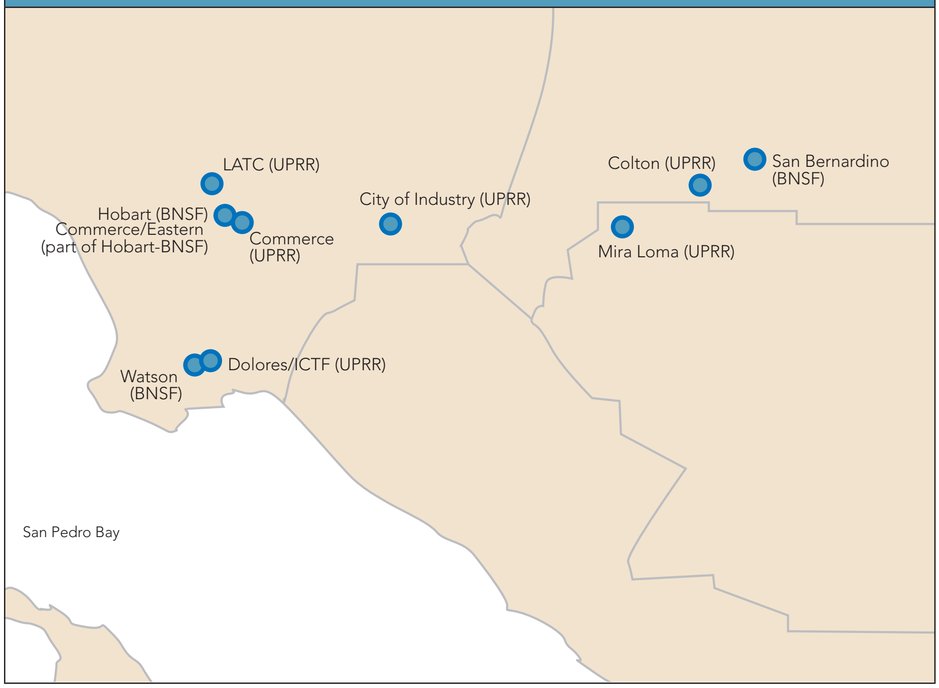
RAILYARDS SUPPORT A VARIETY OF OPERATIONS INCLUDING: LOCOMOTIVES, ON-ROAD AND OFF-ROAD TRUCKS, CARGO-HANDLING EQUIPMENT, TRANSPORTATION REFRIGERATION UNITS AND MAINTENANCE SHOPS.

railyards

RAILYARDS ARE ANOTHER MAJOR component of the goods movement system in Southern California. Railyards are used for switching rail cars to make up or break down trains. Many railyards contain facilities that transfer containers and trailers between trucks and rail cars. Some railyards include locomotive maintenance facilities. They are often sited in mixed industrial and residential areas.

There are nine major railyards in the Southern California region, shown in Figure 5-1. All are owned and operated by either the UP or BNSF railroads. These railyards support a variety of operations including: locomotives, on-road and off-road trucks, cargo-handling equipment, transportation refrigeration units (TRUs), maintenance shops, and others. Activity at railyards can be measured in a variety of ways including: the number of locomotives and their time of operation, truck counts at facility gates, the number of pieces of cargo-handling equipment and their time of operation, or the number of container "lifts."

FIGURE 5-1 LOS ANGELES AREA—MAJOR CLASS I RAILYARDS



AIR QUALITY

Air Quality Impacts

Railyards contain locomotives, cargo-handling equipment, on-road trucks, as well as off-road vehicles and stationary equipment. Railyards equipped to handle truck to train transfer of goods (intermodal facilities) attract heavy truck traffic. All of these sources burn diesel fuel and emit toxic air contaminants such as diesel particulate matter. The number of locomotives and intensity of their use, the volume of on-road trucks serving the facility, and the activity of other diesel equipment used in the railyard contribute to railyard emissions.

In 2005, UP, BNSF and ARB agreed to reduce railroad pollution.[37] This agreement requires that Health Risk Assessments (HRAs) be conducted for 17 designated railyards in the State of California. A number of railyard HRAs were conducted among Southern California's nine railyards in 2007 and 2008. These assessments focused on the health risks associated with diesel pollution. Each assessment included analysis to estimate potential cancer risk associated with railyard emissions.

