Idle Free Corridors: Northeast States Experience

EPA Region 1

Implementation Meeting

April 28, 2004

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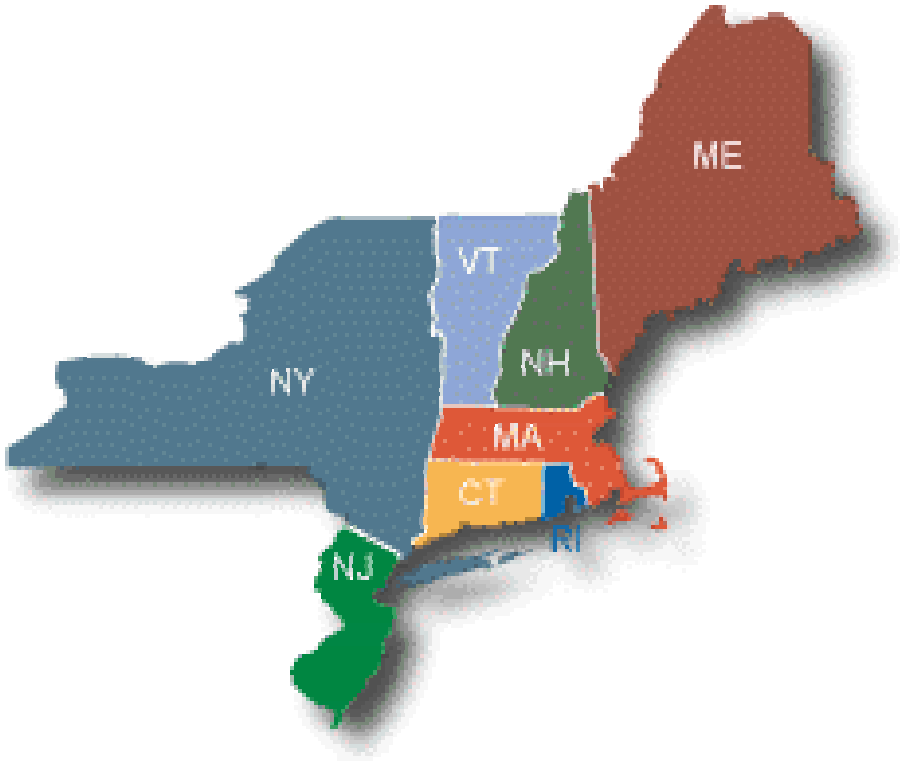
NESCAUM

NESCAUM Background



- The Northeast States for Coordinated Air Use Management
- A nonprofit organization founded in 1967 to assist the New
and c
policy
progr

NESCAUM
Northeast States for Coordinated Air Use Management

Presentation Outline

- **Section I: Long Duration Idling and its Impact Upon the Northeast States**
  - Transportation and Idling Statistics, Air Quality, Public Health
- **Section II: Relevant Northeast States Project Experience**
  - New York State, New Jersey
- **Section III: Overview of NESCAUM Interstate 95 Corridor Analysis**
  - Interactive Mapping
  - Truck Stop Evaluation and Ranking

Section I: Transportation and Idling Statistics

- **Transportation to, from, within, and through I-95 Corridor States accounted for 37.5% of all shipments in U.S. in 1997, or $2.6 Trillion.**

- **Represents a total of 350 Billion ton-miles shipped, at an average distance of 142 miles per shipment.**

- **Over 2.75 Million light heavy and heavy trucks (Class 7 and 8) operating on US Interstate highway system.**

Source: U.S. Department of Transportation, Bureau of Transportation Statistics. *National Transportation Statistics Annual Report.* October, 2003.

Transportation and Idling Statistics (continued)

- **The ATA's TMC (Technology Maintenance Council) estimates that one additional hour of idling per vehicle per day results in:**
  - Equivalent of 64,000 miles in engine wear and tear annually.
  - 500 gallons of wasted fuel.
  - $0.07 per hour in *Increased* ma
  - $0.70 per hour in *Decreased* tir Overhaul.

Transportation and Idling Statistics (continued)

- **A Class 8, long haul driver will typically idle for up to 10 consecutive hours , on average, during extended layover periods while:**
  - Awaiting Dispatch
  - Loading or Unloading
  - Fulfilling Federal HOS requirem
- **As an industry trucking wastes gallons of diesel annually, acco Department of Energy.**

Transportation and Idling Statistics (continued)

- **Class 7 and 8 vehicles have a life expectancy of over 25 years, on average, nationwide. Long haul rigs, by contrast, typically undergo a major engine overhaul or replacement at the 500,000 mile mark.**

- **Northeast States typically have a available parking spaces with sl parking demand growth (< 1.5% Southeast States (NC, SC, GA, F surplus but show very high annu growth (>3.5%).**

Corridor Snapshot: State of Virginia

- **A January, 2003 research report by U.S. DOT Center for Transportation studies found:**

  "Along I-95, the maximum demand for parking exceeded the number of available parking spaces at most truck stops by 10 to 20 percent. On average, the maxim
  areas along I-95 exceeded the number o
  spaces by about 27%."

