Table A-3 – Proposed Signal Timings, 3rd Avenue

Intersection	TP1					NBP (MON-FRI, 8AM-8PM)					AC1					AC2				
	Offset	Phase 1	Phase 2	Phase 3	TP#	Offset	Phase 1	Phase 2	Phase 3	TP#	Offset	Phase 1	Phase 2	Phase 3	TP#	Offset	Phase 1	Phase 2	Phase 3	TP#
3rd & 25th	4	54	36	-	1	6	50	40	-	11	6	45	45	-	12	6	45	45	-	14
3rd & 26th	5	54	36	-	1	14	50	40	-	11	14	45	45	-	12	14	45	45	-	14
3rd & 27th	12	54	36	-	1	22	50	40	-	11	22	45	45	-	12	22	45	45	-	14
3rd & 28th	18	54	36	-	1	18	50	40	-	11	18	45	45	-	12	30	45	45	-	14
3rd & 29th	24	54	36	-	1	18	50	40	-	11	18	45	45	-	12	38	45	45	-	14
3rd & 30th	31	54	36	-	1	18	50	40	-	11	18	45	45	-	12	46	45	45	-	14
3rd & 31st	37	54	36	-	1	18	50	40	-	11	18	45	45	-	12	53	45	45	-	14
3rd & 32nd	43	54	36	-	1	18	50	40	-	11	18	45	45	-	12	51	45	45	-	14
3rd & 33rd	50	54	36	-	1	18	50	40	-	11	18	45	45	-	12	49	45	45	-	14
3rd & 34th	56	45	14	31	1	18	45	14	31	11	18	45	14	31	12	47	45	14	31	14
3rd & 35th	62	54	36	-	1	18	50	40	-	14	18	45	45	-	12	45	45	45	-	13
3rd & 36th	70	33	35	22	1	40	33	35	22	11	40	23	45	22	12	65	23	45	22	14
3rd & 37th	75	45	45	-	1	18	45	45	-	14	18	45	45	-	12	41	45	45	-	13
3rd & 38th	79	54	36	-	1	18	45	45	-	11	18	45	45	-	12	35	45	45	-	14
3rd & 39th	86	50	40	-	1	18	45	45	-	11	18	45	45	-	12	33	45	45	-	14
3rd & 40th	4	48	42	-	1	18	45	45	-	11	18	45	45	-	12	31	45	45	-	14
3rd & 41st	11	45	45	-	1	18	45	45	-	11	18	45	45	-	12	28	45	45	-	14

Note: TP1 (Timing Plan 1) is the NYCDOT base plan labeled as Pre-existing plan in the analysis for this arterial section.

Table A-4 – Proposed Signal Timings, 3rd Avenue

Intersection	AOT					NBP (MON-FRI, 8AM-8PM)				
	Offset	Phase 1	Phase 2	Phase 3	TP#	Offset	Phase 1	Phase 2	Phase 3	TP#
3rd & 42nd	18	46	26	18	101	18	46	26	18	102
3rd & 43rd	25	54	36	-	101	25	50	40	-	102
3rd & 44th	32	54	36	-	101	32	50	40	-	102
3rd & 45th	39	41	49	-	101	39	41	49	-	102
3rd & 46th	45	41	49	-	101	45	41	49	-	102
3rd & 47th	52	54	36	-	101	52	50	40	-	102
3rd & 48th	59	54	36	-	101	59	45	45	-	102
3rd & 49th	66	39	51	-	101	66	39	51	-	102
3rd & 50th	73	45	45	-	101	73	45	45	-	102
3rd & 51st	80	55	35	-	101	80	50	40	-	102
3rd & 52nd	88	54	36	-	101	88	50	40	-	102
3rd & 53rd	5	41	48	-	101	5	41	48	-	102
3rd & 54th	11	41	48	-	101	11	41	48	-	102
3rd & 55th	18	52	38	-	101	18	52	38	-	102
3rd & 56th	24	50	40	-	101	24	50	40	-	102
3rd & 57th	24	46	30	14	101	24	46	30	14	102

Note: AOT (All Other Times) is the NYCDOT base plan labeled as Pre-existing plan in the analysis for this arterial section.

Table A-5 – Proposed Signal Timings, Lexington Avenue

Intersection	AOT					NBP(MON-FRI, 8AM-8PM)					AC1					AC2				
	Offset	Phase 1	Phase 2	Phase 3	TP#	Offset	Phase 1	Phase 2	Phase 3	TP#	Offset	Phase 1	Phase 2	Phase 3	TP#	Offset	Phase 1	Phase 2	Phase 3	TP#
Lex & 83rd	35	54	36	-	1	37	50	40	-	11	37	45	45	-	12	37	45	45	-	14
Lex & 82nd	41	54	36	-	1	45	50	40	-	11	45	45	45	-	12	45	45	45	-	14
Lex & 81st	48	54	36	-	1	53	50	40	-	11	53	45	45	-	12	45	45	45	-	14
Lex & 80th	54	54	36	-	1	61	50	40	-	11	61	45	45	-	12	45	45	45	-	14
Lex & 79th	60	50	40	-	1	61	50	40	-	11	61	45	45	-	12	42	45	45	-	14
Lex & 78th	67	54	36	-	1	69	50	40	-	11	69	45	45	-	12	39	45	45	-	14
Lex & 77th	74	54	36	-	1	75	50	40	-	11	75	45	45	-	12	36	45	45	-	14
Lex & 76th	81	54	36	-	1	75	50	40	-	11	75	45	45	-	12	33	45	45	-	14
Lex & 75th	88	54	36	-	1	75	50	40	-	11	75	45	45	-	12	30	45	45	-	14
Lex & 74th	5	54	36	-	1	75	50	40	-	11	75	45	45	-	12	27	45	45	-	14
Lex & 73th	11	54	36	-	1	75	50	40	-	11	75	45	45	-	12	24	45	45	-	14
Lex & 72th	16	50	40	-	1	75	50	40	-	11	75	45	45	-	12	21	45	45	-	14
Lex & 71st	22	54	36	-	1	75	50	40	-	11	75	45	45	-	12	18	45	45	-	14
Lex & 70th	27	54	36	-	1	75	50	40	-	11	75	45	45	-	12	15	45	45	-	14
Lex & 69th	33	54	36	-	1	75	50	40	-	11	75	45	45	-	12	12	45	45	-	14
Lex & 68th	40	54	36	-	1	75	50	40	-	11	75	45	45	-	12	9	45	45	-	14
Lex & 67th	47	54	36	-	1	75	50	40	-	11	75	45	45	-	12	6	45	45	-	14
Lex & 66th	54	54	36	-	1	75	50	40	-	11	75	45	45	-	12	3	45	45	-	14
Lex & 65th	61	54	36	-	1	75	50	40	-	11	75	45	45	-	12	0	45	45	-	14
Lex & 64th	68	54	36	-	1	75	50	40	-	11	75	45	45	-	12	87	45	45	-	14
Lex & 63rd	75	54	36	-	1	75	50	40	-	11	75	45	45	-	12	84	45	45	-	14
Lex & 62nd	81	54	36	-	1	81	50	40	-	11	81	45	45	-	12	81	45	45	-	14

Note: AOT (All Other Times) is the NYCDOT base plan labeled as Pre-existing plan in the analysis for this arterial section.

Table A-6 – Proposed Signal Timings, Lexington Avenue

Intersection	AOT					MON -FRI, 11AM-2PM				
	Offset	Phase 1	Phase 2	Phase 3	TP#	Offset	Phase 1	Phase 2	Phase 3	TP#
Lex & 61st	88	50	40	-	1	88	45	45	-	16
Lex & 60st	5	50	40	-	1	88	45	45	-	16

Note: AOT (All Other Times) is the NYCDOT base plan labeled as Pre-existing plan in the analysis for this arterial section.

Table A-7 – Proposed Signal Timings, Lexington Avenue

Intersection	AOT					NBP(MON-FRI, 8AM-8PM)				
	Offset	Phase 1	Phase 2	Phase 3	TP#	Offset	Phase 1	Phase 2	Phase 3	TP#
Lex & 59th	12	48	42	-	101	12	48	42	-	102
Lex & 58th	12	48	42	-	101	12	48	42	-	102
Lex & 57th	12	48	42	-	101	12	48	42	-	102
Lex & 56th	12	45	45	-	101	12	45	45	-	102
Lex & 55th	18	48	42	-	101	18	48	42	-	102
Lex & 54th	25	54	36	-	101	25	50	40	-	102
Lex & 53rd	32	54	36	-	101	32	50	40	-	102
Lex & 52nd	39	48	42	-	101	39	48	42	-	102
Lex & 51st	46	48	42	-	101	46	48	42	-	102
Lex & 50th	53	54	36	-	101	53	50	40	-	102
Lex & 49th	60	54	36	-	101	60	50	40	-	102
Lex & 48th	68	48	42	-	101	68	48	42	-	102
Lex & 47th	73	48	42	-	101	73	48	42	-	102
Lex & 46th	78	54	36	-	101	78	54	36	-	102
Lex & 45th	84	54	36	-	101	84	54	36	-	102
Lex & 44th	89	54	36	-	101	89	54	36	-	102
Lex & 43rd	5	54	36	-	101	5	54	36	-	102
Lex & 42nd	5	55	35	-	101	5	55	35	-	102

Note: AOT (All Other Times) is the NYCDOT base plan labeled as Pre-existing plan in the analysis for this arterial section.

Table A-8 – Proposed Signal Timings, QMT

Intersection	NBP				AC1				AC2			
	Offset	Phase 1	Phase 2	Phase 3	Offset	Phase 1	Phase 2	Phase 3	Offset	Phase 1	Phase 2	Phase 3
QMT & 34th	54	36	18	36	54	36	18	36	83	36	18	36
QMT & 35th	48	55	35		48	55	35		77	55	35	

Table A-9 – Proposed Signal Timings, Madison Avenue

Intersection	NBP(MON-FRI, 8AM-8PM)					AOT					AC1				
	Offset	Phase 1	Phase 2	Phase 3	TP#	Offset	Phase 1	Phase 2	Phase 3	TP#	Offset	Phase 1	Phase 2	Phase 3	TP#
Mad & 24th	75	50	40	-	11	75	54	36	-	1	75	45	45	-	12
Mad & 25th	81	50	40	-	11	81	54	36	-	1	81	45	45	-	12
Mad & 26th	88	50	40	-	11	87	54	36	-	1	88	45	45	-	12
Mad & 27th	88	50	40	-	11	4	54	36	-	1	88	45	45	-	12
Mad & 28th	88	50	40	-	11	9	54	36	-	1	88	45	45	-	12
Mad & 29th	88	50	40	-	11	14	54	36	-	1	88	45	45	-	12
Mad & 30th	88	50	40	-	11	21	54	36	-	1	88	45	45	-	12
Mad & 31st	88	50	40	-	11	27	54	36	-	1	88	45	45	-	12
Mad & 32nd	88	50	40	-	11	32	52	38	-	1	88	45	45	-	12
Mad & 33rd	88	50	40	-	11	38	50	40	-	1	88	45	45	-	12
Mad & 34th	88	50	40	-	11	49	50	40	-	1	88	45	45	-	12
Mad & 35th	88	50	40	-	11	49	50	40	-	1	88	45	45	-	12
Mad & 36th	88	50	40	-	11	54	50	40	-	1	88	45	45	-	12
Mad & 37th	88	50	40	-	11	59	50	40	-	1	88	45	45	-	12
Mad & 38th	88	50	40	-	11	66	50	40	-	1	88	45	45	-	12
Mad & 39th	88	50	40	-	11	71	50	40	-	1	88	45	45	-	12
Mad & 40th	88	50	40	-	11	77	50	40	-	1	88	45	45	-	12
Mad & 41st	88	50	40	-	11	82	50	40	-	1	88	45	45	-	12
Mad & 42nd	88	50	40	-	101	88	50	40	-	101	88	50	40	-	101
Mad & 43rd	4	50	40	-	101	4	50	40	-	101	4	50	40	-	101
Mad & 44th	9	50	40	-	101	9	50	40	-	101	9	50	40	-	101
Mad & 45th	14	50	40	-	101	14	50	40	-	101	14	50	40	-	101
Mad & 46th	19	50	40	-	101	19	50	40	-	101	19	50	40	-	101
Mad & 47th	24	48	42	-	101	24	48	42	-	101	24	48	42	-	101
Mad & 48th	30	48	42	-	101	30	48	42	-	101	30	48	42	-	101
Mad & 49th	36	50	40	-	101	36	50	40	-	101	36	50	40	-	101
Mad & 50th	41	50	40	-	101	41	50	40	-	101	41	50	40	-	101
Mad & 51th	47	48	42	-	101	47	48	42	-	101	47	48	42	-	101
Mad & 52nd	52	46	44	-	101	52	46	44	-	101	52	46	44	-	101
Mad & 53rd	59	50	40	-	101	59	50	40	-	101	59	50	40	-	101
Mad & 54th	64	50	40	-	101	64	50	40	-	101	64	50	40	-	101
Mad & 55th	69	47	43	-	101	69	47	43	-	101	69	47	43	-	101
Mad & 56th	76	46	24	20	101	76	46	24	20	101	76	46	24	20	101
Mad & 57th	76	50	40	-	101	76	50	40	-	101	76	50	40	-	101
Mad & 58th	76	48	42	-	101	76	48	42	-	101	76	48	42	-	101
Mad & 59th	76	52	38	-	101	76	52	38	-	101	76	52	38	-	101
Mad & 60th	81	52	38	-	11	81	50	40	-	1	81	52	38	-	12
Mad & 61st	88	52	38	-	11	88	54	36	-	1	88	52	38	-	12
Mad & 62nd	6	52	38	-	11	6	54	36	-	1	6	52	38	-	12
Mad & 63rd	14	52	38	-	11	14	54	36	-	1	14	52	38	-	12

Note: AOT (All Other Times) is the NYCDOT base plan labeled as Pre-existing plan in the analysis for this arterial section.

Table A-10 – Proposed Signal Timings, 5th Avenue

Intersection	AOT					NBP(Mon-Fri, 8AM-8PM)					AC1				
	Offset	Phase 1	Phase 2	Phase 3	TP#	Offset	Phase 1	Phase 2	Phase 3	TP#	Offset	Phase 1	Phase 2	Phase 3	TP#
5 Av & 78th	46	54	36	-	1	45	50	40	-	11	45	45	45	-	12
5 Av & 77th	51	54	36	-	1	45	50	40	-	11	45	45	45	-	12
5 Av & 76th	57	54	36	-	1	45	50	40	-	11	45	45	45	-	12
5 Av & 75th	61	54	36	-	1	45	50	40	-	11	45	45	45	-	12
5 Av & 74th	68	54	36	-	1	45	50	40	-	11	45	45	45	-	12
5 Av & 73rd	73	54	36	-	1	45	50	40	-	11	45	45	45	-	12
5 Av & 72nd	78	49	11	30	1	45	45	11	34	11	45	40	11	39	12
5 Av & 71st	84	54	36	-	1	45	50	40	-	11	45	45	45	-	12
5 Av & 70th	89	54	36	-	1	45	50	40	-	11	45	45	45	-	12
5 Av & 69th	5	54	36	-	1	45	50	40	-	11	45	45	45	-	12
5 Av & 68th	11	54	36	-	1	45	50	40	-	11	45	45	45	-	12
5 Av & 67th	16	54	36	-	1	45	50	40	-	11	45	45	45	-	12
5 Av & 66th	21	48	42	-	1	45	48	42	-	11	45	45	45	-	12
5 Av & 65th	27	48	42	-	1	45	48	42	-	11	45	45	45	-	12
5 Av & 64th	32	54	36	-	1	45	50	40	-	11	45	45	45	-	12
5 Av & 63rd	39	54	36	-	1	45	50	40	-	11	45	45	45	-	12
5 Av & 62nd	45	54	36	-	1	45	50	40	-	11	45	45	45	-	12

Note: AOT (All Other Times) is the NYCDOT base plan for this arterial section.

