Kentucky Statewide Model

Kentucky Model User's Group

October 3, 2007

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Overview

- Brief History of Statewide Model
- Two In-House Efforts
  - Springfield
  - Gilliland
- Lessons Learned
  - Successful Usage
  - Limitations

Model Development History

- 2003, Conversion from MINUTP started
- 2005, Version 1.0 completed
  - Truck component
  - Two TAZ levels, regular, and sub-zone
  - But, takes ***2-6 hours*** to run

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Model Development History

- Version 2.0, rolled out in 2006
  - run time improved to 1 hour
  - select link added
  - but, future forecasts didn't seem reasonable

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Model Development History

- So why use the statewide model?

- Model contains three levels of SE data
- Runtimes are very reasonable to run complete

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Two Modeling Efforts

- Completion of the Springfield Bypass
  - Washington County ~ Rural
- Impact study of a new I-64 Interchange
  - Jefferson/Shelby County ~ Fringe Urban

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In-house Modeling

- Our First Steps:
  - Established Area of Interest
    - drew a circle around the area
  - Used Allroads.shp
    - Added centerline file as a layer and traced new links
  - Filled in new road attributes
    - from HIS/EXOR database and similar roads

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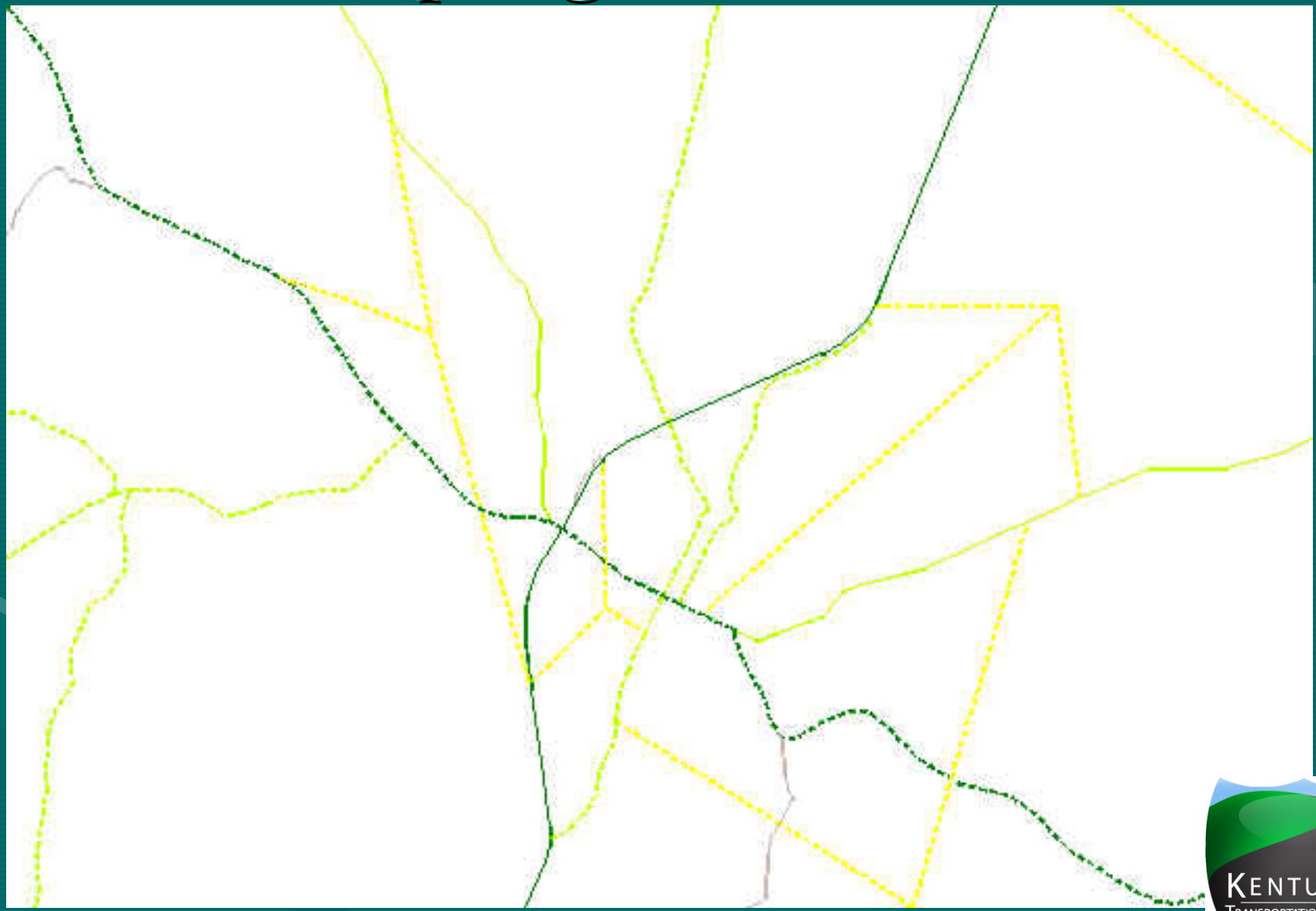
Springfield, KY



