U.S. – Mexico Border Crossings at San Ysidro: Social and Environmental Effects for Pedestrian Crossers and San Diego Communities
Study Information

Collaborators in The Healthy Borders San Ysidro Project:
San Diego State University (SDSU) Graduate School of Public Health (GSPH)
Casa Familiar
San Diego Prevention Research Center (SDPRC)

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• Health and Environmental Impacts of Border Crossing Delays and Traffic on Residents and Workers in the Community of San Ysidro and the San Diego Region’ grant (San Diego Foundation, PI Dr. PJE Quintana)
• ‘Pedestrian Border Element Project’ grant (California Endowment, PI David Flores)
Outline: talk today

1. Environmental Effects of SY Border Crossings
   a. General Information
   b. Pedestrian study
   c. San Ysidro study
   d. Greenhouse gas study

2. Social Effects of SY Border Crossings

3. Conclusions and Solutions
Environmental Effects Studies Objectives

Pedestrian Study: Measure personal exposures to air toxics experienced by pedestrians

San Ysidro Air Quality Study: Measure community air quality in the city of San Ysidro

Greenhouse Gas Study: Estimate contribution of idling vehicle emissions to greenhouse gas emissions in the San Diego region
Environmental Effects: Traffic-Related Emissions

- Toxics
- NO\textsubscript{x}
- 1-NP
- Carbon Monoxide
- Particulate Matter (PM)
- PM\textsubscript{2.5}, ‘ultrafine’ PM or PM\textsubscript{0.1}

Greenhouse gas emissions
Effects of Traffic-Related Air Pollution on Human Health

- **In Adults...**
  - Traffic-related pollution linked to cardiovascular disease, respiratory illness, and cancer

- **In Children...**
  - Links to asthma, reduced lung growth, bronchitis, leukemia, and birth defects
Pedestrian Study

Measure personal exposures to air pollutants experienced by pedestrians crossing border at San Ysidro POE

1. On people - 60 pedestrian border commuters who work or go to school in San Ysidro and live in Mexico and 40 controls San Ysidro only (one 24 hour period)
   - carry carbon monoxide and diesel pollutant monitors for 24 hours (including pedestrian commute across POE)
   - urine analyzed for diesel exposure

2. Stationary Border Monitoring at San Ysidro POE at the same time that the pedestrians were crossing Northbound for
   - ultrafine particles, PM2.5, carbon monoxide and black carbon (same time subject is in line)
Participant personal air monitoring
Pedestrian Study - Results

People who cross the border through the San Ysidro Port of Entry are exposed to relatively high concentrations such as Carbon Monoxide and Ultrafine Particulate Matter

- Adults exposed to these levels on the long term in other studies have negative effects to cardiovascular and respiratory systems
- CO levels this high have been tied to negative birth outcomes

At the POE location where pedestrians cross, Ultrafine Particulate Matter concentrations were 3-4 times higher than in San Ysidro and up to 10 times higher than in Imperial Beach
Pedestrian Study - Results

CO (ppm) vs HBO22 24-hr Time Activity

- Crossed southbound. Drove
- At house.
- In bedroom with window open
- Walked to park. At home
- Shower. T.V.
- Slept
- In house
- Cleaned house
- Drove. Walked in line 12:33
- Crossed Border 14:30
San Ysidro Air Quality Study

Measure levels of traffic-related pollutants in San Ysidro, and examine relationship to waits at San Ysidro POE

Pollutants measured: Black Carbon, Ultrafine Particulate Matter and Carbon Monoxide
- all related to traffic
- measured from 4 stationary rooftop locations
- 24-hour stationary measurements

Measurement periods: Feb-Mar, May-June and November 2010

Pollution levels examined during different wind directions and compared to Northbound wait times (delays) at San Ysidro crossing.
Store: ¼ mile from POE
Elementary School: 0.9 miles from POE
Elementary School: 1.7 miles from POE
Tijuana Estuary (Imperial Beach): 6.2 miles from POE
San Ysidro POE
San Ysidro Air Quality Study - Results

Traffic-related air pollutant concentrations higher in locations closer to POE
- Example, ultrafine particles 3 x higher than at TJ River estuary (24 hr ave was 13620 part/cc vs 3755 part/cc)

Wind direction affects air pollutant levels
- Concentrations higher when the winds are from southerly and easterly directions, and when winds are calm
- “Cleanest” air when ocean breezes blowing from the West and North

 Longer delays at the POE also related to higher pollution near the border
- This is especially true when the wind is blowing from the border toward the San Ysidro community or during calm wind

Currently, no air quality laws or standards control local concentrations of these pollutants, no matter how high they get
Greenhouse Gas Study

Calculate greenhouse gas emissions from Northbound idling vehicles at all San Diego County – Baja California border crossings

Northbound wait times from October 2008 - March 2009
- San Ysidro Regular and Sentri
- Otay Mesa Regular and Sentri
- Tecate Regular

Greenhouse Gas emissions estimated based on type of vehicles and time spent idling
Greenhouse Gas Emissions by Vehicle Activity

- Acceleration: 15%
- Creep Idling: 40%
- Idling: 45%
Total Greenhouse Gas emissions due to Northbound border delays

Between 74,737 and 82,664 Metric Tons of Carbon Dioxide

- This is the equivalent of providing electricity for 1 year to between 8,228 and 9,100 homes

- It is also equivalent to consuming between 157,675 and 174,399 barrels of oil
Greenhouse Gas Study - Results