Table A-11 – Proposed Signal Timings, 5th Avenue

Intersection	AAT				
	Offset	Phase 1	Phase 2	Phase 3	TP#
5 Av & 61st	50	50	40	-	1
5 Av & 60th	58	45	45	-	1
5 Av & 59th	64	47	43	-	101
5 Av & 58th	64	47	43	-	101
5 Av & 57th	64	50	40	-	101
5 Av & 56th	64	50	40	-	101
5 Av & 55th	68	50	40	-	101
5 Av & 54th	74	50	40	-	101
5 Av & 53rd	79	50	40	-	101
5 Av & 52nd	85	46	44	-	101
5 Av & 51st	89	46	44	-	101
5 Av & 50th	5	50	40	-	101
5 Av & S of 50St	5	52	38	-	101
5 Av & 49th	10	50	40	-	101
5 Av & 48th	15	46	44	-	101
5 Av & 47th	22	46	44	-	101
5 Av & 46th	27	50	40	-	101
5 Av & 45th	32	50	40	-	101
5 Av & 44th	37	50	40	-	101
5 Av & 43rd	43	50	40	-	101
5 Av & 42nd	48	50	40	-	101

Note: AAT (At All Times) is the NYCDOT base plan for this arterial section.

Table A-12 – Proposed Signal Timings, 6th Avenue

Intersection	AOT					NBP (Existing Offset)M-F,8AM-8PM					ACP (With Existing Offset)				
	Offset	Phase 1	Phase 2	Phase 3	TP#	Offset	Phase 1	Phase 2	Phase 3	TP#	Offset	Phase 1	Phase 2	Phase 3	TP#
6th & 42nd	70	54	36	-	101										
6th & 41st	65	54	36	-	1	65	50	40	-	11	65	45	45	-	12
6th & 40th	59	54	36	-	101	59	50	40	-	102	59	45	45	-	105
6th & 39th	54	54	36	-	1	54	50	40	-	11	54	45	45	-	12
6th & 38th	49	54	36	-	1	49	50	40	-	11	49	45	45	-	12
6th & 37th	49	54	36	-	1	49	50	40	-	11	49	45	45	-	12
6th & 36th	41	47	43	-	1	41	47	43	-	11	41	45	45	-	12
6th & 35th	33	50	40	-	1	33	50	40	-	11	33	45	45	-	12
6th & 34th	27	54	36	-	1	27	50	40	-	11	27	45	45	-	12
6th & 33rd	21	30	60	-	1	21	30	60	-	11	21	30	60	-	12
6th & 32nd	16	54	36	-	1	16	50	40	-	11	16	45	45	-	12
6th & 31st	11	54	36	-	1	11	50	40	-	11	11	45	45	-	12
6th & 30th	5	54	36	-	1	5	50	40	-	11	5	45	45	-	12
6th & 29th	89	54	36	-	1	89	50	40	-	11	89	45	45	-	12
6th & 28th	83	54	36	-	1	83	50	40	-	11	83	45	45	-	12
6th & 27th	76	54	36	-	1	76	50	40	-	11	76	45	45	-	12
6th & 26th	69	54	36	-	1	69	50	40	-	11	69	45	45	-	12
6th & 25th	63	54	36	-	1	63	50	40	-	11	63	45	45	-	12
6th & 24th	57	54	36	-	1	57	50	40	-	11	57	45	45	-	12
6th & 23rd	50	50	40	-	1	50	50	40	-	11	50	45	45	-	12

Note: TP1 (Timing Plan 1) is the NYCDOT base plan for this arterial section.

APPENDIX B – MICROWAVE SENSOR DATA STATISTICAL ANALYSIS

Included in this appendix is the complete microwave sensor statistical analysis. A summary table is provided for each location where the analysis was preformed along with occupancy histograms and average flow versus occupancy.

Table B-1 below includes information regarding the relevant fields extracted from the microwave sensor database for the analysis.

Table B-1 – Microwave Sensor Data Source, ADB Database (det_data Table)

Relevant Fields	Description
tcsDetID	ID of the subject detection zone, typically representing one lane
startColTime	Start time of the data collection interval
endColTime	End time of the data collection interval
volume	Observed count of vehicle during the specified time interval, expressed in vehicles per hour
occupancy	Observed occupancy of the detection zone during the specified time interval, expressed as an integer from 0 to 100

Table B-2 – Microwave Sensor Analysis Summary, Lexington Ave (E. 59th to E. 58th), Lane 2

Control Plan			Pre-Existing	NBP	AC1	Pre-Existing	NBP	AC1	Pre-Existing	NBP	AC1
Period			AM	AM	AM	MD	MD	MD	PM	PM	PM
Lower		Upper	Pre-Existing, AM	NBP, AM	AC1, AM	Pre-Existing, MD	NBP, MD	AC1, MD	Pre-Existing, PM	NBP, PM	AC1, PM
Occupancy Histogram	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	0	10	10.5%	7.0%	30.0%	19.6%	28.0%	40.0%	4.3%	5.0%	10.0%
	10	20	56.0%	53.5%	36.3%	53.3%	59.0%	57.5%	56.1%	58.1%	63.8%
	20	30	25.0%	28.5%	25.0%	23.1%	11.0%	2.5%	34.2%	31.3%	25.0%
	30	40	8.5%	11.0%	8.8%	4.0%	2.0%	0.0%	4.8%	5.6%	1.3%
	40	50	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%
	50	60	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	60	70	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	70	80	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	80	90	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	90	100	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	100	100	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total			200	200	80	199	200	80	187	160	80
Avg. Flow			608	632	550	561	565	582	639	679	659
Avg. Occ			18	19	16	16	14	11	19	19	16
St. Dev. Occ			7	7	8	7	6	3	6	6	5
Var. Occ.			55	54	72	49	34	9	39	35	27
Statistical Comparison			Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1	Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1	Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1
df			398	278	278	397	277	278	345	265	238
Pooled Var			54.6	59.9	59.2	41.2	37.5	26.8	37.1	35.8	32.2
t Stat			-1.4	2.0	2.9	4.2	6.9	4.2	1.0	3.6	2.9
t Critical (one tail)			1.6	1.7	1.7	1.6	1.7	1.7	1.6	1.7	1.7
p Value (one tail)			0.0887	0.0258	0.0017	1.56E-05	1.65E-11	1.58E-05	0.1680	0.0002	0.0021
Mean Same?			Not Reject	Reject	Reject	Reject	Reject	Reject	Not Reject	Reject	Reject
Improvement?			No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Difference*			1	-2	-3	-3	-6	-3	-1	-3	-2
Note: "Rejecting" a hypothesis of "no difference" is desired in terms of concluding that an improvement exists.											
**Difference is expressed in percentage points of occupancy.*											

