

The Gateway Cities
Air Quality Action Plan

I-710 Health Impact Assessment Final Draft Report

Presented to the Environmental Committee
October 26, 2011

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Agenda

- Presentations & Discussion of HIA Chapters:
 - Mobility
 - Air Quality
 - Traffic Safety
 - Jobs & Economy
 - Access to Neighborhood Resources
 - Noise

HIA Goals

- Provide I-710 Corridor Project decision-makers and other stakeholders with positive and negative health effects, findings, and recommendations for alternatives being considered;
- Increase stakeholder participation and understanding of the I-710 Corridor Project;
- Identify community health concerns/issues within the Gateway Cities and their relationship to the I-710 Corridor Project;
- Provide a model for future transportation and infrastructure HIAs (including evidence and utility of doing an HIA);
- Add value to the I-710 related analyses while utilizing the I-710 Corridor Project EIR/EIS technical data in the HIA to the greatest extent possible to reduce redundancy .

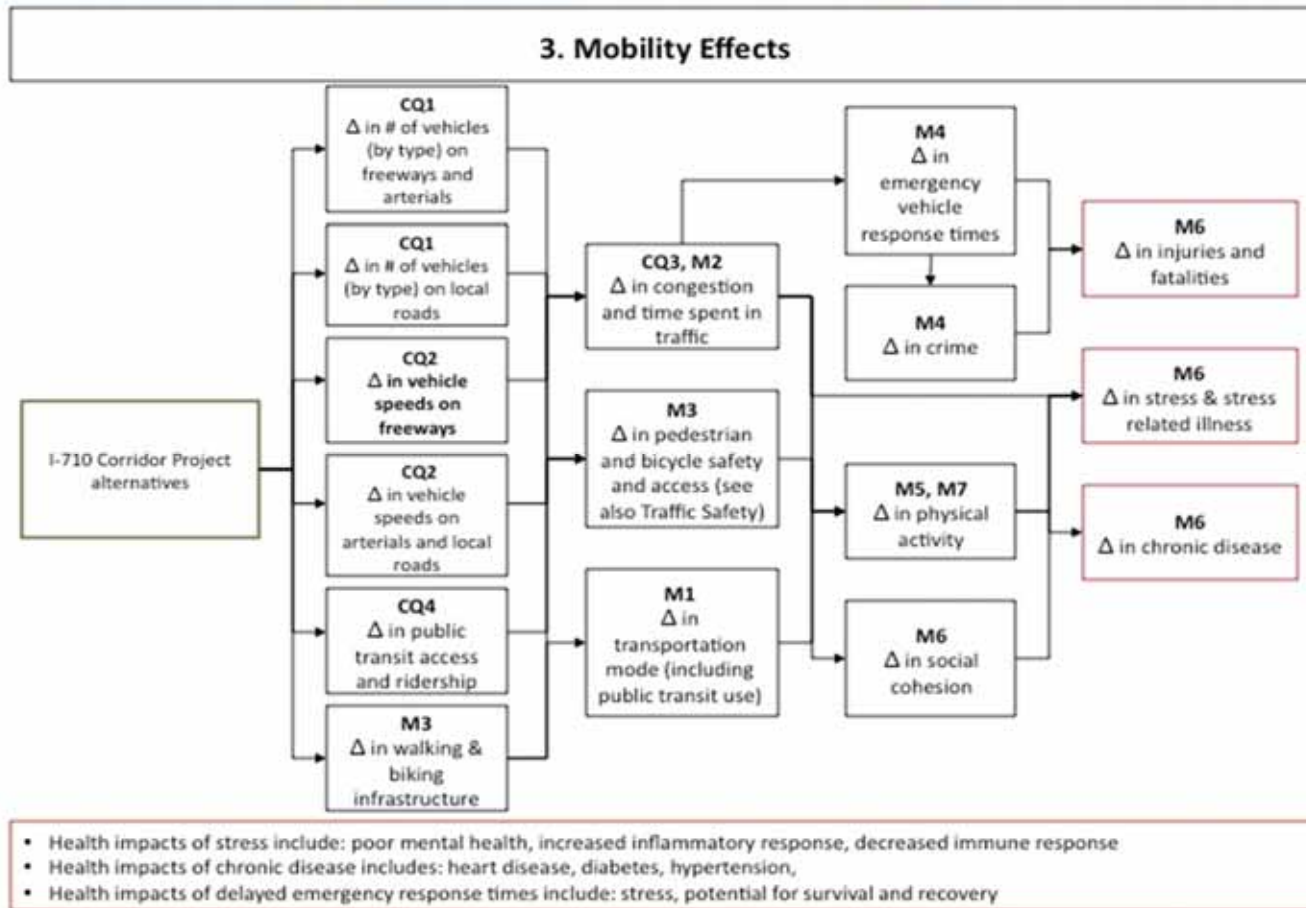
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HIA PART 1: Mobility

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Mobility: Pathways to Health



Mobility Literature Review

- Active Transport – Walking & Biking
 - Lack of physical activity is associated with many diseases (incl. heart disease, diabetes, obesity, depression) and mortality. Even small amounts of physical activity can have a large impact on health outcomes. (CDC)
 - Traffic volume and speed have been shown to explain most of the variation in perceived safety for pedestrians (Landis 2000)
- Public Transit
 - Public transit users spend a median of 19 minutes daily walking to and from transit; 29% achieve recommended physical activity (Besser 2005)
- Driving
 - Faster driving times can allow people to spend more time with their families, getting physical activity, or doing other things that are beneficial for health
 - Improvements in automobile level of service have been associated with harmful health impacts related to traffic injury rates & physical activity for local residents 6

Existing Conditions Related to Mobility

- Vehicle availability: approx. 9% of the population does not have access to a vehicle
- Community has significant concerns regarding mobility
- Walkability/Bikeability conditions are excellent in some areas of the Gateway Cities and not good in other areas
- Heart disease and diabetes rates appear to be similar to county levels near the I-710; diabetes and obesity rates are higher near the I-710

Mobility Impacts: Walkability/Bikeability

Despite proposed infrastructure improvements (Alts 5A, 6A/B/C), research indicates:

- Walking and biking rates are likely to decrease under all the alternatives being considered due to:
 - increased traffic volumes on arterials (Alts 1, 5A, 6A/B/C)
 - increased traffic speeds on arterials (Alts 5A, 6A/B/C) due to intersection changes
- Public transit usage likely to
 - increase under Alts 1 & 5A due to congestion
 - Decrease under Alt 6A/B/C due to faster traffic speeds

The magnitudes of these changes are not possible to predict quantitatively because many factors influence these rates.

8

Source: HIP

Impact Assessment Terms

Impact - refers to whether the alternative will improve health (+), harm health (-), or not impact health (~).

