Load Shape Analysis – IRM 2008

Cenk Yildirim
Resource & Load Adequacy
May 29, 2007

2008 IRM Study Load Shape

- Peak days of our neighbours
- Historic Zonal Peak Date/HR & Coincident Factors
- 2007 IRM Study based on 2002 LS
- Evaluation Includes
  - > Examination of CDD & CTHI Duration Curves
  - > NYCA Load Duration Curves (Hourly & Daily)
  - > J & K Load Duration Curves (Hourly & Daily)
- EDRP & SCR added back into Load Shapes
- 1996, 2000 & 2004 Load shapes are excluded from analysis

2006 PJM & ISO-NE Peak Days

- PJM Peak day occurred on Aug 2nd HR 17:00

  http://www.pjm.com/planning/res-adequacy/downloads/summer-2006%20-peaks-and-5cps.pdf

- IS0-NE Peak day occurred on Aug 2nd HR 15:00

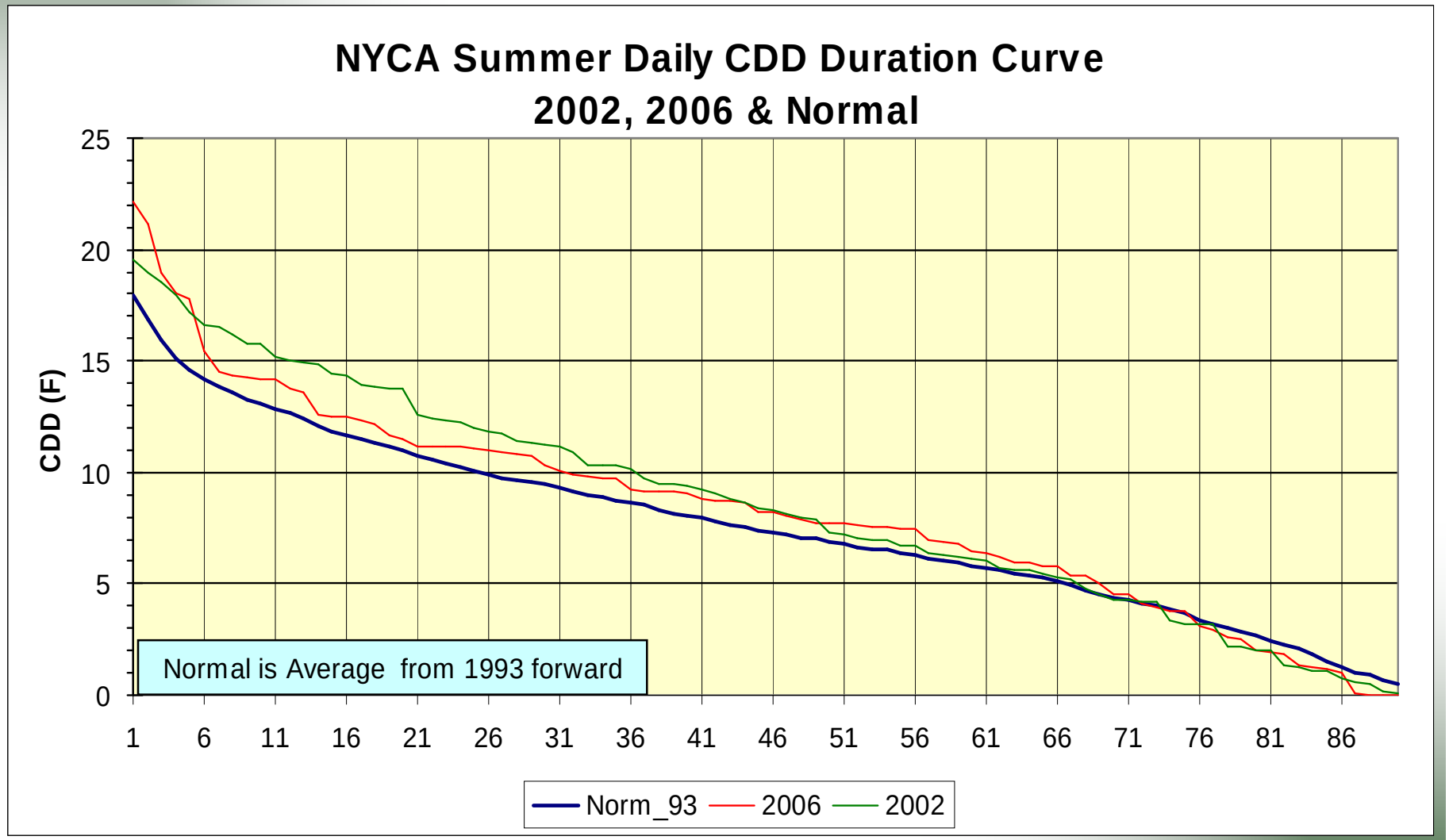
  http://www.iso-ne.com/trans/celt/fsct_detail/2007/peak_data_summary_website.xls

