



Administrative Draft Report

**Evaluation of Economic Impact of Rail
Crossing for the Southern Poplar Corridor
Study**

Prepared for
**Memphis Urban Area Metropolitan Planning
Organization**

Submitted by
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General & Limiting Conditions

Every reasonable effort has been made to ensure that the data contained in this report are accurate as of the date of this study; however, factors exist that are outside the control of AECOM and that may affect the estimates and/or projections noted herein. This study is based on estimates, assumptions and other information developed by AECOM from its independent research effort, general knowledge of the industry, and information provided by and consultations with the client and the client's representatives. No responsibility is assumed for inaccuracies in reporting by the client, the client's agent and representatives, or any other data source used in preparing or presenting this study.

This report is based on information that was current as of March 2010 and AECOM has not undertaken any update of its research effort since such date.

Because future events and circumstances, many of which are not known as of the date of this study, may affect the estimates contained therein, no warranty or representation is made by AECOM that any of the projected values or results contained in this study will actually be achieved.

Possession of this study does not carry with it the right of publication thereof or to use the name of "AECOM" or "Economics Research Associates" in any manner without first obtaining the prior written consent of AECOM. No abstracting, excerpting or summarization of this study may be made without first obtaining the prior written consent of AECOM. Further, AECOM has served solely in the capacity of consultant and has not rendered any expert opinions. This report is not to be used in conjunction with any public or private offering of securities, debt, equity, or other similar purpose where it may be relied upon to any degree by any person other than the client, nor is any third party entitled to rely upon this report, without first obtaining the prior written consent of AECOM. This study may not be used for purposes other than that for which it is prepared or for which prior written consent has first been obtained from AECOM. Any changes made to the study, or any use of the study not specifically prescribed under agreement between the parties or otherwise expressly approved by AECOM, shall be at the sole risk of the party making such changes or adopting such use.

This study is qualified in its entirety by, and should be considered in light of, these limitations, conditions and considerations.

I. Introduction and Executive Summary

The Memphis Metropolitan Area is bisected by the Norfolk Southern Railroad. The increasing frequency of long freight trains has impeded travel between the north and south sides of this growing metropolitan area. In order to address this issue, the Memphis Urban Area Metropolitan Planning Organization (MPO) retained a team of consultants led by the planning firm of Dalhoff Thomas Daws, LLC (DTD) to evaluate the impact and benefit versus cost of various grade separated under crossing. The DTD team and its client selected the Mendenhall Road and Houston Levee Road under crossings as the initial projects to be evaluated.

Economics at AECOM (formerly Economics Research Associates or ERA) assisted with three tasks covered in this report:

- Estimation of real estate acquisition and business relocation costs
- Assessment of the economic impact of these two projects on Shelby County
- A calculation of the benefit to cost ratio of these two transportation improvement projects

The analysis was conducted in the San Francisco office of AECOM Technical Services with William “Bill” Lee serving as Principal in Charge. Tanya Chiranakhon assisted with the real estate acquisition cost estimation and Linda Cheu provided the economic impact assessment. Regional Economic Models Inc. (REMI) served as subconsultant and model provider to AECOM.

Economic Impact

AECOM utilized the REMI model, an advanced economic impact modeling software, to estimate the total impacts, including direct, indirect, and induced, of the construction of the Mendenhall and Houston Levee undercrossings on Shelby County. There are two major categories of impacts:

- One-time impacts, which result from the construction of the improvements and occur on a one-time basis only during the construction period.
- Ongoing impacts, which result from increased quality of life, personal income, and labor productivity created by the travel time savings.

Both types of impacts have been evaluated in this report, and results are highlighted as follows:

- Construction impacts - These impacts are estimated to occur fairly evenly over a five-year period, from 2013 to 2017, and will not recur after the construction period is over. Based on our analysis, the construction of the two underpasses will result in the creation of 785 jobs over five years and create a total \$92.6 million increase in output to firms in Shelby County.

- Ongoing impacts – The travel time savings created by the two undercrossings results in an increase of \$5.9 million in output (in 2010 constant dollars) and an associated additional 25 jobs in 2020 within Shelby County on an annual basis. By 2030, the increase in personal income in the region, in 2030 dollars, is estimated to reach close to \$4.7 million. These impacts recur year after year.

Benefit Cost Ratios

Mendenhall Road

The benefit cost analysis for the Mendenhall Road under crossing showed a benefit to cost ratio of 0.66 with a seven percent annual discount rate and 0.92 using a five percent annual discount rate. The benefits do not outweigh the costs because when real estate acquisition and relocation costs are considered, the overall hard construction cost doubles. From a project perspective, regardless of who is paying, the benefits of additional Shelby County economic output are less than project implementation cost. However, if Shelby County is able to secure State and Federal funding for approximately half of the total project cost, then the Shelby County benefit cost ratio will be greater than one.

Houston Levee Road

The analysis for the Houston Levee Road under crossing showed a benefit to cost ratio of 1.08 with a seven percent annual discount rate and 1.50 using a five percent annual discount rate. The benefits do outweigh the costs because the real estate acquisition and relocation costs are considerably less than Mendenhall Road, and the construction cost is slightly less. Since the travel benefits do not differ greatly and the costs are considerably less, this undercrossing should be the higher priority project. With any State or Federal funding assistance, the Houston Levee Road under crossing appears to be a worthwhile construction project.

II. Acquisition and Relocation Costs

Estimates of Properties to be Acquired

In order to estimate the real estate acquisition and business relocations costs, AECOM inspected the properties and types of businesses impacted by the proposed Mendenhall and Houston Levee rail crossings, provided by Dalhoff Thomas Daws. AECOM relied on 2009 appraisal and assessment information from Shelby County’s Assessor of Property database. Properties impacted by the rail crossings are within the dashed yellow lines, shown in **Figure 1** and **Figure 2** for Mendenhall and Houston Levee, respectively.

The acquisition cost was considered to be the total appraisal value for properties that would be substantially impacted by rail crossing and area revitalization improvements. For properties that would be minimally impacted, the acquisition cost was calculated based on the parcel’s land appraisal value per square foot multiplied by the square footage of that parcel within the revitalization area. Finally, a 25 percent contingency was added to estimate the total acquisition cost. Total acquisition costs for Mendenhall are estimated to be \$29.5 million (**Table 1**) and for Houston Levee, \$14.7 million (**Table 2**).