Source: **University of Virginia – Center for Transpor**
the Demand for Commercial Truck Parking o
Virginia. January 2003. Research Report No. UVA-

Transportation and Idling Statistics (final)

- **In the Northeast, higher prevalence of long duration idling due to:**
  - High traffic volume / Corridor congestion.
  - Unexpected Delays or Downtime (HOS violations).
  - Seasonal weather conditions.
- **Increased likelihood of collatera human and natural environmen**
  - Dense regional population.
  - High demand for parking spaces.
  - Age of TS facilities & proximity to com
  - Inadequate supply and illegal truck pa

Section I: Regional Air Quality

- **In 2001, transportation vehicles and vessels accounted for the following percent annual contribution to the nation's pollution levels :**
  - 66% of carbon monoxide (CO)
  - 47% of nitrogen oxides (NOx)
  - 35% of Volatile organic compou
  - 5% of particulate (PM)
  - 4% of sulfur dioxide (SO2)
  - 6% of ammonia

Source: U.S. Department of Transportation, Bureau of T
2001.

Regional Air Quality (continued)

- From a Northeast States perspective, engine out exhaust emissions from Class 8 heavy duty diesel vehicles adversely impact regional air quality.

- Contribution of PM and NOx from mobile sources introduces additional stresses to non-attainment and/or designation areas already experiencing exceedances.

- In large urban centers, such as New Yo emissions account for 85 to 90 percent load present in ambient air.

Regional Air Quality (continued)

- **EPA, in January 2004 guidance, determined NOx and PM emission factors of 135 g/hr and 3.68 g/hr, respectively, for vehicles within state's mobile source inventory.**

- **In the Northeast, then, opportunity to apply diesel emission reductions within state implementation planning and transportation conformity process.**

- **Further, commercial viability of TSE as for diesel trucks strengthens anti-idling and softens the blow of future compliance enforcement actions by presenting a re compromising situations (temperature**

Corridor Snapshot: Summary of Member state idling regulations

Yes		None
3 Minutes		ME
	CT	RI
	NYC	VT
	NJ	
5 Minutes		
	NH	
	MA	
	MD	
	NY state	

Section I: Public Health Perspective

- **Characterizing the health effects of diesel emission exposure is important for diesel risk reduction program development and better understanding of human health risks.**

- **New CARB finding that “per mil OC from a HHDDT in congested times higher than that of a HHDI transit mode and 1.9 times high**

Public Health Perspective (continued)

- **Is this Significant? Perhaps. Why?**
  - **Traditional exposure assessment/cancer risk models assume that the OC/EC ratio is identical in traffic or in driving.**
  - **Therefore, if OC dominates carcinogenic and toxic effects of PM, human health risk increases 1x order of magnitude under traffic conditions.**
  - **From policy perspective, may influenc locating of truck stops, traffic planning**

Source: Norbeck et al. *Emission Rates of Elemental and Organic Carbon from In* Environmental Science and Technolog

