	1	0	6
Trinidad Fire Department	1	0	0	14
Weott Community Services District	1	1	0	10
Westhaven Volunteer Fire Department	1	2	0	6
Whale Gulch Volunteer Fire Department	1	2	0	18
Whitethorn Fire Protection District	1	2	0	8
Willow Creek Fire Protection District	1	5	0	23
Yurok Volunteer Fire Department	2	2	0	12
Total	55	120	69	689

Response times. Rural fire departments in Humboldt County have:¹¹

- Longer turn-out times (3.5-5.5 minutes or greater) due to more distant proximity of volunteers to fire stations;
- Longer response times (6-13+ minutes);

¹⁰ FSC. Chapter 3: Risk Assessment and Mitigation Strategies (RAMS) Modeling for Wildland Fires. Fire Safe Council Draft Master Fire Plan. Humboldt County Community Development Services Dept. Available at http://co.humboldt.ca.us/planning/fire_safe_council/fsc_default.asp. Accessed on February 18, 2008.

¹¹ Humboldt County Fire Safety Council. 2006. Humboldt County Master Fire Protection Plan. Available at http://co.humboldt.ca.us/planning/fire_safe_council/fsc_default.asp. Accessed on February 1, 2008.

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- Insurance Service Office (ISO) Public Protection Classification (PPC) ratings that are usually in the 8,9,10 rating range, indicating high risk;
- Almost 100% volunteer fire personnel, many of whom do not live in close proximity to the fire station(s).

Urban/semi-rural fire stations in Humboldt County generally have:

- Multiple-station coverage with smaller jurisdictions;
- Shorter response travel times (3-7 minutes);
- Shorter turn-out times (1.5 – 2.5 minutes);
- ISO PPC ratings that are in the low single digit range;
- Considerable amount of water supply and pressure;
- Either full-time paid or a mix of full-time paid and volunteers;
- Volunteers that reside in close proximity to the fire stations.

The average rural Community Structure Fire Response is the sum of the average turnout time (5 minutes), and the average travel time (6 minutes). Thus, average response time is 11 minutes. The average urban/semi-rural Community Structure Fire Response is the sum of average turn-out time (1.5 minutes) and the average travel time (4.3 minutes). Thus average response time is 7 minutes.

Medical emergency calls. Over 50% of the calls for fire organization services are related to medical aid, and they are also the fastest growing type of call. From 2000 to 2003, Fortuna experienced a 33% increase in medical aid and traffic collision call volume (3,088 calls in 2000 vs. 4,106 calls in 2003). Generally, when an emergency medical dispatch is requested, the local fire department responds and provides Basic Life Support until an ambulance which has Advanced Life Support capability arrives. The table below details Fortuna’s Interagency Command Center’s activity.

Table PS.2. Fortuna Interagency Command Center Recorded Activity.¹²

<i>Incident Type</i>	<i>Year</i>						
	<i>1998*</i>	<i>1999</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>
Public Assist	Un-recorded	156	223	331	313	257	143
Medical Aid	2567	2768	2846	2913	3329	3730	2341
Traffic Collisions	152	219	241	218	285	376	451
Structure Fire	92	99	96	102	92	100	81
Vehicle Fire	57	71	61	68	71	86	86
Wildland Fire	347	443	358	520	562	600	278
Referral to other agency	264	188	209	228	243	232	184
Other	595	781	647	919	1066	861	3045
Total	4074	4725	4681	5299	5961	6242	6609
Percent Change		+16%	-1%	+13%	+12%	+5%	+16%
Average Increase per year							+11%
Percent Increase (1998 to 2004)							+62%

**Recorded activity for 1998 was not categorized by Public Assist incident type—these incidents are contained in other categories for that year.*

¹² Humboldt County Fire Safety Council. 2006. Humboldt County Master Fire Protection Plan. Available at http://co.humboldt.ca.us/planning/fire_safe_council/fsc_default.asp. Accessed on February 1, 2008.

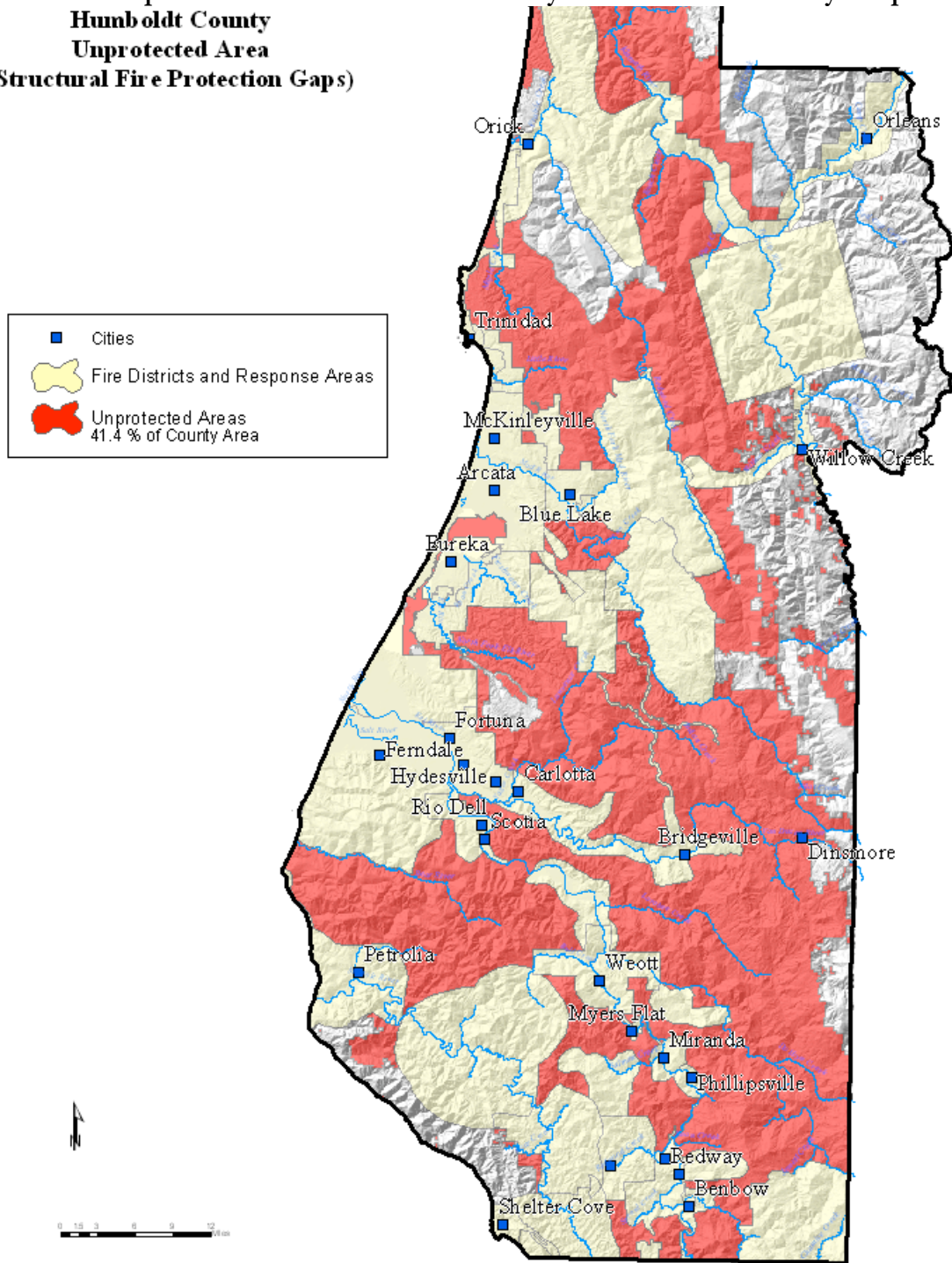
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Areas Without Fire Protection. Similar to other Northern California counties with large rural areas, Humboldt has several areas that are without any dedicated, formal delivery of year-round structural fire protection and/or emergency response services. An analysis of the County fire protection coverage map, created using fire organization survey data, indicates that approximately 41.4% of Humboldt County falls into this category and is without year-round structural fire protection and other necessary emergency services (shown in the figure below). This represents approximately 2% of the housing units within Humboldt County.¹³ These areas may receive a limited form of “good will” emergency response coverage from adjacent fire districts, CDF or other near-by agencies, but only on a seasonal or “as available” basis. These areas can have a response time of up to 45 minutes associated with them and the level of response greatly depends on the availability of resources. Additionally, a significant portion of the “unprotected” and “under protected” areas include State Highways and County Roads. Motorists involved in traffic collisions in these areas may experience long response times from first responders.

