



Air Quality in Texas



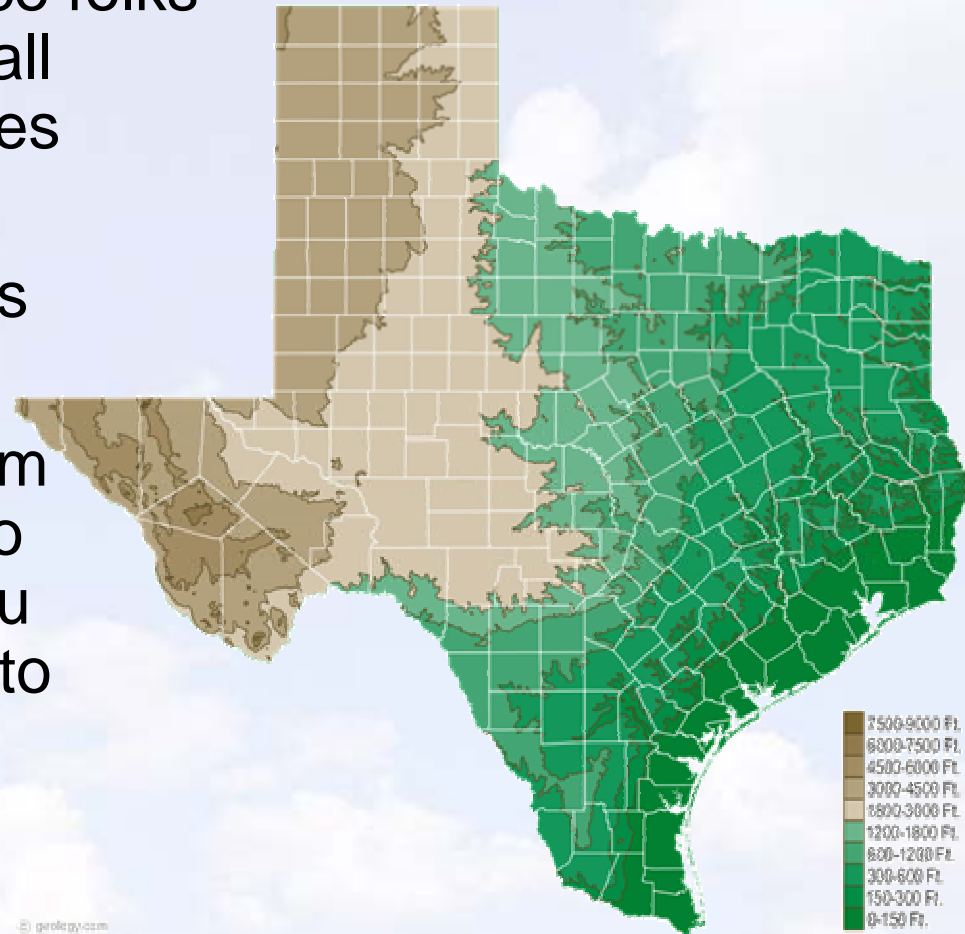
NACAA FALL MEMBERSHIP MEETING

OCTOBER 23-25, 2006



Welcome to Texas

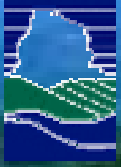
- Population: 22,859,968 nice folks and a few old soreheads, all spread out into 252 counties
- Size: 268,581 square miles
- And yes, you can drive from Texarkana, Tx., to Chicago (677 miles), faster than you can drive from Texarkana to El Paso (795 miles)





