



IMPORTED GOODS ARE MERGED
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CALIFORNIA DISTRIBUTION CENTERS
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ACROSS THE NATION.

warehouses and distribution centers

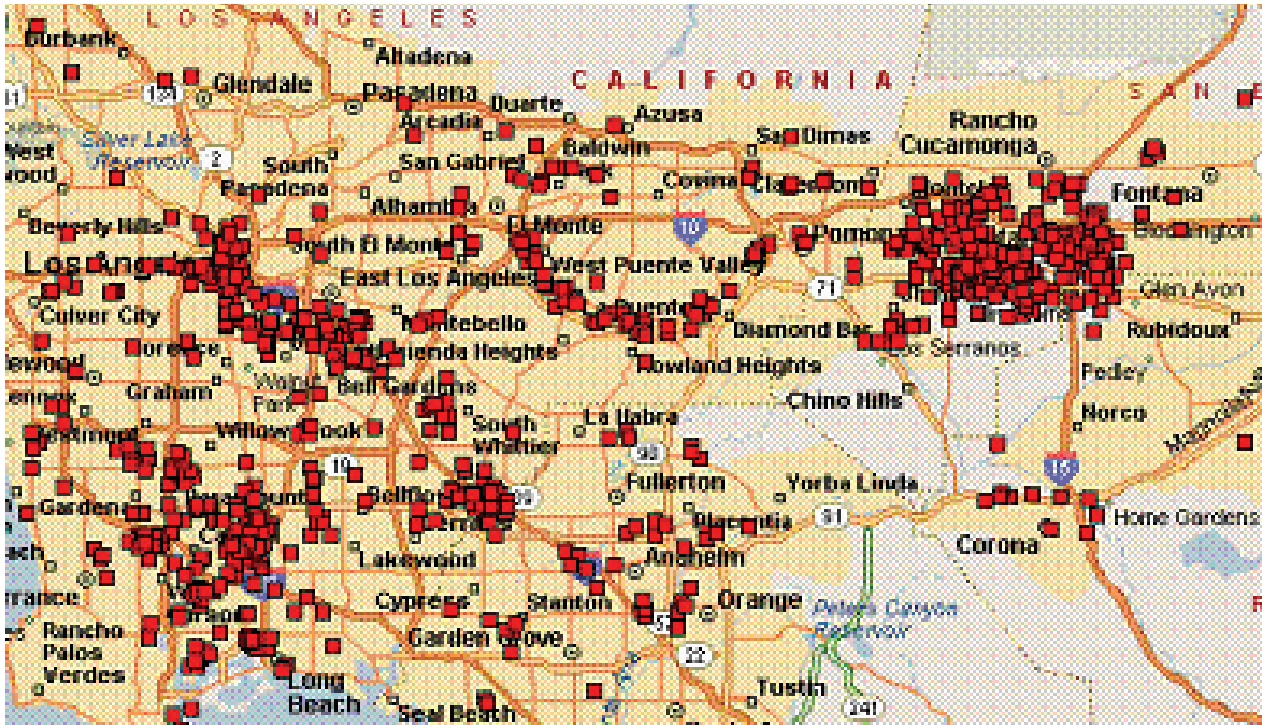
WAREHOUSES AND DISTRIBUTION CENTERS are an important part of the regional goods movement system. These centers are used to receive, deliver, consolidate, distribute, and store freight. Imported goods are merged and sorted at many Southern California distribution centers for delivery to destinations across the nation. Many others serve as distribution hubs for the large retail markets in Southern California.

The locations of distribution centers overlap with manufacturing facilities and connection points between freeways, ports, where freeways connect with ports, airports, and railyards. The region's warehousing, distribution, and intermodal facilities account for 15% of the total U.S. market and 60% of the West Coast market.⁵⁸ The largest distribution centers can encompass millions of square feet. Figure 6-1 on the following page shows the location of distribution centers in the region.

Many distribution centers are clustered around major transportation links. Riverside and San Bernardino Counties support the largest cluster of warehouses, near Ontario Airport. Other warehouse clusters are found close to railyards near the intersection of I-5 and I-10, and along I-710.



FIGURE 6-1 LOCATION OF WAREHOUSES AND DISTRIBUTION CENTERS IN THE SCAG REGION



Source: SCAG. 2006. *Inland Port Feasibility Study*.

AIR QUALITY

Air Quality Impacts

Warehouses and distribution centers can be a significant source of air pollution for local communities. Emissions from these facilities are caused by truck traffic to and from the centers, truck idling, and the operation of equipment. The impacts of truck idling can be large; a recent warehouse study showed that 15 minutes of idling caused emissions that were 50% more than one truck trip's emissions.⁵⁹ Additional emissions can be caused by diesel-powered transportation refrigeration units (TRUs). TRUs are used for perishable goods (often called "reefers"). TRU diesel emissions can pose a health risk to individuals living or working near refrigerated distribution centers.⁶⁰

ARB has adopted several control measures to reduce diesel emissions associated with warehouses and distribution centers. One measure targets truck idling by prohibiting unnecessary idling for more than five minutes at one location.⁶¹ A second measure, which will be phased in between 2008 and 2019, requires

cleaner emission standards for TRUs currently in use.⁶² A third measure will require existing (in-use) trucks to meet emission reduction standards beginning in 2010.⁶³ These warehouse-specific regulations, when combined with other EPA and ARB truck standards (Section 3.2), will improve air quality in neighborhoods surrounding warehouses and freight facilities.

