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**Comparative Analysis of  
Alternative Roadway  
Configurations**

In Response To:

**Draft Environmental Impact Statement**  
U.S.31 in Hamilton County, Indiana

Prepared For:

**Simon Property Group**  
115 W. Washington Street  
Indianapolis, Indiana 46204

August 1, 2003

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Transportation  
Communications  
Building Technologies  
Site and Facility Design

August 1, 2003

Mr. Michael E. McCarty  
President, Community Center Div.  
Simon Property Group  
115 West Washington Street  
Indianapolis, IN 46204

RE: Draft Environmental Impact Statement – U.S.31 in Hamilton County, Indiana

Dear Mr. McCarty:

Attached is our report that compares alternative roadway configurations in the vicinity of 146<sup>th</sup> Street and U.S.31. This report was prepared at your request in response to a Draft Environmental Impact Statement (DEIS) released by the Indiana Department of Transportation (INDOT) on June 10, 2003.

The report compares five alternatives:

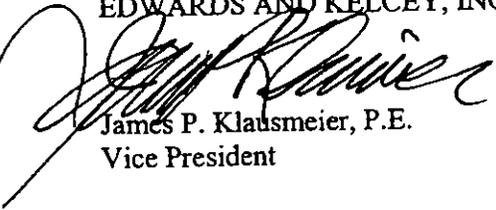
- Existing configuration
- DEIS Option of 146<sup>th</sup> St. Diamond Interchange
- DEIS Option of 146<sup>th</sup> Lateral Access Interchange
- DEIS Option of 146<sup>th</sup> Folded Diamond Interchange
- Collector/Distributor System illustrated in this report

Our findings and conclusions are that the Collector/Distributor System would provide better traffic service than the DEIS Options because it would:

- Reduce potential conflicts and congestion along 146<sup>th</sup> Street
- Disperse vehicle emissions
- Preserve the cross-county functionality of 146<sup>th</sup> Street
- Provide direct routes to, from, and within the commercial district
- Maintain visibility of businesses

Very truly yours,

EDWARDS AND KELCEY, INC..



James P. Klausmeier, P.E.  
Vice President

Attachment

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## GENERAL

INDOT DEIS illustrates three alternative configurations for the segment of the U.S. 31 corridor between its interchange with S.R.431 and 151<sup>st</sup> Street.

The roadway segment is bordered on each side by about 1.4 million square feet of business and commercial development with another 0.7 million approved. The ultimate total of 2.1 million square feet is comparable in size to other regional centers, such as; Castleton Square, Greenwood Park Mall, etc.

The long-term economic vitality of this commercial district depends on visibility of the businesses from the roadway and accessibility into, out of, and between the properties.

## TRIP GENERATION

The commercial district on either side of the U.S. 31 corridor in the vicinity of 146<sup>th</sup> Street includes 1.4 million square feet of existing space and 0.7 million square feet of proposed space that has been approved by local planning commissions. Figure 1 and Table 1 illustrate and enumerate the floor areas within the various sub-areas of the commercial district. The total of 2.1 million square feet is the equivalent of a regional shopping center, such as Castleton Square, Greenwood Park Mall, etc. Major tenants within this commercial district include:

- ❖ Wal-Mart
- ❖ Best Buy
- ❖ Galyan's
- ❖ Target
- ❖ Menard's
- ❖ Lowe's
- ❖ Marsh
- ❖ Frank's

Other Tenants and business include:

- ❖ Restaurants
- ❖ Retail Shops
- ❖ Service Stations
- ❖ Theaters
- ❖ Motel
- ❖ Offices
- ❖ Banks
- ❖ Day Care Center

The total number of trips attracted and produced by these businesses are of three types:

- ❖ Trips from a broad residential market area which have the district as a primary destination
- ❖ Trips which are diverted from the passing streams of traffic which make an intermediate stop while en route to another destination
- ❖ Trips that are made within the district among the various businesses

The total number of trips in each category have been estimated for different time periods using professionally accepted procedures prescribed by the Institute of Transportation Engineers<sup>1</sup>. These procedures rely on statistical equations derived from nationwide studies for a wide variety of Land Use types. Each Land Use type has an associated ITE Code, statistics and equations which are used to estimate the numbers of trips to and from that particular use. Table 2 provides a detailed listing of the trip estimates for the various land uses which are summarized in Table 1.

Table 1 indicates that there are nearly 120,000 vehicle trips each weekday and 145,000 trips on Saturdays are associated with the commercial district. During a typical evening peak hour, nearly 11,000 vehicle trips are generated by the commercial district.

<sup>1</sup> *Trip Generation: 6<sup>th</sup> Edition*, Institute of Transportation Engineers, Washington D.C., 1997

