



RUTGERS

School of Public Health

# Public Health and Our Ports: The Road to Clean Air

## AN OVERVIEW

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# Overview

## Public Health and Our Ports: The Road to Clean Air



Port Newark and Elizabeth (PANYNJ)

# Objectives

- Orientation to the activities of the seaports
- Introduction to some of the varied stakeholder perspectives we will hear more from later.
  - 3 panels
  - Dialogue on
    1. Defining port-related environmental health problems
    2. Potential solutions
    3. Action



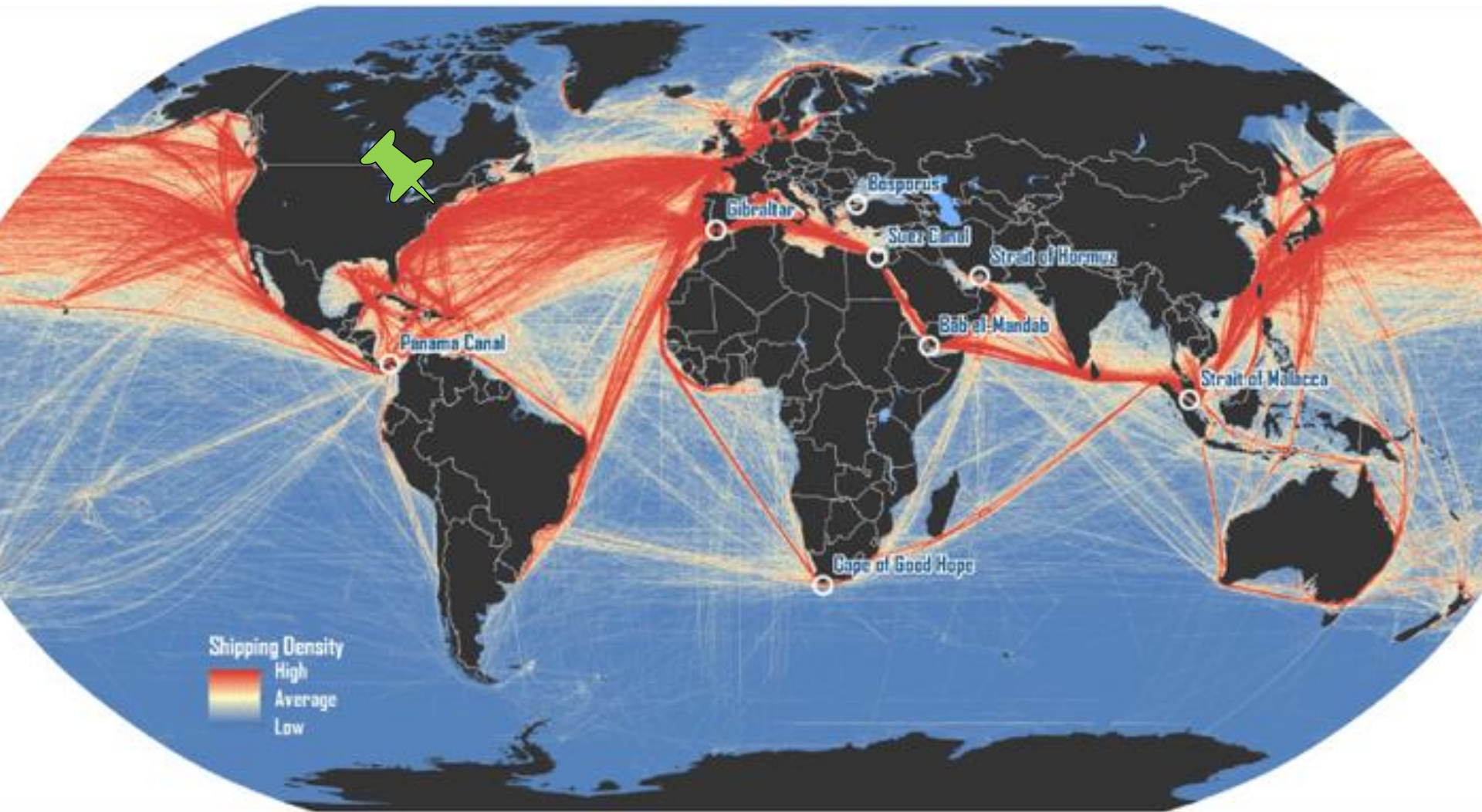






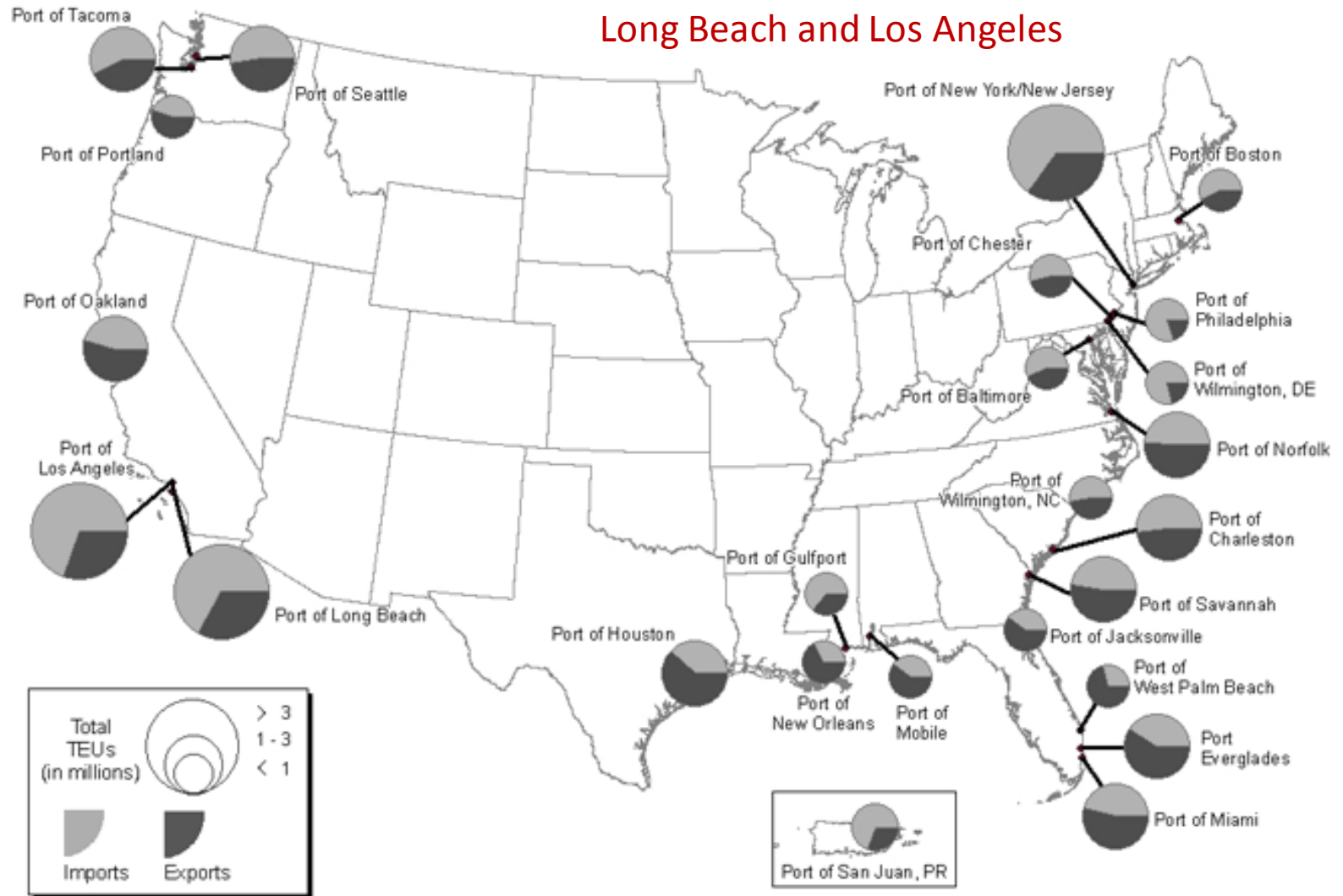


## A Global to Local Perspective



# The Top 25 Largest Commercial Ports in the United States

NY-NJ is the 3<sup>rd</sup> Largest in US after Ports of Long Beach and Los Angeles

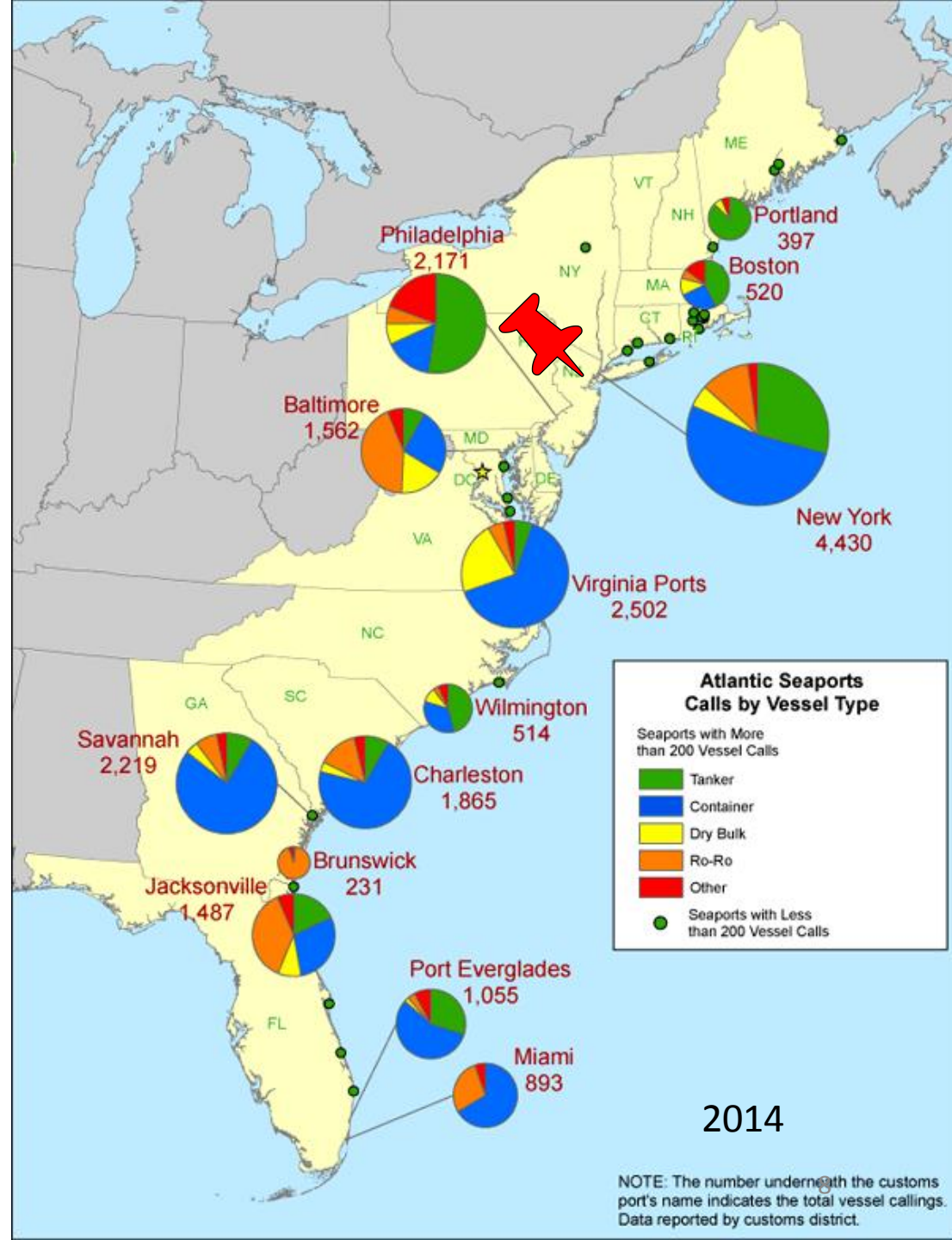


## Port of NY & NJ

> 6 million cargo containers in 2017

Also bulk, break-bulk, roll-on/roll-off (ro-ro)