Over 600 miles of beaches





125 State Parks and Historical / Nature areas

- **15 National Parks / Seashores/ Historic sites**

**7 mountain peaks over 8,000 ft., with
the Guadalupe Peak at 8,749 ft.**



Panhandle Plains

Prairies & Lakes

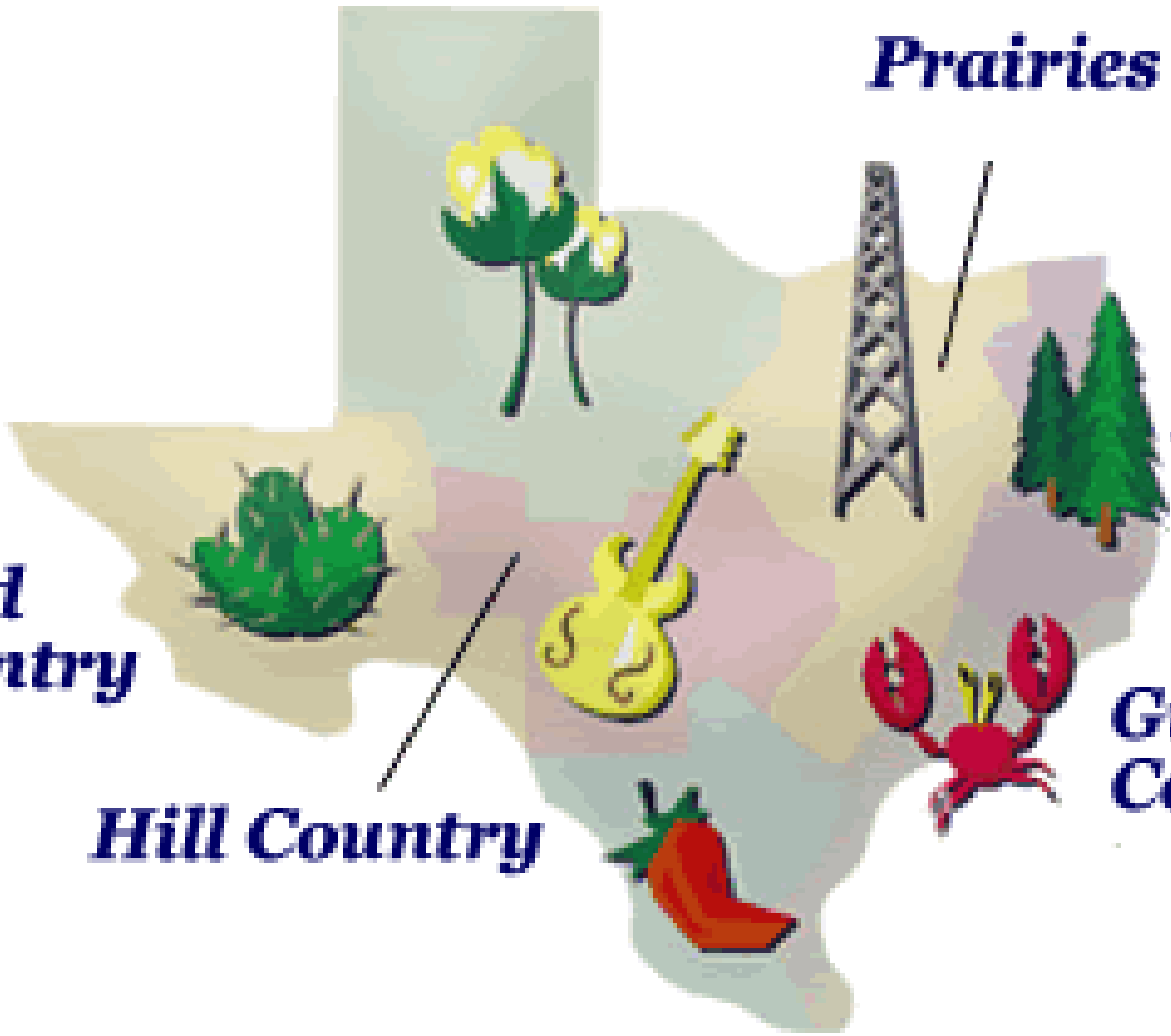
Big Bend Country

Piney Woods

Gulf Coast

Hill Country

South Texas Plains





Panhandle Plains



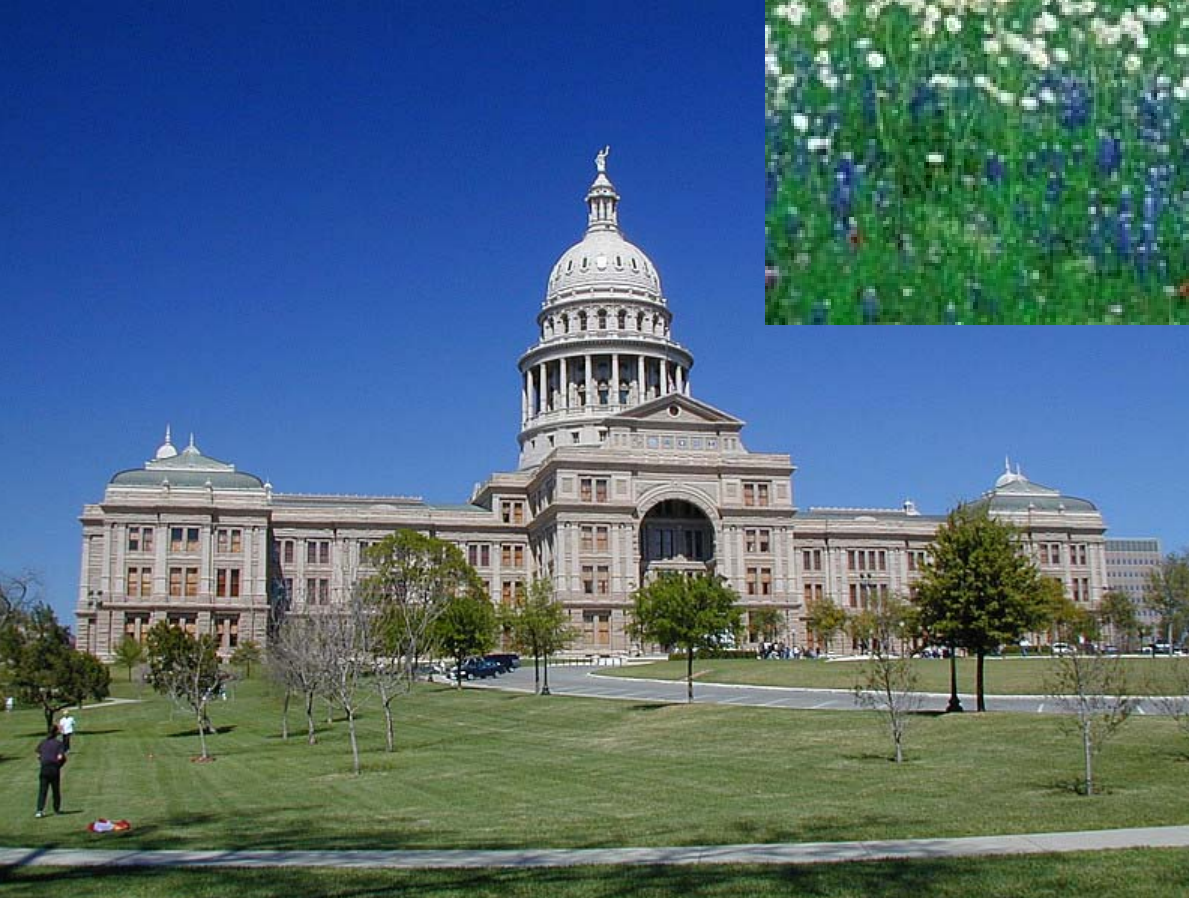


Prairies and Lakes



Piney Woods





Hill Country



Big Bend Country





Gulf Coast





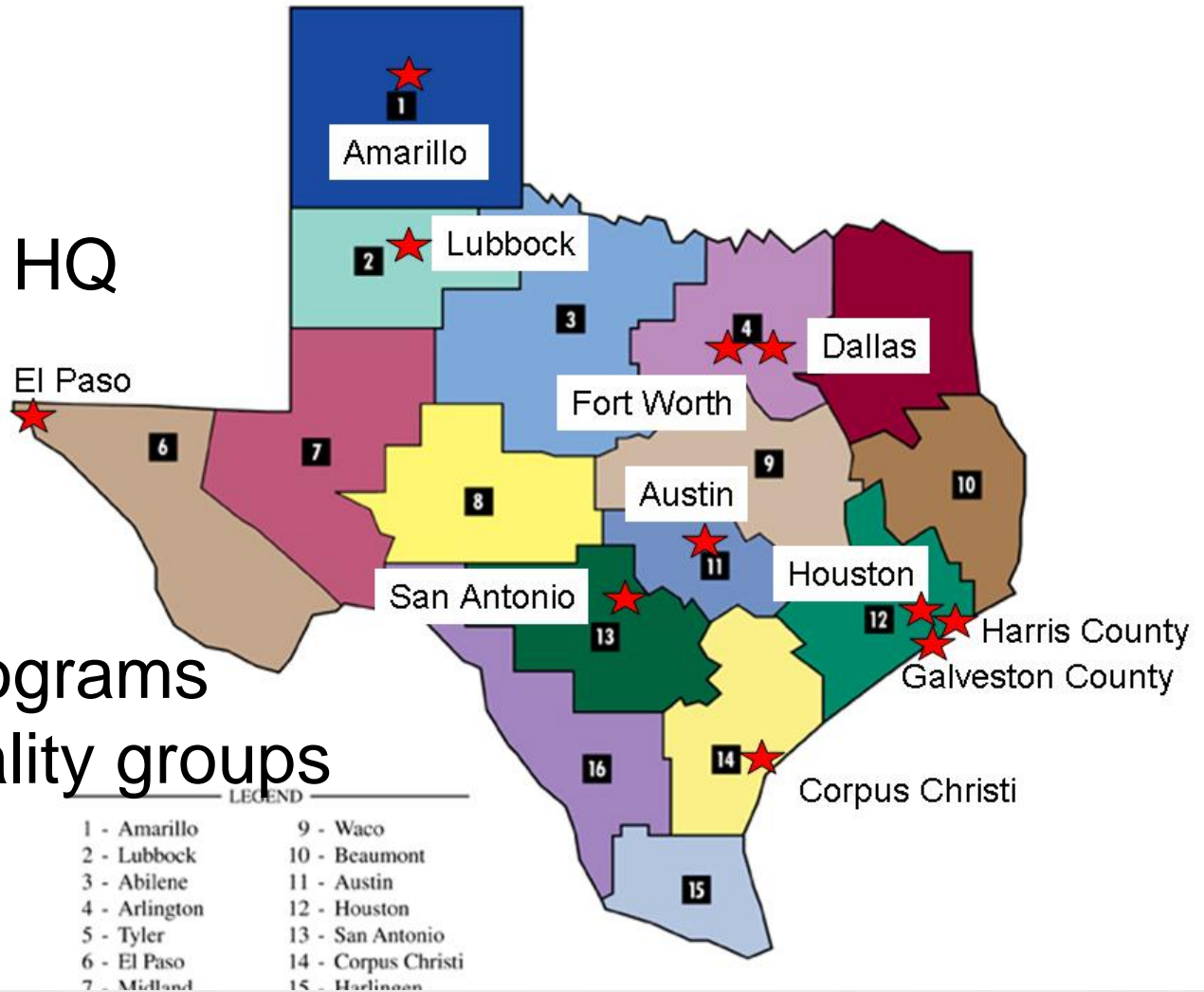
South Texas Plains





TCEQ Regions and Local Programs

- TCEQ has 16 regions plus Austin HQ



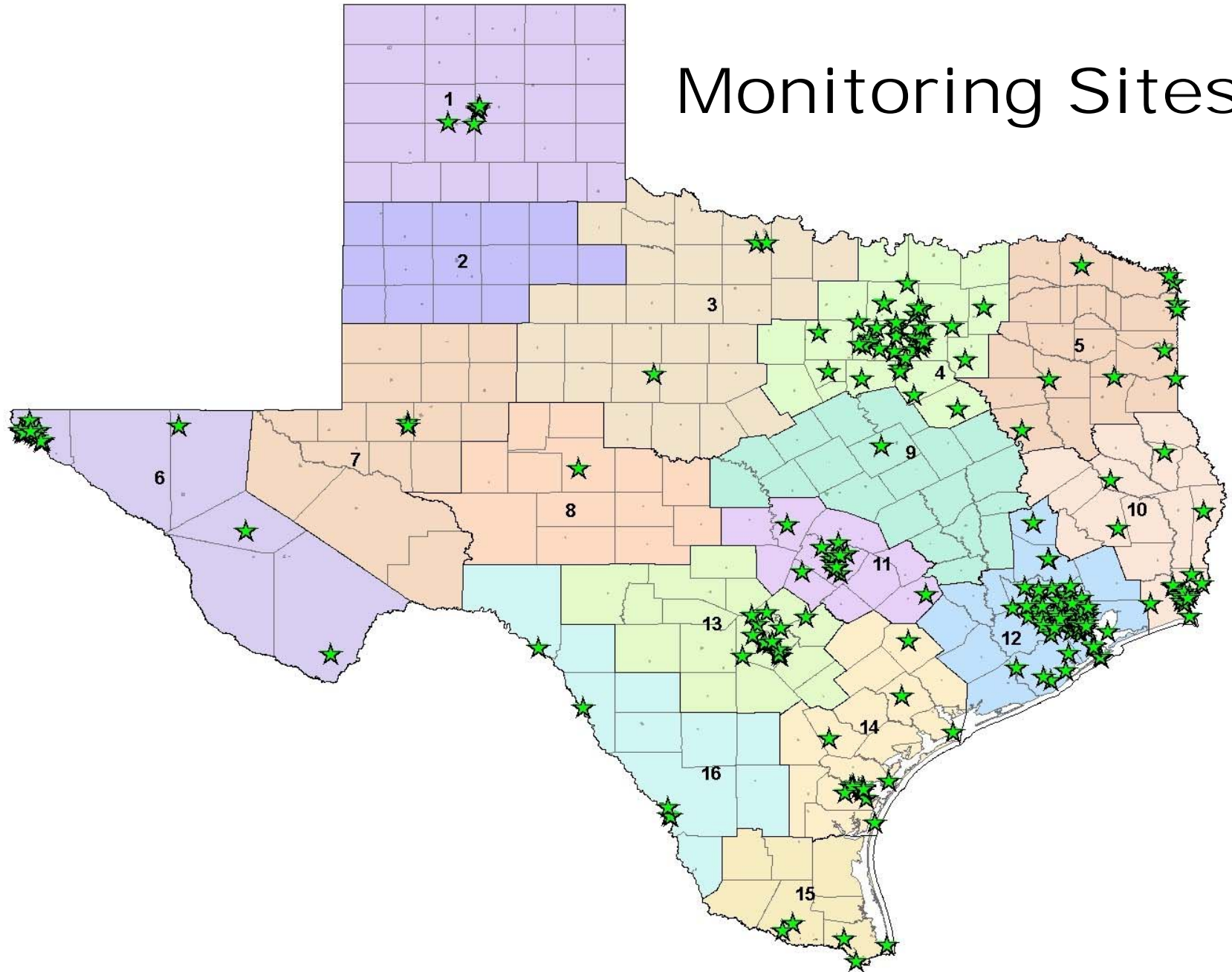
- 11 local programs with air quality groups



Monitoring Sites

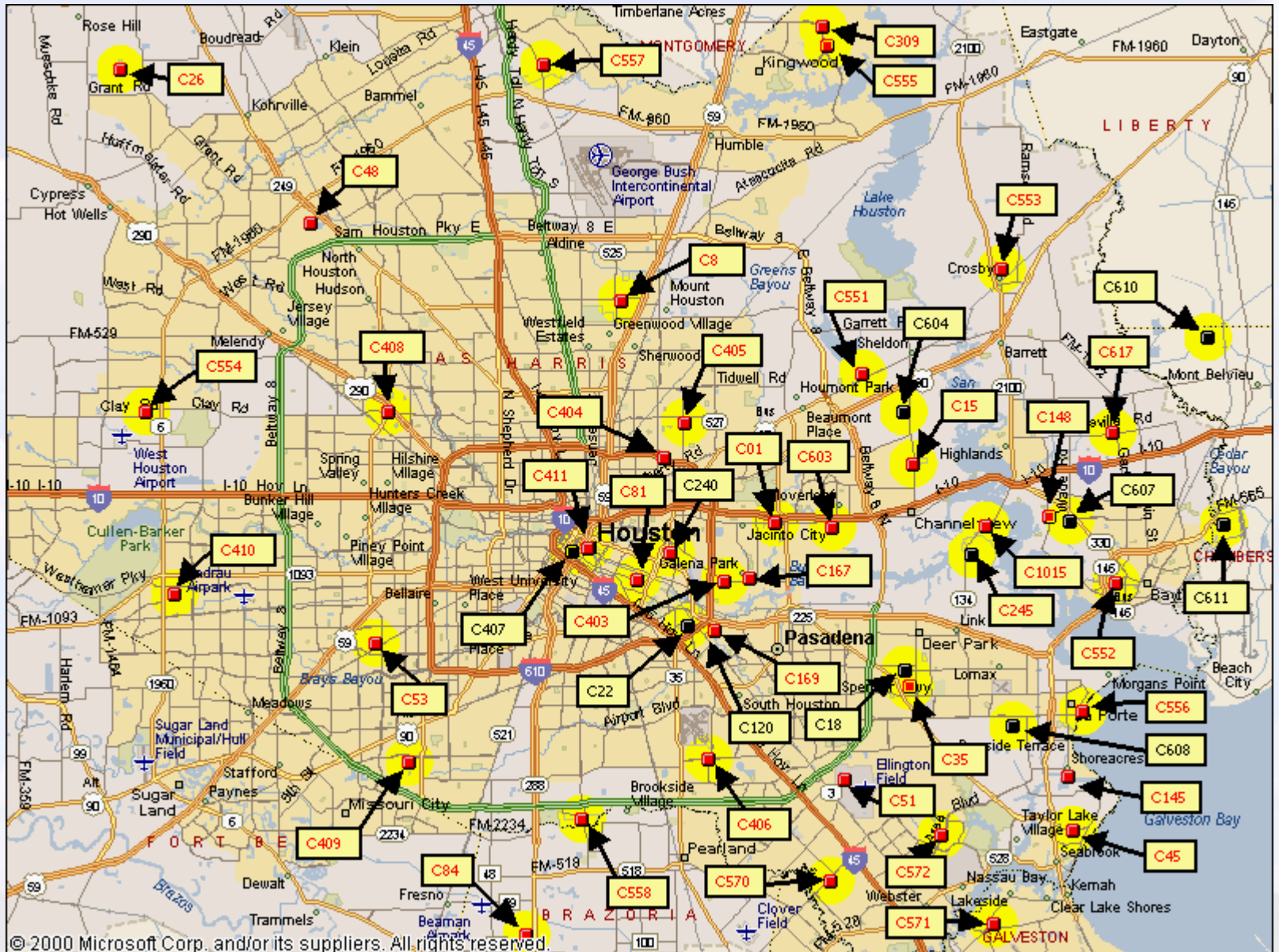
- TCEQ receives data from 188 air monitoring sites
- TCEQ owns 114 sites, with 582 instruments being operated at those sites
- 66 sites are owned by cities, counties, councils of governments, industry, and one Native American tribe
- 8 sites are in Juarez, Mexico

