



LTC 4th Research
Challenge

The Nexus Between Transportation and Housing

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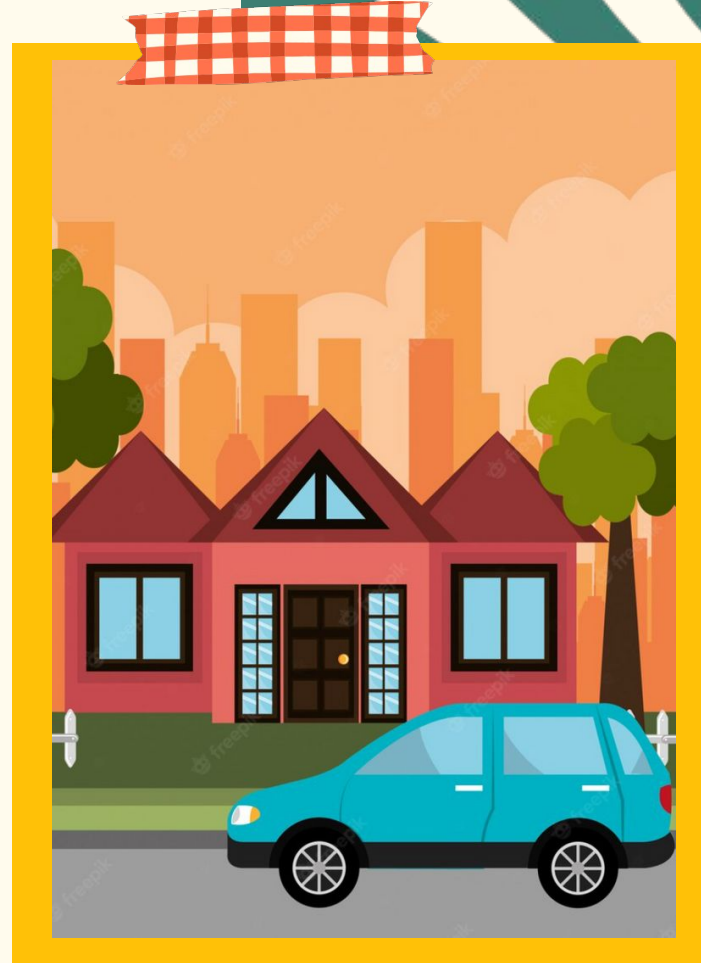
Yash Tike

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Presentation

- Personal Experiences
- The Problem
- Impacts
- Current Initiatives/Programs
- Conclusion





Personal Experiences

Though the details of our experience are different. We share a similar story.

Reasons for Choosing the IE:

- ◆ Affordability
- ◆ Opportunity
- ◆ Housing





The Problem

Housing and transportation costs can have significant impacts on the economic, social, environmental and health of residents in the Inland Empire.



As homes become less affordable within the city limits, residents are forced to move further away causing higher transportation costs.

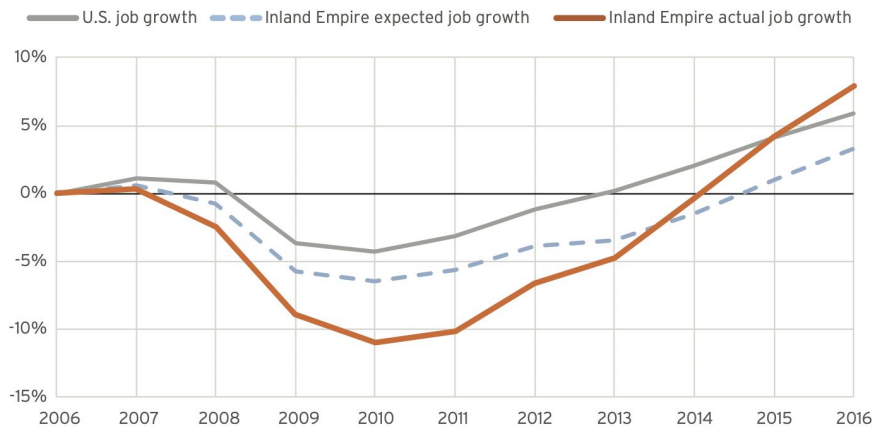
Making it one of the challenges for residents to achieve upward mobility.