Cargo throughput increased 26% since 2006



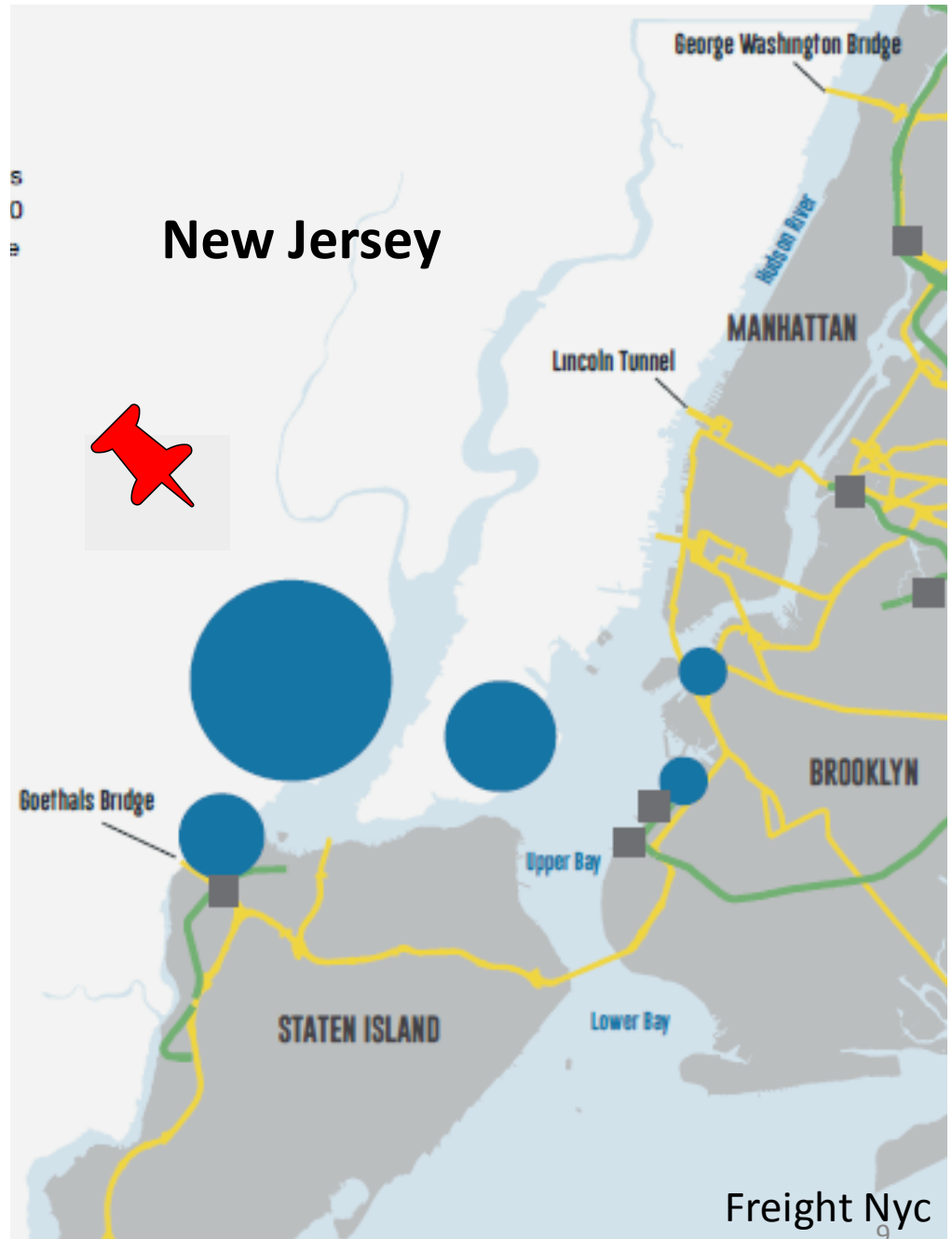


# New Jersey seaports

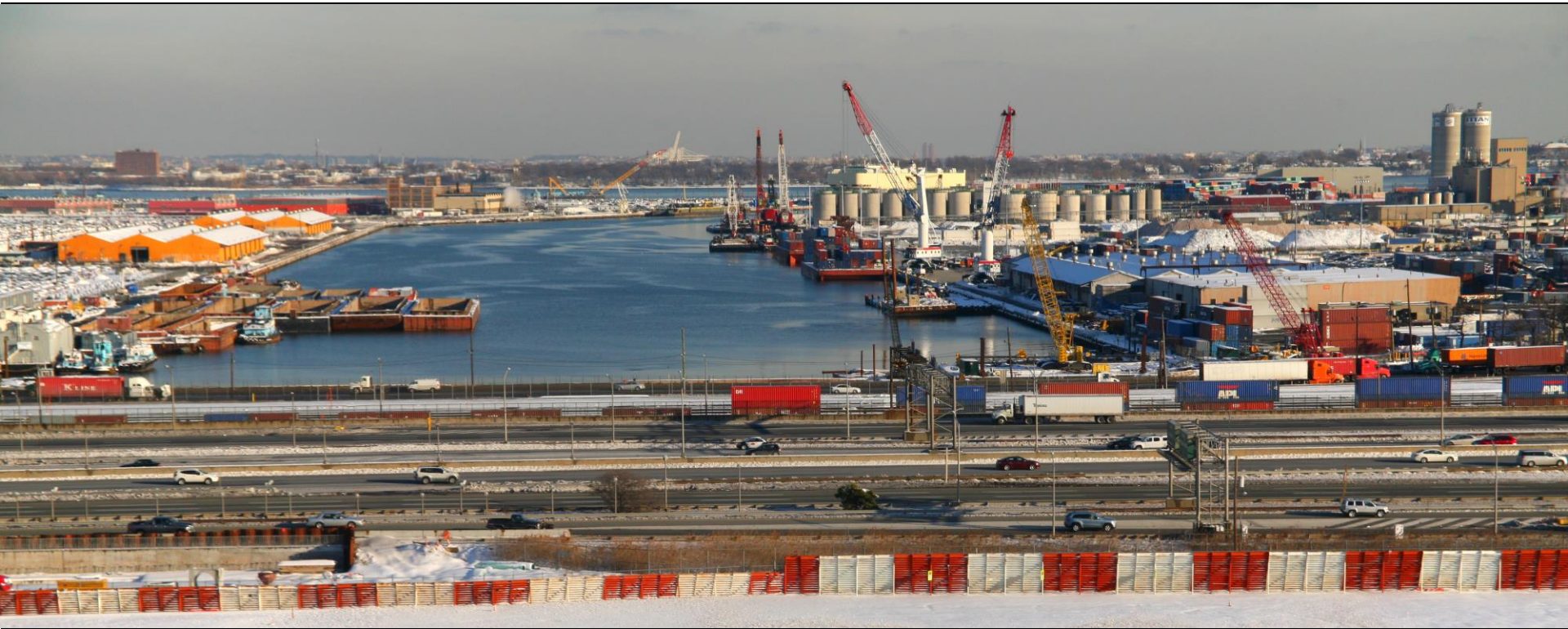
~90% of Port of NY-NJ is  
in New Jersey:

