The Impact of Hillsdale Drive Extension on Local Businesses and Economy

Prepared for the City of Charlottesville

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1. Executive Summary

US Route 29 runs on the edge of the City of Charlottesville and Albemarle County. It is a major thoroughfare to access local businesses, neighborhoods, schools, and other regions such as Lynchburg and Washington, DC. With the population and business growth, the traffic in the area around US 29-Hydraulic-US250 Bypass has been increasingly congested. A priority regional strategy is to complete a network of local roads parallel to Route 29. One critical component of that strategy is the extension of Hillsdale Drive from Greenbrier Drive to Hydraulic Road.[1]

The Hillsdale Drive extension is intended to provide an alternative for local traffic and improve access to existing and future businesses. Its design will not inhibit the development or redevelopment of the commercial/residential area. It is also intended to provide a pedestrian, handicapped and bicycle friendly facility that will be compatible with other safety improvements planned for the existing portion of Hillsdale Drive.[2]

In addition, construction of Hillsdale Drive extension also presents an opportunity for economic redevelopment of the area. For example, vacant parking lot can be redeveloped to house shops or offices. With the change of traffic pattern

[1] See US-29-Hydraulic-250 Bypass Intersection Study (Phase I) by Thomas Jefferson Planning District Commission.

[2] See Location Study Report, JMT

and advent of public transit and bike routes, pedestrian friendly business such as cafes or bookstore may move to the region. Those opportunities can be articulated after a final route is chosen.

Chmura Economics & Analytics (CEA) was commissioned to estimate the economic impact of the Hillsdale Drive Extension. Economic impacts come primarily from two sources: 1) the construction project itself and 2) the changed business activities near the proposed Hillsdale Drive Extension. Millions of dollars of construction money will increase economic activity in the city, and create jobs in construction and related industries. A completed Hillsdale Drive will change traffic pattern and relocate several businesses. This new road could potentially have a sizable impact on the area shopping centers and city at large.

Four Alternatives are under consideration to estimate the impact of the road construction:

1. Alternative A-Meadow Creek Path
2. Alternative B-Senior Center/Pepsi Plant
3. Alternative C-Extend Pepsi Place through Seminole Square Shopping Center. The worse case calls for taking of 15 businesses while best case calls for taking of 5 businesses
4. Alternative D-Extend Pepsi Place behind Pepsi Plant and through Seminole Square Shopping Center

Table 1: Economic Impact Summary, City of Charlottesville					
	Alternative A	Alternative B	Alternative C-Best Case	Alternative C-Worst Case	Alternative D
Total Economic Impact due to Construction Outlay (2010)	$9,954,541	$5,353,444	$4,474,676	$4,474,676	$6,409,436
Annual Direct Impact of Hillsdale Drive on Study Area Businesses (After 2025)	-$1,776,757	-$1,508.463	$2,558,807	-$4,941,551	$13,656,546
Annual Ripping Impact of Hillsdale Drive on the City (After 2025)	-$431,204	-$416,086	$1,114,621	-$1,786,280	$5,666,462

Table 1 provides a high level summary of the estimated economic impact on the City of Charlottesville economy. The construction of a road in a busy shopping district will inject millions of dollars into the local economy and will create dozens of jobs. Not all alternatives of the Hillsdale Drive Extension will help to increase business activity in the study area. Only Alternative D and the best-case scenario of Alternative C have positive impacts on the area businesses, an annual impact of $13.6 million and $2.6 million respectively. The worst case scenario of Alternative C reduces annual sales of the study area by $4.9 million.

The major drivers for changes in businesses surrounding a new road come from two sources: the change of traffic pattern (including traffic volume, access and parking), and the relocation of businesses. From an economic perspective, Alternative D disrupts the fewest businesses, while improving traffic flow to the benefit of attracting both local residents and pass-through customers to the businesses in the study area.

2. Economic Impact of Construction

IMPLAN[3] was used to simulate the economic impact of the roadway construction project. The total construction outlay consists of three parts: preliminary engineering, right-of-way and utilities, and construction cost. Preliminary engineering usually consists of cost to conduct feasibility, environment, and economic impact studies. Right-of-way and utilities includes cost due to total taking of a number of properties. Table 2 lists the estimate of the total construction cost under the four alternatives.[4]

Table 2: Construction Cost

	Alternative A	Alternative B	Alternative C	Alternative D
Preliminary Engineering	$1,992,000	$1,199,000	$1,035,000	$1,114,000
Right-of-Way and Utilities	$13,214,300	$11,446,850	$15,243,500	$10,410,400
Construction Cost	$12,437,000	$6,666,000	$5,566,000	$6,090,000
Total Cost	$27,643,300	$19,311,850	$21,844,500	$17,614,400

Source: JMT

Alternative A is the most expensive in terms of construction because alternative B, C, and D all use existing roads to various degrees, while alternative A builds a completely new road through a wooded area to the east of Seminole Square Shopping Center. Among preliminary engineering cost, location study is budgeted to be $300 thousands, while the rest of the pre-engineering cost will be spent on designing. Consultants outside of Charlottesville are used, which reduces the spending effect to the region compared to the

[3] IMPLANPro Modeling software is used to calculate impacts for estimating broad effects from discrete economic events, such as changes in spending or employment. IMPLANPro was created by the Minnesota Implan Group (MIG), Inc.

[4] Construction cost was estimated by VDOT and provided to CEA by JMT.

situation where area consultants are employed. However, CEA applies 10% of the spending to the region to cover the cost of travel, lodging, and meals when consultants work on site for the studies.

Table 3 presents the total output effect of the roadway construction project on the economy of the City of Charlottesville. The project spans several years. From 2004 to 2006, the project is in the design phase, when the money spent on preliminary engineering will have some impacts on the city. Based on the project schedule, the environmental and economic studies are assumed to be completed in 2004, while the preliminary engineering cost is divided evenly among 2004, 2005, and 2006. 2007-2009 is scheduled for right of way and utility easement acquisition. That is when the money on right-of-way is spent. In this study, right-of-way spending is assumed to have no economic impact.[5] The construction will not commence until June of 2009 and will finish at December of 2010. As a result, the majority of the economic windfall caused by construction will not materialize until 2009 and 2010.

[5] CEA contacted an expert in MIG (who is the producer of IMPLAN Pro). The expert confirmed that "The right of way really does not have any economic impact; there is no sector for that. It's a transfer of funds to the owners of the right of way and you really don't know what they are going to do with the money."

