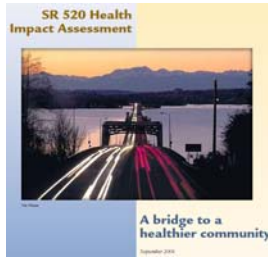


Case: 520 Replacement Bridge

HIA of SR 520 Replacement Bridge and HOV project

- **Funder:** Washington Department of Transportation
- **Conducted by:** Public Health – Seattle & King County and Puget Sound Clean Air Agency
- **Focus:** GHG and public health impacts of new bridge over Lake Washington
- **Findings:** Benefits for physical activity and access to healthy foods
- **Results:**
 - 88 page report includes general recommendations
 - Inform a mediation process



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Case: SR 520 – 3 goals

- Assess the SR 520 Replacement Bridge and HOV Project's impact on "air quality, carbon emissions and other public health issues"
- Protect the health of the public by raising awareness among decision makers of the relationship between health and the physical, social and economic environment, thereby ensuring that they include a consideration of health consequences in their deliberations.
- Make recommendations to enhance the positive impacts and to remove or minimize any negative impacts on health.



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Execution



- Primarily funded-- ~\$125,000—by Wash DOT
- Largely performed "in-house"—including 10 issue papers—and subcontracting out GHG portion
- Considerable effort in appearance

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Table of Contents

HIA recommendations

- Construction period
- Transit Bicycling and Walking
- Landscaped Lids and Green Spaces
- Design Features
- Conclusions
- References

Appendices

- A. Air Quality
- B. Water quality
- C. Noise
- D. Physical Activity
- E. Safety
- F. Social Connections
- G. Mental Well-being
- H. Green spaces
- I. Emergency Medical Services
- J. Green House Gas

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Alternatives

ALTERNATIVE	BASIC DESIGN ELEMENTS
A	<ul style="list-style-type: none"> • Include an interchange at Montlake Boulevard, similar to the configuration of the existing interchange • Draw-out include Lake Washington Boulevard ramp • Add a second Montlake bridge parallel to the existing Montlake Bridge • Include a westbound transit-only off-ramp to Montlake Boulevard
K	<ul style="list-style-type: none"> • A low roadway profile • Include a quarter passover • Includes a berm over the roadway at Foster Island • Includes a single-point urban interchange under the existing SR 520 located at the east Montlake area near the existing Museum of History and Industry • Includes a tunnel under the Montlake Cut • Separates freeway and local traffic across the Montlake Cut, allowing Montlake Boulevard to be a local traffic access roadway • Includes access to and from SR 520 and the Affirmation with a roundabout at the terminus of a new roadway parallel to the existing Lake Washington Boulevard
L	<ul style="list-style-type: none"> • Includes a single-point urban interchange over the SR 520 marine at the east Montlake area near the existing Museum of History and Industry • Includes a second draw bridge over the Montlake Cut • Includes Lake Washington Boulevard ramps

- Focused on three alternatives

Key elements common to all three alternatives include:

- A six-lane corridor including two general-purpose and one HOV lane in each direction.
- Lids at I-5, at 10th Avenue and Central Drive East, and at Montlake Boulevard on the Westside.
- Bicycle and pedestrian connectivity across the bridge and to adjacent communities.
- Exclusion of a median freeway transit stop.
- Reasonable direct access to and from the I-5 express lanes.

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Appendix (example) - Demographics

HIA AREA DEMOGRAPHIC AND HEALTH INDICATOR RATES						
DEMOGRAPHICS	SR 520 AREA			KING COUNTY AVERAGE		
	HEALTH INDICATORS (PERCENT, 3-YEAR AVERAGE, 2005-2007) *					
	95% CI			95% CI		
	Estimate	LB	UB	Estimate	LB	UB
General Health						
Poor or Fair	8.2	6.7	10.1	10.5	9.7	11.2
Poor Mental Health						
More than 14 days	7.8	6.4	9.6	9.6	8.9	10.4
Weight Control						
Overweight (BMI > 25)	44.3	40.7	48.0	54.6	53.3	56.0
Obese (BMI > 30)	11.0	9.0	13.4	20.0	18.7	21.3
Social Connection						
Most people can be trusted	67.5	58.8	75.2	60.6	57.7	63.4
Physical Activity (PA)						
Sedentary job	74.6	69.3	79.3	69.9	67.7	71.9
No leisure time PA	11.8	9.8	14.1	14.8	13.7	16.1
Life Expectancy (2006)						
At birth	84.2	83.8	84.6	81.1	81.0	81.2
Age 50	36.0	35.7	36.3	33.3	33.1	33.4
HEALTH INDICATORS (AGE-ADJUSTED RATE PER 100,000, 3-YEAR AVERAGE, 2004-2006)						
	95% CI			95% CI		
	Estimate	LB	UB	Estimate	LB	UB
Hospitalizations *						
Heart Disease	614.3	594.8	634.4	781.5	773.9	789.3
Asthma	70.4	62.3	79.3	80.6	78.1	83.1
Childhood Asthma (age 1-17)	207.7	175.5	243.0	157.6	150.3	165.2
Diabetes	65.5	40.1	51.6	90.4	87.9	93.0
Mortality *						
All Causes	517.0	499.6	535.1	653.2	646.2	660.2
Cancer	136.1	127.0	145.9	163.0	159.5	166.6
Diabetes	14.0	11.3	17.5	20.2	19.0	21.5
Diabetes-Related	36.4	32.1	41.9	61.7	59.5	63.9
Heart Disease	114.4	106.4	123.0	166.8	163.5	170.2