The emissions from warehouse construction can also have impacts, due to the size and power of diesel equipment involved in construction projects. While construction emissions can be difficult to measure directly, they can be calculated using the URBEMIS emission model supported by the SCAQMD. URBEMIS combines data from other ARB models to characterize construction equipment, and uses a detailed schedule of construction tasks to estimate the total number and hours of equipment utilized. More information about URBEMIS can be found at the SCAQMD website.⁶⁴



Air Quality Improvement

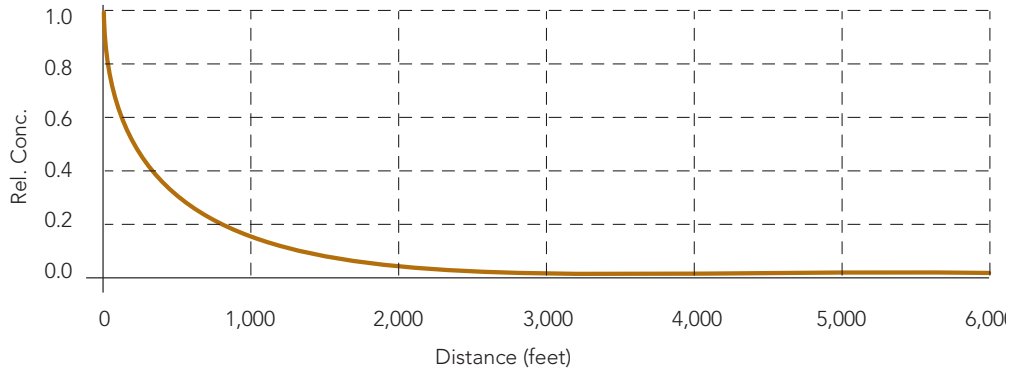
Limiting truck idling is one of the most effective strategies to reduce emissions at distribution centers. Strategies include:

- **Truck idle reduction**
- Limitations on emissions from truck trailers or containers

As described above, ARB has adopted a statewide regulation that limits truck idling. Truck idling can be reduced through on-site **truck idle reduction** policies enforced by distribution center owners and operators.

Additional strategies limit emissions from truck trailers or containers with TRUs, or “reefers.” Reefers are a significant source of pollution since they operate continuously and tend to be concentrated in one location (see Figure 6-2). In 2004, ARB attempted to reduce reefer emissions by requiring TRU upgrades. The ruling is currently unenforceable and is pending a waiver from U.S. EPA.⁶⁵ Truck owners can upgrade to equipment with better

FIGURE 6-2 SENSITIVITY OF CONCENTRATION TO DOWNWIND DISTANCE FROM A DISTRIBUTION CENTER WITH TRUS



Source: California Air Resources Board. 2007. Health Risk Assessment for the Union Pacific Railroad Mira Loma Auto Facility Railyard. November.

emission controls.

NOISE

Noise Impacts

Warehouses and distribution centers can create noise impacts to neighboring communities. Typical noise sources include truck idling, truck entry and exit, and operating heavy-duty equipment. These noise impacts are greatest when heavy truck flow associated with a warehouse passes through residential neighborhoods and other sensitive land uses. In addition, warehouse activities such as freight loading and unloading can create additional noise impacts for nearby residents. Since warehouses and distribution centers are typically sited in industrial zones, noise impacts from their on-site operational activities are often lower than impacts from related truck and railroad traffic.

Doubling traffic on any given roadway causes a noise increase of approximately 3 dBA, which is considered barely perceptible to most people. When evaluating traffic noise impacts from warehouses and distribution centers, it is necessary to consider the noise-emitting characteristics of different vehicles. Truck traffic noise can be measured in terms of automobile traffic noise. For example, a medium-duty and a heavy-duty truck traveling at 55 miles per hour can produce noise similar to 5 and 13 automobiles, respectively.⁶⁶

Noise Impact Improvement

Several strategies reduce noise impacts from warehouses and distribution centers, including:

- **Soundproofing** of affected dwellings
- Installation of **noise barriers**
- Operational **design features** or practices to reduce noise generation
- Land use planning

Typical measures, such as installing noise barriers along affected properties and soundproofing affected structures, provide noise shielding at affected land uses; the noise source can also be shielded. Noise shields could screen particular stationary equipment or along perimeter of the warehouse and distribution center.