Monitoring Sites





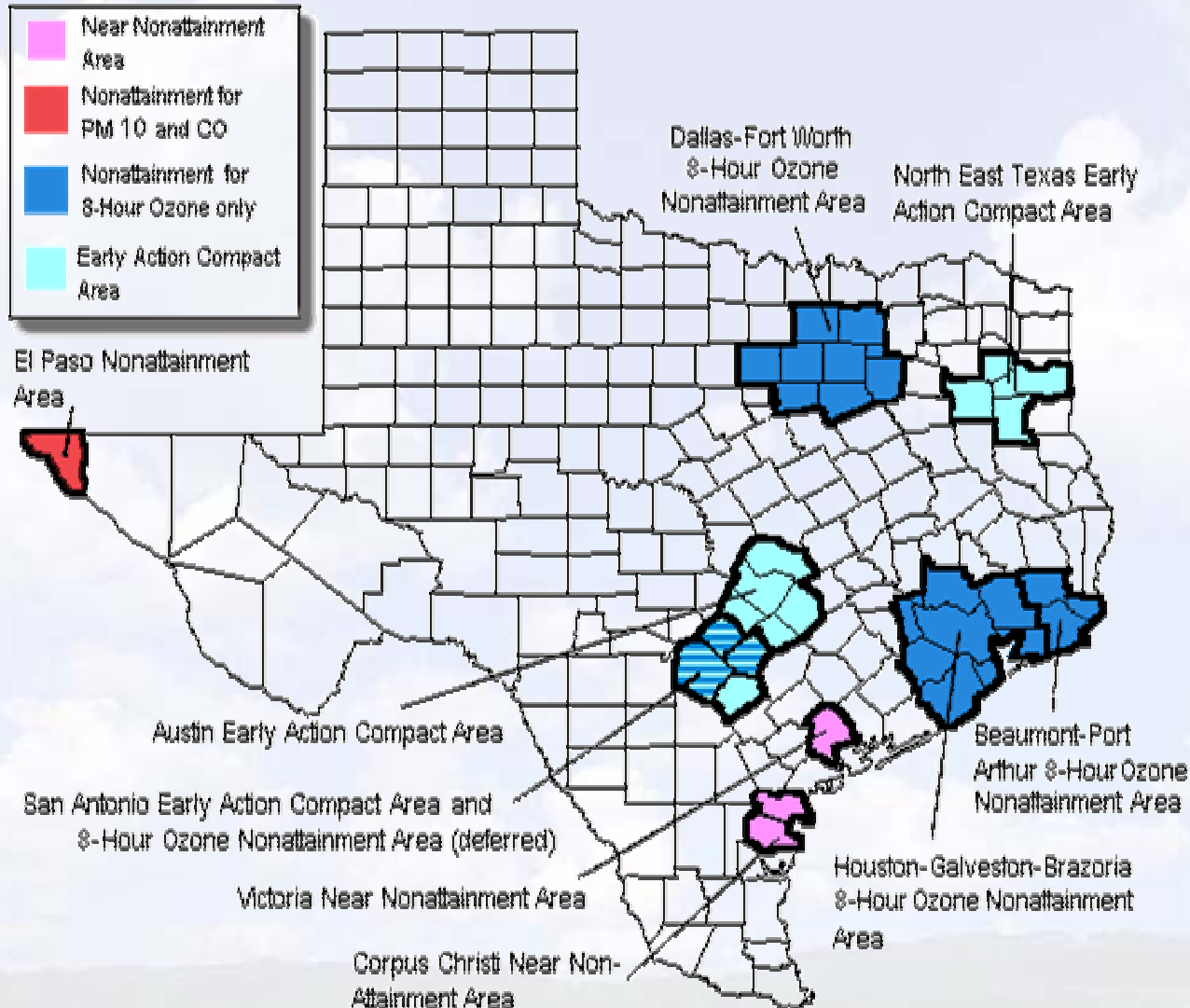
Houston Monitors



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NAAQS Non-attainment areas





National Ambient Air Quality Standards

- NOx – no nonattainment areas
- SO2 – no nonattainment areas
- Lead – no nonattainment areas, one maintenance area (part of Collin County)
- PM2.5 – no nonattainment areas, but we could be getting close in HGB, we are working with local governments and industry to reduce levels



El Paso

- Previously the area was nonattainment for the 1-hour ozone standard, but now designated as **attainment** for the 8-hour ozone standard.

- Designated as moderate nonattainment for PM10 and CO.



- Submitted a maintenance plan for the ozone standard and submitted a maintenance plan and redesignation request to EPA for El Paso for CO this year.



El Paso

- Area is currently monitoring attainment for CO and O3
- The TCEQ has published a proposed Natural Events Action Plan (NEAP) for El Paso concerning PM, hopefully this will allow EPA to flag data and we can work towards being classified as attainment for PM10





8-Hour Ozone Nonattainment Areas

- Houston-Galveston
-Brazoria (HGB)
8 county area
- Dallas-Fort Worth
(DFW) 9 county area
- Beaumont-Port Arthur
(BPA) 3 county area
- San Antonio EAC (deferred until 2007) 3 county
area





HGB and DFW

- 8-hour ozone standard designation: **Moderate**
- Attainment deadline: **June 15, 2010**
- Attainment demonstration: **Ozone season 2009**
- Control strategy compliance dates: **Prior to ozone season 2009**



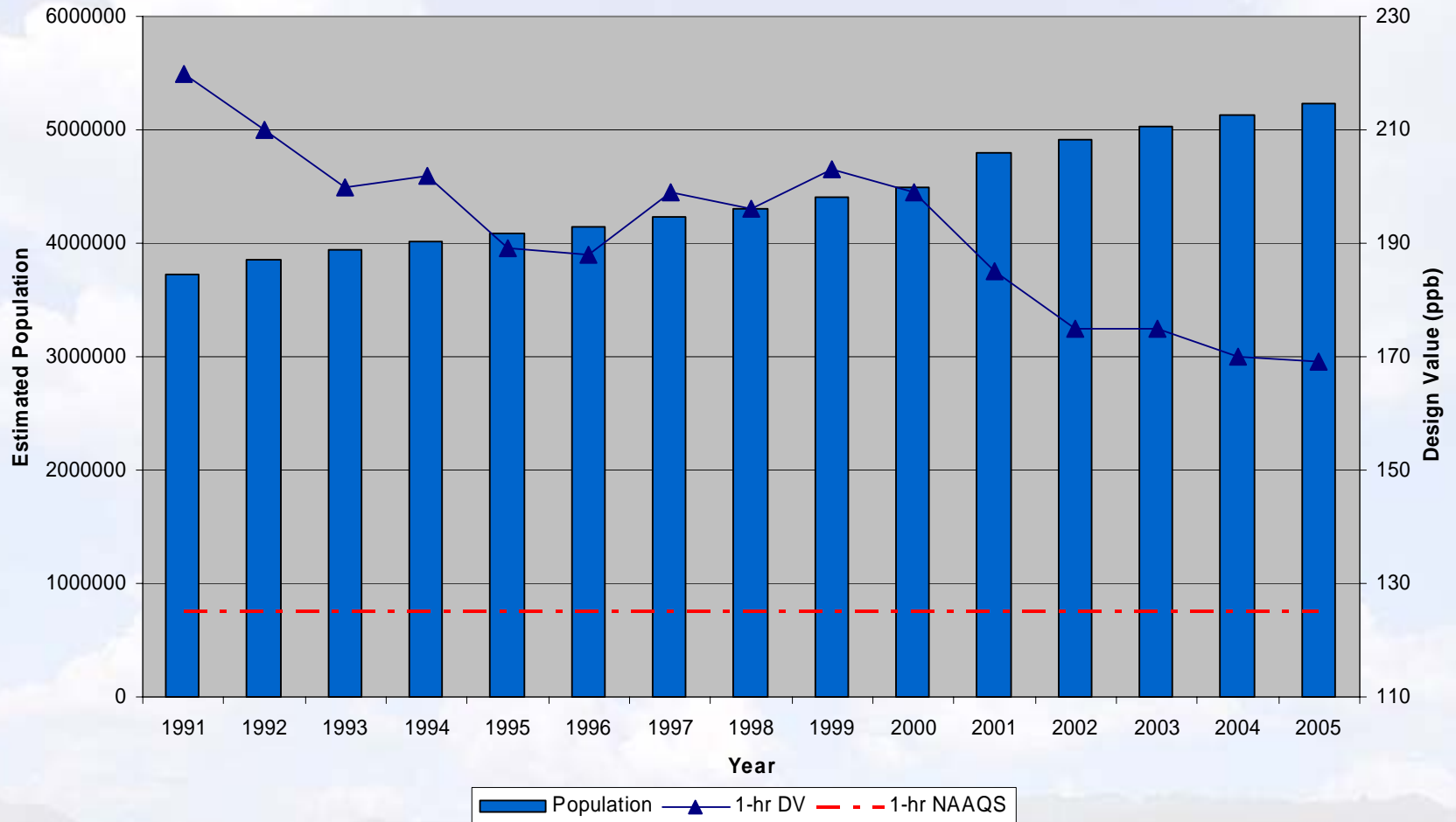
Photo by G. Milligan ©





Houston Area 1-Hour Ozone Trends

Houston Non-Attainment Area Estimated Population and 1-Hour Design Values, 1991-2005



