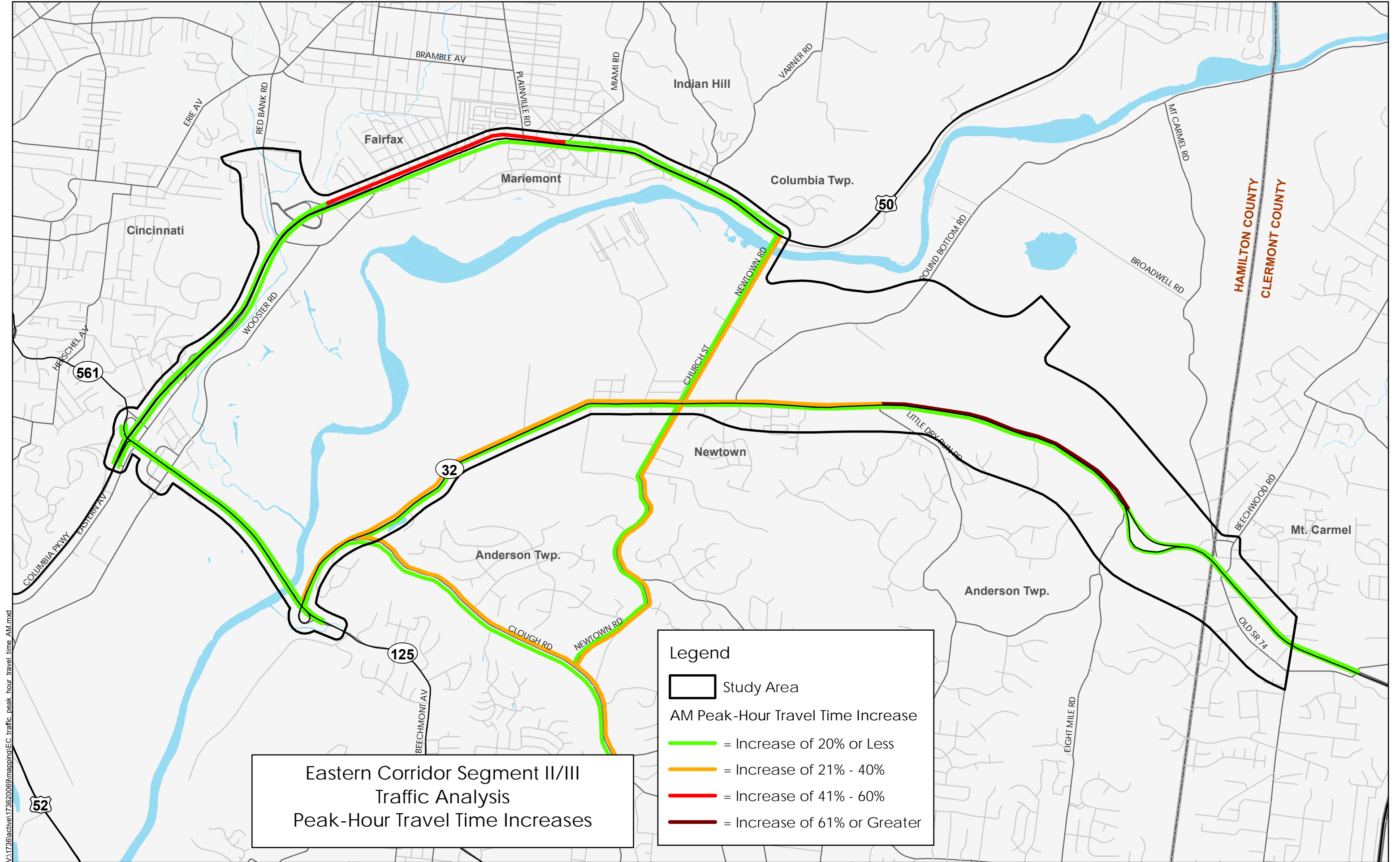
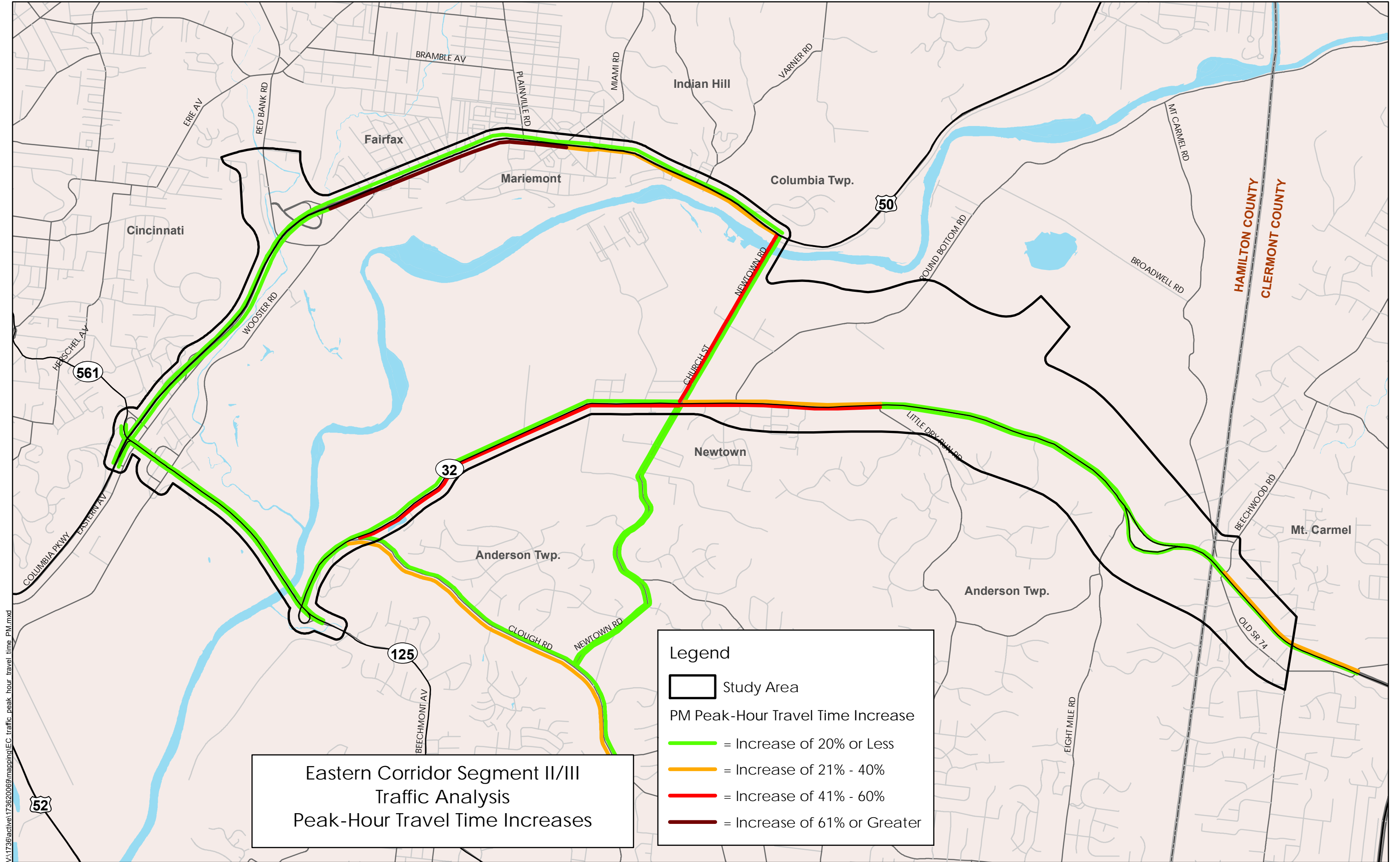


**ATTACHMENT A-4**  
**TRAVEL TIME DATA**





### AM PEAK-HOUR TRAVEL TIMES

Roadway	Direction	Peak-Hour	Average Peak-Hour Travel Time <sup>1</sup> (minutes)	Average Off-Peak Travel Time <sup>1</sup> (minutes)	Difference (minutes)	Percent Increase
<b>Church Street</b>						
Clough Pike to SR 32	NB	8:00 - 9:00	5.06	4.14	0.92	22.2%
	SB	8:00 - 9:00	4.33	3.98	0.35	8.8%
SR 32 to US 50	NB	5:00 - 6:00	4.02	2.90	1.12	38.6%
	SB	5:00 - 6:00	2.75	2.91	-0.16	-5.5%
<b>Clough Pike</b>						
SR 32 to Corbly St	EB	7:00 - 8:00	3.68	3.84	-0.16	-4.2%
	WB	7:00 - 8:00	5.21	3.85	1.36	35.3%
<b>SR 32</b>						
SR 125 to Clough Pike	EB	7:00 - 8:00	0.78	0.69	0.09	13.0%
	WB	7:00 - 8:00	0.87	0.63	0.24	38.1%
Clough Pike to Church St	EB	7:00 - 8:00	3.90	3.77	0.13	3.4%
	WB	7:00 - 8:00	4.17	3.40	0.77	22.6%
Church St to Little Dry Run	EB	7:00 - 8:00	2.42	2.52	-0.10	-4.0%
	WB	7:00 - 8:00	3.66	2.68	0.98	36.6%
Little Dry Run to Eight Mile Rd	EB	7:00 - 8:00	2.16	2.07	0.09	4.3%
	WB	7:00 - 8:00	3.95	2.26	1.69	74.8%
Eight Mile Rd to Beechwood Rd	EB	7:00 - 8:00	1.15	1.19	-0.04	-3.4%
	WB	7:00 - 8:00	0.82	0.78	0.04	5.1%
Beechwood Rd to Old SR 74	EB	7:00 - 8:00	1.58	1.61	-0.03	-1.9%
	WB	7:00 - 8:00	1.78	1.74	0.04	2.3%
<b>SR 125</b>						