Section II: Relevant State Experience

Hunts Point Cooperative Market - Bronx, NY

DeWitt and Chittenango Service Plazas, New York State Thruway - Syr

Travel Centers of America (TA Paulsboro, NJ

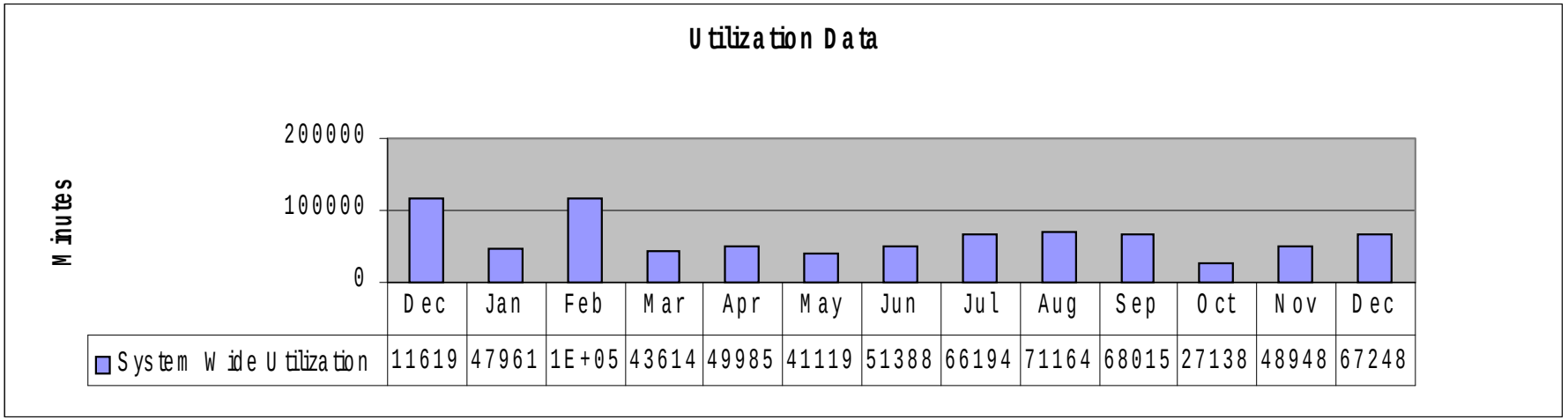
Hunts Point Cooperative Market

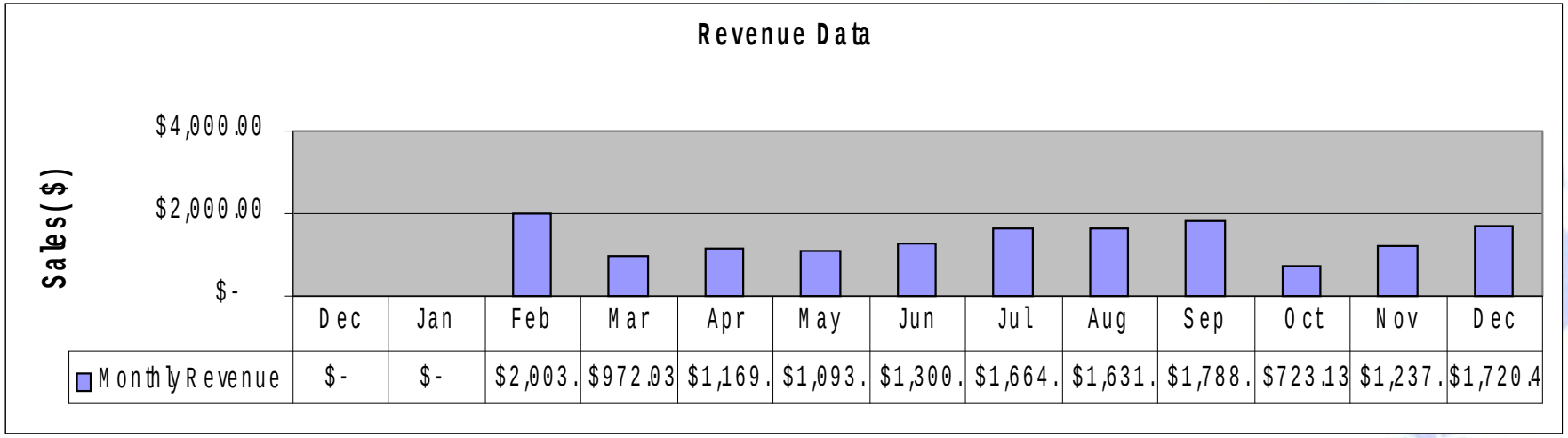
- 28 Bay advanced truck stop electrification (ATE) facility at commercial facility.
- Co-funded by Clean Air Communities, IdleAire, and the New York Power Authority (~ $500,000 total).
- Installed, maintained, staffed and operated by IdleAire Technologies.
- System activated in November, 2002

Hunts Point (continued)