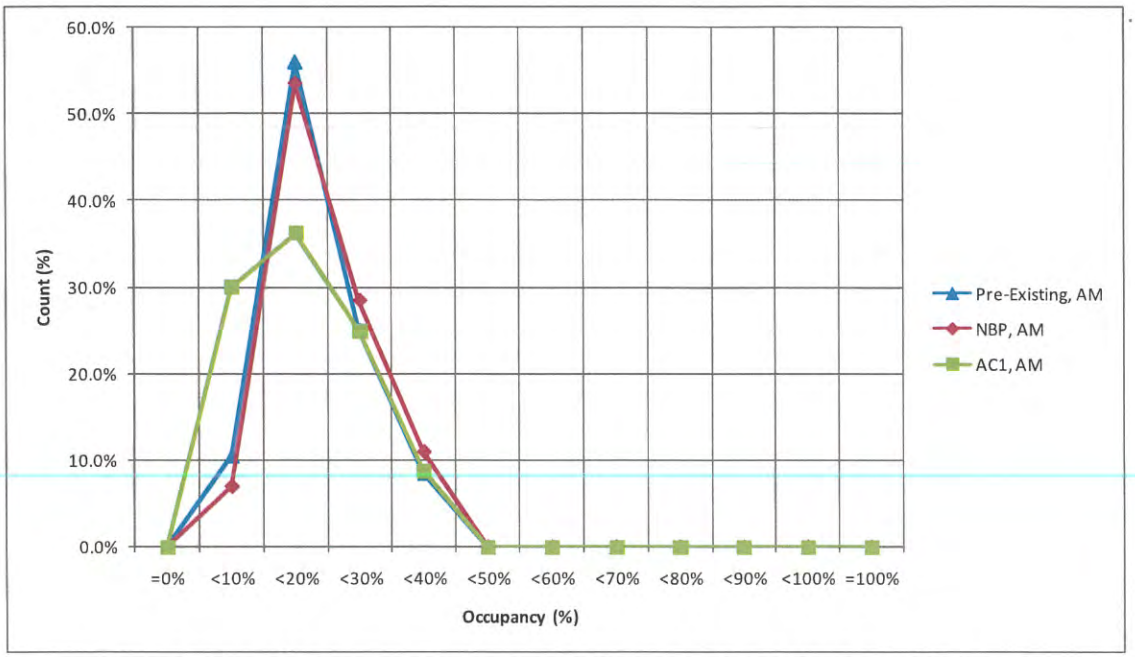

Figure B-1 – AM Occupancy Histogram, Lexington Ave (E. 59th to E. 58th), Lane 2

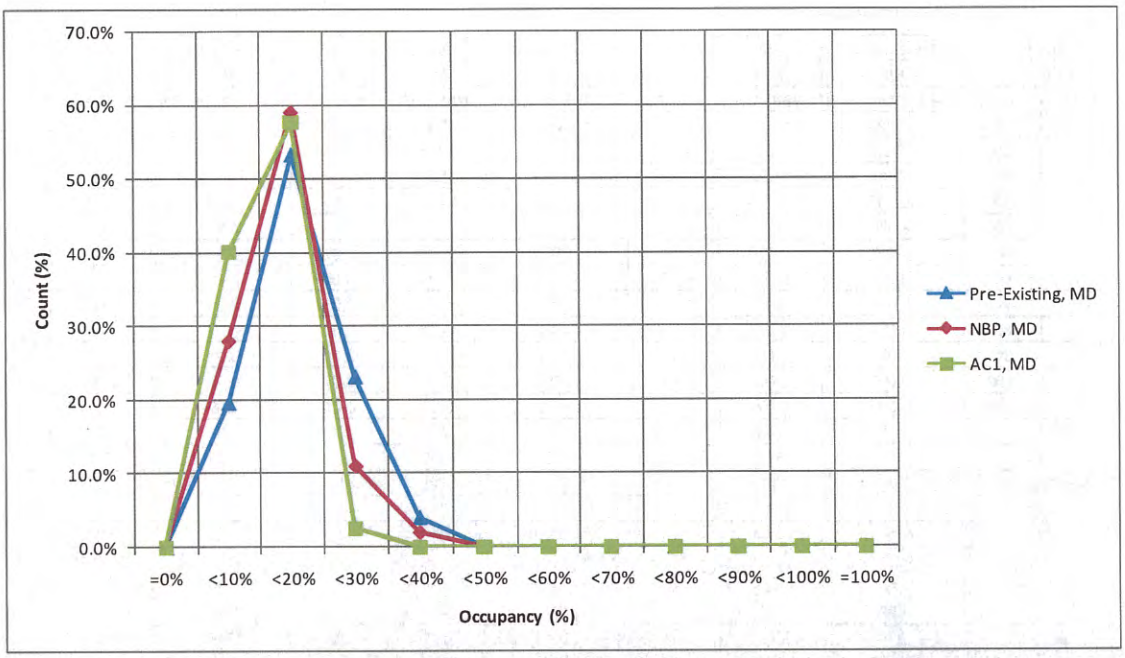

Figure B-2 – MD Occupancy Histogram, Lexington Ave (E. 59th to E. 58th), Lane 2

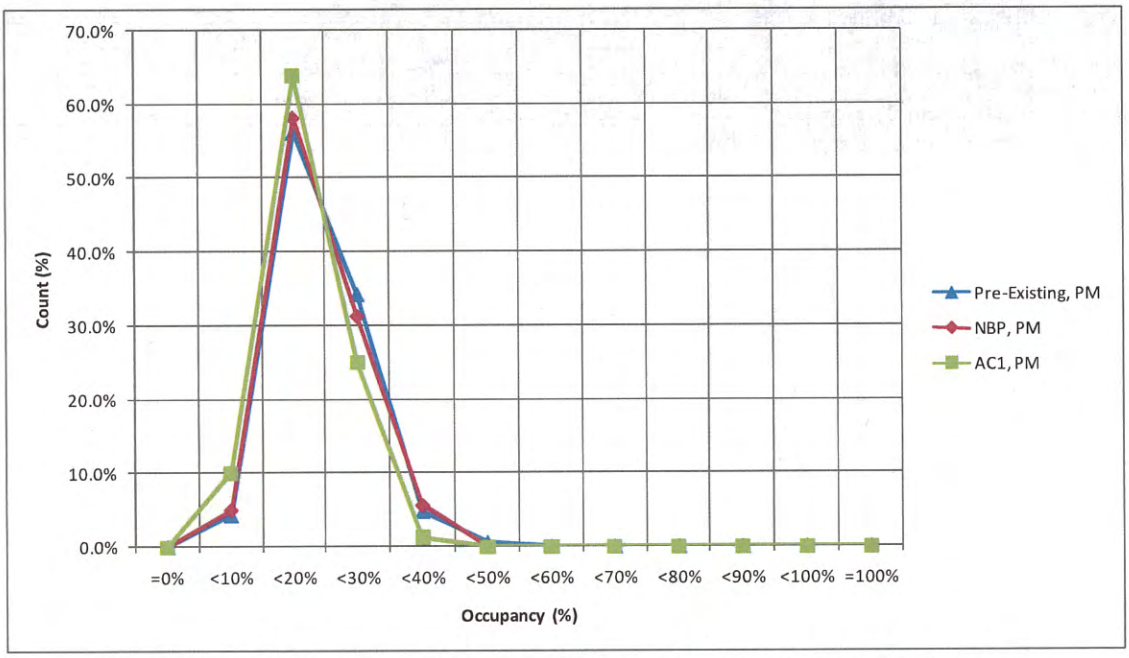

Figure B-3 – PM Occupancy Histogram, Lexington Ave (E. 59th to E. 58th), Lane 2

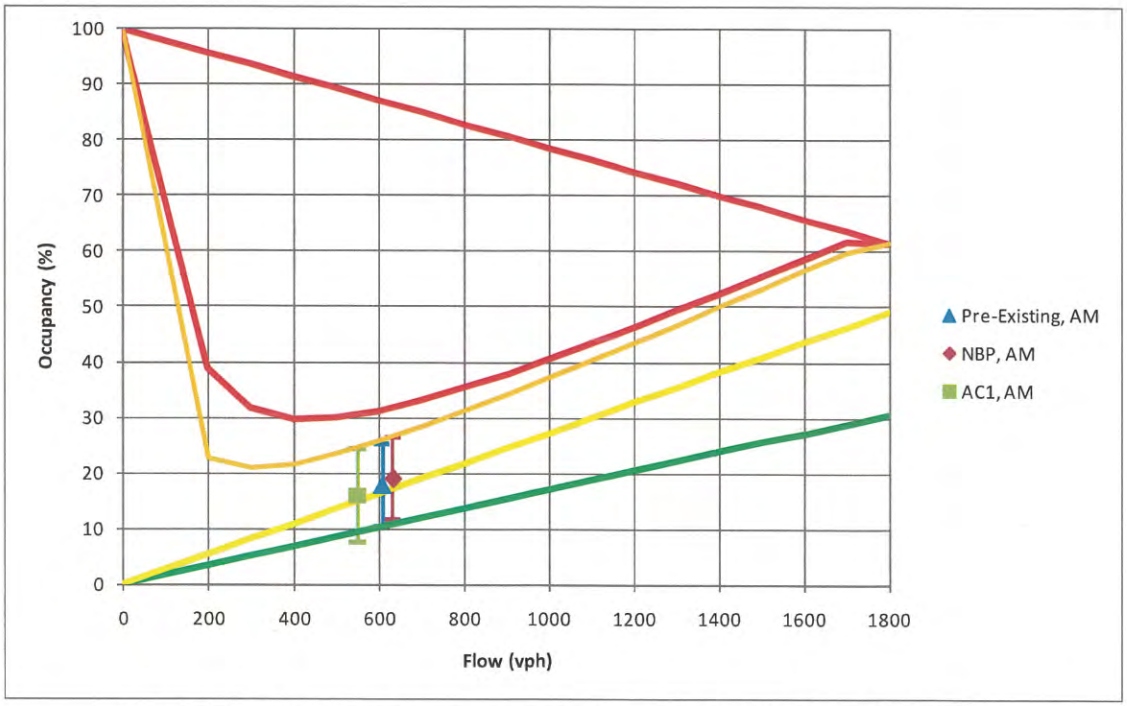

Figure B-4 – AM Flow vs Occupancy, Lexington Ave (E. 59th to E. 58th), Lane 2

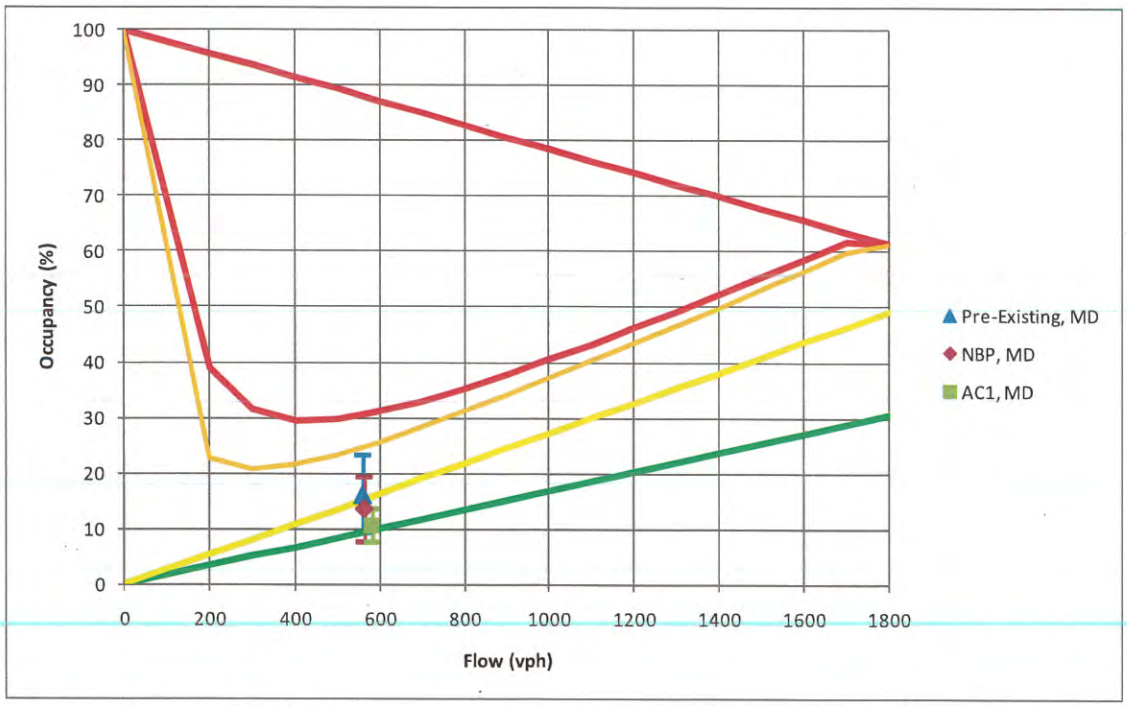

Figure B-5 – MD Flow vs Occupancy, Lexington Ave(E. 59th to E. 58th), Lane 2

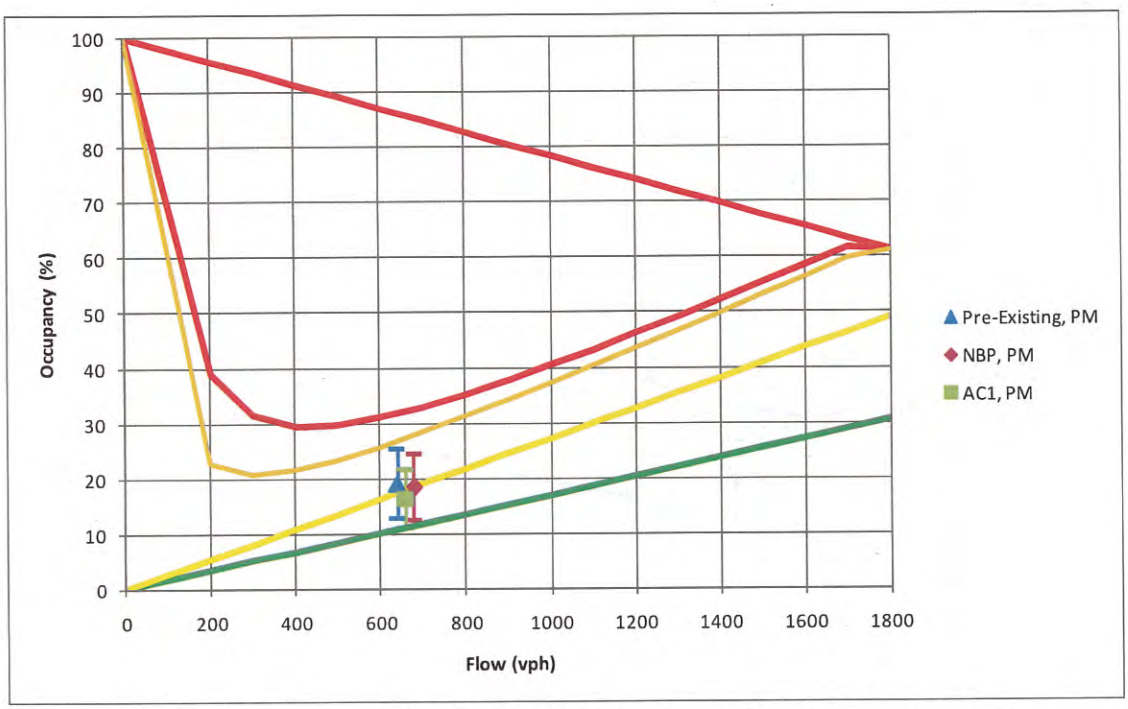

Figure B-6 – PM Flow vs Occupancy, Lexington Ave (E. 59th to E. 58th), Lane 2

Table B-3 – Microwave Sensor Analysis Summary, Lexington Ave (E. 63rd to E. 62nd), Lane 2

Control Plan			Pre-Existing	NBP	AC1	Pre-Existing	NBP	AC1	Pre-Existing	NBP	AC1
Period			AM	AM	AM	MD	MD	MD	PM	PM	PM
Lower		Upper	Pre-Existing, AM	NBP, AM	AC1, AM	Pre-Existing, MD	NBP, MD	AC1, MD	Pre-Existing, PM	NBP, PM	AC1, PM
Occupancy Histogram	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	0	10	0.0%	1.5%	2.5%	0.0%	1.5%	1.3%	0.0%	0.0%	0.0%
	10	20	2.5%	21.5%	35.0%	1.3%	18.5%	17.5%	1.5%	4.4%	11.4%
	20	30	25.0%	32.5%	31.3%	17.5%	34.5%	32.5%	10.4%	27.5%	38.6%
	30	40	16.3%	26.5%	15.0%	26.3%	23.0%	25.0%	22.4%	26.9%	29.5%
	40	50	26.3%	12.0%	12.5%	25.0%	13.5%	17.5%	22.4%	21.3%	11.4%
	50	60	17.5%	2.5%	2.5%	18.8%	7.0%	3.8%	22.4%	13.8%	4.5%
	60	70	8.8%	2.5%	0.0%	6.3%	1.5%	2.5%	17.9%	3.1%	4.5%
	70	80	2.5%	1.0%	1.3%	2.5%	0.5%	0.0%	1.5%	2.5%	0.0%
	80	90	1.3%	0.0%	0.0%	1.3%	0.0%	0.0%	1.5%	0.6%	0.0%
	90	100	0.0%	0.0%	0.0%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%
	100	100	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total			80	200	80	80	200	80	67	160	44
Avg. Flow			490	625	581	400	534	498	376	512	555
Avg. Occ			42	30	27	43	31	31	47	38	33
St. Dev. Occ			14	12	12	14	13	12	14	13	12
Var. Occ.			208	153	149	209	161	134	203	179	139
Statistical Comparison			Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1	Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1	Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1
df			278	158	278	278	158	278	225	109	202
Pooled Var			168.6	178.4	152.0	174.5	171.3	153.3	185.7	177.6	170.3
t Stat			7.2	7.4	2.0	7.3	5.9	-0.3	4.8	5.7	2.4
t Critical (one tail)			1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
p Value (one tail)			2.33E-12	3.92E-12	0.0255	1.95E-12	1.19E-08	0.3757	1.62E-06	4.30E-08	0.0082
Mean Same?			Reject	Reject	Reject	Reject	Reject	Not Reject	Reject	Reject	Reject
Improvement?			Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Difference*			-12	-16	-3	-13	-12	1	-9	-15	-5

Note: "Rejecting" a hypothesis of "no difference" is desired in terms of concluding that an improvement exists.

Difference is expressed in percentage points of occupancy.