¹³ This estimate is based on the 2000 Census, which indicates that the County contains 55,298 housing units of which 1,138 are located in the 41.4 % of the county area that is “unprotected”.

Figure PS.1 A map of the areas of Humboldt County that are not covered by fire protection.

**Humboldt County
Unprotected Area
(Structural Fire Protection Gaps)**



Analysis

Assumptions

- It is assumed that no new fire stations will be built and that staffing levels will remain the same.

Quantitative Analysis

Using information from the Fire Safe Council's Master Fire Protection Plan, the rural response time is 11 minutes, and the urban response time is 7 minutes. However, it is not yet clear whether new development in Plan Alternatives B and C would be in areas considered to be rural or just non-urban. Therefore, it is difficult to quantitatively assess the change in average response times for the County.

Qualitative Analysis

In focus groups with fire personnel held for the Master Fire Protection Plan, participants noted:

- On many occasions that a majority of their calls are medical. Incidence ranged from 56% - 95%, with most saying above 75%;
- Collaboration with forest service is vital to rural areas (however the fire service cannot enter structures by law);
- Insurance is difficult for volunteer firefighters due to its cost;
- Funding is a problem for most volunteer fire stations;
- Response times are long in rural areas;
- Semi-rural areas tend to have an ISO rating of 5 in hydrant areas and 8B in non-hydrant areas.

Disparities

In 1997, the Federal Emergency Management Agency (FEMA) conducted a review of socioeconomic factors and risk of fire. The review found that "virtually every study of socioeconomic characteristics has shown that lower levels of income are either directly or indirectly tied to an increased risk of fire."¹⁴ One study in Dallas, Texas found that there was a 20-fold difference in risk of fire between persons with highest incomes and lowest incomes.¹⁵ The review also found that African American and American Indian children are nearly twice as likely to die in a fire as white or Asian children. Children under age 5 are 40% more likely to die in a fire than the general population.¹⁶

Older adults are also particularly at risk in the event of a fire. Nationally in 2001, the elderly represented 12% of the US population but suffered more than 30% of all fire deaths. This is due to a combination of factors: mental and physical frailties, higher alcohol usage, greater use of medications, higher smoking incidence, and elevated likelihood of living in a poverty situation. The relative risk of an older adult dying in a fire is 2.5 times greater than the general population.¹⁷

¹⁴ FEMA. Socioeconomic Factors and the Incidence of Fire. June 1997. Available at <http://www.usfa.dhs.gov/statistics/reports/socio.shtml>. Accessed online on February 2, 2008.

¹⁵ Istre, GR, et al. NEJM 2001;344:1911-6.

¹⁶ USFA. A Profile of Fire in the U.S.: 1992-2001. October 2004. Available at <http://www.usfa.dhs.gov/downloads/pdf/publications/fa-293-508.pdf>. Accessed on February 2, 2008.

¹⁷ US Fire Administration/National Fire Data Center. 2004. The Fire Risk to Older Adults. Topical Fire Research Series 4(9):1-8.

Conclusions

- A) Plan Alternative A would encourage concentration of population in areas that are already better served by fire departments with a higher percentage of career firefighters. Thus, **response times will be faster in Plan A.** In addition, there are more paramedics and EMTs in the urban areas of Humboldt County (vs. First Responders with Basic Life Support skills and equipment), which have an impact on mortality and morbidity.
- B) Plan Alternative B would encourage population in both urban and non-urban areas, and thus would not have a large impact on response times.**
- C) Plan Alternative C would encourage a greater amount of population growth in rural areas that are served more often by volunteer firefighters with slower response times. As such, **Plan Alternative C would lead to lower average response times.** Negative health outcomes could include increased injuries and deaths from fires and potentially increased harm in medical emergencies.

Recommended Health-Promoting Mitigations:

- Support clustered development in regions where water supply is adequate.
- Establish a uniform measurement system county-wide to track response times.
- Encourage currently trained EMTs to gain paramedic training.

SC.2.b Emergency preparedness training for citizens

Health-Based Rationale

As population density and settlement in high-risk areas continue to rise, natural disasters are expected to increase in frequency and severity. Thus, mass casualties are a likely consequence of such events. In the last 25 years, the United States has been subject to 442 natural disasters. During the last century, more than 16,500 people died and almost 2.5 million people were affected as a result of the top ten natural disasters registered in the US alone.¹⁸ And the occurrence of natural disasters is increasing; in the 1960's disaster totals numbered only 89 a year – in the 1990's it was 392.¹⁹

Studies of injuries after many types of natural disasters (floods, earthquakes, hurricanes, tornados) show that the most common type of injuries are soft tissue injuries, i.e., cuts, lacerations, and puncture wounds; or musculoskeletal injuries like fractures, sprains and closed head injuries. Members of the lay public are often the actual 'first responders' in many disaster events.²⁰ In California, the state government expects residents to be self-sufficient for the first 72 hours after an earthquake.²¹

In a study done in Los Angeles after the Northridge earthquake, 54% of the residents surveyed said they had received first aid training; this is similar to other studies with regard to prevalence of first aid training. Of those, 45% had received it in the last five years. Respondents who had first aid training were 2.4 times more likely to help their family and 2.1 times more likely to help a stranger than those without first aid training. People who had first aid training (treating shock, controlling bleeding, putting on a splint, mouth to mouth resuscitation, CPR) were almost 2 ½ times more likely to use first aid skills.²²

The Multihazard Mitigation Council studied the effectiveness of FEMA grants to mitigate the effects of floods, hurricanes, and earthquakes. They concluded that the mitigations (which include everything from emergency preparedness programs for citizens, hospitals, public health departments to infrastructure support and maintenance) set in place during 1993 – 2003 nationally will save 220 lives and prevent almost 4,700 injuries over the next 50 years. Additionally, they estimate that every \$1 spent on hazard mitigation (actions to reduce disaster losses) provides the nation \$3.65 in future benefits.²³

Existing conditions

In 2006-2007, Humboldt County's chapter of the American Red Cross trained approximately 9,000 people in Health & Safety trainings and 13,000 people attended disaster preparedness trainings or

¹⁸ Bissell RA, Pinet L, Nelson M, Levy M. 2004. Evidence of the effectiveness of health sector preparedness in disaster response: The example of four earthquakes. *Fam Community Health* 27(3):193-203.

¹⁹ WHO. Experts meet in Kobe to discuss earthquakes and health. Press release, January 24, 1997. Available at www.int/archives/inf-pr-1997/en/pr97-08.html.

²⁰ Auf der Heide E. 2003. Convergence behavior in disasters. *Annals of Emergency Medicine* 41:463-6.

²¹ California Governor's Office of Emergency Preparedness.

²² Kano M, Siegel JM, Hyg MS, Bourque LB. 2005. First-aid training and capabilities of the lay public: a potential alternative source of emergency medical assistance following a natural disaster. *Disasters* 29(1):58-74.

²³ Multihazard Mitigation Council. 2005. *Natural Hazards Mitigation Save: An independent study to assess the future savings from mitigation activities*. National Institutes of Building Sciences. Washington, DC.

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workshops.²⁴ However, the trainings that people received could range from a ½ hour presentation to a 2-3 hour focused training. Currently, there is no exact count of the number of citizens who are prepared in case of an emergency.²⁵ ²⁶ Barbara Caldwell, Executive Director of Humboldt Red Cross, indicated that the sites that the Red Cross concentrates on, and thus where most people are trained, are on the coast, given that the coastal region is at greatest risk of earthquake and tsunami.

All county employees (2000 people) are required to have disaster preparedness training. In the Public Health Department, all 200 employees received some training and emergency home kits.²⁷ The Emergency Operations Plan of the Office of Emergency Services designates public employees as Disaster Service Workers, and may be required by their employer to carry out disaster-related activities.²⁸ Also, all local government employees in incorporated areas are required to be trained.²⁹ All public schools are required to have a disaster emergency plan.

Each state has a Governor's Office of Emergency Services to manage state-level organization and response efforts. Within the states, each county is its own Operational Area (OA). Humboldt County Ordinance 2203 established the Humboldt OA and identified the Sheriff as Director of Emergency Services for the County. The Sheriff's Department has an Emergency Operations Plan, which identifies the chain of command, lays out the existing conditions with regard to threat from earthquake, tsunami, flooding, and civil disobedience. Additionally the Emergency Operations Plan details systems that could be affected during a natural disaster (transportation, communications, potable water, electrical power, medical facilities, sanitation systems, natural gas lines, hazardous materials storage, and dam failure). Evacuation areas are laid out.