US 50 Ramps	EB	6:00 - 7:00	0.15	0.15	0.00	0.0%
	WB	7:00 - 8:00	0.23	0.20	0.03	15.0%
US 50 to SR 32	EB	6:00 - 7:00	1.79	1.54	0.25	16.2%
	WB	7:00 - 8:00	1.77	1.56	0.21	13.5%
SR 32 Ramps	EB	6:00 - 7:00	0.38	0.38	0.00	0.0%
	WB	7:00 - 8:00	0.44	0.37	0.07	18.9%
<b>US 50</b>						
SR 125 Ramps	EB	8:00 - 9:00	0.19	0.19	0.00	0.0%
	WB	8:00 - 9:00	0.23	0.23	0.00	0.0%
SR 125 to Red Bank Rd	EB	8:00 - 9:00	1.71	1.74	-0.03	-1.7%
	WB	8:00 - 9:00	1.60	1.68	-0.08	-4.8%
Red Bank Ramps	EB	8:00 - 9:00	0.17	0.18	-0.01	-5.6%
	WB	8:00 - 9:00	0.23	0.25	-0.02	-8.0%
Red Bank Rd to Mariemont Square	EB	8:00 - 9:00	3.64	3.54	0.10	2.8%
	WB	8:00 - 9:00	5.14	3.36	1.78	53.0%
Mariemont Square to Newtown Rd	EB	8:00 - 9:00	2.82	2.94	-0.12	-4.1%
	WB	8:00 - 9:00	3.54	3.04	0.50	16.4%

1. Weekdays from September 12, 2016 through October 21, 2016

**PM PEAK-HOUR TRAVEL TIMES**

Roadway	Direction	Peak-Hour	Average Peak-Hour Travel Time <sup>1</sup> (minutes)	Average Off-Peak Travel Time <sup>1</sup> (minutes)	Difference (minutes)	Percent Increase
<b>Church Street</b>						
Clough Pike to SR 32	NB	17:00 - 18:00	4.40	4.14	0.26	6.3%
	SB	17:00 - 18:00	3.87	3.98	-0.11	-2.8%
SR 32 to US 50	NB	17:00 - 18:00	2.98	2.90	0.08	2.8%
	SB	17:00 - 18:00	4.32	2.91	1.41	48.5%
<b>Clough Pike</b>						