Magnitude – Reflects a qualitative judgment of the size of the anticipated change in health effect (e.g., the increase in the number of cases of disease, injury, adverse events (Negligible, Minor, Moderate Major)

Impact Assessment Terms

Severity – Reflects the nature of the effect on function and life-expectancy and its permanence

(High = intense/severe; Moderate; Low)

Strength of Causal Evidence – Refers to the strength of the research/evidence showing a causal relationship between noise and the health outcome (♦ = plausible but insufficient evidence; ♦♦ = likely but more evidence needed; ♦♦♦ high confidence in causal relationship). Causal effect means, the effect is likely to occur irrespective of the magnitude and severity

Summary of Health Outcomes (2035)

Mobility

- Health outcomes due to changes in active transport primarily as well as social cohesion and stress

Health Impact/ Alternative	Impacts of Alternatives		Health Outcome		Uncertainties
	Impact	Magnitude	Severity	Strength of Causal Evidence	
Chronic Disease (e.g., cardiovascular disease, diabetes) and Decreased Lifespan (e.g., from changes in active transportation, social cohesion, & stress)					
Alt 1	~/-	Potentially significant, non-quantifiable	High	◆◆◆	Project will have multiple impacts, some of which offset others.
Alt 5A					
Alt 6A					
Alt 6B					
Alt 6C					
Mental Illness (e.g., depression; from changes in active transportation, social cohesion, & stress)					
Alt 1	~/-	Potentially significant, non-quantifiable	Mod-High	◆◆	Project will have multiple impacts, some of which offset others.
Alt 5A					
Alt 6A					
Alt 6B					
Alt 6C					
Injuries and Fatalities Related to Delayed Emergency Response					
Alt 1	-	Minor	Mod-High	◆	Data in the literature is not conclusive regarding the impact of response time on health outcomes; emergency response time changes roughly estimated
Alt 5A	~	Negligible			
Alt 6A	+	Minor			
Alt 6B	+	Minor			
Alt 6C	+	Minor			
Explanations:					
<ul style="list-style-type: none"> ○ <i>Impact</i> refers to whether the alternative will improve (+), harm (-), or not impact health (~). ○ <i>Magnitude</i> reflects a qualitative judgment of the size of the anticipated change in health effect (e.g., the increase in the number of cases of disease, injury, adverse events): Negligible, Minor, Moderate, Major. ○ <i>Severity</i> reflects the nature of the effect on function and life-expectancy and its permanence: High = intense/severe; Mod = Moderate; Low = not intense or severe. ○ <i>Strength of Causal Evidence</i> refers to the strength of the research/evidence showing causal relationship between mobility and the health outcome: ◆ = plausible but insufficient evidence; ◆◆ = likely but more evidence needed; ◆◆◆ = high degree of confidence in causal relationship. A causal effect means that the effect is likely to occur, irrespective of the magnitude and severity. 					

Source: HIP

Key Mobility Recommendations

- Support policies and mechanisms to reduce speeds on targeted residential roads and arterials using traffic calming for safety and to encourage bicycling and walking. For any alternative selected, fully fund and if necessary strengthen enforcement of truck route regulations.
- In targeted areas, using physical engineered measures, reduce traffic speeds and volumes on streets with restaurants, stores, and services so that safety and walkability are improved. Examples include chicanes, lateral shifts, reduced lane width, pedestrian refuges and narrower lane width.
- Adopt or advocate for policies to reduce automobile and truck usage including, for example, increasing use of best available rail technologies to transport freight.

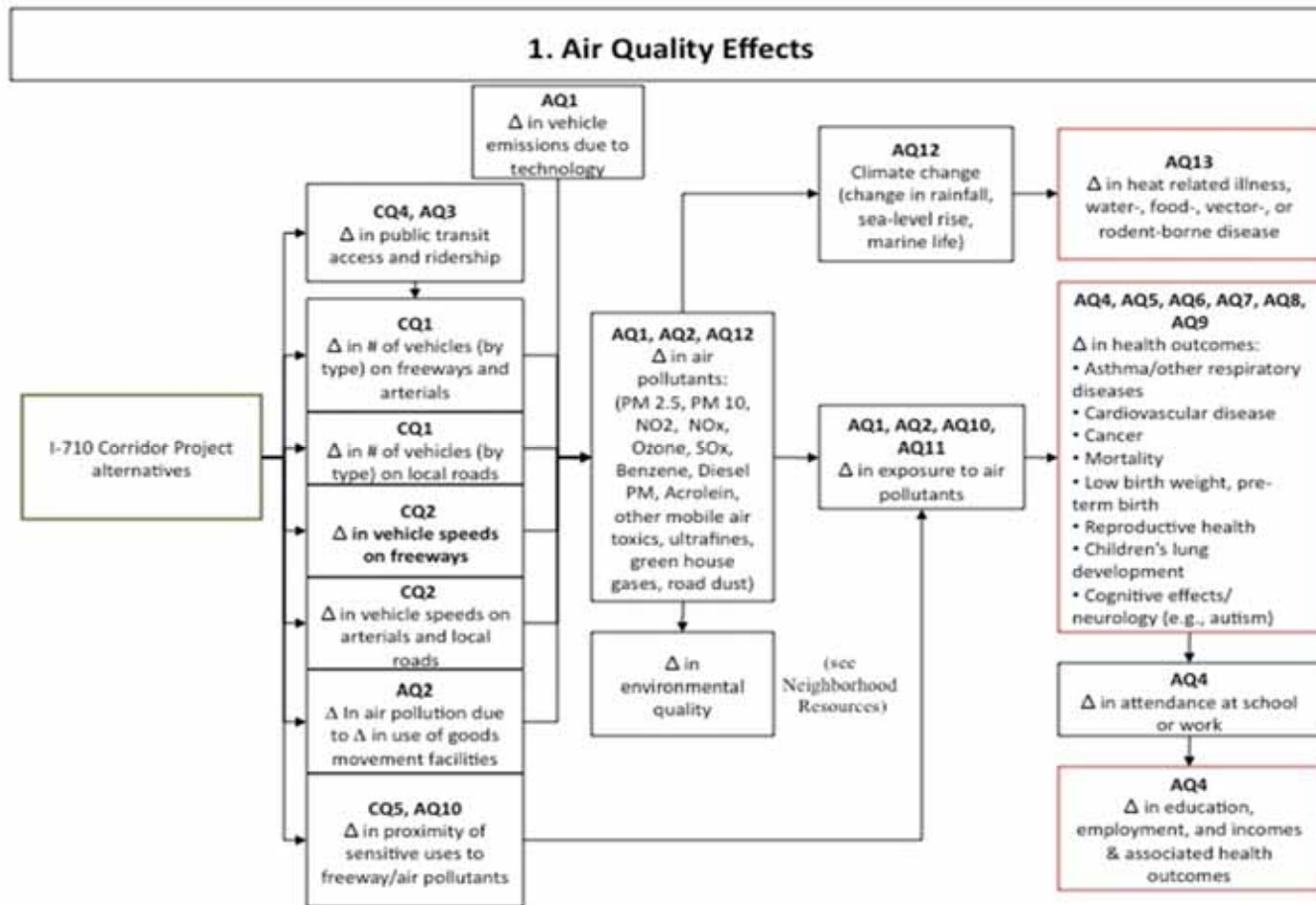
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Air Quality Action Plan