Figure 1: Mendenhall Area Map

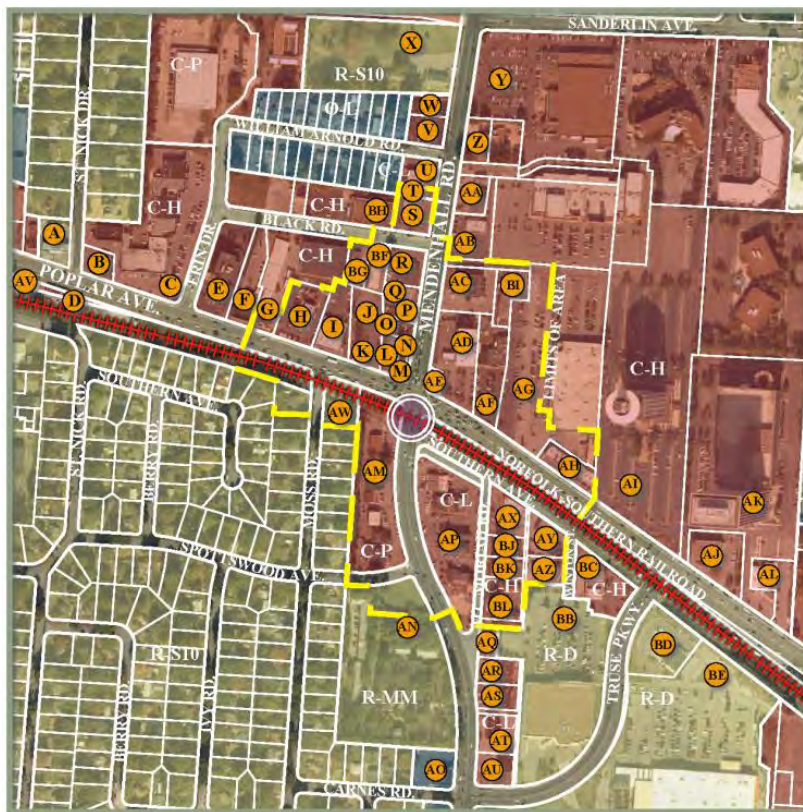


Figure 2: Houston Levee Area Map



Table 1: Mendenhall Rail Crossing Acquisition Costs

(1 of 3)

Property ID	Parcel Number	Address	Business	Acreage		Land Appraisal ¹	Building Appraisal ¹	Total Appraisal ¹	Land Cost per SF	Acquisition Cost
				within revitalization area	whole parcel					
H	056008 00150C	4916 POPLAR AVE	CHICK FIL A	1.00	1.03	\$889,000	\$480,700	\$1,369,700		\$1,369,700
I	056008 00106	4938 POPLAR	AT&T LifeBlood	0.71	0.75	\$535,800	\$486,000	\$1,021,800		\$1,021,800
J	056008 00155	4954 POPLAR AVE	Mr. Pride Carwash	0.76	0.78	\$559,400	\$169,600	\$729,000		\$729,000
K	056008 00156	0 POPLAR AVE	Mr. Pride Carwash (Bill Board Signage)	0.09	0.10	\$70,500	\$0	\$70,500		\$70,500
L	056008 00104	4966 POPLAR	Shops of Ann Addler	0.18	0.19	\$138,000	\$137,400	\$275,400		\$275,400
M	056008 00103	4970 POPLAR	Belmont Grill	0.09	0.10	\$80,200	\$83,400	\$163,600		\$163,600
N	056008 00101C	637 MENDENHALL	Belmont Grill	0.12	0.13	\$93,400	\$26,600	\$120,000		\$120,000
O	056008 00100	629 MENDENHALL	Long Law Firm Ratcliffs Shoe Service Yoga Memphis	0.21	0.22	\$136,800	\$236,500	\$373,300		\$373,300
P	056008 00099	621 MENDENHALL	All About Pets	0.23	0.23	\$148,200	\$117,600	\$265,800		\$265,800
Q	056008 00098	615 MENDENHALL	Handiwork Jewerly	0.19	0.20	\$126,300	\$101,000	\$227,300		\$227,300
R	056008 00097	601 MENDENHALL	SEABROOK WALLCOVERING	0.50	0.52	\$405,000	\$366,500	\$771,500		\$771,500
G	056008 00147C	4910 POPLAR AVE ²	Public Storage	0.21	1.75	\$1,210,400	\$2,529,900	\$3,740,300	\$16	\$1,354,249
S	056008 00070C	571 S MENDENHALL	Cadence Banking	0.52	0.52	\$421,200	\$317,600	\$738,800		\$738,800
T	056008 00069	571 S MENDENHALL RD	Memphis Symphony	0.14	0.14	\$87,000	\$225,600	\$312,600		\$312,600
BF	056008 00096	4963 E BLACK	The Polished Pair Bomar & Brown, LLC	0.33	0.33	\$178,300	\$5,100	\$183,400		\$183,400
BG	056008 00095	4953 BLACK RD	Browndog Lodge	0.31	0.31	\$209,000	\$111,600	\$320,600		\$320,600
U	056008 00067C	571 S MENDENHALL ²	Arts Memphis	0.16	0.38	\$299,100	\$221,500	\$520,600	\$18	\$126,603
AC	056033 00101	606 MENDENHALL RD	Collier Insurance Daniel Yacoubian Jewelers Advanced Computer Center	0.84	0.86	\$515,300	\$689,500	\$1,204,800		\$1,204,800
AH	056033 00095C	5030 POPLAR AVE	Nails by Nicole Sahara Café Pita Wraps Smooth Moves	0.44	0.51	\$363,000	\$621,200	\$984,200		\$984,200

Table 1 (continued): Mendenhall Rail Crossing Acquisition Costs

(2 of 3)

Property ID	Parcel Number	Address	Business	Acreage	Acreage	Land Appraisal ¹	Building Appraisal ¹	Total Appraisal ¹	Land Cost per SF	Acquisition Cost
				within revitalization area	whole parcel					
AD	056033 00100	4990 POPLAR AVE	First Tennessee Bank	1.50	1.55	\$1,436,900	\$1,019,000	\$2,455,900		\$2,455,900
AE	056033 00099	0 POPLAR AVE	First Tennessee Bank	0.07	0.09	\$83,400	\$2,600	\$86,000		\$86,000
AF	056033 00098	5000 POPLAR AVE	Houston's Restaurant <u>STRIP SHOPPING CNTR</u> Vacant	1.00	1.02	\$732,500	\$936,200	\$1,668,700		\$1,668,700
BI	056033 00224	5007 BLACK RD	Stamps & Coins Ben & Jerry's Tate Professional Jewelers Polished Nails & Spa Gil & Co, <u>WHITE STATION COMMONS</u>	0.54	0.54	\$286,100	\$1,230,800	\$1,516,900		\$1,516,900
AG	056033 00225	5014 POPLAR AVE ²	Office Depot Whole Foods	0.50	6.15	\$4,082,500	\$1,557,100		\$15	\$332,019
AB	056033 00236	580 S MENDENHALL RD ²	McAlister's Deli <u>WILLIAMSBURG VILLAGE SHOP CTR</u> Tobacco Corner Beltone Memphis Jewelry Flowers & Etc.	0.33	0.82	\$541,200	\$493,800 \$1,314,600	\$1,035,000 \$1,849,500	\$15	\$218,066 \$1,849,500
AM	065041 00028	679 E. MENDENHALL	Boyer Hair Group The Book Place Simply Divine The Clothes Line Yarniverse Nails by Ruth A Little English Interiors Bogies' Deli	1.62	1.68	\$534,900	\$254,965 \$196,127 \$469,463			

