

Resilient Fontana

Opportunities for Resilient Growth in Fontana, CA and the Greater Inland Empire

**Transportation Policy and Planning Studio
Department of City & Regional Planning
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Our Team

We are a team of eight graduate students studying transportation policy, planning, and engineering in the Department of City & Regional Planning at the University of California, Berkeley.

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We would like to acknowledge that none of the authors are from the City of Fontana or the Inland Empire, and it is through our connection to UC Berkeley that we were granted access to Fontana's city officials and staff members. None of the researchers currently or have previously lived in the City of Fontana, but through our research have come to care for the City, the people who live and work there, and the local environment.

Due to project constraints, we were also unable to collaborate with community-led organizations in Fontana or the region. We want to acknowledge that many ideas considered within our report are not new; local residents, advocates, and organizations have been calling for such changes across the region for many years with varying degrees of success. It is our hope that this report will provide valuable insights to local residents and city staff alike, and provide a foundation for future collaboration.

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Executive Summary

This semester, our team of eight graduate students studying transportation policy, engineering, and planning at UC Berkeley's Department of City & Regional Planning conducted a semester-long research project studying the externalities, both positive and negative, of the warehousing and transportation industry in Fontana, California. Our team completed an array of qualitative and quantitative analyses, including a site visit to Fontana, a deep literature and policy review, a local and regional economic analysis, and explorations into air pollution, truck electrification, and road safety. This report is a culmination of our work.

This is a critical moment to examine the warehousing and logistics industry in the Inland Empire. COVID-19 has accelerated consumer shifts towards e-commerce, leading to an ever greater reliance on the people and places that are foundational to goods movement. In recent months, we have also seen firsthand what happens when the supply chain is disrupted and the global ramifications this has for prices and the availability of basic consumer goods. Warehousing is the primary economic regional cluster based on the data; it's undeniable that they provide jobs but analyses indicate that most of these jobs, irrespective of employer, do not offer adequate pay, stability, or benefits to sustain individuals and their families. Projections suggest it's these low paying jobs that will continue to grow in the region. Despite these challenges, electric vehicle technology is rapidly advancing, creating opportunities to reduce some environmental impacts of goods movement.

The City of Fontana is increasingly at odds with community groups who are rightly concerned about future warehouse development and the impact of development on their health and the quality of life in Fontana. This has resulted in expensive and lengthy litigation and lost opportunities for the city to work with community groups in a proactive, collaborative, and committed way.

There is also an appetite for new regulation in Fontana and the City has proposed a new local ordinance - the Industrial Commerce Center Sustainability Standards Ordinance - to regulate the warehousing industry. Given that the ordinance has not yet been passed by council, the City is still in the window of opportunity to amend the proposed ordinance to

increase transparency in the development process and strengthen environmental and community protections.

We have organized our research into this executive summary and seven chapters listed below:

1. Introduction
2. Policy Overview & Analysis
3. State of the Economy
4. Labor & Coalition Building
5. Air Quality and Pollution Monitoring and Action
6. Modeling Sustainable Trucking Practices
7. Road Safety

As a major logistics center in the global supply chain, our team believes Fontana can lead the region and industry forward in a sustainable, equitable, and resilient way by advocating for higher sustainability standards, labor rights protections, and innovative technologies and regulations to reduce emissions from the transportation of goods.

From all of our work, it feels very clear to us that local residents care very deeply about the warehouses, the logistics industry, and everything they entail. It is unique, frankly, to have so many residents engaged and almost demanding participation in civic life. To respect and harness that energy, we believe that the city can create committed, ongoing proactive processes for these people to engage with, to share their ideas, and to work with elected officials and other stakeholders to negotiate solutions. Hence, in addition to the research we conducted to begin to understand the long history and complexities of the region, as well as the technical analyses detailed in each section, we lay out direct actions various stakeholders can take to leverage the community's assets.

Below is a table of our full list of recommendations, organized by section. For each recommendation we have assigned a priority value, ranging from the lowest (+) to the highest (+++). Although we believe that all the recommendations should be moved forward, some are more pressing or easier to implement and therefore warrant a higher priority. We have also identified the entities responsible for implementation of each recommendation. Most are directed at the City of Fontana, but many will require regional collaboration.

Recommendation		Priority	Implementing Entities
Chapter 2: Policy Analysis			
2.1	Remove the categorical CEQA exemption from Fontana's Industrial Commerce Center Sustainability Standards Ordinance	+++	City of Fontana
2.2	Further strengthen environmental standards in the Industrial Commerce Center Sustainability Standards Ordinance	+++	City of Fontana
2.3	Adopt a good neighbor policy	++	City of Fontana
2.4	Advocate for Federal clean truck legislation	+	City of Fontana
2.5	Support the Indirect Source Rule through current litigation process	++	City of Fontana
2.6	Implement a warehouse moratorium	+++	City of Fontana
Chapter 3: State of the Economy			
3.1a	Direct development impact fees and warehouse mitigation fees towards community benefits	+++	City of Fontana
3.1b	Require warehouse and distribution centers to sign community benefits agreements (CBAs) and project labor agreements (PLAs)	+++	City of Fontana
3.1c	Become a more hospitable environment to union formation	+++	City of Fontana
3.1d	Work together with neighboring municipalities in the Inland Empire on warehousing and logistics regulations	++	City of Fontana
3.2	Documentation of "Slush Fund" processes	+++	City of Fontana
3.3	Direct "Slush Fund" funds to programs to mitigate impacts of warehouse construction and operations	++	City of Fontana
3.4	Build collaborative relationships between educational institutions and employers	+	City of Fontana
3.5	Avoid excessive rezoning of land to industrial uses	+	City of Fontana
3.6	Enforce City rules and regulations on warehouses	+++	City of Fontana
3.7	Promote "just growth" in warehousing and transportation cluster	++	City of Fontana
3.8	Develop an Advanced Green Manufacturing Industry Cluster	+	City of Fontana

Recommendation		Priority	Implementing Entities
3.9a	Conduct research on sales and property tax policy reform	+	San Bernardino County, SCAG, State
3.9b	Work with regional partners to share sales tax revenue regionally	+	San Bernardino County, SCAG, State
3.9c	Work with regional and state partners to reform property tax policy, including alternative ways to allocate property tax revenue	+	State
Chapter 4: Labor & Coalition Building			
4.1	Work with regional partners to raise the local minimum wage.	+++	City of Fontana; San Bernardino County
4.2a	Work to increase Division of Occupational Safety and Health (Cal/OSHA) funding	+	City of Fontana; State
4.2b	Create local mechanisms to enforce state labor laws	++	City of Fontana
4.3	Develop proactive, ongoing, and committed engagement strategies	+++	City of Fontana
Chapter 5: Air Quality, Pollution Monitoring, and Action			
5.1	Invest in air pollution monitoring and sensors	+++	City of Fontana; Chamber of Commerce
5.2	Incorporate air pollution monitoring into community engagement initiatives, including in partnership with STEM education	++	City of Fontana; Fontana Unified School District
5.3	Require air pollution monitoring at logistics industry facilities	+++	City of Fontana
5.4	Apply for funding and additional support of air monitoring	+	City of Fontana; Chamber of Commerce
Chapter 6: Modeling Sustainable Trucking Practices			
6.1	Incentivize Heavy-Heavy truck fleet conversion	++	City of Fontana
6.2	Apply to federal and state funding sources for electrification	+	City of Fontana
6.3	Engage with community to identify an updated network of truck routes	+++	City of Fontana

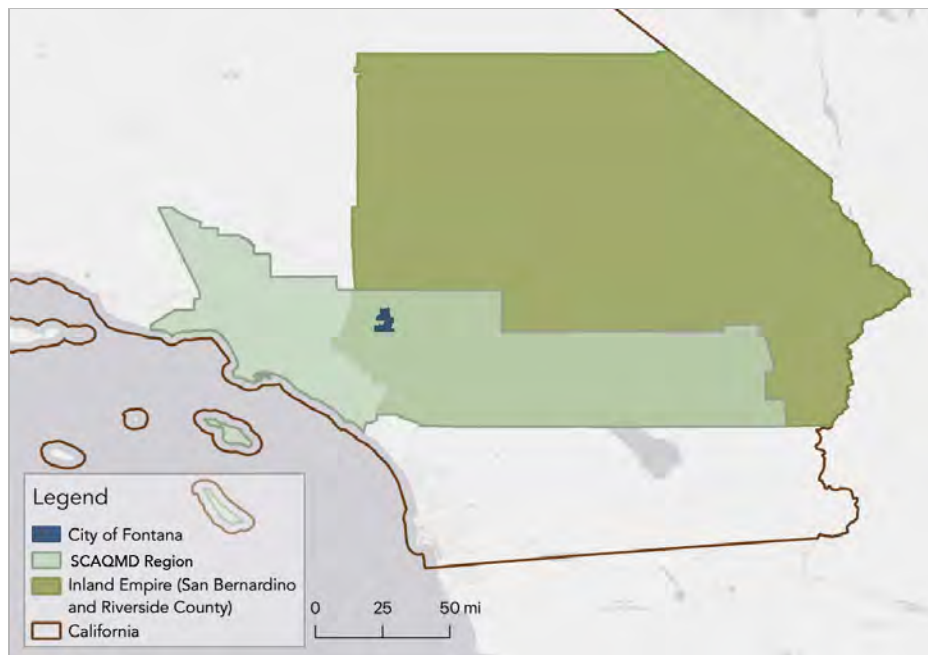
Recommendation		Priority	Implementing Entities
6.4	Focus on regional problems and solutions through a "Future Fleet Fontana" incubator	++	City of Fontana; Chamber of Commerce
6.5	Apply to federal and state funding sources for electrification	++	City of Fontana; Local Businesses
6.6	Invest in and promote alternative solutions, including congestion pricing and electrified short-haul rail	+	City of Fontana
Chapter 7: Road Safety			
7.01	The city should work with CalTrans to improve the safety of roads that are in CalTrans Right of Way	+++	City of Fontana, CalTrans
7.02	The City should instate a Traffic Safety Commission to monitor traffic safety and determine where traffic safety investment should be directed	+++	City of Fontana
7.03	Consider the collision history of the road network when designing the truck priority network	+++	City of Fontana
7.04	The City should actively maintain an open data portal database with documents and files to support their planning initiatives.	+++	City of Fontana
7.05	The City should collect ongoing community input in order to identify locations in the city where Fontana residents feel unsafe and where traffic safety investment should be directed	+++	City of Fontana
7.06	Improve the existing street network to calm traffic in particularly dangerous locations	+++	City of Fontana
7.07	Partner with religious and faith-based institutions to help fight homelessness	++	City of Fontana; Religious Institutions
7.08	Leverage the city's Safe Routes to School partnership to create safer streets and encourage more students to walk and bike to and from school	++	City of Fontana; Fontana Unified School District
7.09	Create a Local Roadway Safety Plan using state funding	++	City of Fontana; CalTrans
7.10	Stay up to date on the latest "best practices" of road safety (e.g., National Association of City Transportation Officials guides)	+	City of Fontana
7.11	Commit to Vision Zero goals and pledge to eliminate all serious and fatal injuries on the road via a systems approach	++	City of Fontana

Overview of Fontana & The Inland Empire

Defining the Inland Empire

While the Inland Empire may be defined differently when considering various social, economic, political, geological, or governance boundaries; for the purposes of this report, we refer to the 'Inland Empire' as San Bernardino and Riverside Counties (Figure 1.01), an area of approximately 27,000 square miles (Shearer, Shah, and Gootman 2019). Throughout the region's history, it has also been home to a multitude of interrelated indigenous communities whose land ownership overlapped geographically (Figure 1.02). The history section in the subsequent pages will provide more detailed insight into the land ownership changes which have occurred throughout the region's history.

Figure 1.01: Contextualizing Fontana within the Inland Empire and SCAQMD Region

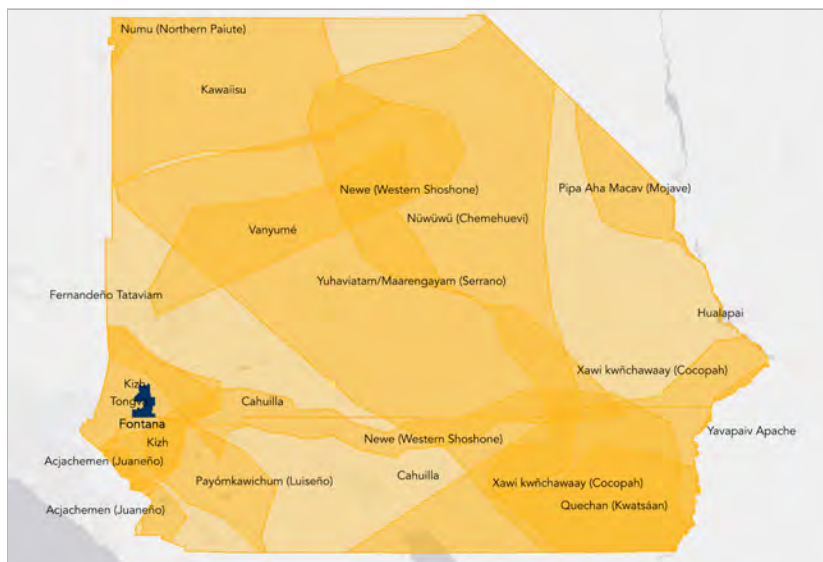


Source: Author generated utilizing data from California's Open Data Portal (<https://data.ca.gov/dataset/ca-geographic-boundaries>)

The City of Fontana, shown in blue in Figure 1.03 is home to approximately 215,000 people and is approximately 42 square miles. With its rapidly growing population, Fontana has become the second largest city in San Bernardino County and 19th largest city in the State of California (City of Fontana 2018). The City is also located approximately 65 miles from the

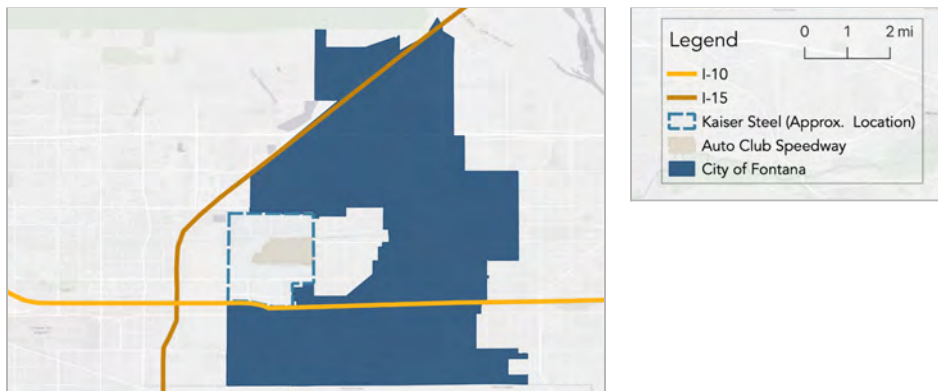
Ports of Long Beach and Los Angeles, making it an accessible industrial and warehousing center for goods traveling from across the Pacific and inland. As shown in Figure 1.03, the City of Fontana is uniquely positioned between Interstate 10 and Interstate 15, which provides the City with abundant automotive options and access. An area just west of Fontana's most populated downtown core is unincorporated (shown in grey in Figure 1.03). This unincorporated land, surrounded by the City of Fontana on three sides, used to be Kaiser Steel's headquarters, but it is now home to the Auto Club Speedway and residential uses. The demographics of both Fontana and the region will be discussed in more detail later in this chapter and throughout the report.

Figure 1.02: Map of Native Land Ownership Across the Inland Empire



Source: Author generated from Native Land Digital (<https://native-land.ca/>)

Figure 1.03: Overview Map of Key Landmarks & Highways in Fontana



Source: Author generated utilizing data from California's Open Data Portal (<https://data.ca.gov/dataset/ca-geographic-boundaries>)

Demographics

To better understand the impact of the warehousing industry on Fontana, CA, we start by delving into demographic data for the city and the surrounding region. Additionally, we include the surrounding county of San Bernardino, the unincorporated part of Fontana (Kaiser, CA¹), and the nearby city of Los Angeles as comparison geographies in our figures. Because of Kaiser's entwined history with Fontana as the historical location for the Kaiser Steel mill, with the mill being the original reason for the city's development, and since Kaiser is within Fontana's sphere of influence, it is important to understand the demographics within Kaiser too.

Figure 1.04: Demographics of Fontana, CA, Kaiser, CA, and San Bernardino County, CA

(a) Population and race/ethnicity data. Other than for '2+' (two or more races), all of the racial categories under 'Non-Hispanic' only include people who only selected a single race in the census form. Uncertainties not shown for San Bernardino County, CA because the US Census Bureau does not provide margins of error for these controlled estimates. Universe: total population.

	population	race and ethnicity (%)					
		Non-Hispanic					Hispanic
		White	Black	Asian	other	2+	
Fontana, CA	208 943 ± 92	13.8 ± 0.8	8.1 ± 0.7	6.1 ± 0.5	0.6 ± 0.2	2.1 ± 0.4	69.3 ± 1.2
Kaiser, CA	39 818 ± 1541	6.4 ± 1.2	4.1 ± 1.4	1.6 ± 0.7	0.6 ± 0.6	0.3 ± 0.2	87.1 ± 5.2
San Bernardino Co, CA	2 135 413	29.2	7.9	6.8	0.8	2.4	52.8
Los Angeles, CA	39 596 57 ± 108	28.5 ± 0.1	8.6 ± 0.1	11.5 ± 0.1	0.7 ± 0.0	2.2 ± 0.1	48.6 ± 0.1

(b) Median household income (universe: households), education attainment (universe: population above 25 years), and percentage of occupied housing that is owner-occupied (universe: occupied housing units). The median household income for Kaiser is calculated as the mean of the median household incomes for the five census tracts comprising Kaiser.

	household income	education attainment	housing
	median (\$)	bachelor's or above (%)	owner occupied (%)
Fontana, CA	70 800 ± 1800	17.1 ± 0.1	64.6 ± 1.8
Kaiser, CA	56 700 ± 5500	8.7 ± 1.4	61.1 ± 3.6
San Bernardino Co, CA	60 200 ± 600	20.3 ± 0.3	59.3 ± 0.5
Los Angeles, CA	58 400 ± 500	33.7 ± 0.2	36.8 ± 0.3

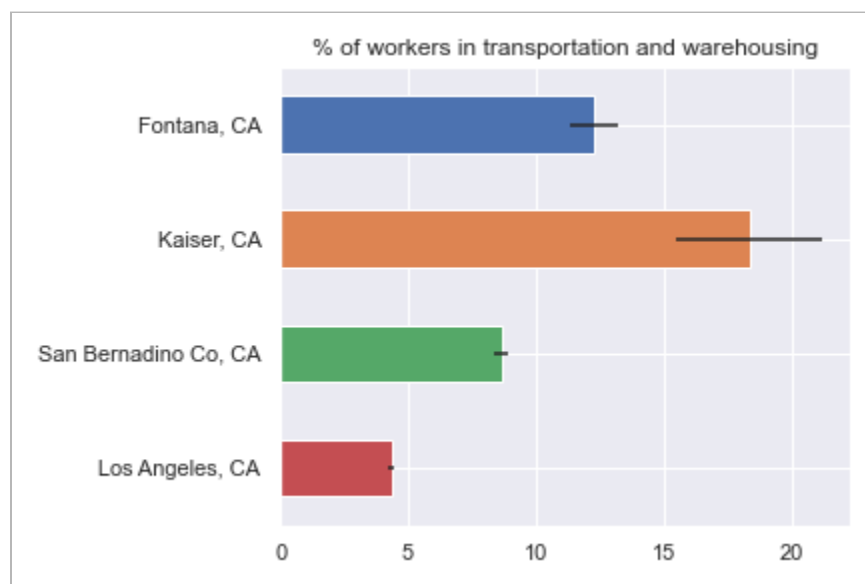
Uncertainties are margins of error at % confidence level. Source: ACS 2019 5-year estimates, tables B03002, B15003, and B25003.

The population of Fontana and Kaiser are approximately 210,000 and 40,000 respectively. Fontana and Kaiser, at 69.3% and 87.1% Hispanic respectively, are markedly more Hispanic than San Bernardino County (51.8% Hispanic) or Los Angeles (48.6% Hispanic). Fontana, Kaiser, San Bernardino, and Los Angeles' median household income are all within the range

¹ Kaiser is defined here as the five census tracts of 23.04, 24.01, 24.02, 25.01, and 25.02 within San Bernardino County, CA. Note though that there are minor overlaps between these census tracts and the incorporated city of Fontana, CA. The overlap happens even at the census block group level and is thus unavoidable for analyses using the US Census' publicly available American Community Survey (ACS) data.

of \$56,000-71,000. However, the percentage of people with Bachelor's degrees or above for Kaiser is only 8.7%, compared to 17.1% for Fontana, 20.3% for San Bernardino County, and 33.7% for Los Angeles. Approximately 60% of the housing units in Fontana, Kaiser, and San Bernardino County are owner occupied.

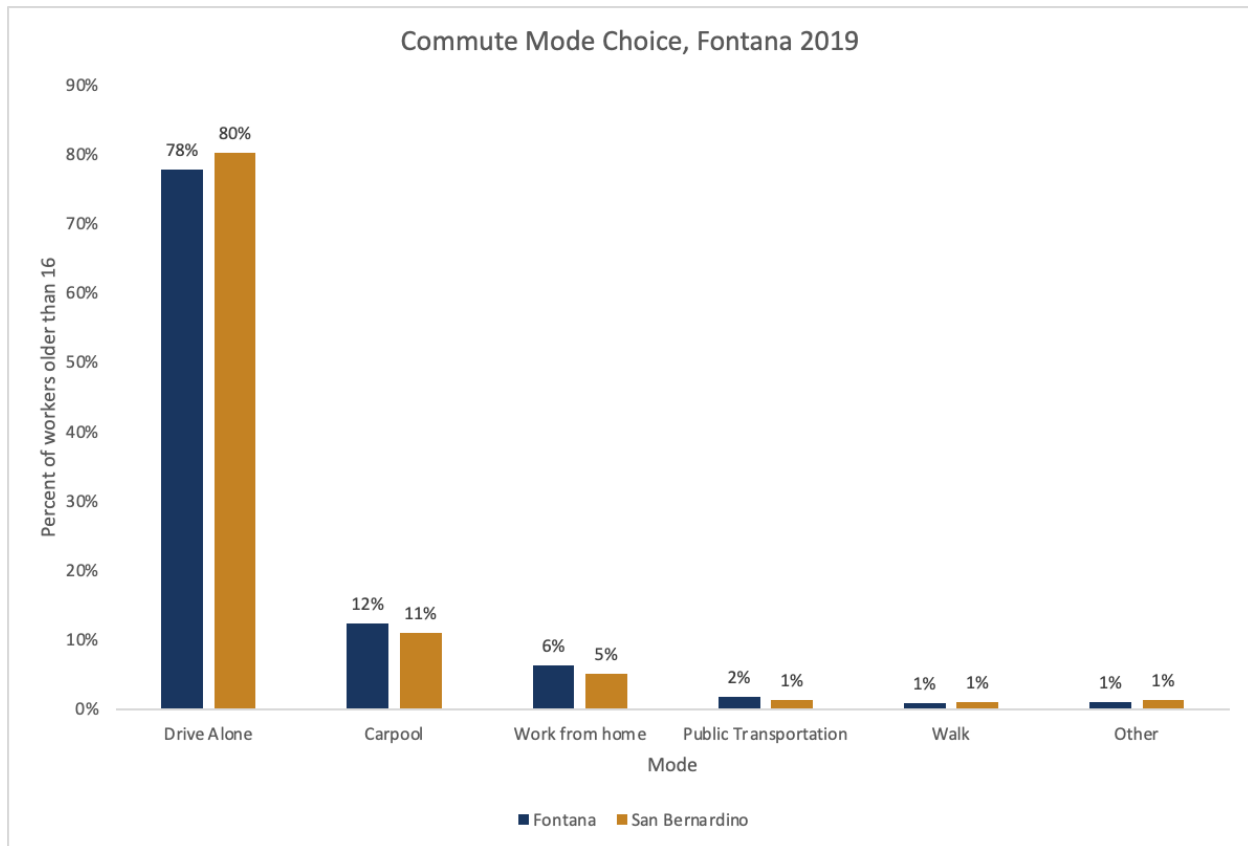
Figure 1.05: Percentage of workers who work in the transportation and warehousing industry for Fontana, CA, Kaiser, CA, San Bernardino County, CA, and Los Angeles, CA.



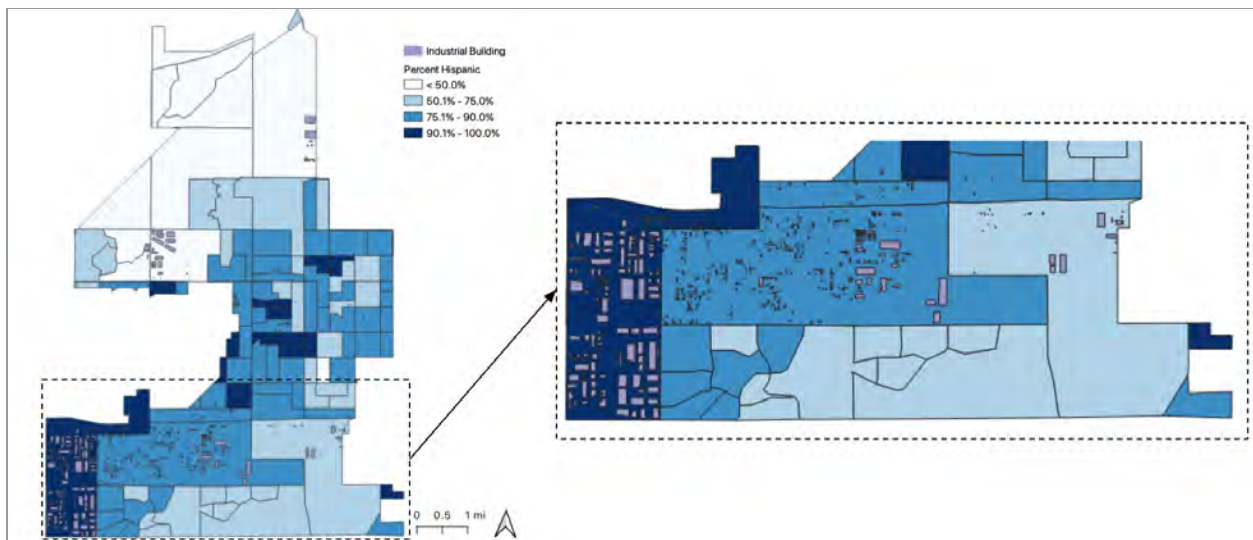
Universe: Civilian employed population 16 years and over. Uncertainties are margins of error at % confidence level. Source: ACS 5-year estimates, table C24030.

Figure 1.05 shows the importance of the transportation and warehousing industry to the Fontana area. 11.3% and 18.4% of the population in Fontana and Kaiser, respectively, work in the transportation and warehousing industry. Note the extremely high figure for Kaiser, where nearly 1 in 5 workers work in the transportation and warehousing industry. These are much higher percentages than that of the surrounding San Bernardino County (8.7%), which is in turn double that of the city of Los Angeles, CA (4.4%).

As seen in Figure 1.06, most residents in Fontana commute by car, with 78% driving alone and another 12% carpooling. Less than 5% of Fontana residents commute by public transportation or other active transportation modes like walking. These numbers are similar to that of San Bernardino County.

Figure 1.06: Commute Mode Choice in Fontana, 2019

Source: ACS 5-year estimates, table C24030.

Figure 1.07: Hispanic Households and Industrial Buildings in Fontana

Source: Author generated from ACS 2019 5-year estimates and using data downloaded from 2016 *Land Use Information for San Bernardino County, Microsoft/USBuildingFootprints* [2018] 2021

There is a higher concentration of Hispanic residents in central Fontana and the southwest portion of Fontana, where most of the warehouses are located.

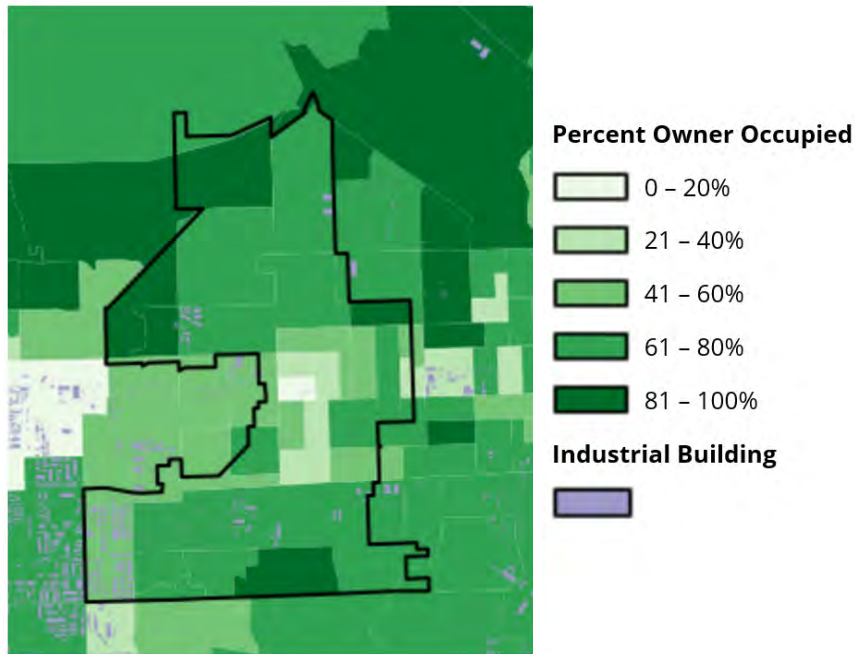
Figure 1.08: Median Household Income and Industrial Buildings in Fontana



Source: Author generated from ACS 2019 5-year estimates and using data downloaded from 2016 *Land Use Information for San Bernardino County*, Microsoft/USBuildingFootprints [2018] 2021

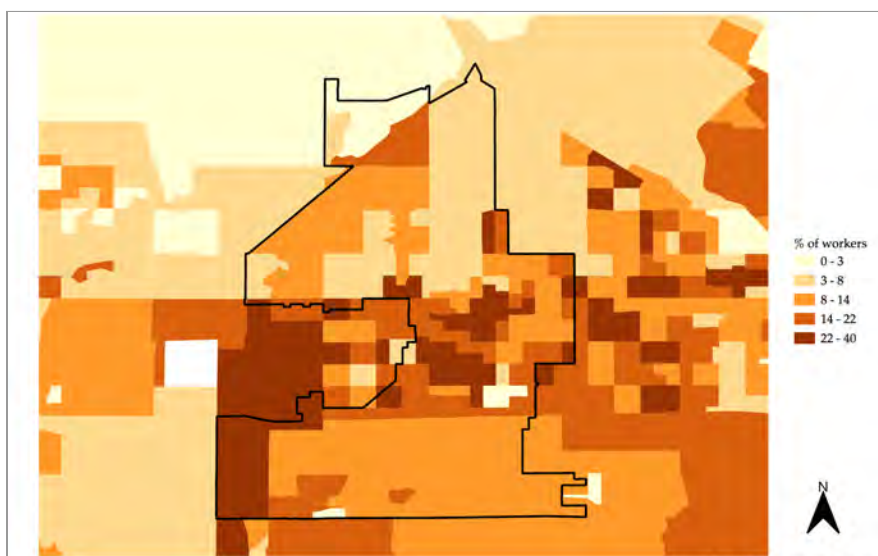
Household income in Fontana is the highest in the newer subdivision developments in the northern part of Fontana and in the south near Jurupa Hills. The area where most of the warehouses are located have a lower residential household income, and central Fontana has the lowest household income in the city.

A majority of Fontana's housing units in the areas north of downtown and in the southernmost subdivisions are owner occupied. Central Fontana has several census block groups with an extremely low rate of owner occupied housing (less than 10%), probably due to the existence of larger scale rental developments in these areas. Notably, the large census block group spanning most of south Fontana, which is where a lot of new warehouses are being built, has a lower homeownership rate than surrounding areas at 49%. While new warehouses may provide new or improved infrastructure including paved roads and sidewalks through the development process, property value increases from infrastructure improvements do not necessarily accrue to current Fontana residents, especially since industrial growth is concentrated in city neighborhoods with a high percentage of renters. These renters are likely to experience the disbenefits of industrial development, without experiencing any financial gain. The rise in property values may also drive up rents, displacing the current residents from Fontana.

Figure 1.09: Housing Tenure in Fontana

Source: Author generated from ACS 2019 5-year estimates and using data downloaded from *2016 Land Use Information for San Bernardino County, Microsoft/USBuildingFootprints [2018] 2021*

A higher percentage of workers work in the transportation and warehousing industries in south Fontana than north Fontana, with the highest concentrations of transportation and warehousing workers in central Fontana.

Figure 1.10: Percentage of Workers in the Transportation and Warehousing Industry in Fontana

Source: Author generated from ACS 2019 5-year estimates.

History of Fontana

1770s - 1850s: First Spanish Missions Arrive (Inland Empire)

While the Spanish Crown had claimed the Pacific Coast of North America in the mid-16th century, efforts to occupy Southern California were not made until the 1760s. Before the Spanish invasion in the late 1760s, Southern California was home to a linguistically and culturally diverse set of indigenous communities comprising over 43,000 people. While these native communities remained relatively independent and self-sustaining, “they were intimately interrelated with regard to the reproduction of social relations and cultural practices” (Patterson 2015). These native communities used an array of resource management practices to sustain their lifestyles, and as a result, the landscape of the Inland Empire was highly manicured by the time the Spanish missionaries arrived. Although the Inland Empire is defined today by San Bernardino and Riverside Counties, the lands belong to a set of unique indigenous communities including the nations of the Payómkawichum, Cahuilla, Tongva, and Kizh people. Today, the City of Fontana sits on the native land of the Tongva and Kizh people (Native Land Digital 2021). The Spanish invasion which occurred at the end of the 1760s was characterized by resource depletion, the introduction of invasive species, and religious conversion both in Fontana and across the region. The process of conversion and the forced movement of native communities to the missions severely disrupted and harmed native communities’ social relationships, health, and production relations as land ownership changed (Patterson 2015).

1850s - 1906: Fontana Develops as a Rural Pioneer Community; the San Pedro Bay ports complex grows

It was not until the arrival of the first Mormon settlers to San Bernardino County in the 1850s that the region began to develop as an agricultural center. Shortly thereafter, a series of irrigation canals sparked a real estate boom in the Inland Empire. By the 1890s, there were three railroad companies -- the Southern Pacific, the Union Pacific, and the Atchison, Topeka, and Sante Fe -- which connected communities across Southern California to the Inland Empire (Patterson 2015).