Table 3: Output Impact of the Construction, City of Charlottesville			Alternative A	Alternative B	Alternative C	Alternative D
2004	Preliminary Engineering	**Total**	**$41,105**	**$41,105**	**$41,105**	**$41,105**
		Direct	$30,000	$30,000	$30,000	$30,000
		Indirect	$4,934	$4,934	$4,934	$4,934
		Induced	$6,172	$6,172	$6,172	$6,172
2005	Preliminary Engineering	**Total**	**$77,241**	**$41,040**	**$33,553**	**$37,159**
		Direct	$56,400	$29,967	$24,500	$27,133
		Indirect	$9,260	$4,920	$4,023	$4,455
		Induced	$11,581	$6,153	$5,031	$5,571
2006	Preliminary Engineering	**Total**	**$154,412**	**$82,044**	**$67,076**	**$74,285**
		Direct	$112,800	$59,934	$49,000	$54,266
		Indirect	$18,492	$9,825	$8,033	$8,896
		Induced	$23,121	$12,285	$10,044	$11,123
2009	Construction	**Total**	**$3,193,955**	**$1,711,900**	**$1,429,408**	**$1,563,977**
		Direct	$2,285,924	$1,225,213	$1,023,032	$1,119,344
		Indirect	$522,813	$280,218	$233,977	$256,005
		Induced	$385,218	$206,470	$172,399	$188,629
2010	Construction	**Total**	**$6,487,828**	**$3,477,355**	**$2,903,534**	**$4,692,910**
		Direct	$4,641,118	$2,487,931	$2,077,065	$2,272,623
		Indirect	$1,063,034	$569,767	$475,746	$520,538
		Induced	$783,676	$420,035	$350,723	$383,744
All Years		**Total**	**$9,954,541**	**$5,353,444**	**$4,474,676**	**$6,409,436**
		Direct	$7,126,242	$3,833,045	$3,203,597	$3,503,366
		Indirect	$1,618,533	$869,664	$726,713	$794,828
		Induced	$1,209768	$651,115	$544,369	$595,239

As construction money is spent to hire workers and buy supplies, the spending will have a rippling effect through the city economy, even though some of those supplies and workers are not located in Charlottesville. For example, as demand for construction materials increases, the suppliers will accordingly increase their production and employment.[6] Further more, as incomes of newly hired workers increase, those workers will in-turn increase their consumptions, further boost the demand in the area.[7]

The total economic impact for Alternative A on the City of Charlottesville is estimated to be $9.95 million through all years.[8] Among them, preliminary engineering will contribute about $272 thousand, accounting for only 2.7% if the total impact. The rest of the economic impact will occur in the second half of 2009 and the full year of 2010. Among those $9.95 million of total impact, $7.13 million (72%) is the direct impact resulting from the direct purchase on construction materials and services locally. $1.62 million (17%) is the indirect impact, resulting from increased output by related suppliers of the construction project. The rest (13%) can be attributed to induced impact, resulting from increased consumer spending due to new jobs created by the construction project. The economic impact of Alternatives B, C, and D can be interpreted similarly.

The construction of the Hillsdale Drive Extension will create jobs in construction and related industries in the City of Charlottesville. It will bring more businesses to area restaurants and shops. As a result, those businesses may also increase their hiring. The employment impacts on Hillsdale Drive Extension under four alternatives are estimated through IMPLAN Pro.

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[6] This is usually called indirect impact.
[7] This type of impact due to change in income is called induced impact.
[8] Some of the suppliers and workers for construction are out of the City of Charlottesville. IMPLAN Pro uses 2001 actual data to estimate that proportion.

Table 4: Employment Impact, City of Charlottesville			Alternative A	Alternative B	Alternative C	Alternative D
2004	**Preliminary Engineering**	**Total**	**0.6**	**0.6**	**0.6**	**0.6**
		Direct	0.4	0.4	0.4	0.4
		Indirect	0.1	0.1	0.1	0.1
		Induced	0.1	0.1	0.1	0.1
2005	**Preliminary Engineering**	**Total**	**1.0**	**0.5**	**0.4**	**0.5**
		Direct	0.8	0.4	0.3	0.4
		Indirect	0.1	0	0	0
		Induced	0.1	0.1	0.1	0.1
2006	**Preliminary Engineering**	**Total**	**2.0**	**1.0**	**0.9**	**0.9**
		Direct	1.5	0.8	0.6	0.7
		Indirect	0.2	0.1	0.1	0.1
		Induced	0.3	0.1	0.2	0.1
2009	**Construction**	**Total**	**31.4**	**16.9**	**14.1**	**15.4**
		Direct	22.1	11.9	9.9	10.8
		Indirect	5	2.7	2.2	2.4
		Induced	4.3	2.3	1.9	2.1
2010	**Construction**	**Total**	**62.6**	**33.6**	**28**	**30.7**
		Direct	44.1	23.6	19.7	21.6
		Indirect	9.9	5.3	4.4	4.8
		Induced	8.6	4.6	3.9	4.2
All Years		**Total**	**97.6**	**52.6**	**44.0**	**48.1**
		Direct	68.9	37.1	30.9	33.9
		Indirect	15.3	8.2	6.8	7.4
		Induced	13.4	7.2	6.2	6.6

Table 4 shows that the jobs created by preliminary engineering are minimal as outside consultants are hired for those consulting services or services are provided by current VDOT staff in Culpeper. When construction starts in 2009, more jobs will be created. In alternative A, for example, there will be 63 jobs created by Hillsdale Drive Extension project in 2010 and 31 jobs created in 2009. Of the 63 jobs created in 2010, 44 of them will work directly for the highway construction, 10 of them will work on the related or support industries such as architectural service, auto-repair, wholesale trade, and food and beverage stores. Those industries provide goods and service for the highway construction. Nine jobs are created due to the increased consumer spending of those newly created jobs. Those 9 jobs are distributed among groceries, gas stations, restaurants, hospitals and other consumer related retail and service industries. Alternative B, C, and D will bring in far less jobs than Alternative A. The total number of jobs created under those three alternatives range from 44 to 53 jobs.

The economic impacts of four alternatives are proportional to the total construction cost.[9] As a result, Alternative A will have the biggest economic impact on the city as it is the most expensive. However, the economic impact and job creation of highway construction should not be construed as the sole criterion in decision making among the four alternatives. Different routes will have significant impacts on area businesses, which are integral parts of the economy of the City of Charlottesville. Study of those impacts is the focus of the next section.

3. Economic Impact of Hillsdale Drive Extension

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[9] This construction cost excludes spending on right-of-way and utilities.

This section evaluates the impact of a finished Hillsdale Drive to area businesses. Even though construction process may cause traffic problems and negatively affect area businesses, since those impacts will occur in less than a two-year period, those impacts will not be the focus of this study. Instead, this section concentrates on the impact of a finished Hillsdale Drive Extension on area businesses.

3.1. Current Business Inventory

Currently, the proposed construction area is a major shopping destination for the residents of the City of Charlottesville and surrounding counties. The central section of this area is Seminole Square Shopping Center. Some other major shopping centers in the immediate proximity are Kroger Center and K-Mart Plaza. The first step to determine the economic impact of a new road is to understand the current business profile of the area.