Port of Newark and  
Elizabeth

Port Jersey In Bayonne



# Port Newark





# Port Elizabeth



## Port Jersey, Bayonne

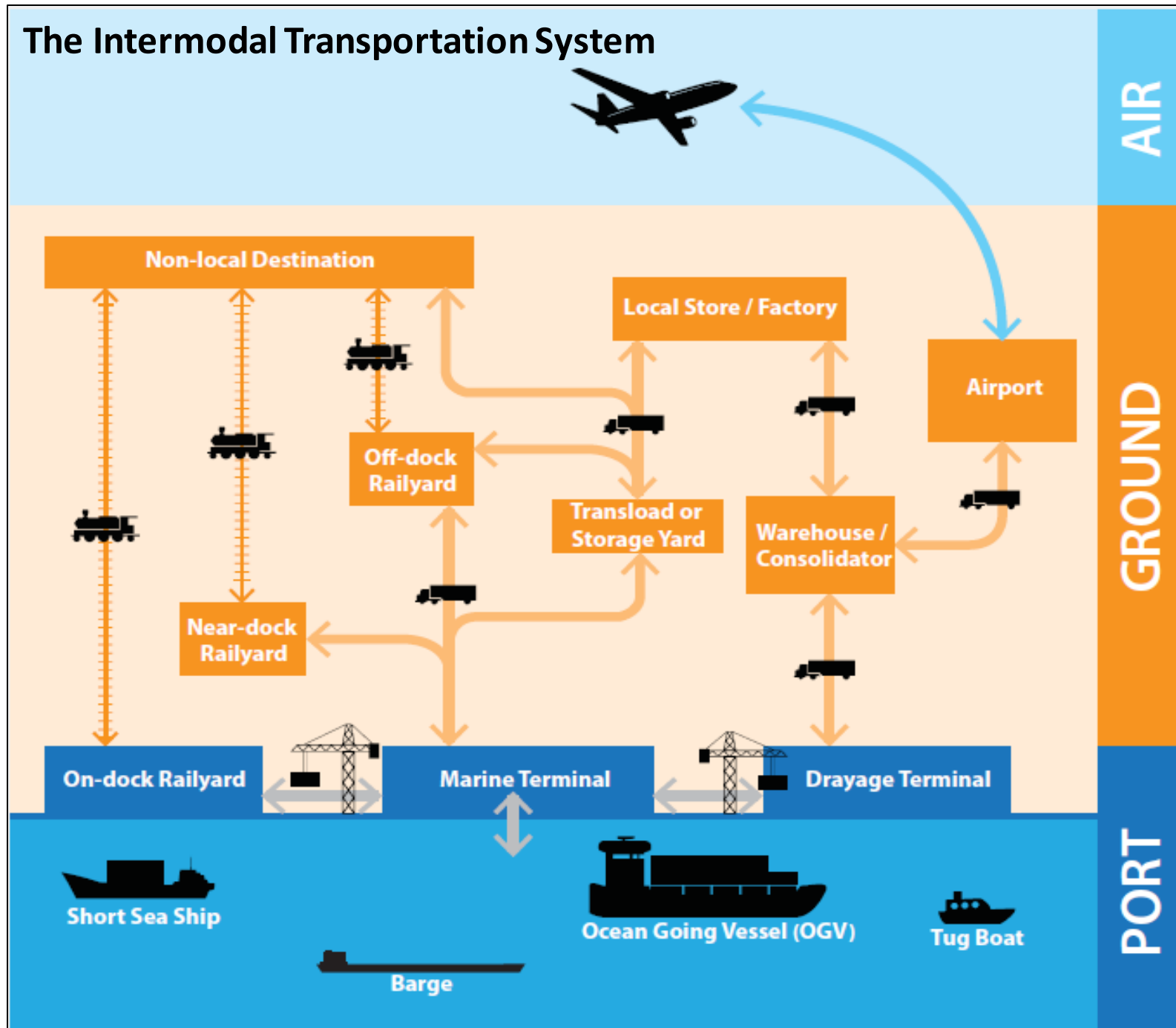




- 100 million customers within a day
- Now we have to get the goods to the customers



# The Intermodal Transportation System





## Harbor craft and a container vessel



- Modern intermodal shipping containers are like Legos
  - You can take them off a ship and snap them onto a truck or a train
- Invented here
- 20' x 8' x 8' = one twenty-foot equivalent unit (TEU)
- 40' x 8' x 8' = one forty-foot equivalent unit (FEU)
- 1992: 100 million containers worldwide
- Today: 600 million containers worldwide