Impacts

Economic Mobility: Jobs to Income Ratio

The Inland Empire overcame its deep recession to post a better-than-expected job recovery

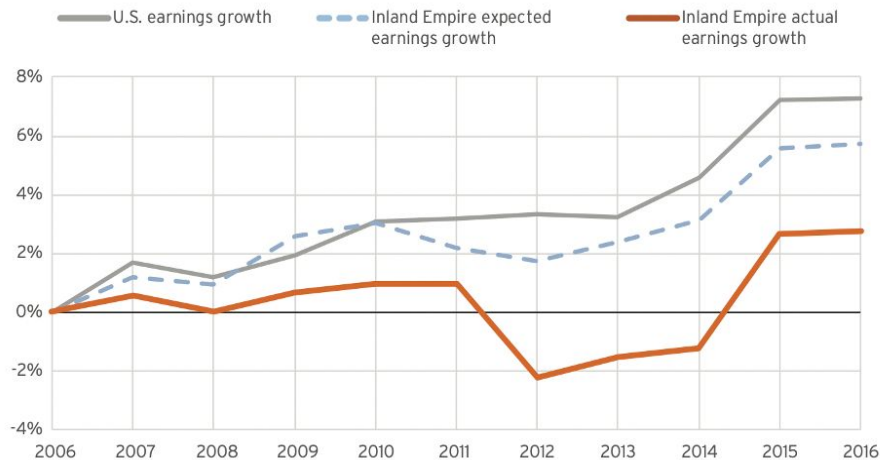
Inland Empire job growth compared to the nation's since 2006



Source: Authors' analysis of Economic Modeling Specialists, Inc. estimates

The Inland Empire's earnings growth has not kept pace with the nation

Inland Empire average annual earnings growth compared to the nation's since 2006



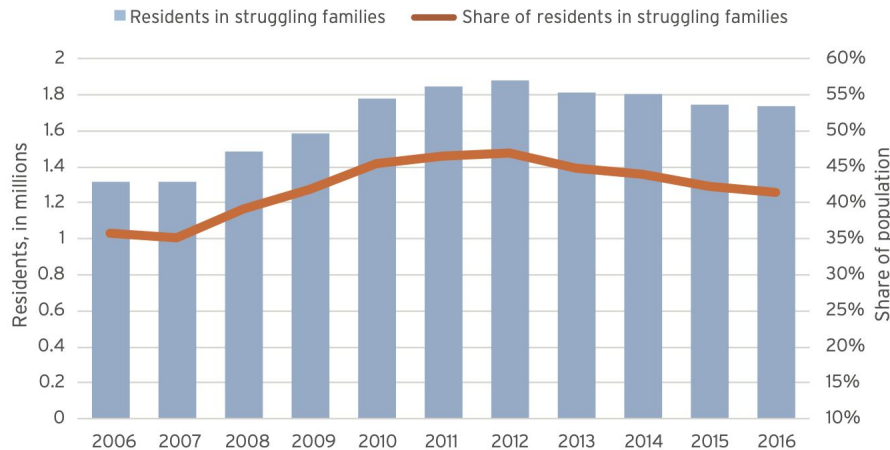
Source: Authors' analysis of Economic Modeling Specialists, Inc. estimates

Impacts

Economic Mobility: Hourly Wages to Housing Affordability Ratio

The share of Inland Empire residents that belong to families that struggle to make ends meet remains higher than in the years prior to the Great Recession

Residents that belong to families that struggle to make ends meet, 2016



Source: Authors' analysis of American Community Survey public-use microdata and the University of Washington Center for Women's Welfare County-Based Sufficiency Standard

Affordable Housing Needs Report (2022)

Riverside County:

- Average Monthly Rent: **\$1,971**
- Hourly Income Needed: **\$34.44**

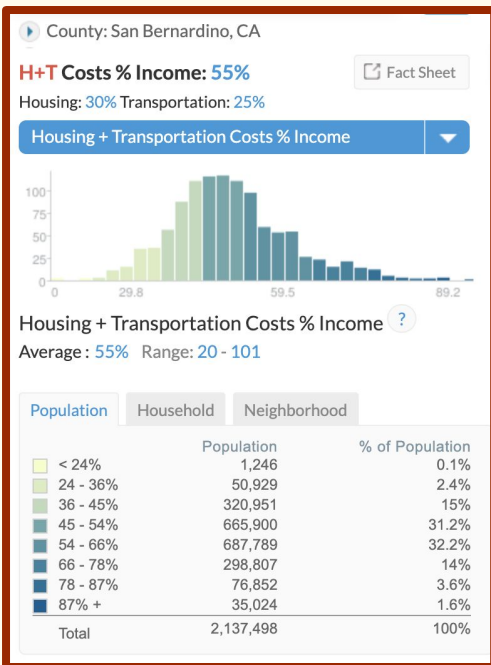
San Bernardino County:

- Average Monthly Rent: **\$1,813**
- Hourly Income Needed: **\$34.86**

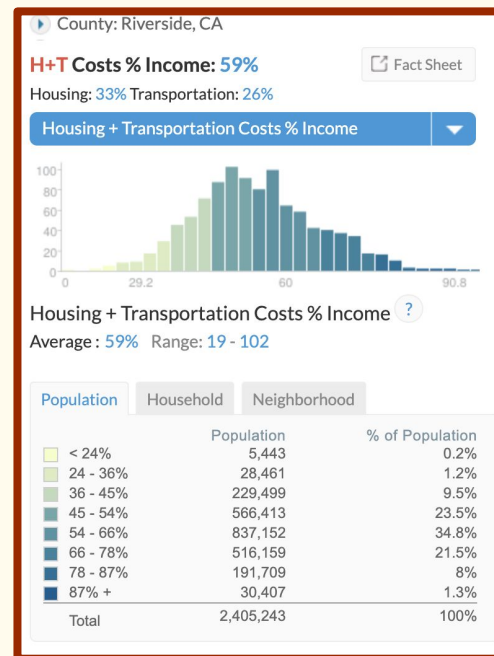
Overall: Income needed for both counties is approx. 2.3x state minimum wage.

Impacts

Economic Impacts: Cost Burden



Households often face tradeoffs between housing and transportation costs, one unintended consequence of focusing on housing costs alone is that many household are encourage to choose cheaper but more isolated housing in which lower housing costs are more than offset by higher transportation costs.



Map Source: <https://htaindex.cnt.org/>



Impacts

Economic Impacts: Cost Burden

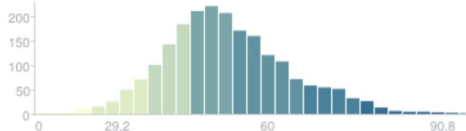
CBSA: Riverside-San Bernardino-Ontario, CA

H+T Costs % Income: 57%

Fact Sheet

Housing: 32% Transportation: 26%

Housing + Transportation Costs % Income



Housing + Transportation Costs % Income ?

Average: 57% Range: 19 - 102

Population

Household

Neighborhood

	Population	% of Population
< 24%	6,689	0.1%
24 - 36%	79,390	1.7%
36 - 45%	550,450	12.1%
45 - 54%	1,232,313	27.1%
54 - 66%	1,524,941	33.6%
66 - 78%	814,966	17.9%
78 - 87%	268,561	5.9%
87% +	65,431	1.4%
Total	4,542,741	100%

The disconnect between jobs, transportation, and affordable housing tends to result in longer commutes and a higher transportation cost burden - particularly in areas with no meaningful alternatives to driving.

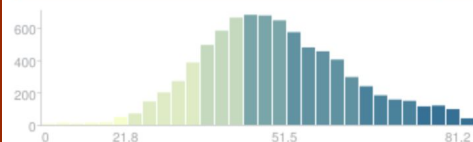
CBSA: Los Angeles-Long Beach-Anaheim, CA

H+T Costs % Income: 55%

Fact Sheet

Housing: 35% Transportation: 20%

Housing + Transportation Costs % Income



Housing + Transportation Costs % Income ?