SR 32 to Corbly St	EB	17:00 - 18:00	5.27	3.84	1.43	37.2%
	WB	17:00 - 18:00	4.12	3.85	0.27	7.0%
<b>SR 32</b>						
SR 125 to Clough Pike	EB	17:00 - 18:00	0.79	0.69	0.10	14.5%
	WB	17:00 - 18:00	0.62	0.63	-0.01	-1.6%
Clough Pike to Church St	EB	17:00 - 18:00	5.82	3.77	2.05	54.4%
	WB	17:00 - 18:00	3.22	3.40	-0.18	-5.3%
Church St to Little Dry Run	EB	17:00 - 18:00	3.60	2.52	1.08	42.9%
	WB	17:00 - 18:00	3.34	2.68	0.66	24.6%
Little Dry Run to Eight Mile Rd	EB	17:00 - 18:00	2.07	2.07	0.00	0.0%
	WB	17:00 - 18:00	2.13	2.26	-0.13	-5.8%
Eight Mile Rd to Beechwood Rd	EB	17:00 - 18:00	1.20	1.19	0.01	0.8%
	WB	17:00 - 18:00	0.81	0.78	0.03	3.8%
Beechwood Rd to Old SR 74	EB	17:00 - 18:00	1.81	1.61	0.20	12.4%
	WB	17:00 - 18:00	2.35	1.74	0.61	35.1%
<b>SR 125</b>						
US 50 Ramps	EB	17:00 - 18:00	0.15	0.15	0.00	0.0%
	WB	17:00 - 18:00	0.20	0.20	0.00	0.0%
US 50 to SR 32	EB	17:00 - 18:00	1.59	1.54	0.05	3.2%
	WB	17:00 - 18:00	1.51	1.56	-0.05	-3.2%
SR 32 Ramps	EB	17:00 - 18:00	0.41	0.38	0.03	7.9%
	WB	17:00 - 18:00	0.36	0.37	-0.01	-2.7%
<b>US 50</b>						
SR 125 Ramps	EB	17:00 - 18:00	0.18	0.19	-0.01	-5.3%
	WB	17:00 - 18:00	0.23	0.23	0.00	0.0%
SR 125 to Red Bank Rd	EB	17:00 - 18:00	1.69	1.74	-0.05	-2.9%
	WB	17:00 - 18:00	1.62	1.68	-0.06	-3.6%
Red Bank Ramps	EB	17:00 - 18:00	0.48	0.18	0.30	166.7%
	WB	17:00 - 18:00	0.24	0.25	-0.01	-4.0%
