REPORT :

ECONOMIC IMPACT OF I-73 ALIGNMENTS ON THE CITY OF ROANOKE

Prepared for:

City of Roanoke
Office of Economic Development

Prepared by:

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Prepared for the City of Roanoke, Office of Economic Development
Prepared by Economic Development Research Group
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Objective. The City of Roanoke engaged Economic Development Research Group to assess the likely economic impacts on the city of alternative alignments for the planned location of I-73 through or around Roanoke. The primary objective for this report is to identify how any of those alternatives may affect the city's economic base and tax revenues, and whether any of the alternatives may lead to dis-investment in established commercial areas in the City.

Alternatives. The proposed I-73 is intended primarily to serve interstate traffic movements as a priority corridor for the national highway system. There are many alternative alignments for I-73 through the state of Virginia, but this report concerns only the alignment options in the vicinity of Roanoke. The current routing alternatives may: (1) go through the center of Roanoke, referred to here as the "Central Alignment," (2) bypass the city to the west, referred to as the "West Bypass Alignment," or (3) bypass the city to the east, referred to as the "East Bypass Alignment." Each of these alternatives is compared to conditions under a "No Build" scenario.

Findings. From the viewpoint of the City of Roanoke, there is no perfect choice for alignment of I-73. Each of the alternative alignments entails some tradeoffs amongst positive and negative impacts, and involves some risks. General findings are as follows:

The "No Build" Scenario, which assumes that I-73 is not built, has significant economic disadvantages for the City. Without any widening of I-581 or construction of bypass routes or development of other transportation alternatives by the City, traffic congestion along I-581 will worsen and become severe by the year 2020. That will serve to degrade access to the downtown area, and make the City much less attractive for visitors, local shoppers and for business locations. The "No Build" scenario will also keep Roanoke's interstate access focused on I-81's northeast-southwest direction, with travel times northwest (to Ohio and Michigan) over 100 minutes longer and travel times southeast (to North Carolina) nearly 60 minutes longer than would occur under any of the I-73 alternatives. That is likely to further constrain the area's ability to continue growing as a major regional distribution center. It would also forgo additional tourism and visitor-related activity that could be achieved by attracting I-73 pass-through traffic.

The Central Alignment has the greatest potential benefits to the City, but also some risks. With additional lanes along much of the I-581 / US-220 route, traffic flow is actually forecast to be better than under the "no build" alternative. Potential economic benefits to the City are created by limiting the supply of competitive suburban development sites and by increasing the potential visitor traffic for highway-serving businesses within the City. This option, if properly designed, could increase demand for central city sites near interchanges for business locations. That would increase the value of those sites and the amount of development in the City, adding jobs and tax base. The risk of losing commercial development and tax base to suburban sites would also be minimized. To realize such advantages, however, the City must take proactive steps to improve

local access streets, redevelop existing industrial and commercial buildings and sites, and provide assistance and incentives for development at available locations. If those steps are not taken, then the City risks limiting prospects for regional economic development and it could also experience economic damage to the central corridor from land takings. If this alignment is pursued, then the City needs to proactively plan to work with VDOT to mitigate potentially negative localized impacts along the highway corridor and encourage redevelopment for higher density commercial uses elsewhere along the central corridor.

The West Bypass Alignment provides the least potential opportunity for economic gains, but also the least economic risk to the City. Because of the mountain terrain and environmental considerations, the West Bypass would have only one new interchange (US-221) west of Roanoke. Thus, it would not open up an abundance of land with highway access for development. In that sense, it would not substantially threaten or enhance either the City's industrial and commercial base. Its benefits for regional economic growth would come primarily from the shortened travel time from Roanoke to markets in Michigan, Ohio and North Carolina. Economic development in the city could also benefit somewhat from this alignment if the US-221 connection to Roanoke was upgraded to four lanes, but that is not currently part of this I-73 option. The West Bypass would keep most of the I-73 through traffic west of the City, so there would relatively minor impacts on traffic flow on I-581 compared to the "no build" scenario.

The East Bypass Alignment presents the greatest potential risk to the City's commercial base by opening up new sites with three interchanges proposed in Botetourt and in Bedford Counties -- which are already the region's fastest-growth areas. While this alignment could help regional growth, these sites would be likely to attract commercial investment, trade, and tax dollars away from existing businesses in the City. Development of the City's RCIT area could be enhanced, and economic risks to the City minimized, if US-460 is upgraded as a spur into the City from I-73. However, that is not currently part of this alignment option. Since, the East Bypass provides the greatest "dog-leg" alignment of I-73, some vehicles traveling along I-73 between points north and south of the City would be expected to use I-581/US-220 as a shortcut. With no expansion to the I-581 / US-220 capacity planned with this alignment, traffic movement along some parts of that central corridor would experience slightly increased congestion levels (compared to the "no build" scenario).

Perspectives from Experiences Elsewhere. Case studies were conducted of similar size cities with existing highways through the center of the city which experienced new bypass highways. While each situation is unique and none are identical to the Roanoke situation, some findings do appear to hold across all cases: New highways which bypass the central business district can weaken the central area's economy, but typically do not devastate them. Central areas which have already adjusted to a visitor and service-based economy are likely to experience little or no loss of business. The locational shift in traffic can cause some existing businesses to close up or relocate, but it can also create some new business opportunities within the city. And highway-related new development, whether in the central city or outlying areas, does not automatically occur -- it requires not only highway interchanges, but also utility services, local access roads and land use regulations that permit it. Both positive and negative economic impacts on the broader community were usually smaller than originally anticipated.

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Highway, Economic and Tourism Information

- Virginia Department of Transportation - Robert H. Cary, District Engineer; Fred Altizer, Jr., District Administrator; and Patsy Napier, Transportation Engineering Programs Supervisor (VDOT's I-73 Project Manager)
- Parsons Brinckerhoff - Chris Lloyd, Project Manager for I-73 Study
- Roanoke Valley Convention & Visitors Bureau - Dave Kjolhede, Director
- Roanoke Department of Economic Development - Linda Bass, Economic Development Specialist
- Roanoke Department of Management & Budget – Lori Spencer
- Virginia Employment Commission
- Virginia Tourism Corporation

Planning and Business Perspectives

- Roanoke Department of Planning & Community Development - Evelyn S. Lander, AICP, Chief
- Fifth Planning District Commission - Michael Gray, Chief of Transportation Planning
- Roanoke Regional Chamber of Commerce - Beth Doughty, President & CEO and Al Moyer, Vice-President, Governmental Relations
- Roanoke Valley Economic Development Partnership - Anne Piedmont, Research Director
- Downtown Roanoke, Inc. - R. Matthew Kennell, President
- Fralin & Waldron - Haywood Fralin, President
- Carillion Health Systems - Tom Robertson, President
- Center in the Square - Jim Sears, Director
- Copty & Company Real Estate - Bob Copty, President

Sources for Case Studies of Other Cities

Danville, VA Case Study

- City of Danville - Gerald Fisher, Community Development Director
- City of Danville - Kenny Gilley, Planning Director
- City of Danville - Lee Newland, City Engineer
- West Piedmont Planning District - Robert Dowd, CEO

Richmond, VA Case Study

- Virginia Department of Transportation - Herb Peagram and Ken Lands
- Richmond Regional Planning District Commission - Dan Lysee, Director of Transportation
- Greater Richmond Economic Development Partnership - Greg Wingfield, Director
- Richmond Chamber of Commerce - Cheryl Tron, Research Director

Appleton, WI Case Study

- City of Appleton - Gerry Tate, Assistant Planning Director
- East Central Wisconsin Regional Planning Commission - Harland Keyso, Director

Fort Wayne, IN Case Study

- Northeast Indiana Regional Coordinating Council - Dan Avery, Transportation Planner
- City of Fort Wayne - John Stafford, Strategic Planning Director

1. INTRODUCTION

❖ 1.1 Objective

The City of Roanoke engaged Economic Development Research Group to assess the likely economic impacts on the city of three alternative alignments for the planned location of Interstate 73 through or around Roanoke. The city is concerned with the question of how any of those alternatives may affect the city's economic base and tax revenues. There is also concern about whether any of the alternatives may lead to dis-investment in established commercial areas in the City.

This report examines the potential positive and negative impacts associated with each of the I-73 alternatives. To provide an appropriate base of reference, this report also examines potential future changes in the city's economic base and traffic conditions associated with not building I-73.

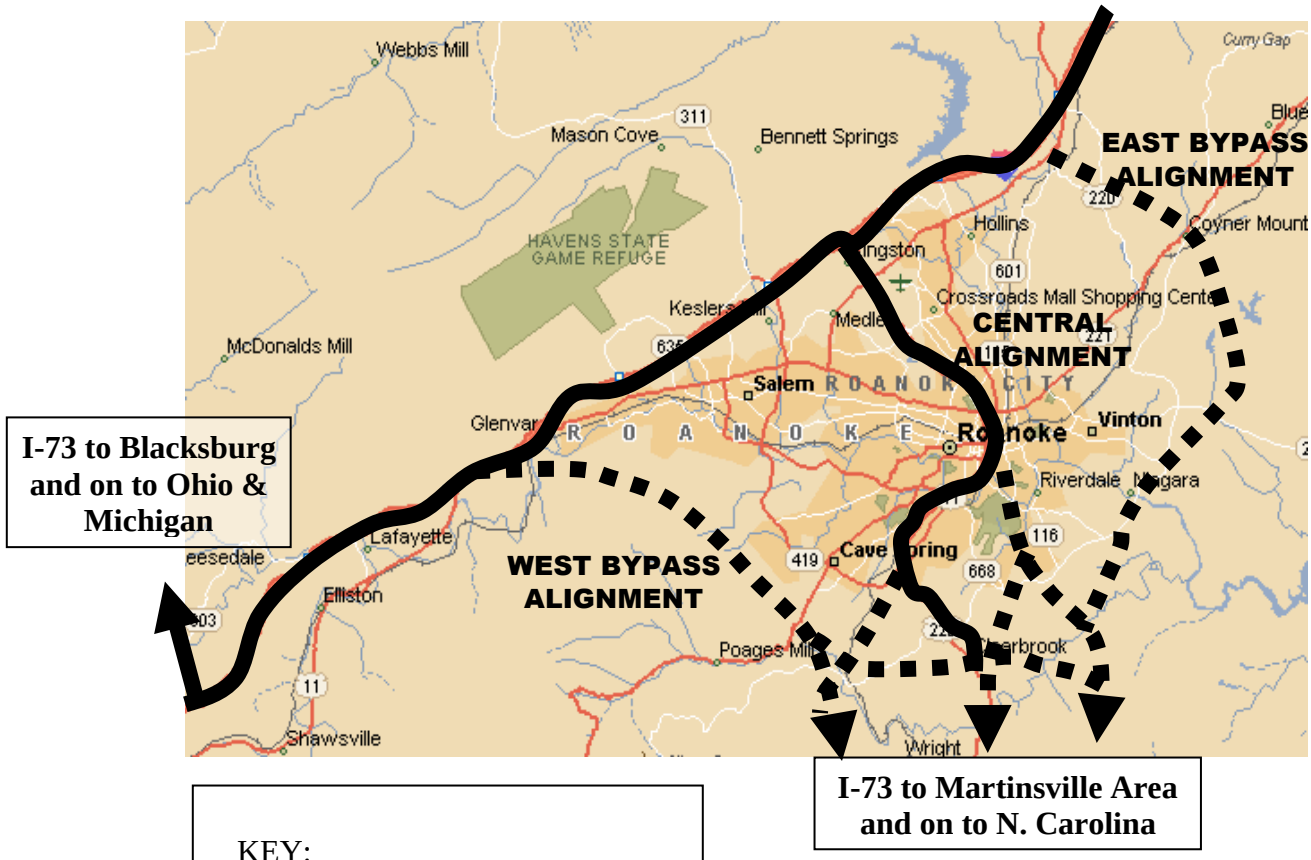
❖ 1.2 Alternatives for I-73

The proposed I-73 highway has been designated by the US Congress as a high priority corridor for the national highway system. It would provide a direct inter-state travel route linking Michigan, Ohio, West Virginia, Virginia and North Carolina. There are many alternative alignments for I-73 through the state of Virginia, but this report concerns only the alignment in the vicinity of Roanoke. The current routing alternatives may: (1) go through the center of Roanoke, referred to here as the "Central Alignment," (2) bypass the city to the west, referred to as the "West Bypass Alignment," or (3) bypass the city to the east, referred to as the "East Bypass Alignment."

These three basic alignments are illustrated in Figure 1-1 on the next page. It is important to note that the diagram is meant to roughly represent the basic concepts of the three alignments and not the exact routing.

As shown in the map, there are two basic versions of the Central Alignment below Elm Avenue in Roanoke – one turns southwest in the southern part of Roanoke, while the other turns southeast . There are also several alternative routings for I-73 south of Roanoke, some of which come closer than others to Smith Mountain Lake. Any of those routings south of Roanoke could be followed regardless of whether the Central, East Bypass or West Bypass alignment is used for the Roanoke area. Since all of those options are beyond the city limits and do not directly affect the City of Roanoke, they are not of concern for this study.

FIGURE 1-1. ROUGH CONCEPTUAL DIAGRAM OF I-73 ALTERNATIVE ALIGNMENTS



The Central Corridor Alignment-- All variations of the central alternative follow the existing I-581 from I-81 southward to the Elm Ave. interchange. One lane would be added in each direction of I-581. The existing interchanges at Peters Creek Road and Hershberger Road would remain. A new interchange at Valley View would be added. Access to downtown would be modified, as the existing Orange Avenue and Williamson Road interchanges would be replaced by one interchange to reach both roads. The Elm Avenue interchange would also be reconfigured. It is expected that the new interchanges would actually improve access to downtown Roanoke. South of Elm Avenue, there are two sub-options:

- ***The Central/East routing*** (which correspond to the state's Options 2, 2A and 2C) turns southeast just below the Elm Avenue Interchange and follows a new alignment near the Roanoke River to the Roanoke Industrial Center, then crossing the river and continuing southeast roughly parallel to (but north of) Mt. Pleasant Blvd. and Jae's Valley Road (Route 116) to the Roanoke City limits. There would be an additional interchange in the vicinity of the Riverland Road crossing.

- ***The Central/West routing*** (which correspond to the state's Options 2B, 3, 3A, 3B and 3C) continues on south of Elm Avenue on US-220, which would be upgraded and widened to full interstate standards. The Franklin and Wonju Street interchanges would be consolidated and replaced by a new Colonial Avenue interchange. There are two variations on this routing south of Wonju. One (Options 2B, 3, 3B, 3C) would continue on US 220 south of the city, keeping the existing interchange at Route 419 (Electric Road), adding an interchange at Route 780 (Old Rocky Mount Road), and keeping the existing one at the Blue Ridge Parkway. The other variation (Option 3A) would turn southwest just before (in the back of) the Tanglewood Mall and continue on Route 419 south of the city.

The West Bypass Alignment – This alternative would provide a bypass loop to the west of the city, through Roanoke County. Due to the mountain terrain and limited development there, only one new interchange would be constructed -- at Route 221. No spur into the city is planned for any I-73 options, though the upgrading of a Route 221 into a four lane road has been proposed. (That could also serve as a spur into the city, connecting with I-581.) An interchange with Route 220 to the south near Boones Mill could also provide access to I-581 and to the City from the south, and of course the existing I-81 to I-581 would provide access to the City from the north .

The East Bypass Alignment -- This alternative would provide a bypass loop East of the City. With this alternative, I-73 would overlay I-81 north of the City, then I-73 would turn south and travel through Botetourt and Bedford Counties. Three new interchanges would be constructed -- at US460, at Rt. 24 (Stewartsville) and at Rt. 634. This option does not entail any spur into the City from I-73 on the east side. No new spur into the city is planned under this or any of the current I-73 alternatives, though an upgrading of Orange Ave. (Rt. 460) could be done as one way to provide a spur into the existing I-581. Of course, the existing I-581 would continue to be a spur into the city from I-81/I-73 on the North side.

❖ 1.3 Issues & Information Covered by this Study

Issues Covered by this Study. This study focuses specifically on how any of the I-73 alignment alternatives would affect Roanoke's economic base (and hence tax base). These effects can occur through essentially five different mechanisms:

- **Expanding Highway Access to Sites** – The location of highways affect the site location decisions of some businesses, particularly those that depend on highway access for incoming or outgoing truck shipments, or which are destinations dependent on highway access for the customer base. A new highway can open up new locations for commercial or industrial activities, and thus shift business patterns between the City and the suburbs.

- **Reducing Travel Times** – Changes in the highway network can affect long distance travel times, changing truck shipment patterns and the market areas which can be served by Roanoke-based businesses. A new interstate route can expand business markets for some manufacturers or distributors.

- **Shifting Traffic Volumes** – The volume of traffic traveling on a road directly affects its supportable level of activity for gas stations, restaurants, hotels and other traveler-serving businesses, as well as potential market size for recreation and tourism destinations. Different highway alignments can increase customer base for some businesses while decreasing it for others.

- **Increasing Congestion** – Increasing traffic delays can limit accessibility to downtown areas and other locations, discouraging growth of local visitors and also discouraging future business investment at those areas. Different highway alignments can improve or worsen those conditions.

- **Disruption of Existing Business Activities** – Construction of additional highways and interchanges generally requires land (and sometimes buildings) to be taken from other existing or planned uses. New highway alignments, widening of existing highways and changes in interchange designs can all displace some businesses (as well as homes).

All of these five factors can simultaneously work to change the nature of Roanoke's economic and tax base.

Issues Not Fully Covered by this Study. This study focuses on how I-73 could affect the city's economic base, *given the Roanoke area's current (1) transportation infrastructure, (2) land use and development policies, and (3) economic development strategies*. Interventions by the City of Roanoke to change public transit services, land development regulations or economic development strategies can increase or decrease the impacts discussed in this report. Related issues concerning the environmental and fiscal consequences of sprawled development patterns and

traffic growth are touched upon at the end of Chapter 2, but are not the major focus of this study.

