



Louisville Area Emissions Inventories for Ozone



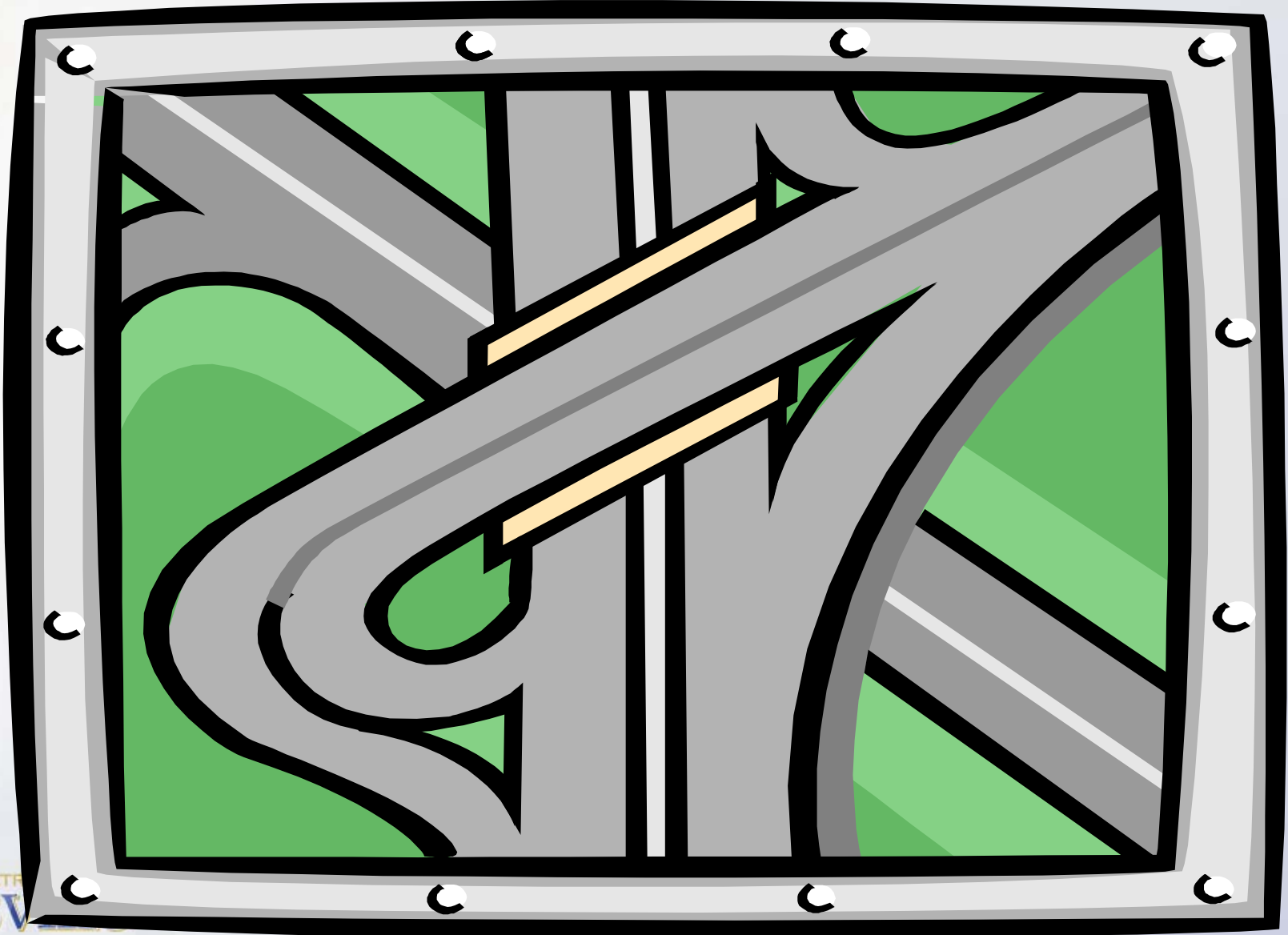
Jon Trout
Tom Spalding - Graphics



Acronyms

- **VOC** - Volatile Organic Compound
 - Hydrocarbons
 - Organics
 - Solvents
- **NO_x** - Oxides of Nitrogen
 - Nitrogen Oxides
- **O₃** - Ozone
- Ozone **Precursor** Emissions
 - VOC
 - NO_x

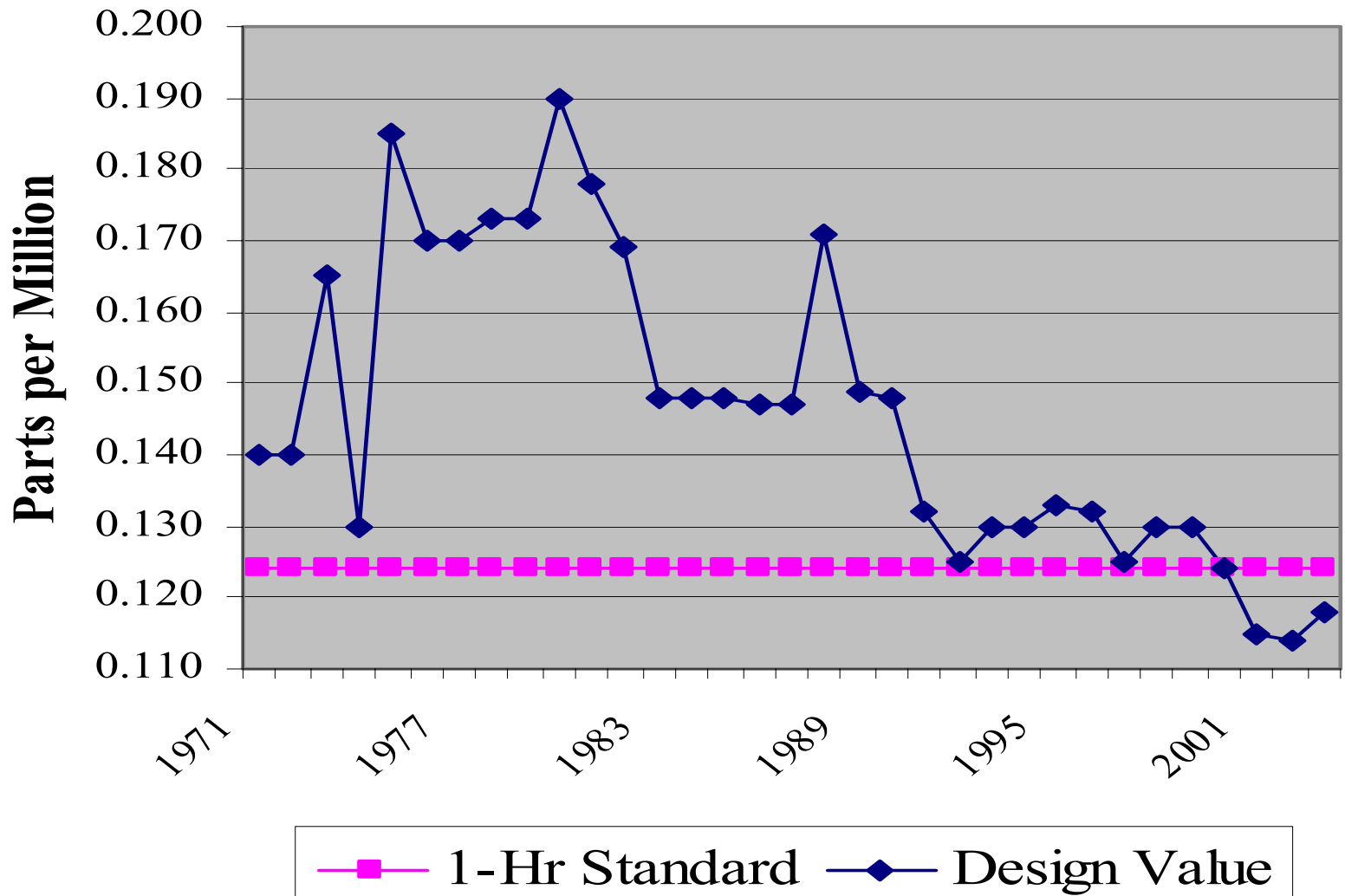
Roadmap for Today's Presentation



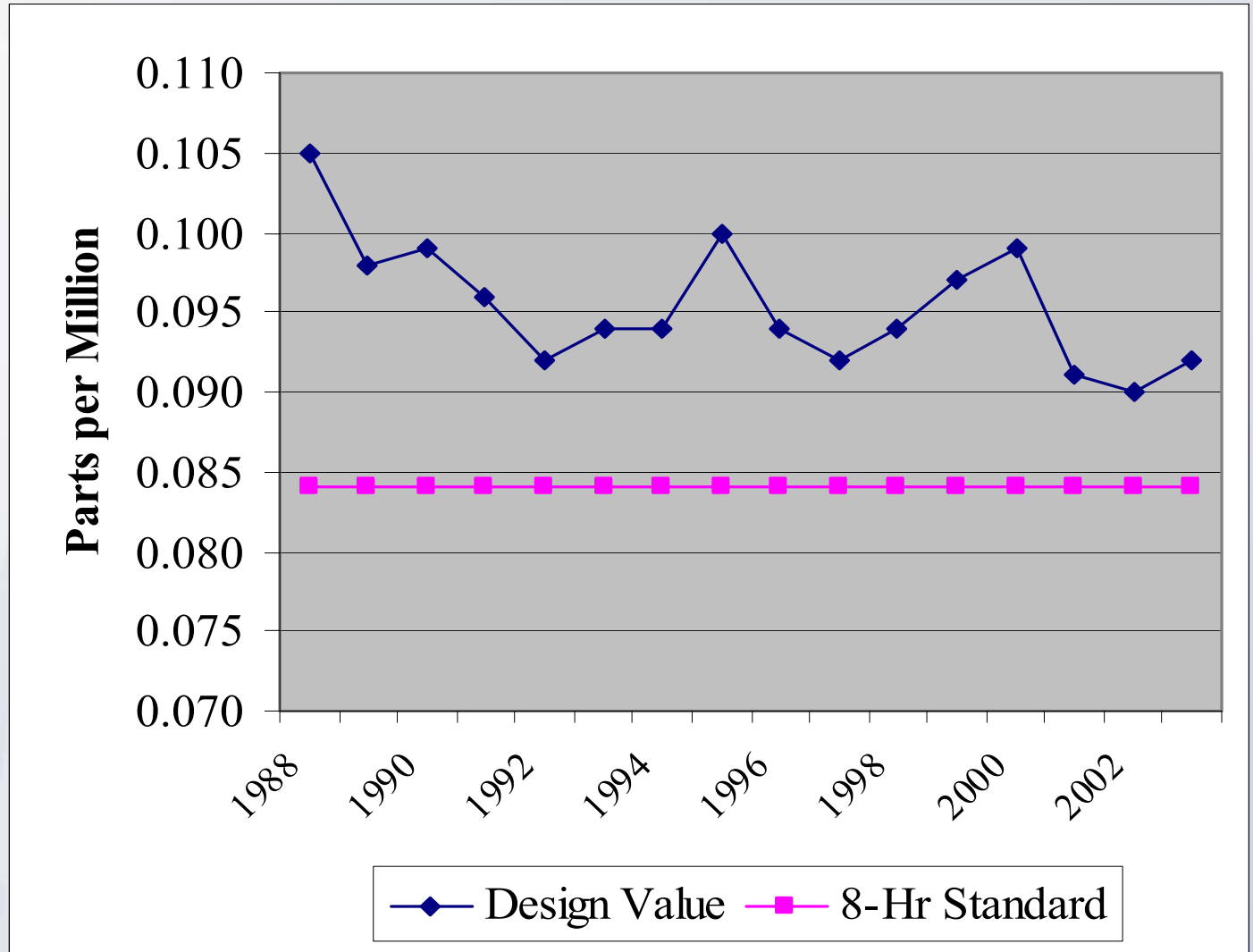
Roadmap for Today's Presentation

- Historical ozone values
- Overview of Emissions by Area
 - Past, Present, Future
 - Jefferson County
 - Bullitt and Oldham Counties, Kentucky
 - Clark and Floyd Counties, Indiana
- Overview of Emissions by Source Categories
 - Past, Present, Future
- Biogenic Emissions
- Closer View of Emissions by Source Category by Area
 - Past, Present, Future
- Detailed View of Individual Sources
 - LG & E
 - Louisville International Airport (SDF)