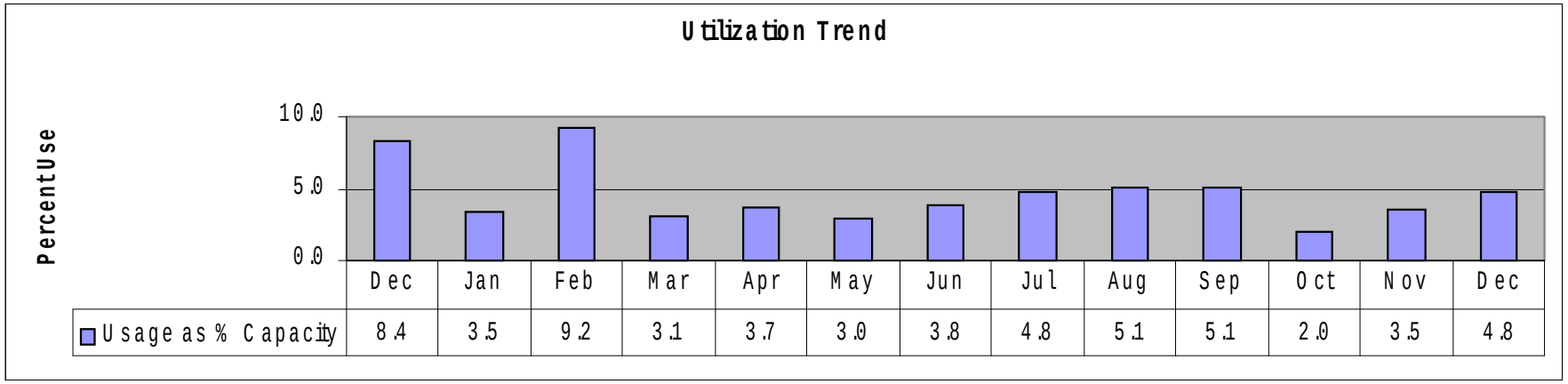
- **Positives**
  - No operational problems
  - Employs Bronx residents
  - Real emissions reductions achieved
  - Driver acceptance strong
- **Negatives**
  - Low resident truck population within market confines
  - G
    $2
    ou
  - C
  - N
    or

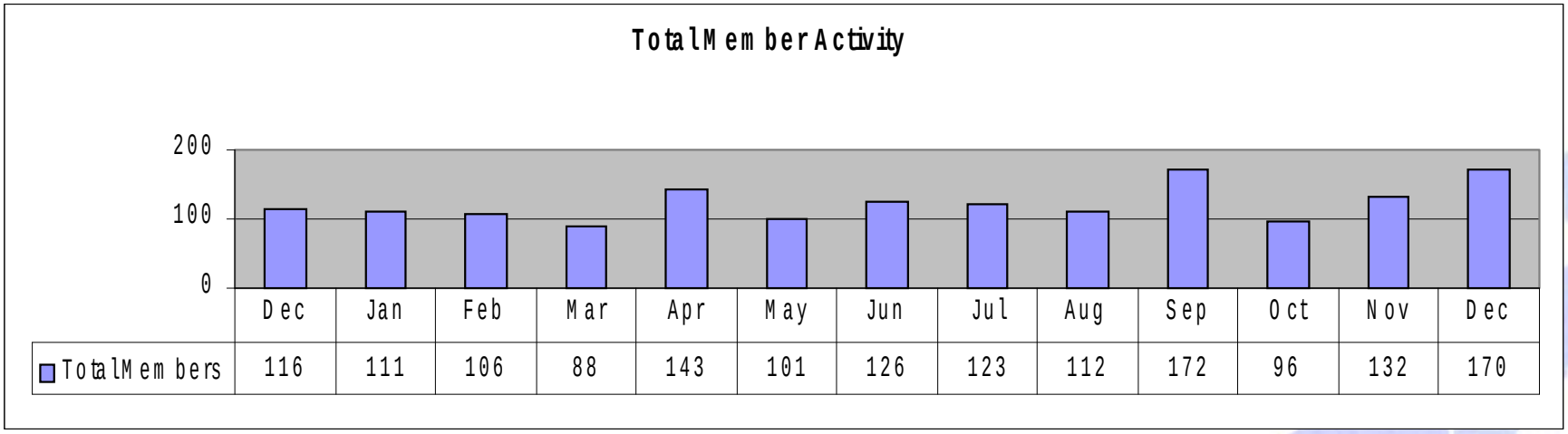
Hunts Point Data Analysis (1)



