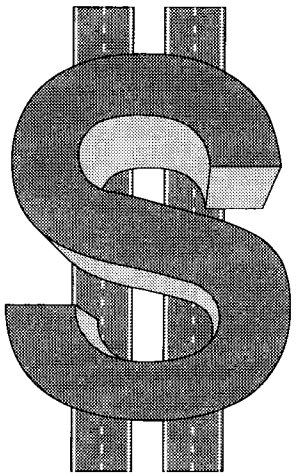
TECHNICAL
ASSISTANCE REPORT

I-73 ECONOMIC IMPACT ANALYSIS



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VTRC
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(The opinions, findings, and conclusions expressed in this report are those of the author and not necessarily those of the sponsoring agencies.)

Virginia Transportation Research Council
(A Cooperative Organization Sponsored Jointly by the Virginia Department of Transportation and the University of Virginia)

Charlottesville, Virginia

January 1995
VTRC 95-TAR7

FOREWORD

The contents of this economic impact report were originally distributed in four parts during February and March 1994. This study assessed the probable economic impact of the future Interstate 73 along each of twelve alternative corridors that were proposed for the new highway. VDOT's Transportation Planning Division (TPD) assembled the economic impact study and four other analyses (environmental impact, traffic service, cost, and public support) for the information of the Commonwealth Transportation Board (CTB), which voted in March 1994 to recommend Alternative 6A to Virginia's congressional delegation.

The CTB revisited the matter of I-73 at its December 1994 meeting, where the TPD presented a new corridor alternative, 6B, plus a multi-faceted impact analysis using the same methods that were used before. The earlier economic impact study has here been revised into a single report to serve as background and reference material for the new economic study of Alternative 6B. The new impact report, rather than repeat the description and critique of the analytical methods at length, will refer the reader to this report.

The first part of the earlier economic study, which the Economic Information Services Division of the Virginia Employment Commission (VEC) submitted to TPD in February, is reproduced here as Appendix A without alteration. The second and third parts, originally issued separately as VTRC 94-TAR9 and VTRC 94-TAR10, form the two main chapters of this report, "Methodology and Results" and "Summary and Synthesis." These two chapters have benefitted from an editing which time did not allow them to receive before their initial distribution. The fourth part was a briefing paper that VTRC produced for the CTB's March 1994 meeting. This has been edited and appears below as the Executive Summary.

I-73 ECONOMIC IMPACT ANALYSIS

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EXECUTIVE SUMMARY

Background

The examination of potential I-73 corridors took place under a tight time constraint. At a December 20, 1993 meeting, representatives of VDOT and the Virginia Employment Commission (VEC) set a two-month target deadline for a policy-level economic impact assessment. The assessment would be part of a more comprehensive report to be published in March 1994.

The Virginia Transportation Research Council (VTRC) and the VEC selected two analytical methods for this assessment on the following bases:

- They had been used in published research on the economic impact of highways
- They could be completed within a short time
- They could be applied without a large amount of original data collection.

The first method, called the "Exits" method, was a joint effort between the VTRC and the VEC. The second method, called the "Dollars" method, was undertaken by the VTRC alone. The two methods are independent of one another, and represent two separate approaches to the same task: forecasting the economic impact for each potential I-73 corridor.

The "Exits" Method

The VTRC and the VEC jointly pursued an approach based on the number and location of the interchanges along the proposed interstate highway. Appendix A reproduces the VEC report detailing the method and results of the "Exits" approach. In summary:

- VDOT's Transportation Planning Division (TPD) supplied detailed maps of proposed routes and interchanges for each I-73 Corridor. A publication of the Traffic Engineering Division (1992) supplied traffic counts for the existing roads in these corridors.
- Using the published findings of a study carried out in North Carolina (Hartgen et al., 1992), plus a small amount of field surveying by VEC field staff, the VEC and VTRC classified all of the proposed interchanges into one of six types based on cross-traffic, proximity to a town, and proximity to another interstate. Then a sin-

gle *development scenario* (number of gas stations, number of restaurants, etc.) was constructed for each type of interchange.

- The VEC's IMPLAN program (Impact Analysis for Planning), a computerized input-output model of the Virginia economy, used the development scenarios to calculate the employment and payroll impact for each potential I-73 corridor.

- The "Exits" results gave estimates of the increase in employment and employee compensation for each alternative corridor. Alternatives 6 and 6A ranked the highest in impact.

The "Exits" method takes into account that more interchanges generally mean more business activity and more economic impact. The analysis focuses almost exclusively, however, on business sectors that serve travelers. The impact on other sectors is only a 'ripple' effect. While such an exclusive focus probably overstates the role of service industries, service establishments that spring up to meet the needs of travelers would most likely be heavily represented among the new enterprises that I-73 would be expected to attract.

The "Dollars" Method

The VTRC also pursued an independent approach (the "Dollars" method) which was broader than the "Exits" approach in that it attempted to take all business activity into account. In summary:

- The TPD supplied data on mileage, interchange location, and estimated construction cost for each I-73 corridor. The Department of Taxation supplied historical data on taxable sales and adjusted gross income for the counties and cities in southwestern Virginia.

- The "Dollars" approach was based on the premise that the economic impact of a highway investment depends on a *multiplier* known technically as an elasticity. Under this premise every 1% increase in the existing highway infrastructure causes a percent increase in economic activity equal to the elasticity. For instance, if we believe the county-level elasticity equals 0.05, we would expect a highway project that adds 20% to the value of the total road network in a county to be accompanied by a 1% increase in economic activity in that county.

- A review of the research literature on the economic impact of highway investment led us to choose three multiplier values for the I-73 impact study: 0.02 is pessimistic, 0.05 is mid-range, and 0.125 is optimistic. This range of values can be said to establish reasonable upper and lower bounds on what empirical research shows investment in highways might be expected to generate in overall economic activity.

- The "Dollars" approach gives estimates of the increase in taxable sales and adjusted gross income for each corridor. Alternatives 6 and 6A again ranked the

highest in impact, although the absolute size of the impact depends on the size of the multiplier.

The "Dollars," or multiplier, approach takes into account that corridors that require more expensive projects generate more economic impact. The analysis, however, does not attempt to identify the specific business sectors in which the predicted economic development will occur; it attempts to capture the sum effect of all types of business activity.

Comparing the Two Sets of Results

The results of the two analytical methods differ in magnitude, but rank the alternatives in nearly the same order. We took a weighted average of the "Exits" and "Dollars" approaches to construct Tables 1-3, representing our best assessment of the low end, mid-point, and high end of the range within which we would expect the economic impacts to fall. The method that governed the weighted-average calculations is detailed in the "SUMMARY AND SYNTHESIS" section of this report . According to any of the three weighted-average forecasts based on both the VEC and the VTRC approaches, alternatives 6 and 6A have the highest expected impact.

The analytical methods depend on correlations between the number of exits and the cost of construction on the one hand and economic impact on the other. The following intuitive observations help to explain our reliance on these correlations:

- Corridors that cover more miles in Virginia generate more impact.
- Corridors that cover more miles in Virginia generate more cost.
- Hence there is a connection between cost and impact.

- Higher population density leads to more impact.
- Higher population density means more intersecting roads and more exits.
- Higher population density means higher land prices and more cost.
- Hence there is a connection between exits and impact, and between cost and impact.

Table 1: Estimated Impact on Employment, Employee Compensation, Taxable Sales, and Adjusted Gross Income: Weighted Average, Low-End Forecast

Corridor Alternative	Employment (# jobs)	Empl Comp ($ million)	Taxbl Sales ($ million)	Adj Gr Inc ($ million)
1	180	3.62	2.64	4.64
2	142	2.84	1.98	3.84
2A	297	5.75	4.12	7.87
2B	214	4.30	3.08	5.62
2AB	369	7.21	5.22	9.65
3	62	1.56	0.91	1.95
3A	58	1.44	0.83	1.84
4	137	2.69	1.82	3.82
5	317	5.47	4.05	8.33
6	616	12.56	9.05	16.10
6A	591	11.79	8.44	15.63
7	450	8.82	6.05	12.47

Table 2: Estimated Impact on Employment, Employee Compensation, Taxable Sales, and Adjusted Gross Income: Weighted Average, Mid-Range Forecast

Corridor Alternative	Employment (# jobs)	Empl Comp ($ million)	Taxbl Sales ($ million)	Adj Gr Inc ($ million)
1	451	9.08	6.63	11.63
2	357	7.11	4.97	9.63
2A	745	14.42	10.34	19.73
2B	536	10.80	7.72	14.09
2AB	925	18.10	13.10	24.19
3	157	3.90	2.28	4.89
3A	145	3.62	2.08	4.60
4	343	6.75	4.57	9.58
5	794	13.72	10.15	20.86
6	1542	31.46	22.66	40.31
6A	1480	29.52	21.14	39.14
7	1127	22.08	15.14	31.21

Table 3: Estimated Impact on Employment, Employee Compensation, Taxable Sales, and Adjusted Gross Income: Weighted Average, High-End Forecast

Corridor Alternative	Employment (# jobs)	Empl Comp ($ million)	Taxbl Sales ($ million)	Adj Gr Inc ($ million)
1	1138	22.93	16.73	29.31
2	896	17.89	12.49	24.21
2A	1877	36.39	26.07	49.73
2B	1348	27.21	19.45	35.48
2AB	2329	45.71	33.03	61.00
3	394	9.83	5.75	12.31
3A	366	9.11	5.25	11.59
4	863	16.98	11.49	24.09
5	1994	34.53	25.52	52.43
6	3868	79.01	56.88	101.19
6A	3714	74.16	53.08	98.28
7	2827	55.40	37.97	78.33

METHODOLOGY AND RESULTS

A sizeable literature describes recent research into the relationship between transportation investment and productivity. The method of economic impact analysis described here assigns a dollar value to the existing highway net in the localities that would be affected by each of the corridors under consideration. A productivity multiplier or "elasticity" value is selected from the range of such values estimated in recent research efforts. The magnitude of the projected cost for the future I-73 in comparison with the value of the existing road net, together with the chosen elasticity, determines for each proposed interstate corridor an estimate of the impact on taxable sales and adjusted gross income in each locality through which I-73 would pass, and an estimate of the impact on taxable sales and adjusted gross income in the state as a whole.

The economic impact relationship depends on the dollar value of the proposed I-73 construction in each county and on the value of the county's existing highway stock. There is more than one method of assigning dollar values. This analysis used two simple methods that require only readily available, current-year data: valuations per mile that approximate the average replacement cost, and construction cost.

The Traffic Engineering Division's *Mileage Tables: State Highway Systems* (1992) lists the number of miles of state roads in each of several categories. VDOT's Transportation Planning Division supplied valuations per mile that approximate the average replacement costs for these types of roads. The existing public roads in each county and city as of December 31, 1992, were valued as follows:

untreated secondary road	0.5M per mile
hard-surfaced secondary road	0.8M per mile
2 or 3 lane primary road	1.5M per mile
4 or more lane primary road	4.0M per mile
interstate highway	8.0M per mile
each interchange	10.0M per mile.

In cities and towns, arterial roads are valued equal to 4-lane primary roads ($4.0M per mile) and collector streets are valued equal to hard-surfaced secondary roads ($0.8M per mile). The value of all highway miles, but not interchanges, is multiplied by the factor 4/3 to account for the cost of right-of-way.

The analysis measures the increase that I-73 would cause in each county and city's stock of highway assets under two alternative assumptions. Under one assumption, each county's section of each proposed I-73 corridor is valued according to the schedule above for existing roads. This has the advantage of putting the old roads and the proposed new one on comparable terms, but it makes it difficult to assign a comparable value to Corridor 3, where lane additions to an existing interstate, rather than mileage additions, make up much of the total cost. Under the alternative assumption, each county's section of each proposed I-73 route is valued at its estimated cost of construction, using estimates provided by the Transportation Planning Division.

The analysis predicts the impact of each proposed I-73 corridor on two economic statistics at both the state and local levels: taxable sales (TS) and adjusted gross income (AGI). The 1992 values of taxable sales in each county and city and in the state as a whole are taken from the Department of Taxation's *Taxable Sales in Virginia Counties and Cities: Annual Report 1992*. The totals of adjusted gross incomes in each county and city and in the whole state in 1991 are from the Department of Taxation's *Annual Report Fiscal Year 1993*. These two economic statistics roughly represent current economic activity. Because business location appears to respond more to improvements in the road net than residence location does, and because commercial development clusters along transportation corridors more than residential development does, the predicted impacts on taxable sales may be more important than those on income.

The economic impact is predicted as a percentage of the existing economic activity in a county or city. The Department of Taxation's reports already include taxable sales and income for the towns in the county totals, treating them as a single geographic area. As with the highway statistics described above, the economic data for independent cities are added to the total of the surrounding county except in those cases where a proposed I-73 corridor passes through a city, in which cases the city is studied separately.

The methodology and assumptions here are drawn from recent research into the statistical relationship between public assets such as the highway network and economic measures such as

employment or income. The fundamental relationship that this analysis assumes can be described by the following equation:

$$\frac{Y+\Delta Y}{Y} = \left(\frac{K+\Delta K}{K}\right)^E$$

or, with the terms arranged differently,

$$\Delta Y = Y\left[\left(\frac{K+\Delta K}{K}\right)^E - 1\right]$$

where

- the quantity K is the current stock of public infrastructure, valued in dollar terms, in the geographic area under study;
- the quantity ΔK is the additional dollars' worth of public infrastructure that will be added as a result of the highway project;
- the quantity Y is some current measure of economic activity in the geographic area under study;
- the quantity ΔY is the additional economic activity that will exist after the new infrastructure has been built;
- the quantity E, called the elasticity, measures the economy's sensitivity to public infrastructure investment. The larger the value of E, the larger the economy's response to a given amount of investment.

