



DC Attainment Demonstration Modeling Update

Metropolitan Washington Air Quality Committee

February 28, 2007

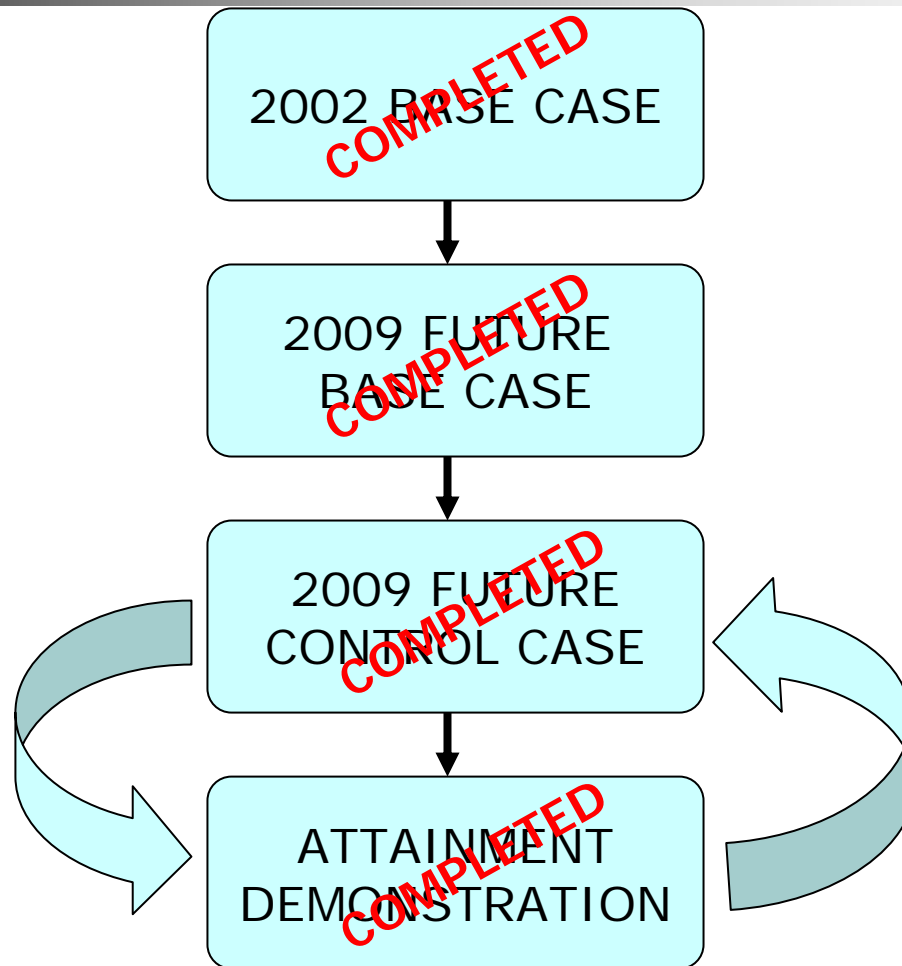
Presented by: VA Department of Environmental Quality



Presentation Outline

- Final DC area modeling results
- Supporting Analyses:
 - Modeling efforts
 - Emissions & air quality trends
 - Model and other uncertainties
 - Voluntary measures