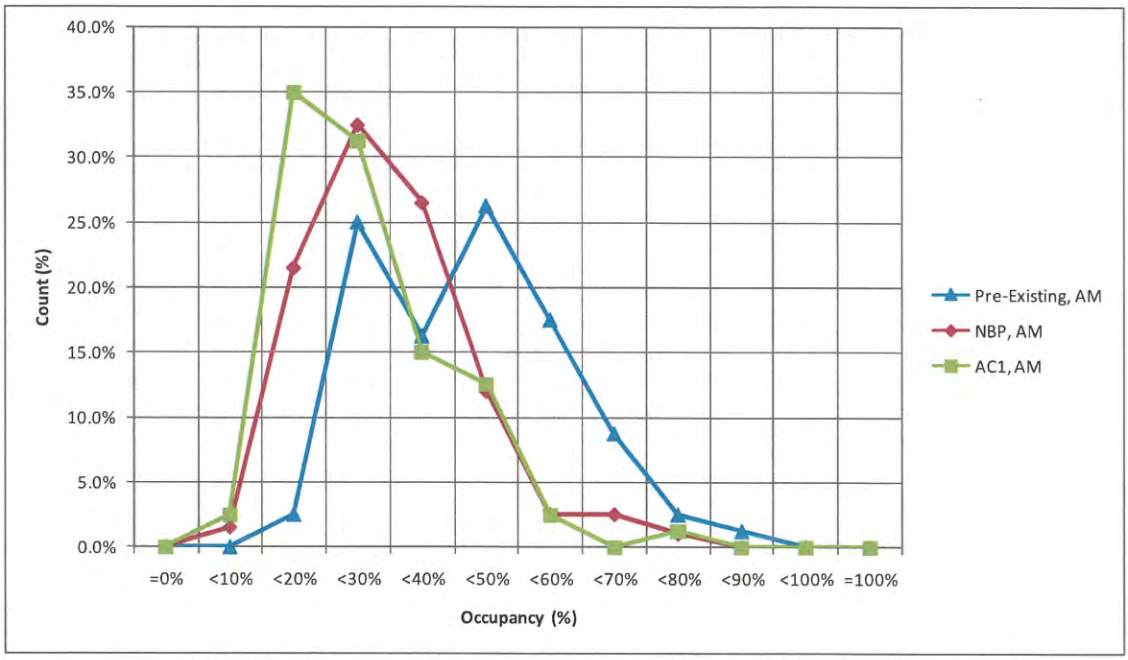

Figure B-7 – AM Occupancy Histogram, Lexington Ave (E. 63rd to E. 62nd), Lane 2

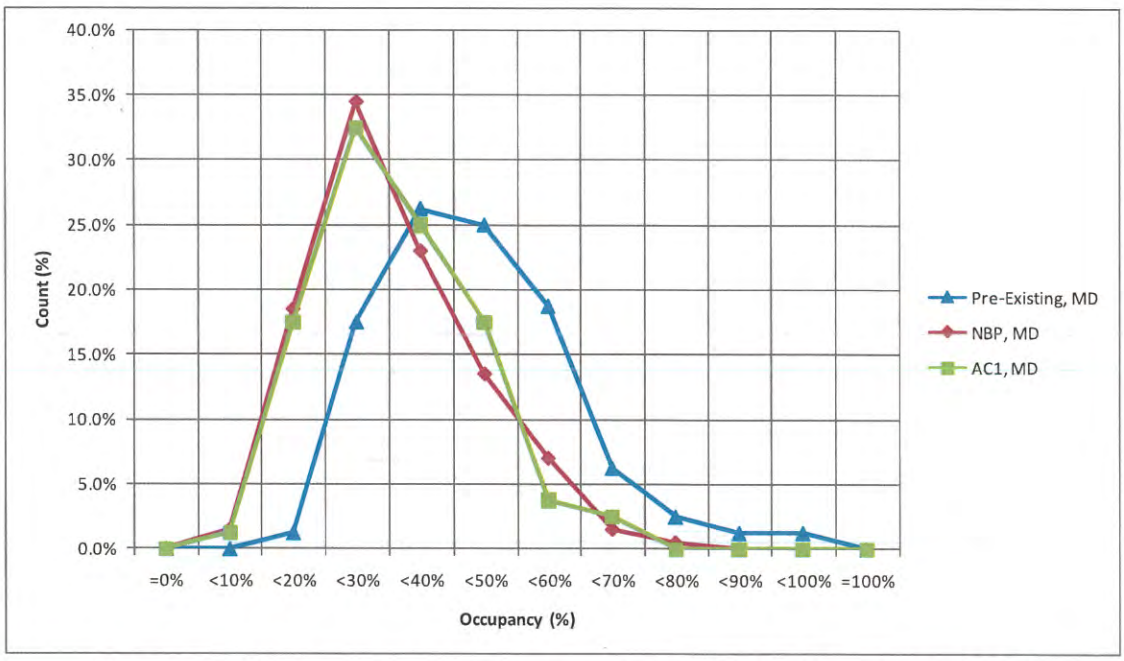

Figure B-8 – MD Occupancy Histogram, Lexington Ave (E. 63rd to E. 62nd), Lane 2

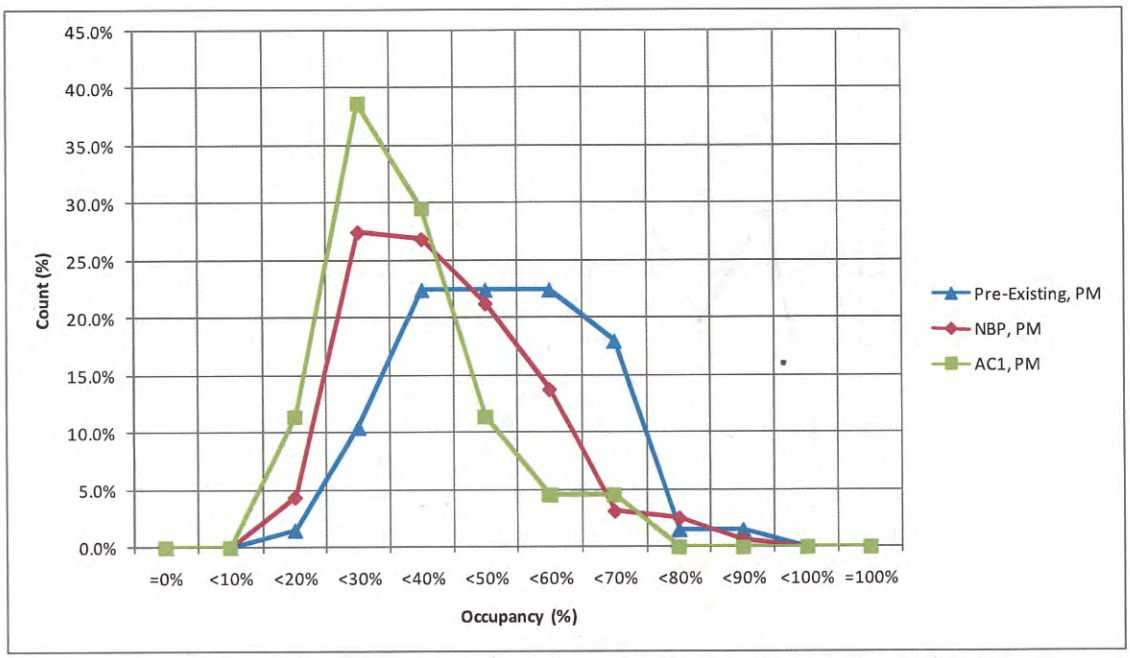

Figure B-9 – PM Occupancy Histogram, Lexington Ave (E. 63rd to E. 62nd), Lane 2

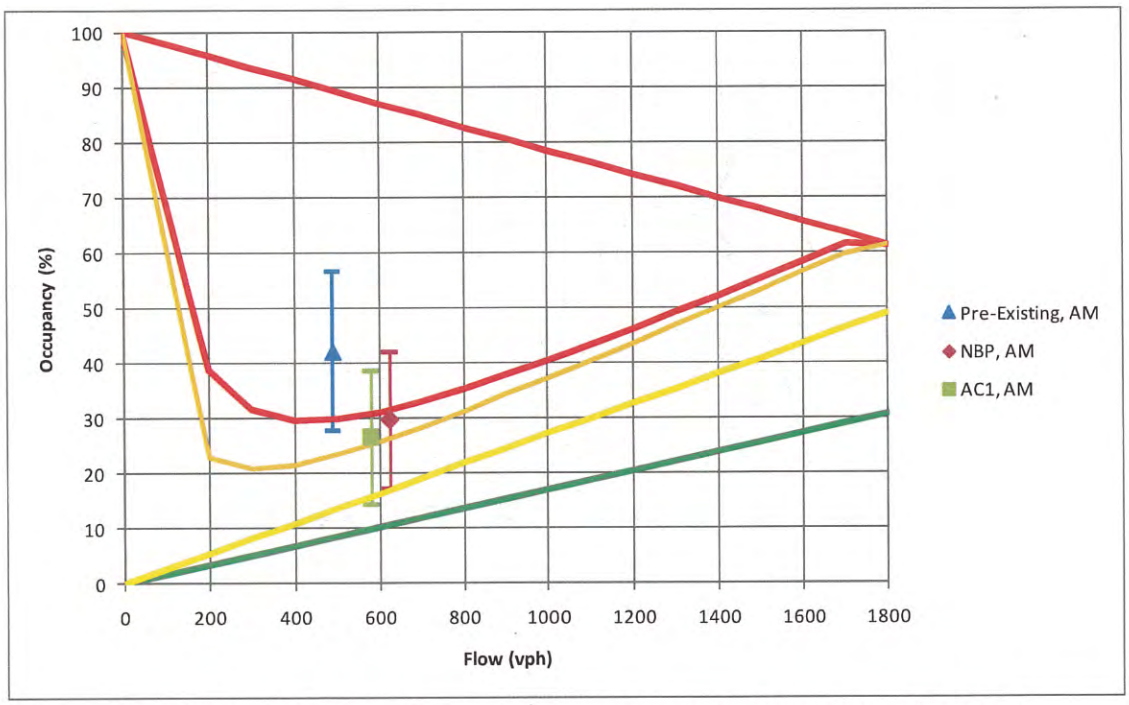

Figure B-10 – AM Flow vs Occupancy, Lexington Ave (E. 63rd to E. 62nd), Lane 2

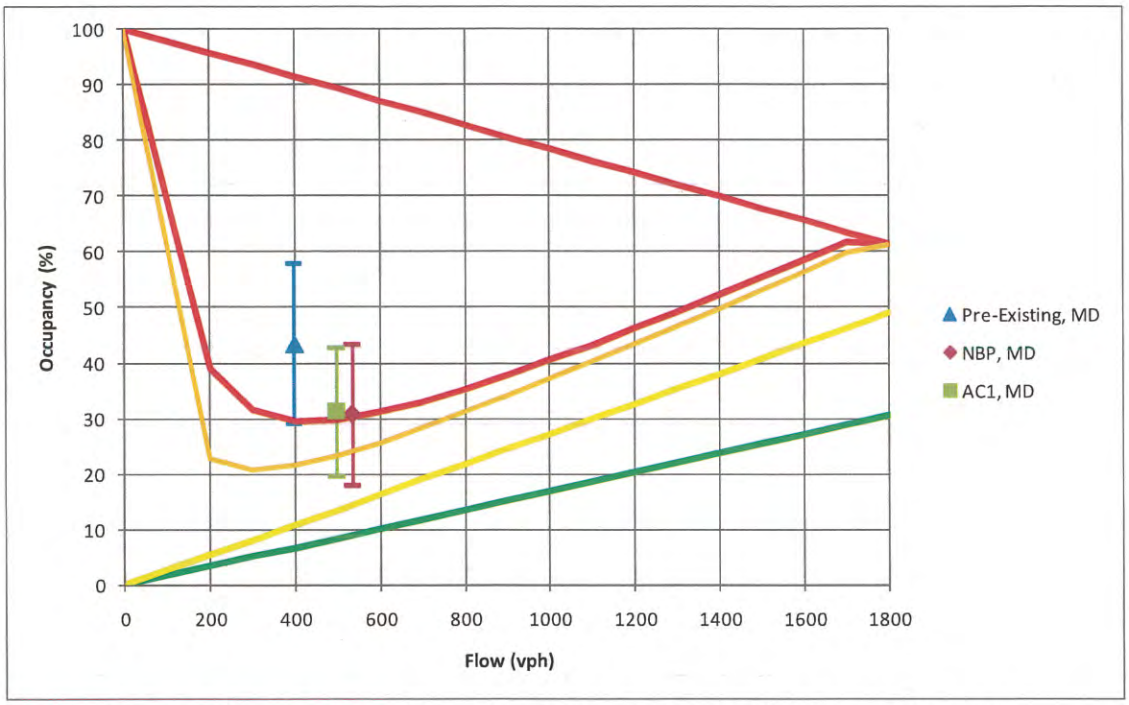

Figure B-11 – MD Flow vs Occupancy, Lexington Ave (E. 63rd to E. 62nd), Lane 2

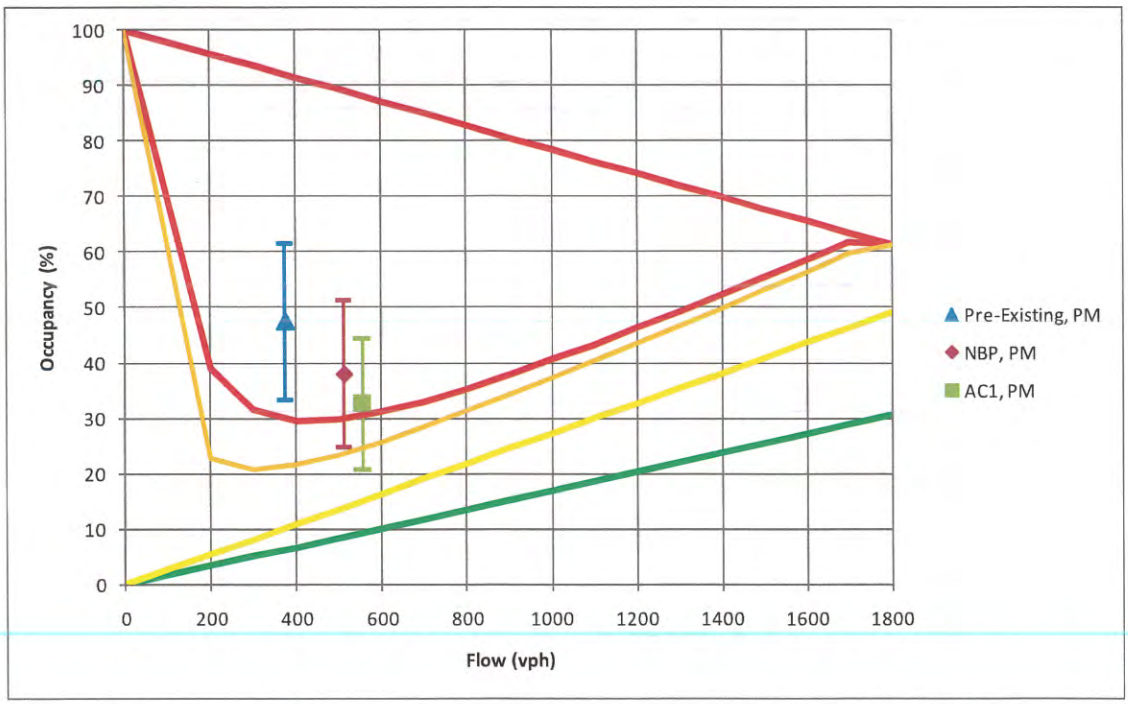

Figure B-12 – PM Flow vs Occupancy, Lexington Ave (E. 63rd to E. 62nd), Lane 2

Table B-4 – Microwave Sensor Analysis Summary, 3rd Ave (E. 44th to E. 45th), Lane 2

Control Plan		Pre-Existing	NBP	AC1	Pre-Existing	NBP	AC1	Pre-Existing	NBP	AC1
Period		AM	AM	AM	MD	MD	MD	PM	PM	PM
Lower	Upper	Pre-Existing, AM	NBP, AM	AC1, AM	Pre-Existing, MD	NBP, MD	AC1, MD	Pre-Existing, PM	NBP, PM	AC1, PM
Occupancy Histogram 0	0	0.0%	0.5%	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%
0	10	33.0%	20.0%	36.3%	23.1%	8.9%	21.3%	74.3%	69.8%	57.5%
10	20	40.0%	36.8%	36.3%	35.7%	27.9%	47.5%	19.8%	19.0%	27.5%
20	30	5.5%	14.6%	8.8%	9.5%	21.8%	8.8%	1.6%	1.7%	3.8%
30	40	10.5%	11.4%	7.5%	16.6%	15.1%	8.8%	3.7%	6.0%	6.3%
40	50	7.0%	10.3%	7.5%	11.6%	13.4%	10.0%	0.5%	1.7%	5.0%
50	60	2.0%	4.3%	2.5%	2.5%	4.5%	2.5%	0.0%	1.7%	0.0%
60	70	1.5%	1.1%	1.3%	0.5%	6.1%	0.0%	0.0%	0.0%	0.0%
70	80	0.5%	0.5%	0.0%	0.5%	0.6%	1.3%	0.0%	0.0%	0.0%
80	90	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
90	100	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
100	100	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%
Total		200	185	80	199	179	80	187	116	80
Avg. Flow		547	557	541	569	535	561	494	505	510
Avg. Occ		18	22	18	22	29	20	10	12	13
St. Dev. Occ		14	16	13	15	18	14	7	10	10
Var. Occ.		208	242	167	216	307	186	45	108	104
Statistical Comparison		Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1	Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1	Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1
df		383	278	263	376	277	257	301	265	194
Pooled Var		224.4	196.4	219.3	258.7	207.1	269.4	69.0	62.4	106.3
t Stat		-2.7	0.1	2.2	-3.9	1.1	3.9	-2.0	-3.1	-0.9
t Critical (one tail)		1.6	1.7	1.7	1.6	1.7	1.7	1.6	1.7	1.7
p Value (one tail)		0.0038	0.4405	0.0140	4.68E-05	0.1276	5.08E-05	0.0232	0.0010	0.1903
Mean Same?		Reject	Not Reject	Reject	Reject	Not Reject	Reject	Reject	Reject	Not Reject
Improvement?		No	No	Yes	No	No	Yes	No	No	No
Difference*		4	0	-4	7	-2	-9	2	3	1

Note: "Rejecting" a hypothesis of "no difference" is desired in terms of concluding that an improvement exists.