Historic Peak Dates & Zones J & K Coincidence Factors

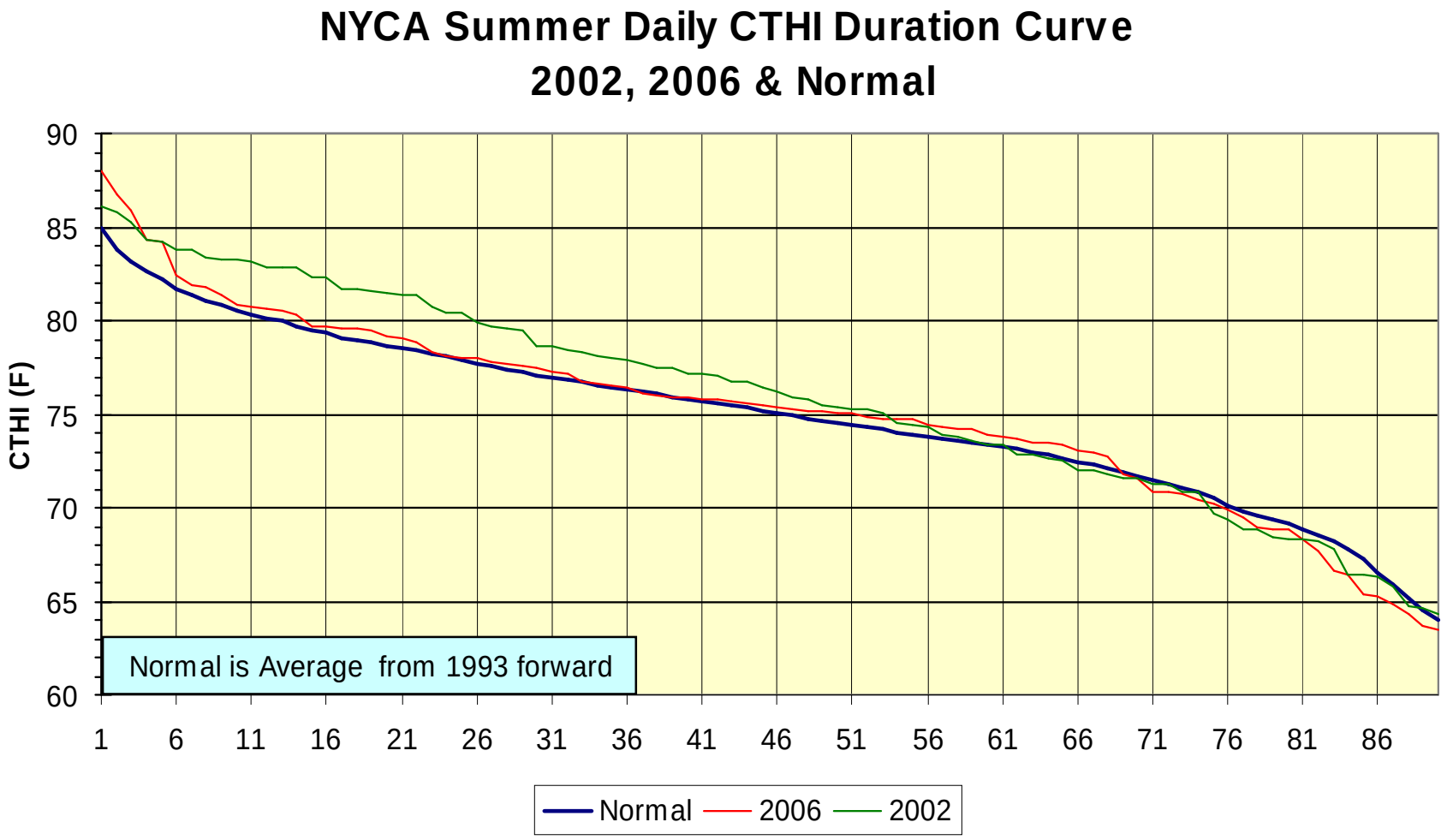
Year	NYCA DT/HR	Zone J - DT/HR	&	C.F.	Zone K - DT/HR	&	C.F.
1993	7/8 - HR 15	7/8 - HR 15		100%	7/10 - HR 13		98%
1994	7/21 - HR 15	7/21 - HR 15		100%	7/13 - HR 17		97%
1995	8/4 - HR 16	8/3 - HR 16		99.8%	8/4 - HR 16		100%
1996	7/18 - HR 17	8/23 - HR 16		95%	8/23 - HR 17		93%
1997	7/15 - HR 15	7/15 - HR 16		99%	7/15 - HR 17		98%
1998	7/22 - HR 17	7/22 - HR 16		100%	7/22 - HR 17		100%
1999	7/6 - HR 14	7/6 - HR 13		100%	7/6 - HR 15		99%
2000	6/26 - HR 17	6/27 - HR 15		99.6%	8/7 - HR 17		94%
2001	8/9 - HR 15	8/9 - HR 15		100%	8/8 - HR 17		100%
2002	8/14 - HR 15	7/23 - HR 16		99.5%	7/29 - HR 18		97%
2003	6/26 - HR 17	6/26 - HR 17		100%	6/26 - HR 17		100%
2004	6/9 - HR 17	6/17 - HR 16		100%	8/20 - HR 16		93%
2005	7/26 - HR 17	7/27 - HR 17		95%	8/5 - HR 15		99%
2006	8/2 - HR 15	8/2 - HR 17		99%	8/3 - HR 17		99%

* Historic EDRP & SCR MWs added back in
* Coincidence Factor (C.F.) = Coin. Peak / Non Coin Peak

Analysis of Weather Patterns



Analysis of Weather Patterns, contd.



On average 2002 is more conservative for top 50 days

Summer CTHI Comparison

	2002	2006
Number of Days Above Normal Curve	60	67
Number of Days Above 84F(Design)	4	4
Number of Days above 80 F	26	15

- 2002 has more extreme days on average
- 2006 peak producing CTHI is 88 F (95th Percentile)