Using historical data on public infrastructure and economic activity aggregated at the national, state, or local (metropolitan) level, numerous researchers have attempted to estimate elasticity. Though methods and results vary widely and are controversial, some patterns emerge.

First, there are three schools of thought about the productivity of public investment in general. One school holds that much of the recent research is methodologically flawed, and that the value of additional investment in public infrastructure has not been proved--that is, that elasticity has not been proven to exceed zero. Another school holds that elasticity is much higher than would have been believed ten years ago, and that the return on an additional dollar of public investment is considerably greater than the return on an additional dollar of private investment. The third school, probably a majority, believes that public capital investment yields small but statistically measurable benefits; in other words, elasticity is evidently greater than zero. *Assessing the Relationship between Transportation Infrastructure and Productivity* (Federal Highway Administration, 1992) surveys the recent research and adopts this third opinion.

Second, a large part of the total benefit from a local investment in public infrastructure apparently takes the form of spillover effects into other localities. For example, the FHWA report cited above lists selected elasticity estimates published since 1986. The five estimates based on

national data range from 0.03 to 0.39, with a median of 0.24. The five estimates based on state data range from 0.04 to 0.25, the median being 0.15. Among the three estimates based on metropolitan area data, the high is 0.31, the low 0.03, and the median value 0.08. If one overlooked the differences in method among the studies cited and accepted the median values as central tendencies, one would infer that the elasticity with which national economic activity responds to a local public infrastructure investment is about three times the elasticity with which the local economy responds, while state elasticity is about twice as big. If the ratio between the level of economic activity and the value of public infrastructure were about the same in all parts of the country, this would imply that for every dollar or job that a small public investment generates in the local economy, it generates one or more elsewhere in the state, and one or more outside the state.

A few studies have examined the effect of highway assets separately from other public capital assets. The four such state-level studies mentioned in the FHWA report cited above produce elasticity estimates for highway capital alone of from 0.04 to 0.25. A metro-level study yielded an estimate of .31. The elasticity of economic activity with respect to highway capital alone equals between one-third and two-thirds of the elasticity for public capital as a whole in these studies. This implies that a 1% increase in the value of highway assets generates from one-third to two-thirds of the economic impact that a 1% increase in the value of all public capital would generate.

One cannot infer, however, that no local economic statistic will ever shrink in response to a highway investment. Several research papers have identified cases in which the statistical impact of highway construction in certain types of counties appears to be small or even negative. For example, Eagle and Stephanedes (1987) suggested that when a new highway makes urban areas more accessible to rural residents, some businesses may relocate from the rural areas to the urban. The research indicates only that in the *average* case will a local infrastructure investment cause the local economic statistics to rise.

This report predicts the impact of each potential I-73 route under three alternative assumptions about elasticity. Elasticities of 0.02, 0.05 and 0.125 are adopted to generate conservative, moderate, and optimistic forecasts, respectively, of the economic impact in each locality through which the highway is supposed to pass. Under all three assumptions, the elasticity of state economic activity with respect to highway capital stock is assumed to be two times the elasticity for local economic activity. If the proposed I-73 investment represented a very small addition (a few percentage points) to each affected locality's total highway capital, this assumption would imply that the total impact in the state would equal a bit more than two times the local impact. Because the dollar value of I-73 is not small (Alternative 2B, for instance, would increase the highway stock in Galax by almost 50%), the state forecast turns out to be much more than twice the local. The economic impact outside the state, which is not calculated, may be supposed to equal roughly half the total impact within the state.

It should be noted that somewhat smaller elasticities, perhaps 0.012, 0.03, and 0.075, would have been chosen to analyze a purely local highway project. The choice of bigger numbers accounts in a crude way for the expectation that the counties through which I-73 is built will also receive some spillover effects from the pieces of I-73 build in other counties, and that the state will receive spillover effects from the pieces of I-73 built in other states.

Tables B1-B27 (Appendix B) show the predicted impact on taxable sales and adjusted gross income in each county and city through which each potential I-73 corridor would pass. they are organized as follows:

- The assumed value of the elasticity is in the top right-hand corner;
- The far left column of each table indicates which alternative (ALT 1 through ALT 7) is assumed, and in which way ("equ. cost"--state average replacement cost, equivalent to existing assets, or "est. cost"--estimated construction costs) the proposed new I-73 facility is valued.

The columns of each table represent, in order:

- The name of the county or city (COUNTY),
- The 1992 taxable sales in that locality (TS $M),
- Its total 1991 adjusted gross income (AGI $M),
- The value of the local highway stock at the end of 1992 (Hwy $M),
- The value of the addition to the local highway stock that the proposed I-73 corridor represents (I73 $M),
- The estimated impact on local economic activity (Ben %),
- The additional annual taxable sale (+TS $M),
- The additional annual income (+AGI $M).

All numbers are given in millions of dollars, except for the impact, which is given in percentage points. The bottom two rows of each table show a total for the counties and cities through which the highway is proposed to pass (Total Local) and a separate estimate (using the elasticity times two) of the impact on the state as a whole (STATE).

SUMMARY AND SYNTHESIS

When the forecasts based on the "Exits" and "Dollars" methods are translated into equivalent terms, evident differences emerge. This section suggests explanations for these differences, and goes on to discuss the construction of weighted averages of the two sets of forecasts to create low-end, middle, and high-end forecasts for each potential I-73 corridor (Tables 1-3 above).

The "Exits" analysis predicts the impact of I-73 on annual employment (EMP) and annual employee compensation (EC). The "Dollars" analysis predicts the impact of I-73 on annual tax-

able sales (TS) and annual adjusted gross income (AGI). To compare the two sets of results, it is necessary to see what the "Exits" forecasts imply about TS and AGI, and what the "Dollars" forecasts imply about EMP and EC. Tables 4-7 translate the forecasts of the two methods in comparable terms.

These translations depend on the data in the reports themselves plus data on statewide employment and the average annual weekly wage in the Commonwealth of Virginia for 1991 and 1992, supplied by VEC, and data on statewide taxable sales for 1992 and adjusted gross income for 1991, supplied by the Department of Taxation. These additional data are shown below:

	1991	1992
Employment	2,762,991	2,789,772
Average Weekly Wage ($)	458	479
Taxable Sales ($M)	-	42,905
Adjusted Gross Income ($M)	82,714	-

Table 4, "Estimated Impact on Employment, EC, TS & AGI: 'Exits' Method," tabulates the EMP and TC impacts predicted by "Exits" and adds two pairs of secondary predictions for TS and AGI, the first pair derived from the EMP impact and the second pair derived from the EC impact. The numbers in the third and fourth columns rely on the simple assumption that the ratio between EMP impact and TS (or AGI) impact in the counties under study is equal to the ratio between total EMP and total TS (or AGI) in the Commonwealth, and that the ratio remains constant from year to year. Likewise the fifth and sixth columns rely on the assumption that the ratio between EC impact and TS (or AGI) impact in the study area equals the ratio between total EC and total TS (or AGI) statewide.

The "Exits" analysis does not report explicit estimates of the impact for Alternative 2AB. The numbers in the fifth row are calculated as the sum of the impacts of Alternatives 2A and 2B minus the impact of Alternative 2. Because the mathematical model that IMPLAN uses is linear, this sum should exactly equal the IMPLAN estimate of the impact for Alternative 2AB.

Tables 5-7 tabulate the TS and AGI impacts predicted by the "Dollars" method for each of three hypothetical elasticities and adds two pairs of secondary predictions for EMP and EC, the first pair in each case derived from the TS impact and the second pair from the AGI impact.

TABLE 4: Estimated Impact on Employment, EC, TS, & AGI: "Exits" Method

			Derived from Empl		Derived from EC	
ALT	**+Empl**	**+EC $M**	**+TS $M**	**+AGI $M**	**+TS $M**	**+AGI $M**
1	1319	16.65	20.29	41.30	10.28	20.92
2	1076	13.52	16.55	33.69	8.35	17.00
2A	2473	30.47	38.03	77.43	18.81	38.30
2B	1507	18.45	23.18	47.18	11.39	23.20
2AB	2904	35.40	44.66	90.92	21.86	44.50
3	49	0.59	0.75	1.53	0.36	0.74
3A	49	0.59	0.75	1.53	0.36	0.74
4	1093	13.69	16.81	34.22	8.45	17.20
5	3438	40.21	52.87	107.64	24.83	50.54
6	4830	68.29	74.28	151.22	42.16	85.84
6A	5087	71.68	78.23	159.27	44.26	90.09
7	4095	56.98	62.98	128.21	35.18	71.63

TABLE 5: Estimated Impact on Empl, EC, TS, & AGI: "Dollars" Method **Elast =0.02**

	Derived from TS		Derived from AGI			
ALT	**+Empl**	**+EC $M**	**+Empl**	**+EC $M**	**+TS $M**	**+AGI $M**
1	178	4.44	151	3.75	2.74	4.47
2	129	3.21	126	3.14	1.98	3.74
2A	254	6.33	242	6.03	3.91	7.17
2B	211	5.24	189	4.72	3.24	5.62
2AB	336	8.37	305	7.60	5.17	9.05
3	59	1.48	66	1.64	0.91	1.95
3A	54	1.35	62	1.54	0.83	1.84
4	112	2.80	124	3.09	1.73	3.68
5	193	4.81	208	5.18	2.97	6.16
6	580	14.44	495	12.32	8.91	14.67
6A	505	12.58	454	11.32	7.77	13.47
7	335	8.34	361	9.00	5.15	10.71

TABLE 6: Estimated Impact on Empl, EC, TS, & AGI: "Dollars" Method **Elast =0.05**

	Derived from TS		Derived from AGI			
ALT	**+Empl**	**+EC $M**	**+Empl**	**+EC $M**	**+TS $M**	**+AGI $M**
1	448	11.16	379	9.43	6.89	11.22
2	323	8.04	316	7.88	4.96	9.38
2A	639	15.92	608	15.15	9.83	18.03
2B	528	13.16	476	11.85	8.13	14.10
2AB	845	21.04	767	19.11	12.99	22.75
3	149	3.70	165	4.10	2.28	4.89
3A	136	3.38	155	3.87	2.08	4.60
4	282	7.01	311	7.75	4.33	9.23
5	485	12.08	522	13.00	7.46	15.47
6	1453	36.18	1240	30.88	22.34	36.76
6A	1266	31.52	1139	28.38	19.46	33.78
7	838	20.89	905	22.55	12.90	26.84

TABLE 7: Estimated Impact on Empl, EC, TS, & AGI: "Dollars" Method **Elast =0.125**

	Derived from TS		Derived from AGI			
ALT	**+Empl**	**+EC $M**	**+Empl**	**+EC $M**	**+TS $M**	**+AGI $M**
1	1135	28.28	958	23.87	17.46	28.42
2	814	20.27	798	19.87	12.51	23.65
2A	1619	40.32	1540	38.36	24.90	45.67
2B	1335	33.25	1202	29.93	20.53	35.63
2AB	2140	53.30	1944	48.43	32.91	57.65
3	374	9.31	415	10.34	5.75	12.31
3A	341	8.50	391	9.73	5.25	11.59
4	710	17.69	785	19.55	10.92	23.27
5	1226	30.53	1319	32.85	18.85	39.10
6	3654	91.02	3121	77.73	56.20	92.52
6A	3186	79.34	2869	71.47	48.99	85.08
7	2107	52.49	2278	56.73	32.41	67.53

For all corridors except Alternatives 3 and 3A these three sets of forecasts were drawn from the "equ. cost" tables in Appendix B. The accounting method that underlies the "equ. cost" tables values the proposed I-73 facilities at the average replacement cost of such facilities in Virginia. The accounting method that underlies the "est. cost" tables values them at their estimated construction cost. Because such factors as terrain and land prices that have little to do with a facility's value in service may affect its construction cost, the "equ. cost" valuation is to be preferred in general, as it assigns a highway of given quality equal value in any location while the "est. cost" valuation assigns a value that varies with location. However, because it does not distinguish between interstate highways with different numbers of lanes, the "equ. cost" valuation produced deceptively small results for Alternatives 3 and 3A, where most of the construction work would involve adding lanes to the existing Interstate 77. Therefore the forecasts for Alternatives 3 and 3A were drawn from the "est. cost" tables in Appendix B.

To put the estimates of AGI impact in 1992 terms comparable to the other estimates, it was assumed that the 1992 AGI in each county was 5.6% bigger than the 1991 AGI, just as total employee compensation in 1992 is 5.6% bigger than in 1991. As these projected 1992 AGI fig-

ures are used in place of the true 1991 figures in constructing the first four tables, all of the tables show an AGI impact 5.6% larger than the value that the 1991 AGI figures would produce. This difference can be seen by comparing the AGI impact estimates in Tables 5, 6, and 7 with the AGI impact estimates in the tables in Appendix B.

Inspection of the tables shows the following patterns:

- The "Exits" forecast for Alternatives 3 and 3A is very low. This is for the same reason that the "Dollars" forecast for these corridors is very low by the replacement cost ("equ. cost") accounting method: neither forecast takes adequate account of lane additions.

- Except for 3 and 3A, the "Exits" forecasts are roughly equivalent to the most optimistic "Dollars" forecasts that use an elasticity of 0.125. The "Dollars" method's EMP forecasts are from 15% to 65% lower than the "Exits" forecasts. The "Dollars" method's EC forecasts are usually higher.

- In general, all of the "Dollars" tables (Tables 5, 6, 7) estimate relatively high impacts on EC and relatively low impacts on EMP in comparison with the "Exits" table (Table 4). Conversely, in Table 4, the TS and AGI impacts derived from EMP are always higher than the ones derived from EC.

- In general, all of the "Dollars" tables estimate relatively high impacts for Alternatives 1 through 4, and relatively low impacts for Alternatives 5 through 7, in comparison with the Table 4.