Red Bank Rd to Mariemont Square	EB	17:00 - 18:00	6.28	3.54	2.74	77.4%
	WB	17:00 - 18:00	3.35	3.36	-0.01	-0.3%
Mariemont Square to Newtown Rd	EB	17:00 - 18:00	3.87	2.94	0.93	31.6%
	WB	17:00 - 18:00	3.23	3.04	0.19	6.3%

1. Weekdays from September 12, 2016 through October 21, 2016

**ATTACHMENT A-5**

**GEOMETRIC DATA**



Sub Area (Focus Area)	Analysis Segment/Intersection	Posted Speed Limit (mph)	Design Speed (mph)	Functional Classification	Alignment																				Stopping Sight Distance			Intersection Sight Distance			Notes
					Horizontal					Vertical					Grade										Required	Actual	OK	Required	Actual	OK	
					Deflection		Degree of Curve			Superelevation Rate		Grade		Grade Break		Crest K		Sag K													
Maximum	Actual	Maximum	Actual	w/o Super.	Maximum	Actual	Maximum	Actual	Maximum	Actual	Maximum	Actual	Required	Actual	Required	Actual	Required	Actual	Required	Actual	Required	Actual	Required	Actual	Required	Actual					
Ancor / SR 32 Hill	Little Dry Run / SR 32 Intersection	50	55	UM Arterial	1'00'	n/a	5'30'	n/a	0'39'	0.06	n/a	5%	1.58%	OK	0.40%	n/a	114	n/a	115	1220	OK	495	>495	OK	610	Left-620, Right-790	Signalized	Field investigation revealed poor stopping sight distance on Little Dry Run approaching SR 32 due to a combination horizontal/vertical curve.			
