GISDK Development and Project Coordination

KYTC STATEWIDE TRAFFIC MODEL

Corradino Work Areas

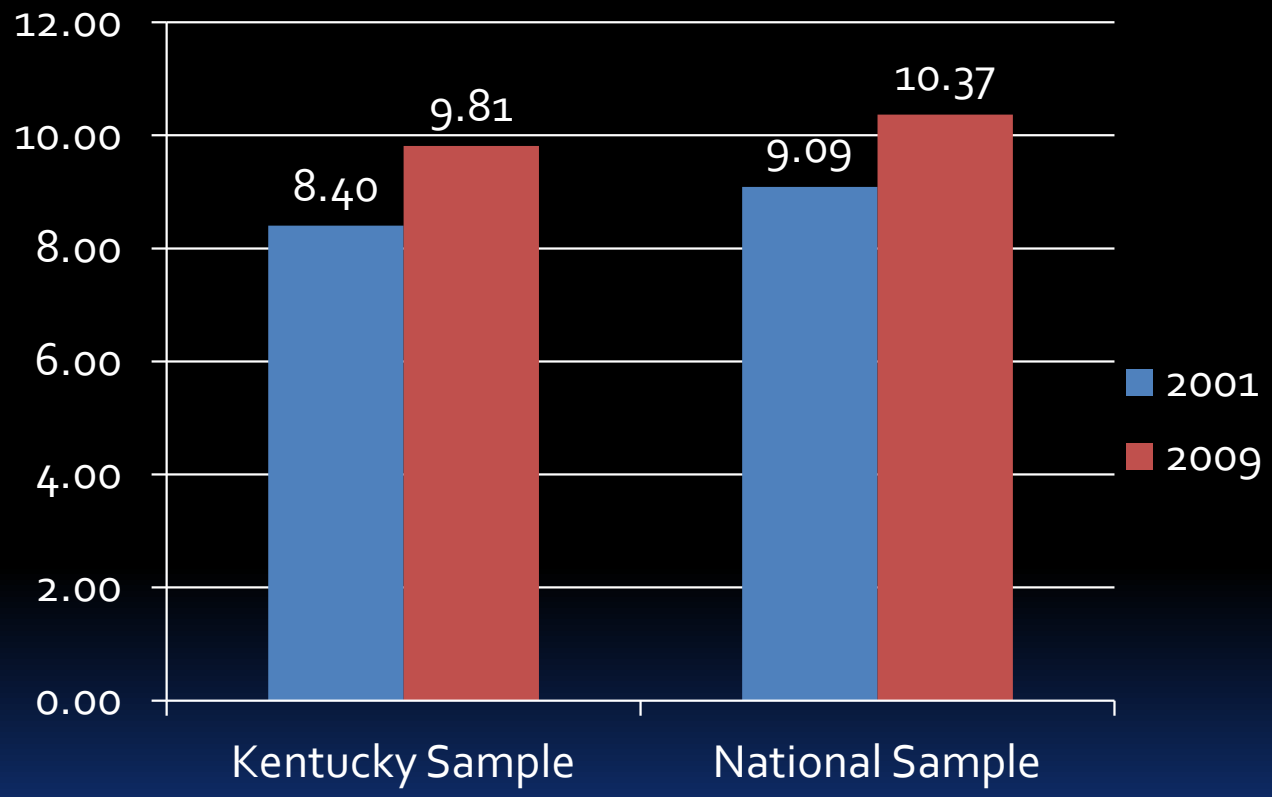
- Coordination
- Trip Rates
- Trip Lengths
- Truck Model
- Model Code Improvements
- Revised documentation
- Validation to 2010
- Forecast to 2040

Coordination

- Consultant team: Corradino, ENTRAN, PB
- Kick-off Meeting
- Organization
- GISDK coding conventions
- Schedule coordination

