

Kentucky State Model Users Group

Possible User Interface Add-On's

June 20, 2007



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The “List”

- ❖ Model Error Report
- ❖ System Performance Report
- ❖ Mapping Macros
- ❖ Accessibility Index Report
- ❖ Air Quality Post-Processor
- ❖ Select / Critical Link Analysis
- ❖ User Cost Report



Model Error Report

- ❖ Stats reported by ...
 - Network as a whole
 - Volume group ranges
 - Designated screenlines and cutlines
 - Functional class and facility type
 - Area types
 - Designated major corridors
 - Links associated with special generators
- ❖ Can be compared to standards



Model Error Report

❖ Range of stats ...

- Means and standard deviations of counts & loadings
- Percent root mean square error
- Mean loading error and percentage error
- Mean absolute value error
- VMT percentage error
- Student's t-test critical confidence error



System Performance Report

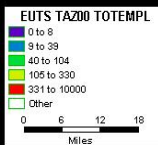
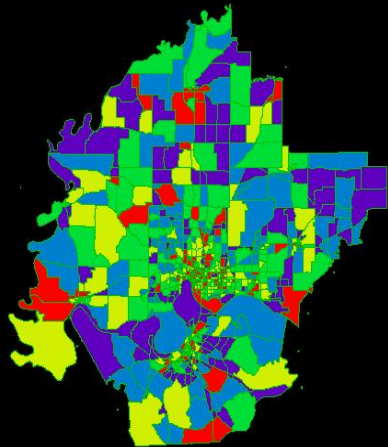
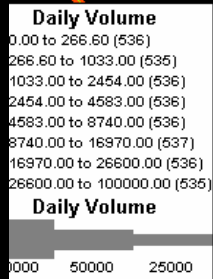
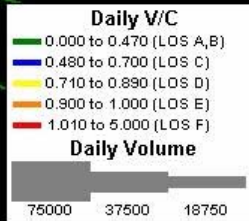
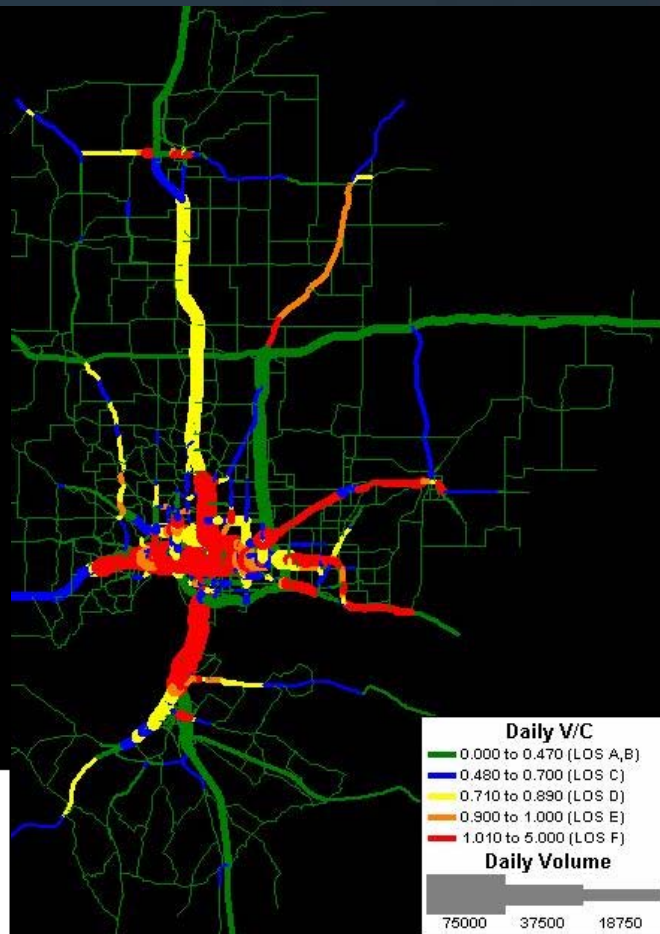
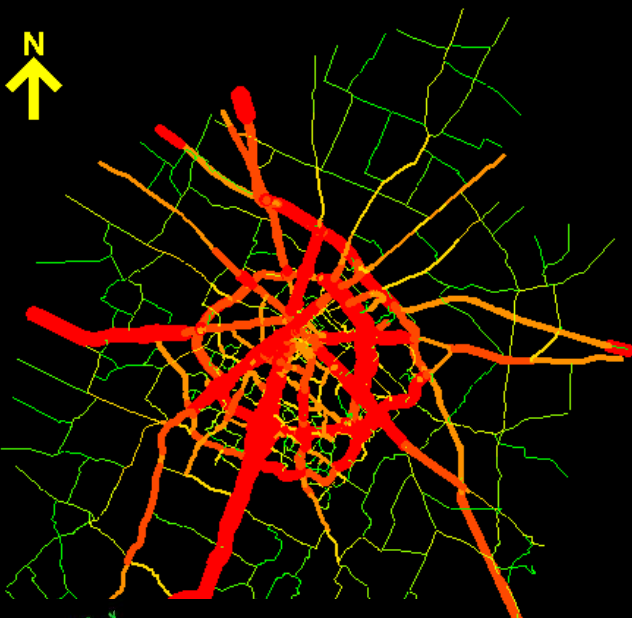
- ❖ Produces performance metrics related to congestion
- ❖ For the ...
 - Network as a whole
 - Important subsets of the network (e.g., facility type)
 - Individual links