# Trucks queuing at Port Newark Container Terminal





## Gantry crane and OGV



# Containers to rail cars





# Container on a chassis





# Trucks on highways





# Trucks in neighborhoods





# To and from Warehouses







# To Review

- A complex intermodal transportation system:
  - Ships
  - Harbor craft
  - Cranes and other cargo handling equipment
  - Rail
  - Trucks
- **ALL USUALLY POWERED BY DIESEL ENGINES**



# What's wrong with diesel engines?

- Diesel particulate matter (soot)
  - Part of PM2.5
  - Can be measured as “black carbon”
  - Direct health effects
  - Contributes to climate change
- Nitrogen oxides
  - Criteria air pollutant
  - Contributes to ozone formation
- Carbon dioxide
  - The major greenhouse gas



# The bright side of Ports

- International trade is nearly 30% of US GDP
- 95% of goods entering US comes by ship
- Global trade contributes to economic development
- Mile-for-mile and pound-for-pound of goods moved, shipping has the lowest carbon footprint compared to other modes

# Benefits to local, regional, national, and global economies

- Jobs, directly and indirectly
- Port of NYNJ: \$80 billion of economic activity
- Increased tax base
- Value added as part of the supply chain in transporting goods
- Benefits to businesses and consumers locally and across the country



# A Darker side: harms on local, regional, national, and global scales

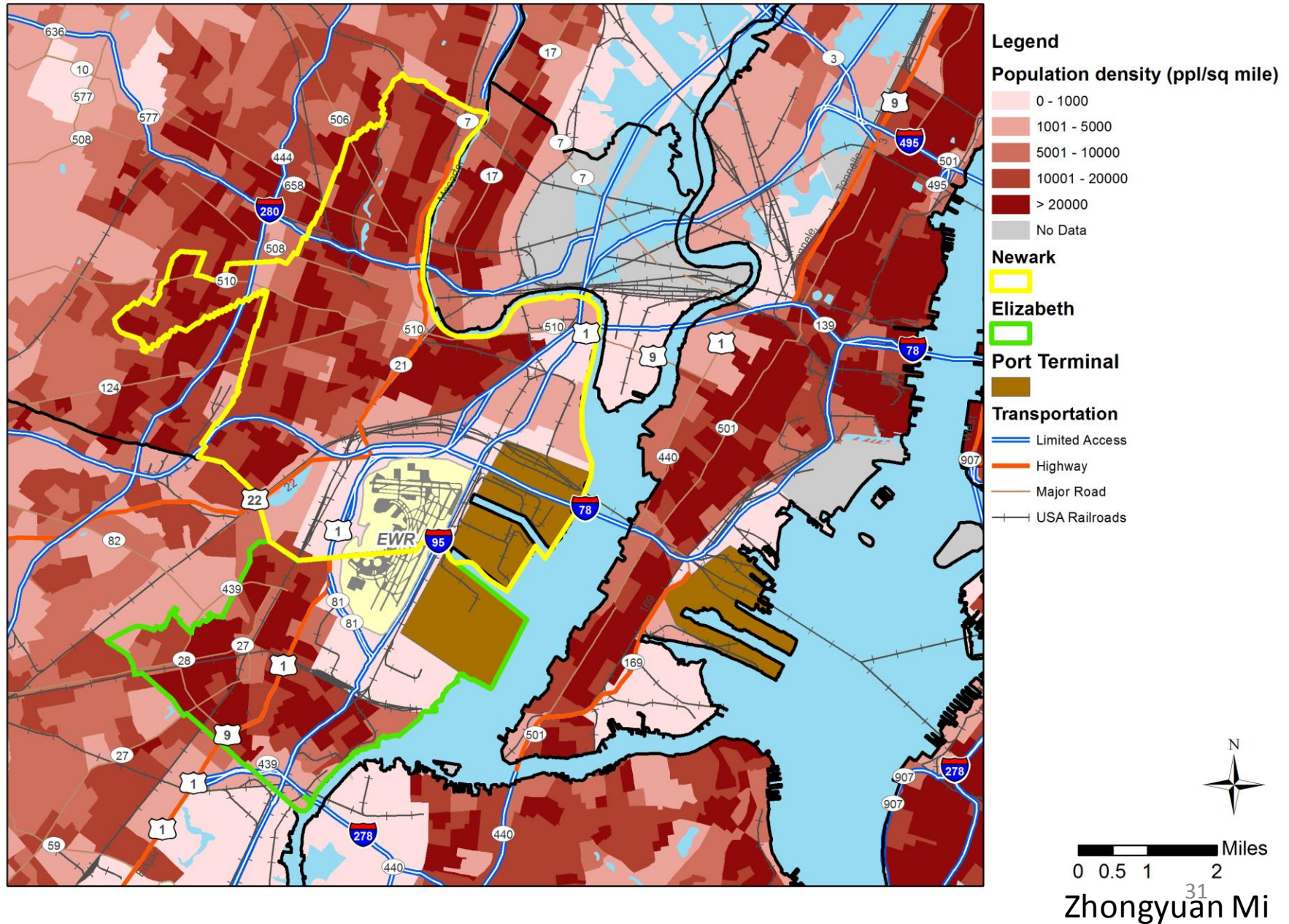
- Disproportionate impacts on near-port communities
- Inequitable distribution of benefits
- Regional air quality and congestion impacts
- Global climate change and sustainability