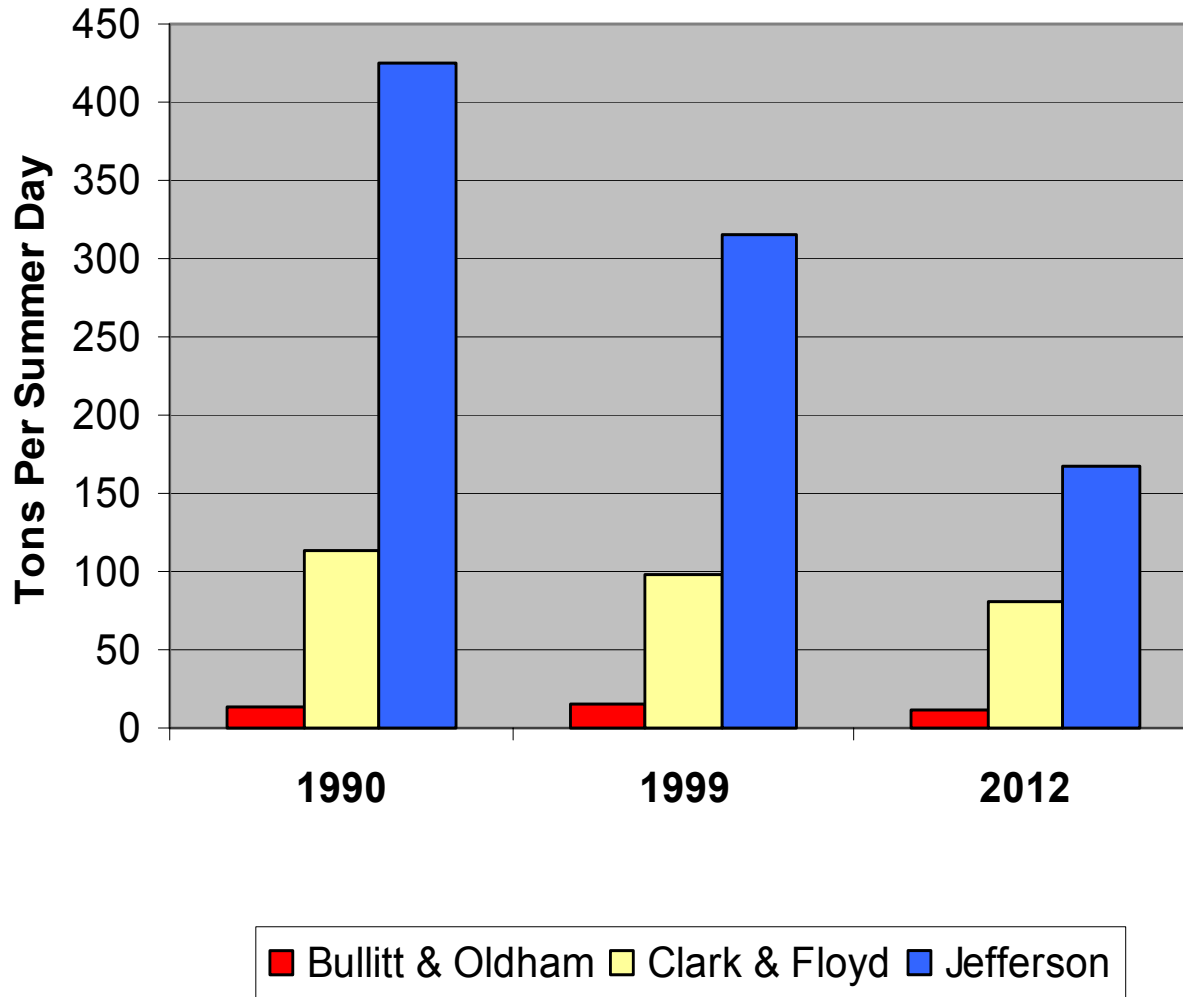
Historical 1-Hour Ozone Design Values



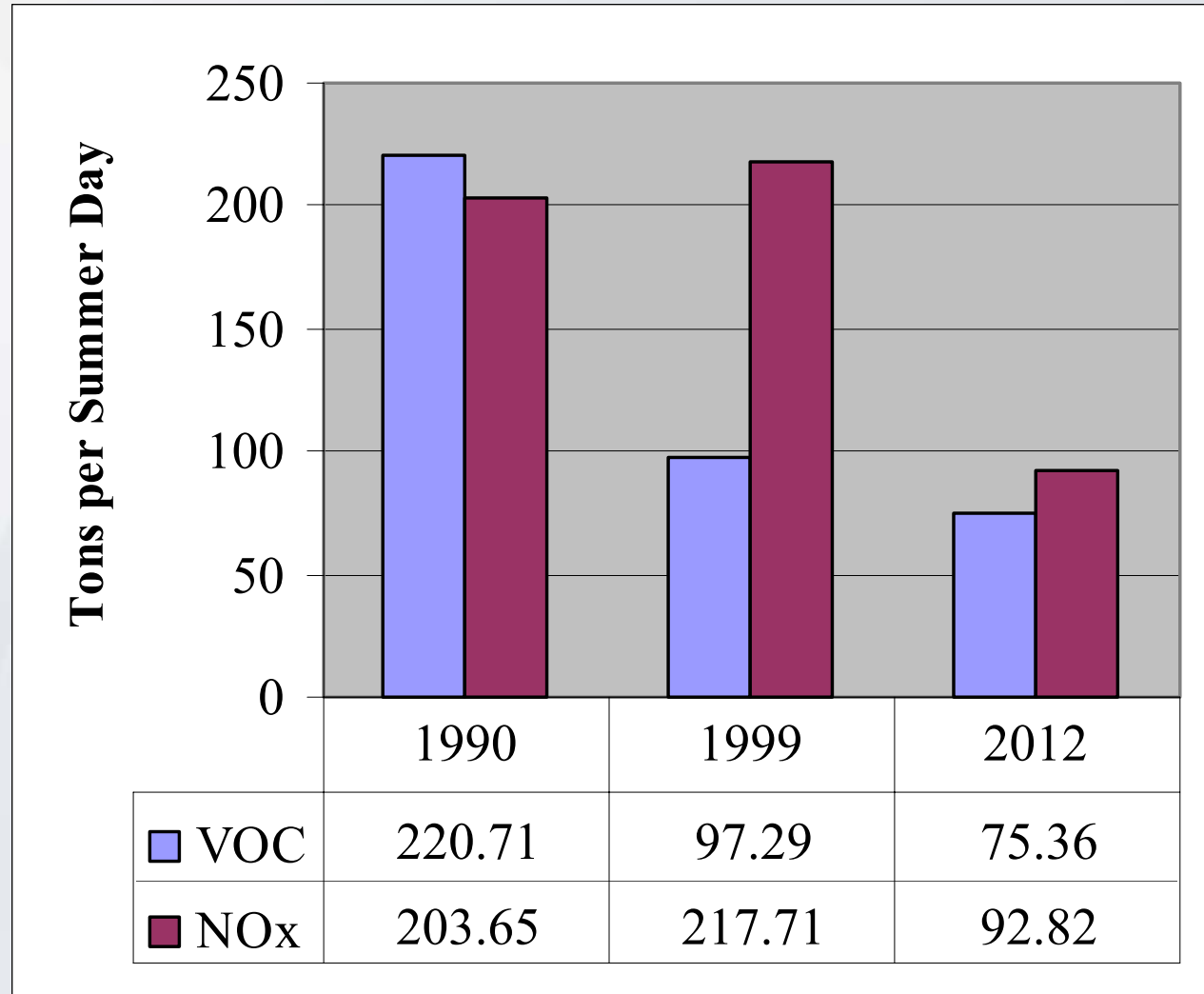
Historical 8-Hour Ozone Design Values



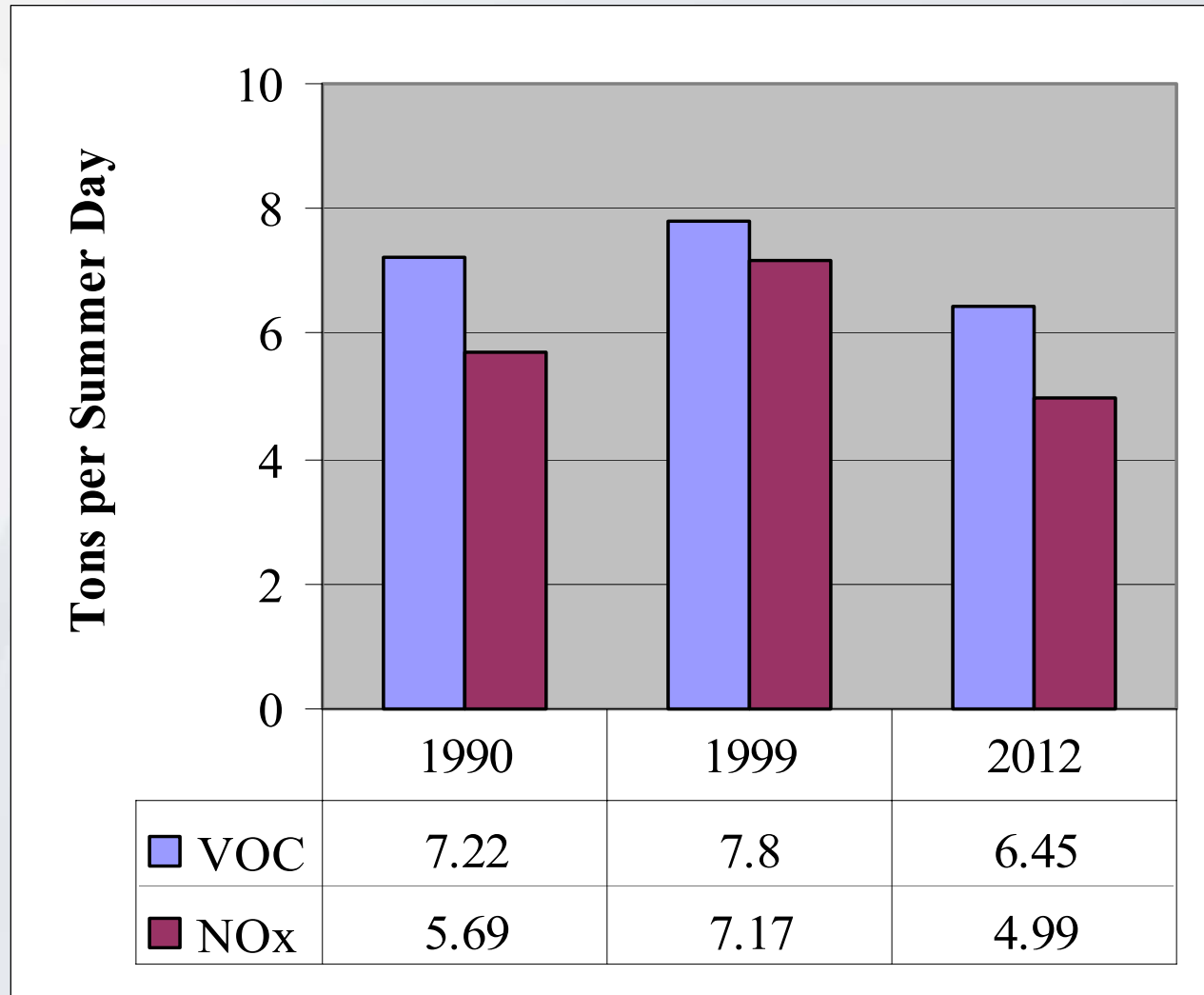
Total VOC and NOx by Area



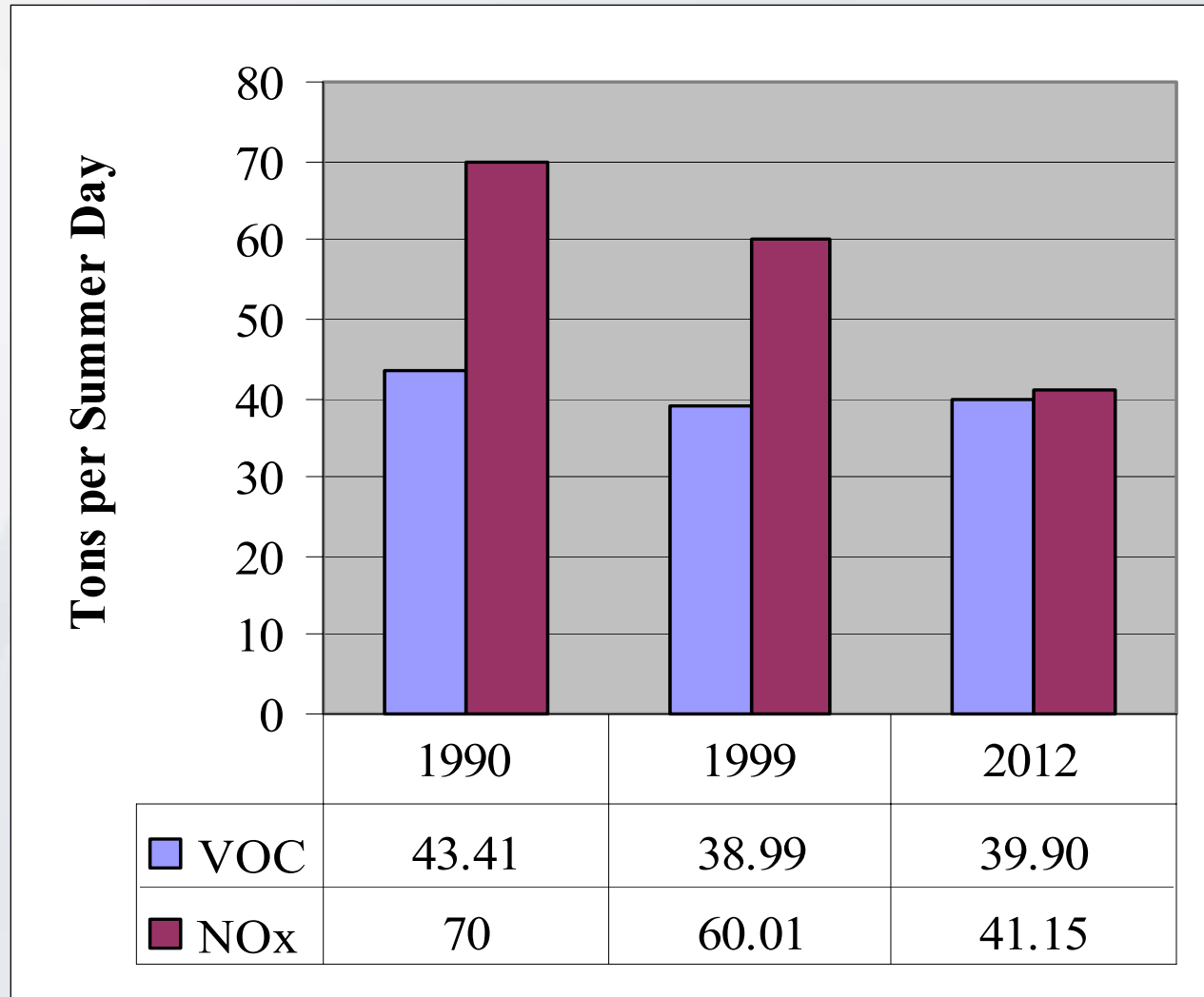
Jefferson County VOC and NO_x Emissions



Bullitt and Oldham Counties VOC and NO_x Emissions



Clark and Floyd Counties VOC and NO_x Emissions



Source Categories




- Point
- Area
- Mobile
- Nonroad

Point Sources

Stationary Sources, Industrial Sources

- Power plants
- Chemical plants
- Automobile manufacturing
- Appliance manufacturing
- Surface coating operations