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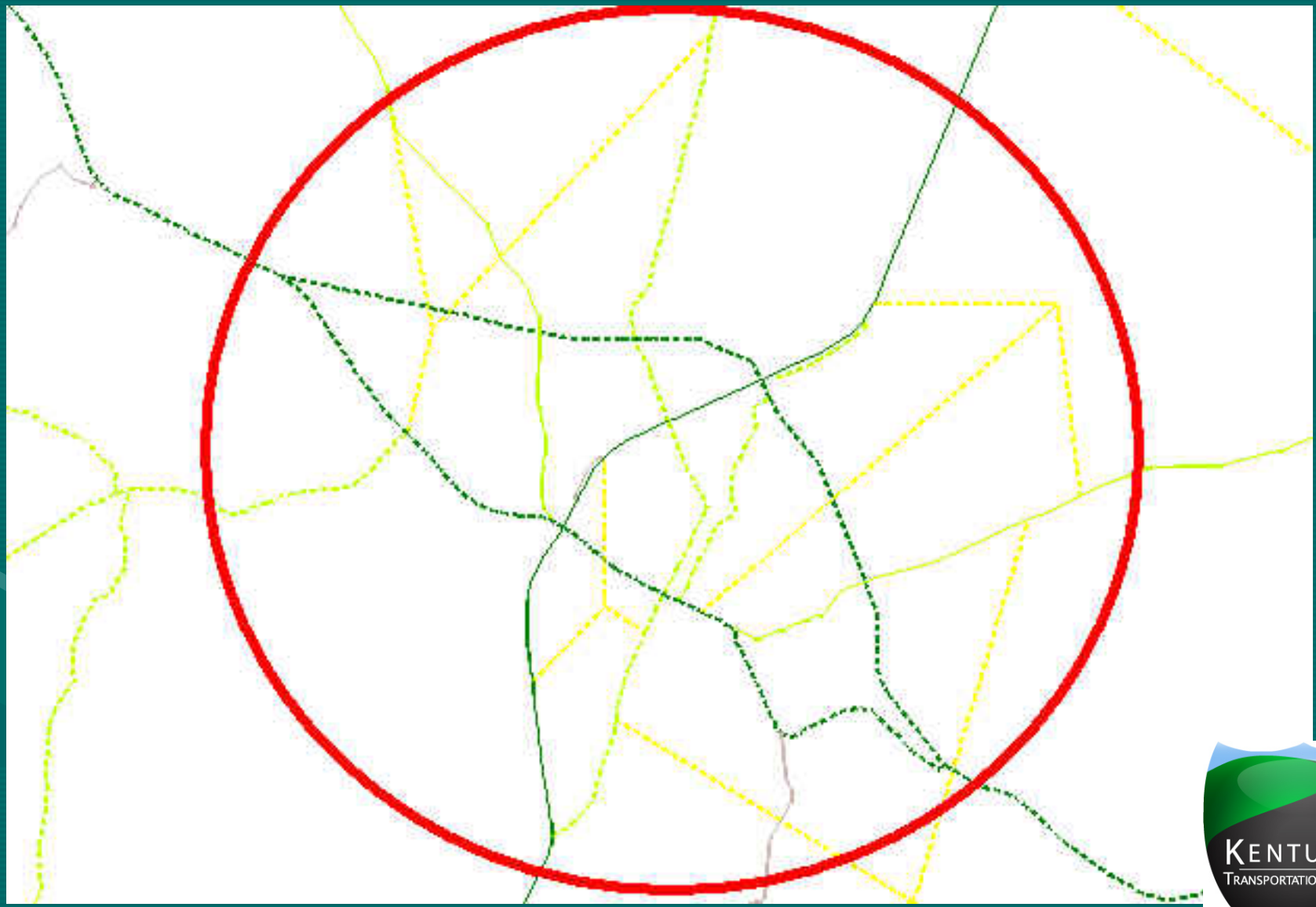
Study Area, 9 roads crossed