Information Sources Used. In the course of conducting our analysis the consulting team has:

- Conducted an analysis of data from the Virginia Department of Transportation (VDOT) of existing and projected traffic patterns on I-581 and I-73.
- Met with key public and private sector stakeholders in the project who represent a range of viewpoints.
- Reviewed prior research on the economic impacts of beltways and bypasses around the country.
- Conducted case studies of the impacts of bypasses on cities similar to Roanoke.
- Projected and quantified the direct economic benefits of each alternative on businesses using or relying on access to the region's highway network.
- Estimated indirect and induced economic impacts of each of the three main alternatives.
- Assessed the critical risks and opportunities presented by each alternative on the economic development of the city and of the region.

❖ 1.4 Report Organization

Our report provides the findings on economic impacts of I-73 alignment alternatives in two chapters.

- Chapter 2 discusses the analysis of potential positive and negative impacts on specific elements of the city's economy – its manufacturing, service, retail and tourism sectors.
- Chapter 3 then presents findings regarding opportunities and risks to the city's economic base associated with each of the alternative highway alignments.

The backup analyses are then provided in four appendix chapters:

- Appendix A presents an analysis of the city and metropolitan area business activity, and assesses their strengths, weaknesses, threats and opportunities. Highway-dependent business activities are highlighted.
- Appendix B presents an analysis of the city and metropolitan area's visitor and tourism base, and its sensitivity to highway system changes.

- Appendix C presents data and findings on traffic movement through the region in order to identify potential future impacts on congestion levels, travel times and visitor traffic.
- Appendix D presents findings from case studies on the impacts of highway bypasses on downtown areas.

2. ANALYSIS OF IMPACTS ON ECONOMIC SECTORS

This chapter examines the City's economic base and identifies the ways in which I-73 alternatives would affect it. It builds upon more detailed analyses of the City's economy, tourism base and traffic changes which are provided in Appendices A, B and C. The analysis results in this chapter are then used as a basis for the findings which are presented in the next chapter.

❖ 2.1 Transportation Changes Affecting Business

The Research. The three alternative alignments were defined as illustrated in Chapter 1. Their economic impacts were analyzed by considering the city's economic trends (Appendix A), tourism patterns (Appendix B), forecast traffic changes associated with each of them (Appendix C) and experiences elsewhere (Appendix D). The economic impacts were estimated by considering how the alternative alignments would affect: (a) site accessibility to highways, (b) travel times to customer and supplier markets, (c) pass-by traffic volumes, (d) traffic congestion levels and (e) disruption of existing business activities.

Transportation Impacts Affecting the Economy. The I-73 alternatives would affect the City's economy and cause the following changes in condition:

(A) Site Accessibility and Development Potentials– The East Bypass and West Bypass alignments both open up new locations for businesses requiring highway access, as illustrated earlier in Figure 1-1 (Chapter 1).

The East Bypass Alignment provides the greatest potential for new development, with three new interchanges and generally open fields available along its route. Essentially all of that new development would be outside of the City limits. The new development could represent attractive alternatives for existing and future businesses that might otherwise locate within the city limits.

The West Bypass Alignment provides relatively limited opportunity for new development, since it would have just one new interchange southwest of the city and it has very hilly terrain along its path.

The Central Alignment provides very little opportunity for development of open space, but it does provide access and interchange improvements which could help to enhance opportunities for redevelopment of older commercial and industrial areas of the City. For that to occur, though, the City would have to have additional improvements made to local access streets, and programs initiated to more

aggressively facilitate redevelopment of unused and underutilized commercial and industrial properties in those areas.

(B) Travel Times and Market Potentials – While Roanoke is currently a major center for trucking distribution, that market is generally oriented to the I-81 corridor. A completed I-73 (under any of the proposed Roanoke area alignments) would provide enhanced access to suppliers and markets along the Michigan-Ohio-West Virginia-North Carolina corridor. It would shave over 1 ½ hours of travel time from Roanoke to Ohio and nearly 1 hour of travel time to North Carolina, thus expanding delivery access to/from those areas.

Table 2-1. Travel Time Changes Associated with I-73 Alternatives

Access to Roanoke from:	Travel Time Now	New Travel Time with I-73	Time Savings
Michigan (Flint)	10.7 hours	9.0 hours	101 minutes
Ohio (Toledo)	8.7 hours	6.9 hours	108 minutes
Greensboro, NC	2.4 hours	1.7 hours	41 minutes
Raleigh, NC	3.8 hours	2.8 hours	56 minutes

Source: VDOT Traffic and Transportation Technical Memorandum, draft, 1999

(C) Pass-by Traffic for Traveler-Serving Businesses – The volume of traffic traveling on a road directly affects its supportable level of activity for gas stations, restaurants, hotels and other traveler-serving businesses, as well as potential market size for recreation and tourism destinations. In particular, traffic volumes on the City's central I-581/US-220 corridor would increase with the Central Alignment and decrease slightly with the two bypass alignments. (See Appendix C for additional data.)

Table 2-2. Percent Change in Traffic Volume (2020)*

Location	1-East	2-Central-East	3-Central-West	4-West
Interstate 581				
4) I-581 South of I-81	9%	18%	18%	-2%
5) I-581 North of US-460	-3%	17%	17%	-2%
6) I-581 US-460(Orange) to VA-11	-3%	17%	17%	-2%
7) I-581 VA-11 to VA-24(Elm)	-3%	17%	17%	-2%
US-220				
8) US-220 VA-24(Elm) to Wonju	0%	-61%	45%	-3%
9) US-220(Wonju) to VA-419 (Franklin)	4%	-48%	27%	-4%

* compared to the Year 2020 "No Build" scenario
Source: VDOT Traffic and Transportation Technical Memorandum, draft, 1999

(D) Congestion Effects on Downtown Access – Increasing traffic delays can limit accessibility to downtown areas and other central locations, discouraging growth of local visitors and also discouraging future business investment in those areas. Severe congestion is already forecast to occur in the I-581 corridor by the year 2020 under "No Build" conditions, and the various alternatives can serve to either worsen or

lessen that congestion. Both the East and West Bypass Alignments do not help that congestion. They are forecast to marginally worsen congestion in the northern part of I-581, marginally lessen congestion in the southern part of I-581 and make essentially no change in congestion along US-220. The Central Alignment would provide added capacity on I-581, more than offseting the additional traffic it would bring. As a result, congestion along much of I-581 would be somewhat reduced. The Central-East option would also take traffic off of US-220 and reduce its congestion. The Central-West option could have I-73 veer off of US-220 south of Wonju or continue on US-220, in which case it would marginally worsen congestion on that route. (See Appendix C for a discussion of "Level of Service" and current ratings.)

Table 2-3. Traffic Level of Service (Year 2020)

Location	Level of Service 2020				
	0-No Build	1-East	2-Central-East	3-Central-West	4-West
Interstate 581					
4) I-581 South of I-81	**C**	**D**	**D**	**C**	**D**
5) I-581 North of US-460	**D**	**D**	**D**	**C**	**D**
6) I-581 US-460(Orange) to VA-11	**F**	**E**	**D**	**D**	**E**
7) I-581 VA-11 to VA-24(Elm)	**F**	**D**	**E**	**E**	**D**
US-220					
8) US-220 VA-24(Elm) to Wonju	**E**	**E**	**E**	**E**	**E**
9) US-220(Wonju) to VA-419 (Franklin)	**C**	**C**	**B**	**D***	**C**

* not applicable under the southwest (Tanglewood Mall) routing option
Source: VDOT Traffic and Transportation Technical Memorandum, draft, 1999

(E) Disruption of Existing Business Activities – The addition of travel lanes and reconfiguration of interchanges on I-581 and US-220 with the Central Alignment would mean that some existing business activities would have to be closed or relocated. For the two bypass alignments, the new right-of-way and new interchanges would also require some land takings, though much of that land is now undeveloped.

❖ 2.2 City and Metro Area Economy

Over the past ten years, employment in the Roanoke Metropolitan Statistical Area (MSA) has grown by 18.5%, nearly equal to the statewide growth rate. That reflects a combination of two rates – a job growth rate of just 10.6% in the City of Roanoke and a job growth rate of 30% experienced in the rest of the MSA. The City is thus concerned that the alternative alignments for I-73 could potentially worsen (or lessen) those differences.

As shown in Table 2-4, the City of Roanoke's most dominant industries are wholesale trade, transportation, FIRE (finance, insurance, and real estate), and services. Roanoke's proportion of these industries is 16% to 44% above the state average. Within the manufacturing sector, primary metals, textiles, and electronics are most highly concentrated in the city. Instruments manufacturing, with over 2700 jobs in the MSA, has almost six times the state average proportion of employment in

this high growth sector, which is rapidly developing in both the city and the wider metro area. (See Appendix A for more detailed profile of the City and Metro economies.) This finding is important, for the manufacturing and wholesaling / distribution sectors in particular depend on long-distance truck access to broad markets, which can be expanded by I-73. On the other hand, the retail and service sectors in particular depend more on local population accessibility, which can be both positively and negatively affected by I-73 alternatives (as discussed below).

Table 2-4 Employment Trends in Major Industries in Roanoke City & MSA*

	CITY			Rest of the Metro Area		
Sector	**1988**	**1998**	**% Change**	**1988**	**1998**	**% Change**
WHOLESALE TRADE	5,616	4,975	-11.4%	3,163	4,621	46.1%
TRANS, COM, & UTIL	4,543	5,423	19.4%	991	1,466	47.9%
RETAIL TRADE	16,116	16,638	3.2%	8,752	10,561	20.7%
FIRE	4,841	4,805	-0.7%	2,856	5,039	76.4%
SERVICES	16,940	24,851	46.7%	10,041	14,724	46.6%
CONSTRUCTION	4,482	4,493	0.2%	3,440	4,050	17.7%
NON-DURABLE MFG.	4,605	3,498	-24.0%	2,993	4,070	36.0%
DURABLE MFG.	4,881	3,463	-29.1%	7,474	7,905	5.8%
GOVERNMENT	6,997	8,002	14.4%	8,119	9,727	19.8%
AG, FOR, MINING	342	446	62.2%	689	907	31.6%
TOTAL	69,363	76,594	10.6%	48,518	63,070	30.0%

* private sector employment, excluding farm, government and self-employed workers
Source: Virginia Employment Commission; calculations by Economic Development Research Group

❖ 2.3 Industrial Sector

Overall Patterns. Within the city, the newer wholesale distribution, trucking and transportation, and manufacturing facilities are clustered largely in the Roanoke Center for Industry and Technology (RCIT) on the City's east side (off US-460). There is also an older industrial area along Shenandoah Avenue and the Norfolk Southern tracks ("Shaffer's Crossing") west of downtown, which is a target area of the City for industrial redevelopment. The vicinity of both these industrial areas are enterprise zones. In addition, there are relatively new industrial and distribution activities in the vicinity of the airport on the City's north side (off I-581), and an older industrial area by the Roanoke River on the City's south side (east of US-220 and below Elm St.).

I-73 Alternatives. The East Bypass alternative could have the most profound impact on the RCIT. A proposed interchange at US-460, about 3 miles east of the industrial park, would provide a route for access to I-73. While an upgrading of US-460 could indeed function as a spur from an I-73 eastern route to the city, that is not currently being considered as part of the I-73 alternatives analysis. From a regional standpoint, the East Bypass alignment can most easily have a positive impact on development of

manufacturing, distribution, and trucking, by providing open sites on developable land for industrial-type uses. However, that growth would be outside of the City.

The Central Corridor Alignment could benefit sites in the Shenandoah/Norfolk Southern (Shaffer's Landing) Industrial Area, which is a target for industrial redevelopment in the City. If these benefits are to be realized, however, an aggressive program of redevelopment of unused and under-utilized sites in this area would have to be pursued.

The West Bypass Alignment should have very little impact on industrial development, since the lack of interchanges and the mountain terrain would limit new development sites. By reducing travel times between Roanoke and the major markets in the Midwest and to the South, however, all of the alternatives for I-73 would extend the market reach of the region's key distribution, trucking, and manufacturing industries.

Magnitude of Impacts. It is not possible to definitively predict the total value of these differences in industrial growth potentials for the City. With the "no build" scenario, it is likely that the City would continue to lose jobs in the manufacturing sector at the current rate of over 2,500 industrial jobs lost per decade. The market expansion made possible by I-73 could help to spur new growth, particularly in the growing electronics and instruments industries – halving the rate of loss of industrial jobs. If the Central Alignment is accompanied by an upgraded effort to redevelop existing industrial sites in the City, then it could possibly attract another 1000 industrial jobs to the City over the decade after completion of the highway (net change compared to the "no build" scenario). If the East Bypass Alignment is built, it would most likely create additional job growth in the metropolitan area, but most of those jobs would be outside of the City limits and hence there would be little net impact on the City's economy.

The additional potential industrial growth would directly affect the City's revenues from property tax revenues, but those impacts are likely to be small because of tax abatements and other special tax reductions associated with the enterprise zones in which the industrial areas are located. In addition, any such industrial growth would create additional worker incomes and hence potentially generate additional retail spending. Overall, the IMPLAN economic model for the City of Roanoke indicates that an additional 1000 jobs in electronics and other high tech industries attracted to the City will also lead to another 560 jobs elsewhere in the City's economy due to additional orders at other suppliers of goods and services in the City plus additional worker spending in the City. That would create $45 million of additional worker income annually.

❖ 2.4 Office Sector

Overall Patterns. The office-based Finance-Insurance-Real Estate (FIRE) and services sectors are very important sources of employment in the city. Within these broad industries, key dominant growth sectors are stockbrokers and insurance. FIRE's employment growth within the region has occurred in the suburbs over the past ten years, while in the city, there has been a slight decline in employment in this vital sector. The suburbs have gained nearly 4700 jobs in FIRE and now have over half of the region's FIRE jobs, compared with just 37% in 1988. Leading the growth of the services sector are business services and health care. These industries added nearly 3,000 jobs in the city since 1988. The majority of office space – some 52% -- is still in the city center (See Table 2-5), the volume of office space in the suburbs is growing, while in the city it is declining as a result of conversion of old office buildings to other uses.

Table 2-5 Office Space In the Roanoke Area

	Square Feet		% Change
	1996	1999	1996-99
Downtown	2,700,664	2,481,087	-8%
Southern Suburbs	1,457,807	1,580,472	8%
Northern Suburbs	671,994	753,546	12%
Total	4,830,465	4,815,105	-0.3%
Percent Downtown	56%	52%	

Source: Waldvogel, Poe, & Cronk Real Estate Group, Inc

I-73 Alternatives. The Central Corridor alignment could reinforce the city center's role as the region's center of office-based industries. For that to occur, the City would have to pursue an aggressive program of redevelopment and refurbishment of old sites and buildings downtown.

The East Bypass alignment would open up new open space ("green field") sites in Botetourt and Bedford counties for office development. That would likely attract new investment in office buildings away from the downtown area to the eastern suburbs.

The West Bypass Alignment should not significantly affect regional office development patterns, due to limited population base and development sites there.

Magnitude of Impacts. The extent of office growth potentials for the City depends largely on efforts to maintain reasonable highway access to the downtown area -- where most of the City's office space is located. The "No Build" scenario indicates a worsening of traffic congestion along I-581. The East and West Scenarios would not improve that situation for I-581. Only the Central Alignment (and particularly the

Central-West option), with its additional lanes, is forecast to lead to a modest improvement in I-581 level of service. With that option, there is a potential for the City to gain a share of the regional office growth.

Currently, office employment in the City is essentially stagnant, while office employment in the suburbs is growing at a rate of roughly 3,000 jobs (700,000 sq ft of space) per decade. If the Central Alignment is accompanied by an upgraded effort to improve downtown access and available office space there, it could possibly attract another 1000 office jobs to the downtown area in the decade following completion of the highway (net change compared to the "no build" scenario). That represents a gain of roughly 10% over the current base of downtown office activity. The IMPLAN economic model for the City of Roanoke indicates that an additional 1000 jobs in insurance or finance attracted to the City will also lead to another 510 jobs elsewhere in the City's economy due to additional orders at other suppliers of goods and services, plus additional worker spending in the City. That would create roughly $65 million of additional worker income annually.

❖ 2.5 Retail Sector

Overall Patterns. The City of Roanoke is an important retail center, drawing customers from a broad trade area. The 1% local retail sales tax is also a source of revenue for the city. Retailing in the city is concentrated along the Northern stretches of I-581, along Route 419 in the southwest, and on Route 220 in the south. The Valley View Mall, off I-581, is the region's largest mall.

Yet despite the City's historically strong position in retailing, jobs in the city's retailing sector grew by just 3% over the past ten years, while those in the suburbs grew by 21%. The city's share of total retail jobs slipped from 65% to 60% over that period (and it accounted for just 22% of the total new retail growth occurring in the region for that period.)

I-73 Alternatives. The Central Corridor alignment would support the existing concentration of retailing along the city's central spine. The Central-West option would funnel traffic down US-220, strengthening the southern tip of this spine, while the Central-East option would result in a 50% drop in traffic on US-220 compared to the present level. That would reduce congestion along US-220 but also negatively affect the customer base for some businesses along that route.

The East Bypass alignment is likely to spark retail development on sites with interstate highway access, particularly given the rapid growth of population in Botetourt and Bedford counties. This development could serve a growing population base there, but it would also compete with existing retailing in the City -- drawing jobs, spending, and tax dollars to outlying locations.

The West Bypass alignment would also support retailing on Route 419, which would be less than 2 miles from the I-73 interchange with Route 221.

Magnitude of Impacts. Impacts on retail trade are important for the City because the City collects a 1% sales tax (out of the 4 ½ % total sales tax) on retail sales. The extent of retail sales growth for the City depends on efforts to maintain reasonable highway access along the I-581 and US-220 corridors, where all of the City's largest retail centers are located. As previously noted, the "No Build" scenario indicates a worsening of traffic congestion along I-581. The East and West Bypass Scenarios would not improve that situation for I-581, and the East Bypass will particularly support newly-emerging competing shopping developments. Only the Central Alignment, with its additional lanes, is forecast to: (a) lead to some modest improvement in I-581 level of service, (b) bring in more pass-by visitors to the City and (c) avoid encouraging new retail development east or west of the City.