Table 1 (continued): Mendenhall Rail Crossing Acquisition Costs

(3 of 3)

Property ID	Parcel Number	Address	Business	Acreage	Acreage	Land Appraisal ¹	Building Appraisal ¹	Total Appraisal ¹	Land Cost per SF	Acquisition Cost
				within revitalization area	whole parcel					
AN	065041 00029	777 MT MORIAH ²	Apartment Complex, 118 units	0.39	5.74	\$812,500	\$1,804,300		\$3	\$55,082
	065039 00023C	663 MOSS	Single Family Residential		0.39	\$53,800	\$87,200	\$141,000		\$141,000
	065041 00001	664 MOSS	Single Family Residential		0.27	\$47,900	\$72,200	\$120,100		\$120,100
			<u>NBHD SHOPPING CENTER</u>				\$1,410,300	\$2,150,500		\$2,150,500
			Half Shell							
			Allied Medical							
AP	065042 00001	688 MENDENHALL	At Home Medical Supply	2.26	2.33	\$740,200	\$920,172			
			Wild Birds Unlimited							
			Midnight Sun Tanning							
			Epic Salon				\$158,755			
			Goodwill							
AX	065043 00001	700 MT MORIAH	All About Pets	0.55	0.55	\$179,400	\$501,300	\$680,700		\$680,700
			Uptech Computer							
BJ	065043 00007	710 MT MORIAH	McGehee Clinic for Animals	0.28	0.28	\$92,800	\$210,300	\$303,100		\$303,100
BK	065043 00009	718 MT MORIAH	Lunt & Co. Financial Planning	0.27	0.27	\$86,600	\$54,700	\$141,300		\$141,300
			726 MPE Suites 100-106							
BL	065043 00008	722 MT MORIAH	Mewtopia	0.53	0.53	\$174,200	\$190,500	\$364,700		\$364,700
			FSBO							
AY	065043 00002	5035 SOUTHERN	Sherwin Williams Paint	0.35	0.35	\$115,700	\$327,500	\$443,200		\$443,200
			Dent Doctor							
AZ	065043 00003C	715 WINTON ST	Sunshine Car Wash	0.34	0.34	\$112,500	\$213,600	\$326,100		\$326,100
AQ	065044 00001	742 MT MORIAH ²	The Urban Gardener	0.05	0.18	\$58,500	\$150,900	\$209,400	\$8	\$16,341
BC	065045 00001C	751 TRUSE PKWY ²	Schnucks Express Gas (Gas Station)	0.20	0.94	\$416,500	\$282,700	\$699,200	\$10	\$88,617
TOTAL				17.79	33.04	\$17,054,000	\$20,786,382	\$27,584,500		\$23,570,977

Note: Businesses removed unless otherwise noted.

¹ Per the Shelby County Assessor's terminology

² Businesses impacted

Source: Shelby County Assessor's database, Dalhoff Thomas Daws, AECOM

Acquisition Cost Sub-total \$23,570,977

25% Contingency \$5,892,744

TOTAL Acquisition Cost \$29,463,722

Table 2: Houston Levee Rail Crossing Acquisition Costs

Property ID	Parcel Number	Address	Business	Acreage	Acreage	Land Appraisal ¹	Building Appraisal ¹	Total Appraisal ¹	Lost Cost per SF	Acquisition Cost
				within revitalization area	whole parcel					
D	C0243 00438	9880 HIGHWAY 72	Independent Bank	0.83		\$783,000	\$660,200	\$1,443,200		\$1,443,200
C	C0243 00439	2116 W POPLAR AVE ²	<u>THE COLLECTION OF HOUSTON LEVEE</u>	1.09	2.882	\$1,696,000	\$2,374,400	\$4,070,400	\$14	\$641,708
			Huey's Sekisui Comcast Super Suppers Americna Family Dentistry Salon De Carlo Three Dog Bakery All American Swim Poplar Wine & Spirits							
B	C0243 00010	2140 W POPLAR AVE ²	<u>COUNTY CLUB COLLECTIONS</u>	0.54	2.869	\$1,690,600	\$1,927,100	\$3,617,700	\$14	\$317,900
			Bangkok Alley Pella Windows & Doors Beauty Supply Richard & Co. Supply Kathy's Nails Century 21 Chiropractic Memphis Superstore Exercise Equipment At's-A-Pizza Tadporter's Custom Framing							
J	C0243 00413C	2082 POPLAR AVE	Landers Ford (Auto Dealer)	9.30		\$3,245,400	\$788,200	\$4,033,600		\$4,033,600
R	C0243 00555	358 S HOUSTON LEVEE RD	Longhorn Steakhouse	1.77		\$926,900	\$1,098,900	\$2,025,800		\$2,025,800
S	C0243 00500	3603 HOUSTON LEVEE RD	Starbucks	0.80		\$629,200	\$302,100	\$931,300		\$931,300
T	C0243 00492	3607 HOUSTON LEVEE RD ²	First State Bank	0.29	1.354	\$1,061,500	\$844,300	\$1,905,800	\$18	\$230,369
Z	C0243 00487	3601 HOUSTON LEVEE RD	Backyard Burger	0.84		\$656,600	\$540,800	\$1,197,400		\$1,197,400
Y	C0243 00486	3574 S HOUSTON LEVEE RD	Vacant Lot	1.37		\$932,700	\$0	\$932,700		\$932,700
TOTAL				16.83	7.11	\$11,621,900	\$8,536,000	\$20,157,900		\$11,753,977

Note: Businesses removed unless otherwise noted.