**Difference is expressed in percentage points of occupancy.*

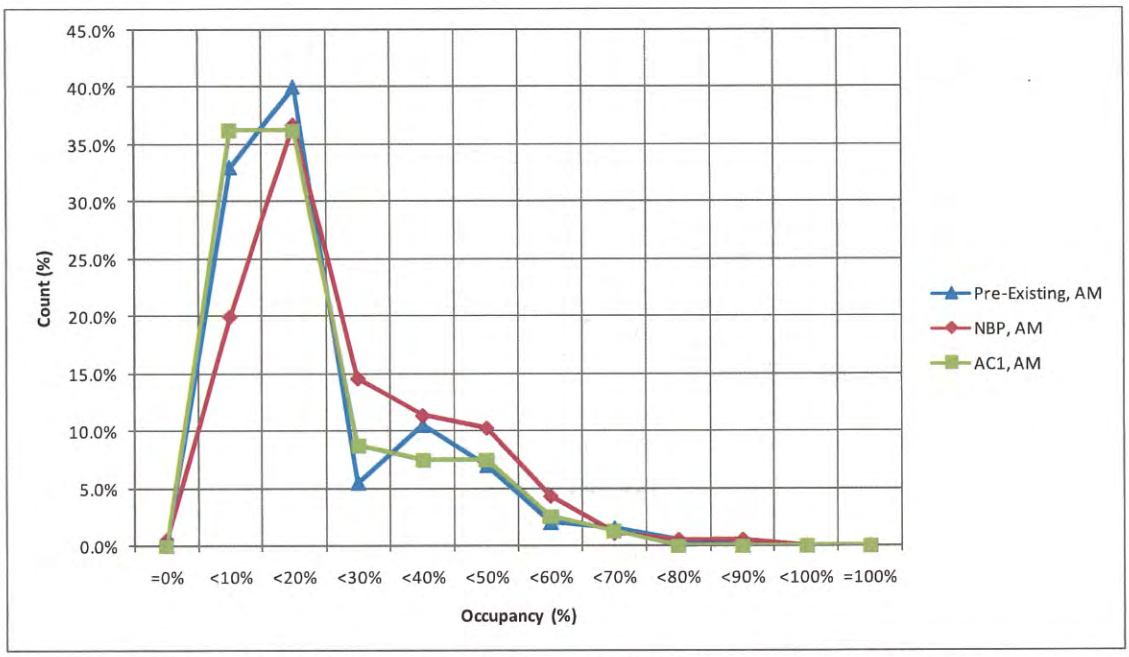

Figure B-13 – AM Occupancy Histogram, 3rd Ave (E. 44th to E. 45th), Lane 2

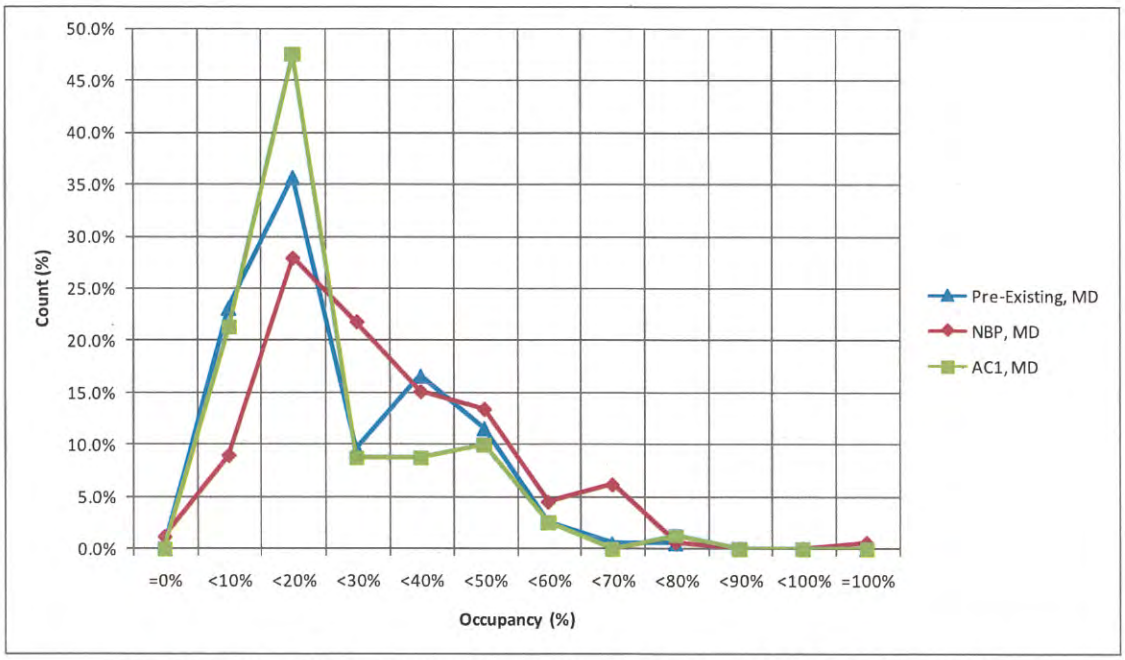

Figure B-14 – MD Occupancy Histogram, 3rd Ave (E. 44th to E. 45th), Lane 2

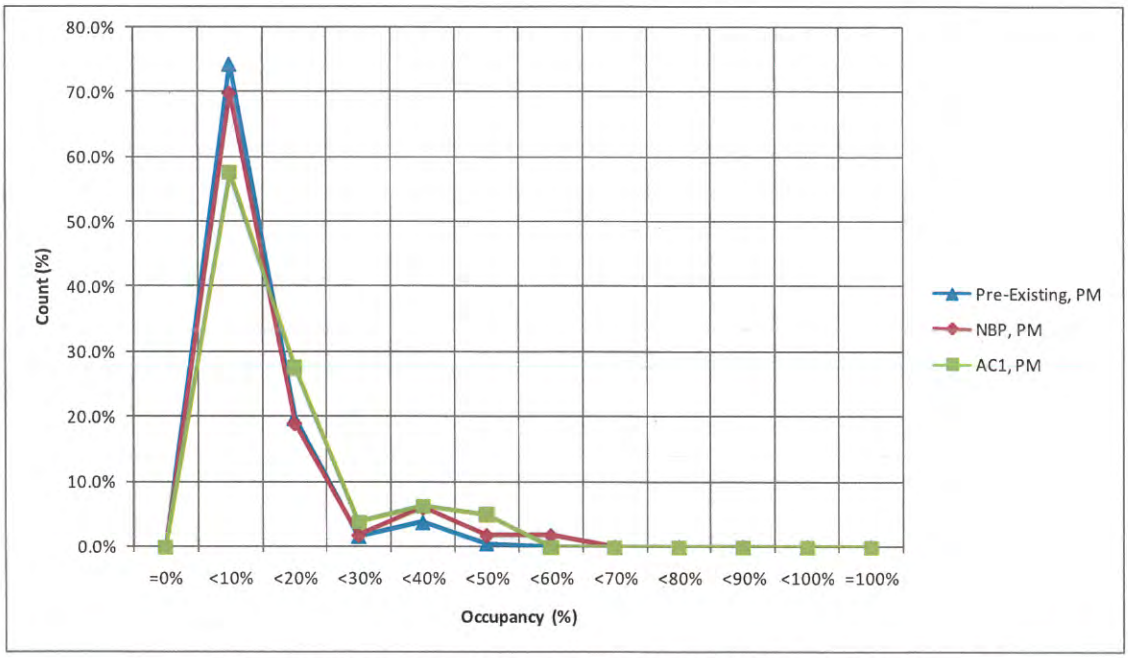

Figure B-15 – PM Occupancy Histogram, 3rd Ave (E. 44th to E. 45th), Lane 2

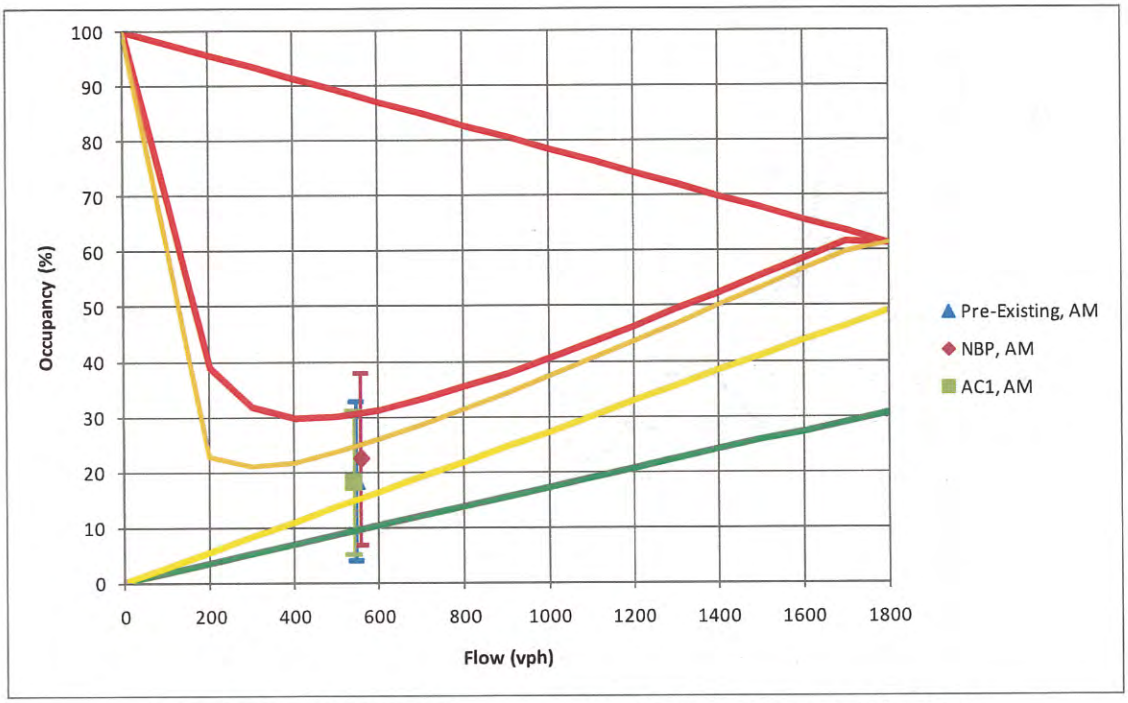

Figure B-16 – AM Flow vs Occupancy, 3rd Ave (E. 44th to E. 45th), Lane 2

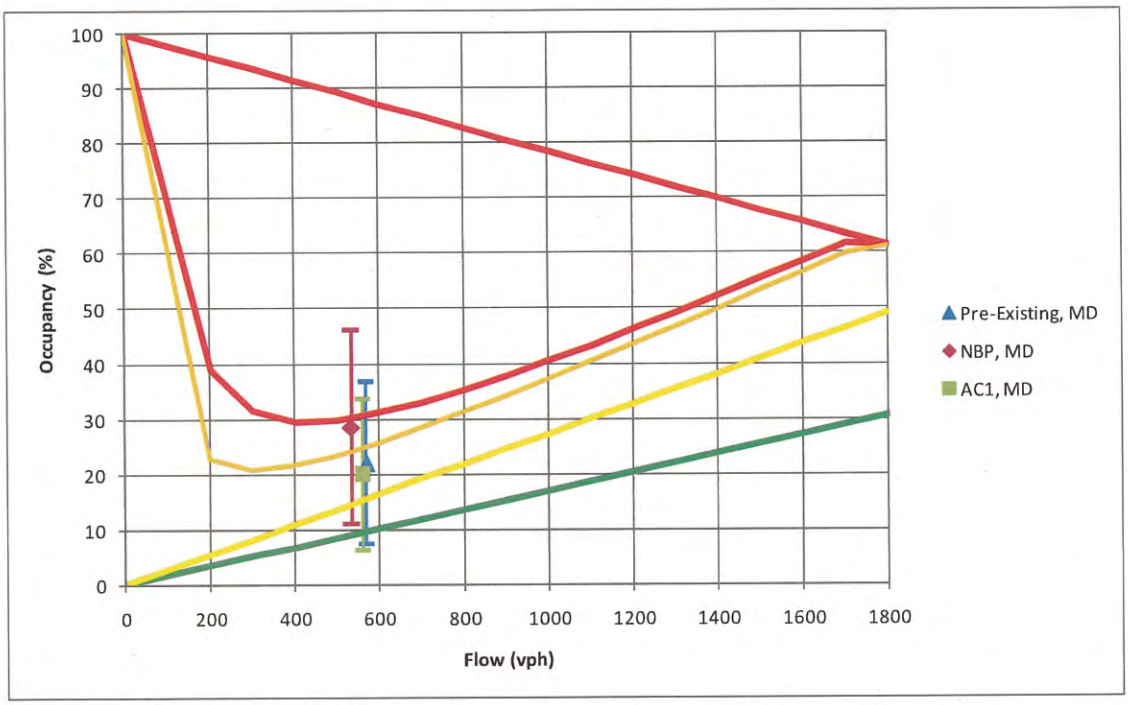

Figure B-17 – MD Flow vs Occupancy, 3rd Ave (E. 44th to E. 45th), Lane 2

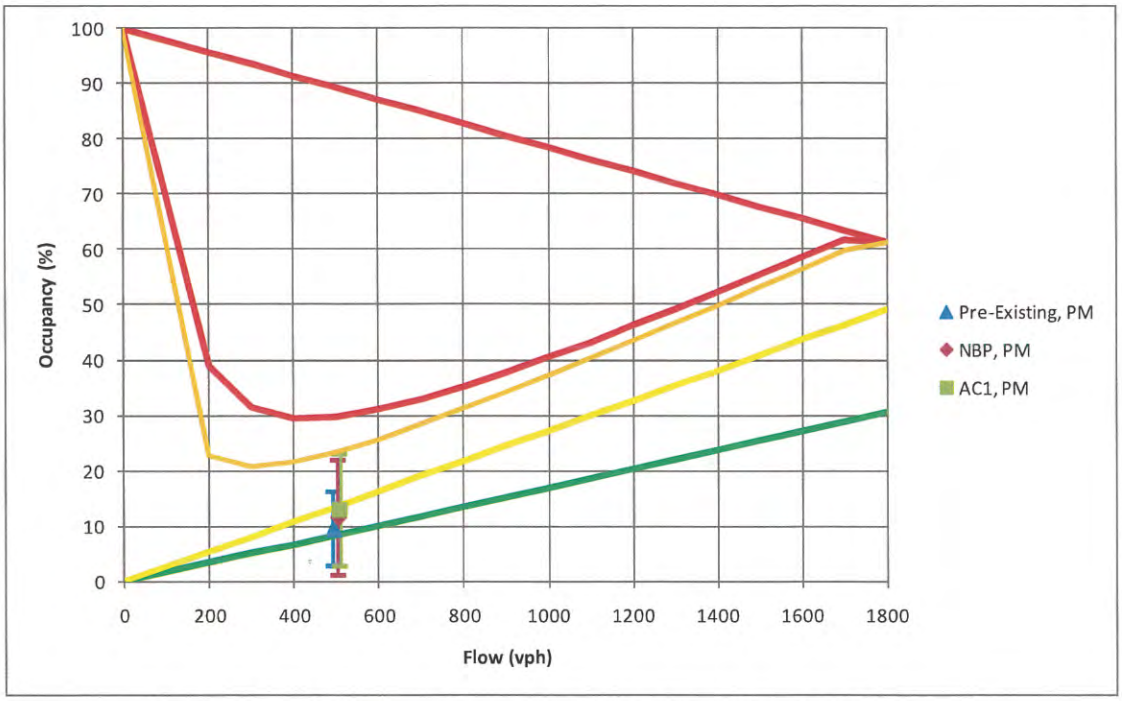

Figure B-18 – PM Flow vs Occupancy, 3rd Ave (E. 44th to E. 45th), Lane 2

Table B-5 – Microwave Sensor Analysis Summary, 3rd Ave (E. 47th to E. 48th), Lane 2

Control Plan		Pre-Existing	NBP	AC1	Pre-Existing	NBP	AC1	Pre-Existing	NBP	AC1
Period		AM	AM	AM	MD	MD	MD	PM	PM	PM
Lower	Upper	Pre-Existing, AM	NBP, AM	AC1, AM	Pre-Existing, MD	NBP, MD	AC1, MD	Pre-Existing, PM	NBP, PM	AC1, PM
Occupancy Histogram 0	0	7.5%	9.5%	7.5%	4.5%	4.5%	0.0%	1.1%	0.6%	0.0%
0	10	47.5%	67.5%	70.0%	44.2%	44.5%	36.4%	65.2%	50.0%	36.3%
10	20	36.0%	16.0%	17.5%	22.1%	28.5%	33.8%	28.3%	16.9%	43.8%
20	30	6.5%	0.5%	5.0%	10.6%	10.0%	16.9%	3.2%	3.8%	7.5%
30	40	1.5%	2.5%	0.0%	7.5%	5.0%	3.9%	1.1%	4.4%	1.3%
40	50	1.0%	0.0%	0.0%	6.5%	3.0%	9.1%	0.5%	10.0%	11.3%
50	60	0.0%	2.0%	0.0%	1.0%	3.5%	0.0%	0.5%	6.9%	0.0%
60	70	0.0%	1.5%	0.0%	1.5%	0.0%	0.0%	0.0%	6.3%	0.0%
70	80	0.0%	0.5%	0.0%	1.5%	1.0%	0.0%	0.0%	1.3%	0.0%
80	90	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%
90	100	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
100	100	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total		200	200	40	199	200	77	187	160	80
Avg. Flow		299	184	273	283	230	331	294	257	337
Avg. Occ		9	8	8	16	14	17	9	21	15
St. Dev. Occ		8	12	6	17	14	12	7	21	12
Var. Occ.		60	152	34	300	199	146	51	441	137
Statistical Comparison		Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1	Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1	Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1
df		398	238	238	397	274	275	345	265	238
Pooled Var		105.6	55.4	132.4	249.2	257.2	184.2	230.5	76.3	340.2
t Stat		1.1	1.3	0.3	1.2	-0.2	-1.3	-7.2	-5.5	2.1
t Critical (one tail)		1.6	1.7	1.7	1.6	1.7	1.7	1.6	1.7	1.7
p Value (one tail)		0.1396	0.1009	0.3940	0.1062	0.4232	0.0950	2.45E-12	4.30E-08	0.0188
Mean Same?		Not Reject	Not Reject	Not Reject	Not Reject	Not Reject	Not Reject	Reject	Reject	Reject
Improvement?		No	No	No	No	No	No	No	No	Yes
Difference*		-1	-2	-1	-2	0	2	12	6	-5

Note: "Rejecting" a hypothesis of "no difference" is desired in terms of concluding that an improvement exists.