Daily Trip Rates

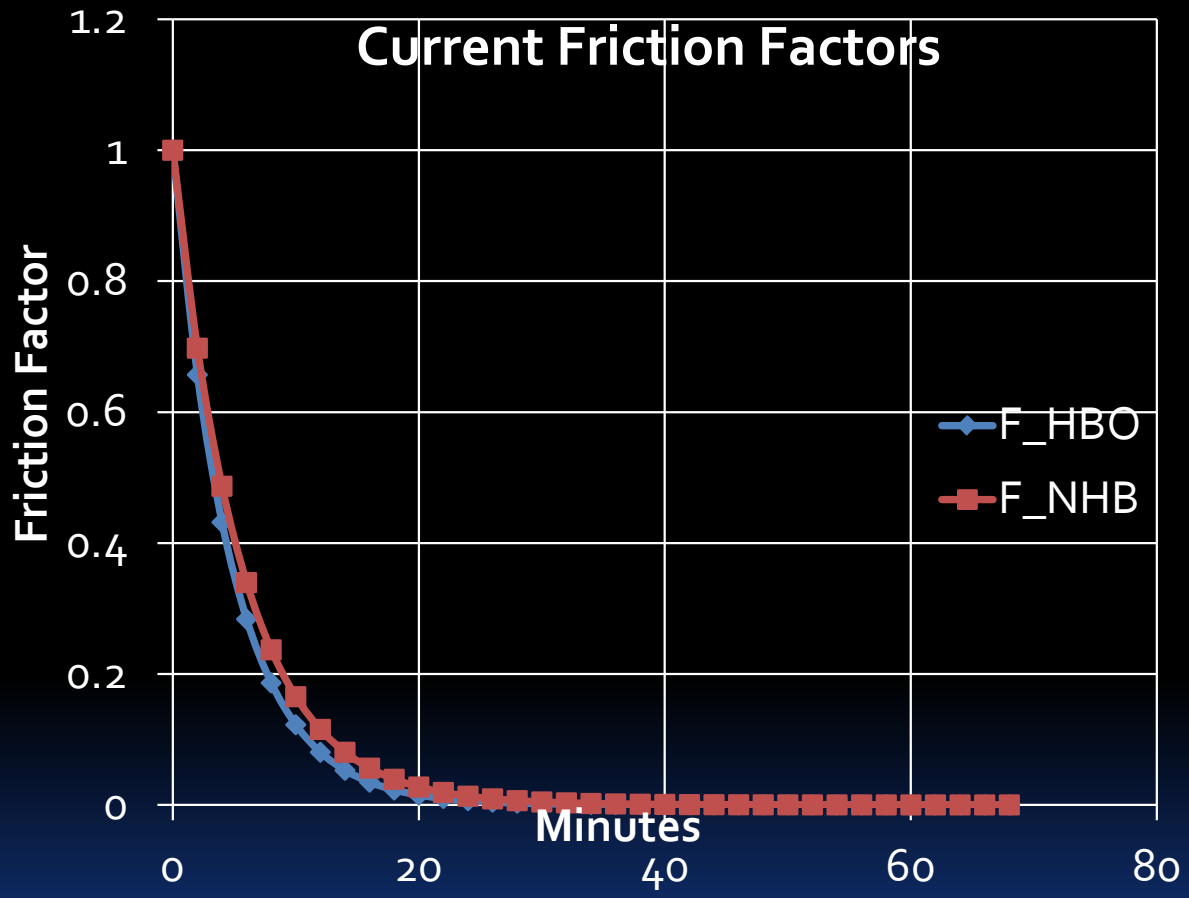
All internal person trips
NHTS: 2001 vs. 2009



Average Trip Lengths

- Comparisons will be made using NHTS data
- Current HBO & NHB Gravity Model based on exponential functions, not gamma or friction factors.
- HBW trips based on a trip table extracted from the 2001 CTPP, which will probably be continued.

Current HBO & NHB FF's



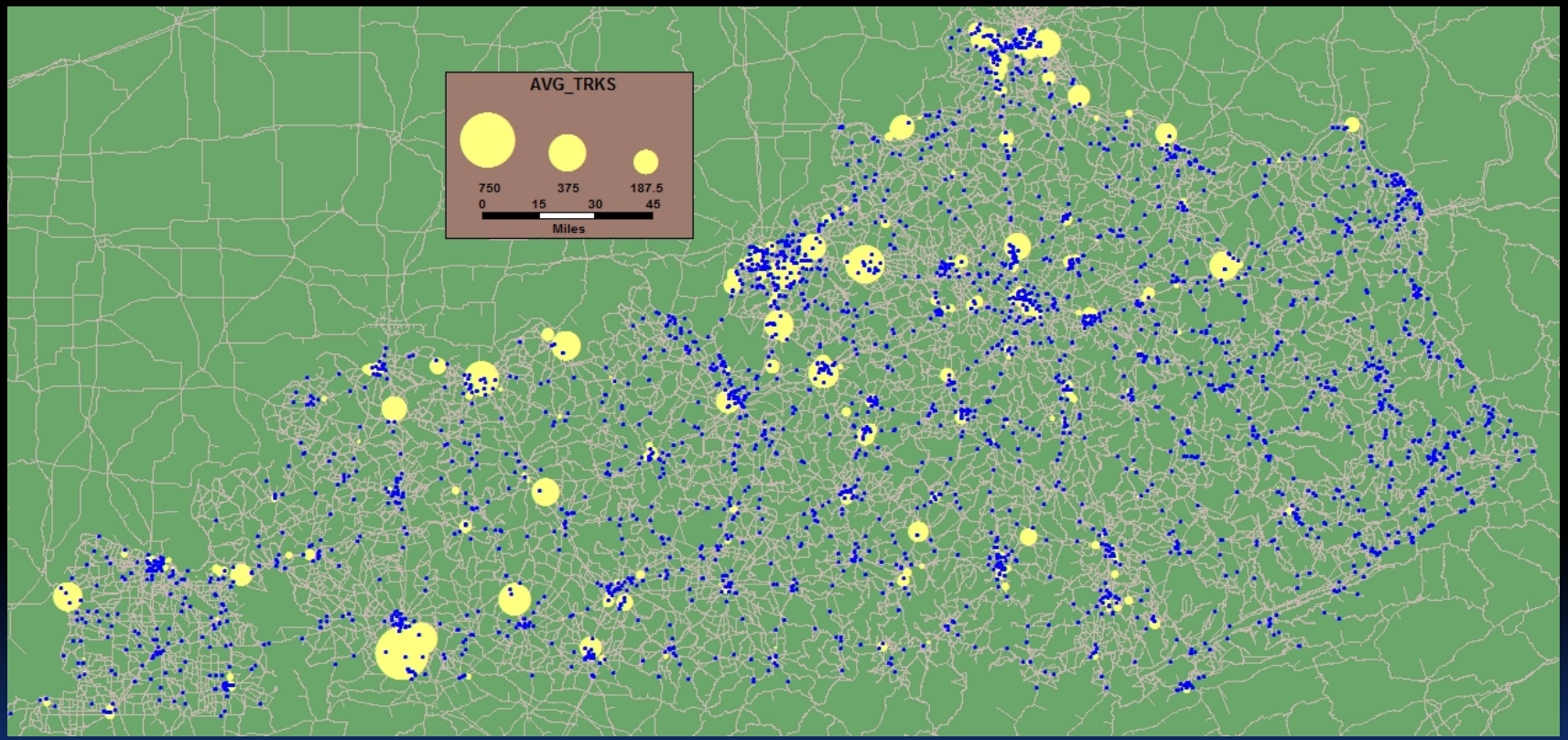
- Simple exponential functions, not FF or gamma.
- Implies an average an average trip time of about 5 minutes.
- Probably too short.