- Fiberglass products manufacturing

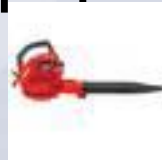
Mobile Sources

- Automobiles 
- Light-duty trucks, SUVs
- Motorcycles
- Heavy-duty trucks 
- Buses 

NonRoad Sources

Off-Road Sources

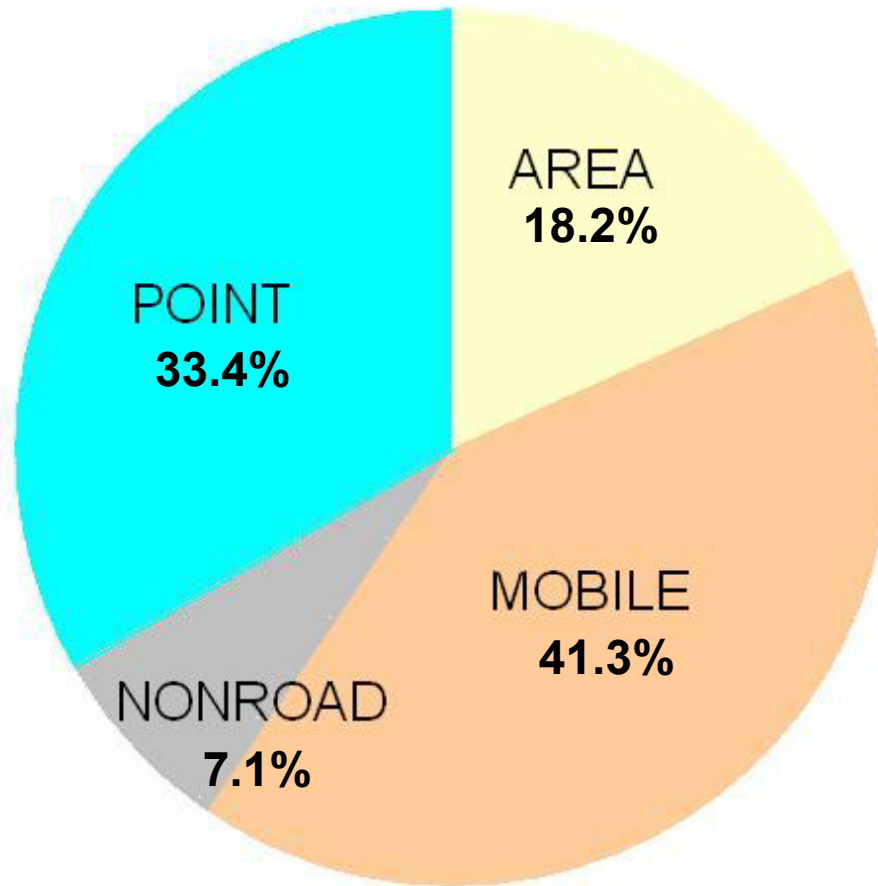
- Industrial and Agricultural equipment 
- Construction equipment
- Off-road vehicles
- Aircraft 
- Watercraft 
- Trains 
- Lawn & Garden equipment



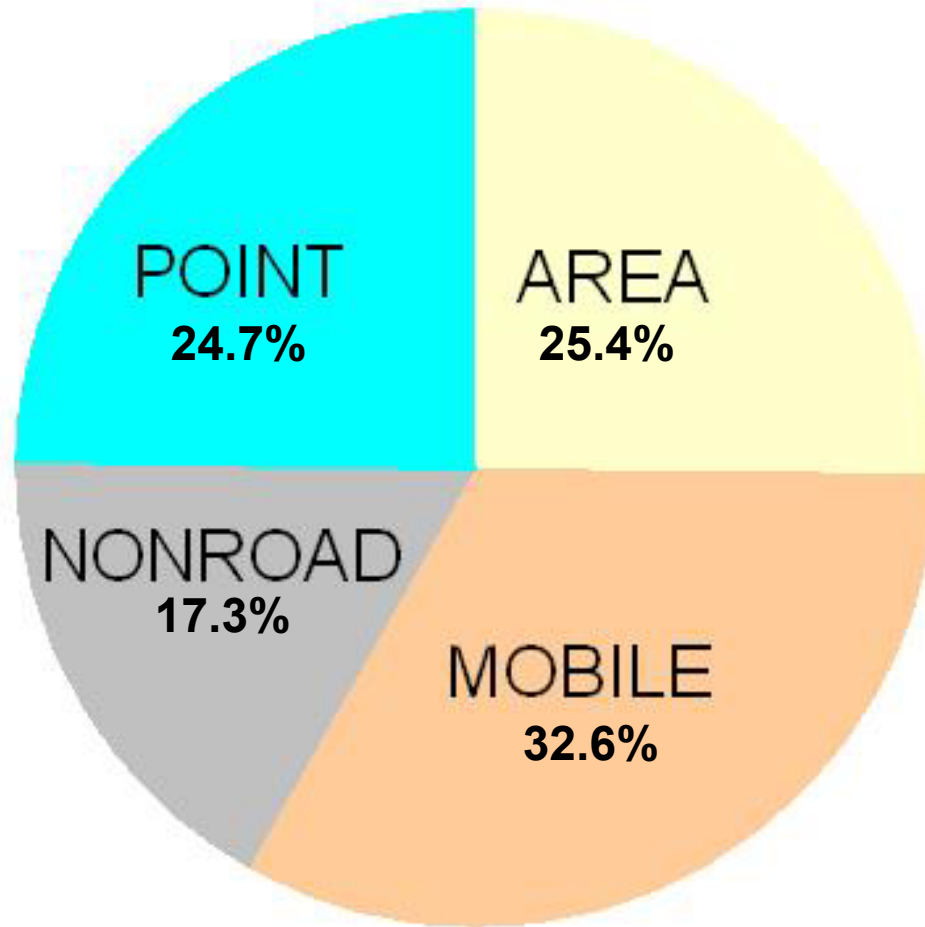
Area Sources

- Gasoline stations
- Auto body refinishers
- Printers
- Architectural coatings, paints
- Commercial/consumer products
- Open burning
- Backyard B-B-Q
- Cigarette smoke