Table 5: Businesses in the Study Area	
Cinema 4	1
Holiday & Hydraulic, W	14
Hydraulic North, W	4
Hydraulic-Michie	2
K-Mart Plaza	3
Kroger Center	9
Seminole East	21
Seminole North	16
Seminole South	18
Seminole West	13
Total	101

Source: City of Charlottesville, JMT and CEA

After studying the hundreds of business names and addresses provided by City of Charlottesville and area businesses, CEA concludes that 101 businesses will be impacted due to their proximity to the Hillsdale Drive. Furthermore, those 101 businesses are distributed into 10 retail areas.[10] Appendix 1 defines the 10 retail areas in this study. The majority of the businesses are in Seminole Square Shopping Center to the east of US 29. Four retail areas are separated by Zan Road, Seminole Court, Line Road, and India Drive, including 68 businesses. In addition, there are 9 businesses in Kroger Shopping center, and 2 in Kmart Plaza. There are 14 businesses on US 29 between Holiday Drive and Hydraulic Road. 4 businesses are located on US 29 to the north of Hydraulic Road, and 2 businesses are located near the intersection of Hydraulic and Michie Drive. Even though businesses outside Seminole Square Shopping Center do not lose sales directly due to construction, some of them will lose parking spaces, and some of them will be affected by the changed traffic pattern in the new Hillsdale Drive. As a result, they are included in the study.

The businesses noted above serve a wide range of needs for area residents, especially those who are low-to-moderate income and have limited access to cars. The shops in this study area include grocery stores, furniture stores, discount department stores, personal services shops, and doctor and lawyer's offices. The most common businesses in the area are restaurants, with 13 of them. Followed by personal care service, which includes hair salon, nail salon, and shoe repairs--shops commonly found at community shopping centers. Table 6 presents the diversity of business in this region.

[10] These 10 areas border Hydraulic/US29/Hillsdale Dr. This is defined for easy analysis of traffic volume and parking. For example, Seminole Square Shopping Center is divided into 4 retail areas because each of those 4 areas is distinct in terms of traffic flow and loss of businesses.

Table 6: Type of Businesses in the Study Area	
Foot Service and Drinking Place	13
Personal Care Service	12
Sporting Good, Hobby, Book and Music Store	7
General Merchandise Store	6
Miscellaneous Store Retailer	6
Clothing and Accessory Store	5
Auto Repair and Maintenance	4
Financial Service	4
Real Estate	4
Doctor's or Dentist's Office	3
Food and Beverage Store	3
Health and Personal Care Store	3
Telecommunications	3
Building Materials and Garden Supply Store	2
Dry-cleaning and Laundry Service	2
Employment Service	2
Fitness and Recreational Sport Center	2
Furniture and Home Furnishing Store	2
Gas Station	2
Hotels and Motels	2
Advertising and Related Service	1
Auto Rental and Leasing	1
College, University and Junior College	1
Federal Military	1
Legal Service	1
Maintenance and Repair of Buildings	1
Newspaper Publisher	1
Other Amusement and Recreation Industry	1
Other Personal Service	1
Photographic Service	1
Scientific Research and Development Service	1
Manufacturing	1
Specialized Design Service	1
Car Wash	2

Source: City of Charlottesville, JMT and CEA

The businesses in the study compete with a number of major retails centers in the City of Charlottesville and Albemarle County. The Barrack Road Shopping Center, located in the city, is about a mile south of the study area. Another proposed shopping center in the area is Albemarle Place, a large shopping center near the intersection of US 29 and Hydraulic Road in Albemarle County. The impact of a competitive environment on businesses in the study area will not be estimated in this study, even if the change in competitive landscape is due to Hillsdale Drive Extension.

3.2. Estimating Baseline Sales

The shopping centers impacted by Hillsdale Drive Extension are commonly known as a community shopping center.[11] Community shopping centers are built around a junior department store, variety store, or discount department store as a the major tenant, in addition to a super market. To assess the impact of a new road and changed traffic pattern, it is necessary to estimate the current sales (year 2003) as the benchmark for change.

Unfortunately, retails sales of individual business are not available because most of the financial data are confidential. CEA estimates sales volume with the help of the physical size of the business, by assuming fixed sales per square feet data. A partial aggregated list of square footage data were obtained, which contains 55 of the impacted businesses. For the remaining 46 businesses, square footage per store assumptions from the Urban Land Institute (ULI) is utilized. Except for a few exceptions such as food and

[11] By the definition of the Urban Land Institute, this area is classified as a community shopping center. The community center makes merchandise available in a greater variety of sizes, styles, colors, and prices. Many centers are built around a junior department store, variety store, or discount department store as the major tenant, in addition to a super market. (*Dollars and Cents of Shopping Centers*, 2000).

beverage store, general merchandize store, and furniture and home furnishing store, the size of the store in study area is comparable to the national median. Please see Appendix 3 for detailed assumptions.

Table 7: Estimated Benchmark Sales, 2003[12]		
Cinema 4	$	1,513,947
Holiday & Hydraulic, W	$	12,498,417
Hydraulic North, W	$	2,168,884
Hydraulic-Michie	$	843,469
K-Mart Plaza	$	14,346,966
Kroger Center	$	30,611,354
Seminole East	$	51,767,331
Seminole North	$	12,382,075
Seminole South	$	26,264,954
Seminole West	$	12,961,171
Total	$	165,538,569

In addition to applying square footage assumptions to 46 businesses, CEA also applies sales per square foot assumptions from ULI to estimate the sales for 2003.[13] For professional services, including doctor's offices and employment services, that do not have sales per square feet information, CEA first estimates the number of employees in those offices.[14] Afterwards, CEA runs the IMPLAN model to arrive at the annual output of

[12] The Sales estimate for Seminole North and East was adjusted up by 5% based on the comments from the representative of the shopping center.
[13] Since assumptions from ULI are based on 1999 sales value, CEA adjusted those sales values for inflation to estimate sales of 2003. According to Bureau of Labor Statistics, the consumer price index (CPI) for December of 1999 is 168.8, and CPI for December of 2003 is 185. This translates into an increase of 9.5% in overall price level.
[14] 250 square feet per worker assumption is used. See "Economic Impact Analysis of High Street Williamsburg" by CEA, and "Impact Analysis of Power Plant Project Richmond" by CEA.

those businesses. For hotels in the study area, an estimate of 31[15] workers per hotel is assumed to estimate the economic impact.

The overall sales of 10 retail areas are estimated to be $162 million in 2003. Seminole East, which includes Giant food store and Office Depot, ranks first with $49 million in sales. These numbers will serve as a bench mark to measure the changes caused by the Hillsdale Drive Extension.