Truck Model

- Current Model Based on Transearch (Reebie) and matrix estimation.
- Current Model Interpolates between 2005 and 2030.
- This method will be retained, but the base tables will be adjusted to account for major truck generators using data from Economic Development Cabinet.
- Modify base truck trip tables on the basis of truck generators and truck counts (in-progress).

Truck Generators and Counts

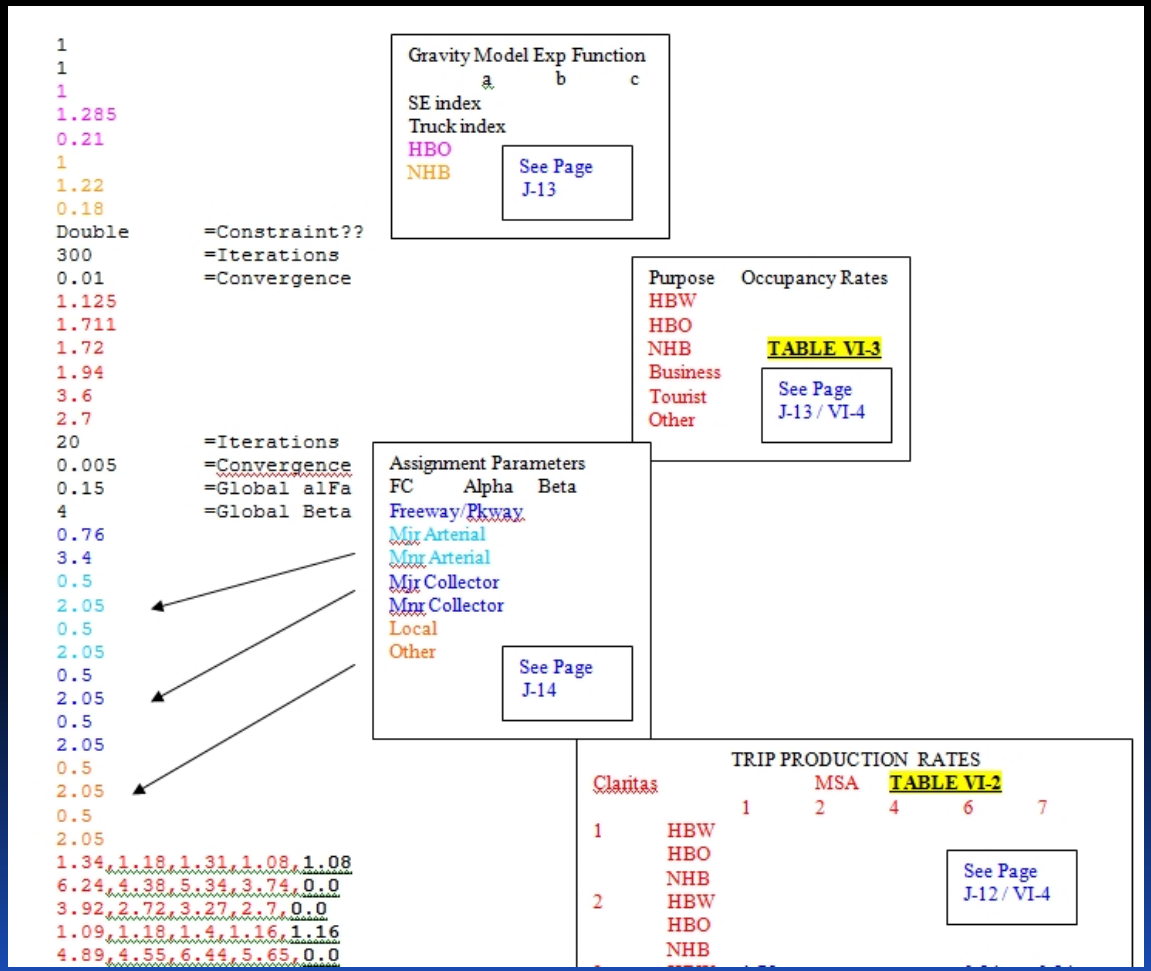
(from Economic Development Cabinet)



Changes in Model GISDK Code

- Input parameters fro "bin" files
- Improved Highway Assignment Methods
  - Origin Based or
  - Bi-conjugate Frank-Wolf
- More flexibility for trip rates ("MSA" classes)
- Easier process for adding a TAZ
- Model reporting

Current Parameters File (excerpt from KYTC documentation)



New Parameter Files

- Parameters
- Trip Production Rates
- Trip Attraction Rates
- Urban Speeds (temporary)
- Rural Speeds (temporary)
- Rural Capacity (temporary)