** From June 1st thru Aug 31st*

Historic EDRP & SCR Events

EDRP & SCR MWs added back into Load

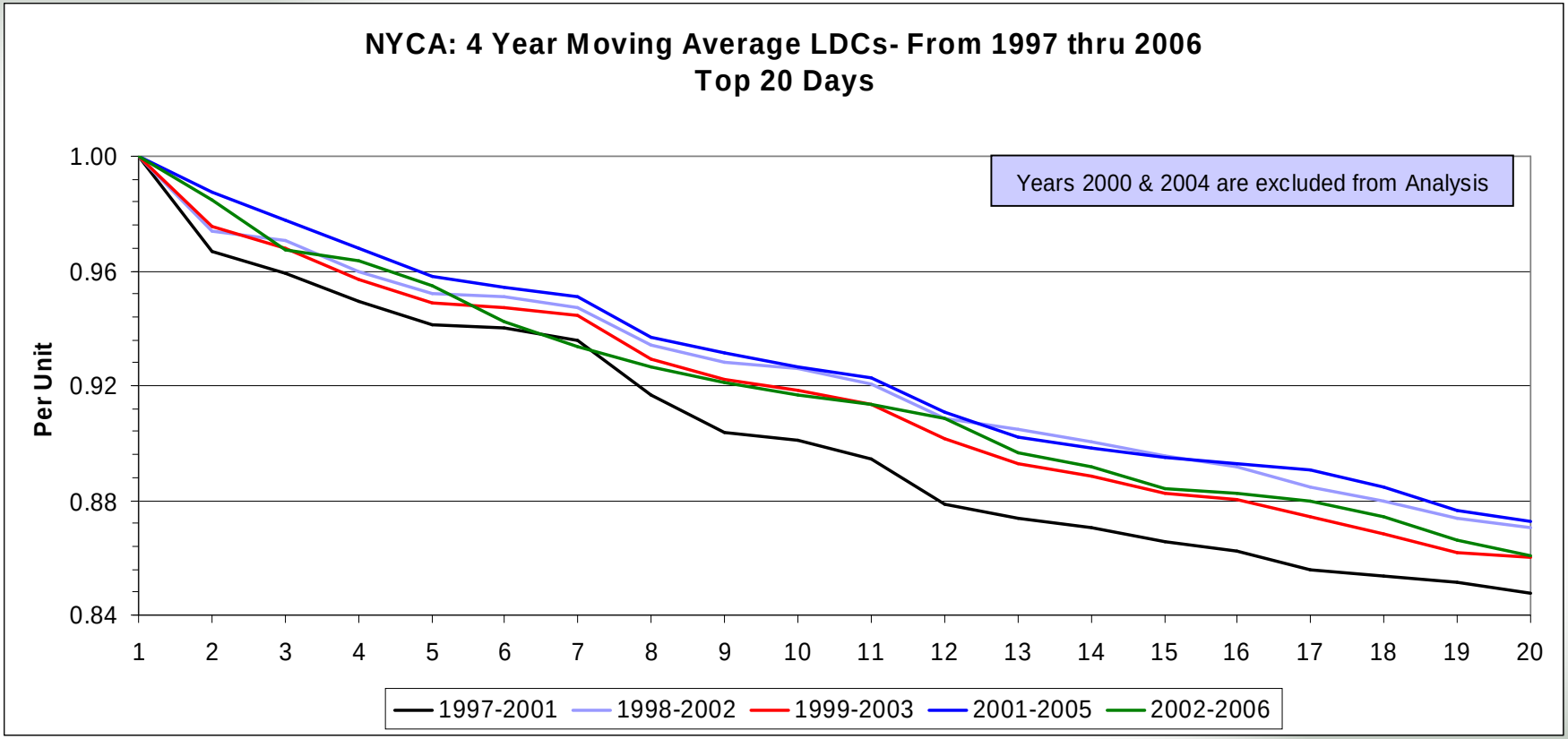
Summary of EDRP/SCR Events

				Average MWh/h performance during the event											
Date	**From**	**To**	**# Hours**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**Total**
8/7/2001	1500	1900	4	210.0	20.0	36.0	0.0	11.0	62.0	10.0	1.0	7.0	33.0	6.0	396.0
8/8/2001	1300	1900	6	252.0	10.0	38.0	0.0	13.0	61.0	9.0	1.0	8.0	37.0	6.0	435.0
8/9/2001	1100	1900	8	228.0	10.0	38.0	1.0	17.0	69.0	10.0	2.0	8.0	35.0	6.0	424.0
8/10/2001	1330	1800	5						57.0	11.0	2.0	8.0	35.0	6.0	119.0
4/17/2002	1200	1800	6							2.6	0.8	4.4	25.8	4.8	38.4
4/18/2002	1200	1800	6							2.4	1.5	5.5	31.9	8.6	49.9
7/30/2002	1300	1800	5	311.3	43.3	39.7	2.5	15.3	61.4	17.6	4.1	7.6	90.6	71.1	664.5
8/14/2002	1300	1800	5	275.3	20.4	27.2	47.6	15.6	58.0	17.9	4.6	9.1	81.2	79.2	636.2
8/15/2003	900	2300	14	292.4	32.9	61.3	13.1	33.8	84.4	26.0	4.6	13.1	173.5	70.1	805.2
8/16/2003	1200	2000	8	251.4	28.2	41.5	6.5	9.6	61.6	13.6	0.9	1.8	43.6	12.3	471.0
7/27/2005	1400	1800	4							15.9	2.7	13.2	201.9	111.3	345.0
7/18/2006	1300	2200	9								1.7	14.9	350.4	118.0	485.0
7/19/2006	1045	1900	9										326.9		326.9
8/1/2006	1400	1900	5										220.0	93.7	313.7
8/2/2006	1300	1900	6										309.9	136.2	446.1
8/2/2006	1400	1900	5	330.9	75.7	95.6									502.2
8/3/2006	1300	1900	6										296.1	102.0	398.1

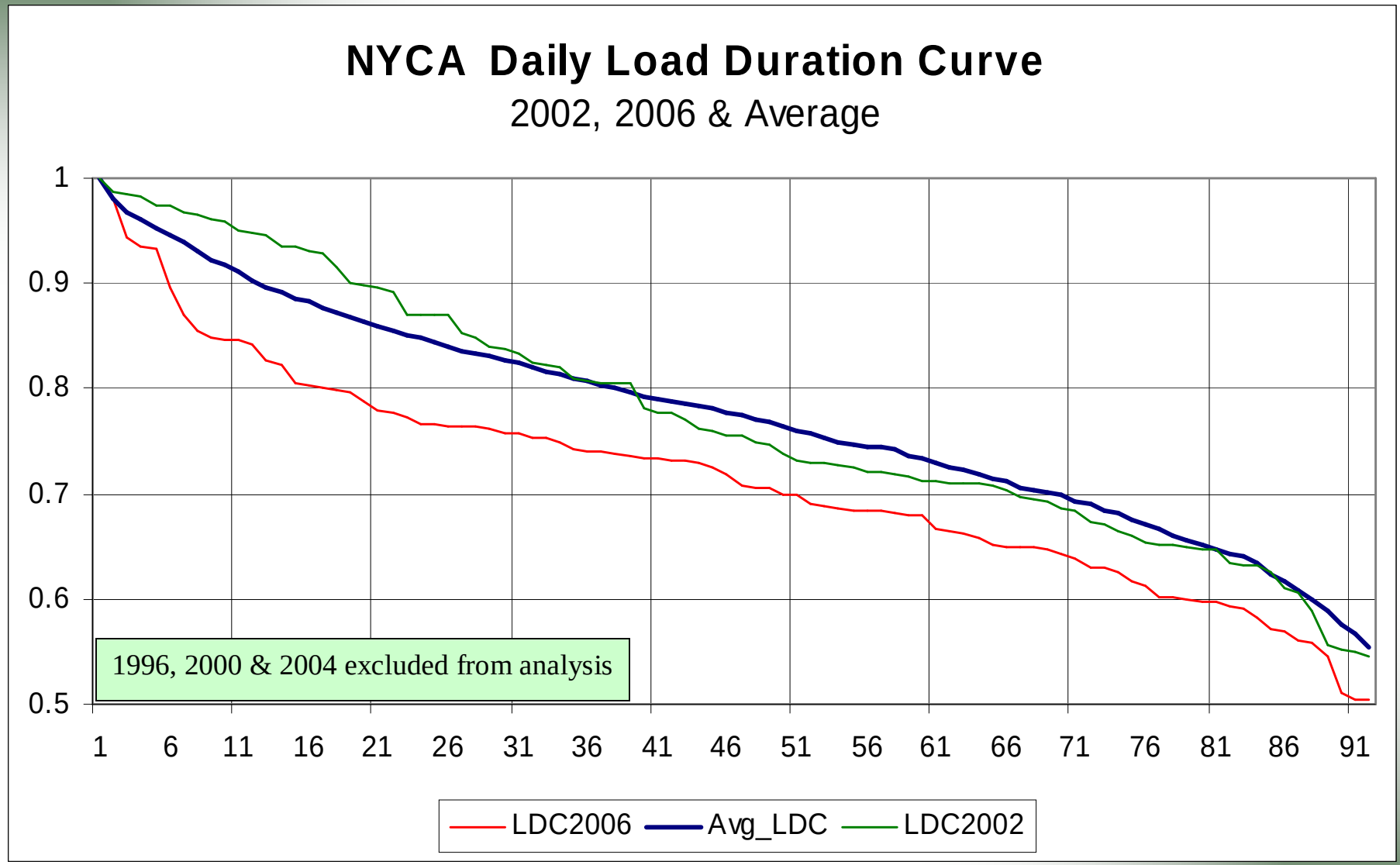
average hours per call:	6.5
std. dev.:	2.5
average hours per year:	18.5

2008 IRM Study Load Shape

Daily Peak LDC Changed?