The figure below shows which areas in Humboldt County will be most affected by earthquakes.

²⁴ Humboldt Red Cross. Annual Report 2006-007. Available at

http://humboldtreddcross.org/media/annual_report.pdf. Accessed on January 30, 2008.

²⁵ Phone conversation with Barbara Caldwell, Executive Director of Humboldt Red Cross, January 30, 2008.

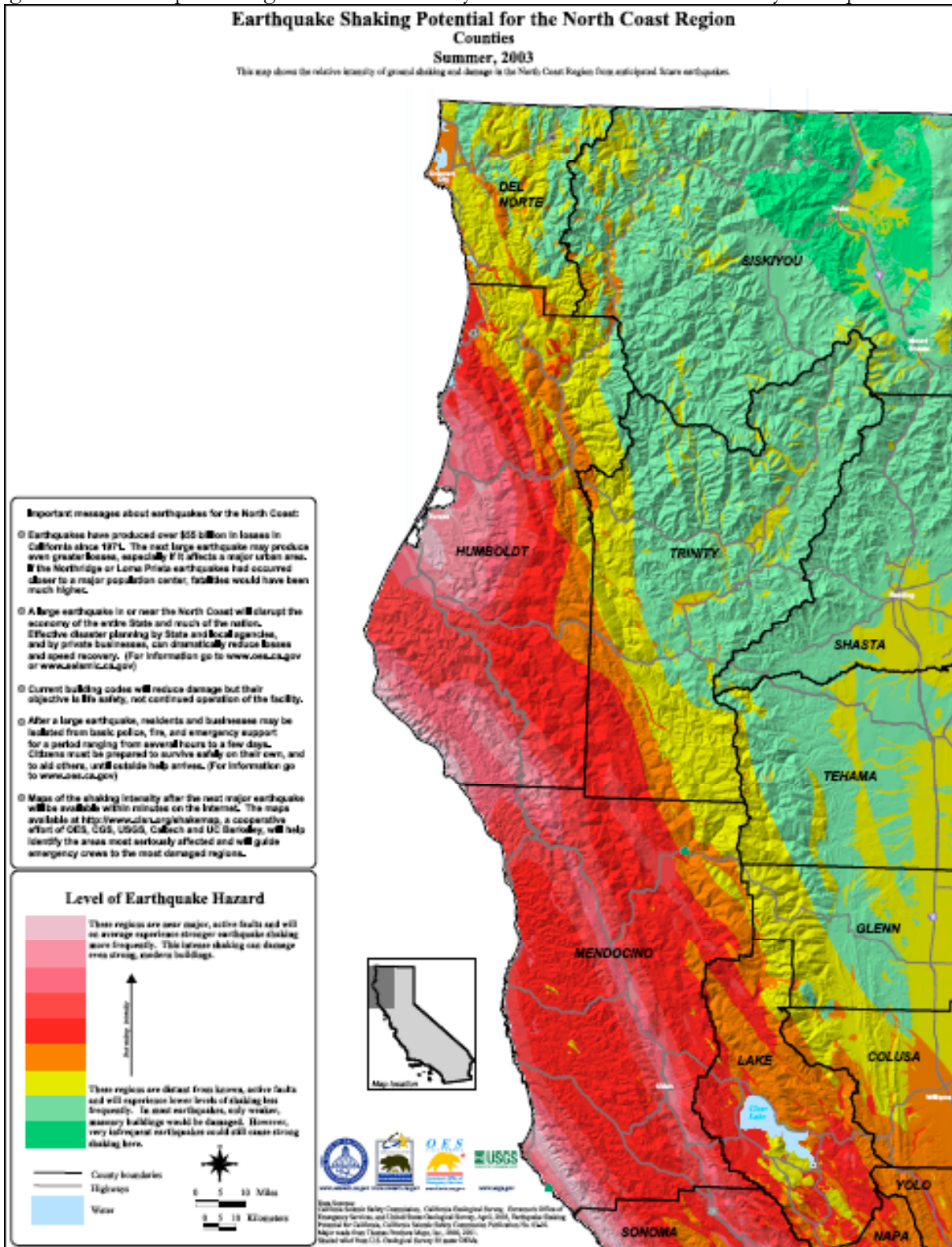
²⁶ Phone conversation with Charlene Pellatze, Emergency Preparedness Coordinator with Humboldt County Public Health Department. February 1, 2008.

²⁷ Phone conversation with Charlene Pellatze, Emergency Preparedness Coordinator with Humboldt County Public Health Department. February 1, 2008.

²⁸ Humboldt County Sheriff's Department. 2002. Humboldt County Emergency Operations Plan. Part 1: General Information. Available at <http://co.humboldt.ca.us/sheriff/OES/EOP/pdf/part1.pdf>. Accessed on February 2, 2008.

²⁹ Phone conversation with Dan Larkin.

Figure PS.2. A map showing areas of the County that would be most affected by earthquakes.³⁰



³⁰ California's Seismic Safety Commission. Available at: www.seismic.ca.gov/pub/intensitymaps/ncoast_county_print.pdf.

Analysis

Assumptions

- Earthquake, tsunami, flooding, wildland fire, and drought conditions will worsen with climate change over the next 25 years.

Quantitative Analysis

Data about current levels of emergency training does not exist. Sources stated that those kinds of numbers are not kept and it would be difficult to extract exactly how many people are trained. Given that, quantitative analysis is not possible.

Qualitative Analysis

Public comments on the Safety Element do not specifically address the County's level and capacity for training its citizenry in emergency preparedness. However, there are comments that reflect a concern for the increase in threats due to an increase in natural disasters as a result of global warming. One comment raises the concern that Humboldt County's own future flood maps points out that the area north and south of Eureka/Arcata will be under water in the future, that Rt. 299 to Redway will also be cut off, and that this could happen sooner rather than later – and abruptly - if ice masses in Greenland and Antarctica slip off. For a map of the 100 and 500 year flood risks, see <http://co.humboldt.ca.us/planning/gp/PrelimHearingDraft/Group3/Maps/base2flood.pdf>. There were also flooding concerns due to upstream timber production policies.³¹

Conclusions

- Plan Alternative A focuses growth in areas of the County where the Red Cross concentrates its trainings.** The Red Cross is the primary agency responsible for citizen emergency preparedness training on a county level.
- Plan Alternative B is likely to bring about an increase in the numbers of people trained in emergency preparedness but no change in the proportion of Humboldt County residents trained in urban vs. non-urban settings.**
- Plan Alternative is likely to bring about an increase in the numbers of people trained due to the increase in population in the urban areas, however, this is the least likely Alternative to bring about a proportional increase in rural residents trained.**

Recommended Health-Promoting Mitigations:

- Increase the importance of emergency preparedness in the General Plan. The Draft Safety Element of the GPU does not cover improving emergency preparedness among Humboldt County's citizenry beyond implementing the Emergency Operations Plan, which also does not cover this topic in detail. Have schools communicate their Emergency Operations Plans to parents.
- Set benchmarks on how many citizens are trained in each area. Designate a public agency responsible.

³¹ Written Comments: Group 3 – Noise and Safety Element. Humboldt GPU Update. Available at <http://co.humboldt.ca.us/planning/gp/PrelimHearingDraft/CommentList2.htm#group3>. Accessed on February 3, 2008.

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- Support the Humboldt Red Cross in outreach efforts to bring people into their CERT training (Community Emergency Response Team).
- Have schools communicate their Emergency Operations Plans to parents.
- Expand funding for trainings and awareness raising about emergency preparedness.
- Set up a Rural Emergency Preparedness outreach team to specifically address the readiness and concerns of rural residents in case of emergency.