Warehouse and distribution center operators can adjust operation practices to reduce noise generation. Practices to reduce noise generation include limiting loading and truck activities during evening and/or nighttime hours, and limiting unnecessary truck idling time. Operation practices may reduce noise emissions at lower cost than noise shielding.

Local communities reduce noise exposure from warehouse and distribution operation through land use planning and policies. Such strategies and policies discourage new residential development near the warehouse and distribution center.

TRAFFIC AND SAFETY

Traffic and Safety Impacts

Residents near warehouses and distribution centers can experience higher traffic congestion due to heavy truck traffic. The scale of these impacts depends on the distribution center size, amount of use, and traffic levels on connecting roads. Traffic studies estimate that distribution centers in the Inland Empire region generate between 330 and 530 daily truck trips per million square feet of warehouse space.^{67, 68} The amount of warehouse vehicles other than trucks causes additional traffic impacts. Vehicle trips vary between 1,100 and 1,600 daily vehicle trips per million square feet of warehouse space.^{69, 70}

Truck and vehicle trip impacts can be greater if there are peaks during morning and evening hours. Studies show that most sites do not have peak periods.⁷¹ Of 11 analyzed sites, only three showed peaks in passenger car trips and one showed peaks in truck trips.

CASE STUDY COACHELLA VALLEY

Located in the eastern portion of Riverside County, the communities in the Coachella Valley anticipate significant community development in the long term, potentially including expansion of the Jacqueline Cochran Regional Airport as an inland port along with nearby supporting industrial and warehousing spaces. The area is also located close to State Route 86S (also known as a key part of the emerging "NAFTA Corridor" route connecting the California/Mexico border with points north) and Interstate 10. The Community Feedback Group identified advance land use and circulation planning for optimal placement of future facilities, residential and commercial land uses to maximize economic benefit and minimize potential impacts.



CASE STUDY CITY OF SOUTH GATE

Trucks frequently block local streets to back into warehouse facilities in the City of South Gate, causing traffic delays and unsafe conditions. The Community Feedback Group identified a number of potential strategies including adding signage at such facilities, and considering new City permit and code requirements that limit or prohibit backing at such facilities.

Traffic and Safety Improvement

Strategies to address traffic from distribution centers are similar to strategies for other freight facilities. Strategies include:

- Designated truck routes
- Facility improvements

Designated truck routes can help to limit traffic congestion in some locations, can channel trucks away from residential areas, and can reduce noise and air quality impacts.

Loading or unloading delays within a distribution center can lead to truck queues that spill over onto local roads, causing congestion. Delays occur when the number of shipments exceeds a facility's capacity. Facility improvements that allow for faster unloading, additional truck parking, or additional waiting areas for trucks can reduce traffic congestion on local roads.

Traffic Design

In addition to adding to the number of vehicles on local streets, large trucks require more space than cars to make turns onto streets or into driveways. Yet not all streets and intersections were originally designed to accommodate large trucks. Similarly, how driveways are positioned at facilities can force trucks to make tight turns or require backing into the facility, which may require the truck to block the connecting street and cause traffic delays and safety impacts.

Local communities can require new facility designs to ease truck traffic; well-designed access points provide easy maneuvering and are located away from nearby sensitive uses whenever possible. Specific intersections that accommodate high truck volumes and turns can be improved for safer truck travel and turns.

AESTHETICS

Aesthetic Impacts

Distribution centers can create visual impacts during construction and on-going impacts in operation. If a new facility is built on a site with scenic or aesthetic characteristics, there are visual impacts during construction. On-going impacts may be caused by excess light, by the industrial nature of building architecture or activities, or by shipping container stacking.

Distribution centers are scattered throughout Southern California and some are in close proximity to residential areas. As a result, many communities may be affected by the visual impacts of distribution centers.

Aesthetic Impact Improvement

Aesthetic impact improvement strategies include:

- Landscaping requirements
- Spillover light controls

Communities can adopt regulations that target the visual impacts of distribution centers. Zoning regulations include landscaping requirements, such as trees, shrubbery, vines, and groundcovers, which serve as a visual shield between distribution centers and residential areas. These regulations can specify the number and location of plants and the total landscaping coverage.⁷²

Communities can adopt regulations to limit the amount of excess light caused by light-industrial buildings. Spillover light controls include specifications on the type and location of light sources, and limits on the amount of spillover light from the property. For example, some cities require that lighting posts be less than 18 feet tall and include reflectors to direct light away from adjacent properties.⁷³

Communities face different challenges in mitigating the visual impacts of distribution centers than they do with railyards and ports. The size of distribution centers can vary greatly from several thousand square feet to millions of square feet. This prevents a “one size fits all” approach. Communities must adapt improvement options to the size and operation of each distribution center, which are commonly operated by individual, independent corporations. Therefore, unlike railyards and ports, each “owner” will need to be approached individually to determine contacts and an approach to community enhancement.