System Performance Report

- ❖ Typical system-wide and subset metrics...
 - VMT and VHT
 - Average V/C weighted by VMT
 - Average “congested” speed weighted by VMT
 - Percent “congested” VMT (e.g., $V/C > .75$)
 - Percent “congested” VHT
 - Percent “congested” lane-miles
- ❖ Link-specific – LOS by *HCM2000* methods or V/C range
 - Definition of “capacity” can be an issue





Mapping Macros



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Accessibility Index Report

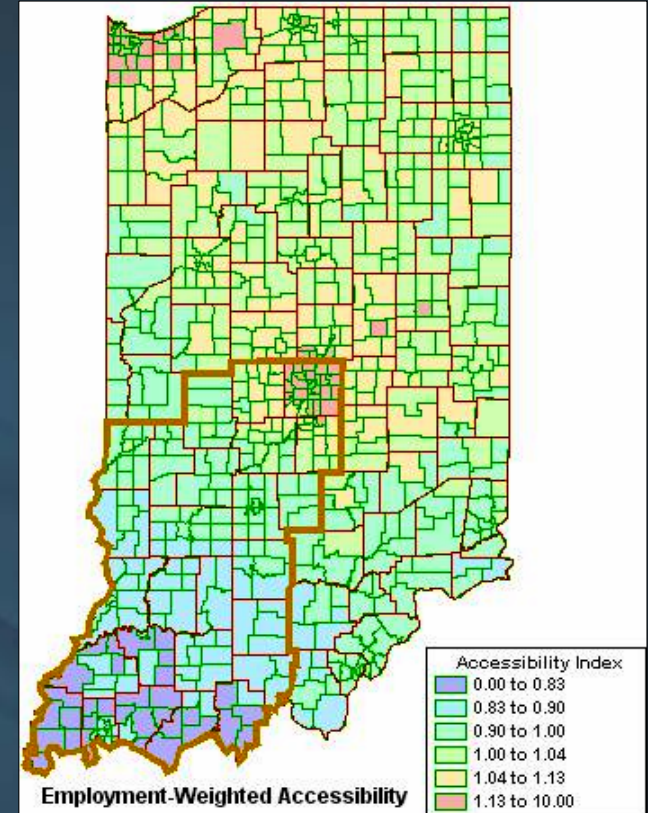
$$AI_j = \sum_j^n AF_j / t_{ij}^x$$

AI_j = Accessibility Index for zone i

AF_j = Attractive Force at zone j (anything)