The sources of diesel particulate matter (DPM) and the total emissions per year were identified. Locomotives were the dominant source of DPM emis-

TABLE 5-1 RAILYARD DPM EMISSIONS BY SOURCE TYPE (TONS/YEAR) AND PERCENT CONTRIBUTION, 2005

Railyard	Locomotives		Cargo-Handling Equipment		On-Road Trucks		Off-Road Trucks and Stationary Sources		Total
BNSF San Bernardino[38]	10.6	48%	3.7	17%	4.4	20%	0.75	3%	22.0
UP Colton[39]	16.3	99%	NA	NA	0.2	1%	0.05	0.3%	16.5
UP City of Industry[40]	5.9	54%	2.8	26%	2.0	18%	0.3	3%	10.9
UP ICTF/ Dolores[41]	9.8	41%	4.4	19%	7.5	32%	2.0	8%	23.7
UP Commerce[42]	4.9	40%	4.8	40%	2.0	17%	0.4	3%	12.1
UP LATC[43]	3.2	44%	2.7	37%	1.0	14%	0.50	7%	7.3
UP Mira Loma[44]	4.4	90%	NA	NA	0.2	4%	0.2	4%	4.9
BNSF Hobart[45]	5.9	25%	4.2	18%	10.1	42%	3.7	15.5%	23.9
BNSF Watson[46]	1.9	100%	NA	NA	<0.01	<1%	0.04	<1%	1.9

sions for all of the railyards evaluated in the region. ARB collected data on the types of locomotives and what locomotives were doing (i.e., moving, idling, or undergoing maintenance testing). ARB estimated locomotive emissions and modeled the air quality impacts on the surrounding community.

Emissions vary by source type and railyard. Total emissions from the Southern California region's nine major railyards range from 4.9 tons per year to 23.9 tons per year, with the highest level of emissions recorded at the BNSF Hobart yard, one of the largest railyards in the nation, which is located just south and east of downtown Los Angeles. Locomotives tend to be the highest emitting source, followed by cargo handling equipment and on-road trucks. Off-road trucks and stationary sources have the lowest emissions among source types. Table 5-1 shows the types of emission sources in the region's nine major railyards.

HRAs focused on potential cancer risk. Cancer risk is evaluated as the number of chances of getting cancer in a certain population (one million people). The risk of cancer at multiple distances from the railyard was estimated. The risk

TABLE 5-2 CANCER RISK ESTIMATES REPORTED BY HRAS OF SOUTHERN CALIFORNIA RAILYARDS, 2005									
Railyard	*Risk At PMI (per One Million)*	*Risk At Boundary (per One Million)*	*Risk per One Million (by Distance from Boundary of Railyard)*						
			200 yards	*400 yards*	*0.5 miles*	*1 mile*	*1.5 miles*	*2 miles*	*4+ miles*
BNSF San Bernardino[47]	3300	> 500	NA	NA	100	50	NA	25	NA
UP Colton[48]	575	> 250	250	100	50	25	NA	≤10	NA
UP City of Industry[49]	480	100-250	NA	NA	50	25	NA	10	NA
UP ICTF/ Dolores[50]	1200	700	NA	NA	NA	100	NA	25	≤10
UP Commerce[51]	650	> 500	NA	>250	100	50	NA	25	≤10
UP LATC[52]	430	100-250	NA	NA	50	25	NA	10	NA
UP Mira Loma[53]	160	50	NA	NA	25	NA	10	NA	NA
BNSF Hobart[54]	3000	> 500	NA	>250a	>250b	100	NA	50	10
BNSF Watson[55]	220	> 100	NA	NA	> 50	10	NA	NA	NA

of cancer was also estimated at the point of maximum impact (PMI). The PMI is the location with the highest cancer risk level outside of the railyard boundary. Table 5-2 summarizes the cancer risk estimates in railyards in Southern California.