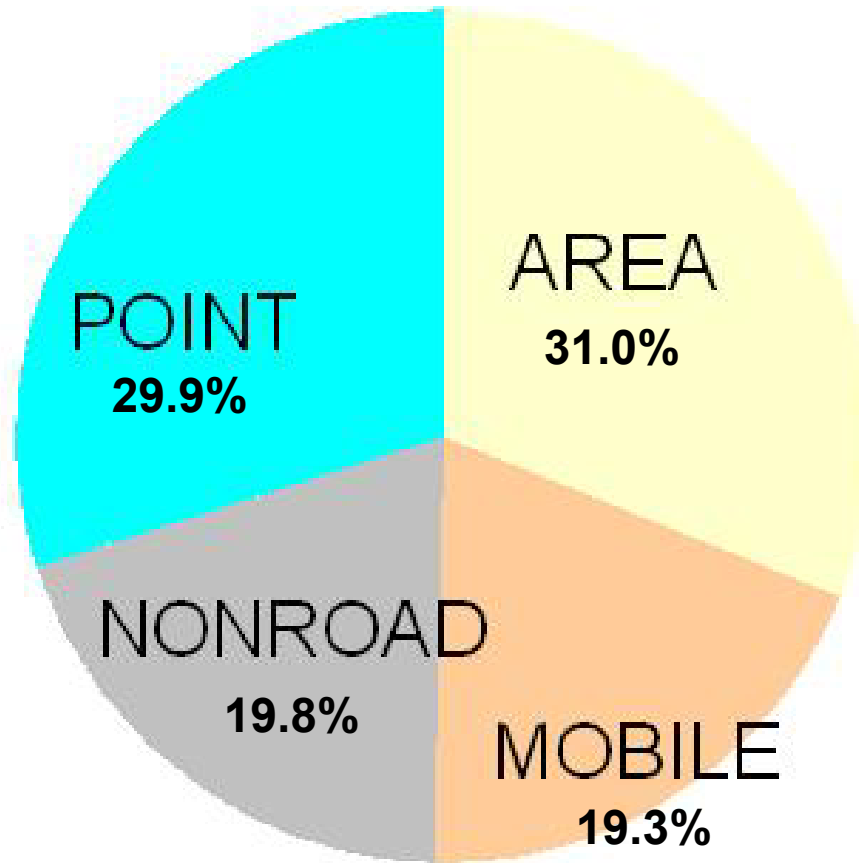
VOC Emissions 1990



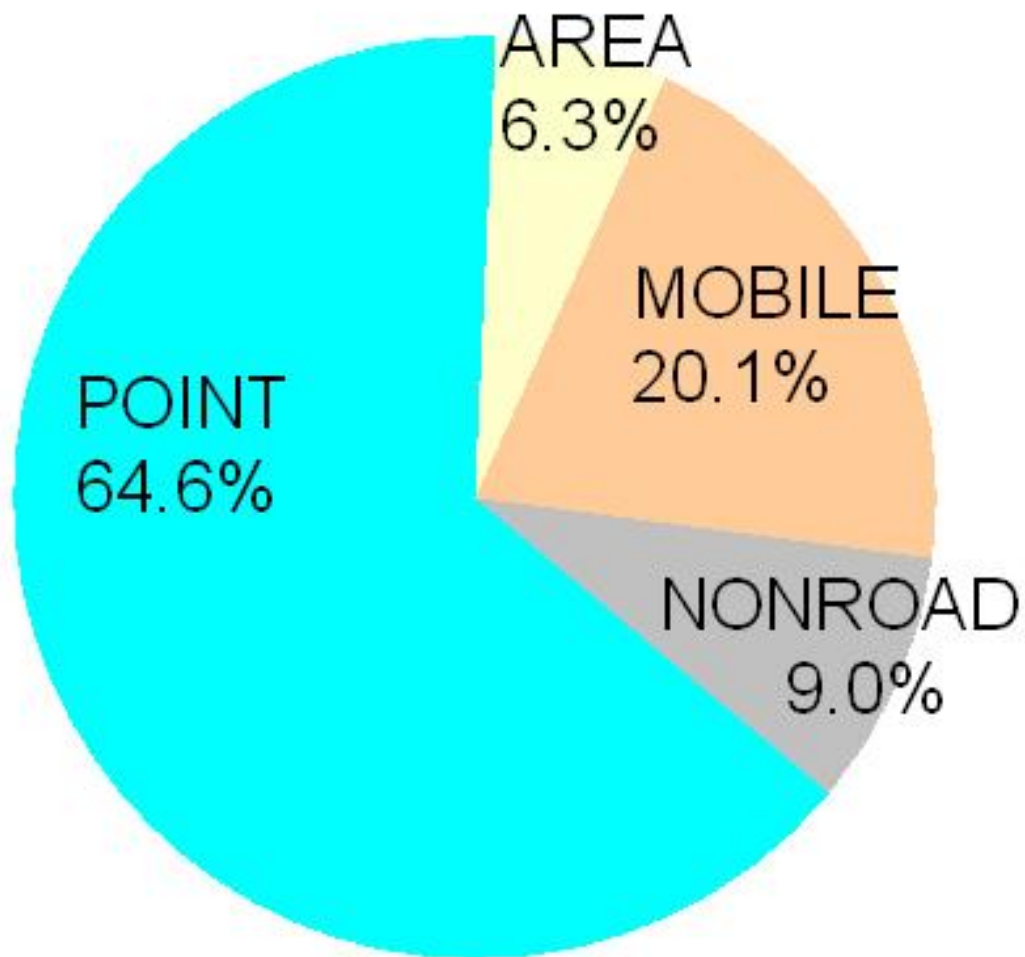
VOC Emissions 1999



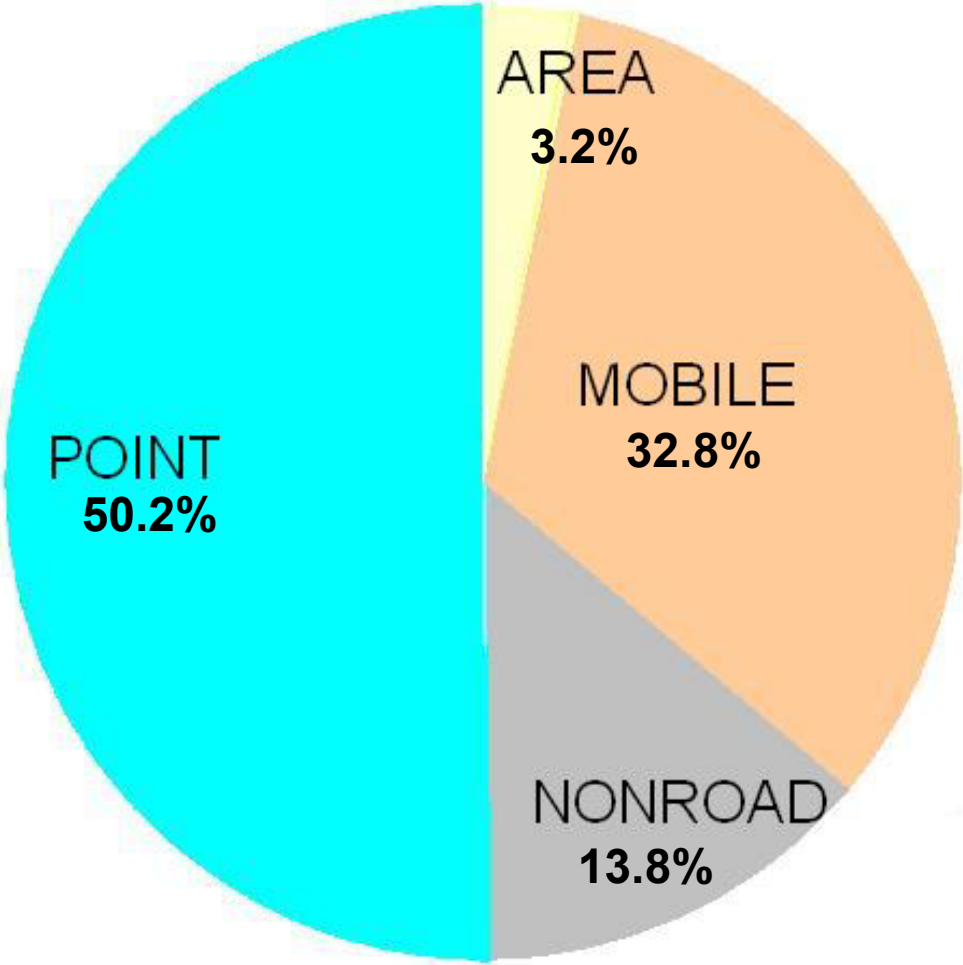
VOC Emissions 2012



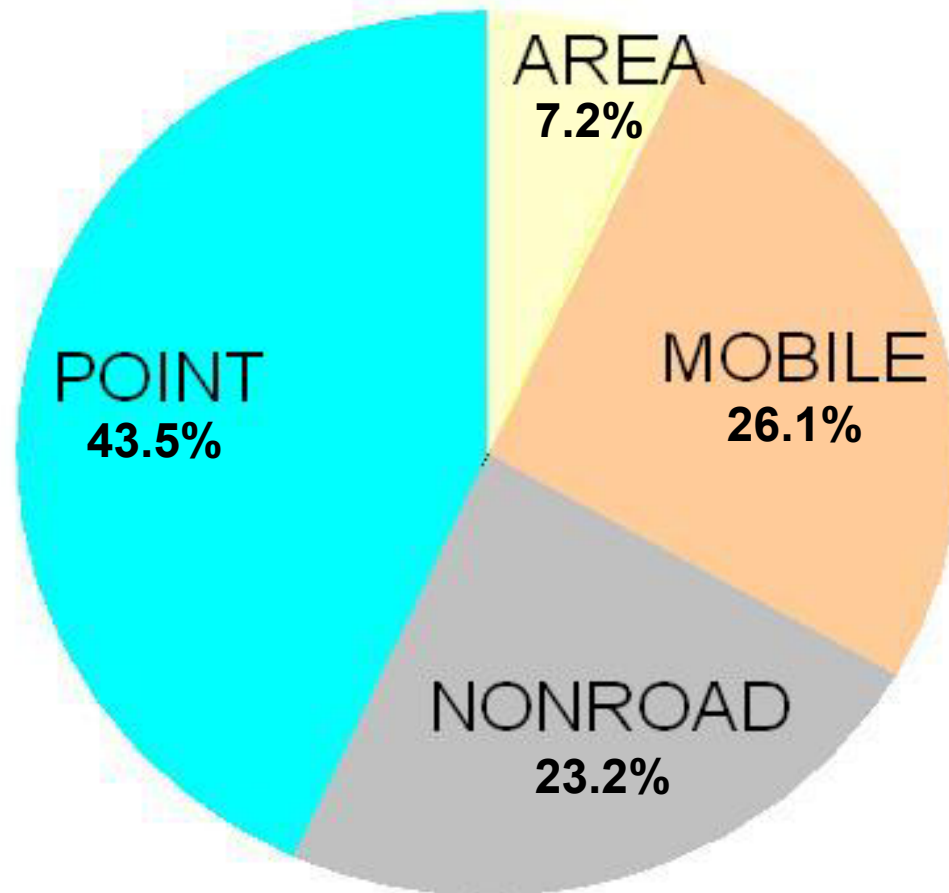
NOx Emissions 1990



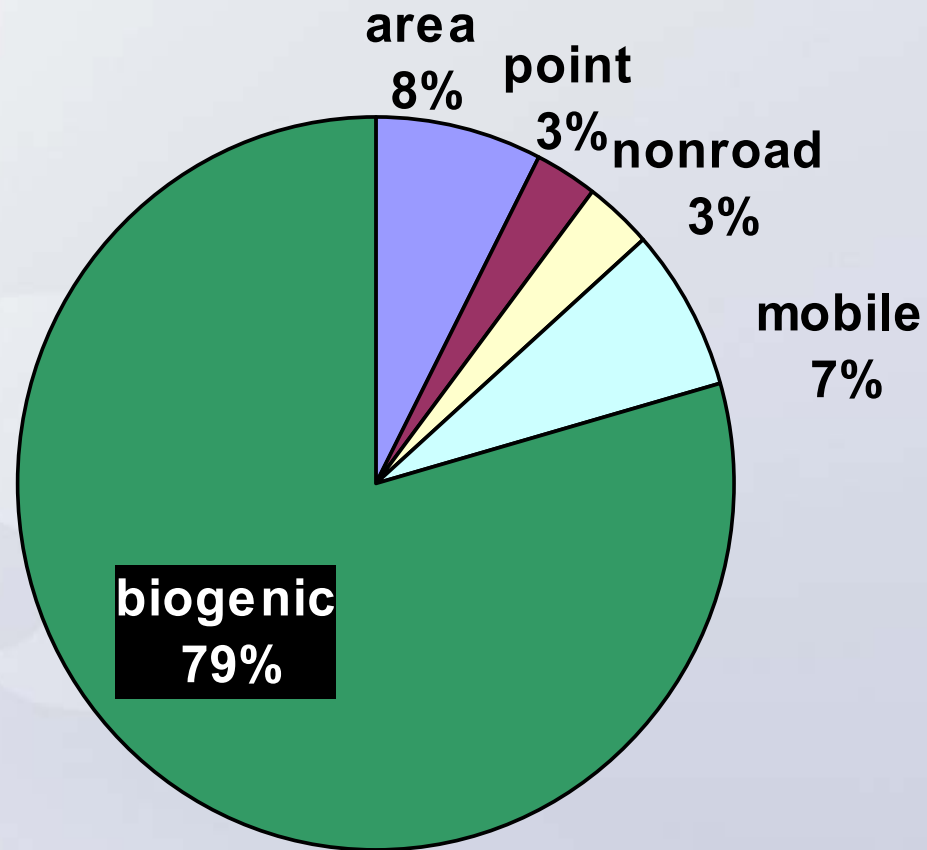