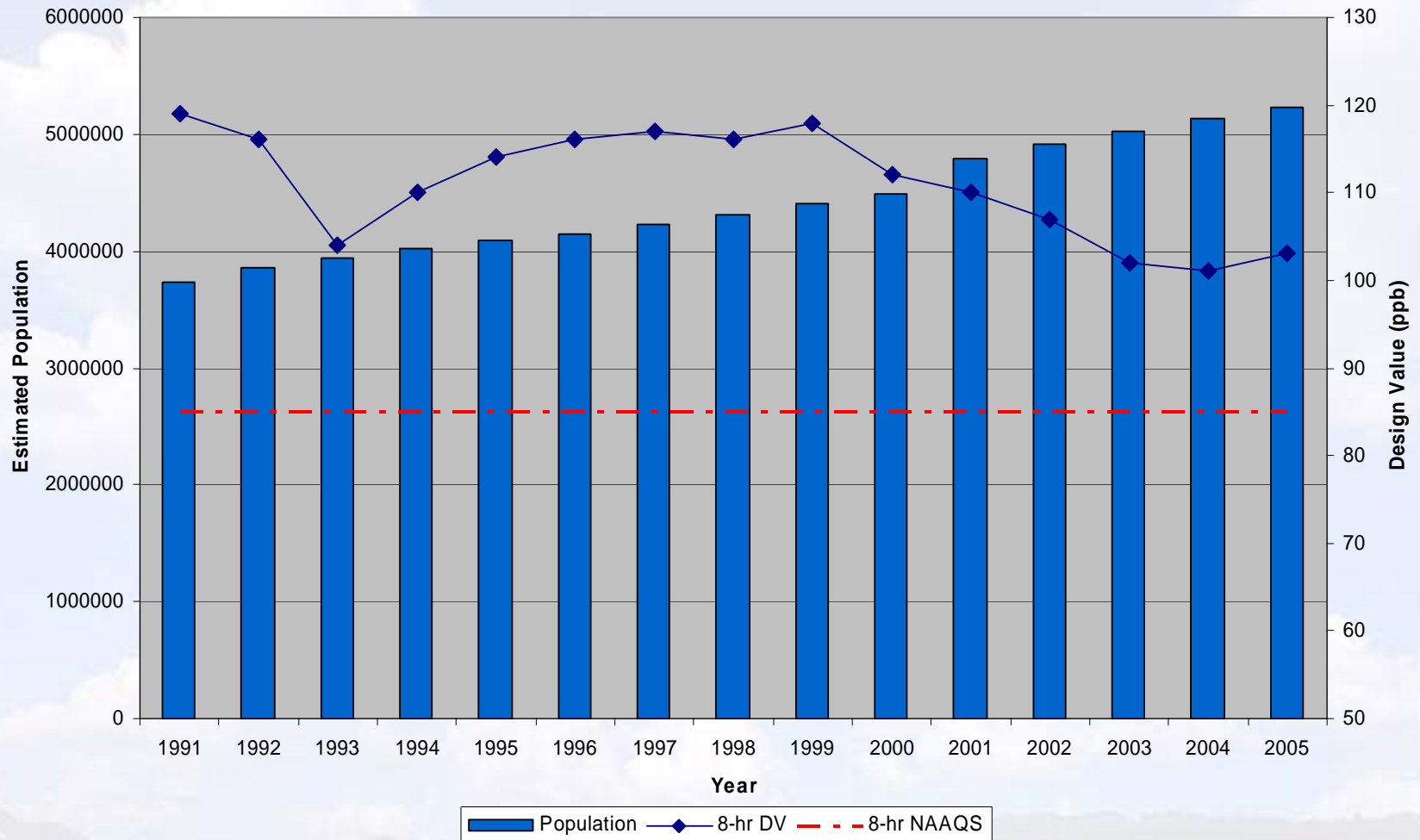
Source: Ozone -- EPA and Mother database

Population -- <http://www.census.gov/popest/archives/1990s/MA-99-03b.txt> and <http://www.census.gov/popest/counties/CO-EST2005-01.html>, July 10, 2006



Houston Area 8-Hour Ozone Trends

Houston Non-Attainment Area Estimated Population and 8-Hour Design Values, 1991-2005



Source: Ozone -- EPA and Mother database

Population -- <http://www.census.gov/popest/archives/1990s/MA-99-03b.txt> and <http://www.census.gov/popest/counties/CO-EST2005-01.html>, July 10, 2006



Existing HGB Control Strategies

- Major point source NO_x reduced 80%
- Highly Reactive Volatile Organic Compounds (HRVOC) site-wide cap and monitoring and testing requirements
- Stationary diesel engine requirements
- Gas-fired heaters and small boilers
- Variety of VOC regulations
- Airport Ground Support Equipment (GSE) electrification



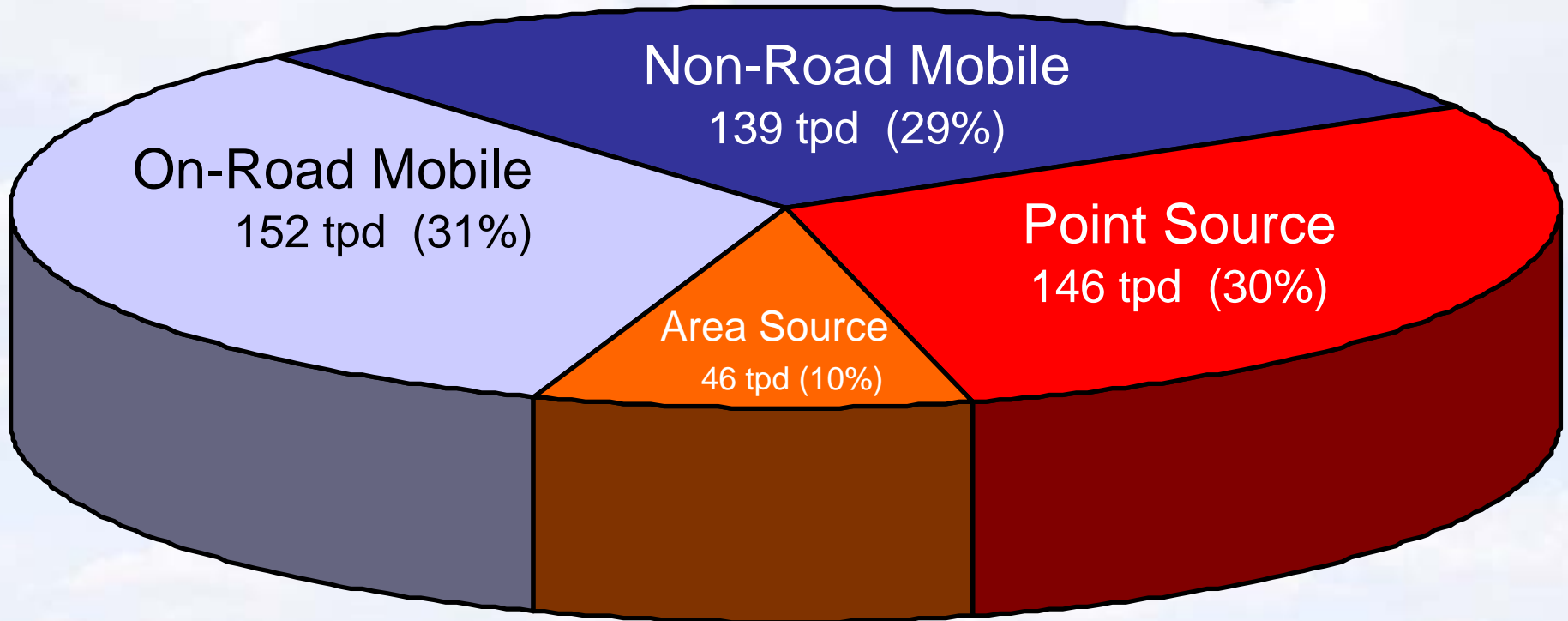
Existing HGB Control Strategies

- Texas emissions reduction plan (TERP)
- Low emission diesel in east and central Texas
- Vehicle inspection/maintenance
- Speed limit reduction
- Transportation control measures
- Voluntary Mobile Emission Reduction Program
- Portable fuel containers (statewide)