Average: 55% Range: 11 - 93

Population

Household

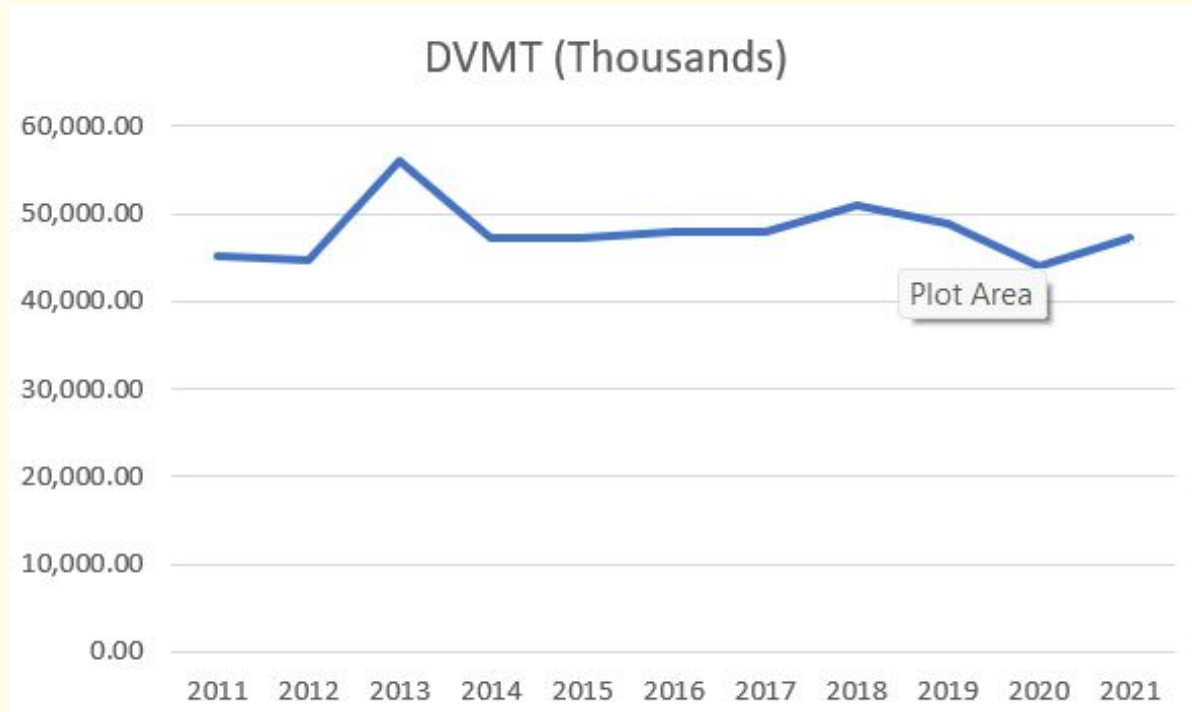
Neighborhood

	Population	% of Population
< 24%	48,055	0.4%
24 - 36%	792,001	6%
36 - 45%	2,410,441	18.2%
45 - 54%	3,812,737	28.8%
54 - 66%	3,602,738	27.3%
66 - 78%	1,699,299	12.9%
78 - 87%	641,863	4.9%
87% +	213,431	1.6%
Total	13,220,565	100%