Overall, northbound border delays emit a relatively small amount of San Diego County’s greenhouse gas emissions

- However, it is an amount that can be easily reduced

- By reducing these delays, we can reduce annual greenhouse gas emissions by up to an amount that equals those of a combined 6,890 San Diego County residents
Social Effects: Background

3 Types of Interviews of San Ysidro Port of Entry Stakeholders

1) Intercept Interviews
   - Pedestrian border crossers

2) Key Informant Interviews
   - Representatives of San Ysidro community groups

3) Focus Group Discussions
   - Group discussion in San Ysidro
Intercept Interviews: Background

- 148 people interviewed after crossing northbound at the San Ysidro POE

- Interviews took place between May and August 2010

- Results compared to a SANDAG survey of 2,742 commuters at San Ysidro POE

- Respondents asked personal data, as well as about the San Ysidro POE and their experiences crossing it
Intercept Interviews: Results

- 30% of Mexican residents and 19% of U.S. residents had concerns associated with waiting in northbound pedestrian line
  - Highest concerns regarding theft, physical abuse, and verbal abuse

- 41% of U.S. residents and 49% of Mexican residents report physical discomfort while waiting in line
  - Most common responses: heat exhaustion, fatigue

- Percentage of Mexican and U.S. residents that found certain amenities highly important while waiting to cross northbound:
  - Places to sit and rest: 64% (Mex), 74% (U.S.)
  - Shade: 93% (Mex), 88% (U.S)
  - Restrooms: 82% (Mex), 93% (U.S)
Key Informant Interviews: Background

- 9 key informants from:
  San Ysidro Community Planning Group
  City of San Diego Councilmember District 8
  San Ysidro Chamber of Commerce
  Border Transportation Council
  San Ysidro Health Center
  San Ysidro Business Association and San Ysidro Transportation Collaborative
  Southwestern College
  Beyer (Willow) Elementary
  Casa Familiar

- 60-minute interviews
- April – July 2010
- Topics included pedestrian crossing experience and environmental and health issues of concern at San Ysidro POE
Key Informant Interviews: Results

The Pedestrian Experience at San Ysidro POE:

- Physical discomforts due to:
  - Exposure to elements (heat, cold, wind, rain, sun)
  - Exposure to pollution (car exhaust, dirty facilities)
  - Lack of amenities (restrooms, lighting)
  - Long periods of time standing

- Other sources of discomfort:
  - Lack of security (fear of robbery, assaults, trafficking)
  - Discrimination by U.S. Customs Border Protection personnel
Key Informant Interviews: Results

Suggestions for Improvement of Pedestrian Experience:

- Free, available restroom facilities
- Rest areas (places to sit, especially for the disabled and elderly)
- Improved lighting
- Protection from elements (i.e. covering/shade)
- Drinking fountains
- Aesthetic improvements (i.e. landscaping, cleanliness)
- Secured facilities
Key Informant Interviews: Results

Suggestions for Reduction of Wait Times:

- Buses to ease crossing
- Improved inspection process
- Clear communication to pedestrians by CBP (explain reason for orders)
- Increase number of booths
- Improved technology (passport scanners that read older passports)
- “Trusted Traveler Program” for frequent crossers
Focus Group Discussions: Background

- Four focus groups held at San Ysidro’s Casa Familiar with community members during Sin Limites meeting
- Approximately 10 participants per group
- Held October 29, 2009
- Focus groups lasted approximately 1 hour
- Topics included the experience of living at the border, pedestrian crossing experience, environmental and health concerns, and suggestions to improve the border crossing experience
Focus Group Discussions: Results

The Pedestrian Experience at San Ysidro POE:

- Physical discomforts due to:
  - Exposure to pollutants (car exhaust)
  - Lack of lighting and security on U.S. side
  - Long lines cause stress/need to get to work/apts.

- Other sources of discomfort:
  - Lack of security (fear of robbery, being scammed)
  - Discrimination by U.S. Customs Agents
Focus Group Discussions: Results

Suggestions to improve the border crossing:

- Separate lines for the elderly, disabled, and those with children
- Free restrooms open during border crossing hours
- More lines
- Benches, trees, and a cleaner environment
- Friendlier and welcoming border crossing experience: minimize sense of rejection, discrimination, and threat
- Creation of a “waiting zone” on the U.S. side of the border where people can wait to pick up those crossing the border
- Better signage on the U.S. side of the border indicating parking lots, public transportation, restrooms
Summary of Environmental and Social Research

- Personal exposures to air pollutants high for those that walk across border
- Several other discomforts are experienced while walking across the border
- Border delays appear to be affecting the San Ysidro community during certain wind conditions
- Delays at the border emit thousands of tons of greenhouse gases into the atmosphere
- Experiences crossing and suggestions for improvements were similar among different stakeholder groups
Where do we go from here?

First priority should be to reduce / eliminate border delays and idling

- Increased Staffing
- Streamlined Processing
- Reduce idling (Truck Stop Electrification)
What else should be done?

Small Improvements to Reduce Discomforts at Pedestrian Crossing

Places to sit
Improved lighting
Covering/shade
Drinking fountains
Landscaping, cleanliness
Secured facilities
What else should be done?

Reduce individual and community exposure to pollution

- Walls, tunnels and barriers to protect border crossing pedestrians at new San Ysidro POE
- Constructed and vegetative barriers in San Ysidro to block pollutants from reaching community
- Routing of vehicles to reduce exposure
- Public transportation