NOx Emissions 1999



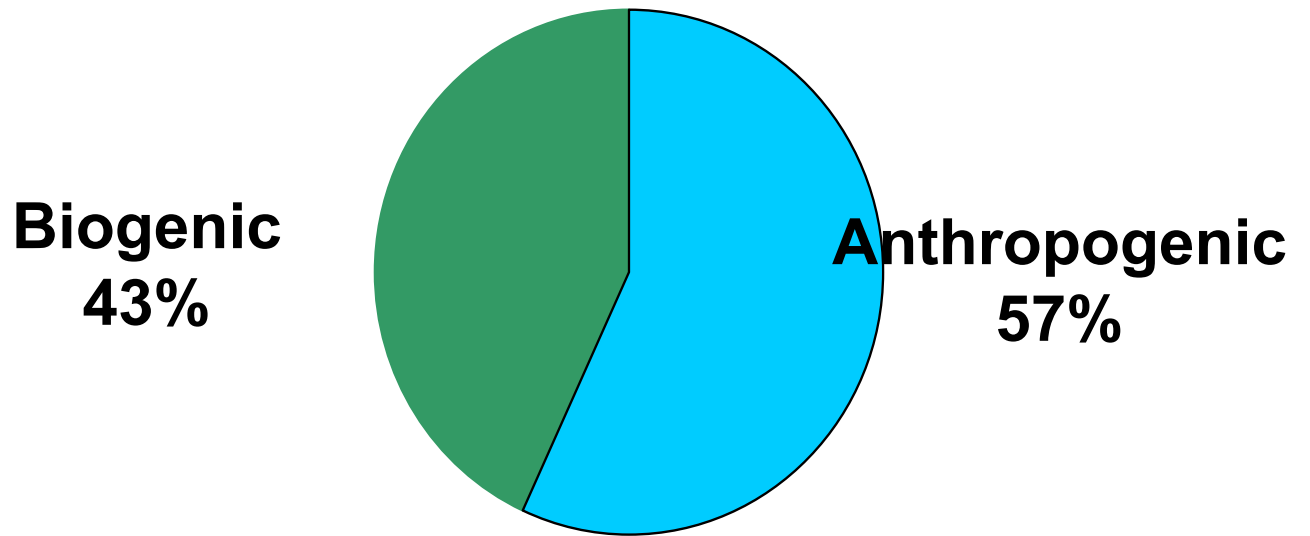
NOx Emissions 2012



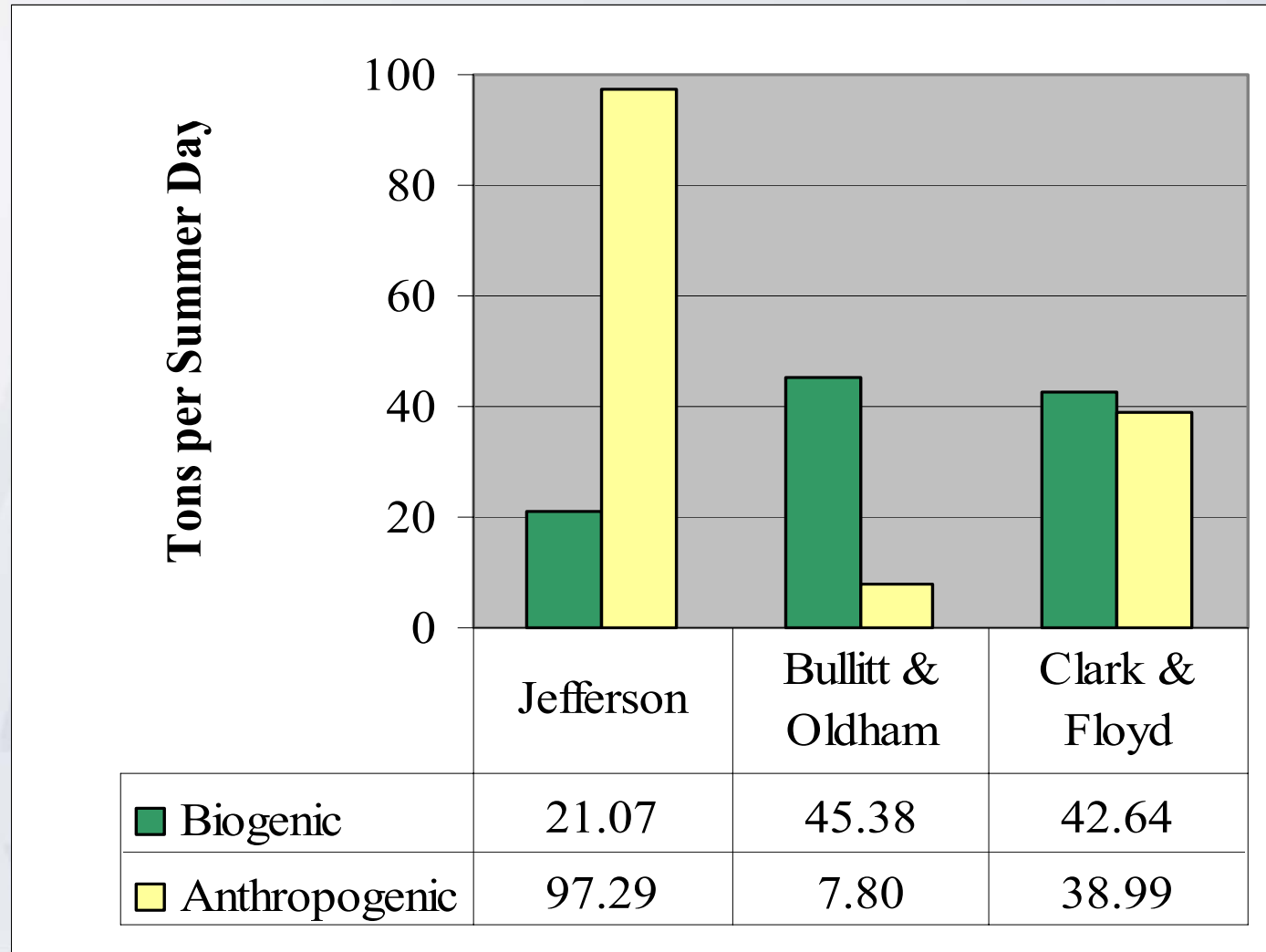
Atlanta VOC Emissions



Louisville Area VOC Emissions



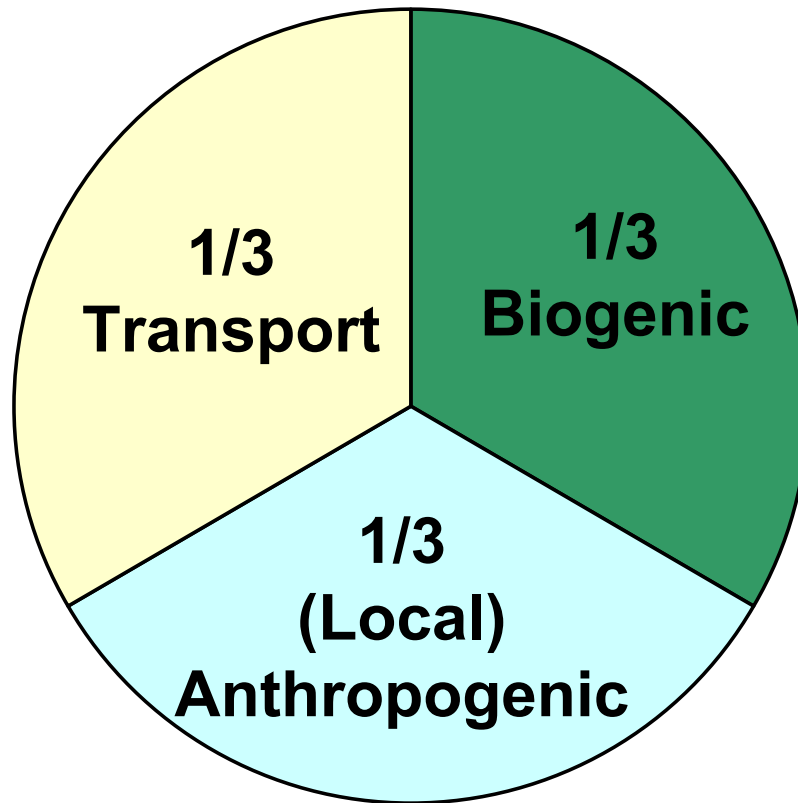
Biogenic and Anthropogenic VOC Emissions by Area



