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James C. Codell, III
Secretary of Transportation

Commonwealth of Kentucky
Transportation Cabinet
Frankfort, Kentucky 40622

Paul E. Patton
Governor

Clifford C. Linkes, P.E.
Deputy Secretary

INTRA-DEPARTMENTAL MEMO

TO: Annette Coffey, P.E., Director
Division of Planning

ATTN: Bruce Siria, P.E.

FROM: Michael L. Hill, P.E., Director *MLH*
Division of Multimodal Programs

DATE: November 18, 2003

SUBJECT: Leslie, Harlan, Perry and Letcher Counties Traffic Forecasts
Harlan to Hazard Alternatives Study

This is to revise and refine our November 10, 2003 forecast on the subject project as follows:

- Residual traffic on KY 118 from US 421 to TR 9006, KY 15 from KY 451 to TR 9006, and TR 9006 from KY 15 to KY 451 were added to these forecasts.
- Traffic volumes on KY 451 were corrected for Alternate 7.
- The Alternate 3 route was modified.

If you have any questions, please call Rob Bostrom or Kong Ee of this Division.

MLH:NRB:KE

Attachments

c: Rob Bostrom w/attachment
Daryl Greer w/attachment



Leslie, Harlan, Perry and Letcher Counties Traffic Forecasts Harlan to Hazard Alternative Study



Division of Multimodal Programs

November 17, 2003

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Executive Summary

PROJECT DESCRIPTION

The purpose of the project is to conduct a corridor study on the Harlan to Hazard Alternatives in Leslie, Harlan, Perry and Letcher counties.

TYPE of FORECASTS

The following types of forecasts were developed for the Build scenario:

- Average daily traffic (ADT) forecasts were developed for the alternatives. These forecasts were developed for current year 2003 and design year 2030.
- Truck forecasts (ADT) forecasts were also provided for this project.

KENTUCKY STATEWIDE MODEL (KYSTM)

The KYSTM was used to determine the alternative diversions. The KYSTM model used were the Base Network and the without I-66 Network. The model showed approximately 500 trips traveling from Hazard to Harlan daily. The alternatives were modeled using a 55 mph speed limit and with a two-lane geometry. Speeds used on US 421 were 35 mph.

TRAFFIC VOLUMES

The 1999 KYSTM Network was well calibrated in this area. Actual counts and the No Build network total volumes were close to each other. Therefore, the Build network traffic volumes were used for the alternate forecasts.

GROWTH RATE

Trendline analysis shows an average growth rate of 1.23% on US 119, US 421, KY 80, TR 9006, KY 15, KY 7, KY 699, and KY 463 in four counties. The KYSTM analysis shows growth rate of 1.57%. Therefore, a growth rate of 1.5% was used on the alternatives.

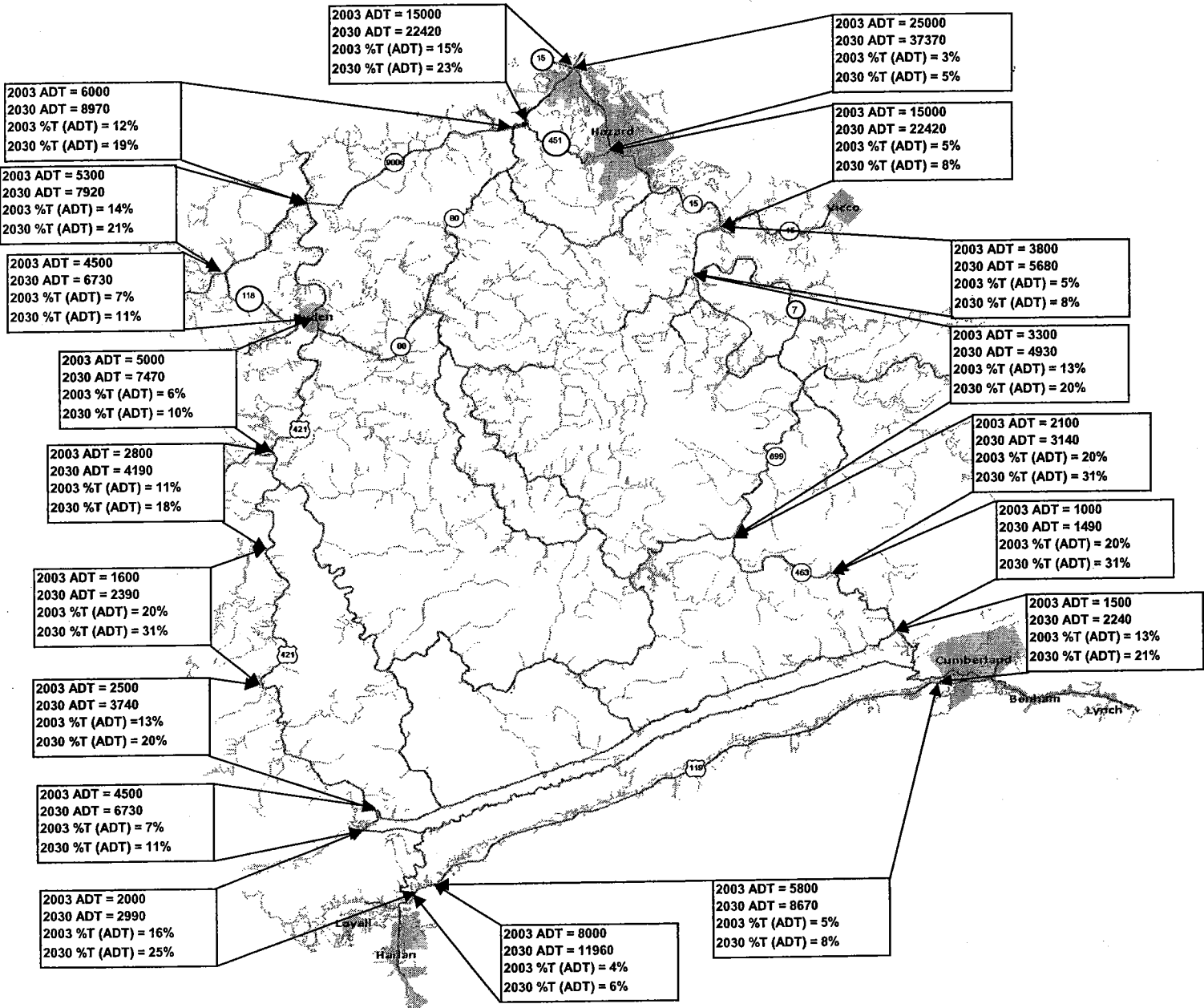
TRUCK PERCENTAGES

The KYSTM was used for truck percentages for the alternatives. Truck percentages for the No Build alternative were based on classification counts.

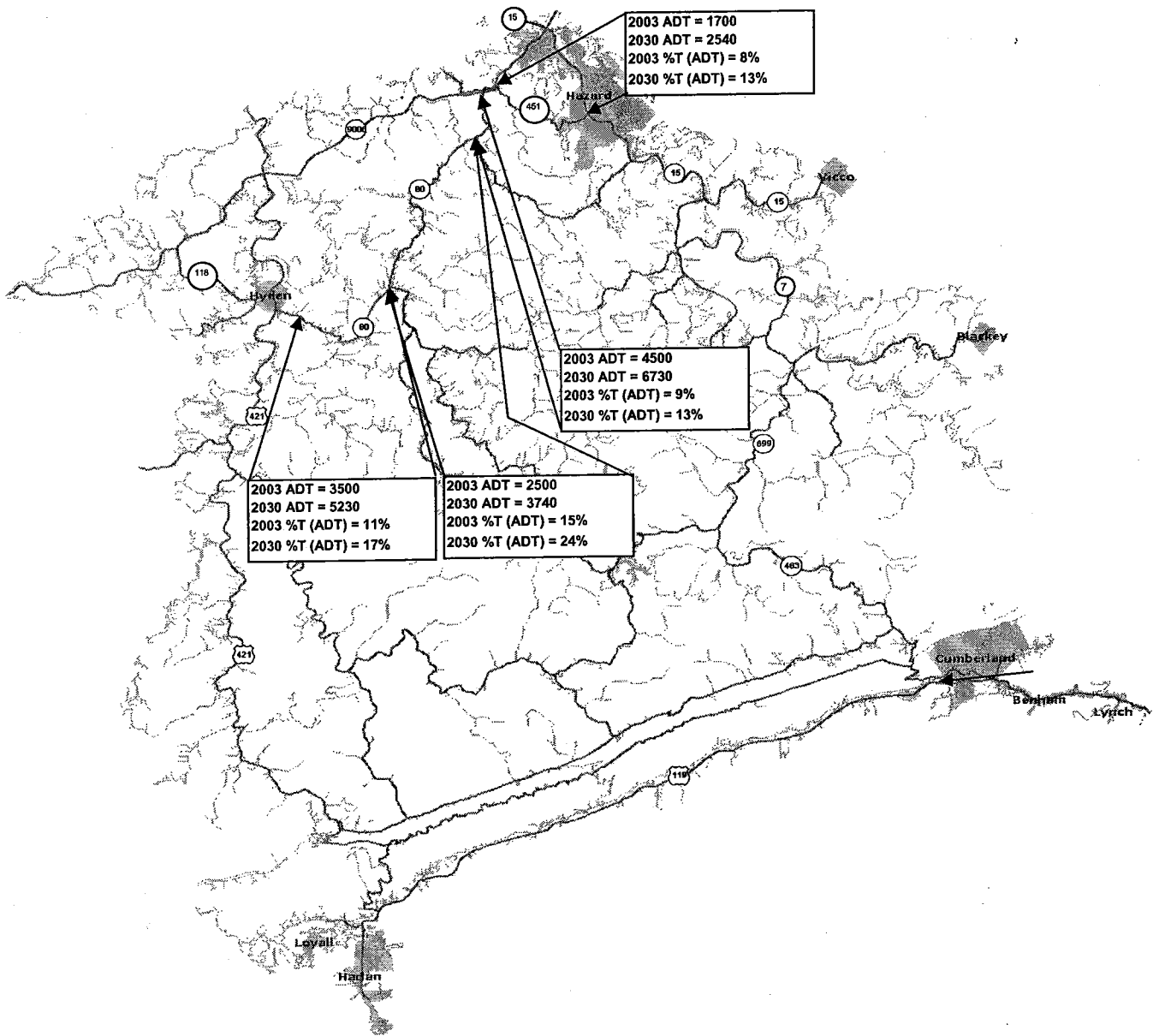
TIME SAVINGS

Several possible routes were taken into consideration from Hazard to Harlan to determine the differences in distance savings and time savings from new roads and old roads. The distances were obtained from the Transcad GIS and the speed limits were obtained from the HIS.

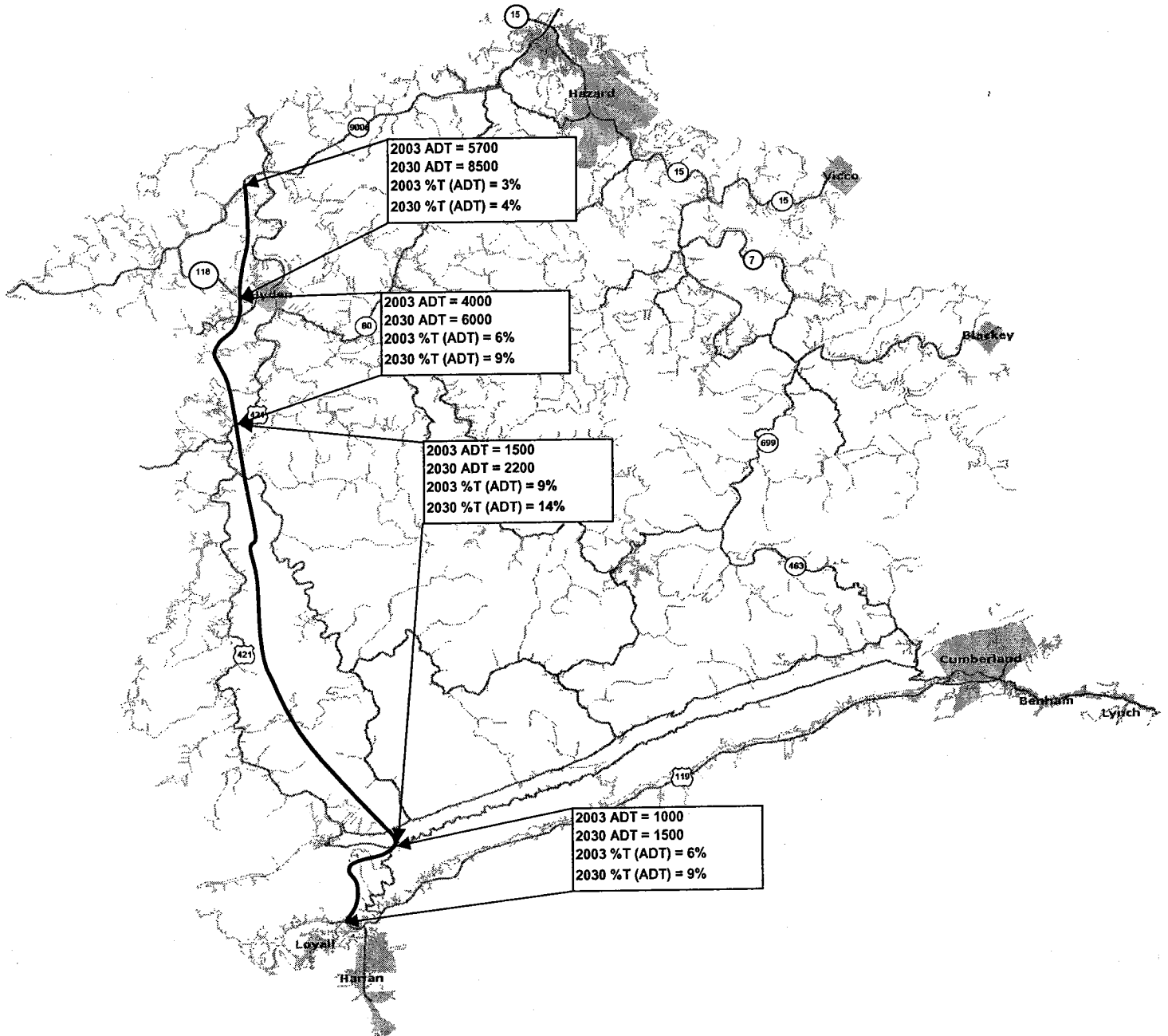
No Build Traffic Volumes



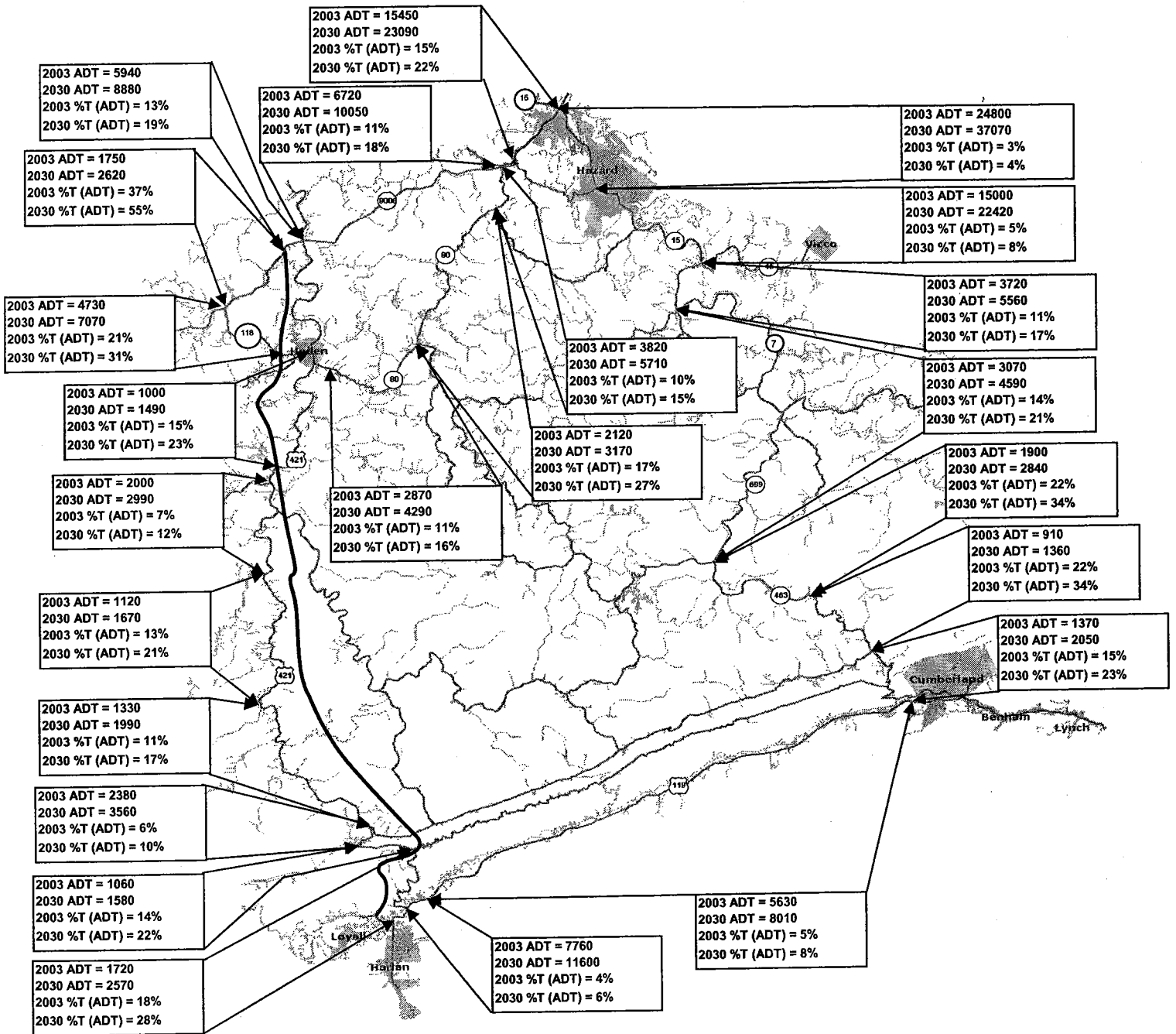
No Build Traffic Volumes



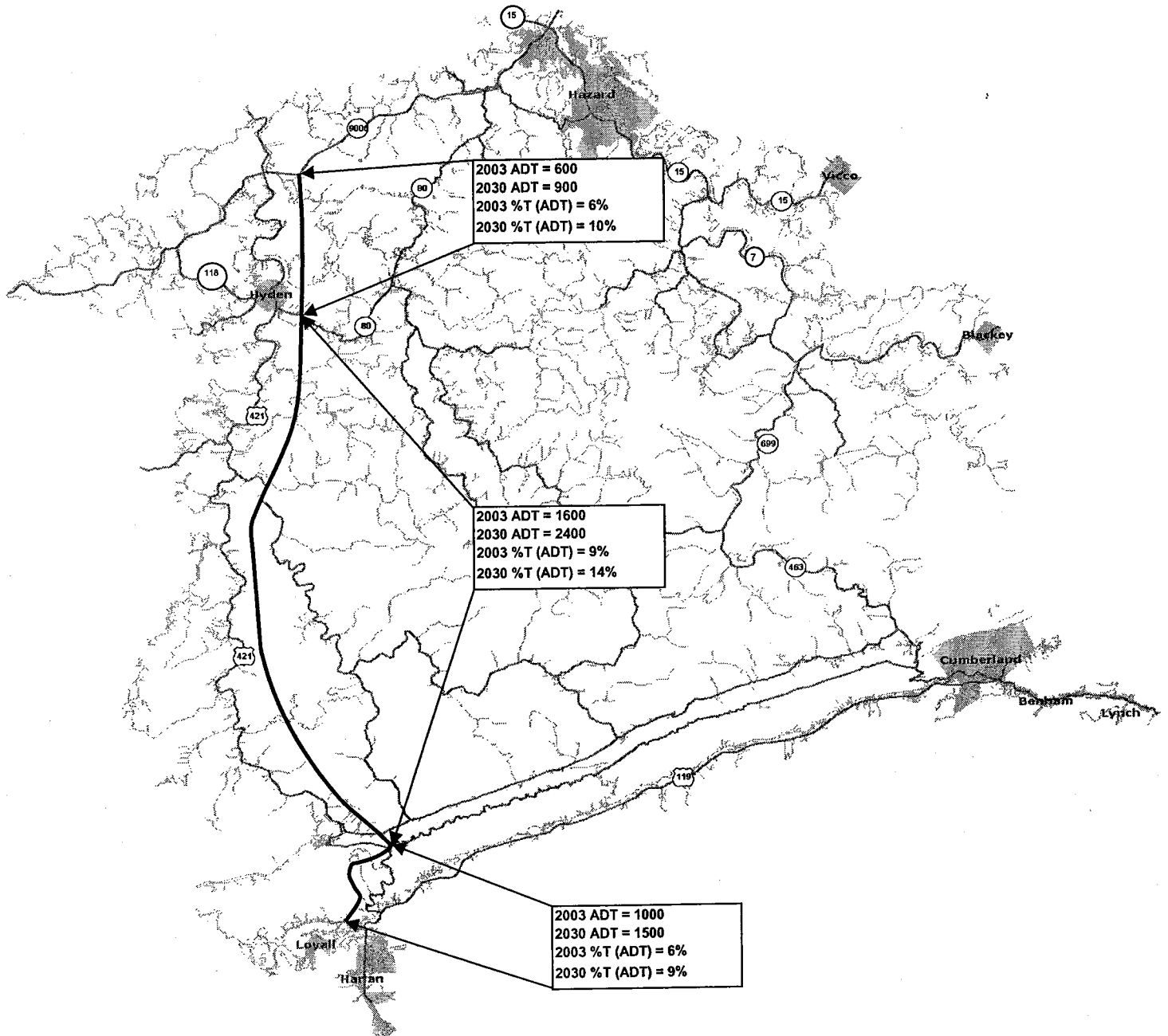
Alternate 1 New Route Traffic Volumes



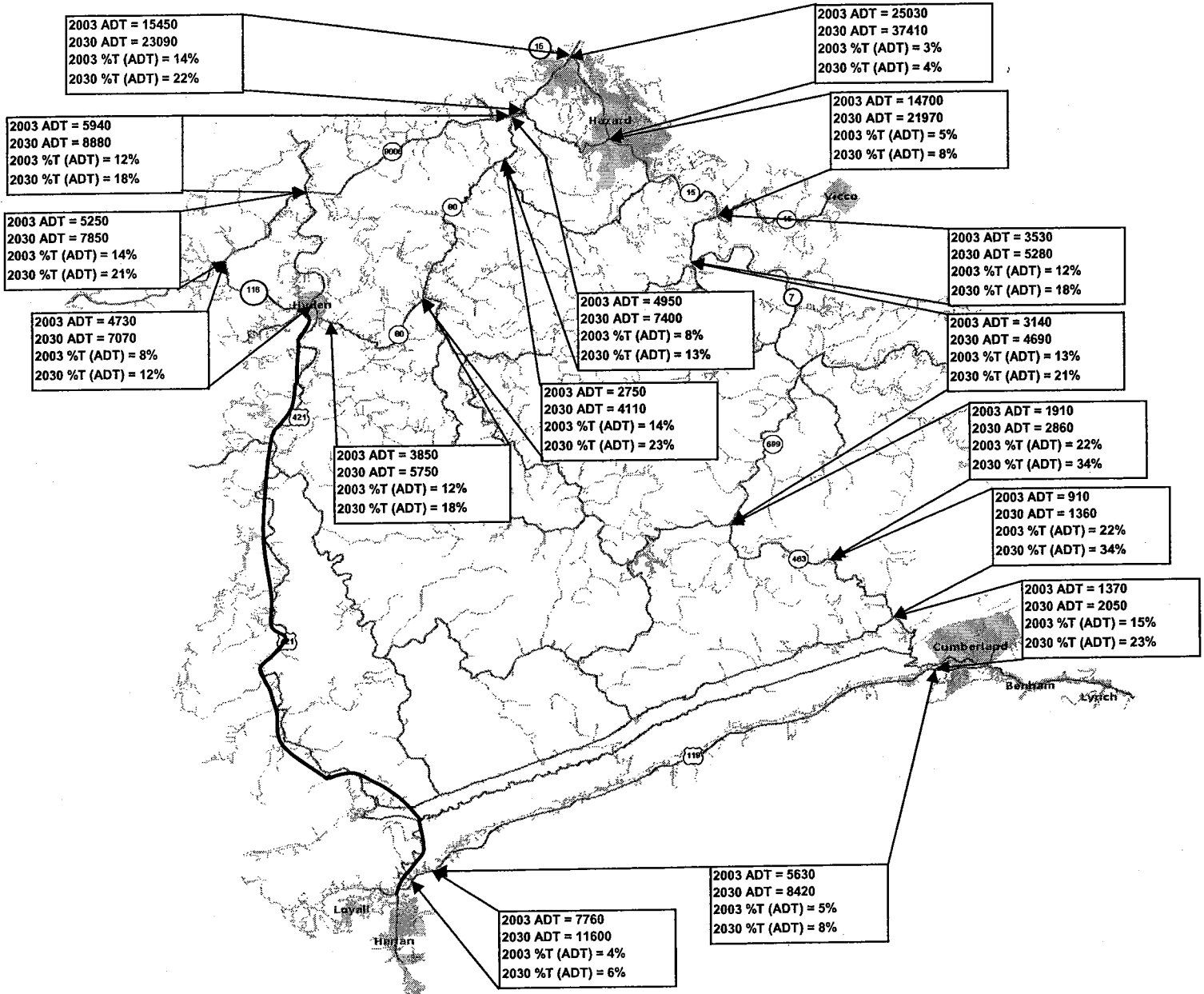
Alternate 1 Residual Route Traffic Volumes