SC.1.c Driving Under the Influence (DUI)

Health-Based Rationale

Drinking and driving is a common occurrence. The main health concerns are death and injury due to motor vehicle accidents (MVA). During 2005, 16,885 people in the U.S. died in alcohol-related motor vehicle crashes, representing 39% of all traffic-related deaths.³² Also in 2005, nearly 1.4 million drivers were arrested for driving under the influence of alcohol or narcotics.³³ However, that's less than 1 percent of the 159 million self-reported episodes of alcohol-impaired driving among U.S. adults each year.³⁴ Drugs other than alcohol are involved in about 18% of motor vehicle driver deaths. These other drugs are generally used in combination with alcohol.³⁵

More than half of the 414 child (ages 14 and younger) passengers who died in alcohol-related crashes during 2005 were riding with the drinking driver. Of the 1,946 traffic fatalities among children ages 0 to 14 years in 2005, 21% involved alcohol. In 2005, 16% of drivers ages 16 to 20 who died in motor vehicle crashes had been drinking alcohol.³⁶

Among motorcycle drivers killed in fatal crashes, 30% have blood alcohol concentrations (BACs) of 0.08% or greater. Motorcyclists ages 40 to 44 years have the highest percentage of fatalities with BACs of 0.08% or greater.³⁷

Among drivers involved in fatal crashes, those with BAC levels of 0.08% or higher were nine times more likely to have a prior conviction for driving while impaired (DWI) than were drivers who had not consumed alcohol.³⁸

Urban counties have a higher *number* of alcohol-involved fatal crashes because they have more people, however, rural counties have higher crashes per capita *rates* for alcohol-related motor vehicle collisions.³⁹ While 17% of the US population is classified as rural, 58% of all fatal crashes and 60% of traffic fatalities were recorded in rural regions of the US between 1993-2004.⁴⁰ Fatal crashes and traffic fatalities in rural areas are 3.5 times more prevalent than expected on the basis of the

³² NHTSA. 2006. Traffic Safety Facts 2005: Alcohol. Dept. of Transportation. National Highway Traffic Safety Administration. Available at <http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/TSF2005/AlcoholTSF05.pdf>. Accessed on January 27, 2008.

³³ Department of Justice (US), Federal Bureau of Investigation (FBI). Crime in the United States 2005: Uniform Crime Reports. Washington (DC): FBI; 2005. Available from URL: <http://www.fbi.gov/ucr/05cius/index.html>.

³⁴ Quinlan KP, Brewer RD, Siegel P, Sleet DA, Mokdad AH, Shults RA, Flowers N. Alcohol-impaired driving among U.S. adults, 1993-2002. *American Journal of Preventive Medicine* 2005;28(4):345-350.

³⁵ Jones RK, Shinar D, Walsh JM. State of knowledge of drug-impaired driving. Dept of Transportation (US), National Highway Traffic Safety Administration (NHTSA); 2003. Report DOT HS 809 642.

³⁶ NHTSA 2006.

³⁷ Paulozzi L, Patel R. 2004. Trends in motorcycle fatalities associated with alcohol-impaired driving: United States 1983-2003. *Morb Mortal Wkly Rep* 53:1103-6. Available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5347a2.htm>.

³⁸ NHTSA. 2006, *ibid*.

³⁹ Traffic Safety Center. Winter 2005-2006. Zeroing in on Drinking-Driving, Mapping, Data Analysis, and Surveys to Help Highlight Problems and Reduce Risks. TSC Newsletter 3(1).

⁴⁰ Burgess M. 2005. Contrasting rural and urban fatal crashes 1993-2004. Dept. of Transportation. Washington DC. National Center for Statistics and Analysis.

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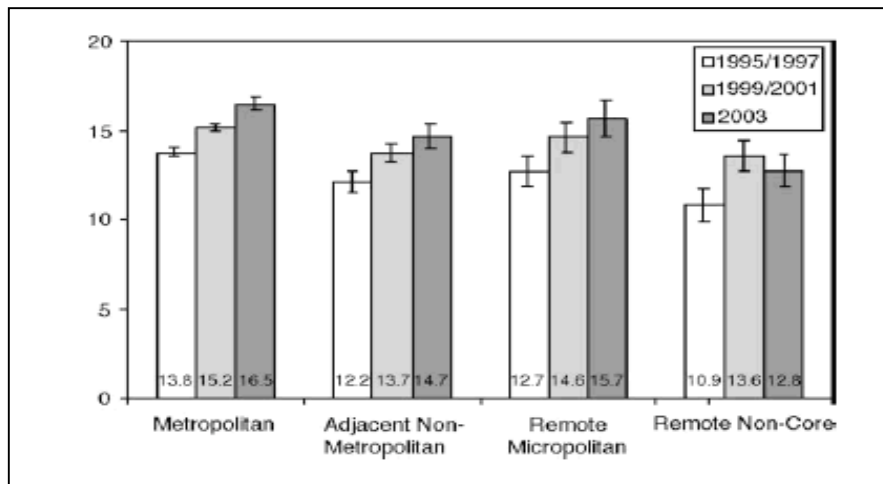
percentage of total population, and the risk that the driver behavior, such as DUI and not wearing seat belts, is attributed to a fatal crash is 10% higher in rural areas than urban.⁴¹

Higher mortality in rural crashes has been attributed in various research to delayed time to medical response, limited access to trauma resources, higher speed limits, an increased rate of alcohol use, and a lower rate of seat belt use in rural locations. However, much research shows the same rate of drinking while driving in urban and rural.⁴²

In a report detailing US-wide rates of motor vehicle accident fatalities comparing rural and urban factors, the distribution of BAC levels was similar for urban and rural drivers at BAC levels of 0.10 or lower. However, for all levels of BAC above 0.10, the percentage of rural drivers with a given BAC exceeded the percentage of urban drivers with that same BAC, i.e., there was a higher percentage of rural drivers with a BAC of 0.11, 0.12, 0.13, etc.⁴³

As the figure below shows, the proportion of adults in the US aged 18-49 who consumed 5 or more drinks in one day in the last year varied little with regard to urban vs. rural.

Figure PS.3. Adjusted percentage (95% confidence intervals) binge drinkers by type of county.⁴⁴



Existing conditions

California. In 2004, 4,120 people in California were killed in traffic crashes. About 40% of all traffic fatalities in the state were the result of alcohol use. The average age of an arrested DUI offender in 2004 was 33.2 years, but the highest percentage of drivers with BAC levels of 0.08 or greater was for

⁴¹ Raskaukas M. 2007. The culture of traffic safety in rural America. Intelligent Transportation Systems. University of Minnesota Center for Transportation Studies. Available at <http://www.its.umn.edu/Publications/ResearchReports/reportdetail.html?pid=1270>. Accessed on February 13, 2008.

⁴² Donaldson AE, Cook LJ, Hutchings CB, Dean JM. 2006. Crossing county lines: The impact of crash location and driver's residence on motor vehicle crash fatality. *Accident Analysis and Prevention* 38:723-7.

⁴³ NHTSA. 2006. Contrasting Rural and Urban Fatal Crashes 1994-2003. US Dept. of Transportation. Available at <http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/Rpts/2005/809896.pdf>. Accessed on February 14, 2008.

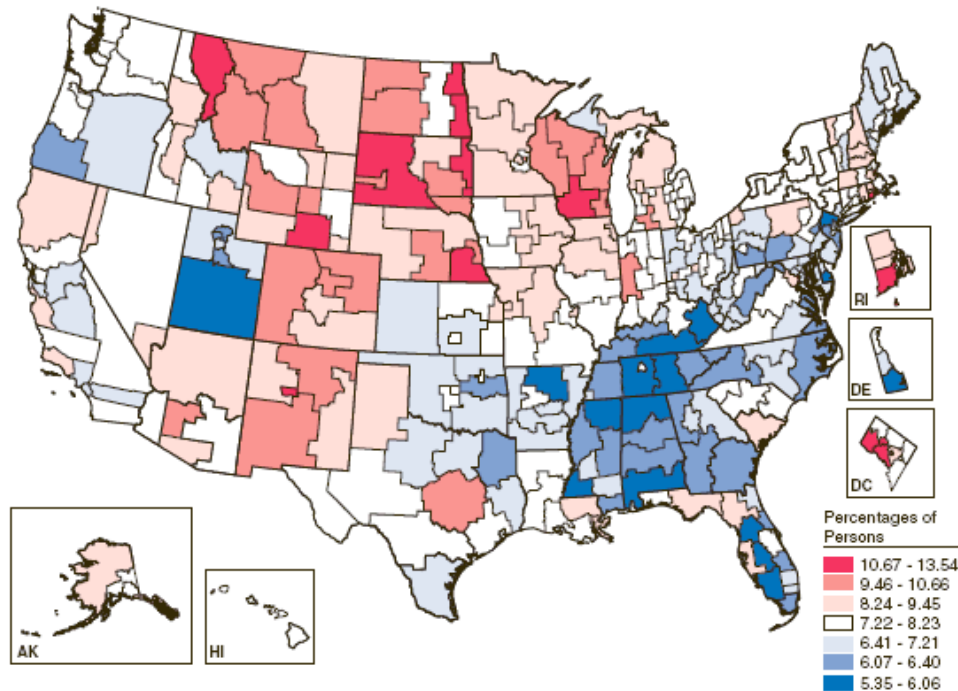
⁴⁴ Jackson JE, Doeschera MP, and Harta LG. Problem drinking: Rural and urban trends in America, 1995/1997 to 2003. *Preventive Medicine.* (2006) 43:122-124.