In light of what has been said about the analytical methods, the differences and similarities suggest the following tentative explanations and conclusions:

- The only reasonably accurate estimates of the economic impact for Alternatives 3 and 3A are the "Dollars" estimates based on the estimated construction cost of I-73 (the "est. cost" tables). The "Exits" estimates that rely on the number of new interchanges and the "Dollars" estimates that value I-73 at the average replacement cost per center-line mile of interstate highway ("equ. cost") are not able to deal with these particular cases.

- The "Exits" forecasts are based on development scenarios that may be very optimistic, at least for some interchanges. Even the most remote intersection is assumed able to attract two gas stations and one motel (see Appendix A). On the other hand, the "Exits" analysis makes little effort to account for the development of business that is not traveler-oriented, and may underestimate the impact of such business.

Most of the research which inspired the choice of elasticities in the "Dollars" forecasts studies investments that added a few percentage points to the public capital stock of the geographic area under study. By contrast, I-73 will represent a huge addition to the public capital stocks in some of the localities where it is built, sometimes over fifty percent. In effect, the "Dollars" analysis is extrapolating a line fitted to small quantities into a region of large quantities where it may not have a good fit. This could make the "Dollars" forecasts either more or less optimistic than is assumed.

In short, reasons exist for either analysis to yield estimates that are more or less optimistic than assumed. Consideration of the absolute size of the numerical results gives no reason to attach more weight to one set of forecasts than to the other.

The "Exits" method is designed to predict mostly the expansion of the service sector that caters to the needs of travellers, a sector in which the average compensation for employees is lower than the average for all Virginia jobs. The secondary "Dollars" predictions of EMP impact and EC impact in Tables 5 through 7, on the other hand, assume that the average compensation for the new jobs created by I-73 will equal the state average for all jobs, which would be the case if the proportion of new jobs in each sector equalled the proportion of existing jobs in each sector. Hence, the "Exits" numbers in the first two columns of Table 4 imply that each new worker earns about $250 per week, whereas the "Dollars" numbers by assumption give each new worker the 1992 state average of $479 per week.

The economic impact of I-73 is likely to be more balanced than the "Exits" analysis suggests, but with a disproportionate number of service jobs to serve travelers on the new interstate. Therefore the best ratio between EMP and EC probably lies somewhere between the ratio shown in Table 4 for "Exits" and the ratio shown in Tables 5 through 7 for "Dollars."

It is difficult to explain why "Exits" gives relatively higher forecasts for some corridors while "Dollars" gives relatively higher forecasts to others. Alternatives 5 through 7 do have more interchanges per mile than the other options. As the "Exits" development scenarios focus on the proposed interchanges, the "Exits" method would tend to predict a greater economic impact along these corridors relative to the others, whereas the "Dollars" method, which weighs the cost per mile of highway as well as the cost of interchanges in its calculations, would tend to predict relatively more impact for Alternatives 1 through 4. This fact is probably part of the explanation.

It is probably not realistic to suppose that construction of additional interchanges in a county, beyond the first three or four, has a large impact on the county's economic development. For this reason, the "Dollars" analysis possibly estimates the *relative* impacts of the corridor alternatives more accurately. Consideration of the relative size of the numerical results, therefore, gives some reason to attach more weight to the "Dollars" forecasts than to the "Exits" forecasts.

The statewide economic impact estimates from the "Dollars" analysis do not appear in the summary tables (Tables 1-3). Because southwestern Virginia is surrounded on three sides by other

states, it can be expected that a relatively large part of the spillover effects of Interstate 73 will fall on localities outside of Virginia. The statewide impact estimates of the "Dollars" analysis do not take account of this geographic fact, and are probably disproportionately high in comparison with the local impact estimates. The economic impact of each proposed interstate route on the rest of Virginia may be supposed to be of the same order of magnitude as its impact on the localities through which it passes.

The above observations suggest that the best economic impact estimates obtainable from this technical assistance project set of forecasts would be a weighted average of the "Exits" forecasts and the "Dollars" forecasts, with more weight given to the latter.

Tables 1-3 above show weighted-average estimates of the economic impacts for each proposed I-73 corridor, under each of the three assumptions about elasticity used in the "Dollars" study. The EMP impact estimates are calculated by the following formula:

$$EMP_{est}(E) = \frac{EMP_{\$,TS}(E) + EMP_{\$,AGI}(E) + EMP_x * \left(\frac{E}{0.125}\right)}{3}$$

where

- E represents the assumed value of the elasticity,
- $EMP_{est}(E)$ represents the weighted average estimate of EMP impact for elasticity E,
- $EMP_{\$,TS}(E)$ represents the "Dollars" estimate of EMP impact derived from TS impact for elasticity E (the first column in Tables 5, 6, and 7),
- $EMP_{\$,AGI}(E)$ represents the "Dollars" estimate of EMP impact derived from AGI for elasticity E (the third column in Tables 5, 6, and 7), and
- EMP_X represents the "Exits" estimate (the first column of Table 4)

The weighted EC impact estimates are calculated analogously.

The TS impact estimates are calculated by the following formula:

$$TS_{est}(E) = \frac{4 * TS_{\$}(E) + (TS_{x,emp} + TS_{x,ec}) * \left(\frac{E}{0.125}\right)}{6}$$

where

- $TS_{est}(E)$ represents the weighted average estimate of TS impact for elasticity E,
- $TS_{\$}(E)$ represents the "Dollars" estimate of TS impact for elasticity E (the fifth column in Tables 5, 6, and 7),
- $TS_{X,EMP}$ represents the IMPLAN estimate of TS impact derived from EMP impact (the third column in Table 4), and
- $TS_{X,EC}$ represents the IMPLAN estimate of TS impact derived from EC impact (the fifth column in Table 4).

The weighted AGI impact estimates are calculated analogously.

The estimates for Alternatives 3 and 3A are exceptions. For these two corridors, the estimates of TS and AGI impact are taken directly from the "Dollars" numbers in Tables 5 through 7, and the estimates of EMP and EC impact are simple averages of the "Dollars" estimates derived from TS impact and AGI impact.

As the formulae indicate, in each case except Alternatives 3 and 3A the "Exits" estimate (or estimates) is given a one-third weight and the "Dollars" estimate (or estimates) is given a two-thirds weight; the "Exits" estimates are also scaled down by the factor E=0.125 in creating the low-end and mid-range estimates in Tables 1 and 2 (for Table 3, E equals 0.125 so that E=0.125 equals one).

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APPENDIX A

An Economic Impact Analysis
of the
Potential Interstate 73 Corridors

February 1994

IMPAC

IMPact Analysis for the Commonwealth

A service provided by the
Virginia Employment Commission
Economic Information Services

An Economic Impact Analysis of the Potential Interstate 73 Corridors

Introduction

The Virginia Department of Transportation (VDOT) requested that the Virginia Employment Commission (VEC) prepare, through its IMPLAN (Impact Analysis for Planning) economic impact modeling system, economic impact analyses of eleven alternative highway corridors for the proposed Interstate 73 through Virginia. In conjunction with a representative of the Virginia Transportation Research Council, VEC staff developed a methodology to conduct the impact analyses.

Predicting the effect of a proposed interstate on economic growth is a difficult task. Economic development is dependent on many other factors. In addition to transportation, a firm's location decision is influenced by other factors such as labor availability and cost, skill level, education and training, and physical space.[1] Predicting business and mall development stemming from a proposed interstate is an insurmountable task. Consequently, the methodoloy adapted for assessing the impact of the potential Interstate 73 corridors focused on interchange development, specifically industries servicing highway users.

The following sections of the report discuss and outline the study methodology and model assumptions, define the type of effects measured, and present a summary of the projected economic impacts by employment, employee compensation, and industry for each of the alternative highway corridors. The summary section provides a comparison of the economic impacts of the potential corridors.

Methodology

The method used to estimate the economic impact of the potential Interstate 73 corridors consisted of 4 steps: 1. predict the stage of economic development expected at each proposed interchange, 2. estimate the amount of economic development that currently exists at each proposed interchange, 3. determine an average employment for the types of businesses expected to develop at the interchanges, and 4. use IMPLAN to measure the effects of the predicted future development on employment and employee compensation. The foundation for this methodology was a study by Hartgen, O'Callaghan, Walcott, and Opgenorth that predicted future growth at interchanges along a newly built section of Interstate 40 in eastern North Carolina, based on economic development at interchanges on Interstate 95 in North Carolina.[1] The methodology used in this analysis expands on this research by accounting for present economic activity

along the potential Interstate 73 corridors and using IMPLAN to measure the economic impact of the predicted future development.

A review of the literature reveals that the amount of economic activity at an interchange is dependent upon traffic volume on the interstate and crossroads, the distance from the interchange to major cities, the distance to the next interchange, the proximity to rest areas, competition from other interchanges, and site factors such as sewer and water service, zoning, visibility, and ease of access and egress.[1] To predict the stage of economic development expected at each of the proposed interchanges, cross street traffic volume, proximity of the proposed interchange to a town, and proximity to a second interstate were examined. Based on these factors and a cursory examination by the VEC of interchange development at six interchanges, economic development at each proposed interchange was classified as one of four stages that were identified by Hartgen, O'Callaghan, Walcott, and Opgenorth.[1] However, a few adjustments were made to their economic development scenarios. Essentially there are two differences. This study did not make a distinction between fast-food and sit-down restaurants due to the type of data that was available. The other difference is that the establishments used in this study's economic development scenarios were essentially industries servicing highway users. There were no other businesses or malls incorporated in the scenarios due to the impossible task of defining them.

The economic development stages used in this study were defined solely in terms of the number of gas stations, restaurants, and motels. Stage 2A, light tourist services, was the lowest designation used and consists of two gas stations and one motel. The next stage of economic development 2B, economically competitive, includes three gas stations, two restaurants, and three motels. Stage 2C, economic integration, consists of five gas stations, seven restaurants, and four motels. Stage 3A, heavy tourist, was the highest designation used and consists of four gas stations, eight restaurants, and seven motels.

To determine the change in economic development due to the proposed Interstate, the current level of economic development had to be estimated. Since time and manpower limitations prevented a survey of current economic activity along the potential Interstate 73 corridors, assumptions regarding the current level of economic development had to be made. The following three assumptions were made: 1. where the proposed corridors follow an existing interstate, assume that the predicted stage of development already exists; 2. where the proposed corridors parallel an existing primary road on both sides of a given interchange, assume the current stage of development is one level lower than the predicted new stage; and 3. at the remaining interchanges that fall outside these two categories, assume all predicted development is new. Once the current and predicted stage of development was determined, the change in economic development due to the proposed Interstate was calculated.

Next, the employment changes due to the economic development from each potential Interstate corridor were determined. To estimate economic assessments, the IMPLAN economic modeling system requires the sector's total output or an institution's expenditure pattern. In this analysis, a change in a sector's total output was used. The changes in output were computed from the IMPLAN database and the employment changes. The changes in employment were calculated based on the total number of each type of establishment (gas station, restaurant, hotel and motel) expected to develop along each corridor and an average employment for each type of establishment. The average employment was computed using ES202 employment data.

Lastly, the effects of the predicted future development on employment and employee compensation were measured using IMPLAN. To estimate the economic impact, the employment changes by type of industry for each potential Interstate corridor were translated into a change in output, which was then inserted in the model.

This methodology was developed by VEC staff in conjunction with Jim Gillespie at the Virginia Transportation Research Council. Like any economic model, this procedure is based on assumptions and has limitations. First, the predicted level of economic development expected at each interchange is based on current average daily traffic. To the extent that the Interstate stimulates additional economic activity, economic growth would be underpredicted. In addition, the economic development scenarios predicted for each interchange primarily include industries servicing highway users and do not include any industry or mall development, which is impossible to predict. To the extent that industry or mall development occurs, this method underpredicts economic growth. Due to time constraints, assumptions had to be made regarding the current level of economic development along the proposed corridors as opposed to conducting surveys. Again due to time limitations, only a limited sample was used in calculating the average employment for gas stations, restaurants, and hotels and motels. Despite its limitations, this method provides an indication of the impact of the potential Interstate 73 corridors.

Model Assumptions and Notes

The IMPLAN model assumptions upon which this economic impact analysis is based are outlined below.

- The economic impact model for the study area was constructed using 1990 economic data.

- It should be noted that IMPLAN is a static I-O modeling system and does not incorporate the dynamics of an actual economy. Thus, the economic impact estimates should be used for short-term assessments.

- The employment generated from the multiplier effects include full and part-time jobs (annual equivalent).

- Employee compensation includes salaries and wages as well as benefits including life and health insurance, pension payments, and any other non-cash compensation.

- Total sector output is total production for that industry.

Economic Effects: Direct, Indirect, and Induced

Impacts can be measured in terms of direct, indirect, and induced effects. As an example, consider the increase in demand for widgets. An increase in demand would cause the manufacturer to increase production in order to meet the demand (Direct Effect). Consequently, the manufacturer would need additional production inputs generating an increase in production from the industries that supply the inputs (Indirect Effect). Finally, the increase in final demand would initiate an increase in household income (direct and indirect effects) generating an increase in income and employment in those industries that are a recipient of household spending (Induced Effect).

Impact Analysis

Alternative 1

The study area for Alternative 1 includes Scott, Lee, and Wise counties and Norton city. Predicted economic development for this alternative consists of 26 new gas stations, 13 new restaurants, and 19 new motels. Table 1 shows that these new establishments would result in an estimated total job gain of 1,319, with associated employee compensation of $16.7 million. As can be seen in Table 2, the Trade and Services industries accounted for the greatest impact. Approximately 92 percent of the total impact on jobs occurred in these industries.