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Ready to run the scenarios? ….Not yet.

- Developed spreadsheet to track results
  - desired bypass split= 50%
- Made initial no-build assignment run
  - Initially, 91% of traffic took the existing bypass
- Compared ADT's at screen line
  - The sum of the 9 routes was within 85%

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Ready to run the scenarios? ….Not yet.

- Adjusted scenario speeds and travel times
  - took 10 iterations to get 67/33 split w/o signals
  - took 7 iterations to get 52/48 split w/ signals
- Adjusted speeds US150, north of town
- Opened the new link with similar bypass speeds

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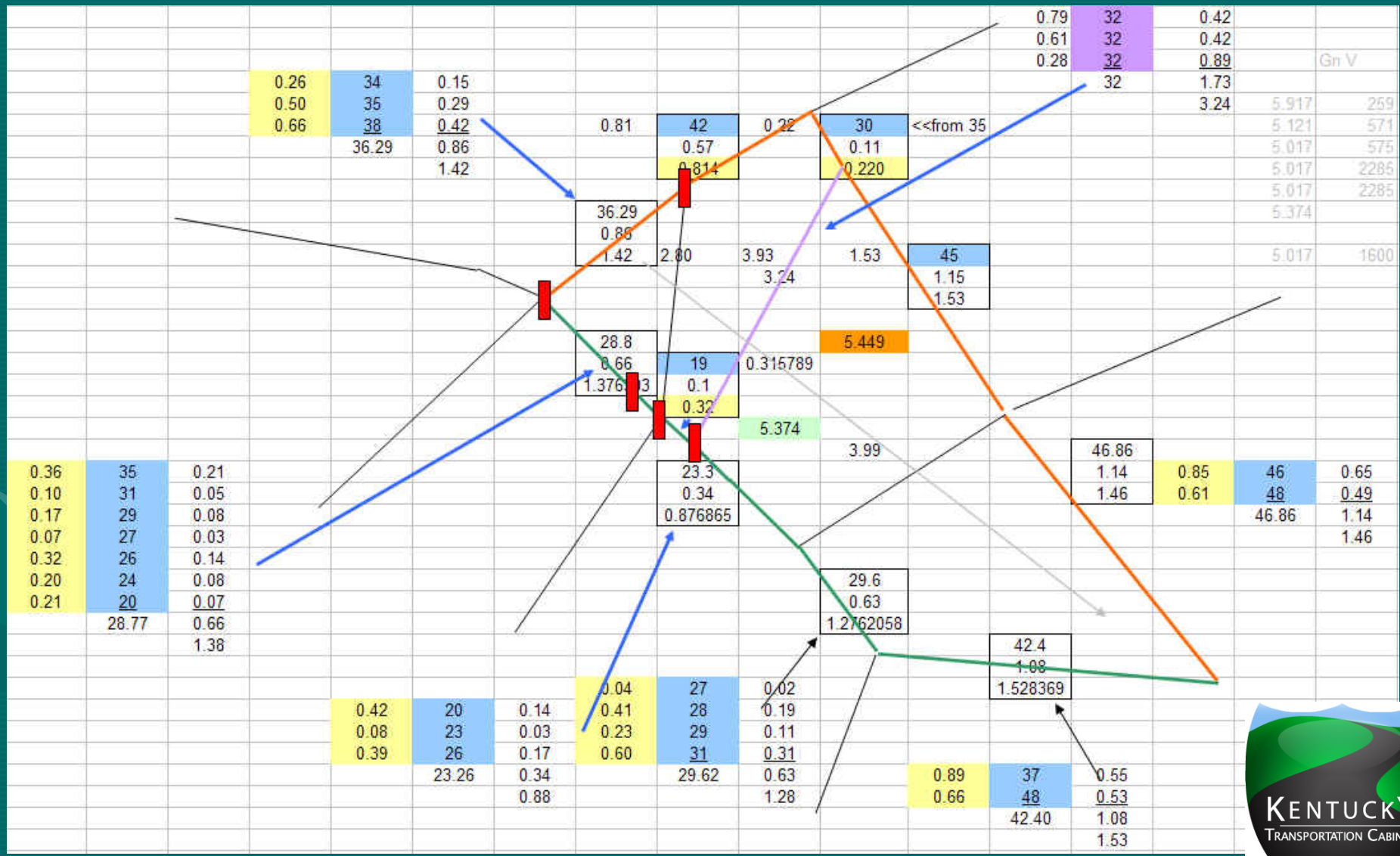
Post processing spreadsheet