# Potential harms are out-of-sight, out-of-mind, for most people

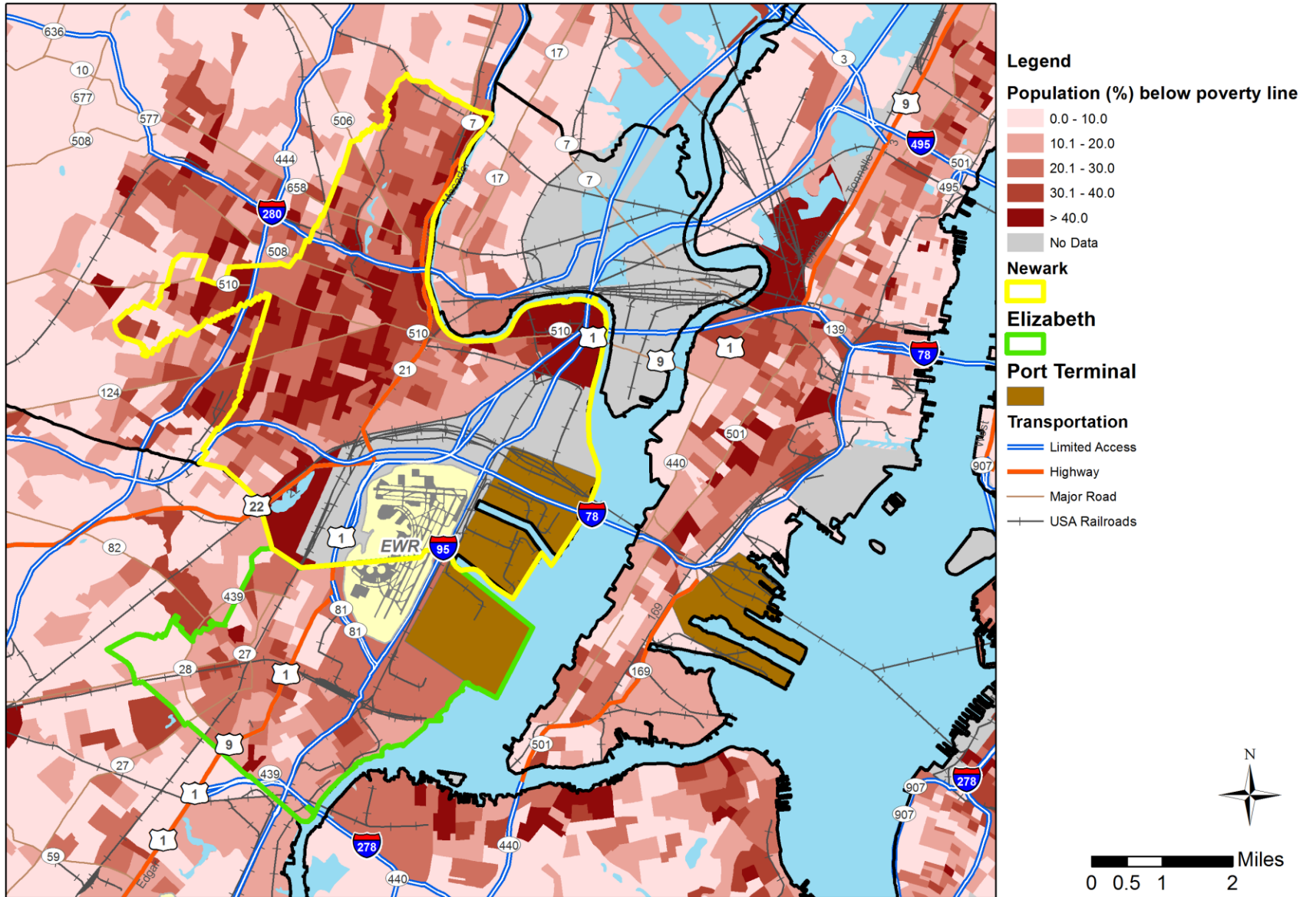
- Shipping in general is a “hidden industry”
  - Out of sight of land
- Our port is also hidden, in plain sight, off of the NJ Turnpike
- Trucks are taken for granted
- But very visible to people who live in neighborhoods close to the port
- Cumulative impacts of multiple stressors and vulnerable, disempowered populations