TABLE 1  
FLOOR AREAS AND TRIP ESTIMATES

Existing Shopping Centers  
Trip Generation per Specific Land Use

Developer/ Shopping Center	Retailer	Area (sq. ft.)	Other Independent Variable	ITE Code	Land Use	Trip Ends						
						Weekday	Saturday	Sunday	Weighted Average Day	AM Peak Hour <sup>2</sup>	PM Peak Hour <sup>2</sup>	
Simon: Village Park Plaza	Wal-Mart	119,092		613	Free-Service Discount Supercenters	5,094	8,801	4,263	6,147	217	451	
	Meach	78,899		600	Supercenter	8,470	12,489	12,842	9,783	373	798	
	Quik-Bits	85,820		620	Shopping Center							
	Kohl's	81,187		620	Shopping Center							
	Mariano's	140,000		668	Home Improvement Supercenters	5,001	8,304	N/A	6,233	207	452	
	Russell Cleaners	87,911	17 Screens	444	Home Textiles with Washers	2,807	8,001	5,878	4,102	182	787	
	Foot Locker	18,778		620	Shopping Center							
	East Bath & Beyond	28,000		620	Shopping Center							
	Valley Coast	1,878		624	Fast-Food Restaurant with Drive-Through Window	781	1,127	858	843	79	83	
	Burger King	2,852		624	Fast-Food Restaurant with Drive-Through Window	1,400	2,036	1,832	1,510	141	84	
	TDI Fryer's	8,120		632	High-Turnover (84-Down) Restaurant	788	871	808	808	87	87	
	Wendy's	2,286		632	High-Turnover (84-Down) Restaurant	428	620	533	443	30	38	
	Miller's Express Carwash	8,832		620	Shopping Center							
	Job Lotz	1,728	2 Service Vehicles	337	Office Equipment Vehicle Shop	120	128	84	118	8	18	
	Best Buy	6,028		612	Office Equipment	1,283	348	82	898	82	278	
	Costco	8,870		632	High-Turnover (84-Down) Restaurant	778	846	787	802	88	82	
	McDonald's	8,887		620	Shopping Center							
	Amberley's	5,484		632	High-Turnover (84-Down) Restaurant	712	805	720	735	81	89	
	Black River Shoes	7,820		620	Shopping Center							
	ShoeMaxx Video	8,872		620	Shopping Center							
	Best Buy Body Works	2,810		620	Shopping Center							
	Beauty First	2,822		620	Shopping Center							
	Madison Bakery	3,777		603	Family Store							
	Walmart	1,287		632	Fast-Food Restaurant without Drive-Through Window	884	840	804	824	83	82	
	Walmart	1,288		620	Shopping Center							
	Dress Barn	4,108		620	Shopping Center							
	The Wooden Key	4,032		620	Shopping Center							
	Macys Clearance	1,851		620	Shopping Center							
	Korras Records	1,728		620	Shopping Center							
	Walmart	1,412		620	Shopping Center							
	Walmart	1,208		620	Shopping Center							
	Female May Candies	1,171		620	Shopping Center							
	Walmart	2,484		620	Shopping Center							
	Spencer's	1,283		632	Fast-Food Restaurant without Drive-Through Window	804	878	832	882	88	82	
	General Clinic	1,203		620	Shopping Center							
	Walmart	1,283		632	Fast-Food Restaurant without Drive-Through Window	818	883	842	878	88	84	
	Walmart	1,218		632	Fast-Food Restaurant without Drive-Through Window	872	848	810	832	83	82	
	Chrysler Vehicles	1,884		620	Shopping Center							
	Chrysler Automobile	880		620	Shopping Center							
	Walmart	4,188		632	Fast-Food Restaurant without Drive-Through Window	2,888	2,815	2,684	2,857	184	110	
	Walmart	1,824		632	Fast-Food Restaurant without Drive-Through Window	882	838	802	821	83	81	
	The Great Clips, Inc.	1,788		620	Shopping Center							
	Lowes	4,880		620	Shopping Center							
	Methodist Maternity	2,000		620	Shopping Center							
	Lebanon	3,000		620	Shopping Center							
	Walmart	2,000		620	Shopping Center							
	Walmart	8,004		620	Shopping Center							
	Walmart	3,541		620	Shopping Center							
	Walmart	3,000		620	Shopping Center							
	Walmart	2,823		620	Shopping Center							
B & K Marooner	4,947		620	Shopping Center								
Old Country Buffet	10,418		632	High-Turnover (84-Down) Restaurant	1,332	1,818	1,247	1,278	89	111		
Walmart	3,184		620	Shopping Center								
Village Park Plaza Subtotal	713,821											
The Blinn & Overhead Plaza of Overhead Plaza	Best Buy	28,770		603	Electronics Supercenters	2,187	N/A	N/A	2,187	14	218	
	Best Buy	17,408		603	Family Store	88	88	81	87	3	8	
	Fluorid Industrial, Inc.	18,000		600	Shopping Center	78	74	70	75	3	3	
	Walmart	23,828		620	Shopping Center							
	Walmart	18,828		620	Shopping Center							
	Office Max	23,403		620	Shopping Center							
	Walmart	28,121		620	Shopping Center							
	Walmart	8,700		632	High-Turnover (84-Down) Restaurant	872	1,081	883	902	82	73	
	Walmart	8,800		620	Shopping Center							
	Walmart	6,850		632	High-Turnover (84-Down) Restaurant	808	1,191	918	935	84	73	
Overhead Plaza Subtotal	183,852											
Unknown: Village Farm	Union Hardware Bank	4,484		612	Drive-In Bank	1,185	287	84	887	88	244	
	First National Bank	3,728		612	Drive-In Bank	1,038	231	72	785	47	205	
	Walmart	7,910		608	Day Care Center	880	48	48	842	83	77	
	Walmart	8,808		715	Strata Term Office Building	283	N/A	N/A	283	40	81	
	Walmart	8,093		620	Shopping Center							
	Walmart	3,648		624	Fast-Food Restaurant with Drive-Through Window	1,813	2,261	1,868	1,881	182	182	
	Walmart	87,883		720	Medical/Postal Office Building	3,378	788	138	2,848	214	270	
Village Farm Subtotal	151,188											
Unknown: (1814 & US 31)	Walmart	121,138		618	Free-Service Discount Supercenters	6,841	8,738	6,851	7,138	120	807	
	Walmart	4,200	12 Fuel Pumps	645	Gasoline/Service Station with Convenience Market and Car Wash	1,824	N/A	N/A	1,824	128	158	
	Walmart	8,772		624	Fast-Food Restaurant with Drive-Through Window	3,380	4,880	3,875	3,822	338	327	
	Walmart	3,471		624	Fast-Food Restaurant with Drive-Through Window	1,728	2,510	1,887	1,880	173	118	
	Walmart	8,274	8 Fuel Pumps	645	Gasoline/Service Station with Convenience Market	1,302	N/A	N/A	1,302	80	187	
	Walmart	8,800		648	Walmart Supercenter	178	187	N/A	177	12	18	
	Walmart	88,432	80 occupied rooms	312	Business Hotel	384	N/A	N/A	384	28	31	
	US 18 & US 31 Subtotal	311,884										
	Kite: Overhead Concessions	Walmart	138,000		602	Home Improvement Supercenters	4,884	8,248	N/A	6,188	208	388
		Kite Subtotal	138,000									
Sum of all LU ITE						18,187	31,287	19,220	19,872	398	1,827	
Part of Trip from other LU						88,898	78,717	81,832	71,280	3,827	6,340	
Grand Total						107,185	110,004	101,052	91,152	4,225	7,167	