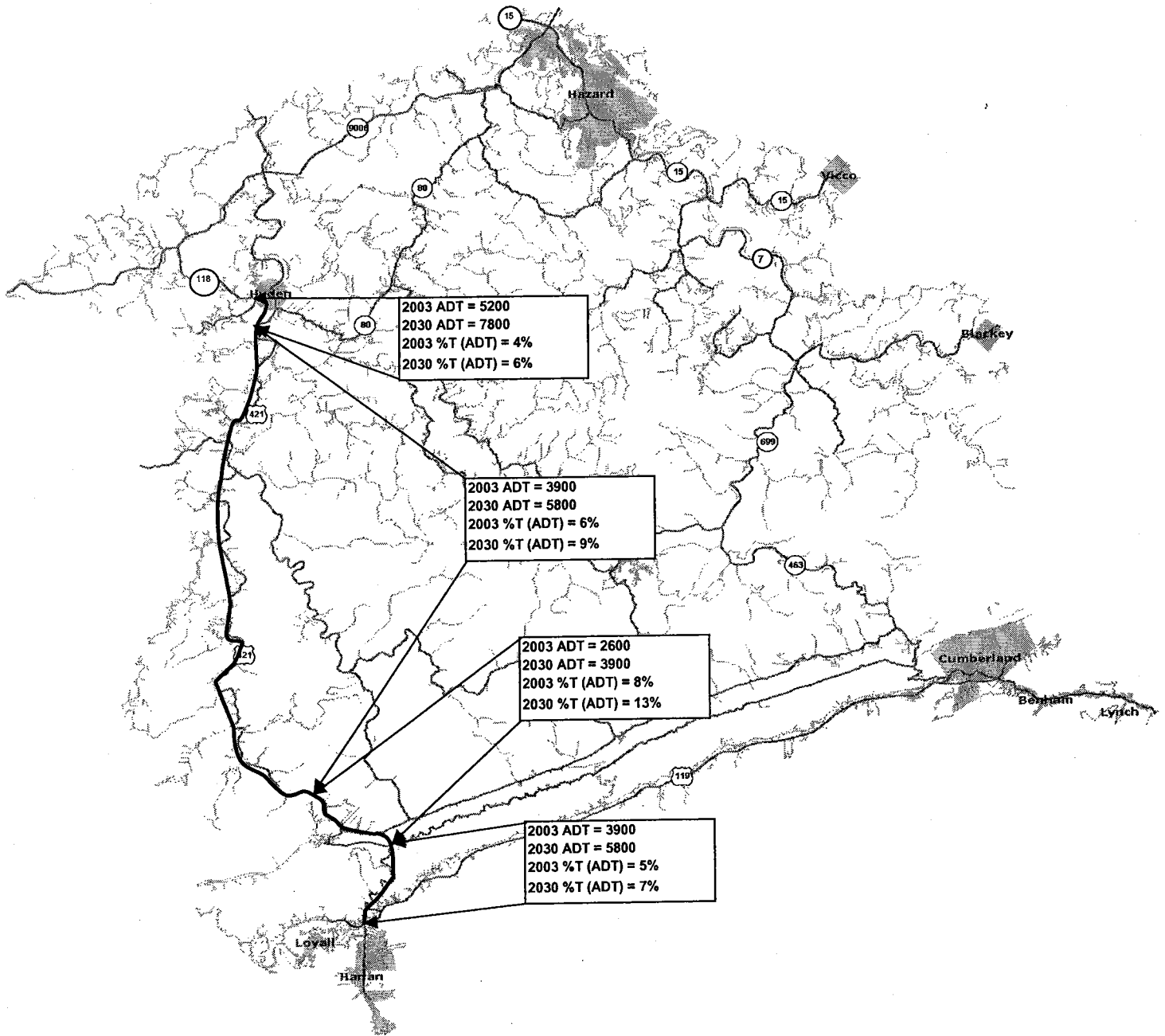
Alternate 1a New Route Traffic Volumes



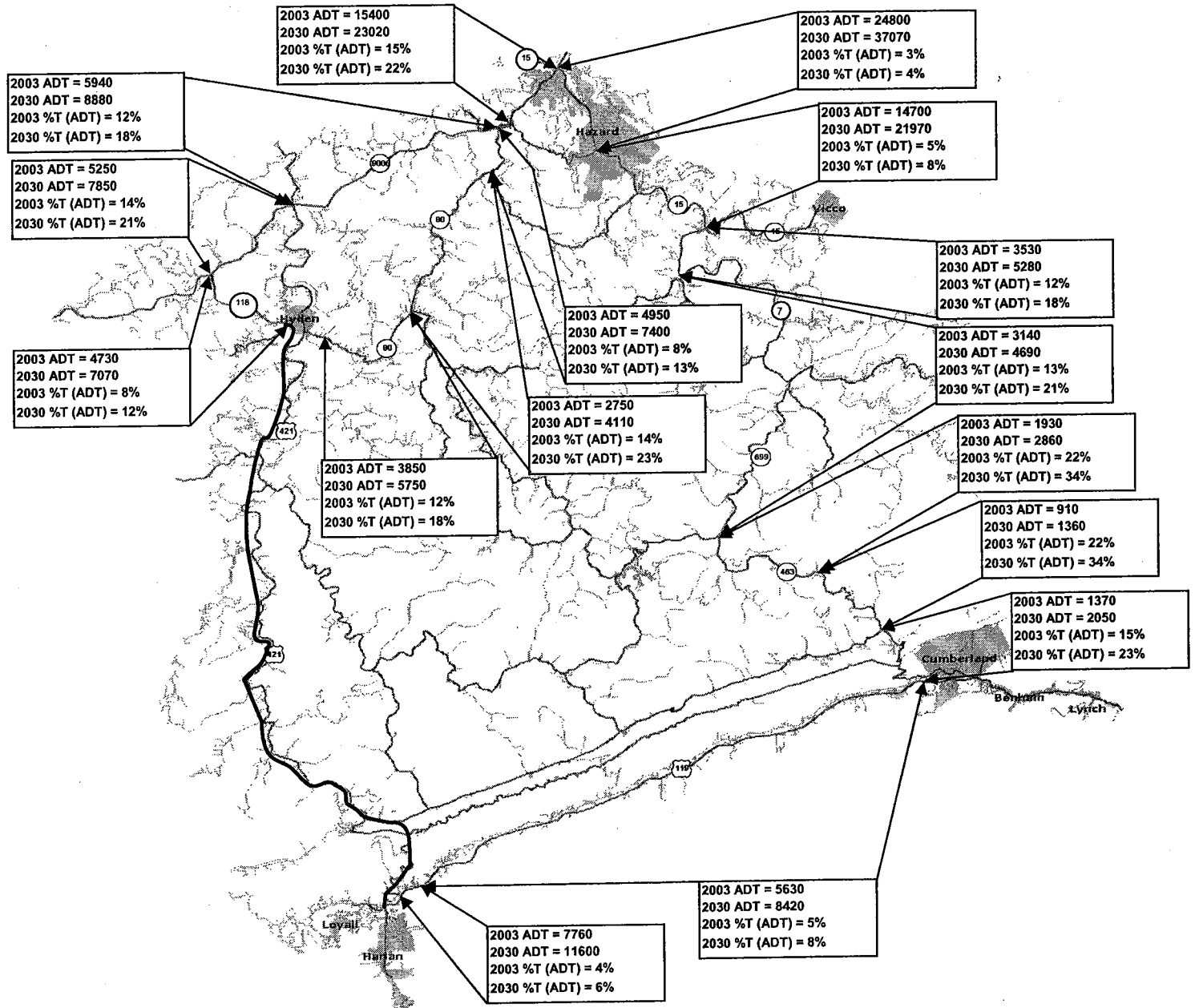
Alternate 2 Residual Route Traffic Volumes



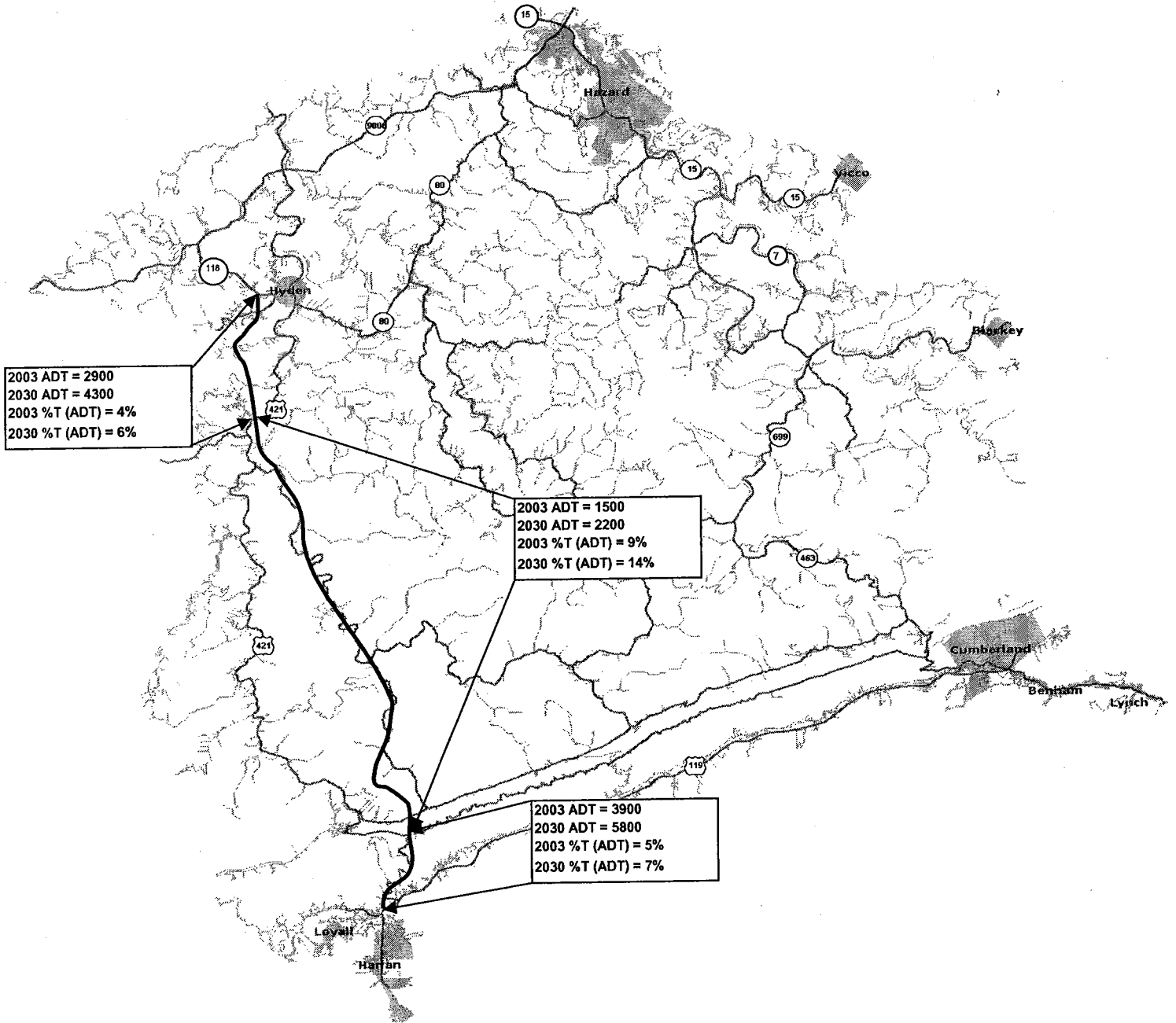
Alternate 2a New Route Traffic Volumes



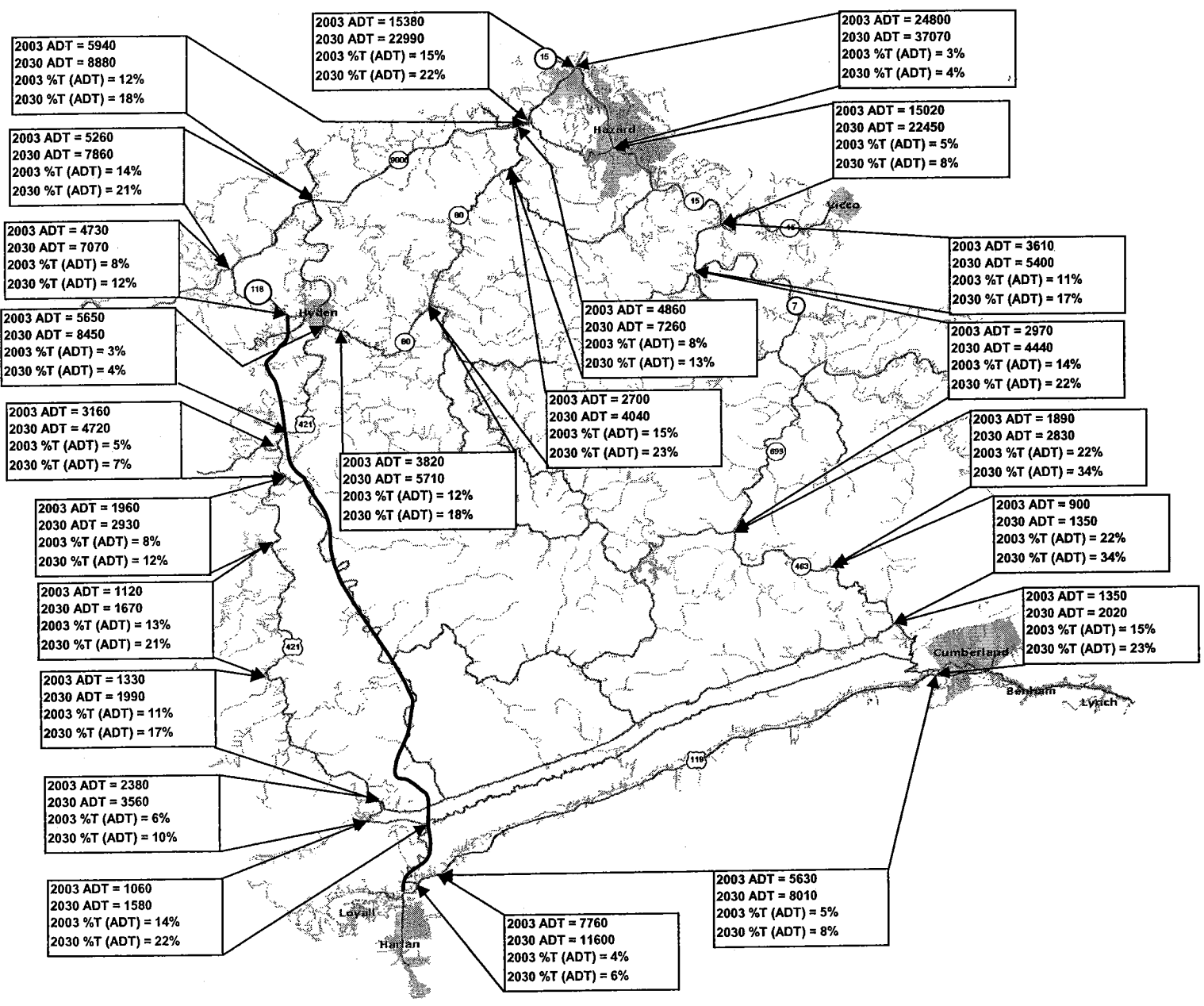
Alternate 2a Residual Route Traffic Volumes



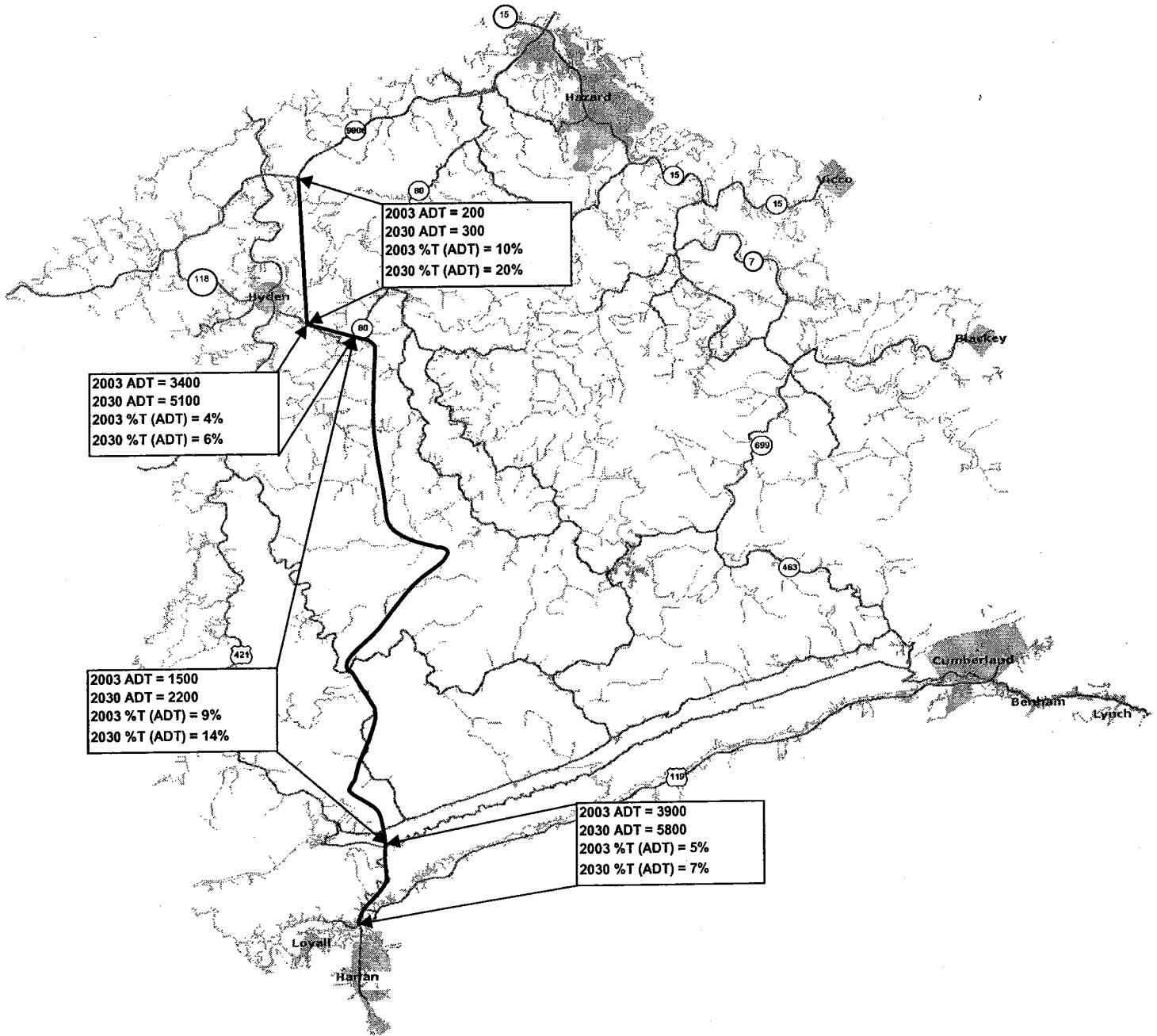
Alternate 3 New Route Traffic Volumes



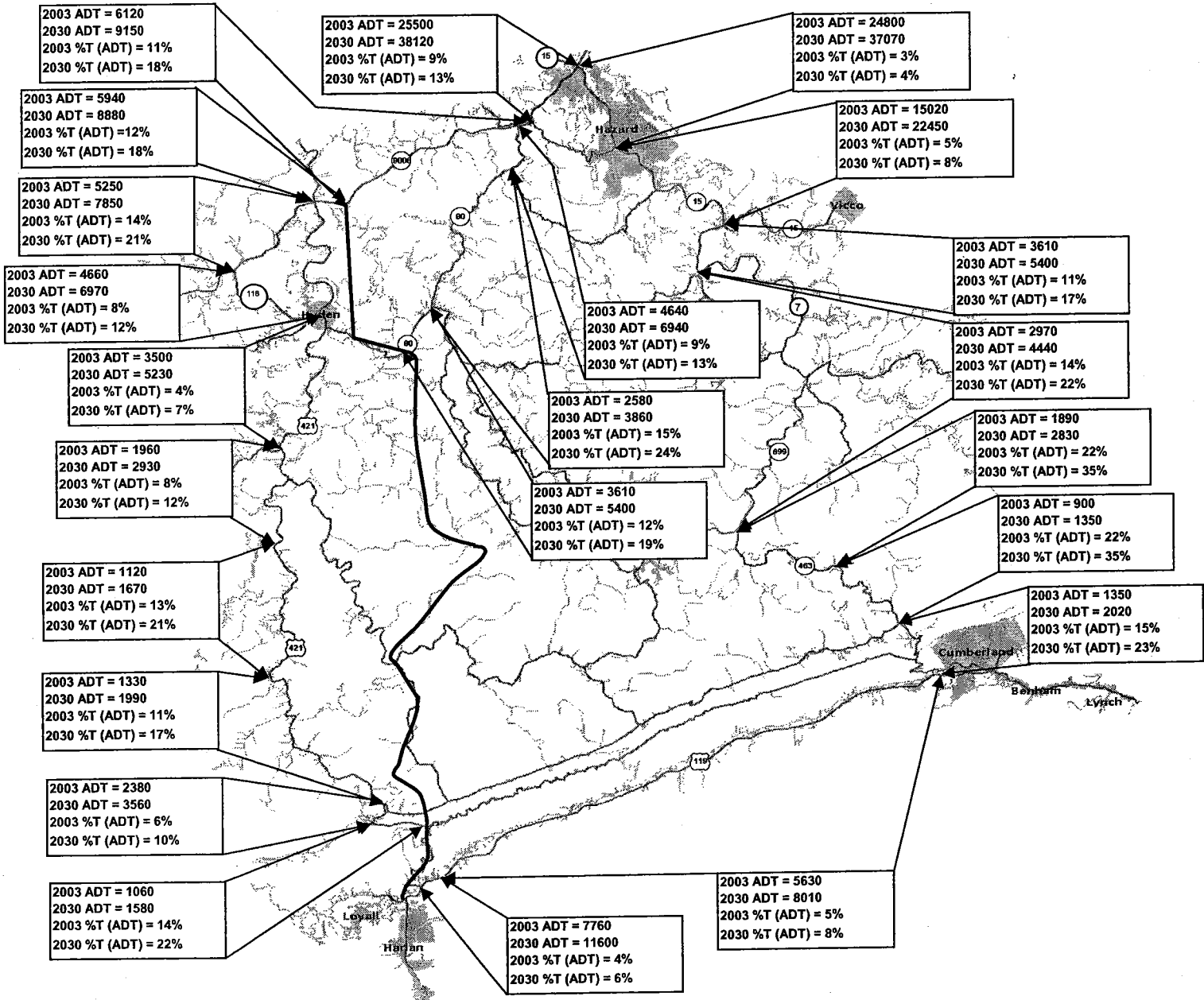
Alternate 3 Residual Route Traffic Volumes



