

Port Truck Air Emissions Inventories And their Relevance to Regional Transportation

Joseph L. Ray
Starcrest Consulting Group, LLC



Northeast Drayage Workshop
13 October 2010

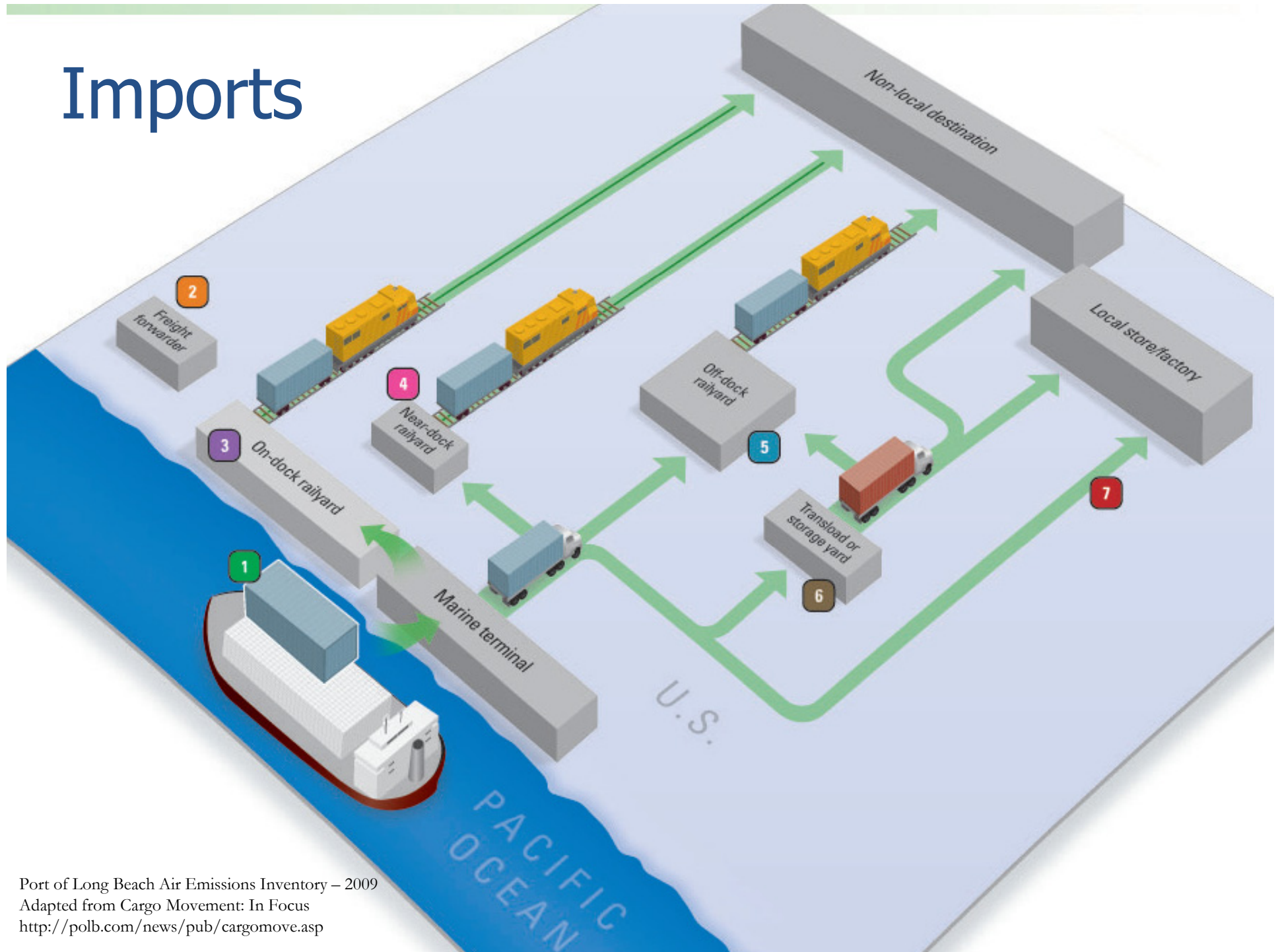
Port Truck Air Emissions Inventories

- Typical Port Truck Operations
- Port Truck Emission Estimates
- Port Trucks - Context