Proposed Shopping Centers

Developer/ Shopping Center	Retailer	Area (sq. ft.)	Other Independent Variable	ITE Code	Land Use	Trip Ends					
						Weekday	Saturday	Sunday	Weighted Average Day	AM Peak Hour <sup>2</sup>	PM Peak Hour <sup>2</sup>
Kite Development Overhead Concessions	DSW, Great City, Dick's Sporting Goods, Wal-Mart, etc.	482,822		620	Shopping Center	18,005	24,888	11,818	18,833	413	1,798
Kite Development Overhead Concessions	(Unknown)	138,000		620	Shopping Center	8,408	11,227	6,281	9,822	184	778
Kite Development Overhead Concessions	(Unknown)	80,000		620	Shopping Center	4,808	6,888	3,182	6,180	118	488
Swire Group Westfield Shoppes	(Unknown)	8,800		620	Shopping Center	1,187	1,858	4,318	1,702	32	104
Grand Total						32,408	44,017	25,609	34,517	787	3,138

**TABLE 2**

**Trip Generation**

Time Period	Estimated Number of Trips (Inbound + Outbound)					Net Number of Trips on Roadway System
	Existing 1,393,100 square feet	Proposed 697,824 square feet	Total 2,090,924 square feet	Reductions		
				Pass-by Trips	Internal Trips	
Typical Weekday	85,195	33,509	118,704	*	30%	83,093
Typical Saturday	101,014	44,417	145,431	*	*	145,431
Typical Sunday	61,753	27,766	89,519	*	*	89,519
Weighted Average Day	87,332	34,247	121,579	*	*	121,579
Morning Peak Hour	4,184	757	4,941	*	*	4,941
Evening Peak Hour	7,866	3,131	10,997	16%	20%	7,037

\* Statistics not available for these time periods.

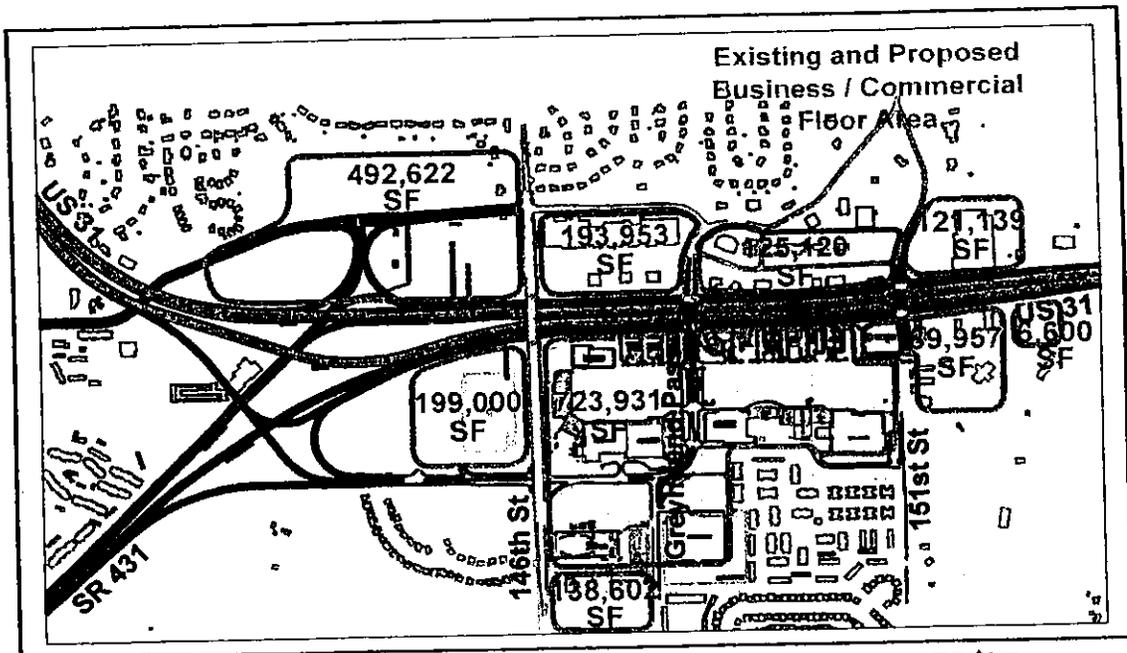


Figure 1  
Square Feet of Business or Commercial Floor Area

## VISIBILITY/ACCESSIBILITY ISSUES

The long term economic vitality of this commercial district depends on visibility and accessibility. These issues are discussed and illustrated for: the existing condition, the three alternative configurations illustrated by the INDOT DEIS, and another preferred alternative illustrated herein.

### **EXISTING CONFIGURATION**

Figure 2 shows the inbound and outbound routes that connect the commercial district with U.S.31/S.R.431. As illustrated, there currently are five major inbound routes and four major outbound routes.

Four of the inbound routes provide direct connections from the corridor into the properties via 146<sup>th</sup> and 151<sup>st</sup> Streets. Businesses are highly visible from these "front door" entry routes. Outbound routes are essentially the reverse of the inbound routes.