Table 1

Summary of Economic Impacts
Alternative 1
($1990 Millions)

	Direct Effects	Indirect Effects	Induced Effects	Total Effects
Employment	803	37	479	1,319
Employee Compensation	8.6	0.7	7.3	$16.7

Table 2

Industry Division Impacts
Alternative 1
($1990 Millions)

Major Industry Division	Employee Compensation	Employment
Agriculture	0.045	9
Construction	0.229	12
Manufacturing	0.320	22
Transportation, Communication, & Public Utilities	0.683	28
Wholesale & Retail Trade	7.326	654
Finance, Insurance, & Real Estate	0.483	29
Services	7.211	553
Government	0.348	12
Total	$16.646	1,319

Source: Virginia Employment Commission – EIS 01/25/94

Alternative 2

The study area for this alternative encompasses Grayson, Smyth, and Tazewell counties. The estimated impact of this corridor results in predicted development of 26 new gas stations, 8 new restaurants, and 18 new motels. Table 1 shows that the direct employment estimate of 664 from these new establishments would result in an estimated total job gain of 1,076, with associated employee compensation of $13.5 million. Table 2 shows the industry division impacts for this alternative. The Services and Trade sectors accounted for the greatest impact, with approximately 92 percent of the total impact on jobs occurring in these industries.

Table 1

Summary of Economic Impacts
Alternative 2
($1990 Millions)

	Direct Effects	Indirect Effects	Induced Effects	Total Effects
Employment	664	33	379	1,076
Employee Compensation	7.3	0.5	5.6	$13.5

Table 2

Industry Division Impacts
Alternative 2
($1990 Millions)

Major Industry Division	Employee Compensation	Employment
Agriculture	0.018	4
Construction	0.224	13
Manufacturing	0.309	17
Transportation, Communication, & Public Utilities	0.348	16
Wholesale & Retail Trade	6.025	492
Finance, Insurance, & Real Estate	0.436	29
Services	5.950	496
Government	0.211	10
Total	$13.521	1,076

Source: Virginia Employment Commission – EIS 01/25/94

Alternative 2A

The study area for Alternative 2A consists of the following counties: Grayson, Smyth, Tazewell, and Buchanan. In this alternative, predicted economic development results in the establishment of 49 new gas stations, 29 new restaurants, and 34 new motels. As shown in Table 1, an estimated total job gain of 2,473 is expected from the predicted economic development, with associated employee compensation of $30.5 million. Table 2 shows the industry division impacts for this alternative. The Trade industry accounted for the greatest impact, followed by the Services industry. Approximately 92 percent of the total impact on jobs occurred in these industries.

Table 1

Summary of Economic Impacts
Alternative 2A
($1990 Millions)

	Direct Effects	Indirect Effects	Induced Effects	Total Effects
Employment	1,587	74	812	2,473
Employee Compensation	16.8	1.3	12.4	$30.5

Table 2

Industry Division Impacts
Alternative 2A
($1990 Millions)

Major Industry Division	Employee Compensation	Employment
Agriculture	0.035	8
Construction	0.499	26
Manufacturing	0.644	36
Transportation, Communication, & Public Utilities	0.837	39
Wholesale & Retail Trade	14.960	1,300
Finance, Insurance, & Real Estate	0.940	58
Services	12.109	985
Government	0.446	20
Total	$30.469	2,473

Source: Virginia Employment Commission – EIS 01/25/94

Alternative 2B

The study area for Alternative 2B includes Carroll, Grayson, Smyth, and Tazewell counties and Galax city. Predicted economic growth for this alternative consists of 35 new gas stations, 11 new restaurants, and 27 new motels. Table 1 shows that this economic development scenario, with an estimated direct employment effect of 952, would result in an estimated total job gain of 1,507, with associated employee compensation of $18.5 million. As can be seen in Table 2, the Services and Trade industries accounted for the greatest impact. Approximately 92 percent of the total impact on jobs occurred in these industries.

Table 1

Summary of Economic Impacts
Alternative 2B
($1990 Millions)

	Direct Effects	Indirect Effects	Induced Effects	Total Effects
Employment	952	47	509	1,507
Employee Compensation	10.3	0.7	7.4	$18.5

Table 2

Industry Division Impacts
Alternative 2B
($1990 Millions)

Major Industry Division	Employee Compensation	Employment
Agriculture	0.038	7
Construction	0.298	17
Manufacturing	0.503	27
Transportation, Communication, & Public Utilities	0.376	18
Wholesale & Retail Trade	7.915	668
Finance, Insurance, & Real Estate	0.598	39
Services	8.455	718
Government	0.271	12
Total	$18.453	1,507

Source: Virginia Employment Commission – EIS 01/25/94

Alternative 3/3A

The study area and predicted economic growth for Alternative 3 and Alternative 3A are the same. The study area encompasses Carroll, Wythe, and Bland counties. Since most of these corridors overlap Interstate 77, the predicted economic growth consists of only 2 new gas stations and 1 new motel. Table 1 shows that these new establishments would result in an estimated total job gain of 49, with associated employee compensation of $0.6 million. As shown in Table 2, approximately 90 percent of the total impact on jobs occurred in the Services and Trade industries.

Table 1

Summary of Economic Impacts
Alternative 3/3A
($1990 Millions)

	Direct Effects	Indirect Effects	Induced Effects	Total Effects
Employment	29	2	18	49
Employee Compensation	0.3	0.0	0.2	$0.6

Table 2

Industry Division Impacts
Alternative 3/3A
($1990 Millions)

Major Industry Division	Employee Compensation	Employment
Agriculture	0.002	0
Construction	0.013	1
Manufacturing	0.013	1
Transportation, Communication, & Public Utilities	0.014	1
Wholesale & Retail Trade	0.218	18
Finance, Insurance, & Real Estate	0.023	1
Services	0.293	26
Government	0.009	0
Total	$0.585	49

Source: Virginia Employment Commission – EIS 01/25/94

Alternative 4

The study area for Alternative 4 consists of Carroll, Wythe, Pulaski, and Giles counties and Radford city. This alternative results in predicted economic development comprised of 25 new gas stations, 7 new restaurants, and 20 new motels. Table 1 summarizes the economic impact of these new establishments. This alternative would result in an estimated total job gain of 1,093, with associated employee compensation of $13.7 million. As can be seen in Table 2, the Services and Trade industries accounted for the greatest impact. Approximately 91 percent of the total impact on jobs occurred in these industries.

Table 1

Summary of Economic Impacts
Alternative 4
($1990 Millions)

	Direct Effects	Indirect Effects	Induced Effects	Total Effects
Employment	673	32	388	1,093
Employee Compensation	7.5	0.6	5.7	$13.7

Table 2

Industry Division Impacts
Alternative 4
($1990 Millions)

Major Industry Division	Employee Compensation	Employment
Agriculture	0.047	8
Construction	0.292	16
Manufacturing	0.445	24
Transportation, Communication, & Public Utilities	0.454	17
Wholesale & Retail Trade	4.950	452
Finance, Insurance, & Real Estate	0.432	27
Services	6.764	540
Government	0.302	10
Total	$13.685	1,093

Source: Virginia Employment Commission – EIS 01/25/94

Alternative 5

For Alternative 5, the study area was defined as Patrick, Floyd, Montgomery, and Giles counties. The estimated impact of this corridor results in predicted development of 44 new gas stations, 49 new restaurants, and 39 new motels. Table 1 shows that the direct employment estimate of 2,137 from these new establishments would result in an estimated total job gain of 3,438, with associated employee compensation of $40.2 million. Table 2 shows that the Trade industry accounted for the greatest impact, followed by the Services industry. Approximately 91 percent of the total impact occurred in these industries.

Table 1

Summary of Economic Impacts
Alternative 5
($1990 Millions)

	Direct Effects	Indirect Effects	Induced Effects	Total Effects
Employment	2,137	91	1,210	3,438
Employee Compensation	22.6	1.4	16.2	$40.2

Table 2

Industry Division Impacts
Alternative 5
($1990 Millions)

Major Industry Division	Employee Compensation	Employment
Agriculture	0.120	23
Construction	0.584	35
Manufacturing	0.980	60
Transportation, Communication, & Public Utilities	0.972	37
Wholesale & Retail Trade	20.606	1,934
Finance, Insurance, & Real Estate	1.371	101
Services	14.559	1,208
Government	1.016	41
Total	$40.208	3,438

Source: Virginia Employment Commission – EIS 01/25/94

Alternative 6

The study area for Alternative 6 includes Henry, Franklin, Roanoke, Montgomery, and Giles counties and Salem, Martinsville, and Roanoke cities. Predicted economic growth for this alternative consists of 61 new gas stations, 60 new restaurants, and 52 new motels. Table 1 shows that this economic development scenario would result in an estimated total job gain of 4,830, with associated employee compensation of $68.3 million. Table 2 shows the industry division impacts for this alternative. The Trade industry accounted for the greatest impact, followed by the Services industry. Approximately 89 percent of the total impact occurred in these industries.

Table 1

Summary of Economic Impacts
Alternative 6
($1990 Millions)

	Direct Effects	Indirect Effects	Induced Effects	Total Effects
Employment	2,733	252	1,846	4,830
Employee Compensation	33.5	4.2	30.6	$68.3

Table 2

Industry Division Impacts
Alternative 6
($1990 Millions)

Major Industry Division	Employee Compensation	Employment
Agriculture	0.165	27
Construction	1.272	63
Manufacturing	2.239	96
Transportation, Communication, & Public Utilities	2.818	95
Wholesale & Retail Trade	30.483	2,502
Finance, Insurance, & Real Estate	3.710	198
Services	26.393	1,810
Government	1.207	39
Total	$68.287	4,830

Source: Virginia Employment Commission – EIS 01/25/94

Alternative 6A

The study area used for this alternative was the same as the one used for Alternative 6. The estimated impact of this corridor results in predicted development of 63 new gas stations, 65 new restaurants, and 53 new motels. As shown in Table 1, an estimated total job gain of 5,087 is expected from this economic development, with associated employee compensation of $71.7 million. Table 2 shows that the Trade sector accounted for the greatest impact, followed by the Services sector. Approximately 89 percent of the total impact occurred in these industries.

Table 1

Summary of Economic Impacts
Alternative 6A
($1990 Millions)

	Direct Effects	Indirect Effects	Induced Effects	Total Effects
Employment	2,882	262	1,944	5,087
Employee Compensation	35.1	4.4	32.2	$71.7

Table 2

Industry Division Impacts
Alternative 6A
($1990 Millions)

Major Industry Division	Employee Compensation	Employment
Agriculture	0.173	29
Construction	1.329	66
Manufacturing	2.356	101
Transportation, Communication, & Public Utilities	2.954	99
Wholesale & Retail Trade	32.384	2,672
Finance, Insurance, & Real Estate	3.904	208
Services	27.311	1,871
Government	1.264	41
Total	$71.675	5,087

Source: Virginia Employment Commission – EIS 01/25/94

Alternative 7

The study area for this alternative encompasses Henry, Franklin, Roanoke, Bedford, Botetourt, and Alleghany counties and Martinsville, Roanoke, Salem, Bedford, Covington, and Clifton Forge cities. For Alternative 7, predicted economic development would result in the establishment of 53 new gas stations, 53 new restaurants, and 39 new motels. Table 1 shows that these new establishments would result in an estimated total job gain of 4,095, with associated employee compensation of $57.0 million. As shown in Table 2, approximately 90 percent of the total impact occurred in the Trade and Services industries.

Table 1

Summary of Economic Impacts
Alternative 7
($1990 Millions)

	Direct Effects	Indirect Effects	Induced Effects	Total Effects
Employment	2,278	183	1,634	4,095
Employee Compensation	27.3	3.0	26.7	$57.0

Table 2

Industry Division Impacts
Alternative 7
($1990 Millions)

Major Industry Division	Employee Compensation	Employment
Agriculture	0.148	25
Construction	1.107	54
Manufacturing	1.939	85
Transportation, Communication, & Public Utilities	1.932	69
Wholesale & Retail Trade	26.640	2,219
Finance, Insurance, & Real Estate	3.291	169
Services	21.062	1,448
Government	0.865	26
Total	$56.984	4,095

Source: Virginia Employment Commission – EIS 01/25/94

Summary

The summary table below provides the impact results of the potential Interstate 73 corridors. In summary, the outcome for each alternative is effected by the predicted number and type of new establishments and the number of proposed interchanges.

The predicted number of new establishments is based on the predicted economic development and the assumed level of current economic development for each proposed interchange. For example, Alternative 3/3A shows the least impact due to the fact that this corridor follows Interstate 77. Consequently, the predicted economic development is assumed to already exist, resulting in few new establishments and the smallest impact.

The type of establishment and number of interchanges also influence the outcome. In this study, average employment was highest for restaurants, followed by motels and gas stations.

Summary Table

Alternative	Interchanges	*New Establishments*			Initial Employment Change	*–Impact Results–*	
		Gas Stations	Restaurants	Motels		Total Employment	*Employee Compensation
1	15	26	13	19	803	1319	16.7
2	14	26	8	18	664	1076	13.5
2A	25	49	29	34	1587	2473	30.5
2B	23	35	11	27	952	1507	18.5
3/3A	15	2	0	1	29	49	0.6
4	16	25	7	20	673	1093	13.7
5	24	44	49	39	2137	3438	40.2
6	30	61	60	52	2733	4830	68.3
6A	34	63	65	53	2882	5087	71.7
7	36	53	53	39	2278	4095	57.0

* Employee Compensation is measured in millions of dollars.

Endnote

1. David T. Hartgen, Janet E. O'Callaghan, Wayne A. Walcott, and Jane Opgenorth. Growth at Rural Interchanges: What, Where, Why. *Transportation Research Record 1359* (1992): 141-150.