HGB 2009 Emissions Inventory

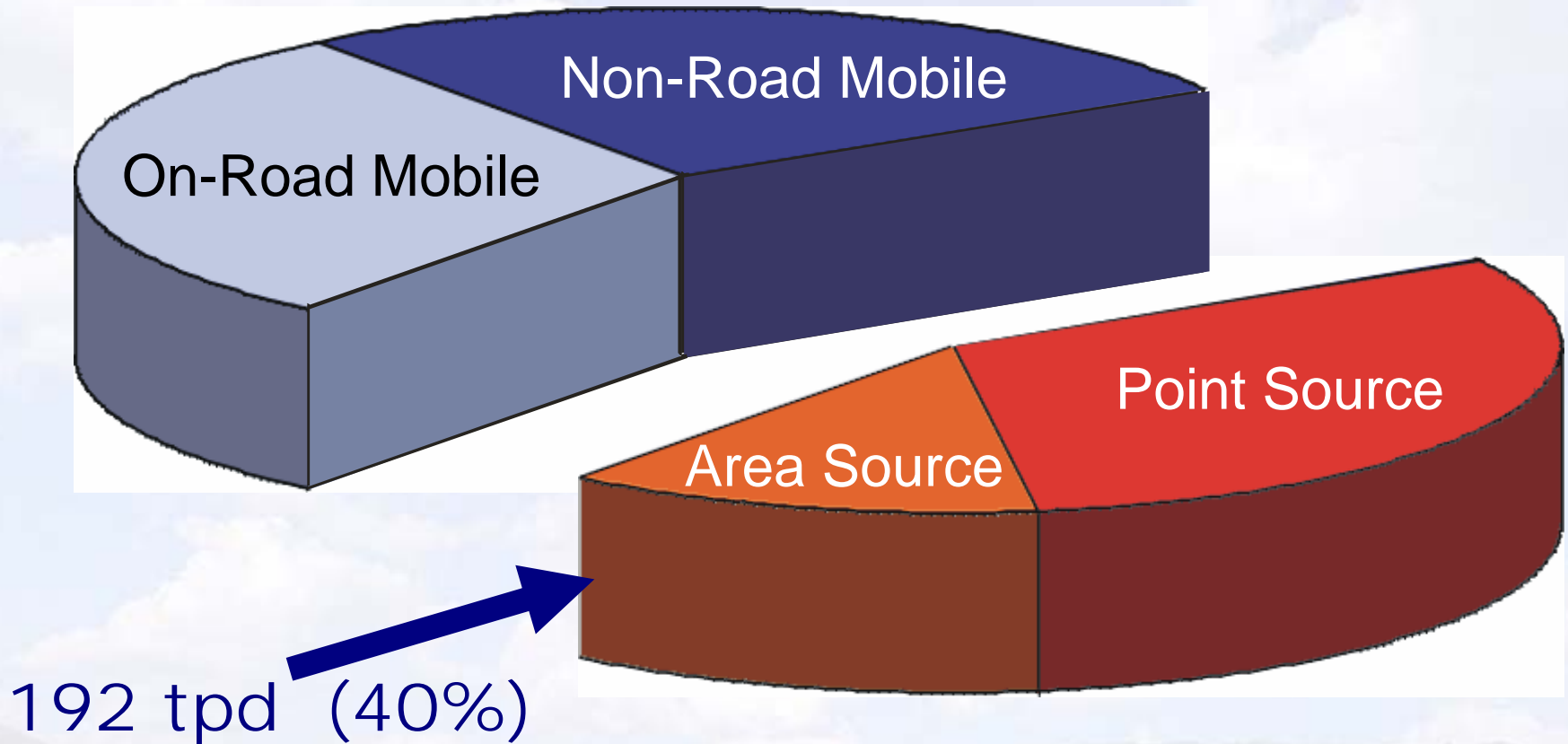
NO_x: Source Category Estimates





HGB 2009 Emissions Inventory

HGB NO_x Sources Directly Regulated by TCEQ





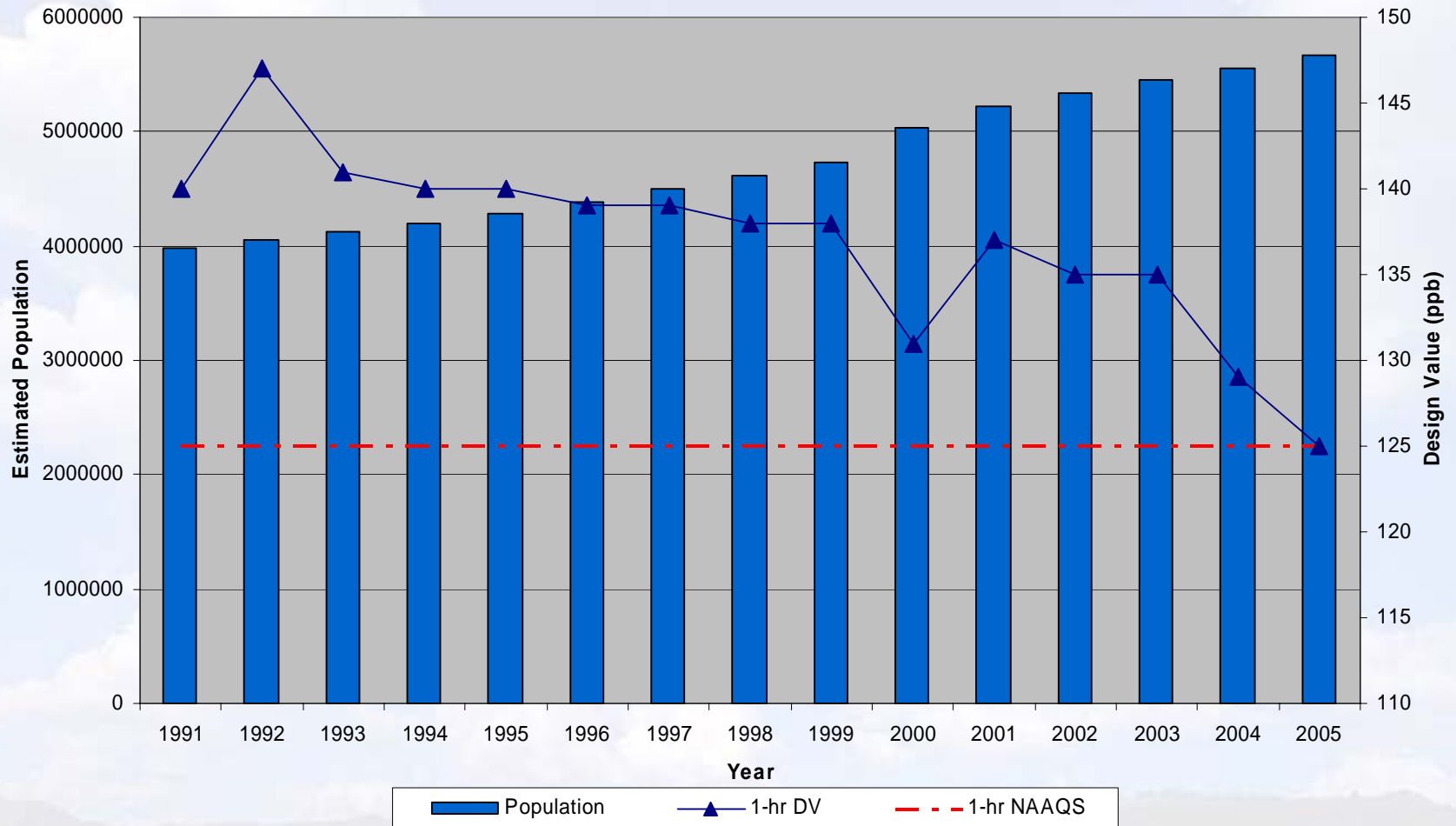
HGB Concepts Under Consideration

- Major Source NO_x reduced an additional 50%
 - Area-wide cap currently reduces 80% from 2000
- Texas low emission diesel for marine fuel in the 8-county area
- Storage and transfer operations requirements (VOC)
- Locally implemented controls Houston-Galveston Area Council (H-GAC)



Dallas-Fort Worth 1-Hour Ozone Trends

Dallas-Fort Worth -- Estimated population and 1-hour Ozone Design Values, 1991 to 2005



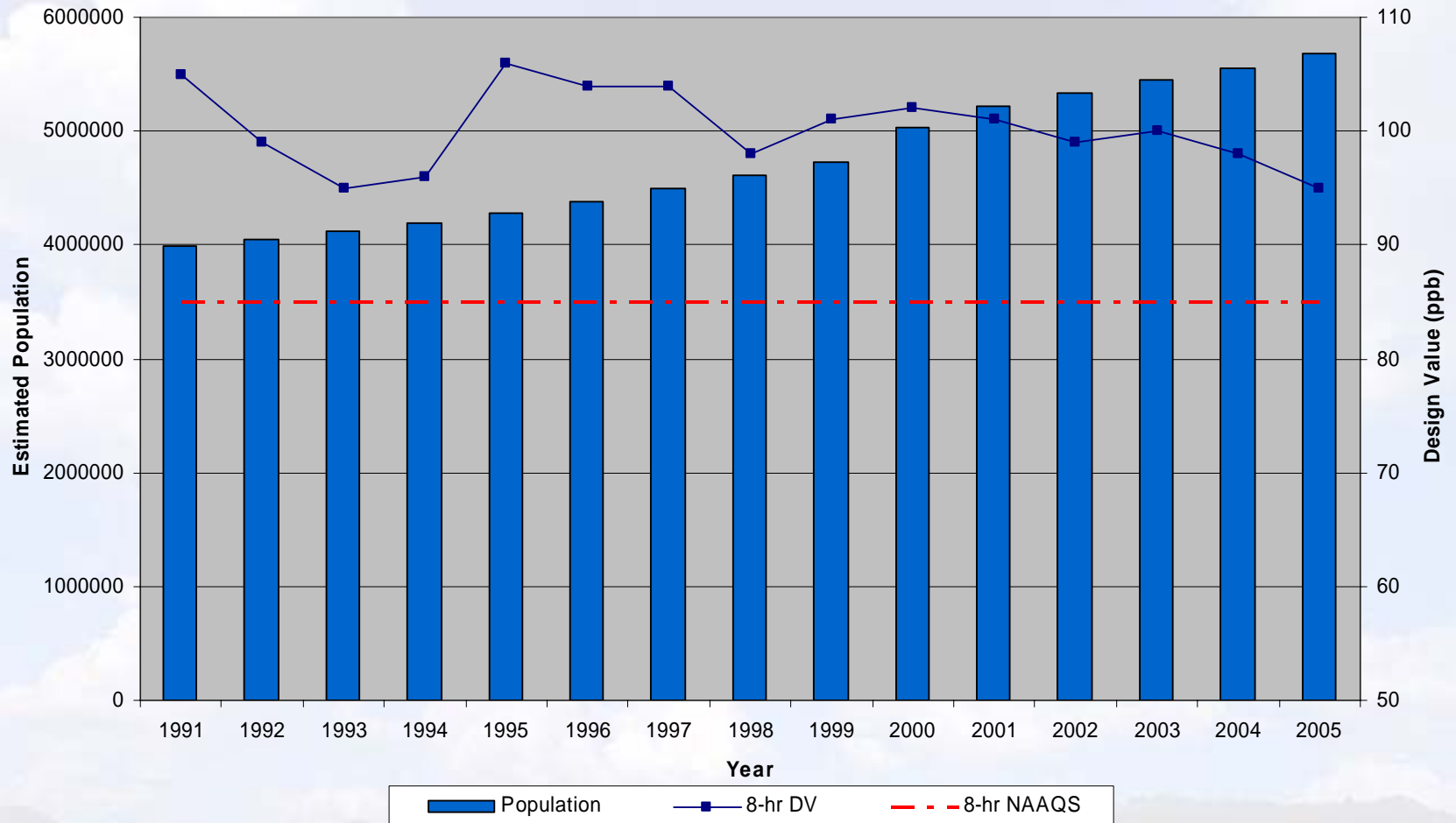
Source: Ozone -- EPA and Missouri database

Population -- <http://www.census.gov/popest/archives/1990s/MA-A-99-03b.txt> and <http://www.census.gov/popest/counties/CO-EST2005-01.html>, July 10, 2006



Dallas-Fort Worth 8-Hour Ozone Trends

Dallas-Fort Worth -- Estimated population and 8-hour Ozone Design values, 1991 to 2005



Source: Ozone -- EPA and M other database

Population -- <http://www.census.gov/popest/archives/1990s/MA-99-03b.txt> and <http://www.census.gov/popest/counties/CO-EST2005-01.html>, July 10, 2006



Existing DFW Control Strategies

- Major Point Source NO_x reductions in four 1-hour ozone area counties
- Cement kilns
- East and central Texas electric generating facilities controls
- Lean-burn and rich-burn engine rule
- Surface coating requirements
- Stage I vapor recovery
- Stage II vapor recovery in four counties
- Variety of VOC regulations