The BNSF San Bernardino and BNSF Hobart railyards were reported as the top two sites associated with the highest potential risk of cancer. The largest cancer risk area ranged from 3,000 to 3,300 chances per one million individuals. Risk decreased at the boundary of the railyard, and continued to decrease outside the boundary of the railyard. The UP ICTF/Dolores Railyard had the highest potential cancer risk at its boundary. Potential cancer risk was estimated to be 700 chances per one million people. In practically every assessment, potential cancer risk decreased outside the boundary of the railyard. Cancer risk remained the same (greater than 250 chances per one million individuals) at 0.5 mile from the boundary of the the cluster of railyards near the City of Commerce (UP LATC, BNSF Hobart, BNSF Commerce/Eastern, and UP Commerce). Risks consistently decreased, however, at 2 miles and 4+ miles from the boundary. Similarly, the HRA for the UP Mira Loma railyard indicated that the greatest cancer risk is located on the northeast fence line of the property and is estimated to be 160 chances per million people. The cancer risk at the boundary of the facility is estimated to be 50 chances per million. Cancer risk decreases with increased distance from the facility: 25 chances per million at 0.5 miles from the facility, and 10 chances per million at 1.5 miles from the facility.

The HRAs concluded that diesel emissions from all railyard sources can exceed 20 tons per year. As shown in Table 5-2, PMI potential cancer risks associated with railyards may range from 160 to 3,300 chances per one million individuals. Studies predicted that potential cancer risk decreased with greater distance from railyards. The potential cancer risk at 2 or more miles from the railyard is significantly lower than the risk at railyard boundaries.

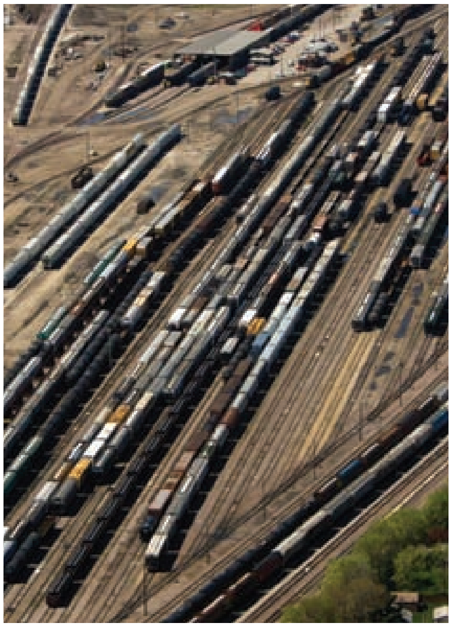
Air Quality Improvement

Strategies to improve air quality include:

- **Hybrid and generator-set, or "gen-set" locomotives**
- **Appointment** and **scheduling systems**
- **Infrastructure improvements**
- **Exhaust retrofits**
- Alternative fuels (such as **biodiesel**)
- **Building filtration systems**
- Restrictions on **siting new community services**

The emissions at railyards can be reduced by operating cleaner locomotives. Potential strategies tend to target switcher locomotives, which move rail cars in the yard and may be old equipment retired from line-haul use. New technologies for switcher locomotives, such as hybrid and gen-set locomotives, can substantially cut emissions and save fuel costs for the railroads.

Railyard emissions can also be reduced by limiting the idling of locomotives. A number of strategies reduce idling times when there is no operational need for engine idling. Strategies include operator training and technology use, such as an auxiliary power unit (APU) or an automatic engine start-stop (AESS) device.



Railyards with significant truck traffic can reduce emissions with policies and programs to streamline truck use. These policies include: appointment and scheduling systems, as well as infrastructure improvements at loading platforms and parking facilities. These policies allow trucks to move goods with less downtime and congestion, and reduce fuel consumption.

Many railyards use yard trucks, cranes, and other types of cargo handling equipment. Emissions from this equipment can be reduced with exhaust retrofits, alternative fuels (such as biodiesel), engine repowering, or electrification.

Local communities can take steps to reduce the exposure of local residents to railyard air pollution. These strategies include building filtration systems and restrictions on siting new community services—including schools and daycare centers—near railyards.