With the Central Alignment, the City could possibly move its share of the region's new retail growth from 22% back to around 45%. That would represent an additional $30 million of retail sales (in 1999 dollars). Another $20 million of retail sales could be generated in the City as an induced effect of the potential industrial and office growth impacts (based on results of the IMPLAN economic model for the City of Roanoke). Together, these factors could increase the City's retail sales tax revenues by $500,000 dollars annually.

❖ 2.6 Tourism Sector

Overall Patterns. A major concern about the alignment of I-73 through the Roanoke Metro area is its impact on tourism. Roanoke is currently visited by nearly 8% of all tourists to Virginia. The city's main tourist attractions are the museums and the market area in downtown Roanoke. It is notable that 30% of tourists are passing through, en route to other destinations. The City has nearly 2500 hotel rooms, about 40% of the metro area's total supply. This number indicates a significant reliance on tourist spending, as tourist-serving industries have a concentration in the City, 19% higher than the statewide average. (See Appendix B for further details on the tourism sector of the economy.) Hotels and restaurants are clustered along Route 581 North and in the downtown area. Local tax revenues from tourist spending (as of 1997) were estimated to be approximately $5.3 million a year.

Yet while the City has a strong concentration of tourism, the visitor-serving sector of the city's economy has some weakness. In contrast to the strong statewide growth trend, employment in hotels in both the city and the region has declined by 14% to 15% over the past ten years. Jobs in other tourist-serving sectors, such as air and road passenger transportation services, restaurants, and gas stations have grown significantly, however, in line with the growth of tourist spending in Roanoke.

Table 2-6 Employment Trends in Visitor-Serving Industries

	ROANOKE CITY			ROANOKE Metro Area		
	1988	**1998**	**% Change**	**1988**	**1999**	**% Change**
Passenger transit	285	396	38.9%	285	396	38.9%
Transportation by air	420	1659	295.0%	433	1675	286.8%
Auto dealers & service stations	1642	2509	52.8%	2916	3641	24.9%
Eating & drinking estabs.	4120	4776	15.9%	6114	8002	30.9%
Hotels & other lodging places	1080	920	-14.8%	1768	1523	-13.9%
Amusements & recreation	454	432	-4.8%	784	1181	50.6%
Totals	8001	10692	33.6%	12015	16022	33.3%

Source: Virginia Employment Commission

I-73 Alternatives. Roanoke stands to gain tourists under all of the three alternative alignments for I-73 which will improve access to major population centers in the Great Lakes, northern Midwest and to the Southeast Coast. Regardless of the alignments for I-73 through or around Roanoke, there are many other options for I-73 south of the City. If an alignment in Eastern Franklin County is chosen for the segment of I-73 that runs south of Roanoke, then the new I-73 could facilitate better access to Smith Mountain Lake, enabling the region to present an attractive package to tourists that includes urban, mountain, and water-based recreation.

The Central Corridor Alignment would support existing tourist-serving industries, which are clustered along I-581 in the downtown Roanoke area, by funneling more potential tourist traffic through the city.

With the East Bypass Alignment, traffic could access tourist sites in the City via I-581 on the North and by Routes 460 and 24 on the east. With the West Bypass Alignment, tourist sites in the City could potentially be accessed from US-221 on the West and from US-220 on the South. If either of those alignments is chosen, then it would be important for the City to ensure that there is a visitor's center and signage at the major highway access points, to increase penetration of the passing tourist trade.

Magnitude of Impacts. Impacts on tourism are particularly important for the City's finances because of the local taxes on restaurants (4% meals tax) and on lodging (6% hotel room tax). An additional 16,000 long-distance travelers could be passing through the Roanoke area each day via I-73 (estimated by the year 2020; see Appendix D). That can represent a potentially important source of additional visitor spending in the City. This market could be most easily tapped with the Central Alignment, but it could also be tapped with the bypass alignments. To achieve that potential impact, the City would have to ensure that there is the necessary marketing information, highway signage, lodging capacity and highway accessibility to the sites. The additional traffic passing the Roanoke area could generate in the range of $40-60 million of additional hotel and lodging revenues annually (an 18-25% growth of tourism, providing 2000-3000 new jobs in lodging, restaurants, auto services and

entertainment industries). That could generate another $2 – 3 million of restaurant and hotel tax revenues annually for the City.

The IMPLAN economic model for the City of Roanoke indicates that an additional 2000 jobs in lodging and restaurants will also lead to another 600 jobs elsewhere in the economy due to additional orders from suppliers in the City and additional worker spending in the City. Together, that would create roughly $50 million of additional worker income annually.

❖ 2.7 Overall Impacts & Related Development Issues

Opportunities to Maximize Overall Economic Growth. The overall impacts discussed in the preceding pages do indicate significant differences associated with the alternative alignments for I-73. However, the total magnitude of those impacts are relatively modest. That reflects findings from the case studies of experiences elsewhere, discussed in Appendix D, which indicate that bypass freeways can have negative impacts on a central city, but those impacts tend to be smaller than originally feared. Three important findings from the case studies are that:

- Areas which have already adjusted to reliance on a more specialized visitor and service-based economy are less likely to experience much loss of business if a new bypass route opens up competing areas.
- Locational shifts in traffic do cause some existing businesses to close up or relocate, but they also tend to create some new business opportunities – reducing the net economic change for the city as a whole.
- Highway-related new development, whether in the central city or outlying areas, does not automatically occur -- it requires not only highway interchanges, but also utility services, local access roads and land use regulations that permit it. Cities can take significant actions to encourage, discourage or otherwise shape the nature of those impacts.

The overall impacts also will depend on whether the City of Roanoke can take advantage of highway-related economic growth opportunities, by: (1) strategically expanding its investment in revitalization of neighborhoods and older industrial areas, (2) focusing investment priorities for public transit and roads to maximize access for its residents and business activities, and (3) adopting land use plans and incentives to guide development to where it is most beneficial to the city and its residents. Such actions can affect not only the city's future economic base, but also its future quality of life. In fact, those issues need to be confronted in planning for the future, regardless of the I-73 option that is adopted.

Land Use and Environment. A related issue is whether or not any or all of the I-73 alternatives will promote sprawled development and degradation of the quality of life. In the long run, both the public costs of growth and the quality of environment can

affect the attractiveness of Roanoke as a place to live. It is important to note how those issues can be related to the economic impacts:

- "Sprawl" is defined as dispersed, low density development. While that can be desirable for some people and businesses, there is evidence that such development can require greater investment costs for sewer and water lines, roads, police and fire facilities than denser "cluster development," or reliance on "infill development" (which takes place in areas that already have the public infrastructure and facilities in place). The public costs and benefits can differ widely, though, depending on the specific locations of development sites.

- The type of development impacts associated with new highways and interchanges can also depend critically on the location and its land use regulation, as discussed in the case studies (Appendix D). In general, development occurs where there is not only highway interchange access, but also where there are available utility services, land, a surrounding base of customers and workers, and land use / development policies allowing it to occur. Public policy can either encourage or prevent development that is not desired, and hence also affect public costs of new development.

- Traffic congestion as well as highway access affect air quality and the attractiveness of a community as a place to live and do business. In that respect, impacts of highways can be positive or negative. Motor vehicle emissions tend to be increased when there are higher volumes of traffic. However, emissions also tend to be greatest when traffic congestion delays increase in severity, and there are no transportation system improvements made to reduce that congestion. For this reason, it is important to consider traffic congestion forecast to occur over the 1999 –2020 period under no-build as well as I-73 alternatives. Air quality is an issue addressed in the State's Environmental Impact Report, and *not* in this report.

3. FINDINGS -- IMPACTS OF ALTERNATIVE ALIGNMENTS

❖ 3.1 "No Build" vs. "Build" Scenarios

Traffic Congestion. The "No Build" Scenario assumes that I-73 is not built. Without any widening of I-581 / US-220 or construction of bypass routes or development of other transportation alternatives by the City, traffic congestion along I-581/US-220 is forecast to significantly worsen and become very severe by the year 2020, with continuing traffic delays. That translates into additional vehicle operating costs, driver costs for trucks and negative environmental consequences. (See Appendix C for detailed traffic analysis.) Most importantly for Roanoke's economy, that scenario will serve to degrade access to the downtown area, and make the City much less attractive for visitors, local shoppers and for future business location decisions.

Business Market Access. The "No Build" Scenario will keep Roanoke's interstate access focused on I-81's northeast-southwest direction, with travel times northwest (to Ohio and Michigan) over 100 minutes longer and travel times southeast (to North Carolina) nearly 60 minutes longer than would occur under any of the I-73 alternatives. That is likely to further constrain the area's ability for manufacturing, wholesaling and distribution sectors to continue growing by limiting their ability to serve markets in those directions.

The " Build" Scenario, under any of the alternative alignments, will provide businesses in Roanoke with improved access to markets and suppliers located in the Great Lakes/Midwest and Southeast Coast regions.

Pass-By Traffic. It will also provide 16,000 additional pass-through trips (i.e., travelers with both origins and destinations outside of the Roanoke region) daily, which can generate business for Roanoke businesses in the traffic-serving and tourism sectors (including restaurants, hotels, retail stores and gas stations). The capture of pass-through traffic can be very real; currently 28% of the visitors to Roanoke are spending time and money in the city while passing through on their way to other destinations (see Appendix B). The additional traffic is estimated to have a value in the range of $40 - 150 million annually for Roanoke area businesses. (Of course, the portion of those benefiting businesses which are in the City would depend on the alignment that is selected).

Access to Smith Mt. Lake. I-73 could also provide better access to the recreation-related attraction of Smith Mountain Lake, south of Roanoke. That can enhance opportunities for recreation-related development in that area and also enhance the attractiveness of the Roanoke area as a place to live and work. However, that depends on decisions to be made regarding alignment for I-73 south of Roanoke. It is important to note that none of the alignment options south of Roanoke are necessarily precluded by decisions regarding whether I-73 would be routed through or around Roanoke.

Choices Among the "Build" Scenarios. The potential positive and negative economic impacts of the three basic alignments for I-73 are discussed below, and are also summarized in Table 3-1 at the end of this chapter.,

❖ 3.2 The Central Corridor Alignment

Competitive Opportunities for Central Roanoke. The Central Corridor Alignment for I-73 would route the new interstate down the present path of I-581, through the center of Roanoke. The principal benefits of this option to the city include a potential for strengthening the role of the Central Business District in the region by retaining its position at the core of the central traffic corridor. The city's restaurants, shopping centers, and hotels in the vicinity of the airport as well as downtown stand to benefit from additional tourist spending. Six to ten new interchanges are planned (varying with options for the southern part of this Central Alignment, discussed later).

This option would not increase the supply of "greenfield" (open space) development sites for industry and commerce outside of the City. It thus could help encourage redevelopment of city sites near I-73 with higher density commercial uses. That could be both an economic opportunity for strengthening developer interest in the City, as well as reducing the potential for environmental encroachment on rural areas in Roanoke and Botetourt counties. It could also be a risk. If the City fails to redevelop its own sites for industry, then businesses may perceive a reduced set of "open space" choices for large new industrial or warehousing facilities. That could ultimately reduce investment in the broader region's economic base.

Displacements. There are clear costs to the City and its business community entailed in the Central Alignment. This option would add an additional lane in each direction on I-581 and US-220 and potentially necessitate some new frontage or access roads along parts of the route. Displacement of businesses would be inevitable, although VDOT and its engineering consultants have not yet finalized the design and list of properties that would have to be purchased or taken. Displacements would also occur where major interchanges would be rebuilt – the consolidation of Orange and Williamson interchanges and the consolidation of Franklin and Wonju interchanges. On the other hand, the new design would also open up opportunities for more development elsewhere in the city, as explained below.

Downtown Access. Offsetting the displacements would be new opportunities for improving downtown access and for encouraging business locations and development along the access routes into downtown. Besides a new interchange at Valley View, the other new I-581 interchange designs are expected to actually improve traffic flow in the interchange areas and also improve access into and out of downtown (compared to year 2020 "No Build" conditions; see Appendix C). That improved access can be beneficial for encouraging visitors to downtown, as well as for encouraging employment growth in the downtown area. The greater additional pass-by traffic can also generate more visitors to the City, as current surveys show that already 1/3 of visitors to the City's attractions are passing through on the way to other destinations. (See Appendix B.)

The extent to which any of this occurs will depend on VDOT's final designs, how they are implemented and coordinated with the City, and how the City makes improvements to local access roads and takes action to encourage new development along them. The reduction in numbers of interchanges and the widening of the highway are also expected to improve safety along the road.

Other Risks. Other risks include traffic encroachment into central city neighborhoods. Some of these impacts can be minimized with appropriate improvement of feeder routes into I-581, including Routes 419 and 460 and Elm Avenue. These changes should go hand-in-hand with improvement and promotion of public and other modes of transportation, as well as continued improvements to the pedestr0ian environment in the downtown area. Efforts should be made to minimize displacement of businesses and to relocate displaced businesses and residents.

The Central Corridor alignment can increase demand for inner city sites with highway access, raising commercial property values in the corridor. In the longer term, city sites in the vicinity of the interchange may have potential for development for higher-density commercial uses. Planning and funding for redevelopment of key under-used sites in the Central Corridor would be needed for this to occur.

Options for the Southern Part of the Central Corridor. If the Central Alignment is selected, there are a couple of options for the route south of the Elm Avenue interchange. The advantages and disadvantages of each option are summarized in Table 3-2 at the end of this chapter. The options are:

- ***Central West Option*** **--** Under this option, I-73 would continue south of Elm Avenue on the current I-581 and then continue down US-220. It then has two routing variations: one would stay on this route with 3 more interchanges along the current US-220 route within the city limits, and have four more interchanges south of the City in Roanoke County. The interchanges within the City limits could spur investment by commercial and traffic-serving businesses located along the collector/distributor road system that would serve this high traffic area, although the proposal would also involve some displacement of existing businesses on US-220. However, the four interchanges south of the city in

Roanoke County could encourage more commercial and residential development outside of the city limits, drawing some businesses and investment away from the city. This routing might also affect some homes in the Hunting Hills area.

The other routing variation for the Central West option would have I-73 continue on US-220 only until the Tanglewood Mall at Route 419, where it would then turn southwest and continue through largely open land in southeastern Roanoke County. This routing would have no new interchanges to attract competing development out of the City into Roanoke County. Fewer businesses on US-220 would be displaced by this routing and many of the US-220 businesses would stand to benefit by direct access to I-73. Potential drawbacks might include incursion on parts of the Tanglewood Mall property and possible displacement in the Penn Forest neighborhood in Roanoke County.

- ***Central – East Option -*** Under this Option, I-73 would split from the current path of I-581 at Elm Ave, running eastward through the Riverland neighborhood. The first interchange to the south would be at Red Valley, some six miles from the city limits. With just one interchange added, this option is likely to be relatively benign in terms of generating local traffic in Roanoke and competing business development outside of the city limits. It would entail minimum displacement of businesses, though it could involve displacement of some residents of the historic Riverland neighborhood. Since it branches from I-581 just south of Elm Avenue, it avoids displacement issues at the Wonju Interchange and on US-220.

❖ 3.3 The West Bypass Alignment

The West Bypass Alignment would branch south from I-81 at Exit 132, near Dixie Caverns, bypassing the city through Roanoke County. Of the two bypass options, the West Bypass would have the most minimal impact on development because only one new interchange would be constructed west of the city. Due to the mountainous terrain, little development is possible along this bypass route. The new interchange would be constructed at US-221. There is no widening of US-221 under the current I-73 alternatives, although it has been proposed that the road be expanded to four lanes as part of a separate project. This road could then serve as a spur into the city, connecting with I-581. In any case, there would be an additional link from I-73 to Roanoke via the US-220 interchange south of the city (near Boones Mill).

The West Bypass would provide the most direct route for traffic on I-73, which connects the Midwestern States with the Southeast. It would strengthen the region's link with Virginia Tech, since travel time to Blacksburg would be reduced. The West Bypass would be less beneficial to traffic moving between I-81 northeast of the City and I-73 south of the City. Some of that traffic could use I-581 as a distance shortcut, adding to the traffic congestion on I-581 which is already expected to be severe by the year 2020.

Other potential negative impacts include the economic risk to the region if the City of Roanoke and other communities fail to provide sufficient sites with highway access for future industrial development. There is also a fear by some residents of Roanoke County that encroachment of commercial and industrial development along the proposed West Bypass alignment could have negative environmental impacts.

On balance, the West Bypass Alignment is likely to have the least impact on the city – either positive or negative. Because only one interchange is planned, this alignment for I-73 will not open up an abundance of land with highway access for development.

❖ 3.4 The East Bypass Alignment

The East Bypass Alignment would bypass the city to the east. Under this option, I-73 would overlay I-81 to the north of the city from around Exit 132 east to Exit 150. It would then turn south from exit 150, running through Botetourt and Bedford Counties. The city would still be accessed by I-581, which would function as a spur for I-73 as well as for I-81. No new spur into the city is currently being considered as part of the I-73 East Bypass option.

The East Bypass Alignment passes through the largest supply of flat, developable land in the region. It would have three new interchanges east of Roanoke: one is proposed for the junction with Route 460 in Botetourt County and the other two are proposed for the junctions with Routes 24 and 634 in Bedford County. This area comprises the fastest-growing segment of the region; the population of the eastern side of the metropolitan area is forecast to grow by some 22% by 2010 – contrasting with expectations of stagnant to declining population levels in the City over the next two decades.

Due to both the population growth and the availability of open space, commercial nodes are likely to develop around these suburban interchanges. The development of new land on the east side can be viewed as positive or negative, depending on one's viewpoint and weighting of economic and environmental factors. From a *regional* perspective, the East Bypass Alignment would open up sites in a high growth area to industries that need large sites with convenient interstate highway access. However, it is clear that this option would entail the greatest potential economic risk to the City since it would also be likely to draw some retail and office development out of the city to the vicinity of the new interchanges. Zoning the new interchange sites for industry could mitigate the risks of fostering sprawl commercial development that could weaken the city.