3.3. Factors Affecting Sales

There are many factors that could affect sales, such as the economy, major holidays, or other seasonal effects. In this study, however, CEA will be focusing on the impact of area traffic on sales in the surrounding shopping centers. Traffic pattern changes will occur both in the construction phase and after construction is completed. Construction of a highway in a crowded shopping area may cause traffic jams and long time delays for the shoppers. Construction may also close certain roadways, blocking access to certain shopping centers, thus negatively affecting sales. On the other hand, after Hillsdale Drive is completed, through traffic can be diverted from the local shoppers, thus improving the traffic flow and congestion, as well as business activities. Due to the scope of the project and short duration of the construction, the changes in sales in construction phase are not estimated.

[15] Average hotel worker per hotel in Charlottesville is from www.JobsEQ.com

In this study, we assume that three major traffic-related factors could affect the number of shoppers, as well as sales of a shopping center. They are traffic flows of the surrounding roadways, the available parking spaces of a shopping center, and the number of accesses (entrances and exits of a shopping center).

The relationship between traffic flow and sales should be considered from two angles. That is, two types of shoppers visit a store—the random stop-by and the pre-determined shoppers. Random stop-bys are those who pass through an area and decide to stop for various reasons. They could be travelers who stop for a meal or buy some drinks or snacks. They could also be people who are driving through and some of the shops catch their eye. Suppose on any given day, there is certain percentage of travelers who fall into this random stop-by category--more traffic flow will likely bring more shoppers and sales. Since US 29 is a major thoroughfare linking Washington and the central Virginia cities of Charlottesville and Lynchburg, a significant amount of sales in Seminole Square and other neighboring shopping centers should come from random stop-bys.[16]

On the other hand, the relationship between traffic flows and sales from pre-determined shoppers are not so positive. Those pre-determined shoppers are normally area residents who know what they want and where to get it. They also know other alternative shops where they can find similar commodities. They can be weekly grocery

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[16] This will be different if the shops are far away from a major highway. For example, a neighborhood restaurant will get mostly local residents, rather than customers who are passing through the area.

shoppers, weekend home improvement warriors, or area families who eat out. For them, slow-moving traffic will deter them from coming to this area. Those shoppers prefer fast moving traffic, so that they can go in and out quickly. The overall impact of changed traffic volume to an individual business largely depends on the clientele base of the business. For businesses that cater mostly to local customers (such as grocery store, personal care business), increased traffic can deter sales. For businesses with a large percentage of pass-through customers (such as fast food, gas stations), increased traffic can boost sales.

The second factor that could impact sales is the parking spaces available. It is commonly understood that if a shop has limited parking space, would-be shoppers will probably circle around and leave. Since different alternatives of the Hillsdale Drive Extension will take away parking for various shopping centers, the impact of parking on sales should be considered. However, the effect of reduced sales due to reduced parking only occurs when a parking lot is close to its capacity. If a parking lot is only half full at peak hours, taking away 20% of the parking space should have negible effect on sales.

Finally, the number of access points (entrance/exits) to a shopping center could also impact sales. To see this point, suppose there are two shopping centers with similar retail mix and parking capacity, surrounded by four streets with the same traffic flow. One center has only one entrance, while the other one has four entrances in each of the four streets. The second shopping center should have higher sales than the first. Since Hillsdale

Drive Extension may alter the access to several shopping centers, the impact of those changes to sales should also be examined.

3.4. Changes in Traffic, Parking and Access after Construction

The main purpose of Hillsdale Drive Extension is to separate local traffic from through traffic in US 29, thus reducing the congestion in the intersection of Hydraulic and US 29. By doing so, the project can improve the access and appeal of the area as a shopping destination and increase the sales for local businesses and tax revenue for the city. In this section, CEA analyzes the impact of Hillsdale Extension Drive traffic, parking, and access to area businesses. In combination with the base line sales volume, this analysis paves the way to assess how these changes will affect the sales of area businesses.

Table 8: Percentage Change in Total Traffic

Retail Areas	Current Average Daily Traffic[17]	A	B	C	D	No Build
Holiday & Hydraulic	69,100	38%	38%	39%	39%	40%
Hydraulic North	79,800	26%	26%	29%	29%	36%
Hydraulic-Michie	30,200	48%	79%	70%	70%	36%
K-Mart Plaza	93,550	27%	19%	19%	19%	32%
Kroger Center	78,100	28%	32%	30%	30%	35%
Seminole East	14,250	22%	85%	100%	144%	36%
Seminole North	70,600	16%	14%	35%	25%	35%
Seminole South	72,150	12%	12%	24%	24%	30%
Seminole West	74,725	12%	12%	20%	20%	29%
Cinema 4	3,650	-15%	-36%	-36%	-36%	33%
Overall	586,125	24%	26%	31%	31%	34%

[17] The average daily traffic of a shopping center is the summation of average daily traffic on all roads surrounding that shopping center.

Based on the traffic simulation data from JMT, CEA analyzed the traffic changes under different scenarios for all area shopping centers (Table 8). If Hillsdale Extension is not built, surrounding traffic for those shopping centers will increase by 34%. It varies from 29% for Seminole West to 40% for Holiday & Hydraulic section of US 29. If Hillsdale Drive Extension is built, the traffic congestion will decrease the most under alternative A, where the road is located to the far east of the shopping center. Under that scenario, passing through traffic on Hillsdale Drive will not mingle with shopping traffic. A similar situation occurs under alternative B, where proposed Hillsdale Drive runs to the east of the shopping area, right behind Office Depot and Giant Food in Seminole East retail area. Compared with the no-build situation, the total traffic flow on all surrounding roads in the study area will decline by 3 percentage point under Alternatives C and D. In those cases, Hillsdale Drive will still serve as a mix of shopping traffic and local through traffic.

The traffic that will have direct and immediate impact on business sales are travelers on the roads with access points to shopping centers because any additional shoppers have to travel through those roads to get to any of those stores. Take Seminole West as an example. This shopping center borders US 29, but there is no direct access from US 29 to this retail center. Even though the average daily traffic on US 29 is 60,900 currently, any of the travelers who want to stop at Seminole West have to arrive either from Zan Road or Seminole Court. Those travelers will be counted as traffic flow of Zan Road and Seminole Court. As a result, there exists a more direct relationship between traffic flows on roads with immediate access to a shopping center and the sales of businesses.

The overall pattern of changes in traffic flow on roads with immediate access to a shopping center is consistent with the changes in traffic flow in all surrounding roads (Table 9). Under the scenario of no-build, the shopping traffic will increase by 36% by 2025. Alternatives A and B will alleviate the traffic problem most significantly. Under the Alternatives C and D, the traffic volume problem for the retail area is more severe than the no-build situation. That is because Hillsdale Drive Extension runs through Seminole Square Shopping Center. While traffic on US 29 generally will improve by more than 5%, traffic on Hillsdale Drive, which can be used to access several shopping centers, will increase significantly.