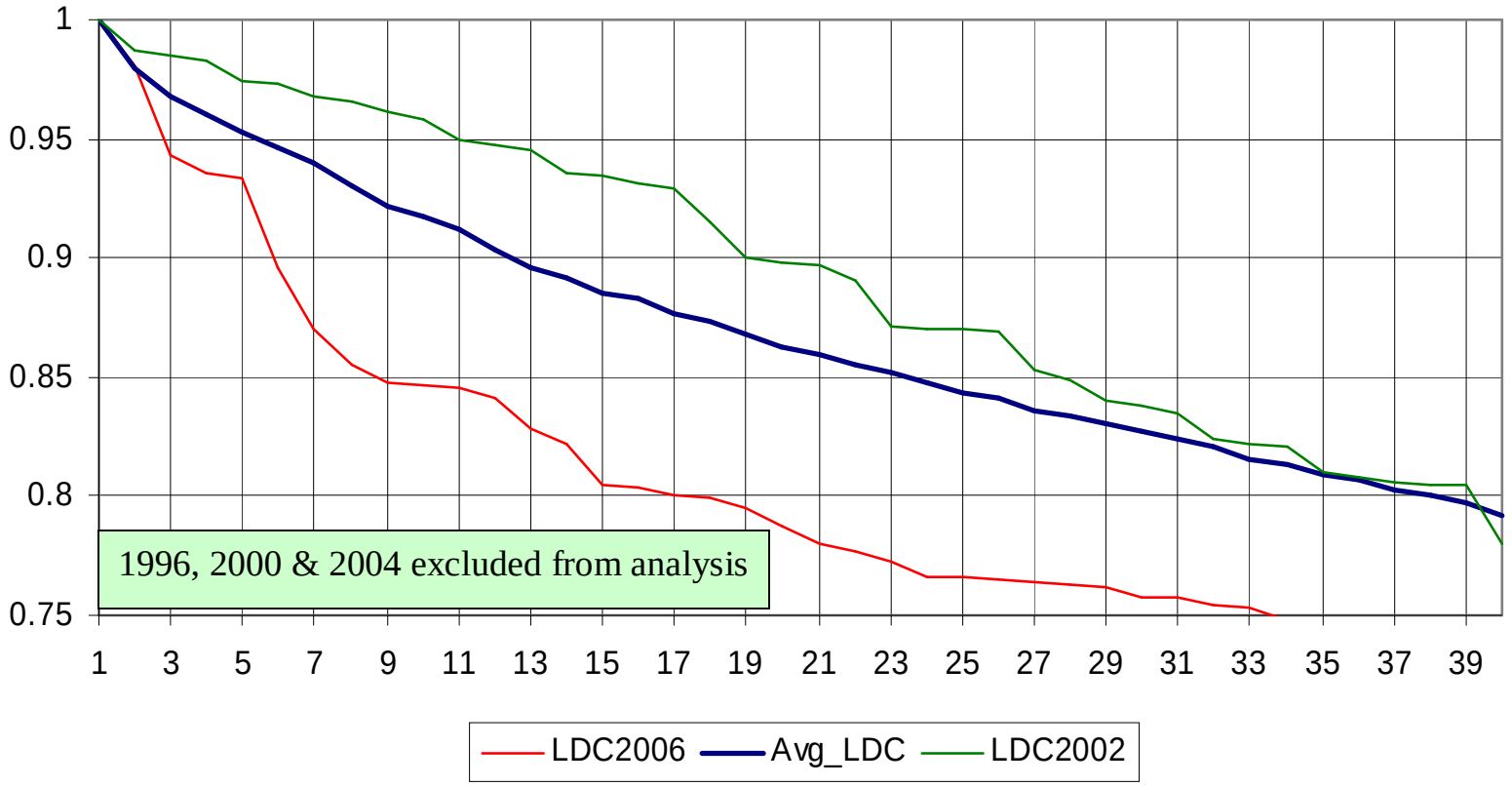


- There's no evidence of a trending change in LDCs

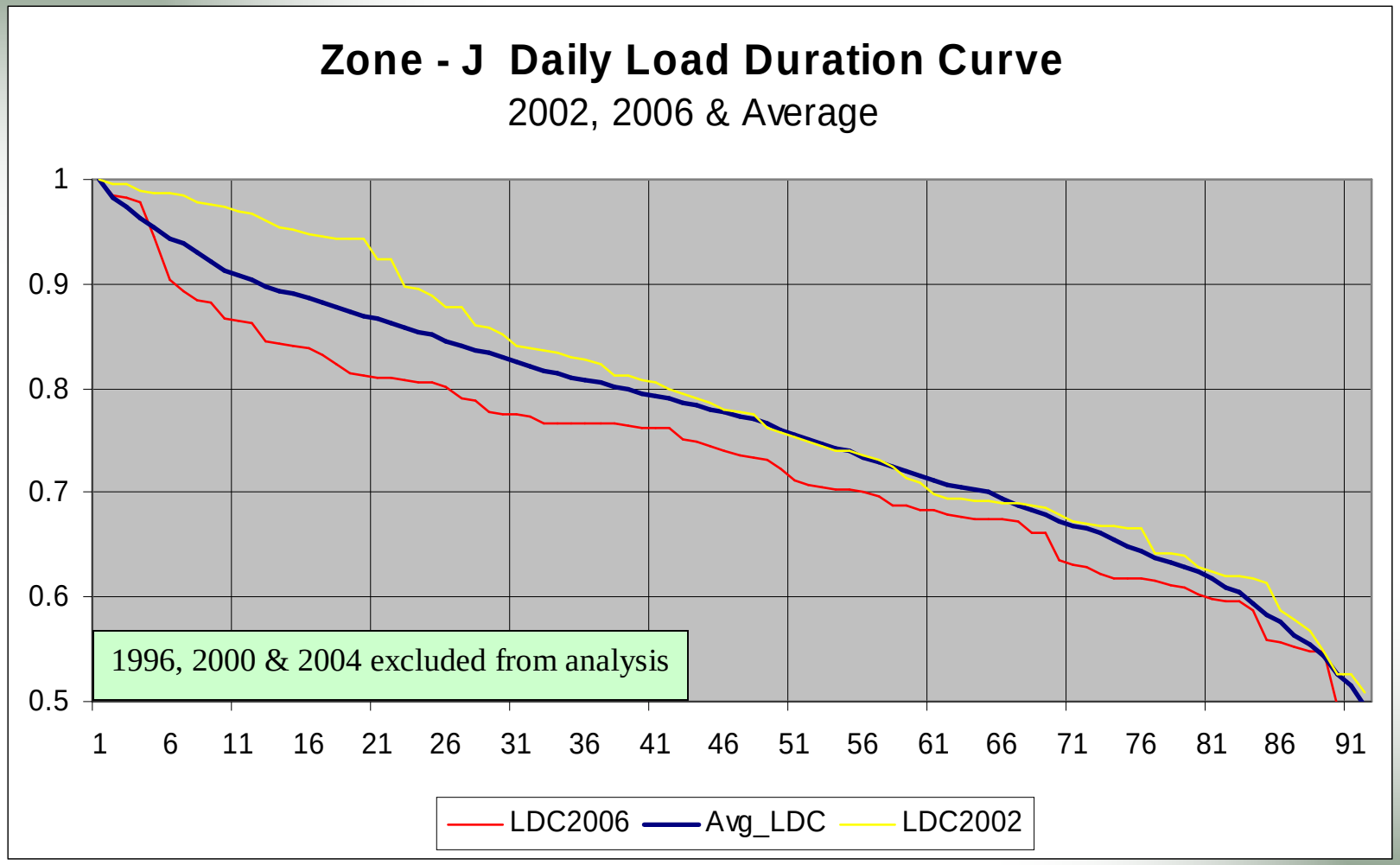

NYCA Daily Load Duration Curve
2002, 2006 & Average
1
0.9
0.8
0.7
0.6