Attainment Modeling Steps

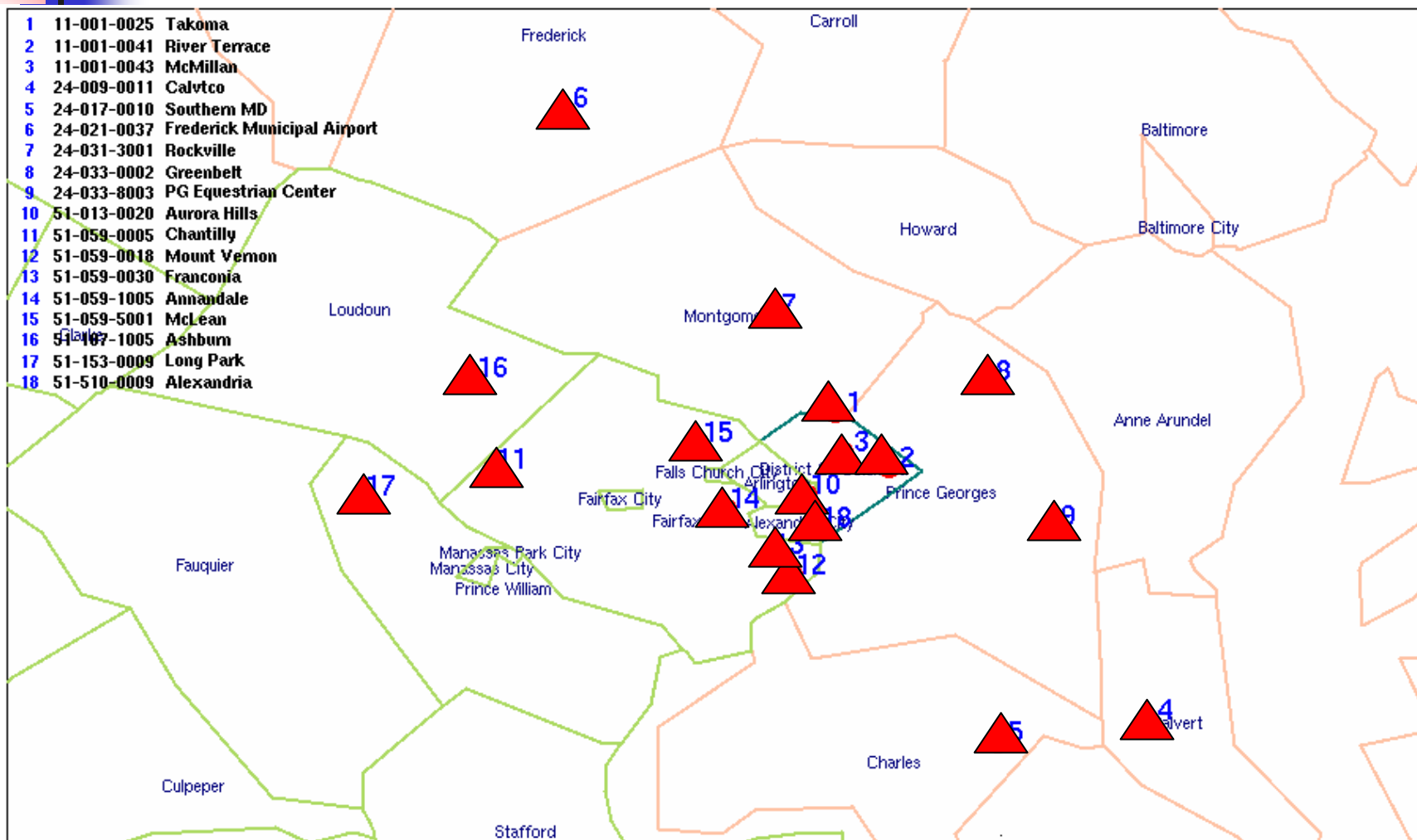




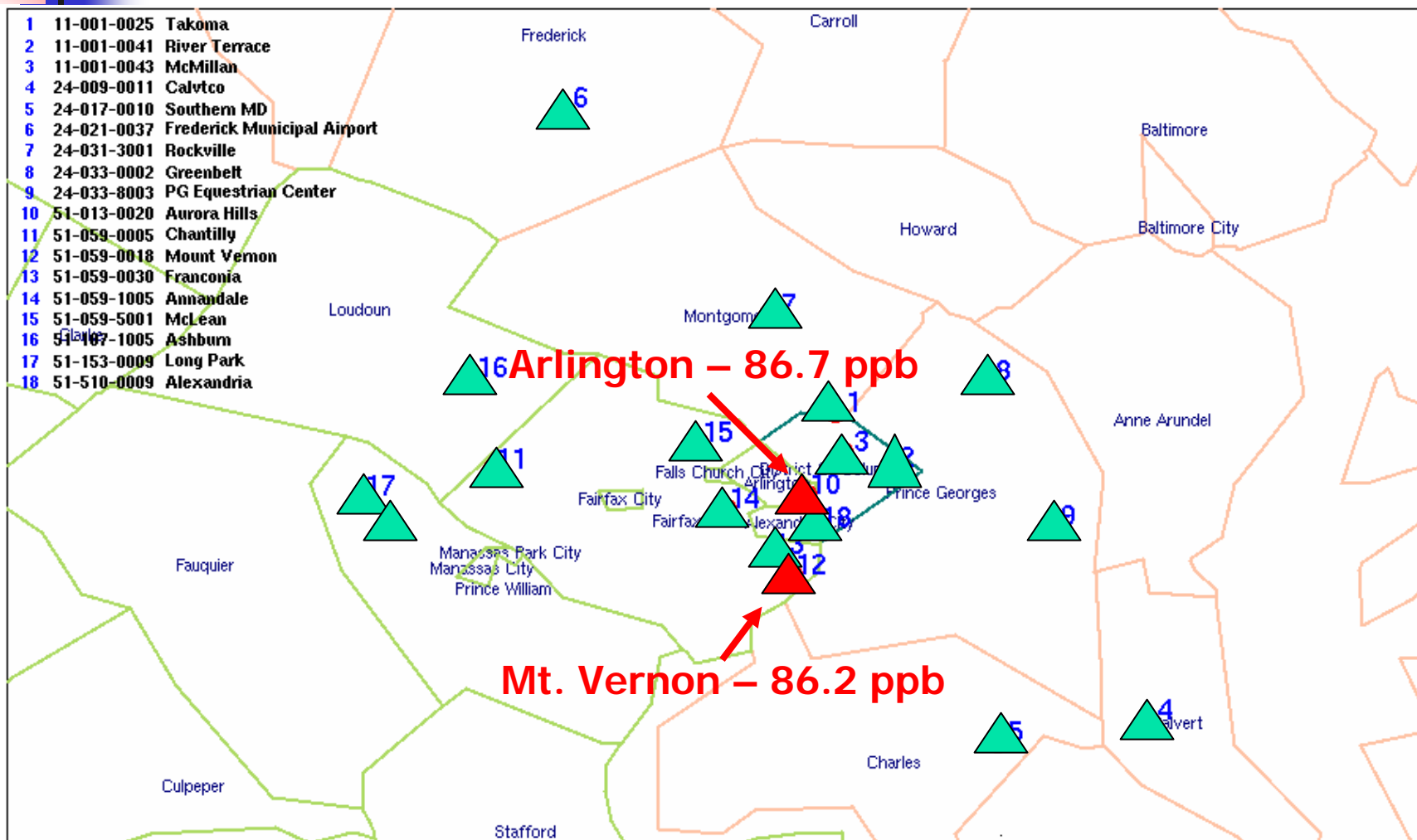
Attainment Modeling Run

- Emissions adjustments:
 - Additional power plant controls in NOVA
 - (12 tpd NO_x reduction)
 - Additional area source controls in NOVA
 - (2 tpd VOC reduction)
 - Removed area source controls from DC
 - (3.5 ton VOC increase)