HIA PART 2: Air Quality

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Air Quality: Pathways to Health



HIP Air Quality Literature Review: Pollutants

Scientific evidence in the public health literature firmly establishes the relationship between traffic-related air pollution and numerous negative health impacts. Traffic-related air pollutants known to impact health include:

- Pollutants: ozone, PM10, PM2.5, ultrafines, carbon monoxide, nitrogen dioxide, sulfur dioxide, lead; benzene, 1,3-Butadiene, formaldehyde, acrolein, acetaldehyde and diesel particulate matter (DPM)
- Health outcomes: asthma and other respiratory diseases, cardiovascular disease, cancer, premature death, mortality, and preterm and low birth weight births
- Sources: Traffic is a major source
- Exposure: Those living near busy roadways have higher exposure

Existing Conditions Related to Air Quality

- Los Angeles air basin has the worst air quality in the nation
- Primary source of air pollution is traffic
- Air quality is the primary concern of the residents of the I-710 Corridor
- Levels of some air pollutants currently exceed standards
- Air quality related health status near the I-710 similar to health status in LA County

Overall Impacts Related to Air Quality

HIP analysis shows:

- Air quality will improve in 2035 due to cleaner fuels and more efficient technologies despite increases in traffic volumes in all I-710 Corridor Project Alternatives.
- Because of differences in the distribution of vehicles (i.e., whether they will use the I-710, other freeways, or the arterials) and differences in speeds (e.g., due to congestion), the alternatives impact different air pollutants by varying amounts.

We caution that our conclusions are based on preliminary data contained in an early version of the draft I-710 Corridor Project Draft AQ/HRA.

Source: HIP/Draft I-710 Corridor Project Draft AQ/HRA

17

Summary of Health Outcomes (2035)

Air Quality

General air quality will improve under any of the alternatives, resulting in a high likelihood that health of children, adults, and seniors throughout the corridor will improve.

Source: HIP

Health Impact/ Alternative	Impacts of Alternatives		Health Outcome		Uncertainties
	Impact	Magnitude	Severity	Strength of Causal Evidence	
Asthma					
Alt 1	+	Magnitude not estimated	High	◆◆◆	Final traffic analyses and air quality modeling were not available at the completion of this HIA.
Alt 5A					
Alt 6A					
Alt 6B					
Alt 6C					
Mortality					
Alt 1	+	Estimates pending PM _{2.5} modeling data	High	◆◆◆	Modeled estimates of mortality attributable to PM _{2.5} were not available for this analysis. Magnitude is not estimated.
Alt 5A					
Alt 6A					
Alt 6B					
Alt 6C					
Cancer Risk (from Mobile Source Air Toxics from the I-710 Corridor)					
Alt 1	+	Minor	High	◆◆◆	Final traffic analyses and air quality modeling were not available at the completion of this HIA.
Alt 5A	+	Minor			
Alt 6A	-	Major			
Alt 6B	+	Minor			
Alt 6C	+	Not available			
Cardiovascular disease					
Alt 1	+	Magnitude not estimated	High	◆◆◆	Final traffic analyses and air quality modeling were not available at the completion of this HIA.
Alt 5A					
Alt 6A					
Alt 6B					
Alt 6C					
Low birth weight and pre-term births					
Alt 1	+	Magnitude not estimated	Mod	◆◆	Final traffic analyses and air quality modeling were not available at the completion of this HIA.
Alt 5A					
Alt 6A					
Alt 6B					
Alt 6C					
Explanations:					
<ul style="list-style-type: none"> ○ <i>Impact</i> refers to whether the alternative will improve (+), harm (-), or not impact health (~). ○ <i>Magnitude</i> reflects a qualitative judgment of the size of the anticipated change in health effect (e.g., the increase in the number of cases of disease, injury, adverse events): Negligible, Minor, Moderate, Major. ○ <i>Severity</i> reflects the nature of the effect on function and life-expectancy and its permanence: High = intense/severe; Mod = Moderate; Low = not intense or severe. ○ <i>Strength of Causal Evidence</i> refers to the strength of the research/evidence showing causal relationship between air quality and the health outcome: ◆ = plausible but insufficient evidence; ◆◆ = likely but more evidence needed; ◆◆◆ = high degree of confidence in causal relationship. A causal effect means that the effect is likely to occur, irrespective of the magnitude and severity. 					

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Key Air Quality Recommendations

- Planning departments should ensure that all local land use planning improves the separation of residential and other sensitive uses from the goods movement infrastructure.
- Clean truck accountability: If cleaner trucks or zero emissions trucks are adopted as a strategy, ensure that proper regulatory and enforcement actions maintain emissions reduction goals over time and that such efforts are fully funded.
- Monitor and mitigate air quality at sensitive receptor sites: After the project is completed, regularly monitor air quality at sensitive receptors such as schools, community centers, libraries, and senior facilities and commit to retrofit these facilities (e.g., providing upgrades to building thermal performance and ventilation systems) to keep indoor air pollutant levels below that which is considered harmful to human health and the environment.