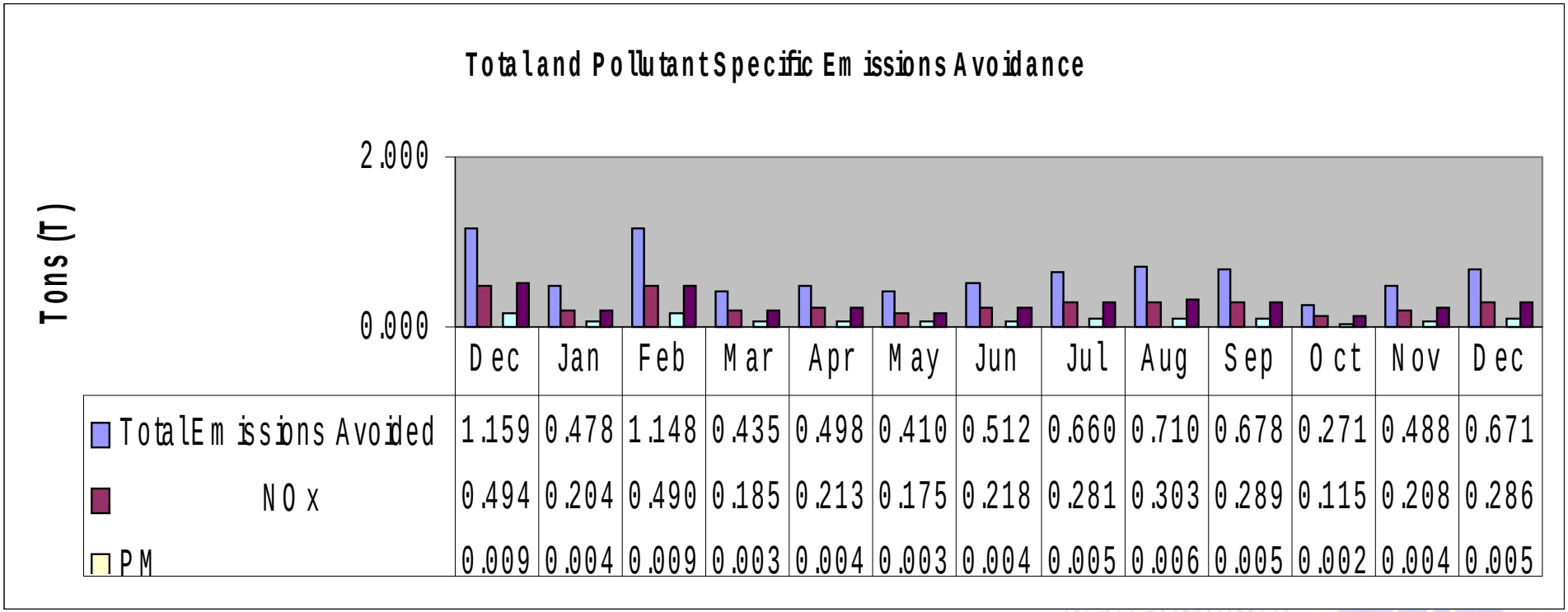


Hunts Point Data Analysis (2)





Hunts Point Data Analysis (3)



NYSTA - Syracuse, NY

- **NESCAUM case study of two TSE locations along I-90 East/West in greater Syracuse, NY area.**
- **Designed study to characterize spatial and temporal variability of mobile source aerosol using Aethalometers to measure black carbon soot concentrations (light absorption through a quartz filter).**
- **Truck stop 'signature' not statistically background, a state park maintenance did experience episodic spikes during and lawn mover maintenance.**

Syracuse (continued)

- **Antares Group sub-contracted to manage field work, data analysis component for NESCAUM.**

- **Issued driver marketing survey to 212 drivers between July 2002 and January 2003.**
  - 192 of 197 respondents would
  - 138 drivers recorded layovers b hours.
  - Most drivers indicated they idle rpm range.

Paulsboro, NJ

- NJDEP consent order with NJ violator stipulating $1.0 M environmentally beneficial project (SEP) using TSE technology.
- 100 truck parking space electrification. IdleAire, NESCAUM, and NJDEP partners. 2 phase installation starting in May, 2004.
- NESCAUM to study environmer economic, operator benefits of web based software applicatior system data. Coordinated educ effort.
- Sister project (75 spaces) in Bo

Section III: Overview of NESCUAM I-95 Corridor Analysis

- **Assembled NESCAUM Work Group in late 2002 to begin explore ways to expedite TSE implementation along I-95 corridor.**

- **Developed truck stop evaluatior database format using existing demographic, and economic da analyze, and rank truck stop loc to a set of prescribed selection**

I-95 Corridor Analysis (continued)

Selection criteria:

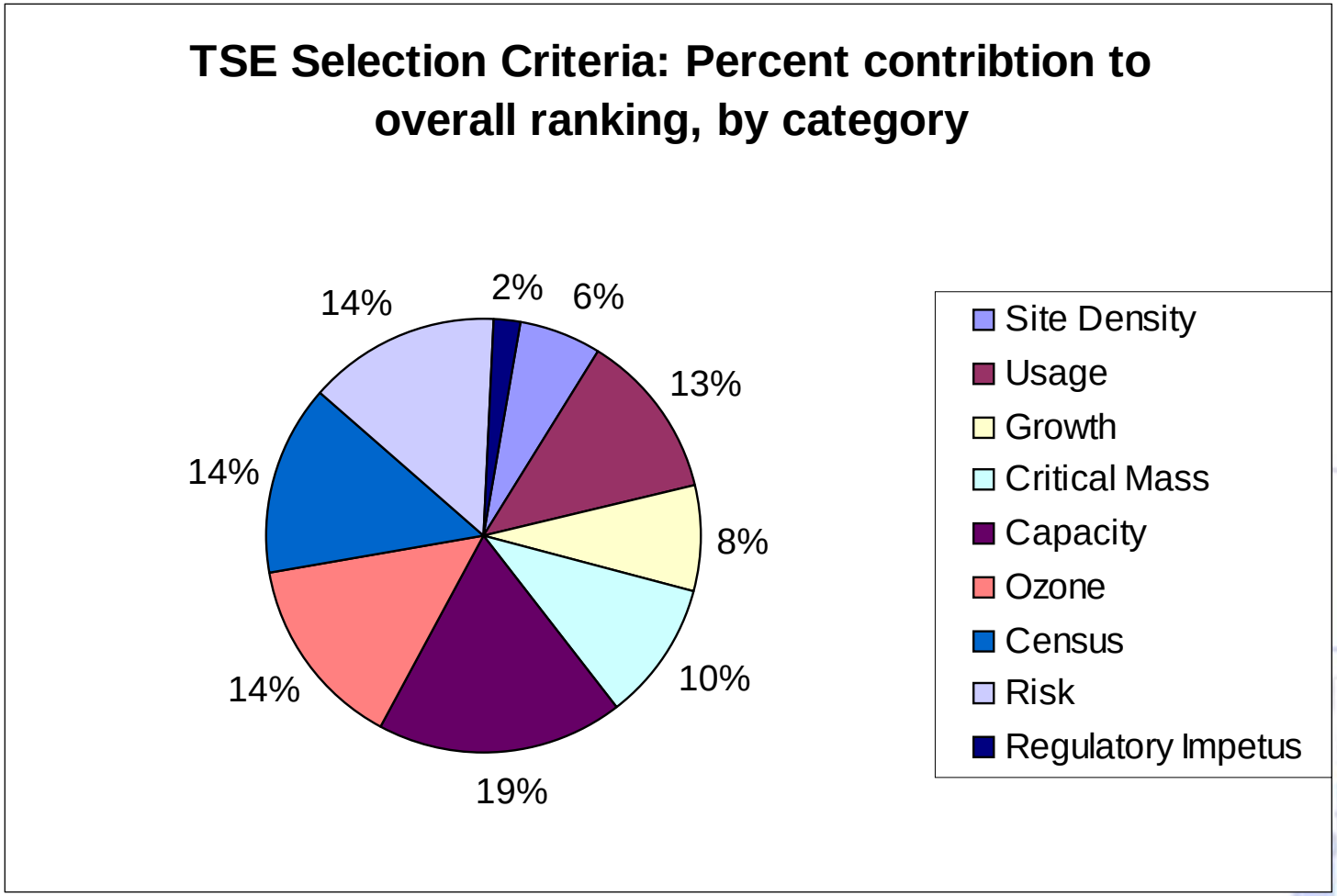
- Site density
- Usage
- Growth
- Critical Mass
- Public Health Index
- Regulatory Impetus

Criteria Weighting Factors / Sensitivity

Criteria Name	Scoring Range Min	Max	% Total
Site Density	1	3	6.13%
Usage	0.63	6.16	12.58%
Growth	0.5	3.8	7.76%
Critical Mass	0	5	10.21%
Capacity	0	9	18.38%
Ozone	1	7	14.30%
Census	1	7	14.30%
Risk	1	7	14.30%
Regulatory Impetus	0	1	2.04%