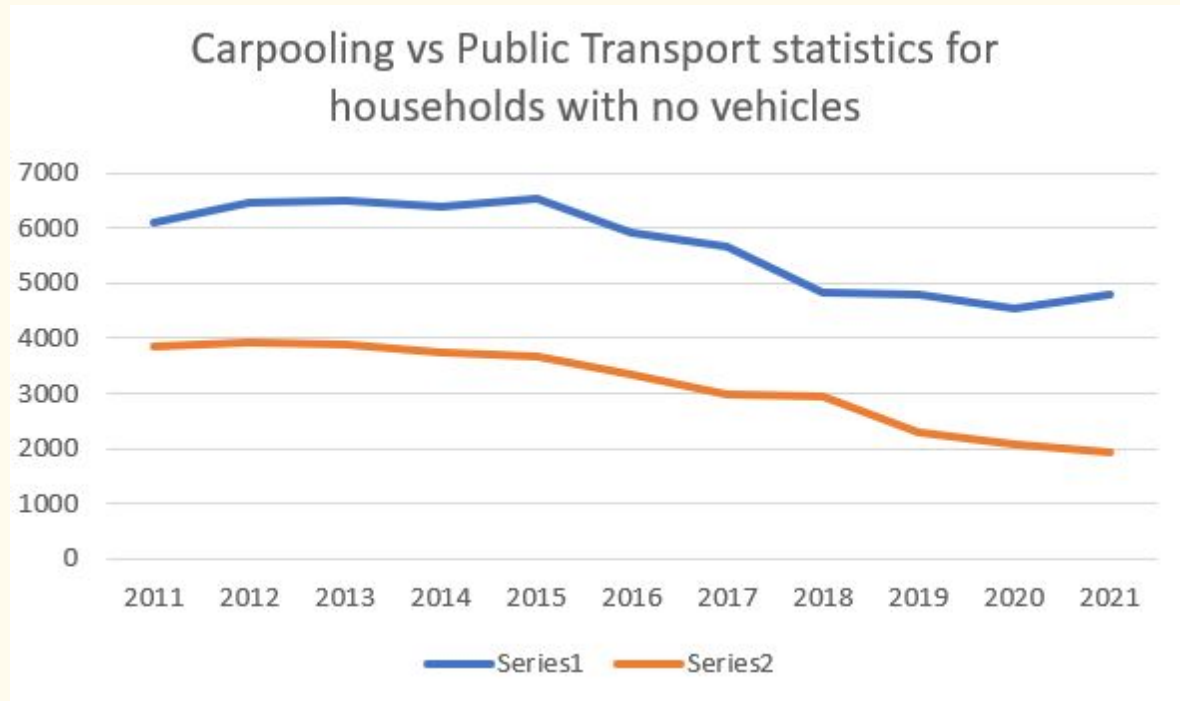
Impacts

Economic Mobility: VMT



Impacts

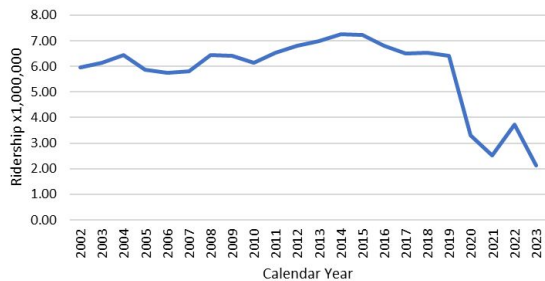
Social Mobility: Carpooling vs Public Transit



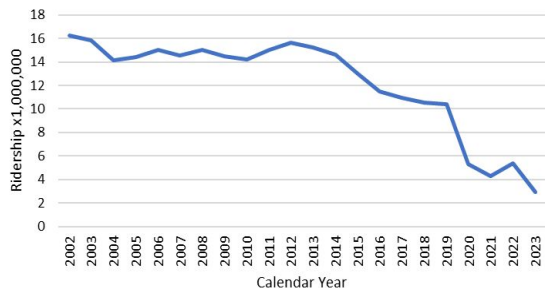
Impacts

Social Impacts: Public Transit (Bus)

LTC Dialogue Meeting: UPT for RCTC



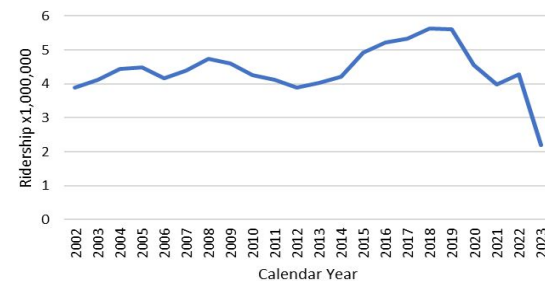
LTC Dialogue Meeting: UPT for Omni Trans