Parameters

Dataview1 - params

Name	Value	Comment
SE Index	1	Socioeconomic Data Index
Truck Index	1	Truck Index
HBO_a	1	HBO Gamma A
HBO_b	1.285	HBO Gamma B
HBO_c	0.21	HBO Gamma C
NHB_a	1	NHB Gamma A
NHB_b	1.22	NHB Gamma B
NHB_c	0.18	NHB Gamma C
GM Constraint	Double	Gravity Model Type
GM Iters	300	Gravity Model Maximum Iterations
GM Converge	0.005	Gravity Model Converge Requirement
HBW_Occ	1.125	HBW auto occupancy
HBO_Occ	1.711	HBO auto occupancy
NHB_Occ	1.72	NHB auto occupancy
Busi_Occ	1.94	Business auto occupancy
Tour_Occ	3.6	Tourist auto occupancy
Other_Occ	2.7	Other auto occupancy
Asgn Iters	20	Highway assignment maximum iterations
Asgn Converge	0.005	Highway Assignment Convergence Requirement
Bpr_a	0.15	General BPR alpha
Bpr_b	4	General BPR beta
Fwy_a	0.76	Freeway BPR alpha
Fwy_b	3.4	Freeway BPR beta
MajArt_a	0.5	Major Arterial BPR alpha
MajArt_b	2.05	Major Arterial BPR beta
MinArt_a	0.5	Minor Arterial BPR alpha
MinArt_b	2.05	Minor Arterial BPR beta
MajColl_a	0.5	Major Collector BPR alpha
MajColl_b	2.05	Major Collector BPR beta
MinColl_a	0.5	Minor Collector BPR alpha
MinColl_b	2.05	Minor Collector BPR beta
Local_a	0.5	Local BPR alpha
Local_b	2.05	Local BPR beta
Other_a	0.5	Other BPR alpha
Other_b	2.05	Other BPR beta
Ext Spd by FC	70,60,55,50,45,40,65,65,55,50,45,35	Outside KY speed by functional class
TermT_O	1,1.25,1,1.5,2,15	Origin Terminal Time by Area Type
TermT_D	1,1.75,2,2.5,3,15	Destination Terminal Time by Area Type
PCE by Terrain	1.5,2.5,4.5,2	Truck PCE by Terrain

Production Rates

Dataview1 - Prod_Rates

[Claritas AT Name]	Claritas	Pname	Purp	MSA1	MSA2	MSA4	MSA6	MSA7	MSA8
Rural	1	HBW	1	1.34000	1.18000	1.31000	1.08000	0.88000	0.88000
Rural	1	HBO	2	6.24000	4.38000	5.34000	3.74000	2.62000	2.62000
Rural	1	NHB	3	3.92000	2.72000	3.27000	2.70000	1.89000	1.89000
Town	2	HBW	1	1.09000	1.18000	1.40000	1.16000	0.98000	0.98000
Town	2	HBO	2	4.89000	4.55000	6.44000	5.65000	2.14000	2.14000
Town	2	NHB	3	2.92000	2.77000	3.93000	2.96000	0.82000	0.82000
Suburban	3	HBW	1	1.79000	1.27000	1.36000	0.84000	1.27000	1.27000
Suburban	3	HBO	2	5.96000	5.40000	5.57000	7.26000	3.03000	3.03000
Suburban	3	NHB	3	3.99000	3.61000	3.18000	2.72000	2.20000	2.20000
Second City	4	HBW	1	1.18000	1.00000	1.13000	1.17000	0.78000	0.78000
Second City	4	HBO	2	5.32000	4.84000	4.48000	4.95000	2.20000	2.20000
Second City	4	NHB	3	2.98000	2.68000	2.57000	2.80000	1.40000	1.40000
Urban	5	HBW	1	0.00000	0.00000	1.04000	0.51000	0.51000	0.51000
Urban	5	HBO	2	0.00000	0.00000	3.99000	2.14000	1.50000	1.50000
Urban	5	NHB	3	0.00000	0.00000	2.23000	0.82000	0.80000	0.80000

