



SIP Timeline and Modeling Episode

Doug Boyer

Photochemical Modeling Technical Committee

August 31, 2010



Overview

- DFW and the National Ambient Air Quality Standards
 - DFW and the 1997 Eight-Hour Ozone Standard
- DFW Area Reclassification SIP Development
 - Elements of the Attainment Demonstration
 - Timeline for DFW SIP Revision
- Photochemical Modeling Episode

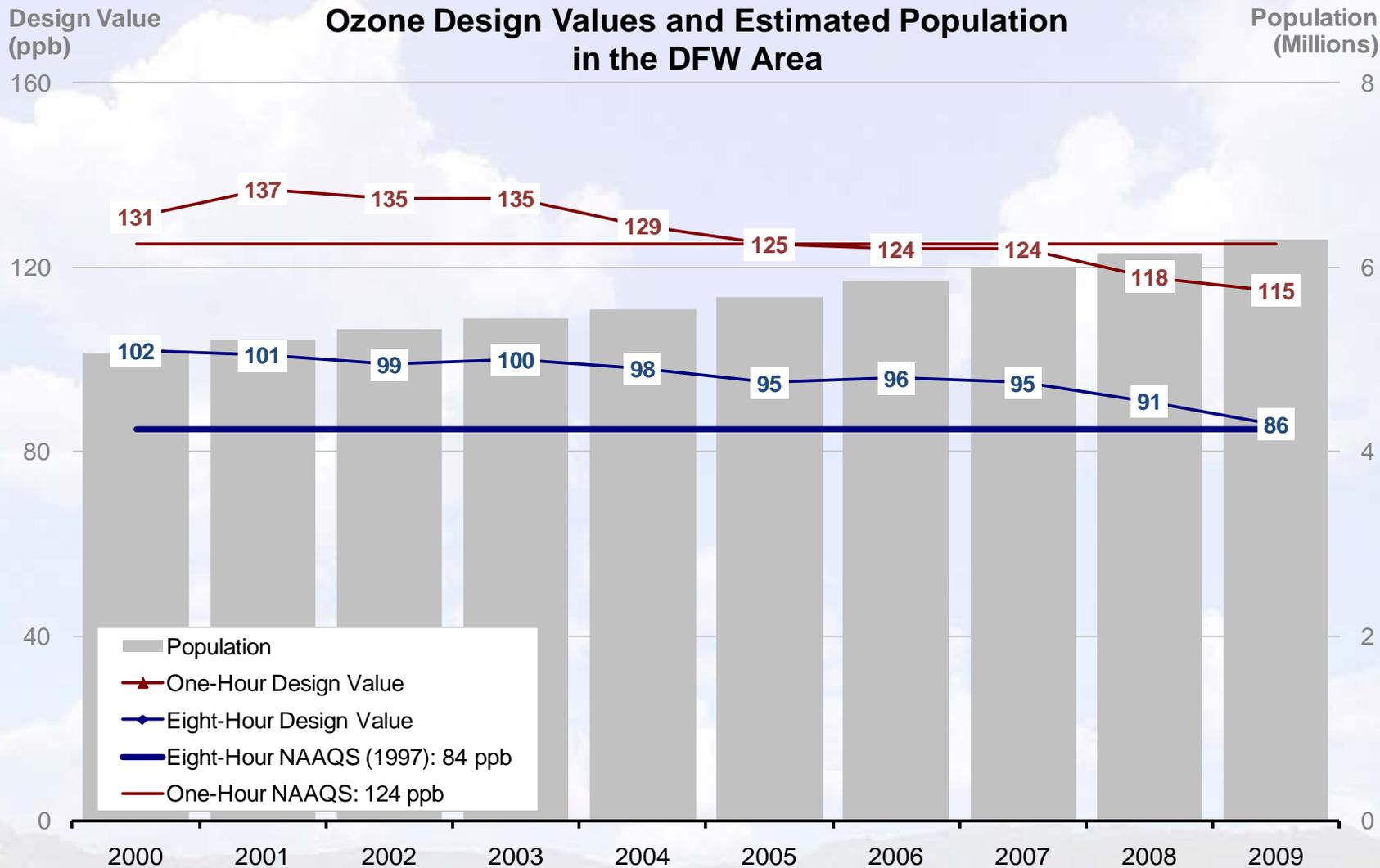


DFW and 1997 Eight-Hour Ozone Standard

- DFW 1997 eight-hour ozone standard nonattainment area:
 - Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties
 - The DFW 2009 design value of 86 parts per billion (ppb) exceeded the 1997 eight-hour ozone standard of 84 ppb.
 - EPA issued a proposed failure to attain and reclassification notice (August 9, 2010).
 - The DFW area will be reclassified to serious, with a new attainment deadline of June 15, 2013.
- DFW Nonattainment Area Eight-Hour Design Values:
 - 2000: 101 ppb
 - 2007: 95 ppb (Attainment Demonstration adopted May 23, 2007)
 - 2009: 86 ppb