Maximum Achievable Score = (? all categories)	48.96

Criteria Contribution to Overall Truck Stop Ranking

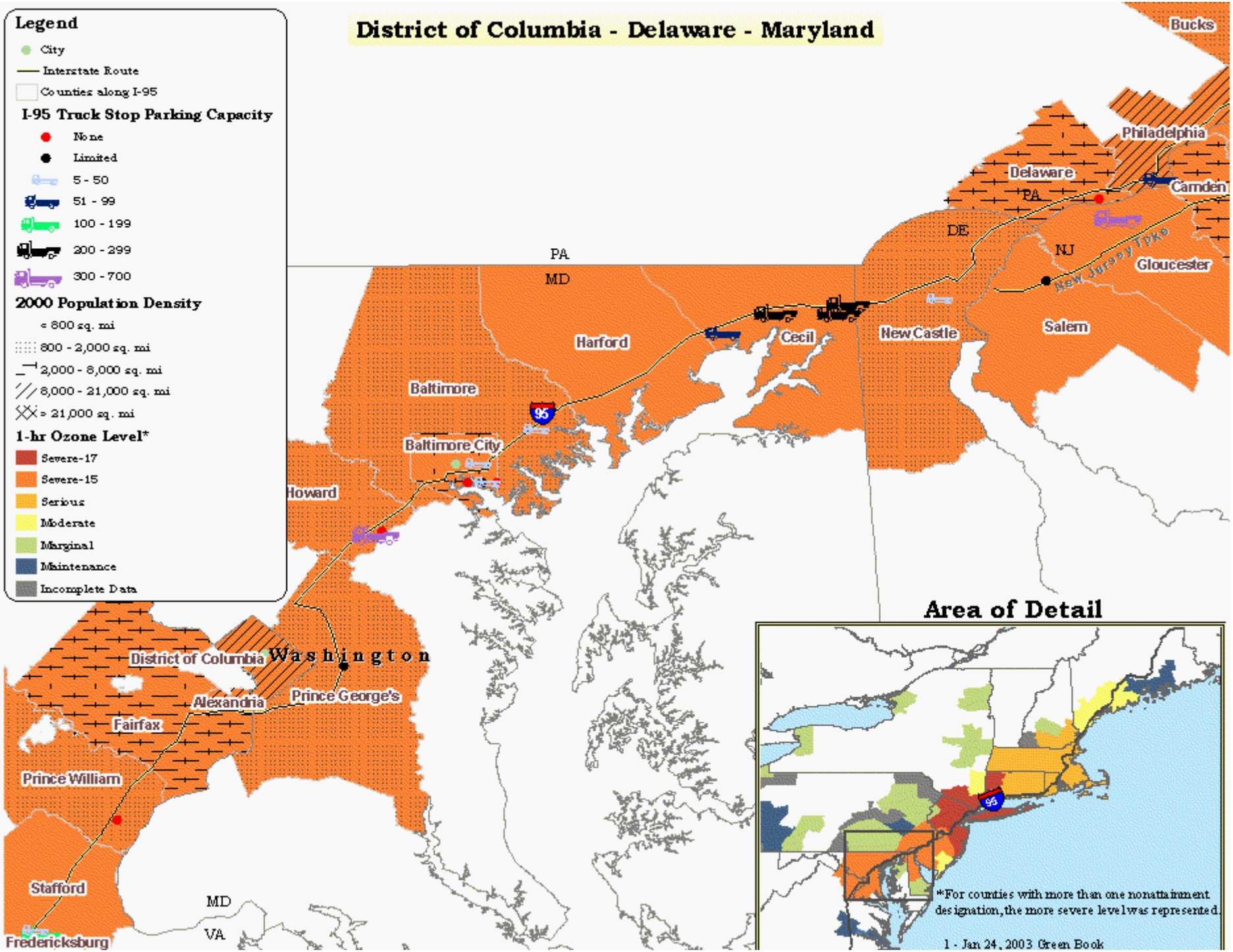


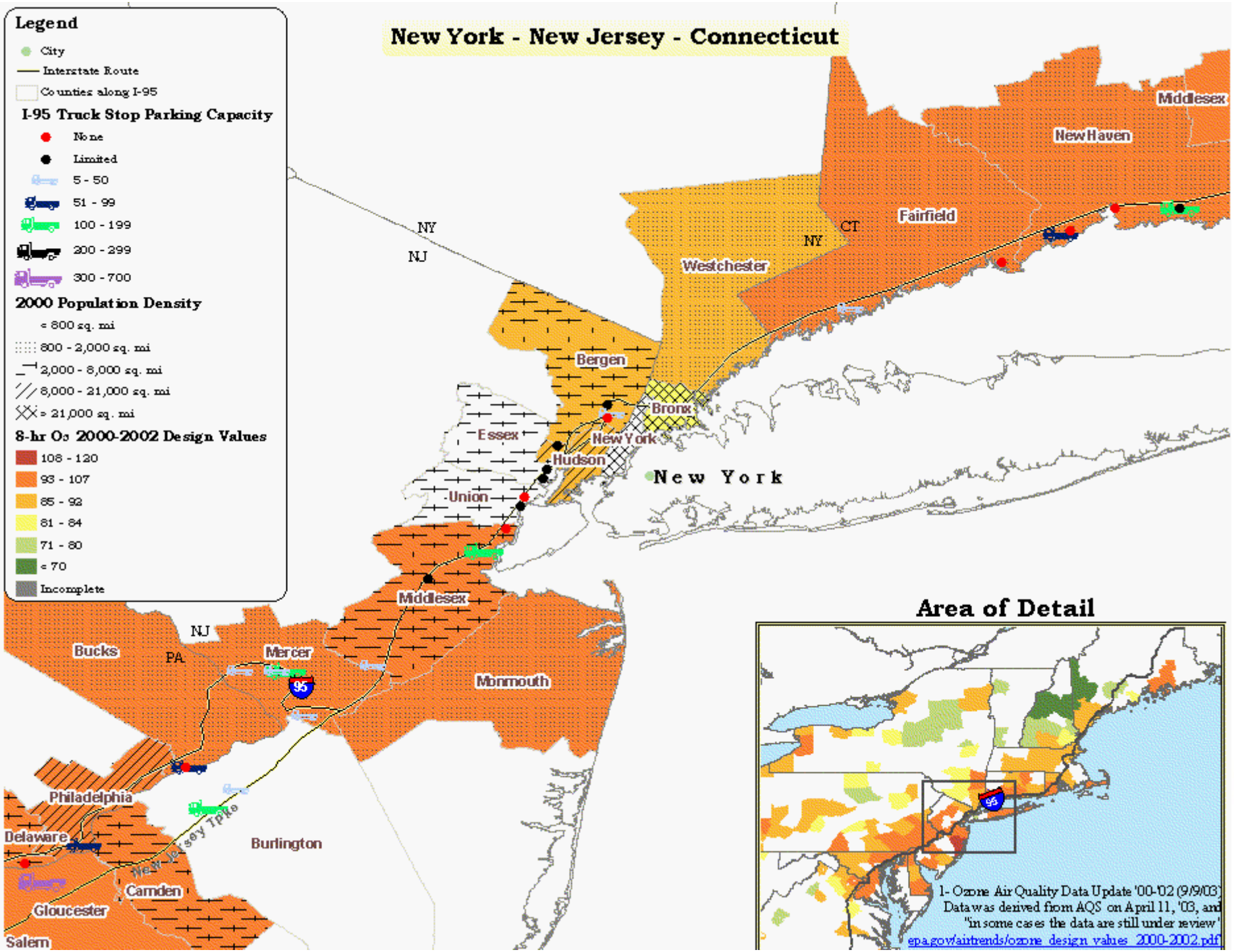
Corridor Analysis (continued)

- The evaluation matrix allows the user to sort any of the criteria specific or ranking and ordering categories (such as Parking capacity, or St

Corridor Analysis (Part II)

- Developed a series of web-based interactive maps that plot each truck stop location with background ozone attainment levels, population density figures, and county utility provider information.
- Truck stop specific evaluation and ranking data is accessible by mouse activating a stop symbols on the map series.
- The map series and evaluation m (password protected version) is the NESCAUM web-site.


District of Columbia - Delaware - Maryland
Legend
City
Interstate Route
Counties along I-95
I-95 Truck Stop Parking Capacity
None
Limited
5 - 50
51 - 99
100 - 199
200 - 299
300 - 700
2000 Population Density
< 800 sq. mi
800 - 2,000 sq. mi
2,000 - 8,000 sq. mi
8,000 - 21,000 sq. mi
> 21,000 sq. mi
1-hr Ozone Level*
Severe-17
Severe-15
Serious
Moderate
Marginal
Maintenance
Incomplete Data
Bucks
Philadelphia
Delaware
PA
Camden