An Economic Impact Analysis of the Potential Interstate 73 Corridors

Summary Table

Alternative	Interchanges	*New Establishments* Gas Stations	Restaurants	Motels	Initial Employment Change	*–Impact Results–* Total Employment	*Employee Compensation
1	15	26	13	19	803	1319	16.7
2	14	26	8	18	664	1076	13.5
2A	25	49	29	34	1587	2473	30.5
2B	23	35	11	27	952	1507	18.5
2T**	34	58	32	43	1875	2906	35.1
3/3A	15	2	0	1	29	49	0.6
4	16	25	7	20	673	1093	13.7
5	24	44	49	39	2137	3438	40.2
6	30	61	60	52	2733	4830	68.3
6A	34	63	65	53	2882	5087	71.7
7	36	53	53	39	2278	4095	57.0

* Employee Compensation is measured in millions of dollars.

** 2T is a combination of Alternatives 2A, 2, and 2B.

Source: Virginia Employee Commission, 03/03/94.

APPENDIX B

TABLE B1. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity=0.125	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 1	Scott	92.6	191.4	906.1	348.0	4.15	3.84	7.93
(equ.	Lee	60.4	145.2	741.4	42.7	0.70	0.42	1.02
cost)	Wise	184.2	348.6	818.0	378.7	4.42	8.14	15.40
	Big Stone Gap	-	-	53.3	0.0	"	-	-
	Wise Tn	-	-	45.1	0.0	"	-	-
	Norton City	89.9	45.4	57.0	31.3	5.63	5.06	2.56
	Total Local	427.1	730.6		800.7		17.46	26.91
	STATE	42904.9	82713.7	103640.2	800.7	0.19	82.63	159.29
ALT 1	Scott				285.3	3.48	3.22	6.66
(est.	Lee				33.4	0.55	0.33	0.80
cost)	Wise				313.6	3.75	6.90	13.06
	Big Stone Gap				0.0	"	-	-
	Wise Tn				0.0	"	-	-
	Norton City				26.7	4.91	4.42	2.23
	Total Local				659.0		14.88	22.76
	STATE				659.0	0.16	68.04	131.17

TABLE B2. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity=0.02	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 1	Scott	92.6	191.4	906.1	348.0	0.65	0.60	1.25
(equ.	Lee	60.4	145.2	741.4	42.7	0.11	0.07	0.16
cost)	Wise	184.2	348.6	818.0	378.7	0.69	1.28	2.42
	Big Stone Gap	-	-	53.3	0.0	"	-	-
	Wise Tn	-	-	45.1	0.0	"	-	-
	Norton City	89.9	45.4	57.0	31.3	0.88	0.79	0.40
	Total Local	427.1	730.6		800.7		2.74	4.23
	STATE	42904.9	82713.7	103640.2	800.7	0.03	13.21	25.47
ALT 1	Scott				285.3	0.55	0.51	1.05
(est.	Lee				33.4	0.09	0.05	0.13
cost)	Wise				313.6	0.59	1.09	2.06
	Big Stone Gap				0.0	"	-	-
	Wise Tn				0.0	"	-	-
	Norton City				26.7	0.77	0.69	0.35
	Total Local				659.0		2.34	3.59
	STATE				659.0	0.03	10.88	20.97

TABLE B3. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity=0.05	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 1	Scott	92.6	191.4	906.1	348.0	1.64	1.52	3.14
(equ.	Lee	60.4	145.2	741.4	42.7	0.28	0.17	0.41
cost)	Wise	184.2	348.6	818.0	378.7	1.74	3.21	6.08
	Big Stone Gap	-	-	53.3	0.0	"	-	-
	Wise Tn	-	-	45.1	0.0	"	-	-
	Norton City	89.9	45.4	57.0	31.3	2.21	1.99	1.01
	Total Local	427.1	730.6		800.7		6.89	10.63
	STATE	42904.9	82713.7	103640.2	800.7	0.08	33.03	63.68
ALT 1	Scott				285.3	1.38	1.28	2.64
(est.	Lee				33.4	0.22	0.13	0.32
cost)	Wise				313.6	1.48	2.73	5.17
	Big Stone Gap				0.0	"	-	-
	Wise Tn				0.0	"	-	-
	Norton City				26.7	1.94	1.74	0.88
	Total Local				659.0		5.88	9.01
	STATE				659.0	0.06	27.20	52.44

TABLE B4. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.125	
	COUNTY	TS $M	AGI $M	Hwy $M	I73 $M	Ben %	+TS $M	+AGI $M
ALT 2	Grayson	22.5	146.5	782.0	179.3	2.61	0.59	3.83
(equ.	Smyth	151.1	281.9	928.0	316.0	3.40	5.14	9.58
cost)	Marion Tn	-	-	75.7	0.0	"	-	-
	Saltville Tn	-	-	27.2	0.0	"	-	-
	Tazewell	290.4	384.3	891.4	199.3	2.34	6.79	8.98
	Tazewell Tn	-	-	35.3	10.7	"	-	-
	Bluefield Tn	-	-	68.3	0.0	"	-	-
	Richlands	-	-	39.0	0.0	"	-	-
	Buchanan	118.8	232.3	645.2	0.0			
	Galax City	120.4	47.7	117.2	0.0			
	Carroll	67.2	191.7	1260.7	0.0			
	Total Local	770.4	1284.4		705.3		12.51	22.39
	STATE	42904.9	82713.7	103640.2	705.3	0.17	72.81	140.37
ALT	Grayson				179.3	2.61	0.59	3.83
2A	Smyth				316.0	3.40	5.14	9.58
(equ.	Marion Tn				0.0	"	-	-
cost)	Saltville Tn				0.0	"	-	-
	Tazewell				399.3	4.17	12.10	16.01
	Tazewell Tn				0.0	"	-	-

TABLE B4. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.125	
	COUNTY	TS $M	AGI $M	Hwy $M	I73 $M	Ben %	+TS $M	+AGI $M
	Bluefield Tn				0.0	"	-	-
	Richlands Tn				0.0	"	-	-
	Buchanan				379.3	5.95	7.07	13.82
	Galax City				0.0			
	Carroll				0.0			
	Total Local				1274.0		24.90	43.25
	STATE				1274.0	0.31	131.25	253.03
ALT	Grayson				433.3	5.67	1.27	8.30
2B	Smyth				316.0	3.40	5.14	9.58
(equ.	Marion Tn				0.0	"	-	-
cost)	Saltville Tn				0.0	"	-	-
	Tazewell				199.3	2.34	6.79	8.98
	Tazewell Tn				10.7	"	-	-
	Bluefield Tn				0.0	"	-	-
	Richlands Tn				0.0	"	-	-
	Buchanan				0.0			
	Galax City				52.7	4.75	5.71	2.26
	Carroll				264.0	2.41	1.62	4.61
	Total Local				1276.0		20.53	33.74
	STATE				1276.0	0.31	131.45	253.42

TABLE B4. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.125	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT	Grayson				433.3	5.67	1.27	8.30
2AB	Smyth				316.0	3.40	5.14	9.58
(equ.	Marion Tn				0.0	"	-	-
cost)	Saltville Tn				0.0	"	-	-
	Tazewell				399.3	4.17	12.10	16.01
	Tazewell Tn				0.0	"	-	-
	Bluefield Tn				0.0	"	-	-
	Richlands Tn				0.0	"	-	-
	Buchanan				379.3	5.95	7.07	13.82
	Galax City				52.7	4.75	5.71	2.26
	Carroll				264.0	2.41	1.62	4.61
	Total Local				1844.7		32.91	54.59
	STATE				1844.7	0.44	189.65	365.62

TABLE B5. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.02	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 2	Grayson	22.5	146.5	782.0	179.3	0.41	0.09	0.61
(equ.	Smyth	151.1	281.9	928.0	316.0	0.54	0.81	1.51
cost)	Marion Tn	-	-	75.7	0.0	"	-	-
	Saltville Tn	-	-	27.2	0.0	"	-	-
	Tazewell	290.4	384.3	891.4	199.3	0.37	1.08	1.42
	Tazewell Tn	-	-	35.3	10.7	"	-	-
	Bluefield Tn	-	-	68.3	0.0	"	-	-
	Richlands	-	-	39.0	0.0	"	-	-
	Buchanan	118.8	232.3	645.2	0.0			
	Galax City	120.4	47.7	117.2	0.0			
	Carroll	67.2	191.7	1260.7	0.0			
	Total Local	770.4	1284.4		705.3		1.98	3.54
	STATE	42904.9	82713.7	103640.2	705.3	0.03	11.64	22.44
ALT	Grayson				179.3	0.41	0.09	0.61
2A	Smyth				316.0	0.54	0.81	1.51
(equ.	Marion Tn				0.0	"	-	-
cost)	Saltville Tn				0.0	"	-	-
	Tazewell				399.3	0.66	1.90	2.52

TABLE B5. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.02	
	COUNTY	TS $M	AGI $M	Hwy $M	I73 $M	Ben %	+TS $M	+AGI $M
	Tazewell Tn				0.0	"	-	-
	Bluefield Tn				0.0	"	-	-
	Richlands Tn				0.0	"	-	-
	Buchanan				379.3	0.93	1.10	2.16
	Galax City				0.0			
	Carroll				0.0			
	Total Local				1274.0		3.91	6.79
	STATE				1274.0	0.05	20.97	40.43
ALT	Grayson				433.3	0.89	0.20	1.30
2B	Smyth				316.0	0.54	0.81	1.51
(equ.	Marion Tn				0.0	"	-	-
cost)	Saltville Tn				0.0	"	-	-
	Tazewell				199.3	0.37	1.08	1.42
	Tazewell Tn				10.7	"	-	-
	Bluefield Tn				0.0	"	-	-
	Richlands Tn				0.0	"	-	-
	Buchanan				0.0			
	Galax City				52.7	0.74	0.90	0.36
	Carroll				264.0	0.38	0.26	0.73

TABLE B5. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.02	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
	Total Local				1276.0		3.24	5.32
	STATE				1276.0	0.05	21.01	40.50
ALT	Grayson				433.3	0.89	0.20	1.30
2AB	Smyth				316.0	0.54	0.81	1.51
(equ.	Marion Tn				0.0	"	-	-
cost)	Saltville Tn				0.0	"	-	-
	Tazewell				399.3	0.66	1.90	2.52
	Tazewell Tn				0.0	"	-	-
	Bluefield Tn				0.0	"	-	-
	Richlands Tn				0.0	"	-	-
	Buchanan				379.3	0.93	1.10	2.16
	Galax City				52.7	0.74	0.90	0.36
	Carroll				264.0	0.38	0.26	0.73
	Total Local				1844.7		5.17	8.57
	STATE				1844.7	0.07	30.29	58.39

TABLE B6. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.05	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 2	Grayson	22.5	146.5	782.0	179.3	1.04	0.23	1.52
(equ.	Smyth	151.1	281.9	928.0	316.0	1.35	2.03	3.79
cost)	Marion Tn	-	-	75.7	0.0	"	-	-
	Saltville Tn	-	-	27.2	0.0	"	-	-
	Tazewell	290.4	384.3	891.4	199.3	0.93	2.70	3.57
	Tazewell Tn	-	-	35.3	10.7	"	-	-
	Bluefield Tn	-	-	68.3	0.0	"	-	-
	Richlands	-	-	39.0	0.0	"	-	-
	Buchanan	118.8	232.3	645.2	0.0			
	Galax City	120.4	47.7	117.2	0.0			
	Carroll	67.2	191.7	1260.7	0.0			
	Total Local	770.4	1284.4		705.3		4.96	8.88
	STATE	42904.9	82713.7	103640.2	705.3	0.07	29.11	56.12
ALT	Grayson				179.3	1.04	0.23	1.52
2A	Smyth				316.0	1.35	2.03	3.79
(equ.	Marion Tn				0.0	"	-	-
cost)	Saltville Tn				0.0	"	-	-

TABLE B6. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.05	
	COUNTY	TS $M	AGI $M	Hwy $M	I73 $M	Ben %	+TS $M	+AGI $M
	Tazewell				399.3	1.65	4.78	6.33
	Tazewell Tn				0.0	"	-	-
	Bluefield Tn				0.0	"	-	-
	Richlands Tn				0.0	"	-	-
	Buchanan				379.3	2.34	2.78	5.43
	Galax City				0.0			
	Carroll				0.0			
	Total Local				1274.0		9.83	17.07
	STATE				1274.0	0.12	52.45	101.12
ALT	Grayson				433.3	2.23	0.50	3.27
2B	Smyth				316.0	1.35	2.03	3.79
(equ.	Marion Tn				0.0	"	-	-
cost)	Saltville Tn				0.0	"	-	-
	Tazewell				199.3	0.93	2.70	3.57
	Tazewell Tn				10.7	"	-	-
	Bluefield Tn				0.0	"	-	-
	Richlands Tn				0.0	"	-	-
	Buchanan				0.0			
	Galax City				52.7	1.87	2.25	0.89

TABLE B6. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.05	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
	Carroll				264.0	0.96	0.64	1.83
	Total Local				1276.0		8.13	13.35
	STATE				1276.0	0.12	52.53	101.28
ALT	Grayson				433.3	2.23	0.50	3.27
2AB	Smyth				316.0	1.35	2.03	3.79
(equ.	Marion Tn				0.0	"	-	-
cost)	Saltville Tn				0.0	"	-	-
	Tazewell				399.3	1.65	4.78	6.33
	Tazewell Tn				0.0	"	-	-
	Bluefield Tn				0.0	"	-	-
	Richlands Tn				0.0	"	-	-
	Buchanan				379.3	2.34	2.78	5.43
	Galax City				52.7	1.87	2.25	0.89
	Carroll				264.0	0.96	0.64	1.83
	Total Local				1844.7		12.99	21.54
	STATE				1844.7	0.18	75.76	146.05