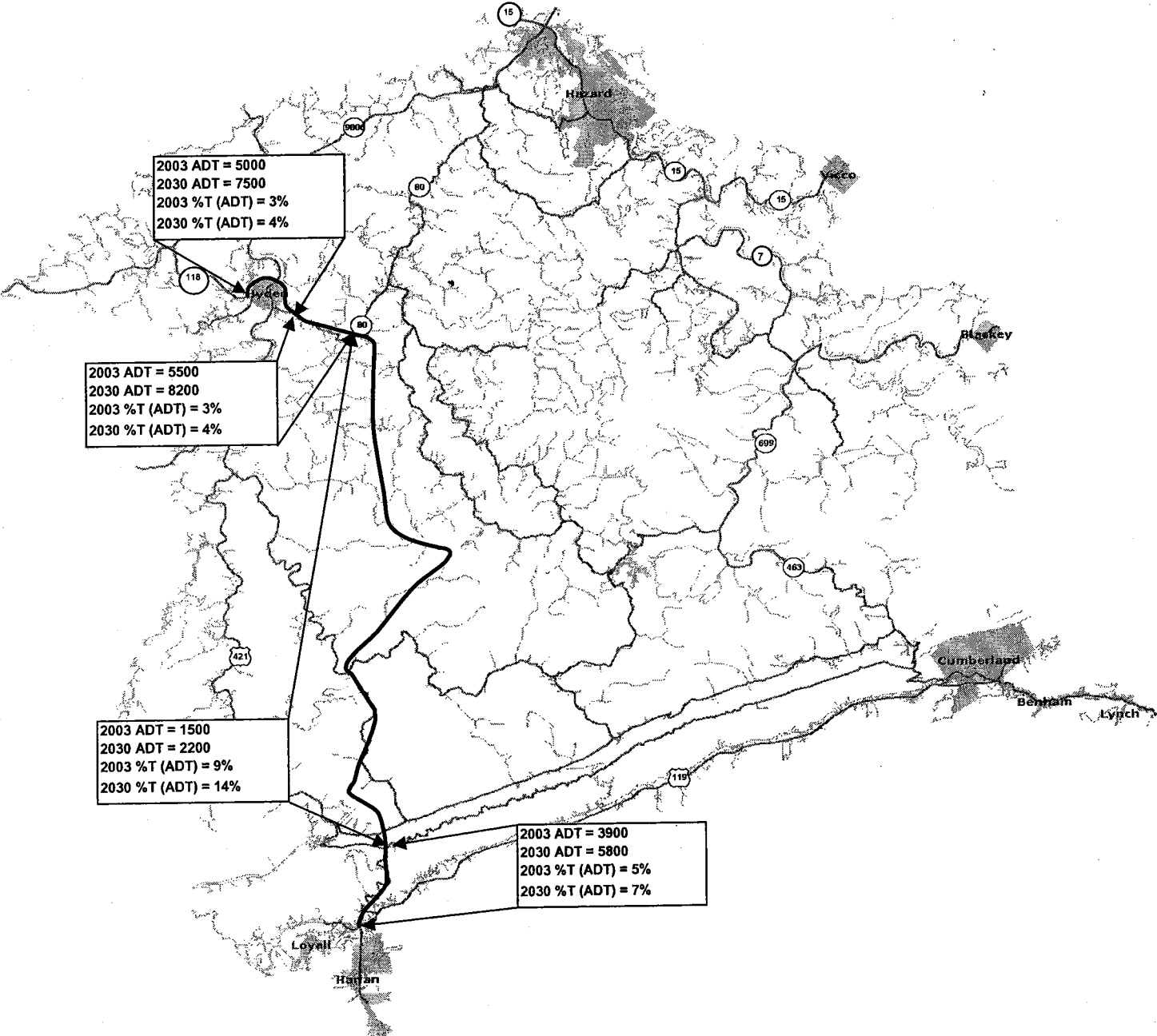
Alternate 3a New Route Traffic Volumes



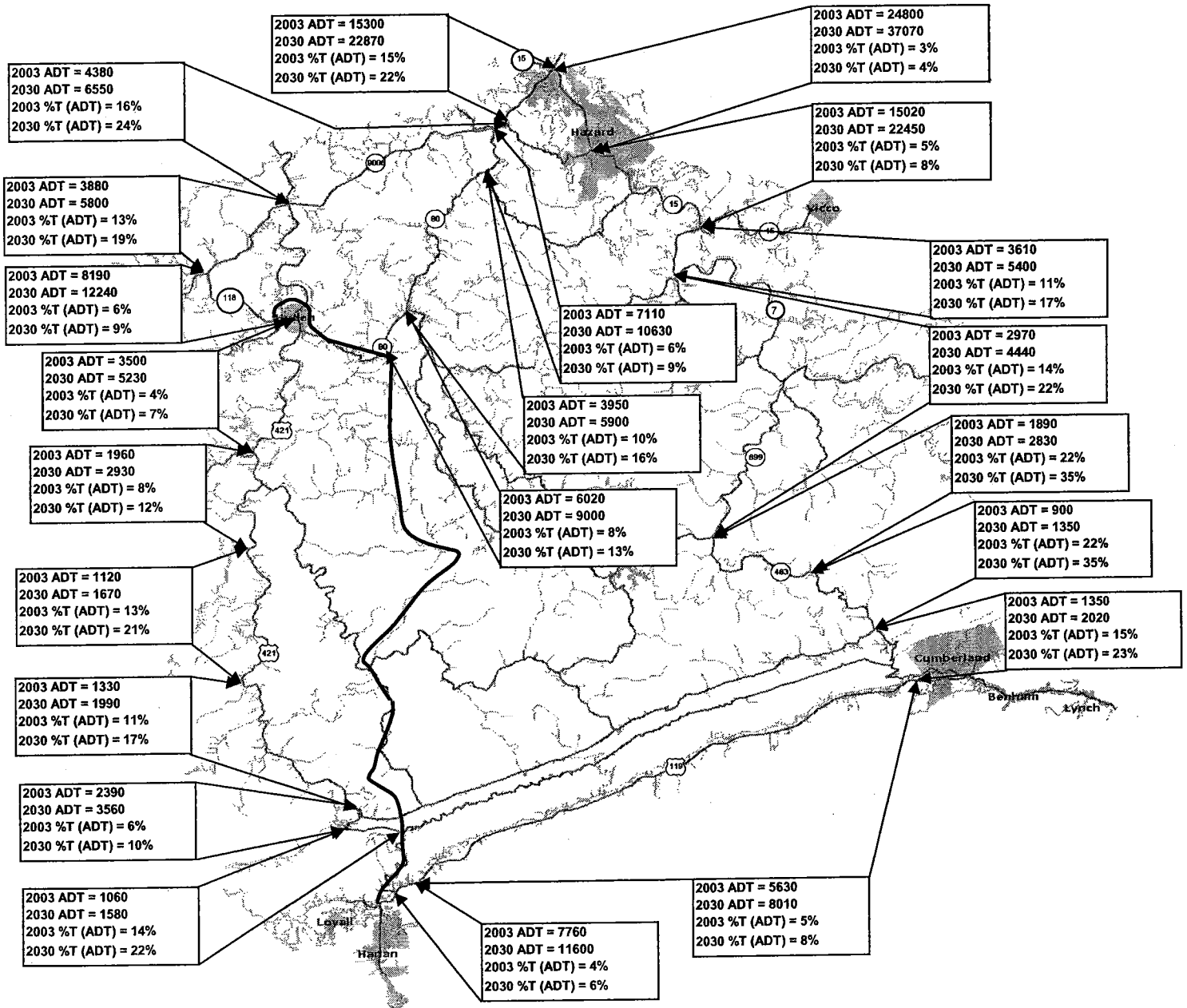
Alternate 3a Residual Route Traffic Volumes



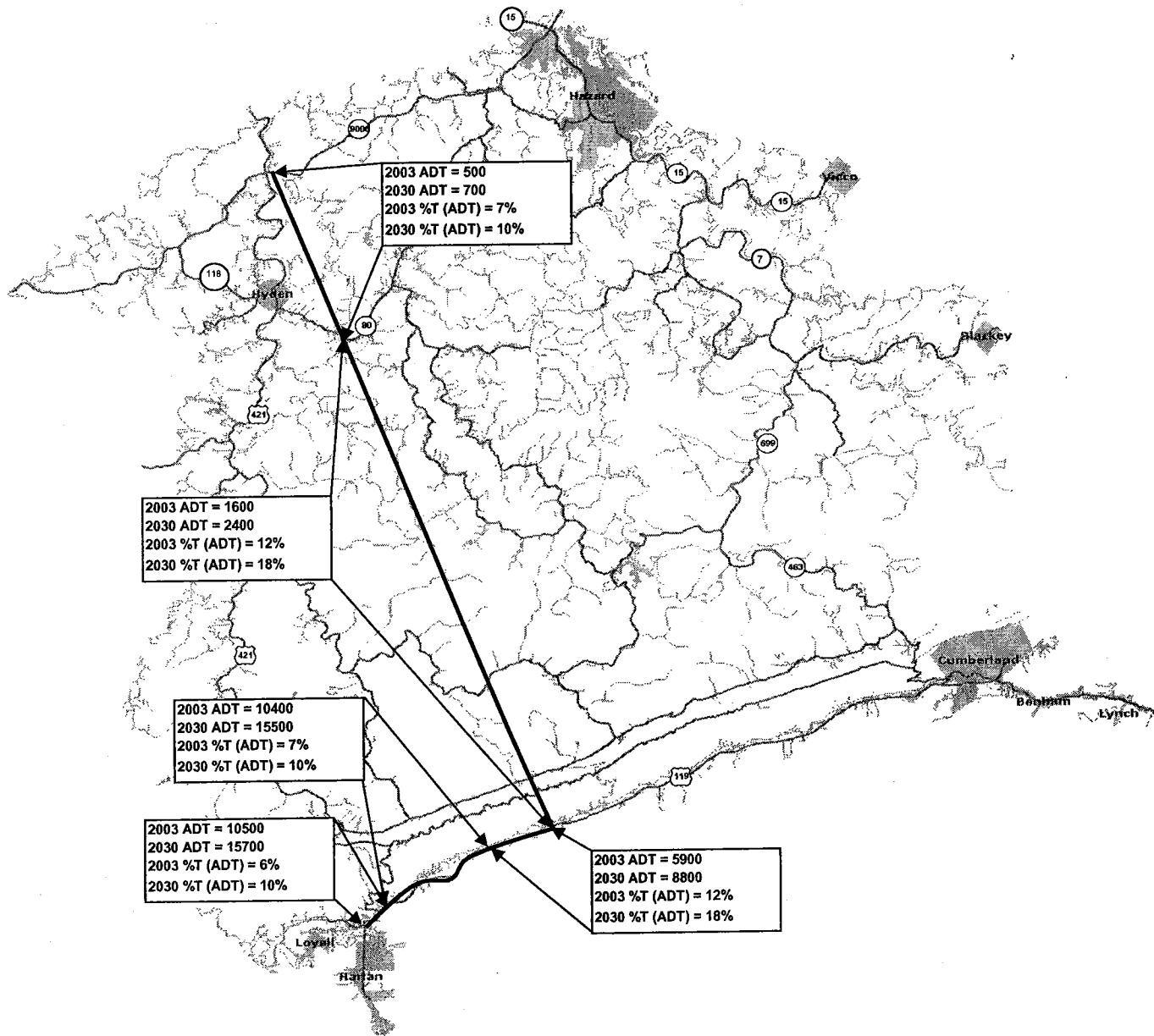
Alternate 3b New Route Traffic Volumes



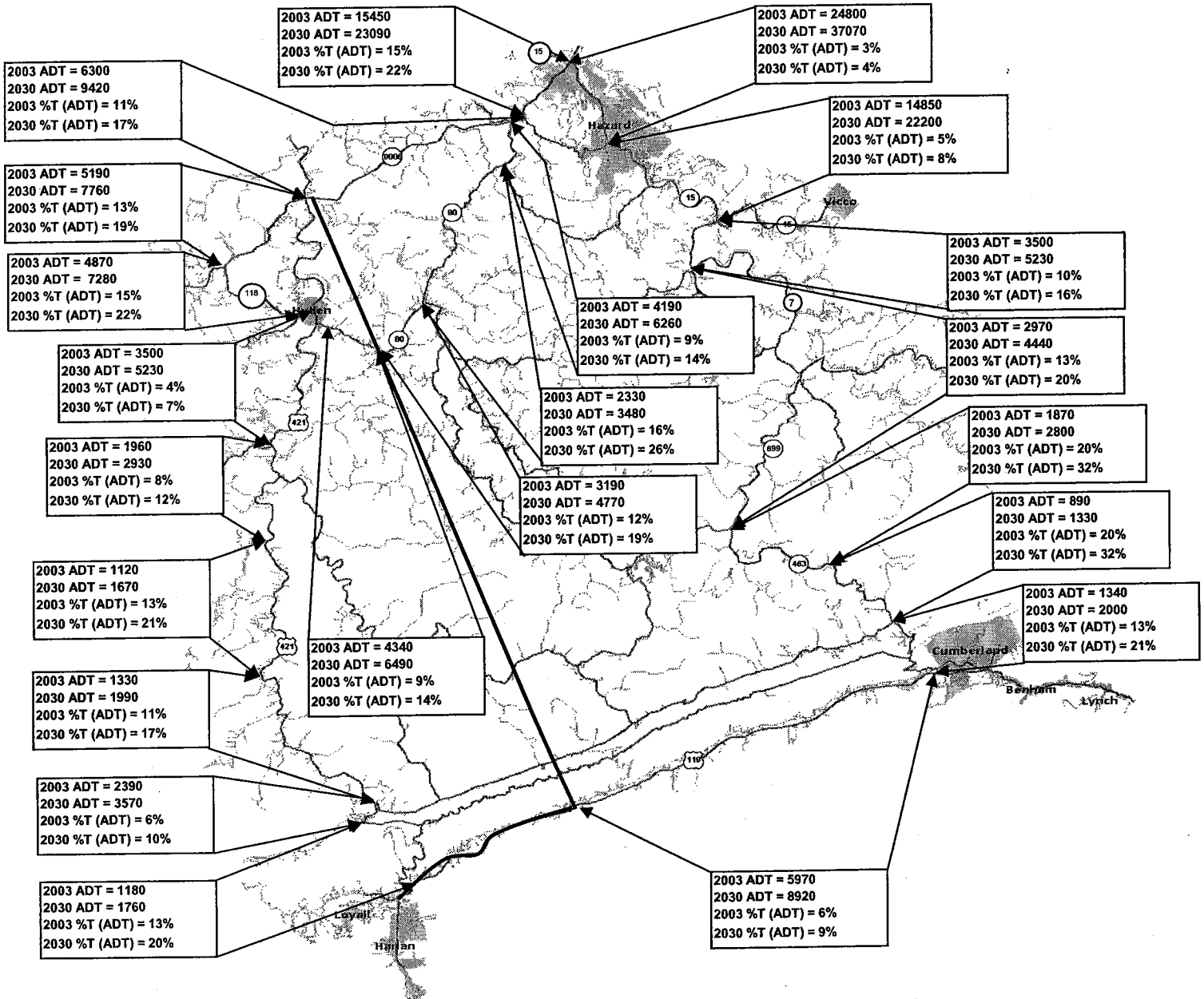
Alternate 3b Residual Route Traffic Volumes



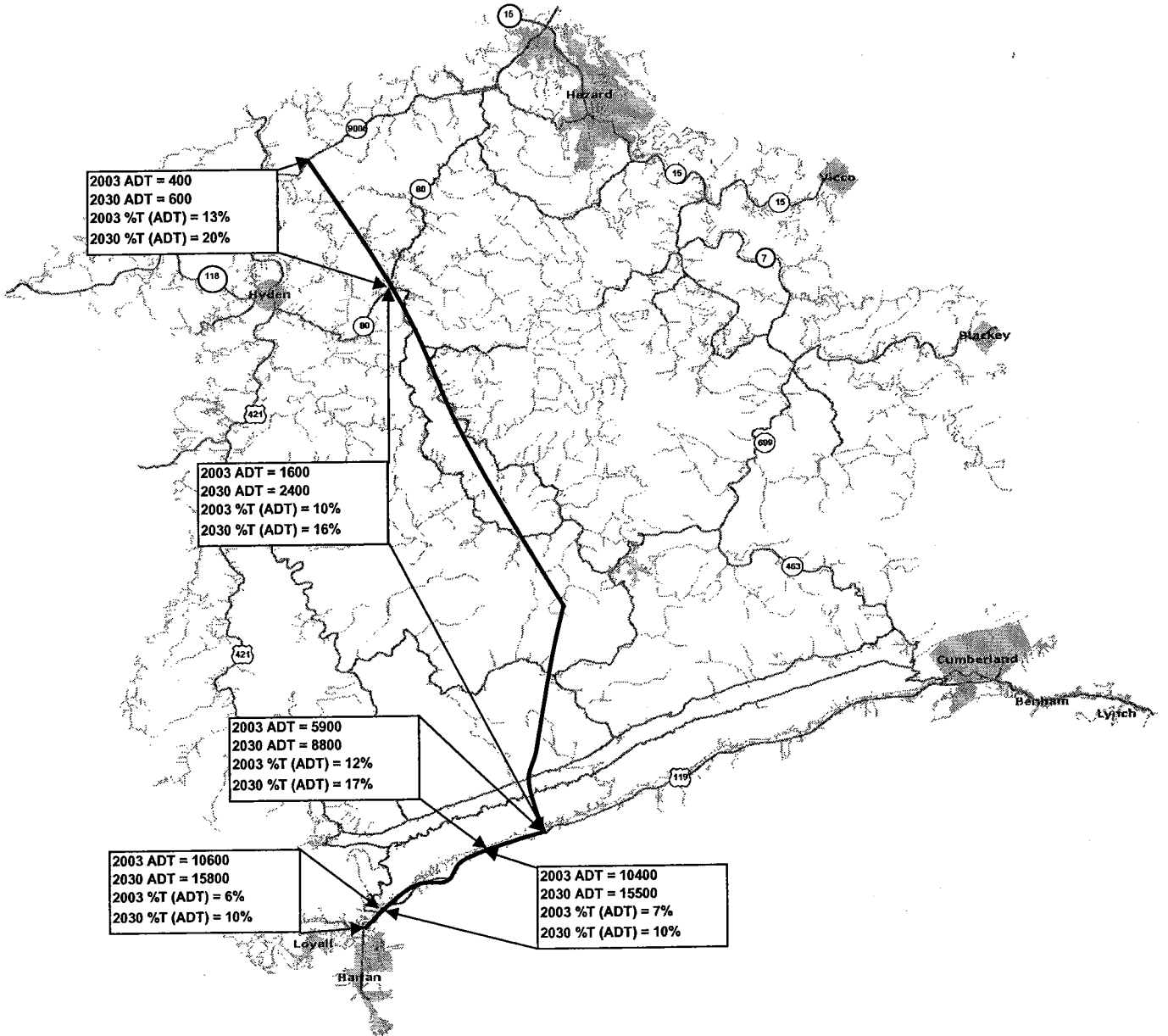
Alternate 4 New Route Traffic Volumes



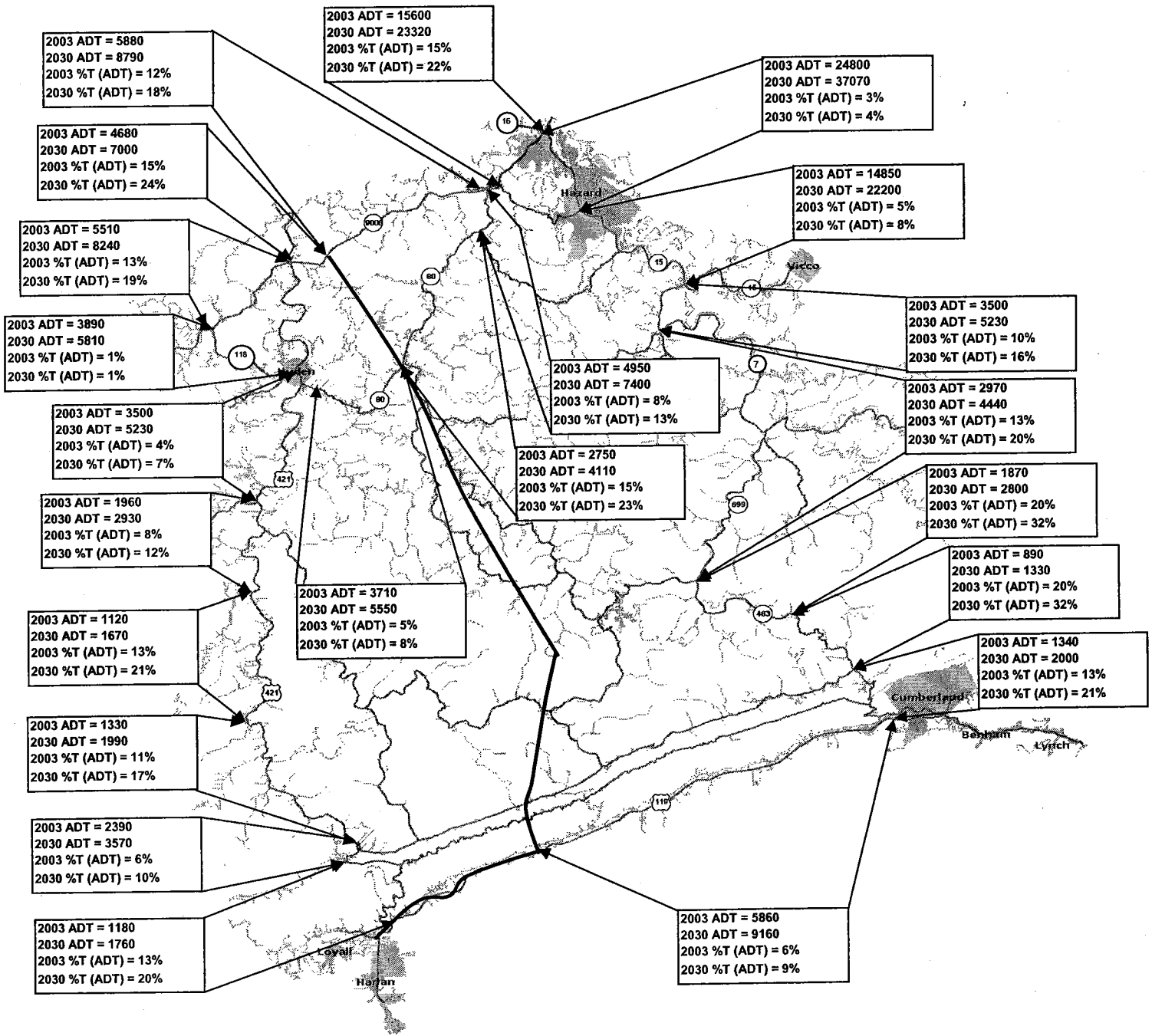
Alternate 4 Residual Route Traffic Volumes



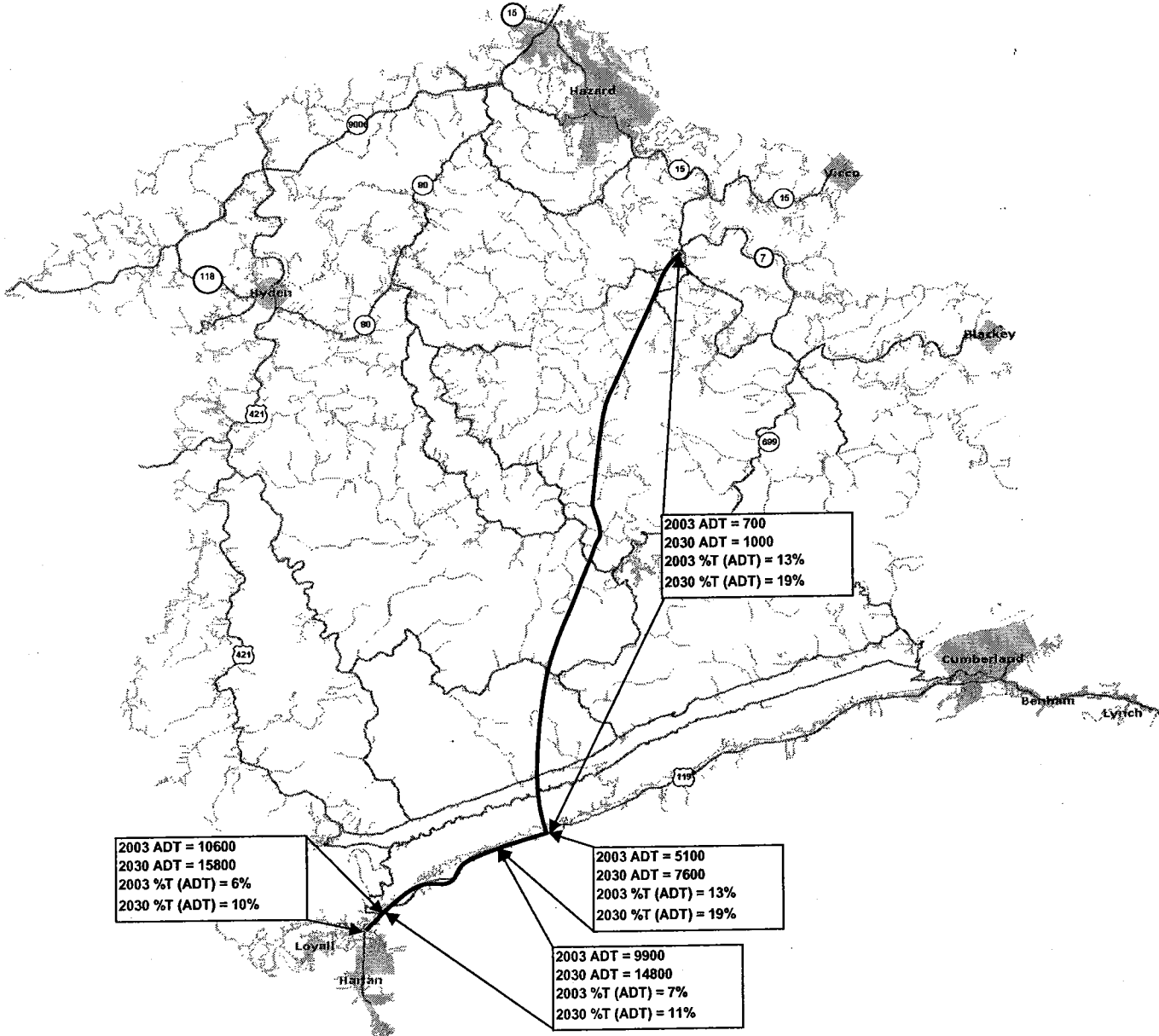
Alternate 5 New Route Traffic Volumes



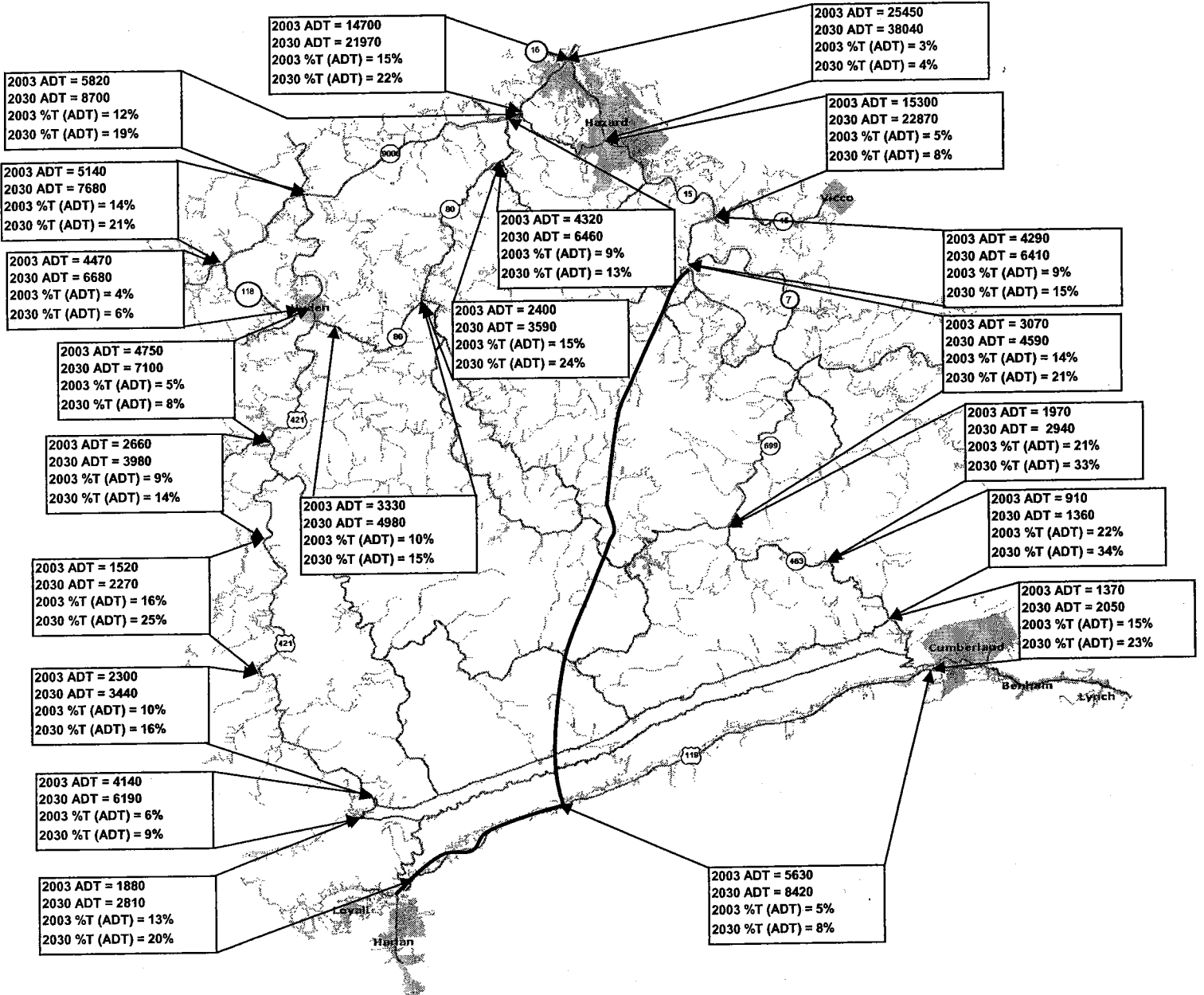
Alternate 5 Residual Route Traffic Volumes