Rail was not the only path-altering investment of the era. Looking to expand America’s ‘gateway’ to countries across the Pacific, local government officials, the Army Corps of Engineers, and entrepreneurs laid the groundwork for Southern California’s logistics industry by expanding local ports. The San Pedro Bay ports of Los Angeles and Long Beach,

like most of the area coastline, were too shallow. With the construction of the largest-to-date hydraulic dredging ship in 1903, officials deepened the bay. This massive investment -- \$100,000 alone for the ship -- spurred further capital investment in dredging from localities and private entities up and down the coast as well as land speculation on future port infrastructure (Tejani 2014).

1906 - 1942: Fontana Becomes a Center for Agriculture

In 1906 A.B. Miller, a major early developer in the region, bought 28 square miles of land in San Bernardino County and constructed a vast irrigation system. This irrigation system bought water from Mount Baldy to support what would become a combination of industrialized plantations called Fontana Farms and small self-starter farms for prospective 'Fontanan' residents. These model small farms were sold to individuals (as little as 1.5 acres for a starter farm), and gradually, purchasers would move from farming on the weekends to building live-in quarters. Through this venture, the region became home to many citrus trees, walnut trees, and grapevines (Davis 2006). While the trees matured, A.B. Miller encouraged residents to participate in poultry and pork production. As Mike Davis writes in *City of Quartz*, "This famous 'Partnership of Hens and Oranges' was intended to stabilize the small tree rancher through the vagaries of frost and cashflow, while simultaneously guaranteeing the Fontana Company its installment payments. Ideally, it was supposed to allow the retired couple with a modest pension, the young family with rustic inclinations, or the hardworking immigrant the means to achieve a citrus-belt lifestyle formerly accessible only to the well-to-do" (Davis 2006). By 1930, the Fontana Company had subdivided over 3,000 starter farms, half of them being occupied full-time. This approach to development and agricultural production was successful even through the Great Depression as the region continued to develop as a major poultry and citrus center (Davis 2006).

1942 - 1983: Kaiser Steel Mill Brings Steel Manufacturing; Containerization comes to the San Pedro Bay Ports Complex

During World War II, Fontana transitioned from an agricultural center to become a center for wartime manufacturing. Henry Kaiser, who had before run a shipyard out of Oakland, relocated Kaiser Steel to Fontana in 1942 due to the presence of affordable power, abundant rail connections, and "weak claims of local government" in the unincorporated land adjacent to Fontana (Davis 2006). With a \$250 million loan from the Reconstruction Finance Corporation (RFC), the steel mill went into production quickly to meet wartime demand. Kaiser promised the steel mill would not disrupt the region's agricultural industry and would bring a surplus of taxes, however neither of these promises were met. Within

the first year of production, farmers were noticing that the high sulfur content from the coal had detrimental effects on the wellbeing of the region's citrus as well as air quality. However, without significant taxation and with unionized workers trained to construct ships in just a number of days, Kaiser steel was producing ships faster than was previously thought possible just two years later in 1944 (Davis 2006).

As the war came to an end, Kaiser began to develop business ventures in non-wartime markets, as he predicted that personal savings and productivity advances achieved through the war would spur mass consumerism. With experience building workforce housing for his steel and shipyard workers, Kaiser began creating prefabricated homes to meet post-war housing demands. The changing of presidential administrations after the war in 1946 also highlighted the precarity of Kaiser Steel due their inability to refinance the RFC loan; however, the Korean War shortly thereafter caused an increased demand for steel and shipbuilding. Kaiser Steel soon went public, diversifying its market with the newfound access to capital. At the same time, high demand for workers quickly created housing shortages, leading early Fontana farmers to feel pressure from prospective housing developers (Davis 2006). This pressure caused the first housing boom in the region.

By the late 1970s, with steel prices collapsing, Kaiser Steel was suffering. Additionally, with this steel production, "Fontana had emerged as the literal epicenter of air pollution in Southern California, and Kaiser Steel's huge plume of acrid smoke became indissolubly linked in the public mind with the smog crisis in the Inland Empire" (Davis 2006). As a result, Kaiser Steel was forced to sign a consent decree with the Southern California Air Pollution Control Board, requiring them to spend \$127 million to reduce pollution. This mandate is partially to blame for the collapse of the steel mill which laid off more than 4,500 workers in the early 1980s (Bernick 2018).

Kaiser Steel was just one of many manufacturing operations in Southern California during and after World War II. With the growth of manufacturing came increased corporate need for shipping. Wartime innovations (and leftover war ships) pushed companies to create the modern shipping container, dramatically increasing the efficiency of goods movement. The first container ship, owned by Matson, sailed through west coast ports in 1958 (Levinson 2016).

Containers were a vast departure from the 'breakbulk' work that historically happened at ports, where skilled longshoremen expertly unpacked goods from ship-hulls so as not to capsize the ship, then repacked them to go elsewhere. The use of containers required less

sorting at the ports under the purview of the International Longshore and Warehouse Union (ILWU) (De Lara 2018).

Shipping containers also changed how labor interacted with shipping. Particularly in the Ports of Los Angeles and Long Beach, before the advent of containers, the ILWU strictly enforced hard-fought union rules about how many members were needed for specific tasks; though some protections were superfluous, they protected jobs. Containers prompted a renegotiation of labor protections, resulting in the Mechanization and Modernization Agreement. Shipping companies agreed to pay \$5 million per year into a fund for wages and retirement benefits in exchange for ending many of the staff-minimums and goods weight maximums, for the length of the contract. Notably, Long Beach and Los Angeles locals did not vote to approve the Mechanization and Modernization Agreement, but it passed without their support (Levinson 2016).

Even though the use of containers remained very low into the 1960s -- containers made up 2% of cargo in west coast ports by 1962 -- preparation for containers remained a priority for the San Pedro Bay ports complex as Pacific ports vied for corporate attention. Voters in Los Angeles approved financing millions in port improvements in the late 1950s and early 1960s, and Long Beach unintentionally lowered their port floor by pumping oil deposits from under it, thereby making it more competitive. Container and port development was timed perfectly for the massive flood of people and materials needed to be shipped to continue the Vietnam War; Southern California was the manufacturing hub of the west, and business at its ports reflected that (Levinson 2016).

As container use grew, so did its land use footprint. Shipping companies prized land adjacent to the ports for container storage, pushing historic warehouses inland onto agricultural areas along Southern California highways (Patterson 2015).

1983 - 2009: Fontana Becomes a Bedroom Community for Los Angeles

As the fortunes of Kaiser Steel waned in the 1970s and 1980s, landowners and city officials transitioned the region into a bedroom community for Los Angeles. Policies to waive city fees, enable tax rebates, and implement tax exempt bonds made Fontana an extremely attractive place for developers to build homes. For example, the developers of the Village of South-ridge -- the city's first greenfield master planned development -- convinced city leaders that they could recreate a famous Irvine master planned community in Fontana if they waived many of the infrastructure costs developers typically are responsible for. Due to development-friendly decisions like this, the population of Fontana grew from

approximately 35,000 to 70,000 in the seven years between 1980 and 1987. During this time, the Fontana Redevelopment Agency also began uprooting the remaining agricultural land south of I-10 to develop the Southwest Industrial Park, an area of the city that is home to many manufacturing and warehousing facilities today. Fontana, which sits at the intersection between I-10 and I-15, was strategically positioned to house commuters working in Los Angeles as well as goods traveling inland to the rest of the country from the Ports of Los Angeles and Long Beach (Davis 2006).

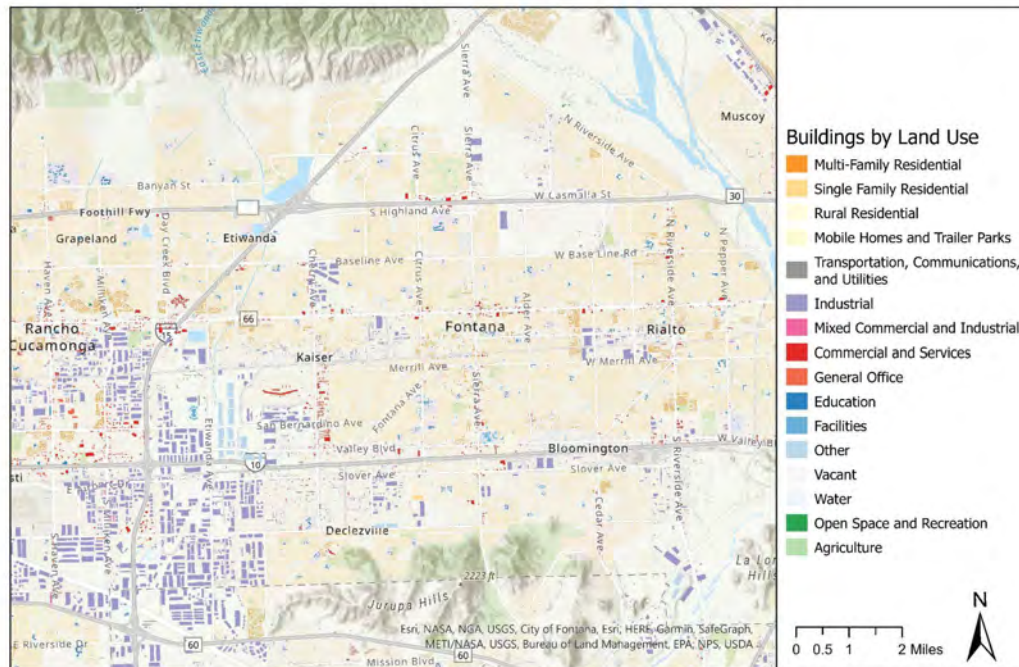
Post Great Recession: Fontana Today - Logistics and Manufacturing Services

Although Fontana remains a bedroom community, warehousing and logistics have developed a strong foothold in Fontana and drive a significant portion of local economic activity and city tax revenues. As the volume of goods at the Ports of LA and Long Beach increased, and as the Inland Empire searched for jobs to replace those that had been lost with the Kaiser Steel Mill closure and the North American decline in manufacturing, the region was increasingly seen as a place that could accommodate imported goods and minimize the impact of goods movement on urban populations; SCAG planners determined that the Inland Empire was capable of providing 50 percent of the space required to accommodate future import growth (De Lara 2018). Ultimately this fueled massive speculation in industrial land, which along with new real estate investment products and the standardization of logistics practices, led to the meteoric growth of warehousing in the Inland Empire (De Lara 2018).

Today, most of Fontana's remaining vacant land has been approved for development, and is expected to be developed by 2025 (Fontana General Plan, 2018). As seen in Figure 1.11, much of Fontana has been developed into single-family residences. Commercial and service activity within the city is centered around main streets like Sierra Ave, Foothill Blvd, Cherry Ave, and SR-210. Industrial development expands past the City's southwestern border into the neighboring cities of Ontario and Rancho Cucamonga.

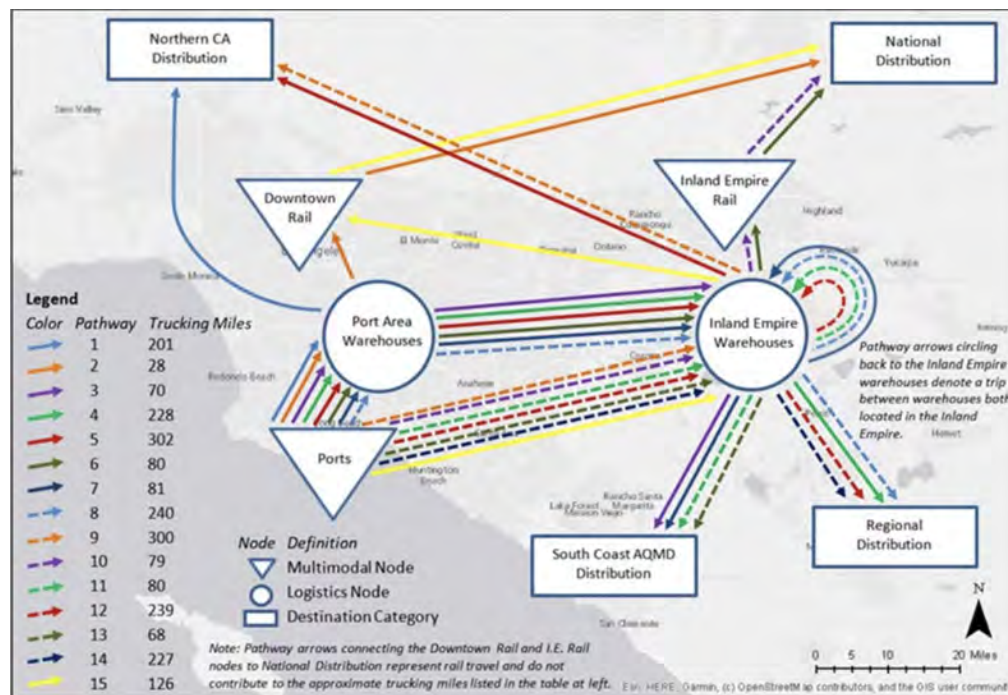
The Inland Empire is an important node in the goods movement network (Figure 1.12) and warehouses there are primarily focused on sorting goods and fulfilling orders before they are sent out for regional distribution (Harris 2018).

Figure 1.11: Buildings by land use in Fontana and surrounding area



Source: Author generated using data downloaded from 2016 *Land Use Information for San Bernardino County*, 2016 *Land Use Information for Riverside County*, Microsoft/USBuildingFootprints [2018] 2021

Figure 1.12: Goods Flows in the Inland Empire and Surrounding Regions

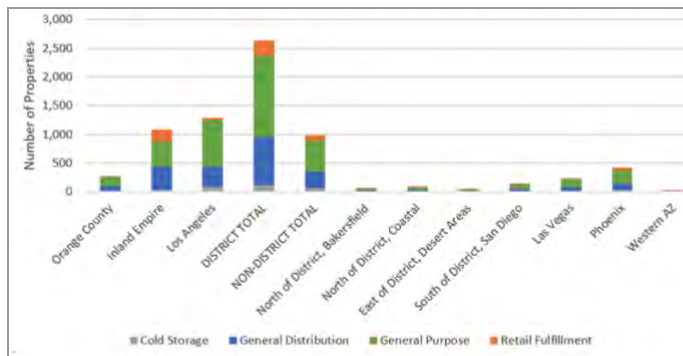


Source: Industrial Economics, Incorporated and CALSTART 2020.

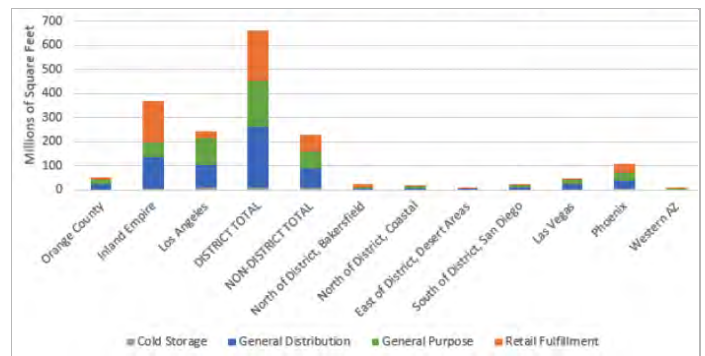
The Inland Empire has more warehouse square feet than Los Angeles and Orange County combined (Figure 1.13). The Inland Empire also has more warehousing square feet than regions outside of Southern California including Las Vegas, Phoenix, and Western Arizona.

Figure 1.13: Number of Warehouse Properties and Warehouse Square Footage

Warehouse Properties



Warehouse Square Feet



Source: Industrial Economics, Incorporated and CALSTART 2020.

“District” refers to the entire SCAQMD district

Figure 1.14: Monthly rent and sale prices across markets for warehouses with building area of at least 100,000 square feet (2019)

MARKET	AVERAGE RENTAL PRICE PER SQUARE FOOT	AVERAGE SALE PRICE PER SQUARE FOOT
South Coast AQMD Total	\$0.88	\$1,087
Orange County	\$0.92	\$503
Inland Empire	\$0.70	\$1,164
Los Angeles	\$0.93	\$1,173
Non-District Average	\$0.58	\$344
North of District, Coastal	\$0.78	\$100
North of District, Bakersfield^	\$0.34	\$105
East of District, Desert Areas^^	\$0.81	\$27
South of District, San Diego	\$0.92	\$225
Las Vegas	\$0.63	\$574
Phoenix	\$0.50	\$307
Western AZ^^	\$0.32	No Data
Grand Average	\$0.71	\$815

*Denotes fewer than five properties with available sales data.

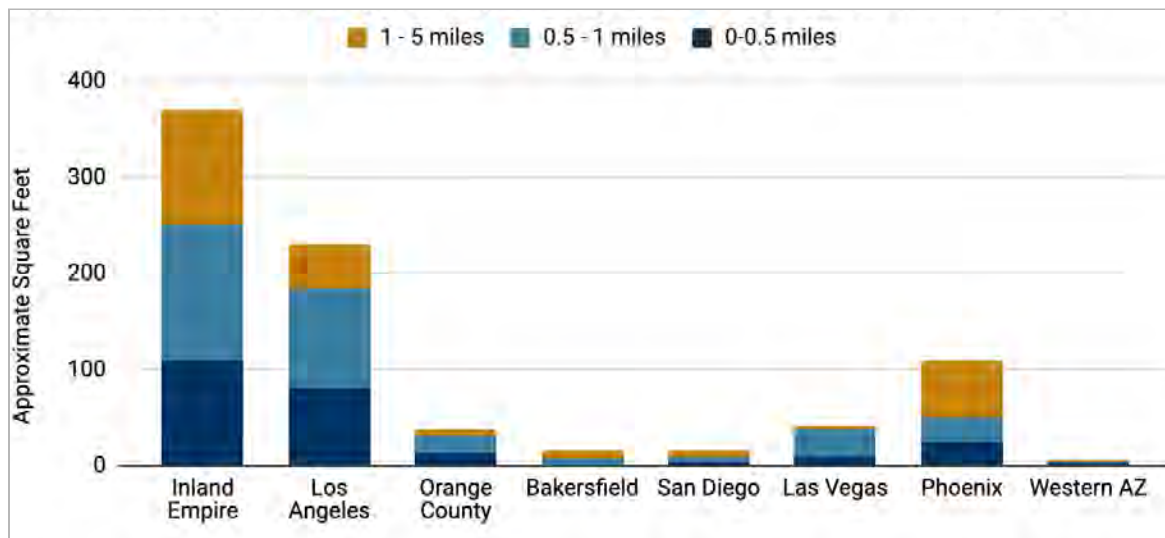
^Denotes fewer than five properties with available rent data.

Source: Industrial Economics, Incorporated and CALSTART 2020.

Of regions in the South Coast Air Quality Management District, monthly rents for warehousing space are lower in the Inland Empire than in Orange County and Los Angeles. However, warehouse rents in the Inland Empire are higher than those in Bakersfield, Las Vegas, Phoenix, and Western Arizona (Figure 1.14). While this may appear to put the Inland Empire at a competitive disadvantage, it is important to recognize that locational advantages of Fontana, including proximity to the Ports of Los Angeles and Long beach, the Ontario airport, and regional highway networks, keep transportation costs low. These low transportation costs offset higher land rents in the Inland Empire.

The Inland Empire thus sits at the heart of the transportation network in Southern California, and is located farther from the coast leading to low land costs, which is important as warehousing is a land-intensive industry. Compared to many of its competitors, the Inland Empire is the most accessible warehouse region by distance to major roads (Figure 1.15). Hence the Inland Empire dominates the wider region in the warehousing and logistics industry. See “Rootedness of the warehousing and logistics industry in the Inland Empire” in Section 3 for more details on the difficulty for the warehousing and logistics industry to relocate away from the Inland Empire.

Figure 1.15: Approximate Square Footage of Properties by Distance from Major Roads



Source: Industrial Economics, Incorporated and CALSTART 2020.

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Policy Overview & Analysis

Warehousing is a complex industry with nuanced impacts to the environment, workers, residents, transportation networks, and local and regional economies. As a result, there is no single regulatory body that oversees the warehousing and logistics industry; rather, a patchwork of regulations from different local, regional, state, and federal agencies govern warehousing and logistics operations. This section details the agencies and regulations that are most relevant to the warehousing industry in Fontana and this study's scope. Regulations detailed relate to air quality, truck electrification, and worker protections.

State

The California Environmental Quality Act (1970)

The California Environmental Quality Act (CEQA) is a California statute, passed in 1970, that requires state and local government agencies to disclose the potential environmental impact of proposed projects, identify ways to avoid or mitigate environmental damage, document the public reasons for agency approval of projects with significant environmental effects, and enhance public participation in the planning process (Fontana Sierra Business Center Project Draft EIR). While CEQA can be effective at identifying environmental impacts and mitigation strategies, projects found to have a significant and unavoidable impact on the environment can still receive approval provided that they provide for mitigation measures. Despite environmental challenges, the act establishes a process for community involvement which can be critical in jurisdictions that have few established ties between residents and the government or have limited public participation in planning processes.

In March 2021, the California Department of Justice issued a guide for CEQA compliance for proposed warehouse projects (Becerra 2021). The document details best practices to help agencies comply with CEQA requirements while promoting “environmentally just” warehouse development. The document includes recommendations around proactive planning, community engagement, warehouse siting and design considerations, air quality and greenhouse gas emissions analysis and mitigation, noise impacts analysis and mitigation, traffic impacts analysis and mitigation, and strategies to offset other significant environmental impacts. Best practices from this document that Fontana has the opportunity to implement include:

- Adopt a good neighbor policy that sets a universal standard that all warehouses in the local jurisdiction must abide by
- Create a community advisory board of local residents to review and provide feedback on project proposals while they are in the preliminary planning stage
- Site warehouse facilities so that their property lines are at least 1,000 feet from sensitive receptors¹
- Forbidding trucks from idling for more than two minutes and requiring operators to turn off engines when not in use
- When analyzing cumulative impacts, consider the project's incremental impact in combination with past, present, and reasonably foreseeable future projects, even if the project's individual impact alone does not exceed the applicable significance thresholds
- Refrain from labeling compliance with CARB or air district regulations as a mitigation measure
- Limiting construction on days with an Air Quality Index forecast of greater than 100 for Particulate Matter or Ozone in the project area
- Adopting a lower significance threshold for incremental noise increases when baseline noise already exceeds total noise significance thresholds

Based on a review of existing environmental impact reports and project documents, Fontana could adopt several Department of Justice recommendations especially around community engagement. Projects that do not conform to these standards are more likely to have negative impacts on Fontana residents that could have been avoided or mitigated as well as face delays and legal challenges in the approval process.

Heavy-Duty Low NO_x Omnibus Regulation (CARB, 2021)

Heavy duty vehicles are responsible for 31% of NO_x emissions in California and a quarter of particulate matter emissions (California Air Resources Board, n.d.). NO_x contributes to ozone formation which can cause respiratory problems that may lead to premature death. Of note, the consulting firm Ramboll found that between 2004 and 2019, ozone concentrations in Fontana exceeded the federal standard between 47 and 85 days of the year (Lakshmi Jayaram, Hower, and Lester 2021).

Emerging regulations related to NO_x emissions and Ozone Concentration will be critical for Fontana to consider in future planning and development. In 2013 California established optional NO_x standards to encourage the production of heavy duty vehicles with technology

¹ As defined by CARB, sensitive receptors are subsets of the population (e.g. children, elderly, chronically ill) which may be more vulnerable to negative health outcomes when exposed to air pollution.

that could help reduce NO_x emissions below existing mandatory standards for model year 2010 or later heavy-duty engines (California Air Resources Board, n.d.). While the initial rule was optional, in 2020, the California Air Resources Board passed the Heavy-Duty Low NO_x Omnibus regulation that will require heavy-duty vehicle manufacturers to incorporate engine technology for vehicles sold in California to reduce NO_x emissions by 90 percent. The Air Resources Board analysis suggests that NO_x reductions from the regulation will be equivalent to taking 16 million light-duty cars off the road, resulting in 3,900 avoided premature deaths and 3,150 avoided hospitalizations, with statewide health benefits of \$36.8 billion (California Air Resources Board).

While the regulation is expected to enable the South Coast Air Basin to meet federal ozone standards by 2021, there is also a need for federal action as heavy duty vehicles purchased outside of California are not subject to this regulation but travel through the region. Fontana could play a role in advocating for a similar federal rule, to ensure that all heavy-duty trucks traveling through the region are subject to California standards. This would bring health and environmental benefits to the city and ensure that Fontana's warehousing industry does not operate at a competitive disadvantage due to more stringent state regulations by having all states at a similar baseline.

Advanced Clean Trucks Regulation (CARB, 2021)

The Advanced Clean Trucks rule is designed to help California move towards an electrified, zero-emission truck fleet. Under the rule, manufacturers who produce Class 2b to Class 8 chassis or complete vehicles with internal combustion engines will be required to sell zero-emission trucks as an increasing percentage of their annual California sales between 2024 and 2035. By 2035, manufacturers will be required to hit the following sales quotas for zero emission vehicles (California Air Resources Board n.d.):

- 55% of Class 2b-3 trucks
- 75% of Class 4 -8 trucks
- 40% of truck tractors

The Air Resources Board estimates that once implemented, Advanced Clean Trucks will result in reductions of 27.9 tons of NO_x emissions and 0.85 tons of PM_{2.5} emissions per day by 2040. The Air Resources Board also estimates a cumulative reduction of 17.9 million metric tons of Greenhouse Gas Emissions. Combined, these emissions savings will result in \$8.9 billion in health savings from avoided premature mortality, emergency room visits, hospitalizations and lost workdays (California Air Resources Board n.d.). The regulation is also poised to provide economic benefits as the Air Resources Board estimates that the

regulation will create 7,500 jobs. Given Fontana's expertise and experience in warehousing and transportation, the city is uniquely positioned to capture a portion of economic activity related to this policy.

Regional

Warehouse Indirect Source Rule (SCAQMD, 2021)

The Indirect Source Rule, adopted by the South Coast Air Quality Management District (SCAQMD) in May, 2021, aims to reduce emissions from warehouses and trucks associated with warehouses. The rule applies to warehouses greater than 100,000 square feet and requires warehouse owners and operators to take action to reduce or mitigate their emissions (South Coast Air Quality Management District n.d.). Warehouse owners earn points for taking actions that include but are not limited to, relying on an electrified fleet, installing electric charging infrastructure, installing solar panels, and installing high quality air filters at neighboring schools.

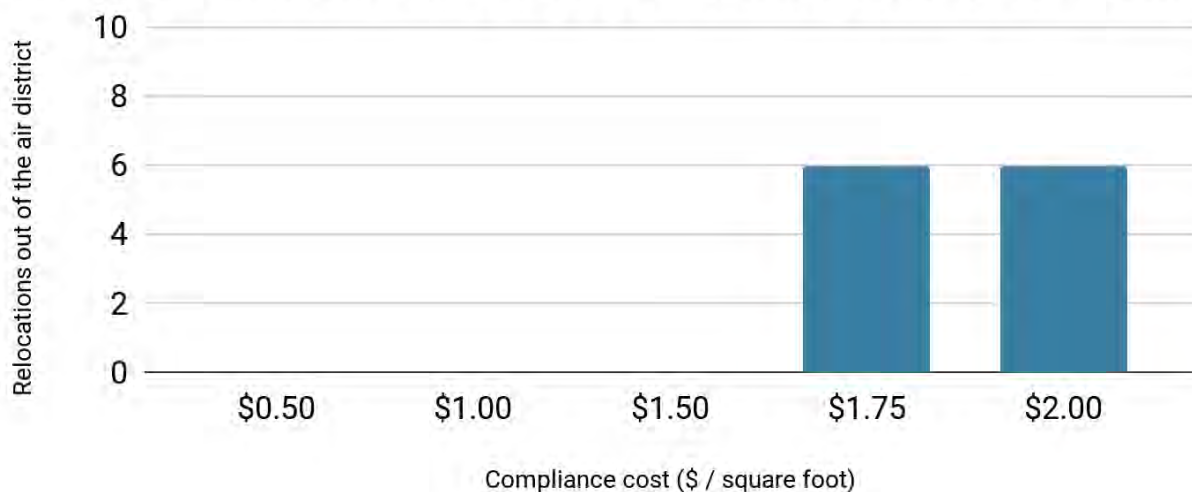
Under the regulation, warehouse owners must earn a set number of WAIRE points every year, and this compliance obligation is based on the number of weighted annual truck trips to that warehouse and warehouse owners can elect to pay a mitigation in lieu of earning WAIRE points (South Coast Air Quality Management District n.d.). SCAQMD prepared a number of studies analyzing the expected impact of the Indirect Source Rule on the environment, public health, and the economy. Key findings are summarized below and they suggest that the rule will address environmental and health concerns with minimal impact to economic growth. The California Truck Association has filed a lawsuit in 2021 against the Warehouse Indirect Source Rule arguing that the rule is outside the scope of the SCAQMD authority; and the Air Resources Board and California Attorney General Rob Bonta have expressed an intent to defend the rule. Given the anticipated benefits from the recommendations, it is recommended that localities across the South Coast district support SCAQMD and the California Attorney General in defending this rule.

Economic Growth

Local governments in the Inland Empire have expressed concern that stringent regulation of the warehousing industry will impact economic growth by causing businesses to move their warehouses leading to a loss in local jobs and government revenues. The question of warehouse relocation however, is also highly relevant to environmental and public health impacts; if warehouses relocate to a jurisdiction with fewer environmental requirements and rules, regions in SCAQMD's jurisdiction will continue to be subject to emissions from

trucks traveling through Southern California, but SCAQMD no longer has the regulatory authority to impose environmental requirements on these fleets (Industrial Economics, Incorporated and CALSTART 2020). Modeling by Industrial Economics Inc. on behalf of SCAQMD suggests that at maximum, 6 warehouses will relocate under the Indirect Source Rule, representing 0.2 percent of the 2,687 warehouses that would be impacted by the indirect source rule (Industrial Economics, Incorporated and CALSTART 2020) (Figure 3.01). The study also found that regions outside of SCAQMD that warehouses could relocate to do not have the capacity to absorb new warehouse activity.² It is forecasted that these regions will have 67 million square feet available for new warehousing activity in the medium term, which is less than 20% of the current warehousing capacity in the Inland Empire (Industrial Economics, Incorporated and CALSTART 2020).

Figure 3.01: Modeled Warehouse Relocations out of the South Coast Air District from ISR Costs



Source: Industrial Economics, Incorporated and CALSTART 2020.

Air Pollution and Public Health

The Warehouse Indirect Source Rule is expected to contribute to emissions reductions by encouraging the adoption of zero emission or near zero emission trucks and infrastructure to support an electrified fleet. SCAQMD's analysis suggests that by 2023 the rule will reduce PM_{2.5} emissions by 0.22 tons per day, NO_x emissions by 124 tons per day, and Volatile Organic Compound (VOC) emissions by 64 tons per day. It is expected that emissions reductions will be even greater by 2031, and it's expected that the indirect source rule will reduce PM_{2.5} emissions by 2.4 tons per day, NO_x emissions by 128 tons per day, and VOC

² Regions include Bakersfield, the Central Coast, the San Bernardino Desert, San Diego, Las Vegas, Phoenix, and Western Arizona

emissions by 72 tons per day (South Coast Air Quality Management District, 2021).

As a result of emissions reductions, the Indirect Source Rule is projected to have significant public health benefits. Between 2022 and 2031, the Indirect Source Rule is expected to result in 150 to 300 fewer deaths; 2,500 to 5,800 fewer asthma attacks; and 9,000 to 20,000 fewer work loss days from 2022 -2031 (South Coast Air Quality Management District, 2021). The expected monetized value of public health benefits is expected to range from \$1.2 billion to \$1.7 billion between 2022 and 2031. In reality, the Indirect Source Rule will deliver significantly higher benefits as mental health benefits and quality of life improvements for people living adjacent to warehouses have not been quantified.

Local, City of Fontana

All local policies are summarized and evaluated following this section.

Fontana General Plan (2018)

In 2018, Fontana updated its general plan to provide a vision for the city and guide local development through 2035. The plan lays out goals across fourteen categories including public health, circulation, noise and safety, sustainability, economic development, and land use that are of particular relevance to this project and the challenges presented by warehousing. The plan situates Fontana in the city's contemporary and historical context noting that Fontana is a maturing suburban community, future development will be primarily infill, many Fontana residents work elsewhere, and that improving educational outcomes will improve future employment prospects for Fontana's young people. We find that while Fontana's General Plan calls for environmental protection, improving labor conditions and improving health outcomes and the quality of life in Fontana, the reality of warehouse development conflicts with these goals. The city should consider additional warehouse and labor regulation to ensure that warehouse development does not undermine objectives detailed in the general plan.

The following significant goals in Fontana's General Plan are particularly relevant to warehouse development, and may be compromised during the development process.

- Fontana has healthy and safe development patterns (Building a Healthier Fontana, Goal 2)
- The City of Fontana considers health at all levels of decision making (Building a Healthier Fontana, Goal 3)
- The City of Fontana incorporates health considerations into the development review process (Building a Healthier Fontana, Goal 4)

- The City of Fontana has a comprehensive and balanced transportation system, with safety and multimodal accessibility the top priority of citywide transportation planning, as well as accommodating freight movement (Community Mobility and Circulation, Goal 1)
- Fontana's road network is safe and accessible to all users, especially the most vulnerable such as children, youth, older adults and people with disabilities (Community Mobility and Circulation, Goal 2).
- Fontana's commercial and mixed use areas include a multi-functional street network that ensures a safe, comfortable, and efficient movement of people, goods, and services to support a high quality of life and economic vitality (Community Mobility and Circulation, Goal 5).
- The City of Fontana participates in shaping regional transportation policies to reduce traffic congestion, pollution and greenhouse gas emissions (Community Mobility and Circulation, Goal 7).
- The City of Fontana protects sensitive land uses from excessive noise by diligent planning through 2035 (Goal 8, Noise and Safety)
- The City of Fontana provides a diverse and efficiently operated ground transportation system that generates the minimum feasible noise on its residents through 2035 (Goal 9, Noise and Safety)
- Fontana's Residents are protected from the negative effects of "spillover" noise (Goal 10, Noise and Safety)
- Fontana development patterns support a high quality of life and economic prosperity (Goal 2, Land Use and Urban Design)
- High-quality job producing industrial uses are concentrated in a few locations where there is easy access to regional transportation routes (Goal 5, Land Use and Urban Design)

Industrial Commerce Center Sustainability Standards Ordinance [*Proposed by the City of Fontana*]

Fontana recently proposed an ordinance that will increase regulation of the warehouse industry to meet or exceed all state and environmental standards for warehouse operations. The proposed ordinance also categorically exempts projects that comply with regulations contained in the ordinance from CEQA.