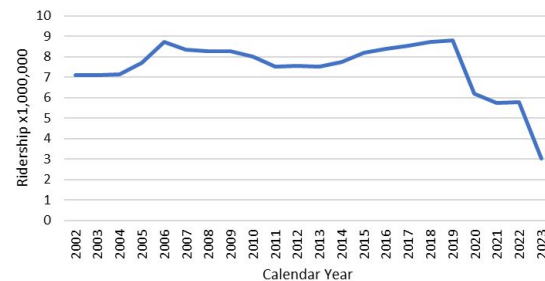
- Lowest boarding per capita*
- More Rides = Low Op. Cost
- MB - Motor Bus Data only DOT:
Fixed-route bus service, powered by a motor and fuel contained within a vehicle. Deviated fixed-route service is also reported as MB.



LTC Dialogue Meeting: VRM for RCTC



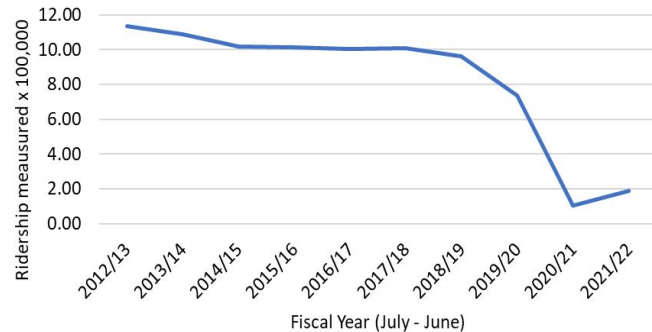
LTC Dialogue Meeting: VRM for Omni Trans



Impacts

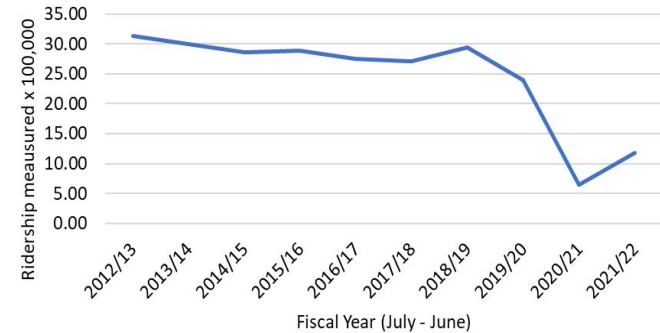
Social Impacts: Public Transit (Rail)

LTC Dialogue: Riverside Line Ridership Over Years



- CR - Commuter Rail as per DOT is: Rail on tracks that are (or used to be) shared with freight railways, Amtrak, or both. Long distances between stops, connecting to a central city. Diesel/ Electric.
- Note: Slow COVID Recovery
- Impact & possible reasons for this: spread of population to cheaper areas, increase in remote jobs, expansion of local market

LTC Dialogue: San Bernardino Line Ridership Over Years



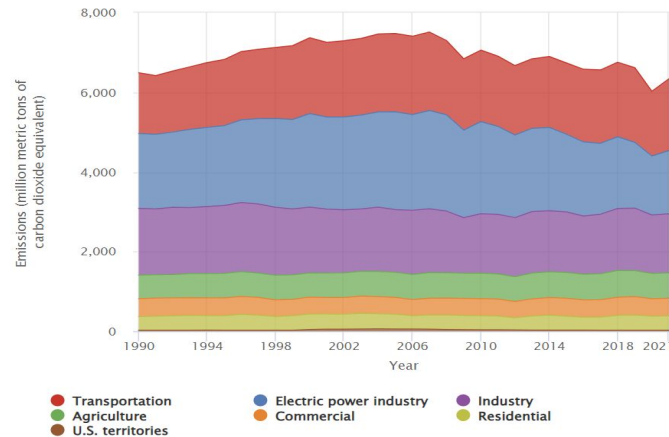
Impacts

Environmental Impacts: Air Quality

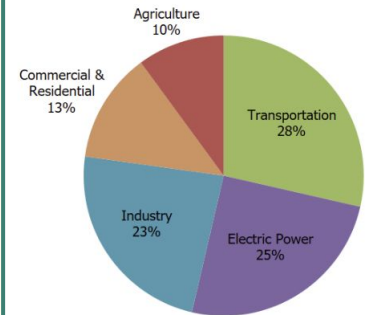
[EPA, U.S. Environmental Protection Agency – Smart Growth and Transportation](#)

Transportation investments have important consequences for the environment, including air and water quality, climate change, and open space preservation. Providing a range of transportation choices and the walkable neighborhoods that support them can help improve air quality and reduce greenhouse gas emissions.