**Difference is expressed in percentage points of occupancy.*

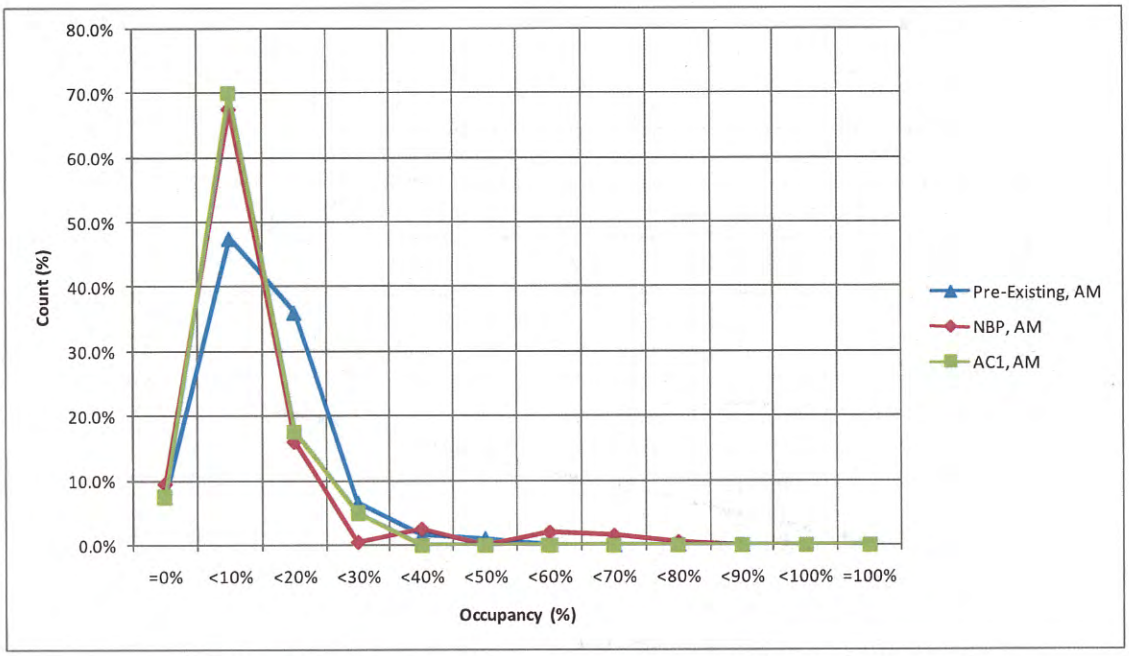

Figure B-19 – AM Occupancy Histogram, 3rd Ave (E. 47th to E. 48th), Lane 2

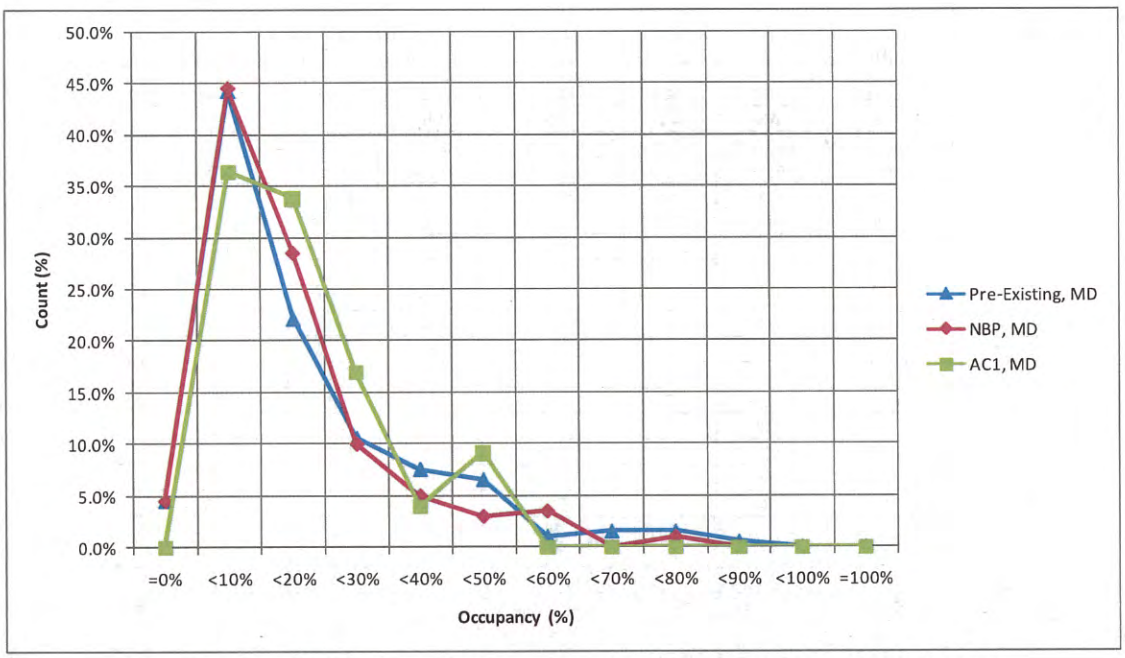

Figure B-20 – MD Occupancy Histogram, 3rd Ave (E. 47th to E. 48th), Lane 2

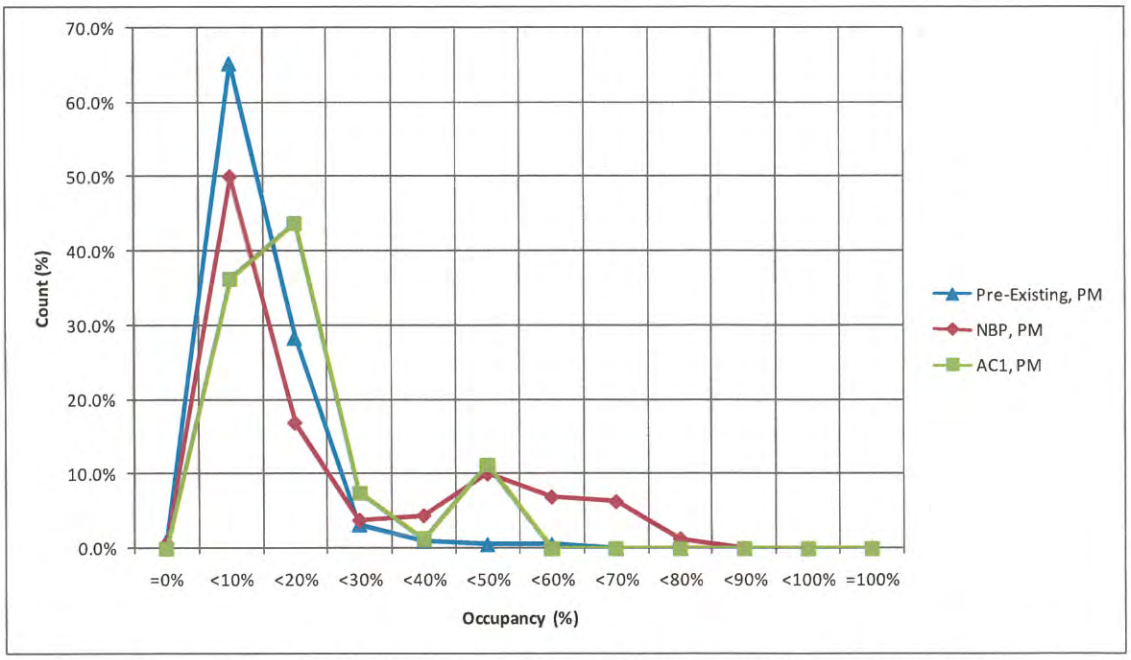

Figure B-21 – PM Occupancy Histogram, 3rd Ave (E. 47th to E. 48th), Lane 2

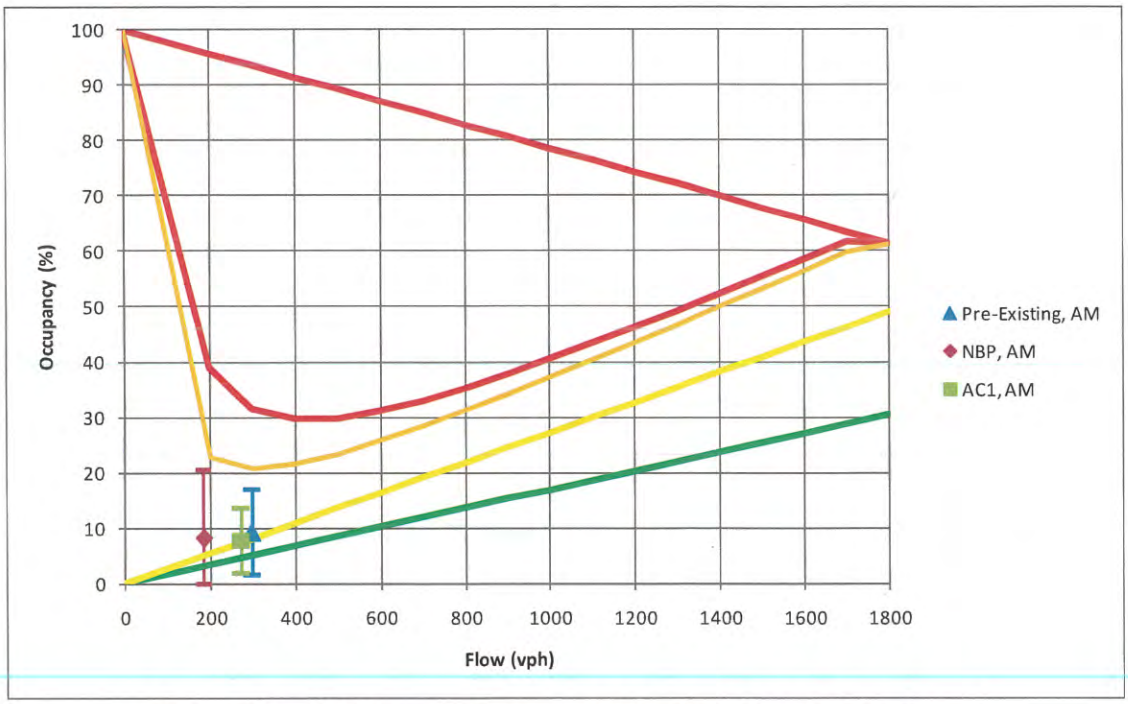

Figure B-22 – AM Flow vs Occupancy, 3rd Ave (E. 47th to E. 48th), Lane 2

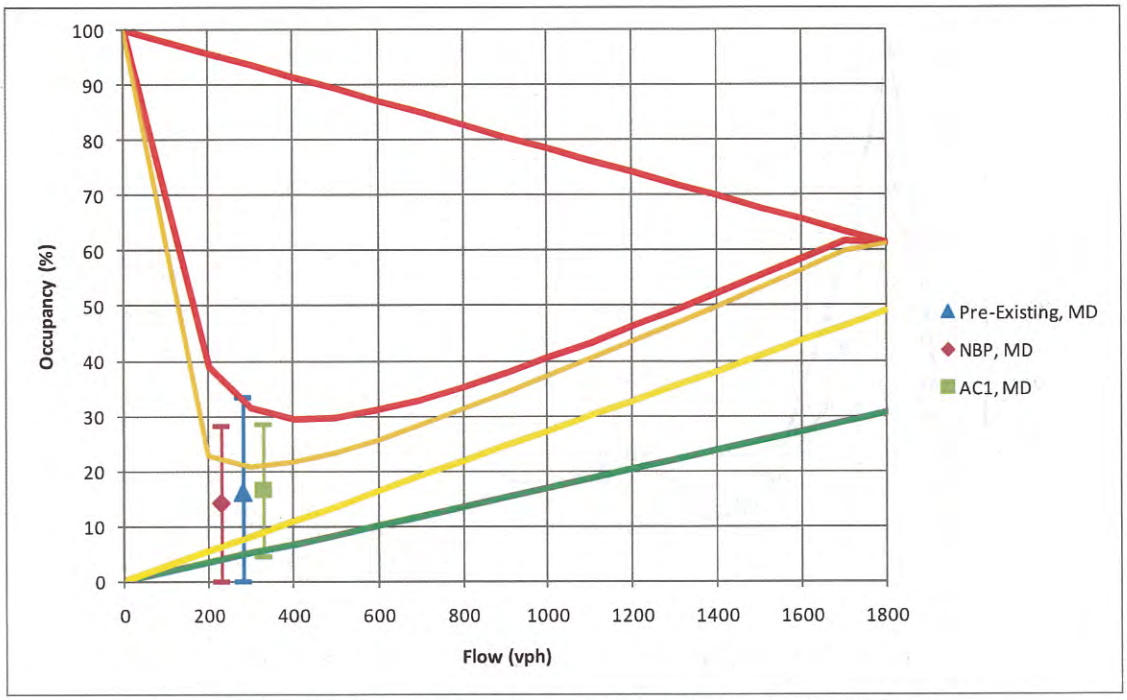

Figure B-23 – MD Flow vs Occupancy, 3rd Ave (E. 47th to E. 48th), Lane 2

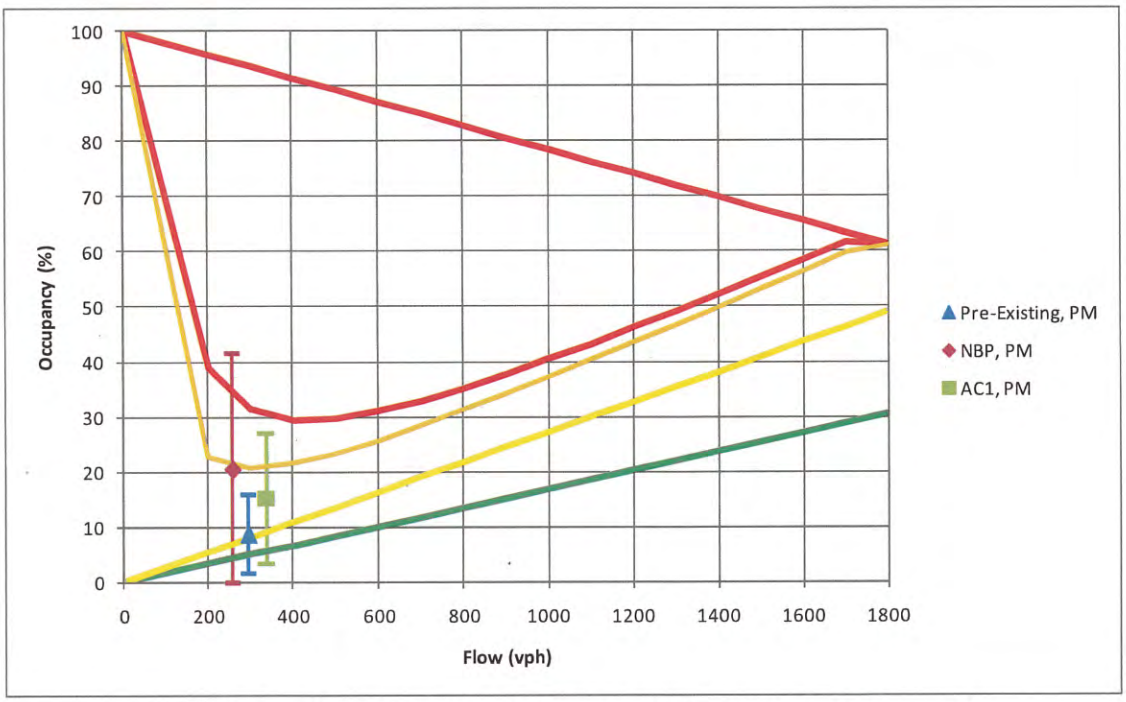

Figure B-24 – PM Flow vs Occupancy, 3rd Ave (E. 47th to E. 48th), Lane 2

Table B-6 – Microwave Sensor Analysis Summary, Lexington Ave (E. 51st to E. 50th), Lane 3