The East Bypass Alignment has the additional disadvantage of providing the least direct route for through traffic on I-73. This alignment is expected to cause some traffic (which we estimate to be roughly 3,000 additional vehicles per day) to use I-581 as a distance shortcut. With no additional capacity programmed for I-581 under

this option, the effect would be to worsen traffic congestion expected to occur on I-581. That would have negative effects on access to downtown Roanoke.

On balance then, the East Alignment presents the greatest potential threats to the commercial dominance of the city by opening up new sites in the region's highest growth corridor. These sites could attract commercial investment, trade, and tax dollars from existing businesses in the city.

❖ 3.5 Conclusions

From the viewpoint of the City of Roanoke, there is no optimal choice for alignment of I-73. Each of the alternative alignments entails some tradeoffs amongst positive and negative impacts, and involves some risks. Our observations regarding the positive and negative impacts and risks associated with each alignment alternative are summarized in Table 2-1 on the next two pages.

The "No Build" scenario assumes that I-73 is not built, but that currently planned highway maintenance, rehabilitation and improvements are done. That alternative has significant disadvantages for the City. Without any widening of I-581, construction of reliever (bypass) routes or development of other transportation alternatives by the City, traffic congestion will substantially worsen along that corridor. VDOT traffic models forecast a significant worsening of traffic conditions along I-581, with very severe congestion by the year 2020. Such congestion would degrade access to the downtown area, making the area much less attractive for visitors, local shoppers and for business locations. The "No Build" scenario will also keep Roanoke's interstate access focused on a northeast-southwest direction, with travel times northwest (to Ohio and Michigan) over 100 minutes longer and travel times southeast (to North Carolina) nearly 60 minutes longer than would occur under any of the I-73 alternatives. That will further constrain the area's ability to grow as a major regional distribution center. (Refer to Appendix C for traffic details.)

The Central Alignment has the greatest potential benefits to the City but also significant potential risks. Benefits to the City are created by limiting the supply of competitive suburban development sites and by increasing the potential visitor traffic for highway-serving businesses within the City. This option, if properly designed, could increase demand for central city sites near interchanges, increasing their value. Higher values could stimulate higher density, higher value development, adding jobs and tax base. The risk of losing commercial development and tax base to suburban sites would also be minimized. To realize such advantages, the City must take proactive steps to improve local access streets, redevelop existing industrial and commercial buildings and sites, relocate some businesses, and provide assistance and incentives for development at available locations. If those steps are not taken, then the City risks limiting prospects for regional economic development and it could also experience economic damage to the central corridor from land takings. If this alignment is pursued, then the City needs to proactively plan to work with VDOT to

mitigate potentially negative localized impacts along the highway corridor and encourage redevelopment for higher density commercial uses elsewhere along the central corridor.

The West Bypass Alignment provides the least potential opportunity for economic gains and the least risk of economic losses to the City. Because only one interchange is planned, the Western Bypass would not open up an abundance of land with highway access for development. In that sense, it would not substantially threaten or enhance either the city industrial and commercial base. Its benefits for regional economic growth would come primarily from the shortened travel time from Roanoke to markets in Michigan, Ohio and North Carolina. Its impact on the City's downtown area could be negative, though, because of traffic congestion impacts. The western bypass would keep northwest-southeast through traffic on I-73 west of the City. However, traffic moving between I-73 south of the City and I-81 northeast of the City would use I-581/US-220 as a shortcut between the two routes. The extra traffic on I-581/US-220, with no plan for expansion of that highway's capacity, would further degrade traffic movement along Roanoke's Central Corridor and significantly increase its congestion levels.

The East Bypass Alignment presents the greatest potential threats to the City's commercial base by opening up new sites with three interchanges proposed in Botetourt and in Bedford Counties, the region's highest-growth corridor. These sites could attract commercial investment, trade, and tax dollars away from existing businesses in the city. In addition, the East Bypass provides the greatest "dog-leg" alignment of I-73, so a significant share of the vehicles traveling along I-73 between points north and south of the City would be expected to use I-581/US 220 as a shortcut route. Without no expansion to the I-581/US-220 capacity planned under this alignment, traffic movement along that corridor would also degrade and experience severely increased congestion levels.

Tradeoffs among the alternative alignments are summarized in Tables 3-1 and 3-2 on the next pages.

Table 3-1

Potential Impacts of Alternative Alignments for I-73 at Roanoke

Alignment	Potential Positive Impacts for the City	Potential Negative Impacts for the City	Critical Risks	Conditions for Success
Central Corridor:	• Strengthen downtown by retaining central traffic corridor role • Increased tourism from higher volume traffic • Higher density development in the city • Redevelopment of city sites	• Increased traffic congestion on I-581 & city feeder routes • Displacement of existing businesses due to widening • Loss of Williamson & Franklin Road Interchanges • Displacement from reconfiguration of Wonju interchange	• Insufficient sites with highway access for industrial development in the region • Pollution in central area will damage the environment • Traffic congestion in central area will depress growth • Encroachment on city neighborhoods	• Funding for downtown redevelopment • Improvement of feeder routes into I-581 • Improve public transportation • Continue pedestrian improvements • Minimal displacement of businesses
West Bypass:	• Minimal development impacts, with only 1 new interchange • Two possible links to I-581 • Strengthen link with VA Tech • Most direct route for I-73 traffic	• Loss of I-73 and some local traffic may hurt city businesses	• Insufficient sites with highway access for future industrial development • Negative environmental impact	• Zone for industry at US-221 interchange
East Bypass:	• Attraction of new industry to sites opened up at four new interchanges • Greatest potential regional economic benefit	• Greatest potential threat to the city: 3 interchanges in fast-developing area likely to attract business competition • Traffic congestion on I-581 / US-220, made worse by I-73 shortcut traffic	• Main Growth corridor: will facilitate development competitive with city • Weaken the city center • Costs of sprawl	• Zone interchange sites for industrial development • Signs to city center & tourist attractions on I-73

Table S-2

Potential Pros & Cons of Three Alternative Alignments for the Southern Part of the Central Route for I-73

Alignment	Advantages to the City	Disadvantages for the City
Central West I *(Southwest; Tanglewood Mall Option)*	▪ No interchanges until Franklin County line ▪ No displacement of businesses on US-220.	• May take parts of Tanglewood Mall property • Possible displacement in Penn Forest neighborhood • Wonju interchange improvements will cause displacement
Central West 2 *(South Central; US- 220 Option)*	▪ Retention of existing central corridor through region ▪ 3 interchanges within city limits should promote commercial development there ▪ Support by some existing businesses on US-220	• Displacement of existing businesses on US-220 and Wonju interchange • Four interchanges in Roanoke Co. could draw competing commercial development • Possible encroachment on Hunting Hills neighborhood
Central – West *(Mill Mountain; Riverland Option)*	▪ Most direct access to Smith Mountain Lake ▪ No interchanges for 6 miles south ▪ Minimum displacement of businesses ▪ Avoids displacement issues at US-220 & Wonju interchange	• Residential displacement in Riverland neighborhood • Displacement of Appalachian Electric Power • Could draw development south from metro area into sites in Eastern Franklin County

APPENDIX A: ROANOKE'S ECONOMY

❖ A.1 Overview

Objective. The economic impacts of the alternative alignments for I-73 through the Roanoke Valley hinge on the industrial structure of the region and the location of key industries within the city and the wider region. In order to forecast differential impacts of alternatives on the city, it is important to evaluate past trends in growth, decline, and concentration of industries. This Appendix provides a summary of the current state and trends of Roanoke's economy.

In this chapter, economic conditions in the city of Roanoke are compared with those of the wider Roanoke Valley and the State. We begin by reviewing broad demographic shifts among the city and the surrounding counties. Employment trends in 10 major sectors in the city are then compared with their performance in the rest of the metropolitan statistical area (MSA). Detailed industrial clusters that are highly concentrated in the City and in the MSA are then analyzed. Trends in growth and decline of prominent industrial clusters are reviewed. Trends in growth and decline in detailed industrial clusters are compared among the city, the MSA, and the state.

Major Findings. This review of the state of the local economy is particularly important given the substantial changes now occurring. Jobs in the City have grown by 10% over the past decade, compared with 30% job growth in the rest of the MSA. Due to the limited size of the city, its inability to expand by annexation, and the depletion of most large sites, it is to be expected that manufacturing and distribution job growth would be centered in suburban locations. But the city is losing its position as the center of several key financial services and tourist-serving industries. The Central Business District (CBD) has struggled to maintain dominance as a center of producer services but the city still retains its dominance in retailing and most other service industries. It is essential that the alignment chosen for I-73 support and protect this role.

❖ A.2 Demographic Trends

Since 1980, the population of the city has been relatively stable, with a slight decline due to the shrinking size of households – a national trend. There are some 230,000 people in the Roanoke MSA (see Table A-1). The majority – some

58%-- now lives in the suburban communities surrounding the city. The city's population has declined by 5% since 1980, while that of the surrounding area grew by 12%, for an overall average growth of 4% for the MSA as a whole since 1980. Population growth in Botetourt County -- some 21% -- has by far outpaced the rest of the MSA.

Forecasts for 2010 show that the growth of the MSA is expected to accelerate slightly, growing by about 6%. The city's population is expected to remain relatively stable. Most of the population growth will continue to be in Botetourt County, where the population is forecast to increase by 22% and in Roanoke County, which is expected to grow by 10% over the next 10 years.

Table A-1

Population Change in Roanoke Metropolitan Area(1980-1996)

	Actual			Forecast		Percent Change	
	1980	1990	1996	2000	2010	1980-96	1996-2010
City of Roanoke	100200	96509	95600	95596	94500	-5%	-1%
City of Salem	23958	23797	24500	24792	25894	2%	6%
Botetourt County	23270	24992	28200	29799	34302	21%	22%
Roanoke County	72945	79294	81800	84710	89800	12%	10%
Total	220373	224592	230100	234897	244496	4%	6%
% Roanoke City	45%	43%	42%	41%	39%		

Source: US Census Bureau

❖ A.3 Employment & Office Space Trends

Jobs in the city are growing at one-third of the rate of job growth in the suburbs. There are nearly 140,000 jobs in the Roanoke MSA (Chart E-1). The majority – some 55% -- are still in the city of Roanoke, but this trend is changing. From 1988 to 1998, the city gained 7,400 new jobs, a gain of 10%. Meanwhile, suburban areas gained 14,400 new jobs, for an increase of 30%. Overall, jobs in the MSA grew by 18% or 21,750 new jobs. Two out of three of the new jobs were based in suburban locations. (See Table A-2.)

Similarly, the majority of the MSA's office space is still in the Central Business District – some 52%, but this trend is also changing. The suburbs now have 48% of the total office space compared with 44% just four years ago. Office space in the Northern Suburbs has grown by 12% since 1996, while the amount of office space in the Southern Suburbs has increased by 8%. These figures compare with a decline of 8% in city office space since 1996. The decline is due to the removal of three large buildings from office use, which will be redeveloped for housing

and institutional uses. Vacancy in city and suburban locations averages a relatively healthy 8% to 11%. The city center has retained a vital niche as the region's center of producer services. It is critical that the option selected for the alignment of I-73 supports downtown's role as a center of producer services, healthcare, entertainment, and tourism.

Dominant Industries. Table A-2 compares employment trends in growth and concentration of 10 major economic sectors in the city and the suburbs. Location Quotients (LQ's), comparing the concentration of employment in each sector in the city and suburbs, are shown. A location quotient of 1.0 means that the sector has the same proportion of jobs as the state average. An LQ of more than 1.0 indicates concentration of an industry in a local area, while an LQ of less than one indicates that a sector is less important in a given local area than in most of the state. Key findings are discussed below.

Table A-2

Employment Trends in Major Industries: Roanoke City & Metro

	City				Rest of the Metro Area			
Sector	1988	1998	% Change	1998 LQ	1988	1998	% Change	1998 LQ
Wholesale Trade	5,616	4,975	-11%	1.44	3,163	4,621	46%	1.42
Trans, Com., Utilities	4,543	5,423	19%	1.39	991	1,466	48%	0.40
Retail Trade	16,116	16,638	3%	1.19	8,752	10,561	21%	0.99
Finan, Ins, Real Est.	4,841	4,805	-1%	1.16	2,856	5,039	76%	1.09
Services	16,940	24,851	47%	1.11	10,041	14,724	47%	0.71
Construction	4,482	4,493	0%	0.99	3,440	4,050	18%	1.20
Non-Durable Mfg	4,605	3,498	-24%	0.76	2,993	4,070	36%	1.03
Durable Mfg.	4,881	3,463	-29%	0.71	7,474	7,905	6%	2.41
Government	6,997	8,002	14%	0.58	8,119	9,727	20%	0.93
Agric, Forestry, Mining	342	446	62%	0.55	689	907	32%	1.01
Totals	69,363	76,594	11%	NA	48,518	63,070	30%	NA

Source: Virginia Employment Commission ; calculations by Economic Development Research Group

Roanoke is an important distribution center for the surrounding rural area. This is reflected in the fact the most highly concentrated industry in both the city and suburbs is wholesale trade, with a location quotient of 1.42. Many of the distribution firms in the city are clustered in the Roanoke Center for Industry and Technology (RCIT) and along I-581 near the airport. As illustrated on Chart E-1, however, jobs in wholesaling have declined by 11% (641 jobs) since 1988, while those in the suburbs have risen by 46% in the city (1458 jobs). Jobs in the next

most dominant sector -- Transportation, Communications, and Utilities -- have grown in both the city and the suburbs over the past ten years, although the suburban growth of 48% in this sector has far outpaced the city's 19% growth.

Retailing in the city is concentrated along the northern stretches of I-581 and along Route 419 in the southwest. The city's retailing sector, with a location quotient of 1.19, grew by just 3.2% since 1988, only a fraction of the suburban rate of 21%. The city's share of retail jobs slipped from 65% in 1988 to 60% in 1998. The city is rapidly losing its position as the center of employment in Finance, Insurance, and Real Estate (FIRE), once the exclusive dominion of the Central Business District. Jobs in .FIRE have declined slightly in the city over the past ten years, but have risen dramatically in the suburbs. The suburbs gained nearly 4700 jobs in this important sector and now have over half of jobs in FIRE, compared with just 37% ten years ago.

The city's main target industrial areas are in the RCIT on the City's east side and the area around Shenandoah Ave./Norfolk Southern tracks west of downtown. Despite the city's efforts to provide sites for new industries, manufacturing jobs in the city have declined by 27%, while they have grown by 14% in the suburbs. The suburbs now have nearly two-thirds of all manufacturing jobs in the metropolitan area, compared with less than half in 1988. This trend is a reflection of the availability of "green field" sites in suburban locations where costs are lower. The suburbs now have a very high concentration of durable goods manufacturing with 2.4 times the statewide average. Growth in services has been equal in both the city and the suburbs at a healthy rate of 47%. The city still has almost two-thirds of the jobs in services.

❖ A.4 Detailed Analysis of Industries

Relative Concentration of Industries. Table A-3 shows a more detailed breakdown of industries highly concentrated in the city by 2 digit SIC (Standard Industrial Classification) code. Growth and concentration in these industries in the city is compared with that of the overall MSA. The city's most concentrated industry, security and commodity brokers, with a location quotient of 4.15, is highly concentrated in both the city and the MSA. Jobs in this vital sector have grown by nearly 360% over the past 10 years. Other highly concentrated industries showing good growth in both the city and the suburbs are air transportation and local passenger transportation. The latter indicates that use of public transportation in the region is growing.

Primary metals manufacturing is also very important to the MSA's economic base, but jobs have declined since 1988. Electronic manufacturing, with a location quotient of 2.3 has performed much better, growing by 133% in the city since 1988.

Table A-3

Industry Concentration in the City Compared to Metro Area

SIC	Sector	City		MSA	
		Location Quotient	Percent Job Change 1988-1998	Location Quotient	Percent Job Change 1988-1998
	Overall		10.6%		18.4%
62	Security and commodity brokers	4.15	358.5%	2.32	3.8%
33	Primary metal manufacturing	2.82	-11.5%	1.86	-1.3%
45	Transportation by air	2.28	295.0%	1.26	286.8%
41	Local and interurban passenger transit	2.17	38.9%	1.19	38.9%
39	Misc. manufacturing industries	2.03	-20.8%	1.73	18.1%
67	Holding & Investment Offices	1.99	0.0%	1.30	8.5%
63	Insurance carriers	1.86	4.9%	2.55	44.8%
23	Textile manufacturing	1.85	-0.3%	2.06	-1.5%
50	Wholesale trade - durable goods	1.78	-13.6%	1.50	-7.0%
36	Electronic and electric equipment	1.70	132.7%	2.29	18.1%
80	Health services	1.67	44.3%	1.45	33.0%
16	Heavy construction	1.62	51.4%	1.35	12.0%
55	Automotive dealers & service stations	1.61	52.8%	1.29	24.9%
49	Electric, gas, and sanitary services	1.57	NA	1.09	NA
59	Miscellaneous retail	1.53	25.2%	1.53	33.3%
84	Museums, botanical, zoological gardens	1.38	NA	1.02	NA
81	Legal services	1.38	11.1%	0.99	23.5%
53	General merchandise	1.35	-29.4%	1.01	-19.2%
75	Auto repair, services, and parking	1.33	-12.8%	1.16	5.6%
42	Trucking and warehousing	1.30	-25.4%	1.18	3.0%
83	Social services	1.25	58.5%	1.25	105.4%
76	Miscellaneous repair services	1.24	36.7%	1.13	39.6%
64	Insurance agents, brokers, & services	1.24	-10.9%	0.97	8.1%
72	Personal services	1.21	28.1%	1.14	17.2%
56	Apparel and accessory stores	1.20	-42.1%	0.89	-35.4%
28	Chemical manufacturing	1.18	-23.6%	0.82	-6.7%
73	Business services	1.15	104.5%	0.90	107.7%
52	Building materials & garden supplies	1.14	-6.9%	0.85	-15.4%
57	Furniture and home furnishing stores	1.06	-11.3%	0.79	-12.1%
58	Eating and drinking establishments	1.04	15.9%	0.96	30.9%
20	Food Processing	1.03	-10.0%	0.78	-7.1%
48	Communications	1.01	55.1%	0.73	15.8%

Note: A location quotient (LQ) of 1 means the the local share of a given industry is equal to the state average. An LQ of 1.5 means that the local proportion of an industry is 50% greater than the state average.