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Design Features

- Specific recommendations

<p>1) REDUCE NOISE THROUGHOUT THE CORRIDOR by implementing the following actions:</p> <ul style="list-style-type: none"> a) Incorporate multiple solutions (e.g. freeway lids, noise walls, quieter pavement, landscaping) to reduce noise in the corridor for the lifespan of the project. b) Design sound walls that decrease noise but do not result in additional problems (e.g. isolated areas, unsightly concrete structures, interference of natural views).
<p>2) ADD TO THE ADJACENT COMMUNITIES' VISUAL CHARACTER WITH ART AND DESIGN by implementing the following actions:</p> <ul style="list-style-type: none"> a) Incorporate architectural, art, and design solutions into all elements of the project (i.e. landscaped lids, trails, noise walls, transit infrastructure, bicycle storage areas, signage, and structural components of the bridge) that harmonize with adjacent neighborhoods and natural surroundings and conceal the roadway footprint. b) Design landscaped lids, walking and bicycling paths, transit infrastructure, and other elements within a human scale to make the user feel more comfortable and not overwhelmed by the adjacent large concrete structures. c) Identify areas and opportunities for art early in the WSDOT design process that reflect and build upon strategies in the SR 520 Corridor Aesthetics Handbook - Ideas for Urban Corridor Design and partner with local jurisdictions, neighborhood organizations or others to collaborate on these projects.
<p>3) UTILIZE INNOVATIVE STORM WATER MANAGEMENT PRACTICES along the SR 520 corridor to substantially reduce vehicular pollution from entering Lake Washington.</p>

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Design Features, actions & health effects

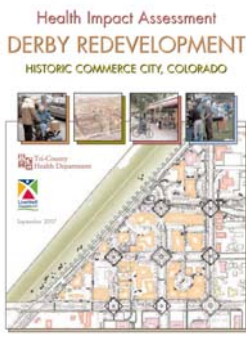
RECOMMENDATIONS	ACTIONS	HEALTH RELATED EFFECTS
1) Reduce noise throughout the corridor	<ul style="list-style-type: none"> Quieter road surfacing, road screening and landscaping Decreased noise pollution in surrounding communities Designed sound walls that blend into the adjacent areas and infrastructure 	<ul style="list-style-type: none"> Decrease noise-related annoyance, stress, and stress-related health effects Reduce risk of sleep disturbances and subsequent effects Decrease mental fatigue
2) Add to the adjacent communities' visual character with art and good design	<ul style="list-style-type: none"> Increased neighborhood aesthetics Increased sense of community culture Added public art and design to humanize the large concrete infrastructure Designed lids, paths, transit infrastructure and other elements with architectural, art, and design solutions that harmonize with the surroundings and conceal the roadway footprint Increased use of community public spaces, especially by pedestrians and bicycles 	<ul style="list-style-type: none"> Reduce stress and stress-related health effects Decrease risk factors associated with inactivity, including cardiovascular disease, diabetes, obesity, and osteoporosis
3) Utilize innovative storm water management practices along the SR 520 corridor	<ul style="list-style-type: none"> Decreased polluted runoff into waterways Improved water quality in Lake Washington and surrounding wetlands and streams Increased recreational opportunities Increased quality of edible fish 	<ul style="list-style-type: none"> Reduce exposure to water toxins Increase opportunity for physical activity

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Case: Derby Redevelopment

HIA of Downtown Redevelopment of Historic Town in Suburban Denver

- Funder: Kaiser Permanente grant to Tri-County Health Department
- Conducted by: County with short-term consultants on transportation, law and health
- Focus: Physical activity and nutrition
- Findings: Benefits for physical activity and access to healthy foods
- Results:
 - 65 page report includes general recommendations
 - Related master plan was adopted by council