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drivers ages 21-24 (32%). Drivers under the age of 21 who are drinking are twice as likely to be involved in fatal crashes as those who are older than 21. Even so, alcohol-related motor vehicle fatalities for ages 15-20 has declined 59% since 1982. Nearly $\frac{3}{4}$ of the drivers convicted of driving while impaired are either frequent heavy drinkers or alcoholics.⁴⁵

Underage drinking among youth aged 12-17 was higher in rural than non-rural areas. Binge drinking (5 or more drinks on the same occasion at least one day in past month) is also higher among rural youth age 12-17 (4.1%) than non-rural (1.6%). Both of these measures were not higher in rural areas for the age group 18-20.⁴⁶ Three years of Substance Abuse and Mental Health Services Administration data from the National Survey on Drug Use and Health (2002-2004), found that of the 15 sub-state areas with the highest rates of past year alcohol dependence or abuse, most were in the northern West or Midwest of the country.

Figure PS.4. Alcohol dependence or abuse in the past year among persons aged 12 or older by sub-state region: percentages, annual averages based on 2002, 2003 and 2004 NSDUH data.⁴⁷



Humboldt County. In Humboldt, the rate of alcohol dependence is higher than in the urban Bay area, with 8.2-9.5% of people reporting alcohol dependence or abuse in the last 12 months.

⁴⁵ Source: CA Dept of Alcohol & Drug Programs. Fact Sheet: Driving Under-the-Influence (DUI) Statistics. March 2006. Available at http://www.adp.ca.gov/FactSheets/Driving_Under_the_Influence_Statistics.pdf. Accessed on January 27, 2008.

⁴⁶ SAMHSA. 2004. The National Survey on Drug Use and Health Report: Underage Drinking in Rural Areas. Substance Abuse and Mental Health Services Administration. Available at <http://www.oas.samhsa.gov/2k4/ruralYouthAlc/ruralYouthAlc.htm>.

⁴⁷ National Survey on Drug Use and Health. 2006. The NSDUH Report. Issue 25: Alcohol Dependence or Abuse in Substate Areas. SAMHSA. Available at <http://www.oas.samhsa.gov/2k6/subStateAlc/subStateAlc.htm>.

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Humboldt County has one of the highest rates of deaths due to alcohol and drug use in California.⁴⁸ In some areas, DUI citations are increasing. For example, there were 336 DUIs in Arcata in 2001, 442 DUIs in 2005.⁴⁹ This increase is not unexpected; research from 2005 at the Traffic Safety Center at University of California at Berkeley forecast that alcohol-related motor vehicle accidents will increase by 10% by 2008. This research involved looking throughout California at transportation zones and corridors and found that rural counties have the highest rates of DUI crashes.⁵⁰

Adult arrests for DUI. In 2001, there were 15.2 adults arrested for DUI in Humboldt per 1,000 (1316 total). This is much higher than state's rates, which were 8.4 per 1000. Humboldt is ranked near the bottom (47th out of 52) of counties in the state in terms of its DUI arrest rates. From 1996 – 2001, Humboldt County was consistently higher than California.⁵¹

Adult arrests for alcohol violations. 18.9 per 1,000 people in Humboldt were arrested for alcohol violations in 2001. This is more than triple the state's rate of 5.5 per 1,000. Again, from 1996 – 2001, Humboldt County rate was consistently much higher than the state's.⁵²

Alcohol-involved motor vehicle accidents. In 2000, there were 140 total alcohol involved motor vehicle accidents with a rate of 153.5 per 100,000 licensed drivers in Humboldt. This is much higher than state's rates, which were 98.1 per 100,000. Again, from 1996 – 2001, Humboldt County's rate was consistently much higher than California's.⁵³

Binge drinking. Binge drinking is a significant public health problem in Humboldt County. The area comprised of Humboldt and Del Norte counties has the highest rate of binge drinking in California for persons aged 18-34, and the fourth highest rate of binge drinking among adults in the state.⁵⁴

Binge drinking rates among youth in Humboldt County are also alarmingly high. 56 percent of 11th- grade students report being drunk or sick after drinking alcohol in their lifetime. Additionally, 6 percent of seventh-grade students reported drinking five or more drinks in a couple of hours during the past 30 days. By 11th grade, 33 percent of female students and 43 percent of male students reported drinking five or more drinks in a couple of hours during the past 30 days.⁵⁵

Analysis

Assumptions

⁴⁸ 2004 Community Indicators of Alcohol and Drug Abuse/Risk.

⁴⁹ Weaver B. The LumberJack – student newspaper of Humboldt State University. Arcata increases drunk driving enforcement. 9/19/07. Available at <http://media.www.thejackonline.org/media/storage/paper1142/news/2007/09/19/News/Arcata.Increases.Drunk.Driving.Enforcement-2970516.shtml>.

⁵⁰ TSC. 2006. Using GIS to Identify Clusters of DUI Crashes. University of California – Berkeley. Traffic Safety Center. Available at <http://www.tsc.berkeley.edu/research/dui.html>. Accessed on February 3, 2008.

⁵¹ CARS, Inc. 2004. Community Health Indicators of Alcohol & Drug Abuse Risk: Humboldt County 2004. Center for Applied Research Solutions. Available at http://www.ca-cpi.org/Publications/Community_Indicators/County_Data_Files/Humboldt_04.pdf. Accessed on February 3, 2008.

⁵² CARS, Inc. 2004, *ibid*.

⁵³ CARS, Inc. 2004, *ibid*.

⁵⁴ California Department of Health Services Center for Health Statistics May 2004, based on the 2001 California Health Interview Survey.

⁵⁵ 2004-2006 California Healthy Kids Survey results for Humboldt County.

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- Enforcement, prevention, and deterrence interventions to decrease drunk driving will remain the same.

Quantitative Analysis

Quantitative analysis was not possible due to data limitations; the DUI rates were not separated by location (urban vs. non-urban).

Qualitative Analysis

The Humboldt County Health and GPU focus groups identified driving under the influence as a cause for great concern. In the GPU and Health focus groups, participants felt that alcohol dependency and DUI are a threat to public health and wanted to see an analysis included in the HIA. Additionally, comments on the Draft Safety Element included this by a Humboldt County resident:⁵⁶

The Safety Element is supposed to protect Humboldt County citizens from risk of death, injuries and property damage and economic and social dislocation resulting from fire, earthquake, flood and other hazards. The elephant in the room is that one of the other hazards is risk of death from auto accidents. That risk of death is more than twenty times higher than the risks from earthquake, fire and flood combined. And yet there is no mention of the best ways to go about reducing this huge threat to our physical safety.

Conclusions

- A) With Plan Alternative A, in which all population growth is accommodated in urban areas, fatality rates from driving under the influence of alcohol would likely decrease while accident and injury from DUI accidents would likely increase.** Urban and rural rates of drinking are similar in the existing literature about DUI, but prevalence statistics show higher rates of arrest for driving while intoxicated and fatality as well as use of substance abuse treatment in Humboldt County. While it is unclear if a causal relationship between alcohol intake and living in a rural area is implicated, fatality from DUI would likely decrease due to lower speed limits and less dangerous conditions (such as curved roads, cliffs, poorly lit roads).
- B) Plan Alternative B would likely result in the same rates of DUI** and thus a similar rate of incidence of injury and death due to DUI. An increase in population generally, though, would result in more DUI accidents.
- C) Plan Alternative C may or may not affect the rates at which residents are driving impaired; however it would likely increase the rate at which people are die due to driving under the influence,** given that road conditions and speed make all fatalities more likely in rural areas and thus more difficult to navigate while drunk.

Recommended Health-Promoting Mitigations:

- Implement evidence-based interventions and policies against alcohol-impaired driving:

⁵⁶ Humboldt General Plan Update. Public comments. Available at <http://co.humboldt.ca.us/planning/gp/PrelimHearingDraft/CommentList2.htm#group3>. Accessed on January 28, 2008.

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- Implement 0.08% blood alcohol concentration (BAC) laws. These are state laws that lower the illegal BAC for drivers from 0.10% to 0.08%. These have been shown to reduce alcohol-related fatalities by a median of 7 percent;
- Implement minimum legal drinking age laws and lower BAC laws specific to young or inexperienced drivers (zero tolerance laws);
- Increase the use of sobriety checkpoints;
- Fund mass media campaigns to educate the population about the dangers of drunk driving;
- Increase school-based education programs to educate students about the dangers of drunk driving and of riding with a drinking driver;
- Train alcohol servers on intervening with people who have been drinking and intend to drive;
- Decrease alcohol outlets and their hours of operation.