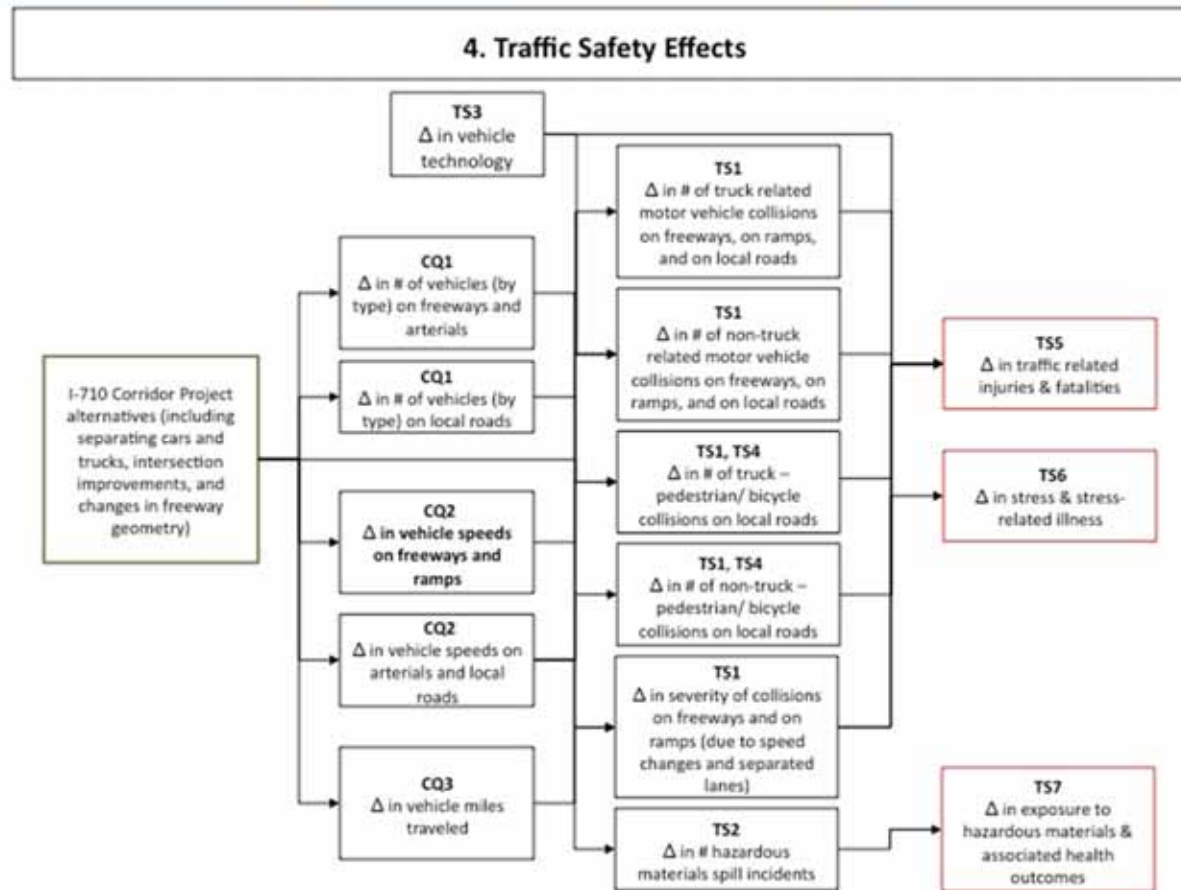
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HIA PART 3: Traffic Safety

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Traffic Safety: Pathways to Health



Traffic Safety Literature Review

Collision Frequency:

- Increased volume, number of lanes, and truck share results in increased collision frequency in proportion to volume
- Freeway design treatments and lower vehicle densities will decrease collision frequency

Collision Severity:

- Reductions of speed could reduce the frequency of fatal collisions
- Increased truck share will increase the share of collisions are fatal

Pedestrian & Bicyclist Injuries:

- Vehicle-ped/bike collisions increase with pedestrian/bike and vehicle volume

Existing Conditions Related to Traffic Safety

- Truck-related collisions are a substantial share of all collisions on the I-710
- Many more car-collisions occur off the freeway than on the freeway
- Between 2006 and 2008, there were 36 pedestrian fatalities and 108 severe pedestrian injuries within 1 mile of the I-710
- Between 2006 and 2008, there were 5 bicyclist fatalities and 35 severe bicyclist injuries within 1 mile of the I-710
- Collisions tend to occur in areas with higher car volumes and ped/bike volumes
- Traffic safety is of great concern to residents in the corridor

Predicted Impacts Related to Traffic Safety: I-710 General Purpose Lanes

Compared to 2008 levels:

- Non-truck collisions on general purpose lanes:
 - Alt 1: higher volumes, lower speeds → increased collisions, lower severity
 - Alt 5A: slightly higher volumes and speeds → small increase in the number of collisions and a proportional increase in number of severe collisions
 - Alt 6A/B/C: higher volumes and speeds → increase in the number of collisions and the severity of collisions
- Truck collisions on general purpose lanes:
 - GP lane truck volumes increasing for all alternatives
 - Increases in number of severe collisions expected in all alternatives
 - Volumes and number of collisions correlates as follows: Alt 5A > Alt 1 > Alt 6A/B

Source: HIP

24

Predicted Impacts Related to Traffic Safety: Arterials

Compared to 2008 levels:

- Non-truck collisions:
 - Alt 1: higher volumes, lower speeds → increased collisions, lower severity
 - Alt 5A and Alt 6A/B/C: higher speeds (LOS) and volumes → increase in the number of collisions and the number of severe collisions
- Truck collisions:
 - ~40% increase in volumes under all alternatives → increase in number and severity of collisions
- Ped/bike collisions:
 - Under all alternatives, future growth in population and traffic volume → increase in number of collisions, which are disproportionately severe
 - Potential changes in ped/bike volumes specific to each alternative could change number of collisions (see Mobility chapter)

Source: HIP

25

Summary of Health Outcomes (2035)

Traffic Safety

Health Impact/ Alternative	Impacts of Alternatives		Health Outcome		Uncertainties
	Impact	Magnitude	Severity	Strength of Causal Evidence	
Non-truck Vehicle-Vehicle Fatalities and Injuries					
Alt 1	-	Minor	High	◆◆◆	Relative effects of improved freeway ramps on collision rates uncertain; changes in Alt 1 arterial collisions uncertain
Alt 5A		Minor-Mod			
Alt 6A		Minor-Mod			
Alt 6B		Minor-Mod			
Alt 6C		Minor-Mod			
Truck-Auto Fatalities and Injuries					
Alt 1	-	Moderate	High	◆◆◆	Relative effects of improved freeway ramps on collision rates uncertain
Alt 5A		Moderate			
Alt 6A		Minor-Mod			
Alt 6B		Minor-Mod			
Alt 6C		Minor-Mod			
Vehicle-Pedestrian/Bicycle Fatalities and Injuries					
Alt 1	-	Minor-Mod	High	◆◆	Changes in pedestrian and bicycle activity uncertain
Alt 5A		Minor			
Alt 6A		Minor			
Alt 6B		Minor			
Alt 6C		Minor			
Hazardous Materials Exposure from Releases					
Alt 1	~/-	Negligible	Typically low, but infrequently high	◆	High severity hazardous material spills are low probability events
Alt 5A		Negligible			
Alt 6A		Negligible			
Alt 6B		Negligible			
Alt 6C		Negligible			
Explanations:					
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Source: HIP

Key Traffic Safety Recommendations

- Arterial speeds should be limited via traffic controls and traffic calming measures in order to reduce the number and severity of collisions and to encourage traffic to remain on the freeway.
- Supplement the intersection improvements outlined in the draft I-710 Corridor Project EIR/EIS with pedestrian-level improvements that increase their visibility and safety. Such improvements include, for example, clearly marked and protected crosswalks (e.g., with laddered crosswalks and pedestrian countdown signals).
- Starting with existing residential streets that are walkable/bikeable, expand the network of walkable/bikeable streets throughout the I-710 corridor to provide safe and pleasant streets that can be used for active transportation. This could include implementing “bicycle boulevards” (i.e., limited-access, low speed streets that have traffic calming features such as mid-block diverters with bicycle cut-outs) in local streets.