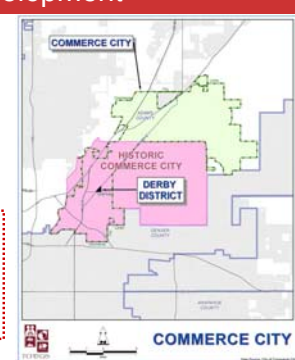


Health Impact Assessment
DERBY REDEVELOPMENT
HISTORIC COMMERCE CITY, COLORADO

Design for Health
January 2010 http://www.tchd.org/pdfs/hia_final.pdf

Case: Derby Redevelopment

- Interesting demographics:
 - Historic Commerce City Population 27,452
 - 52% Latino
 - 70% of household earned less than \$50,000 per year in 2000 (compared with 52% in Colorado)
- Mixed methods:
 - Telephone survey of Commerce City adults
 - Videos by youth
 - Walkability workshops
 - Photovoice (day with a camera)
 - GIS
 - Community forums

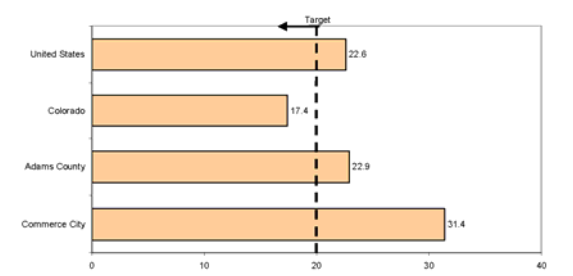


COMMERCE CITY
HISTORIC COMMERCE CITY
DERBY DISTRICT

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Case: Survey: No Leisure PA

Figure 5. Percent of adults who engage in no leisure-time physical activity in the United States, Colorado, Adams County and Commerce City, 2006.



Location	Percent
United States	22.6
Colorado	17.4
Adams County	22.9
Commerce City	31.4

Survey of 303 Adults using BRFSS Questions

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Adams City High School teens discuss issues and solutions related to walking to school in April, 2006.

Highway 2:
"Next to that huge highway, there are no crosswalks whatsoever."
Anthony Denning-Lenhart, Adams City High School student.

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Case: Walkability Assessment

72nd Avenue



72nd Avenue:

The signs say it is okay to cross here, but the street sends a different message. Pedestrians feel unsafe because the street is wide and the crosswalk is unsigned.

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Case: Photovoice (Day With Camera)



Bicyclists in Derby

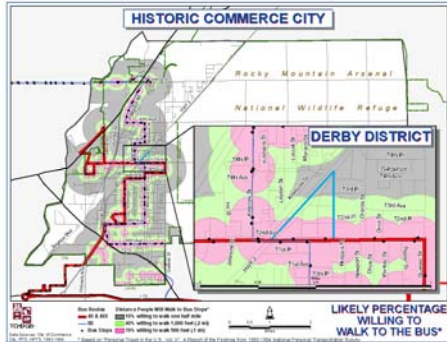
"Commerce City needs more bike paths. Riding bikes on narrow sidewalks is dangerous for pedestrians and bike riders."
Photovoice photographer

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Case: GIS Analysis: Transit

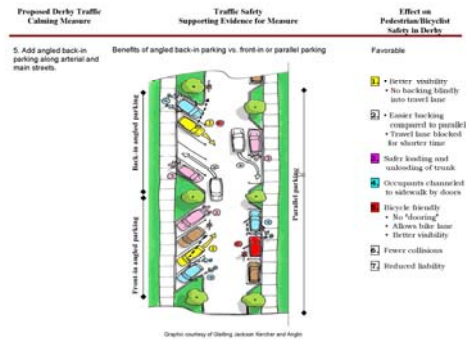
Figure 14. Likely percentage willing to walk to the bus and bus routes in historic Commerce City, including Derby



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Case: Recommendations



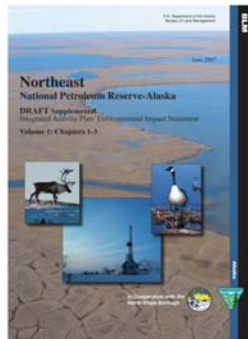
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Case: Alaskan Oil and Gas Development

HIA of Oil and Gas Development on the Alaska's North Slope

- **Funder:** Alaska Inter-Tribal Council
- **Conducted by:** Alaska Inter-Tribal Council, with Bureau of Land Management
- **Focus:** Disease, psychological and social problems, air and water quality
- **Findings:** Displacement of hunters and animals, loss of subsistence culture, transient workers may increase access to drugs/alcohol
- **Results:**
 - Health content in supplemental environmental impact statement
 - Public health mitigation strategies