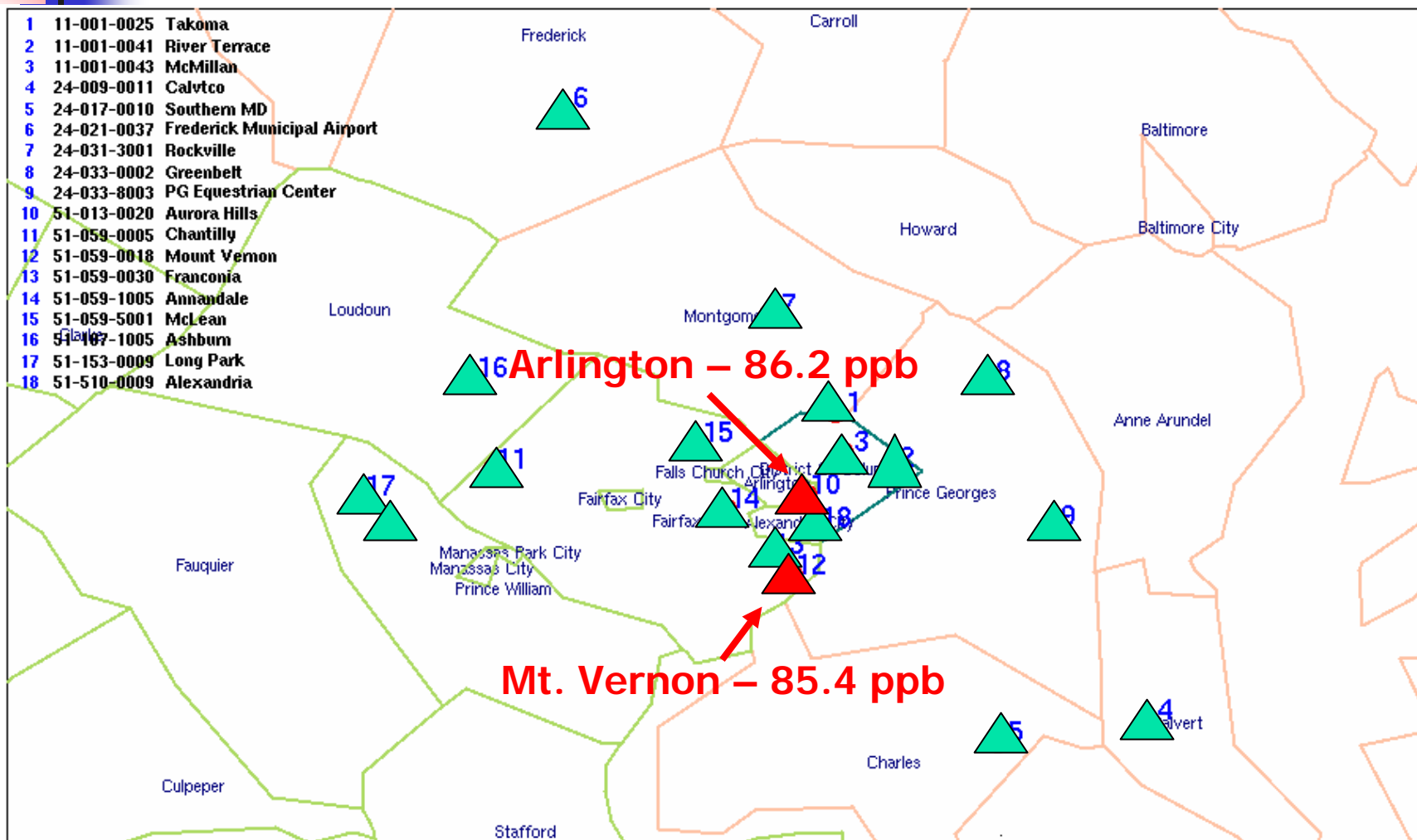
Actual Monitor Status – 2002



Predicted Monitor Status 2009 Base Case



Predicted Monitor Status 2009 Base Case



Predicted Monitor Status – 2009

AIRS ID	Site Name	Jurisdiction	State	DVB	RRF	DVF
11-001-0025	Takoma	District of Columbia	---	88.7	0.892	79
11-001-0041	River Terrace	District of Columbia	---	89.0	0.883	78
11-001-0043	McMillan	District of Columbia	---	92.7	0.883	81
24-009-0010	Calvert	Calvert	MD	NA	0.836	NA
24-017-0010	Southern MD	Charles	MD	93.0	0.808	75
24-021-0037	Frederick Municipal Airport	Frederick	MD	87.3	0.846	73
24-031-3001	Rockville	Montgomery	MD	86.7	0.881	76
24-033-0002	Greenbelt	Prince George's	MD	94.0	0.869	81
24-033-8003	PG Equestrian Center	Prince George's	MD	94.0	0.865	81
51-013-0020	Aurora Hills	Arlington County	VA	96.7	0.891	86
51-059-0005	Chantilly	Fairfax County	VA	87.0	0.867	75
51-059-0018	Mount Vernon	Fairfax County	VA	96.7	0.883	85
51-059-0030	Franconia	Fairfax County	VA	95.0	0.88	83
51-059-1005	Annandale	Fairfax County	VA	94.0	0.88	82
51-059-5001	McLean	Fairfax County	VA	88.0	0.883	77
51-107-1005	Ashburn	Loudoun County	VA	90.0	0.869	78
51-153-0009	Long Park	Prince William County	VA	85.0	0.871	74
51-510-0009	Alexandria	Alexandria City	VA	90.0	0.883	79



Weight of Evidence (WOE)

- **Evidence that supports future attainment**
 - Due to model uncertainties
 - Model used in a relative sense – Relative Response Factors (RRF)
 - WOE range (82 to 87 parts per billion)
- **All DC monitors in or below WOE range**
- **Types of Evidence:**
 - Other modeling efforts
 - Emissions & air quality trends
 - Uncertainty
 - Voluntary measures