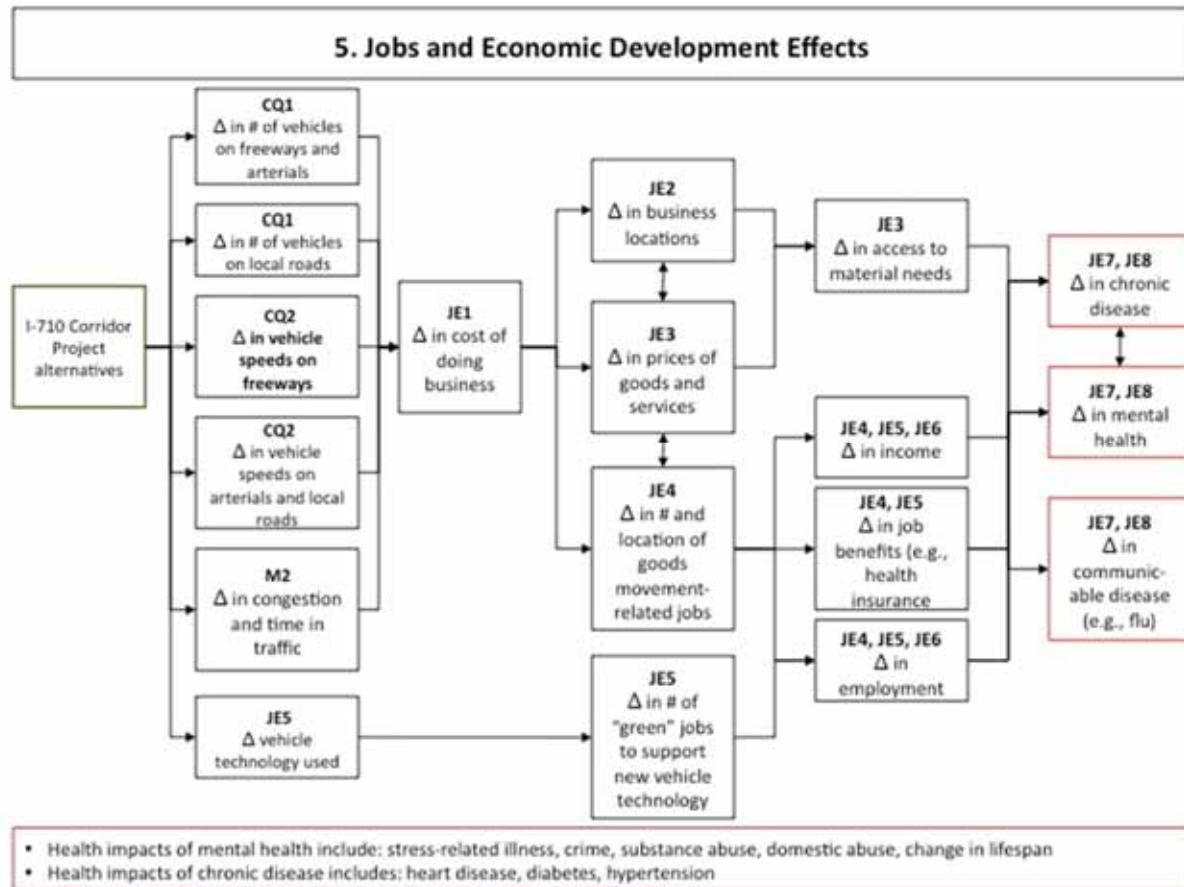
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HIA PART 4: Jobs & Economic Development

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Jobs & Economic Development: Pathways to Health



Jobs & Economic Development Literature Review

DRAFT

- Socioeconomic Status (SES) including education, income, and “job control” is associated with (Bravemen 2011):
 - Lifespan
 - Overall health
 - Chronic disease
- Unemployment is associated with mortality, cardiovascular disease, depression, suicide, and access to health insurance (Kroll 2011, Roelfs 2011, Fronstin 2010, Voss 2004)

Existing Conditions Related to Jobs & Economic Development

- Jobs in LA County account for over ¼ of jobs in the state
- Transportation and warehousing jobs are an important and growing sector in LA County
- Many of the new jobs in this sector are likely to not pay a living wage that can support a family
- Residents are concerned about job growth in the I-710 corridor, support 'new' and 'proactive' economic approaches, and are concerned about wages
- Lifespan, one health indicator related to jobs, is similar in the Gateway Cities to LA County

Predicted Impacts Related to Jobs & Economic Development

- All I-710 Corridor Project EIR/EIS alternatives assume that the ports expand their operations to process approximately 42 million twenty-foot-equivalent units (TEUs) annually in 2035 (compared to approximately 13 million TEUs in 2008).
- In making this assumption, the EIR/EIS also assumes that, under any alternative, the regional goods movement sector will grow the same (substantial) amount.
- Local job growth in each alternative varies due to changes specific to each alternative (e.g., congestion?). Economic modeling has not been done, so it is difficult to say how increasing the number of lanes will impact the number of local vs. regional jobs.

Predicted Economic Impacts

Changes difficult to predict, have not been modeled elsewhere in the I-710 Corridor Project analyses

→ Not enough information to make specific justifiable predictions, however we can say:

- Very likely that total goods movement jobs will increase in the I-710 Corridor (e.g., some industries like transloading are highly unlikely to be able to move further from the ports)
- Alternative 6B may potentially create and foster a new sector of jobs in the research, development and manufacturing of zero emission technologies. This may help to increase employment rates in the study area, assuming that the education and skills required for these jobs either match the education and skill base of the local population or that a significant investment in local job-training is made.