Table 9: Percentage Change in Shopping Traffic

Retail Areas	Current Average Daily Traffic	A	B	C	D	No Build
Holiday & Hydraulic, W	69,100	38%	38%	39%	39%	40%
Hydraulic North, W	79,800	26%	26%	29%	29%	36%
Hydraulic-Michie	30,200	48%	79%	70%	70%	36%
K-Mart Plaza	30,250	17%	26%	17%	17%	37%
Kroger Center	26,600	21%	35%	24%	24%	38%
Seminole East	14,250	22%	13%	100%	144%	36%
Seminole North	6,900	15%	-2%	11%	57%	31%
Seminole South	11,050	-13%	-11%	45%	45%	30%
Seminole West	14,225	-13%	-13%	20%	20%	24%
Cinema 4	3,650	-15%	-36%	-36%	-36%	33%
Overall	286,025	26%	30%	37%	40%	36%

Source: JMT and CEA

The other factor that could impact area businesses is parking availability. As discussed in previous section, if current parking lots in area shopping centers are close to capacity, a reduction in parking space will impact the sales of businesses in the area.

Table 10 presents the changes in parking spaces of the ten retail areas that are impacted by the Hillsdale Drive Extension. Overall, Alternative A suffers the minimum ill effect in terms of parking capacity of the business. Alternative D will cause an average 12% reduction in parking spaces. Alternative C will reduce the parking capacity by 11%. Not all retail areas are impacted similarly. Retail areas to the west of the US 29 see no impact, while those close to the Hillsdale construction site will be impacted most. For example, Cinema 4 will see over a third of its parking spaces disappear under Alternatives C and D. K-Mart Plaza will lose 10% of parking space under Alternatives B, C, and D. The negative impact of loss of parking to area businesses and other organizations can be mitigated by compensation from Right-of-way part of the construction cost. The compensation will be determined through negotiation, on a case by case basis, based on damage estimates.

The last factor that could impact area business associated with Hillsdale Extension construction is the access to those retail areas. According to build alternatives, access points to most of the 10 retail areas will not be changed, with the exception of Cinema 4 and Seminole North. Cinema 4 currently has two entrances leading to its parking lot from India Road. It will lose one entrance at the end of India Road under Alternatives B, C, and

D, but will gain another entrance from the new Hillsdale Drive under Alternative B, C, and D. As a result, it will maintain current access points. Seminole North currently has two entrances on Seminole Court. A customer can reach all 12 shops from either entrance. Under Alternative C, Hillsdale Drive will bisect this shopping center in the middle. A customer from the west entrance will not be able to reach shops at the other end of the shopping center without crossing the busy Hillsdale Drive and vice versa. As a result, access to shops in the Seminole North retail area will be negatively impacted.

Table 10: Percentage Changes in Parking					
Retail Area	**Current Parking**	**A**	**B**	**C**	**D**
Holiday & Hydraulic, W	N/A	0%	0%	0%	0%
Hydraulic North, W	N/A	0%	0%	0%	0%
Hydraulic-Michie	N/A	0%	0%	0%	0%
K-Mart Plaza	554	0%	-10%	-10%	-10%
Kroger Center	N/A	0%	0%	0%	0%
Seminole East	744	-1%	-4%	-8%	-13%
Seminole North	488	0%	0%	-7%	-5%
Seminole South	277	0%	0%	0%	0%
Seminole West	332	0%	0%	0%	0%
Cinema 4	529	0%	-33%	-34%	-34%
Overall	2924	0%	-9%	-11%	-12%

Source: JMT and CEA

3.5. Relocation of Businesses

The construction of Hillsdale Drive in a busy shopping center will cause the relocation of several businesses. The relocations under different scenarios are listed in Table 11. Alternative C will cause the most losses of business as it runs directly through the Seminole North retail area. In the worst case scenario, up to 14 businesses in that shopping center have to be moved. In the best case scenario, 4 businesses will be impacted. The economic impacts of both cases are evaluated.

In economic impact analysis, the relocated businesses are treated as a loss of sales for the study area. Due to the high vacancy rate of the area, those businesses may relocate to the nearby shopping centers.[18] They can also relocate to surrounding counties. Without knowing the intended areas they plan to move to, CEA takes a pessimistic approach by assuming that those businesses will leave the study area.

Table 11: Businesses Lost Due to Construction

	Alternative A	Alternative B	Alternative C	Alternative D
Cinema 4				
Holiday & Hydraulic, W				
Hydraulic North, W				
Hydraulic-Michie				
K-Mart Plaza		Detail Express Car Wash	Detail Express Car Wash	Detail Express Car Wash
Kroger Center				
Seminole East	University Tire			University Tire
Seminole North			Up to 14 Businesses	
Seminole South				
Seminole West				

3.6. Sales Changes

Section 3.3 discussed three factors that could have an impact on businesses located in the construction area. Those are traffic volume, parking, and access. The effect of access

[18] See 29H250 Report, section Economic Analysis.

is minimal because currently, there is no plan to open new access or to close existing access to those shopping centers. The impact of parking is also minimal as parking capacity of those retail areas has not reached the saturation point.[19] The only exception is Cinema 4 shopping area where a third of parking spaces are lost under Alternatives B, C, and D. Sales estimates for Cinema 4 have taken into account the fact that sizable parking will be lost due to construction.

To assess the changes in sales due to traffic volume, it is necessary to understand the percentage of sales that can be attributed to pass-through customers and the percentage attributed to local residents. The sales of the first type usually increase with traffic, while the sales of the second type could decrease with traffic when it becomes congested.[20] The percentage that can be attributed to the local residents depends on the type of business. For example, almost all of the personal care service, professional service, and furniture stores should come from pre-determined, local residents. The percentage of pass-through customers increases for businesses such as restaurants, fast food, and gas stations. Almost all sales from area hotels and motels will come from outsiders. Please see Appendix 4 for assumptions used in this study.

[19] Seminole Square shopping center has a high vacancy rate. See previous study "US-29-Hydraulic-250 Bypass Intersections Study." As a result, it is likely that parking at the shopping center has not reached capacity. The exception is Cinema 4 where a third of parking could be impacted under Alternative B, C and D. In that area, CEA estimate a 2% decrease due to parking lost.

[20] The only exception is the manufacturing business, where its output is assumed not to be affected by traffic volume.