t_{ij} = Network travel time between zones i and j

x = Impedance exponent



Applications in NEPA studies and Environmental Justice

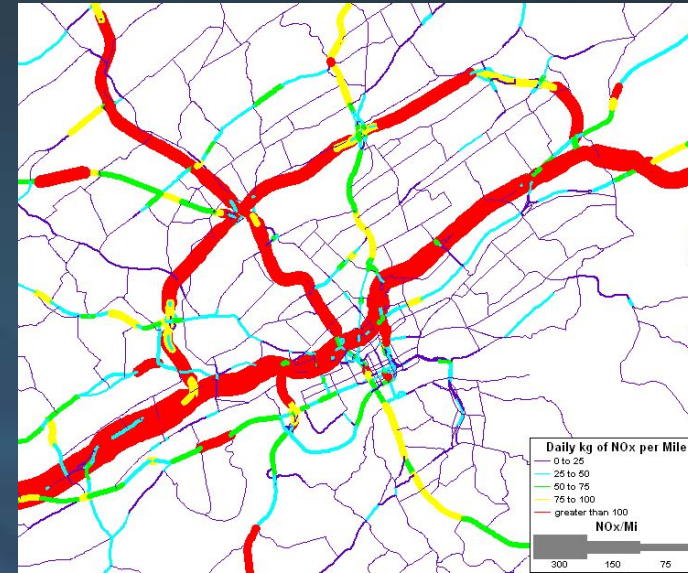
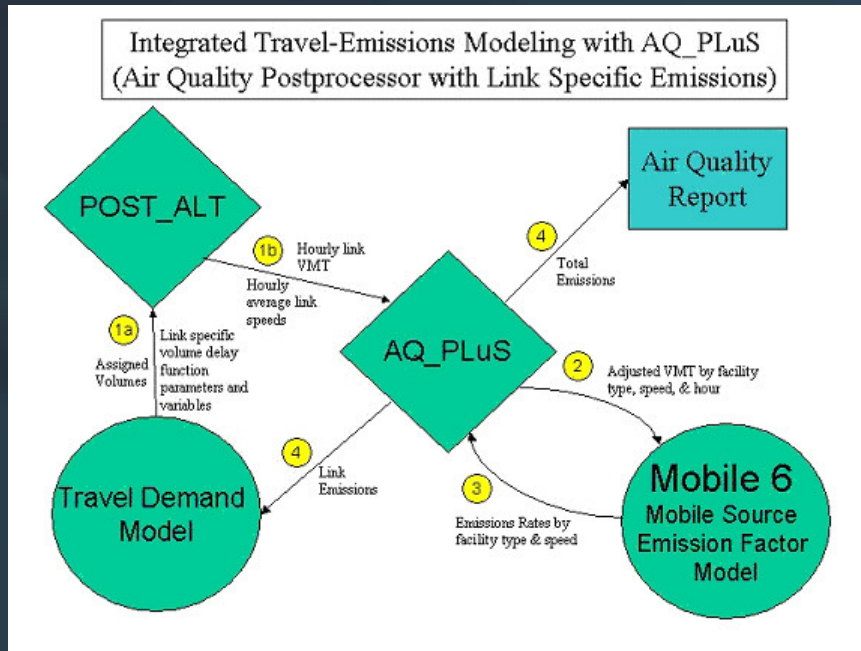


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**KENTUCKY
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Air Quality Post-Processing



Link-specific emissions & conformity analysis

Air Quality Conformity Analysis Report for Knoxville Region
from MOBILE6 and the Knoxville Regional Travel Demand Model

Mon Mar 29 02:08:59 2004

Year: 2000

12,748,220 VMT in Knox County

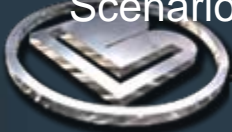
VOC

CO

NO_x

Scenario: 29.26 tons/day 326.91 tons/day 45.31 tons/day

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Select / Critical Link Analysis



- *How many trips are traveling between Evansville and Indianapolis on I-69 ?*
- *Show me the O-D flows*



User Cost Report

The I-69 Evansville to Indianapolis Study
 The Benefit Cost Analysis for Alternative 3C_7-7_NEWCOSTS
 Date: 10/22/03
 Time: 4:37:36 PM

Number of crashes by type & vehicle class

Application of crash rates / 100,000,000 VMT by facility type and volume range

***** SAFETY BENEFIT *****

A. Annual Number of Accidents by Severity

1. Fatal Accidents (Mainline)

	Auto Work	Auto Commute	Auto Non-Work	Truck	Total
Base Year Build Network	88	387	964	316	1,755
Forecast Year Build Network	113	498	1,241	377	2,229
Base Year E+C Network	88	390	970	317	1,765
Forecast Year E+C Network	113	500	1,244	378	2,235

2. Injury Accidents (Mainline)

	Auto Work	Auto Commute	Auto Non-Work	Truck	Total
Base Year Build Network	4,111	18,127	45,149	14,776	82,162
Forecast Year Build Network	5,423	23,916	59,568	18,090	106,997
Base Year E+C Network	4,153	18,312	45,610	14,903	82,978
Forecast Year E+C Network	5,497	24,240	60,374	18,323	108,434

3. PDO Accidents (Mainline)

	Auto Work	Auto Commute	Auto Non-Work	Truck	Total
Base Year Build Network	6,079	26,806	66,766	21,851	121,501
Forecast Year Build Network	8,045	35,479	88,368	26,836	158,728
Base Year E+C Network	6,118	26,980	67,200	21,958	122,255
Forecast Year E+C Network	8,124	35,824	89,227	27,080	160,255



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User Cost Report

Conversion of crashes by type to monetary costs

Delta between No-Build and Build costs is the safety benefit.