Source: Virginia Employment Commission; calculations by Economic Development Research Group

Industry Growth Trends. Table A-4 lists the fastest-growing as well as the most rapidly-declining industries in the city. Most of the fastest-growing industries are services including brokerage, air transportation, business services, engineering, healthcare, and social services. The most rapidly declining sectors include many durable goods manufacturing industries. Although the decline in manufacturing sectors would be expected in an older central city as industry expands and moves to green-field sites, the decline in key service industries such as banking, hotels, and insurance and credit agencies is notable. Traditionally, these services have been centered in the city.

Table A-4

Growing & Declining Industries in the City of Roanoke
Employment Change 1988 - 1998

Top Growth Industries			Major Declining Industries		
SIC		Growth	SIC		Decline
	Average Growth: All Industries	10.6%	20	Food and kindred products	-10.0%
			64	Insurance agents/brokers services	-10.9%
62	Security and commodity brokers	358.5%	57	Furniture & home furnishing	-11.3%
45	Transportation by air	295.0%	33	Primary metal industries	-11.5%
36	Electronic and electric equip.	132.7%	75	Auto repair, services, and parking	-12.8%
73	Business services	104.5%	50	Wholesale trade - durable goods	-13.6%
87	Engineering & mgmt. services	72.0%	70	Hotels and other lodging places	-14.8%
7	Agricultural services	62.9%	39	Misc. manufacturing industries	-20.8%
83	Social services	58.5%	28	Chemicals and allied products	-23.6%
48	Communications	55.1%	26	Paper and allied products	-25.4%
55	Auto dealers & service stations	52.8%	42	Trucking and warehousing	-25.4%
16	Heavy construction	51.4%	15	General contractors	-26.3%
86	Membership organizations	48.1%	27	Printing and publishing	-26.8%
80	Health services	44.3%	88	Private Household	-28.0%
41	Passenger transit	38.9%	53	General merchandise	-29.4%
76	Miscellaneous repair services	36.7%	82	Educational services	-35.2%
38	Instruments	36.7%	60	Banking	-35.5%
72	Personal services	28.1%	24	Lumber and wood products	-36.7%
59	Miscellaneous retail	25.2%	56	Apparel and accessory stores	-42.1%
58	Eating & drinking establishments	15.9%	32	Stone, Clay, and glass products	-42.9%
	Federal Government	15.6%	61	Credit Agencies	-46.8%
	Local Government	15.5%	35	Industrial machinery & equipment	-65.2%
54	Foods stores	12.6%	34	Fabricated metal products	-78.2%
81	Legal services	11.1%			

Source: Virginia Employment Commission, calculations by Economic Development Research Group

❖ A5. Economic Trends

A Shift-Share analysis that compares growth of industries in the City of Roanoke with statewide and metro area trends has been conducted. Tables A-5 and A-6 below summarize these results.

Table A-5
Shift Share Analysis Comparing City Growth with State Average

Growing in the city faster than the state average:
Automotive dealers & service stations
Miscellaneous repair services
Security and commodity brokers
Personal services
Communications
Engineering & management services
Food stores
Miscellaneous retail
Instruments and related products
Business services
Health services
Agricultural services

Declining in the city while growing in the state:
Amusement & recreation services
Hotels and other lodging places
Wholesale trade – non-durable goods
Trucking and warehousing
Insurance agents, brokers, & services
Real estate
Credit Agencies
Furniture and home furnishing stores
General merchandise retailing
Building materials & garden supplies
Misc. manufacturing industries
Industrial machinery and equipment
Paper and allied products
Food and kindred products
Wholesale trade - durable goods
Printing and publishing
Lumber and wood products
Fabricated metal products

Growing in the city while declining statewide:
Federal Government
Electronic and electric equipment
Heavy construction

Declining in the city slower than in the state:
Primary metal industries
Chemicals and allied products
Apparel and other textile products

Growing in the city slower than in the state:
Social services
Eating and drinking establishments
Legal services
Insurance carriers

Declining in the city faster than in the state:
Apparel and accessory stores
Banking
Stone, Clay, and glass products

Note: Excludes industries for which confidential data on city employment were not available.
Source: Economic Development Research Group; data from Virginia Employment Commission

Table A-5 compares growth in detailed economic categories with statewide growth rates for these industries. The city's strongest industries emerge as air transportation, stock brokers, personal and business services, communications, engineering, and health services. Instruments is the only manufacturing sector represented here. These industries are growing faster in the city than statewide. Other bright spots are electronic equipment manufacturing and construction, which are growing in the city while they are declining statewide. Construction is a good indicator of the local economic climate.

Other industries are growing slower in the city of Roanoke than in the state. These are relatively weak in view of the overall strong market for their services. These include restaurants, legal services, and insurance companies. These are traditional downtown businesses, which should be flourishing in the city. They are growing at only a fraction of the average state rate, indicating weakness of the CBD market to retain and foster growing business services.

A large number of industries in the city are declining, while in the state as a whole they are growing. These include a number of uses of interest to our research, such as the highway-dependent wholesaling sector, which is very highly concentrated. Also under-performing by statewide standards are the tourist-serving sectors of Amusement & Recreation Services, and Hotels. Also declining are a number of FIRE industries, which has direct relevance to our analysis of impacts of highway improvements on the CBD.

Still other industries are declining, but at a slower rate than the state as a whole. These include textile manufacturing, in which jobs in the city have dropped by only 0.3% in Roanoke compared with a 47% drop in the statewide workforce. Industries declining faster in the city than in the state include banking, in which jobs decreased by 36%, compared with a drop of 4% statewide. Employment in another traditional downtown sector, apparel & accessories stores dropped 47% of its jobs in the city since 1988, compared to a decrease of just 1% in the state as a whole.

Table A-6 shows results of a Shift-Share Analysis comparing growth in the city's industries with that of the metro area as a whole. Within the Roanoke Valley MSA, the city has competitive strengths in security brokers, communications, and personal and health services. Electronic equipment manufacturing is the only manufacturing sector that is stronger in the city than the suburbs, possibly a reflection of this industry's need to be near the airport. Manufacture of instruments, while growing in the city, is growing faster in the suburbs as are restaurants, legal services, and insurance carriers, which have traditionally been the domain of the CBD.

Table A-6

Shift Share Analysis Comparing City Growth with Metro Average

Growing in the City faster than the Metro Area Average:	**Declining in the City while growing in the Metro Area:**
Security and commodity brokers	Wholesale trade - nondurable goods
Heavy construction	Trucking and warehousing
Communications	Amusements & recreation services
Food stores	Banking
Automotive dealers & service stations	Real estate
Personal services	Insurance agents, brokers, & services
Health services	Educational services
Engineering & management services	Special trade contractors
Electronic and electric equipment	Misc. manufacturing industries
	Printing and publishing
	Lumber and wood products
Growing in the City slower than in the Metro Area:	**Declining in the City faster than in the Metro Area:**
Miscellaneous retail	Hotels and other lodging places
Social services	Wholesale trade - durable goods
Eating and drinking establishments	General merchandise
Legal services	Apparel and accessory stores
Insurance carriers	Credit Agencies
Instruments and related products	Paper and allied products
	Primary metal industries
	Industrial machinery and equipment
	Chemicals and allied products
	Fabricated metal products
	Stone, Clay, and glass products
	Food and kindred products
	General contractors

Note: Excludes industries for which confidential data on city employment were not available.
Source: Economic Development Research Group; data from Virginia Employment Commission

Areas of weakness (in terms of growth) for the city are highway-dependent wholesale trade and trucking and warehousing which are declining in the city but growing in the suburbs. A number of FIRE related sectors, also traditional downtown occupants, are also weak in the city. These weaknesses include banking, insurance agents, and real estate. Other industries weaker in the city than in the suburbs are tourist-serving hotels and general merchandise and clothing stores, as well as a number of manufacturing sectors. Although distribution and manufacturing would be expected to be expanding on suburban sites, the loss of hotels, FIRE, and retailing indicate that the city is losing position as the traditional center of these activities.

APPENDIX B. TOURISM

❖ B.1 Overview

Currently, nearly 8% of tourists in Virginia visit Roanoke. Of those who do visit Roanoke, 72% are traveling specifically to visit the city. For the other 28%, the city is *not* their primary destination, but they stop in Roanoke.

Roanoke stands to gain tourists under any of the three alternative alignments for I-73. With the Eastern Alignment, I-581 will continue to serve as a spur to the downtown area. The Central Corridor Alignment could potentially funnel more potential tourist traffic to the city, while the East Bypass would funnel traffic past the current I-581 spur into the city. With the West Bypass Alignment, the downtown area could be accessed if there are upgrades to US-221 on the West and/or US-220 on the South.

This appendix reviews the tourism sector of the economy. It covers the pattern of hotel rooms in the Roanoke area, trends in employment in tourist-serving sectors, the mix of tourist spending by type of accommodation, motivation for trips to Roanoke and top origins of tourists to Roanoke.

❖ B.2 Employment in Tourist-Serving Industries

Hotel Rooms. The city's hotel rooms are concentrated along I-581 North and in the downtown area. Table B-1 shows that there are nearly 5000 hotel rooms in 60 hotels in the Greater Roanoke area. Over 60% of rooms are outside of the city in Salem and Roanoke and Botetourt counties. Hotel occupancy is estimated at around 60% in the Roanoke Valley, a relatively healthy level.

Table B-1

Hotel Rooms in the Roanoke Metro Area

	Establishments	Rooms
Roanoke City	23	2486
Roanoke County	19	1373
Salem City	11	671
Botetourt County	7	458
Total	60	4988

Source: Roanoke Valley Convention & Visitors Bureau

Table B-2 shows employment trends in six tourist-serving industries in both the city and in the wider Metro Area. These employment figures represent industries serving both visitors and local residents. With a combined location quotient of 1.19, these industries are highly concentrated in the city, while their presence in the suburbs is closer to the state average. In aggregate, employment in these industries grew by a third in both the city and the metro area, but there were stark contrasts in the performance of the individual sectors.

Table B-2

Employment Trends in Tourist-Serving Industries, 1988-1998

		ROANOKE CITY				ROANOKE Metro Area			
SIC	Economic Sector	1988	1998	% Change	Location Quotient	1988	1999	% Change	Location Quotient
41	Passenger transit	285	396	38.9%	2.17	285	396	38.9%	1.19
45	Transportation by air	420	1,659	295.0%	2.28	433	1,675	286.8%	1.26
55	Autos & service stations	1,642	2,509	52.8%	1.61	2,916	3,641	24.9%	1.29
58	Eating & drinking estabs.	4,120	4,776	15.9%	1.04	6,114	8,002	30.9%	0.96
70	Hotels & other lodging	1,080	920	-14.8%	0.84	1,768	1,523	-13.9%	0.76
79	Amusements & recreation	454	432	-4.8%	0.56	784	1,181	50.6%	0.84
	Total	8,001	10,692	33.6%	1.19	12,015	16,022	33.3%	0.98

Note: The Shift/Share factor compares growth in each sector with the state average growth for that sector.
Source: Virginia Employment Commission; calculations by Economic Development Research Group

Of the six industries, air transportation has registered the strongest growth since 1988, having almost tripled in both the city and the suburbs. Jobs in restaurants in the city have grown by 16%, only about half the rate of the metro and the state averages. In contrast to the statewide growth trend, jobs in hotels have declined by about 15% in both the city and in the wider Metro Area. Employment in amusement and recreation services in the city has declined by 5%, while rising in the metro area by over 50%. The suburbs now have almost two-thirds of the metro area's jobs in amusement and recreation services.

Business sales in Roanoke now include $26 million for auto repair / service stations, $133 million for restaurants and $25 million for hotels (source: VA Dept. of Taxation, 1997 data). Of course, not all of these sales are attributable to visitors; the automobile services and restaurants serve local residents as well as out-of-town visitors.

❖ B.3 Tourist Spending

Table B-3 presents estimates of total tourist spending in the four counties comprising the Roanoke Metro Area. In 1997, tourists spent some $317 million in the area. About 62% of that amount ($19 million) was spent within the City of Roanoke, a proportion corresponding to the city's percentage of hotel rooms.

Of the tourist spending in Roanoke, nearly 30% goes for food service, about 20% for hotels, while auto and public transportation account for 18% and 17% respectively. Spending on retail, entertainment and recreation comprises the balance.

Table B-3
Spending by Tourists in the Roanoke Metro Area, 1997

	(Millions of Dollars)	% Total
Roanoke City	$ 195.790	62%
Salem City	$ 26.360	8%
Roanoke County	$ 72.370	23%
Botetourt County	$ 22.680	7%
Metropolitan Total	$ 317.200	100%

Source: Virginia Tourism Corporation

Table B-4 presents trends in tourist spending, employment and taxes in the City of Roanoke from 1989 to 1997. Tourist spending, which decreased during the recessionary years of the early 1990's, picked up by almost 5% a year between 1993 and 1997, registering an overall average annual increase of 1.8%. This figure is less than half of the 3.8 % average annual growth rate for tourist spending in the state as a whole for this period.

Although tourist spending and payroll increased, the number of jobs in the City of Roanoke supported by tourists decreased 9% during this period. This percentage is in line with the decrease in employment in hotels. Local tax revenues from tourist spending have risen by 2.5% a year and, in 1997, totaled almost $5.3 million a year.

Table B-4
Travel Spending, Payroll, Jobs & Taxes in City of Roanoke, 1989-1997

(Dollars in Millions)	1989	1993	1997	1989-1993	1993-1997	1989-1997
Travel Spending	$ 170.110	$161.860	$ 195.790	-1.2%	4.9%	1.8%
Travel Payroll	$ 45.900	$ 44.610	$ 53.340	-0.7%	4.6%	1.9%
Travel-Related Jobs	$ 3.540	$ 2.980	$ 3.230	-4.2%	2.0%	-1.1%
Local Travel Taxes	$ 4.320	$ 4.230	$ 5.280	-0.5%	5.7%	2.5%

Source: Virginia Tourism Corporation

Table B-5 breaks down tourist days and spending by type of accommodation. Of the total visitors to Roanoke, one-quarter are day-trippers, with the balance spending an average of 4.4 days. Thirty-seven percent of visitors to Roanoke stay with friends and relatives. Almost 30% stay in hotels, with the balance staying at campgrounds and other accommodations. The average spending per day for both day-trippers and overnight visitors is $52.00.

Table B-5
Tourist Spending in City of Roanoke by Type of Accommodation

		No. of Days	Est. Spending
Day Trip	25%	941,298	$ 48,947,500
Hotel/Motel	29%	1,091,906	$ 56,779,100
Family/Friends	37%	1,393,121	$ 72,442,300
Campground	3%	112,956	$ 5,873,700
Other	6%	225,912	$ 11,747,400
Total	100%	3,765,193	$195,790,000

Source: Virginia Tourism Corporation

❖ B.4 Tourism Markets

Destinations of Visitors to Roanoke. The major visitor attractions in downtown Roanoke include the Historic Farmers Market and Center in the Square (museums). Other visitor attractions in the surrounding area include the Blue Ridge Parkway, Booker T. Washington Monument, the Roanoke Star, and Washington & Jefferson National Forests. Further south is the recreation area of Smith Mountain Lake. The Explore Park, near the Roanoke River, is also an attraction.

For 70% of visitors, the primary destination is Roanoke Valley, 2% are going to Smith Mountain Lake, and 28% are passing through on their way to destinations outside of the region . About 10% of those visiting Roanoke also visit Smith Mountain Lake. Over half of the visitors are on vacation or visiting family and friends, while 1/4 are on business or are attending conventions in Roanoke .

Table B-6
Primary Destination of Trip

Roanoke Valley	70%
Smith Mountain Lake	2%
Elsewhere	28%
Total	100%

Source:1998 Roanoke Visitor Center Survey

Table B-7
Purpose of Trip to Roanoke

Vacation	36%
Family & Friends	18%
Sporting/Special Event	4%
Business/Convention	25%
Other	18%
Total	100%*

* sums to over 100% due to rounding

Source: 1998 Roanoke Visitor Center Survey

Origins of Visitors to Roanoke. Table B-8 shows the top tourist origin locations for the City of Roanoke. These locations account for almost 40% of all trips. By cutting travel times, I-73 will improve access to six of these markets, which account for 12.6% of all trips to Roanoke. The project will have a major impact on trips from the northern markets of Pittsburgh and Cleveland and the mid-southern cities of Greensboro and Charlotte. It will have a more minor impact on trips from Roanoke's main Florida markets, including Tampa, St. Petersburg, Orlando, and Daytona. Estimated 1997 spending from the affected markets totaled some $24.7 million. Interstate 73 is expected to have a positive impact on tourism from these areas by reducing travel times and by enhancing connections between Roanoke and some of its main tourist markets.