	Little Dry Run to 8-Mile	50/55	55/60	UM Arterial	0'55'	n/a	4'15'	3'00'	OK	0'33'	0.06	0.062	OK	8%	6.42%	OK	0.30%	n/a	151	64, 102	OK	136	74, 86, 127, 130	OK				Six deficient vertical curves.			
	8-Mile / SR 32 Intersection	55	55	UM Arterial	1'00'	n/a	5'30'	2'00'	OK	0'39'	0.06	0.062	OK	8%	6.42%	OK	0.40%	n/a	114	n/a	115	n/a	495	EB-350, WB-415	Deficient	610	Left-300, Right-310	Deficient	Vertical Grade deficiency. Maximum vertical grade for 35 mph arterial street is 10%. Grade for right turn lane from S.R. 32 to Eight Mile Rd. is close to 15% as measured in the field.		
	8-Mile to Beechwood	55	55	UM Arterial	1'00'	n/a	05'30'00"	12'08'49", 7'50'06", 7'24'10", 6'00'00"	Deficient	0'39'	0.06	0.135	Deficient	8%	8.00%	Deficient (Length of grade)	0.40%	n/a	114	66	Deficient	115	190	OK						Four deficient horizontal curves. One deficient vertical curve. The vertical grade is deficient because the length of 8% grade is 1750' which exceeds the standard critical length of 600'	
	Beechwood / SR 32 Intersection	55	55	UP Arterial	1'00'	n/a	5'30'	n/a	0'39'	0.06	n/a	5%	0.00%	OK	0.40%	n/a	114	313	OK	115	n/a	495	EB-160, WB->495	Signalized	610	SB Beechwood: Left->610, Right->610 NB Old SR 74: Left-130, Right->610	Signalized	At Old S.R. 74 approach the sight distance is very poor. Signal controller, signal pole, regulatory signs, and parked cars obstruct sight distance.			
	Beechwood to Bells	55	55	UP Arterial	1'00'	n/a	5'30'	3'00'	OK	0'39'	0.06	0.063	OK	5%	0.80%	OK	0.40%	n/a	114	n/a	115	115	OK								
	Bells / SR 32 Intersection	55	55	UP Arterial	1'00'	n/a	5'30'	3'00'	OK	0'39'	0.06	0.063	OK	5%	0.70%	OK	0.40%	n/a	114	n/a	115	n/a	495	EB->495, WB->495	Signalized	610	NB Bells: Left->610, Right->610 SB Bells: Left->610, Right->610	Signalized			
Broadwell / Roundbottom Intersection	45	45	U Collector	1'40'	n/a	8'00'	n/a	5'40'	0.04	n/a	7%				0.55%		61	40	Deficient	79	n/a	360	NB-800, SB-540	OK	500	Left-800, Right-540	OK				
SR 32: West Corp Line to Church	25/35	30/40	UM Arterial	2'05'	2'	OK	10'45'	n/a	7'42'	0.04	n/a	7%	1.50%	OK	0.75%	n/a	44	180.46	OK	64	175.81	OK									
Newtown Village	Church / Main (SR 32) Intersection	25	30	UM Arterial	3'45'	n/a	22'45'	n/a	17'30'	0.04	n/a	8%	1.42%	OK	1.30%	n/a	19	n/a	37	n/a	200	EB-110, WB->200	Signalized	335	NB Church Street: Left-110, Right-180 SB Church Street: Left->335, Right-150 WB SR 32: Left-80, Right-150 WB SR 32: Left-90, Right-90	Signalized	Buildings on two corners of the intersection obstruct sight distance.				