TABLE B7. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.05	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 2	Grayson	22.5	146.5	782.0	144.1	0.85	0.19	1.24
(est.	Smyth	151.1	281.9	928.0	252.3	1.10	1.66	3.10
cost)	Marion Tn	-	-	75.7	0.0	"	-	-
	Saltville Tn	-	-	27.2	0.0	"	-	-
	Tazewell	290.4	384.3	891.4	142.8	0.67	1.95	2.58
	Tazewell Tn	-	-	35.3	5.3	"	-	-
	Bluefield Tn	-	-	68.3	0.0	"	-	-
	Richlands Tn	-	-	39.0	0.0	"	-	-
	Buchanan	118.8	232.3	645.2	0.0			
	Galax City	120.4	47.7	117.2	0.0			
	Carroll	67.2	191.7	1260.7	0.0			
	Total Local	770.4	1284.4		544.5		3.80	6.93
	STATE	42904.9	82713.7	103640.2	544.5	0.05	22.49	43.35
ALT	Grayson				144.1	0.85	0.19	1.24
2A	Smyth				252.3	1.10	1.66	3.10
(est.	Marion Tn				0.0	"	-	-
cost)	Saltville Tn				0.0	"	-	-

TABLE B7. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.05	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
	Tazewell				253.1	1.10	3.20	4.23
	Tazewell Tn				0.0	"	-	-
	Bluefield Tn				0.0	"	-	-
	Richlands Tn				0.0	"	-	-
	Buchanan				211.0	1.42	1.69	3.31
	Galax City				0.0			
	Carroll				0.0			
	Total Local				860.5		6.74	11.89
	STATE				860.5	0.08	35.49	68.42
ALT	Grayson				397.4	2.08	0.47	3.04
2B	Smyth				252.3	1.10	1.66	3.10
(est.	Marion Tn				0.0	"	-	-
cost)	Saltville Tn				0.0	"	-	-
	Tazewell				142.8	0.67	1.95	2.58
	Tazewell Tn				5.3	"	-	-
	Bluefield Tn				0.0	"	-	-
	Richlands Tn				0.0	"	-	-
	Buchanan				0.0			
	Galax City				50.5	1.81	2.17	0.86

TABLE B7. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.05	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
	Carroll				270.7	0.98	0.66	1.87
	Total Local				1119.0		6.91	11.46
	STATE				1119.0	0.11	46.10	88.87
ALT	Grayson				397.4	2.08	0.47	3.04
2AB	Smyth				252.3	1.10	1.66	3.10
(est.	Marion Tn				0.0	"	-	-
cost)	Saltville Tn				0.0	"	-	-
	Tazewell				253.1	1.10	3.20	4.23
	Tazewell Tn				0.0	"	-	-
	Bluefield Tn				0.0	"	-	-
	Richlands Tn				0.0	"	-	-
	Buchanan				211.0	1.42	1.69	3.31
	Galax City				50.5	1.81	2.17	0.86
	Carroll				270.7	0.98	0.66	1.87
	Total Local				1435.0		9.85	16.42
	STATE				1435.0	0.14	59.04	113.82

TABLE B8. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.02	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 2	Grayson	22.5	146.5	782.0	144.1	0.34	0.08	0.50
(est.	Smyth	151.1	281.9	928.0	252.3	0.44	0.66	1.24
cost)	Marion Tn	-	-	75.7	0.0	"	-	-
	Saltville Tn	-	-	27.2	0.0	"	-	-
	Tazewell	290.4	384.3	891.4	142.8	0.27	0.78	1.03
	Tazewell Tn	-	-	35.3	5.3	"	-	-
	Bluefield Tn	-	-	68.3	0.0	"	-	-
	Richlands Tn	-	-	39.0	0.0	"	-	-
	Buchanan	118.8	232.3	645.2	0.0			
	Galax City	120.4	47.7	117.2	0.0			
	Carroll	67.2	191.7	1260.7	0.0			
	Total Local	770.4	1284.4		544.5		1.52	2.76
	STATE	42904.9	82713.7	103640.2	544.5	0.02	8.99	17.34
ALT	Grayson				144.1	0.34	0.08	0.50
2A	Smyth				252.3	0.44	0.66	1.24
(est.	Marion Tn				0.0	"	-	-
cost)	Saltville Tn				0.0	"	-	-

TABLE B8. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.02	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
	Tazewell				253.1	0.44	1.27	1.69
	Tazewell Tn				0.0	"	-	-
	Bluefield Tn				0.0	"	-	-
	Richlands Tn				0.0	"	-	-
	Buchanan				211.0	0.57	0.67	1.32
	Galax City				0.0			
	Carroll				0.0			
	Total Local				860.5		2.69	4.74
	STATE				860.5	0.03	14.19	27.36
ALT	Grayson				397.4	0.83	0.19	1.21
2B	Smyth				252.3	0.44	0.66	1.24
(est.	Marion Tn				0.0	"	-	-
cost)	Saltville Tn				0.0	"	-	-
	Tazewell				142.8	0.27	0.78	1.03
	Tazewell Tn				5.3	"	-	-
	Bluefield Tn				0.0	"	-	-
	Richlands Tn				0.0	"	-	-
	Buchanan				0.0			
	Galax City				50.5	0.72	0.87	0.34

TABLE B8. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.02	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
	Carroll				270.7	0.39	0.26	0.75
	Total Local				1119.0		2.75	4.57
	STATE				1119.0	0.04	18.43	35.54
ALT	Grayson				397.4	0.83	0.19	1.21
2AB	Smyth				252.3	0.44	0.66	1.24
(est.	Marion Tn				0.0	"	-	-
cost)	Saltville Tn				0.0	"	-	-
	Tazewell				253.1	0.44	1.27	1.69
	Tazewell Tn				0.0	"	-	-
	Bluefield Tn				0.0	"	-	-
	Richlands Tn				0.0	"	-	-
	Buchanan				211.0	0.57	0.67	1.32
	Galax City				50.5	0.72	0.87	0.34
	Carroll				270.7	0.39	0.26	0.75
	Total Local				1435.0		3.92	6.54
	STATE				1435.0	0.06	23.61	45.51

TABLE B9. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.05	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 2	Grayson	22.5	146.5	782.0	144.1	0.85	0.19	1.24
(est.	Smyth	151.1	281.9	928.0	252.3	1.10	1.66	3.10
cost)	Marion Tn	-	-	75.7	0.0	"	-	-
	Saltville Tn	-	-	27.2	0.0	"	-	-
	Tazewell	290.4	384.3	891.4	142.8	0.67	1.95	2.58
	Tazewell Tn	-	-	35.3	5.3	"	-	-
	Bluefield Tn	-	-	68.3	0.0	"	-	-
	Richlands Tn	-	-	39.0	0.0	"	-	-
	Buchanan	118.8	232.3	645.2	0.0			
	Galax City	120.4	47.7	117.2	0.0			
	Carroll	67.2	191.7	1260.7	0.0			
	Total Local	770.4	1284.4		544.5		3.80	6.93
	STATE	42904.9	82713.7	103640.2	544.5	0.05	22.49	43.35
ALT	Grayson				144.1	0.85	0.19	1.24
2A	Smyth				252.3	1.10	1.66	3.10
(est.	Marion Tn				0.0	"	-	-
cost)	Saltville Tn				0.0	"	-	-

TABLE B9. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.05	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
	Tazewell				253.1	1.10	3.20	4.23
	Tazewell Tn				0.0	"	-	-
	Bluefield Tn				0.0	"	-	-
	Richlands Tn				0.0	"	-	-
	Buchanan				211.0	1.42	1.69	3.31
	Galax City				0.0			
	Carroll				0.0			
	Total Local				860.5		6.74	11.89
	STATE				860.5	0.08	35.49	68.42
ALT	Grayson				397.4	2.08	0.47	3.04
2B	Smyth				252.3	1.10	1.66	3.10
(est.	Marion Tn				0.0	"	-	-
cost)	Saltville Tn				0.0	"	-	-
	Tazewell				142.8	0.67	1.95	2.58
	Tazewell Tn				5.3	"	-	-
	Bluefield Tn				0.0	"	-	-
	Richlands Tn				0.0	"	-	-
	Buchanan				0.0			
	Galax City				50.5	1.81	2.17	0.86

TABLE B9. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.05	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
	Carroll				270.7	0.98	0.66	1.87
	Total Local				1119.0		6.91	11.46
	STATE				1119.0	0.11	46.10	88.87
ALT	Grayson				397.4	2.08	0.47	3.04
2AB	Smyth				252.3	1.10	1.66	3.10
(est.	Marion Tn				0.0	"	-	-
cost)	Saltville Tn				0.0	"	-	-
	Tazewell				253.1	1.10	3.20	4.23
	Tazewell Tn				0.0	"	-	-
	Bluefield Tn				0.0	"	-	-
	Richlands Tn				0.0	"	-	-
	Buchanan				211.0	1.42	1.69	3.31
	Galax City				50.5	1.81	2.17	0.86
	Carroll				270.7	0.98	0.66	1.87
	Total Local				1435.0		9.85	16.42
	STATE				1435.0	0.14	59.04	113.82

TABLE B10. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.125	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 3	Carroll	67.2	191.7	1260.7	0.0			
(equ.	Wythe	173.6	234.7	1039.8	211.3	1.91	3.32	4.49
cost)	Wytheville Tn	-	-	249.9	0.0	"	-	-
	Bland	8.9	52.2	628.1	0.0			
	Total Local	249.6	478.6		211.3		3.32	4.49
	STATE	42904.9	82713.7	103640.2	211.3	0.05	21.86	42.13
ALT	Carroll				0.0			
3A	Wythe				200.7	1.82	3.17	4.28
(equ.	Wytheville Tn				0.0	"	-	-
cost)	Bland				0.0			
	Total Local				200.7		3.17	4.28
	STATE				200.7	0.05	20.75	40.01
ALT 3	Carroll				254.8	2.33	1.56	4.46
(est.	Wythe				247.3	2.22	3.85	5.20
cost)	Wytheville Tn				0.0	"	-	-
	Bland				218.9	3.81	0.34	1.99

TABLE B10. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.125	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
	Total Local				721.0		5.75	11.65
	STATE				721.0	0.17	74.43	143.48
ALT	Carroll				254.8	2.33	1.56	4.46
3A	Wythe				164.9	1.93	3.34	4.52
(est.	Wytheville Tn				47.8	"	-	-
cost)	Bland				218.9	3.81	0.34	1.99
	Total Local				686.4		5.25	10.97
	STATE				686.4	0.17	70.86	136.61

TABLE B11. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.02	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 3	Carroll	67.2	191.7	1260.7	0.0			
(equ.	Wythe	173.6	234.7	1039.8	211.3	0.30	0.53	0.71
cost)	Wytheville Tn	-	-	249.9	0.0	"	-	-
	Bland	8.9	52.2	628.1	0.0			
	Total Local	249.6	478.6		211.3		0.53	0.71
	STATE	42904.9	82713.7	103640.2	211.3	0.01	3.50	6.74
ALT	Carroll				0.0			
3A	Wythe				200.7	0.29	0.50	0.68
(equ.	Wytheville Tn				0.0	"	-	-
cost)	Bland				0.0			
	Total Local				200.7		0.50	0.68
	STATE				200.7	0.01	3.32	6.40
ALT 3	Carroll				254.8	0.37	0.25	0.71
(est.	Wythe				247.3	0.35	0.61	0.82
cost)	Wytheville Tn				0.0	"	-	-
	Bland				218.9	0.60	0.05	0.31

TABLE B11. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.02	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
	Total Local				721.0		0.91	1.85
	STATE				721.0	0.03	11.90	22.94
ALT	Carroll				254.8	0.37	0.25	0.71
3A	Wythe				164.9	0.31	0.53	0.72
(est.	Wytheville Tn				47.8	"	-	-
cost)	Bland				218.9	0.60	0.05	0.31
	Total Local				686.4		0.83	1.74
	STATE				686.4	0.03	11.33	21.84

TABLE B12. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.05	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 3	Carroll	67.2	191.7	1260.7	0.0			
(equ.	Wythe	173.6	234.7	1039.8	211.3	0.76	1.32	1.79
cost)	Wytheville Tn	-	-	249.9	0.0	"	-	-
	Bland	8.9	52.2	628.1	0.0			
	Total Local	249.6	478.6		211.3		1.32	1.79
	STATE	42904.9	82713.7	103640.2	211.3	0.02	8.74	16.85
ALT	Carroll				0.0			
3A	Wythe				200.7	0.73	1.26	1.70
(equ.	Wytheville Tn				0.0	"	-	-
cost)	Bland				0.0			
	Total Local				200.7		1.26	1.70
	STATE				200.7	0.02	8.30	16.00
ALT 3	Carroll				254.8	0.92	0.62	1.77
(est.	Wythe				247.3	0.88	1.53	2.07
cost)	Wytheville Tn				0.0	"	-	-
	Bland				218.9	1.51	0.13	0.79

TABLE B12. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.05	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
	Total Local				721.0		2.28	4.63
	STATE				721.0	0.07	29.75	57.36
ALT	Carroll				254.8	0.92	0.62	1.77
3A	Wythe				164.9	0.77	1.33	1.80
(est.	Wytheville Tn				47.8	"	-	-
cost)	Bland				218.9	1.51	0.13	0.79
	Total Local				686.4		2.08	4.36
	STATE				686.4	0.07	28.33	54.62

TABLE B13. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.125	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 4	Carroll	67.2	191.7	1260.7	305.3	2.75	1.85	5.27
(equ.	Wythe	173.6	234.7	1079.8	63.3	0.58	1.01	1.37
cost)	Wytheville	-	-	249.9	0.0	"	-	-
	Pulaski	168.8	293.0	718.0	253.3	3.28	5.53	9.60
	Pulaski Tn	-	-	143.1	0.0	"	-	-
	Giles	69.3	158.5	600.2	210.7	3.66	2.54	5.80
	Pearisburg Tn	-	-	17.9	0.0	"	-	-
	Narrows Tn	-	-	14.0	0.0	"	-	-
	Total Local	478.8	878.0		832.7		10.92	22.04
	STATE	42904.9	82713.7	103640.2	832.7	0.20	85.92	165.64
ALT 4	Carroll				307.5	2.77	1.86	5.30
(est.	Wythe				58.1	0.54	0.93	1.26
cost)	Wytheville				0.0	"	-	-
	Pulaski				232.2	3.03	5.11	8.88