Access between the separated east side and west side districts are provided by three streets which cross U.S.31: 146<sup>th</sup> Street, Greyhound Pass, and 151<sup>st</sup> Street.

### **INDOT DEIS: Diamond Option**

Figure 3 shows the inbound and outbound routes that connect U.S.31/S.R.431 with the commercial district. As illustrated, there would be three major inbound routes and two major outbound routes. All inbound and outbound traffic would use a portion of 146<sup>th</sup> Street. As a result, the functionality of 146<sup>th</sup> Street as a cross-county roadway would be diminished.

None of the routes deliver customers directly to the fronts of businesses, but rather route them circuitously through "back doors".

Access between the separated east and west districts is provided by two streets that cross over U.S.31: 146<sup>th</sup> Street and 151<sup>st</sup> Street. Note that the cross-over traffic would be co-mingled with inbound and outbound traffic on 146<sup>th</sup> Street.

### **INDOT DEIS: Lateral Access Option**

Figure 4 shows the inbound and outbound routes that connect U.S. 31/S.R.431 with the commercial district. As illustrated, there would be three major inbound and two major outbound routes. All inbound and outbound traffic would use a portion of 146<sup>th</sup> Street. As a result, the functionality of 146<sup>th</sup> Street as a cross-county roadway would be diminished.

None of the routes deliver customers directly to the fronts of businesses, but rather route them circuitously through "back doors".

Access between the separated east and west districts is provided by two streets that cross U.S. 31: 146<sup>th</sup> Street and 151<sup>st</sup> Street. Note that the crossover traffic would be co-mingled with inbound and outbound traffic on 146<sup>th</sup> Street.

### **INDOT DEIS: Folded Diamond Option**

Figure 5 shows the inbound and outbound routes that connect U.S.31/S.R.431 with the commercial district. As illustrated, there would be three major inbound routes and two major outbound routes. All inbound and outbound traffic would use a portion of 146<sup>th</sup> Street. As a result, the functionality of 146<sup>th</sup> Street as a cross-county roadway would be diminished.

None of the routes deliver customers directly to the fronts of businesses, but rather circuitously through "back doors".

Access between the separated east and west districts is provided by two streets crossing over U.S. 31: 146<sup>th</sup> Street and 151<sup>st</sup> Street. Note that the crossover traffic would be co-mingled with inbound and outbound traffic on 146<sup>th</sup> Street.

## **PROPOSED: Urban Collector/Distributor Interchange**

**Figure 6** shows the inbound and outbound routes that connect the commercial district with U.S.31/S.R.431. As illustrated, there would be seven major inbound routes and six major outbound routes.

The collector/distributor configuration enables customers to be delivered directly into the properties via Greyhound Pass and 151<sup>st</sup> Streets, similar to the "front door" routes currently being used. Outbound routes are essentially the reverse of the inbound routes. Commercial traffic along 146<sup>th</sup> Street is minimized by dispersing it along the collector/distributor system. Thus, the functionality of 146<sup>th</sup> St. as a cross-country roadway is maintained.

Access between the separated east and west districts is provided by three streets that cross over U.S.31: 146<sup>th</sup> St., Greyhound Pass, and 151<sup>st</sup> Street.

The collector/distributor configuration has two options:

**Figure 7** illustrates the option of partially depressing the mainline U.S.31, with the collector/distributor roadways at or slightly above existing elevations. The depth of the depression would be constrained by drainage and soil conditions.