	SR 32: Church to Round Bottom	25	30	UM Arterial	3'45'	1'	OK	22'45'	n/a	17'30'	0.04	n/a	8%	0.65%	OK	1.30%	n/a	19	n/a	37	n/a										
	Round Bottom / SR 32 Intersection	25	30	UM Arterial	3'45'	n/a	22'45'	n/a	17'30'	0.04	n/a	8%	0.54%	OK	1.30%	n/a	19	3750	OK	37	n/a	200	EB-Roundbottom-100, EB-Riverhills-100, WB-Roundbottom->335, WB-Riverhills->200	Partially Signalized/OK	335	SB Roundbottom: Stop condition Right Turn Left-290, Left->335, Right-100 NB Riverhills Dr: Left-130, Right->335	Partially Signalized/Partially Deficient	Round Bottom Road right turn movement is unsignalized and has deficient intersection sight distance.			
	SR 32: Round Bottom to Little Dry Run	35/50	40/55	UM Arterial	1'00'	n/a	5'30'	0'30'	OK	0'39'	0.06	0.026	OK	8%	1.46%	OK	0.40%	n/a	114	n/a	115	200	OK								
	Round Bottom: SR 32 to Valley	25/35	25/35	U Collector	2'45'	n/a	15'30'	09'10"	OK	11'28"	0.04	0.032	OK	9%	1.98%	OK	0.95%	n/a	29		49										
	Round Bottom / Valley Intersection	35	35	U Collector	2'45'	n/a	15'30'	0'35'	OK	11'28"	0.04	n/a	9%	0.44%	OK	0.95%	n/a	29	n/a	49	n/a	250	EB->250, WB-230	Signalized	390	Left-230, Right->335	Signalized				
	Round Bottom: Valley to Broadwell	35/45	35/45	U Collector	1'40'	n/a	8'00'	8'50'	Deficient	5'40'	0.04	0.038	OK	8%	2.86%	OK	0.55%	n/a	61	88	OK	79	221	OK							
	Valley (entire length)	25	25	U Collector	5'30'	n/a	37'00'	n/a	29'20'	0.04	n/a	9%	2.00%	OK	1.85%	OK	1.85%	n/a	12	76	OK	26	99	OK							
Church (Newtown) / Valley Intersection	25	25	U Collector	5'30'	n/a	37'00'	n/a	29'20'	0.04	n/a	9%	1.76%	OK	1.85%	OK	1.85%	n/a	12	n/a	26	40	OK	155	EB->155, WB->155	Signalized	280	Valley: Left-240, Right-180 Park Entrance: Left->280, Right->280	Signalized			
Church (Newtown): SR 32 to Valley	25	25	U Collector	5'30'	n/a	37'00'	n/a	29'20'	0.04	n/a	9%	1.90%	OK	1.85%	OK	1.85%	n/a	12	10	Deficient	26	n/a									
Church (Newtown): Valley to US 50	35	35	U Collector	2'45'	n/a	15'30'	n/a	11'28"	0.04	n/a	9%	2.56%	OK	0.95%	OK	0.95%	n/a	29	n/a	49	n/a										
SR 125: Beechmont Circle to SR 32	45	45	Expressway	1'40'	n/a	8'	1'	OK	5'40'	0.04	n/a	4%	0.75%	OK	0.55%	n/a	61	200	OK	79	200	OK									
SR 125 / SR 32	SR 125 / SR 32 Interchange	45	45	Expressway	1'40'	n/a	8'	3'30'	OK	5'40'	0.04	0.083	OK	4%	0.92%	OK	0.55%	n/a	61	143	OK	79	43	Deficient	360	No blatant sight distance issues.	OK	500	WB 125 to EB 32-vehicles must come to a stop. Sight distance is >500	OK	The sag vertical curve on S.R. 32 underneath S.R. 125 is deficient The adjacent crest vertical curve has a k-value of 57. The crest is not deficient however due to the lowered ramp design speed.