While the proposed ordinance rules exceed SCAQMD and Air Resource Board standards and repeat DOJ best practices, many prominent rules called for by the DOJ and

environmental justice groups have been omitted. In particular, the DOJ calls for a 1,000 foot buffer between warehouse facilities and sensitive receptors; this issue is unaddressed in Fontana's new proposed ordinance. Furthermore, while the ordinance calls for 3-minute idling restriction (in section 9.72), which is more stringent than CARB standards, the DOJ best practices document suggests that truck and heavy equipment idling should not exceed two minutes. Additionally, the ordinance does not fully ameliorate the impacts of warehouses on an area. More can be done to negate noise, for example. The heightened presence of trucks will still bring air pollution to the areas, even with minimized idling. Finally, the ordinance does little to ensure compliance with warehouse operation rules.

The ordinance also creates a CEQA exemption for warehouse projects. This is extremely concerning with regards to community involvement as eliminating environmental review removes an avenue through which community members can provide input on a project. Given that Fontana has few established channels for engaging with community members on warehouse development, people living in Fontana have historically been forced to rely on CEQA to voice their concerns to the city (see Section 5, Labor and Coalition Building for more information on community involvement in Fontana).

Eliminating CEQA for warehouses also poses environmental and public health concerns, as a key requirement of CEQA is that project impacts are evaluated on a cumulative basis in addition to a project by project impact basis. This is important in cities like Fontana where warehouse development is highly geographically concentrated, and disproportionately concentrated in residential communities that are home to low income people and people of color (see Figure 2.07 and 2.08). Furthermore, the southwestern neighborhoods that warehouses are concentrated in are already subject to disproportionate environmental harms (refer to Section 8, Air Quality and Pollution). Over 20 warehouses have been developed in the southwest portion of Fontana in the last 10 years and another three have been approved for construction (Bonta 2021), and comments by city staff indicate that 40 million square feet of warehouse space have been constructed of a total 70 million possible square feet of warehousing space. As noted by the Attorney General of California:

" (a) project's cumulative impact is significant when its incremental addition to environmental impacts from past, current, and reasonably probable future projects is cumulatively considerable...A project's incremental addition to existing environmental impacts may be cumulatively considerable even if its environmental impact is "individually limited" (Bonta 2021).

Eliminating CEQA review will make it difficult, if not impossible, to consider the impact of the warehousing industry as a whole.

Summary Table of Local Policies

Overview			Potential Impact			
Policy/Regulation	Scale	Report Section	Air Quality	Economic Diversification	Road Safety	Community Engagement
Warehouse Indirect Source Rule	Regional	Policy	++	++	n/a	n/a
Fontana General Plan	Local	Policy	n/a	+	+	-
Industrial Commerce Center Sustainability Standards Ordinance (proposed)	Local	Policy	--	--	+	--

Policy Recommendations

Recommendation 2.1: Remove the categorical CEQA exemption from Fontana's Industrial Commerce Center Sustainability Standards Ordinance

In recent years, Fontana has clashed with community groups and the State of California on local warehouse development, leading to litigation against the city.³ While litigation is time consuming and costly, CEQA has been one of the only channels through which local residents have power to intervene in Fontana's development process. Reinstating CEQA for industrial development is essential to allow for comprehensive environmental review, more governmental transparency and for the community to voice their input in development decisions.

Recommendation 2.2: Further strengthen environmental standards in the proposed Industrial Commerce Center Sustainability Standards Ordinance

Fontana should strengthen environmental standards in the Industrial Commerce Center Sustainability Ordinance to better protect community health. Fontana can strengthen the proposed Industrial Commerce Center Sustainability Standards Ordinance in the following ways:

1. Further align with California Department of Justice Recommendations on warehousing best practices. This includes adding rules that require at least a 1,000 foot buffer zone and restrict idling to two minutes.

³ See Slover Oleander Development

2. Resolve ambiguous and unspecific language. Phrases such as “at the discretion of the planning director” occur throughout the ordinance (example Section 9-74) and give extensive latitude to city staff who may exercise judgement inconsistently, potentially undermining the environmental protections contained within the ordinance.
3. Specify enforcement mechanisms at the municipal level, and we recommend that Fontana collaborate with community groups already involved in supporting warehouse workers (e.g. the Warehouse Workers Resource Center) to jointly develop mechanisms for inspecting and enforcing warehouse regulations.
4. Extend the ordinance to include existing warehouses. Since Fontana already has a large existing industrial footprint, retroactively applying this ordinance is essential to genuinely mitigate the impacts of the industry on the surrounding community.

Recommendation 2.3: Adopt a good neighbor policy

The West Riverside Council of Governments (WRCOG) convened a Regional Air Quality Task Force (RAQTF) to study air quality issues and develop recommendations for policymakers confronted with the nuances of warehouse development. The Task Force produced the “Good Neighbor Guidelines for Siting New and/or Modified Warehouse/Distribution Facilities” which are designed to minimize the diesel particulate matter impacts from heavy duty trucks and mitigate other local impacts of warehousing (Western Riverside Council of Governments 2005). Good neighbor policies can also stipulate economic requirements including requiring community benefit agreements or project labor agreements. Municipalities across the South Coast Air Basin including Riverside and Moreno Valley have adopted Good Neighbor policies that are either identical to or based on WRCOG’s original recommendations. While many rules in the proposed Industrial Commerce Center Sustainability Ordinance repeat DOJ best practices, prominent ones are left out, including siting warehouse facilities so that their property lines are at least 1,000 feet from the property lines of the nearest sensitive receptors per CARB guidance.

In addition, unlike other cities in the Inland Empire, the ordinance calls for a categorical CEQA exemption for warehouse projects that follow regulations in the ordinance, which as described above, is cause for significant concern and undermines the spirit and intention of good neighbor policies.

Recommendation 2.4: Advocate for Federal clean truck legislation

California often leads the nation in vehicle emissions standards, providing a model for the rest of the nation to follow. Emission standards under the Heavy-Duty Low NO_x Omnibus

Regulation will require that trucks sold in California incorporate technology to reduce NO_x emissions by 90 percent. However, without similar regulation from neighboring states or at the federal level, heavily polluting trucks will continue to traverse the state and the region.

Fontana should work with state legislators to advocate for the continued advancement of control technologies and attainment standards at the federal level. Federal clean truck legislation would offer Fontana two key advantages: firstly, it would contribute to improved air quality and reduced ozone formation through emission reductions, secondly it would ensure that Fontana and other cities in the Inland Empire do not operate at a competitive disadvantage due to California's more stringent environmental standards.

Recommendation 2.5: Support the Indirect Source Rule through current litigation by the California Truck Association

SCAQMD has demonstrated that warehouses in the South Coast Air Basin are limited in their ability to relocate due to the infrastructural advantages and abundant existing warehousing space in the Inland Empire, even if environmental regulations increase warehouse operating costs (IEc and CALSTART 2020).

Given the benefits that the rule is poised to deliver, the City of Fontana should support the state through the rule's current litigation process by offering letters of support or other testimony. Supporting the state in litigation also presents a unique opportunity for the city to build bridges with environmental justice advocates who played a pivotal role in passing the rule and serve as partners in building a healthier, more economically inclusive, and more just future Fontana.

Recommendation 2.6: Implement a warehouse moratorium

A concern voiced by government officials in Fontana is that there is no existing localized air quality data. Thus, it is prudent for Fontana to implement a warehouse moratorium while additional work is undertaken to establish localized air quality monitoring systems that emphasize data collection at sensitive receptors near warehouses (see section 5 - Labor and Coalition Building and section 6 - Air Quality and Pollution Monitoring).

Many cities that border Fontana have implemented warehouse moratoria over the last two years. Colton, Jurupa Valley, and Riverside have all implemented temporary moratoria in response to community concerns over the health and safety impacts of warehousing, and there is legal precedent for establishing moratoria on development while impacts are

studied.⁴ Fontana should follow suit and pause warehouse development until adequate mitigation work has occurred and it is clear that warehouses do not increase health risks for people who live, work, and play near warehouses.

⁴ See *Tahoe-Sierra Preservation Council, Inc. v. Tahoe Regional Planning Agency*, 535 U.S. 302 (2002)

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State of the Economy

Introduction

This section uses commute, employment, and wage data to analyze the strengths, challenges, and opportunities facing the warehousing and logistics industry in Fontana and the Inland Empire. Because of the nature of the data and the sector, most analyses are conducted at the regional level, however where data are available, analyses are conducted at the city level. Though the City of Fontana is one actor among many in the region, understanding the state of the industry in the region can help the City become more resilient to the threats facing the primary industry in the region. Additionally, because the industry fuels the local economy and has positive and negative impacts on quality of life of residents, recommendations are made for how the City can strengthen vulnerabilities, improve the quality of life for workers, and reduce impacts on the environment.

Commute Patterns

This section analyzes commute patterns and times for the City of Fontana and the Inland Empire as a region.

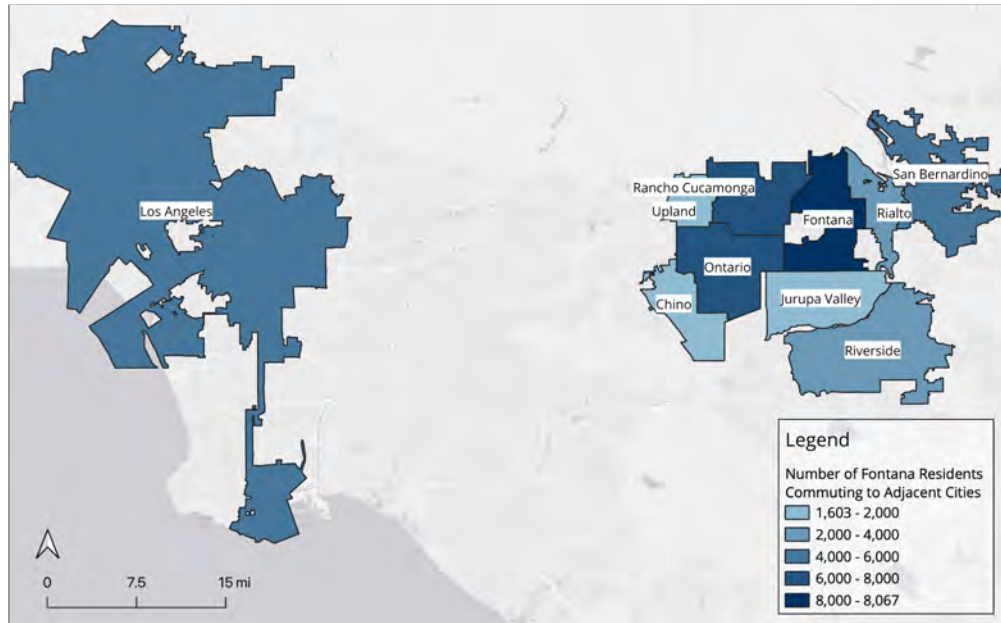
Longitudinal Employer-Household Dynamics (LEHD) Analysis and LEHD Map

The United States Census Bureau and the U.S. Department of Labor maintains the [Longitudinal Employer-Household Dynamics \(LEHD\) Origin-Destination Employment Statistics \(LODES\)](#), a longitudinal database detailing labor trends. LODES details employment trends, including home and work location for employees across various industries and wage brackets. This dataset can be used to understand where a jurisdiction's labor market commutes from and where their residents commute to.

Using LODES, we analyzed the commute patterns for the City of Fontana to understand where Fontana residents are commuting for work, and where Fontana workers are commuting from. However, since the city of Fontana is very much integrated into the Inland Empire economy, it is not surprising that many of Fontana's residents commute to neighbouring municipalities and vice versa. Figure 3.01 and 3.02 below shows that the

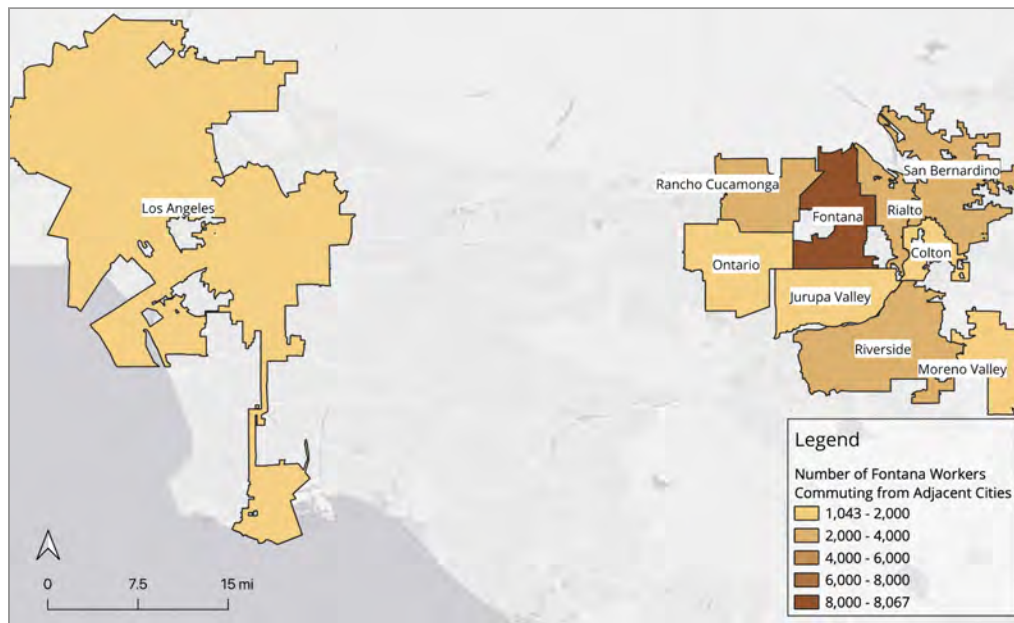
largest proportion of Fontana residents who work outside of the city commute to Ontario, Rancho Cucamonga, Los Angeles, and San Bernardino.

Figure 3.01: Top Employment Locations for Fontana Residents, 2019



Source: Author generated from Longitudinal Employer-Household Dynamics, 2019

Figure 3.02: Top Residential Locations for Fontana Employees, 2019



Source: Author generated from Longitudinal Employer-Household Dynamics, 2019

Figure 3.03 shows the 2019 commute and employment patterns for Fontana broken down by industry. Fontana is exporting approximately 80,000 workers and importing approximately 51,000 workers. Of the working population in Fontana, 90% work outside of the city. Looking exclusively at jobs in the Trade and Transportation sector, Fontana is exporting 21,138 workers and importing 17,765 workers. Of the Fontana residents who work in the Trade and Transportation sector, approximately 90% work in a different city. Due to the prominence of the Warehousing and Logistics industry in Fontana, many Fontana residents are working in the sector in neighboring cities.

Figure 3.03: Commute and employment patterns for the City of Fontana

	Fontana Residents who Work in Fontana	Fontana Residents who Work Elsewhere	Not Fontana Residents who Work in Fontana
Number of Workers	8,064	78,290	50,757
Goods Producing Industry (%)	10%	17%	12%
Trade and Transportation (%)	25%	27%	35%
All Other Services (%)	65%	57%	53%

Source: LEHD On the Map, 2019

The top five cities from which other workers are commuting and to which Fontana residents are commuting, by number of commuters, are San Bernardino (approximately miles), Rancho Cucamonga (approximately 10 miles), Riverside (approximately 11 miles), Rialto (approximately 5 miles), and Los Angeles (approximately 50 miles) (Figure 3.01 & Figure 3.02).

Comparison Cities

The commute and employment patterns of Moreno Valley (Figure 3.04) and Ontario (Figure 3.05) are included as a comparison to the commute patterns of Fontana, as all three cities are in the Inland Empire and are heavily invested in the Warehousing and Logistics industry. There are limitations of these comparisons due to varying timelines of development, geographic and demographic factors; difference in geographic scales; and access to transportation infrastructure. Care must thus be applied when comparing the numbers between the three cities.

Moreno Valley imports approximately 35,500 jobs and exports 72,000 jobs. Of the working population in Moreno Valley, 86% work outside of the city. Specifically in the Trade and Transportation sector, Moreno Valley is exporting 18,660 workers and importing 16,005 workers. Ontario imports approximately 116,000 workers and exports approximately 64,000. Of the working population in Ontario, 85% work outside of the city. Specifically in the Trade and Transportation sector, Ontario is exporting 46,310 workers and importing 15,402 workers. Of the Moreno Valley and Ontario residents who work in the Trade and Transportation sector, about 86% and 82%, respectively, work in a different city than the one in which they live. Compared to Moreno Valley and Ontario, Fontana is exporting a higher percentage of their working population both generally, and within the Trade and Transportation sector.

Figure 3.04: Commute and employment patterns for the City of Moreno Valley

	Moreno Valley Residents who Work in Moreno Valley	Moreno Valley Residents who Work Elsewhere	Not Moreno Valley Residents who Work in Moreno Valley
Number of Workers	11,513	71,769	35,566
Goods Producing Industry (%)	6%	17%	4%
Trade and Transportation (%)	26%	26%	45%
All Other Services (%)	68%	57%	51%

Source: LEHD On the Map, 2019

Figure 3.05: Commute and employment patterns for the City of Ontario

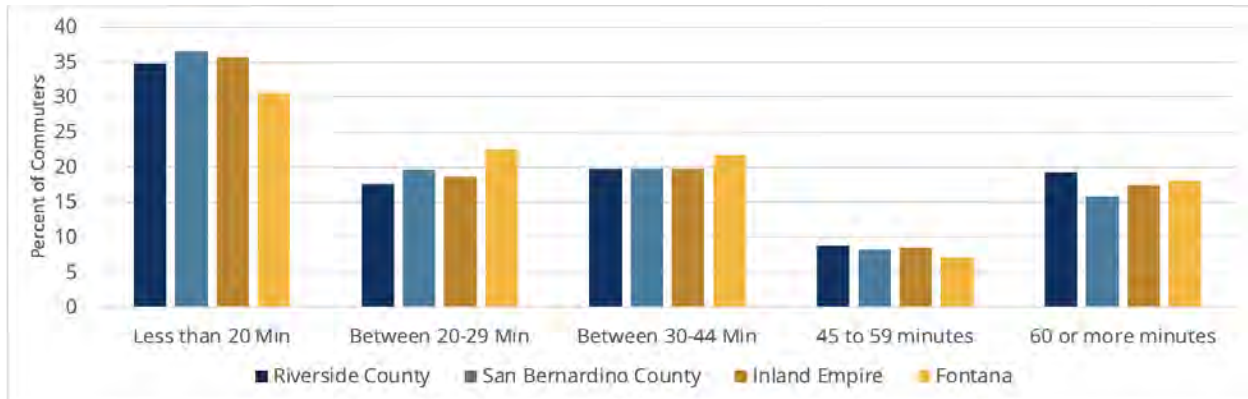
	Ontario Residents who Work in Ontario	Ontario Residents who Work Elsewhere	Not Ontario Residents who Work in Ontario
Number of Workers	11,107	64,176	115,776
Goods Producing Industry (%)	17%	17%	16%
Trade and Transportation (%)	31%	24%	40%
All Other Services (%)	52%	58%	54%

Source: LEHD On the Map, 2019

According to the U.S. Census Bureau, the mean travel time to work across the state of

California is 31 minutes, slightly shorter than the reported mean travel time to work for Fontana's residents (34 min). Approximately 18% of Fontana's residents report traveling over an hour to work, which is on par with the region as a whole (Figure 3.06). It is important to note that this data should be taken with a grain of salt due to the method of self-reporting this information on the Census.

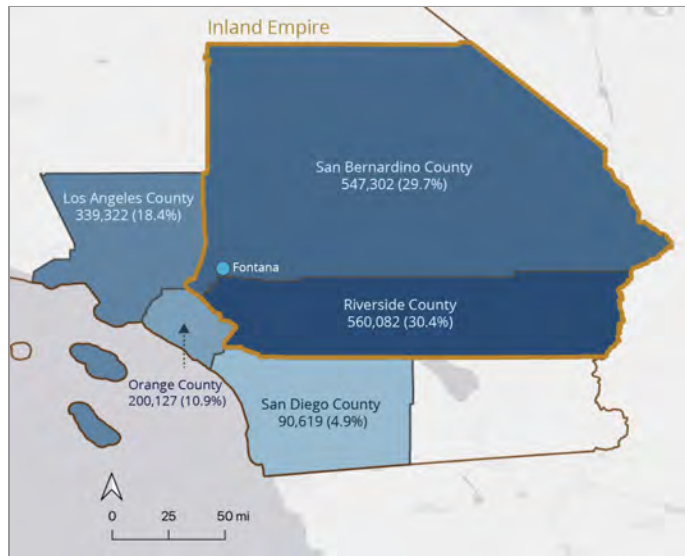
Figure 3.06: Commuter Travel Times to Work Across the Inland Empire, 2019



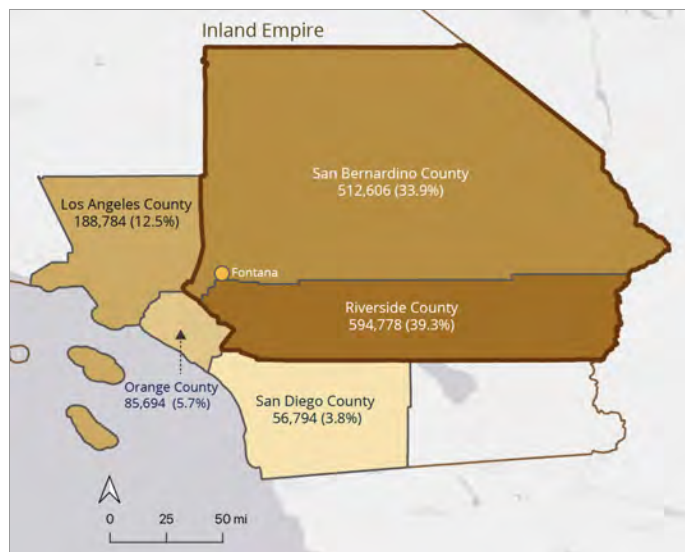
Source: Commute Characteristics by Sex (Table ID S0801) 2019. ACS 5-Year Estimates Subject Tables.

Approximately 60% of Inland Empire residents also work in the Inland Empire, while another 40% commute to a different region for work. The majority of Inland Empire residents who commute travel to adjacent counties in Southern California, including Los Angeles County, Orange County, and San Diego County (Figure 3.07). Similarly almost three quarters (73%) of jobs in the Inland Empire are also held by Inland Empire residents. Other significant sources of workers include Los Angeles County, Orange County, and San Diego County (Figure 3.08).

Although these counties are adjacent to the Inland Empire, commutes can be lengthy due to Southern California's large geographic scale, traffic congestion, and a heavy reliance on automobile travel. Addressing the gap between residents and jobs in the Inland Empire may increase the share of residents who are able to live and work in the Inland Empire, and have positive environmental impacts by reducing emissions related to commute time and distance. Reducing commute-related congestion may also have positive economic impacts by enabling the more efficient movement of goods, which, as detailed below, is critical to the future growth of the Inland Empire's economy.

Figure 3.07: Employment Location for Inland Empire Residents, 2019

Source: Author generated from Longitudinal Employer-Household Dynamics, 2019

Figure 3.08: Residential Location for Inland Empire Employees, 2019

Source: Author generated from Longitudinal Employer-Household Dynamics, 2019

Industry Cluster Analysis

This section analyzes employment data for the region. Consistent with the literature, we find that the sole existing industry cluster of the region is the Warehousing and Logistics Industry. This section presents the current industry's employment data, earnings across occupations in the industry, and forecasts projected growth of the industry at the regional scale.

Industry Analysis

NAICS Analysis

Developed by oversight from the United State Census Bureau's Office of Management and Budget, the [North American Industry Classification System \(NAICS\)](#) is the standard for collecting and analyzing data related to the U.S. business economy. NAICS uses a six-digit hierarchical coding system to aggregate sub-economic industries into 20 aggregated industry sectors (Blakely and Leigh 2013). Two-digit NAICS codes, for example, provide information on the most aggregated industry sectors, while three-digit codes provide more granular data within each of the 20 aggregated industry sectors. Industries become increasingly specialized and specific as one adds digits to the NAICS codes.

The team used NAICS data for the Inland Empire, defined as San Bernardino and Riverside Counties, to assess the top 20 sub-economic sectors (three-digit NAICS codes) by employment. Using this data, the team developed location quotients and an assessment of 'industry strength' for each of these industries. As defined by Malizia et al., "*A location quotient measures the proportion of employment, earnings, or output in one regional sector compared to that sector's proportion in a reference region, usually the nation*" (Malizia et al. 2020). The location quotients displayed in Figure 3.09 below compare the concentration industries in the Inland Empire relative to the concentration of the same industry across the state of California. To determine industry strength, the team assessed industries on values calculated for local competitiveness/differential shift, industry mix/proportional shift, and job growth.

Figure 3.09 shows the top 20 industry sectors (three-digit NAICS codes) by employment across the Inland Empire. These 20 sectors represent 887,147 workers or 72% of the total workforce of the Inland Empire. The 'Food Services and Drinking Places' industry is the largest industry in the Inland Empire by employment, employing 140,000 people and 11% of the region's total workforce. This industry is a competitive industry and has also grown in employment by 39% in the ten years between 2009 and 2019. The most locally competitive and growing industry within the Inland is the 'Warehousing and Storage' industry with a location quotient of 5.1, significantly higher than any other industry in the region. This is unsurprising given the increase in e-commerce in recent years and the location of the Inland Empire in relation to the Ports of Los Angeles and Long Beach, major highways, and rail lines.

Figure 3.09: Top 20 Economic Sectors (NAICS 3-Digit Codes) by Employment in the Inland Empire, 2019

NAICS 3 Digit Code	NAICS Description	2019 Employment	Percent of Regional Employment	Employment Growth (2009-2019)	Location Quotient (LQ)	Industry Strength
722	Food services and drinking places	139,641	11%	39%	1.14	Competitive
561	Administrative and support services	79,192	6%	10%	0.6	Opportunity
621	Ambulatory health care services	78,558	6%	50%	1.14	Competitive
238	Specialty trade contractors	71,390	6%	41%	1.58	Competitive
622	Hospitals	56,220	5%	27%	1.29	Stable
493	Warehousing and storage	54,757	4%	150%	5.1	Competitive
423	Merchant wholesalers, durable goods	43,099	3%	28%	1.16	Stable
541	Professional, scientific, and technical services	40,104	3%	19%	0.4	Stable
445	Food and beverage stores	35,421	3%	4%	1.24	At Risk
452	General merchandise stores	32,991	3%	1%	1.6	At Risk
623	Nursing and residential care facilities	28,044	2%	30%	1.12	Competitive
424	Merchant wholesalers, nondurable goods	27,928	2%	30%	1.06	Stable
721	Accommodation	27,615	2%	23%	1.26	Opportunity
484	Truck transportation	27,265	2%	27%	2.76	Stable
713	Amusement, gambling, and recreation industries	26,534	2%	2%	1.27	At Risk
441	Motor vehicle and parts dealers	26,003	2%	35%	1.61	Stable
624	Social assistance	25,333	2%	47%	0.9	Competitive
448	Clothing and clothing accessories stores	24,177	2%	26%	1.33	Stable
611	Educational services	24,170	2%	26%	0.68	Opportunity
492	Couriers and messengers	18,705	2%	1242%	2.26	Competitive

Source: US Census County Business Patterns (2009 - 2019)

Note: Within the 'Industry Strength' column, industries were identified as 'competitive' if their differential shift, proportional shift, and job growth were positive. An industry was identified as 'opportunity' if the proportional shift and job growth were positive and differential shift was negative. An industry was identified as 'stable' if the

differential shift and job growth were positive and the proportional shift was negative. An industry was identified as 'at risk' if the job growth was positive and the proportional shift and differential shift were negative.

Figure 3.10: Employment in NAICS Industry Clusters in the City of Fontana, 2019

NAICS Industry Cluster	Number of Employees	Share
Health Care and Social Assistance	11,127	19%
Transportation and Warehousing	9,245	16%
Retail Trade	6,967	12%
Administration & Support, Waste Management and Remediation	4,760	8%
Educational Services	4,673	8%
Accommodation and Food Services	4,665	8%
Manufacturing	4,402	8%
Wholesale Trade	4,367	8%
Construction	2,267	4%
Public Administration	1,389	2%
Other Services (excluding Public Administration)	1,376	2%
Professional, Scientific, and Technical Services	857	2%
Real Estate and Rental and Leasing	623	1%
Finance and Insurance	491	1%
Utilities	411	1%
Arts, Entertainment, and Recreation	324	1%
Information	113	0%
Management of Companies and Enterprises	90	0%
Agriculture, Forestry, Fishing and Hunting	26	0%
Mining, Quarrying, and Oil and Gas Extraction	0	0%

Source: U.S. Census Bureau, On The Map Tool, 2019

While NAICS three-digit data are unavailable at the city scale, the [U.S. Census Bureau's On The Map](#) tool provides a quantification of total employment by NAICS industry clusters, as shown in Figure 3.10. Location quotient and industry strength were not calculated due to unavailability of data at the city scale. As shown, the 'Health Care and Social Assistance' industry cluster employs the largest share of employees of any industry cluster in Fontana (19%). The 'Transportation and Warehousing' industry cluster also employs a decent portion of Fontana's total workforce (16%). With more detailed NAICS data for the City of

Fontana, it would be incredibly valuable to assess industry growth and competitiveness of the top industry sectors.

Wage Analysis for the Transportation and Material Moving Industry

Through the State of California's Employment Development Department, the [Occupational Employment and Wage Statistics \(OEWS\)](#) program releases estimates of the number of employees and wages paid in over 800 occupations. The team utilized this data to perform a wage analysis for the Transportation and Material Moving Occupation group in the Riverside-San Bernardino-Ontario MSA. While it is critical to note that there are likely employees working in this industry that are *not captured* within the 'Transportation and Material Moving' occupational title (e.g. Management, financial operations, and engineering positions), Figure 3.11 provides a snapshot of wages in this strong and growing industry.

The Riverside - San Bernardino - Ontario MSA has a total estimated employment of approximately 1.5 million people, and the Transportation and Material Moving Occupation employs a significant portion of the workforce (15% or 223,180 people). The mean hourly wage within this occupation is \$19.67 (\$40,914/year). While some occupations within this group provide promising jobs, many occupations fall below the living wage for the region. The annual living wage for one adult with zero children in San Bernardino County is \$36,965 (\$18.48/hour), as calculated by the Economic Policy Institute (Economic Policy Institute 2021). Approximately 142,000 employees (64%) of the workers in the Transportation and Material Moving Occupation group make below a living wage. With additional time, it would be valuable to do a longitudinal analysis both within this occupation classification and across all occupations to determine how the percentage of workers making below the living wage has changed over time. As will be discussed in more detail in the Labor section of this report, this wage data does not include temporary employment, a common practice employed in the region.

Our analysis affirms claims that Transportation and Material Moving Occupations are growing in the region. However, there is a low density of jobs per square foot. Most importantly, with such a high percentage of employees making less than the living wage, it feels clear that they are not quality employment opportunities.

This report only provides detailed occupation and wage statistics for one Occupation: Transportation and Material Moving. Basic information on the 21 other occupation groupings in the OEWS dataset can be found on OEWS datasets. With additional time and

resources, it would be valuable to identify occupations which may align with the top industries in the region (see Figure 3.09).

Figure 3.11: All Transportation and Material Moving Occupation Employment and Wage Statistics, 2021 - First Quarter

SOC	Occupational Title	Mean Hourly Wage	Mean Annual Wage	Job Type
53-0000	Transportation and Material Moving Occupations	\$19.67	\$40,914	Above Living Wage
53-7021	Crane and Tower Operators	\$37.62	\$78,257	Above Living Wage
53-6051	Transportation Inspectors	\$33.69	\$70,064	Above Living Wage
53-1047	First-Line Supervisors of Transportation and Material-Moving Workers, Except Aircraft Cargo Handling Supervisors*	\$29.73	\$61,819	Above Living Wage
53-3032	Heavy and Tractor-Trailer Truck Drivers	\$26.32	\$54,748	Above Living Wage
53-7081	Refuse and Recyclable Material Collectors	\$26.26	\$54,624	Above Living Wage
53-3099	Motor Vehicle Operators, All Other	\$25.56	\$53,153	Above Living Wage
53-4013	Rail Yard Engineers, Dinkey Operators, and Hostlers	\$23.55	\$51,053	Above Living Wage
53-3033	Light Truck Drivers	\$22.97	\$47,780	Above Living Wage
53-3052	Bus Drivers, Transit and Intercity	\$22.44	\$46,678	Above Living Wage
53-3058	Passenger Vehicle Drivers, Except Bus Drivers, Transit and Intercity*	\$19.97	\$41,542	Above Living Wage
53-7011	Conveyor Operators and Tenders	\$19.88	\$41,347	Above Living Wage
53-7051	Industrial Truck and Tractor Operators	\$19.52	\$40,585	Above Living Wage
53-3031	Driver/Sales Workers	\$18.25	\$37,960	Below Living Wage
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	\$17.56	\$36,519	Below Living Wage
53-7063	Machine Feeders and Offbearers	\$17.03	\$35,439	Below Living Wage
53-7065	Stockers and Order Fillers	\$16.92	\$35,202	Below Living Wage
53-6031	Automotive and Watercraft Service Attendants	\$16.81	\$34,955	Below Living Wage
53-7199	Material Moving Workers, All Other	\$16.64	\$34,625	Below Living Wage
53-7061	Cleaners of Vehicles and Equipment	\$15.73	\$32,711	Below Living Wage
53-6021	Parking Attendants	\$15.01	\$31,208	Below Living Wage
53-7064	Packers and Packagers, Hand	\$13.68	\$30,529	Below Living Wage

Source: OEWS Employment and Wage Statistics Data Tables, Employment Development Department for the State of California. Geographic Area: Riverside-San Bernardino-Ontario MSA. 2021 1st Quarter. <https://www.labormarketinfo.edd.ca.gov/data/oes-employment-and-wages.html#OES>

Note: Only data identified to be in the 'Transportation and Materials Moving' occupation group by the Occupational Employment and Wage Statistics (OEWS) program is included in this figure. There are undoubtedly additional occupations which operate within the Warehousing and Logistics industry which are present in other occupation groupings.

Note: Occupations highlighted in light orange fall below the living hourly wage for a household size of one for San Bernardino county which was calculated using the Economic Policy Institute's Family budget calculator (<https://www.epi.org/resources/budget/>).

Projected Employment Growth

The State of California's Employment Development Department provides projected industry and employment growth for major industries in various regions over the short-term (2 year) and long-term (10 year). Projections are based on anticipated industry growth, changes in technology, as well as other factors. In this analysis, the team used 2018-2028 employment projects; however, because these projections are based on historical data, they do not take into account the impacts of COVID-19. COVID-19 is likely to have caused structural changes in the economy that are not reflected in the data in Figure 3.12 below.