U.S. Greenhouse Gas Emissions by Economic Sector, 1990–2021



Sources of U.S. Greenhouse Gas Emissions in 2021



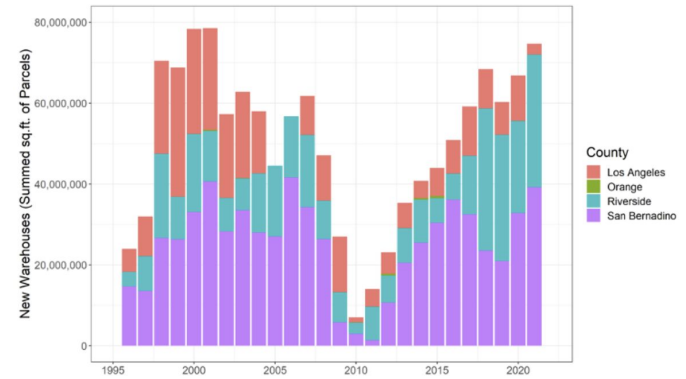
Impacts

Environmental Impacts: Air Quality (Inland Empire)

[CalMatters – California warehouse boom comes with health, environmental costs for Inland Empire residents](#)

INLAND EMPIRE

- There are now more than 4,000 warehouses in the IE. Nearly 40 square miles of the region's land today sit beneath the roof of a warehouse.
- According to Warehouse CITY, the Inland Empire's 4,000 warehouses generate:
 - Over 600,000 truck trips per day;
 - ~1,000 pounds of Diesel PM per day;
 - ~100,000 pounds of NOx per day;
 - Over 50,000,000 pounds of CO₂ per day.
- In just one year, from 2019 to 2020, the number of unhealthy air days in San Bernardino County jumped from 15% of the calendar to 20% of all days.



Comparing Warehouses by City

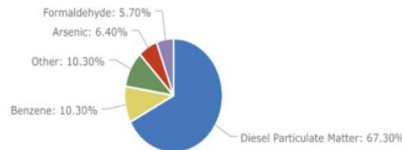
	Number	Acres	Daily Truck Trips	Daily PM lbs	Daily NOx lbs	Daily CO2 lbs
Ontario	664	5091	95000	100	1500	8000000
Riverside	254	1864	35000	50	5550	2980000
San Bernardino	227	1860	34000	45	5200	2900000
Rancho Cucamonga	273	1753	33300	40	5200	2800000
Los Angeles	952	3225	62000	85	9800	5300000
Fontana	325	2794	53000	70	8300	4480000
Moreno Valley	85	1622	31000	40	4800	260000

Impacts

Health Impacts of Pollution: Diesel Death Zones

67% of the residential cancer risk due to toxic air contaminants is caused by **diesel particulate matter** (2018 data)

Air Toxics Cancer Risk by Pollutant

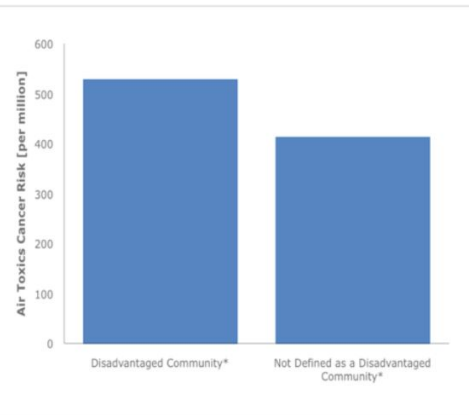


In 2010 337,445 of Inland Empire residents lived within $\frac{1}{4}$ mile of a warehouse; by 2022 this number grew by 30,000 to 367,584 individuals, roughly 60% of whom are Latino.