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http://www.blm.gov/ak/st/en/prog/planning/npra_general/ne_npra/ne_n_pr-a_supplemental.html

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Case: Alaskan Oil and Gas Development

- **Methods:**
 1. Determined baseline health status data and determinants (based on literature)
 - Disease (e.g. diabetes, obesity, cancer)
 - Life expectancy
 - Psychological and social problems (e.g. violence, suicide rates, alcohol abuse)



Psychological and Social Problems

1. Suicide rates: 45/100,000 (11.1/100,000)
2. Violence (rape, assault, domestic violence, homicide): arrest rates 8-15 times U.S. rate (unprocessed data)
3. High prevalence of alcohol abuse

Psychological and Social Problems

- Data link rapid sociocultural change to social and psychological pathology in Inuit communities.
- Prohibition (in effect over most of North Slope) reduces alcohol-related morbidity and mortality
- Economic development may mitigate sociocultural change

Source: Wenham 2007

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Case: Alaskan Oil and Gas Development

- **Methods:**
 2. Predict health effects based on impacts in EIS - qualitative analysis of potential health effects (e.g. air and water quality, economy)

• Impact on *subsistence culture, species, and harvests* is key concern → "social pathology", injury due to increased travel, food insecurity, increased diabetes with shift to store-bought food, bioaccumulation of contaminants in fish and game

Table 3. Summary of Impacts Predicted Under Northeast NPR-A EIS*

Project Disturbances	Predicted Effects
<ul style="list-style-type: none"> • Seismic activity • Increased ground and air traffic • Pipelines, roads, ice roads • Oil facilities (wells, processing facilities) • Staging areas • Airborne discharges (flaring, exhaust, volatile organics) • Oil spills, other contaminant spills • Local employment opportunity • Employment decline at termination of project • Influx of non-Native workers • Oil camps • Revenue (taxation, Native corporation employment) 	<p>1. Subsistence/Life/Lively:</p> <ul style="list-style-type: none"> - Displacement of hunters away from productive areas - Displacement/dispersion of animals <p>2. Socio-cultural:</p> <ul style="list-style-type: none"> - Low/degredation of traditional subsistence areas - Fear of contaminants - Subsistence impacts lead to breakdown of kinship/community sharing networks - Subsistence impacts lead to difficulty in transmitting cultural customs to youth - Increasing economic disparities within villages - Acculturation from intense exposure to large numbers of transient outside workers - Alcohol and drug trafficking via new access routes

Source: Wenham 2007

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Case: Alaskan Oil and Gas Development

- **Mitigation:**
 - Proposed mitigation strategies
 - Implemented by BLM through regulations on developers
 - Proposed that BLM fund and convene health advisory board – monitor mitigation, review projects

Suggested Mitigation Measures	Targeted Health Outcome
<p>2. Public Health Monitoring</p> <p>Require developer to fund baseline and ongoing monitoring of a selected set of health indicators</p>	Same as Health Advisory Board
<p>3. Subsistence Measures</p> <p>a. Harvest study: baseline and ongoing monitoring to determine amount of each subsistence species</p> <p>b. Intake study: intake might provide a more sensitive indicator of dietary/metabolic impacts than harvest</p> <p>c. Management: measures to support subsistence intake, including financial support for community hunters, construction of community freezers, and programs to ensure adequate healthful food choices in village stores, would be required*.</p>	<ul style="list-style-type: none"> ○ Diabetes/metabolic diseases ○ Hunger and food insecurity ○ Social pathology ○ Injury

Source: Wenham 2007

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Case: Alaskan Oil and Gas Development

Suggested Mitigation Measures	Targeted Health Outcome
<p>8. Sustainable Development Management Plan</p> <p>This measure would require a comprehensive plan to address the anticipated sociocultural and economic changes. The World Bank Operational Policy 4.10 (World Bank, 2005), for example, provides guidelines for such measures. Other plans have included, for example:</p> <ul style="list-style-type: none"> ■ Sustainable savings and investment plans targeting long-term fiscal stability* ■ Economic diversification/strengthening locally sustainable businesses ■ Cultural stewardship/preservation initiatives ■ Hunter support programs (as discussed above) ■ Education financing 	<ul style="list-style-type: none"> ○ General health



Source: Wenham 2007

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Implications

- **Commerce City/Derby**
 - Mix of participatory and technical methods
 - Selective use of consultants
- **SR 520 Bridge**
 - Good execution of legislative mandate
 - Used to inform citizen's mediation process
 - Clear recommendations on 4 dimensions of the process
- **Alaska Oil and Gas**
 - Legal and methodological capacity to address health in EIS
 - Collaboration with responsible agency is essential
 - HIA is an important advocacy tool for disadvantaged groups

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