DFW Ozone Design Values with Population

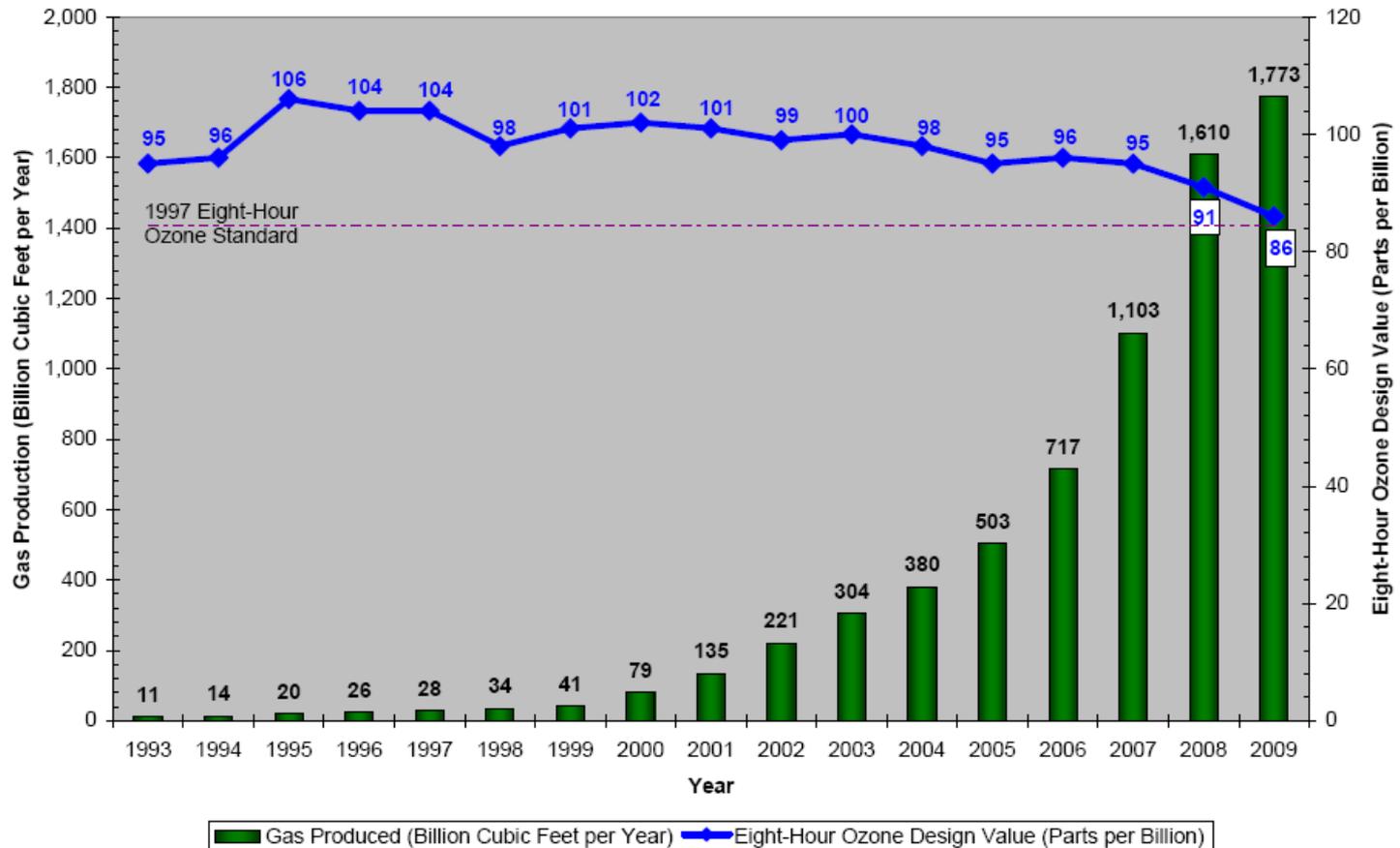


*Source: Ozone -- EPA's AQS database.
Population -- U.S. Census Bureau, Population Division