Table B-8

Top Roanoke Tourist Origin Markets that will be Served I-73

	% of Total Trips	Impact of I-73	Estimated Visitor Days		Estimated Spending
Mid-Atlantic States	15.2%	None	572,309	$	29,760,080
Northeastern States	9.2%	None	647,613	$	25,844,280
Greensboro	4.0%	***Major***	150,608	$	7,831,600
Raleigh-Durham	2.4%	***Major***	90,365	$	4,698,960
Pittsburgh	2.4%	***Major***	90,365	$	4,698,960
Charlotte	2.0%	***Major***	75,304	$	3,915,800
Atlanta	2.0%	None	75,304	$	3,915,800
Florida Cities	1.4%	Minor	52,713	$	2,741,060
Cleveland	0.4%	***Major***	15,061	$	783,160
Total Trips Affected	**12.6%**		**474,414**	**$**	**24,669,540**

Source: Virginia Tourism Corporation

APPENDIX C. TRAFFIC IMPACTS

❖ C.1 Traffic Volumes and Congestion

This section discusses projected changes in traffic volumes and traffic flow conditions between current conditions and projected future conditions in the year 2020. It is important to realize that, from an economic perspective, changes in traffic volume can be a double-edged sword. On the one hand, more traffic can mean more visitors and customers to some businesses. However, it can also mean a slowdown of traffic movement, which can be a negative factor for travelers passing through an area.

Traffic volumes are measured in terms of Average Daily Traffic (ADT), a counting of the number of vehicles passing by a given location (in both directions). All traffic data comes from the I-73 Location Study, Traffic and Transportation Technical Memorandum (draft, August 1999). Table C-1 shows the current traffic counts and projected traffic levels for 2020 under each highway alternative. The percentage changes from "No Build" conditions are shown for each of the I-73 alternatives in Table C-2.

Density of traffic flow is measured in terms of Level of Service (LOS) rating during peak hour. The ratings are parallel to school grades, with an "A" denoting the best possible conditions -- free flow at posted speed limits. An "F" denotes severe congestion with traffic stoppages (and generally stop-and-go movement) during the peak period. The projected level of service ratings (from A to F) are shown in Table C-3, and the direction of changes in level of service (compared to "No Build" conditions) are shown in Table C-4.

Key findings for changes by the year 2020 are as follows:

Changes for I-81 in the Vicinity of Roanoke

- With the *East* or *Central* alignments of I-73, traffic on I-81 (in the vicinity of Roanoke) would gain an average of 13,000 ADT (ranging from 9,000 to 17,000 for specific segments), a 24% average increase over the “no build” scenario. With the *West* alignment, there would be a smaller change in traffic on I-81, with an average gain of 6,500 ADT (ranging from 2,000 to 9,000 for specific segments), a 12% average increase over the "no build" scenario.

- This portion of the highway now suffers from congestion in the peak period. For the portion of I-81 which is south (west) of I-581, the level of service is now "D", but scheduled improvements by the year 2020 will improve that to "B" under "no build" conditions. With an *East* or *Central* alignment of I-73, the level of service will degrade slightly to a "C" rating, which is worse than "no build", but still better flow than current conditions. With a *West* alignment of I-73, it will stay at "B" level -- similar to traffic flow with the "No Build" scenario.
- For the portion of I-81 which is north (east) of I-581, the level of service is now "E" --denoting severe congestion. However, scheduled improvements by the year 2020 will improve that to "C" under "no build conditions". It will stay at that "C" rating under any of the I-73 alternatives.

Changes for I-581 in Roanoke

- With a *West* (bypass) alignment of I-73, traffic on I-581 would drop slightly, by 1600-2000 ADT, representing a 2% decrease from base case (no build) conditions in the year 2020.
- With an *East* (bypass) alignment of I-73, traffic on I-581 would rise by 9% (7500 ADT) in the northern part of I-581 and fall by 3% (2500 ADT) in the southern part of I-581.
- With a *Central* alignment of I-73 (using I-581), traffic on I-581 would rise by 17-18% (in the range of 15,000 – 18,000 ADT).
- The northern part of I-581 (between I-81 and Orange Ave/US 460) currently has a peak period level of service rating of "C", which would degrade to a "C/D" rating under the "no build" scenario. With the *west* and *east* alignments of I-73, all of that segment would get a "D" rating; however with the *Central-west* alignment, it would improve slightly to a "C" rating.
- The southern part of I-581 (south of Orange Ave/US 460) is a problem under all alternatives. It currently has a peak period level of service rating of "D", with congestion there projected to get worse, degrading to "F" (severe congestion) under the "no build" scenario. With any of the I-73 alternatives, that portion of I-581 would improve marginally to a "D/E" rating.

Changes for US-220 in Roanoke (between Downtown and the Blue Ridge Parkway)

- With the *West* or *East* alignments of I-73, traffic on US-220 would have little change (+4% with the *East* alignment and –4% with the *West* alignment).
- With the *Central-West* alignment of I-73 which uses US-220, traffic on that highway segment would rise 27-45%, and the level of service for traffic movement would degrade.
- With the *Central-East* alignment of I-73, traffic on US-220 would fall 48-61%, and the level of service for traffic movement would be improved.

Changes for US-460 (Central to East Part of Roanoke)

- With a *Central* or *West* alignment of I-73, there would be essentially no change in traffic levels (within 2% of the "no build" levels).
- With the *East* alignment of I-73, traffic levels would be 39-40% less than the "no build" levels, and also 38-44% less than today's levels.

TABLE C-1. TRAFFIC VOLUMES (1997 - 2020)

[shading denotes I-73 segments]

Location (see Figure C-1 on next page)	Traffic 1997 Current	Traffic 2020 0-No Build	1-East	2-Central-East	3-Central-West	4-West
Interstate 81						
1) I-81 South of I-581	48,800	56,500	72,300	73,900	74,200	58,300
2) I-81 North of I-581	57,900	62,300	78,100	72,600	72,500	71,100
3) I-81 North of alt US-220	36,600	40,100	49,700	49,600	49,500	49,100
Interstate 581						
4) I-581 South of I-81	76,000	84,500	92,000	99,700	99,800	82,900
5) I-581 North of US-460	75,100	91,300	88,800	106,400	106,600	89,700
6) I-581 US-460(Orange) to VA-11	89,300	108,700	105,700	126,700	126,900	106,700
7) I-581 VA-11 to VA-24(Elm)	76,200	92,700	90,100	108,000	108,200	91,000
US-220						
8) US-220 VA-24(Elm) to Wonju	58,300	68,200	67,900	26,900	98,700	66,400
9) US-220(Wonju) to VA-419 (Franklin)	48,600	54,500	56,500	28,400	69,300	52,300
US-460						
10) US-460 East of alt US-220	37,800	44,800	27,200	44,700	45,600	44,700
11) US-460 West of alt US-220	21,900	20,200	12,200	20,100	20,500	20,100
New (Bypass) Routes						
12) New East Route I-81 to US-460	0	0	29,400	0	0	0
13) New East Route US-460 to Rt.122	0	0	12,900	0	0	0
14) New Central Route VA-24 to Rt.122	0	0	0	37,100	0	0
15) New West Route I-81 to US-220/419	0	0	0	0	0	19,600

Source: VDOT Traffic and Transportation Technical Memorandum, draft, 1999.

Figure C-1
Key to Location of Traffic Segments (Tables C-1 through C- 4)

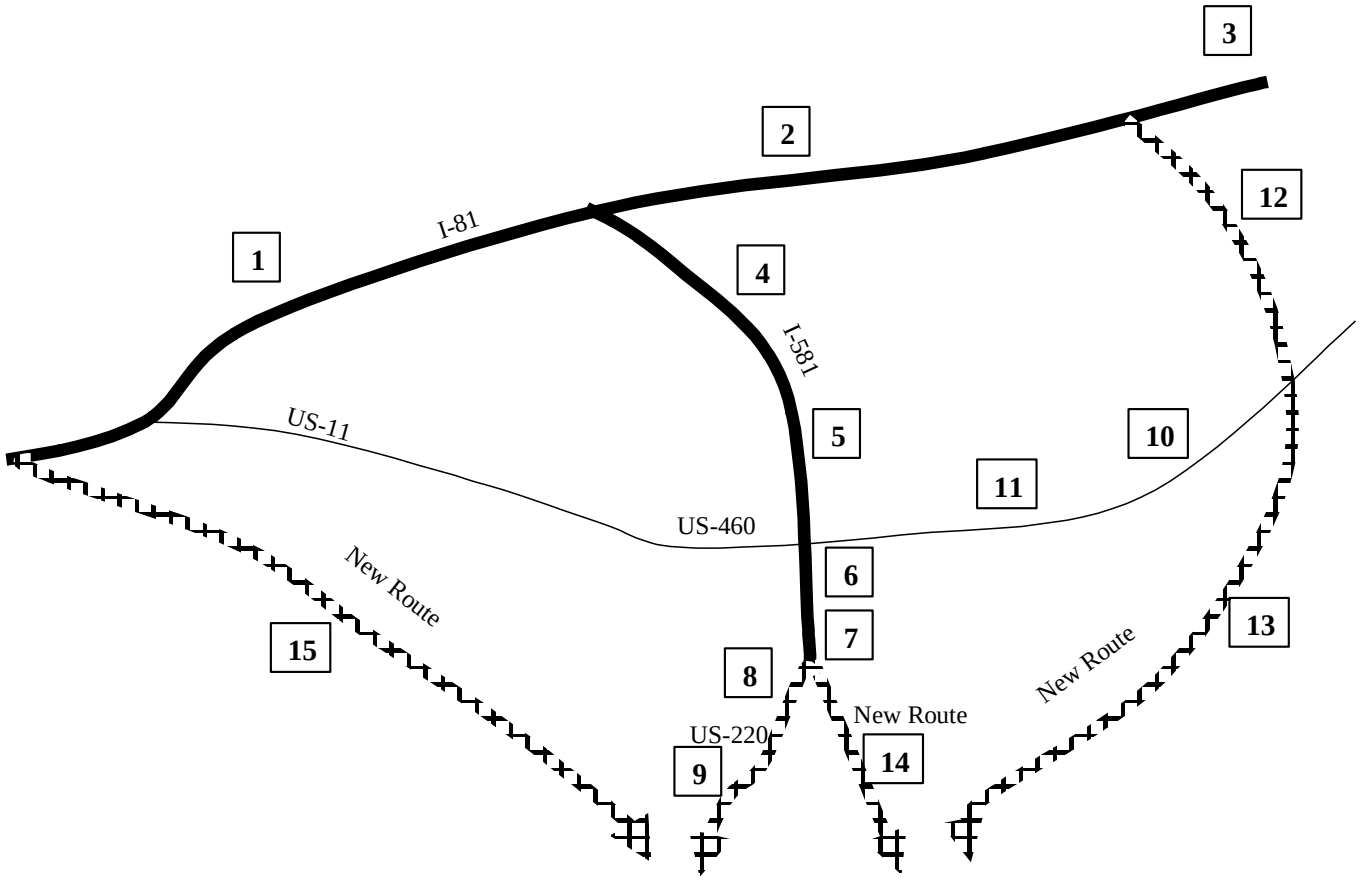


TABLE C-2. PERCENT CHANGE IN TRAFFIC VOLUME (1997 - 2020)

[shading denotes I-73 segments]

Location	1-East	2-Central-East	3-Central-West	4-West
Interstate 81				
1) I-81 South of I-581	28%	31%	31%	3%
2) I-81 North of I-581	25%	17%	16%	14%
3) I-81 North of alt US-220	24%	24%	23%	22%
Interstate 581				
4) I-581 South of I-81	9%	18%	18%	-2%
5) I-581 North of US-460	-3%	17%	17%	-2%
6) I-581 US-460(Orange) to VA-11	-3%	17%	17%	-2%
7) I-581 VA-11 to VA-24(Elm)	-3%	17%	17%	-2%
US-220				
8) US-220 VA-24(Elm) to Wonju	0%	-61%	45%	-3%
9) US-220(Wonju) to VA-419 (Franklin)	4%	-48%	27%	-4%
US-460				
10) US-460 East of alt US-220	-39%	0%	2%	0%
11) US-460 West of alt US-220	-40%	0%	1%	0%

TABLE C-3. LEVEL OF SERVICE (1997 - 2020)

[shading denotes I-73 segments]

Location	LOS 1997 Current	Level of Service 2020				
		0-No Build	1-East	2-Central-East	3-Central-West	4-West
Interstate 81						
1) I-81 South of I-581	**D**	**B**	**C**	**C**	**C**	**B**
2) I-81 North of I-581	**E**	**C**	**C**	**C**	**C**	**C**
3) I-81 North of alt US-220	**C**	**B**	**C**	**C**	**C**	**C**
Interstate 581						
4) I-581 South of I-81	**C**	**C**	**D**	**D**	**C**	**D**
5) I-581 North of US-460	**C**	**D**	**D**	**D**	**C**	**D**
6) I-581 US-460(Orange) to VA-11	**D**	**F**	**E**	**D**	**D**	**E**
7) I-581 VA-11 to VA-24(Elm)	**D**	**F**	**D**	**E**	**E**	**D**
US-220						
8) US-220 VA-24(Elm) to Wonju	**D**	**E**	**E**	**E**	**E**	**E**
9) US-220(Wonju) to VA-419 (Franklin)	**B**	**C**	**C**	**B**	**D**	**C**
US-460						
10) US-460 East of alt US-220	**C**	**C**	**B**	**C**	**C**	**C**
11) US-460 West of alt US-220	**B**	**B**	**B**	**B**	**B**	**B**
New (Bypass) Routes						
12) New East Route I-81 to US-460	-	-	**C**	-	-	-
13) New East Route US-460 to Rt.122	-	-	**A**	-	-	-
14) New Central Route VA-24 to Rt.122	-	-	-	**C**	-	-
15) New West Route I-81 to US-220/419	-	-	-	-	-	**B**

Source: VDOT Traffic and Transportation Technical Memorandum, draft, 1999.

TABLE C-4. CHANGE IN LEVEL OF SERVICE (1997 - 2020)

[shading denotes I-73 segments]

Location	Change in Level of Service 2020			
	1-East	2-Central-East	3-Central-West	4-West
Interstate 81				
1) I-81 South of I-581	-neg-	-neg-	-neg-	*same*
2) I-81 North of I-581	*same*	*same*	*same*	*same*
3) I-81 North of alt US-220	-neg-	-neg-	-neg-	-neg-
Interstate 581				
4) I-581 South of I-81	-neg-	-neg-	*same*	-neg-
5) I-581 North of US-460	*same*	*same*	Better	*same*
6) I-581 US-460(Orange) to VA-11	Better	Better	Better	Better
7) I-581 VA-11 to VA-24(Elm)	Better	Better	Better	Better
US-220				
8) US-220 VA-24(Elm) to Wonju St.	*same*	*same*	*same*	*same*
9) US-220(Wonju) to VA-419(Franklin)	*same*	Better	-neg-	*same*
US-460				
10) US 460 East of alt US-220	Better	*same*	*same*	*same*
11) US 460 West of alt US-220	*same*	*same*	*same*	*same*

Source: Segment Level of Service Ratings, from VDOT Traffic and Transportation Technical Memorandum, draft, 1999.

❖ C.2 MIX OF LOCAL VS. THROUGH TRAFFIC

Based on our analysis of Table C-1 data, we estimate the following breakdown between local and pass-through traffic, as shown below.

Table C-5. Estimated Mix of Local vs. Pass-Through Traffic

Market Segment	1 East Alignment	2-3 Central Alignment	4 West Alignment
Base Traffic -- Through Trips (No Build 2020) *	NA	34-44	NA
Base Traffic -- Local Trips (No Build 2020) *	NA	50-65	NA
Additional I-73 Traffic due to Through Trips (I-73 Build 2020) *	13	16	16
Additional I-73 Traffic due to Local Trips (I-73 Build 2020)*	16	0-2	4
TOTAL	**29**	**100-127**	**20**

Source: calculations and estimates by Economic Development Research Group

* Total traffic along I-73, including base traffic (without I-73) and additional traffic (with I-73) is based on the state's traffic model forecasts for 2020 as shown in Table C-1. The breakdowns of local-vs-through trips for existing (base) traffic are estimates, since no data was collected for an accurate measure. The breakdown of local-vs-through trips for incremental I-73 traffic was calculated by comparing forecasts of traffic levels at/near Roanoke with forecasts of traffic levels south of the city.

❖ C.3 ACCESS TO ROANOKE

With any of the I-73 alternatives, access to Roanoke from the North and South would be dramatically improved (by 1 1/2 hours from the North Central US and by 1 hour from the South).

Table C-6. Travel Time Changes Associated with I-73 Alternatives

Access to Roanoke from:	Travel Time Now	New Travel Time with I-73	Time Savings
Michigan (Flint)	10.7 hours	9.0 hours	101 minutes
Ohio (Toledo)	8.7 hours	6.9 hours	108 minutes
Greensboro, NC	2.4 hours	1.7 hours	41 minutes
Raleigh, NC	3.8 hours	2.8 hours	56 minutes

Source: Segment Level of Service Ratings, from Traffic and Transportation Technical Memorandum, draft, 1999

APPENDIX D. CASE STUDIES OF EXPERIENCE ELSEWHERE

❖ D.1 Overview

Analysis. One basis for assessing potential impacts of city center vs. outer belt options for I-73 through Roanoke is to consider the experience of other, similarly-sized cities that have been bypassed by interstate highway improvements. Accordingly, the consulting team conducted case studies of the effects of new interstate highways bypassing downtowns in four other cities – two in Virginia and two in the Midwest. These findings are also generally consistent with hundreds of studies of highway bypasses in smaller communities in Kansas, Wisconsin, Iowa, Texas, North Carolina, and Washington State.

Summary of Findings. The wide range of highway bypass studies carried out around the country provides a generally consistent story. They indicate new highways bypassing the central business district of a community are seldom either devastating or the savior of the area. The locational shift in traffic can cause some existing businesses to close up or relocate, but it can also create some new business opportunities. Net economic impacts on the broader community are usually relatively small (positive or negative). Downtown business districts having a strong identity as a destination for visitors or for local shoppers are the ones most likely to be strengthened due to the reduction in traffic delays through their centers. However, there is also a broad perception that adequate signage to the bypassed business center is an important need (and concern) for ensuring its continued success.

Across the case studies, some positive and negative factors are common. The positive benefits of bypassing downtown areas commonly include the removal of heavy truck traffic from central areas and the opening up of additional industrial sites along the new route, thus attracting new investment from outside of the region. The negative impacts include increases in sprawled, low density commercial and residential development entailing high environmental and infrastructure costs.