SC.4.a Isolation index

Health-Based Rationale

GPU and Health focus group participants felt very strongly that a health challenge of rural life was being socially isolated. In fact, there is a broad literature base that demonstrate this. Those who feel socially isolated also feel higher levels of anxiety, negative mood, hostility, stress, as well as less optimism, happiness and life satisfaction.⁵⁷ Social isolation has been shown to weaken the body's ability to repair and maintain its systems.⁵⁸ Studies show that adults who report social isolation also report poorer sleep quality.⁵⁹

Higher rates of social connectedness or support are associated with lower resting blood pressure, better immune system function, and lower amounts of stress hormones.⁶⁰ One study showed that in patients recovering from heart surgery, ratings of the statement "I feel lonely" predicted survival at 30 days and five years after surgery, even after controlling for preoperative conditions known to increase mortality.⁶¹ A study in Australia showed that higher levels of social integration as measured by almost all indicators were associated with lower mortality rates.⁶²

Social connectedness can be of great use during times of stress. Those who consider themselves socially connected are more likely to actively cope (e.g., problem solve) with stressful tasks and situations. Active coping has been associated with a biomarker signifying a healthier cardiac response.⁶³ Studies consistently find an inverse relationship between levels of social connection (defined as "social capital") and mental health issues: the higher the level of trust and connectivity in an area, the lower the levels of mental illness.⁶⁴

Theory behind why social connection has such an impact on health commonly cites three pathways:⁶⁵

1. Ease of diffusion of information;
2. Psychosocial support;
3. Political organizing which can bring resources into an area.

⁵⁷ Cacioppo JT, et al. 2000. Lonely traits and concomitant physiological processes: The MacArthur Social Neuroscience Studies. *Int J Psychophysiol* 35:143-54.

⁵⁸ Cacioppo JT. 2002. Loneliness and health: Potential mechanisms. *Psychosom Med* 64:407-17.

⁵⁹ Buysse DJ, et al. 1989. The Pittsburg Sleep Quality Index: A new instrument for psychiatric practice and research. *Psychiatry Res* 28:193-213.

⁶⁰ Uchino BN, Cacioppo JT, Kiecolt-Glaser JK. 1996. The relationship between social support and physiological processes: A review with emphasis on underlying mechanisms and implications for health. *Psycho Bull* 119:488-531.

⁶¹ Herlitz J, et al. 1998. The feeling of loneliness prior to coronary artery bypass grafting might be a predictor of short- and long-term postoperative mortality. *Eur J Vasc Endovasc Surg* 16:120-5.

⁶² Siahpush M, Singh GK. 1999. Social integration and mortality in Australia. *Aust N Z J Public Health* 23(6):571-7.

⁶³ Cacioppo JT, Hawkley LC. Summer 2003. Social isolation and health, with an emphasis on the underlying mechanisms. *Perspectives in Biology and Medicine* 46(3 supplement):S39-S52. Available at http://muse.jhu.edu/journals/perspectives_in_biology_and_medicine/v046/46.3xcacioppo.pdf. Accessed on February 17, 2008.

⁶⁴ Scheffler RM, Brown TT, Rice JK. 2007. The role of social capital in reducing non-specific psychological distress: The importance of controlling for omitted variable bias. *Soc Sci & Med* 65:842-854.

⁶⁵ Kawachi, I., Berkman, L. (2000). Social cohesion, social capital, and health. In I. Kawachi and L.F. Berkman (Eds). *Social Epidemiology*. New York: Oxford University Press.

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Isolation is difficult to measure, but there are proxy measures. There is a vast literature on social cohesion in public health as well as other fields, and making the assumption that social isolation was the opposite of social cohesion helped to define indicators. The Organization for Economic Cooperation and Development, in their *Society at a Glance 2003 Social Indicators*, chose the following as their “social cohesion” indicators:⁶⁶

- CO1. Subjective well-being
- CO2. Social isolation
- CO3. Group membership
- CO4. Teenage births
- CO5. Drug use and related deaths
- CO6. Suicides

Here, the rates of the following will be examined:

- Psychological distress and mental well-being;
- Treatment for mental health and substance abuse;
- Depression and suicide;
- Crime;
- Volunteerism and civic engagement.

Existing conditions

Psychological distress and mental well-being. In Humboldt County:⁶⁷

- 53% of residents said they spent 0 days in poor mental health in the last month;
- In 2005, 10.2%, or 1 out of every 10 people, stated they had spent between 10 – 20 days in the last month in poor mental health;
- 21% of the people polled did not do their usual work due to emotional problems in 2001;
- In 2001 less than 500 people in the county felt down most of the time, 16.5% felt down some of the time, 21% felt down a little of the time, and almost 60% felt down not at all
- 4.8% of respondents said they have psychological distress;
- In 2005, 11.2% saw a health professional for emotional problems;
- In 2005, 20.3% felt that they needed help for an emotional/mental problem.

Depression/suicide. Depression and suicidal intent is linked to social isolation. One study showed that in people who consider themselves to be socially isolated, some level of depression was 8 times more likely, and major depression was 21 times more likely.⁶⁸ Social isolation is also linked to suicidal intent.^{69 70} In adolescents, social isolation was associated with an increased risk for depressive symptoms, suicide attempts, and low self-esteem.⁷¹

⁶⁶ OECD. 2006. *Society at a Glance: Social Indicators: 2006 Edition*. Organization for Economic Development. Available at http://www.oecd.org/document/24/0,2340,en_2649_33729_2671576_1_1_1_1,00.html. Accessed on February 17, 2008.

⁶⁷ California Health Information Survey. Available at <http://www.chis.ucla.edu/>.

⁶⁸ Hawthorne G. 2008. Perceived social isolation in a community sample: its prevalence and correlates with aspects of peoples' lives. *Soc Psychiatry Psychiatr Epidemiol* 43:140-50.

⁶⁹ Haw C, Hawton K. 2008. Life problems and deliberate self-harm: Associations with gender, age, suicidal intent and psychiatric and personality disorder. *J Affect Disord*. Epub ahead of print.

⁷⁰ Hokans KD, Lester D. 2007. Motives for suicide in adolescents: A preliminary study. *Psychol Rep* 101(3 Pt 1):778.

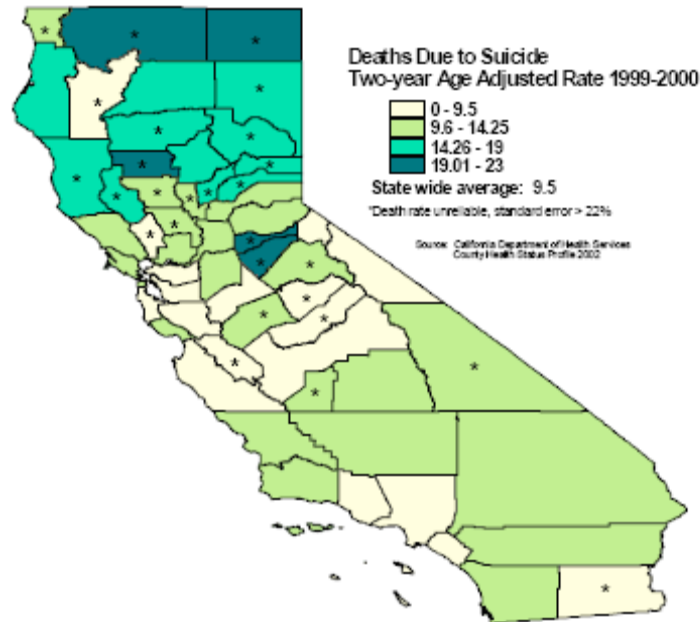
⁷¹ Hall-Lande JA, Eisenberg ME, Christenson SL, Neumark-Sztainer D. Social isolation, psychological health, and protective factors in adolescence. *Adolescence* 42(166):265-86.

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Suicide rates are higher in rural areas. The Centers for Disease Control compared suicide rates in urban and rural counties and found that men in urban counties committed suicide at a rate of 21-22 per 100,000; in rural counties male suicide rate was 31 per 100,000. Men tend to have *rates* of suicide 4- 6 times higher than females because they use more reliably lethal methods. However, suicide *attempts* are higher for females.⁷² Some posit that ease of accessing firearms may play a part in the higher rate in rural areas, as firearms suicides count for 62% of suicides, and in fact, rural counties had 54% more firearm suicides.⁷³ For both men and women, suicide rates in rural counties of the West were higher than those in any other region of the US. Lower treatment rates for depression in rural areas may also contribute to higher suicide rates.⁷⁴

In Humboldt County, 34 people committed suicide in 2007, the highest total since 1990, and a 60 percent increase over 2006.⁷⁵ In the three year period from 2001-2004, Humboldt County's rough suicide rate was 22.3 per 100,000, over three times Los Angeles's rate of 7.1 per 100,000. The most recent statistic for California is 9.4 per 100,000.⁷⁶ The figure below shows these rates for the state.