Attraction Rates

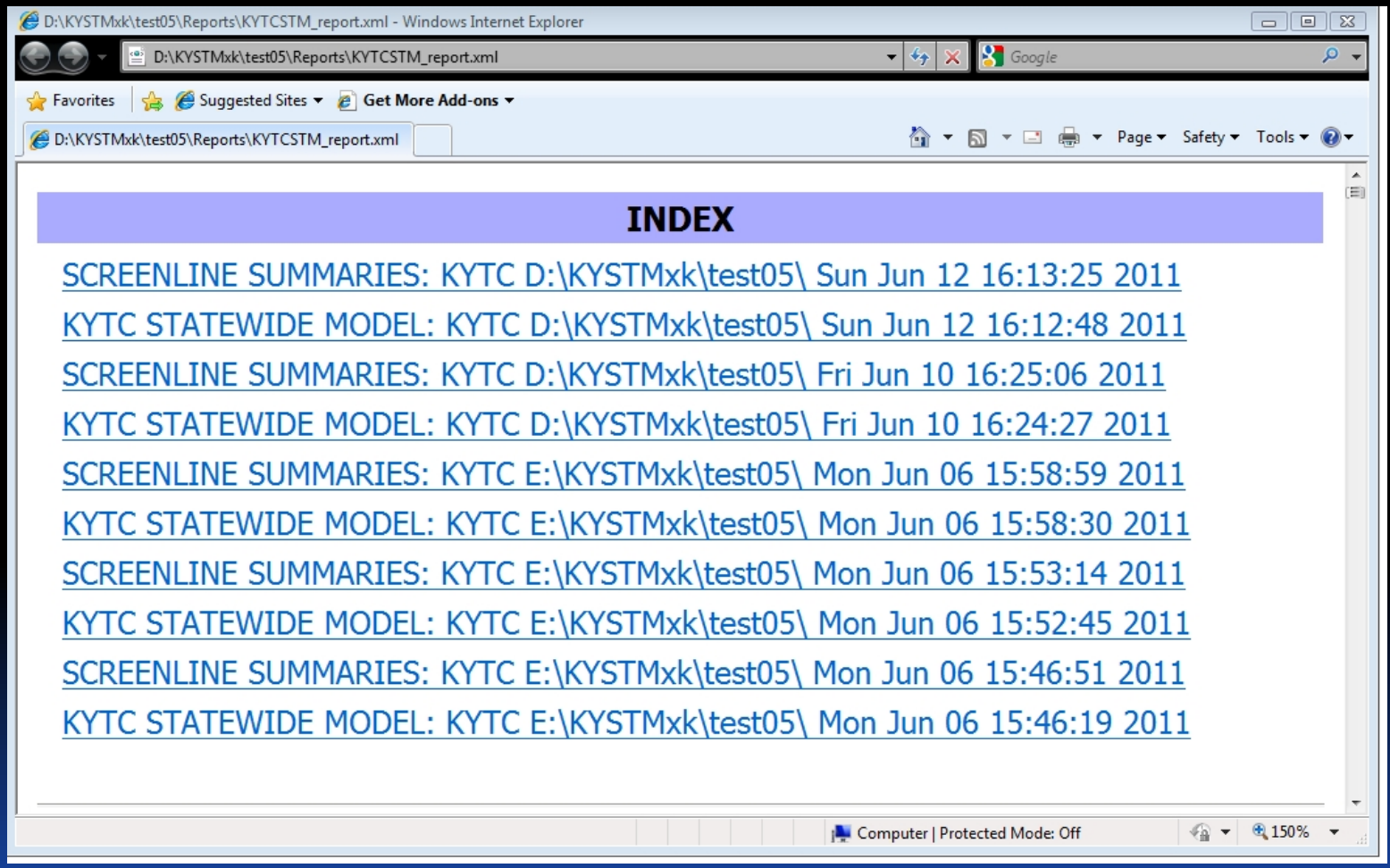
Dataview1 - Attr_Rates

ITEM	HBW	HBO	NHB
Service	0.81090	1.70000	1.20000
Retail	0.81090	9.00000	4.10000
Non-Retail	0.81090	0.50000	0.50000
Dwelling units	0.00000	0.90000	0.50000

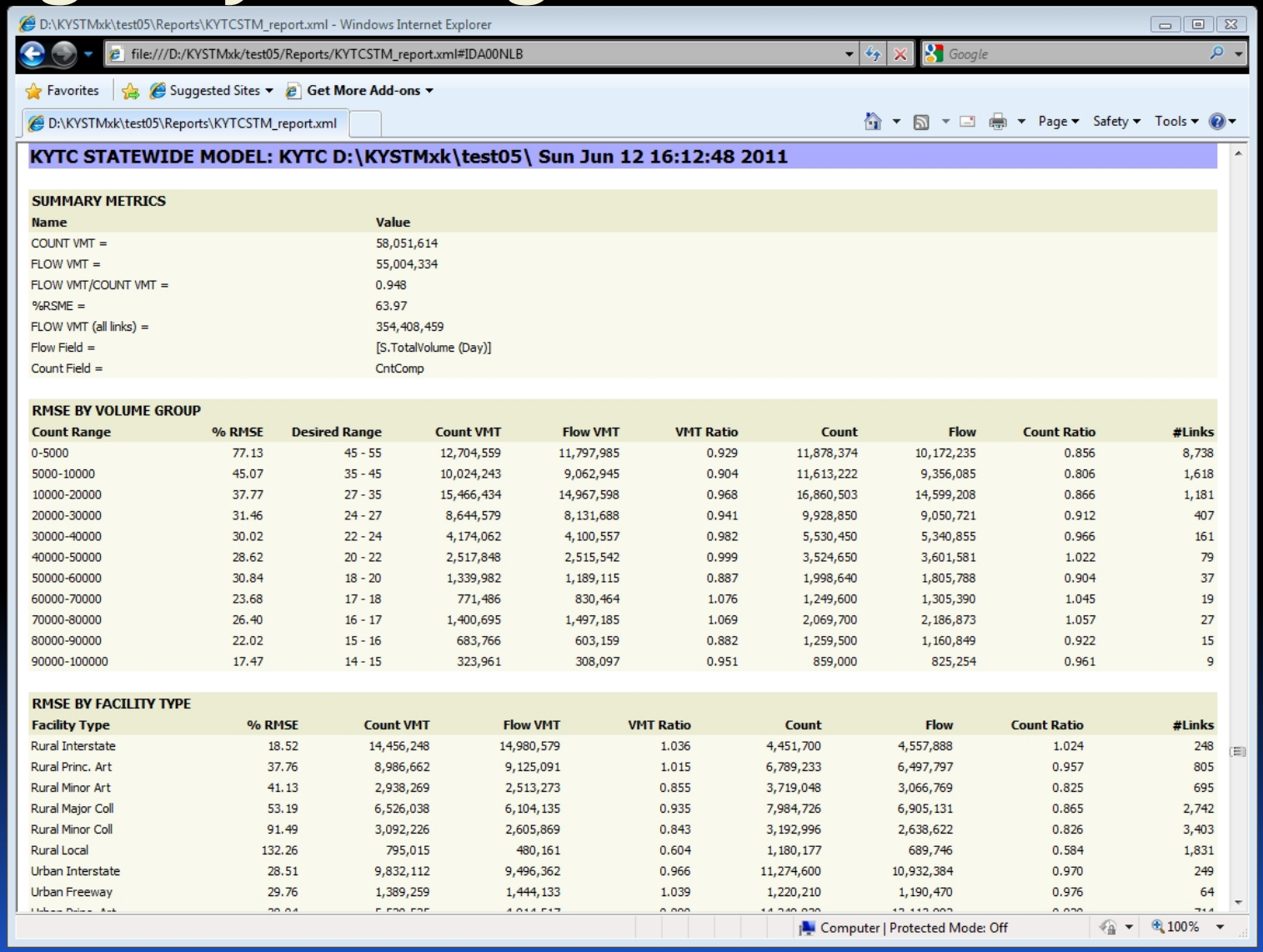
Reporting

- Output to XML files
  - Logs saved for each run
  - Errors displayed
  - Can be copied into Excel
- Example report for Highway Evaluation shown on following slide