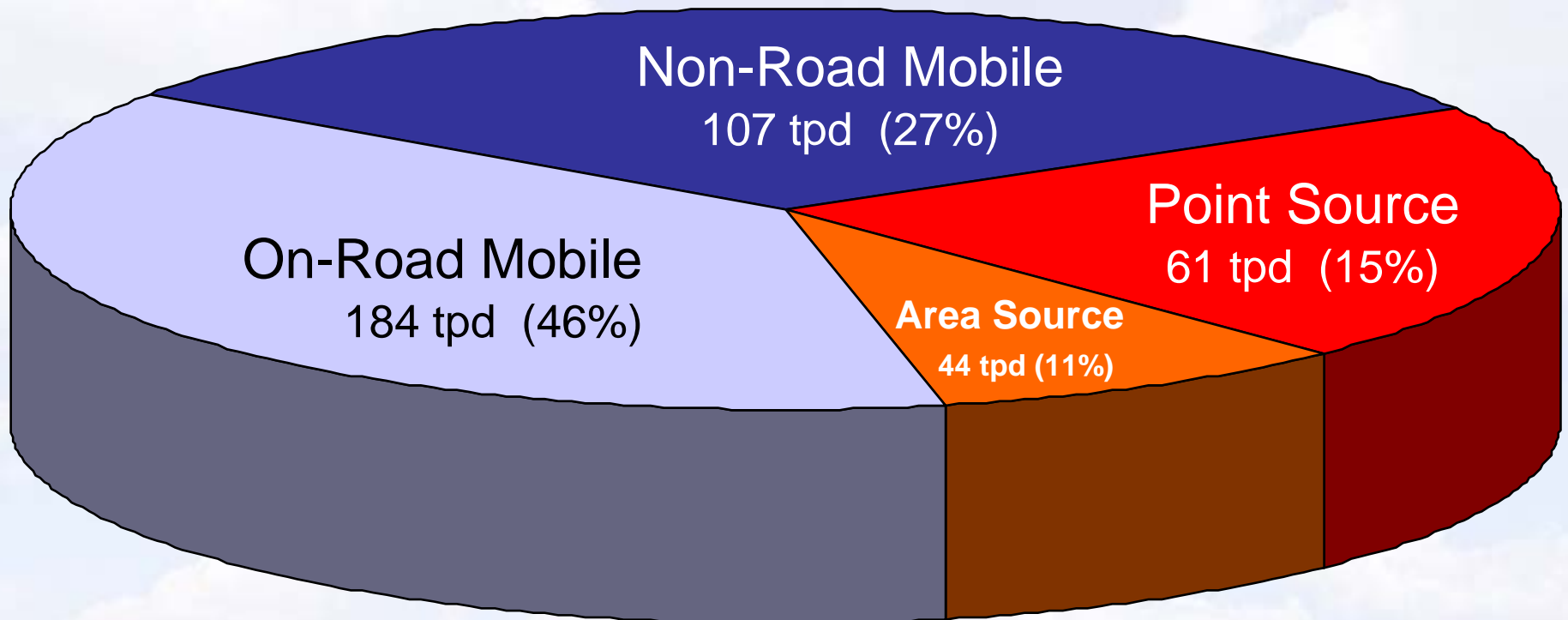
Existing DFW Control Strategies

- Texas Emissions Reduction Plan (TERP)
- Vehicle inspection and maintenance
- Low emission diesel in east and central Texas
- Airport ground support equipment (GSE) electrification in four counties
- Energy efficiency
- Portable fuel containers (statewide)
- Speed limit reduction
- Voluntary Mobile Emission Reduction Program
- Transportation control measures in four counties



2009 Modeling Inventory

9 County Dallas/Fort Worth NOx

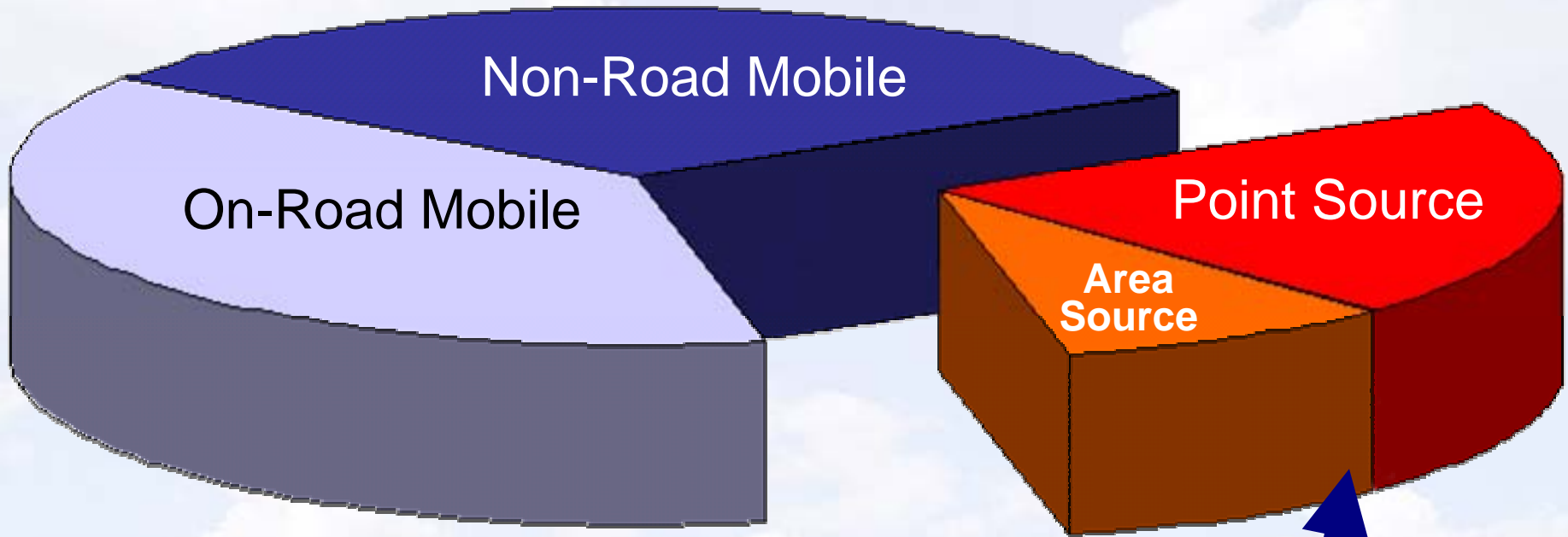


Source: Model Run44.fy2009.a1



NOx Sources Directly Regulated by TCEQ

9 County Dallas/Fort Worth NOx



Source: Model Run44.fy2009.a1

105 tpd (27%)



DFW Concepts Under Consideration for 8-hour ozone

- Cement kilns
- Major sources in DFW area [potential to emit (PTE) equal to or greater than 50 tons/year]
 - Examples: electric generating units (EGUs), boilers, reciprocating internal combustion engines, metallurgical furnaces, incinerators, gas turbines
- Minor sources in DFW area (PTE less than 50 tons/year)
 - Examples: boilers, process heaters, engines



DFW Concepts Under Consideration for 8-hour ozone

- Gas-fired reciprocating internal combustion engines in approx. 200 km area around DFW
- VOC Reasonable Available Control Technology (RACT) requirements
 - Expands existing requirements in Dallas, Tarrant, Collin, and Denton counties to Ellis, Johnson, Kaufman, Parker, and Rockwall counties
 - Examples: industrial wastewater treatment, transport vessels, refining, natural gas and petrochemical processes, pharmaceutical manufacturing
- Locally implemented control strategies
 - Effort led by the North Central Texas Council of Governments



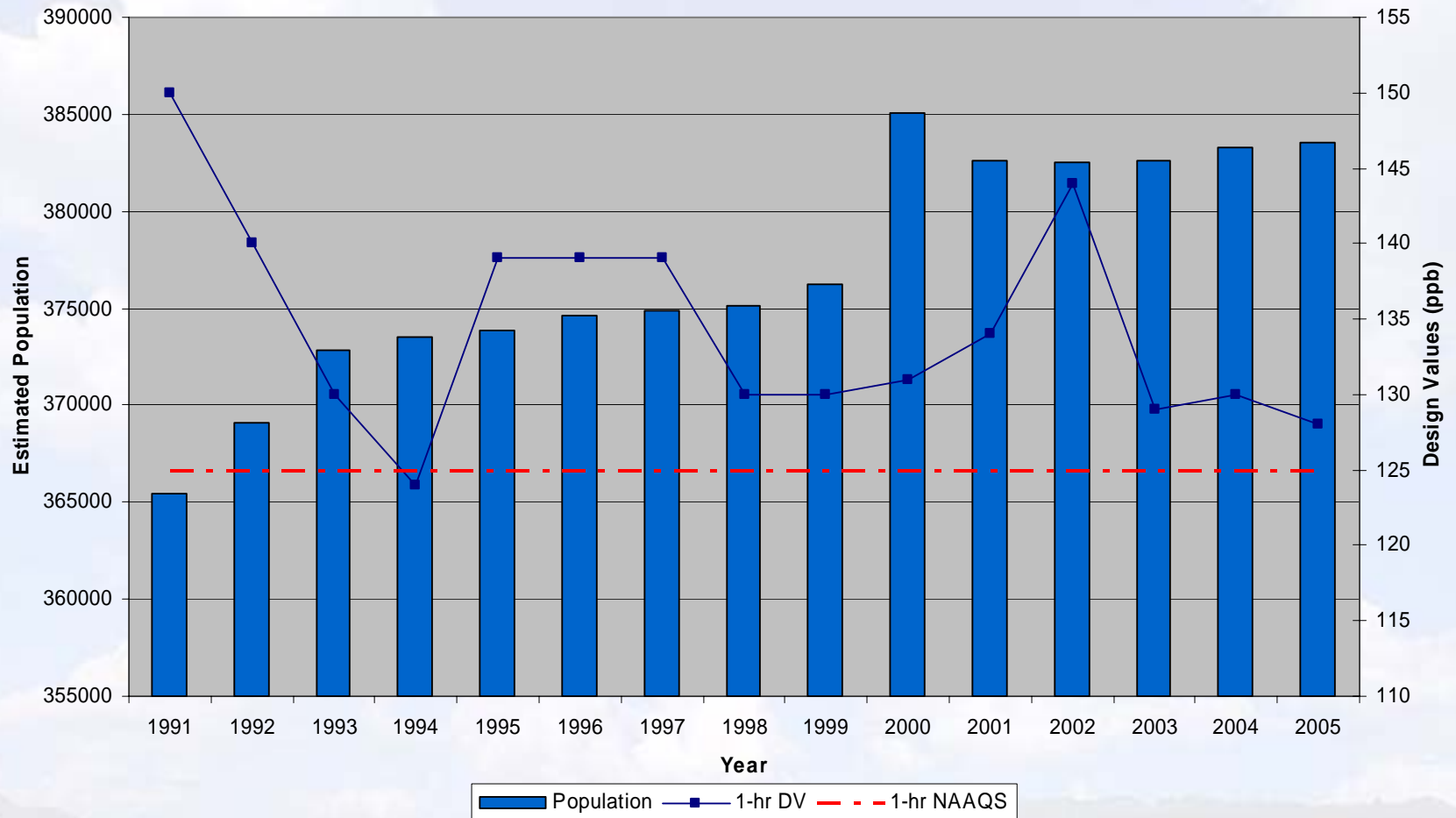
Beaumont-Port Arthur

- 8-hour ozone standard designation: **Marginal**
- Attainment deadline: **June 15, 2007**
- TCEQ submitted a BPA 1-hour and an 8-hour ozone attainment demonstration SIP in 2004 and a revision in 2005
- 8-hour average: **84 ppb (from 2004 to June 30, 2006)**