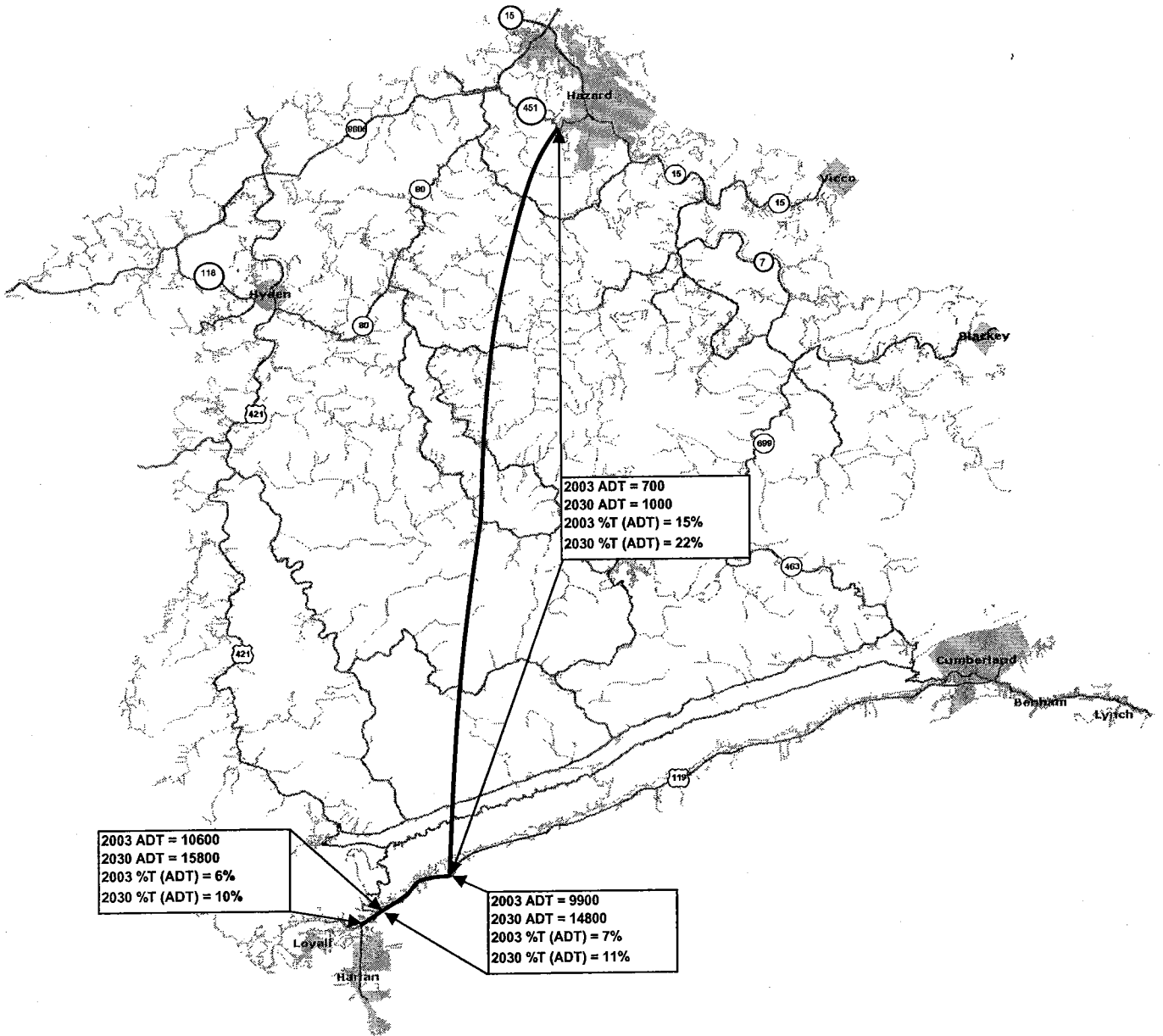
Alternate 6 New Route Traffic Volumes



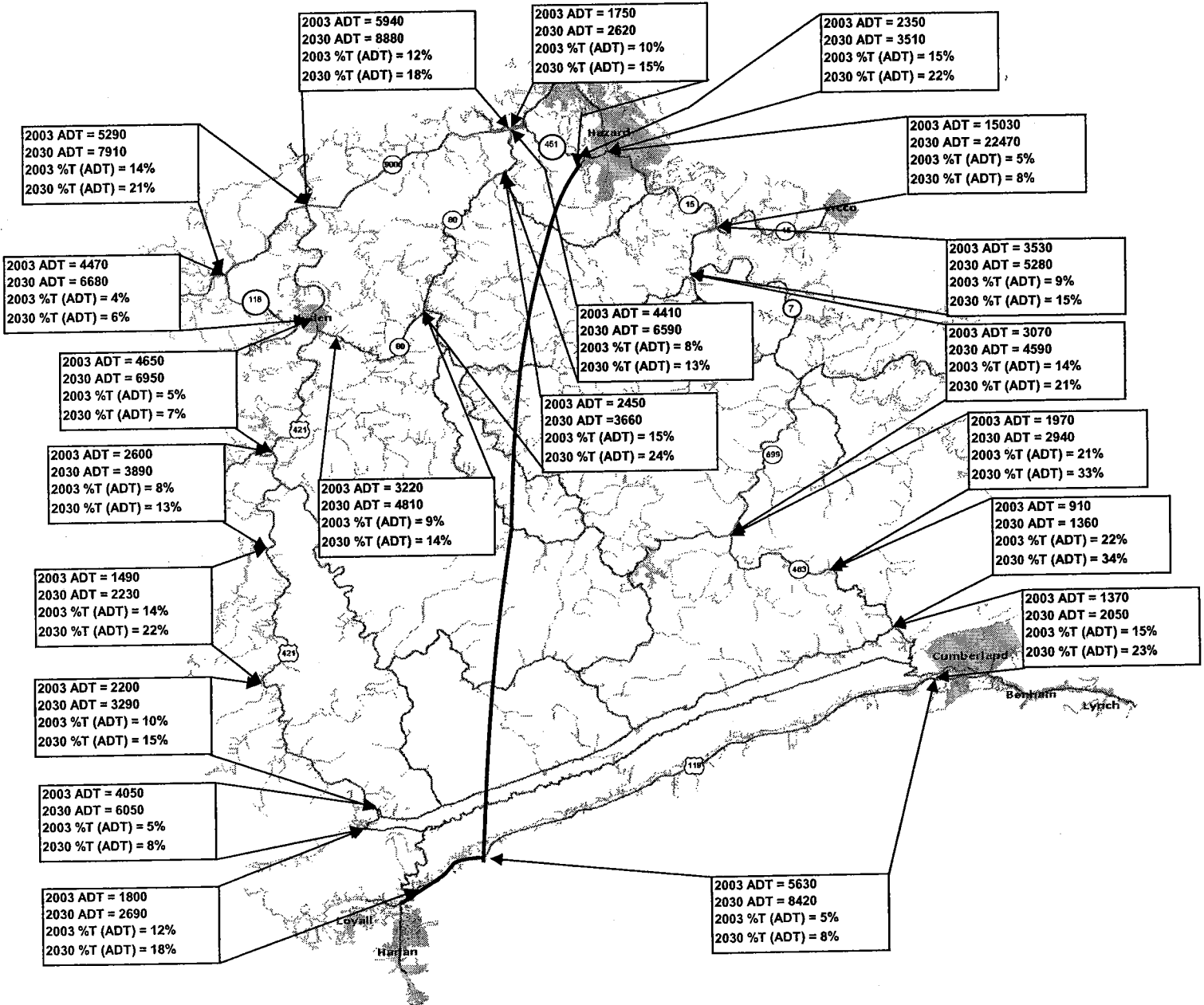
Alternate 6 Residual Route Traffic Volumes



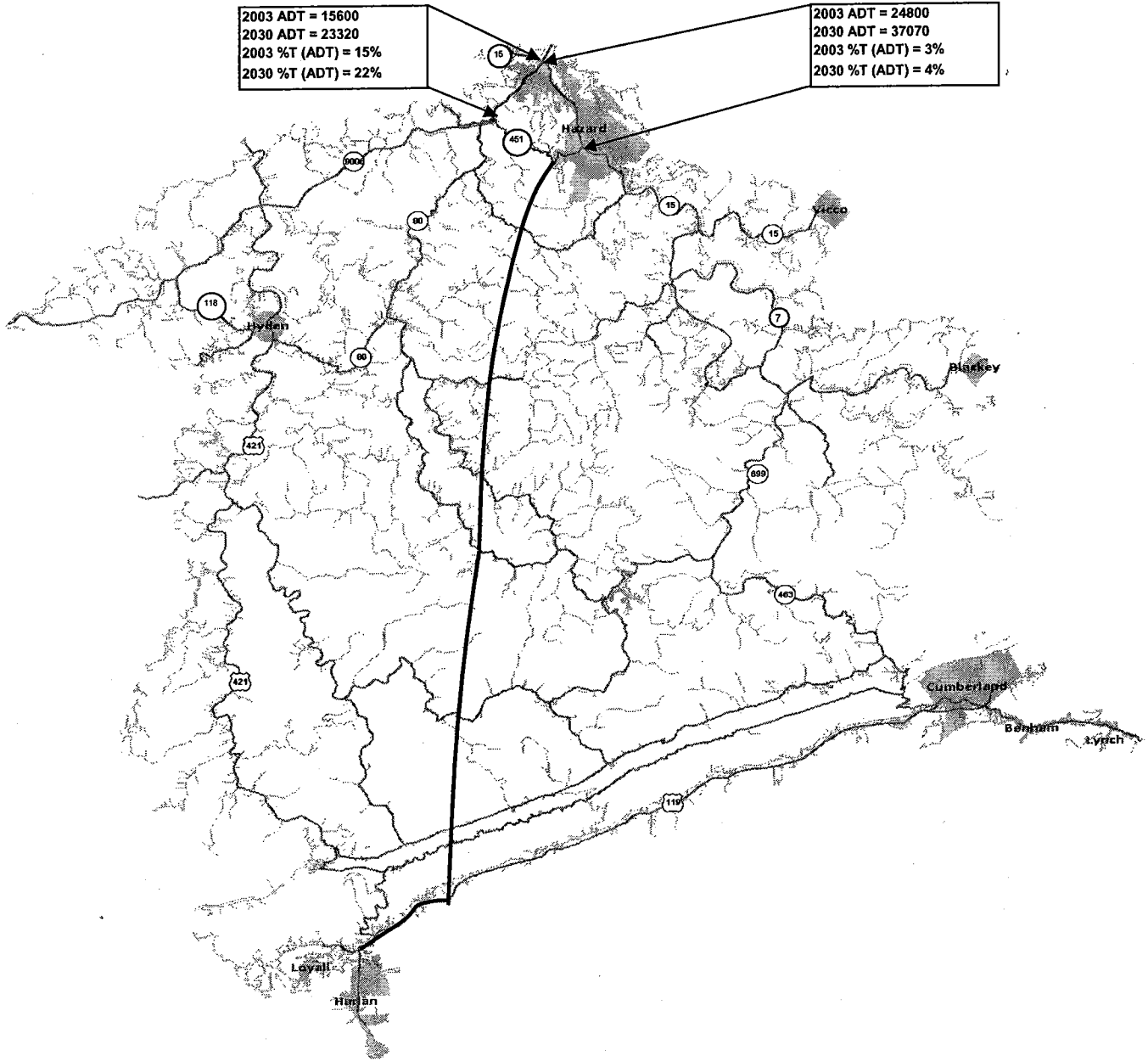
Alternate 7 New Route Traffic Volumes



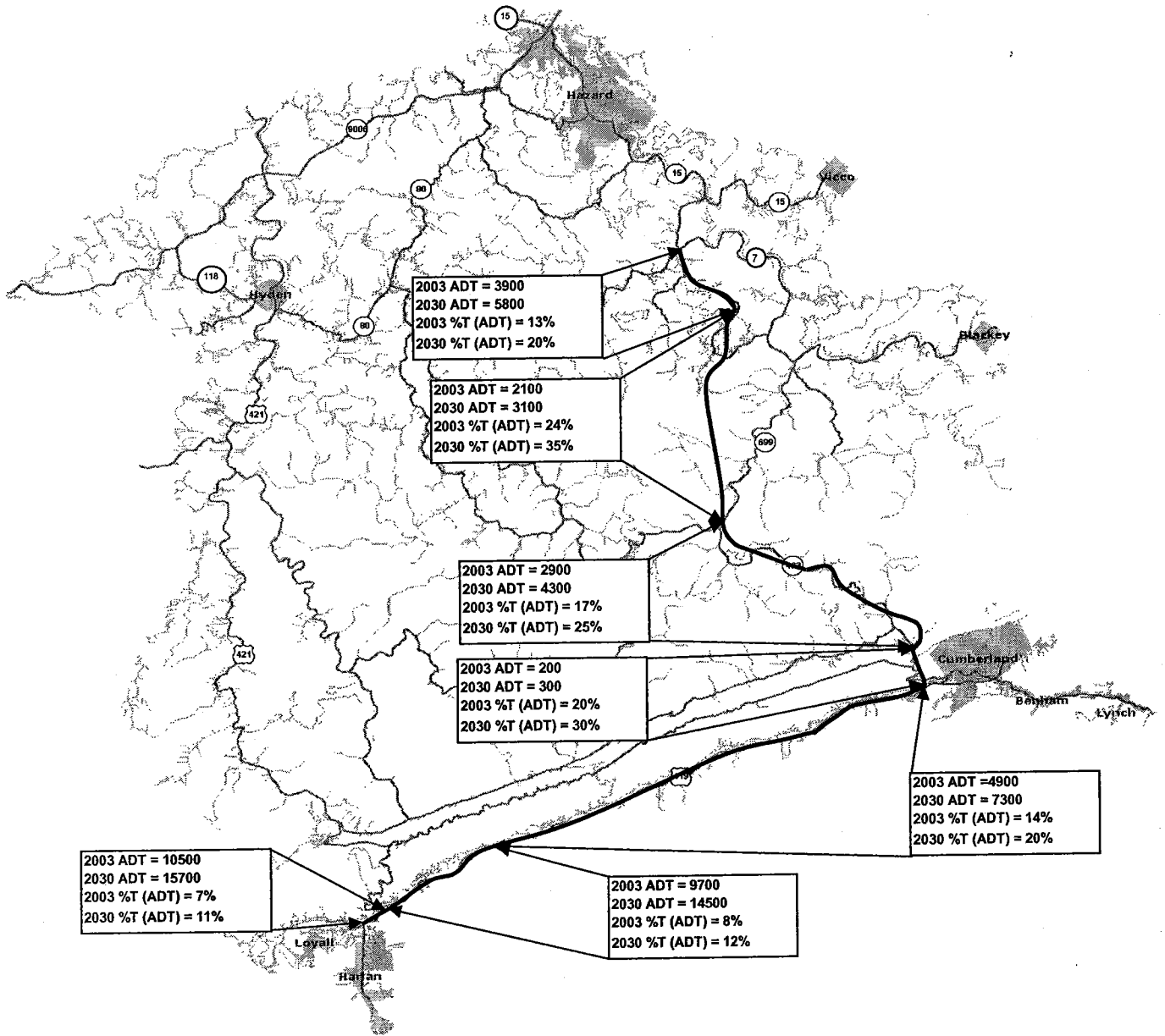
Alternate 7 Residual Route Traffic Volumes



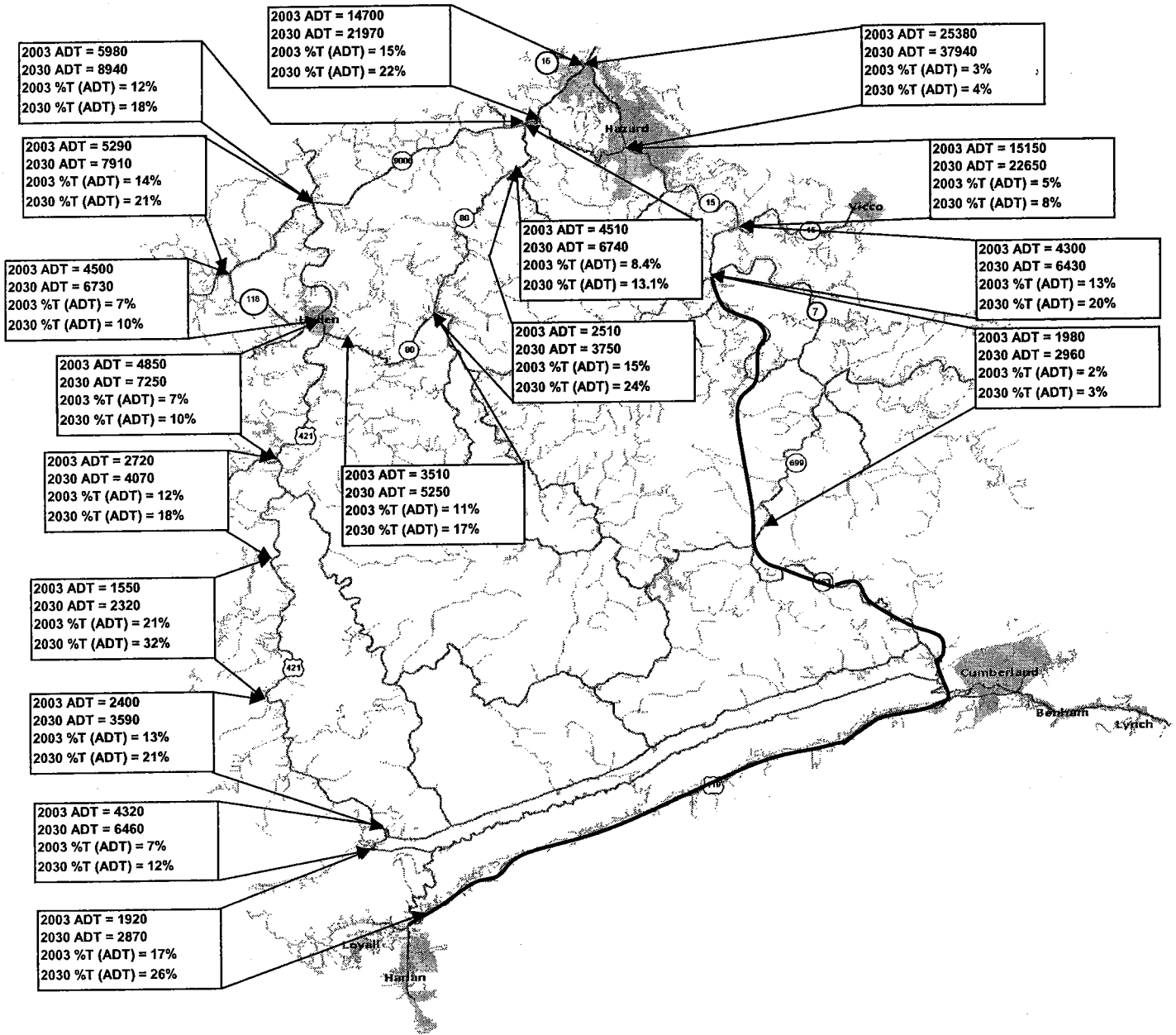
Alternate 7 Residual Route Traffic Volumes



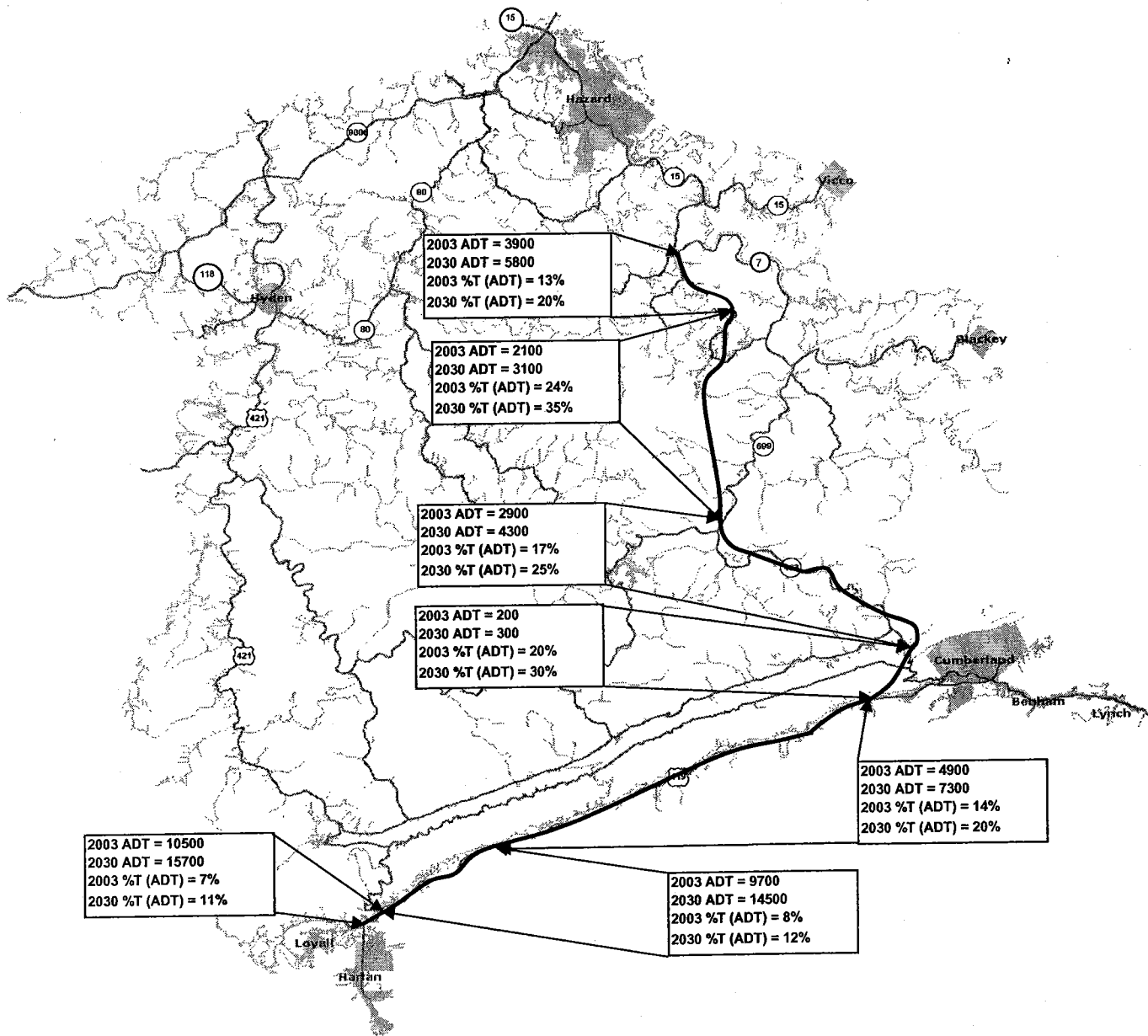
Alternate 8 New Route Traffic Volumes



Alternate 8 Residual Route Traffic Volumes



Alternate 8a New Route Traffic Volumes





Commonwealth of Kentucky
Transportation Cabinet
Frankfort, Kentucky 40622

DIV OF PLANNING

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Maxwell C. Bailey
Secretary of Transportation

Ernie Fletcher
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INTRA-DEPARTMENTAL MEMO

TO: Annette Coffey, P.E., Director
Division of Planning

ATTN: Bruce Siria, P.E.

FROM: Michael L. Hill, P.E., Director *MLH*
Division of Multimodal Programs

DATE: December 15, 2003

SUBJECT: Leslie, Harlan, Perry and Letcher Counties Traffic Forecasts
Harlan to Hazard Alternatives Study

This is to revise, refine and supplement our November 18, 2003 forecast on the subject project as follows:

- Due to no interchange at KY 257/HR Parkway, travel time and distance savings from Harlan to Hazard were modified in Alternates 1 and 1a.
- KY 451 was not considered as a route to calculate travel time and distance savings except Alternate 7.
- Travel time and distance savings from Harlan to London were added.

If you have any questions, please call Rob Bostrom or Kong Ee of this Division.