Source: HIP

33

Summary of Health Outcomes (2035)

DRAFT

Jobs & Economic Development

- Alt 6B could stimulate greater benefits if “green jobs” are attracted and filled by local residents

Health Impact/ Alternative	Impacts of Alternatives		Health Outcome		Uncertainties
	Impact	Magnitude	Severity	Strength of Causal Evidence	
Chronic Disease (e.g., cardiovascular disease, diabetes) and Decreased Lifespan (e.g., from changes in income, employment, and access to health benefits)					
Alt 1	+	Potentially significant, non-quantifiable	High	◆◆◆	Distribution of new jobs between I-710 Corridor Communities and greater region uncertain.
Alt 5A					
Alt 6A					
Alt 6B					
Alt 6C					
Mental Illness (e.g., depression; from changes in income and employment)					
Alt 1	+	Potentially significant, non-quantifiable	Mod-High	◆◆	Distribution of new jobs between I-710 Corridor Communities and greater region uncertain.
Alt 5A					
Alt 6A					
Alt 6B					
Alt 6C					
Explanations:					
<ul style="list-style-type: none"> ○ <i>Impact</i> refers to whether the alternative will improve (+), harm (-), or not impact health (~). ○ <i>Magnitude</i> reflects a qualitative judgment of the size of the anticipated change in health effect (e.g., the increase in the number of cases of disease, injury, adverse events): Negligible, Minor, Moderate, Major. ○ <i>Severity</i> reflects the nature of the effect on function and life-expectancy and its permanence: High = intense/severe; Mod = Moderate; Low = not intense or severe. ○ <i>Strength of Causal Evidence</i> refers to the strength of the research/evidence showing causal relationship between mobility and the health outcome: ◆ = plausible but insufficient evidence; ◆◆ = likely but more evidence needed; ◆◆◆ = high degree of confidence in causal relationship. A causal effect means that the effect is likely to occur, irrespective of the magnitude and severity. 					

Source: HIP

Key Jobs & Economic Development Recommendations

- Measure and track the proportion of local jobs in each industry that are filled by local residents. This data would allow policymakers to make informed decisions regarding strategies to enhance and stimulate local economies.
- Increase job-training opportunities for residents in the study area to better prepare the workforce for the employment opportunities in the region and reduce unemployment. Training should target jobs that pay a living wage and provide benefits such as health insurance.
- The green and sustainable technology jobs created locally (e.g., through Alternative 6B or projects at the Ports) could be a strong source of employment, training opportunities, and improved health outcomes for residents in the study area. We recommend that jobs in this relatively new industry be encouraged to move into the I-710 study area regardless of the build alternative chosen, and that government agencies and employers should be encouraged to train local workers in skills that will allow them to succeed in this field.

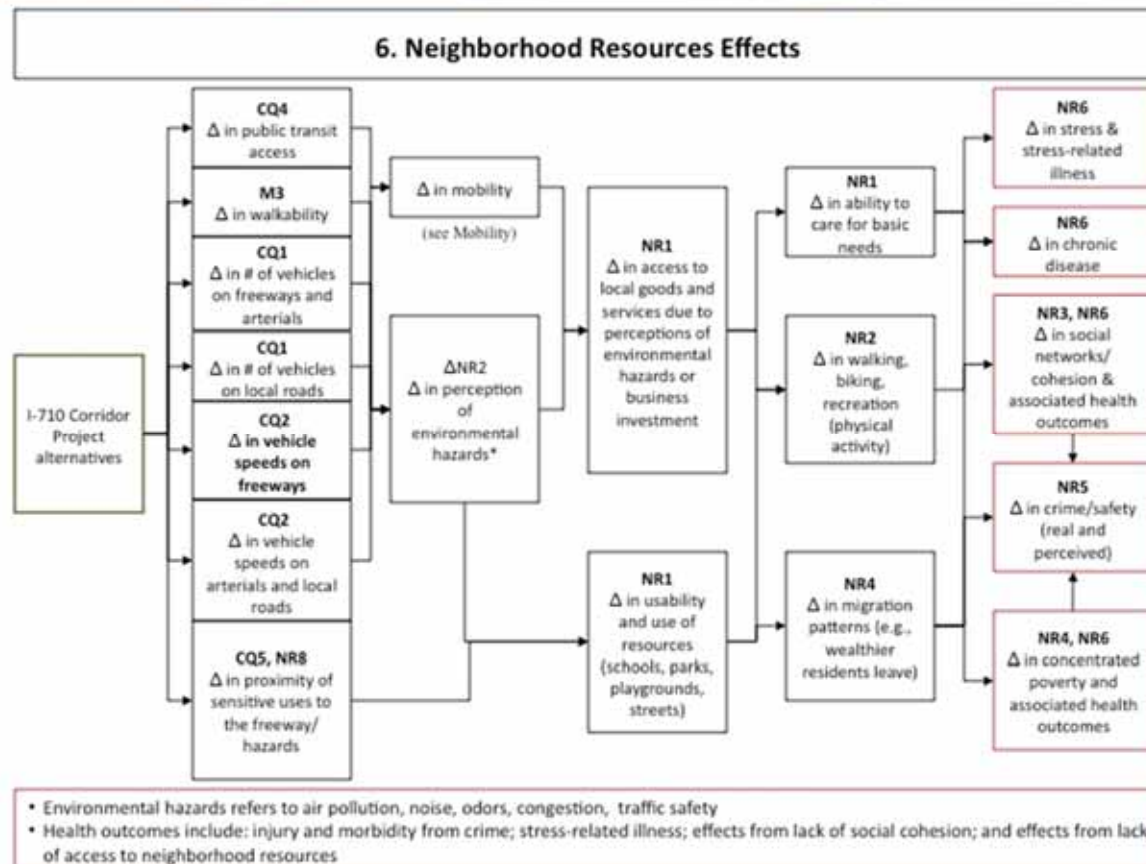
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HIA PART 5: Neighborhood Resources

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Access to Neighborhood Resources: Pathways to Health



Access to Neighborhood Resources Literature Review

DRAFT

- Research exists on how freeways are good for mobility and funneling people/goods through an area but how this makes them bad for “place-making” (Cervero 2009, Burden 2007)
- Access to a mix of retail is important for health and quality of life: increases walking and biking, possibilities for healthful and meaningful work, and interactions among neighbors; reduces daily vehicle trips and miles traveled, air and noise pollution.
- Perceptions of environmental quality influence health-related decisions.
- After a freeway expansion, property values for residences nearest to the freeway (e.g., with more environmental impacts) decrease, while those further away (e.g., that may gain better access to the freeway or benefit from reduced commute times) increase.