Table 12 summarizes the impact of changes in traffic volume on sales[21] under different alternatives, as well as no-build situations. The sales are broken down by retail areas. Under the no-build situation, the overall sales of the area businesses declines by 2% compared with benchmark sales of 2003 while traffic increases by 34%. This can be attributed to the fact that the majority of the area businesses cater to local residents. As a matter of fact, 67% of businesses are in the category of personal care, dry cleaning, and professional services. The only businesses that benefit from the no-build situation are located to the west of US 29 between Holiday Drive and Hydraulic Road. This retail area will see an estimated 16% increase in sales from 2003 figure. A closer look reveals that a high percentage of businesses in this area cater not only local residents, but also pass through customers. Of the 14 businesses here, there is one hotel, one gas station, and 4 restaurants. Those businesses will have more customers as traffic on the surrounding roads grows.

Of the four alternatives roads, without considering the loss of business, the traffic patterns of C and D will improve traffic flow to the benefit of area businesses. The overall sales in the area are expected to grow by 5% and 12% respectively. That is largely due to the fact that the Hillsdale Drive runs through the Seminole Square Shopping Center and traffic volumes more than double for Seminole East retail area. In that case, boost in sales

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[21] Let %S be percentage change sales, and %T be percentage change in traffic volume. Let %L be percentage of sales that can be attributed to local traffic. %S = (1+%T)*%L+ (1-%L)*(1+%T)*MAX((1-%T), 0.5).

due to increased traffic volume overweighs the negative impact caused by the reluctance of local residents coming to this region. On the other hand, under Alternatives A and B, proposed Hillsdale Drive runs to the east of the study area. Even though connection roads are provided to Seminole Court from Hillsdale Drive, the area receives limited boost in sales.

Table 12: Changes in Sales due to Traffic Pattern							
Retail Area	Benchmark Sales		A	B	C	D	No Build
Cinema 4	$	1,513,947	-5%	-20%	-20%	-20%	-2%
Holiday & Hydraulic, W	$	12,498,417	15%	15%	15%	15%	16%
Hydraulic North, W	$	2,168,884	-2%	-2%	-3%	-3%	-6%
Hydraulic-Michie	$	843,469	-12%	4%	-1%	-1%	-5%
K-Mart Plaza	$	14,346,966	-1%	-3%	-1%	-1%	-9%
Kroger Center	$	30,611,354	0%	-3%	0%	0%	-5%
Seminole East	$	51,767,331	-3%	0%	8%	32%	-9%
Seminole North	$	12,382,075	1%	0%	1%	-7%	-2%
Seminole South	$	26,264,954	-2%	-2%	-3%	-3%	0%
Seminole West	$	12,961,171	-3%	-3%	-1%	-1%	-2%
Overall	$	165,538,569	0%	-1%	3%	10%	-4%

Among all shopping areas, Cinema 4 shopping area will be negatively impacted the most by the new traffic pattern under Alternative B, C, and D, with an estimated reduction of 20% in sales compared with the benchmark. Movie theaters cater to local residents. Increased traffic congestion will likely deter movie-goers. Moreover, under Alternative B, C and D, a third of parking spaces will be lost for the movie theater, resulting in further decreases in the business of this shopping center. As mentioned above, Holiday and Hydraulic West of US 29 will benefit from new traffic patterns under all alternatives as its retail mix caters to pass-through customers. Kroger Center and K-mart

Plaza, on the other hand, will bear limited impact of the construction. Shops in current Seminole Square Shopping Center will be affected negatively by the new traffic pattern to various degrees.

The impact on area businesses due to the taking of business is the most pronounced under Alternative C (Table 13). Under the worst case scenario where a total of 15 businesses are lost, the sales of the area are reduced by 9% compared with benchmark sales of 2003. Under the best case scenario where only five businesses are taken, the decline in total sales is only 1% for all business in the study area.

Table 13: Changes in Sales due to Relocation of Businesses

Retail Area	Benchmark Sales	A	B	C		D	No Build
				Best Case	Worst Case		
Cinema 4	$1,513,947	0%	0%	0%	0%	0%	0%
Holiday & Hydraulic, W	$12,498,417	0%	0%	0%	0%	0%	0%
Hydraulic North, W	$2,168,884	0%	0%	0%	0%	0%	0%
Hydraulic-Michie	$843,469	0%	0%	0%	0%	0%	0%
K-Mart Plaza	$14,346,966	0%	-3%	-3%	-3%	-3%	0%
Kroger Center	$30,611,354	0%	0%	0%	0%	0%	0%
Seminole East	$51,767,331	-3%	0%	0%	0%	-4%	0%
Seminole North	$12,382,075	0%	0%	-16%	-78%	0%	0%
Seminole South	$26,264,954	0%	0%	0%	0%	0%	0%
Seminole West	$12,961,171	0%	0%	0%	0%	0%	0%
Overall	$165,538,569	-1%	0%	-1%	-6%	-1%	0%

Combining sales changes due to new traffic patterns and the loss of business, the overall changes in sales are presented in Table 14. Under Alternative A and B, overall sales will decrease by 1% after Hillsdale Drive Extension is completed, less than $2 million a year. Under Alternative C, there is a reduction of 6% in total sales in the worst case scenario, and 2% increase in best case scenario, compared with benchmark sales. Under Alternative D, overall sales will increase by 8% due to improved traffic patterns and less loss of current business bases, which amounts to $13 million of increased sales for the study area. This impact numbers do not include potential benefit of a separate bike route from Hillsdale to the Shopping Center under Alternative C. The proposed bike route can improve the access to shopping centers. However, if this bike route is used mostly by area residents for recreational purposes, the increase in sales to area business is marginal.

Table 14: Overall Changes in Sales of Study Area Businesses

Retail Area	Benchmark Sales	A	B	C		D	No Build
				Best Case	Worst Case		
Cinema 4	$1,513,947	-5%	-20%	-20%	-20%	-20%	-2%
Holiday & Hydraulic, W	$12,498,417	15%	15%	15%	15%	15%	16%
Hydraulic North, W	$2,168,884	-2%	-2%	-3%	-3%	-3%	-6%
Hydraulic-Michie	$843,469	-12%	4%	-1%	-1%	-1%	-5%
K-Mart Plaza	$14,346,966	-1%	-6%	-4%	-4%	-4%	-9%
Kroger Center	$30,611,354	0%	-3%	0%	0%	0%	-5%
Seminole East	$51,767,331	-5%	0%	8%	8%	29%	-9%
Seminole North	$12,382.075	1%	0%	-15%	-77%	-7%	-2%
Seminole South	$26,264,954	-2%	-2%	-3%	-3%	-3%	0%
Seminole West	$12,961,171	-3%	-3%	-1%	-1%	-1%	-2%
Overall	$165,538,569	-1%	-1%	2%	-3%	8%	-4%

3.7. Rippling Sales Effect on the Region

Any changes in the area businesses will have a rippling effect throughout the city. Take a grocery store as an example. As the sales decrease, the store will accordingly reduce its purchases from suppliers or local farmers. As a result, the output of related businesses, even they are not in the same region, will also decrease.[22] As sales decline, the store can further cut wages of current workers or even lay off employees. As a result, changes in sales also have important job implications. Furthermore, as income of current grocery store workers is reduced, they will in-turn cut back their consumption, further reducing the demand in the area.[23]

CEA estimates the indirect and induced output and employment impact due to the construction of Hillsdale Drive Extension under four alternative routes, as well as the no-build situation. Under Alternative C, two scenarios, where either 5 or 15 businesses are lost, are considered.