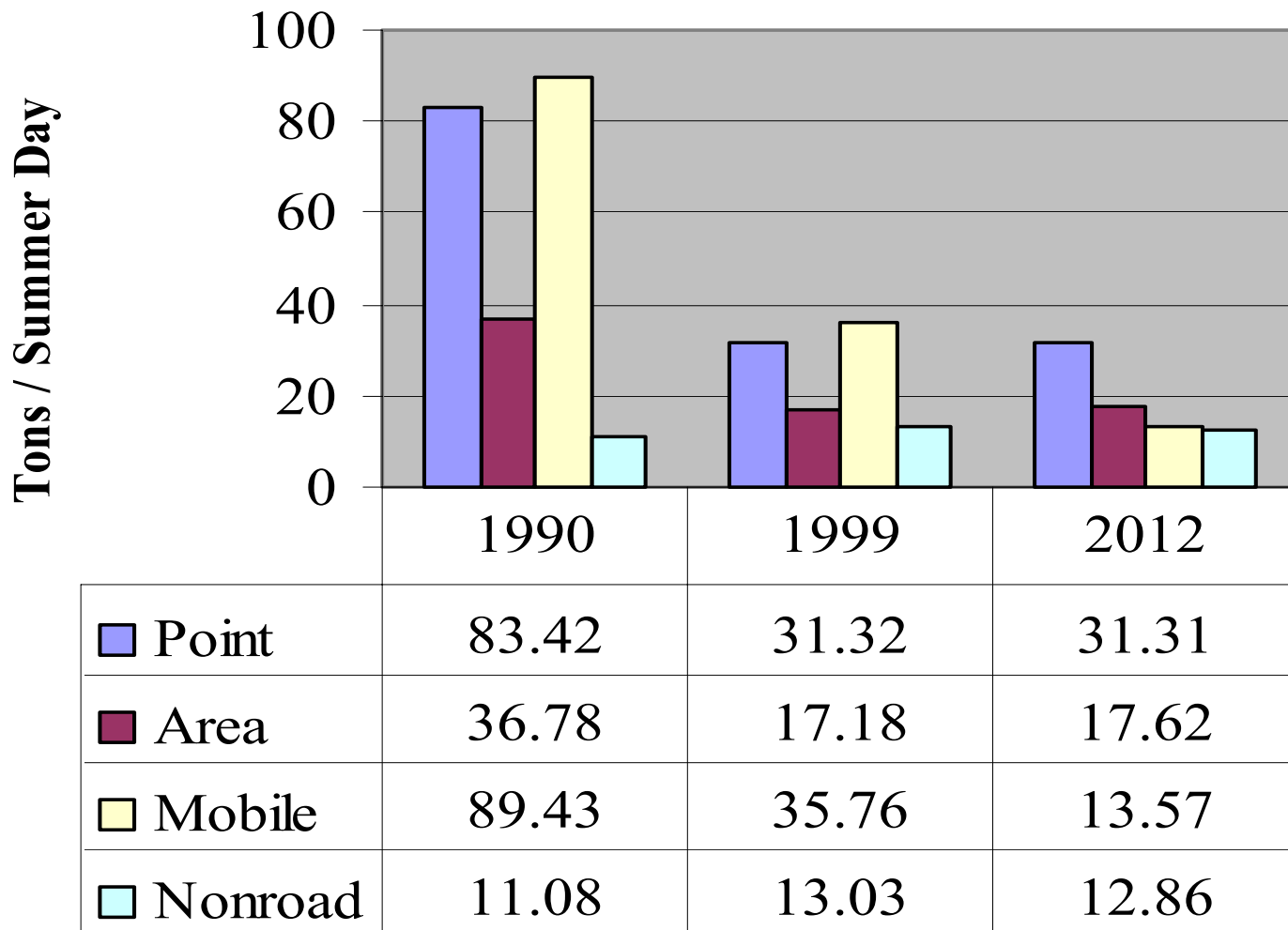
What about Transport?



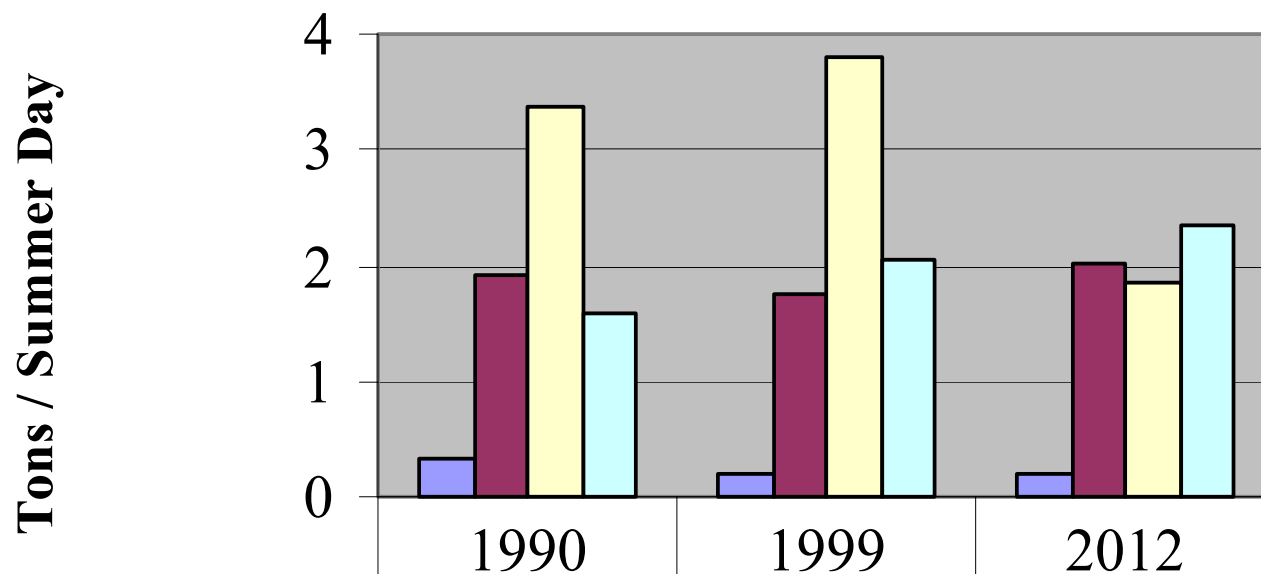
What about Transport? ... “Urban Legend?” ...