	SR 125: SR 32 to Elstun	45	45	UP Arterial	1'40'	n/a	8'00'	2'30'	OK	5'40'	0.04	0.0485	OK	6%	2.73%	OK	0.55%	1.00%	Deficient	61	n/a	79	n/a								
	SR 125 / Elstun Intersection	45	45	UP Arterial	1'40'	n/a	8'00'	2'30'	OK	5'40'	0.04	n/a	6%	2.73%	OK	0.55%	n/a	61	n/a	79	38	Deficient	360	EB/WB->360	Signalized	500	SB Driveway: Left-525, Right-750 NB Elstun: Left-500, Right-550	Signalized			
	SR 32: SR 125 to Clough	45	50	UM Arterial	1'05'	n/a	6'45'	4'20'	OK	0'47'	0.06	n/a	6%	4.00%	OK	0.45%	n/a	84	n/a	96	n/a										
	Clough / SR 32 Intersection	45	50	UM Arterial	1'05'	n/a	6'45'	2'19'	OK	0'47'	0.06	n/a	6%	2.00%	OK	0.45%	n/a	84	139	OK	96	n/a	425	EB-380, WB-120	Signalized	555	Left-220, Right-120	Signalized			
SR 32: Clough to West Newtown Corp Limit	55	60	UM Arterial	0'55'	0'46'	OK	4'15'	9'45'00", 5'00'00", 10'45'00"	Deficient	0'33'	0.06	0.08	OK	5%	3.52%	OK	0.30%	n/a	151	108	Deficient	136	216	OK							
Linwood / Herschel Intersection	Linwood / Herschel Intersection	30	30	UM Arterial	3'45'	n/a	22'45'	n/a	17'30'	0.04	n/a	8%	3.16%	OK	1.30%	n/a	19	n/a	37	n/a	200	WB->200, EB->200	Signalized	335	Left-340, Right-220	Signalized					
	SR 125 / US 50 Interchange	35/50	40/50	Expressway	1'05'	n/a	06'45'	14'19'22"	Deficient	0'47'	0.06	0.0778	OK	4%	2.69%	OK	0.45%	n/a	84	40	Deficient	96	35, 31, 45	OK	250	Viewing EB Columbia to Eastern Stop condition: WB 125-250, EB 125-100	Deficient	390	EB Columbia to S.R. 125: Left-90, Right-240	Deficient	Ramp Deficiencies: Ramp from Eastern Ave to U.S. 50/S.R. 125 has two 76'00' horizontal curves. Ramp from S.R. 125 to U.S. 50 W has horizontal curve with degree of 44°. None of these curves meet a 25 mph design speed. Merging taper length on ramp from Eastern Ave to S.R. 125 is 115' compared to the minimum of 420'. Total length of U.S. 50 exit ramp to S.R. 125 is deficient. Does not meet minimum length of 800'.
	SR 125: US 50 to Beechmont Circle	35	40	Expressway	2'05'	n/a	10'45'	n/a	7'42'	0.04	n/a	6%	6.00%	OK	0.75%	n/a	44	133.33	OK	64	30	Deficient									