# Population Density in Newark / Elizabeth and surrounding area for year 2016

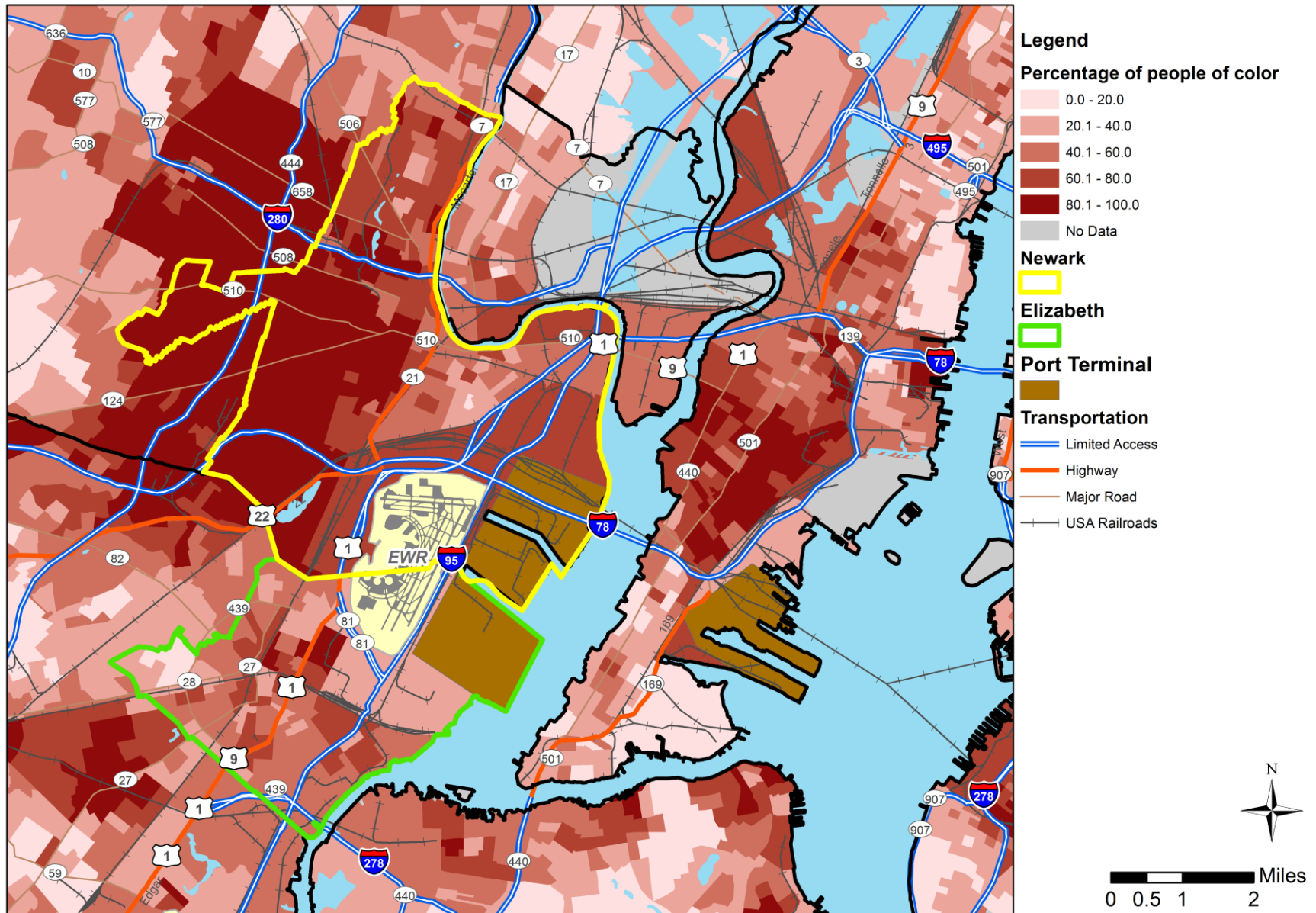


# Percentage of population live below poverty line in Newark / Elizabeth and surrounding area for year 2016





# Percentage of people of color in Newark / Elizabeth and surrounding area for year 2016



# Community concerns

- High rates of asthma, especially among children
- Other health disparities: other lung disease, heart disease, diabetes
- Cumulative impacts
  - Vulnerable populations
  - Multiple stressors
  - Multiple pollutants

# Coalition for Healthy Ports (CHP)

- Clean Water Action, Ironbound Community Corporation, NJ Environmental Justice Alliance, Teamsters Union, Greenfaith, Weequahic Park Assoc. and others
- Working since before 2006 to reduce emissions, exposure, and health impacts
- A member of the nationwide MovingForward Network.





# Ironbound Community truck counts

**04/22/17 Stockton and Delancy (1 hr):**

**Container:**

**Am: 54**

**Pm: 77**

**Bobtails:**

**Am: 55**

**Pm: 76**

**Garbage:**

**Am: 33**

**Pm: 45**

**Other:**

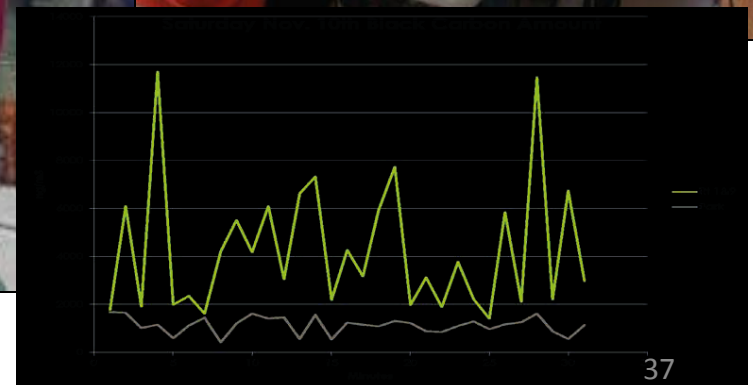
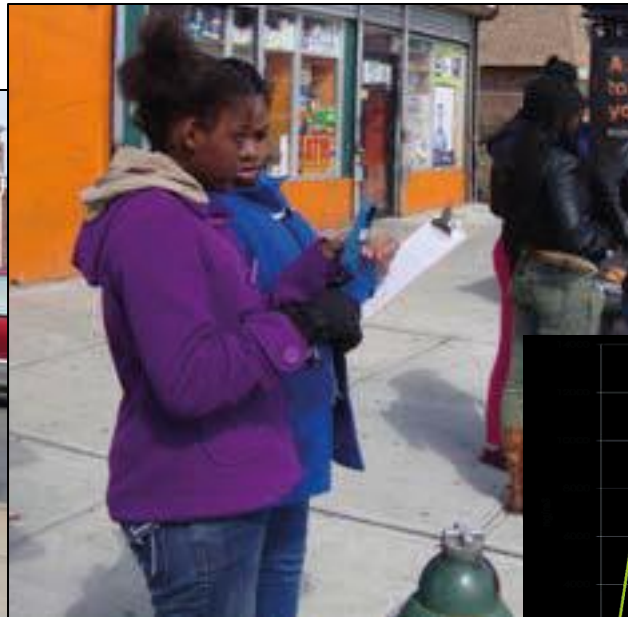
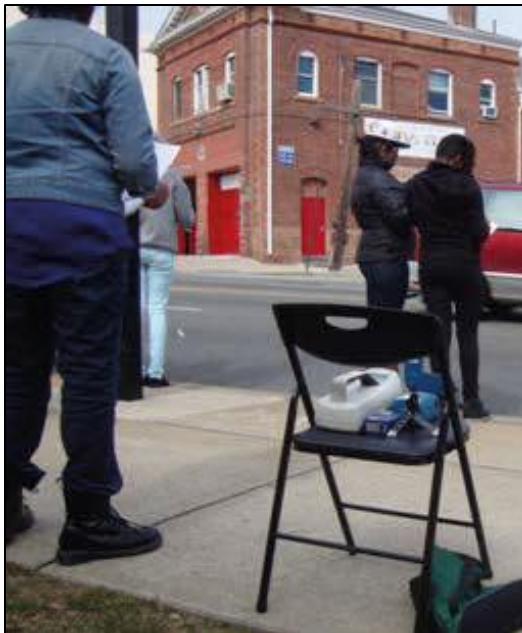
**Am: 126**