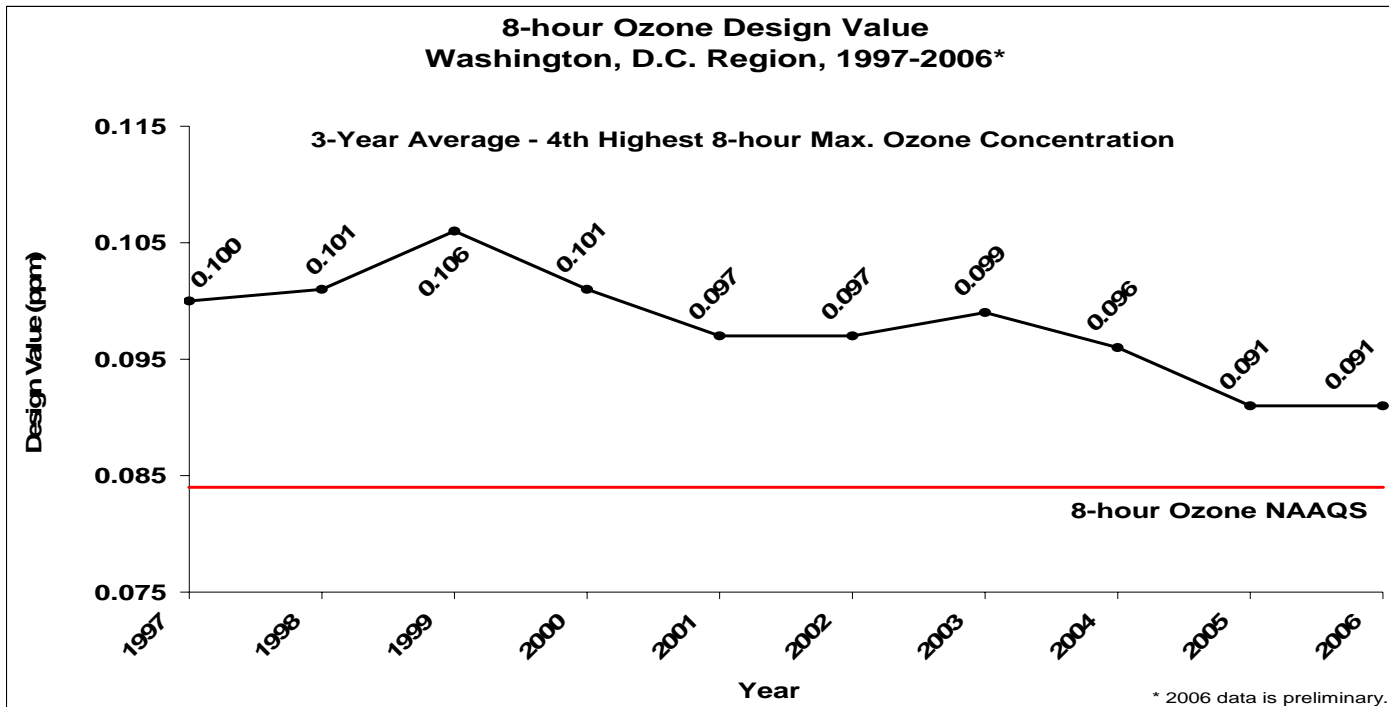


Modeling Efforts

- Better models & inventories
- Longer evaluation period (five months)
- Relative use of results (RRFs)
- Three separate 2009 modeling projects
 - VADEQ, OTC, VISTAS
 - DC predictions all within 1 ppb
- 2012 results are even better