Beaumont-Port Arthur 1-Hour Ozone Trends

Beaumont-Port Arthur Estimated Population and 1-Hour Design Values, 1991-2005

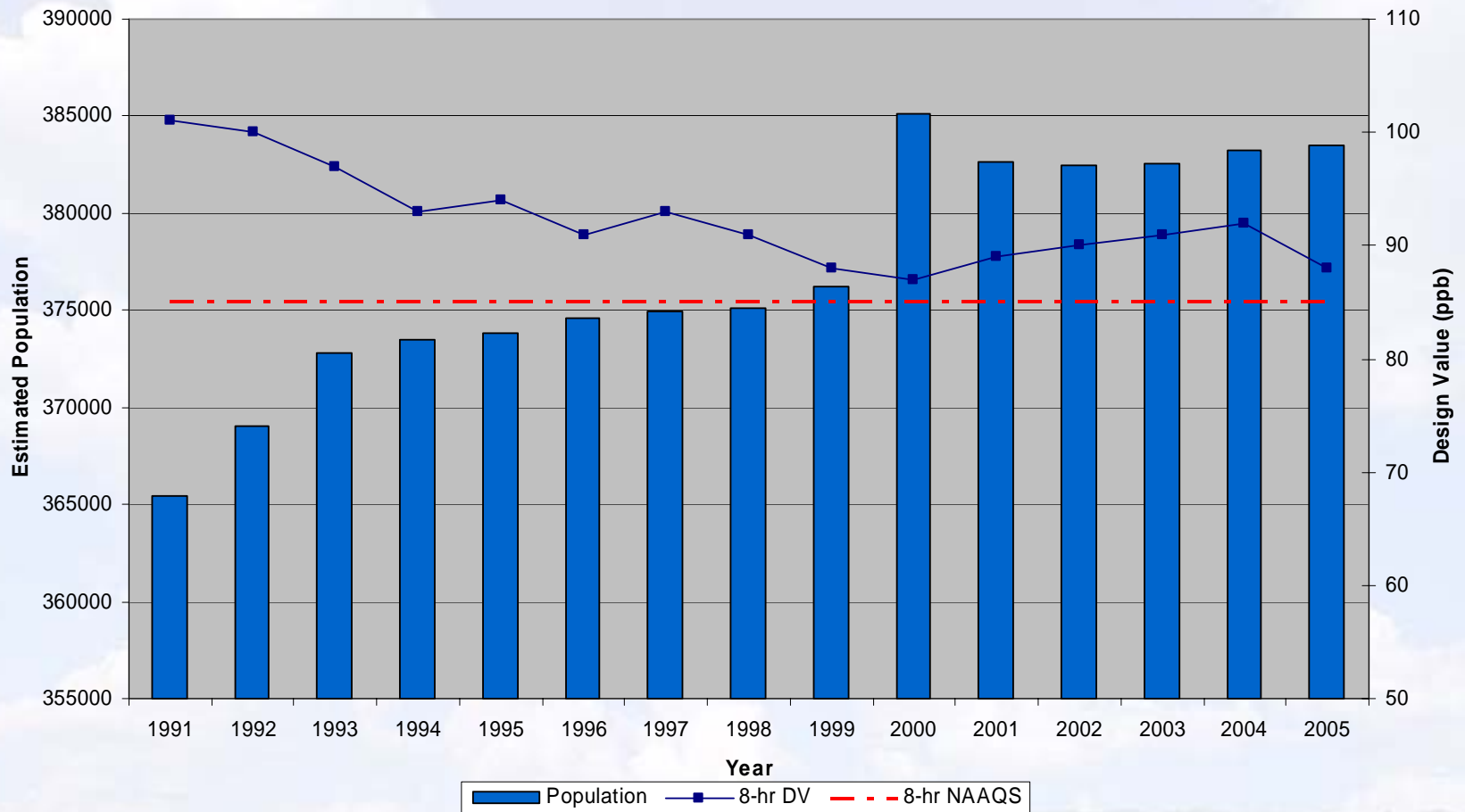


Source: Ozone -- EPA and M other database
Population -- <http://www.census.gov/popest/archives/1990s/MA-99-03b.txt> and <http://www.census.gov/popest/counties/CO-EST2005-01.html>, July 10, 2006



Beaumont-Port Arthur 8-Hour Ozone Trends

Beaumont-Port Arthur - Estimated Population and 8-Hour Design Value, 1991-2005



Source: Ozone -- EPA and M other database

Population -- <http://www.census.gov/popest/archives/1990s/MA-99-03b.txt> and <http://www.census.gov/popest/counties/CO-EST2005-01.html>, July 10, 2006



Early Action Compact (EAC) Areas

- San Antonio, Austin, northeast Texas
- Early planning, implementation and emission reductions for expeditious attainment and maintenance
- TCEQ submitted EAC SIPs in 2004
- EPA deferred the effective date of nonattainment designation for San Antonio
- 8-hour ozone average (from 2004 to July 27, 2006)
 - San Antonio 87 ppb
 - Northeast Texas 85 ppb
 - Austin 82 ppb



Other Areas

- **Corpus Christi**
(Ozone Near Nonattainment Area)
- **Victoria**
(Ozone Maintenance Area)
- **Lower Rio Grande Valley**
- These 3 areas are monitoring attainment of the 8-hour ozone standard
- Occasionally experience exceedances



General Challenges

- Magnitude of reductions needed
 - Numerous control strategies were implemented under the 1-hour ozone standard
- For DFW and HGB, reductions needed are greater than the amount of emissions that TCEQ directly regulates
 - Existing control strategies at the state level focus on stationary sources



General Challenges

- Difficulty synchronizing control strategies with potential requirements under the EPA Clean Air Interstate Rule, Clean Air Mercury Rule and regional haze
- The state is dependent on the federal government to address emissions from federally pre-empted sources (e.g., mobile sources)



Landing of floating roof





50% VOC Ship Channel Increase

Preliminary estimates show landing loss emissions may increase reported total point source VOCs by 6,000 to 7,000 tpy or an approximate 50% increase in the Houston Ship Channel area, not including Baytown.



Next? Oil and Gas flash emissions





Questions???

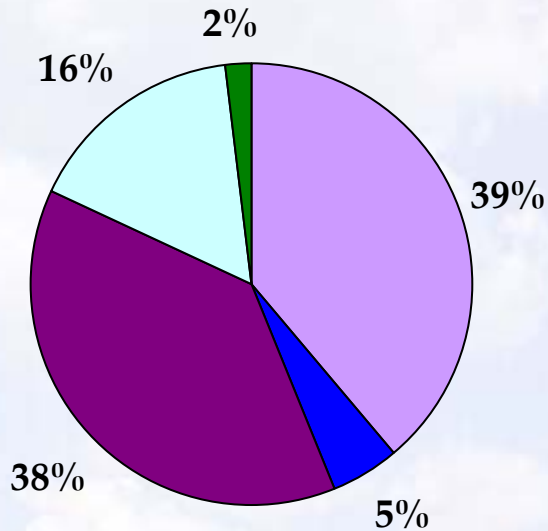
**Keith Sheedy
Chief Engineer's Office
(512) 239-1556**



Houston-Galveston-Brazoria Area Emissions

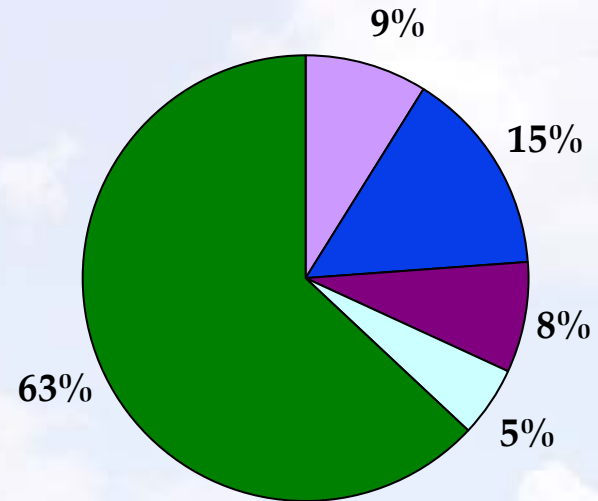
2002 Emissions Inventory

NO_x



- Point
- Area
- Onroad Mobile
- Nonroad Mobile
- Biogenics

VOC



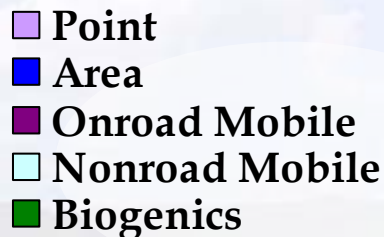
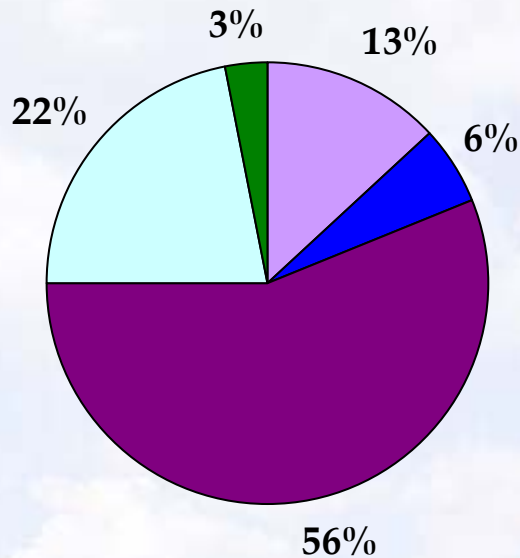
- Point
- Area
- Onroad Mobile
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- Biogenics



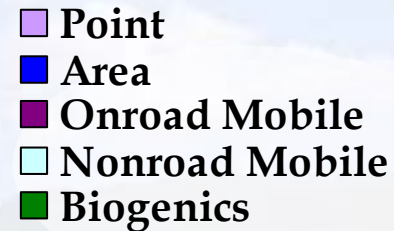
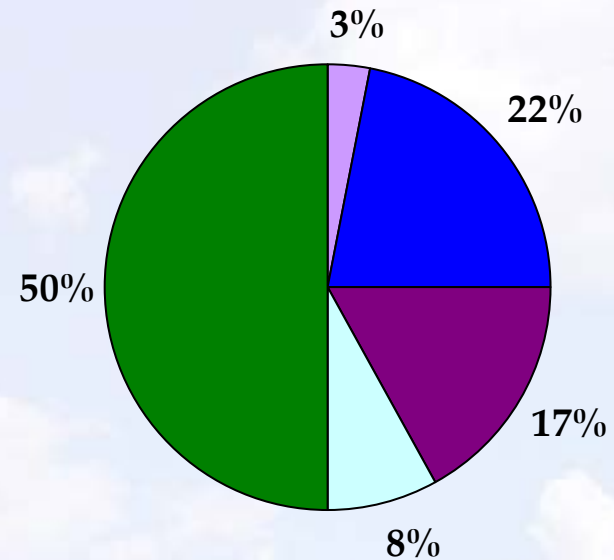
Dallas-Fort Worth Area Emissions

2002 Emissions Inventory

NO_x



VOC

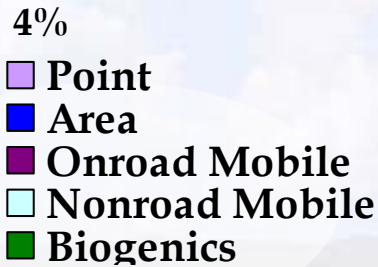
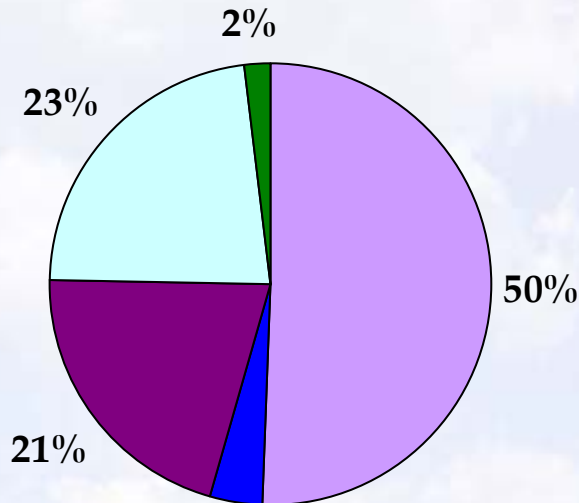