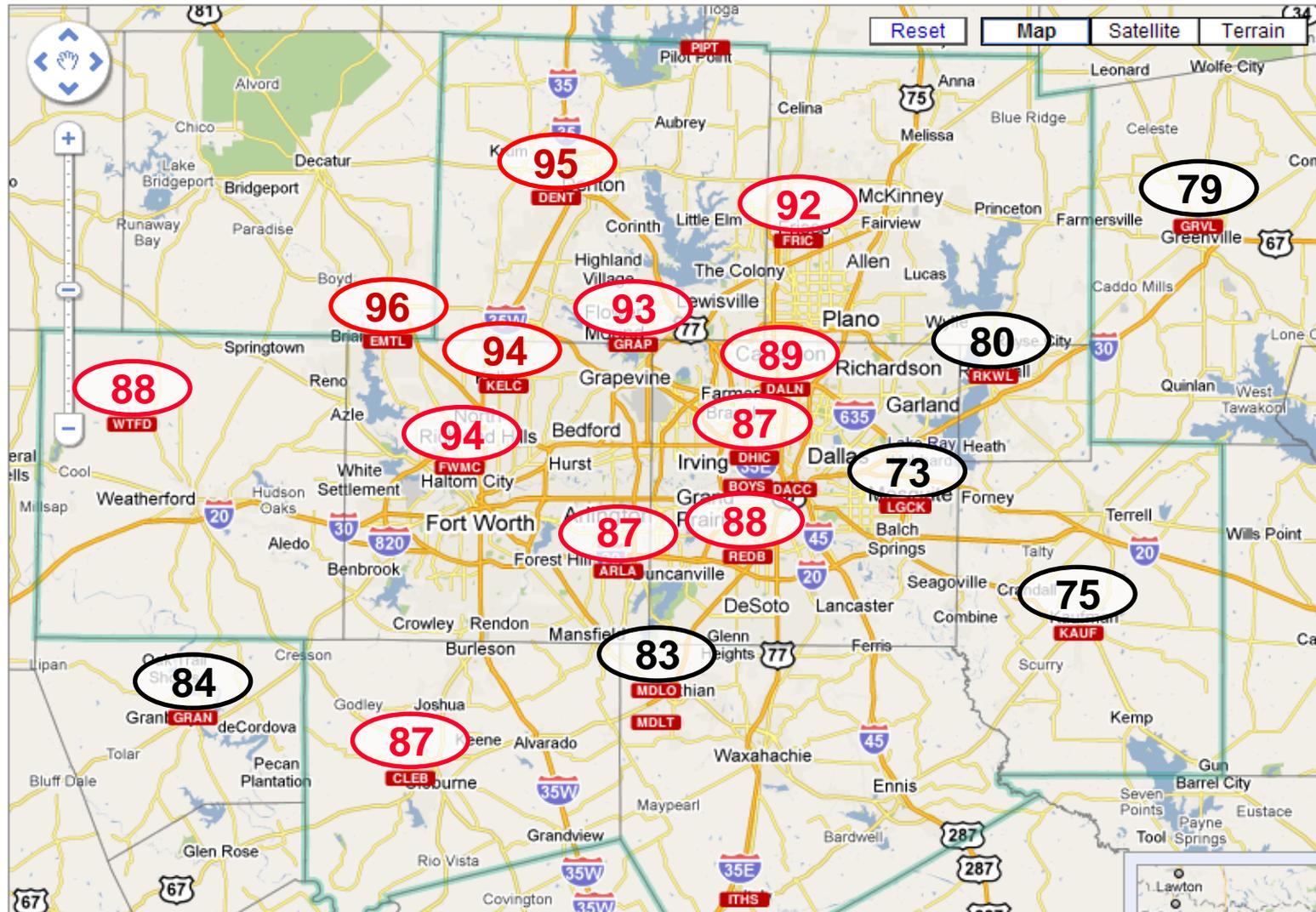
DFW Ozone Design Values and Barnett Shale Production

Dallas-Fort Worth Ozone Design Values Compared to Barnett Shale Natural Gas Production