DE
NJ
Gloucester
New Jersey Tpke
PA
MD
Harford
Cecil
New Castle
Salem
Baltimore
95
Baltimore City
Howard
District of Columbia
Washington
Alexandria
Prince George's
Fairfax
Prince William
Stafford
Fredericksburg
MD
VA
Area of Detail
95
*For counties with more than one nonattainment designation, the more severe level was represented.
1 - Jan 24, 2003 Green Book


New York - New Jersey - Connecticut
Legend
City
Interstate Route
Counties along I-95
I-95 Truck Stop Parking Capacity
None
Limited
5 - 50
51 - 99
100 - 199
200 - 299
300 - 700
2000 Population Density
< 800 sq. mi
800 - 2,000 sq. mi
2,000 - 8,000 sq. mi
8,000 - 21,000 sq. mi
> 21,000 sq. mi
8-hr O3 2000-2002 Design Values
108 - 120
93 - 107
85 - 92
81 - 84
71 - 80
< 70
Incomplete
NY
NJ
CT
Middlesex
New Haven
Fairfield
Westchester
Bergen
Bronx
Essex
New York
Hudson
Union
New York
Middlesex
Bucks
PA
Mercer
Monmouth
95
Philadelphia
Delaware
New Jersey Tpke
Burlington
Camden
Gloucester
Salem
Area of Detail
1- Ozone Air Quality Data Update '00-'02 (9/9/03)
Data was derived from AQS on April 11, '03, and
"in some cases the data are still under review"
epa.gov/airtrends/ozone_design_values_2000-2002.pdf

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