The AQMD reports higher risks from PMs for people who live within a half mile of warehousing facilities, where the asthma rate average is 56 per 10,000 individuals (64th percentile) and heart attack rates are 9.2 per 10,000 individuals (65th percentile). This is over ten percentile points higher than comparison areas.

State of Emergency Public Health Request, Letter to the Governor, 2023

Cancer risk due to toxic air contaminants is **28% higher** in disadvantaged communities (2018 data)



Impacts

Health Impacts of Pollution: Diesel Death Zones

Inland Populations suffered COVID-19 infection and mortality at higher rates, because people's immune systems were weakened due to chronic pollution exposure.

Proximity to freeways that act as logistics truck routes also create high exposure for local school air quality.

State of Emergency Public Health Request, Letter to the Governor, 202
Ober, Holly Poor Air Quality and warehouses linked to Inland Empire
COVID-19 inequities UC riverside professors call for intersectional approach
to COVID-19 exposure interventions
<https://insideucr.ucr.edu/stories/2021/06/02/poor-air-quality-and-warehouses-linked-inland-empire-covid-19-inequities>

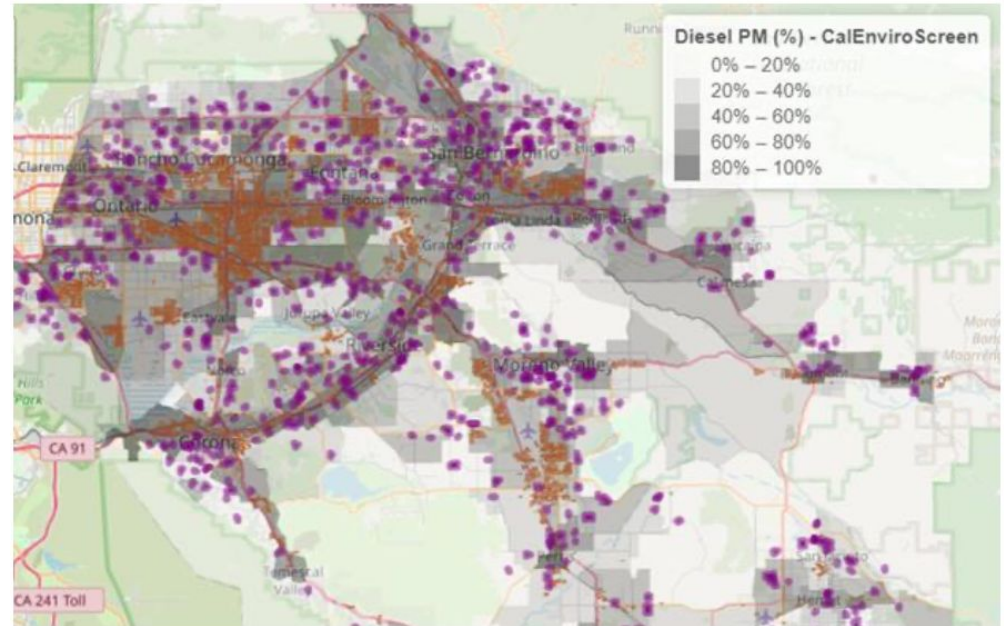


Figure 3. Western portion of SB and Riverside Counties demonstrating proximity of schools (purple) to warehouses (brown) and overlaid with CalEnviroScreen data on Diesel Particulate Matter exposure (gray gradient). Courtesy Radical Research, LLC and the Redford Conservancy, Pitzer College.

Current Initiatives/Programs

- SCAG Future Communities Initiative (Pilot Program)
 - **Example: City Of Ontario (Smart Ontario)**
- SCAG Smart Cities & Mobility Innovation (SCMI) Project
- Rancho Cucamonga (Cucamonga Station & the HART District)
- EPA Smart Growth Developments (ex. Albuquerque)
- Etc.



Conclusion
Thank you!