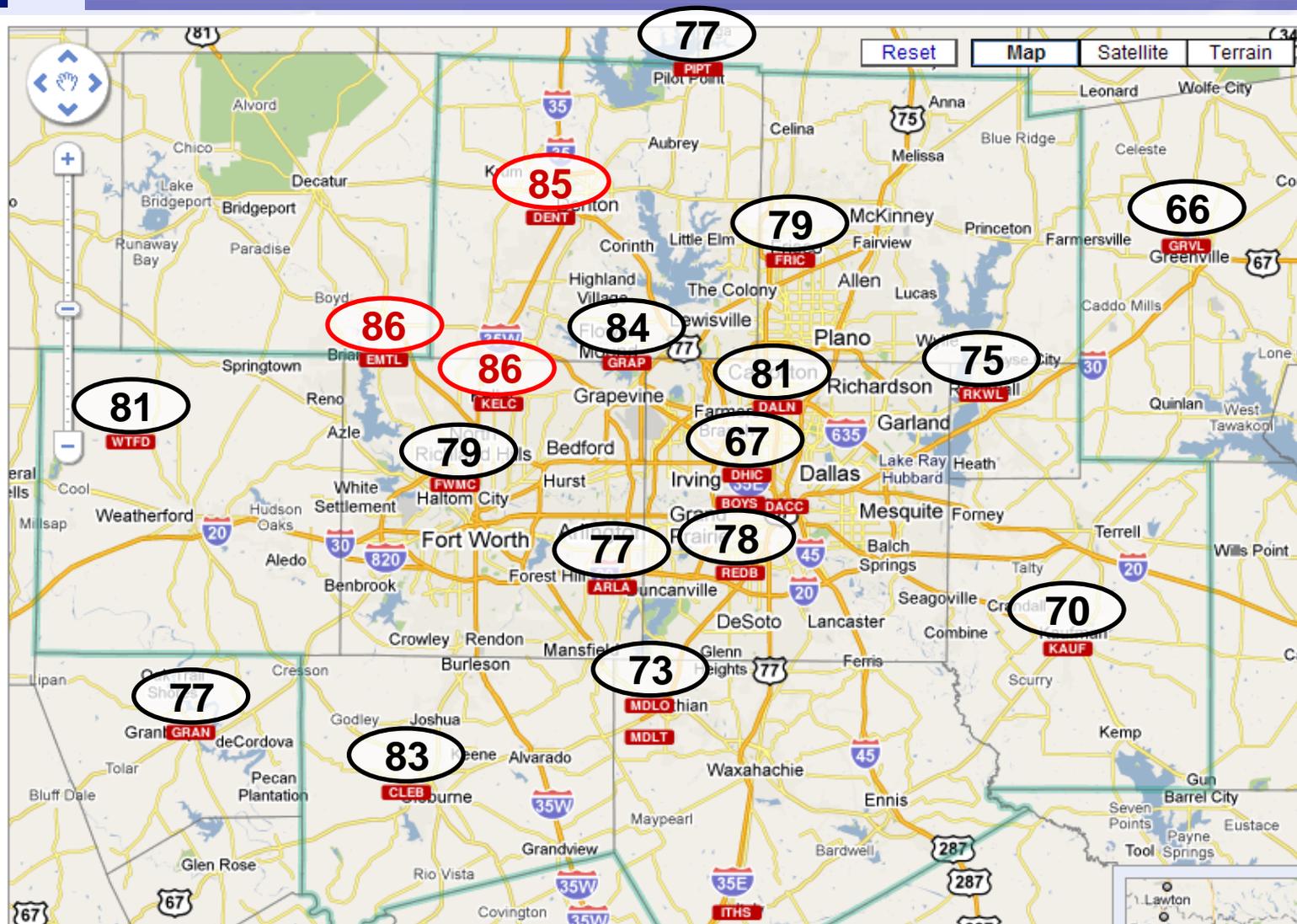
2006 Design Values

30 days \geq 85 ppb



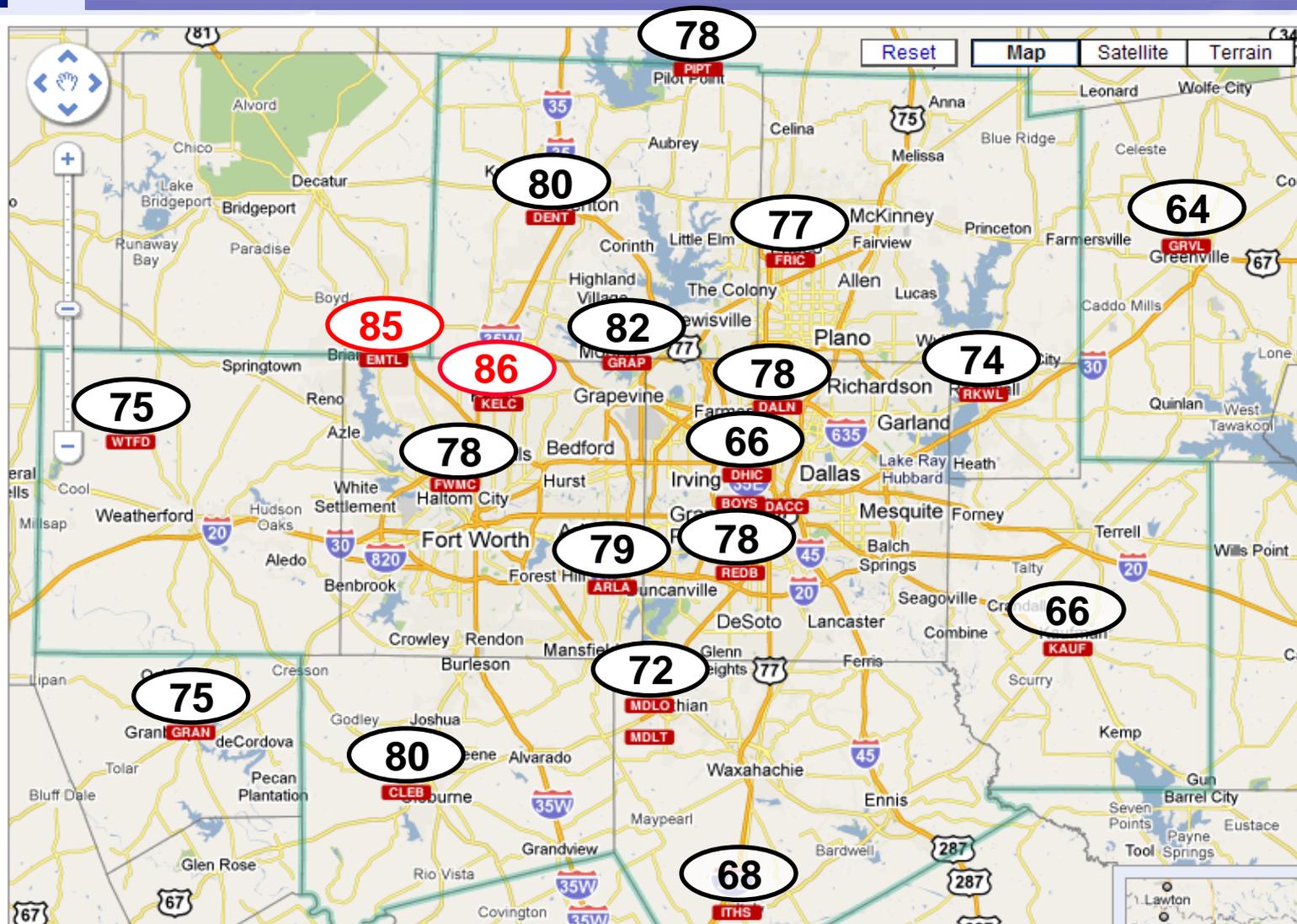
2009 Design Values

12 days \geq 85 ppb



2010* Design Values

8 days \geq 85 ppb



*2010 Design values as of August 30, 2010 and are subject to change



2010 4th High Needed to Exceed 1997 Ozone Standard (84 ppb)

DFW Monitor	Current 2010 Design Value (ppb)	Current 2010 4th High (ppb)	2010 4th High to Exceed 84 ppb Std
Keller C17	86	85	80
Eagle Mountain Lake C75	85	80	79
Grapevine Fairway C70/A301/X182	82	83	92
Denton Airport South C56/A163/X157	80	74	89
Cleburne Airport C77/C682	80	78	92
Arlington Municipal Airport C61	79	79	97
Pilot Point C1032	78	78	97
Ft. Worth Northwest C13/AH302	78	80	99
Dallas North No.2 C63/C679	78	71	91
Dallas Executive Airport C402	78	78	99
Frisco C31/C680	77	73	97
Parker County C76	75	70	98
Granbury C73/C681	75	77	105
Rockwall Heath C69	74	73	104
Midlothian OFW C52/A137	72	72	111
Italy C1044/A323	68	63	113
Kaufman C71/A304/X071	66	63	118
Dallas Hinton St. C401/C60/AH161	66	74	129
Greenville C1006/A198	64	64	125

*Values as of August 30, 2010



DFW Area Reclassification SIP Development



Elements of the Attainment Demonstration

- Demonstration that the state's control strategy for the area will result in its attainment of the 1997 eight-hour ozone standard by June 15, 2013
- Photochemical modeling
 - Conceptual model
 - Emissions inventories
 - Modeling (base case, baseline, future baseline)
 - Attainment test
 - Corroborative analysis/weight of evidence
- Control strategies
 - Reasonably Available Control Technology (RACT)
 - Reasonably Available Control Measures (RACM)
 - Other measures necessary to attain
 - New contingency measures
- Reasonable Further Progress (RFP) analysis