¹ Per the Shelby County Assessor's terminology

² Businesses impacted

Source: Shelby County Assessor's database, Dalhoff Thomas Daws, AECOM

Acquisition Cost Sub-total \$11,753,977

25% Contingency \$2,938,494

TOTAL Acquisition Cost \$14,692,471

Relocation and Goodwill

In addition to real estate acquisition costs, AECOM considered the costs of relocation and goodwill for businesses and households impacted. These costs would include escrow, demolition, moving, relocation goodwill and costs associated to re-establishing in a new location. For the purposes of this study, the following relocation and goodwill costs were assumed:

- \$35,000 per household
- \$50,000 for businesses smaller than 5,000 square feet
- \$60,000 for businesses between 5,000 and 15,000 square feet
- \$75,000 for businesses larger than 15,000 square feet

A 25 percent contingency was added to these for the total relocation and goodwill costs. AECOM estimated these costs based on project experience and professional judgment. Relocation and goodwill cost calculations are detailed in **Table 3** for Mendenhall and **Table 4** for Houston Levee. Total relocation and goodwill costs are estimated to be approximately \$4.3 million for Mendenhall and \$344,000 for Houston Levee.

Table 3: Mendenhall Rail Crossing Relocation and Goodwill Costs

(1 of 3)

Property ID	Parcel Number	Address	Business	Building S.F.	Estimated Business SF	Demo/Goodwill/Relocation Costs
H	056008 00150C	4916 POPLAR AVE	CHICK FIL A	4,545	4,545	50,000
I	056008 00106	4938 POPLAR	AT&T LifeBlood	9,884	4,942 4,942	50,000 50,000
J	056008 00155	4954 POPLAR AVE	Mr. Pride Carwash	3,966	3,966	50,000
K	056008 00156	0 POPLAR AVE	Mr. Pride Carwash (Bill Board Signage)	0	3,966	50,000
L	056008 00104	4966 POPLAR	Shops of Ann Addler	4,320	6,585	60,000
M	056008 00103	4970 POPLAR	Belmont Grill	2,265		50,000
N	056008 00101C	637 MENDENHALL	Belmont Grill	1,976	1,976	50,000
			Long Law Firm		1,200	50,000
O	056008 00100	629 MENDENHALL	Ratcliff's Shoe Service Yoga Memphis	3,600	1,200 1,200	50,000 50,000
P	056008 00099	621 MENDENHALL	All About Pets	2,658	2,658	50,000
Q	056008 00098	615 MENDENHALL	Handiwork Jewelry	2,952	2,952	50,000
R	056008 00097	601 MENDENHALL	SEABROOK WALLCOVERING	7,959	7,959	60,000
G	056008 00147C	4910 POPLAR AVE ²	Public Storage	81,840	4,837	50,000
S	056008 00070C	571 S MENDENHALL	Cadence Banking	5,634	5,634	60,000
T	056008 00069	571 S MENDENHALL RD	Memphis Symphony	2,384	2,384	50,000
BF	056008 00096	4963 E BLACK	The Polished Pair	4,000	2,000	50,000
BG	056008 00095	4953 BLACK RD	Bomar & Brown, LLC		2,000	50,000
U	056008 00067C	571 S MENDENHALL ²	Browndog Lodge	2,800	2,800	50,000
			Arts Memphis	3,970		
AC	056033 00101	606 MENDENHALL RD	Collier Insurance	25,401	25,401	75,000
			Daniel Yacoubian Jewelers		1,467	50,000
			Advanced Computer Center		1,467	50,000
AH	056033 00095C	5030 POPLAR AVE	Nails by Nicole	8,800	1,467	50,000
			Sahara Café		1,467	50,000
			Pita Wraps		1,467	50,000
			Smooth Moves		1,467	50,000

Table 3 (continued): Mendenhall Rail Crossing Relocation and Goodwill Costs

(2 of 3)

Property ID	Parcel Number	Address	Business	Building S.F.	Estimated Business SF	Demo/Goodwill/Relocation Costs
AD	056033 00100	4990 POPLAR AVE	First Tennessee Bank	61,144	61,144	75,000
AE	056033 00099	0 POPLAR AVE	First Tennessee Bank			
AF	056033 00098	5000 POPLAR AVE	Houston's Restaurant	7,570	7,570	60,000
			<u>STRIP SHOPPING CNTR</u>			
			Vacant		1,711	50,000
			Stamps & Coins		1,711	50,000
BI	056033 00224	5007 BLACK RD	Ben & Jerry's	10,264	1,711	50,000
			Tate Professional Jewelers		1,711	50,000
			Polished Nails & Spa		1,711	50,000
			Gil & Co,		1,711	50,000
			<u>WHITE STATION COMMONS</u>			
AG	056033 00225	5014 POPLAR AVE ²	Office Depot	68,792	34,396	
			Whole Foods		34,396	
AB	056033 00236	580 S MENDENHALL RD ²	McAlister's Deli	3,818		
			<u>WILLIAMSBURG VILLAGE SHOP CTR</u>	23,755		
			Tobacco Corner	3,500	3,500	50,000
			Beltone		1,237	50,000
			Memphis Jewelry		1,237	50,000
			Flowers & Etc.	4,949	1,237	50,000
			Boyer Hair Group		1,237	50,000
AM	065041 00028	679 E. MENDENHALL	The Book Place	1,225	1,225	50,000
			Simply Divine	3,900	1,950	50,000
			The Clothes Line		1,950	50,000
			Yarniverse	3,000	1,500	50,000
			Nails by Ruth		1,500	50,000
			A Little English Interiors	7,181	3,591	50,000
			Bogies' Deli		3,591	50,000

Table 3 (continued): Mendenhall Rail Crossing Relocation and Goodwill Costs

(3 of 3)

Property ID	Parcel Number	Address	Business	Building S.F.	Estimated Business SF	Demo/Goodwill/Relocation Costs
AN	065041 00029	777 MT MORIAH ²	Apartment Complex, 118 units	98,607		
	065039 00023C	663 MOSS	Single Family Residential	1,488		35,000
	065041 00001	664 MOSS	Single Family Residential	963		35,000
AP	065042 00001	688 MENDENHALL	<u>NBHD SHOPPING CENTER</u>	29,969		
			Half Shell	6,449	6,449	60,000
			Allied Medical	6,449	6,449	60,000
			At Home Medical Supply	14,560	4,853	50,000
			Wild Birds Unlimited		4,853	50,000
			Midnight Sun Tanning		4,853	50,000
			Epic Salon	2,512	2,512	50,000
AX	065043 00001	700 MT MORIAH	Goodwill		2,754	50,000
			All About Pets	8,261	2,754	50,000
BJ	065043 00007	710 MT MORIAH	Uptech Computer		2,754	50,000
			McGehee Clinic for Animals	4,615	4,615	50,000
BK	065043 00009	718 MT MORIAH	Lunt & Co. Financial Planning	1,568	1,568	50,000
			726 MPE Suites 100-106		2,184	50,000
BL	065043 00008	722 MT MORIAH	Mewtopia	6,551	2,184	50,000
			FSBO		2,184	50,000
AY	065043 00002	5035 SOUTHERN	Sherwin Williams Paint	7,182	3,591	50,000
AZ	065043 00003C	715 WINTON ST	Dent Doctor		3,591	50,000
			Sunshine Car Wash	3,435	3,435	50,000
AQ	065044 00001	742 MT MORIAH ²	The Urban Gardener	3,000		
BC	065045 00001C	751 TRUSE PKWY ²	Schnucks Express Gas (Gas Station)	2,204		
TOTAL				575,864	331,087	3,380,000

Note: Businesses removed unless otherwise noted.