Typical Port Truck Operations

- Imports
 - Off-Loaded from Ship
 - On-Terminal Handling by Non-Road Equipment
 - Transportation from Port to First Destination
(“First Point of Rest”)
 - From Dock Directly to Rail
 - By Truck to Rail Yard
 - By Truck to Transloading Center
 - By Truck to Local Destination

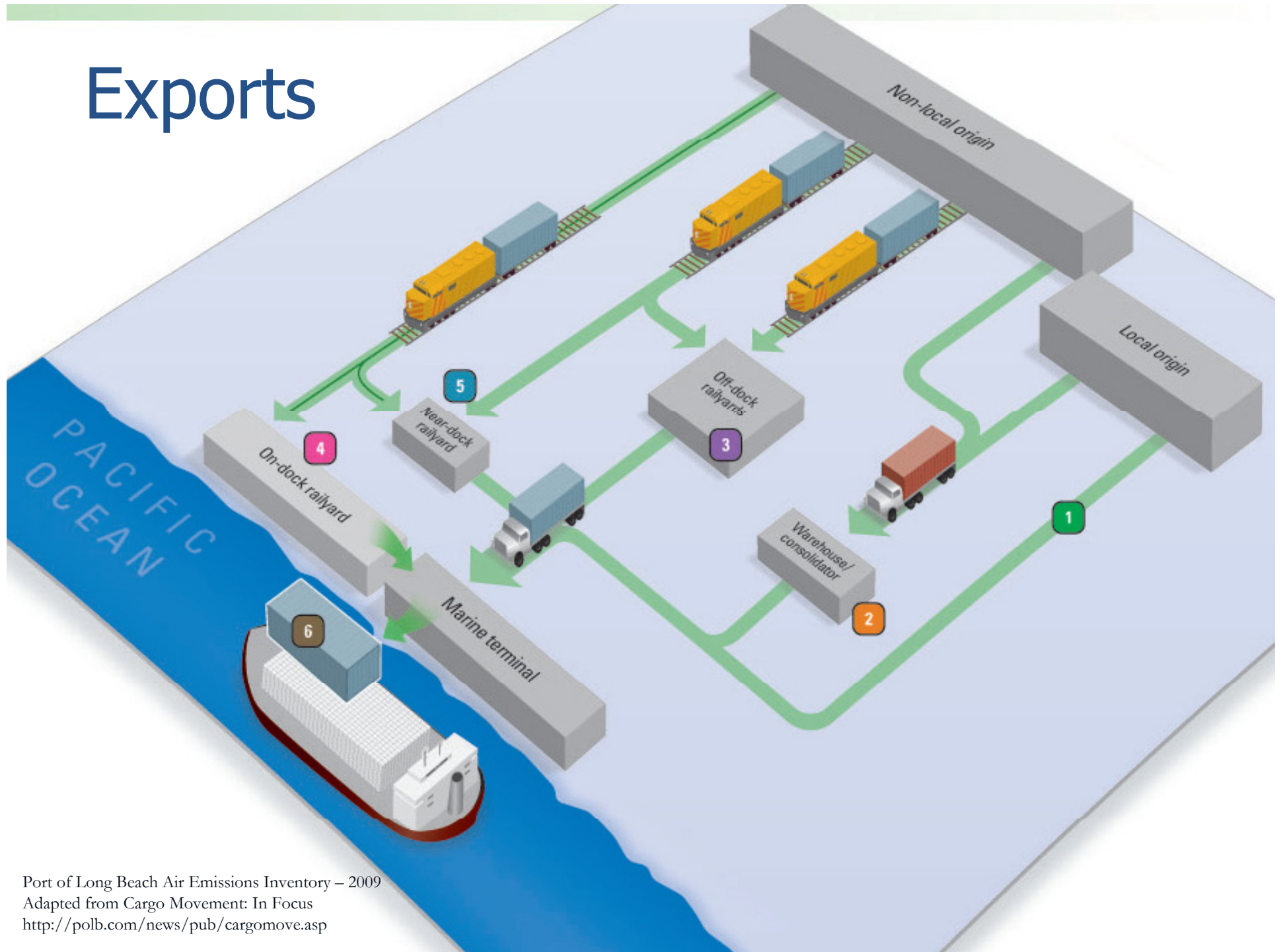
Imports



Typical Port Truck Operations

- Exports
 - Brought to Port
 - By Rail Directly to Port or Terminal
 - By Rail to Local Rail Yard, then Trucked to Port
 - By Truck to Warehouse/Consolidator, then Trucked to Port
 - By Truck from Local Origin