Report Table of Contents



Highway Assignment Metrics



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Favorites | Suggested Sites | Get More Add-ons

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Page | Safety | Tools

KYTC STATEWIDE MODEL: KYTC D:\KYSTMxk\test05\ Sun Jun 12 16:12:48 2011

SUMMARY METRICS

Name	Value
COUNT VMT =	58,051,614
FLOW VMT =	55,004,334
FLOW VMT/COUNT VMT =	0.948
%RSME =	63.97
FLOW VMT (all links) =	354,408,459
Flow Field =	[S.TotalVolume (Day)]
Count Field =	CntComp

RMSE BY VOLUME GROUP

Count Range	% RMSE	Desired Range	Count VMT	Flow VMT	VMT Ratio	Count	Flow	Count Ratio	#Links
0-5000	77.13	45 - 55	12,704,559	11,797,985	0.929	11,878,374	10,172,235	0.856	8,738
5000-10000	45.07	35 - 45	10,024,243	9,062,945	0.904	11,613,222	9,356,085	0.806	1,618
10000-20000	37.77	27 - 35	15,466,434	14,967,598	0.968	16,860,503	14,599,208	0.866	1,181
20000-30000	31.46	24 - 27	8,644,579	8,131,688	0.941	9,928,850	9,050,721	0.912	407
30000-40000	30.02	22 - 24	4,174,062	4,100,557	0.982	5,530,450	5,340,855	0.966	161
40000-50000	28.62	20 - 22	2,517,848	2,515,542	0.999	3,524,650	3,601,581	1.022	79
50000-60000	30.84	18 - 20	1,339,982	1,189,115	0.887	1,998,640	1,805,788	0.904	37
60000-70000	23.68	17 - 18	771,486	830,464	1.076	1,249,600	1,305,390	1.045	19
70000-80000	26.40	16 - 17	1,400,695	1,497,185	1.069	2,069,700	2,186,873	1.057	27
80000-90000	22.02	15 - 16	683,766	603,159	0.882	1,259,500	1,160,849	0.922	15
90000-100000	17.47	14 - 15	323,961	308,097	0.951	859,000	825,254	0.961	9

RMSE BY FACILITY TYPE

Facility Type	% RMSE	Count VMT	Flow VMT	VMT Ratio	Count	Flow	Count Ratio	#Links
Rural Interstate	18.52	14,456,248	14,980,579	1.036	4,451,700	4,557,888	1.024	248
Rural Princ. Art	37.76	8,986,662	9,125,091	1.015	6,789,233	6,497,797	0.957	805
Rural Minor Art	41.13	2,938,269	2,513,273	0.855	3,719,048	3,066,769	0.825	695
Rural Major Coll	53.19	6,526,038	6,104,135	0.935	7,984,726	6,905,131	0.865	2,742
Rural Minor Coll	91.49	3,092,226	2,605,869	0.843	3,192,996	2,638,622	0.826	3,403
Rural Local	132.26	795,015	480,161	0.604	1,180,177	689,746	0.584	1,831
Urban Interstate	28.51	9,832,112	9,496,362	0.966	11,274,600	10,932,384	0.970	249
Urban Freeway	29.76	1,389,259	1,444,133	1.039	1,220,210	1,190,470	0.976	64