Demo/Goodwill/Reloc Cost Sub-total \$3,380,000

¹ Per the Shelby County Assessor's terminology

25% Contingency 845,000

² Businesses impacted

TOTAL Demo/Goodwill/Reloc Cost \$4,225,000

Source: Shelby County Assessor's database, Dalhoff Thomas Daws, AECOM

Table 4: Houston Levee Rail Crossing Relocation and Goodwill Costs

Property ID	Parcel Number	Address	Business	Building S.F.	Estimated Business SF	Demo/Goodwill/Relocation Costs
D	C0243 00438	9880 HIGHWAY 72	Independent Bank	3,536	3,536	50,000
C	C0243 00439	2116 W POPLAR AVE ²	<u>THE COLLECTION OF HOUSTON LEVEE</u>	27,544		
B	C0243 00010	2140 W POPLAR AVE ²	Huey's Sekisui Comcast Super Suppers Americna Family Dentistry Salon De Carlo Three Dog Bakery All American Swim Poplar Wine & Spirits <u>COUNTY CLUB COLLECTIONS</u> Bangkok Alley Pella Windows & Doors Beauty Supply Richard & Co. Supply Kathy's Nails Century 21 Chiropractic Memphis Superstore Exercise Equipment At's-A-Pizza Tadporter's Custom Framing Landers Ford (Auto Dealer)	24,480		
J	C0243 00413C	2082 POPLAR AVE		35,670	35,670	50,000
R	C0243 00555	358 S HOUSTON LEVEE RD	Longhorn Steakhouse	6,190	6,190	50,000
S	C0243 00500	3603 HOUSTON LEVEE RD	Starbucks	1,779	1,779	50,000
T	C0243 00492	3607 HOUSTON LEVEE RD ²	First State Bank	3,926		
Z	C0243 00487	3601 HOUSTON LEVEE RD	Backyard Burger	3,568	3,568	75,000
Y	C0243 00486	3574 S HOUSTON LEVEE RD	Vacant Lot	0	0	
TOTAL				106,693	50,743	275,000

Note: Businesses removed unless otherwise noted.

¹ Per the Shelby County Assessor's terminology

² Businesses impacted

Source: Shelby County Assessor's database, Dalhoff Thomas Daws, AECOM

Demo/Goodwill/Reloc Cost Sub-total	\$275,000
25% Contingency	68,750
TOTAL Demo/Goodwill/Reloc Cost	\$343,750

III. Impact on the Regional Economy

REMI Model

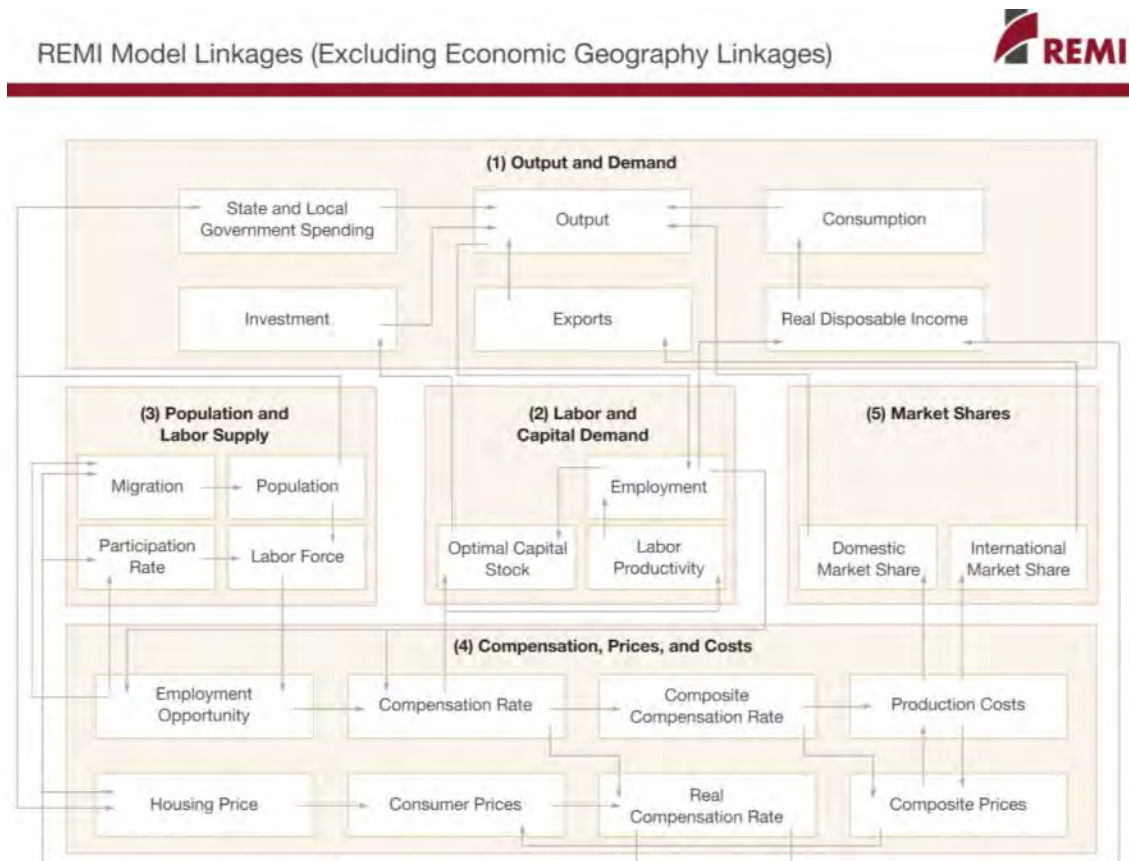
AECOM estimated the regional economic impact of the two undercrossings using an economic impact modeling software created by Regional Economic Models, Inc. (REMI) for Shelby County. The REMI model was developed in 1980 and has since been widely used throughout the United States as a forecasting and policy analysis tool by universities, private businesses, and state, local, and national government agencies. It is a sophisticated modeling tool that incorporates many principles of economics and economic impact models, including:

- Input-output mechanisms – The REMI model contains detailed industries and incorporates inter-industry relationships.
- General equilibrium economic theory – REMI models are dynamic and allow users to examine economic changes over time, allowing firms and individuals to change their behavior in response to changing economic conditions.
- Econometrics – The REMI model includes econometric principles through the underlying equations and response estimations using advanced statistical techniques.
- New economic geography - The spatial dimension of the economy is represented through the productivity and competitiveness benefits due to the concentration, or agglomeration, of economic activity in cities and metropolitan areas, and to the clustering of industries.