As noted in the industry analysis earlier in this report, Warehousing and Logistics is currently the only real cluster and, based on the literature and data, what the region currently specializes in. Due to the relative availability of land, the history of industry in the region, and connection to multimodal transportation, Fontana and the Inland Empire more generally have become a hub for warehousing and logistics in the United States. The industries included in this cluster (Figure 3.12) are those associated with warehousing and logistics and goods movement. Road construction was included as a supporting industry. Figure 3.12 shows the industries (4-digit NAICS codes) that make up the Warehousing and Logistics cluster with their location quotients, job growth, 2019 employment, and projected 2028 employment growth with a weighted average across industries.

While the unprecedented rise in e-commerce during the COVID-19 pandemic may lead to higher employment projections than what is indicated for the warehousing and logistics cluster shown in Figure 3.12, it is important to consider what pressures this cluster might face in the coming years. As the [Brookings Institute](#) notes, historically, technological disruption has caused minor economic disturbances in Fontana and the Inland Empire. However, with technological breakthroughs in recent years, automation now poses a threat across all industries, including warehousing and logistics. The report also notes that

Fontana and the region as a whole may be susceptible to reduced trade with Asia, new infrastructure which could disrupt trade routes and trade volumes at the Ports of Los Angeles and Long Beach, and increasing labor costs which, historically, was one critical advantage the Inland Empire had over other regions. These trends are putting increasing pressure to invest in automation, especially within the manufacturing and logistics industry cluster (Gootman 2019).

Figure 3.12: Warehousing and Logistics Cluster Projected Employment Growth, 2018-2028

Code	Industry	LQ	% Growth (2009-19)	Projected % Growth in Employment (2018-28)
4931	Warehousing and Storage	5.08	150%	52%
4922	Local Messengers and Local Delivery	0.64	55%	40%
4921	Couriers and Express Delivery Services	2.48	1399%	39%
4842	Specialized Freight Trucking	1.77	-21%	24%
4841	General Freight Trucking	3.21	50%	28%
4812	Nonscheduled Air Transportation	0.32	47%	39%
4811	Scheduled Air Transportation	0.18	113%	39%
2373	Highway, Street, and Bridge Construction	2.12	12%	11%
2371	Utility System Construction	2.02	40%	11%

Source: NAICS 2009-2019 & State of California Employment Development Department 2018-2028.

It is also important to consider the quality of economic growth that will be generated by the continued growth of the warehousing industry in Fontana. Figure 3.13 shows the projected growth for occupations tied to warehousing and transportation in Riverside and San Bernardino and the prevailing wage for these occupations. While growth is projected in occupations that earn a higher wage, particularly in heavy truck drivers and supervisory roles, much of the job growth is expected to occur in occupations that pay below the living wage in the Inland Empire (Figure 14). Furthermore, many of these occupations are not unionized which creates barriers to improving working conditions, raising pay and benefits, and empowering workers to advocate for themselves in the workplace. While these trends may make Fontana a desirable location for warehousing in the short-run, in the long-run

the trend toward low-wage work with few pathways for advancement will undermine the city's prosperity and further entrench existing economic and social inequities.

Figure 3.13: Projected Growth for Occupations in the Warehousing and Transportation Industries

SOC	Occupational Title	Mean Hourly Wage (2020)	Projected Growth Rate (2018 - 2028)	Added Jobs (2018-2028)	Job Type
53-6051	Transportation Inspectors	\$33.69	11%	30	Above Living Wage
53-1047	First-Line Supervisors of Transportation and Material-Moving Workers, Except Aircraft Cargo Handling Supervisors*	\$29.73	28%	2,040	Above Living Wage
53-3032	Heavy and Tractor-Trailer Truck Drivers	\$26.32	24%	6,380	Above Living Wage
53-7081	Refuse and Recyclable Material Collectors	\$26.26	7%	1	Above Living Wage
53-3099	Motor Vehicle Operators, All Other	\$25.56	-6%	-20	Above Living Wage
53-4013	Rail Yard Engineers, Dinkey Operators, and Hostlers	\$23.55	17%	20	Above Living Wage
53-3033	Light Truck Drivers	\$22.97	25%	3,910	Above Living Wage
53-7051	Industrial Truck and Tractor Operators	\$19.52	30%	4,930	Above Living Wage
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	\$17.56	31%	20,050	Below Living Wage
53-7063	Machine Feeders and Offbearers	\$17.03	46%	1,220	Below Living Wage
53-7065*	Stockers and Order Fillers	\$16.92	14%	4,940	Below Living Wage
53-6031	Automotive and Watercraft Service Attendants	\$16.81	4%	40	Below Living Wage
53-7199	Material Moving Workers, All Other	\$16.64	10%	130	Below Living Wage
53-7061	Cleaners of Vehicles and Equipment	\$15.73	6%	390	Below Living Wage
53-6021	Parking Attendants	\$15.01	0%	0	Below Living Wage
53-7064	Packers and Packagers, Hand	\$13.68	7%	810	Below Living Wage

Source: 2018-2028, Employment Development Department for the State of California. Geographic Area: Riverside County (part of Riverside-San Bernardino-Ontario MSA). 2021 1st Quarter.

<https://www.labormarketinfo.edd.ca.gov/data/oes-employment-and-wages.html#OES>

*Classification code was 43-5081 prior to 2018

To increase long-term economic vitality of Fontana and the Inland Empire, it will be valuable to diversify Fontana's economic base, invest in educational opportunities to up-train workers, focus on the development of promising, middle-class jobs, and provide workers with the skills needed to support new, seed industry clusters. While this employment projection data are valuable for the warehousing and logistics cluster, it would

be valuable for the County of San Bernardino and City of Fontana to utilize this employment and industry data to develop a quantitative understanding of other industries in the region which may provide promise for wage growth, growth in jobs, economic resilience, and against the threats of automation. While technological innovation and change will likely displace jobs in the warehousing industry as well as in other industries, “such innovation bring[s] new occupations to life, generate[s] demands for new forms of expertise, and create[s] opportunities for rewarding work” (Autor, Mindell, and Reynolds 2020).

Figure 3.14: Distribution of Job Growth between 2018 and 2020 For Jobs Above and Below the Living Wage

Job Type	Added Jobs (2018 -2020)	Percent of Added Jobs
Above Living Wage	17,291	38.53%
Below Living Wage	27,580	61.47%

Source: Author’s calculations based on Figure 3.14

Note: This table includes all occupations which *had* a wage forecast. It does not include occupations which did *not* have a wage forecast in the dataset.

Benefits and Challenges of the Logistics Industry

A study by the Economic Policy Institute has shown that new warehouses in a county grow warehousing jobs there by about 30 percent, yet the growth is ‘likely offset by job losses in other industries’ or is small enough to be undetectable in the data. Thus the net effect would simply be a shift of jobs from other industries towards the warehousing and storage industry within the county, without a net growth in jobs overall, especially if the labor supply is limited (Jones and Zipperer 2018). Indeed, the share of warehousing jobs within the Inland Empire grew from 12.7% in 2018, to 13.3% in 2019 and 15.3% in 2020; the growth in the job share is especially pronounced given the job losses due to COVID (Downey 2021).

The jobs that the warehousing industry brings to a region, too, are not particularly high paying. In fact, in the past decade, four of the six Californian counties where Amazon established fulfillment centers saw a fall in their average wages (Sheehan 2018). These positions tend also to be precarious and further entrench vulnerable populations in a cycle of low wage, low skilled work (see section 5 for more details).

Logistics firms pick their location based on the inherent advantages a locale offers, and state and local taxes only represent on average less than 2 percent of business costs. Hence the dreams of local governments who offer regulatory and tax incentives to warehousing companies in the hope of job creation may never be realized. In general, ‘reducing public services to provide tax cuts does not actually spur economic growth and job creation’, and may instead prove to be but a windfall for the companies benefited (Jones and Zipperer 2018).

Lastly, the large amount of land tied up with the logistics and warehousing industry, together with the environmental degradations wrought by the industry, could decrease the attractiveness of Fontana and the Inland Empire to entrepreneurs and the associated high-paying jobs (Downey 2021).

City Finances and the Warehousing Industry

In the California context, the creation of Prop 13 and other regulations have made property taxes comparatively scarcer, pushing municipal governments to seek more innovative ways to financially support public services and capital, including various debt financing schemes and the fiscalization of land (namely using land as a source of revenue via development fees, taxes, and other means, and making land use decisions that could reduce government service costs) (Chapple 2018). Currently, Fontana is able to extract development fees whenever a new warehouse is built or a substantial modification is made to an existing warehouse.¹ While relying on development fees for funding is arguably better than plunging a municipality into debt, the question still remains whether the pros of building more warehouses outweigh the externalities arising from the freight industry or the opportunity cost of not using the land on which warehouses sit for other purposes.

Sales Tax

Sales tax revenue is one of the city revenue streams. In addition to the state-wide sales tax, the County of San Bernardino has an additional 0.25% sales tax. Under the current Bradley-Burns sales tax law, the municipality where the place of sale (“situs”) is located (which can often be the fulfillment center where goods are shipped from) can receive part of the sales tax revenue for each transaction. However, this law is vulnerable to changes in state tax policy, and the situs is highly dependent on the internal ownership structure for large retailers (League of California Cities 2021). In 2021, an effort spearheaded by a neighbouring municipality sought to change California state tax law to redirect revenue

¹ Interviews with City staff and leaders

from the municipality where the fulfillment center is located, to the municipality where the buyer is located. While such a change (or a variation where the sales tax revenue is shared between both the municipality with the fulfillment center and the one where the buyer is) might engender a more equitable distribution of sales tax benefits, since externalities arising from truck use is not confined to the area immediately surrounding fulfillment centers, it could also have enormous fiscal implications for a city whose economy is heavily reliant on its warehousing industry.

According to the [City of Fontana FY 2020-2021 Operation Budget](#), the following firms are the top twenty-five sales tax producers. The firms are organized by sector. Besides the auto dealerships, most firms included in the list support the Warehousing and Logistics industry.

- Warehousing and Logistics
 - American Hotel Registry
 - HSN
- Gas and Transportation
 - Arco AM/PM
 - Chevron
 - Fontana Truck Stop
 - Rush Truck Center
 - Shell
- Material Production
 - Brown Strauss Steel
 - Thompson Bldg Materials
- Commercial and Distribution Centers
 - Costco
 - Home Depot
 - Lowes
 - Ross
 - Stater Bros
 - Target
 - Walmart
- Auto Dealerships
 - Fontana Mazda
 - Fontana Motors Direct
 - Fontana Nissan
 - Pacific Auto Center
 - Rock Honda

- Rotolo Chevrolet
- Sunrise Ford
- Utility Trailer Sales
- Valley Kia

Impact Fees

Impact fees are charges on new development that typically are used to help fund the expansion of municipal services that will support the new development. The City of Fontana charges development impact fees that vary by land use. Specific fees can be found on the [City's Website](#). There are additional fees charged per square foot of development by the [Fontana Unified School District](#) (Fontana Unified School District n.d.). The County of San Bernardino charges separate fees for development outside of the city jurisdiction but within the Fontana Sphere of Influence.

Figure 3.15: Cost of Development Fees for a 205,949 Square Foot Warehouse

Fee	Cost
San Bernardino County Fontana Sphere of Influence	\$319,221
Fontana City limits	\$809,738
Fontana Unified School District	\$135,926
Fontana with discretionary zoning change	\$875,283

Source: Author calculated.

Outside of the traditional development impact fees, the City of Fontana charges discretionary square-footage-based fees to developers for spot zoning changes to industrial uses at warehouse sites. **While it is unclear how decisions are made with regards to how these funds are used, our team recommends that the City create a process for allocating these funds to mitigate impacts of the development of these warehouses and invest in placemaking in the city.** Additionally, when creating this process, the City should better document the legal nexus for requesting these funds, per *Nollan v. California Coastal Commission* 483 U.S. 825. Figure 3.15, for example, details the cost of development of a 205,949 square-foot warehouse depending on the location of the development and the fees exacted.

Fiscalization of Land Use

The fiscalization of land creates incentives for municipalities to favor commercial uses over residential and industrial uses. This may lead to municipalities over-zoning for commercial uses and under-zoning for residential and industrial uses, thus discouraging compact development in urban form (Chapple 2018; Lewis 2001). The resultant sprawl would work against Fontana's desire to promote active transportation and make the formation of compact live-work communities more difficult. Though creating a live-work community would improve congestion and mitigate Greenhouse Gas emissions, a short commute within the region to neighboring cities is unlikely to benefit Fontana economically. Chapple (2018) also suggests that a more compact development pattern could bring fiscal benefits, such as reducing the need to chase sales tax base, thus breaking the cycle of fiscalization of land use.

Even if the city of Fontana is benefiting financially from fees and taxes from warehouse developments, most of the new warehouses are located in the southwest portion of the city, where a higher percentage (51%) of the residents are renters as compared to the rest of Fontana (refer back to Figure 3.09). Thus the impact of the conversion of land for warehouse use in this area within Fontana falls disproportionately on renters, who cannot reap the financial benefits of a rise in home value, and may instead be displaced as rents rise.

Rootedness of the logistics and warehousing industry in the Inland Empire

Inherent attractiveness of the Inland Empire

The Inland Empire is attractive to the logistics industry, being situated amidst a well-developed freeway network, the Ports of Los Angeles and Long Beach, and a number of airports (including Ontario and San Bernardino International Airports). Beyond these locational advantages, other factors, such as "abundant cheap land", a large and readily available workforce, a strong infrastructure network of major ports, railways, and highways, and proximity to customers (including other businesses in the supply chain and end users), also work together to draw logistics companies to the region. Regional leaders have recognized the importance of these factors since the mid 20th century, and thus encouraged the growth of the logistics sector in the Inland Empire. As a result, the combined region of the Inland Empire, Los Angeles County, and Orange County dominates

the warehousing market within the wider Southern California-Las Vegas-Phoenix region (De Lara 2018; Harris 2018; Industrial Economics, Incorporated and CALSTART 2020).

Elasticity of warehouse locations to costs and subsidies

The aforementioned structural advantages, long recognized and identified by the regional government, cities, and industry stakeholders, allow local jurisdictions the confidence to not offer subsidies to logistics companies in order to draw or keep companies within their communities. Stakeholders know that the logistics sector cannot easily relocate, unlike manufacturing jobs (De Lara 2018; Harris 2018). Moreover, Lewis (2001) argues that whatever incentives local governments give to compete for retailers would ultimately end up being a net transfer of local public resources to these private companies, since these incentives do not change the 'broad locational characteristics of the industry' and retailers are unlikely to relocate out of the market area (Lewis 2001). This argument can be similarly applied to the warehousing and logistics industry in the Inland Empire.

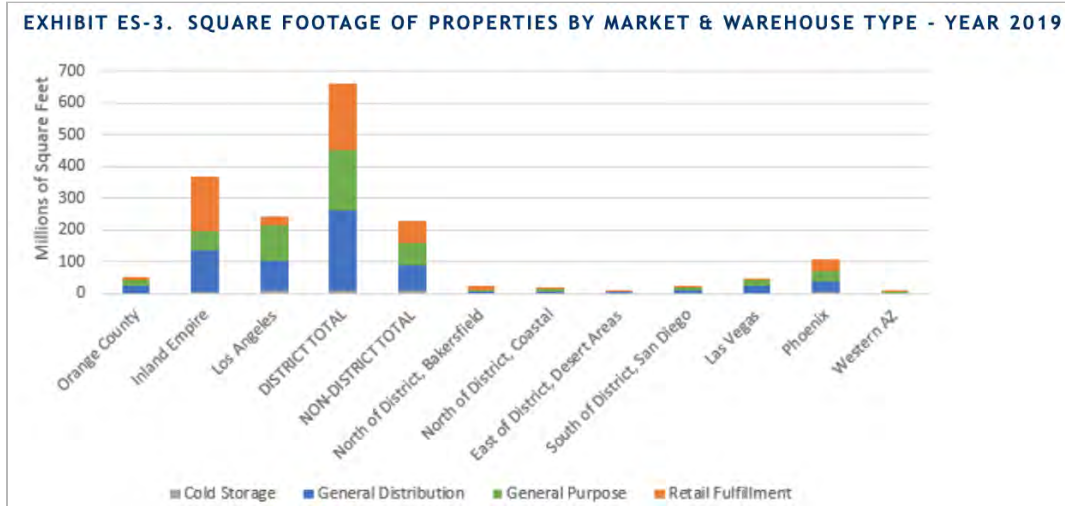
When interviewed, logistics industry stakeholders indicate that their locational choices are driven by the overall costs of operating a warehouse, rather than by any single factor. Factors that affect locational decisions include transportation costs, labor costs and availability, real estate costs, and regulatory burdens. Even if labor and real estate costs are lower further inland from the Inland Empire, the transportation cost to move goods from the ports to these inland locations would offset a lot of these cost savings. The lower labor availability and distance from customers also makes these inland locations less attractive to logistics companies (Industrial Economics, Incorporated and CALSTART 2020).

Since margins are thin in the logistics sector, additional regulatory costs could have a relatively large impact on profits. Even so, (Industrial Economics, Incorporated and CALSTART 2020) finds that a regulatory cost increase of \$2 per square foot of warehouse space would only cause 6 warehouses in the entire South Coast Air Quality Management District to relocate outside the region, representing a minuscule 0.2% of the warehouses in the region.

Even if firms were to relocate, Figures 3.16 and 3.17 shows that the current warehousing capacity in the regions further inland (such as the Central Valley, Nevada, or Arizona) is far below that of the Inland Empire and Los Angeles. Only with about a decade of developing and building warehouse space would these other regions have a warehouse inventory that comes close to matching the current amount in the Inland Empire. The long time frame required to develop a warehousing industry in other regions would give the Inland Empire

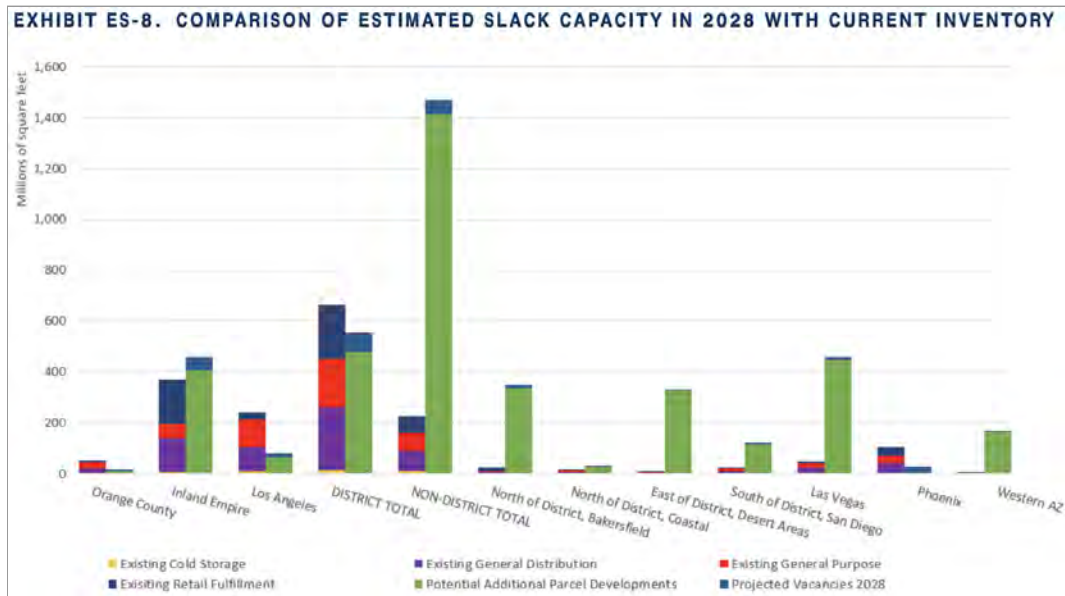
ample time to respond to the potential loss of logistics jobs, or to work with surrounding regions and states on imposing more stringent environmental regulations and standardizing them across regions (see Recommendation 3.1).

Figures 3.16 and 3.17: Potential Warehouse Square Footage Available in the Inland Empire and Surrounding Regions in the Medium-Term and Long-Term (10 years)



Source: IEc and CALSTART, 2020

“District Total” refers to the entire SCAQMD district”



Source: IEc and CALSTART, 2020

Examples of municipalities successfully negotiating with logistics companies

As a specific example, Amazon is known to negotiate for “tax abatements, credits, exemptions, and infrastructure assistance [from state and local governments ...] in the name of regional economic development” and job creation. Through encouraging inter-city competitions for its facilities, Amazon tries threatening local governments into offering these large economic incentives. Localities in California have thus far (up to at least 2018) avoided making such concessions to Amazon. In fact, the neighboring City of San Bernardino turned down Amazon’s request for a sales tax remittance deal in return for locating a facility there in 2012, yet Amazon still built its facility in the city without the deal (Harris 2018; Jones and Zipperer 2018). Eastvale, also in the Inland Empire, did not offer Amazon any incentives either, and the sales tax revenue the city gains from Amazon is enough to cover its operating budget (Waddell and Singh 2021).

‘Strengths, Weaknesses, Opportunities, Threats & Challenges’ Analysis of Fontana

A SWOT or SWOC analysis is a valuable tool in economic development which can identify a region’s ‘competitive advantages—those indigenous assets that make the region special or competitive in the national and global economies—juxtaposed against those internal or external factors that can keep a region from realizing its potential’ (U.S. Economic Development Administration 2021). By articulating strengths, weaknesses, opportunities, and threats or challenges, a city can target resources and develop strategies to deter threats, capitalize and strengthen opportunities, and continue to grow its strengths. The literature considers strengths and weaknesses internal factors which help or hinder goal achievement, while opportunities, threats, and challenges are considered external factors which may influence a strategy (Frick and Elizabeth 2017). The SWOT&C analysis (Figure 3.18) below was created by our team after conducting the detailed economic analysis above and provides information on what we believe to be the assets the region can utilize to continue to improve its economic resilience.

Figure 3.18: SWOT&C Analysis for Fontana

Strengths	Weaknesses	Opportunities	Threats & Challenges
Land availability	Land limitations	Educational institutions	Automation
Proximity to ports	Instability of development impact fees & spot rezoning fees	Environmental regulations	Supply chain disruptions
Highway network density	Lack of economic diversification	Unionization	Long term threats of warehouse relocation
Lower cost of living	Labor shortages	Spot zoning fees	Workforce retention
Proximity to market	Data collection, management, and dissemination	Locational advantages	Congestion
Educational Institutions	Auto dependency for freight and passenger movement	Coalition building	Vulnerability to global, political, economic, and social forces
History of labor unions	Air quality due to pollution	Grants and funding	Lack of headquarters
Civic buildings	Quality of life impacts	Data collection and management	Lack of coordination within the region
Access to open spaces	Shortage of "good" and "promising" jobs	New federal funding sources	Race to the bottom
Chamber of commerce	Displacement due to expulsive zoning & warehouse development	New federal funding sources	
Community, faith, and social groups	Lack of unionization	Developing multimodal freight transportation	
	Racial disparities in income & opportunity		

Strengths

- *Land Availability:* Fontana and many of its neighboring cities have attracted industry and economic activity through its abundance of large parcels of affordable,

developable land. This availability of land has also kept rental rates for distribution centers lower than in Los Angeles County adjacent to the Ports.

- *Proximity to Ports:* Located approximately 70 miles inland from the Ports of Los Angeles and Long Beach, logistics companies can make numerous round trips from the Ports to Fontana each day using freight trucks.
- *Highway Network Density:* Uniquely positioned between I-10 and I-15, Fontana is ideally positioned for automotive transportation access for commuters, residents, and logistics companies.
- *Lower Cost of Living:* With a lower comparative cost of living than many communities closer to Greater Los Angeles, Fontana has been able to attract families and workers which both stay in the city to work and commute to adjacent cities.
- *Proximity to Market:* With a sizable consumer market in California's densely populated coastal cities, logistics companies have been attracted to regions adjacent to these markets in order to fulfill one- and two-day delivery expectations.
- *Educational Institutions:* Within a strong school district, trade schools, and close proximity to educational institutions like University of California, Riverside and California State University, San Bernardino, Fontana can continue to grow its educational attainment levels and attract graduates from nearby institutions.
- *History of Labor Unions:* The City of Fontana can use its history of strong labor unions during the Kaiser Steel Mill era to collectively negotiate and advocate for the continuous betterment of workplaces and working conditions.
- *Civic Buildings:* The City of Fontana has an abundance of well maintained civic buildings and spaces (e.g. Libraries, parks, and pools) that are attractive to workers and residents alike.
- *Access to Open Space:* Fontana's abundance of parks and proximity to the San Gabriel Mountains makes it attractive for people seeking to be near outdoor amenities.
- *Chamber of Commerce:* Fontana's strong Chamber of Commerce allows the city to make collective development decisions.
- *Community, Faith, and Social Groups:* Fontana's abundant and strong community and social groups allow residents to develop collective voice and allow for coalition building.

Weaknesses

- *Land limitations:* Land within the city limits available for the development of warehouses is limited.
- *Instability of development impact fees and spot rezoning fees:* Because land available for the development of warehouses within the city limits is limited, funds from

impact fees and from spot rezoning fees are limited. Development impact fees and spot rezoning fees are not a sustainable revenue stream.

- *Lack of economic diversification:* The City of Fontana has heavily invested in the warehousing and logistics industry and as a result has overlooked investing in other industries and diversifying the economy. This lack of economic diversity means that the success of the local economy is dependent on one industry's success.
- *Labor shortages:* There are currently labor shortages in the Inland Empire which affects the industry of warehousing and logistics. Many firms are unable to fill vacant positions, and there is a shortage of truckers (Ngo and Swanson 2021).
- *Data collection, management, and dissemination:* While the city does have an open data portal, there is very limited data available on it.
- *Auto dependency for freight and passenger movement:* Because of its placement in the Inland Empire and the auto-centricity of the region, the City of Fontana is very dependent on vehicular movement. 90% of Fontana residents commute to work by car, and although freight travels through the city by rail, because there is no freight pooling station, goods coming into and out of the city are primarily transported by trucks.
- *Air quality due to pollution:* Because of its geographic location and the high auto-dependency of the city and region, the Inland Empire has poor air quality. In addition to the negative health outcomes associated with air pollution like higher rates of asthma, the effects of COVID-19 are exacerbated (Ober 2021). Census tracts in the South-West of Fontana see some of the highest rates of air pollution in the state (Bonta 2021).
- *Quality of life impacts:* Living among warehouses negatively impacts residents' quality of life. Trucks servicing warehouses cause noise pollution, congestion, and more severe collisions, creating less safe roads (Chen et al. 2020).
- *Shortage of "good" and "promising" jobs:* The Brookings Institute reports the the Inland Empire has a shortage of "good and promising" jobs; "'good jobs' refer to those that provide middle-class wages and benefits and 'Promising jobs' are entry level jobs that provide career pathways to good jobs" (Gootman 2019).
- *Displacement due to expulsive zoning and warehouse development:* When land is rezoned from residential to industrial use, it can displace residents who currently live there (Bonta 2021).
- *Lack of unionization:* While there are many unions present in the region, because workers in the warehousing and logistics industry specifically are not unionized, they cannot collectively bargain for better working conditions and livable wages.
- *Racial disparities in income and opportunity:* The region and the city have a shortage

of “good and promising jobs,” which disproportionately affects racial minorities. Of members of the workforce with the same educational attainment, Black men and women are less likely to hold good and promising jobs than non-Hispanic residents of other races (Gootman 2019).

Opportunities

- *Educational Institutions:* Fontana is home to a community college and close to regional campuses including UC Riverside and California State University, San Bernardino that can anchor a diversified economy by partnering with public and private actors to offer workforce development programs
- *Environmental Regulations:* There is an opportunity to introduce new environmental regulations that improve the quality of life for Fontana residents by reducing pollution and congestion from logistics and warehousing
- *Unionization:* Unionization provides a pathway for collective bargaining contributing to better working conditions, higher wages, and better benefits, improving the quality of low wage work
- *Spot Zoning Fees:* Fees on rezoning land to industrial use generate discretionary income for the city. The City can create a process for allocating these funds to mitigate impacts of the development of these warehouses and invest in placemaking in the city. Additionally, when creating this process, the City should better document the legal nexus for requesting these funds
- *Locational Advantages:* Fontana has locational advantages including access to highways, airports, and proximity to the ports of LA and Long Beach that make it particularly attractive for warehousing. SCAQMD has found that increasing warehouse operating costs by up to \$2 per square foot is unlikely to lead to warehouse displacement in the short- to medium- term and that as a result there is room for additional warehouse regulation (IEc and CALSTART 2020)
- *Coalition Building:* Building coalitions with environmental justice and community advocates is critical to correct past trends of unequal growth and building a just and inclusive future
- *Grants and Funding:* There are opportunities to pursue grants at the regional and state levels to fund truck electrification and other green infrastructure projects
- *Data collection and management:* There is an opportunity for the city to implement data sharing requirements to improve the city's knowledge of warehousing activity
- *New Federal Funding Sources:* While details are currently unclear, Build Back Better will likely expand federal funding for infrastructure projects including goods movement and clean energy projects

- *Developing Multimodal Freight Transportation:* Currently Fontana relies on automotive modes to transport freight between ports, warehouses, and customers. There is an opportunity to advocate for funding multimodal freight transportation to reduce impacts from trucks that include congestion and pollution

Threats & Challenges

- *Automation:* With recent technological breakthroughs are increasing many industries' vulnerability to automation, and the logistics industry, where up to 75% of its jobs could be robotized, is particularly more vulnerable than other economic sectors. Occupations less vulnerable to automation include those which use skills including inductive reasoning and complex-problem solving. Fontana can prepare for automation by moving up the value chain within the logistics industry (Gootman 2019).
- *Supply Chain Disruptions:* Fontana may be vulnerable to global supply chain disruptions caused by forces outside of their control with an economy based solely in the warehousing and logistics industry.
- *Long-Term Threats of Warehouse Relocation:* Increased costs of operating distribution centers in the state of California may lead companies to relocate to adjacent states.
- *Workforce Retention:* Low quality, low-paying jobs in warehouses can exacerbate labor shortages and may make it difficult to retain workers in the industry
- *Congestion:* High rates of auto dependency in passenger and goods movement creates congestion which reduces the efficiency of trucking and logistics activity
- *Vulnerability to Global, Political, Economic, and Social Forces:* The level of goods movement activity is largely determined by global macroeconomic conditions, and can also be influenced by unforeseen events such as natural disasters, global pandemics, and political activity like trade policy
- *Lack of Headquarters:* The largest local employers are not headquartered in Fontana, exposing Fontana to greater risk that employers may choose to relocate
- *Lack of Coordination Within the Region:* Without coordination and communication between cities and key stakeholders across the Inland Empire, Fontana may be vulnerable to competing local employment incentives.
- *Race to the Bottom:* Competition within the region for warehouses may lead to municipalities competing for warehouses on the basis of cost, depressing wages and local tax revenue

Recommendations

The following is a list of recommendations to support economic development related to the above analyses. While many of the recommendations are actions the city can take to make their economy more resilient, sustainable, equitable, and encourage the development of “good” and “promising” jobs, some of the recommendations target regional or state actors or require collective action. The recommendations are organized by geographic scale, starting with local recommendations and expanding to regional and state.

Recommendation 3.1: Regulate the warehousing and logistics industry

Scale: National, State, Local. The City of Fontana and other municipalities in the region should not shy away from imposing more stringent regulations on the warehousing and logistics industry. The Inland Empire is inherently attractive to the logistics industry due to its location and infrastructure network. This, together with the difficulty and time required to set up a new logistics cluster elsewhere, means that warehousing companies are unlikely to leave the Inland Empire in large numbers. Any shift of warehousing jobs to nearby municipalities would just mean a slightly longer commute for affected workers, and is unlikely to have a large impact on the city’s economy. Additionally, the blue-collar jobs offered by the warehousing industry are neither high-paying nor high-skilled. Hence, as the city and the region slowly shifts its job balance, the threat of job losses in the warehousing industry is reduced. Environmental and labor regulations for the warehousing and logistics industry are ultimately needed to protect the health and wellbeing of the residents and workers of Fontana, so enacting them sooner rather than later will give Fontana a head start and lead the region in adapting its economy to diversify beyond the logistics industry.

Recommendation 3.1a: Direct development impact fees and warehouse mitigation fees towards community benefits

Scale: Local. Development Impact Fees can be used to help create a sense of place in the City by using revenue to help build and maintain parks and other recreational facilities, to calm traffic and create safer roads, and fund community centers and other local amenities.

Recommendation 3.1b: Require warehouse and distribution centers to sign community benefits agreements (CBAs) and project labor agreements (PLAs)

Scale: Local. Through this requirement, the warehousing and logistics industry can better support workers, residents, and environmental sustainability. The City of Fontana can turn to Riverside County as a model for how to develop community

benefits agreements. Riverside County currently utilizes this funding stream to support pollution mitigation and offset programs (Becerra 2021).²

Recommendation 3.1c: Become a more hospitable environment to union formation

Scale: National, State, Local. By strengthening the presence and power of unions in and around Fontana, the region can develop and sustain coalitions which support a path forward for economic development which supports “worker rights, skill investment, and wages and benefits.” As opposed to employers seeking a competitive advantage through lower wages “and shifting costs and risks onto workers,” unions play a critical role in establishing a “framework of rules and organizational structures to regulate economic development in a way that closes off the low road and builds the high road” to economic development (Greer, Byrd, and Fleron 2018).

Recommendation 3.1d: Work together with neighboring municipalities in the Inland Empire on warehousing and logistics regulations

Scale: Regional. Instead of competing with each other for firms to locate within their jurisdictions, municipalities in the Inland Empire should work together to impose a region-wide minimum level of regulation for the warehousing and logistics industry, and ensure that no undue incentives are acceded to warehousing and logistics companies by individual cities. This would help prevent a “race to the bottom” as municipalities try to attract warehouses with various incentives. With such agreements in place, cities in the Inland Empire can rely on the inherent locational benefits of the Inland Empire to the warehousing and logistics industry to keep the industry in place, and not worry about individual companies relocating to a neighboring jurisdiction for a better ‘deal’.

Recommendation 3.2: Documentation of discretionary fund processes

Scale: Local. The City should better document the legal nexus for requesting these funds, per *Nollan v. California Coastal Commission* 483 U.S. 825. In addition, the city should develop and document a process for publically allocating how these funds are spent.

Recommendation 3.3: Direct discretionary funds to programs to mitigate impacts of warehouse construction and operations

² Please see Section 4: Labor & Coalition Building for additional discussion of recommendations 4.1b.

Scale: Local. The City should create a process for allocating these funds to mitigate impacts of the development of these warehouses and invest in placemaking in the city. The City should consider directing these funds to initiatives which, for example, capture air quality data, mitigate pollution through electric vehicle infrastructure, and provide additional green and recreational spaces. The fund can also be used to help the city build capacity to enforce laws that are not currently being enforced (see Recommendation 3.6).