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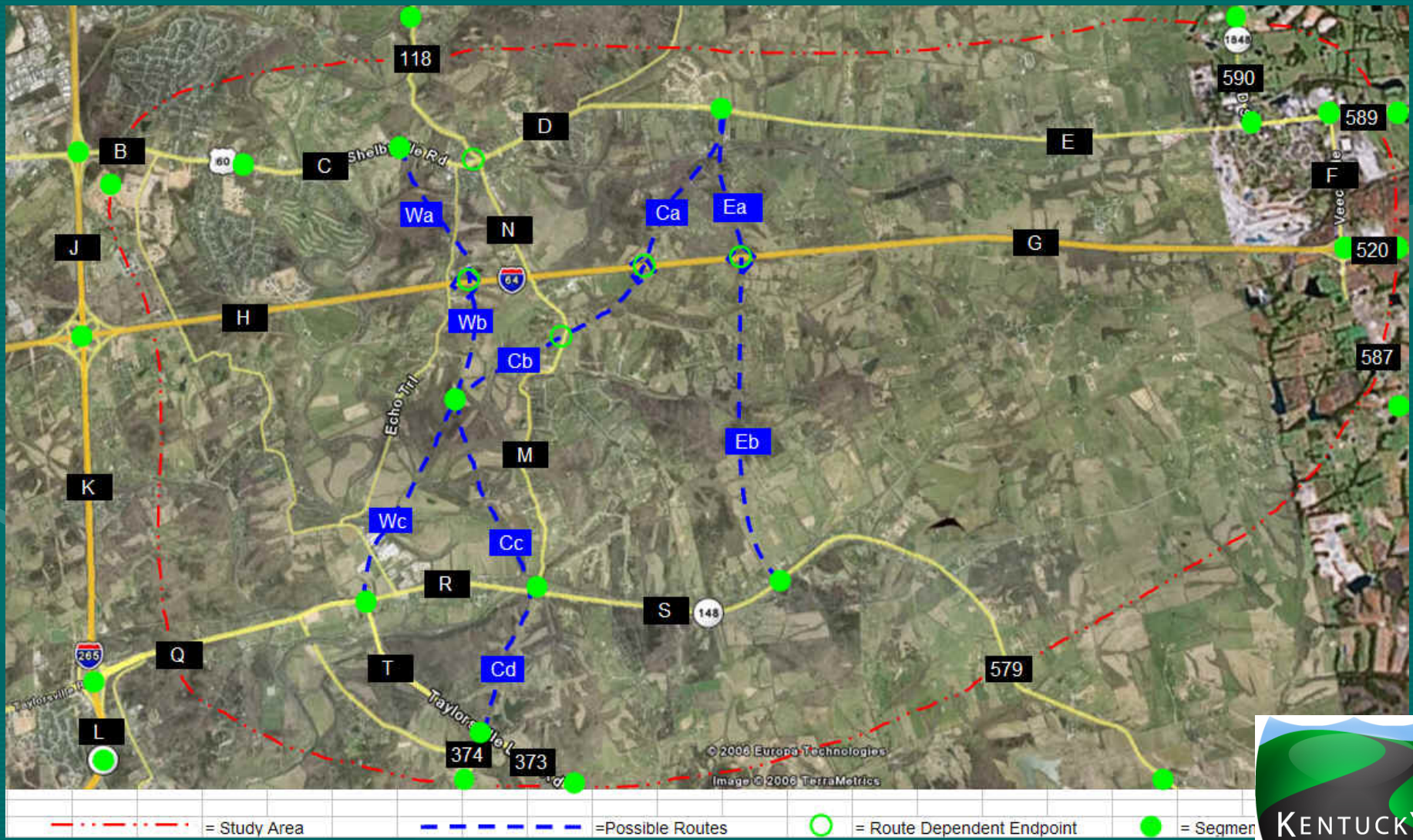
Springfield Final Results