The model consists of thousands of simultaneous equations, although the exact number of equations used varies depending on the extent of industry, demographic, demand, and other detail in the specific model being used. Forecasts and simulations are generated on an annual basis and include behavioral responses to compensation, price, and other economic factors.

The overall structure of REMI includes five major blocks shown in **Figure 3** below: (1) Output and Demand, (2) Labor and Capital Demand, (3) Population and Labor Supply, (4) Compensation, Prices, and Costs, and (5) Market Shares.

Figure 3: REMI Model Structure



REMI Inputs and Outputs

There are two major categories of impacts resulting from the construction and operation of the new undercrossings in Shelby County, described below:

- **Construction Impacts** – The construction associated with this project creates employment opportunities, including direct construction jobs and indirect and induced jobs that result from increased income in the region. The indirect and induced jobs are created by the construction firm and its employees, who have more income as a result of this project, spending more money in the local economy that in turn flows through other businesses and industries. This new employment to the region only occurs during the construction period and is considered a one-time only impact.
- **Travel Efficiency Impacts** – As a result of the new underpasses, there will be some time savings in travel and commuting costs. These time savings can be translated into an enhancement of quality of life, increase in personal income, and increased overall labor productivity. These impacts recur year after year and are considered ongoing impacts.

- Travel Efficiency Impacts for Trucking – The lower travel times also affect commercial trucks, which are utilized to different degrees by industries in Shelby County. These savings in travel times are realized as decreased production costs and also recur year after year.

Assumptions for REMI Model Inputs

Specific assumptions related to the REMI modeling process and the development of the REMI inputs are as follows:

Construction

- Construction impacts were entered into the model using total construction cost with the Exogenous Final Demand policy variable for the construction sector. While there are three methods of entering construction inputs into the REMI model, this variable is the most appropriate when the activity represents new demand for construction, which may or may not be satisfied locally. The Exogenous Final Demand variable changes the total demand in the specified industry, and only the portion of demand that can be supported by local market conditions is supplied locally and added to local production. The remainder of the amount is assumed to be produced outside the Shelby County region and is imported.
- The construction cost was spread evenly throughout a five-year period from 2013 to 2017. Construction costs used for the purposes of REMI included a percentage of relocation costs assumed to stay within the County, but excluded any site acquisition costs. The construction cost inputs are shown in the table below:

Table 5: Construction Cost Inputs to REMI Model

Category	Amount (2009 \$)
Poplar Avenue at Mendenhall Road	
Utility Relocation	\$2,412,000
Construction Cost	\$27,125,000
Preliminary Engineering	\$2,713,000
Relocation ¹	\$2,154,750
Total Construction Cost Inputs for Mendenhall Road	\$34,404,750
Poplar Avenue at Houston Levee Road	
Utility Relocation	\$1,884,000
Construction Cost	\$24,313,000
Preliminary Engineering	\$2,432,000
Relocation ¹	\$175,313
Total Construction Cost Inputs for Houston Levee Road	\$28,804,313

¹ Relocation costs are assumed to be 60% of the estimated Relocation and Goodwill Costs (presented in Table 3 and Table 4). 85% of affected business are anticipated to be relocated within Shelby County.

Source: Kimley-Horn and Associates, AECOM

Travel Savings

Travel efficiencies are created as a result of travel time savings and the reduction of accidents and air pollution. AECOM calculated the monetary value of these benefits, which were then translated into three variables in the REMI model:

- An increase in personal income, resulting from additional employment time;
- Improved quality of life, translated into REMI using the non-pecuniary amenity variable; and
- Increased output to firms as a result of increased overall labor productivity.

AECOM assumed that the time savings were split fairly evenly between quality of life and increased personal income. For the increase in personal income and the increased output, we weighted the savings by size of industry in Shelby County before inputting into the REMI model.

REMI Outputs

One-Time Construction Impacts

Below we show the total direct, indirect and induced employment and output impacts that result from the expenditures related to construction of the Mendenhall and Houston Levee underpasses. These impacts are estimated to occur fairly evenly over a five-year period and will not recur after the

construction period is over. As shown, the construction of the two underpasses results in the creation of 785 jobs over the five-year construction period and a \$92.6 million increase in output to firms in Shelby County.

Table 6: Employment and Output Impacts for the 5-Year Construction Period

Year	Employment			Output (constant 2010 \$)		
	Houston		Total	Houston		Total
	Mendenhall	Levee		Mendenhall	Levee	
2013	91	76	167	\$10,725,000	\$8,938,000	\$19,663,000
2014	89	75	164	\$10,598,000	\$8,938,000	\$19,536,000
2015	86	72	158	\$10,215,000	\$8,938,000	\$19,153,000
2016	82	69	151	\$9,704,000	\$7,661,000	\$17,365,000
2017	79	66	145	\$9,193,000	\$7,661,000	\$16,854,000
Total	427	358	785	\$50,435,000	\$42,136,000	\$92,571,000

Source: REMI, AECOM

Travel Time Savings Impacts

The savings in travel times resulting from the proposed undercrossings result in an annual increase of \$5.9 million in output (in 2010 constant dollars) and an associated additional 25 jobs in 2020 within Shelby County. By 2030, the annual increase in personal income in the region is estimated to reach close to \$4.7 million (in 2030 dollars). The vast majority of the impact on employment and output is due to the increased labor productivity.