Figure PS.5. Two year age adjusted suicide rates in California, 1999-2000.⁷⁷



⁷² Eberhardt MS, Ingram DD, Makuc DM, et al. 2001. Health, United States, 2001. Urban and Rural Health Chartbook. National Center for Health Statistics. Available at <http://www.cdc.gov/nchs/data/hus/hus01.pdf>. Accessed on February 16, 2008.

⁷³ Branas CC, Nance ML, Elliott MR, Richmond TS, Schwab CW. 2004. Urban-rural shifts in intentional firearm death: different causes, same results. *Am J Public Health* 94(10):1750-5.

⁷⁴ Eberhardt MS, Ingram DD, Makuc DM, et al. 2001. Health, United States, 2001. Urban and Rural Health Chartbook. National Center for Health Statistics. Available at <http://www.cdc.gov/nchs/data/hus/hus01.pdf>. Accessed on February 16, 2008.

⁷⁵ Humboldt County Coroner's Office.

⁷⁶ Harrison C. Jan. 3, 2008. County posts highest suicide total in 18 years. *The Eureka Reporter*. Available at <http://eurekareporter.com/article/080103-county-posts-highest-suicide-total-in-18-years>.

⁷⁷ Avram S. 2002. North State Rural Mental Health Summit: Review of Relevant Data. Northern Sierra Rural Health Network.

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Mental health treatment. Humboldt has served a fairly consistent amount of mental health clients per year. From 1990–1998, there were between 2,000–3,000 clients per year, going up and down but with no consistent trend.⁷⁸ There were 3,504 clients in 2000-2001, the most recent year for which there is data.⁷⁹ Unfortunately, the state Dept of Mental Health does not do a comparison analysis of mental health clients in rural vs. urban areas of the county. However, it is of note that Humboldt County only has 16 licensed mental health professionals per 10,000 residents. Marin County has 63 per 10,000.⁸⁰

In Humboldt County, 11.2% of those polled had seen a mental health professional, and 11.8% said they had difficulty or delays in getting mental health care.⁸¹

In treating depression, travel time to the preferred provider was significantly associated with making fewer visits and having a lower likelihood of receiving care in accordance with guidelines.⁸²

According to the Office of Statewide Health Planning and Development (OSHPD) hospital utilization data, there are only six hospitals in Humboldt County. None of them have chemical dependency beds, and only one of them takes psychiatric admissions (Semper Virens PHF in Eureka). Thus, all hospital admissions for psychiatric illnesses were located in Eureka, and there were 5840 licensed bed days, 473 discharges, and 4014 patient days. There is no psych ER listed in the County. As such, data that is kept on emotional and mental health issues at the hospital level is limited and it is not possible to disaggregate between rural and urban admissions.⁸³

Rates of substance abuse and substance abuse treatment. For the years from 1997 to 2002, Humboldt's rates of admission for alcohol and drug treatment programs was higher than the state's. In 2002, Humboldt's rate was 14.2 per 1000, while California's was 8.7 per 1000.⁸⁴

With regard to deaths due to alcohol and drug use, for the years 1996 to 2000, Humboldt's rates were substantially higher than the state's. In 2001, the rate in Humboldt (39.5 per 100,000) were more than double the states' (18.0 per 100,000).⁸⁵

As the figure below shows, trends in US substance abuse treatment statistics show that rates of alcohol admission rise precipitously with increasing rural-ness, peaking in rural areas with a city with

⁷⁸ California Health and Human Services Agency, Dept. of Mental Health. Table 9A: Number of unduplicated clients Fiscal Years 1991-1992 through 1997-1998. Available at http://www.dmh.cahwnet.gov/Statistics_and_Data_Analysis/County_Mental_Hospital_Data.asp. Accessed February 16, 2008.

⁷⁹ 2002. North State Rural Primary Care – Mental Health Summit: Collaborating for Care. Final Report. California Institute for Mental Health. Available at <http://cimh.org/downloads/FinalReport.pdf>. Accessed on February 15, 2008.)

⁸⁰ 2002. North State Rural Primary Care – Mental Health Summit: Collaborating for Care, *ibid*.

⁸¹ California Health Information Survey. Available at <http://www.chis.ucla.edu/>.

⁸² Fortney J, Rost K, Zhang M, Warren J. 1999. The impact of geographic accessibility on the intensity and quality of depression treatment. *Med Care* 37(9):884-93.

⁸³ OSHPD <http://www.oshpd.ca.gov/HID/DataFlow/HospData.html>

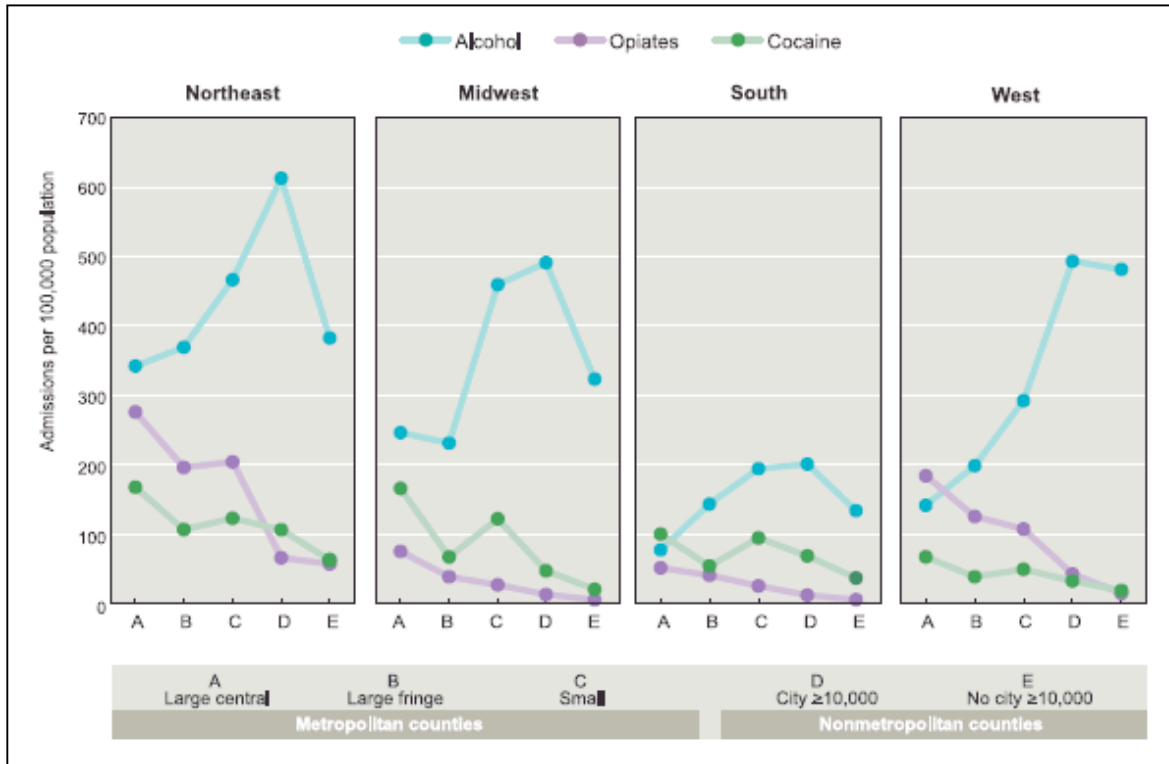
⁸⁴ CARS. 2004. Community Indicators of Alcohol and Drug Abuse. Humboldt County 2004. Center for Applied Research Solutions. CA Dept of Alcohol and Drug Programs.

⁸⁵ CARS. 2004, *ibid*.

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greater than 10,000 people then declining in completely rural areas. Admissions for opiates and cocaine continuously decline further from urban areas.

Figure PS.6. Substance abuse treatment admission rates by primary substance, region and urbanization level in the United States.⁸⁶



Crime statistics. Overall levels of crime in Humboldt County as reported to the Federal Bureau of Investigation are shown in the table below.