MLH:NRB:KE

Attachments

c: Rob Bostrom w/attachment
Daryl Greer w/attachment

Harlan to London Alternates

Travel Times and Travel Distances

	Distance (miles)	Time (minutes)
No Build 1 (Harlan to London)	80.45	107.52
No Build 2 (Harlan to London)	81.32	108.68
No Build 3 (Harlan to London)	76.16	82.4
Alternate 1 (Harlan to London)	75.31	82.16
Alternate 1 - KY 118 (Harlan to London)	70.92	77.37
Alternate 1a (Harlan to London)	76.56	83.52
Alternate 1a - KY 80 - KY 118 (Harlan to London)	72.28	79.71
Alternate 2 (Harlan to London)	73.06	79.7
Alternate 2a (Harlan to London)	73.2	79.85
Alternate 3 (Harlan to London)	70.94	77.39
Alternate 3a (Harlan to London)	78.95	86.13
Alternate 3a - KY 80 - KY 118 (Harlan to London)	74.67	82.32
Alternate 3b (Harlan to London)	75.19	82.03
Alternate 4 (Harlan to London)	78.14	85.24
Alternate 4 - KY 80 - KY 118 (Harlan to London)	75.21	83.33
Alternate 5 (Harlan to London)	80.79	88.13
Alternate 5 - KY 80 - KY 118 (Harlan to London)	79.64	88.72

Harlan to Hazard Alternates

Travel Times and Travel Distances

	Distance (miles)	Time (minutes)
No Build 1 (Harlan to Hazard)	52.73	81.16
No Build 2 (Harlan to Hazard)	51.86	80
No Build 3 (Harlan to Hazard)	55.21	70.9
Alternate 1 (Harlan to Hazard)	42.21	46.85
Alternate 1a (Harlan to Hazard)	40.28	44.75
Alternate 1a - KY 80 (Harlan to Hazard)	41.09	48.73
Alternate 2 (Harlan to Hazard)	44.72	52.91
Alternate 2a (Harlan to Hazard)	44.86	53.06
Alternate 3 (Harlan to Hazard)	44.59	53.52
Alternate 3 - US 421 (Harlan to Hazard)	48.4	60.23
Alternate 3a (Harlan to Hazard)	42.67	47.36
Alternate 3a - KY 80 (Harlan to Hazard)	39.78	46.81
Alternate 3b (Harlan to Hazard)	44.43	51.88
Alternate 4 (Harlan to Hazard)	43.51	48.27
Alternate 4 - KY 80 (Harlan to Hazard)	40.5	47.66
Alternate 5 (Harlan to Hazard)	42.94	47.65
Alternate 5 - KY 80 (Harlan to Hazard)	40.27	46.83
Alternate 6 (Harlan to Hazard)	34.55	39.66
Alternate 7 (Harlan to Hazard)	29.22	31.88
Alternate 8 (Harlan to Hazard)	47.5	53.79
Alternate 8a (Harlan to Hazard)	46.15	52.31

Harlan to London Alternates

Time Savings and Distance Savings

<u>Routes</u>	<u>Distance (miles)</u>	<u>Distance Savings</u>	<u>Time (minutes)</u>	<u>Time Savings</u>
No Build 3 (Harlan to London)	76.16	4.29	82.4	25.12
No Build 1 (Harlan to London)	80.45		107.52	
Alternate 1 (Harlan to London)	75.31	6.01	82.16	26.52
No Build 2 (Harlan to London)	81.32		108.68	
Alternate 1 - KY 118 (Harlan to London)	70.92	10.4	77.37	31.31
No Build 2 (Harlan to London)	81.32		108.68	
Alternate 1a (Harlan to London)	76.56	4.76	83.52	25.16
No Build 2 (Harlan to London)	81.32		108.68	
Alternate 1a - KY 80 - KY 118 (Harlan to London)	72.28	9.04	79.71	28.97
No Build 2 (Harlan to London)	81.32		108.68	
Alternate 2 (Harlan to London)	73.06	7.39	79.7	27.82
No Build 1 (Harlan to London)	80.45		107.52	
Alternate 2a (Harlan to London)	73.2	7.25	79.85	27.67
No Build 1 (Harlan to London)	80.45		107.52	
Alternate 3 (Harlan to London)	70.94	9.51	77.39	30.13
No Build 1 (Harlan to London)	80.45		107.52	
Alternate 3a (Harlan to London)	78.95	1.5	86.13	21.39
No Build 1 (Harlan to London)	80.45		107.52	
Alternate 3a - KY 80 - KY 118 (Harlan to London)	74.67	5.78	82.32	25.2
No Build 1 (Harlan to London)	80.45		107.52	
Alternate 3b (Harlan to London)	75.19	5.26	82.03	25.49
No Build 1 (Harlan to London)	80.45		107.52	
Alternate 4 (Harlan to London)	78.14	2.31	85.24	22.28
No Build 1 (Harlan to London)	80.45		107.52	
Alternate 4 - KY 80 - KY 118 (Harlan to London)	75.21	5.24	83.33	24.19
No Build 1 (Harlan to London)	80.45		107.52	
Alternate 5 (Harlan to London)	80.79	-0.34	88.13	19.39
No Build 1 (Harlan to London)	80.45		107.52	
Alternate 5 - KY 80 - KY 118 (Harlan to London)	79.64	0.81	88.72	18.8
No Build 1 (Harlan to London)	80.45		107.52	

Harlan to Hazard Alternates

Time Savings and Distance Savings

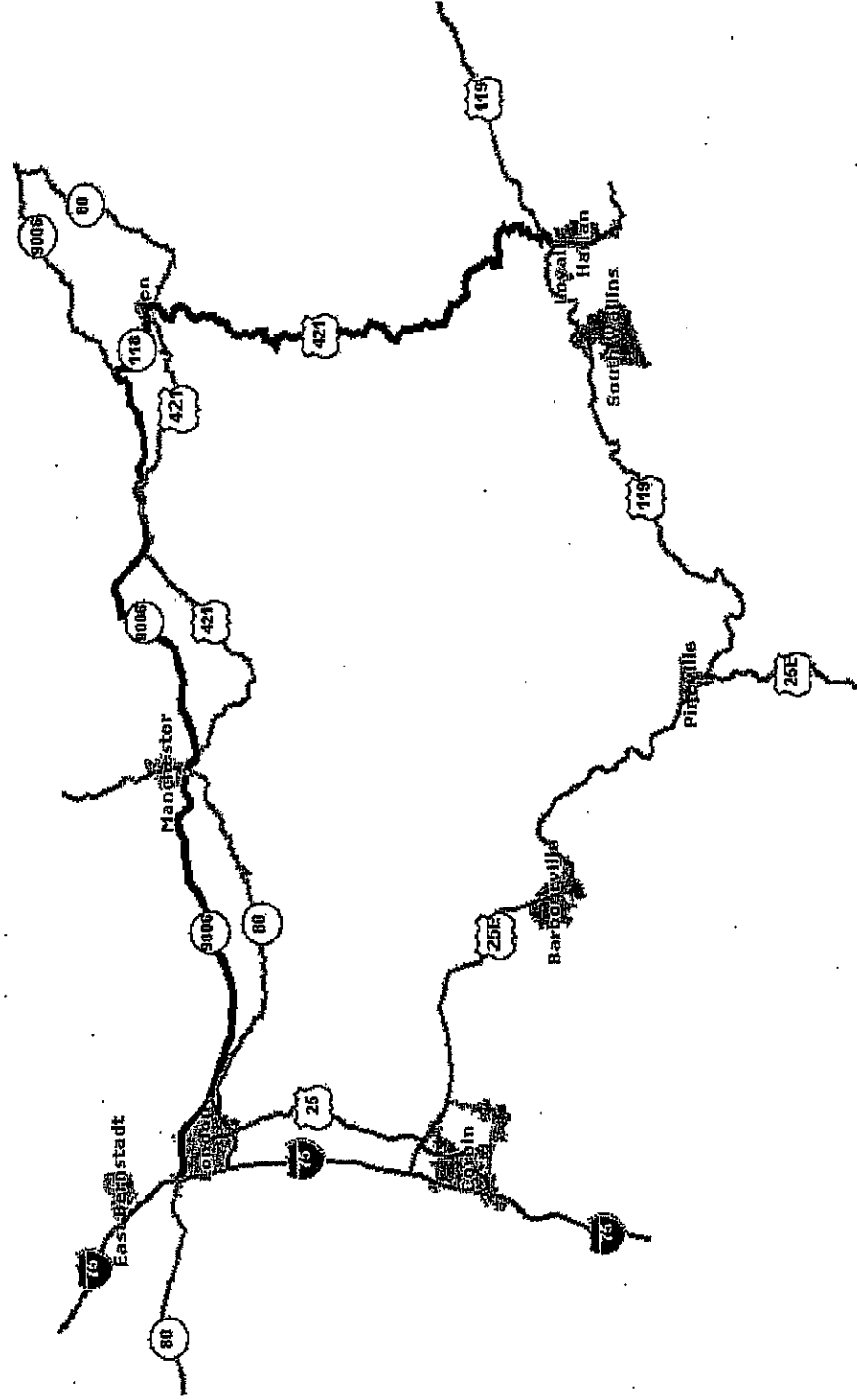
Routes	Distance (miles)	Distance Savings	Time (minutes)	Time Savings
Alternate 1 (Harlan to Hazard)	42.21	10.52	46.85	34.31
No Build 1 (Harlan to Hazard)	52.73		81.16	
Alternate 1a (Harlan to Hazard)	40.28	12.45	44.75	36.41
No Build 1 (Harlan to Hazard)	52.73		81.16	
Alternate 1a - KY 80 (Harlan to Hazard)	41.09	11.64	48.73	32.43
No Build 1 (Harlan to Hazard)	52.73		81.16	
Alternate 2 (Harlan to Hazard)	44.72	7.14	52.91	27.09
No Build 2 (Harlan to Hazard)	51.86		80	
Alternate 2a (Harlan to Hazard)	44.86	7	53.06	26.94
No Build 2 (Harlan to Hazard)	51.86		80	
Alternate 3 (Harlan to Hazard)	44.59	7.27	53.52	26.48
No Build 2 (Harlan to Hazard)	51.86		80	
Alternate 3 - US 421 (Harlan to Hazard)	48.4	3.46	60.23	19.77
No Build 2 (Harlan to Hazard)	51.86		80	
Alternate 3a (Harlan to Hazard)	42.67	9.19	47.36	32.64
No Build 2 (Harlan to Hazard)	51.86		80	
Alternate 3a - KY 80 (Harlan to Hazard)	39.78	12.08	46.81	33.19
No Build 2 (Harlan to Hazard)	51.86		80	
Alternate 3b (Harlan to Hazard)	44.43	7.43	51.88	28.12
No Build 2 (Harlan to Hazard)	51.86		80	
Alternate 4 (Harlan to Hazard)	43.51	11.7	48.27	22.63
No Build 3 (Harlan to Hazard)	55.21		70.9	
Alternate 4 - KY 80 (Harlan to Hazard)	40.5	14.71	47.66	23.24
No Build 3 (Harlan to Hazard)	55.21		70.9	
Alternate 5 (Harlan to Hazard)	42.94	12.27	47.65	23.25
No Build 3 (Harlan to Hazard)	55.21		70.9	
Alternate 5 - KY 80 (Harlan to Hazard)	40.27	14.94	46.83	24.07
No Build 3 (Harlan to Hazard)	55.21		70.9	
Alternate 6 (Harlan to Hazard)	34.55	20.66	39.66	31.24
No Build 3 (Harlan to Hazard)	55.21		70.9	
Alternate 7 (Harlan to Hazard)	29.22	25.99	31.88	39.02
No Build 3 (Harlan to Hazard)	55.21		70.9	
Alternate 8 (Harlan to Hazard)	47.5	7.71	53.79	17.11
No Build 3 (Harlan to Hazard)	55.21		70.9	
Alternate 8a (Harlan to Hazard)	46.15	9.06	52.31	18.59
No Build 3 (Harlan to Hazard)	55.21		70.9	

No Build 1 (Harlan to London)

Routes

Harlan (US 421@US 119) -
US 421 - KY 118 - TR 9006 -
London (TR 9006@I-75)

Distance (miles) 80.45
Time (minutes) 107.52



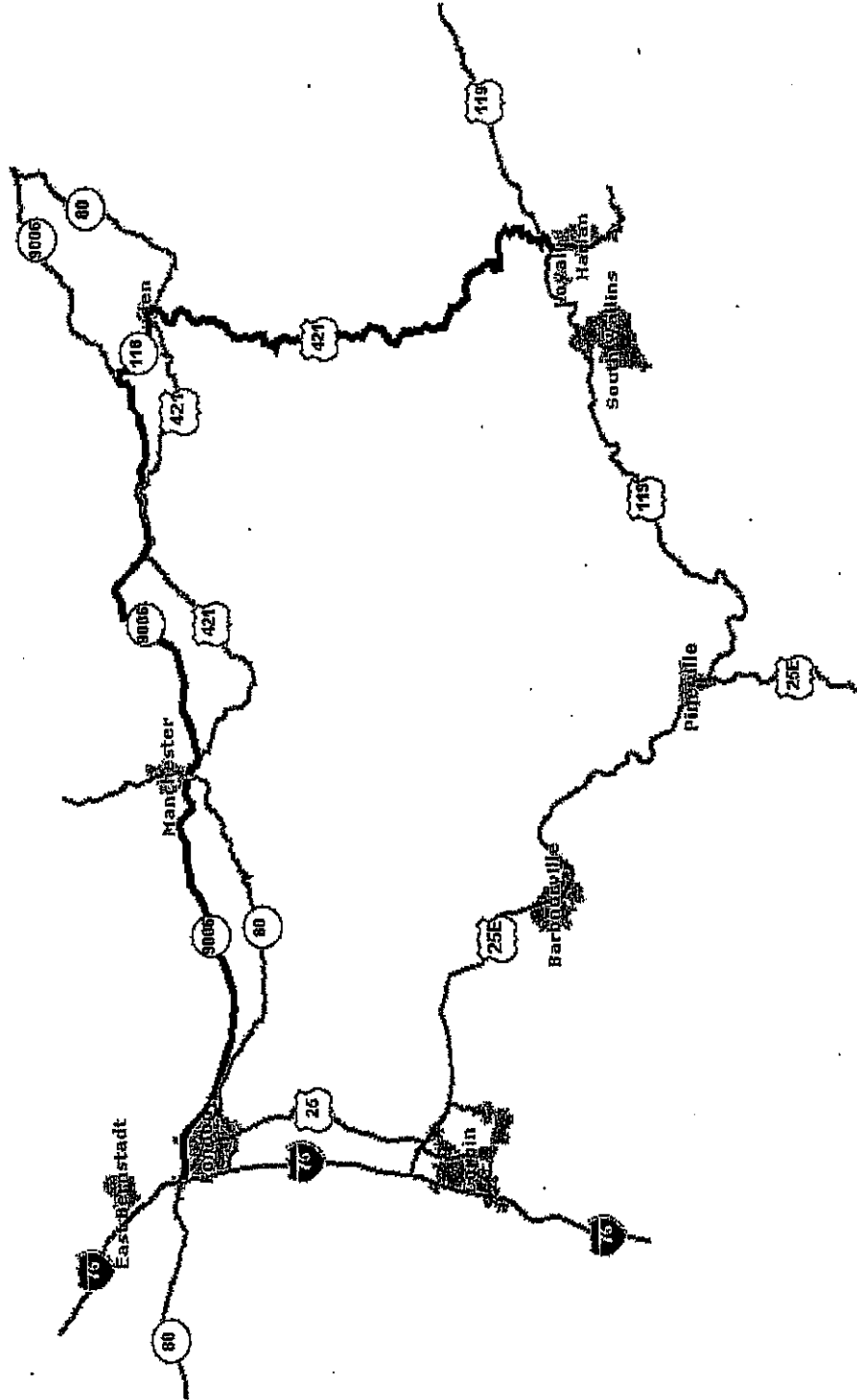
No Build 2 (Harlan to London)

Routes

Harlan (US 421@US 119) -
US 421 - KY 118 - TR 9006 -
London (TR 9006@I-75)

Distance (miles)
81.32

Time (minutes)
108.68

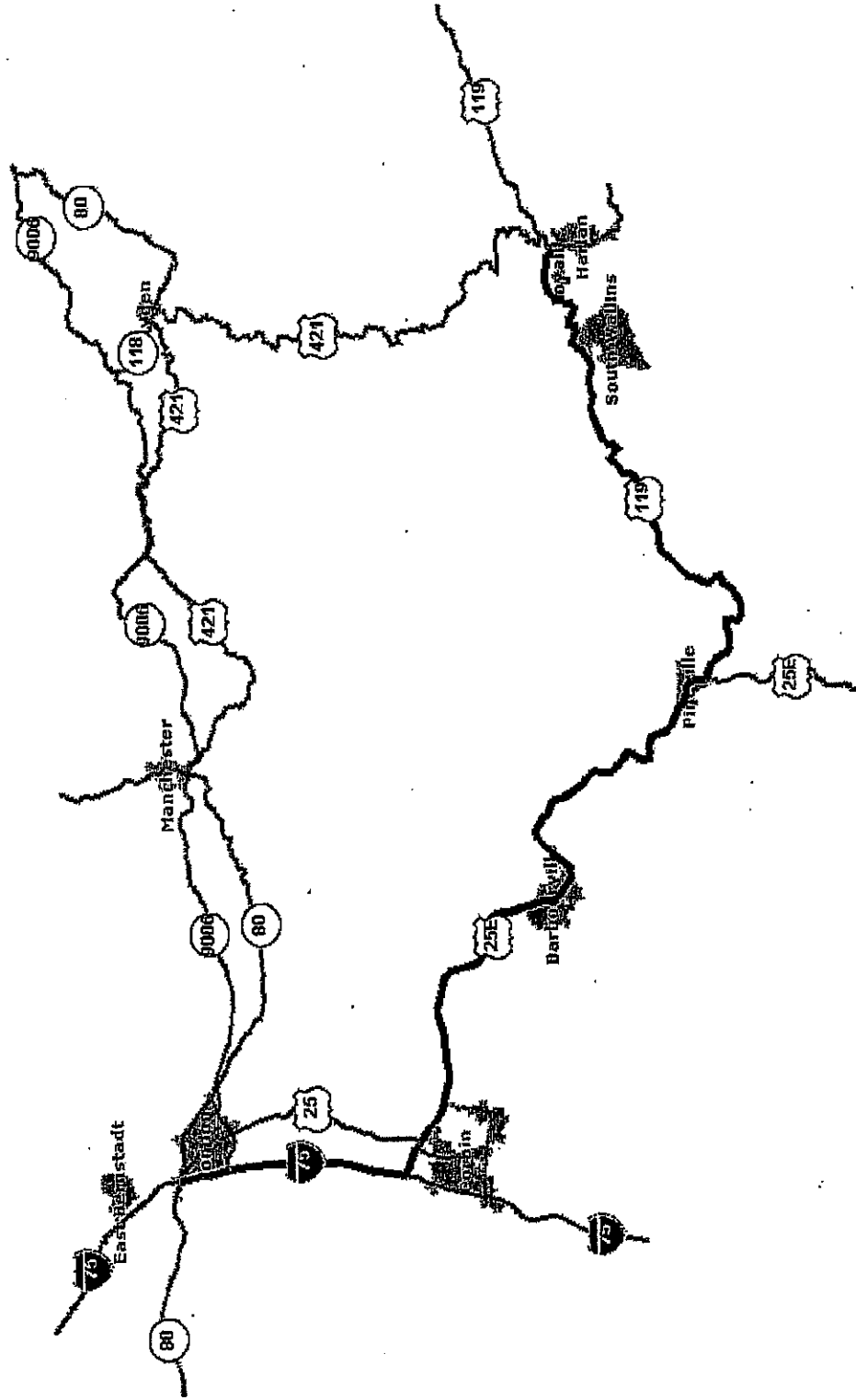


No Build 3 (Harlan to London)

Routes

Harlan (US 421@US 119) -
US 119 - US 25E - I-75 -
London (TR 9006@I-75)

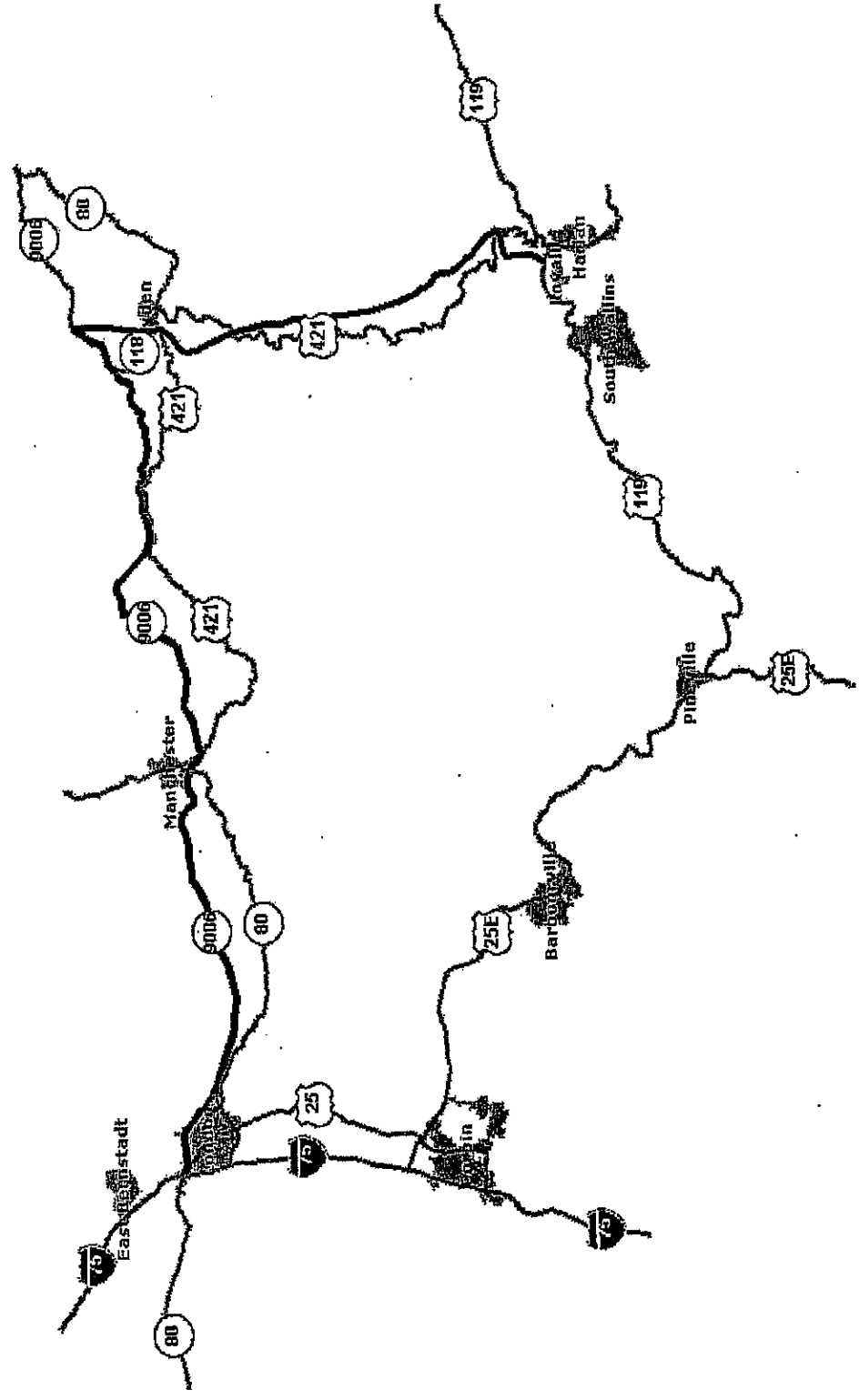
Distance (miles) 76.16
Time (minutes) 82.40



Alternate 1 (Harlan to London)

Routes
Harlan (Alternate 1@US 119) -
Alternate 1 - TR 9006 -
London (TR 9006@I-75)

Distance (miles) 75.31
Time (minutes) 82.16

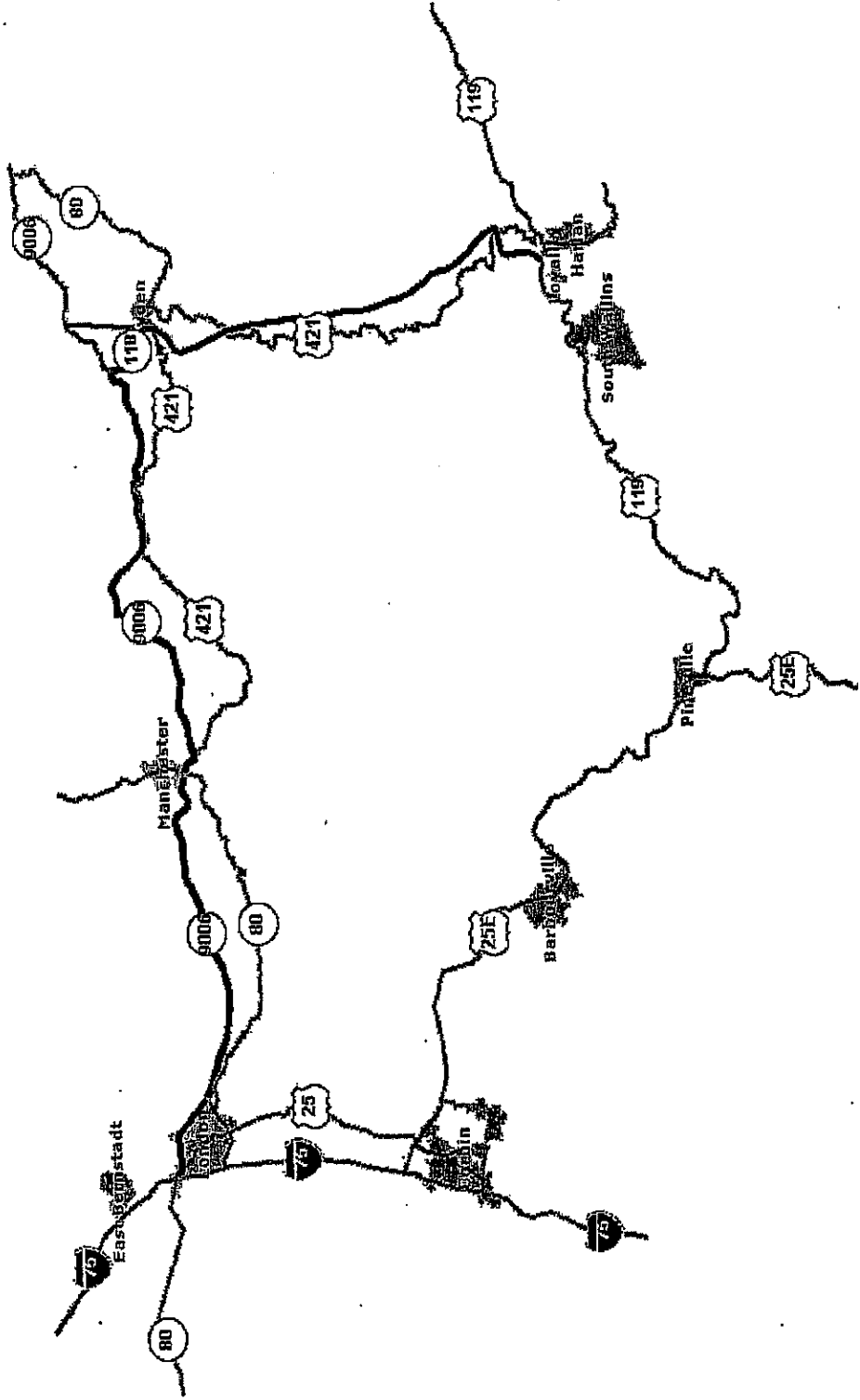


Alternate 1 - KY 118 (Harlan to London)