Table 7: Ongoing Impacts to Shelby County Resulting from Travel Time Savings¹

Category	Employment		Output (2010 dollars)		Personal Income (current year dollars)	
	2020	2030	2020	2030	2020	2030
<u>Mendenhall</u>						
Personal income and amenity	3	3	\$438,000	\$555,000	\$700,000	\$1,160,000
Labor productivity	9	7	\$2,439,000	\$2,298,000	\$790,000	\$1,090,000
Subtotal Mendenhall	12	10	\$2,877,000	\$2,853,000	\$1,490,000	\$2,250,000
<u>Houston Levee</u>						
Personal income and amenity	3	4	\$478,000	\$614,000	\$740,000	\$1,266,000
Labor productivity	10	7	\$2,554,000	\$2,464,000	\$830,000	\$1,160,000
Subtotal Houston Levee	13	11	\$3,032,000	\$3,078,000	\$1,570,000	\$2,426,000
TOTAL	25	21	\$5,909,000	\$5,931,000	\$3,060,000	\$4,676,000

¹ All ongoing impacts shown are on an annual recurring basis.

Source: REMI, AECOM

IV. Benefit Cost Analysis of Under Crossings

Whereas the economic impact evaluation examines the impact of these two under crossings from the perspective of the Memphis Metropolitan Area regional economy. The benefit cost evaluation is a narrower analysis conducted from a transportation project perspective. It essentially compares the benefits of each project against its costs with all dollars adjusted to a single point in time.

Benefits

From a transportation project perspective, the benefits include essentially time savings which accrue to motorists, and these have been divided into household sector benefits and employment sector benefits. The time savings to the household sector allows motorist to spend a bit more time throughout the years in personal consumption of goods and services, including recreation goods and services. This time savings benefit has a fairly moderate impact on increasing the output of the Shelby County economy. The time savings to the employment sector allows each employee to spend a few more hours at work throughout the year, and this contributes to businesses increasing their production of goods and services. The output gains of both sectors were calculated by the REMI model and described in Section III, and these benefits increase the overall output of the Shelby County economy.

The proposed community redevelopment activities around these under crossings have not been included in this benefit cost analysis because assuming regional demand exists for such development they would have occurred within Shelby County in any case. These are viewed as geographic shifts in economic development activity rather than a net benefit from these transportation improvement projects.

Costs

The costs are very direct in this analysis, and they include items addressed in Section III:

- Construction of each under crossing
- Real estate acquisition of commercial buildings and a few residences
- The cost of relocating businesses and residents covering both the physical move and compensation for the loss of goodwill associated with an established business location

Time Value of Money

The benefit cost analysis compares dollars at a single point in time. In order to facilitate that comparison, the analysis made the following forecasts and assumptions:

- **Inflation** – due to the current deep national recession, no inflation is assumed from 2009 through 2012. However, because of considerable deficit spending by the Federal

government to counter the current recession, long term inflation is expected by most economists. Inflation is assumed to be 2.0 percent for 2013 and 2.7 percent from 2014 forward.

- **Period of Analysis** – since the transportation benefits will not even begin until 2018 and the improvements will last perhaps 100 years, the analysis was taken out to 2050. REMI model results were used until 2030, which would only show the resulting benefits for 12 years. The figures were extended forward to 2050 to show benefits over a longer period and resulted in a more accurate benefit cost ratio calculation.
- **Discount Rate** – since future dollars are worth less than current year dollars and the costs are front-end loaded but the benefits extend decades into the future, the selection of a discount rate is extremely important. We applied two different discount rates, **seven percent** as recommended by the Federal Office of Management and Budget (OMB) a number of years ago and **five percent** which is more reflective of the current government sector long term borrowing rate.

Benefit Cost Ratios

Mendenhall Road

The benefit cost analysis for the Mendenhall Road under crossing showed a benefit to cost ratio of 0.66 with a seven percent annual discount rate and 0.92 using a five percent annual discount rate. The benefits do not outweigh the costs because when real estate acquisition and relocation costs are considered, the overall hard construction cost doubles. From a project perspective, regardless of who is paying, the benefits of additional Shelby County economic output are less than project implementation cost. However, if Shelby County is able to secure State and Federal funding for approximately half of the total project cost, then the Shelby County benefit cost ratio will be greater than one (see **Table 8** for details).

Houston Levee Road

The analysis for the Houston Levee Road under crossing showed a benefit to cost ratio of 1.08 with a seven percent annual discount rate and 1.50 using a five percent annual discount rate. The benefits do outweigh the costs because the real estate acquisition and relocation costs are considerably less than Mendenhall Road, and the construction cost is slightly less (see **Table 9**). Since the travel benefits do not differ greatly and the costs are considerably less, this undercrossing should be the higher priority project. With any State or Federal funding assistance, the Houston Levee Road under crossing appears to be a worthwhile construction project.

Table 8: Benefit-Cost Analysis of Shelby County Rail Undercrossings: Mendenhall Road Undercrossing