Jefferson County VOC Emissions by Source Category

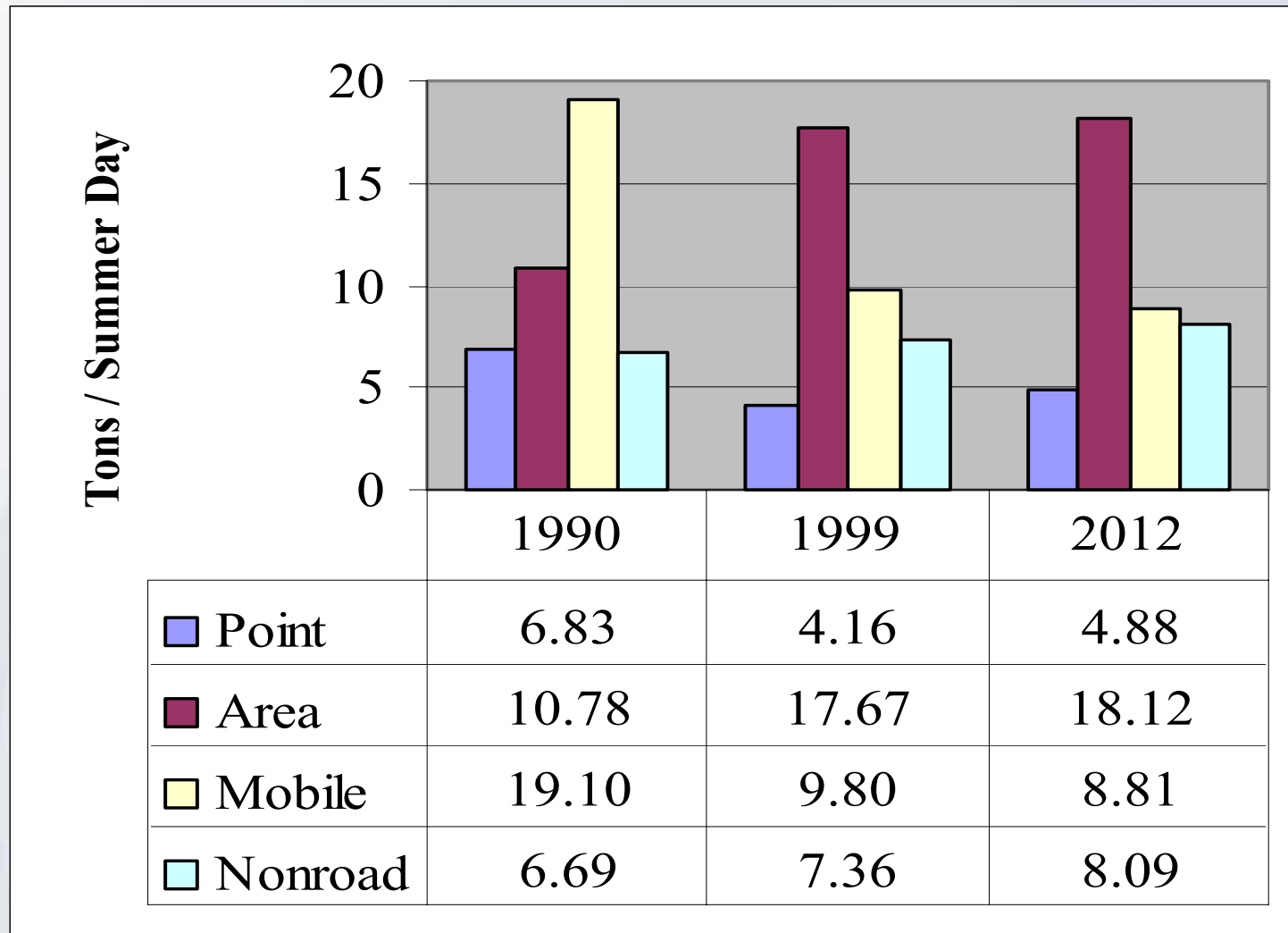


Bullitt and Oldham Counties VOC Emissions by Source Category

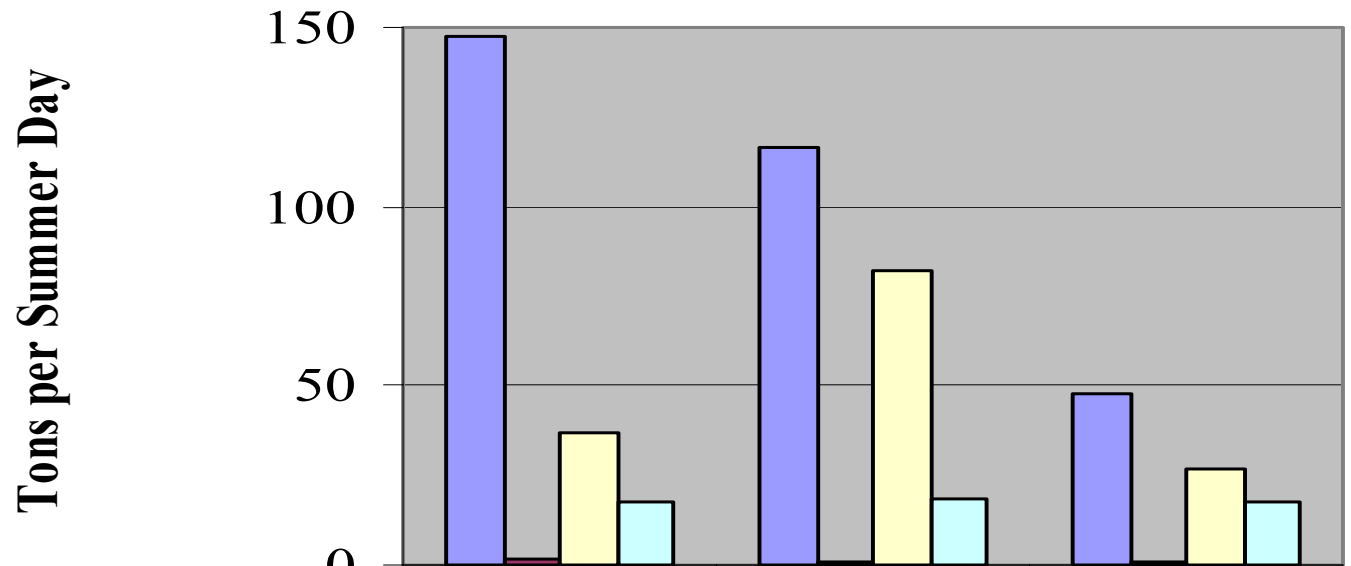


■ Point	0.33	0.20	0.21
■ Area	1.91	1.76	2.02
■ Mobile	3.38	3.80	1.86
■ Nonroad	1.60	2.04	2.36

Clark and Floyd Counties VOC Emissions by Source Category

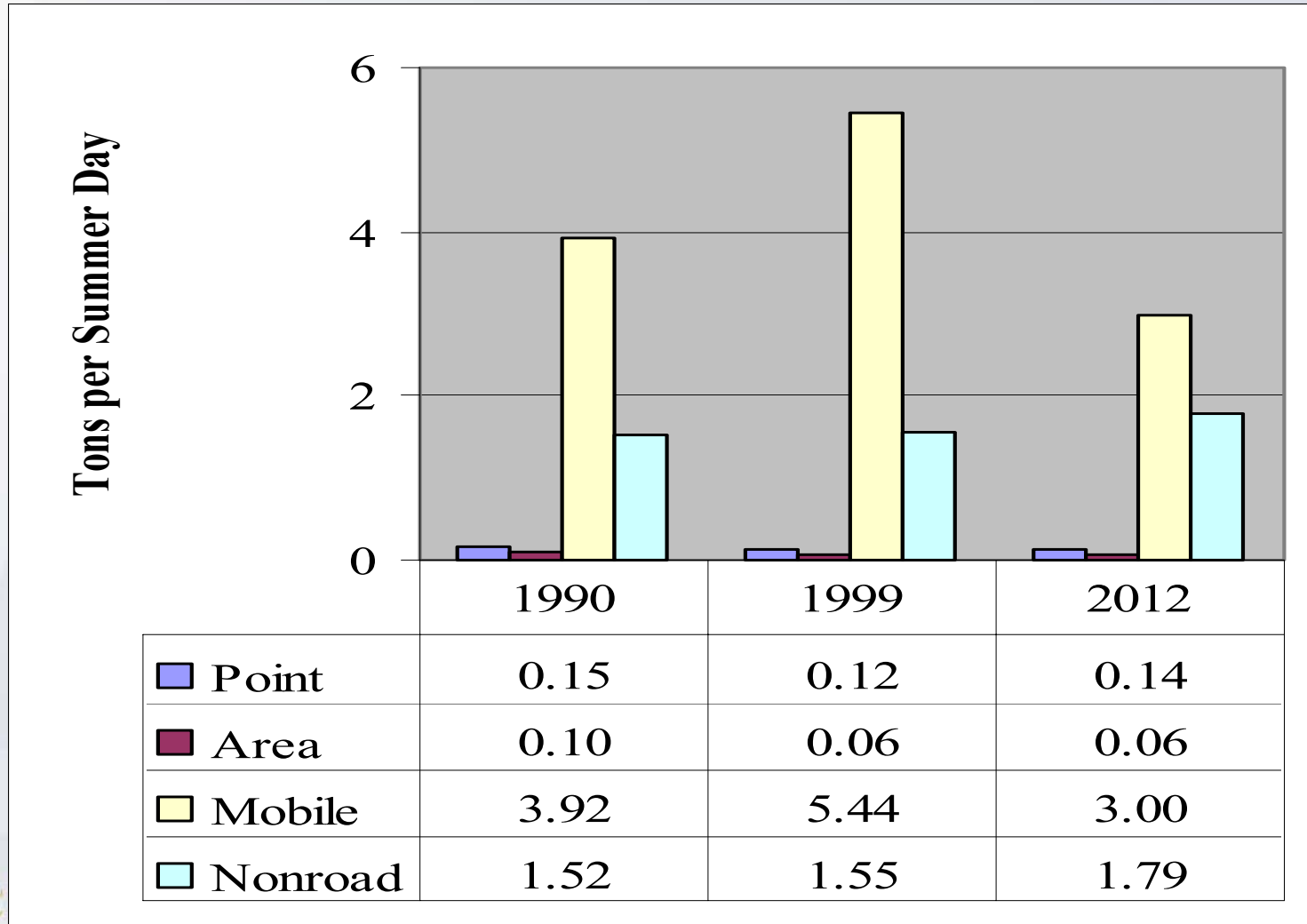


Jefferson County NO_x Emissions by Source Category

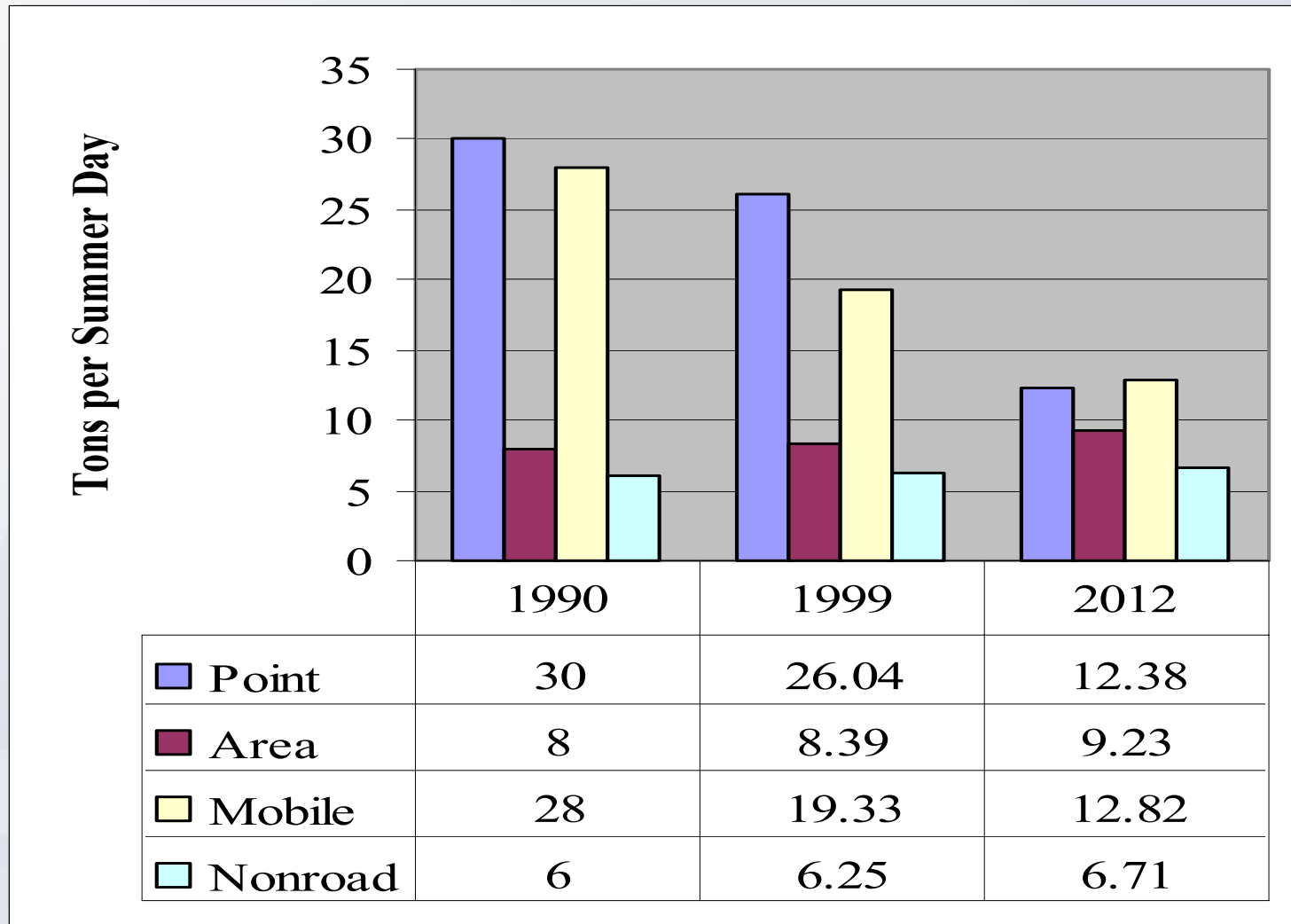


	1990	1999	2012
Point	147.72	116.74	47.85
Area	1.69	0.75	0.76
Mobile	36.57	81.82	26.59
Nonroad	17.67	18.40	17.62