0.5
1 6 11 16 21 26 31 36 41 46 51 56 61 66 71 76 81 86 91
1996, 2000 & 2004 excluded from analysis
LDC2006
Avg_LDC
LDC2002

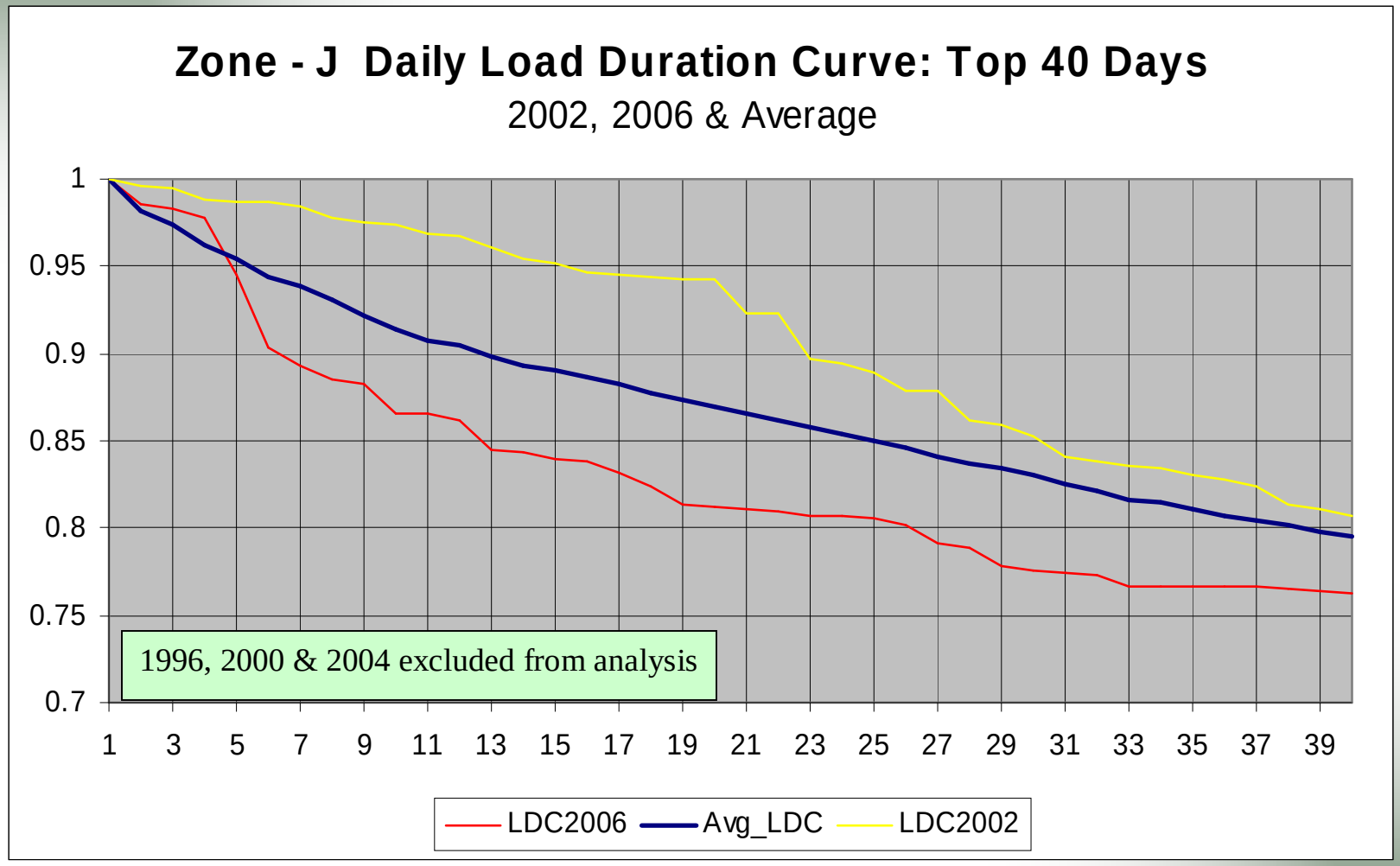
NYCA Daily Load Duration Curve: Top 40 Days