Year	Inflation Index	Personal Time Savings	Gain in Labor Production	Total Gain in County Output	Total Gain in County Output	Construction & Relocation Cost Constant 2010\$	Construction & Relocation Cost Current Dollars ¹	
				Constant 2010\$ ¹	Current Dollars ²			
2010	1.000	0	0	0	0	0	0	
2011	1.000	0	0	0	0	0	0	
2012	1.000	0	0	0	0	33,688,722	33,688,722	
2013	1.020	0	0	0	0	6,450,000	6,579,000	
2014	1.048	0	0	0	0	6,450,000	6,756,633	
2015	1.076	0	0	0	0	6,450,000	6,939,062	
2016	1.105	0	0	0	0	6,450,000	7,126,417	
2017	1.135	0	0	0	0	6,450,000	7,318,830	
2018	1.165	428,629	2,451,498	2,880,127	3,356,325	0	0	
2019	1.197	448,164	2,477,034	2,925,199	3,500,888	0	0	
2020	1.229	438,333	2,438,730	2,877,063	3,536,247	0	0	
2021	1.262	438,333	2,400,425	2,838,758	3,583,374	0	0	
2022	1.296	438,333	2,387,657	2,825,990	3,663,572	0	0	
2023	1.331	457,868	2,362,120	2,819,989	3,754,499	0	0	
2024	1.367	457,868	2,311,048	2,768,916	3,786,037	0	0	
2025	1.404	457,868	2,285,511	2,743,379	3,852,400	0	0	
2026	1.442	467,572	2,285,511	2,753,083	3,970,409	0	0	
2027	1.481	487,108	2,259,975	2,747,082	4,068,722	0	0	
2028	1.521	516,347	2,285,511	2,801,858	4,261,897	0	0	
2029	1.562	535,754	2,285,511	2,821,266	4,407,286	0	0	
2030	1.604	555,290	2,298,279	2,853,569	4,578,109	0	0	
2031	1.648	555,290	2,298,279	2,853,569	4,701,718	0	0	
2032	1.692	555,290	2,298,279	2,853,569	4,828,664	0	0	
2033	1.738	555,290	2,298,279	2,853,569	4,959,038	0	0	
2034	1.785	555,290	2,298,279	2,853,569	5,092,932	0	0	
2035	1.833	555,290	2,298,279	2,853,569	5,230,441	0	0	
2036	1.882	555,290	2,298,279	2,853,569	5,371,663	0	0	
2037	1.933	555,290	2,298,279	2,853,569	5,516,698	0	0	
2038	1.985	555,290	2,298,279	2,853,569	5,665,649	0	0	
2039	2.039	555,290	2,298,279	2,853,569	5,818,621	0	0	
2040	2.094	555,290	2,298,279	2,853,569	5,975,724	0	0	
2041	2.151	555,290	2,298,279	2,853,569	6,137,069	0	0	
2042	2.209	555,290	2,298,279	2,853,569	6,302,770	0	0	
2043	2.268	555,290	2,298,279	2,853,569	6,472,944	0	0	
2044	2.330	555,290	2,298,279	2,853,569	6,647,714	0	0	
2045	2.393	555,290	2,298,279	2,853,569	6,827,202	0	0	
2046	2.457	555,290	2,298,279	2,853,569	7,011,537	0	0	
2047	2.523	555,290	2,298,279	2,853,569	7,200,848	0	0	
2048	2.592	555,290	2,298,279	2,853,569	7,395,271	0	0	
2049	2.662	555,290	2,298,279	2,853,569	7,594,943	0	0	
2050	2.733	555,290	2,298,279	2,853,569	7,800,007	0	0	
Total Undiscounted		17,233,264	76,494,397	93,727,661	172,871,219	0	65,938,722	68,408,663
Total Discounted @ 7%					\$35,518,000			\$54,203,948
Total Discounted @ 5%					\$52,997,364			\$57,754,684
Benefit v Cost Ratio @ 7% Discount Rate								0.66
Benefit v Cost Ratio @ 5% Discount Rate								0.92

¹ Includes total value of Personal Time Savings and Gain in Labor Production in Shelby County as compared to a no-build scenario.

² Assumes no inflation from 2009 through 2012 and 2.0% in 2013 and 2.7% thereafter

Source: AECOM Technical Services

Table 9: Benefit-Cost Analysis of Shelby County Rail Undercrossings: Houston Levee Undercrossing

Year	Inflation Index	Personal Time Savings	Gain in Labor Production	Total Gain in	Total Gain in	Construction &	Construction &
				County Output Constant 2010\$ ¹	County Output Current Dollars ²	Relocation Cost Constant 2010\$	Relocation Cost Current Dollars ¹
2010	1.000	0	0	0	0	0	0
2011	1.000	0	0	0	0	0	0
2012	1.000	0	0	0	0	15,036,221	15,036,221
2013	1.020	0	0	0	0	5,725,800	5,840,316
2014	1.048	0	0	0	0	5,725,800	5,998,005
2015	1.076	0	0	0	0	5,725,800	6,159,951
2016	1.105	0	0	0	0	5,725,800	6,326,269
2017	1.135	0	0	0	0	5,725,800	6,497,079
2018	1.165	458,379	2,553,644	3,012,023	3,510,028	0	0
2019	1.197	467,317	2,566,412	3,033,729	3,630,777	0	0
2020	1.229	477,531	2,553,644	3,031,175	3,725,669	0	0
2021	1.262	467,317	2,528,107	2,995,424	3,781,134	0	0
2022	1.296	477,531	2,515,339	2,992,870	3,879,914	0	0
2023	1.331	496,684	2,464,266	2,960,950	3,942,173	0	0
2024	1.367	506,898	2,451,498	2,958,396	4,045,120	0	0
2025	1.404	506,898	2,425,961	2,932,860	4,118,478	0	0
2026	1.442	526,051	2,413,193	2,939,244	4,238,884	0	0
2027	1.481	526,051	2,400,425	2,926,476	4,334,423	0	0
2028	1.521	565,632	2,438,730	3,004,362	4,569,925	0	0
2029	1.562	574,570	2,438,730	3,013,300	4,707,275	0	0
2030	1.604	614,151	2,464,266	3,078,417	4,938,843	0	0
2031	1.648	614,151	2,464,266	3,078,417	5,072,192	0	0
2032	1.692	614,151	2,464,266	3,078,417	5,209,141	0	0
2033	1.738	614,151	2,464,266	3,078,417	5,349,788	0	0
2034	1.785	614,151	2,464,266	3,078,417	5,494,232	0	0
2035	1.833	614,151	2,464,266	3,078,417	5,642,576	0	0
2036	1.882	614,151	2,464,266	3,078,417	5,794,926	0	0
2037	1.933	614,151	2,464,266	3,078,417	5,951,389	0	0
2038	1.985	614,151	2,464,266	3,078,417	6,112,076	0	0
2039	2.039	614,151	2,464,266	3,078,417	6,277,102	0	0
2040	2.094	614,151	2,464,266	3,078,417	6,446,584	0	0
2041	2.151	614,151	2,464,266	3,078,417	6,620,642	0	0
2042	2.209	614,151	2,464,266	3,078,417	6,799,399	0	0
2043	2.268	614,151	2,464,266	3,078,417	6,982,983	0	0
2044	2.330	614,151	2,464,266	3,078,417	7,171,524	0	0
2045	2.393	614,151	2,464,266	3,078,417	7,365,155	0	0
2046	2.457	614,151	2,464,266	3,078,417	7,564,014	0	0
2047	2.523	614,151	2,464,266	3,078,417	7,768,242	0	0
2048	2.592	614,151	2,464,266	3,078,417	7,977,985	0	0
2049	2.662	614,151	2,464,266	3,078,417	8,193,391	0	0
2050	2.733	614,151	2,464,266	3,078,417	8,414,612	0	0
Total Undiscounted		18,948,036	81,499,538	100,447,574	185,630,597	43,665,221	45,857,840
Total Discounted @ 7%					\$37,927,748		\$35,129,978
Total Discounted @ 5%					\$56,690,005		\$37,782,548
Benefit v Cost Ratio @ 7% Discount Rate							1.08
Benefit v Cost Ratio @ 5% Discount Rate							1.50

¹ Includes total value of Personal Time Savings and Gain in Labor Production in Shelby County as compared to a no-build scenario.

² Assumes no inflation from 2009 through 2012 and 2.0% in 2013 and 2.7% thereafter

Source: AECOM Technical Services