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***** SAFETY BENEFIT *****

C. Breakdown of Annual Accident Cost

1. Fatal Accident Cost (Mainline)

	Auto Work		Auto Commute		Auto Non-Work		Truck	
	Monetary	Non-Monetary	Monetary	Non-Monetary	Monetary	Non-Monetary	Monetary	Non-Monetary
Base Year Build Network	\$93,948,607	\$254,009,196	\$414,297,954	\$1,120,138,912	\$1,031,894,531	\$2,789,937,066	\$337,723,161	\$913,103,361
Forecast Year Build Network	\$120,915,861	\$326,920,662	\$533,219,126	\$1,441,666,526	\$1,328,092,247	\$3,590,767,926	\$403,323,614	\$1,090,467,548
Base Year E+C Network	\$94,537,387	\$255,601,083	\$416,894,379	\$1,127,158,876	\$1,038,361,464	\$2,807,421,736	\$339,293,069	\$917,347,926
Forecast Year E+C Network	\$121,204,877	\$327,702,076	\$534,493,640	\$1,445,112,434	\$1,331,266,687	\$3,599,350,672	\$404,033,779	\$1,092,387,626

2. Injury Accident Cost (Mainline)

	Auto Work		Auto Commute		Auto Non-Work		Truck	
	Monetary	Non-Monetary	Monetary	Non-Monetary	Monetary	Non-Monetary	Monetary	Non-Monetary
Base Year Build Network	\$104,730,509	\$283,160,265	\$461,844,376	\$1,248,690,349	\$1,150,318,705	\$3,110,120,944	\$376,481,566	\$1,017,894,605
Forecast Year Build Network	\$138,177,953	\$373,592,243	\$609,342,121	\$1,647,480,548	\$1,517,692,270	\$4,103,390,213	\$460,902,571	\$1,246,143,988
Base Year E+C Network	\$105,801,063	\$286,054,727	\$466,565,345	\$1,261,454,450	\$1,162,077,252	\$3,141,912,571	\$379,718,211	\$1,026,645,532
Forecast Year E+C Network	\$140,048,895	\$378,650,715	\$617,592,666	\$1,669,787,580	\$1,538,241,957	\$4,158,950,477	\$466,849,894	\$1,262,223,788

3. PDO Accident Cost (Mainline)

	Auto Work		Auto Commute		Auto Non-Work		Truck	
	Monetary	Non-Monetary	Monetary	Non-Monetary	Monetary	Non-Monetary	Monetary	Non-Monetary
Base Year Build Network	\$34,157,353	\$5,560,499	\$150,628,327	\$24,520,890	\$375,170,925	\$61,074,337	\$122,787,656	\$19,988,688
Forecast Year Build Network	\$45,209,022	\$7,359,608	\$199,364,375	\$32,454,666	\$496,558,110	\$80,835,041	\$150,797,967	\$24,548,506
Base Year E+C Network	\$34,379,837	\$5,596,718	\$151,609,444	\$24,680,607	\$377,614,600	\$61,472,144	\$123,388,647	\$20,086,524
Forecast Year E+C Network	\$45,648,656	\$7,431,176	\$201,303,088	\$32,770,270	\$501,386,873	\$81,621,119	\$152,168,784	\$24,771,663



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User Cost Report

Same thing can be done with travel time costs, although a little more complex. The computations are on trip tables instead of link volumes.

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Date: 10/22/03
Time: 4:37:36 PM

***** MOBILITY BENEFIT *****

A. Daily Travel Time Benefit (in vehicle-hours)

	Passenger Vehicle	Truck
Base Year	10,183	2,425
Forecast Year	17,271	4,616

B. Annual Travel Time Benefit by Trip Type

	Auto Work	Auto Commute	Auto Non-Work	Single Truck	Heavy Truck
Base Year	\$5,198,644	\$14,790,430	\$34,075,721	\$5,189,694	\$18,808,796
Forecast Year	\$8,816,712	\$25,084,035	\$57,791,193	\$9,878,043	\$35,800,584

C. Total Mobility Benefit

Base Year	\$78,063,284
Forecast Year	\$137,370,567



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thank you!



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