Recommendation 3.4: Build collaborative relationships between educational institutions and employers

Scale: Local. The City should facilitate a collaborative relationship between educational institutions and local and regional employers.

Recommendation 3.5 Avoid excessive rezoning of land to industrial uses

Scale: Local. As discussed in the section on the Fiscalization of Land Use, excessive conversion of residential land into a single non-residential use discourages compact development. This is especially apparent in Fontana's rezoning of large areas for warehousing uses given the sheer size and floor area required of these building. The resultant sprawl would work against Fontana's active transportation initiatives and make the formation of compact live-work communities more difficult. Traffic congestion and accidents may also increase with the increased truck traffic going through the city's street network (Chen et al. 2020). The proximity of some of these new warehousing lots to residences and schools could also be a concern in terms of air pollution generated by trucks serving the new site.

Recommendation 3.6 Enforce City rules and regulations on warehouses

Scale: Local. The city should ensure that it has enough enforcement and monitoring capability for all of its rules and regulations. Without such enforcement of its laws, an unfair advantage is given to the companies that choose to ignore city regulations and do business in a cost-cutting manner that hurts the city and its residents. In the longer run, the investment taken to ensure that companies are compliant should pay for itself, leading to a better cityscape for beautification rules, better city finances for development and other fees, and better health for residents for environmental regulations. The discretionary fund can also be used to help the city build up its enforcement and monitoring capabilities.

Recommendation 3.7: Promote “just growth” in warehousing and transportation cluster

Scale: Regional. Currently, the Warehousing and Transportation cluster is the city and region’s primary economic cluster and what the region specializes in. Because of its current specialization, our team recommends strategically growing this industry cluster by encouraging unionization of the workforce to eliminate the jobs paying below a living wage and move up the value chain by participating in the production of innovative technology to advance the sustainability and efficiency of this industry, in turn, creating more “good” and “promising” jobs. By following strategies of high road economic development, Fontana will maintain its strategic advantage in this industry despite threats of automation and environmental regulation, foster equitable and environmentally just growth. This strategy could also help retain college educated individuals who leave the region upon graduating.

Recommendation 3.8: Develop an Advanced Green Manufacturing Industry Cluster

Scale: Regional. With a long history in manufacturing, the Inland Empire already has a competitive advantage in this industry. To Enable Fontana and the Inland Empire to become a global leader in Advanced Green Manufacturing, the region should expand “advanced manufacturing in the region by strengthening the competitiveness of existing firms and ecosystems” (Inland Economic Growth & Opportunity 2019). With CARB’s new headquarters in nearby Riverside, Fontana is strategically located to take advantage of the scientific, technological, and policy expertise CARB provides to innovate in this space. The development of this cluster will drive wage growth, improve competitiveness for the City and region’s business, reduce air pollution and congestion, and create wealth-building opportunities (IEGO 2020).

Recommendation 3.9: Reform sales and property taxes

Recommendation 3.9a: Conduct research on sales and property tax policy reform

Scale: Regional, State. Fontana, in collaboration with other municipalities, should push for regional governments and the state to conduct more research into reforms for sales and property tax policy, so as to ensure a more equitable distribution of resources based on costs and externalities generated by local industries. Two ideas are listed below as potential starting points.

Recommendation 3.9b: Work with regional partners to share sales tax revenue regionally

Scale: Regional, State. As suggested by Chapman (1998) and Chapple (2018), sharing sales tax and other tax revenues on a regional basis would discourage municipalities from land conversion for fiscal reasons, since the fiscal benefits would be shared with other municipalities within the region. Such schemes are reasonable given the regional nature of the labor market (Chapple 2018). However, care must be taken to not implement tax sharing in an inequitable manner, such as transferring resources from communities near warehouses and along truck routes, to wealthy suburbs far away from environmental harms. Moreover, implementing a regional sharing scheme for sales tax could be politically difficult, as it could be seen as an erosion of local control (Lewis 2001).

Recommendation 3.9c: Work with regional and state partners to reform property tax policy, including alternative ways to allocate property tax revenue

Scale: Regional, State. Even under the property tax limits in California under Proposition 13, fiscalization of land use could be curtailed by reforms to return more property tax to municipalities, reallocate property taxes on a regional basis, or allow for more local control on property tax (Chapple 2018; Lewis 2001), by reducing the financial incentives that commercial properties can bring to a municipality.

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Labor & Coalition Building

This section will describe what warehouse employment can be like for the most vulnerable people employed in the industry -- those in 'unskilled' low wage positions -- in the region, focusing on precarious hiring practices, low wages and wage theft, dangerous working conditions, and other common practices.

As discussed in Section 3, people commute to Fontana from other municipalities for Trade and Transportation sector work, and Fontana residents commute to other municipalities for warehousing work as well. As such, this section will consider workers throughout the Inland Empire. We will examine organizing efforts around warehouses and warehouse labor in the region and make recommendations to the city about how to engage with coalitions. This section relies heavily on a cluster of researchers and academics that have studied warehousing and employment in the Inland Empire for more than 14 years.

It is important to note that many warehouse workers are Latinx and that their racialized identities exacerbate the precarity of their employment. We will not delve into the ways that race impacts the experiences of warehouse workers; to better understand this important aspect of warehouse labor in the Inland Empire, we recommend reading "The matrix of exploitation and temporary employment: Earnings inequality among Inland Southern California's blue-collar warehouse workers" by Juliann Emmons Allison, Joel S. Herrera, Jason Struna, and Ellen Reese, as well as other works by these authors.¹

Introduction

Fontana and municipalities throughout the Inland Empire play an important role in America's connection to the global supply chain. The ports of Los Angeles and Long Beach together process 17 million Twenty-foot Equivalent Units (TEUs) annually (Port of Los Angeles 2021; Port of Long Beach 2021). All of these goods must be stored, processed, and distributed in the region, primarily the Inland Empire.

¹ Emmons Allison, Juliann, Joel S. Herrera, Jason Struna, and Ellen Reese. 2018. "The Matrix of Exploitation and Temporary Employment: Earnings Inequality among Inland Southern California's Blue-Collar Warehouse Workers." *Journal of Labor and Society* 21 (4): 533–60. <https://doi.org/10.1111/wusa.12366>.

It is the people of the Inland Empire who make this work happen. Their physical labor is an integral part of the global supply chain. Without it, the supply chain breaks. The seeming abundance of 'cheap labor' in the region is a documented part of the attraction of warehouses and logistics businesses to the region, in addition to its pivotal location next to highways and the ports (IEc and CALSTART 2020).

Warehouse Labor

'Warehouses,' 'logistics centers,' 'distribution centers,' 'e-commerce centers,' and 'industrial commerce centers' are only some of the names for the diverse arrangements of goods movement in the Inland Empire. Some warehouses serve traditional retail operations, while others serve the growing e-commerce industry. Some retailers own the storage and distribution facilities they use, while others contract with independently owned warehouses or third party logistics groups (3PLs) to perform storage, sorting, and the like or manage others' work. Likewise, some firms and 3PLs hire their workers directly, while others use temporary employment agencies (temp agencies) to hire temporary employees ('temps') (Gutelius and Theodore 2019). As discussed below, temp agencies are used to hire people for a few days to multiple years, which causes employment precarity.

Temporary Labor

Temp agencies are not unique to the Inland Empire or to the logistics industry. Nationally, employment in temporary labor has been on the rise since the 1990s. Across all occupations and industries, the average weekly hours of temp employees has decreased from 35 hours per week to 34 since 2014, indicating that more people are working fewer hours through temporary employment (Luo, Mann, and Holden 2010; 2021).

In 2018, 610,000 people worked as temps in warehouse-related occupations, constituting 17% of temporary laborers nationally, according to the Bureau of Labor Statistics. Between 2010 and 2018, laborers within the transportation and materials moving occupations (the classification for most people working in warehouses) were the largest portion of temporary workers nationally. As of 2018, more than 1 in 5 'laborers and hand freight, stock, and material movers' are employed through temp agencies. Though not the focus of this report, it is important to note that temps in industrial truck and tractor operating -- a critical part of the logistics industry in the Inland Empire -- also grew during the same time period. One tenth of all people employed in this occupation across all industries are temps (Lou et al 2021).

The Bureau of Labor Statistics likely does not count every temporary employee, as their statistics rely on numbers reported by the temp agencies. It is difficult to quantify the fluctuations of workers regularly in and out of employment at different agencies and within different warehouses in a single number (De Lara 2018, chap. 6).

How do companies benefit from using temporary staffing? Flexible staffing optimizes efficiency within the supply chain; temp agencies enable distribution centers to have the exact number of workers necessary at a given time, which eases the administrative work of hiring or firing permanent employees. This enables warehouses and their staffing companies to scale up in size for high-productivity months. It also enables companies to pay workers less for very strenuous work (Bonacich and De Lara 2009). Even without temp agencies, warehouse companies can and do still maintain flexibility in their directly hired labor pool by changing shift lengths after shifts have begun. (Loewen 2018).

Vulnerable Employment

The next section discusses ways warehouse work leaves people employed in the industry open to harm. Warehouse employees were recognized as frontline workers early in the COVID-19 pandemic (Alamo 2020); despite their pivotal work in maintaining the flow of goods to people across the country, for many the terms of their employment leave them vulnerable.

Hiring people for short-term or long-term periods through temp agencies creates vulnerability. Workers do not have security in the terms of their employment and therefore cannot make long-ranging financial plans or investments. Short-term employment, for weeks or months, means individuals must constantly devote time and energy to securing future employment. Long term employment through temp agencies denies people access to company benefits, though even direct employment may not result in stable, well paid jobs.

No benefits

Warehouse workers hired indirectly do not receive company benefits, like vacation time, paid sick leave, or health insurance. In general, warehouse workers are under-insured. A UC Riverside study of both temp and directly-hired workers found that only 35% of respondents had any kind of health insurance (Allison et al. 2015), despite that the majority of respondents (78%) worked at least 35 hours a week. Other research shows that about one third of Latinx warehouse workers in the Inland Empire delay seeking medical care due to costs and that, overall, survey respondents seek medical care less than the national

average. There is a statistically significant relationship between workers' temporary employment status and decreased visits to medical care (Emmons Allison et al. 2017).

High injury

Low rates of insurance are especially notable because of the high-rate of workplace injury experienced by warehouse workers. Companies value workers maintaining a fast pace while moving heavy objects and actively incentivize workers to physically extend themselves to improve efficiency. Consequently, workplace injuries are common in distribution centers (Warehouse Workers United and Cornelio 2011). Amazon warehouses specifically are known for having nearly twice the rate of workplace injury as non-Amazon warehouses ("Primed for Pain: Amazon's Epidemic of Workplace Injuries" 2021; Greene and Alcantara 2021).

Nationally, injuries are reported twice as often in warehousing than in all private industries (Bureau of Labor Statistics 2018). There is likely under-reporting to the Bureau of Labor Statistics of workplace injuries in warehousing. If workplaces do not record and report injuries, they can more easily deny that injuries are workplace-related and avoid insurance issues. Additionally, people are less likely to report injuries when they are afraid of losing their positions, missing work, or retaliation (Struna 2015, sec. Injury and Illness).

Wage theft

Wage theft has been common in low-paying jobs nationally for decades (Bernhardt, Milkman, and Theodore 2009) and the Inland Empire is no exception (Cal/OSHA 2021) and . Over \$27 million in wages have been returned to warehouse workers in the region the past 5 years, and the California Labor Commission's "Wage Theft Is A Crime" campaign specifically targets the Inland Empire region (Bernstein 2017). Extended shifts without overtime or breaks for basic needs -- in order to handle the peaks in goods -- are a common example of wage theft in warehouses. AB 1003 increases the penalty to companies for intentional wage theft (Gonzalez 2021). AB 1003 is not a perfect solution; this process still relies on workers filing citations, which can be an arduous process.

There are also more subtle forms of wage theft in the industry through the use of charge cards. When temp agencies use charge cards to process their payroll, they move the cost burden of payroll onto workers. If a person is unbanked or under-banked, they can incur transaction fees or inactivity fees while accessing their wages. In order to keep these cards active, workers must leave a minimum balance, meaning they are unable to access their entire paycheck (De Lara 2018, chap. 6).

Wages

This section discusses the disparities between a living wage, median hourly wages, and the wages of temporary and part-time workers in the logistics industry in the Inland Empire.

Official Bureau of Labor Statistics data from the first quarter of 2020 describes median and mean wages for various warehouse occupations in Riverside and San Bernardino Counties in Figure 4.01. The two most common positions -- “Stockers and Order Fillers” and “Laborers and Freight, Stock, and Material movers, Hand” -- collectively officially include 114,730 people in San Bernardino and Riverside counties. The median and mean reported wages vary slightly -- \$14.80 and \$14.96 versus \$16.92 and \$17.56, respectively -- but both are below the minimum living wage for the MSA region of \$18.48 for a single person to support themselves.

Figure 4.01 does not include wage information for temporary workers or workers employed at e-commerce sites, both of which are categorized with different NAICS codes (Gutelius and Theodore 2019).

As has been pointed out through conversations with Fontana city staff, there are positions available with much higher wages, such as some of those at Amazon facilities in the region that pay \$25.00 an hour. We, the authors of this report, cannot stress enough that such positions do not represent the majority of employment opportunities in the industry, especially for residents without associate or bachelor degrees. A casual look at anonymized payroll analysis, such as that provided by ZipRecruiter, shows that, as of November 2021, 74% of ‘warehousing’ positions available in Fontana offer less than \$25.00 an hour and that ‘Amazon warehouse’ positions in the area pay on average \$14.30 to 15.30 an hour (ZipRecruiter 2021a; 2021b; 2021c; 2021d). These numbers align with wage data presented in Section 3 and in Figure 4.01 below.

Figure 4.01 Occupational Employment (May 2020) & Wage (2021 - 1st Quarter) Data for Transportation and Material Moving Occupations in Riverside-San Bernardino-Ontario MSA

Occupational Title	May 2020 Employment Estimates	Median Hourly Wage	Mean Hourly Wage	Mean Annual Wage
<i>MSA regional living wage</i>			\$18.48	\$38,438
Stockers and Order Fillers	57,780	\$14.80	\$16.92	\$35,202
Laborers and Freight, Stock, and Material Movers, Hand	56,950	\$14.96	\$17.56	\$36,519
Packers and Packagers, Hand	12,850	**14.00	\$14.68	\$30,529
Driver/Sales Workers	5,480	\$16.38	\$18.25	\$37,960
Cleaners of Vehicles and Equipment	4,310	**14.00	\$14.73	\$32,711
Machine Feeders and Offbearers	2,260	\$16.85	\$17.03	\$35,439
Material Moving Workers, All Other	960	\$14.56	\$16.64	\$34,625

Source: OEWS Employment and Wage Statistics Data Tables, Employment Development Department for the State of California. Geographic Area: Riverside-San Bernardino-Ontario MSA. 2021 1st Quarter.

<https://www.labormarketinfo.edd.ca.gov/data/oes-employment-and-wages.html#OES>

***: California minimum wage is currently \$14.00.

Historically, prominent regional economists and other professionals associated with SCAG supported the growth of warehousing in the region in large part due to proposed higher wage jobs for lower income workers. However, their arguments were based on economic calculations that included broad categories of higher paying jobs that are neither prominent in the industry as represented in Fontana nor available to many residents of Fontana due to educational attainment and training (De Lara 2018, chap. 6).

Independent research in the past 10 years suggests many workers in the region make less than official Bureau of Labor statistics numbers. In a 2013 study of warehouse workers, researchers found that survey respondents and American Community Survey (ACS) data for Riverside and San Bernardino Counties reported workers making well below a living wage. Of respondents working at least 20 hours a week, the median annual income was \$15,000. ACS data showed directly hired workers making slightly more, at \$20,000 annually (Allison et al. 2015). \$15,000 annually amounts to less than the 2013 California minimum wage of \$8.00 an hour at full time.

Nationally, warehouse worker wages have fallen since 2001 when adjusted for inflation, despite the success of the industry and rise in employment numbers in that time (Gutelius and Theodore 2019).

When workers are only hired for part-time or short term positions, they will make less than the yearly mean wages listed, as described in the previous section. When workers are forced to use pay cards instead of receiving cash or check wages, they implicitly lose money due to the fees associated with the card. These practices ultimately harm residents of Fontana and the Inland Empire.

Recommendations

Fontana has a vested interest in protecting their residents and individuals employed within city bounds. Protecting and improving labor rights is not anti-development or anti-business. Rather, it is the city's duty as a public, regulatory body to ensure the wellbeing of its most vulnerable. As has been discussed throughout the report, the warehousing and logistics industry is rooted in the Inland Empire, and further regulation is unlikely to push companies away.

We reiterate the following recommendation from Chapter 3:

Recommendation 3.1b: Require warehouse and distribution centers to sign community benefits agreements (CBAs) and project labor agreements (PLAs)

CBAs can include financial support for community resources, commitments to job training programs, investment in air filtration systems at neighboring households. It is important for CBA negotiation to involve a broad coalition of community groups to accurately represent affected individuals (Beach and The Partnership for Working Families 2014). PLAs can include requirements for direct employment minimums and acknowledgement of and

support for workers' rights to unionize. These agreements mitigate the potential harms of employment in warehouses, and these processes can expand Fontana's engagement practices.

Labor agreements can create a path for union formation within the industry in Fontana and the Inland Empire. Unions give workers a greater voice in the workplace and an organized means of making complaints and protecting their safety and wellbeing. Research shows that unionized logistics workers make higher wages, ultimately resulting in greater spending power in their communities that could further stimulate Fontana's economy (Bonacich and De Lara 2009).

Recommendation 4.1: Work with regional partners to raise the minimum wage

The California minimum wage is currently \$14.00 an hour and slated to increase to \$14.00 an hour by 2023. This is currently under the necessary living wage for Riverside and San Bernardino Counties. A 20 year national study has demonstrated that raising minimum wages improves racial equity by shrinking the wage gap without demonstrable disemployment (Wursten and Reich 2021). Other cities throughout California, including neighboring Los Angeles and Los Angeles County, have set higher minimum wages. We recommend that Fontana work with other local governments to pass a higher minimum wage indexed to cost of living adjustments.

Recommendation 4.2: Increase worker protections.

Recommendation 4.2a: Work to increase Division of Occupational Safety and Health (Cal/OSHA) funding

The City of Fontana and neighboring municipalities should work with their state legislators to make increasing Cal/OSHA funding a priority and to prioritize the hiring of inspectors in the Southern California region. Cal/OSHA, also known as the Division of Occupational Safety and Health (DOSH), sets and enforces standards to protect and improve the health and safety of working Californians, among many other activities.

Fontana can work with neighboring municipalities to lobby the state for more OSHA funding to benefit all workers, not just warehouse employees, so that regulations around work breaks, indoor temperatures, and other workplace regulations have a better chance of being enforced for the health and safety of Inland Empire residents and workers.

Cal/OSHA is and has been under-funded and under-staffed for many years, resulting in slow citation processing and an inadequate number of inspectors to enforce critical work safety rules (Cal/OSHA 2020; Botts and Tobias 2020; Lee 2021). While laws such as the forthcoming AB 701, regarding productivity minimums, empower workers to enforce workplace regulation on their own, more can be done to ensure these rules are actually enforced (Hussein and Stecker 2021; Hussain 2021).

Recommendation 4.2b: Create local mechanisms to enforce state labor laws

The City of Fontana can create an inspection team to cite logistics firms for breaking pertinent state labor laws. One way to do this could be partnering with a local nonprofit organization like the Warehouse Workers Resource Center (discussed in the next section) to expand their capacity and outreach abilities. The discretionary fund described in Section 3 could be used to fund these efforts.

Coalition Work

The sections above have discussed how warehouse workers' employment is precarious, how Inland Empire warehouse workers do not make a living wage to support a single person, and how their workplaces endanger them. This section will focus on how warehouse workers and allies have been building power and how the City of Fontana and other municipalities can engage with these coalitions and organizations like them.

Collective Organizing

Due to the precarious nature of warehouse employment, organizing warehouse workers requires broader community organizing. The multi-tiered hiring schemes resulting from temporary and short-term employment make traditional union organizing difficult (Bonacich and De Lara 2009). Organizers have identified that it is critical to work not only with people who currently work in warehouses but also those who have in the past to build collective power. This kind of organizing is increasingly common in the US; it lends itself to bargaining for the common good ("Examples of Bargaining for the Common Good Demands" 2019).

Warehouse Workers Resource Center

There has been one primary hub for organizing warehouse workers in Southern California: the Warehouse Workers Resource Center (WWRC). Located in Ontario, California, WWRC and its predecessor, the Warehouse Workers Union (WWU), have provided important support for warehouse and other logistics workers in Southern California since 2008.

Currently WWRC offers advocacy, education, resources and services to warehouse workers and their families. Their work ranges from teaching English classes and workers rights to administering COVID relief funding and offering legal services (“About Us” 2021; Reese and Bielitz 2021).

WWU began organizing warehouse workers through canvassing in 2008 and, together with a diverse array of organizing partners, pressured warehousing companies in the region via legal action and protest to recognize the necessity of paying workers a fair wage in a safe environment, regardless of whether they were hired directly (De Lara, Reese, and Struna 2016). They have continued to support warehouse workers through the recession and expanded to offer more services as the WWRC in 2011. Their research and advocacy has resulted in new Cal/OSHA regulations and millions of dollars in stolen wages -- many largely from unpaid overtime -- being returned, among other victories (Reese and Bielitz 2021).

Coalition Building

WWRC is part of a network of progressive centers, including the Los Angeles Alliance for a New Economy (LAANE), who pioneered the use of CBAs, and warehouse worker centers in other states. In addition to joining national campaigns such as Making Change to Walmart, they work closely with a number of regional nonprofit organizations, including the Inland Coalition for Immigrant Justice (IC4IJ), who work to protect immigrants in the region; the local Sierra Club chapter, who have campaigns focused on truck emissions and public health; and the Center for Community Action and Environmental Justice (CCA EJ), who also focus on increased environmental regulation from the goods movement industry (Reese and Bielitz 2021).

This kind of coalition work, where many seemingly disparate groups can unite around specific issues, is unique and takes time and intention to form. WWRC and partners led multiple smaller projects, such as environmental justice tours of facilities, before taking on larger work together (Reese and Bielitz 2021).

While we were unable to interview organizers due to limited time, it is clear from the detailed literature that WWRC’s and partners’ work has been integral to the protection of labor rights for warehouse workers in Southern California and throughout the state. In the following section, we consider how Fontana and local jurisdictions can better engage with this pivotal work for the betterment of their residents and workers.

Recommendations

The broad scope of interests this coalition represents -- from air quality to labor rights -- should not be suppressed or ignored. Municipalities like Fontana can support the work of WWRC and their partners in a number of ways, discussed in the recommendation section below.

Recommendation 4.3: Develop proactive, ongoing, and committed engagement strategies

The City of Fontana can use its position as a civic leader to partner with coalition members to co-create spaces to discuss and make decisions with coalitions working in the warehousing space, concerned residents, unions, and other stakeholders. These processes could be used, for example, to determine the aforementioned good neighbor policy

As this section and others demonstrate, there are many people who care very deeply about warehouses, the logistics industry, and everything they entail; they deserve adequate civic space to contribute to decisions.

These processes -- whatever form it may take -- should include the following qualities:

1. *Co-create them*: The City can work with the labor-environmental coalitions discussed earlier and others to create what these engagement processes could look like together. It is important to be clear about how decisions will be made throughout these processes. For example, if a series of surveys and meetings is selected, who will arbitrate through the feedback to select a path forward?
2. *Be accessible*: An accessible engagement process ensures people are compensated for the time they spend contributing. While representatives from industries or people employed at nonprofits are likely 'working' while contributing to such meetings, residents are likely attending during their free time.

Other means of making engagement accessible include providing translation services so that all members of the community will be understood; providing childcare services during the event so that parents and guardians can attend without incurring childcare costs; providing meals; planning events at varied times; attending others' events instead of exclusively hosting separate events; and utilizing a variety of engagement methods beyond in-person meetings.

3. *Have teeth*: The decisions made through these processes need to be concrete, actionable, and enforceable. The hard work and time spent by stakeholders should be honored by having their decisions upheld.
4. *Be ongoing*: Warehousing and distribution have changed in the past decade and will continue to change. Community decisions made to protect residents and workers will need to change in response to them, so these processes should be ongoing and evolve with them.

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Air Quality, Pollution Monitoring, and Action

This section reviews the well-documented negative impacts of pollution on local health as well as the sources of these emissions. Our analysis focuses on Fontana and warehousing-related air pollution.. Although warehouses do not directly contribute heavy amounts of pollution, activity at these sites attracts mobile sources of pollution. The California Air Resources Board notes that heavy-duty trucks are responsible for more than 50 percent of nitrogen oxides and fine particle pollution from all mobile sources in the state. (Lambert 2021). These impacts are both local and regional, with studies indicating that in addition to known adverse environmental and health impacts, air pollution from warehousing activity exacerbates social disparity in the Southern California region. Notably, warehouses facilities “are approved in communities already experiencing pollution burdens from toxic facilities,” encroach on sensitive land uses like schools, and “are more likely to be located in neighborhoods with lower median income and higher levels of poverty.” (Torres et al. 2021)

Due to the lack of available data, we recommend pursuing monitoring as a means of documenting pollution. However, without removing the sources of air pollution from the area, its negative impacts will persist. Additionally, we want to acknowledge that there are immense climate change impacts associated with the pollutants discussed in this section. Because we are focusing on the local impacts, we have determined discussing climate change is outside the scope of this report.

Sources of Emission

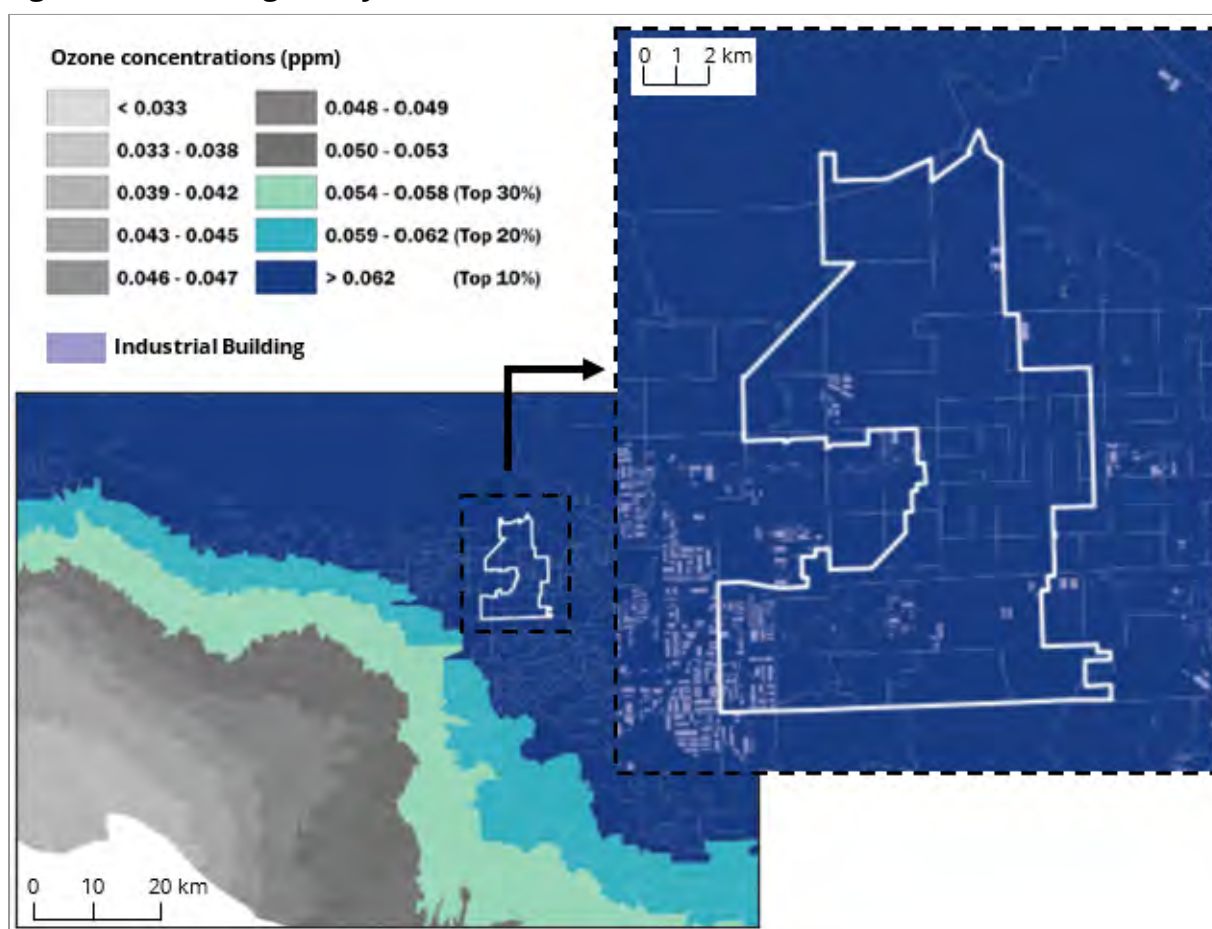
Mobile Sources

Mobile sources of emissions (e.g. cars, trucks, etc.) are the largest sources of air pollution in the United States. The transportation sector represents 29% of all greenhouse gas (GHG) emissions, a quarter of which come from medium-heavy and heavy-heavy trucks (US EPA 2015). Weight ranges for various truck classifications are defined in Figure 5.01. Vehicle emissions include greenhouse gases like CO₂ and CO, smog-forming ozone (O₃), nitrogen oxide (NO_x), and fine particulate matter (PM 2.5 and PM 10). Even in small concentrations, these pollutants can have detrimental impacts on one’s health.

Figure 5.01: Truck Classification Table

Light-Heavy (4.25 - 7 tons)	
Medium-Heavy (7 - 16.5 tons)	
Heavy-Heavy (over 16.5 tons)	

Source: US EPA 2015. Icons sourced from Flaticon.

Figure 5.02: Average Daily Maximum 9-Hour Ozone Concentrations (2017-2019)

Source: Author generated with data from: August et al. 2021; 2016 *Land Use Information for San Bernardino County* n.d.; 2016 *Land Use Information for Riverside County* n.d.; Microsoft/USBuildingFootprints [2018] 2021.

Ozone is one air pollutant that is prevalent in the Southern California region. Numerous studies display how acute ozone exposure is associated with damage to lung tissue, lung disease, and respiratory symptoms (e.g., asthma) (Last, Pinkerton, and Schelegle 2017;

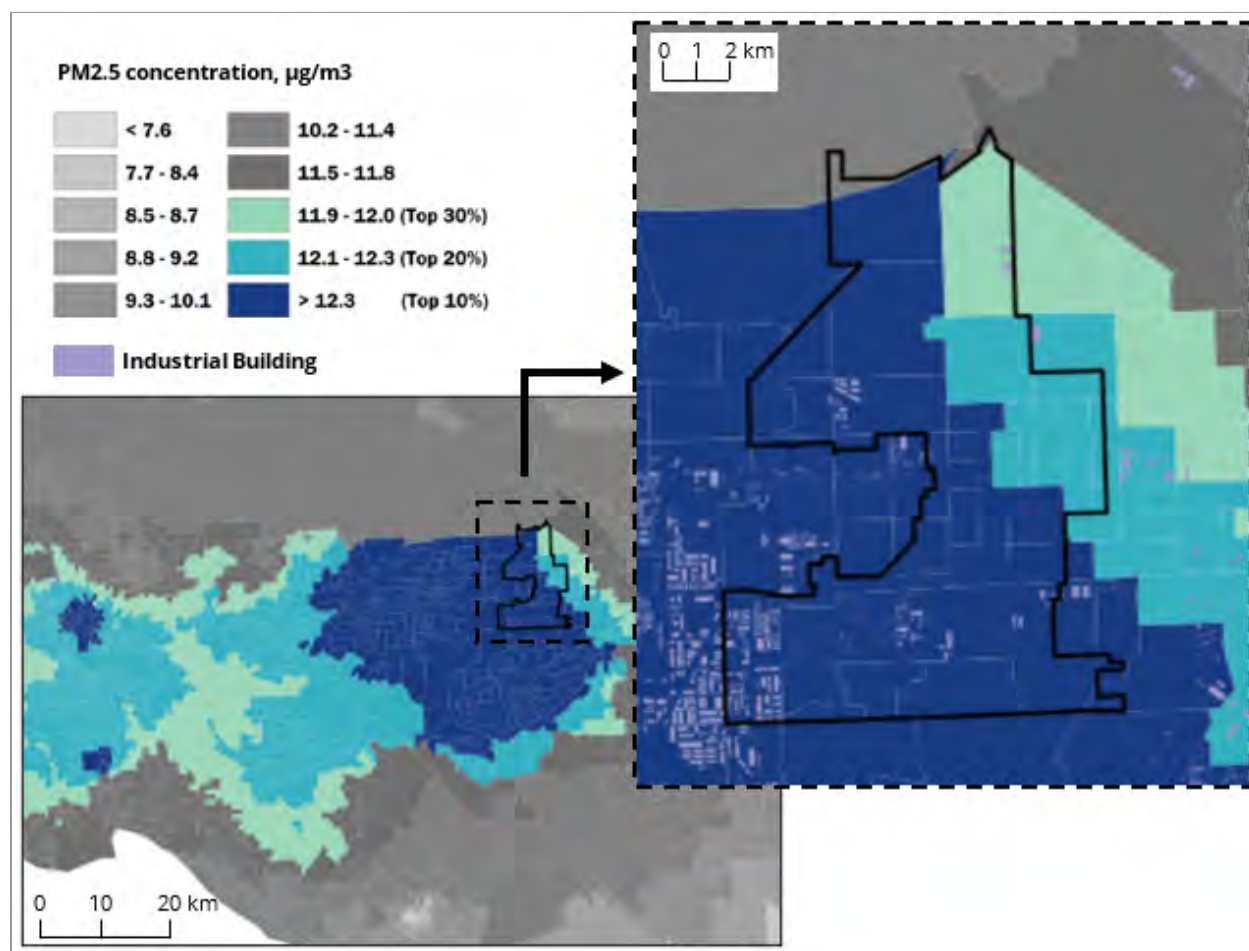
Malig et al. 2016; Moore et al. 2008). The health impacts of ozone are heightened in afternoons and during warmer months when emissions stay at ground-level for prolonged periods of time. Ozone is the primary component of smog, and although California has taken significant steps to reduce its ozone concentration, there is still an abundance of pollution in Fontana. Figure 5.02 displays the average daily concentrations of ozone in the region. Fontana and the Inland Empire contain the top 10% of most polluted tracts in the state.