Control Plan			Pre-Existing	NBP	AC1	Pre-Existing	NBP	AC1	Pre-Existing	NBP	AC1
Period			AM	AM	AM	MD	MD	MD	PM	PM	PM
Lower		Upper	Pre-Existing, AM	NBP, AM	AC1, AM	Pre-Existing, MD	NBP, MD	AC1, MD	Pre-Existing, PM	NBP, PM	AC1, PM
Occupancy Histogram	0	0	0.0%	0.0%	3.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	0	10	0.0%	0.0%	5.0%	0.0%	1.5%	7.5%	1.1%	0.0%	7.5%
	10	20	3.0%	0.0%	2.5%	1.5%	1.0%	27.5%	23.0%	0.0%	37.5%
	20	30	15.0%	0.5%	1.3%	10.1%	2.0%	6.3%	9.6%	0.0%	27.5%
	30	40	13.5%	0.0%	5.0%	14.6%	2.6%	11.3%	1.1%	0.6%	17.5%
	40	50	5.5%	1.5%	5.0%	8.5%	4.6%	10.0%	0.0%	5.0%	10.0%
	50	60	3.0%	3.5%	7.5%	5.5%	4.1%	8.8%	1.6%	13.1%	0.0%
	60	70	1.0%	7.0%	16.3%	1.0%	7.7%	3.8%	5.3%	22.5%	0.0%
	70	80	10.0%	11.0%	7.5%	10.1%	18.4%	3.8%	15.5%	22.5%	0.0%
	80	90	30.5%	32.0%	8.8%	26.6%	25.5%	1.3%	31.0%	24.4%	0.0%
	90	100	18.0%	36.5%	5.0%	22.1%	20.4%	5.0%	11.8%	11.9%	0.0%
	100	100	0.5%	8.0%	32.5%	0.0%	12.2%	15.0%	0.0%	0.0%	0.0%
Total			200	200	80	199	196	80	187	160	40
Avg. Flow			331	141	98	317	148	295	334	227	409
Avg. Occ			64	85	70	67	78	45	60	73	24
St. Dev. Occ			27	13	31	26	21	33	31	14	11
Var. Occ.			743	163	977	669	446	1091	992	191	132
Statistical Comparison			Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1	Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1	Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1
df			398	278	278	393	277	274	345	225	198
Pooled Var			452.6	809.2	394.2	558.1	789.0	631.9	622.7	842.7	179.3
t Stat			-9.7	-1.5	5.8	-4.8	5.8	9.9	-4.9	7.1	20.7
t Critical (one tail)			1.6	1.7	1.7	1.6	1.7	1.7	1.6	1.7	1.7
p Value (one tail)			2.01E-20	0.0710	1.17E-08	1.41E-06	8.72E-09	3.94E-20	7.00E-07	8.68E-12	8.96E-52
Mean Same?			Reject	Not Reject	Reject	Reject	Reject	Reject	Reject	Reject	Reject
Improvement?			No	No	Yes	No	Yes	Yes	No	Yes	Yes
Difference*			21	6	-15	11	-22	-33	13	-36	-49

Note: "Rejecting" a hypothesis of "no difference" is desired in terms of concluding that an improvement exists.

Difference is expressed in percentage points of occupancy.