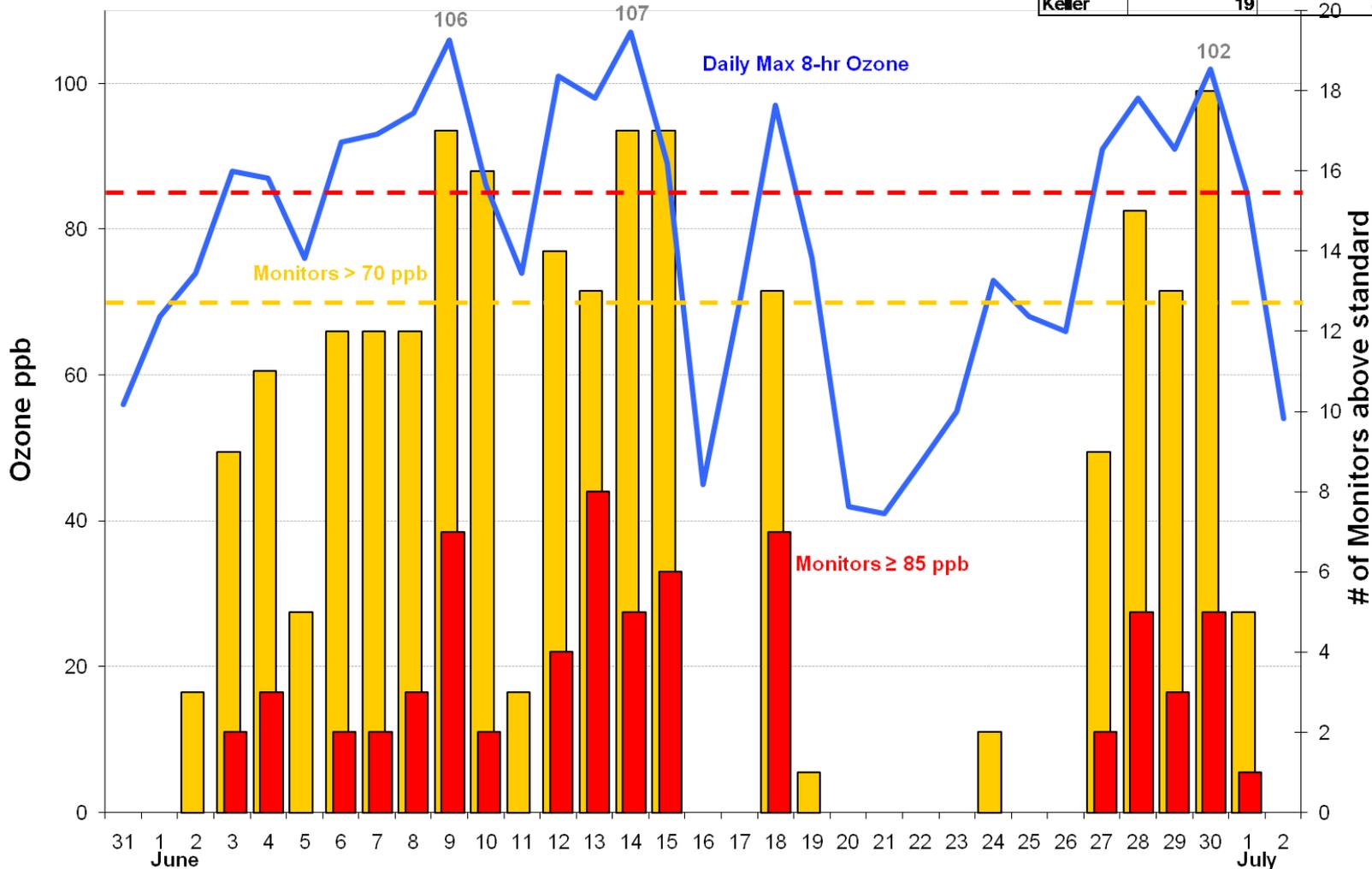
Extended June 2006 Episode

DFW Daily Max Ozone

May 31 - July 2, 2006

17 Days \geq 85 ppb

Monitor	Days \geq 70 ppb	Days \geq 85 ppb
Denton	17	9
Eagle Mtn	18	8
Frisco	14	7
Keller	19	8