NOISE

Noise Impacts

Noise from railyards can significantly impact neighboring communities. Noise sources associated with railyard operations include: locomotive engines, horns and whistles, and switching and moving operations. In addition, noise from associated truck and railroad traffic can impact nearby communities. The significance of the impacts depends on the distances between railyards and sensitive land uses, and background noise levels.

Noise Impact Improvement

Several strategies reduce noise impact from railyards, including:

- Land use planning
- **Soundproofing** of affected dwellings
- Installation of **noise barriers** along sensitive land uses
- Operational practices to reduce noise generation (**operating restrictions**)

Typical measures provide noise shielding and can include the installation of noise barriers along affected properties and soundproofing of affected structures. The noise source can also be shielded.

Railyard operators can reduce noise generation with operating restrictions and programs, which include limiting idling time and reducing train speed. Operation practices reduce noise emissions at lower costs than noise shielding.

Local communities can reduce noise exposure from railyard operation through land use planning and policies. These strategies discourage new development near railyards.

TRAFFIC AND SAFETY

Traffic and Safety Impacts

Railyards and facilities contribute to traffic congestion and safety issues on roadways when they generate large numbers of truck trips. The flow of trucks entering or exiting a railyard can cause congestion, which affects cars and other trucks, and can affect residential and commercial areas.

Truck traffic to and from railyards can be high. The main source of traffic is from drayage trucks, which transfer cargo containers between railyards and local freight facilities including ports and distribution centers. Typically, railyards are connected to nearby freeways by only a few routes that are built to handle truck traffic. Because of this, residents along these truck routes can experience impacts from these truck trips including air quality, traffic safety, and traffic congestion.

In Southern California, some of the greatest railyard truck impacts occur near the UP Dolores / ICTF intermodal yard in Long Beach and the cluster of railyards near the City of Commerce (UP LATC, BNSF Hobart, BNSF Commerce/ Eastern, and UP Commerce). The UP Dolores / ICTF railyard, which is four miles from the SPB ports, generated more than 2,500 truck trips per day in 2005.[56] While the railyard has sufficient freeway access (it is positioned near the intersections of I-710 and I-405 freeways), it has only two established heavy truck routes. Of these two routes, traffic and air quality impacts from the southerly route is of most concern, since it passes through residential neighborhoods in West Long Beach.

> **CASE STUDY**
> **MIRA LOMA**
>
> Community activists in Mira Loma successfully engaged the local railyard operator in re-aligning truck access points to reduce truck traffic in nearby residential areas. To further reduce these impacts, the Community Feedback Group prioritized establishing clearly designated and signed truck routes away from sensitive land uses as a strategy to improve public safety.

Truck traffic at many railyards is expected to grow significantly over the next decade as the volume of intermodal freight movement grows. For example, UP is planning a modernization project within ICTF, which will greatly expand cargo capacity of rail traffic. As a result, truck traffic to and from the railyard is projected to double, to nearly two million truck trips per year.[57] BNSF is planning a new near-dock railyard project south of the ICTF yard, which will further increase railyard truck traffic in the area.

Traffic and Safety Improvement

Strategies to reduce railyard traffic and safety impacts are similar to those for other large truck trip generators. **Designated truck routes** limit traffic congestion in some locations, and direct trucks away from residential areas, reducing the noise and air quality impacts.

AESTHETICS

Aesthetic Impacts

Railyards have negative visual impacts when equipment or facilities block vistas or create excessive light or glare. The sheer size of railyards can potentially make these impacts more severe. Colton Railyard, for example, is 5.5 miles long and almost 1/3 of a mile wide. Because of the space required, railyards are predominantly located in industrial areas, where their visual impacts tend to be less significant.

Aesthetic Impact Improvement

Railyards share many attributes with other industrial land uses. Many industrial area strategies for aesthetic impacts apply to railyards. Many cities have guidelines that apply to all industrial land uses including:

- Bordering walls
- Lighting controls
- Landscaping

Bordering walls block visual impacts and reduce noise impacts. Many zoning regulations, such as setback requirement and height restrictions, reduce railyard visual impacts. Local city and county governments can use landscaping, such as trees, shrubbery, vines, and groundcovers as a visual barrier between railyards and the surrounding community.