Routes

Harlan (Alternate 1@US 119) -
Alternate 1 - KY 118 - TR 9006 -
London (TR 9006@I-75)

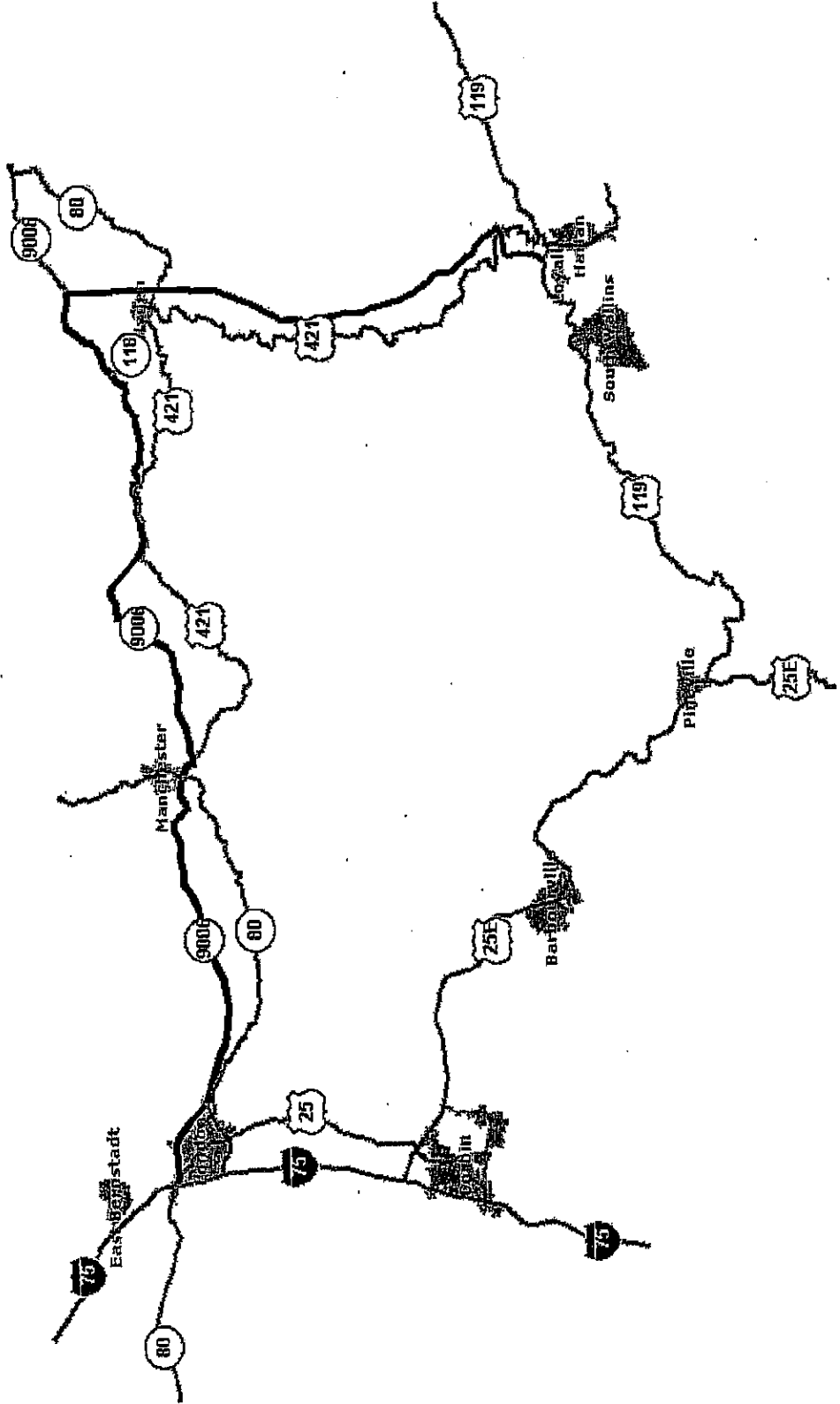
Distance (miles) 70.92
Time (minutes) 77.37



Alternate 1a (Harlan to London)

Routes
Harlan (Alternate 1a@US 119) -
Alternate 1a - TR 9006 -
London (TR 9006@I-75)

Distance (miles) 76.56
Time (minutes) 83.52

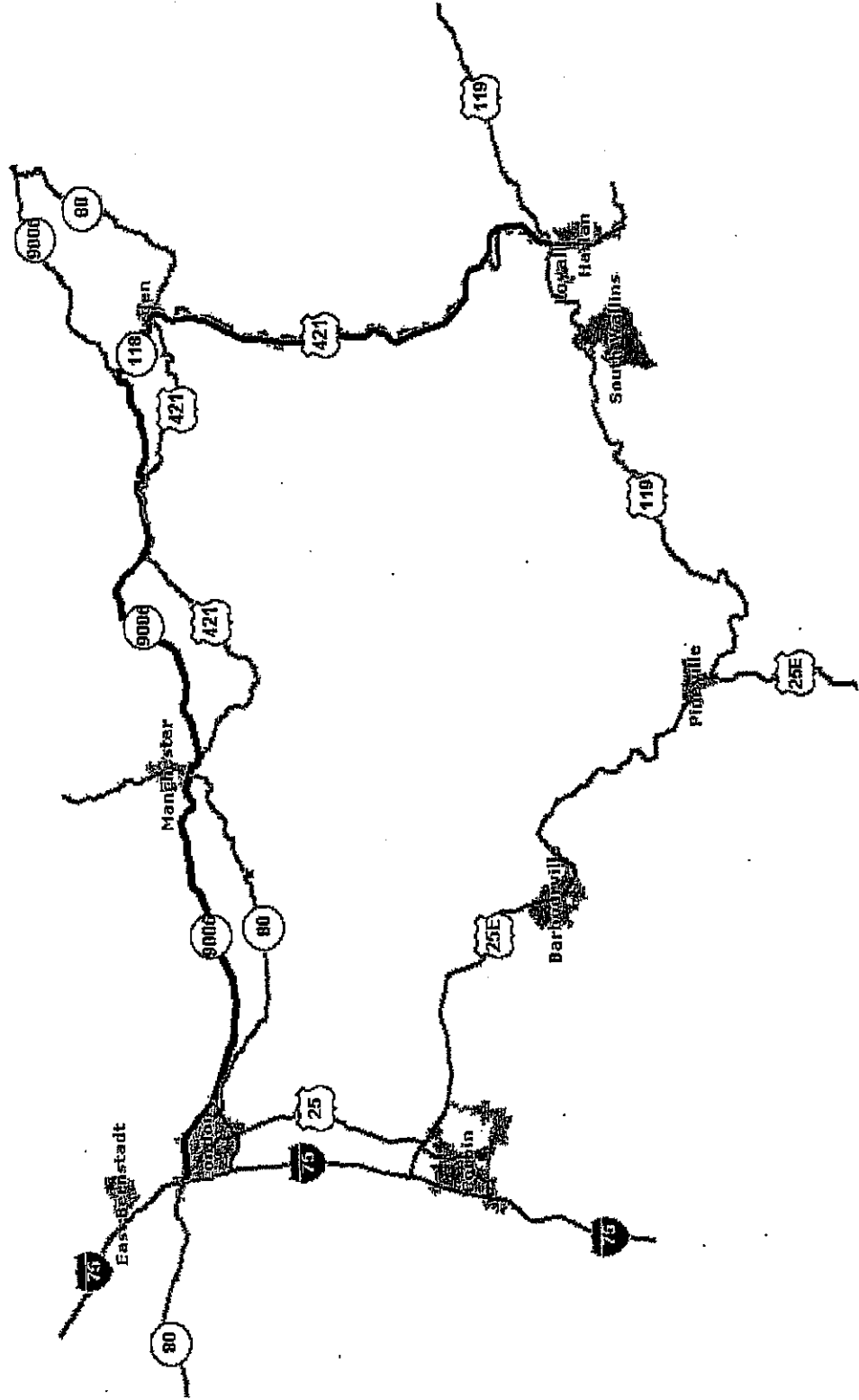


Alternate 2a (Harlan to London)

Routes

Harlan (Alternate 2a@US 119) -
Alternate 2 - KY 118 - TR 9006 -
London (TR 9006@I-75)

Distance (miles) 73.20
Time (minutes) 79.85

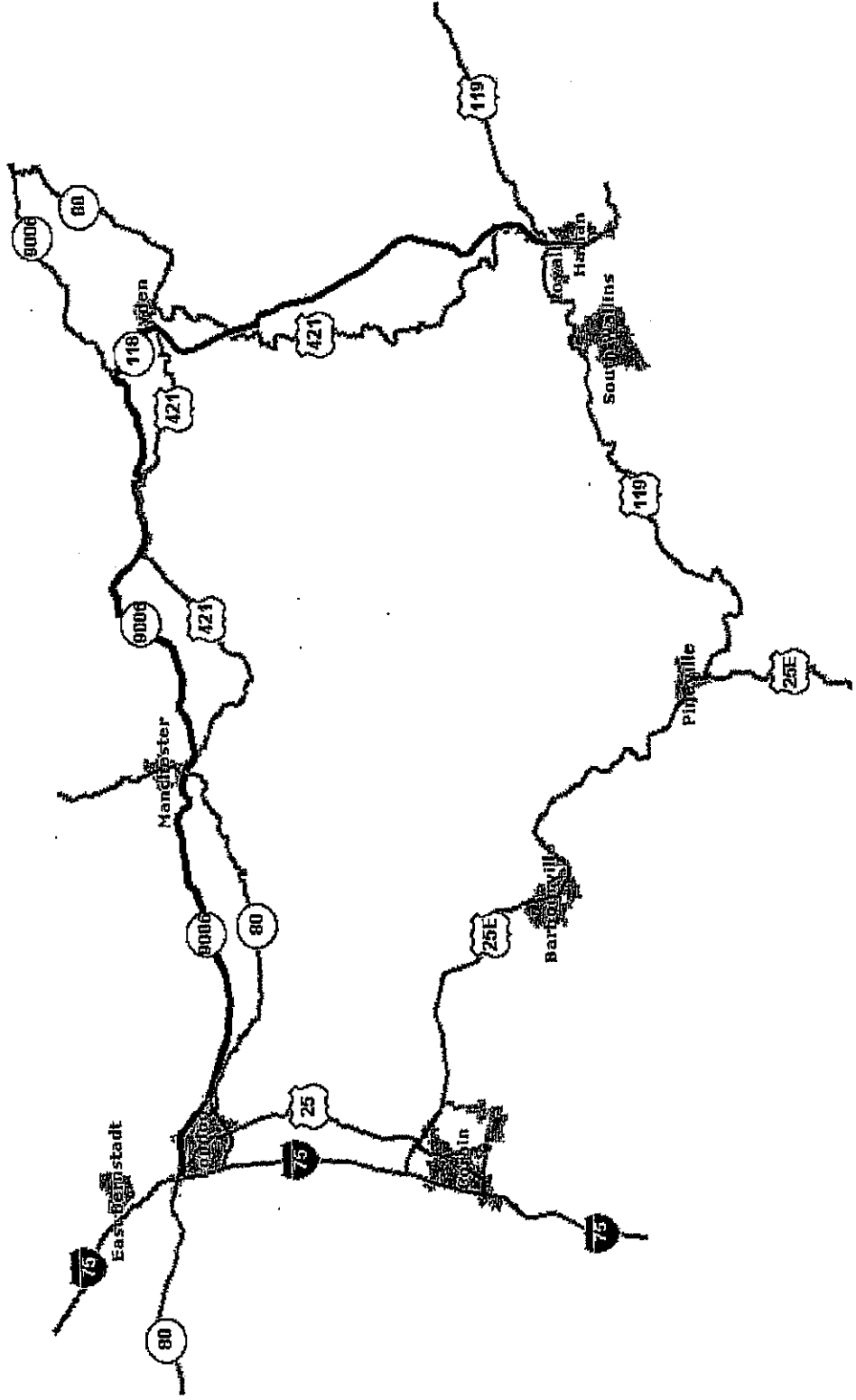


Alternate 3 (Harlan to London)

Routes

Harlan (Alternate 3@US 119) -
Alternate 3 - KY 118 - TR 9006 -
London (TR 9006@I-75)

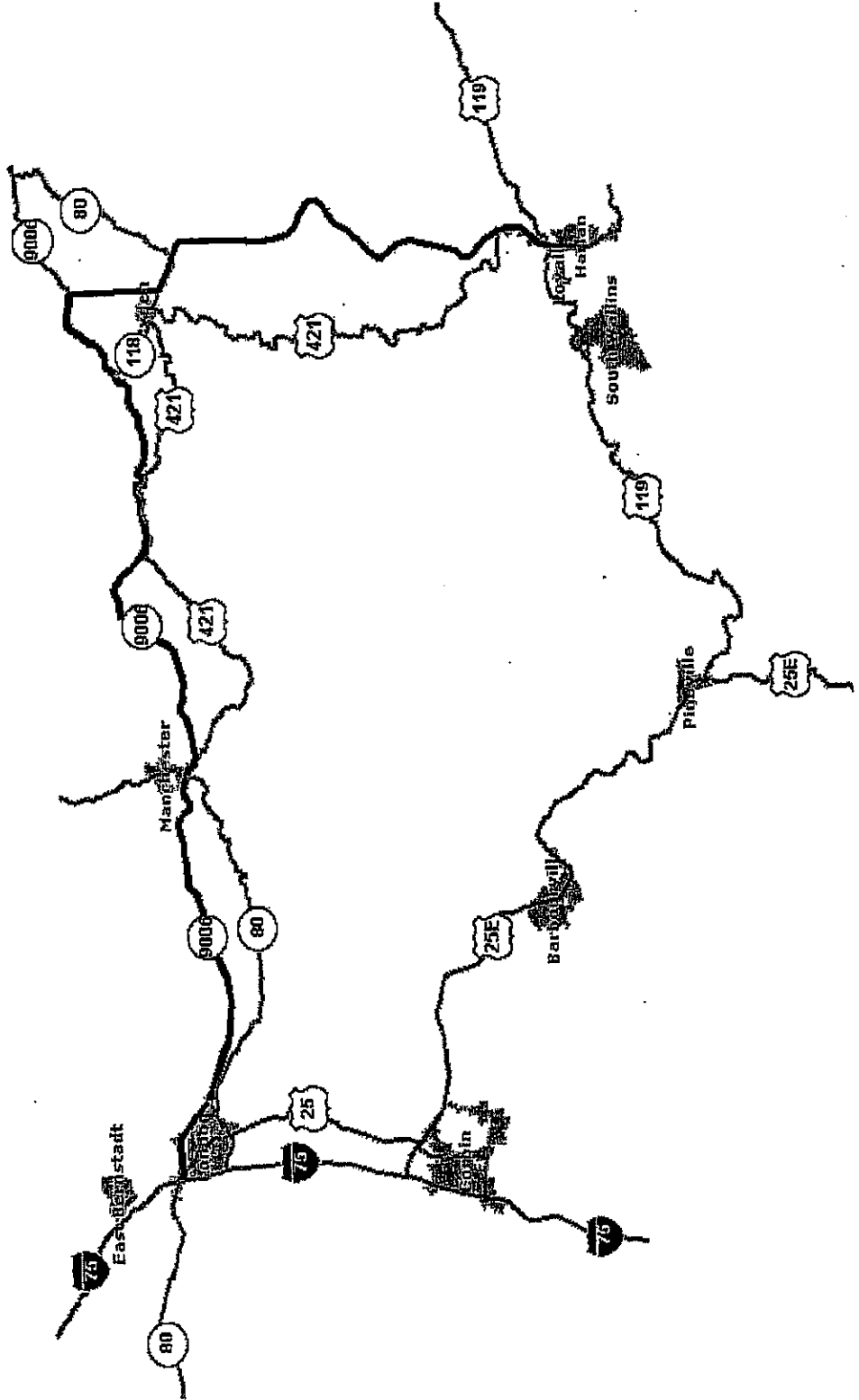
Distance (miles) 70.94
Time (minutes) 77.39



Alternate 3a (Harlan to London)

Routes
Harlan (Alternate 3a@US 119) -
Alternate 3a - TR 9006 -
London (TR 9006@I-75)

Distance (miles) 78.95
Time (minutes) 86.13

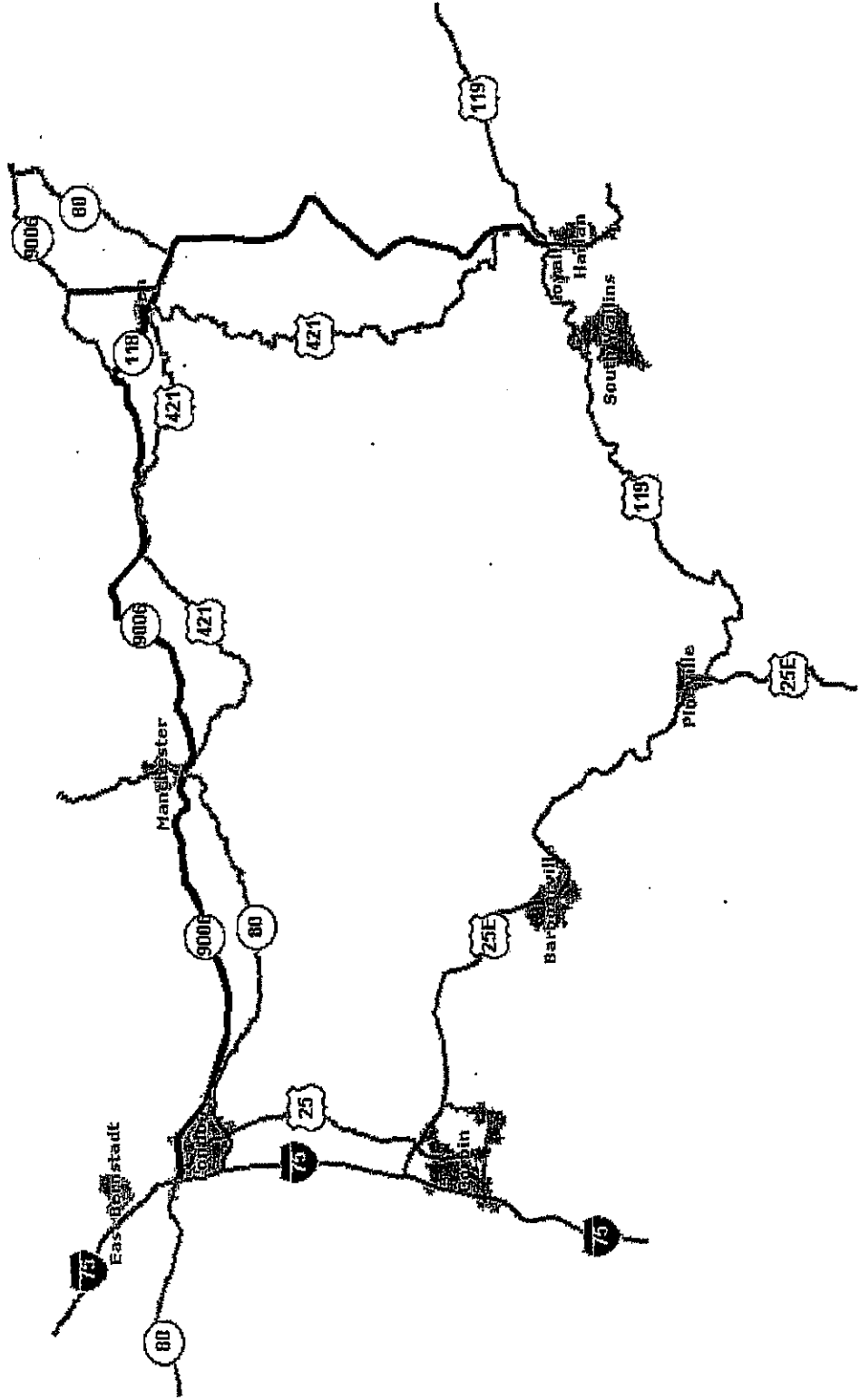


Alternate 3a - KY 80 - KY 118 (Harlan to London)

Routes

Harlan (Alternate 3a@US 119) -
Alternate 3a - KY 80 - KY 118 - TR 9006 -
London (TR 9006@I-75)

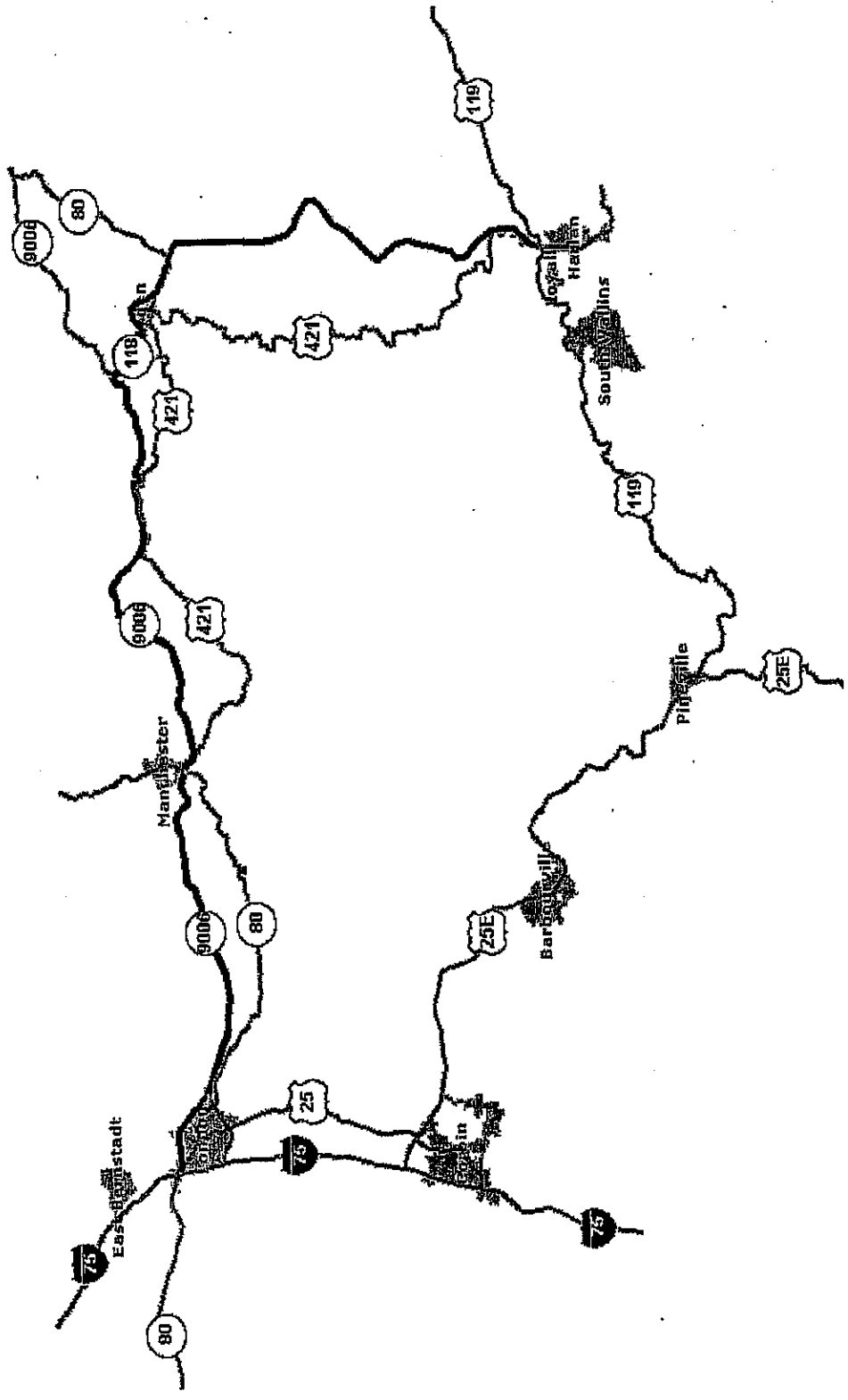
Distance (miles) 74.67
Time (minutes) 82.32



Alternate 3b (Harlan to London)