Neighborhood Completeness: Existing Conditions

- Some neighborhoods (e.g., Long Beach and East LA) are more complete than others (e.g., Compton) in that they have a greater number of goods and services available
- Residents have significant concerns regarding environmental quality and this could impact their use of neighborhood resources
- Measures of social cohesion (e.g., crime rates, voting registration) indicate that social cohesion is good but not excellent in the area
- Corridor residents have less wealth (as measured by income, poverty, property values) than others in the county
- Health outcomes related to neighborhood completeness (e.g., those related to physical activity) are similar to the county

Source: HIP

39

Predicted Impact Related to Access to Neighborhood Resources

- Displacement will be minimal
- Access to goods and services will not improve under Alt 1; will improve for transit users under Alt 5A; and will improve for drivers and transit users under Alt 6A/B/C
- Difficult to predict how perceptions of environmental quality will change and how usability of existing resources will change
- The extent of government and business investment that will result from any proposed alternative is unknown. Significant investment could lead to improved neighborhood completeness.
- Social cohesion likely to stay the same or decrease for those living closest to freeway, while for those further away social cohesion may not be impacted
- Neighborhood wealth not likely to improve, especially for those closest to the freeway

Source: HIP 40

Summary of Health Outcomes (2035)

Access to Neighborhood Resources

Health Impact/ Alternative	Impacts of Alternatives		Health Outcome		Uncertainties
	Impact	Magnitude	Severity	Strength of Causal Evidence	
Chronic Disease (e.g., cardiovascular disease, diabetes; from changes in physical activity, social cohesion, & stress)					
Alt 1	+/-	Potentially significant, non-quantifiable	Mod-High	◆	Likely benefits for some populations and harms to others; specifics (e.g., distance from freeway) uncertain
Alt 5A					
Alt 6A					
Alt 6B					
Alt 6C					
Mental Illness (e.g., depression; from changes in physical activity, social cohesion, & stress)					
Alt 1	+/-	Potentially significant, non-quantifiable	Mod-High	◆	Likely benefits for some populations and harms to others; specifics (e.g., distance from freeway) uncertain
Alt 5A					
Alt 6A					
Alt 6B					
Alt 6C					
Decreased Lifespan (e.g., from changes in physical activity, social cohesion & stress)					
Alt 1	+/-	Potentially significant, non-quantifiable	High	◆	Likely benefits for some populations and harms to others; specifics (e.g., distance from freeway) uncertain
Alt 5A					
Alt 6A					
Alt 6B					
Alt 6C					
Injury and fatality (e.g., from crime)					
Alt 1	+/-	Potentially significant, non-quantifiable	Mod-High	◆	Likely benefits for some populations and harms to others; specifics (e.g., distance from freeway) uncertain
Alt 5A					
Alt 6A					
Alt 6B					
Alt 6C					
Explanations:					
<ul style="list-style-type: none"> ○ <i>Impact</i> refers to whether the alternative will improve (+), harm (-), or not impact health (-). ○ <i>Magnitude</i> reflects a qualitative judgment of the size of the anticipated change in health effect (e.g., the increase in the number of cases of disease, injury, adverse events): Negligible, Minor, Moderate, Major. ○ <i>Severity</i> reflects the nature of the effect on function and life-expectancy and its permanence: High = intense/severe; Mod = Moderate; Low = not intense or severe. ○ <i>Strength of Causal Evidence</i> refers to the strength of the research/evidence showing causal relationship between access to neighborhood resources and the health outcome: ◆ = plausible but insufficient evidence; ◆◆ = likely but more evidence needed; ◆◆◆ = high degree of confidence in causal relationship. A causal effect means that the effect is likely to occur, irrespective of the magnitude and severity. 					

Source: HIP

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Key Neighborhood Resources Recommendations

DRAFT

- In order to at least partially offset any negative impacts on access to neighborhood resources, the I-710 Corridor Project could include additional improvements to neighborhood resources that are currently available. Local jurisdictions could each be given funding as part of the project to invest in the neighborhood resources (e.g., libraries, schools, parks, community centers) that are likely to be impacted by the project or by future changes in the community that may result from the project.
- Increase direct government investment in community infrastructure and services to ensure that people have access to the goods and services they need to live healthy lives and to improve social cohesion in local communities.
- Recommendations contained in the Air Quality, Noise, and Traffic Safety Chapters of this HIA, including those related to future land use, would help ensure improvements to environmental quality. Improved perceptions of environmental quality are likely to follow actual improvements and lead to more investment in the corridor communities, improve social cohesion, increase physical activity, and lead to other neighborhood improvements.

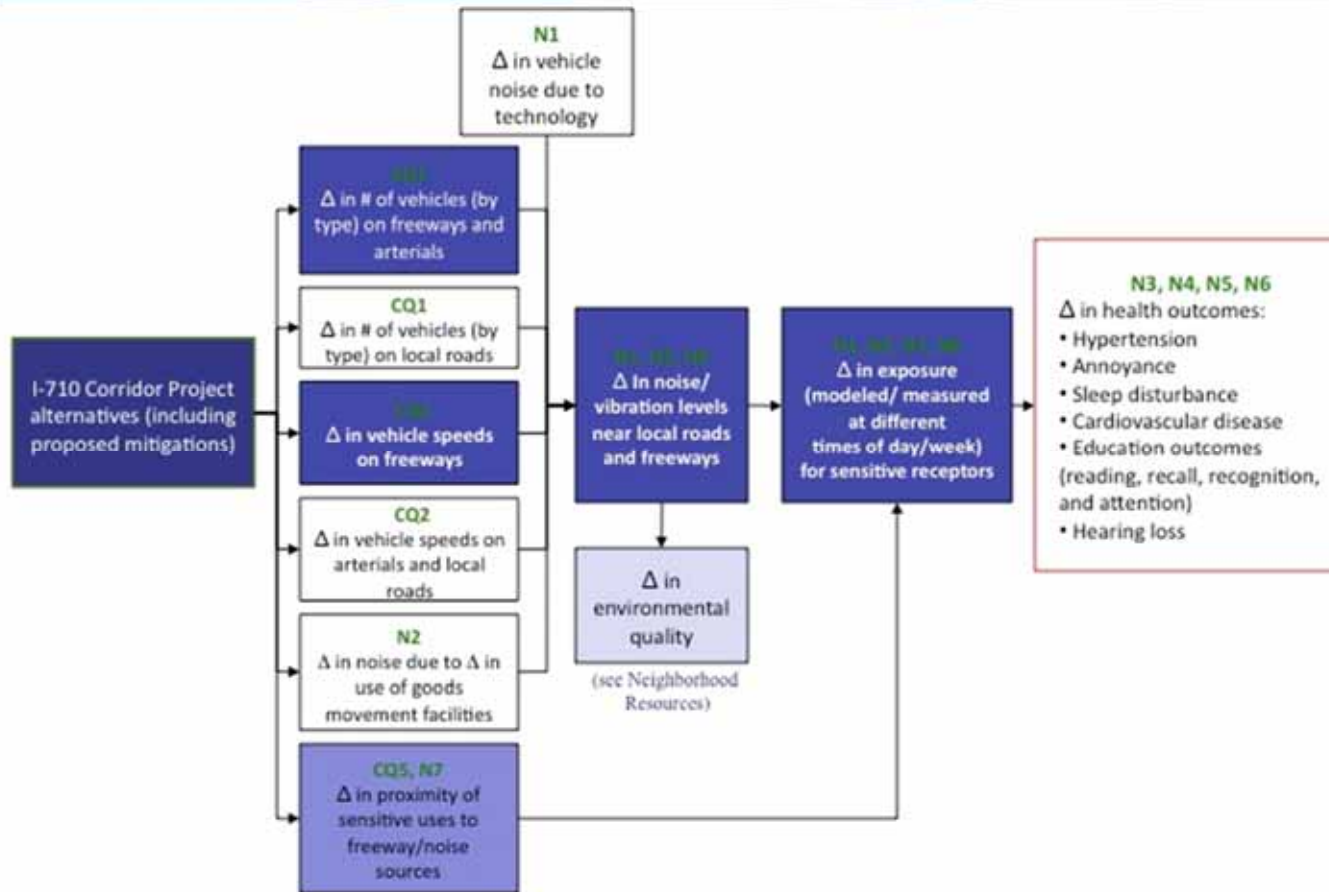
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HIA PART 6: Noise