TABLE B13. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.125	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
	Pulaski Tn				0.0	"	-	-
	Giles				188.2	3.31	2.29	5.25
	Pearisburg Tn				0.0	"	-	-
	Narrows Tn				0.0	"	-	-
	Total Local				786.0		10.19	20.69
	STATE				786.0	0.19	81.12	156.38

TABLE B14. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.02	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 4	Carroll	67.2	191.7	1260.7	305.3	0.43	0.29	0.83
(equ.	Wythe	173.6	234.7	1079.8	63.3	0.09	0.16	0.22
cost)	Wytheville	-	-	249.9	0.0	"	-	-
	Pulaski	168.8	293.0	718.0	253.3	0.52	0.87	1.52
	Pulaski Tn	-	-	143.1	0.0	"	-	-
	Giles	69.3	158.5	600.2	210.7	0.58	0.40	0.91
	Pearisburg Tn	-	-	17.9	0.0	"	-	-
	Narrows Tn	-	-	14.0	0.0	"	-	-
	Total Local	478.8	878.0		832.7		1.73	3.48
	STATE	42904.9	82713.7	103640.2	832.7	0.03	13.74	26.48
ALT 4	Carroll				307.5	0.44	0.29	0.84
(est.	Wythe				58.1	0.09	0.15	0.20
cost)	Wytheville				0.0	"	-	-
	Pulaski				232.2	0.48	0.81	1.40
	Pulaski Tn				0.0	"	-	-
	Giles				188.2	0.52	0.36	0.83

TABLE B14. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.02	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
	Pearisburg Tn				0.0	"	-	-
	Narrows Tn				0.0	"	-	-
	Total Local				786.0		1.61	3.27
	STATE				786.0	0.03	12.97	25.00

TABLE B15. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.05	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	+AGI $M
ALT 4	Carroll	67.2	191.7	1260.7	305.3	1.09	0.73	2.09
(equ.	Wythe	173.6	234.7	1079.8	63.3	0.23	0.40	0.55
cost)	Wytheville	-	-	249.9	0.0	"	-	-
	Pulaski	168.8	293.0	718.0	253.3	1.30	2.19	3.80
	Pulaski Tn	-	-	143.1	0.0	"	-	-
	Giles	69.3	158.5	600.2	210.7	1.45	1.00	2.30
	Pearisburg Tn	-	-	17.9	0.0	"	-	-
	Narrows Tn	-	-	14.0	0.0	"	-	-
	Total Local	478.8	878.0		832.7		4.33	8.74
	STATE	42904.9	82713.7	103640.2	832.7	0.08	34.35	66.21
ALT 4	Carroll				307.5	1.10	0.74	2.10
(est.	Wythe				58.1	0.21	0.37	0.50
cost)	Wytheville				0.0	"	-	-
	Pulaski				232.2	1.20	2.03	3.52
	Pulaski Tn				0.0	"	-	-

TABLE B15. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.05	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	+AGI $M
	Giles				188.2	1.31	0.91	2.08
	Pearisburg Tn				0.0	"	-	-
	Narrows Tn				0.0	"	-	-
	Total Local				786.0		4.04	8.20
	STATE				786.0	0.08	32.43	62.52

TABLE B16. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.125	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 5	Patrick	43.3	145.7	795.7	284.7	3.90	1.69	5.68
(equ.	Floyd	24.3	106.4	645.2	169.3	2.96	0.72	3.15
cost)	Montgom	425.5	656.7	881.5	179.3	2.97	12.65	19.53
	Christ'burg Tn	-	-	215.4	52.0	"	-	-
	Blacksburg Tn	-	-	172.6	104.0	"	-	-
	Giles	69.3	158.5	600.2	336.0	5.47	3.79	8.68
	Pearisburg Tn	-	-	17.9	0.0	"	-	-
	Narrows Tn	-	-	14.0	0.0	"	-	-
	Total Local	562.4	1067.4		1125.3		18.85	37.03
	STATE	42904.9	82713.7	103640.2	1125.3	0.27	116.00	223.62
ALT 5	Patrick				300.0	4.08	1.76	5.94
(est.	Floyd				179.1	3.11	0.76	3.31
cost)	Montgom				203.5	3.22	13.69	21.12
	Christ'burg				54.1	"	-	-
	Blacksburg				108.2	"	-	-

TABLE B16. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.125	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
	Giles				407.1	6.41	4.44	10.16
	Pearisburg				0.0	"	-	-
					0.0	"	-	-
	Total Local				1252.0		20.65	40.54
	STATE				1252.0	0.30	128.99	248.68

TABLE B17. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.02	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 5	Patrick	43.3	145.7	795.7	284.7	0.61	0.27	0.89
(equ.	Floyd	24.3	106.4	645.2	169.3	0.47	0.11	0.50
cost)	Montgom	425.5	656.7	881.5	179.3	0.47	2.00	3.09
	Christ'burg Tn	-	-	215.4	52.0	"	-	-
	Blacksburg Tn	-	-	172.6	104.0	"	-	-
	Giles	69.3	158.5	600.2	336.0	0.86	0.59	1.36
	Pearisburg Tn	-	-	17.9	0.0	"	-	-
	Narrows Tn	-	-	14.0	0.0	"	-	-
	Total Local	562.4	1067.4		1125.3		2.97	5.83
	STATE	42904.9	82713.7	103640.2	1125.3	0.04	18.54	35.74
ALT 5	Patrick				300.0	0.64	0.28	0.94
(est.	Floyd				179.1	0.49	0.12	0.52
cost)	Montgom				203.5	0.51	2.16	3.33

TABLE B17. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.02	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
	Christ'burg				54.1	"	-	-
	Blacksburg				108.2	"	-	-
	Giles				407.1	1.00	0.69	1.58
	Pearisburg				0.0	"	-	-
					0.0	"	-	-
	Total Local				1252.0		3.25	6.38
	STATE				1252.0	0.05	20.61	39.74

TABLE B18. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.05	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 5	Patrick	43.3	145.7	795.7	284.7	1.54	0.67	2.24
(equ.	Floyd	24.3	106.4	645.2	169.3	1.17	0.29	1.25
cost)	Montgom	425.5	656.7	881.5	179.3	1.18	5.02	7.74
	Christ'burg Tn	-	-	215.4	52.0	"	-	-
	Blacksburg Tn	-	-	172.6	104.0	"	-	-
	Giles	69.3	158.5	600.2	336.0	2.15	1.49	3.41
	Pearisburg Tn	-	-	17.9	0.0	"	-	-
	Narrows Tn	-	-	14.0	0.0	"	-	-
	Total Local	562.4	1067.4		1125.3		7.46	14.65
	STATE	42904.9	82713.7	103640.2	1125.3	0.11	46.36	89.38
ALT 5	Patrick				300.0	1.61	0.70	2.35
(est.	Floyd				179.1	1.23	0.30	1.31
cost)	Montgom				203.5	1.27	5.42	8.37
	Christ'burg				54.1	"	-	-
	Blacksburg				108.2	"	-	-

TABLE B18. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.05	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
	Giles				407.1	2.52	1.74	3.99
	Pearisburg				0.0	"	-	-
					0.0	"	-	-
	Total Local				1252.0		8.16	16.02
	STATE				1252.0	0.12	51.55	99.38

TABLE B19. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.125	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 6	Henry	260.3	564.8	1173.9	272.7	2.29	5.97	12.96
(equ.	Martinsville	162.3	230.6	196.1	0.0	"	3.73	5.29
cost)	Franklin	156.9	386.4	1334.5	326.7	2.66	4.18	10.28
	Rocky Mount Tn	-	-	62.6	0.0	"	-	-
	Roanoke	473.1	1212.8	1033.1	274.0	1.61	7.61	19.50
	Roanoke City	1129.0	965.5	925.8	0.0	"	18.15	15.52
	Vinton Tn	-	-	54.5	0.0	"	-	-
	Salem City	322.0	266.9	256.8	41.3	1.88	6.07	5.03
	Montgom	425.5	656.7	881.5	169.3	1.58	6.71	10.36
	Christ'burg Tn	-	-	215.4	0.0	"	-	-
	Blacksburg Tn	-	-	172.6	0.0	"	-	-
	Giles	69.3	158.5	600.2	336.0	5.47	3.79	8.68
	Pearisburg Tn	-	-	17.9	0.0	"	-	-
	Narrows Tn	-	-	14.0	0.0	"	-	-
	Total Local	2998.6	4442.3		1420.0		56.20	87.62
	STATE	42904.9	82713.7	103640.2	1420.0	0.34	146.21	281.88

TABLE B19. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.125	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT	Henry				272.7	2.29	5.97	12.96
6A	Martinsville				0.0	"	3.73	5.29
(equ.	Franklin				326.7	2.66	4.18	10.28
cost)	Rocky Mount Tn				0.0	"	-	-
	Roanoke				178.7	0.95	4.50	11.54
	Roanoke City				0.0	"	10.74	9.19
	Vinton Tn				0.0	"	-	-
	Salem City				0.0	"	3.06	2.54
	Montgom				242.0	3.06	13.02	20.09
	Christ'burg Tn				0.0	"	-	-
	Blacksburg Tn				104.0	"	-	-
	Giles				336.0	5.47	3.79	8.68
	Pearisburg Tn				0.0	"	-	-
	Narrows Tn				0.0	"	-	-
	Total Local				1460.0		48.99	80.57
	STATE				1460.0	0.35	150.31	289.77

TABLE B20. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.02	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 6	Henry	260.3	564.8	1173.9	272.7	0.36	0.95	2.05
(equ.	Martinsville	162.3	230.6	196.1	0.0	"	0.59	0.84
cost)	Franklin	156.9	386.4	1334.5	326.7	0.42	0.66	1.63
	Rocky Mount Tn	-	-	62.6	0.0	"	-	-
	Roanoke	473.1	1212.8	1033.1	274.0	0.26	1.21	3.10
	Roanoke City	1129.0	965.5	925.8	0.0	"	2.88	2.47
	Vinton Tn	-	-	54.5	0.0	"	-	-
	Salem City	322.0	266.9	256.8	41.3	0.30	0.96	0.80
	Montgom	425.5	656.7	881.5	169.3	0.25	1.07	1.65
	Christ'burg Tn	-	-	215.4	0.0	"	-	-
	Blacksburg Tn	-	-	172.6	0.0	"	-	-
	Giles	69.3	158.5	600.2	336.0	0.86	0.59	1.36
	Pearisburg Tn	-	-	17.9	0.0	"	-	-
	Narrows Tn	-	-	14.0	0.0	"	-	-
	Total Local	2998.6	4442.3		1420.0		8.91	13.89
	STATE	42904.9	82713.7	103640.2	1420.0	0.05	23.36	45.04

TABLE B20. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.02	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT	Henry				272.7	0.36	0.95	2.05
6A	Martinsville				0.0	"	0.59	0.84
(equ.	Franklin				326.7	0.42	0.66	1.63
cost)	Rocky Mount Tn				0.0	"	-	-
	Roanoke				178.7	0.15	0.72	1.84
	Roanoke City				0.0	"	1.71	1.46
	Vinton Tn				0.0	"	-	-
	Salem City				0.0	"	0.49	0.40
	Montgom				242.0	0.48	2.06	3.17
	Christ'burg Tn				0.0	"	-	-
	Blacksburg Tn				104.0	"	-	-
	Giles				336.0	0.86	0.59	1.36
	Pearisburg Tn				0.0	"	-	-
	Narrows Tn				0.0	"	-	-
	Total Local				1460.0		7.77	12.76
	STATE				1460.0	0.06	24.01	46.30

TABLE B21. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.05	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 6	Henry	260.3	564.8	1173.9	272.7	0.91	2.37	5.15
(equ.	Martinsville	162.3	230.6	196.1	0.0	"	1.48	2.10
cost)	Franklin	156.9	386.4	1334.5	326.7	1.06	1.66	4.08
	Rocky Mount Tn	-	-	62.6	0.0	"	-	-
	Roanoke	473.1	1212.8	1033.1	274.0	0.64	3.03	7.76
	Roanoke City	1129.0	965.5	925.8	0.0	"	7.23	6.18
	Vinton Tn	-	-	54.5	0.0	"	-	-
	Salem City	322.0	266.9	256.8	41.3	0.75	2.41	2.00
	Montgom	425.5	656.7	881.5	169.3	0.63	2.67	4.12
	Christ'burg Tn	-	-	215.4	0.0	"	-	-
	Blacksburg Tn	-	-	172.6	0.0	"	-	-
	Giles	69.3	158.5	600.2	336.0	2.15	1.49	3.41
	Pearisburg Tn	-	-	17.9	0.0	"	-	-
	Narrows Tn	-	-	14.0	0.0	"	-	-
	Total Local	2998.6	4442.3		1420.0		22.34	34.81
	STATE	42904.9	82713.7	103640.2	1420.0	0.14	58.43	112.64

TABLE B21. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.05	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT	Henry				272.7	0.91	2.37	5.15
6A	Martinsville				0.0	"	1.48	2.10
(equ.	Franklin				326.7	1.06	1.66	4.08
cost)	Rocky Mount Tn				0.0	"	-	-
	Roanoke				178.7	0.38	1.80	4.60
	Roanoke City				0.0	"	4.28	3.66
	Vinton Tn				0.0	"	-	-
	Salem City				0.0	"	1.22	1.01
	Montgom				242.0	1.21	5.16	7.96
	Christ'burg Tn				0.0	"	-	-
	Blacksburg Tn				104.0	"	-	-
	Giles				336.0	2.15	1.49	3.41
	Pearisburg Tn				0.0	"	-	-
	Narrows Tn				0.0	"	-	-
	Total Local				1460.0		19.46	31.99
	STATE				1460.0	0.14	60.06	115.79