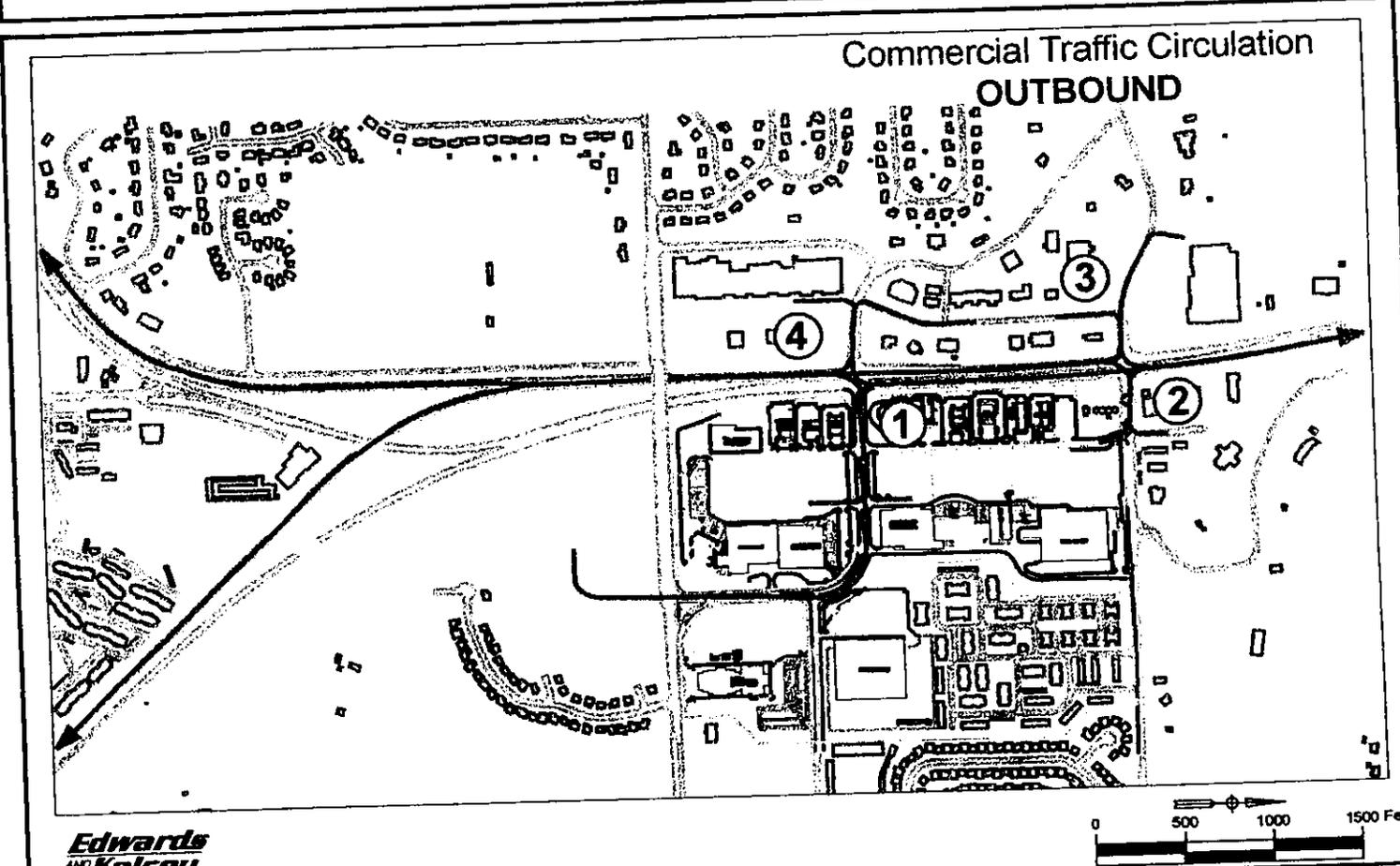
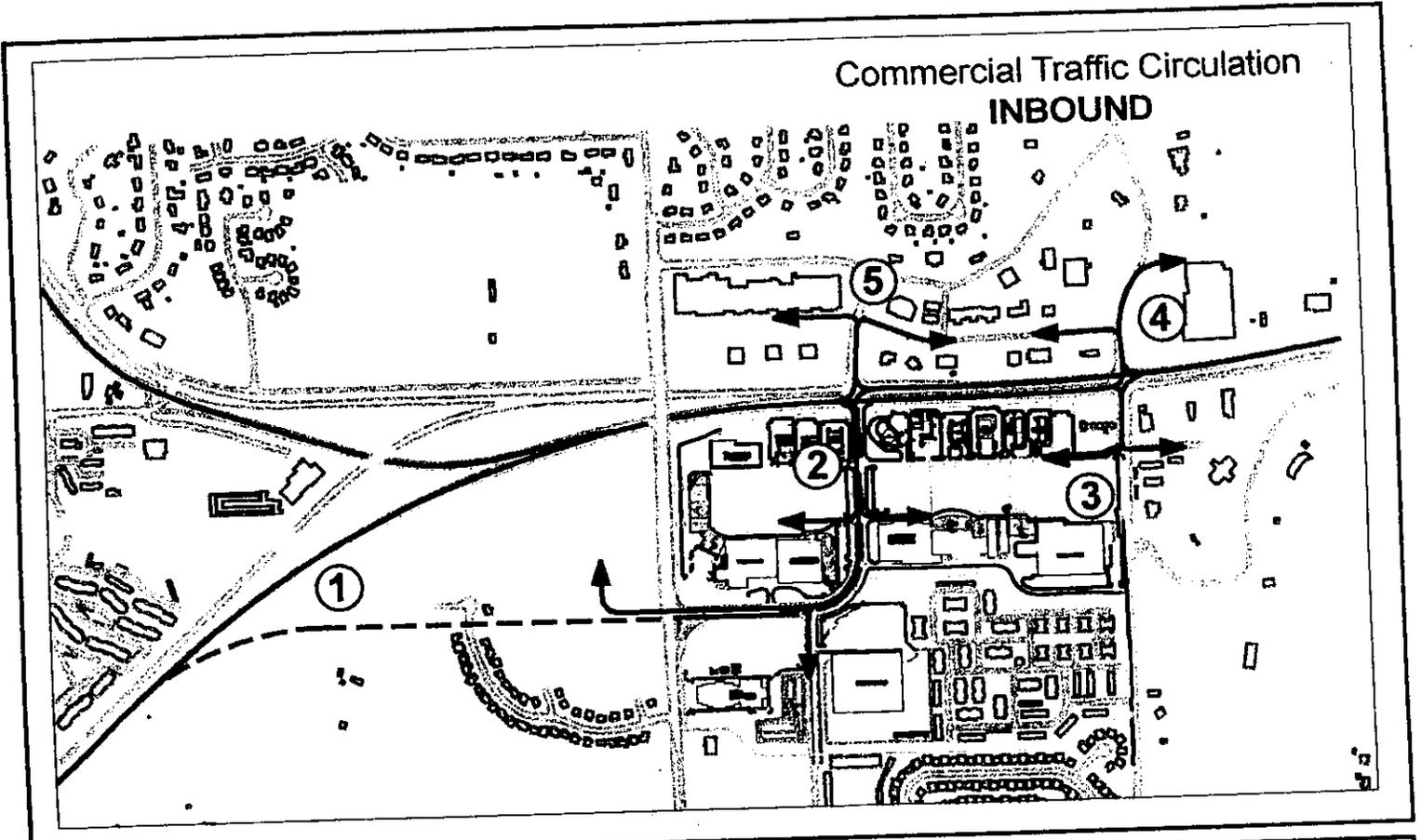
**Figure 8** illustrates the option of elevating the mainline U.S.31 with the collector/distributor roadways, beneath, at, or slightly below existing elevations in order to minimize right-of-way requirements. This option includes a wide median (50') for the collector/distributor road that can be used for additional turn lanes. This wide median could also provide a construction staging area to minimize delays and impacts to local businesses.