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Noise: Pathways to Health



Literature review

The literature contains significant evidence on causal links between noise and the following conditions:

- Sleep disturbance
- Annoyance
- Speech interruption
- Learning & educational outcomes
- Stress
- Cardiovascular disease

FHWA & Caltrans Policy

Federal (23 CFR 772) and state policy:

- Traffic noise prediction
- Traffic noise analysis
- Analysis of noise abatement
- Informing local officials

Simplest summary: keep noise levels below 67 dBA

DRAFT

World Health Organization Noise Guidelines

Environment	Health effect	Sound level (dBA)	Time (hours)
Bedrooms	Sleep disturbance	30	8
Inside dwellings	Speech intelligibility	35	16
School classrooms, indoors	Disturbance of communication	35	School hours
Outdoor living areas	Annoyance	50-55	16
Industrial, commercial and traffic areas	Hearing impairment	70	24
Music through earphones	Hearing impairment	85	1
Ceremonies and entertainment	Hearing impairment	100	4

<http://www.who.int/docstore/peh/noise/guidelines2.html>

Existing Conditions

- Noise is a significant concern of residents in the I-710 corridor
- Existing noise levels near the I-710 are mostly between 50 and 70 dBA
- Based on Caltrans noise measurements and our calculations, between 22,000 and 35,000 people would currently be expected to report being highly annoyed and between 5,000 and 7,500 people would be expected to report experiencing highly disturbed sleep due to noise near the southern portion of the I-710; Cardiovascular disease rates are not higher in the study area.

Change in Noise Emissions (2035): Summary

Alternative	Changes in Noise Emissions by Source Compared to 2008 levels and Relative to Each Other		
	Freeway	Arterials	Other Goods Movement Infrastructure
Alt 1	↑↑	↑↑↑	↑↑
Alt 5A	↑↑↑	↑↑	↑↑
Alt 6A	↑↑↑	↑↑	↑↑
Alt 6B	↑↑↑	↑	↑↑
Alt 6C	↑↑↑	N.D.	↑↑

Note: The number of '↑' signs indicate the relative increase in noise from each source.

*Other goods movement infrastructure refers to warehouses, intermodal facilities and similar noise-producing that may be located near sensitive receptors

Source: HIP

Freeway Noise Exposure

- No noise modeling data available yet from Caltrans
- Alternative 6:
 - High truck volumes & speeds
 - Freight Corridor further from residences on same side of LA river and closer to residences on opposite side;
 - Some areas with existing soundwalls, some with proposed soundwalls
- HIA can't predict changes in noise or compare to other alternatives (but modeling in process as part of EIR/EIS)

Summary of Health Outcomes (2035)

Even if noise is reduced to 67 dBA by new soundwalls, the following health outcomes are anticipated:

Health Impact/ Alternative	Impacts of Alternatives		Health Outcome		Uncertainties
	Impact	Magnitude	Severity	Strength of Causal Evidence	
Annoyance					
Alt 1	-	Estimates pending noise modeling data from Caltrans	Low	◆◆◆	Modeled changes in noise exposure were not available for this analysis; magnitude is not estimated
Alt 5A					
Alt 6A					
Alt 6B					
Alt 6C					
Sleep Disturbance					
Alt 1	-	Estimates pending noise modeling data from Caltrans	Mod-High	◆◆◆	Modeled changes in noise exposure were not available for this analysis; magnitude is not estimated
Alt 5A					
Alt 6A					
Alt 6B					
Alt 6C					
Cardiovascular Disease (including hypertension and myocardial infarction)					
Alt 1	-	Estimates pending noise modeling data from Caltrans	High	◆◆	Modeled changes in noise exposure were not available for this analysis; magnitude is not estimated
Alt 5A					
Alt 6A					
Alt 6B					
Alt 6C					
Cognitive Impairment and Academic Achievement					
Alt 1	-	Estimates pending noise modeling data from Caltrans	Mod-High	◆◆◆	Modeled changes in noise exposure were not available for this analysis; magnitude is not estimated
Alt 5A					
Alt 6A					
Alt 6B					
Alt 6C					
Hearing Impairment					
Alt 1	~	None	Mod	◆◆◆	
Alt 5A		None			
Alt 6A		None			
Alt 6B		None			
Alt 6C		None			
Explanations:					
<ul style="list-style-type: none"> ○ <i>Impact</i> refers to whether the alternative will improve (+), harm (-), or not impact health (~). ○ <i>Magnitude</i> reflects a qualitative judgment of the size of the anticipated change in health effect (e.g., the increase in the number of cases of disease, injury, adverse events): Negligible, Minor, Moderate, Major. ○ <i>Severity</i> reflects the nature of the effect on function and life-expectancy and its permanence: High = intense/severe; Mod = Moderate; Low = not intense or severe. ○ <i>Strength of Causal Evidence</i> refers to the strength of the research/evidence showing causal relationship between noise and the health outcome: ◆ = plausible but insufficient evidence; ◆◆ = likely but more evidence needed; ◆◆◆ = high degree of confidence in causal relationship. A causal effect means that the effect is likely to occur, irrespective of the magnitude and severity. 					

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Source: HIP

Key Noise Recommendations

- After the project is completed, regularly monitor noise levels at schools, community centers, libraries, and senior facilities and commit to retrofit these facilities (e.g., providing upgrades to windows and ventilation systems) to keep indoor noise below levels considered harmful by the World Health Organization standards.
- If Alternative 6C is adopted, use revenue from tolling to fund mitigations to noise impacts. Funds could be used, for example, for enforcement of truck routes, parking, idling regulations, and speed limits; installation of truck noise reduction technology; sound insulation at schools; and vegetative buffers between freeways and parks.
- Construct sound walls in all locations in the corridor that are adjacent to a residential area, school, or park. For these soundwalls, use greening and aesthetic principles found in the project's Urban Design and Aesthetics Toolbox Report.

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Thank You

Questions / Comments?

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