**Pm: 146**



# South Ward Air Monitoring (SWAM) Project 2014

- New Jersey Environmental Justice Alliance (NJEJA)
- NJ Department of Environmental Protection (NJDEP)
- Central Highschool 9<sup>th</sup> grade students and teachers
- Rutgers Scientists
- Truck counts analysis of black carbon data

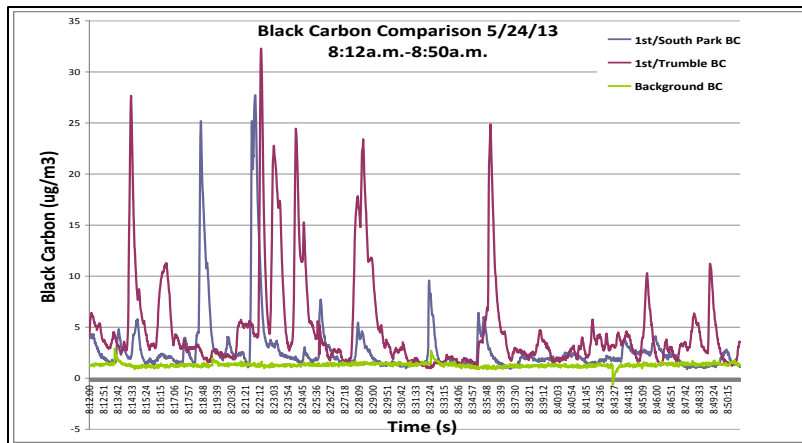




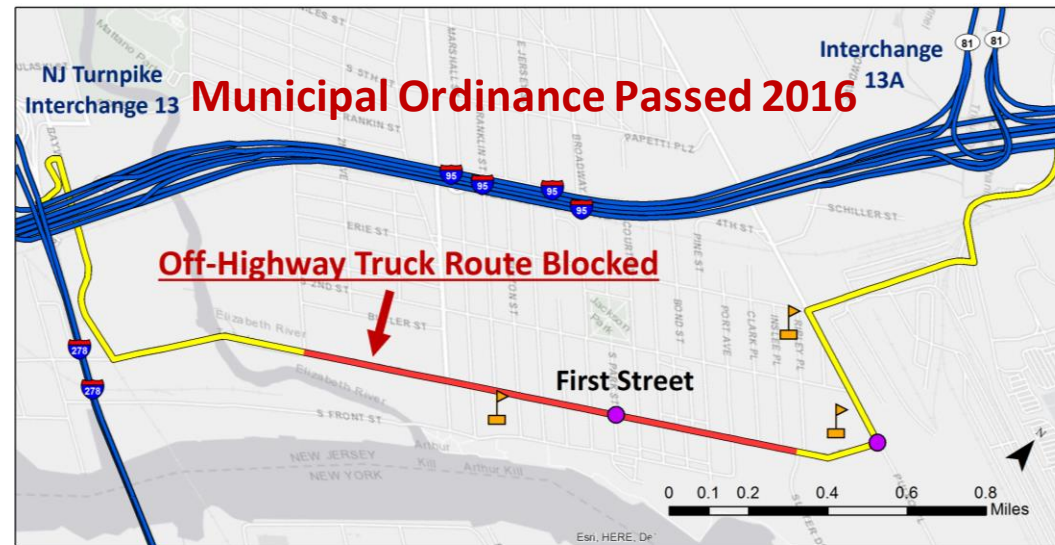
# Elizabeth Community Truck Count May 24, 2013



Counted > 60  
large trucks per  
hour at two  
locations



Air monitoring showed peaks of black carbon and particulate matter with passing trucks



- Truck Ban Ordinance affected Route
- Local Truck Route
- K-8 School
- Site of truck count and air monitoring

# Port Authority Clean Air Strategy

- 2009: voluntary actions to reduce emissions
- Later banned 1993 and earlier diesel trucks
- Updated the Strategy in 2014
- Proposed that all trucks meet 2007 standards effective 1/1/17
- In 2016, rolled back the plan back to 1996 or newer trucks



# Cleaning up oceangoing vessels at Port of NY & NJ

- A major source of PM from port activities
- Use auxiliary diesel engines in the port
- International Maritime Organization (IMO) regulations now require  $<0.1\%$  sulfur fuel
- Emissions of  $\text{SO}_2$  decreased 98% since 2006
- Next steps? Shore power (plug in) or “capture and control”?



# Cleaning up Trucks

- >90% reduction in PM from 2007 and later trucks
- Further reduced NOx in 2010.
- Most port trucks are still pre-2007
- Truck replacement program: ~400 trucks
- Clean Air Strategy was to ban pre-2007 trucks in 2017
- Only banned 1994 and 1995 trucks
- Where do we go from here?





# Cleaning up Trucks - Operations

- Waiting times
- Congestion
- An appointment system?



# Cleaning up Port Equipment, Harbor Craft, and Trains

- Cleaner engines
  - Cleaner diesel engines
  - Alternative fuels
- Zero-emission engines
  - Electrification
  - Other technologies
- Incentives
  - Congestion Mitigation Air Quality (CMAQ) grants
  - Volkswagen (VW) Settlement funds?



# Other community impacts

- Congestion
- Noise
- Public safety
- Land-use
  - Competition with other land uses
  - Access to greenspace, recreation

# Impacts beyond the adjacent neighborhoods

- Trucks going on interstates through the region means that the pollution is being dispersed more widely.
- The pollution is less concentrated, but more people are affected.
- Makes the problem less noticeable in those areas, but does not diminish it.

# The Future: bigger ships, more trucks. How much cleaner?





# Greater Stakeholder Engagement

- Taking steps
- More meaningful engagement with community members in planning decisions
- One of the outcomes we hope from this meeting is more engagement among stakeholders

# The Future: Sustainable Ports

- “Triple Bottom Line” or i.e., an organization’s performance in three areas:
- 3Es – Economic, Environmental, and social (Equity)



Thank you!