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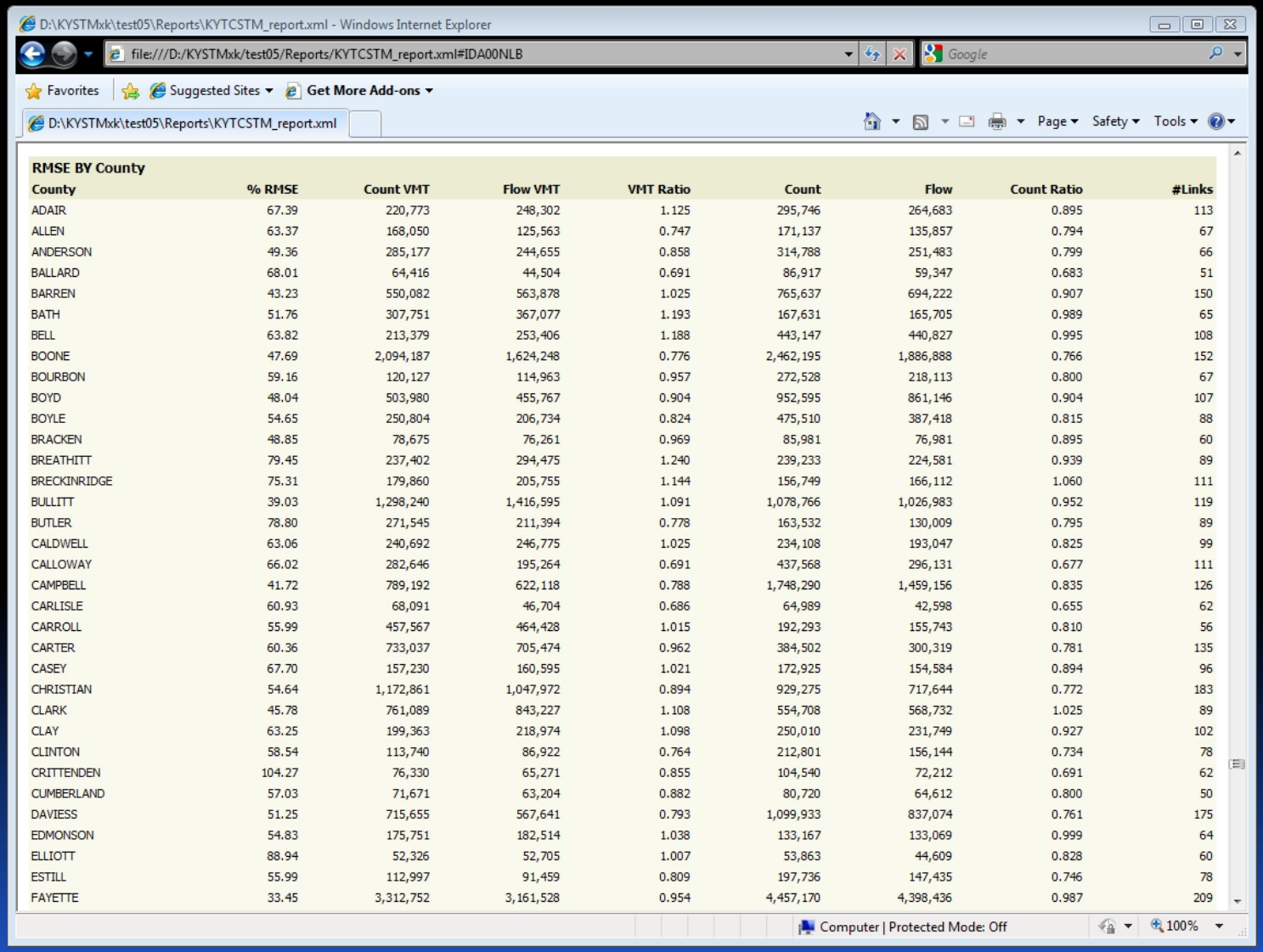
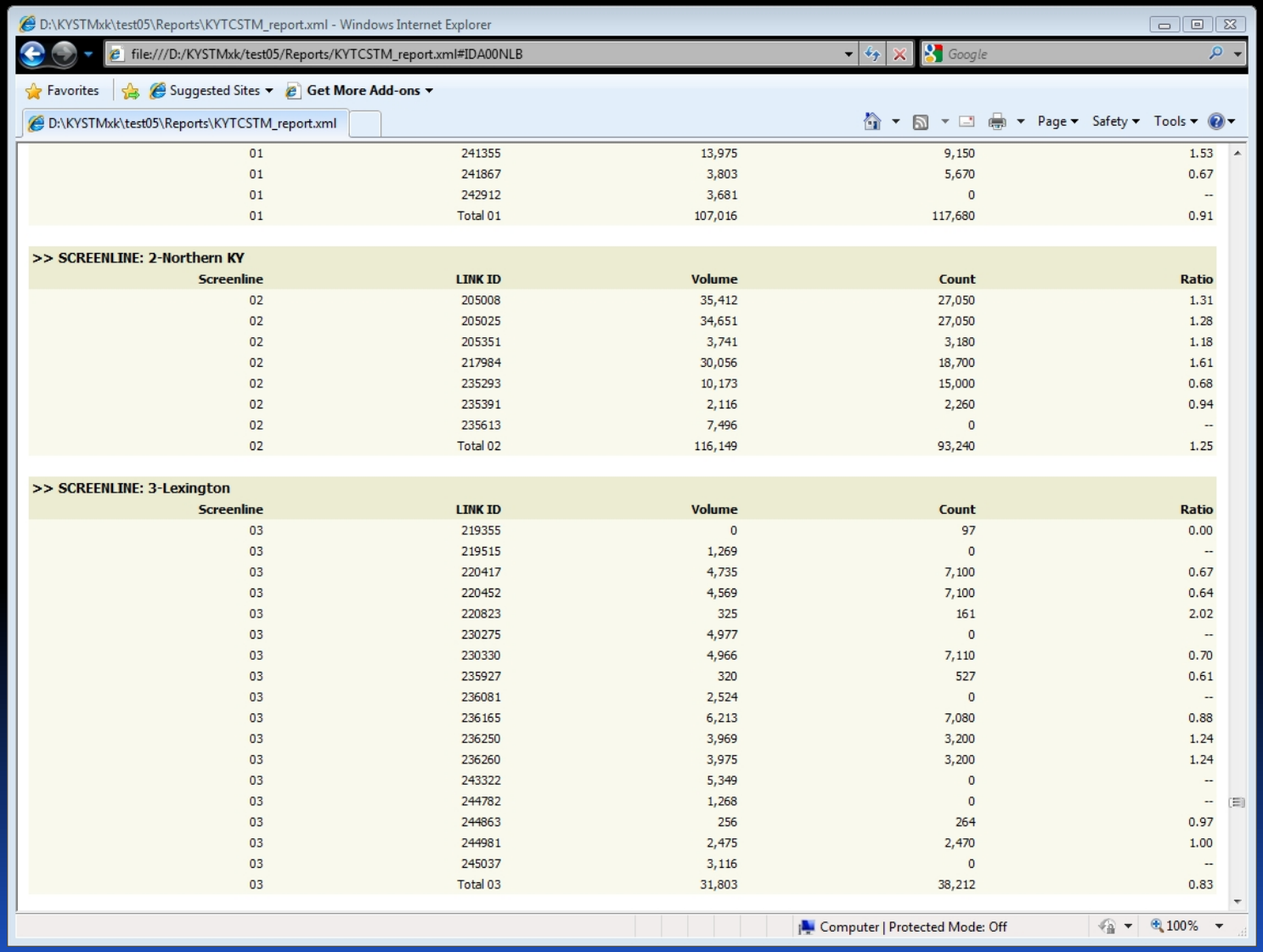
RMSE by County