Another significant impact on health is particulate matter (PM). Fine, inhalable particulate matter (PM_{2.5}¹) has been directly linked to decreased lung function, aggravated asthma, and irregular heartbeats (US EPA and OAR 2016; “Common Air Pollutants | California Air Resources Board” n.d.). Smaller particles can enter a person’s bloodstream and have been shown to increase hospitalization for cardiovascular disease, respiratory disease, and can even cause premature death (Crouse et al. 2012; Wu et al. 2020). PM_{2.5} comes from cars and trucks, with heavy-duty diesel trucks emitting very hazardous exhaust. Diesel PM has been found to contain carcinogens like benzene and formaldehyde (Krivoshto et al. 2008). Although recent technological innovations have reduced diesel emissions the particles released are often ultrafine and will continue to be harmful until entirely eliminated.

Other activities that emit PM_{2.5} involve combustion, such as industrial facilities and forest fires. In Southern California, where [the risk and severity of fires has increased in recent years](#), the density of particulate matter can exacerbate existing emissions from mobile sources.

Fontana is overly exposed to PM_{2.5}. Figure 5.03 displays how particulate matter sits within the basin surrounding Fontana. The geographic location, combined with the reliance on cars and trucks for transportation, make efforts to mitigate and minimize PM_{2.5} emissions a top priority. Populations such as children, the elderly, and those with respiratory or cardiovascular conditions who are more susceptible to the adverse effects of PM_{2.5} should be taken into account when developing strategies for reduced emissions.

¹ PM_{2.5} are particles less than 2.5 micrometers in diameter - nearly 30 times smaller than the width of one hair

Figure 5.03: Annual Mean PM2.5 Concentration (2015-2017)

Source: Author generated with data from: August et al. 2021; 2016 Land Use Information for San Bernardino County n.d.; 2016 Land Use Information for Riverside County n.d.; Microsoft/USBuildingFootprints [2018] 2021.

Warehouses and Distribution Centers

Static sources, such as buildings, are another significant contributor to air pollution. Direct emissions from fossil fuels and electricity consumption (both on-site and off-site) are responsible for [approximately 25% of California's GHG emissions](#). The majority of emissions from buildings comes from electricity usage, which, despite advancements, is not operating on an entirely clean grid and will require significant investment to manage fluctuations in demand (Simon 2021). To benchmark the climate impact of different buildings in the city, we identified building footprint by land use and used their total area (in square feet) to estimate electricity consumption (in kWh) and CO₂ emissions (in metric tons). Building footprints were identified from [a dataset developed by Microsoft](#) using machine learning to draw building outlines from satellite imagery. These footprints were

overlaid on [land use maps developed by the Southern California Association of Governments](#) to identify the land use code per building.

Figure 5.04 displays these estimates of energy usage and carbon emissions at warehouses, single-family residential units, and commercial buildings in Fontana. These buildings are three of the largest types of development in the city with regards to area. Despite their large footprint, warehouses and distribution centers are considerably energy efficient. When considering tons of CO₂ emitted per square foot, warehouses emit CO₂ at a lower rate of intensity than single-family residential and commercial buildings.²

Figure 5.04: Estimated Electricity Usage and Emissions for Selected Building Types

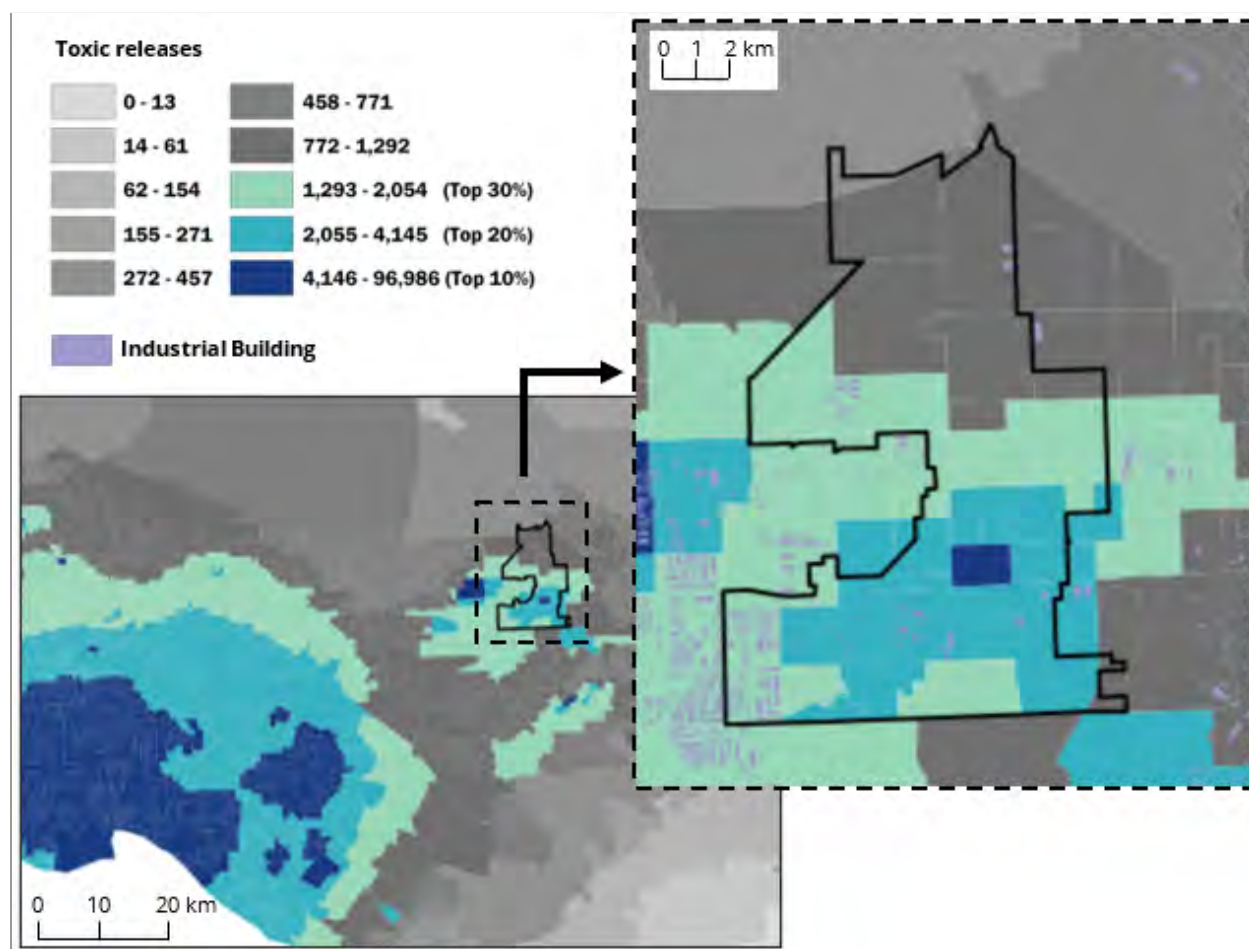
Building Type	Estimated Units	Estimated Area (sq. ft)	Energy Usage (MWh/year)	CO ₂ Emissions (tons/year)	CO ₂ Emissions Intensity (tons/sq. ft)
Single-Family Residential	39,709	122,780,100	4,249,628	873,587	0.007
Commercial	615	7,761,200	272,951	56,110	0.007
Warehouse / Distribution Center	98	23,497,400	364,210	74,869	0.003

Source: Author generated, with data from: (Energy Star 2021; Energy Information Administration 2016; Microsoft/USBuildingFootprints [2018] 2021; 2016 Land Use Information for San Bernardino County n.d.).

One study shows that increased automation can further decrease energy consumption per warehouse (Lewczuk, Kłodawski, and Gepner 2021). However, the reductions in emissions are small for the cost of implementation. Additionally, warehouses operate on small profit margins and are often unable to take large financial risks, such as those present in early adoption of automated facilities (“The Future of Warehouse Work: Technological Change in the U.S. Logistics Industry” n.d.).

² Note that the estimates for warehouse energy intensity and emissions in Figure 5.04 are likely lower than in reality. The data could not distinguish between warehouse types, so assumed all were standard distribution centers. However, refrigerated facilities are significantly more energy intensive compared to non-refrigerated facilities (requiring 4x the electricity per square foot). Development standards for refrigerated facilities should be higher and more stringent to account for these much higher costs.

Figure 5.05: Toxicity-Weighted Concentrations of Modeled Chemical Releases to Air from Facilities (2017-2019)



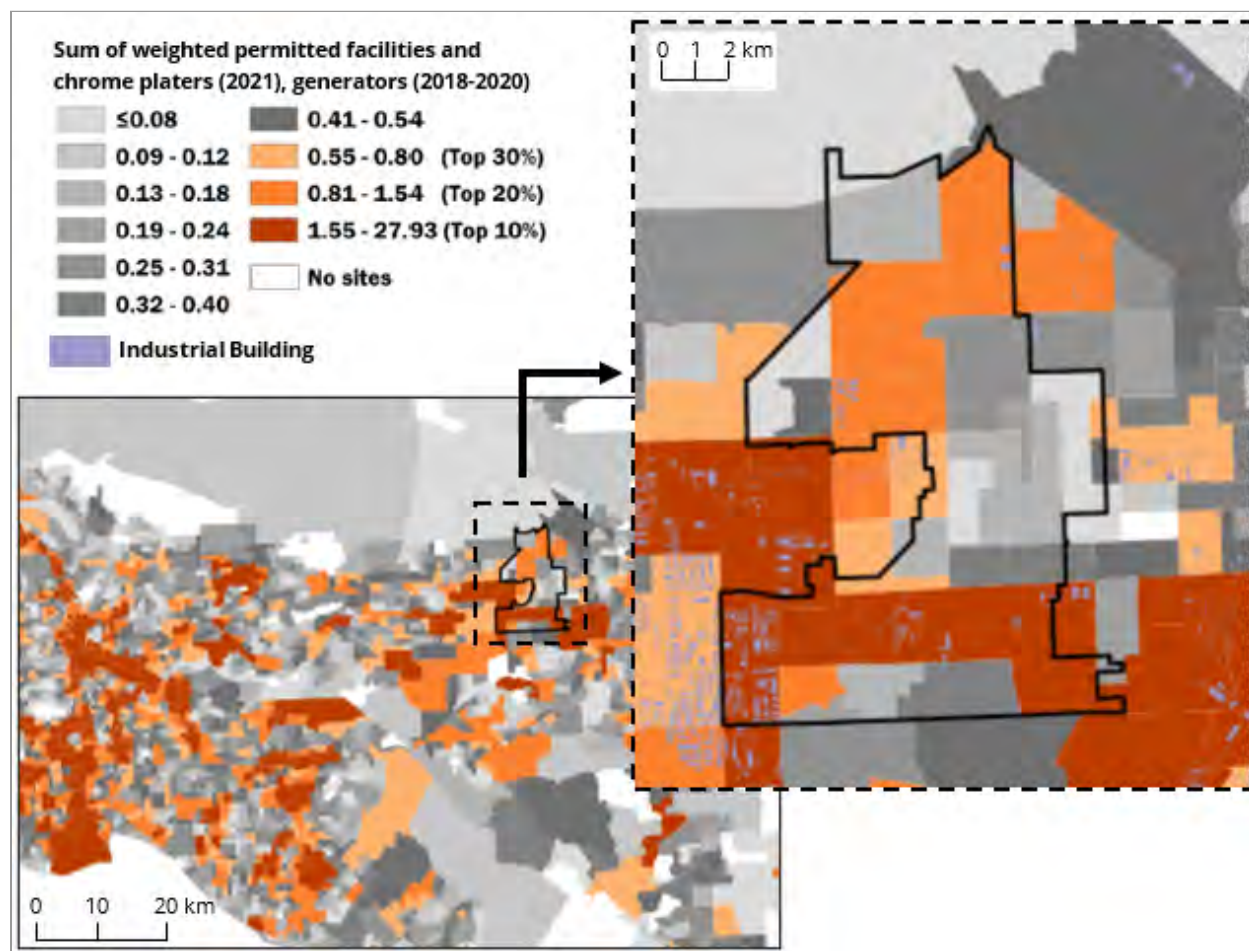
Source: Author generated with data from: August et al. 2021; 2016 *Land Use Information for San Bernardino County* n.d.; 2016 *Land Use Information for Riverside County* n.d.; Microsoft/USBuildingFootprints [2018] 2021.

A concern in Fontana is that there are already locations with high toxicity concentrations and hazardous waste generation. As seen in Figures 5.05 and 5.06 these locations are correlated with the location of industrial buildings. They are also the locations with higher proportions of people of color and low income households within the City (Figures 2.08 and 2.09), furthering concerns found in studies that indicate how there are racial and ethnic disparities in exposure to these toxins (Zwickl, Ash, and Boyce 2014). All sources of pollution should be addressed, however an equitable response involves prioritizing these communities that have been (and are) disproportionately impacted.

Warehouses and distribution centers are often sited in locations with other industrial land uses. There is concern of release of toxic chemicals at these locations, both in the air and in the ground. Although difficult to track, several studies indicate that living and working near

toxic-releasing industries increases the risk of cancer and increases infant mortality rates (Morello-Frosch et al. 2002; McCarthy et al. 2009).

Figure 5.06: Hazardous Waste Generators (2018-2020) and Facilities (2021)

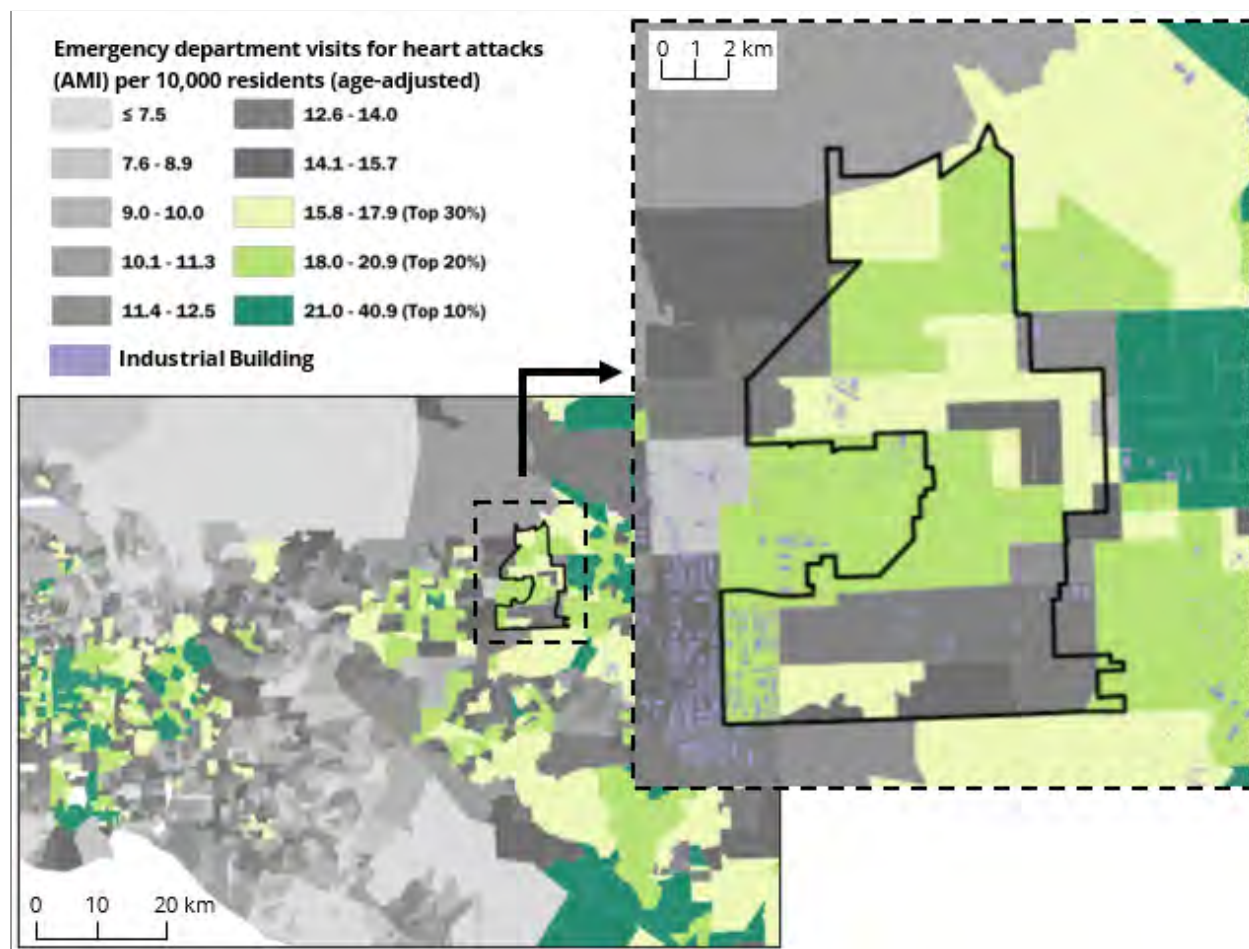


Source: Author generated with data from: August et al. 2021; 2016 Land Use Information for San Bernardino County n.d.; 2016 Land Use Information for Riverside County n.d.; Microsoft/USBuildingFootprints [2018] 2021.

Future studies are needed to fully understand the air pollution impact of warehouses. These facilities are so new that many emissions- and health-related datasets that rely on older indicators (ranging in age from three to ten years) do not fully capture their presence. It is likely that true pollution exposure is higher than estimated (Bonta 2021).

Health Impacts of Emissions

As mentioned above, even low levels of air pollution have been linked to higher rates of hospitalizations. Figure 5.07 displays the spatially- and age-adjusted emergency department visits within Fontana and the Greater Los Angeles region for heart attacks.

Figure 5.07: Cardiovascular Disease

Source: Author generated with data from: August et al. 2021; 2016 *Land Use Information for San Bernardino County* n.d.; 2016 *Land Use Information for Riverside County* n.d.; Microsoft/USBuildingFootprints [2018] 2021.

Central Fontana and unincorporated Kaiser have higher incidence rates of heart attacks than parts of north Fontana and most of south Fontana. When compared to the wider region, the cardiovascular incidence rates are near those of Los Angeles. Despite potential inconsistencies in reporting rates (it is unclear who goes to the hospital for heart attacks and how it is reported) we find this data compelling because Central Fontana and unincorporated Kaiser have a higher proportion of poor or Hispanic households in the region (Figures 2.08 and 2.09). These communities bear a greater pollution burden, and, as mentioned above, should be prioritized when planning equitable approaches to pollution mitigation and reduction.

Recommendations

Recommendation 5.1: Invest in air pollution monitoring and sensors

An important aspect of tracking these changes and providing guidance for future policy will be the addition of more air quality monitoring stations throughout the Fontana area. The South Coast Air Quality Management District (SCAQMD) currently only operates [one air pollution monitor](#) in the entire city. SCAQMD and others such as [CalEnviroScreen](#) have developed models to obtain fine-grained (spatially and temporally) measurements of air quality, but for the City of Fontana to do their own measurements in this manner would require investment. Increasing the number of locations where air quality measurements (including but not limited to PM 2.5, PM 10, NO₂, O₃, and CO) are being taken will help track the progress of electrification. These monitoring stations will provide insight into areas that are seeing more or less benefits, and, more generally, provide more data the city can use to shape policy around trucking to most benefit the people who live there.

A cost-effective approach to increased monitoring is to invest in outdoor, stand-alone sensors, such as those sold by PurpleAir. A recent study by SCAQMD found that PurpleAir PA-II particulate matter sensors were “very reliable” and highly correlated to the corresponding measurements collected using a substantially more expensive particle instrument (“PurpleAir PA-II” 2017). Each unit [costs approximately \\$250](#). Each unit reported PM_{1.0}, PM_{2.5}, and PM_{10.0} mass concentration within 20-second intervals, which the researchers found to result in low variability.

Although these less expensive monitors do not capture all GHGs like NO₂ and O₃, they can be an extremely useful resource for city-wide monitoring of air quality. The sensors simply require a 100-240V AC power supply to operate, and therefore could be installed at nearly every light pole in the city. We recommend first locating sensors at locations with populations that are more sensitive to worsening air quality. This includes educational centers, senior centers, and residential neighborhoods with high rates of cardiovascular or respiratory diseases.

It is essential to not place monitors directly adjacent to freeways. The interest is in measuring how particulate matter congregates in residential and work environments, not just on the road. Additionally, although two major freeways, the I-10 and I-15, cut through the City of Fontana and are located near warehouses and other industrial buildings, these roads are not under City jurisdiction. The freeways are a major source of pollution, but the

City can still mitigate the impacts of air pollution on its residents by understanding how emissions from mobile sources are distributed.

Recommendation 5.2: Incorporate air pollution monitoring into community engagement initiatives

Monitoring the levels of particulate matter will inform not only the City about how to address pollution but also its residents. A benefit, for example, of placing stand-alone sensors at educational centers, such as elementary, middle, and high schools, could include incorporating air quality information and data analysis into the curricula and club activities, allowing students to learn about the importance of good air quality. Monitoring provides an opportunity to teach Fontana's youth about environmental science, environmental justice, and air pollution.

Recommendation 5.3: Require air pollution monitoring at logistics industry facilities

To ensure ongoing air monitoring, we recommend Fontana require all logistics industry facilities to install and maintain monitoring technology on their grounds. This would require installing both indoor and outdoor sensors to measure particulate matter emissions on their premises. In addition to working with existing facilities to install sensors, the city should require it of all new facilities through the permitting process. This can be considered akin to the other development impact fees for sewage, for example.

Recommendation 5.4: Apply for funding and additional support of air monitoring

Given the low cost of stand-alone sensors, the Fontana Chamber of Commerce has already expressed interest in financially supporting a first round of air quality monitor purchase and placement. The City, however, should also seek additional sources of funding to track and measure emissions.

An example is the Community Air Protection Program (CAPP), established by CARB in association with AB 617, which supports community organizations in limiting their community's exposure to air pollution. Communities awarded through the program create emissions reduction plans, educate around air quality standards and best practices, implement and support air quality monitoring, and more.³ For example, the Center for Community Action and Environmental Justice successfully applied to have an inclusive, community-centered planning process with the community of Westside San Bernardino to create an air quality and climate resilience plan in 2019.

³ To learn more about the Community Air Protection Program, including application timelines and previous awardees, visit this webpage: <https://ww2.arb.ca.gov/capp>

CAPP projects have strong community involvement requirements. Implementing a CAPP project in Fontana would provide support for an extended engagement process and is an opportunity for community-led planning. City staff and officials could use this process to better understand the needs of residents harmed by warehousing and associated pollution.

Because this program has existed for several years, CAPP implementation in Fontana can learn from the challenges of previous projects. It is imperative for the efficacy of the project and the health of Fontana residents that such a project result in permanent, enforceable emissions reductions prioritized (Mohan et al. 2021).

Applicants to the grant program cannot be municipalities, but we recommend that Fontana use this program as a means of working with a local non-profit invested in the air quality of the region. We also recommend that the City of Fontana encourage and support a local non-profit in applying for a Community Air Grant in 2022. By combining financial support from the Chamber with CARB funding, the City of Fontana and partners could purchase air quality monitors as well as design an extended community-involved program to maintain monitors and improve air quality.

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6. Modeling Sustainable Trucking Practices

Introduction

Trucking is a major activity in Fontana and the Inland Empire. Fontana's location near the intersection of I-10 and I-15 makes it a major crossroads for long-haul transportation and also a destination for many short-haul trips to the city's logistic and distribution warehouses. Previous sections described economic benefits of leveraging this industry in Fontana, but there are externalities associated with increased heavy vehicle movement.

This chapter focuses on the air quality impact of trucking in the City of Fontana and the costs and benefits Fontana can expect to see from future electrification of truck fleets. Results from the Southern California Area Government's (SCAG) Heavy-Duty Truck Model (HDTM) are used to identify truck routes and flows in Fontana both now and in the future. The HDTM is then used to develop a model to estimate the particulate matter emissions from trucks in Fontana. This model is used to assess the operating and capital costs of fleet electrification to Fontana-based logistics companies as well as benefits to Fontana residents of investment in electrification strategies for reducing truck emissions.

The results of this analysis are displayed in Figure 6.01. Adoption of electric heavy-duty trucks in Fontana will yield an annual fuel savings of nearly \$50,000,000 and a reduction in PM2.5 emissions by over 10,000 lbs per year. Policies to assist in electrification strategies and reduce truck emissions are proposed based on these results.

Figure 6.01: Yearly Modeled Difference in Cost and Local Emissions Based on Conversion to Electric Vehicle Truck Fleet

	2035 No Adoption	2035 EV Adoption	Difference
Average Annual Fuel Equivalent Cost	\$ 75,754,583	\$ 26,007,295	-34.33%
Local Air Pollution from Trucks (lbs PM2.5 / year)	61,101	49,656	-18.73%

Truck Trips in Fontana

The Ports of Los Angeles and Long Beach handle nearly 17 million twenty-foot equivalent units of intermodal container traffic per year. Over a third of these containers are moved by truck less than 80 miles to the Inland Empire (Yanity, 2019). The City of Fontana is situated by the intersection of the I-10 and I-15 freeways and the Ontario Airport, making it a major destination for transportation logistics and distribution.

Reliance on trucks to power the growing goods industry has unchecked externalities, however. This most noticeably came to national attention in October, 2021 when backups at the Ports highlighted bottlenecks within container transportation and distribution. (TheZvi, 2021). Even when containers were more efficiently stacked there was a shortage of trucks and available warehouse space to move goods out of the Ports in a timely manner. These delays drive up the costs of truck transportation, as do port fees, fuel prices, newer vehicles, and congestion delays. Many of these costs are borne not only by operators in the industry, but also by road users and local residents. Travel times on major thoroughfares are predicted to increase throughout Southern California (Yanity, 2019). And mobile source emissions, specifically diesel trucks, are a significant factor of air pollution that has been linked to accelerating climate change and negative health impacts (see Section 6 for more discussion).

We use the Southern California Area Government's (SCAG) Heavy-Duty Truck Model (HDTM) to quantify the impact of trucking on air quality and propose solutions for more sustainable mobility. The HDTM is a travel demand model that has been tested and calibrated to forecast transportation impacts and maintain air quality compliance in the Southern California region ("2016 Regional Travel Demand Model and Model Validation," 2020). It is part of a larger, passenger travel demand model to fully identify not only truck trips but also measure their impact on the existing road network and congestion.

Within the model heavy-duty trucks are classified by their weight and fuel type. We follow the the classification scheme used by the SCAG HDTM in our analyses and define trucks as Light-Heavy (8,500 to 14,000 lbs. gross vehicle weight), Medium-Heavy (14,001 to 33,000 lbs. gross vehicle weight) and Heavy-Heavy (over 33,000 lbs. gross vehicle weight) ("2016 Regional Travel Demand Model and Model Validation," 2020). A more detailed breakdown of these vehicle classes, including fuel efficiency, fleet mix of diesel and gas powered vehicles, and daily vehicle miles traveled can be found in Figure 6.02.

Figure 6.02: Truck Classes in the SCAG HDTM

Vehicle Class	Vehicle Description	Fuel Efficiency (mpg)	Fleet Mix Diesel Power	Vehicle Miles Traveled	
				2021	2030
Light-Heavy	Full-size pick-up trucks, very large passenger vans, panel trucks, small enclosed delivery trucks	8.5	1%	16%	15%
Medium-Heavy	City delivery trucks, rental trucks, single-axle vans, tow trucks, garbage collection trucks	6.0	92%	13%	13%
Heavy-Heavy	Single and double long-haul semi-tractor trailer rigs	6.0	100%	71%	72%
All	-	-	-	263,409	296,480

Source: "2016 Regional Travel Demand Model and Model Validation" 2020; Chambers and Schmitt 2015; Reinhart 2016.

Note: Fleet Mix Diesel Power indicates the share of vehicles that are diesel powered. The remainder are gasoline powered.

Additionally, the HDTM forecasts trips within the following time periods:

- AM Peak: 6:00 AM – 9:00 AM
- Mid-day: 9:00 AM - 3:00 PM
- PM Peak: 3:00 PM - 7:00 PM
- Evening: 7:00 PM – 9:00 PM
- Night: 9:00 PM – 6:00 AM

SCAG used these time periods to calibrate the model to match factors of observed truck movements. For this study the time of day results are aggregated to return daily estimates.

The HDTM is an activity-based model, indicating that it uses disaggregate trip data to predict truck flows through the region. Trips from outside the SCAG region (external trips) are generated and distributed based on supply chain models while those within the region. Internal trips, which represent the majority of vehicle miles in the region, are based on trip rates (number of trips per employee or household) for different land uses/industry sectors ("2016 Regional Travel Demand Model and Model Validation" 2020).

These internal trip rates are described in Figure 6.03, which displays how Light-Heavy trucks are more likely to make trips to individual households while heavier vehicles are more likely to go to warehouses and other transportation/utility land uses. Each distribution model relies on an additional series of gravity models that SCAG developed from GPS surveys.

Figure 6.03: Modeled Truck Trip Rates and Trip Ends within the SCAG Region

Category	Light-Heavy Trip Rate	Medium-Heavy Trip Rate	Heavy-Heavy Trip Rate	Percent of Trip Ends
Households	0.0146	0.0046	0.0072	15%
Agriculture, Mining, and Construction	0.0739	0.0716	0.0658	10%
Retail	0.0667	0.0666	0.0708	16%
Government	0.0301	0.0153	0.0151	2%
Manufacturing	0.0612	0.0654	0.0924	14%
Transportation/Utility	0.153	0.1759	0.31	26%
General Warehouse	0.1436	0.1651	0.2917	3%
High Cube Warehouse	0.1463	0.1682	0.2964	2%
Wholesale	0.0902	0.0954	0.1296	12%
Other	0.0095	0.0111	0.0151	1%

Source: "2016 Regional Travel Demand Model and Model Validation" 2020.

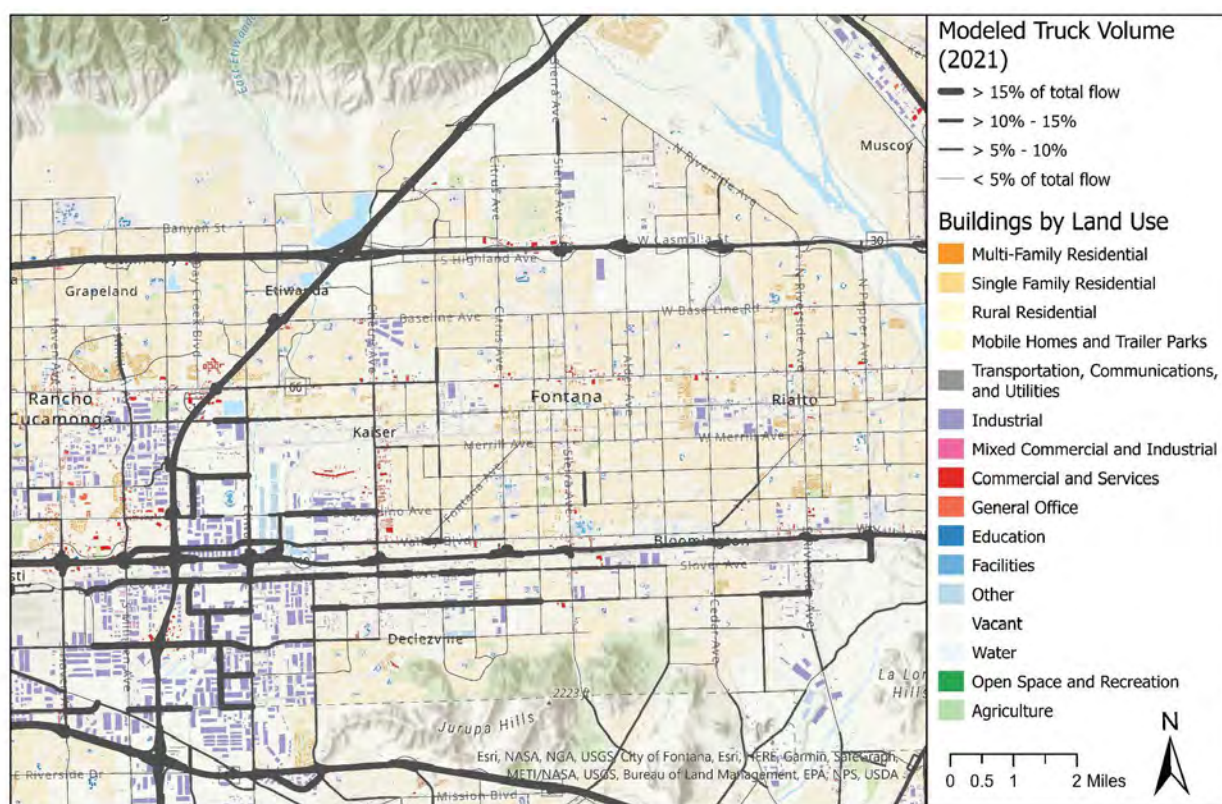
Following trip generation and distribution, truck trips are assigned to the network. As seen in Figure 6.04, the majority of truck movement in Fontana and the surrounding region is on freeways. There is also significant activity on freeway ramps and local access roads near industrial land uses. Most streets within the city of Fontana do not experience as heavy truck traffic as the I-10, I-15, and SR-210 freeways. However, truck movement through the city is present. The City of Fontana has already developed a Truck Route Map to prioritize collector streets that operators should use for travel between freeways and local destinations ("Local Truck Routes" 2004). By following the Truck Route Map there should be fewer emissions near sensitive locations (residential units, educational facilities, etc.), less wear and tear on local roads, and improved safety outcomes for vulnerable road users (see next chapter). However, the process used to identify these routes is unclear and the

mechanism forcing operators to adhere to these routes may not be strong enough to maintain compliance (*ARTICLE X. - TRUCK ROUTES Sec. 17-426 n.d.*).

The modeled results for the current year (2021) and a future year (2030) were provided on request by SCAG. The shared data included a full geospatial network of the SCAG region with the following factors per road segment, per vehicle class, and per time of day:

- Length (miles)
- Facility type
- Number of lanes
- Posted Speed (miles per hour)
- Free-flow Travel Time (minutes)
- Congested Travel Time (minutes)
- Flow (number of vehicles)

Figure 6.04: Modeled Truck Volumes in Fontana and Surrounding Areas



Source: Author generated from data provided by SCAG.

Using these results we calculated the speed of congested traffic and vehicle miles traveled within the SCAG region, and more specifically within the City of Fontana. These metrics were used to estimate particulate matter emissions from heavy-duty vehicles.

Estimated Particulate Matter from Heavy-Duty Trucks

Trucks are responsible for a range of different pollutants, including both greenhouse gasses and particle emissions. Although all have adverse impacts, we focus specifically on PM_{2.5} in this study. We do this for two reasons. First is the significant role it plays in public health, described in detail in the environmental section. Second, is because PM_{2.5} can be traced directly to a source, such as a construction site, fire, or heavy-duty diesel truck.¹ This means that PM_{2.5} represents pollution that has significant localized impacts to Fontana and the contribution of this pollution from trucking can be quantified with reasonable accuracy. Therefore, PM_{2.5} emissions provide the best indication of how the trucking industry could be impacting communities in Fontana. On the same token, it acts as a good metric for quantifying the benefits Fontana could see from electrification over the coming years.