**Figure 9** provides conceptual illustrations of the depressed and elevated options. The two options would function similarly and would each provide the following advantages as compared to INDOT alterations

- Preservation of visibility and awareness of this large shopping district along the collector/distributor roadway.
- Preservation of the existing direct front door access that the businesses are accustomed to now.
- Distribution of the traffic throughout the length of the business district and, thus, minimizes potential impacts to 146<sup>th</sup> Street.
- Reduction of the negative environmental impacts (air, noise), since traffic will be evenly distributed across 146<sup>th</sup> Street, Greyhound Pass, and 151<sup>st</sup> Street.\*
- Fulfillment of the U.S.31 project "Purpose and Need Statement" which is to:
  - reduce congestion along the U.S.31 corridor
  - improve the level of safety for motorists using the U.S.31 corridor
  - provide for the reliable and efficient movement of commerce and regional travel
- Reduction of the negative economic impacts, such as, the loss of business.
- Improvement of overall roadway safety.
- Preservation of the cross-county functionality of 146<sup>th</sup> Street by dispersing commercial district traffic.

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\* TRB Paper #981579, Emissions Reduction Potential of the Congestion Management and Air Quality Improvement Program; Transportation Research Board; Washington, D.C., 1998



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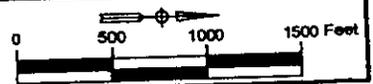
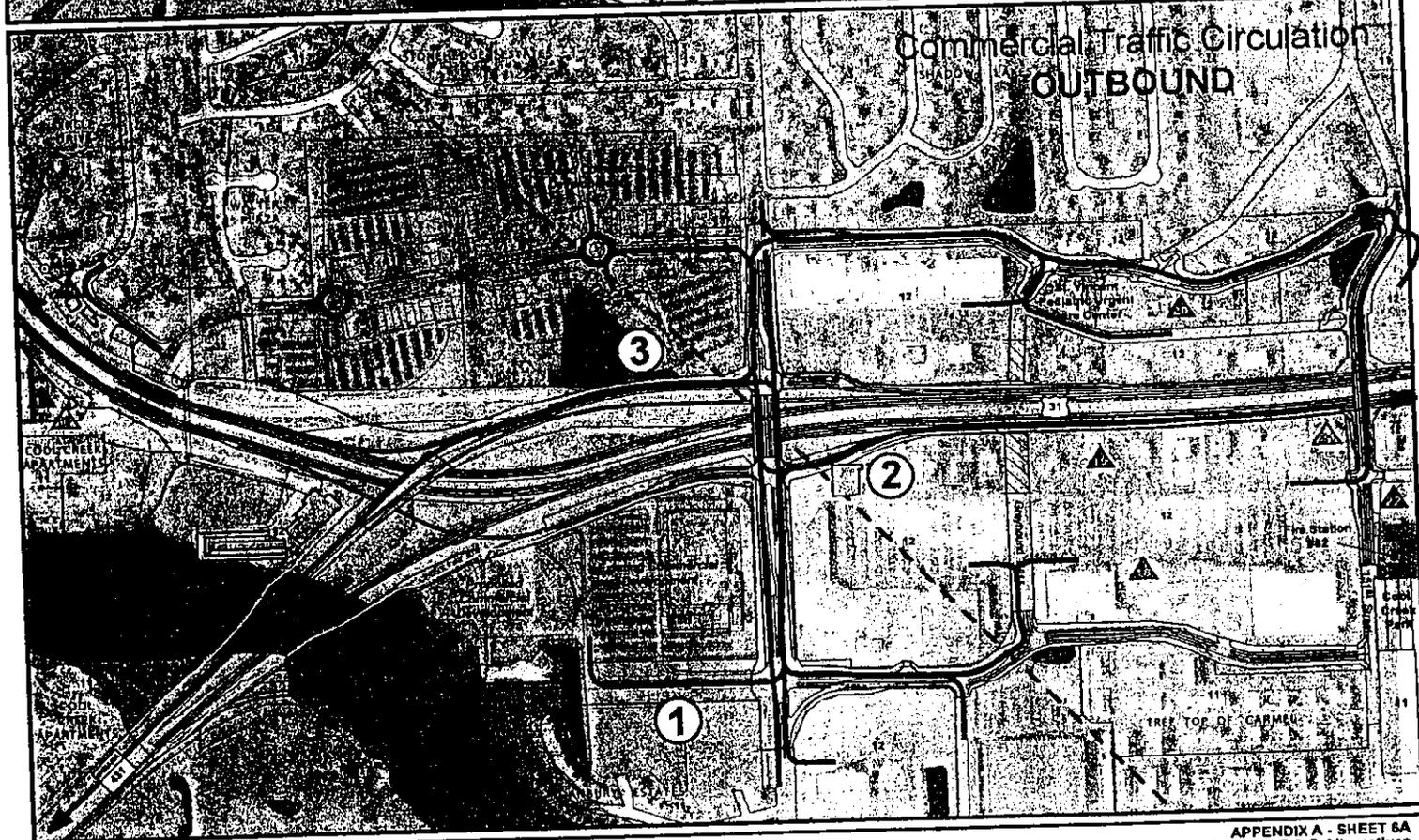
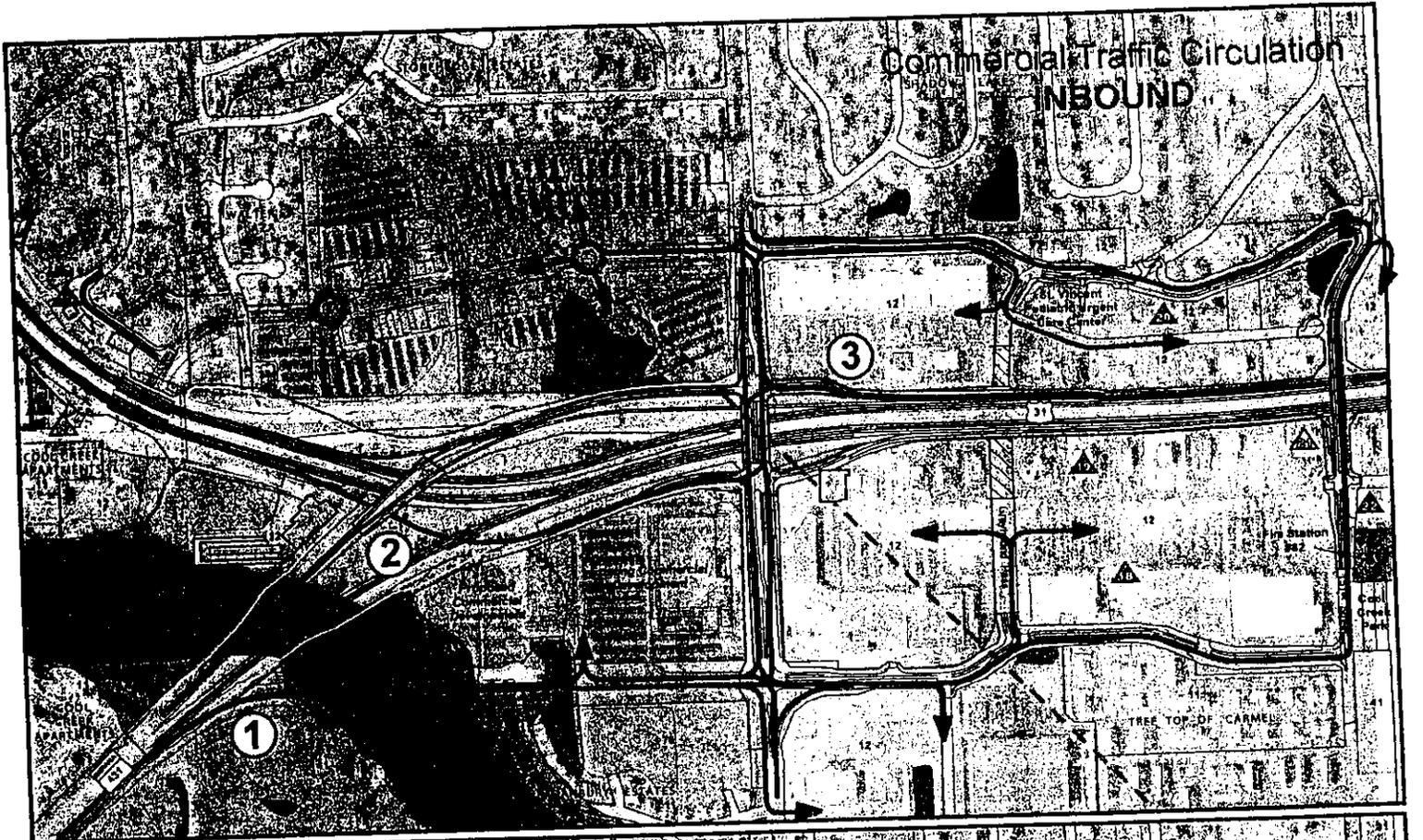