Year	2000	2005
Crime Total	5,570	
Murder	4	3
Rape	65	54
Robbery	85	98
Aggravated assault	273	239
Burglary	1,134	1,334
Larceny – theft	3,530	2,753
Motor vehicle thefts	420	733

⁸⁶ Eberhardt MS, Ingram DD, Makuc DM, et al. 2001. Health, United States, 2001. Urban and Rural Health Chartbook. National Center for Health Statistics. Available at <http://www.cdc.gov/nchs/data/hus/hus01.pdf>. Accessed on February 16, 2008.

⁸⁷ Crime, Humboldt County, 2000 – Federal Bureau of Investigation, National Archive of Criminal Justice, University of Michigan. Available at <http://www.fedstats.gov/mapstats/crime/county/06023.html>. Accessed on February 17, 2008.

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The table below shows rates of crime in the unincorporated areas of Humboldt County vs. the incorporated areas.

Table PS.4. 2005 crime rates by location in Humboldt County.⁸⁸

Jurisdiction	Violent crimes					Property crimes				Larceny-theft			Arson
	Total	Homicide	Forcible rape	Robbery	Aggravated assault	Total	Burglary	Motor vehicle theft	Larceny-theft over \$400	Total	Over \$400	\$400 and under	
County total	394	3	54	98	239	2,593	1,334	733	526	2,753	526	2,227	37
Sheriff's Department	124	2	9	21	92	574	354	17	203	569	203	366	4
Unincorporated	124	2	9	21	92	574	354	17	203	569	203	366	4
Arcata	48	0	6	11	31	398	252	83	63	519	63	456	4
Blue Lake	6	0	2	1	3	47	29	15	3	50	3	47	0
Eureka	170	1	25	63	81	1,037	503	348	186	1,000	186	814	18
Ferdale	0	0	0	0	0	14	12	0	2	10	2	8	3
Fortuna	21	0	7	2	12	166	95	42	29	316	29	287	4
Rio Dell	18	0	2	0	16	27	16	7	4	50	4	46	0
Trinidad	0	0	0	0	0	21	10	3	8	33	8	25	1
CSU Humboldt	5	0	3	0	2	33	10	1	22	158	22	136	3
North Coast Redwoods DPR	1	0	0	0	1	53	48	0	5	27	5	22	0
Union Pacific Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0
CA Highway Patrol	1	0	0	0	1	223	5	217	1	21	1	20	0

In a report from the California State District Attorney's office comparing urban and rural rates of crime, 97% of California's population is urban and 98% of crime takes place in urban counties. The table below shows rates of each type of crime per 100,000 people in urban and rural areas of California. In all categories except burglary, rates of crime are lower in rural areas of California; specifically rural violent crime comprises 1/3 of violent crime incidence even though approximately 1/2 of the population lives in rural areas.

Table PS.5. Rates of crime per 100,000 people in urban and rural areas.⁸⁹

	Total	Violent crimes	Willful homicide	Forcible rape	Robbery	Aggravated assault	Property crimes	Burglary	Motor vehicle theft
1996 Urban	2,578.9	857.8	9.1	31.7	298.5	518.5	1,721.1	958.3	762.8
Rural	1,974.4	567.8	4.5	30.4	63.7	469.2	1,406.6	1,093.0	313.6

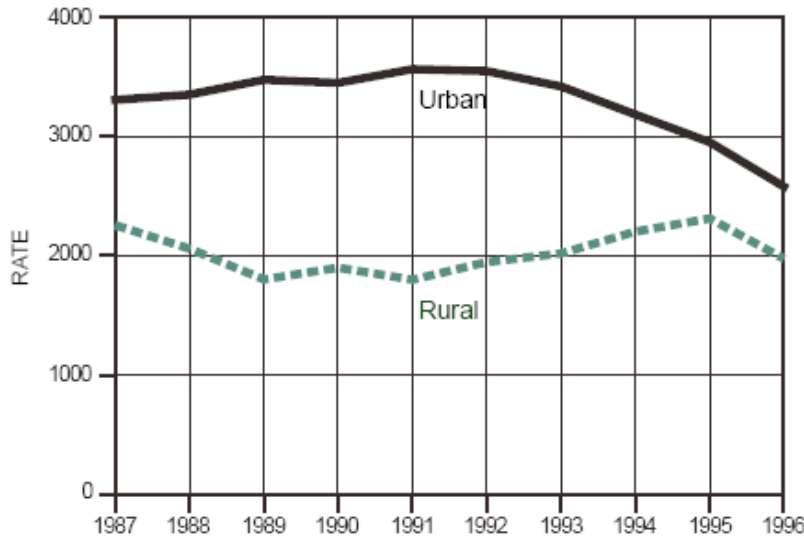
Between 1987 and 1996 (the last year this comparison was done in the report), crime decreased 22% in urban areas and 12.5% in rural areas, but from 1991-96, crime in rural areas has increased (see chart below).

⁸⁸ California Department of Justice. Table 1: Crimes and Crime Rates by category and crime. Humboldt County. Available at http://stats.doj.ca.gov/cjsc_stats/prof05/12/1.htm. Accessed on February 17, 2008.

⁸⁹ Criminal Justice Statistics Center. 1997. Outlook: Crime in urban and rural California. Office of the Attorney General, California. Available at <http://ag.ca.gov/cjsc/publications/misc/urbrurt.pdf>. Accessed on February 17, 2008.

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Figure PS.7. California crime rates (1987-1996) in urban and rural areas per 100,000 people.⁹⁰



Crime rates per 1,000 people in Humboldt were slightly higher than the state's for the years 1996 to 2001. In 2001, Humboldt's rate was 46.3 crimes per 1,000 people, while the state's was 39.4.⁹¹

Group Membership/Civic Engagement. Humboldt County has higher participation and registration rates than California as a whole. The County has between 5-11 percent higher voter registration rates than California since 1996. In 2000, 73% of those registered cast a ballot, slightly higher than California's rate of 71%. Also, 59% of the electorate turned out to vote in 1996 and 2000, which is 7% higher than California.

53% of all adults volunteer in their communities every year. 62% of Humboldt County residents volunteered at least one hour per month in a survey generated by the Humboldt County Board of Supervisors during National Volunteer Week (4.11.00).⁹²

Analysis

Quantitative Analysis

A quantitative analysis is not possible with existing data.

Qualitative Analysis

GPU and Health focus group participants felt very strongly that a health challenge of rural life was being socially isolated.

⁹⁰ Criminal Justice Statistics Center. 1997. Outlook: Crime in urban and rural California. Office of the Attorney General, California. Available at <http://ag.ca.gov/cjsc/publications/misc/urbrurt.pdf>. Accessed on February 17, 2008.

⁹¹ CARS. 2004. Community Indicators of Alcohol and Drug Abuse. Humboldt County 2004. Center for Applied Research Solutions. CA Dept of Alcohol and Drug Programs.

⁹² 2001. Humboldt County Social and Wealth Indicators Project 2001. Available at <http://www.humboldt.edu/~envecon/Indicators/>. Accessed on February 18, 2008.

Conclusions

- A) Given that Alternative Plan A concentrates residents in a smaller area, people are more likely to have unintentional contact. Also, because more civic organizations are located in urban areas, rates of civic engagement will likely increase, resulting in more social cohesion, greater ability to advocate for resources which can aid in healthy living. The greater opportunities for social connection **may result in decrease in isolation** and thus decreased rates of suicide, depression, and substance abuse treatment.
- B) **Plan Alternative B, due to an increase in residents, will probably bring a decrease in social isolation.** However, the gains brought about by simple population increase will be tempered by the fact that half of the increase will be located in non-urban areas with less opportunity for social cohesion. Thus, while some of the health benefits such as increased access to resources due to social networks and civic activism may result as well as a decrease in mental health issues, the effect would be less pronounced than with Plan Alternative A.
- C) **Plan Alternative C is likely to bring about an increase in social isolation due to locating more people in the non-urban areas** of the County where there are fewer organizations and less opportunities for casual contact. Subsequently, Plan Alternative C is the least healthy option with regard to social connection.

Recommended Health-Promoting Mitigations:

- Incentivize employers to encourage volunteering and voting.
- Require construction or renovation of community centers with funding for staff and programs with large rural or urban development projects.
- As part of a community benefits package, require developers to fund programs to engage the community, such as community concerts, parades, festivals.
- Expand outreach for Citizen Advisory Committees on various types of municipal projects.
- Support programming to build retiree/ student partnerships or other mentoring relationships.
- Measure isolation and social cohesion in Humboldt County using a validated tool such as the Saguaro Index⁹³ or the Petris Scale⁹⁴ in order to have an indicator to measure.
- Support community building activities such as parades and events that showcase local artisans.

⁹³ <http://www.ksg.harvard.edu/saguaro/communitysurvey/>.

⁹⁴ <http://www.petris.org/>.