TABLE B22. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.125	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 6	Henry	260.3	564.8	1173.9	270.3	2.28	5.93	12.86
(est.	Martinsville	162.3	230.6	196.1	0.0	"	3.70	5.25
cost)	Franklin	156.9	386.7	1334.5	323.6	2.64	4.14	10.20
	Rocky Mount Tn	-	-	62.6	0.0	"	-	-
	Roanoke	473.1	1212.8	1033.1	287.1	1.68	7.95	20.38
	Roanoke City	1129.0	965.5	925.8	0.0	"	18.97	16.22
	Vinton Tn	-	-	54.5	0.0	"	-	-
	Salem City	322.0	266.9	256.8	42.7	1.94	6.25	5.18
	Montgom	425.5	656.7	881.5	193.2	1.79	7.60	11.73
	Christ'burg Tn	-	-	215.4	0.0	"	-	-
	Blacksburg Tn	-	-	172.6	0.0	"	-	-
	Giles	69.3	158.5	600.2	407.1	6.41	4.44	10.16
	Pearisburg Tn	-	-	17.9	0.0	"	-	-
	Narrows Tn	-	-	14.0	0.0	"	-	-
	Total Local	2998.6	4442.6		1524.0		58.97	91.99
	STATE	42904.9	82713.7	103640.2	1524.0	0.37	156.86	302.41

TABLE B22. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.125	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT	Henry				270.3	2.28	5.93	12.86
6A	Martinsville				0.0	"	3.70	5.25
(est.	Franklin				323.6	2.64	4.14	10.20
cost)	Rocky Mount Tn				0.0	"	-	-
	Roanoke				154.2	0.83	3.90	10.01
	Roanoke City				0.0	"	9.31	7.97
	Vinton Tn				0.0	"	-	-
	Salem City				0.0	"	2.66	2.20
	Montgom				230.9	2.87	12.22	18.86
	Christ'burg Tn				0.0	"	-	-
	Blacksburg Tn				91.8	"	-	-
	Giles				407.1	6.41	4.44	10.16
	Pearisburg Tn				0.0	"	-	-
	Narrows Tn				0.0	"	-	-
	Total Local				1478.0		46.30	77.51
	STATE				1478.0	0.35	152.15	293.33

TABLE B23. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.02	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 6	Henry	260.3	564.8	1173.9	270.3	0.36	0.94	2.04
(est.	Martinsville	162.3	230.6	196.1	0.0	"	0.59	0.83
cost)	Franklin	156.9	386.7	1334.5	323.6	0.42	0.66	1.61
	Rocky Mount Tn	-	-	62.6	0.0	"	-	-
	Roanoke	473.1	1212.8	1033.1	287.1	0.27	1.26	3.24
	Roanoke City	1129.0	965.5	925.8	0.0	"	3.01	2.58
	Vinton Tn	-	-	54.5	0.0	"	-	-
	Salem City	322.0	266.9	256.8	42.7	0.31	0.99	0.82
	Montgom	425.5	656.7	881.5	193.2	0.28	1.21	1.86
	Christ'burg Tn	-	-	215.4	0.0	"	-	-
	Blacksburg Tn	-	-	172.6	0.0	"	-	-
	Giles	69.3	158.5	600.2	407.1	1.00	0.69	1.58
	Pearisburg Tn	-	-	17.9	0.0	"	-	-
	Narrows Tn	-	-	14.0	0.0	"	-	-
	Total Local	2998.6	4442.6		1524.0		9.35	14.57
	STATE	42904.9	82713.7	103640.2	1524.0	0.06	25.06	48.31

TABLE B23. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.02	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT	Henry				270.3	0.36	0.94	2.04
6A	Martinsville				0.0	"	0.59	0.83
(est.	Franklin				323.6	0.42	0.66	1.61
cost)	Rocky Mount Tn				0.0	"	-	-
	Roanoke				154.2	0.13	0.62	1.60
	Roanoke City				0.0	"	1.49	1.27
	Vinton Tn				0.0	"	-	-
	Salem City				0.0	"	0.42	0.35
	Montgom				230.9	0.45	1.93	2.98
	Christ'burg Tn				0.0	"	-	-
	Blacksburg Tn				91.8	"	-	-
	Giles				407.1	1.00	0.69	1.58
	Pearisburg Tn				0.0	"	-	-
	Narrows Tn				0.0	"	-	-
	Total Local				1478.0		7.34	12.27
	STATE				1478.0	0.06	24.31	46.86

TABLE B24. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.05	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 6	Henry	260.3	564.8	1173.9	270.3	0.90	2.35	5.11
(est.	Martinsville	162.3	230.6	196.1	0.0	"	1.47	2.09
cost)	Franklin	156.9	386.7	1334.5	323.6	1.05	1.64	4.05
	Rocky Mount Tn	-	-	62.6	0.0	"	-	-
	Roanoke	473.1	1212.8	1033.1	287.1	0.67	3.16	8.11
	Roanoke City	1129.0	965.5	925.8	0.0	"	7.55	6.46
	Vinton Tn	-	-	54.5	0.0	"	-	-
	Salem City	322.0	266.9	256.8	42.7	0.77	2.48	2.06
	Montgom	425.5	656.7	881.5	193.2	0.71	3.02	4.67
	Christ'burg Tn	-	-	215.4	0.0	"	-	-
	Blacksburg Tn	-	-	172.6	0.0	"	-	-
	Giles	69.3	158.5	600.2	407.1	2.52	1.74	3.99
	Pearisburg Tn	-	-	17.9	0.0	"	-	-
	Narrows Tn	-	-	14.0	0.0	"	-	-
	Total Local	2998.6	4442.6		1524.0		23.43	36.53
	STATE	42904.9	82713.7	103640.2	1524.0	0.15	62.68	120.83

TABLE B24. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.05	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT	Henry				270.3	0.90	2.35	5.11
6A	Martinsville				0.0	"	1.47	2.09
(est.	Franklin				323.6	1.05	1.64	4.05
cost)	Rocky Mount Tn				0.0	"	-	-
	Roanoke				154.2	0.33	1.56	3.99
	Roanoke City				0.0	"	3.72	3.18
	Vinton Tn				0.0	"	-	-
	Salem City				0.0	"	1.06	0.88
	Montgom				230.9	1.14	4.85	7.48
	Christ'burg Tn				0.0	"	-	-
	Blacksburg Tn				91.8	"	-	-
	Giles				407.1	2.52	1.74	3.99
	Pearisburg Tn				0.0	"	-	-
	Narrows Tn				0.0	"	-	-
	Total Local				1478.0		18.39	30.76
	STATE				1478.0	0.14	60.80	117.21

TABLE B25. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.125	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 7	Henry	260.3	564.8	1173.9	272.7	2.29	5.97	12.96
(equ.	Martinsville	162.3	230.6	196.1	0.0	"	3.73	5.29
cost)	Franklin	156.9	386.4	1334.5	326.7	2.66	4.18	10.28
	Rocky Mount Tn	-	-	62.6	0.0	"	-	-
	Roanoke	473.1	1212.8	1033.1	136.7	0.73	3.47	8.89
	Salem City	322.0	266.9	256.8	0.0	"	2.36	1.96
	Roanoke City	1129.0	965.5	925.8	0.0	"	8.28	7.08
	Vinton Tn	-	-	54.5	0.0	"	-	-
	Bedford	91.4	552.8	1314.9	63.3	0.55	0.50	3.04
	Bedford City	69.6	91.4	96.7	0.0	"	0.38	0.50
	Botetourt	76.6	319.9	1144.2	442.7	4.17	3.20	13.35
	Alleghany	37.7	132.0	928.8	20.7	0.24	0.09	0.32
	Clifton Forge	22.4	44.2	50.8	0.0	"	0.05	0.11
	Covington	81.7	68.3	87.8	0.0	"	0.20	0.16
	Total Local	2883.1	4835.7		1262.7		32.41	63.95
	STATE	42904.9	82713.7	103640.2	1262.7	0.30	130.09	250.79

TABLE B25. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.125	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 7	Henry				270.3	2.28	5.93	12.86
(est.	Martinsville				0.0	"	3.70	5.25
cost)	Franklin				323.6	2.64	4.14	10.19
	Rocky Mount Tn				0.0	"	-	-
	Roanoke				135.4	0.73	3.44	8.81
	Salem City				0.0	"	2.34	1.94
	Roanoke City				0.0	"	8.20	7.02
	Vinton Tn				0.0	"	-	-
	Bedford				62.7	0.54	0.50	3.01
	Bedford City				0.0	"	0.38	0.50
	Botetourt				438.2	4.14	3.17	13.23
	Alleghany				20.5	0.24	0.09	0.31
	Clifton Forge				0.0	"	0.05	0.11
	Covington				0.0	"	0.19	0.16
	Total Local				1250.8		32.13	63.40
	STATE				1250.8	0.30	128.87	248.44

TABLE B26. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.02	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 7	Henry	260.3	564.8	1173.9	272.7	0.36	0.95	2.05
(equ.	Martinsville	162.3	230.6	196.1	0.0	"	0.59	0.84
cost)	Franklin	156.9	386.4	1334.5	326.7	0.42	0.66	1.63
	Rocky Mount Tn	-	-	62.6	0.0	"	-	-
	Roanoke	473.1	1212.8	1033.1	136.7	0.12	0.55	1.42
	Salem City	322.0	266.9	256.8	0.0	"	0.38	0.31
	Roanoke City	1129.0	965.5	925.8	0.0	"	1.32	1.13
	Vinton Tn	-	-	54.5	0.0	"	-	-
	Bedford	91.4	552.8	1314.9	63.3	0.09	0.08	0.49
	Bedford City	69.6	91.4	96.7	0.0	"	0.06	0.08
	Botetourt	76.6	319.9	1144.2	442.7	0.66	0.50	2.10
	Alleghany	37.7	132.0	928.8	20.7	0.04	0.01	0.05
	Clifton Forge	22.4	44.2	50.8	0.0	"	0.01	0.02
	Covington	81.7	68.3	87.8	0.0	"	0.03	0.03
	Total Local	2883.1	4835.7		1262.7		5.15	10.14
	STATE	42904.9	82713.7	103640.2	1262.7	0.05	20.79	40.07

TABLE B26. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.02	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 7	Henry				270.3	0.36	0.94	2.04
(est.	Martinsville				0.0	"	0.59	0.83
cost)	Franklin				323.6	0.42	0.66	1.61
	Rocky Mount Tn				0.0	"	-	-
	Roanoke				135.4	0.12	0.55	1.41
	Salem City				0.0	"	0.37	0.31
	Roanoke City				0.0	"	1.31	1.12
	Vinton Tn				0.0	"	-	-
	Bedford				62.7	0.09	0.08	0.48
	Bedford City				0.0	"	0.06	0.08
	Botetourt				438.2	0.65	0.50	2.08
	Alleghany				20.5	0.04	0.01	0.05
	Clifton Forge				0.0	"	0.01	0.02
	Covington				0.0	"	0.03	0.03
	Total Local				1250.8		5.10	10.05
	STATE				1250.8	0.05	20.59	39.70

TABLE B27. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.02	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 7	Henry	260.3	564.8	1173.9	272.7	0.36	0.95	2.05
(equ.	Martinsville	162.3	230.6	196.1	0.0	"	0.59	0.84
cost)	Franklin	156.9	386.4	1334.5	326.7	0.42	0.66	1.63
	Rocky Mount Tn	-	-	62.6	0.0	"	-	-
	Roanoke	473.1	1212.8	1033.1	136.7	0.12	0.55	1.42
	Salem City	322.0	266.9	256.8	0.0	"	0.38	0.31
	Roanoke City	1129.0	965.5	925.8	0.0	"	1.32	1.13
	Vinton Tn	-	-	54.5	0.0	"	-	-
	Bedford	91.4	552.8	1314.9	63.3	0.09	0.08	0.49
	Bedford City	69.6	91.4	96.7	0.0	"	0.06	0.08
	Botetourt	76.6	319.9	1144.2	442.7	0.66	0.50	2.10
	Alleghany	37.7	132.0	928.8	20.7	0.04	0.01	0.05
	Clifton Forge	22.4	44.2	50.8	0.0	"	0.01	0.02
	Covington	81.7	68.3	87.8	0.0	"	0.03	0.03
	Total Local	2883.1	4835.7		1262.7		5.15	10.14
	STATE	42904.9	82713.7	103640.2	1262.7	0.05	20.79	40.07

TABLE B27. ESTIMATED IMPACT ON TAXABLE SALES & ADJ GROSS INC							Elasticity =0.02	
	COUNTY	**TS $M**	**AGI $M**	**Hwy $M**	**I73 $M**	**Ben %**	**+TS $M**	**+AGI $M**
ALT 7	Henry				270.3	0.36	0.94	2.04
(est.	Martinsville				0.0	"	0.59	0.83
cost)	Franklin				323.6	0.42	0.66	1.61
	Rocky Mount Tn				0.0	"	-	-
	Roanoke				135.4	0.12	0.55	1.41
	Salem City				0.0	"	0.37	0.31
	Roanoke City				0.0	"	1.31	1.12
	Vinton Tn				0.0	"	-	-
	Bedford				62.7	0.09	0.08	0.48
	Bedford City				0.0	"	0.06	0.08
	Botetourt				438.2	0.65	0.50	2.08
	Alleghany				20.5	0.04	0.01	0.05
	Clifton Forge				0.0	"	0.01	0.02
	Covington				0.0	"	0.03	0.03
	Total Local				1250.8		5.10	10.05
	STATE				1250.8	0.05	20.59	39.70