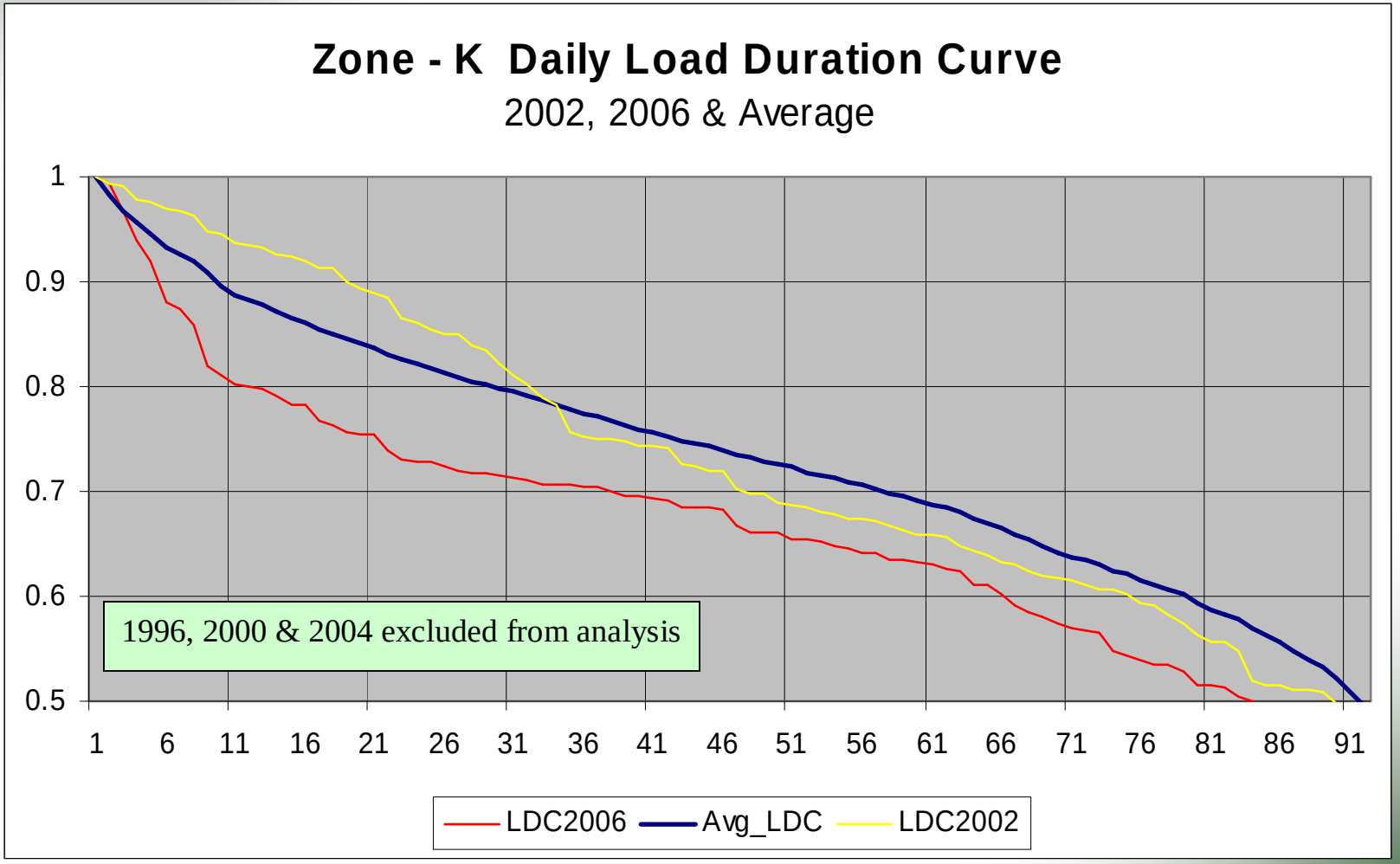
2002, 2006 & Average

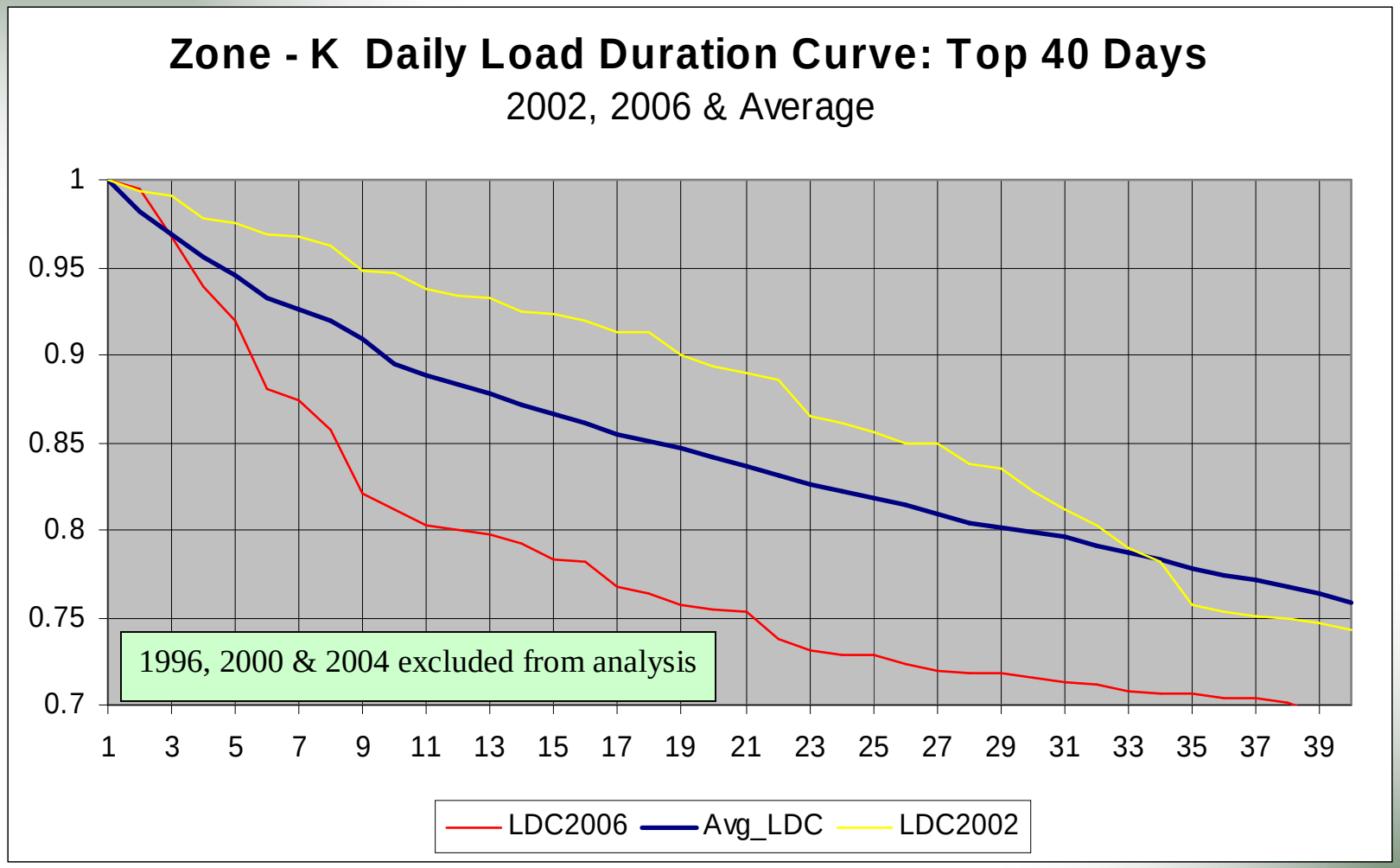


	AVG	2002	2006
Number of days above 90%:	12	19	8
Number of days above 95%:	6	11	2

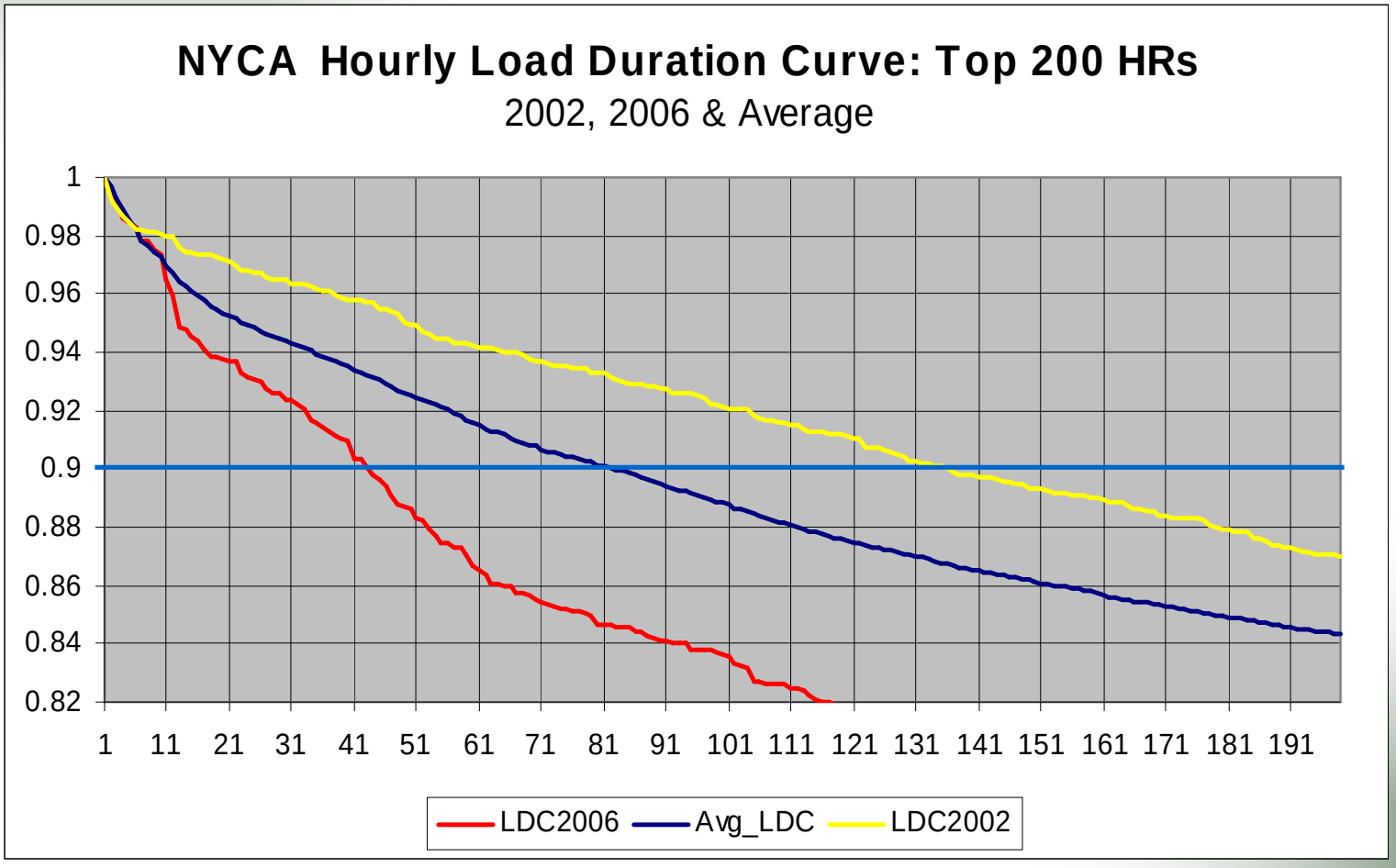

Zone - J Daily Load Duration Curve
2002, 2006 & Average
1
0.9
0.8
0.7
0.6
0.5
1 6 11 16 21 26 31 36 41 46 51 56 61 66 71 76 81 86 91
1996, 2000 & 2004 excluded from analysis
LDC2006
Avg_LDC
LDC2002


Zone - J Daily Load Duration Curve: Top 40 Days
2002, 2006 & Average
1
0.95
0.9
0.85
0.8
0.75
0.7
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39
1996, 2000 & 2004 excluded from analysis
LDC2006
Avg_LDC
LDC2002


Zone - K Daily Load Duration Curve
2002, 2006 & Average
1
0.9
0.8
0.7
0.6
0.5
1 6 11 16 21 26 31 36 41 46 51 56 61 66 71 76 81 86 91
1996, 2000 & 2004 excluded from analysis
LDC2006
Avg_LDC
LDC2002