RMSE BY County

County	% RMSE	Count VMT	Flow VMT	VMT Ratio	Count	Flow	Count Ratio	#Links
ADAIR	67.39	220,773	248,302	1.125	295,746	264,683	0.895	113
ALLEN	63.37	168,050	125,563	0.747	171,137	135,857	0.794	67
ANDERSON	49.36	285,177	244,655	0.858	314,788	251,483	0.799	66
BALLARD	68.01	64,416	44,504	0.691	86,917	59,347	0.683	51
BARREN	43.23	550,082	563,878	1.025	765,637	694,222	0.907	150
BATH	51.76	307,751	367,077	1.193	167,631	165,705	0.989	65
BELL	63.82	213,379	253,406	1.188	443,147	440,827	0.995	108
BOONE	47.69	2,094,187	1,624,248	0.776	2,462,195	1,886,888	0.766	152
BOURBON	59.16	120,127	114,963	0.957	272,528	218,113	0.800	67
BOYD	48.04	503,980	455,767	0.904	952,595	861,146	0.904	107
BOYLE	54.65	250,804	206,734	0.824	475,510	387,418	0.815	88
BRACKEN	48.85	78,675	76,261	0.969	85,981	76,981	0.895	60
BREATHITT	79.45	237,402	294,475	1.240	239,233	224,581	0.939	89
BRECKINRIDGE	75.31	179,860	205,755	1.144	156,749	166,112	1.060	111
BULLITT	39.03	1,298,240	1,416,595	1.091	1,078,766	1,026,983	0.952	119
BUTLER	78.80	271,545	211,394	0.778	163,532	130,009	0.795	89
CALDWELL	63.06	240,692	246,775	1.025	234,108	193,047	0.825	99
CALLOWAY	66.02	282,646	195,264	0.691	437,568	296,131	0.677	111
CAMPBELL	41.72	789,192	622,118	0.788	1,748,290	1,459,156	0.835	126
CARLISLE	60.93	68,091	46,704	0.686	64,989	42,598	0.655	62
CARROLL	55.99	457,567	464,428	1.015	192,293	155,743	0.810	56
CARTER	60.36	733,037	705,474	0.962	384,502	300,319	0.781	135
CASEY	67.70	157,230	160,595	1.021	172,925	154,584	0.894	96
CHRISTIAN	54.64	1,172,861	1,047,972	0.894	929,275	717,644	0.772	183
CLARK	45.78	761,089	843,227	1.108	554,708	568,732	1.025	89
CLAY	63.25	199,363	218,974	1.098	250,010	231,749	0.927	102
CLINTON	58.54	113,740	86,922	0.764	212,801	156,144	0.734	78
CRITTENDEN	104.27	76,330	65,271	0.855	104,540	72,212	0.691	62
CUMBERLAND	57.03	71,671	63,204	0.882	80,720	64,612	0.800	50
DAVIESS	51.25	715,655	567,641	0.793	1,099,933	837,074	0.761	175
EDMONSON	54.83	175,751	182,514	1.038	133,167	133,069	0.999	64
ELLIOTT	88.94	52,326	52,705	1.007	53,863	44,609	0.828	60
ESTILL	55.99	112,997	91,459	0.809	197,736	147,435	0.746	78
FAYETTE	33.45	3,312,752	3,161,528	0.954	4,457,170	4,398,436	0.987	209

Screenlines



01	241355	13,975	9,150	1.53
01	241867	3,803	5,670	0.67
01	242912	3,681	0	--
01	Total 01	107,016	117,680	0.91

>> SCREENLINE: 2-Northern KY

Screenline	LINK ID	Volume	Count	Ratio
02	205008	35,412	27,050	1.31
02	205025	34,651	27,050	1.28
02	205351	3,741	3,180	1.18
02	217984	30,056	18,700	1.61
02	235293	10,173	15,000	0.68
02	235391	2,116	2,260	0.94
02	235613	7,496	0	--
02	Total 02	116,149	93,240	1.25

>> SCREENLINE: 3-Lexington

Screenline	LINK ID	Volume	Count	Ratio
03	219355	0	97	0.00
03	219515	1,269	0	--
03	220417	4,735	7,100	0.67
03	220452	4,569	7,100	0.64
03	220823	325	161	2.02
03	230275	4,977	0	--
03	230330	4,966	7,110	0.70
03	235927	320	527	0.61
03	236081	2,524	0	--
03	236165	6,213	7,080	0.88
03	236250	3,969	3,200	1.24
03	236260	3,975	3,200	1.24
03	243322	5,349	0	--
03	244782	1,268	0	--
03	244863	256	264	0.97
03	244981	2,475	2,470	1.00
03	245037	3,116	0	--
03	Total 03	31,803	38,212	0.83

Coming soon …

- Trip length analyses
- Truck model improvements
- Many new model GISDK code improvements
- New TAZ system and zonal data (PB)
- New network (ENTRAN)
- HCM 2010 speed and capacity calculators (ENTRAN)