 - On-Port Handling by Non-Road Equipment
 - Loaded onto Ship for Export

Exports



Typical Port Truck Operations

- Imported Cargo may be Moved by Truck other than "Port Truck" beyond the "First Point of Rest"
- Cargo to be Exported may be Moved by Truck before being Moved by "Port Truck"
- Port Truck Operations are Part of Larger Goods Movement System
- Port Truck Activity is Most Concentrated in the Immediate Port Area

Some Ports (such as PANYNJ) are Geographically Dispersed

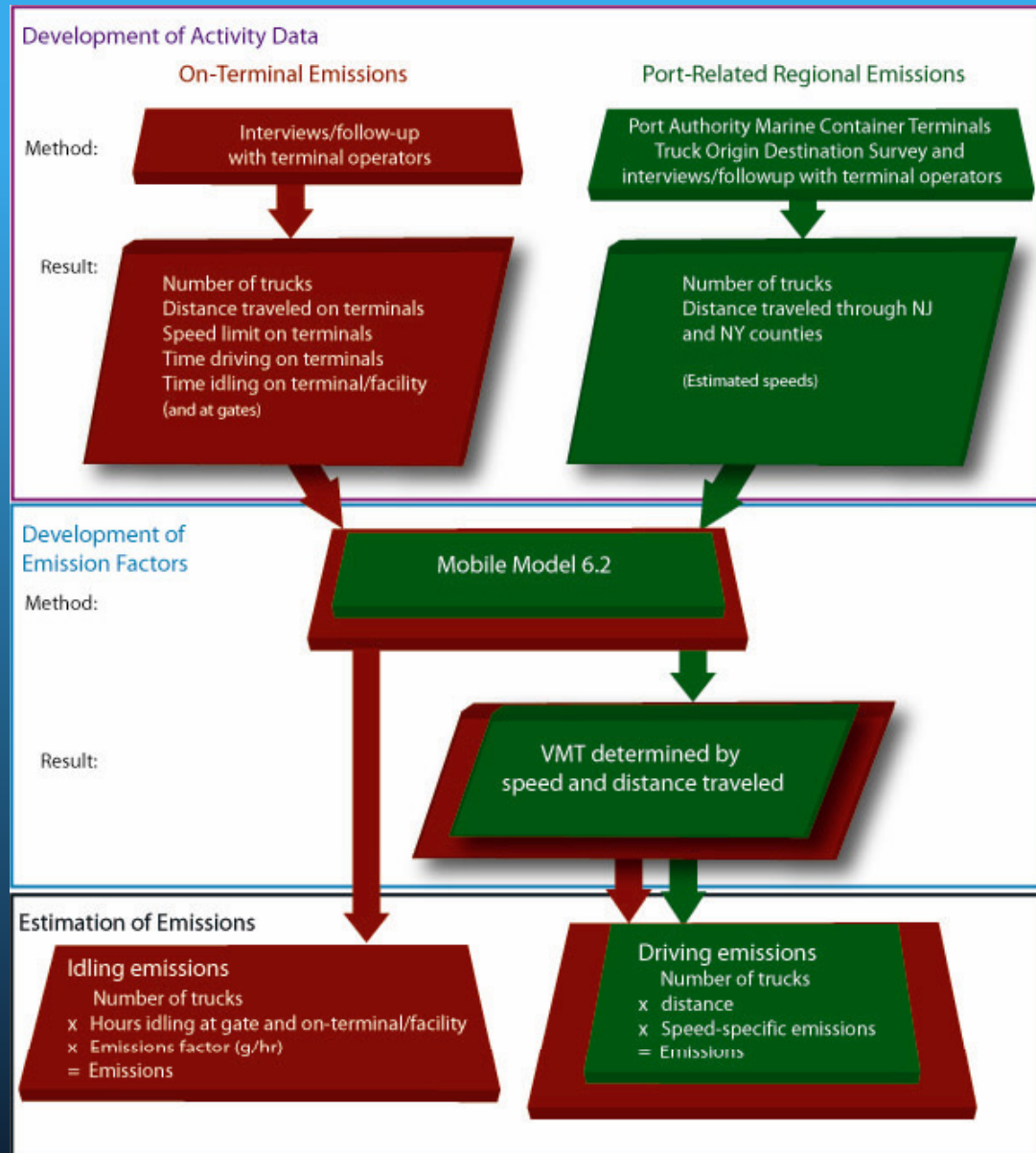
- Area of concentration in Newark/Elizabeth