Figure 2  
Existing Conditions



Aerial Source: Hamilton County  
Flood Information Source: FEMA

APPENDIX A - SHEET 6A  
Environmental Features: F & G Alternatives  
146th Street Interchange: Diamond Option  
Draft Environmental Impact Statement  
Hamilton County, Indiana

Figure 3  
INDOT DEIS Alternative

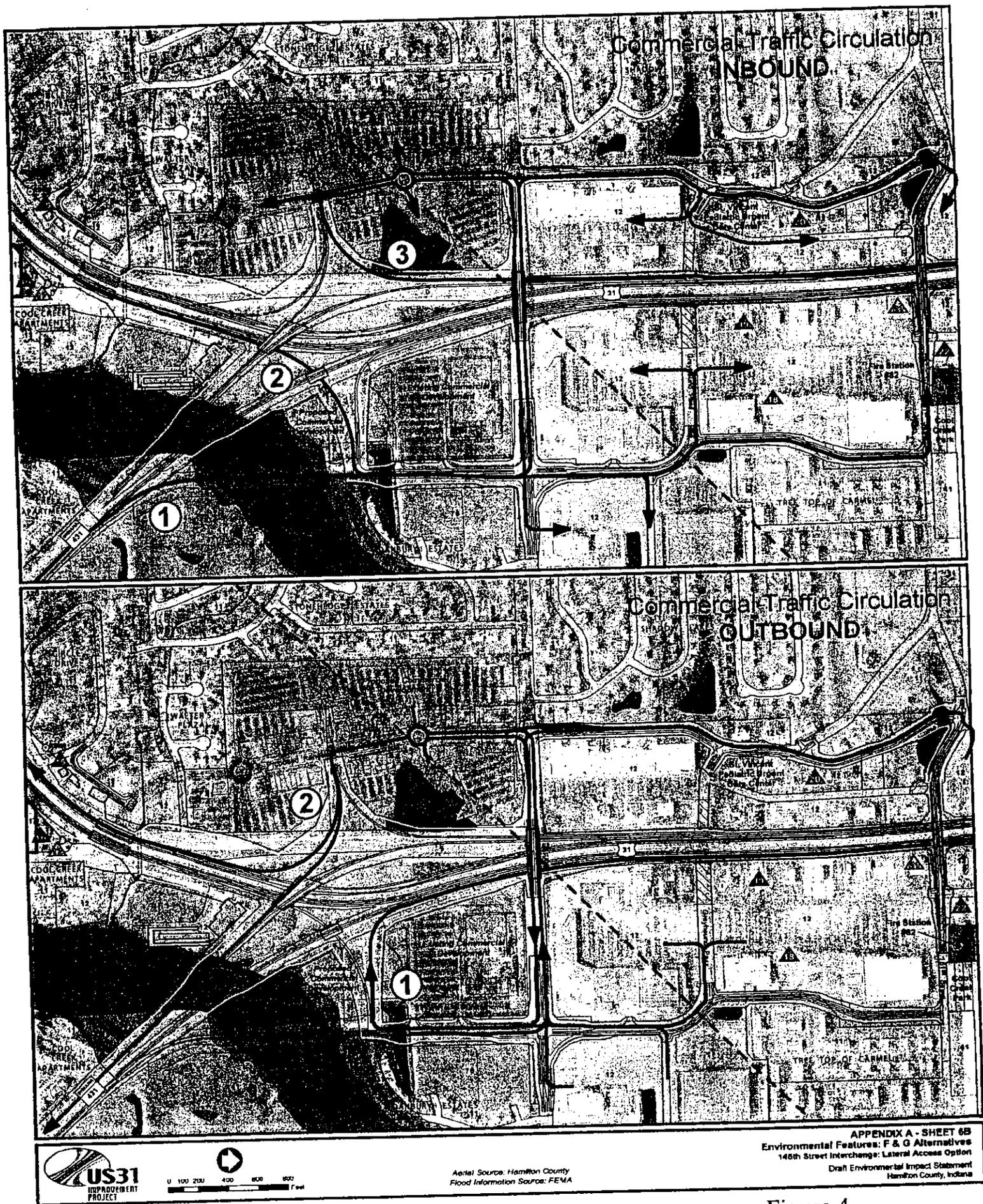


Figure 4  
INDOT DEIS Alternative

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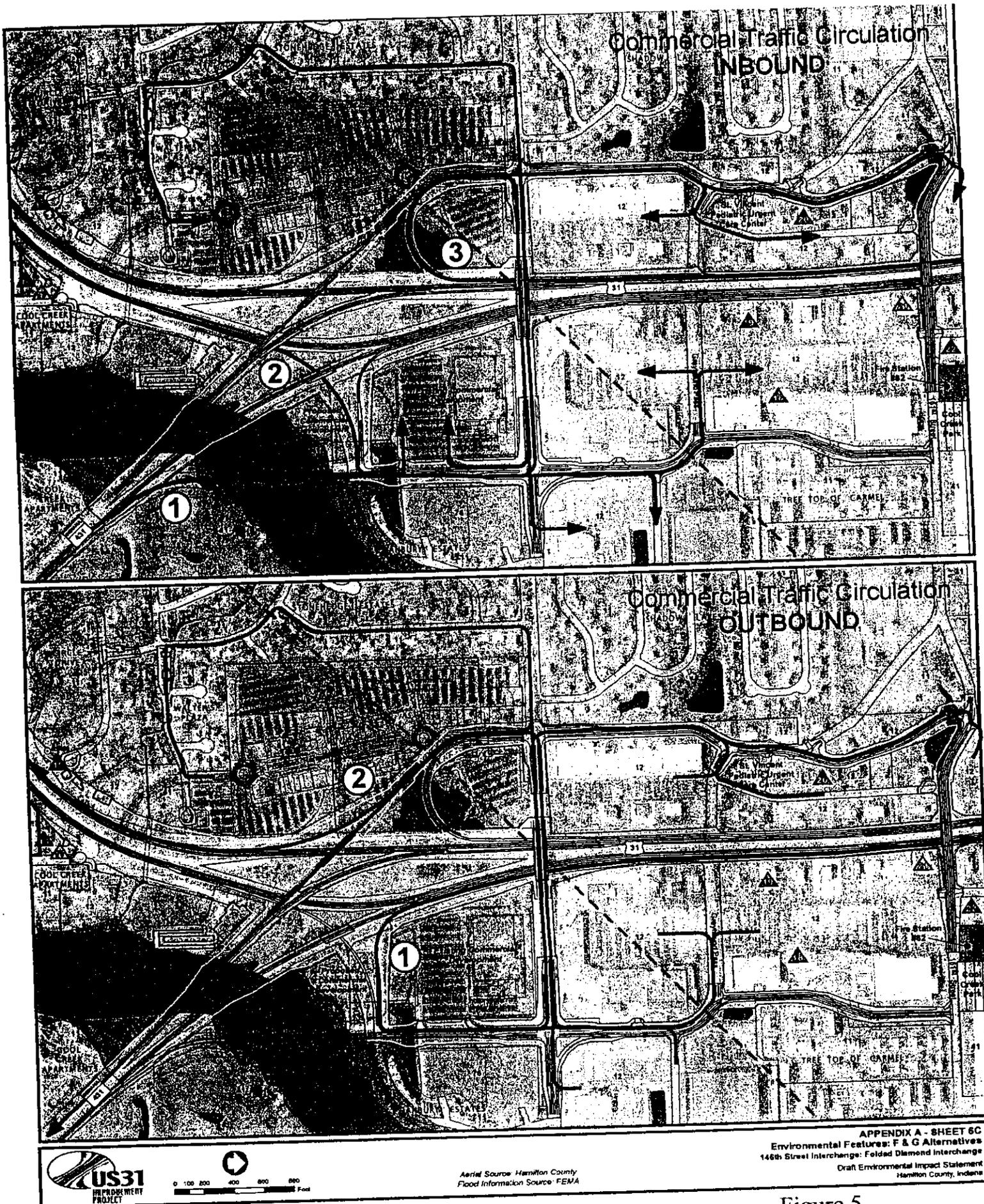


Figure 5  
INDOT DEIS Alternative

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