Bullitt and Oldham Counties NO_x Emissions by Source Category

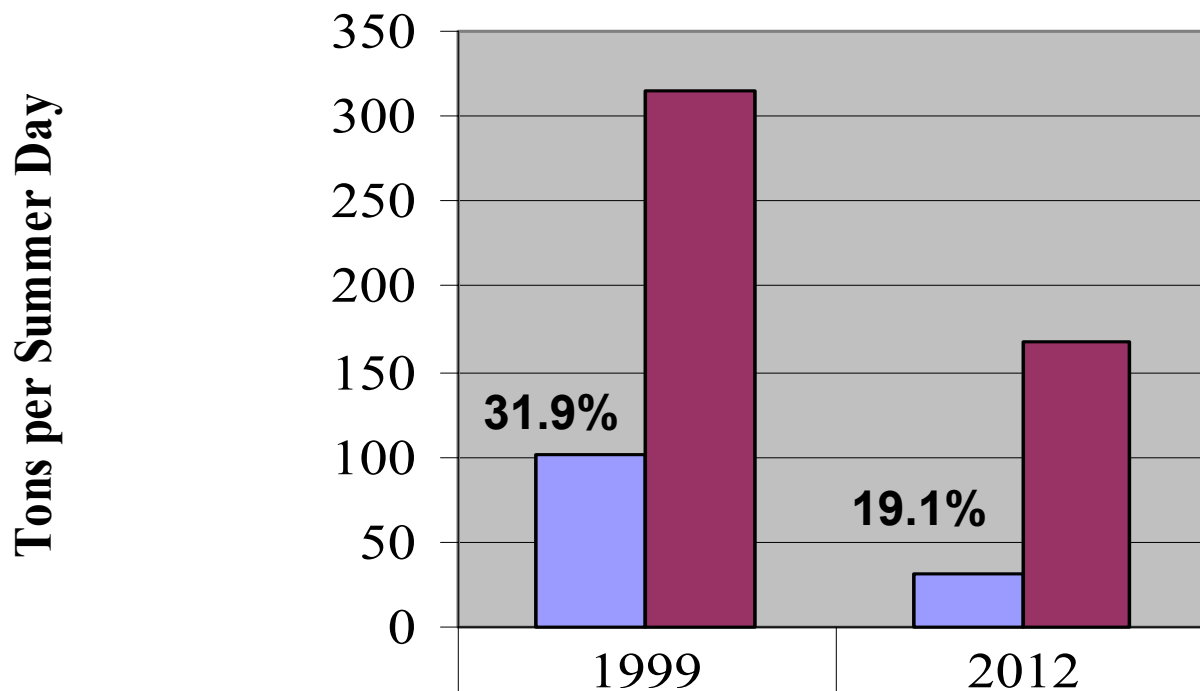


Clark and Floyd Counties NO_x Emissions by Source Category



LG&E – VOC + NO_x

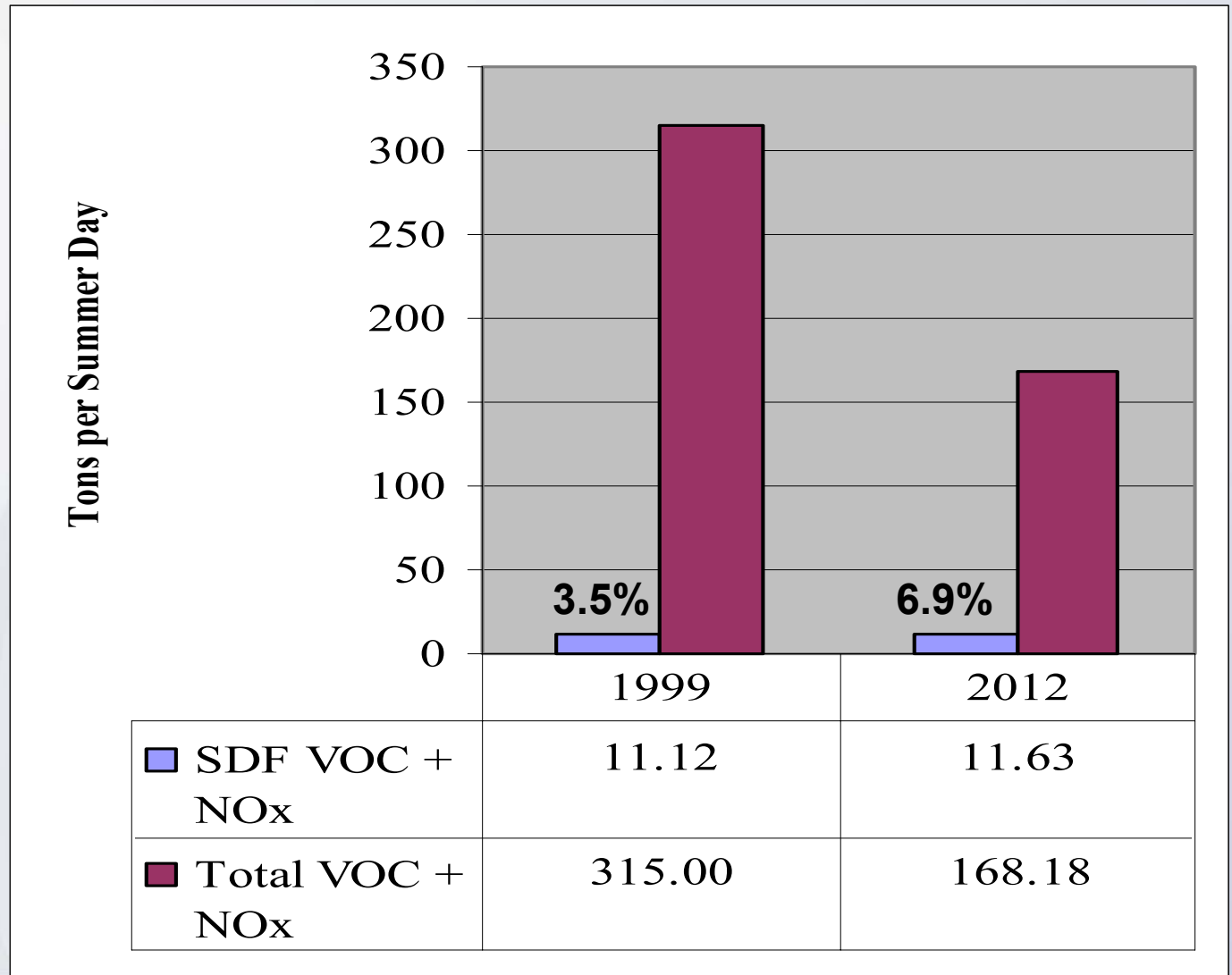
Percent of Total Jefferson County VOC + NO_x



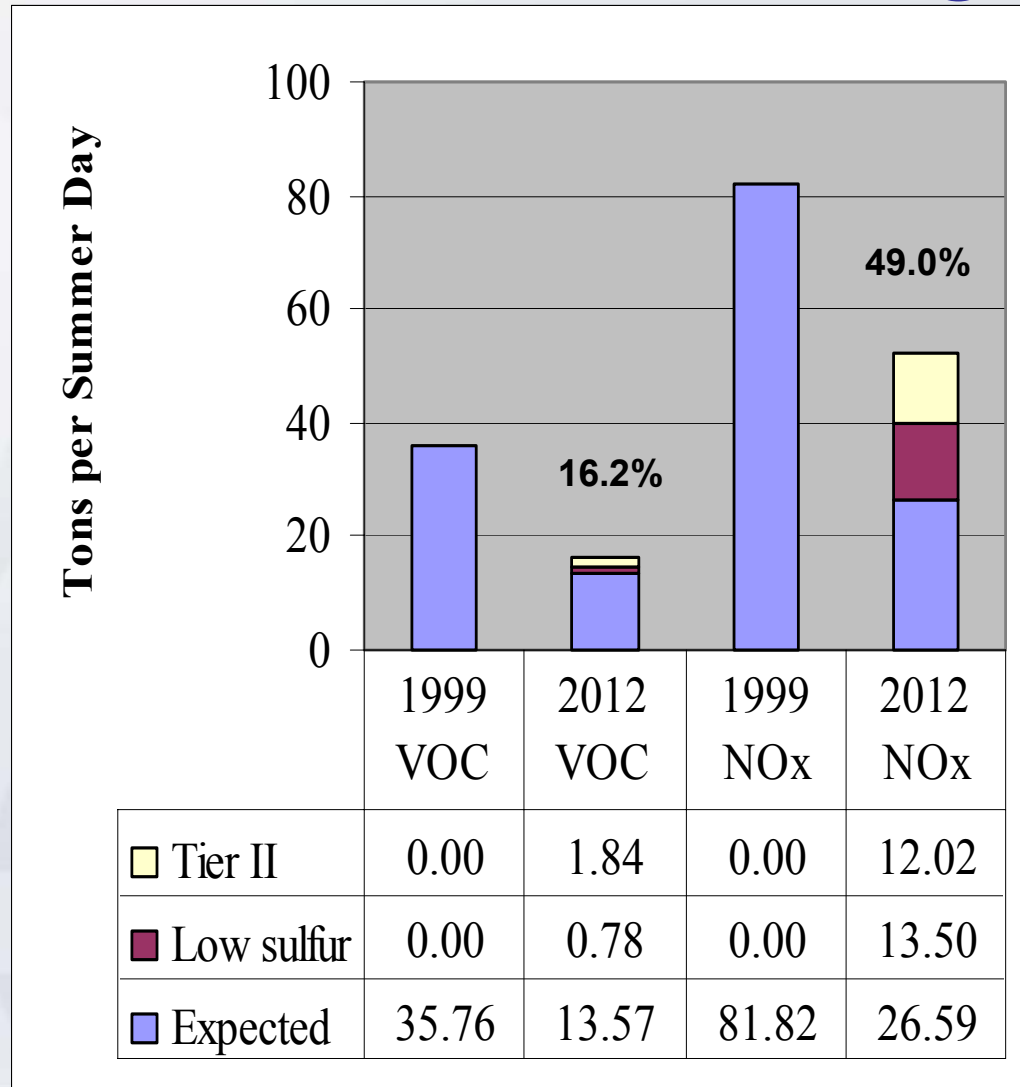
■ LG&E VOC + NO _x	100.42	32.04
■ Total VOC + NO _x	315.00	168.18

SDF LTO – VOC + NO_x

Percent of Total Jefferson County VOC + NO_x



Jefferson County Mobile Sources Reduction with Tier II, Sulfur in gasoline





METRO Louisville