Other findings are as follows:

- Bypasses do not necessarily result in a reduction in total traffic volume in the downtown area. Often, the removal of most truck movements and other pass-through highway traffic encourages more local traffic, which had previously avoided the downtown area due to heavy traffic. The result is often little or no

change in total traffic levels, which is often associated with improved travel opportunities for local residents and access for downtown businesses.

- Even in cases in which bypasses have a limited impact on redirecting traffic, development and economic impacts can be profound. Bypasses designed to serve local traffic can have a significant impact on the development and location of retailing and local services. But generally, retailers will locate only in areas with an existing population base.

- A new bypass route without supporting infrastructure seldom ignites a development explosion. In the absence of water and sewer services, local interchanges and local access roads, bypasses around small cities usually do not facilitate sprawled development in outlying areas. In the longer term, outer-beltway bypasses can be expected to have profound effects on development patterns, but in smaller cities this impact could take 20 or more years.

- A new interstate highway corridor can open up sites for industrial development to attract investment from outside of the region. Proactive planning by local authorities can catalyze industrial development in the vicinity of interchanges. Regional planning controls can be important to prevent sprawl and over-development of retail space, although in practice such controls require significant effort and are not always in place. In cases where a bypass goes through several jurisdictions, there is likely to be competition for tax-producing retail and other commercial businesses.

- Downtown areas hard-hit by the proliferation of shopping malls of the 1970's and 1980's are likely to have already restructured away from consumer retailing to new roles as office, financial, health and entertainment centers even before they were bypassed by more recent highway improvements. In response to those changes, city centers have become increasingly specialized centers for institutions and the service sector of the economy.

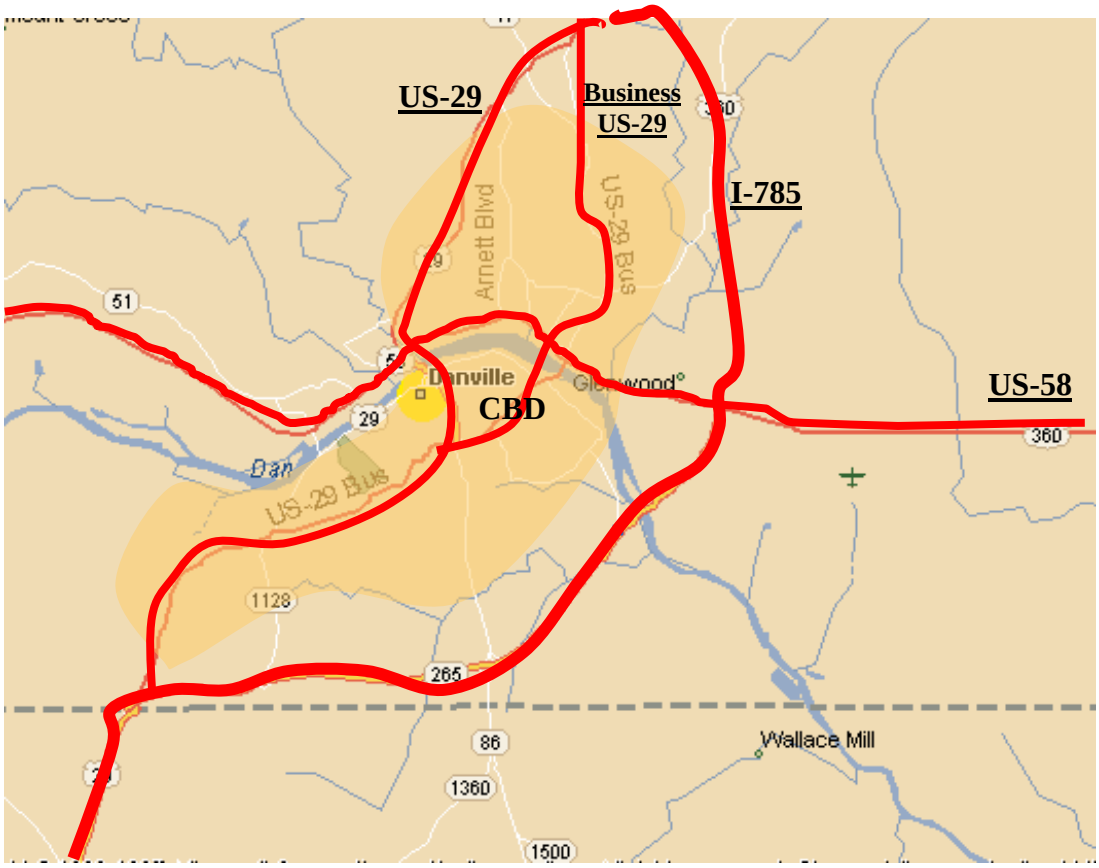
- Outer beltways entail both benefits and costs for inner cities. Cities cannot always compete with open space ("green field") sites for new industrial and commercial development when those businesses are seeking large lots. Cities must continue to reinvest in and upgrade their infrastructure and buildings to continue to attract new industrial, office and commercial development.

The detailed case study reports are presented on the following pages.

❖ D.2 Danville, VA: I-785 Bypass

Project and Setting. Danville, located in south central Virginia at the North Carolina border, is a city of 53,000 within a metropolitan area of 108,000 people. Until construction of the I-785 bypass in 1997, traffic traveling north and south on Interstate 29 was routed through the city along "Business 29", a four lane road with stop lights at major intersections. The I-785 bypass, which is 3 - 4 miles from the previous route, has six interchanges.

Planning for the I-785 Bypass began in the 1960's but construction did not start until the late 1980's. The road is being developed in three phases. Phase I, completed in 1990, connects US 29 south of the city with US 58 east of the city. It bypasses Business 29, where traffic serving retail and service businesses traditionally clustered. Phase II, completed in 1997, connects US 58 east of the city with US-29 north of the city. Phase III, now underway, is a seven-mile stretch connecting US 29 south of the city with US 58 west of the city. The new system is intended to serve as a spur from I-85, spanning a 46 mile stretch from Greensboro, North Carolina to Danville.



Economy. Like Roanoke, Danville, is a regional center for a large rural area. Danville does not compete with nearby municipalities for development. The metro area's 108,000 population has been relatively stable and is projected to be growing at a rate of less than 1% a year.

Based on recent labor force data, jobs in Danville are considered to be growing somewhat faster than the population. Danville's economy is heavily dependent on manufacturing. Textiles and tobacco are the traditional dominant industries, but the manufacturing base has been diversified in recent years with the attraction of food processing, building materials, and auto-related manufacturing. Forty-five percent of the workers are engaged in manufacturing compared with just 12% statewide and 9% in Roanoke.

Impacts on Existing Business. The bypass has not resulted in a decrease in traffic on Business 29, as was feared, but has resulted in a significant drop in the number of trucks. The lack of decline in traffic on Business 29 is due to an increase in local vehicles, which had previously avoided the route due to heavy truck traffic. There is no evidence of negative impacts on business there.

The downtown area has similarly not suffered any negative impact to date from the bypass. A massive exodus of retailers from the city center occurred during the early 1980's, when the Piedmont Mall, located west of the bypassed junction of US 58 and US 29, opened. Since then, downtown has restructured as an office center. The legal services sector is strongly represented along with finance, insurance, and communications. A number of old retail anchor buildings have been converted to office uses and some have been redeveloped.

Although the new bypass does route traffic around the Piedmont Mall, it has not impacted sales at the shopping center, which is currently expanding with new retail space and a multiplex cinema. Similarly, another major retail development, Cain Creek Shopping center, a locus for big box retailers located just east of the bypassed junction of US 58 and US 29, has not been affected by I-785. In fact, the new highway is considered to have benefited the center, presumably by encouraging more local traffic. Occupancy at the center has risen from 90% to 100% since completion of the bypass, although other factors such as the strong local economy, also played a role.

Impacts on New Development. There are six interchanges along the 25-mile stretch of the I-785 bypass. Due to the availability of serviced sites, most of the development in the vicinity of the bypasses has been industrial. The city has established the Riverside Industrial Park at a site just south of the junction of the bypass and US 58. The initial 170 acres have been filled and an additional 180 acres are being developed for further expansion of the park. The Pittsylvania Industrial Park, developed just north of the bypass on US 29, has also attracted new investment since completion of the bypass in 1997. Dan River Industries, a local textile manufacturer who expanded into the Riverside Industrial Park, was retained in the community although most of

the other industries have come in from outside of the area. The bypass is considered to have had a major impact on bringing about this investment.

Retail development has been limited to a few gas stations, convenience stores, and fast food restaurants. No major retail development has yet been spawned at or near bypass interchanges. A few new apartments have been developed on the North side of US 58 near the airport but there has been no significant residential development. Some hotel developers are rumored to be looking at interchange sites, but nothing concrete has transpired.

The city has not undertaken any measures to discourage sprawl development in the vicinity of the bypass interchanges. Since the bypass is within the city limits, they believe that any development in the area -- which is zoned for a mix of commercial, residential, and industrial uses -- would be of benefit. Lack of development is due to the lack of water and sewer infrastructure at (all but industrial) sites near the bypass. The city has insufficient resources to provide additional infrastructure. The hottest development area is along Piedmont Drive, a new four-lane road just northwest of the bypassed junction of US 29 and US 58, where big box retail, restaurants, and cinemas have clustered around new residential developments. This area has the water and sewer infrastructure needed to support development.

Conclusions & Lessons Leaned. Overall, the I-785 bypass is regarded as having had a positive impact on the city in two main respects:

- The bypass has catalyzed development of industrial sites located near the interchanges. Jobs generated by this development have supported expansion of existing shopping centers, which were actually bypassed by the highway improvements.

- The bypass has removed truck traffic from the city's main business artery. This loss has been offset by a growth in local passenger traffic, benefiting the traffic-serving businesses clustered along Business 29.

The case of Danville represents potential short-term impacts of a bypass on a small city in a relatively isolated location serving a large rural hinterland. The following lessons emerge:

- Bypasses do not necessarily result in a reduction in traffic since more local traffic may be encouraged to use a route previously avoided due to heavy truck traffic.

- Downtown areas hard-hit by the proliferation of shopping malls of the 1970's and 1980's are likely to have restructured away from retailing to new roles as office and entertainment centers before they were bypassed by more recent highway improvements.

- Proactive planning by local authorities can catalyze industrial development in the vicinity of bypass interchanges.

- In the absence of water and sewer services, small town bypasses alone are unlikely to facilitate sprawl development. However, in the longer term, sprawl may be facilitated if funding is provided for water and sewer.

- In cases where bypasses are within city limits, cities are less likely to be concerned about impacts on existing development.

❖ D.3 Richmond, VA: I-295 Bypass

Project and Setting. The capital city of Richmond, with 192,000 residents, lies at the core of the Greater Richmond Metropolitan area. The I-295 Bypass connects Interstates 95 and 64, forming three-quarters of a loop around the city of Richmond. The bypass was undertaken in three phases. Phase I, the southeastern quadrant, was completed in the early 1980's. Phase 2, which forms the Northeast quarter of the loop, was finished in the mid-1980's. The final phase of the loop, stretching from I-95 north to I-64 west was finished in 1990. The 30-mile bypass has 18 interchanges. It most closely resembles the eastern bypass option for I-73 in Roanoke. The bypass, which lies 6 to 10 miles from the center of Richmond, is outside of the city limits in the surrounding counties of Price George, Charles City, Henrico, Bedford, and Goochland Counties.

Population & Economy. The population of the Greater Richmond metro area, which now stands at nearly 950,000, has been expanding at an average annual rate of 1.5% since 1980. The city, whose population has declined by nearly 1% a year over this period, represents a shrinking share of the metro area total – currently some 23% compared with 35% in 1980.

The number of jobs in the MSA has grown by 12% to 525,000 since 1990. The dominant industries are chemicals, printing, business services, and back office financial services. Like its population, the city's share of the region's jobs is declining both proportionally and in real terms. Since 1990, the number of jobs in the city declined by 10 % while jobs in the suburbs have increased by 27%. The city's share of MSA jobs, some 40% in 1990, had declined to one-third by 1998.

Downtown Richmond has a high proportion of government employment and a relatively strong financial sector. Tourism is developing, as is the institutional sector with the expansion of the downtown campus of the Medical College of Virginia. It is generally agreed that the city has "turned the corner" since the recession years of the early 1990's and is beginning to adapt to a new, more specialized role as an institutional, financial, tourist, and entertainment center.

Impacts on Traffic. The I-295 Bypass has not resulted in any decreases on I-95, which is still the main route for non-local traffic going North and South. The bypass carries less than 20% of the total traffic. Nearly equal proportions of trucks use the new bypass and the original route. Three main factors explain this:

Prior to opening the bypass, I-95 was a toll road. Due to fears of loss of traffic to the bypass, tolls were dropped from the old route when the bypass opened. This change apparently encouraged more local traffic on the original route.

The old I-95 route retained the official name of the highway, which has encouraged some of the passing trade to stay on the old route. Tourism and recreation opportunities in the inner city are clearly sign-posted, a fact that has probably stimulated tourism.

Although the speed limit is 10 mph lower in the old route, I-95 is still the shortest route in mileage. The fact that the new bypass is 7 miles longer than the old route is a key factor for many truckers, because trucks are compensated based on the shortest distance between pickup and delivery.

Overall growth in traffic has been an additional factor in maintaining the previous level of traffic on I-95. Currently, about 120,000 vehicles a day use the old I-95 route, while only 20,000 use the new outer belt. About 10% of vehicles on both routes are trucks.

Impact on Development in the Suburbs. The main impacts of the I-295 bypass have been in opening sites for development in the suburban ring. In this way, it has

been typical of real estate markets in larger cities responding to new opportunities posed by outer beltways, particularly at interchanges where two major highways intersect.

Considerable industrial development has occurred along the northern arc of I-295. The White Oak semi-conductor plant, a joint venture between Motorola and Siemens has located in Eastern Henrico County, near the junction of the bypass and I-64 east, near the airport. Another Motorola plant is planned on the west side, near the junction of I-64 and the bypass. These two investments have drawn a number of semi-conductor vendors to the White Oak Industrial Park on I-295. A new 1000 acre Metalview Industrial Park on I-295 South in Chester is now being developed. Next door is the Riverbend Office park, a mixed-use office, industrial, and residential golf course community.

Four major regional shopping malls have located near interchanges along 295. Another large new upscale mall is planned near the intersection of I-64 and I-295. Hotels have developed on the south end of the interchange in Chester County and near the airport, at the eastern end of 295 near the junction with I-64. Also near the airport is the site of a major investment from outside the region – the corporate headquarters of Lavetee Shampoo Inc. I-295 has strengthened the airport by making it more accessible to the smaller towns to the north and south of the Richmond MSA.

Most of the residential development has been in the northwestern segment of the 295 arc, in Eastern Henrico County, where water and sewer are available. The Wyndam residential development near the Innsbruck Office park in the northwestern suburbs, with several thousand acres, is the largest. The abutting, largely-rural Hanover County, where water and sewer are currently more limited, is expected to be the focus of future housing development.

Impacts on Development in the City. As previously noted, the city has been losing population and jobs to the suburbs since construction of the bypass began in the early 1980's. The city now has 23 % of the region's population and 35% of its jobs, compared with 25% and 40% respectively in 1990. A number of major employers, including the Richmond Times Dispatch and Bonsecouer Hospital, with 1500 jobs have expanded to locations on I-295. Other expanding manufacturing plants, such as the shopping cart maker Rehig, have moved to the outer belt. But a growing number of new, smaller firms have absorbed inner city sites vacated by expanding industries. One such operation is a $50 million switching station developed by Cavalier Telecom, employing 200.

Downtown Richmond lost two major department anchor stores in 1992, shortly after the bypass was constructed and malls along I-295 began to open. Downtown retailing is now limited to a few specialty stores, but the downtown office market, with a vacancy rate of 8%, is relatively healthy. Growth in state and local government employment has absorbed some of the available commercial space. The downtown

campus of the Medical College of Virginia has spawned the development of a biotech park, demonstrating the city center's resilience in adapting to new circumstances.

Tourism in downtown is accelerating with the expansion of the Convention Center and the opening of the Canal Walkway. The institutional sector has expanded to absorb some of the sites abandoned by retailers. Inner city residential development is picking up; 1000 units of housing will be renovated this year.

Conclusions. At the regional level, the bypass has spurred economic growth by providing access to sites for high technology and consumer products industries from outside of the region. Without the new outer loop, these investments may not have occurred due to the lack of sites along the existing interstate network. However, relocations of retailing, local industries, offices, and residents facilitated by the outer belt have weakened the city's downtown business district. This drop has been partially offset by increased demand for center city services, restaurants, and entertainment establishments. Without the bypass, local planners agree there would have likely been more redevelopment at high densities in the downtown area. However, they also agree that the inner city has and will continue to adapt to new roles. While the I-295 bypass has attracted some investment away, there have been benefits. On balance, the impact of the bypass on the city is generally perceived to be neutral.

Lessons Learned. The following lessons emerge from this case:

- If a bypass lengthens a journey, many long-distance travelers may choose the old route, particularly trucks.

- Even in cases in which bypasses have a limited impact on redirecting traffic, development and economic impacts can be profound.

- "Greenfield" sites having easy accessibility to water and sewer services will be most likely to be developed for industrial, commercial, and residential uses after construction of an outer beltway -- in the absence of land use controls.