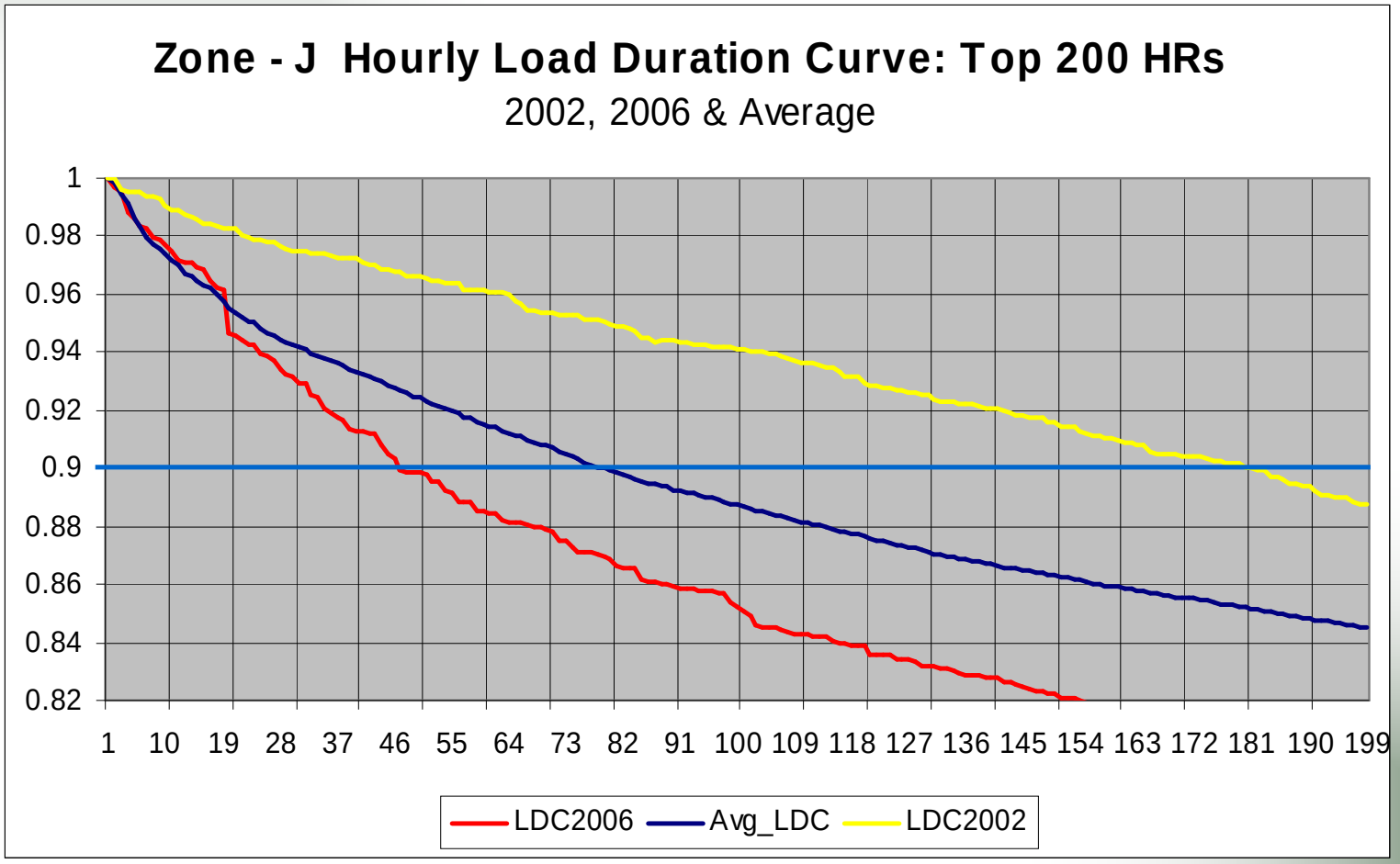

Zone - K Daily Load Duration Curve: Top 40 Days
2002, 2006 & Average
1
0.95
0.9
0.85
0.8
0.75
0.7
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39
1996, 2000 & 2004 excluded from analysis
LDC2006
Avg_LDC
LDC2002

Hourly View of NYCA LDCs

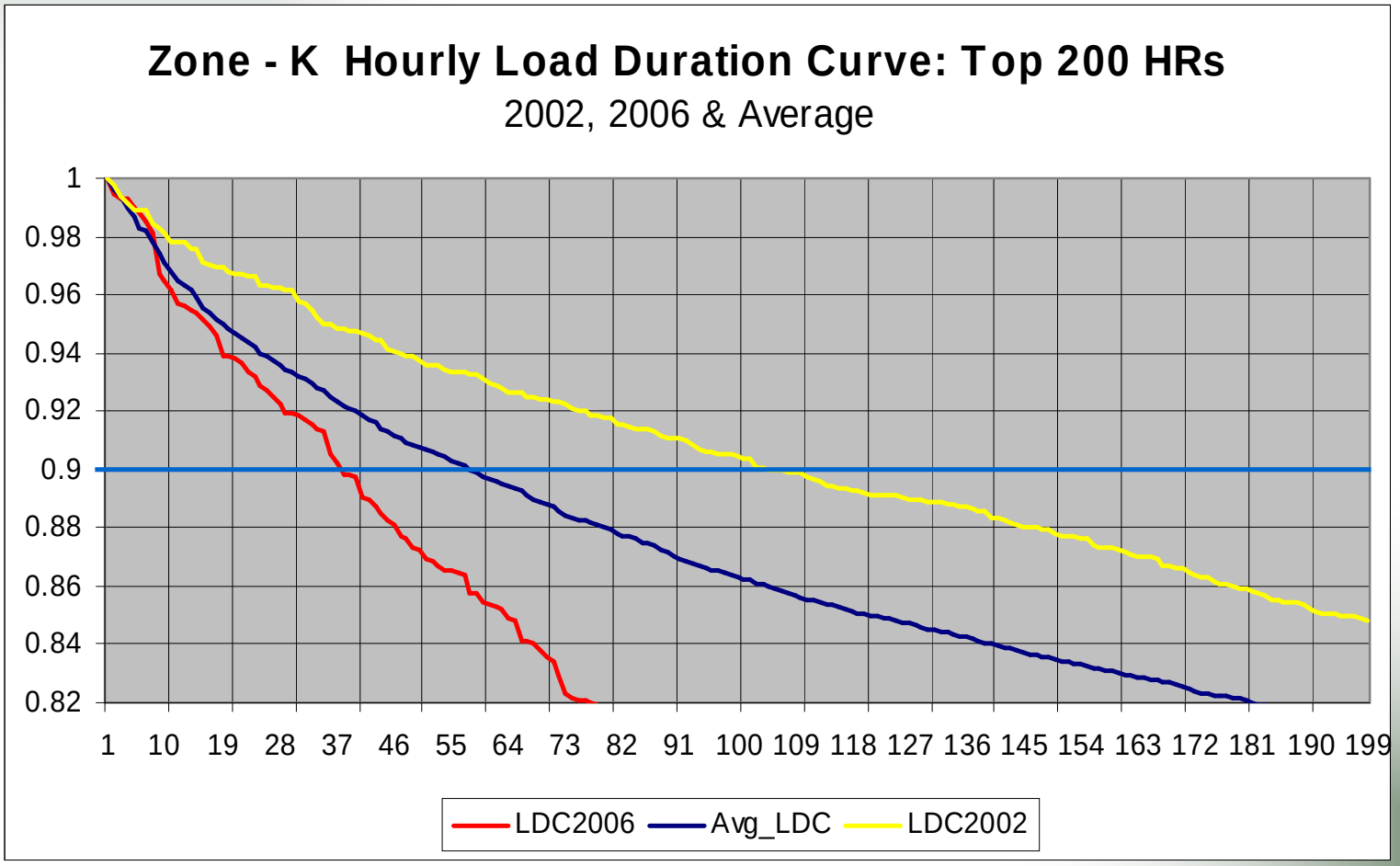


Draft – For Discussion Only

Hourly View of Zone-J LDCs



Hourly View of Zone-K LDCs



Conclusion

- 2006 Load Shape is less conservative compared to 2002.