Distance (miles) 75.19
Time (minutes) 82.03

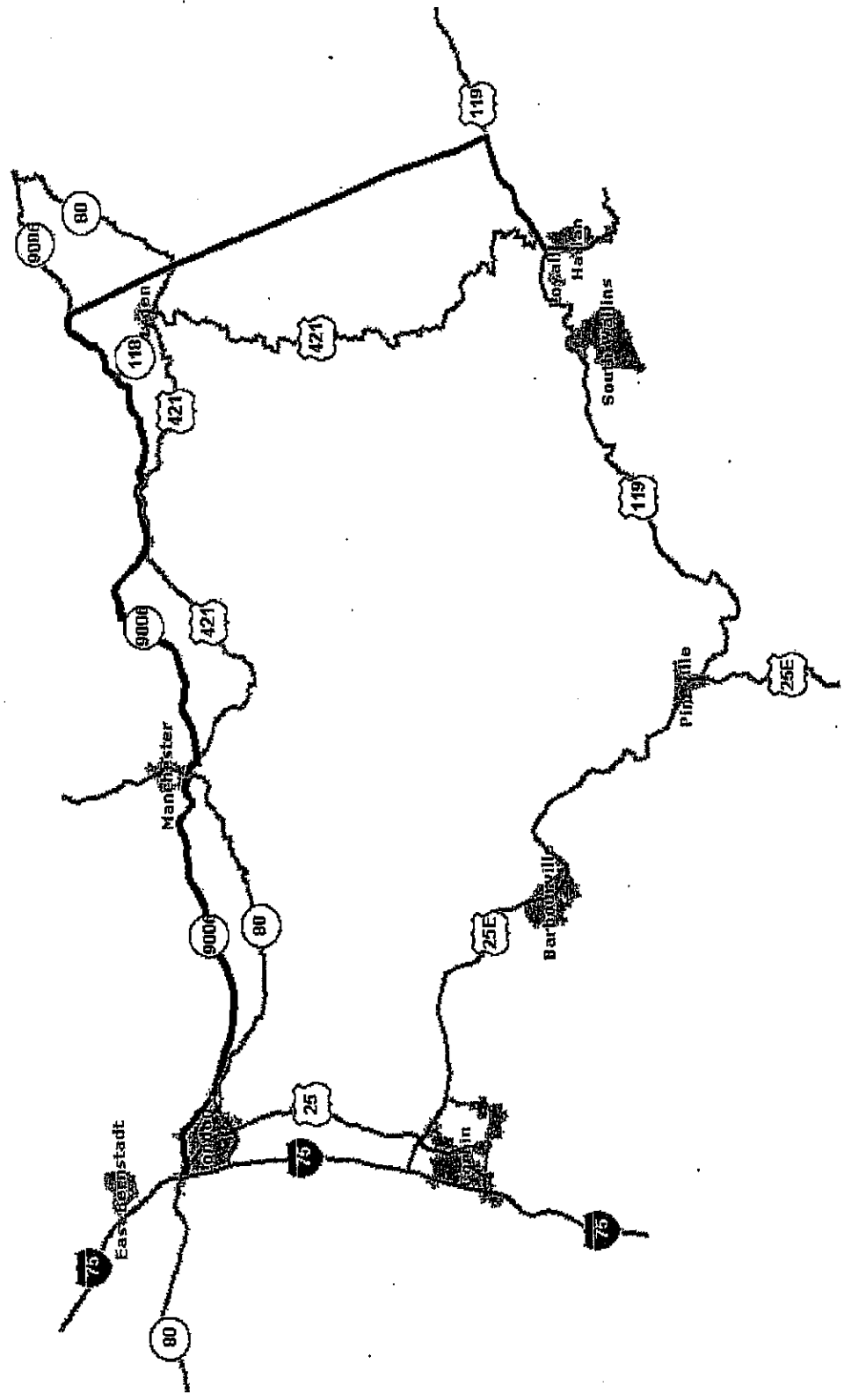
Routes
Harlan (Alternate 3b@US 119) -
Alternate 3b - KY 118 - TR 9006 -
London (TR 9006@I-75)



Alternate 4 (Harlan to London)

Distance (miles) 78.14
Time (minutes) 85.24

Routes
Harlan (Alternate 4@US 119) -
Alternate 4 - TR 9006 -
London (TR 9006@I-75)

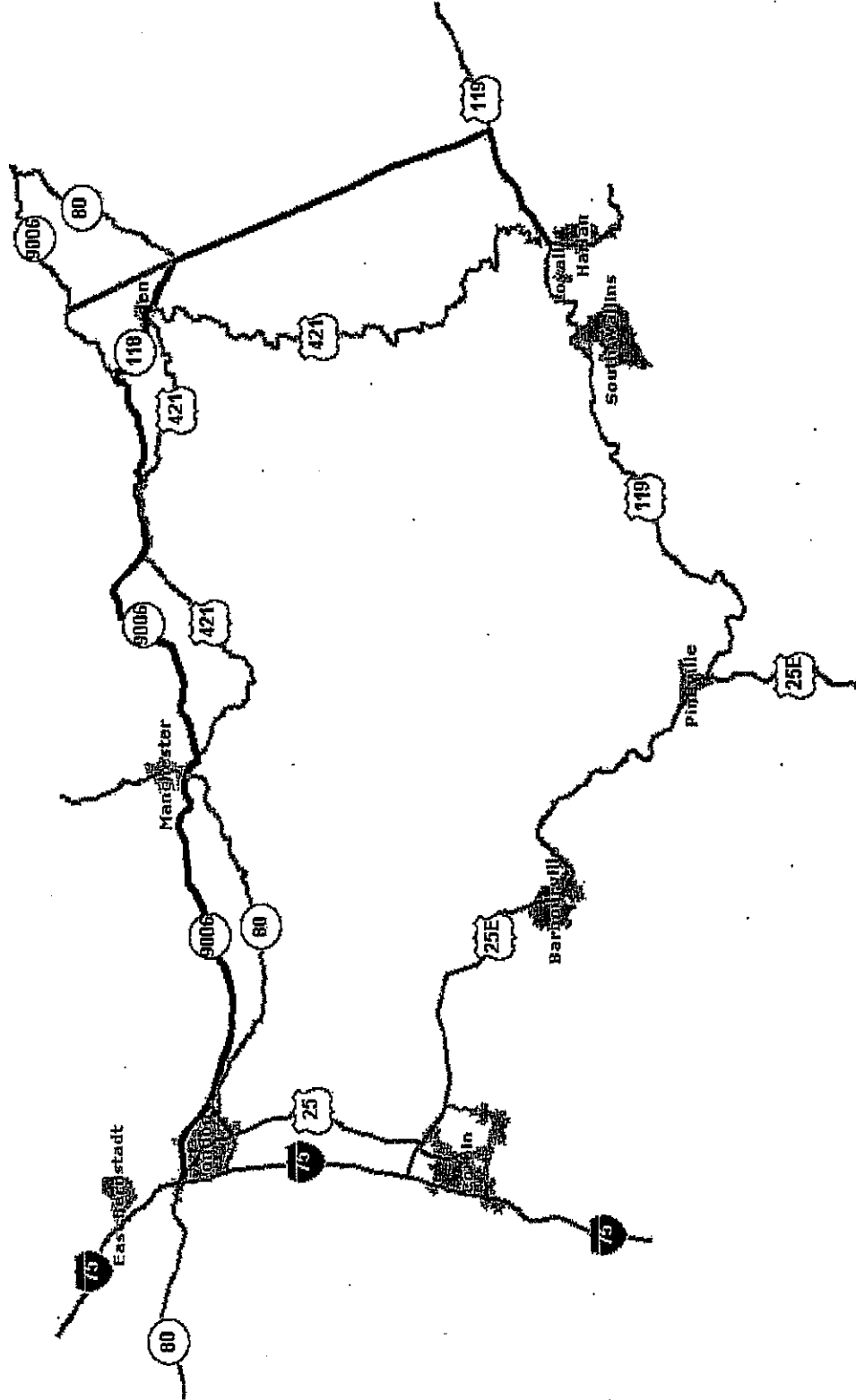


Alternate 4 - KY 80 - KY 118 (Harlan to London)

Routes

Harlan (Alternate 4@US 119) -
Alternate 4 - KY 80 - KY 118 - TR 9006 -
London (TR 9006@I-75)

Distance (miles) 75.21
Time (minutes) 83.33

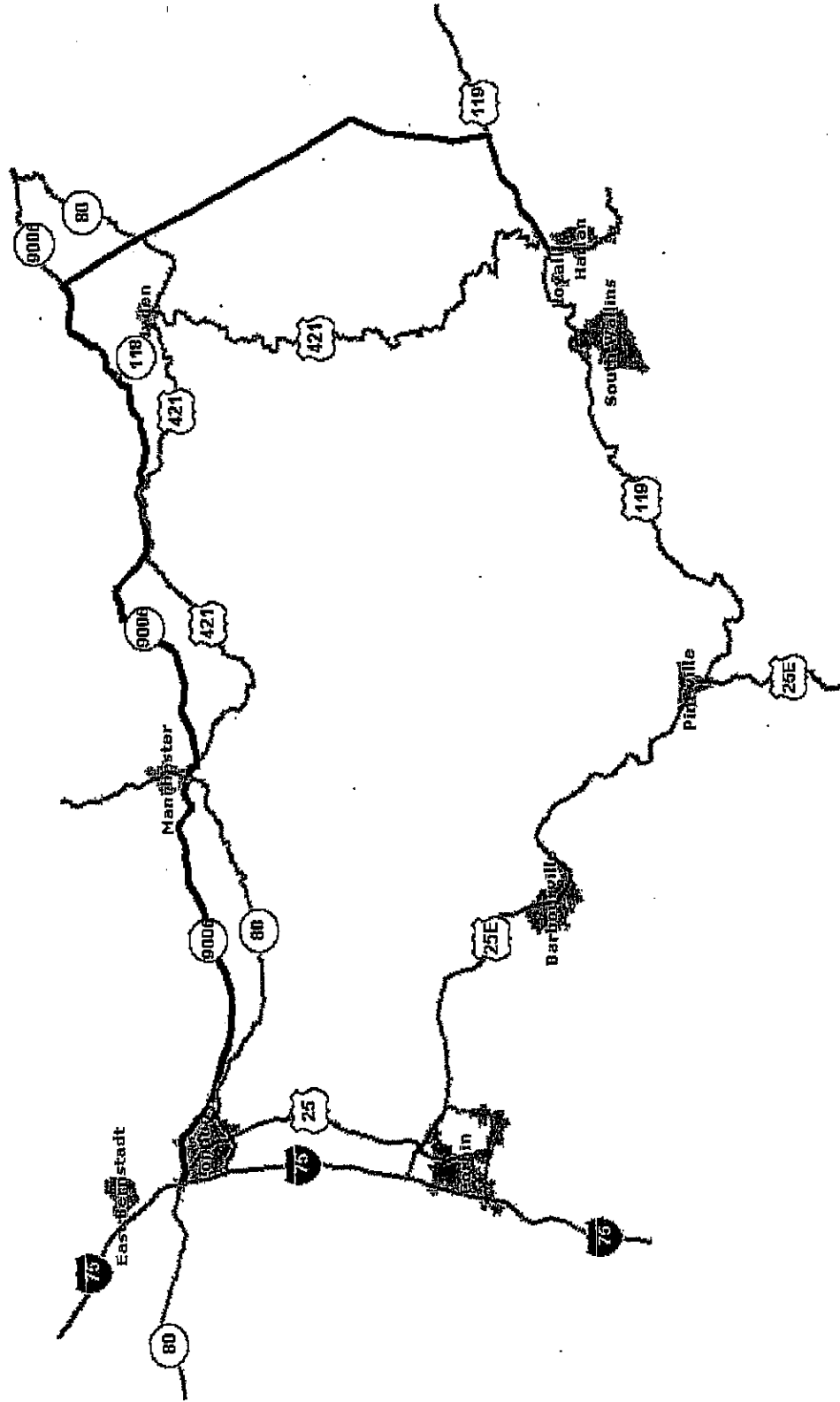


Alternate 5 (Harlan to London)

Routes

Harlan (Alternate 5@US 119) -
Alternate 5 - TR 9006 -
London (TR 9006@I-75)

Distance (miles) 80.79
Time (minutes) 88.13

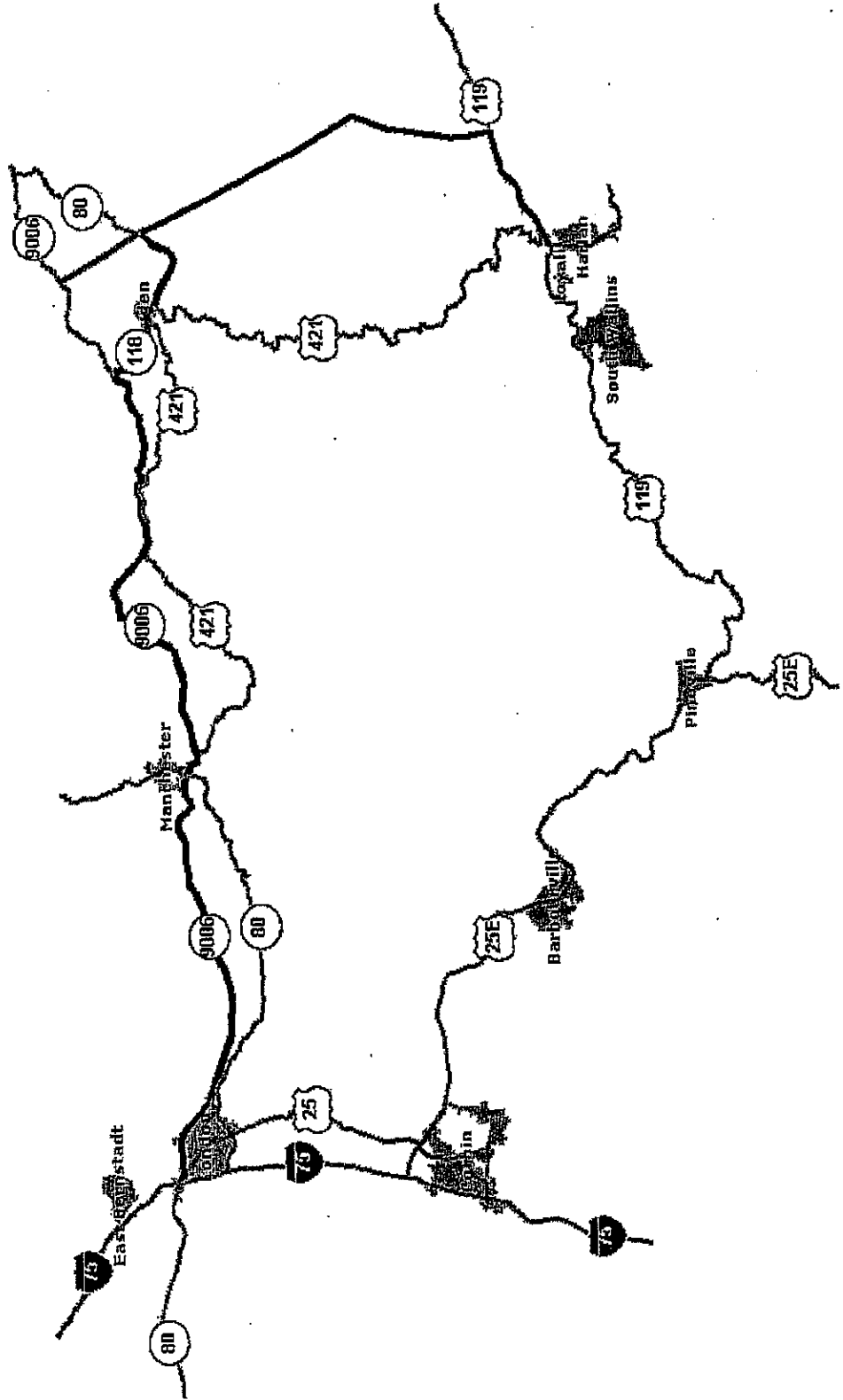


Alternate 5 - KY 80 - KY 118 (Harlan to London)

Routes

Harlan (Alternate 5@US 119) -
Alternate 5 - KY 80 - KY 118 - TR 9006 -
London (TR 9006@I-75)

Distance (miles) 79.64
Time (minutes) 88.72



No Build 1 (Harlan to Hazard)

Routes

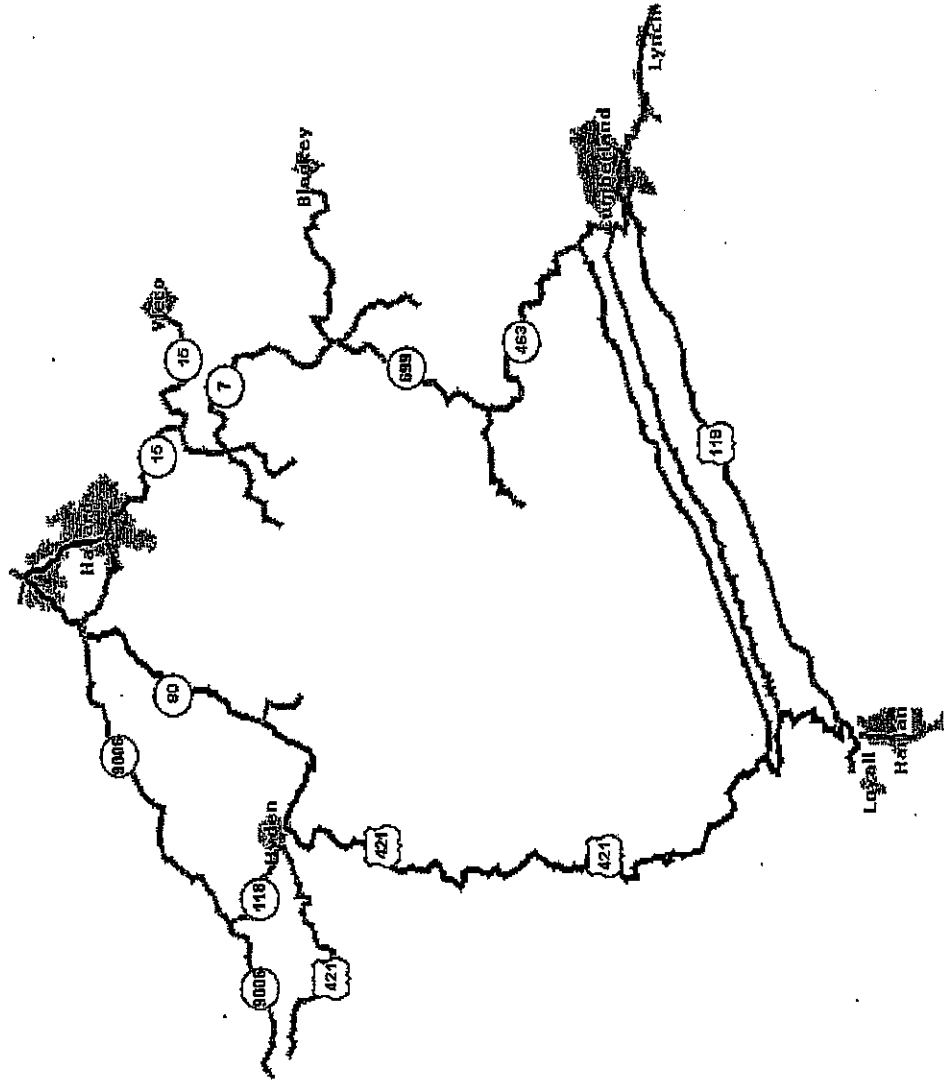
Harlan (US 421@US 119) -

US 421 - KY 80 - TR 9006 - KY 15

Hazard (KY 15@KY 451)

Distance (miles) 52.73

Time (minutes) 81.16



No Build 2 (Harlan to Hazard)

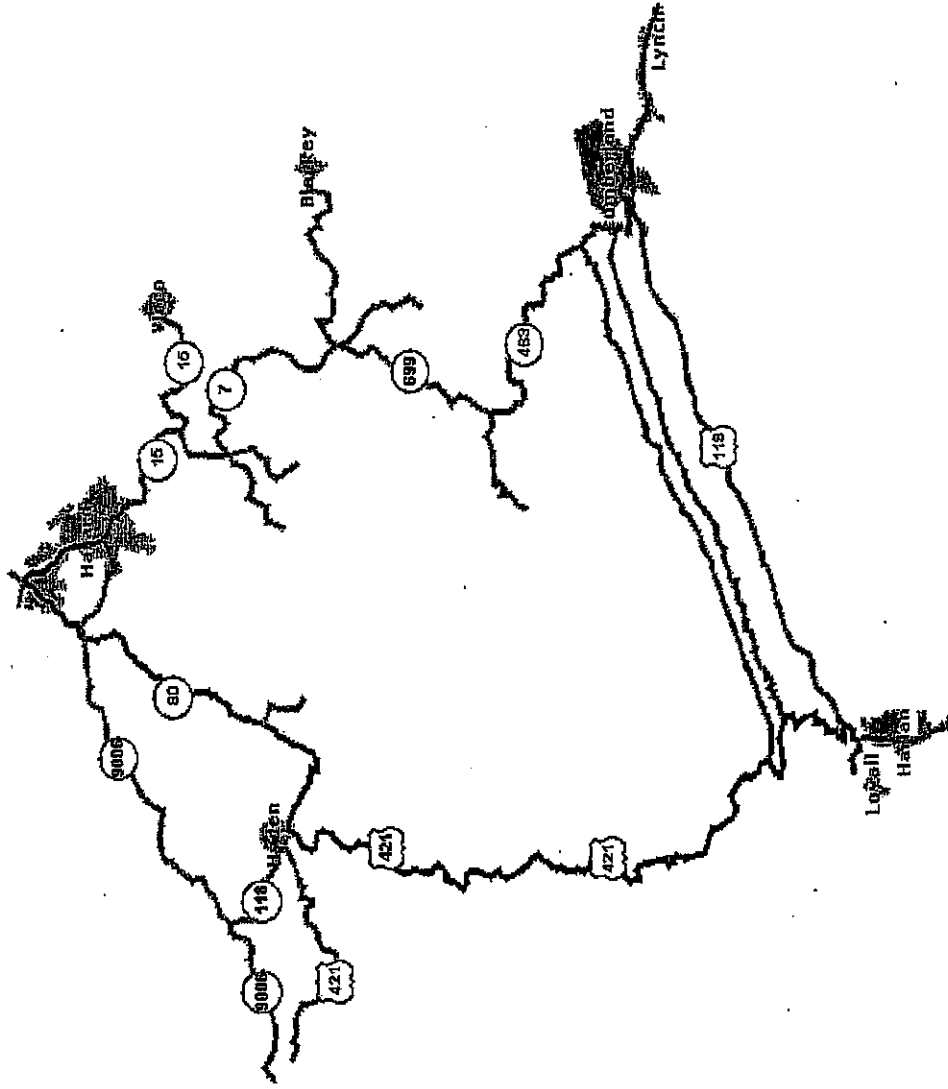
Routes

Harlan (US 421@US 119) -

US 421 - KY 118 - TR 9006 - KY 15

Hazard (KY 15@KY 451)

Distance (miles) 51.86
Time (minutes) 80.00

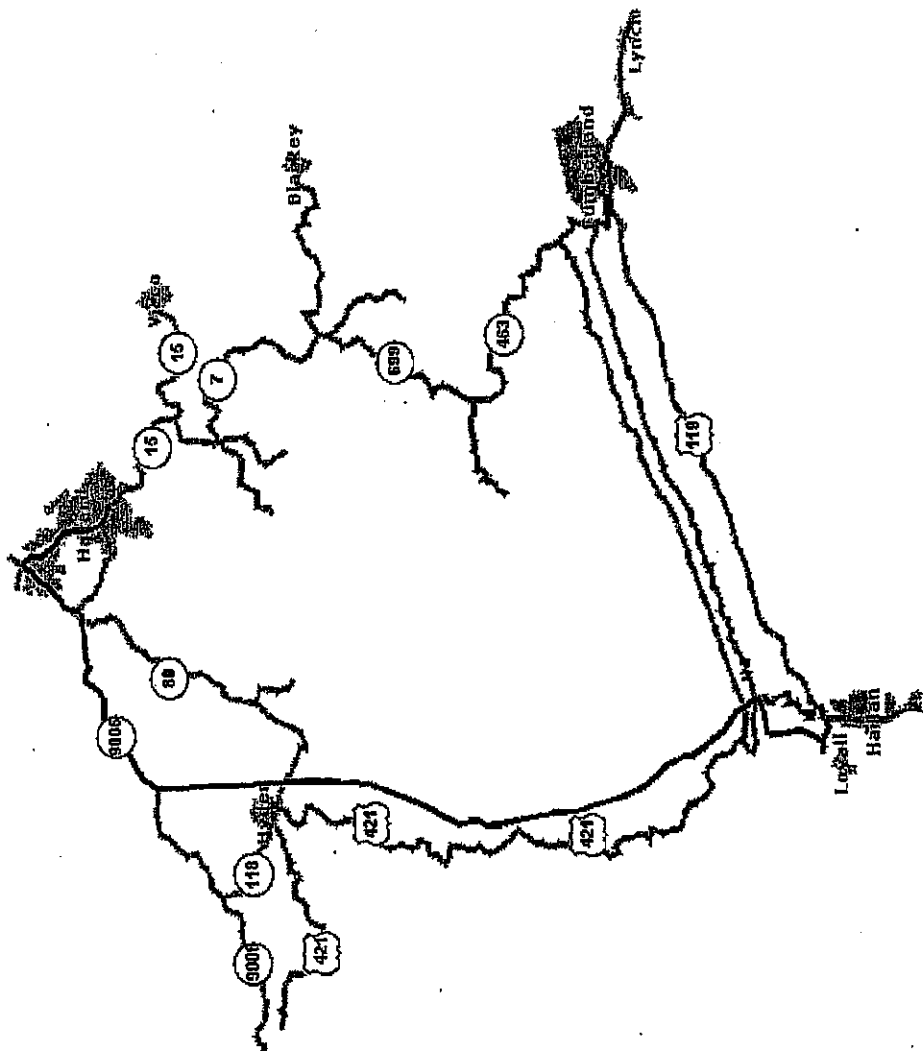


Alternate 1a (Harlan to Hazard)

Routes

- Harlan (Alternate 1a@US 119) -
- Alternate 1a - TR 9006 - KY 15 -
- Hazard (KY 15@KY 451)

Distance (miles) 40.28
Time (minutes) 44.75



Alternate 1a - KY 80 (Harlan to Hazard)