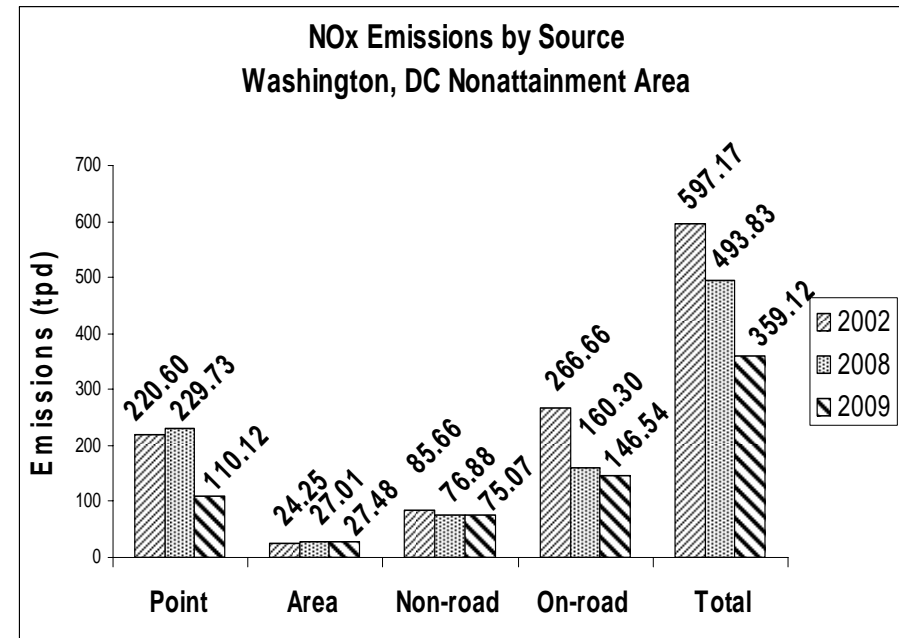
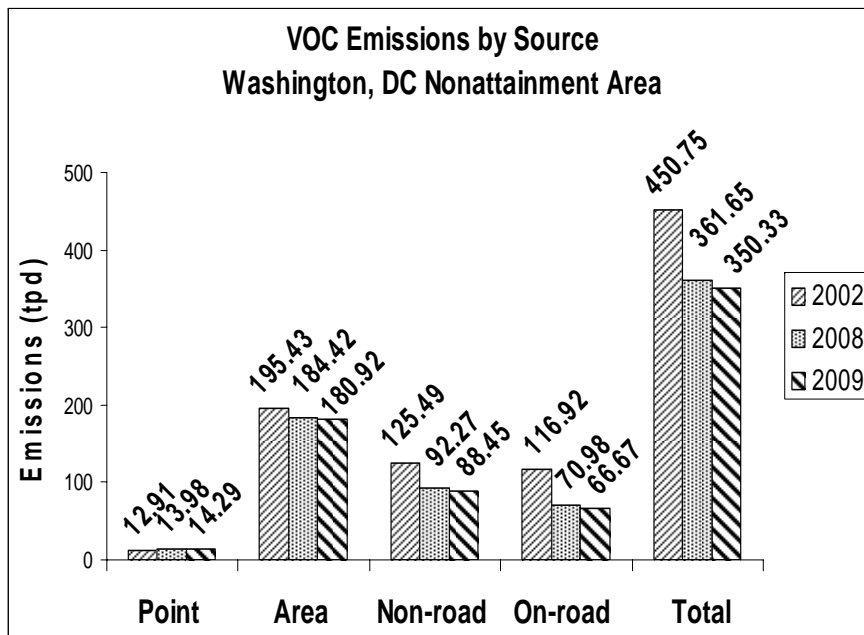
Washington Air quality trends

- Air quality continues to improve



Washington Emissions trends

- And emissions continue to decrease





Model Uncertainties

- Model uncertainties:
 - Under-predicts 2002 observed values
 - Still with EPA acceptance criteria
 - May under-predict benefits future emission reduction benefits
 - Current design values near 2009 predictions
 - Ozone aloft is under-predicted



Other Uncertainties

- Current & future design value calculations:
 - Preferred & Alternative methods from EPA
 - Heavily weights “worst case” conditions (2002)
 - Evaluated alternative baseline design values (DVB)
 - Evaluated alternative Relative Response Factors (RRF)
- Yields a range of modeling results

Alternative DVF Calculation

AIRS ID	Site Name	Jurisdiction	State	ALT. DVF	EPA DVF
11-001-0025	Takoma	District of Columbia	---	76	79
11-001-0041	River Terrace	District of Columbia	---	74	78
11-001-0043	McMillan	District of Columbia	---	78	81
24-009-0010	Calvert	Calvert	MD	NA	NA
24-017-0010	Southern MD	Charles	MD	72	75
24-021-0037	Frederick Municipal Airport	Frederick	MD	71	73
24-031-3001	Rockville	Montgomery	MD	73	76
24-033-0002	Greenbelt	Prince George's	MD	79	81
24-033-8003	PG Equestrian Center	Prince George's	MD	78	81
51-013-0020	Aurora Hills	Arlington County	VA	81	86
51-059-0005	Chantilly	Fairfax County	VA	73	75
51-059-0018	Mount Vernon	Fairfax County	VA	82	85
51-059-0030	Franconia	Fairfax County	VA	80	83
51-059-1005	Annandale	Fairfax County	VA	82	82
51-059-5001	McLean	Fairfax County	VA	74	77
51-107-1005	Ashburn	Loudoun County	VA	75	78
51-153-0009	Long Park	Prince William County	VA	72	74
51-510-0009	Alexandria	Alexandria City	VA	75	79



Voluntary Control Measures

- Voluntary controls could reduce ozone further:
 - Local voluntary bundle measures
 - Enhanced ozone action days program
 - Smart-ways
 - Urban tree canopy
- Significant high ozone day benefits
 - 2-4 ppb improvement on high ozone days



Conclusions

- There is strong direct (modeling) and indirect (WOE) evidence that the Washington D.C area will attain the ozone standard by 2009
- Air quality in the area will continue to improve beyond 2009