Extended June 2006 Episode Information

Monitor	Max 8-hour Ozone (ppb)	Days ≥ 85 ppb	Days ≥ 70 ppb	Site-specific Baseline Design Value (ppb)
Eagle Mountain Lake C75	107	8	18	93.3
Denton Airport South C56	106	9	17	93.3
Keller C17	103	8	19	91.0
Grapevine Fairway C70	95	5	14	90.7
Ft. Worth Northwest C13	101	8	17	89.3
Parker County C76	101	5	15	87.7
Frisco C31	94	7	14	87.7
Cleburne Airport C77	98	2	15	85.0
Dallas Executive Airport C402	91	2	17	85.0
Dallas North No.2 C63	86	2	12	85.0
Arlington Municipal Airport C61	91	3	11	83.3
Granbury C73	92	3	12	83.0
Dallas Hinton St. C401	84	0	14	81.7
Rockwall Heath C69	78	0	11	77.7
Greenville C1006	78	0	8	75.0
Kaufman C71	78	0	11	74.7
Pilot Point C1032	101	9	14	NA
Midlothian Tower C94	98	2	14	NA
Midlothian OFW C52	96	1	11	NA
Italy High School C650	89	1	10	NA

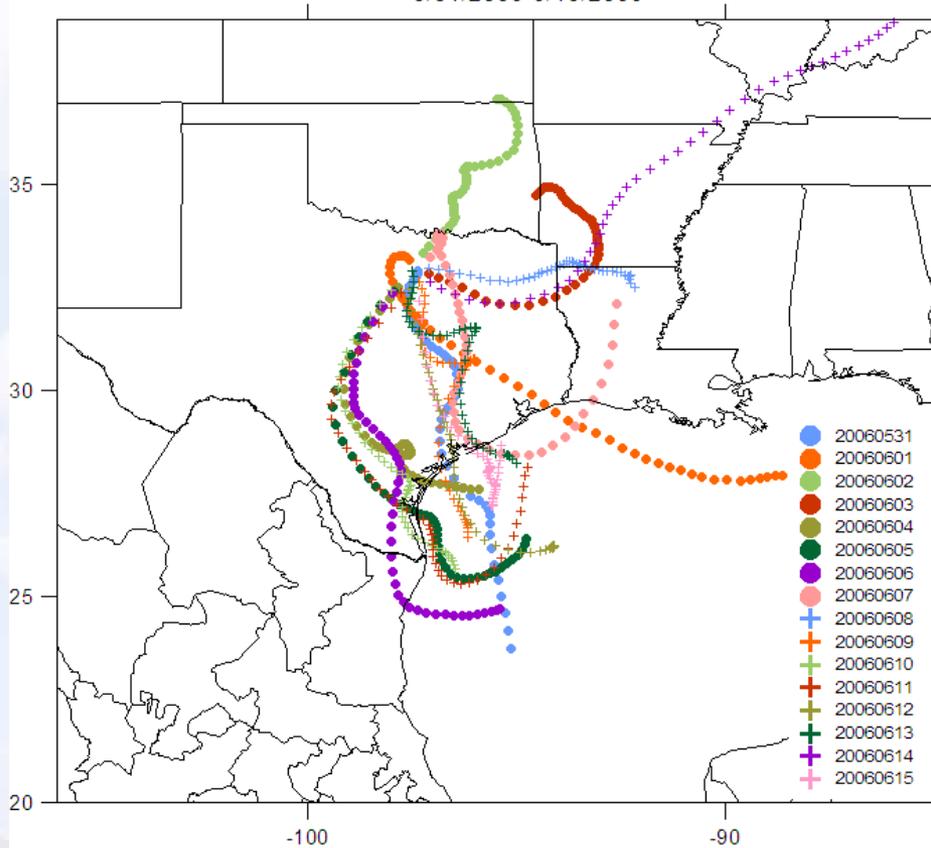


Back Trajectories at Eagle Mountain Lake

May 31 –July 2, 2006 Modeling Episode

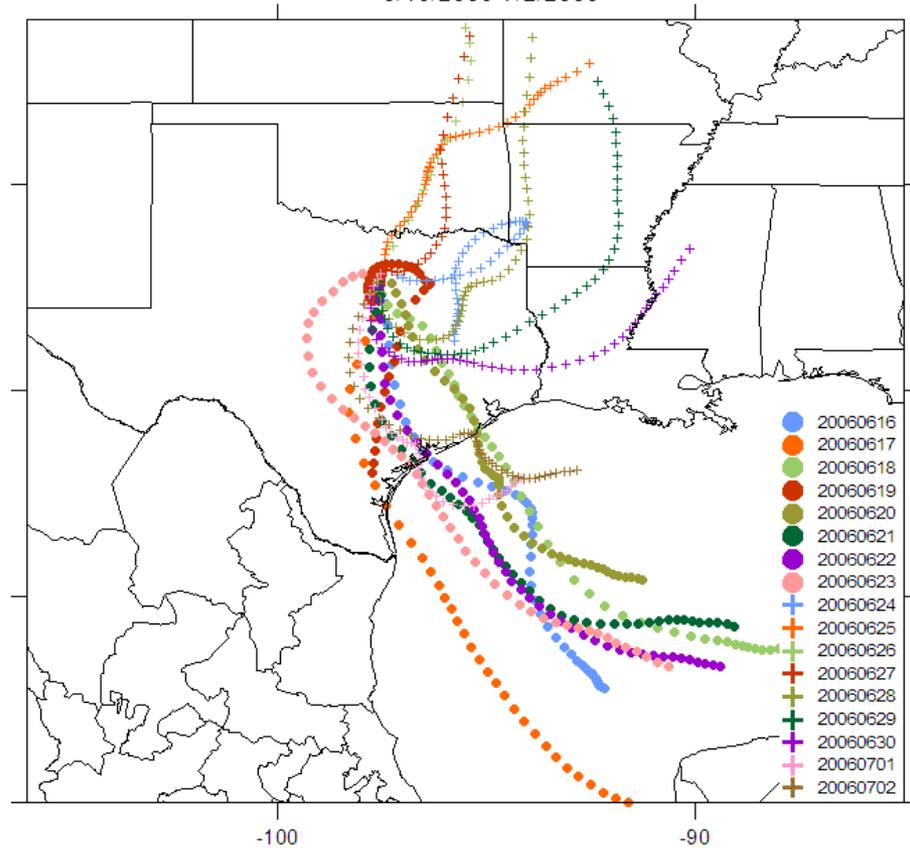
Two Day Back Trajectory at Eagle Mountain Lake C75

Trajectory Start Time: 3:00 pm Local Time Height: 500 m
5/31/2006-6/15/2006



Two Day Back Trajectory at Eagle Mountain Lake C75

Trajectory Start Time: 3:00 pm Local Time Height: 500 m
6/16/2006-7/2/2006





Extended June 2006 Episode Highlights

EPA Modeling Guidance Criteria

Simulate meteorological conditions corresponding to high ozone...

The May 31 – July 2, 2006 period had many days of ozone conducive meteorology including calm (e.g. 6/18), light E (6/8), SE (6/9), and S (6/6) winds.

Model a sufficient number of days...

17 of the 33 days exceeded the 85 ppb eight-hour standard.

Eagle Mountain Lake C75 and Denton Airport South C56 exceeded on 8 and 9 days, respectively.

On almost 20 days, eight-hour ozone was >70 ppb at key monitors for the modeled attainment test (future design value calculation).



Extended June 2006 Episode Highlights

EPA Modeling Guidance Criteria

Model periods in which observations are close to the baseline design values...