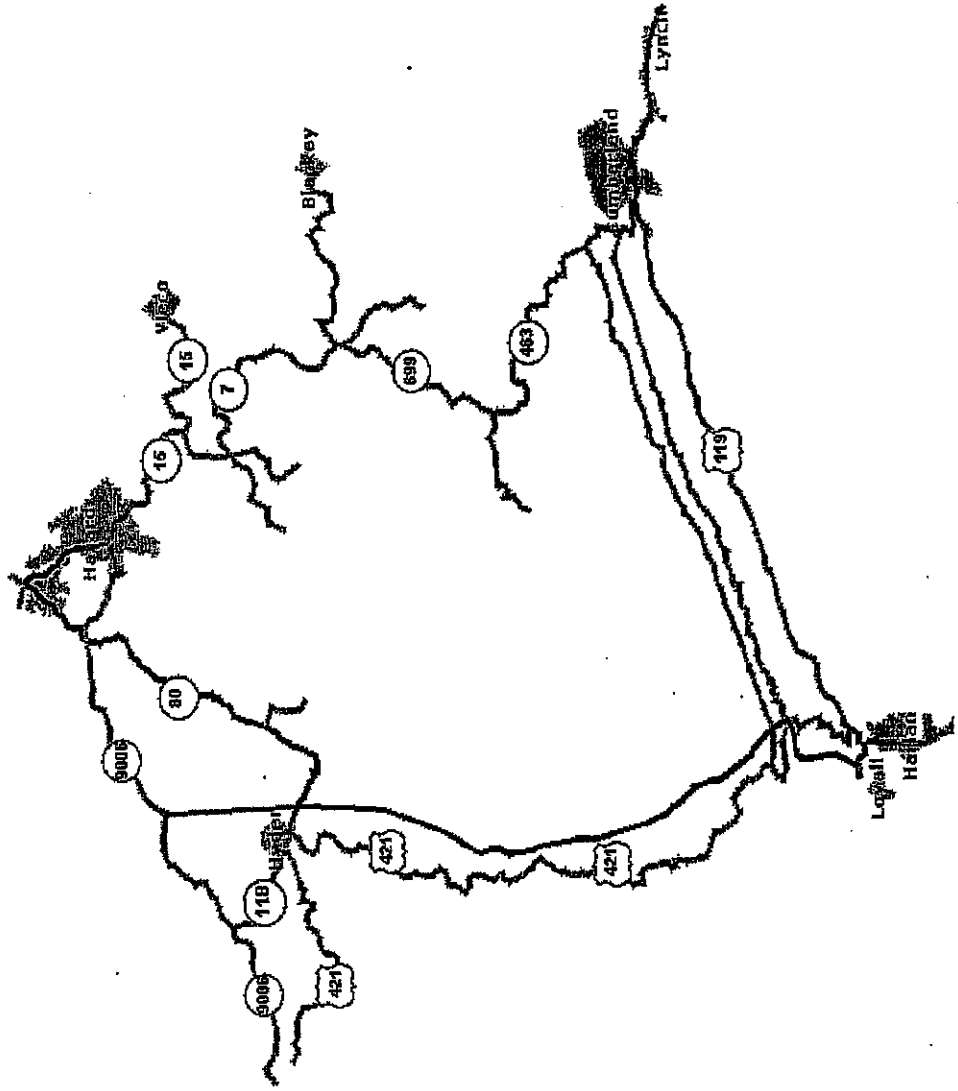
Routes

Harlan (Alternate 1a@US 119) -

Alternate 1a - KY 80 - TR 9006 - KY 15 -

Hazard (KY 15@KY 451)

Distance (miles) 41.09
Time (minutes) 48.73



Alternate 2 (Harlan to Hazard)

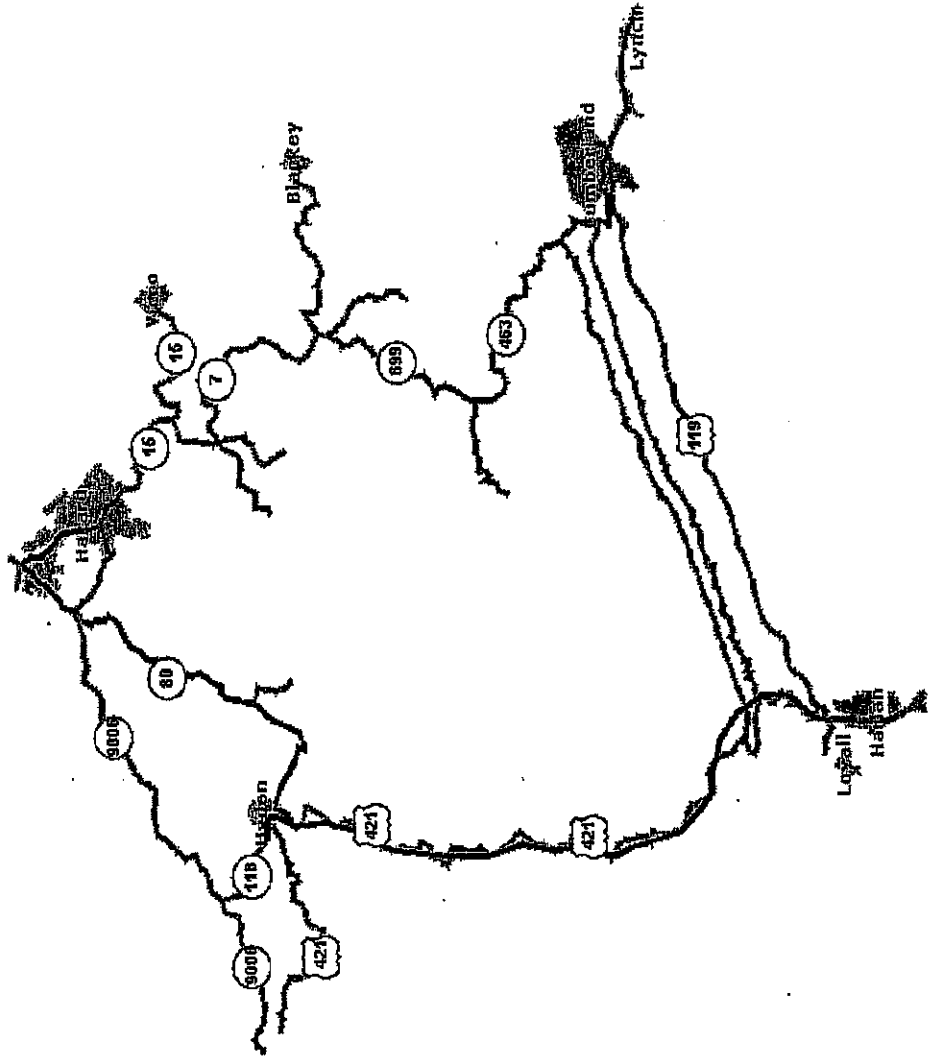
Routes

Harlan (Alternate 2@US 119) -

Alternate 2 - KY 80 - TR 9006 - KY 15 -

Hazard (KY 15@KY 451)

Distance (miles) 44.72
Time (minutes) 52.91



Alternate 2a (Harlan to Hazard)

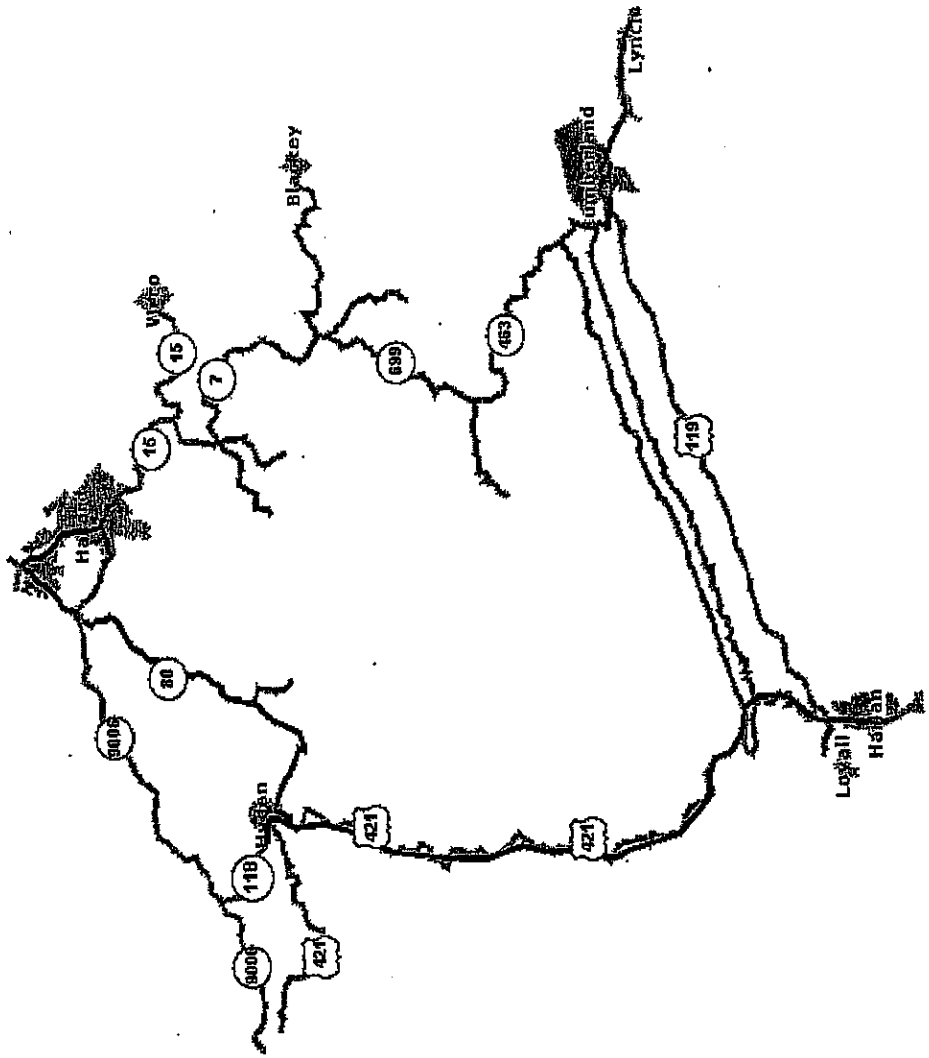
Routes

Harlan (Alternate 2a@US 119) -

Alternate 2a - KY 80 - TR 9006 - KY 15 -

Hazard (KY 15@KY 451)

Distance (miles) 44.86
Time (minutes) 53.06

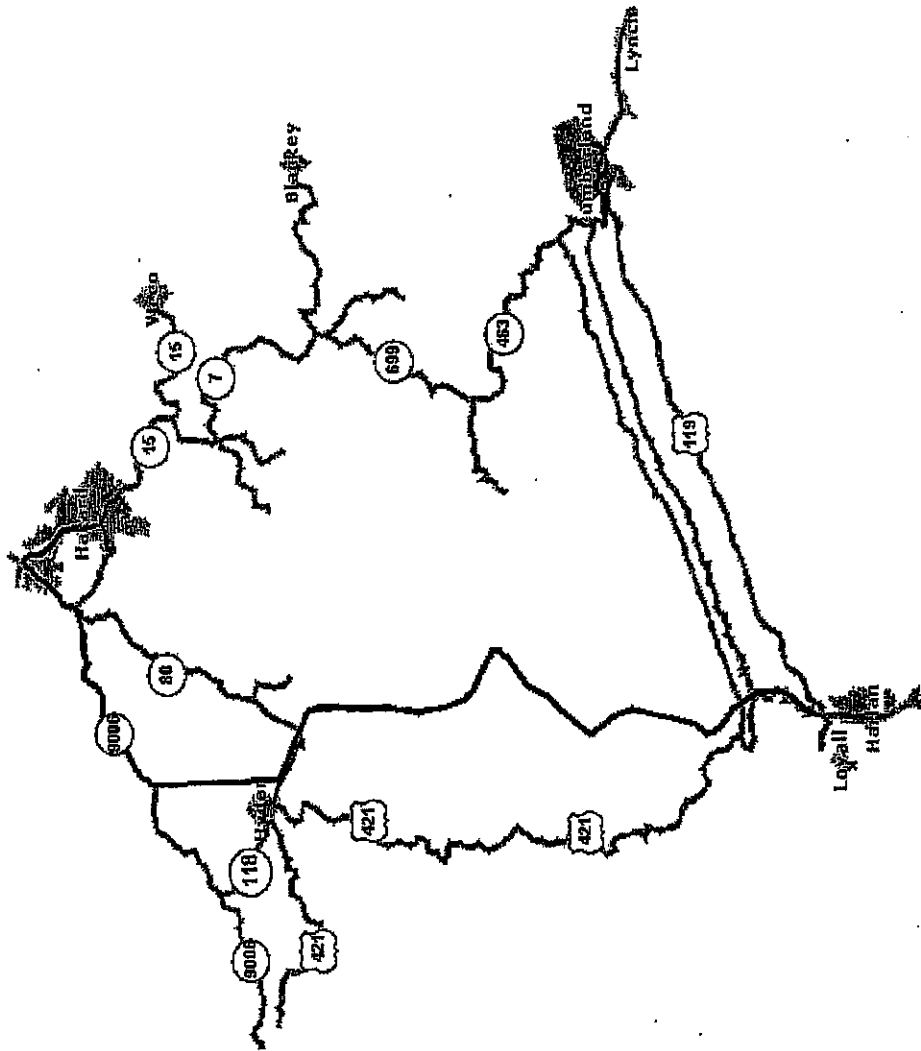


Alternate 3a (Harlan to Hazard)

Routes

- Harlan (Alternate 3a@US 119) -
- Alternate 3a - TR 9006 - KY 15 -
- Hazard (KY 15@KY 451)

Distance (miles) 42.67
Time (minutes) 47.36



Alternate 3a - KY 80 (Harlan to Hazard)

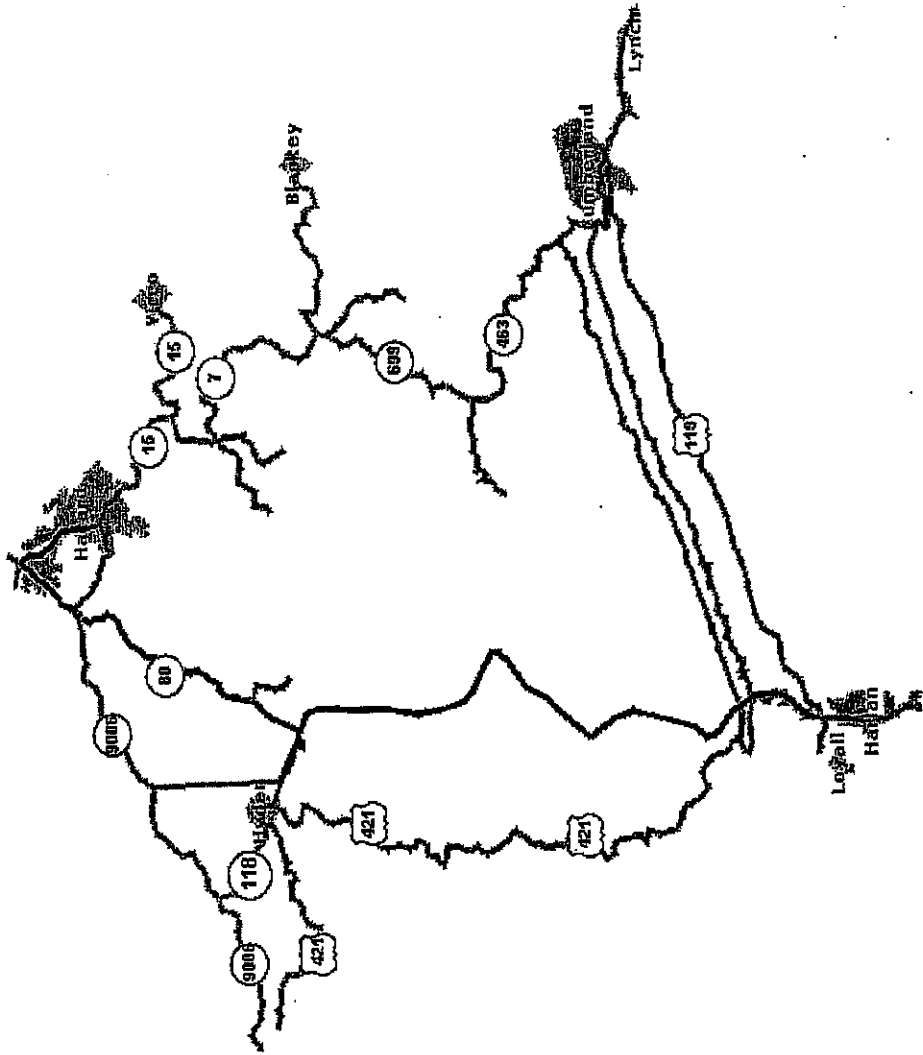
Routes

Harlan (Alternate 3a@US 119) -

Alternate 3a - KY 80 - TR 9006 - KY 15 -

Hazard (KY 15@KY 451)

Distance (miles) 39.78
Time (minutes) 46.81



Alternate 4 - KY 80 (Harlan to Hazard)

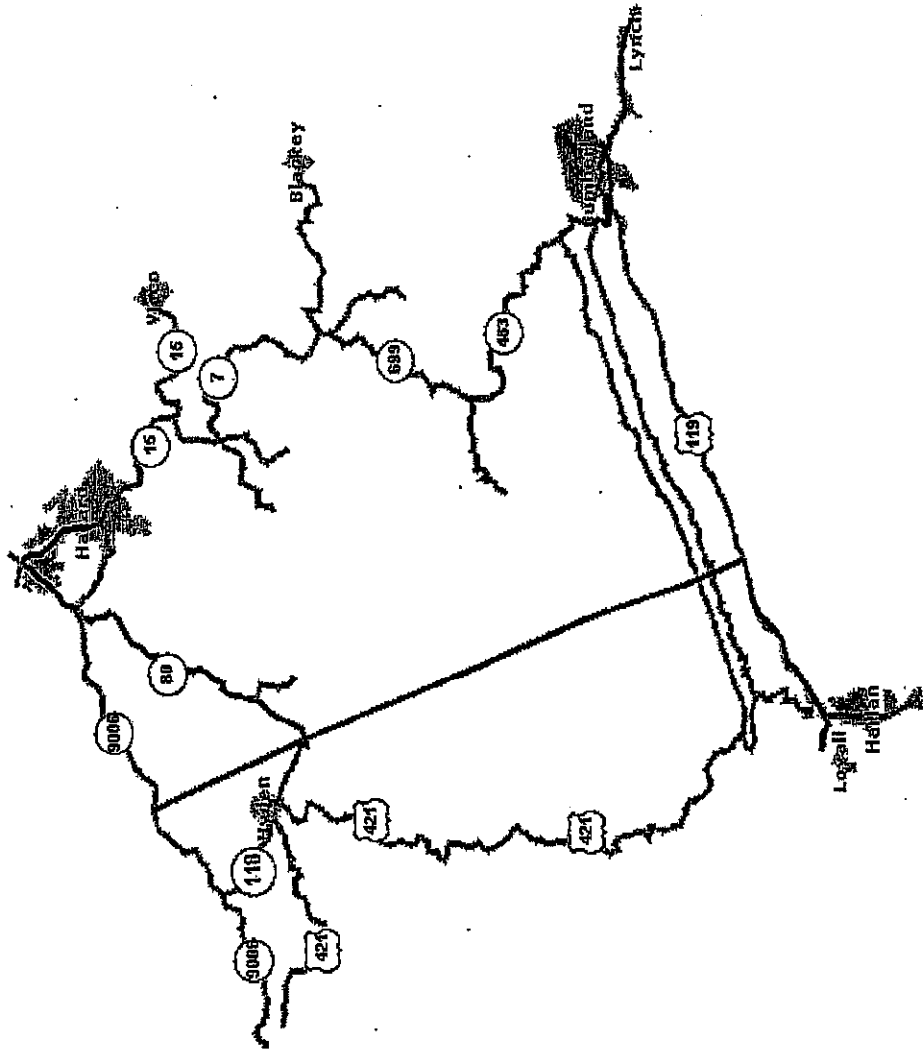
Routes

Harlan (Alternate 4@US 421) -

Alternate 4 - KY 80 - TR 9006 - KY 15 -

Hazard (KY 15@KY 451)

Distance (miles) 40.50
Time (minutes) 47.66

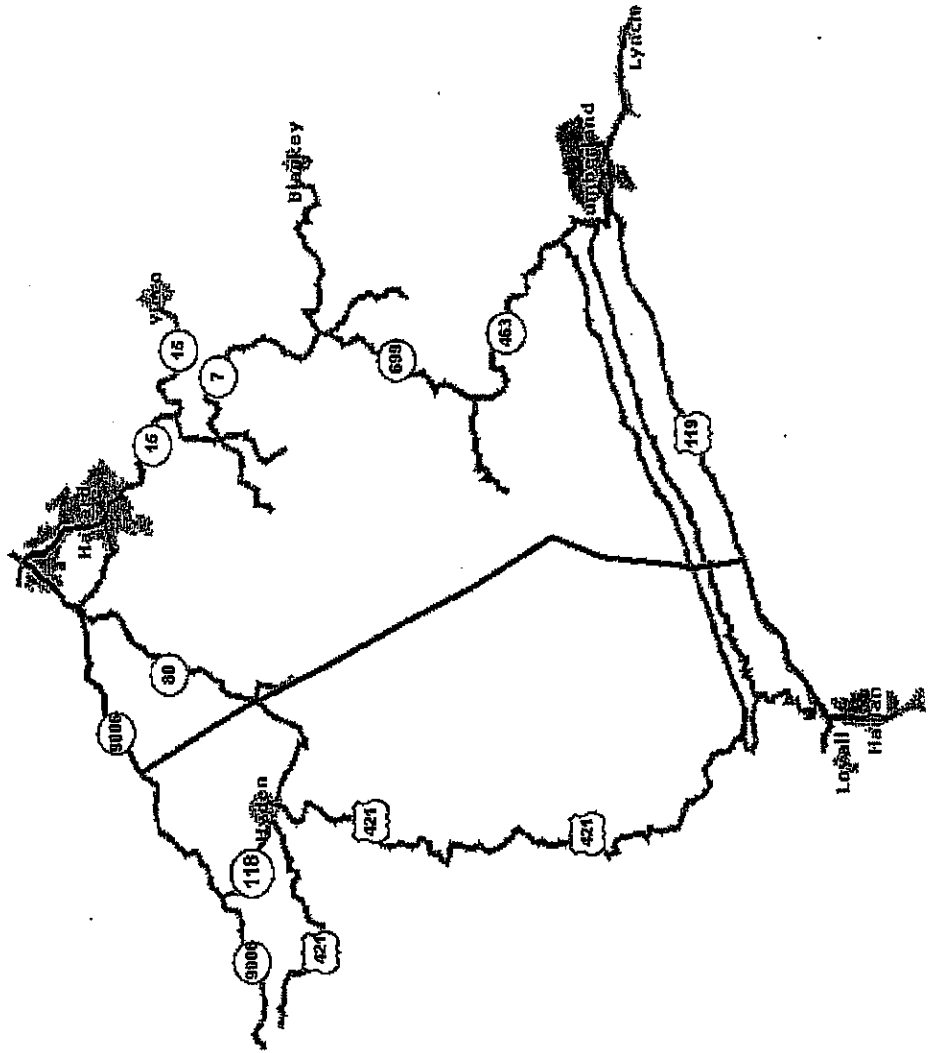


Alternate 5 (Harlan to Hazard)

Routes

- Harlan (Alternate 5@US 421) -
- Alternate 5 - TR 9006 - KY 15 -
- Hazard (KY 15@KY 451)

Distance (miles) 42.94
Time (minutes) 47.65



Alternate 5 - KY 80 (Harlan to Hazard)

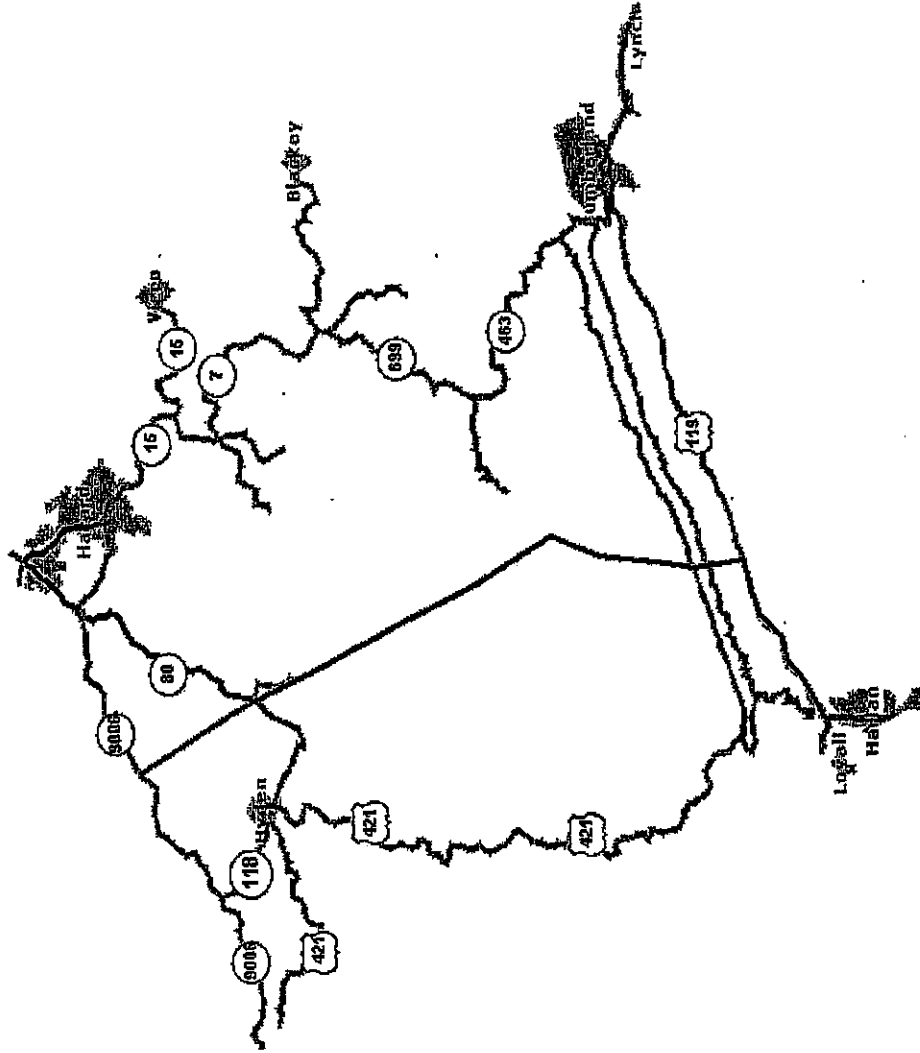
Routes

Harlan (Alternate 5@US 421) -

Alternate 5 - KY 80 - TR 9006 - KY 15 -

Hazard (KY 15@KY 451)

Distance (miles) 40.27
Time (minutes) 46.83



Alternate 8 (Harlan to Hazard)

Routes

Harlan (Alternate 8@US 421) -

Alternate 8 - KY 7 - KY 15 -

Hazard (KY 15@KY 451)

Distance (miles) 47.50
Time (minutes) 53.79