• Update network	2 hours
• Initial analysis	4 hours
• Calibration runs	28 hours
• Build scenario	2 hours
• Final Report	6 hours
	total 42 hours

Gilliland Interchange Study



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Our second project!

- Elements
  - Three general routes
  - Ten alternates
  - Estimate impact along adjacent links

Our second project!

Steps

- Established project limits
- Used Allroads.shp
  - added links for connectivity
- Ran calibration runs for current year
  - adjusted speeds to adjust trip assignments
  - established 'feel' for reasonable link speeds

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Gilliland Interchange Study
Calibration Results

		BASE RUN COMPARISON TO ACTUAL COUNTS							
	Segments	Sta	Year	Count	2006 est			No Build	
US 60	B	998	2005	33300	34800	-0.36	(12118)	28095	0.81
	C	16	2005	15900	16500	-0.19	(3097)	14871	0.90
	D	119	2006	9640	9600	-0.21	(2035)	8522	0.89
	E	596	2004	5920	6300	-0.35	(2044)	5178	0.82
I-64	H	19	2006	52000	52000	-0.06	(3054)	50450	0.97
	G	19	2006	52032	52000	-0.06	(3054)	50450	0.97
KY-148	Q	996	2006	**17100**	17100	-0.13	(2221)	**15951**	0.93
	R	251	2005	3421	3600	-0.71	(2442)	2042	0.57
	S	369	2006	2010	2000	-0.56	(1129)	1320	0.66
KY-155	T	361	2004	14752	16300	-0.15	(2243)	15137	0.93
I-265	J	O36	2006	69400	69400		(34383)	49297	0.71
	K	D01	2006	62100	62100	-0.70	(43485)	34000	0.55
	L	D35	2006	57500	57500	-0.78	(44635)	27198	0.47
KY-1531	N	117	2003	624	700	-0.45	(280)	542	0.77
KY-1531	M	117	2003	624	800	-0.69	(433)	542	0.68
KY-1848	F	522	2006	6524	6500	-0.41	(2668)	4991	0.77
				109191	218200			91%	77%
	Wa							198091	

Gilliland Final Results

• Update network	6 hours
• Initial analysis	12 hours
• Calibration runs	70 hours
• Alternative runs	20 hours
• Final Report	18 hours
	total 126 hours

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Conclusions

- Model is an ADT or "average hr" model
- Reasonable current year trip generation
- Study "screen circle" for reasonableness
- Link speeds need to be adjusted

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Conclusions

- Calibrated Model provided good results
  - Signals can create up to 60% time penalty
  - Consider impact of curves and hills
  - Consider time penalty for stop signs

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Model Limitations

- Model does not consider congestion
- Truck speeds do not equal Auto speeds
- Statewide Model not suited for future projections
- Eastern Kentucky area doesn't calibrate well

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Model Limitations

- ✓ Model IS sensitive to speeds
- ✗ Model is NOT sensitive to link capacity

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Successful Models Simulated

Rural interchanges

New rural routes

Small community bypasses

Ramp closures

Scheduled Interstate lane closures

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Questions??
Comments??

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