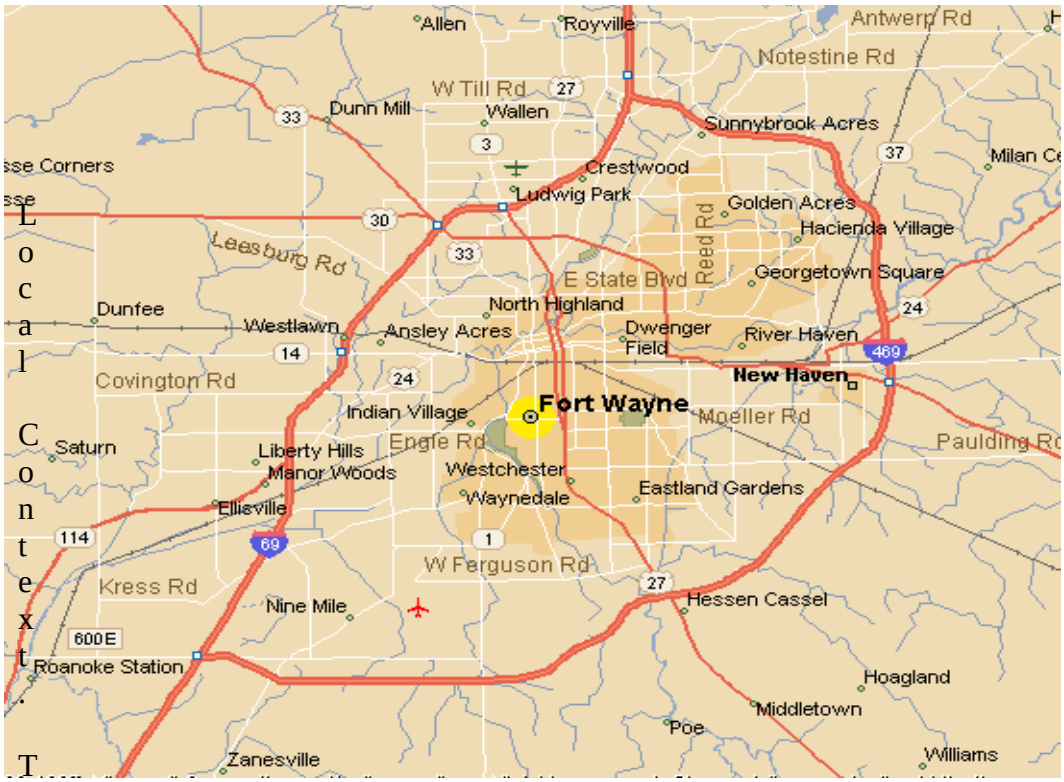
- Inner cities cannot always compete with outlying "greenfield" sites for new industrial, commercial, and residential development, but can strive to seek new roles as centers of tourism, entertainment, and institutions.

❖ D.4 Fort Wayne, Indiana: I-469 Bypass

Project and Setting. Fort Wayne's I-469 bypass was finished just four years ago. It replaced an old inner-urban bypass with at-grade intersections (Coliseum Road), extending from US 33 on the northwest to US 14 on the city's west side to connect the spokes of radial state highways transgressing the metro area.

The new bypass is outside of the city limits, in unincorporated districts within Allen County. At the time of planning for the bypass, concern was expressed by businesses both in the downtown area and on the old Coliseum Road bypass, that the new road would divert traffic and business. City and regional planning officials, however, supported the bypass on the grounds that the existing transportation infrastructure was inadequate to make the region competitive for future growth and investment. Immediately following construction of the I-469, traffic volumes on the old bypass were down by about 5,000 to 8,000 vehicles a day. Due to growth in traffic, however, traffic counts are now up to their past pre-bypass levels – about 30,000 to 50,000 vehicles a day. A significant volume of truck traffic has been diverted onto the bypass, which carries a lower volume of 20,000 to 30,000 vehicles a day, on average.

The 30-mile long I-469 bypass goes from Interstate 69 south of the city limits, extending eastward in an half loop back up to I-69 on the north side of the city. Since it adds 15 miles to the journey, the bypass is used primarily for local and regional travel rather than for long-distance I-69 travel. It provides a connector and distributor for traffic on the older US radial highways forming spokes around the city of Fort Wayne. US-30, US-24, and US-33 are now routed along the outer rim of the city by the bypass. About 70% of the traffic on the bypass is regional, with the balance being local traffic.



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Population and Economy. The Fort Wayne Indiana metro area with just over 300,000 people and 174,000 jobs has experienced modest growth since 1980. Over the past 18 years, population has grown by only 0.1% a year, while jobs have increased by 1.3% annually. The city of Fort Wayne, in Allen County, has 203,000 residents. It has grown by 35,000 people within the past decade, although that has been due largely to annexations.

The area has traditionally been dependent on manufacturing, which accounts for 26% of the workers, compared with the national average of 15%. The auto industry continues to be dominant. The city is an important regional retailing and service center. The nearest large cities are over 100 miles away, giving Fort Wayne a trade area that extends 50 to 60 miles outward.

Impact on New Development. Thirty years before the completion of the I-469 bypass, Interstate 69, bordering the city on the western fringes, was completed. This road was routed about 4 to 5 miles west of the city center through what was then a rural area. It took over 10 years for I-69 to have a profound impact on development patterns in the metro area. Eventually, however, new shopping malls located at interchanges along the new interstate took trade from downtown, and ultimately helped bring about the collapse of the downtown retail sector. One major utility, a number of corporate headquarters, and a major hospital moved to sites along the new highway, pulling residential development to the west side of the metro area.

To date, the I-469 Bypass, completed just four years ago, has had little impact on development, except in the southeast and the northeast where residential growth was already occurring. There has been no "leapfrog" effect on development in the region. The bypass transgresses largely rural unincorporated areas of Allen County, most of which lack adequate water and sewer capacity for commercial development.

On the southern end, there has been no development at the first two interchanges, which are still surrounded by green fields. A major food distribution warehouse has located near the third interchange, near the airport. This site on I-469 was key in attracting the new employer into the region. The county is spending $8 million to increase the capacity of water and sewer systems here to attract more freight forwarding and distribution operations.

There has been no development for the next six interchanges, which span a six-mile arc on the southeast of the region. Due east of the city center, at the Interchange with Route 30, a truck stop, fast food, and convenience retail strip has developed to serve the passing trade on I-469. At the next interchange to the North, at Route 24, a major HVAC manufacturer, Aeroquip Corp., has located, bringing 550 new jobs into the region. The highway was fundamental to the decision to site the plant in Fort Wayne.

The next junction with Route 37 has seen the most commercial development in the form of box retail uses. There is now a large Meijers grocery / general merchandise

super store. A Menards home improvement store will soon open at the site. These stores are fed by the residential development in this area. The pace of house building here had slowed during the recession and was considered to be suffering due to its poor access. The bypass and the strong economy have spurred residential growth supported by the retail uses. In other words, the population was here before the retailers and was a necessary pre-condition to the establishment of outlets here. The bypass also facilitated the decision, but was not fundamental.

Access restrictions on Maplehurst Road, at the next interchange, have discouraged large-scale development, but some smaller strip retail uses are now going through permitting. The most active development hot-spot in the region is just north of the I-469 bypass on I-69 where two satellite facilities for two local hospitals, a large corporate headquarters facility, and apartments, with scattered commercial uses have developed. As previously noted, I-69, in the eastern part of the Metro area is the most-developed artery and is likely to be some time before I-469 catches up.

Impact on the City of Fort Wayne. The merchants on Coliseum Road, the old route, who vehemently opposed the project during the planning stages have not been negatively affected by the bypass. Average daily traffic on the old bypass route exceeds that on the new bypass by 50% to 60% and traffic volumes on the old road are now up to their previous levels before I-469 was built. New sites on Coliseum Road continue to be developed for retail and convenience uses.

Downtown Fort Wayne was nearly devastated in the mid 1960's in the wake of the opening of large regional malls along Interstate 69 and the loss of corporations and institutions to sites along the new highway. Prior to construction of the bypass, downtown had struggled to re-established itself as a corporate center for business and financial services and as a cultural and educational center. There has been some reuse and redevelopment of old buildings, but funds are low and, in a town dominated by manufacturing, the office market is weak. High vacancy in existing Class A space has been a problem, even during recent bull economic times.

New fringe-area housing development at the northern edge of I-469 has not hurt the city's housing market, which is generally healthy, with rising prices and brisk sales. About 1500 to 1600 new permits are granted each year for new housing units. Residential vacancy is low.

Conclusions. Fort Wayne presents a typical case of a short-term development response to a fringe-area bypass in a community of 200,000 to 300,000. Except in areas with existing pressure for development, like the airport and the burgeoning northeast suburbs, there has been little development at interchanges of the bypass. The bypass, has, however, begun to attract some industrial uses that are bringing new jobs into the region. Availability of infrastructure is critical for development and the local authorities have been active in raising funds to bring water and sewer to target industrial sites near the airport. In the longer term, when sites along the more established I-69 western development corridor are saturated, more development will

be pulled toward the east. Gradually, the focus will shift to the east toward I-469. In a slow growth region, this shift could cause vacancies in the inner core. But the process is expected to be slow, allowing the inner areas to adapt to new, lower-density uses.

Lessons Learned. The Fort-Wayne I-469 Bypass illustrates the short-term impacts on fringe development in a slow-growth environment. The most notable points are:

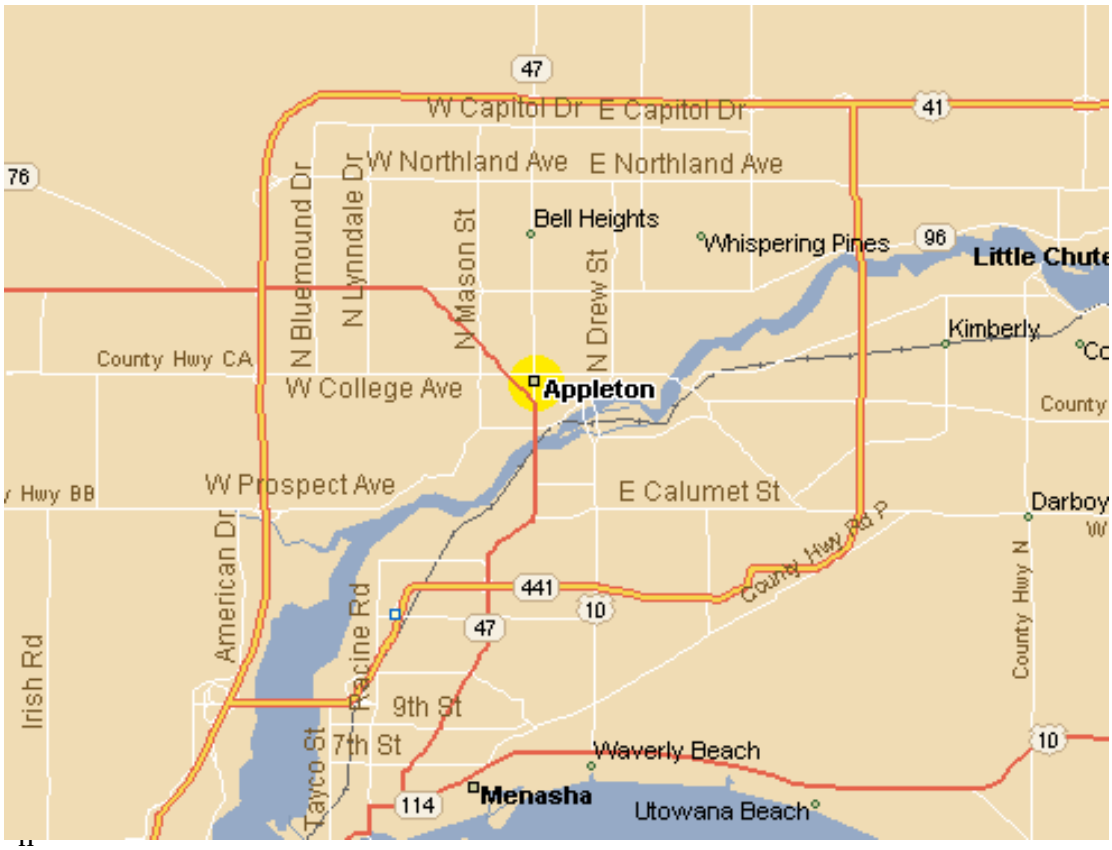
- A new interstate corridor can open up sites for development that can attract investment from outside of the region. However, without supporting infrastructure and a supporting population base (in the case of retailing), there will not necessarily be any immediate development explosion.

- In the longer term, outer-beltway bypasses may have profound effects on development patterns, but in small, slow-growth cities this effect could take 20 years.

❖ D.5 Appleton, Wisconsin: Route 441 Bypass

Route 441 is a new freeway which skirts around the city of Appleton, Wisconsin, forming part of an outer ring road bordering the city on the east and south sides. The road is not really a bypass for long distance traffic, which continues to be routed along the US- 41 freeway. Its main function is rather to route local traffic around the city. Planning for Route 441 began in the 1970's, but was not completed until 1992. The seven-mile long freeway has four major interchanges. Most of the development opportunities near these interchanges are in the surrounding counties of Oshkosh, Winnebago, and Outagamie.

Context. Appleton is a city of 72,000 within an MSA of 350,000. The population of the MSA has been growing by about 2% a year, in line with employment growth. Jobs in the MSA have grown by about 23% since 1990, but job growth in the city has been significantly lower at just 2% over the nine-year period. Meanwhile jobs in the rest of the MSA have grown by 30% since 1990. The city now has 20% of the region's jobs compared with 25% in 1990. The home of Appleton Paper Company, manufacturing is the major employer. In the city, business and financial services are strong and tourism is emerging as an important employer.



Impact on New Development. Aside from relieving the US-41 freeway of local traffic, the major impact of Route 441 has been to spawn retail development at the interchanges. Three major "Power Center" developments, anchored by discount mass merchandisers and "category killer" big box stores, have developed at its interchanges. In total, about 100 acres have been developed for retailing. The new space has been supported by the strong growth trend, averaging about 2% a year over the past decade. This growth is now slowing to about 1% a year and planners fear the area is becoming over-shopped, resulting in retail vacancies.

Driven by the region's strong industrial tradition, about 100 acres of industrial land near the interchanges have also been developed. A more limited amount of office space has been developed in suburban locations near the interchanges. Some residential sprawl development at the outer fringes of the MSA has been supported by the infrastructure serving commercial development along Route 441, but most has occurred in areas not directly served by the freeway.

Impact on the City Center. Retailing in downtown Appleton was hard-hit by the Fox River Mall, a 1.4 million sq. ft. development on the western edge of the MSA that opened in the late 1970's, well before Route 441 was built. Since then, downtown Appleton has restructured away from retailing and toward a more

specialized role as a financial services and entertainment district. Some redevelopment and reuse of retail stores as office space has been funded by CD grants and by special Tax Increment Financing districts. A downtown shopping mall development has been moderately successful, retaining one department store downtown.

The business and financial services sector is strong and vacancy in offices has been low. A $32 million Performing Arts Center is now under construction to reinforce the city's role as a tourism, entertainment, and cultural center. Hotels, convention facilities, and restaurants downtown are reported to be thriving. Daytime office activity is supplemented in the evenings by patronage of entertainment and tourist outlets.

Conclusions. Route 441 has had both positive and negative impacts on the city of Appleton. On the positive side, the road has relieved traffic on Interstate 41 and on routes along the edges of the city. The new highway has facilitated about 100 acres of industrial development.

On the negative side, Route 441 has spawned new retail growth that, with the deceleration in growth projected to occur over the next several years, may result in a surplus of retail space. The proliferation of discount power centers at the interchanges has had a negative impact, not so much on downtown Appleton, which has been restructuring away from retailing for the past twenty years, but on a number of small towns surrounding Appleton.

The new highway has also spawned some office development that may well have occurred in the city center without the interchange sites. Although the city has been active in financing redevelopment and reuse of downtown buildings, more redevelopment of downtown office space at higher densities would have been encouraged if sites on Route 441 had not been available

Lessons Learned. The following points emerge from this case study:

- Bypasses designed to serve local traffic can have a significant impact on the development and location of retailing and local services.

- Planners under-anticipated the large volume of retail development produced by a local traffic-serving outer ring road.

- Regional planning controls can be used to prevent sprawl and over-development of retail space, but in practice, prevention is difficult. In cases where a bypass transgresses a number of jurisdictions, there will be competition for tax-producing retail and other commercial businesses.

- A strong redevelopment program using community development funds and tax incentives can lower costs of redeveloping downtown sites for non-retail uses.

- Outer beltways can open up sites for industrial development, particularly in cities with a strong industrial tradition.

❖ D.6 Other Bypass Studies

The preceding case studies focused on medium-sized cities in the same size range as Roanoke. There have also been many prior studies of the economic impacts of bypass highways on smaller communities, whose downtowns are directly threatened by the loss of traffic. These include the following:

- *Wisconsin Bypass Studies.* In January 1998, WisDOT published the results of a year-long study of the economic impacts of highway bypasses on 17 Wisconsin communities bypassed since 1980.
- *Kansas Bypass Studies.* A 1996 study conducted by David Buress, of the Institute for Public Policy and Business research at the University of Kansas addresses some of the economic impacts of bypasses on 21 Kansas towns.
- *Iowa Bypass Studies.* A 1991 study for the Office of Advanced Planning of the Iowa Department of Transportation examined 11 cities and towns where highway bypasses had been constructed.
- *Texas Bypass Studies.* A study of bypassed towns in Texas by Johann Andersen et al used statistical models incorporating data on retail sales, gasoline sales, restaurant sales, and service receipts to analyze the economic base, business volume, and related economic impacts of highway bypasses on six Texas cities.
- *North Carolina Bypass Studies.* A 1991 report, "Impacts of Highway Bypasses on Community Businesses," was prepared for the North Carolina Division of Community Assistance and the I-40 Steering Committee.
- *Washington State Bypass Studies.* A 1994 study focusing on the impacts of bypasses on small cities in Eastern Washington State was funded by the Federal Highway Administration.

Summary of Findings. The wide range of highway bypass studies carried out around the country provides a generally consistent story. They indicate highway bypasses are seldom either devastating or the savior of a community business district. The locational shift in traffic can cause some existing businesses to turn over or relocate, but net economic impacts on the broader community are usually relatively small (positive or negative). Communities and business districts having a strong identity as a destination for banking, health care, other services, or for convention visitors or tourists are the ones most likely to be strengthened due to the reduction in traffic delays through their centers.