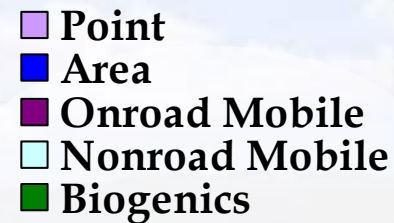
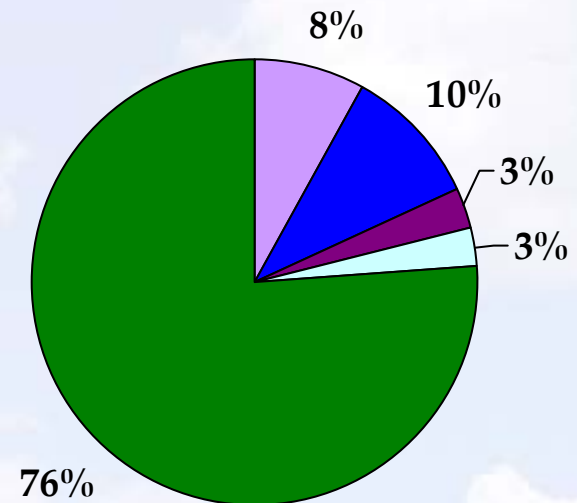
Beaumont-Port Arthur Area Emissions

2002 Emissions Inventory

NO_x



VOC

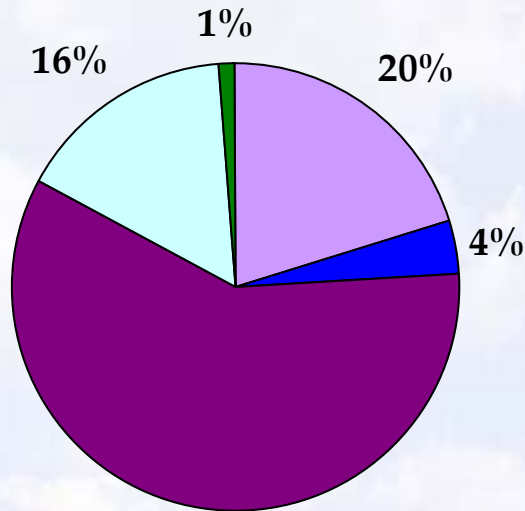




El Paso Emissions

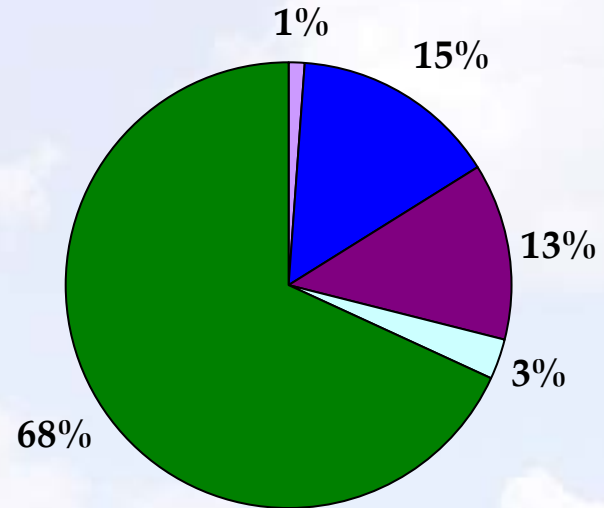
2002 Emissions Inventory

NO_x



59%
■ Point
■ Area
■ Onroad Mobile
■ Nonroad Mobile
■ Biogenics

VOC



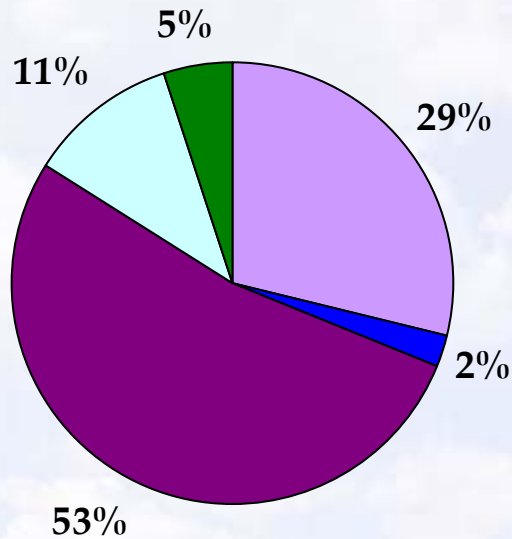
1%
15%
13%
3%
68%
■ Point
■ Area
■ Onroad Mobile
■ Nonroad Mobile
■ Biogenics



San Antonio Area Emissions

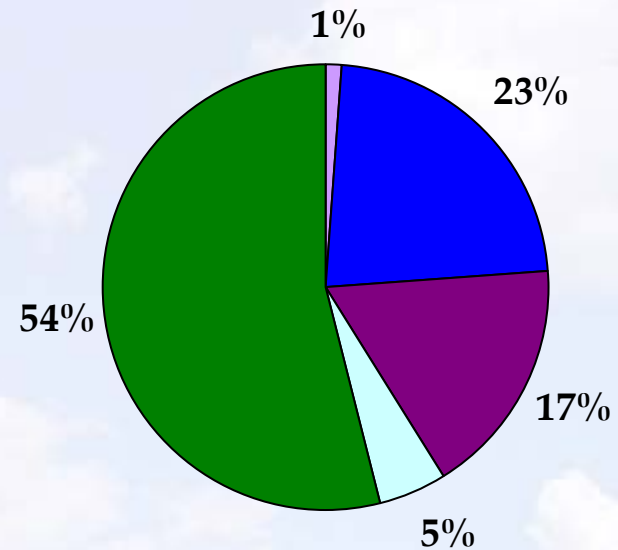
2002 Emissions Inventory

NO_x



- Point
- Area
- Onroad Mobile
- Nonroad Mobile
- Biogenics

VOC



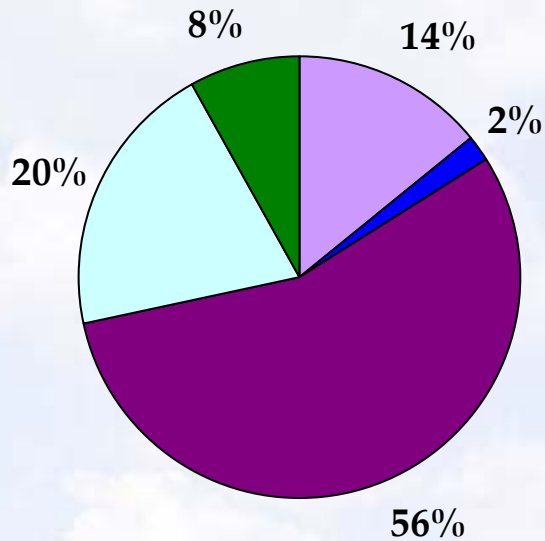
- Point
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- Biogenic



Austin Area Emissions

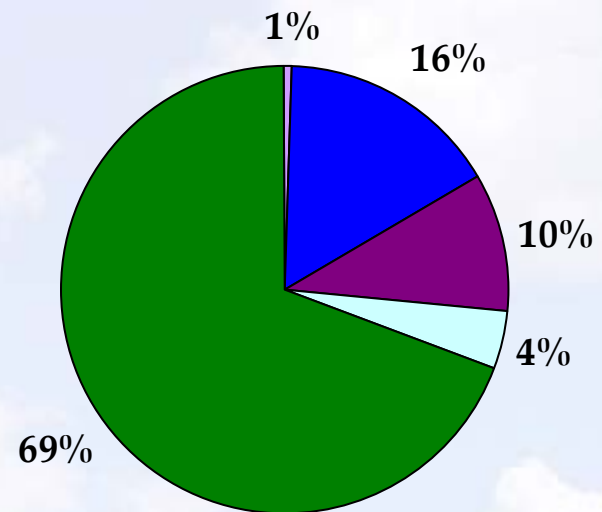
2002 Emissions Inventory

NO_x



■ Point
■ Area
■ Onroad Mobile
■ Nonroad Mobile
■ Biogenic

VOC



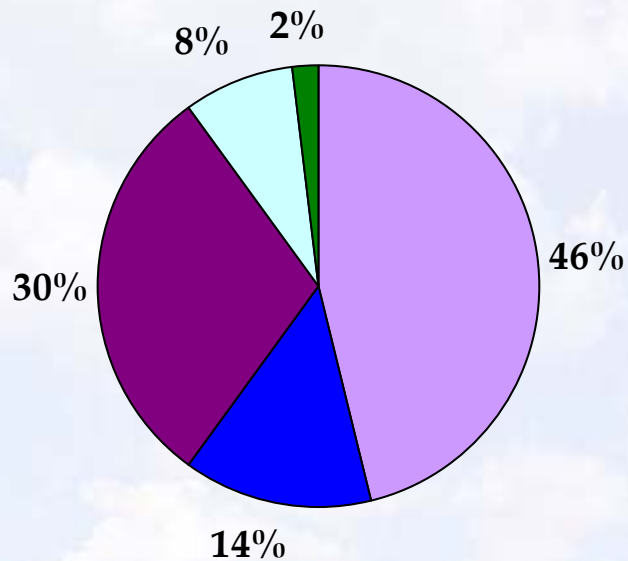
■ Point
■ Area
■ Onroad Mobile
■ Nonroad Mobile
■ Biogenic



Northeast Texas Area Emissions

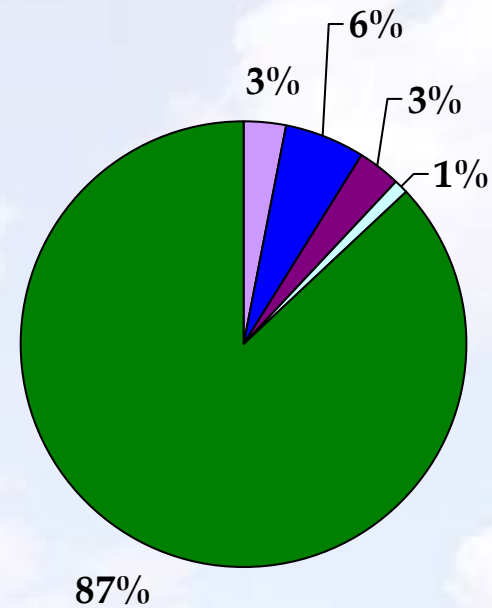
2002 Emissions Inventory

NO_x



- Point
- Area
- Onroad Mobile
- Nonroad Mobile
- Biogenic

VOC



- Point
- Area
- Onroad Mobile
- Nonroad Mobile
- Biogenic