There are already regional mandates to curtail the air quality impacts of trucking. The California Air Resources Board's (CARB) Advanced Clean Trucks rule is designed to help California move towards an electrified, zero-emission truck fleet. To reach state emissions goals truck sales for Light-Heavy, Medium-Heavy, and Heavy-Heavy classes will be required to be electric (see Chapter 3). The South Coast Air Quality Management District's (SCAQMD) more recent Warehouse Indirect Source Rule (Rule 2305), requires warehouses larger than 100,000 square feet to reduce diesel particulate matter emissions both onsite and from heavy-duty trucks that originate at these locations (South Coast Air Quality Management District 2021). Facility operators can move into compliance by completing actions such as increasing solar panels, building zero-emissions charging, and replacing internal combustion engine vehicles (both on-site and on-road) to zero-emissions or near-zero emissions (see Chapter 3).

Major operators in the Inland Empire are also independently working to phase electric vehicles into trucking fleets. In this study we focus specifically on the Port of Long Beach's Clean Air Action Plan ("Fueling the Future Fleet: Assessment of Public Truck Charging and Fueling Near the Port of Long Beach" 2021), which established in 2017 a goal of transitioning on-road trucks to zero-emissions by 2035. In meeting this goal they set out an

¹ Note that tailpipe emissions are not the only particle emissions trucks give off. Particulate matter from tire deterioration, breaks, and other mechanical parts of the vehicles contribute to impact of these vehicles as well. However, we are not considering them here because we expect them to remain relatively constant between EVs and traditional trucks.

implementation timeline based on the zero-emissions vehicles sales target mandated by CARB's Advanced Clean Truck regulation.

Methodology

We developed scenarios to calculate total emissions for both the current trucking activity with an entirely traditional fleet (assuming all internal combustion engines (ICE)) and in the future with some degree of electrification. To do this, we used the same base equation, changing the inputs for each scenario. The equation is as follows:

$$Total\ PM\ 2.5 = \sum_{road\ segment} \sum_{truck\ class} \sum_{time\ period} \sum_{fuel\ type} VMT * emission\ rate_{fuel} * percent\ fuel * speed\ factor * EV\ Factor$$

Where:

- VMT is the total vehicle miles traveled for a particular truck class, road segment, time period, and fuel type
- Emission rate (g/mile) is the PM2.5 rate for a given fuel type (diesel or gasoline) and vehicle class
- Percent fuel is the percentage of trucks for a particular vehicle class that use that fuel
- Speed factor is an adjustment factor of emissions based on the average speed of vehicles for a segment and time period
- EV factor is the percentage of trucks projected to be EV for a given truck class (zero in the base scenario where no trucks are EV).

The vehicle miles traveled (VMT) were calculated directly from the SCAG HDTM. Each road segment contains a length (in miles) and a value for the number of vehicles that flowed on it over a time period. The road length and the vehicles were multiplied together to identify the VMT.

The emission rates are identified in Figure 6.05, which summarizes the PM2.5 emissions in grams per mile from each class of vehicle. The values of percent diesel and percent gas are the split of vehicles per class that operate on diesel and gas power. These unitless values are defined in Figure 6.02 in the column Fleet Mix Diesel Powered, where only 1% of Light-Heavy trucks are diesel powered, while 92% of Medium-Heavy and 100% of Heavy-Heavy trucks are diesel powered.

The speed factor is another unitless parameter that scales the emission rates based on the speed of the vehicle. A study by Outapa, Kondo, and Thepanondh (2016) demonstrated

that vehicles emit more particulate matter at slower speeds, so we use their speed factor to scale the emissions rate based on the SCAG HDTM modeled average speed. As seen in Figure 6.06, vehicles traveling at free-flow emit the base level of PM2.5, while vehicles traveling at slower speeds emit up to 55% more particulate matter.

Figure 6.05: Emissions Rates (in grams per mile) for Heavy-Duty Vehicles

Pollutant	Fuel	Light-Heavy	Medium-Heavy	Heavy-Heavy
VOC	gas	1.510	3.050	3.628
	diesel	0.195	0.339	0.500
CO	gas	13.515	23.720	28.560
	diesel	0.874	1.360	2.752
NOX	gas	2.827	3.929	4.892
	diesel	3.243	5.590	10.091
PM2.5	gas	0.044	0.049	0.049
	diesel	0.082	0.129	0.227
PM10	gas	0.050	0.060	0.061
	diesel	0.089	0.140	0.246

Source: "Average In-Use Emissions from Heavy-Duty Trucks", 2008.

Figure 6.06: Speed Factors for PM2.5 Emissions

Speed (mph)	0 - 12	12 - 19	19 - 25	25 - 31	31 - 37	37 - 44	44 - 50	> 50
PM2.5 Scale Factor	1.554	1.394	1.219	1.131	1.079	1.044	1.018	1.000

Source: Outapa, Kondo, and Thepanondh, 2016.

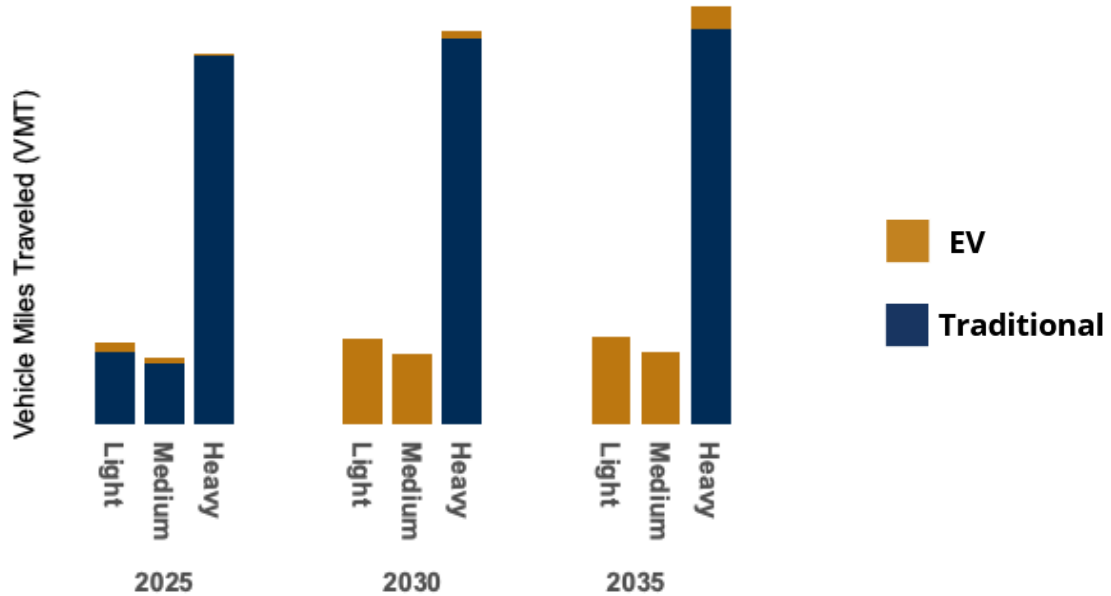
The last parameter is the EV factor, which is a unitless percentage that determines how many vehicle miles in the EV adoption scenario are traveled with no-emission electric vehicles, thereby reducing the total PM2.5 emissions. For the base scenario, this value is 1, as we assume there are no additional EV vehicles replacing existing vehicles in the truck fleet. For the EV adoption scenario we assumed the following: in 2025 an additional 3% of

the fleet will be electric, in 2030 an additional 30% of the fleet will be electric, and in 2035 an additional 90% of the fleet will be electric. These adoption rates come from the Port of Long Beach Electrification Plan, which states that these benchmarks need to be reached in order to perform operations within an environmentally sustainable regime. (“Fueling the Future Fleet: Assessment of Public Truck Charging and Fueling Near the Port of Long Beach” 2021). Additionally, we note that the adoption rate for electric trucks is not equal across vehicle classes. Currently, the technology for electrification of Heavy-Heavy trucks does not exist, so their conversion to more sustainable power will be slower than that of Light-Heavy trucks (Smith et al. 2020). Thus, we assume that by 2030 the electric adoption rate for Light-Heavy trucks will be 25%, for Medium-Heavy trucks will be 18%, and for Heavy-Heavy trucks will be 2% (Heid et al. 2017). We assume this growth will be exponential because of the immense investment within the trucking industry and the external pressure from mandates such as the Port of Long Beach Electrification Plan, Executive Order N-79-20 (a mandate that all ports move to zero-emission drayage fleets by 2035), and California’s Advanced Clean Trucks (ACT) regulation.

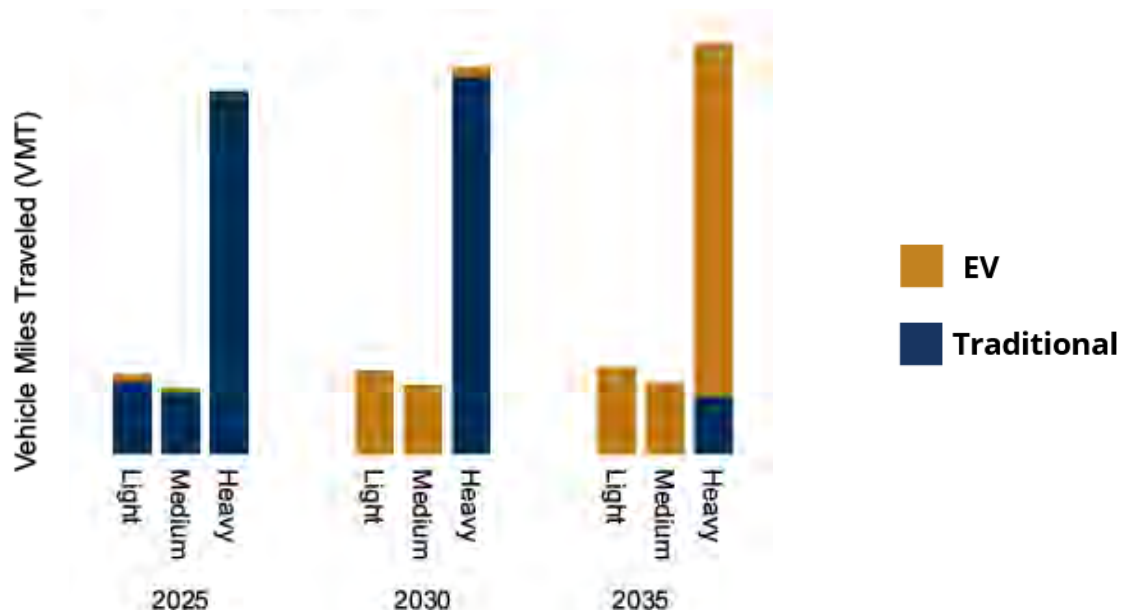
Scenarios

We developed two scenarios to test PM_{2.5} emissions reductions from electric vehicle adoption. For each scenario we modeled emissions in the years 2025, 2030, and 2035. For each scenario the results are compared against a Base Scenario where there is no adoption and all vehicle miles traveled are by traditional ICE trucks. The first scenario is the EV Adoption Scenario, where electric trucks are adopted at the existing ratios per vehicle class (Heid et al. 2017) in an attempt to meet the 3%, 30%, and 90% targets set by the Port of Long Beach. However, as seen by Figure 6.07, the current market prediction for Heavy-Heavy truck adoption will not reach the necessary thresholds to meet the Port’s targets. By 2030 only 28.8% of all heavy-duty trucks will be electric, and by 2035 there is only a slight increase to 31.9%.

The second scenario, the Advanced EV Adoption Scenario, tests the impacts of increased investment in Heavy-Heavy truck electrification. To meet the 2035 target set by the Port of Long Beach it would require 62% of Heavy-Heavy trucks to electrify (Figure 6.08). As displayed in Figure 6.02, 6.07, and 6.08, the Heavy-Heavy truck class represents the greatest share of vehicle miles traveled on the road, and as displayed in Figure 6.03, is the heaviest emitter of PM_{2.5} amongst the truck classes. Therefore, in this scenario we assume there is market intervention to increase the share of Heavy-Heavy electric vehicles and meet the Port of Long Beach’s adoption targets.

Figure 6.07: Vehicle Miles Traveled by Weight Class (No Market Intervention)

Source: SCAG HDTM; Heid et al. 2017; "Fueling the Future Fleet: Assessment of Public Truck Charging and Fueling Near the Port of Long Beach" 2021.

Figure 6.08: Vehicle Miles Traveled by Weight Class (Market Action Taken)

Source: SCAG HDTM; Heid et al. 2017; "Fueling the Future Fleet: Assessment of Public Truck Charging and Fueling Near the Port of Long Beach" 2021.

Results

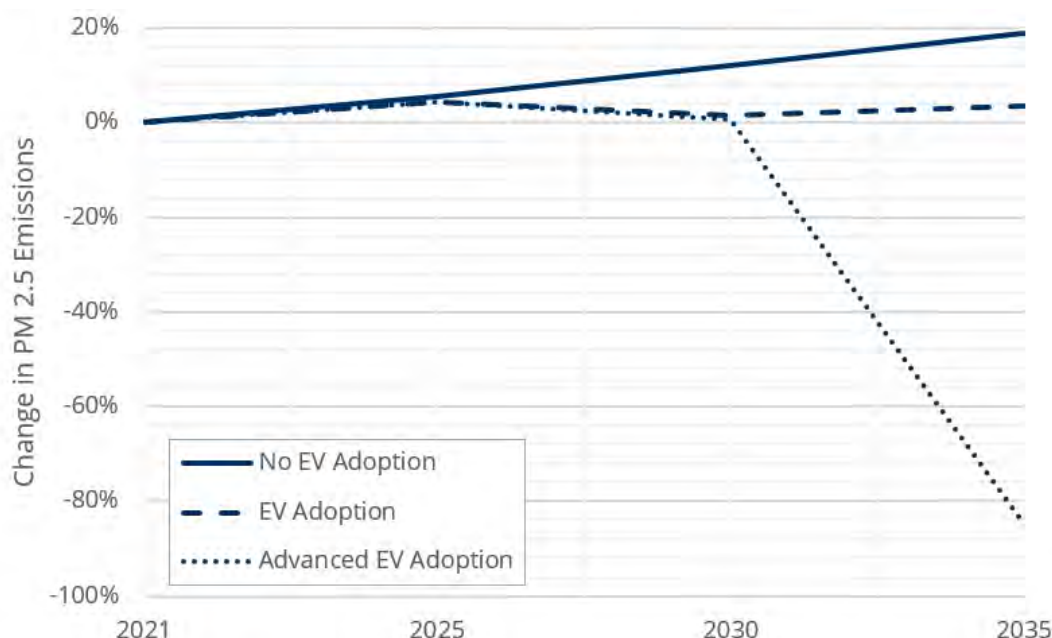
The emissions reductions from the EV Adoption Scenario and the Advanced EV Adoption Scenario, compared to the Base Scenario with all traditional ICE trucks, can be seen in Figure 6.09. Without intervention there will be reductions in PM2.5 emissions, assuming electric vehicles are adopted at market rates. Reductions in emissions from electric truck adoption will overcome any increased emissions that occur from growth in vehicle miles traveled (the SCAG HDTM assumes increased travel demand in the future). However, emissions reductions will be significantly improved if market intervention occurs to increase the adoption of Heavy-Heavy electric trucks

Figure 6.09: Modeled PM2.5 Emissions Reductions from Heavy-Duty Vehicles

Vehicle Class	EV ADOPTION PM2.5 Emissions Reduction			ADVANCED EV ADOPTION PM2.5 Emissions Reduction		
	2025	2030	2035	2025	2030	2035
Light-Heavy	11%	100%	100%	11%	100%	100%
Medium-Heavy	9%	94%	100%	9%	100%	100%
Heavy-Heavy	0%	2%	6%	0%	2%	86%
All	1%	9%	13%	1%	10%	87%

Source: Author generated from data provided by SCAG. The base scenario assumes linear growth of vehicle miles traveled and no adoption of electric vehicles. The EV adoption scenario takes the base scenario values, but with adoption rates of electric vehicles in 2025 (3%), 2030 (30%), and 2035 (90%).

This data is displayed again in Figure 6.10 to highlight the importance of Heavy-Heavy truck emissions mitigation. The prioritization of Heavy-Heavy electric vehicles leads to a significant decrease in PM2.5 emissions. The overwhelming majority of PM2.5 emissions are from Heavy-Heavy vehicles. This is partly because these trucks have the most vehicle miles traveled in Fontana but also due to the higher particulate matter emissions rates and slower speeds of these vehicles. Slower adoption of these electric vehicles limits the total impact of emissions reduction.

Figure 6.10: Modeled PM2.5 Emissions From All Heavy Trucks

Source: Author generated from data provided by SCAG. The solid line represents a scenario with no EV adoption, while the dashed lines indicate different EV adoption scenarios.

Electric Conversion Cost Analysis

One of the largest expenditures for traditional trucks is the annual cost of fuel. The following cost analysis shows that by converting to electric trucks, money will be saved in terms of fuel costs.

In order to estimate the capital and operational expenditures for both traditional and battery-electric trucks several assumptions needed to be made. Our assumptions for the basic cost values are summarized in Figure 6.11. For the purposes of this study we assume the cost to invest in new trucks to be negligible, and set the value to \$0.00. There is a lot of uncertainty in estimating the projected price of fuel, but the price of diesel tends to stay between \$3.00 and \$4.00 annually ("AAA Gas Prices" 2021). For the purpose of this study, we chose the most recent annual average from 2020 of \$3.35. The estimated fuel economy is an estimated average of 6.5 miles per gallon (Williams, n.d.).

Figure 6.12 is for visualizing the EV adoption rates from Figure 6.07 and 6.08, based on the POLB ("Fueling the Future Fleet: Assessment of Public Truck Charging and Fueling Near the

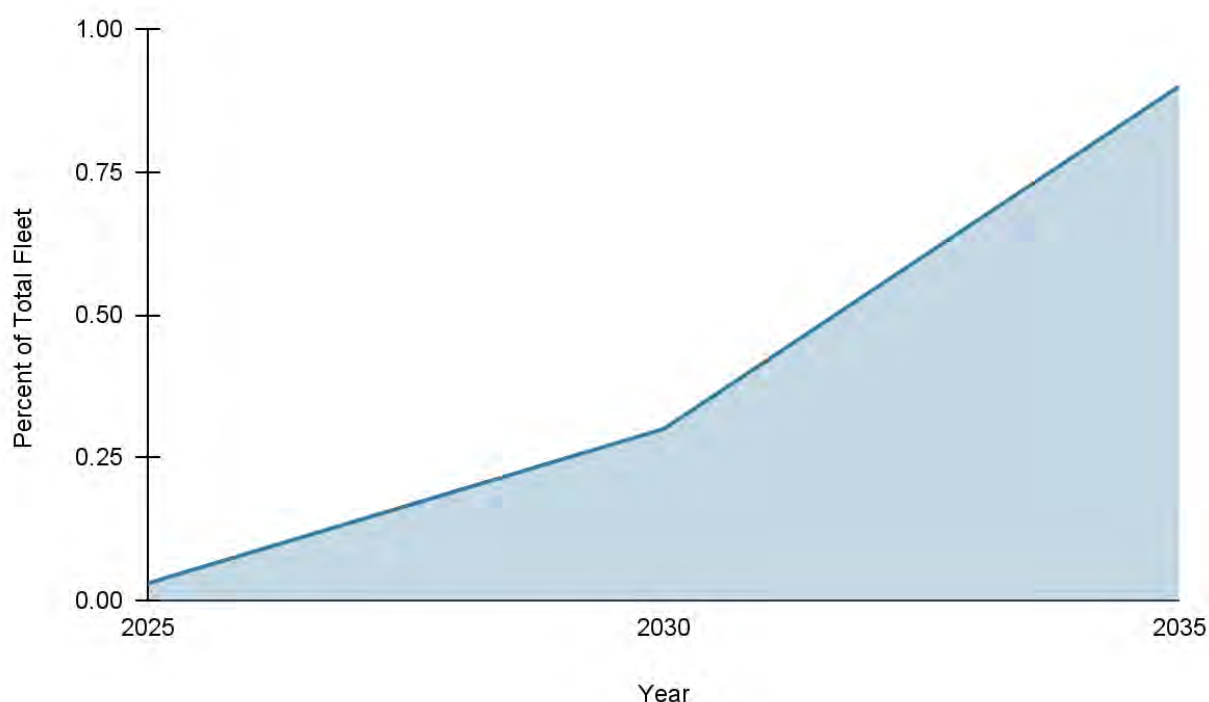
Port of Long Beach” 2021) study and projected adoption rates by truck class. These rates were also used to estimate the VMT for potential electric trucks shown in Figure 6.13.

Figure 6.11: Traditional Truck Cost Assumptions

Traditional Truck Cost	\$ 0.00
Diesel Fuel (2021 USD/gal)	\$ 3.35
Diesel Fuel Economy¹ (miles per equivalent gallon)	6.5

Source: Author generated \$0 truck cost as an assumption. Diesel fuel cost from AAA Gas Prices, 2021. Fuel economy estimate from (Williams, n.d.)

Figure 6.12: EV Adoption Rates



Source: “Fueling the Future Fleet, 2021.

We used the SCAG travel model to estimate VMT for trucks in Fontana for 2021 and 2030. With this model we also estimated annual VMT for battery-electric trucks for the years 2025, 2030, and 2035, as summarized in Figures 6.07 and 6.08. These EV adoption rates were used to estimate the daily VMT for the projected EV fleets based on the POLB

(“Fueling the Future Fleet: Assessment of Public Truck Charging and Fueling Near the Port of Long Beach” 2021) study.

In order to estimate the capital and operational costs of electric trucks, we needed to find a mile per gallon equivalent for electricity consumption by truck class. A study estimated the per truck capital cost for electrification as well as the fuel economy in equivalent miles per gallon (Vijayagopal and Rousseau 2021). Figure 6.13 summarizes those estimates to be used for the average annual fuel costs in our study.

Figure 6.13: Traditional and Battery Electric Truck Assumptions Summary Table

	Light	Medium	Heavy
Estimated Purchase Price	\$ 151,900	\$ 396,500	\$ 500,000
Fuel Economy (miles per gallon equivalent)	18.9		

Source: Vijayagopal and Rousseau 2021.

Another significant investment that will need to be made for truck electrification to be feasible is the purchase and installation of chargers. Current estimates suggest an average capital cost of \$82,000 per DC Fast Charger (Nicholas 2019). For simplicity, we assumed all of Fontana’s possible truck fleets would charge overnight, summarized in Figure 6.14. This is a rough estimate, but studies indicate that there are several different strategies that can be implemented to reduce the required number of chargers required (Furnari et al. n.d.).

Figure 6.14: Total Truck Charger Infrastructure Investment by Year

Year	Projected Fleet Size	Capital Cost
2025	229	\$ 18,742,867
2030	2,062	\$ 168,685,807
2035	4,811	\$ 393,600,216
Average Annual Capital Cost		\$ 581,028,891

To estimate the annual cost of fuel the equation below was applied. We then took the average of the three vehicle classes to find the average annual cost of fuel, as summarized

in Figure 6.15. A similar process was used for battery-electric trucks, but using the fuel economy equivalents instead.

$$\text{Annual Cost} = \text{Fuel Cost} * \frac{\text{Daily VMT}}{\text{Fuel Economy}} * 365 \text{ days}$$

Figure 6.15: Projected Capital and Operating Expenses for Traditional and Electric Trucks

	Traditional Trucks	Electric Trucks
Average Annual Capital Expenditures until 2035 (2021 USD)	\$ 0	\$ 204,436,459
Average Annual Fuel Equivalent Cost (2021 USD)	\$ 75,754,583	\$ 26,007,295*

*Annual fuel and charger equivalent cost at 90%

Although the initial investment until 2035 for adopting electric vehicles is high, that value would essentially go to \$0 as significant additional capital investment for new trucks won't be necessary once 90% of the fleet is converted. It is also still less than the average annual fuel expenditures for traditional trucks.

Policy Recommendations

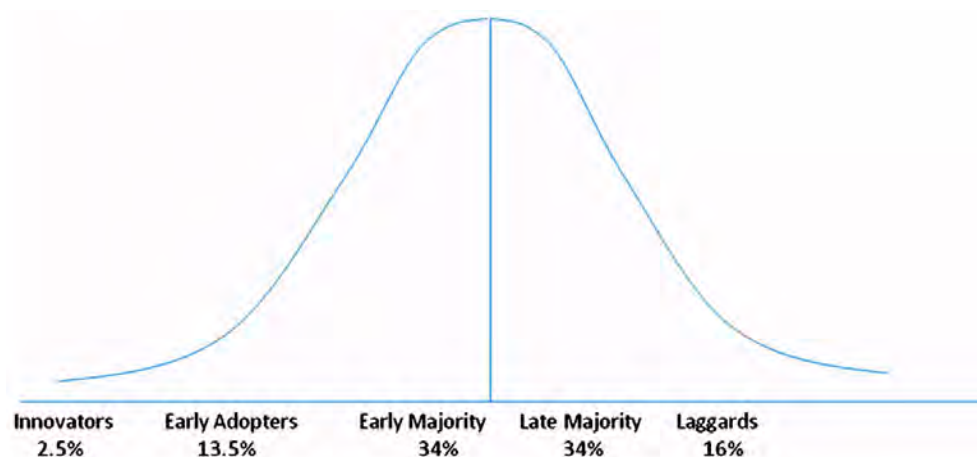
From this analysis, there are a number of policy recommendations to be made for the City of Fontana to help maximize their benefit from an electrifying truck fleet mix.

Recommendation 6.1: Incentivize Heavy-Heavy truck fleet conversion

A large part of our findings point to the importance of electrifying heavy trucks over 33,000 lbs. gross vehicle weight. This size category, Heavy-Heavy, makes up the largest percentage of vehicle miles travelled for trucks in Fontana, and thus an outsized proportion of the PM2.5 emissions as well. However, technical limitations make this size category the slowest for companies to adopt into their fleets (Smith et al. 2020; Heid et al. 2017). Any technology will have innovators and early adopters who take on the technology before the majority of the customer base.

Incentivizing current Fontana-based companies to convert these fleets more quickly, as well as attracting logistics companies that are already willing to be innovators and early adopters in this change, would have an outsized benefit to the health and well-being of residents of the City. Companies partnered with CALSTART, a leading organization seeking to ensure an efficient and effective transition to electric freight vehicles, would be a good place to begin when looking for companies willing to collaborate on this issue. These include numerous major manufacturers and logistics companies (Heartquist n.d.).

Figure 6.16: Adoption Curves for New Technologies



Source: Rogers 1983.

Recommendation 6.2: Leave charger allocation to be addressed by the private sector

The range capability of the trucks mean that optimizing specific charging locations will be less important. Generally current truck stop locations should be able to transition to electric charging services without significant impacts to efficiency, particularly when on-demand charging becomes more comparable to traditional fuels in terms of recharging times. However, a number of points should be taken into account when considering the future of charging infrastructure in Fontana. One is the benefit of slower overnight charging. Electric charging will place strains on the electricity infrastructure in any case, but the instantaneous load is reduced by ensuring as much of the charging as possible is done more slowly and at off-peak hours (Mao, Zhang, and Zhou 2019). Ensuring that Fontana-based logistics companies are preparing to add this infrastructure to their sites will be a useful step in minimizing the impact on the utilities systems. This is particularly important in the short-term, as on-demand charging times are currently too long to be practical. However, in the future it will be critical to support on-demand charging to provide service for the nearly one third of trucks that are independently owned and do not have a

home yard (“Fueling the Future Fleet: Assessment of Public Truck Charging and Fueling Near the Port of Long Beach” 2021).

A second point to consider is ensuring the long-term vitality of Fontana’s truck stops. This will be reinforced by the rapid and smooth adoption of these types of charging stations at their locations, which could encourage the continued overnight use of these businesses by truckers into the coming decades. Providing support through providing adequate infrastructure and policy to meet the changing needs of these companies will be important and the transition to zero-emission vehicles begins.

Recommendation 6.3: Engage with community to identify an updated network of truck routes

Establishing a new network of truck routes is essential to mitigating the impacts of diesel particulate emissions within Fontana. The City may not have control over the thousands of trucks that pass through Fontana each day on I-10 and I-15, but it can restrict the exposure of its residents to the vehicles that do travel to and from logistics centers in the City.

The City of Fontana’s existing truck route designates specific streets that heavy-duty vehicles can travel on to access the freeway from logistics centers (“Local Truck Routes” 2004). However, this map does not appear to have been updated since 2004 and it is unclear how these routes were originally identified by the City. A more recent version of the Truck Routes Map was provided directly by the City, but was not publicly accessible online. The City did not provide us with a description of how this map was developed. Additionally, enforcement of the routes as dictated by the current City ordinance and by the proposed Industrial Commerce Center Sustainability Standards Ordinance does not appear strong enough to hold facility operators accountable for improper truck movements (“Local Truck Routes” 2004) (see Chapter 3).

A strong model for developing an improved truck routing map comes from the work done by the City of Oakland and the Port of Oakland (City of Oakland and Port of Oakland 2019). [The West Oakland Truck Management Plan \(TMP\)](#) was approved in 2019 following almost two years of extensive public engagement. Stakeholder participation was included from the start of the planning process, allowing West Oakland residents to envision and comment on scenarios and solutions. This engagement was essential for City and Port staff to identify areas of concern and best prioritize where to focus reducing disruptions from truck circulation and parking.

The TMP also outlined a five year implementation schedule which directly assigns activities, including enforcement, to the City of Oakland and the Port of Oakland. Many of the proposed strategies for truck routing are similar to those proposed by the City of Fontana in the Industrial Commerce Center Sustainability Standards Ordinance, including improved route signage and updated parking regulations. However, the City and Port of Oakland acknowledge that full operation will require active oversight and activity, not just reliance on facility operator compliance. Required strategies for truck routing also includes:

- Improved training for issuing tickets, including consideration of increase fees
- Conducting traffic enforcement spot-checks
- Using urban design to promote use of truck routes

For each task the TMP outlines the expected goals, which can then feed back to the community engagement process to further hold the City and the Port accountable.

The City of Fontana should also engage in critical public engagement when redesigning their truck route map. Similar to the TMP, this should start before any plans are made to collect community input, and continue through plan adoption and implementation. This can include:

- Developing period briefings to key Community Based Organizations
- Publishing annual reports and regular updates on the status of the truck route map and facility operator compliance with regulations
- Continuous outreach to truck drivers to educate them on new regulations and obtain feedback on implementation

Recommendation 6.4: Focus on regional problems and solutions through a "Future Fleet Fontana" incubator

A major consideration in addressing pollution is the regional nature of the problem. A significant portion of the VMT in Fontana comes from trucks passing through that are owned by companies and individuals based outside Fontana. As mentioned above, actors in the LA and Inland Empire areas already exist that are seeking to address electrification. Fontana should seek to advocate for itself at the regional level and position itself as an innovator in this space in order to maintain a competitive advantage moving forward and ensure the well-being of its community. Forming an incubator to look specifically into positioning Fontana as a regional leader in clean air and electrification could be an effective step to take moving forward. Identifying Fontana's needs, resources, community feedback, and value adds and organizing these materials to engage with regional partners and raise funds are critical steps that could benefit from a dedicated initiative on the part of the City.

Current regional initiatives to be aware of include the Port of LA and Long Beach’s drayage electrification plans, SCAG’s study into the infrastructure needs to zero-emissions technologies, and the Los Angeles Clean Tech Incubator, which is looking to identify potential electric heavy truck charging locations in the area around the Ports (“Fueling the Future Fleet: Assessment of Public Truck Charging and Fueling Near the Port of Long Beach” 2021). They are looking into funding and business models to help ensure zero-emissions trucking is financially feasible for relevant stakeholders as well. These plans generally involve a plethora of partnering organizations and represent spaces Fontana could become involved in.

Recommendation 6.5: Capitalize on federal and state funding sources for electrification

The City of Fontana does not have to rely entirely on its own budget to plan for truck electrification and emissions reduction. There are federal and state funding sources to assist in electrification. The City should develop applications to one or multiple of the following sources to capitalize on the resources available for completing work that is in the best interest of the City.

If these funding sources cannot be accessed by the City, Fontana should encourage and work with private companies who are interested in electrification. Some smaller logistics facility operators may not be aware of these opportunities and the City can serve as a liaison for accessing and utilizing this funding.

Figure 6.17: Federal and state funding sources for truck electrification

Name	Description
Diesel Emissions Reduction Act (DERA)	The EPA has an annual budget up to \$100 million earmarked for diesel emissions reductions. Grant awardees have used the funding to electrify trucks, buy zero-emission school buses, and install electric charging parking spaces.
Low or No Emissions Vehicle Program (Low-No)	A competitive grant that funds state and local purchase or lease of zero-emission and low-emission transit buses and supporting facilities. Although city transit is not a major source of emissions, electrification of these heavy-duty vehicles could be a good image for the City as it pursues bigger emissions reductions strategies.
Truck Loan Assistance Program	Provides financing for small-business fleet owners (10 or fewer trucks) to upgrade their fleets with newer trucks. This loan can overcome potential

	issues of high adoption costs for smaller operators and can be particularly beneficial for local Fontana businesses.
Hybrid & Zero-Emission Truck & Bus Voucher Incentive Project (HVIP)	Makes purchases of zero-emission and near-zero-emission vehicles more affordable by providing point-of-sale vouchers. A strong program for the City of Fontana, small facility operators, and even organizations outside of the industry (i.e. a church shuttle bus).
Carl Moyer Program	An air quality standards attainment program that can contribute to advancement of zero and near-zero emissions truck adoption.
Volkswagen Environmental Mitigation Trust	Funding provided by Volkswagen to mitigate excess NOX caused by the company's illegal emissions testing defeat devices. The trust has \$423 million available, much on a first-come-first-serve basis, that includes funding for zero-emission Heavy-Heavy trucks, school buses, and vehicle infrastructure (charging stations).

Recommendation 6.6: Invest in and promote alternative solutions

As mentioned above, our findings show significant harmful emissions continuing throughout the transition to zero emissions trucking fleets, and this is without accounting for emissions caused by private vehicles. Based on this, it is our recommendation not to rely solely on technological innovation to address this issue. We have compiled a number of additional solutions that can be considered to reduce emissions. While many of these are beyond the scope of the research we have performed on Fontana specifically, they have been extensively studied at the industry level and thus are included here.