Port Truck Emission Estimates

- Two Areas of Operation
 - On-Terminal / On-Port
 - On-Road (Mixed with General Traffic Flow)
- Based on Vehicle Miles Traveled (VMT) and On-Port Idling Time (hours)
- Emission Factors from EPA Models
 - MOBILE6.2
 - MOVES (new)
 - g/mile, g/hour

Port Truck Emission Estimates



Port Truck Emission Estimates

- On-Port Information from Operators
 - How Many Truck Visits during the Year?
 - How Far (on Average) does each Truck Travel while on Port?
 - What is the Average Speed?
 - What is the Average Turn Time?
 - How Much Time spent Idling?
 - At Gate
 - Within Terminal

Port Truck Emission Estimates

- On-Road Information
 - Number of Truck Trips
 - Overall Truck Mileage (VMT)
 - Traffic Modeling (subset of Regional Modeling)
 - Origin/Destination Surveys
 - Average Speed

Port Truck Emission Estimates

- Model Year Distribution
- Emission Factors from Emission Models
 - Model year distribution used to develop composite EF reflecting fleet makeup
- Emissions =
 - Miles driven x g/mile emission factors
 - Hours idling x g/hour emission factors
 - Idling calc'd for on-port, built into on-road emission factors

Port Truck Emission Estimates

- Uncertainties =
 - On-Port
 - Operating characteristics are estimates of averages, may be high or low
 - On-Road
 - Total miles driven - estimates may be high or low
 - Speeds vary, emission factors vary somewhat with speeds
 - Model Year Distribution
 - Truck Model Year vs Engine Model Year
 - Change in EPA Model, MOBILE to MOVES

Port Trucks - Context

- Ports act as “funnel” that may concentrate truck activity in the port vicinity
- Local/regional goods movement activity patterns affect the mix – port trucks plus other goods movement on the same roads
- Focusing on “port trucks” can improve immediate port area but effect is diluted by non-port activity
- And... may affect trucking activity in other areas

Port Trucks - Summary

- Critical Data:
 - How many truck trips?
 - Where do they come from/depart to? (O/D info)
 - What is model year distribution?
- ◎ Benefits, detriments to focusing on port trucks:
 - Can have beneficial effect close to port
 - Effects are diluted further from port where trucks are intermingled with other diesel traffic
 - May cause change in truck usage patterns

Thank You!

Joseph L. Ray
Starcrest Consulting Group, LLC