Table 15, Output Impact, City of Charlottesville				
	Direct	Indirect	Induced	Total Impact
A	-$1,776,757	-$233,789	-$197,415	-$2,207,961
B	-$1,508,463	-$193,758	-$222,328	-$1,924,549
C- Best Case	$2,558,807	$645,361	$469,261	$3,673,428
Worst Case	-$4,941,551	-$942,706	-$843,573	-$6,727,831
D	$13,656,546	$3,353,305	$2,313,157	$19,323,009
No Build	-$5,937,335	-$1,263,629	-$957,150	-$8,158,114

Table 15 presents a summary of the output impact. Under the no-build situation, the direct loss to businesses in the impacted area is $5.8 million. Combining that with indirect and induced impacts, the total loss could reach $8 million per year. In terms of economic impact, Alternative D will create an additional output of $19 million, with $13.4 million direct impacts on the study area and a rippling effect of $5.6 million. In Alternative

[22] This is usually called indirect impact.
[23] This type of impact due to change in income is called induced impact.

A and B, after the construction is completed, the total output impact will be a loss to businesses around $2 million. The total impact of Alternative C depends on the number of businesses that are taken. In the worst case scenario, the combined impact is a $6.6 million loss, while in the best case scenario, the new Hillsdale Drive Extension yields an estimated increase of $3.6 million in sales.

The impact on employment follows a similar pattern, with a net job creation in Alternative D, and job losses in the No-Build situation. The number of jobs impacted depends not only on the loss of business, but also the wage level of different types of businesses. For example, a million dollar loss of sales impacts 20 jobs in the grocery business, but only about 12 jobs in legal services, or doctor's offices.[24]

Table 16: Employment Impact, City of Charlottesville				
	Direct	Indirect	Induced	Total Employment
A	-16	-4	-3	-22
B	-29	-3	-3	-34
C- Best Case	66	7	6	80
Worst Case	-113	-12	-11	-136
D	323	39	31	394
No Build	-117	-16	-13	-146

4. Other Impacts

In 2004, the total assessed property value of Seminole Square Shopping center is $55,506,600. While a detailed breakdown of the property value in the impacted area is not available, the overall impact of Hillsdale Drive Extension can still be assessed. Aside from

[24] This is the number estimated with IMPLAN model.

land value and the size of the property, property value of a business also depends on the performance of the business, such as sales per square feet. In that regard, under Alternative A and B, the overall property value will see slight decreases while under Alternative D, the overall property value of the region will increase due to an 8% increase in sales. Those effects include the property losses due to construction. The biggest change in property value will be under Alternative C, due to the relocation of as many as 15 businesses. While total property value in the study area will decline, the net fiscal impact on the city depends on where those businesses are relocated.

The impact of changes in sales as well as property values on the city's revenue can be estimated as well. The area under study is an important revenue source of the City of Charlottesville.[25] The changes in sales tax will change proportionally to changes in sales, compared with benchmark year of 2003, so does the changes in property tax. The meal tax and lodging tax receipts should increase as a significant portion of revenues of those businesses comes from pass-through customers. Increased traffic volume in both US 29 and Hydraulic Road can only bring more businesses. For example, increased sales under Alternative D can bring in over 189 thousand dollars more sales tax for the city.[26]

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[25] See previous study "US-29-Hydraulic-250 Bypass Intersections Study"

[26] The phase II of 29H250 estimates that additional city tax revenue from Hillsdale will be over 500 thousand dollars. This does not contradict our results, as there are two significant differences. 1. Their number included property, sales, and meal tax while CEA only quantifies sales tax increase. 2. Their impact compass the whole 29H250 project, which includes new ramps, new lanes, in addition to Hillsdale Drive extension. This report estimated only the impact of Hillsdale Drive extension.

Last but not least, there are other institutions in the area which will be negatively affected by the Hillsdale Drive construction. However, those impacts are not easily quantifiable. Rosewood Village (an assisted living facility) and nearby Senior Center and Jordan office building will lose parking spaces under several alternatives. This could reduce the convenience of senior citizens in the area. The Pepsi plant could lose 65 parking spaces under Alternative D. That reduction in spaces could potentially impact employee parking, as well as the efficiency of supply and delivery of the Pepsi plant.[27]

5. Conclusions

The construction of Hillsdale Drive Extension in a crowded shopping district in the City of Charlottesville is a multi-million dollar project spanning over 5 years. This project will have a significant impact on nearby businesses, rippling impact on the city and county, and fiscal impact on the local governments. The engineering and construction of the road will inject millions of dollars into the local economy and create dozens of jobs. After the Hillsdale Drive Extension is completed, the changed traffic pattern, parking, and relocation of businesses could have a multi-million dollar impact on the businesses located around the construction. This economic impact study quantifies the impact under 4 different roadway alternatives. IMPLAN model and some assumptions based on national