- Further reducing truck idling is a straightforward and effective way of reducing emissions already being acted upon by the City.** The Industrial Commerce Center Sustainability Standards Ordinance proposal reducing the idling time cap to 3 minutes is a very clear move in the right direction. Ensuring that drivers are in compliance will be a key factor in ensuring the efficacy of these regulations. Due to the difficulty of enforcement, changing driver behavior and “culture” around idling is crucial to the success of these programs. The signage required by the ordinance is a good place to start, however studies show that going beyond this to increase the number of instances drivers are reminded of these policies are consistently more effective at further reducing idling. This includes stickers, “leakage” (i.e. word of mouth, peer pressure, etc), and workshops and outreach.
- Urban trees have been noted as a potential solution to the ill effects of emissions. However, a meta-analysis of research in this area reveals there is not a

straightforward relationship between urban trees, air quality, and respiratory health (Eisenman et al. 2019). Urban vegetation's ability to mitigate PM emissions depends on complex interactions of a variety of variables. Depending on particular locations, densities of vegetation, wind conditions, and so forth, urban trees can potentially exacerbate air quality problems, or simply move them from one location to another. Beyond this, issues related to pollen from the trees themselves can have health implications as well. The ultimate findings of the meta-analysis are that the best way to mitigate emissions is to reduce their production. **While urban trees may have a variety of uses, there is not consistent evidence to suggest reducing air quality related illness is one of them.** City of Fontana beautification strategies or efforts to reduce heat island effects could still rely on trees (Hamstead and Coseo 2020), but their placement along truck routes does not appear to have a significant (or possibly even beneficial) impact.

- **Road pricing is another incredibly important tool for mitigating system-wide emissions in the Inland Empire.** SCAG has studied strategies for road pricing extensively and found it to be an important aspect of addressing the region's emissions, transportation performance problems, and transportation funding gaps ("Value Pricing" n.d.). While implementation would generally be at the regional level, Fontana should seek to become involved to the greatest extent possible in initiatives around implementing these strategies. Fontana bears much of the externalized costs associated with congested traffic in the Inland Empire, and this is one of the most promising ways of addressing these externalities as well as providing opportunities for Fontana to begin recouping the outsized costs it has been bearing.
- **Although trucks are the dominant mode in Southern California, investment in short-haul, intermodal freight rail may be the best solution to eliminating emissions from the transportation logistics industry.** Rail has an inherent energy efficiency advantage over trucks, requiring between a third and a fifth of the energy per ton-mile compared to trucking. While this carries obvious emissions advantages, it will remain relevant post-electrification as a way of reducing strain on the power grid. It also has the advantage of addressing the growing congestion problems in the Inland Empire. Several studies, including current interest from the Port of Long Beach and the Port of Los Angeles, have determined that freight rail is operationally feasible and efficient (Yaniv 2019). However, it is not yet cost-effective. The main rail operators in the region (UP and BNSF) make their profits from long-haul trains and have historically not invested in this space. As projects like the [Alameda Corridor](#) discuss potential expansion and capital investments sponsored by the proposed

Build Back Better Plan are planned, these regional solutions could use support from cities that are also invested in goods movement.

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Road Safety

This chapter provides an overview of road safety in the City of Fontana and within the Inland Empire. The section includes an analysis of collision¹ data and outlines potential opportunities for improving the safety of the city's transportation network.

Methodology and Data Sources

This analysis is conducted using collision data representing collisions that occurred during the ten-year period between January 1, 2010 and December 31, 2019 in Fontana and uses the Inland Empire (Riverside and San Bernardino counties) as a comparison geography, using data retrieved from the Transportation Injury Mapping System (TIMS) (SafeTREC 2021). TIMS applies a methodology to clean and geocode data from California Statewide Integrated Traffic Records System (SWITRS), a database of police traffic records (California Highway Patrol 2021). Because the database uses police records, it only contains collisions for which police reports were filed and thus likely under-reports the true number of collisions in Fontana or the Inland Empire.

Collision Data Analysis

During this ten-year period, there were 7,199 collisions in the City of Fontana, which resulted in 149 deaths and 10,068 injuries. In the same period of time, there were 185,249 collisions in the Inland Empire, which resulted in 5,326 deaths and 265,340 injuries. Normalized by the average population over those 10 years, Fontana saw an average of 3.50 collisions per 1,000 residents per year, compared with the Inland Empire's average of 4.15 collisions per 1,000 residents per year. Overall, the collisions that occurred in Fontana were less severe (less likely to result in a fatality or severe injury). Figure 7.01 shows the distribution of collisions by severity.

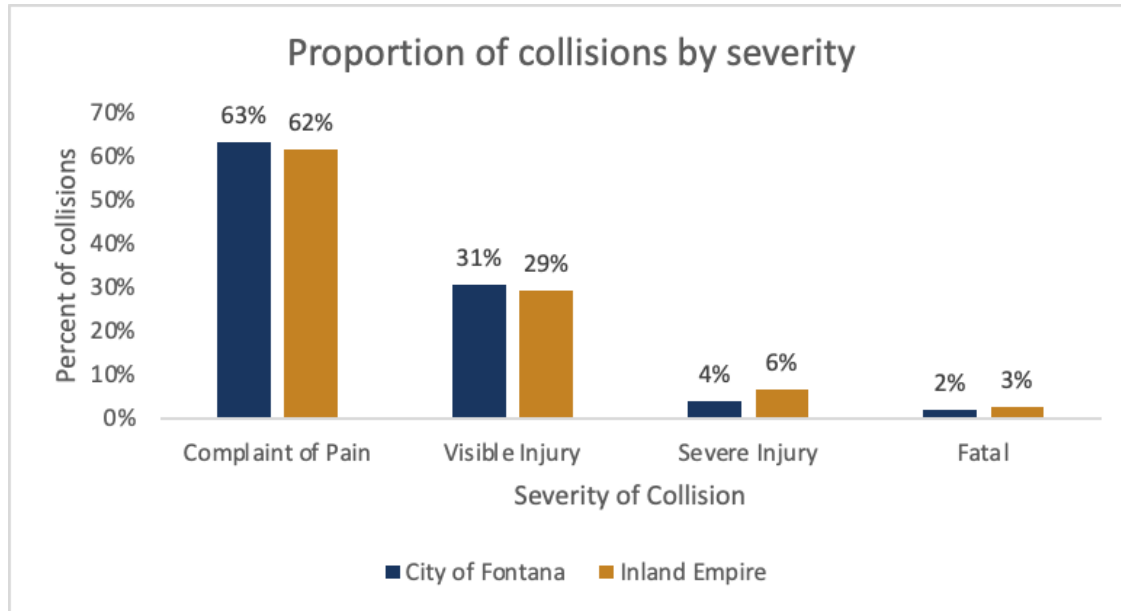
Modes Involved and Collision Severity

There were higher rates of collisions that involved trucks, pedestrians, and cyclists in Fontana when compared with in the Inland Empire. Figure 7.02 shows the proportion of collisions involving certain modes of transport for both geographies. Each difference is

¹ This report refers to collisions as such, and not as "accidents," which they are often colloquially referred to as. The field of traffic safety refers to them as such because "accident" implies that no one is at fault, when in reality that may not be the case.

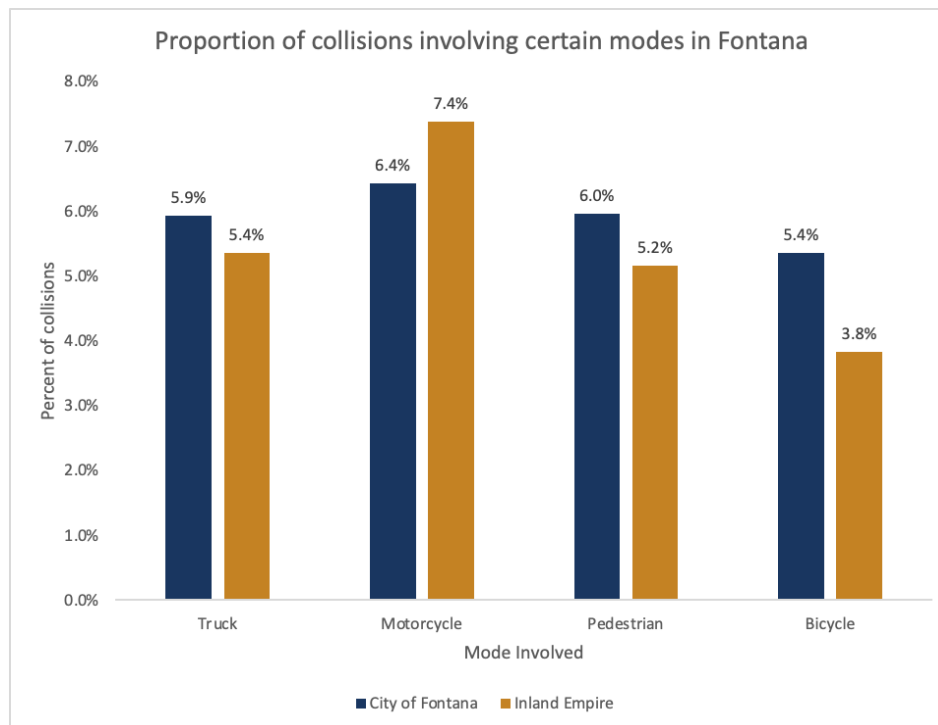
statistically significant at $p < 0.01$. Not only does heavy truck traffic increase the risk of collisions, but collisions with trucks involved are more likely to result in severe or fatal injuries (Chen et al. 2020).

Figure 7.01: Proportion of Collisions by Severity



Source: Author generated with TIMS data.

Figure 7.02: Proportion of Collisions Involving Certain Modes



Source: Author generated with TIMS data.

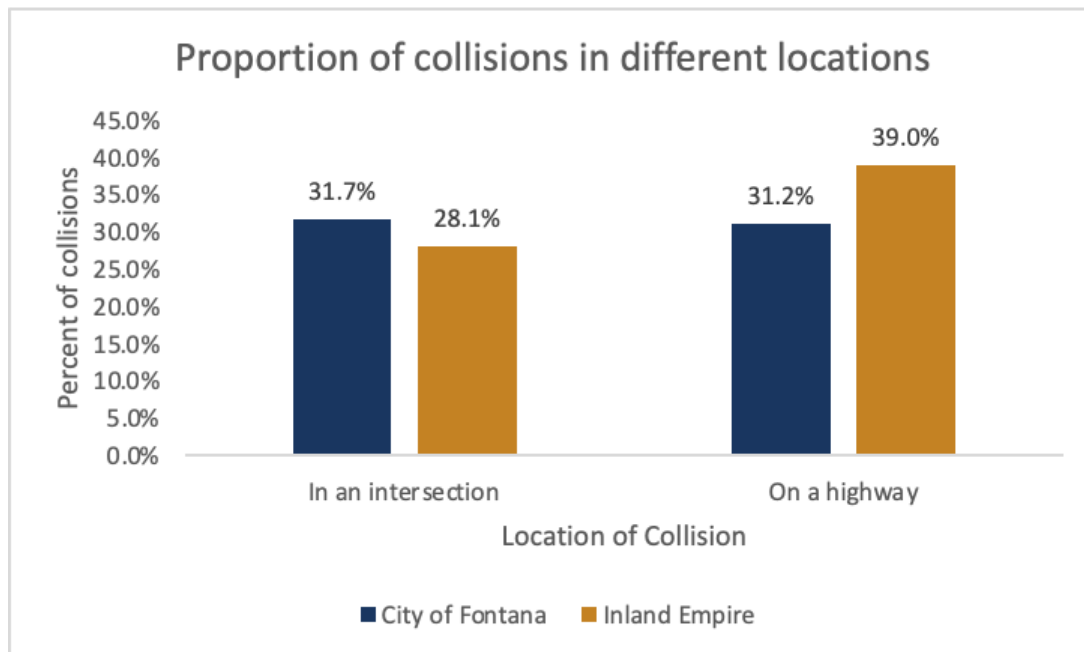
Location of Collisions

Fontana had higher rates of collisions occurring at intersections than on highways, compared to the Inland Empire; Figure 7.03 shows the proportion of collisions occurring in each location. Both differences are statistically significant at $p < 0.001$. While the roads considered “highways” are technically the State of California’s Right of Way, intersections on local roads are under the jurisdiction of the City.

Recommendation 7.01: The city should work with CalTrans to improve the safety of roads that are in CalTrans Right of Way

Though the city does not have jurisdiction over state highways, the City should make sure that CalTrans is aware that their roads see high rates of collisions. Furthermore, there are a multitude of examples of local jurisdictions working with CalTrans to improve traffic safety on roads in CalTrans right of way. In 2020, the City of Claremont implemented traffic calming measures on Foothill Blvd (Route 66) with their [Foothill Blvd Master Plan Improvements Project](#). There is opportunity present to improve safety planning at intersections to reduce local collisions.

Figure 7.03: Proportion of Collisions at Different Locations on the Road Network



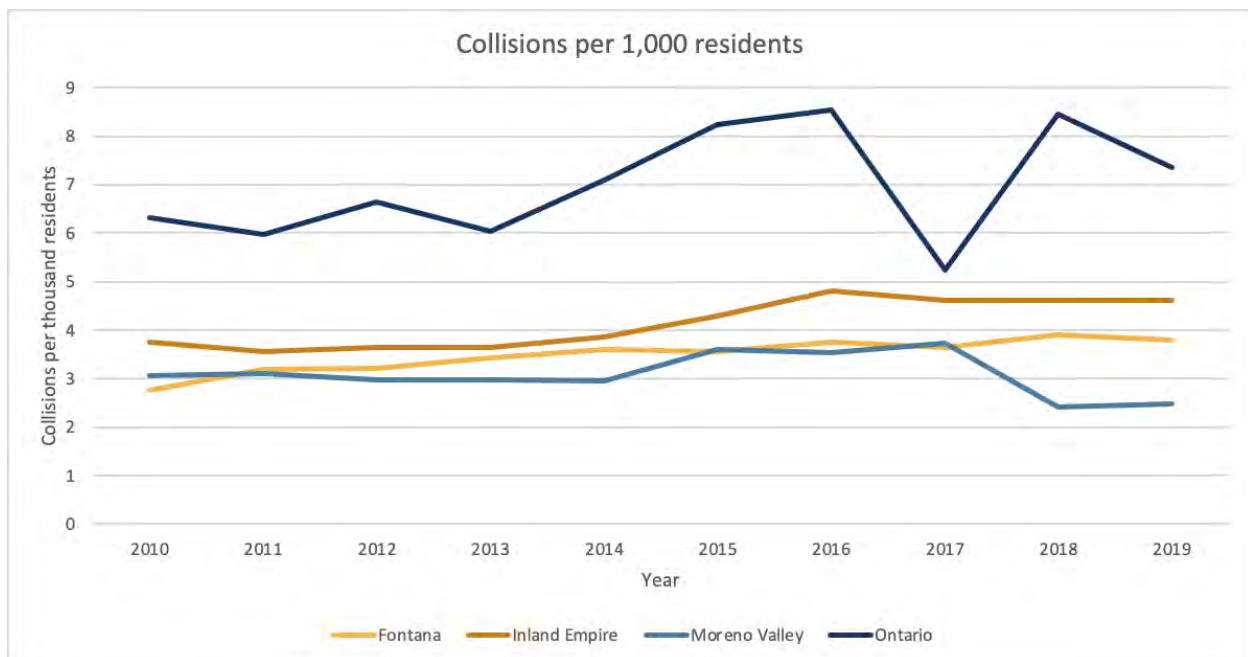
Source: Author generated with TIMS data.

The roads in Fontana and the Inland Empire are frequently congested, and data suggest that collision rates in congested traffic states are up to 5 times higher than collision rates in

free-flow traffic (Yeo, Jang, and Skabardonis 2010), even though collisions at slower speeds on congested roads may be less deadly. Although the City of Fontana is limited in its response to traffic congestion, it is important to understand the factors that affect the frequency of traffic collisions in order to understand what countermeasures they can take to make the roads safer.

While there are many factors involved in a collision, a safe systems approach builds in a buffer for human error. Drivers under the influence of alcohol or drugs have a higher rate of being involved in severe and fatal collisions (NHTSA 2021), and a safe systems approach to road safety can reduce the chances of such collisions from happening in the first place, and minimize their severity when these collisions do occur. In Fontana over the analysis period, 10.5% of collisions (757 collisions) involved alcohol, compared with 11.6% (21,544 collisions) in the Inland Empire. While Fontana does have a smaller rate of collisions involving alcohol than the region, the vast majority of collisions do not involve alcohol, therefore infrastructure improvements could and should be implemented to prevent the collisions from occurring.

Figure 7.04: Collisions in Fontana, Moreno Valley, Ontario, and the Inland Empire Normalized by Population



Source: Author generated with TIMS data.

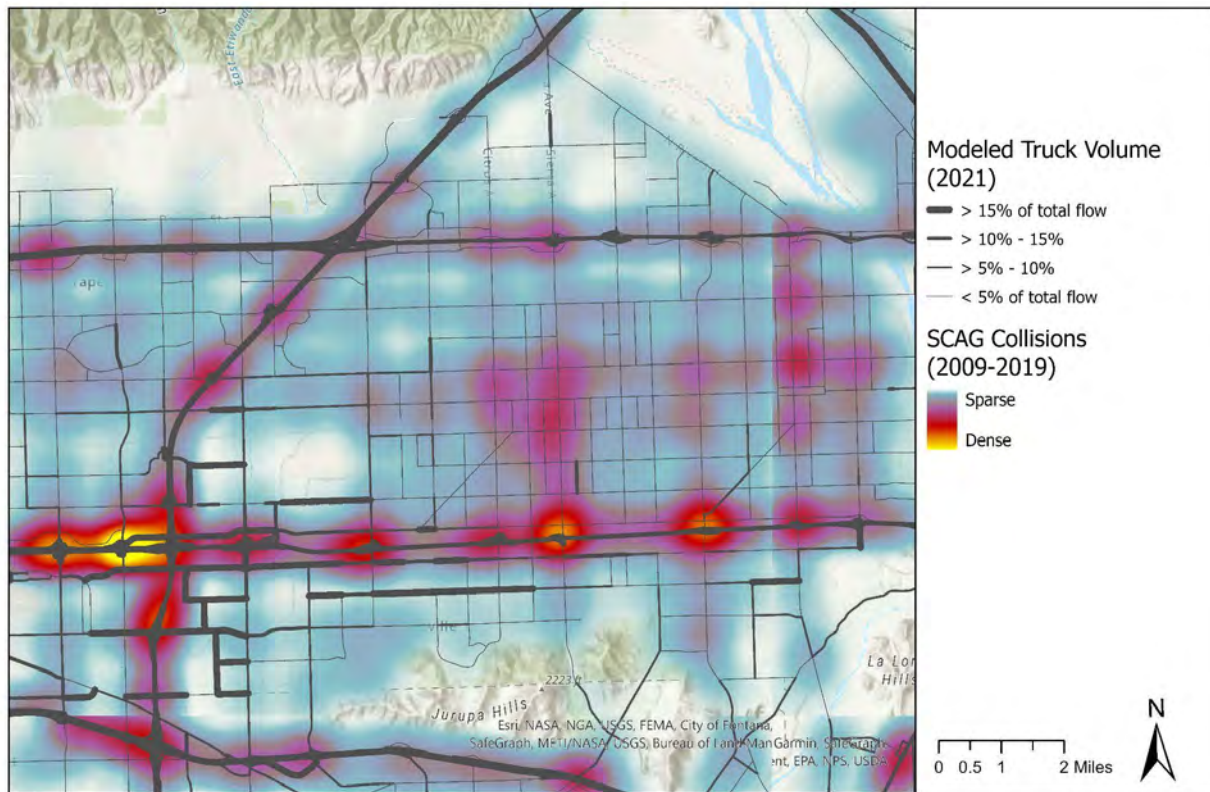
Future Data Needs

Collisions in Fontana were also compared with those in the Inland Empire, Moreno Valley, and Ontario; two similar, nearby cities. Figure 7.04 shows that when normalized by population, Fontana is seeing fewer collisions within their jurisdiction. Although this is a good baseline, there is a need for more detailed road safety metrics, such as comparing collisions against counts of vehicular and non-automotive traffic. While the City did have vehicular traffic counts for certain streets, there were only 35 roads in the network with Average Daily Traffic (ADT) counts from the past five years. There is, therefore, an opportunity for the City to collect more robust traffic counts. In addition to collecting ADT, the City can collect up-to-date data on peak hour traffic, 85th percentile speed, and traffic counts across modes to monitor traffic safety throughout its road network.

Also seen in Figure 7.04 is that the rate of collisions in Fontana is increasing over time, even when accounting for population growth. Although Ontario sees the highest rates of per capita collisions, they have started to address road safety issues and were recently awarded a \$470,000 grant from the California Office of Traffic Safety (City of Ontario 2021). The City of Moreno Valley also acknowledged that traffic safety is an issue and created a [Traffic Safety Commission](#) to both evaluate traffic safety improvements and educate the public (Moreno Valley n.d.). **Recommendation 7.02: The City should instate a Traffic Safety Commission to monitor traffic safety and determine where traffic safety investment should be directed.** This Traffic Safety Commission should also be tasked with securing funding to be used for infrastructure improvements.

Figure 7.05 shows a heat map of where the collisions occurred, along with the Southern California Association of Government's truck forecast model. There are hot spots near the on- and off-ramps of freeways, and on the local streets. Sierra Boulevard is one of the local streets with the highest number of collisions, goes through the center of downtown Fontana, and is a truck route. **Recommendation 7.03: Consider the collision history of the road network when designing the truck priority network** The following local streets saw the highest number of collisions during the ten-year period:

- Sierra (659)
- Juniper (165)
- San Bernardino (103)
- Foothill (430)
- Jurupa (159)
- Randall (103)
- Citrus (396)
- Merrill (153)
- Cypress (80)
- Cherry (306)
- Slover (147)
- Miller (78)
- Valley (276)
- Beech (111)
- Palmetto (73)
- Baseline (270)
- Alder (110)
- Locust (68)
- Arrow (207)
- Mango (107)

Figure 7.05: Heat Map of Collisions in Fontana and Neighboring Cities

Source: Author generated with TIMS data.

Although we were interested in spatially analyzing traffic collisions with respect to the current bicycle network and city recommended truck routes, the city does not maintain a database with these shapefiles. **Recommendation 7.04: The City should actively maintain an open data portal database with documents and files to support their planning initiatives.** Open data portals can increase constituent participation and data transparency with the public (Lněnička and Nikiforova 2021). Although the city does technically maintain an [open data portal](#), there is limited data included on it, and the available data is not well documented. The [City of Oakland](#) has an exemplary Open Data Portal, with over 700 files available to the public. The nearby city of [Rancho Cucamonga](#) has almost 200 files available on their Open Data Portal, including planning-related data like bike lanes and truck routes, and also valuable information for the public like infrastructure work order requests, fire-hazard maps, and street sweeping schedules.

Traffic Safety and Community Engagement

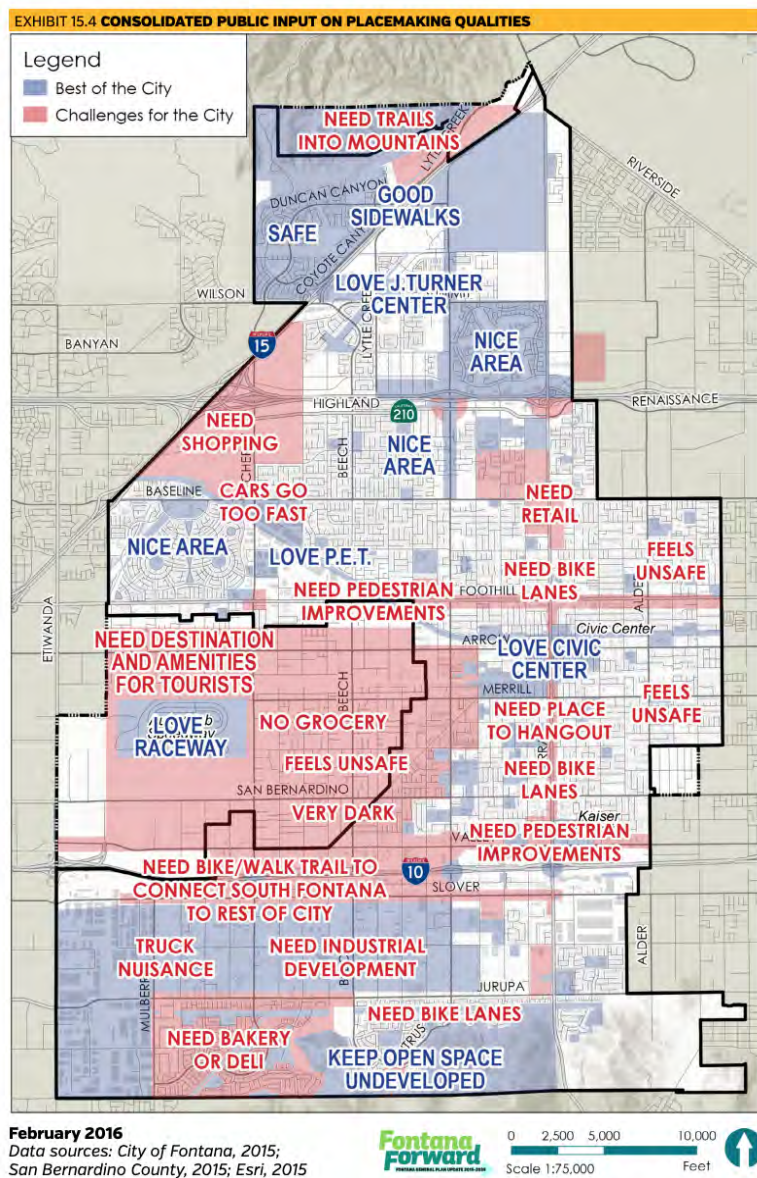
Fontana Residents have expressed a desire for safer roads. Chapter 15 of the 2015 [City of Fontana General Plan](#) includes the results of a public opinion survey on land-use planning initiatives. Many of the priorities the community identified were related to transportation and traffic safety investments. 87% of respondents said they view it as a priority to “make it easier and safer to walk to local destinations.” 87% of respondents said it was a priority to “redevelop and revitalize Foothill Boulevard and Valley Boulevard,” two streets with a high number of collisions. Between 2010 and 2019, there were 278 collisions on Valley Boulevard that resulted in 389 injuries and 4 deaths (one pedestrian, one motorcyclist, and two drivers); during the same period there were 430 collisions on Foothill Boulevard that resulted in 607 injuries and 22 deaths (eight pedestrians, two cyclists, and 12 drivers). 74% of respondents said that “creat[ing] a safe network of bike routes” was a priority.

The General Plan also includes a community-made map that identifies “best of” and “challenges for” the City of Fontana; this map is shown in Figure 7.06. Although some of the comments refer to the unincorporated area of San Bernardino County, many comments directly refer to City land. Fontana residents identify multiple areas that they feel need bike lanes and pedestrian improvements, in addition to areas where “cars go too fast,” and where “trucks [are a] nuisance.” Residents also identify a lack of bicycle and pedestrian facilities that connect the Southern portion of the city to the rest of the city. Two areas within the city’s jurisdiction were identified as “feel[ing] unsafe,” and while this may not be directly related to traffic safety, infrastructure improvements like additional street lighting could help mitigate these feelings.

The unincorporated area outside of the City jurisdiction still impacts the residents of Fontana. Many Fontana residents drive through this area, and the land sits within the Sphere of Influence of the City. Just as the Kaiser Steel Mill and the Speedway are associated with Fontana due to their intertwined history with the City, the areas where the community reported “feel[ing] unsafe” and that are “very dark” are associated with the city. Though it is not in the jurisdiction of the City, the City should work with county officials to improve the safety conditions of the roads in this area, to the benefit of its residents and its own image.

Although this map was created in 2016 and there has been considerable investment in bicycle and pedestrian infrastructure since this feedback was received, it represents the sentiment of former and current Fontana residents. **Recommendation 7.05: The City should collect ongoing community input in order to identify locations in the city where Fontana residents feel unsafe and where traffic safety investment should be directed.** The city should also work with residents to understand what aspects of safety the community values and feels is most important to address.

Figure 7.06: “Consolidated Public Input on Placemaking Qualities” Map from Fontana General Plan



Source: Fontana General Plan

Strategies and Funding Sources

This section details recommendations and strategies to improve road safety in the city of Fontana and identifies potential funding sources that can be used to help implement these road safety improvements.

Recommendation 7.01: The city should work with CalTrans to improve the safety of roads that are in CalTrans Right of Way

The City does not control the right of way on state routes, but is still affected by collisions that occur on those roads. As such, the City should work with CalTrans, make sure they know about the high rates of collisions on certain roads, and create a plan to improve road safety on these roads.

Recommendation 7.02: The City should instate a Traffic Safety Commission to monitor traffic safety and determine where traffic safety investment should be directed

Following in Moreno Valley's footsteps, Fontana should create a Traffic Safety Commission tasked with securing funding and directing said funding to traffic safety improvements. This commission should talk with officials in neighboring cities to learn about the work they do to improve traffic safety and learn about how they secure funding for their traffic safety projects, like the grant Ontario received (see page 7.5).

Recommendation 7.03: Consider the collision history of the road network when designing the truck priority network

As mentioned above, collisions involving trucks are more likely to be severe, so the city should consider high-injury corridors when designing truck priority routes. The city should also consider whether they want to remove Sierra Blvd from the priority truck network since it is a high-injury corridor and runs through the center of downtown.

Recommendation 7.06: Improve the existing street network to calm traffic in particularly dangerous locations

It is clear that there are "hot-spots" of particularly dangerous streets on the street network in the City. The City can implement traffic calming measures to improve road safety. While some road safety measures require capital investment, like lane narrowing or infrastructure-based improvements like speed humps, others like signal retiming to encourage slower speeds are low-cost and quick-turnaround solutions. In 2020, Alta Planning, along with the California Bicycle Association published a [report detailing "Quick](#)

[Build” solutions for safer streets](#). These “quick build” projects implement cheap materials that can be installed quickly, like posts, planters, and striping, that are meant to be installed for a trial period. Because they are temporary, the City can adjust or remove elements based on constituent feedback. The National Association of City Transportation Officials (NACTO) details various [Speed Reduction Mechanisms](#) which offer a variety of local safety improvements the City can implement (NACTO 2021). NACTO publishes a variety of “best practices” guides that can be used when designing street improvements (NACTO 2021). Investment in infrastructure improvements also will help to create more job opportunities to employ local residents.

Recommendation 7.07: Partner with religious and faith-based institutions to help fight homelessness

When talking with local stakeholders, the team learned that many of the pedestrian collisions in the city involve unhoused residents of Fontana crossing the streets late at night. Faith-based institutions that are interested in tackling issues of homelessness in the City may be good partners in decreasing the number of pedestrian-related fatalities and collisions that are related to homelessness.

Recommendation 7.08: Leverage the city’s Safe Routes to School partnership to create “safer streets and encourage more students to walk and bike to and from school

The city currently partners with Safe Routes to School and has “Suggested Routes to School for each school in the City. However, the City can do more to leverage the Safe Routes to School toolkit to encourage students to walk and bike to school. The [toolkit](#) already includes activities for keeping families engaged, incorporating community partners and incentivizing students to walk to school, like “Monthly or Weekly Walk & Roll Days,” “Bike Rodeos,” or “Safety Assemblies” (City of Fontana 2017). The toolkit also details a list of funding sources on pages 49-50, and these should be utilized to help finance infrastructure improvements.

Recommendation 7.09: Create a Local Roadway Safety Plan using state funding

CalTrans offers cycles of grants to help fund the development of Local Roadway Safety Plans (LRSP), to provide “a framework for organizing stakeholders to identify, analyze, and prioritize roadway safety improvements on local and rural roads. The process of developing an LRSP can be tailored to local protocols, needs, and issues” (California n.d.). In October 2021, CalTrans closed their most recent application cycle, but there may be opportunities

for funding these plans in the future. We recommend that the City remain aware of this funding stream, should CalTrans open up their call for applications.

Recommendation 7.10: Stay up to date on the latest “best practices” of road safety

As mentioned in Recommendation 7.3, NACTO publishes best practices for roadway design. Additionally, Build Back Better, which passed in the US House of Representatives in November 2021, includes funding for road safety initiatives. Section 110006 allocates funding to “develop recommendations and best practices to help States collect and use traffic safety enforcement data to promote equity and reduce traffic-related fatalities and injuries” (US House of Representatives 2011). As funding is allocated, best practices will be compiled; these practices should be followed when updating local roadway design.

Recommendation 7.11: Commit to Vision Zero goals and pledge to eliminate all serious and fatal injuries on the road via a systems approach

To address concerns of road safety, transportation planners have been rethinking how traffic safety is implemented. The traditional approach has been to focus on changing driver behavior, where specific and general deterrence through enforcement is meant to reduce unsafe actions by increasing the perceived costs and decreasing perceived benefits of committing offenses. Despite improvements in safety technology, policy, and enforcement, Fontana continues to have unsafe roads. To establish itself as a leader within the Inland Empire, the City of Fontana should commit to [Vision Zero](#) goals and pledge to eliminate all serious and fatal injuries on the road via a systems approach, detailed below.

The goal of a transportation system is not just to provide efficient mobility but to ensure access to equitable, sustainable, and safe mobility. We must move towards a safe system which eliminates injuries and fatalities. The Vision Zero approach recognizes that road users make mistakes, and we must build in safety buffers so mistakes do not cost someone’s life (Belin, Tillgren, and Vedung 2012; Tingvall and Haworth 1999). Examples of these safety infrastructure buffers are those listed above for calming traffic like lane narrowing, speed bumps, smaller radii around corners, and those detailed in the NACTO best practices and the quick build guide described above. Vision Zero is an ethical imperative for all road safety measures that says one death on the road is too many. It is not just a long-term goal, but a paradigm shift, reframing safety from a conversation about preventing collisions to preventing injury, death, and the trauma associated with loss.

Vision Zero is also a multi-disciplinary approach to road safety. This idea is captured in the five E’s that are traditionally used to describe Vision Zero: Evaluation, Engineering,

Education, Encouragement, and Enforcement. This cross-cutting, systems approach is how Oslo, Norway has drastically improved road safety over the last two decades. After committing to Vision Zero in 1999 they dropped to only 1 death and 33 serious injuries in 2019 (Hartmann and Abel 2020). Political and public buy-in was the key element for these road safety improvements. Oslo not only made top-down changes to road design standards that prioritized slower and pedestrian-friendly streets (including establishing a car-free city center) but also received community support in educating vulnerable road users about the changes and encouraging mode shifts to reduce car traffic. Engineering is the priority in Vision Zero, and it shows in Norway where street improvements have created a safer environment without relying on forcing drivers to change behaviors.

Many cities in California have committed to Vision Zero Goals. In addition to larger cities, like Los Angeles, San Jose, San Francisco, and San Diego, smaller cities like Alameda, Santa Barbara, San Luis Obispo, and La Mesa have already committed to Vision Zero (Vision Zero Network 2021).

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