Observed eight-hour peaks were 85 – 107 ppb. Baseline design values exceeding the 1997 standard range from 85 – 93 ppb.

Eagle Mountain Lake C75 observed the highest eight-hour concentration at 107 ppb (6/14).

Model periods for which extensive air quality/meteorological data bases exist...

TexAQS II provided additional monitors, along with radar wind profilers, to aid in model performance evaluation.

High quality modeling exists from the 2010 HGB SIP modeling (June 1 – 15, 2006).

Austin/San Antonio/Environ optimized meteorological modeling of the June episode for central Texas and DFW because of the episode's regional applicability.



Timeline for DFW SIP Revision

- Modeling: June – December 2010
- Control strategy development: September – December 2010
- Proposal agenda for SIP revision and rules: May/June 2011
- Adoption agenda: November/December 2011



SIP Revision Process

STEP	Time Frame
1. Select episode	Developing June 2006
2. Prepare emission inventories	In Progress
3. Conceptual model & modeling protocol	Drafted
4. Base case/baseline modeling	March-September 2010
5. Future baseline modeling	June-November 2010
6. Select control measures for modeling	September-November 2010
7. Future controlled modeling	September-December 2010
8. Finalize recommended control strategy	December 2010
9. Draft SIP revision & rules	January-March 2011
10. Commission adopts proposal	June 2011
11. Formal comment period	July 2011
12. Staff prepares responses	July-August 2011
13. Re-model measures if necessary	July-August 2011
14. Finalize SIP revision & rules	September 2011
15. Commission adopts SIP revision & rules	November 2011
16. Submit SIP revision & rules to EPA	January 2012



Key Technical Considerations

- Determine local, regional contribution to ozone
- Evaluate emission source contribution to ozone
 - For example, on-road, point source, Barnett Shale
- Evaluate effectiveness of NO_x, VOC controls
- Determine emission reductions required to attain
- Determine final control strategy