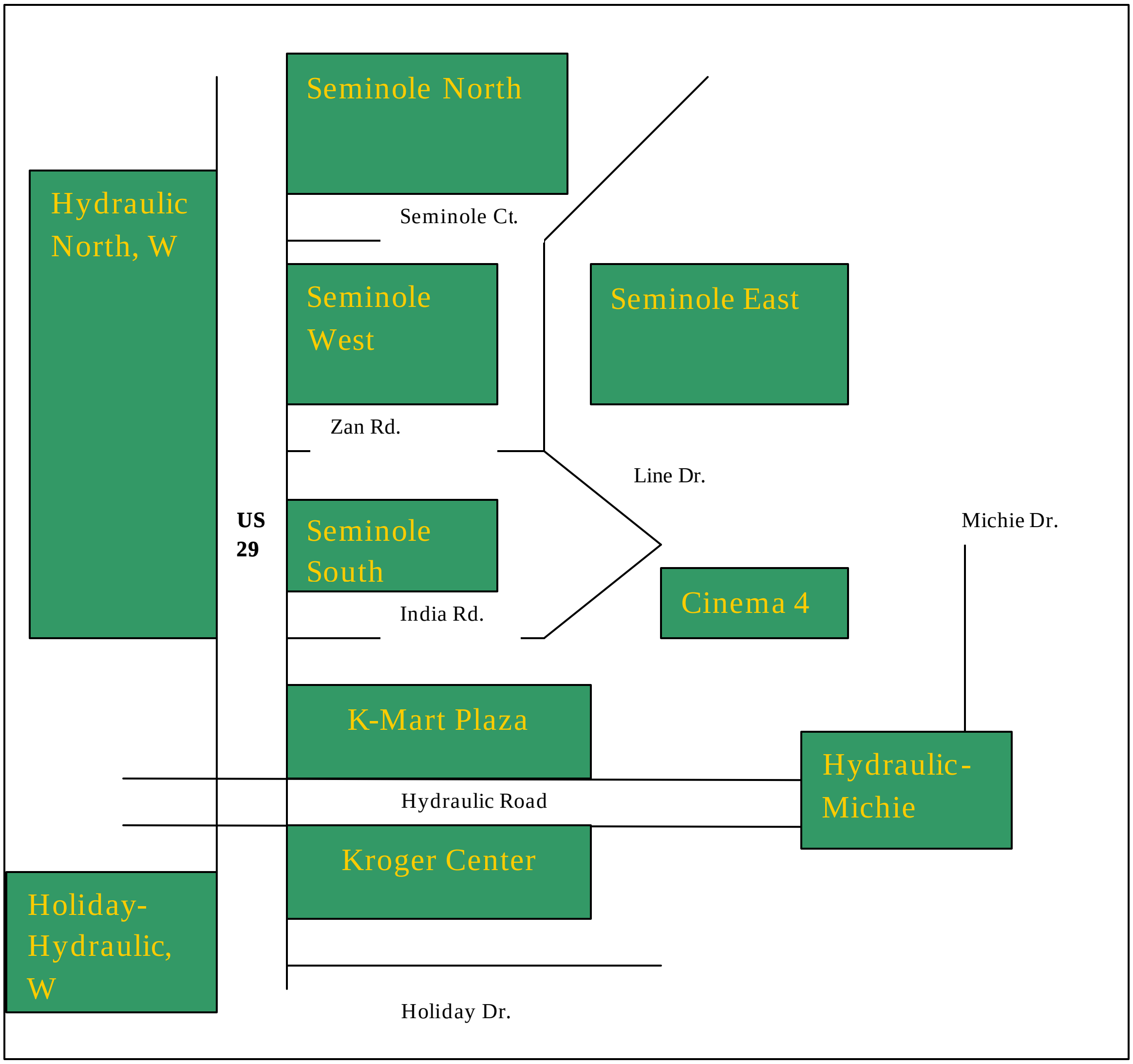
[27] Under Alternatives C and D, it is possible that parking space for Pepsi Place will be kept intact. This will minimize business disruption for Pepsi Plant, as well as minimize inconvenience for nearby offices and residents, and other organizations.

trends are helpful to derive those impacts. Further analysis can be conducted around the sensitivity of those assumptions.

The vision of the city and the business community is to turn this area into a pedestrian friendly, main-street type of retail area. To achieve that goal, serious investments need to be taken, in addition to the construction of Hillsdale Drive Extension. For example, there are residential neighborhoods to the east of the study area. Bicycle paths could link those neighborhoods to the shopping area. Currently, this area is accessible by public transportation. Public transportation can bring in students and other moderate-income residents from other parts of the city. To realize those customers, sidewalks, pedestrian crossings, and bike trails have to be built in the study area to create a safe and convenient shopping environment. Investments in landscaping, such as parks, fountains, benches, are also necessary to make this area appealing to pedestrians.

Appendix 1: Retail Areas Defined

The green areas indicate 10 retail shopping centers studied in this report.



Appendix 2: Construction Cost Allocation Assumptions

Table A2: Construction Cost Allocations						
Cost Items	Year		Alternative A	Alternative B	Alternative C	Alternative D
Preliminary Engineering	**Total**		**$1,992,000**	**$1,199,000**	**$1,035,000**	**$1,114,000**
Location Study	2004		$300,000	$300,000	$300,000	$300,000
		Local(10%)	$30,000	$30,000	$30,000	$30,000
Design	2005		$564,000	$299,667	$245,000	$271,333
		Local(10%)	$56,400	$29,967	$24,500	$27,133
	2006		$1,128,000	$599,333	$490,000	$542,667
		Local(10%)	$112,800	$59,934	$49,000	$54,267
Right-of-way and Utilities	**Total**		**$13,214,300**	**$11,446,850**	**$15,243,500**	**$10,410,400**
Construction Cost	**Total**		**$12,437,000**	**$6,666,000**	**$5,566,000**	**$6,090,000**
	2009		$4,104,210	$2,199,780	$1,836,780	$2,009,700
	2010		$8,332,790	$4,466,220	$3,729,220	$4,080,300
Total Cost			**$27,643,300**	**$19,311,850**	**$21,844,500**	**$17,614,400**

Source: JMT and CEA

Appendix 3: Square Footage Assumptions

Table A3: Average Store Square Footage		
Industry	Known	ULI Assumption
Auto Repair and Maintenance	6318	6725
Building Materials and Garden Supply Store	3906	2750
Clothing and Accessory Store	5895	2584
Doctor's or Dentist's Office	1830	1789
Dry-cleaning and Laundry Service	1500	1680
Employment Service	3339	1499
Financial Service	756	1600
Food and Beverage Store	52700	24893
Foot Service and Drinking Place	3443	3318
Furniture and Home Furnishing Store	18784	4860
General Merchandise Store	22731	42339
Personal Care Service	1779	1297
Real Estate	1609	2000
Sporting Good, Hobby, Book and Music Store	5035	900
Telecommunications	3381	1800

Source: Seminole Square Shopping Center and Urban Land Institute

Appendix 4: Assumptions on Percentage of Sales by Local Residents

IMPLAN Model generates a percentage indicating the economic impact within City of Charlottesville. The only exception is one manufacturing business, where no change is assumed due to traffic.

Sector Name	% Local Sales
Maintenance and Repair of Buildings	100%
Manufacturing	N/A
Furniture and Home Furnishing Store	95%
Building Materials and Garden Supply Store	80%
Food and Beverage Store	95%
Health and Personal Care Store	95%
Gas Station	20%
Clothing and Accessory Store	90%
Sporting Good, Hobby, Book and Music Store	90%
General Merchandise Store	90%
Miscellaneous Store Retailer	95%
Newspaper Publisher	54%
Telecommunications	95%
Financial Service	95%
Real Estate	95%
Auto Rental and Leasing	70%
Legal Service	95%
Specialized Design Service	75%
Scientific Research and Development Service	74%
Advertising and Related Service	74%
Photographic Service	75%
Employment Service	100%
College, University and Junior College	100%
Doctor's or Dentist's Office	93%
Fitness and Recreational Sport Center	100%
Other Amusement and Recreation Industry	80%
Hotels and Motels	0%
Food Service and Drinking Place	60%
Auto Repair and Maintenance	80%
Personal Care Service	95%
Dry-cleaning and Laundry Service	95%
Other Personal Service	95%
Federal Military	100%

Source: IMPLAN and CEA