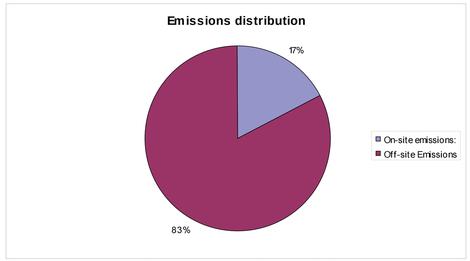
Environmental Improvements

Air Emissions



* Li, Wei, Jing Yuan, Chan Pham, and Hector Castaneda. Health Risk Assessment for the BNSF Hobart Railyard. California Environmental Protection Agency Air Resources Board. 2007.

Emissions distribution

The chart shows the diesel particulate matter emissions distribution of a typical inter-modal facility. The chart is divided into two parts, off-site and on-site emissions. Off-site emissions refer to those made by the trucks idling outside of the facility, as they wait to enter. On-site emissions refer to those made by on-site hostler trucks, locomotives on-site, etc.

* Li, Wei, Jing Yuan, Chan Pham, and Hector Castaneda. Health Risk Assessment for the BNSF Hobart Railyard. California Environmental Protection Agency Air Resources Board. 2007.

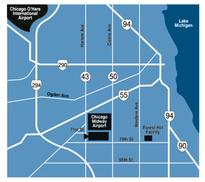
Emissions Model

The graph is a model for annual on-site and off-site emissions, based on data from the BNSF Hobart facility, inter-modal container usage trends, the average age of trucks, and EPA Emissions regulations for diesel engines.

Intermodal Container Traffic over the last 20 years

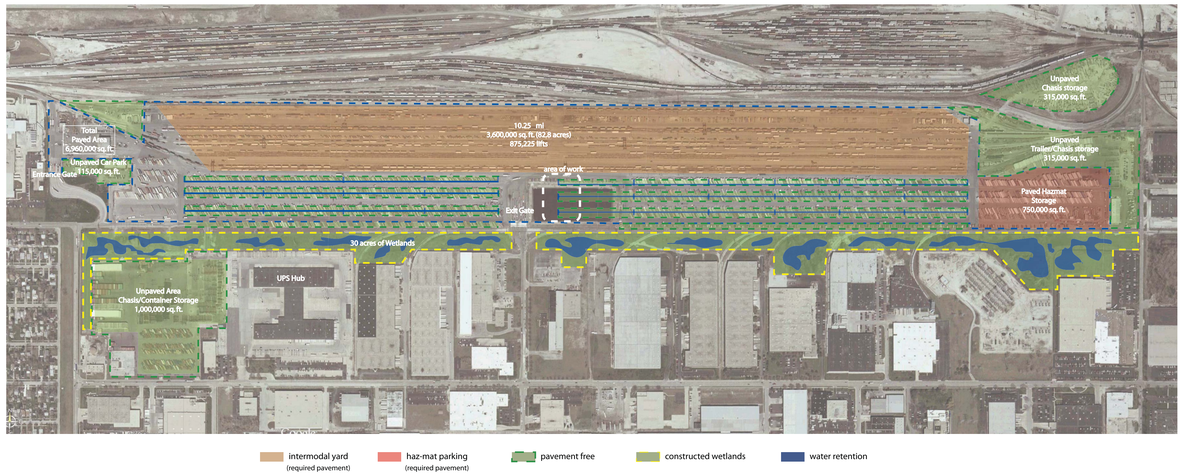
The above graph indicates intermodal container traffic in the US over the last twenty years. Despite the upturns and downturns of the US economy, intermodal traffic has been growing at a constant rate. This growth trend was used to predict the change in emissions in the figures above.

case study: CSXI - Bedford Park, IL



- 875,225 lifts in 2005*
- 278 acres (9,920,000 sq. ft.) land area
- 105 acres (4,600,000 sq. ft.) of container storage
- 9 tracks - 10.25 miles of track
- 8 Mi-Jack Cranes
- 7 side-loader cranes (estimate)
- 30 hostler (estimate)

Retention improvements to CSXI - Bedford Park, IL



Benefits of Improvements

- reduced water retention area
- 1,250% increase in water retention
- improved water quality
- 4% increase in trailer storage capacity

Cost of Improvements

bioswales	$3,168,000
contaminated water basins	$850,560
wetland ($40,000 / acre)	$880,000
total	$4,898,560

Water retention capability

- the 30 acres of wetland can retain 30,000,000 to 45,000,000 gallons of water
- the parking retention and filtration area can retain the water runoff during a 6 in rainfall (25 year storm total)

Stage 1

Pavement Reduction

The simplest method to reduce on-site retention is to allow water to percolate into the ground. As in the case of the CSXI - Bedford Park Intermodal Yard the reduction in pavement in low traffic areas, mainly parking highlighted in green, water retention was limited by 1/4 of what is currently required. Pavement reduction is limited by location, as brown-field site are restricted to water percolation.

Stage 2

On-site Parking Filtration

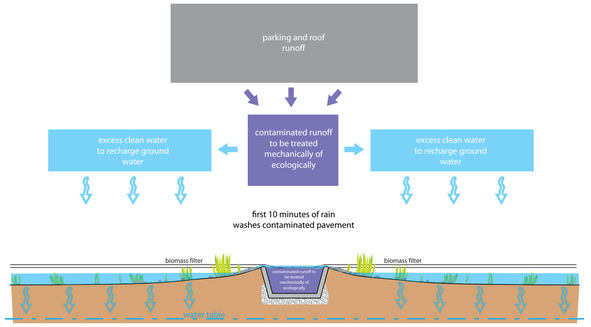
The on-site filtration system utilizes phytoremediation to remove impurities in the runoff. Plants like common reed and cattail are known to uptake the metals and contaminants commonly found in road runoff. After filtration the remaining water can be discharged back into the ground water system.

Stage 3

Constructed Wetlands

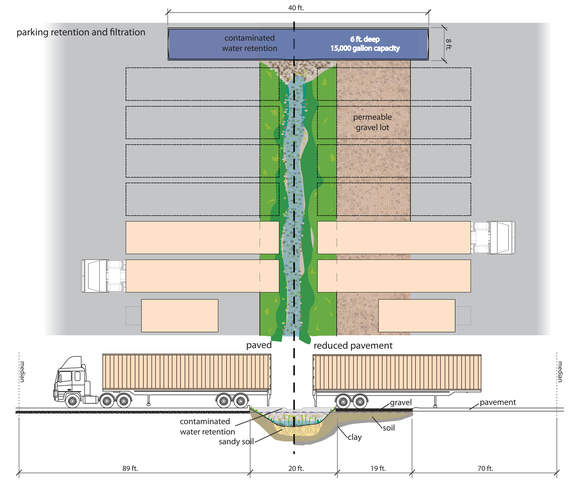
According to the EPA an acre of wetland can retain 1-1.5 million gallons of water. With this kind of retention the wetland can retain all the runoff of both the intemodal yard as well as the surrounding warehouse spaces.

Water Retention



On-site Filtration Diagram

The EPA states that the initial road runoff, the flush, contains the majority of water contaminants. In accordance the filtration system collects this initial flush (first ten minutes of runoff in a basin. The remaining water is allowed to flow into the bioswales. Within the bioswales the water is further treated with plant life and is finally allowed to leach into the ground water.



- each contaminated water basin treats a tributary area of 600 l.f. of parking.
- the estimated cost for parking bioswale is $120 dollars per linear foot of parking
- the estimated cost for the contaminated water basin is $17,720.

Constructed Wetlands

IPRO307: Intermodal Transport Facility
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