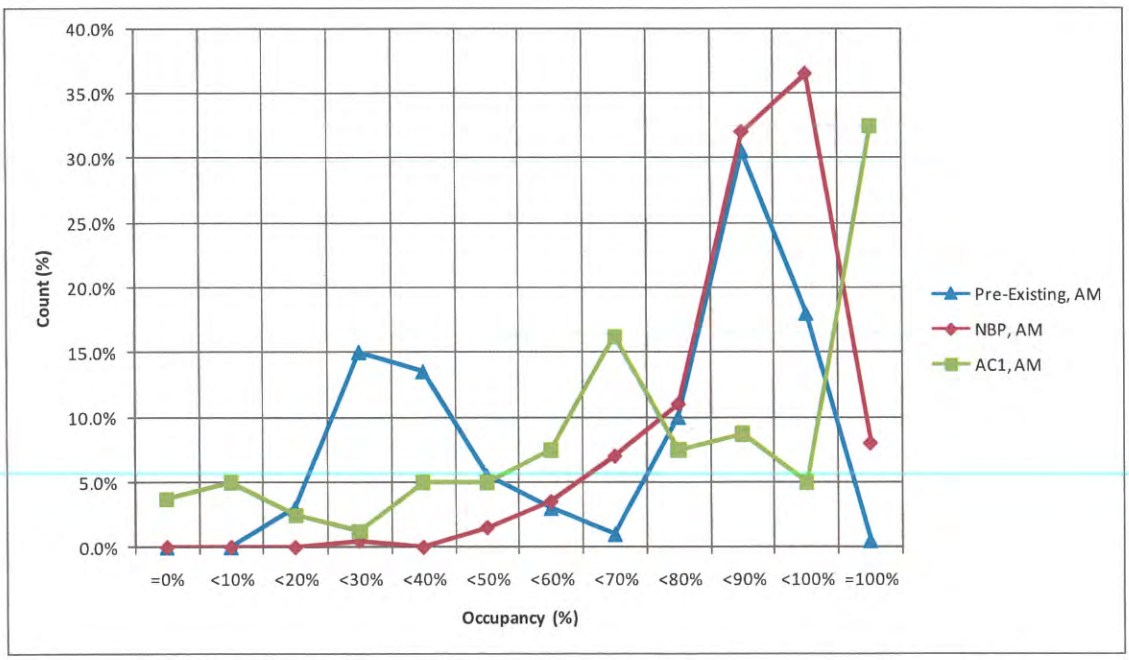

Figure B-25 – AM Occupancy Histogram, Lexington Ave (E. 51st to E. 50th), Lane 3

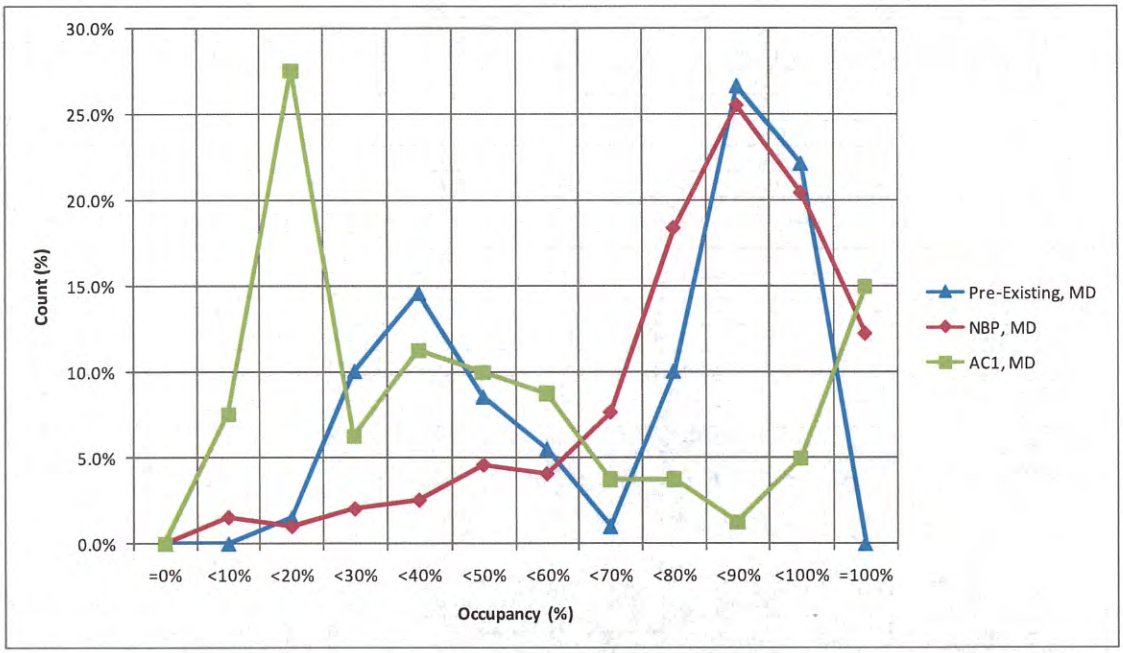

Figure B-26 – MD Occupancy Histogram, Lexington Ave (E. 51st to E. 50th), Lane 3

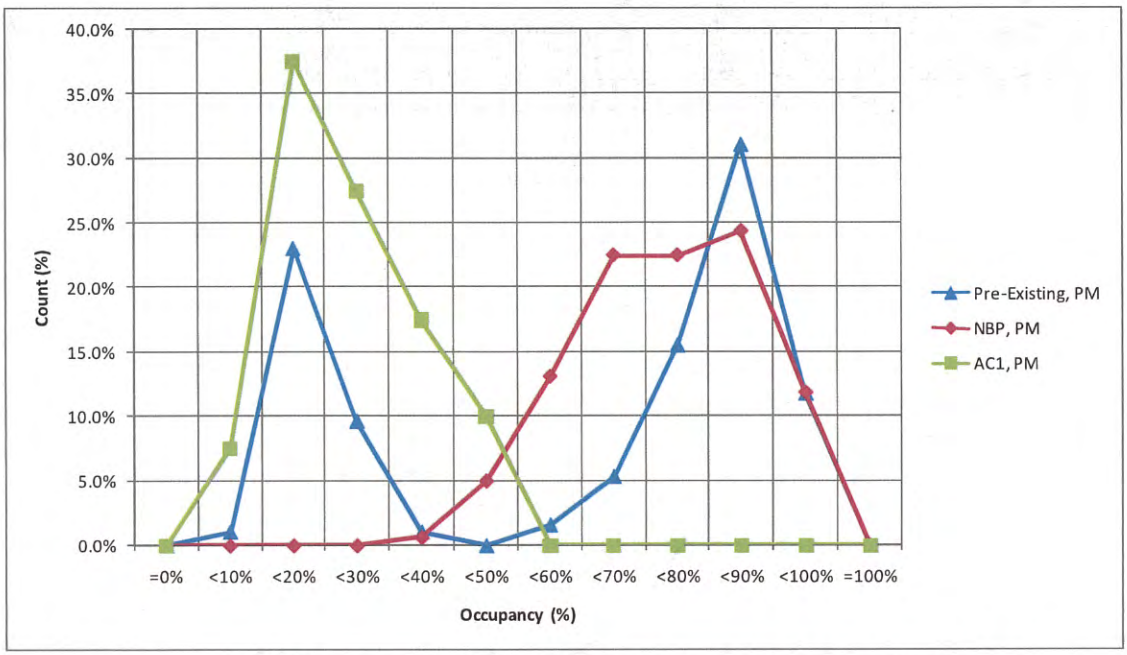

Figure B-27 – PM Occupancy Histogram, Lexington Ave (E. 51st to E. 50th), Lane 3

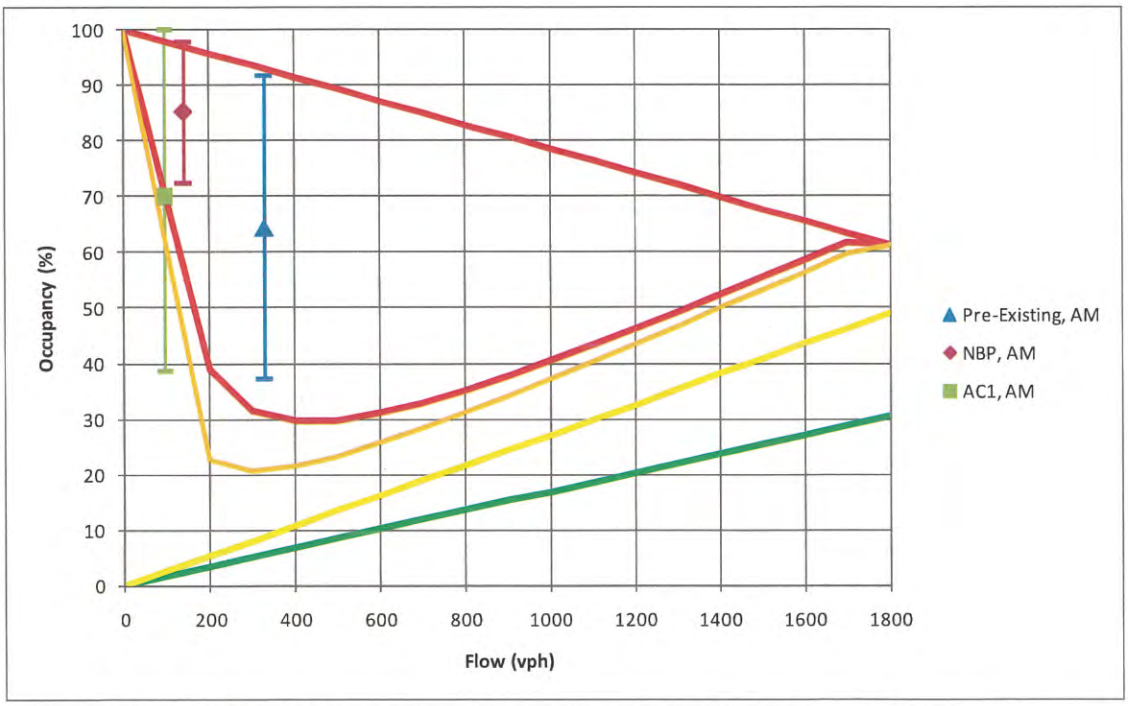

Figure B-28 – AM Flow vs Occupancy, Lexington Ave (E. 51st to E. 50th), Lane 3

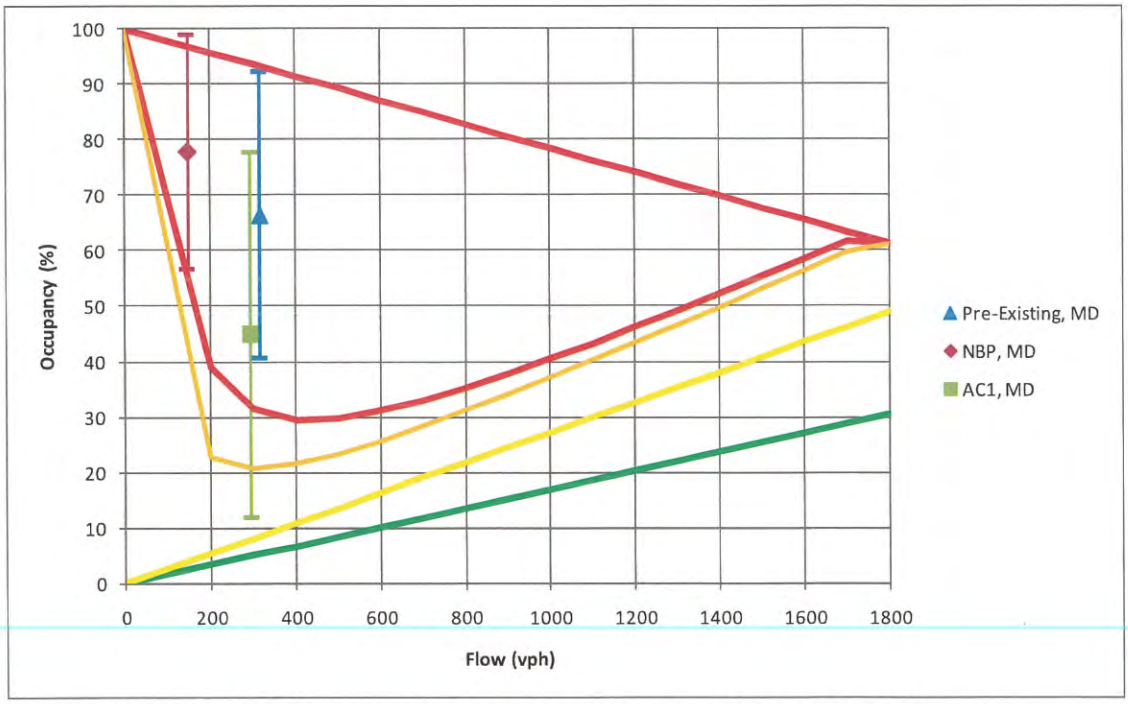

Figure B-29 – MD Flow vs Occupancy, Lexington Ave (E. 51st to E. 50th), Lane 3

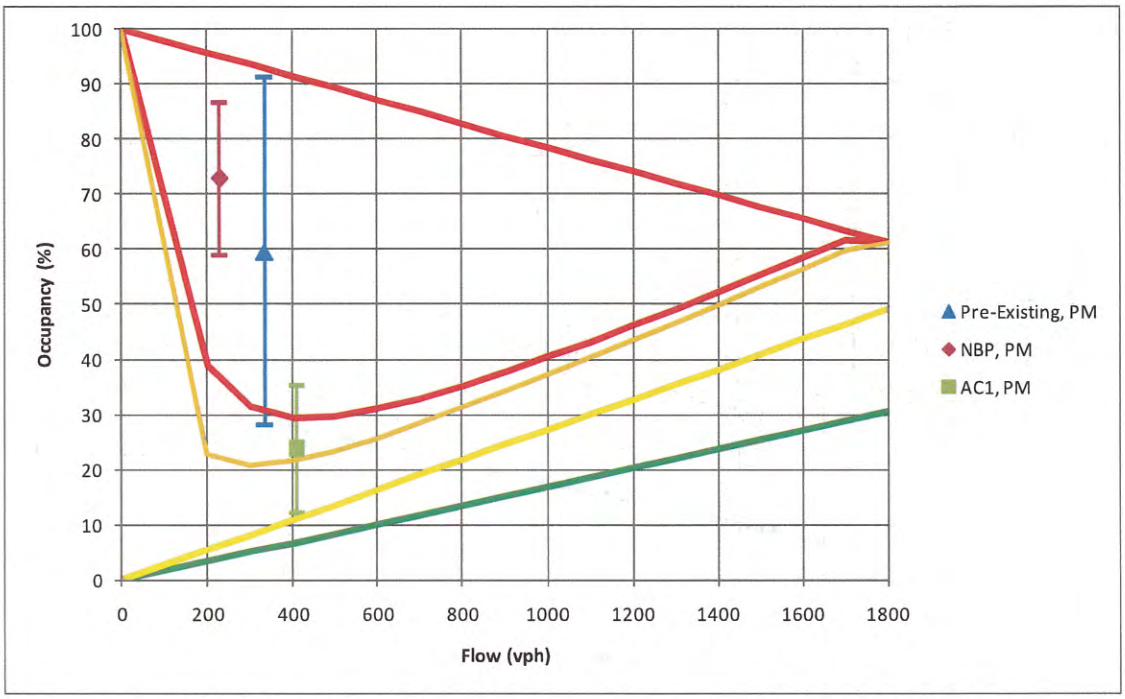

Figure B-30 – PM Flow vs Occupancy, Lexington Ave (E. 51st to E. 50th), Lane 3

APPENDIX C – ETC TAG READER DATA STATISTICAL ANALYSIS

Included in this appendix is the complete ETC statistical analysis. A summary table is provided for each location where the analysis was preformed along with number of stoops histograms.

Table C-1 below includes information regarding the relevant fields extracted from the ETC database for the analysis.

Table C-1 – ETC Data Source, MySQL Database (segments Table)

Relevant Fields	Description
time	Time stamp of when the vehicles passes 'lid1'
lid0	ID of the first intersection passed
lid1	ID of the second intersection passed
tt	Travel time from 'lid0' to 'lid1', expressed in seconds

Table C-2 – ETC Analysis Summary, Lexington Ave (E. 49th to E. 42nd)

Time Period			AM	AM	AM	MD	MD	MD	PM	PM	PM
Control Plan			Pre-Existing	NBP	AC1	Pre-Existing	NBP	AC1	Pre-Existing	NBP	AC1
Stops	Lower TT	Upper TT	Pre-Existing, AM	NBP, AM	AC1, AM	Pre-Existing, MD	NBP, MD	AC1, MD	Pre-Existing, PM	NBP, PM	AC1, PM
0	0.0	120.0	2.0%	1.7%	8.1%	26.8%	19.5%	47.1%	27.4%	37.0%	30.7%
1	120.0	180.5	13.5%	18.2%	39.8%	32.7%	48.9%	35.2%	33.1%	28.8%	36.0%
2	180.5	270.5	35.8%	46.6%	35.6%	28.7%	20.7%	12.0%	27.5%	19.4%	25.6%
3	270.5	360.5	30.9%	23.3%	7.8%	4.7%	5.6%	1.9%	6.7%	7.9%	4.3%
4	360.5	450.5	10.2%	4.7%	2.3%	2.3%	1.2%	0.8%	1.9%	3.4%	0.9%
5	450.5	540.5	2.7%	1.3%	0.8%	0.9%	0.5%	0.8%	0.6%	1.2%	0.4%
6	540.5	630.5	1.0%	0.8%	1.1%	0.6%	0.7%	0.4%	0.3%	0.2%	0.5%
7	630.5	720.5	0.6%	0.9%	1.1%	0.6%	0.3%	0.1%	0.4%	0.3%	0.4%
7+	720.5	Infinity	3.3%	2.5%	3.4%	2.6%	2.7%	1.7%	2.2%	1.8%	1.1%
Number of Observations			2790	2798	731	2640	2229	1383	3294	2536	1591
Percentile		50%	262	223	184	170	141	121	143	131	137
Average TT			266	241	196	179	166	134	168	163	158
Standard Deviation			96	88	95	89	78	71	85	98	80
Variance			9197	7827	9057	7856	6077	5094	7143	9528	6327
Statistical Comparison			Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1	Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1	Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1
df			5586	3519	3527	4867	4021	3610	5828	4883	4125
Pooled Var			8510.7	9167.7	8081.3	7041.6	6906.5	5700.7	8180.5	6877.2	8294.3
t Stat			10.2	17.7	12.0	5.3	16.0	12.1	2.2	4.0	1.7
t Critical (one tail)			1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
p Value (one tail)			1.01E-24	3.27E-67	4.89E-33	6.22E-08	4.81E-56	2.13E-33	0.0145	3.42E-05	0.0472
Mean Same?			Reject	Reject	Reject	Reject	Reject	Reject	Reject	Reject	Reject
Improvement?			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
% Improvement			-9%	-26%	-19%	-7%	-25%	-19%	-3%	-6%	-3%

Note: "Rejecting" a hypothesis of "no difference" is desired in terms of concluding that an improvement exists.

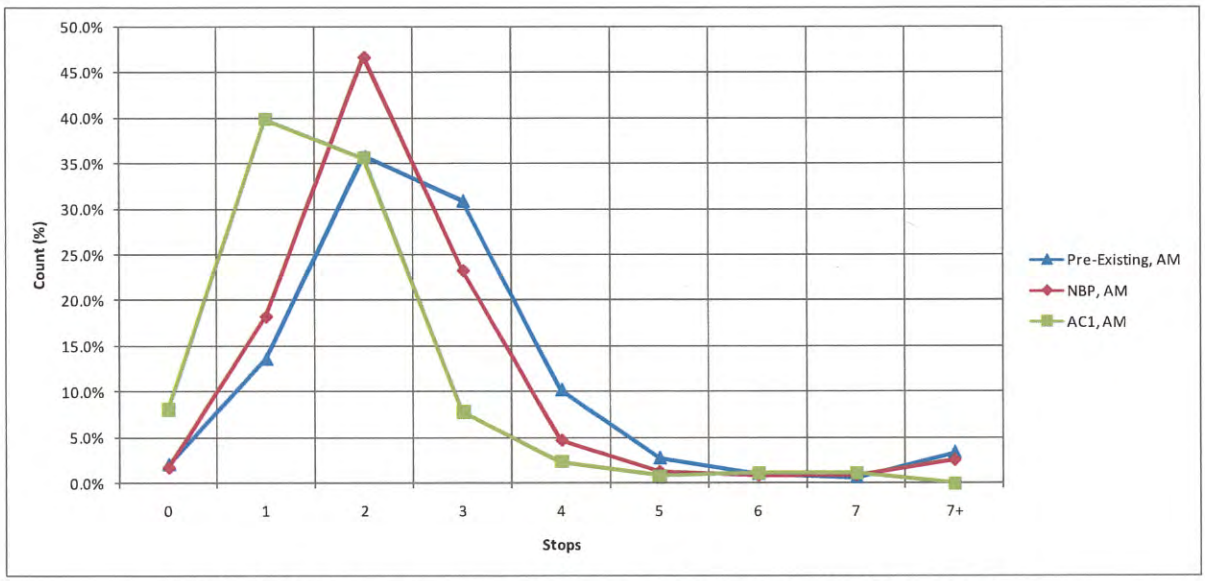

Figure C-1 – AM Stop Frequency Histogram, Lexington Ave (E. 49th to E. 42nd)

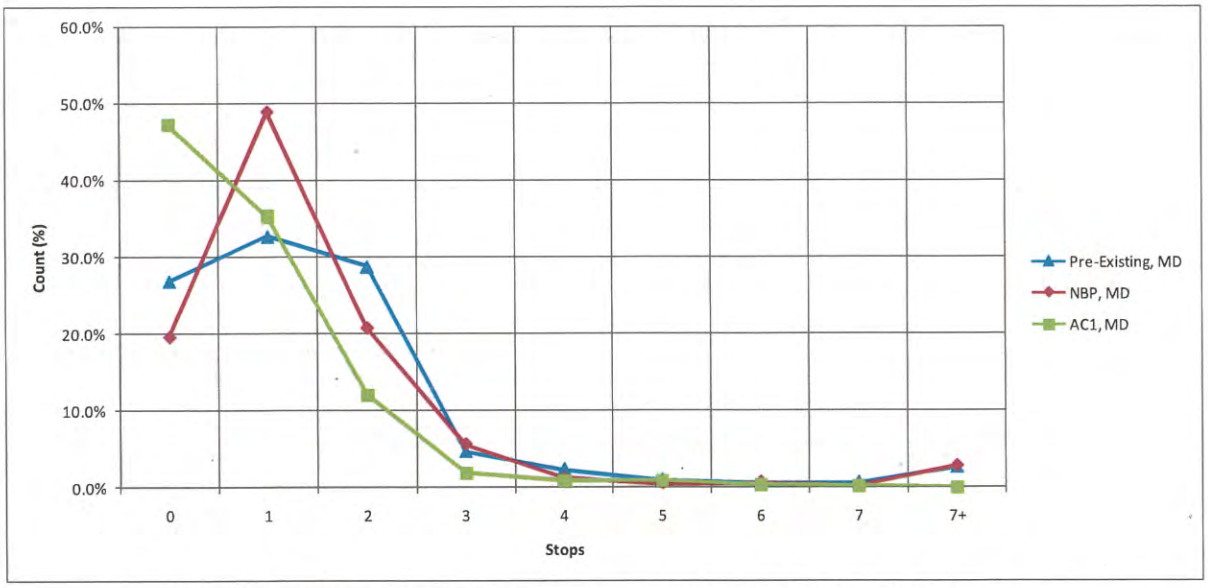

Figure C-2 – MD Stop Frequency Histogram, Lexington Ave (E. 49th to E. 42nd)

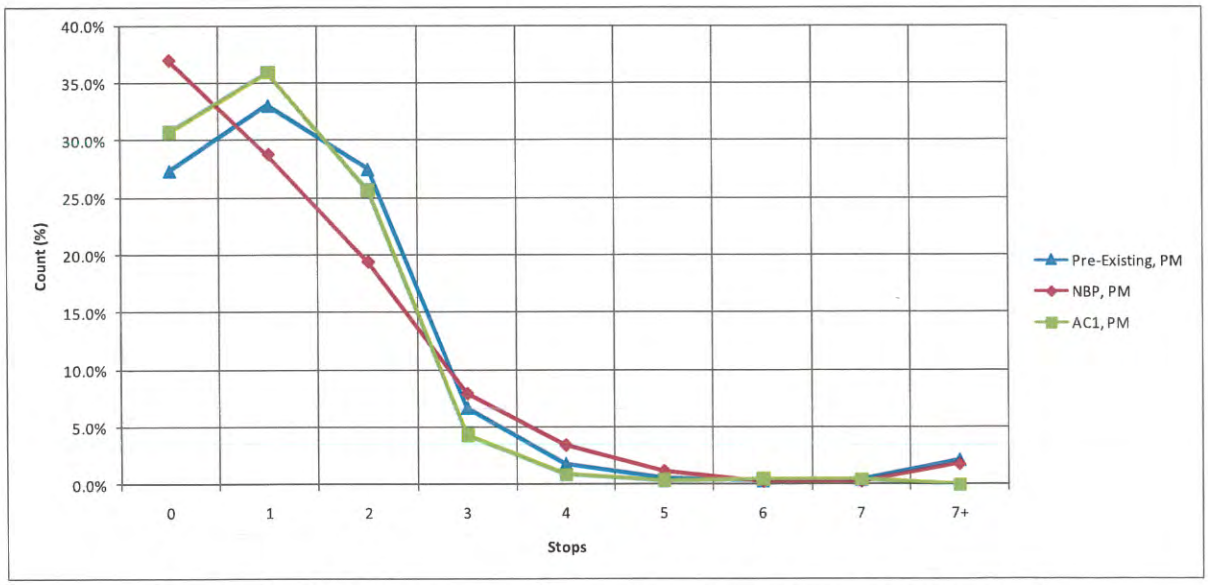

Figure C-3 – PM Stop Frequency Histogram, Lexington Ave (E. 49th to E. 42nd)

Table C-3 – ETC Analysis Summary, Lexington Ave (E. 57th to E. 49th)

Time Period			AM	AM	AM	MD	MD	MD	PM	PM	PM
Control Plan			Pre-Existing	NBP	AC1	Pre-Existing	NBP	AC1	Pre-Existing	NBP	AC1
Stops	Lower TT	Upper TT	Pre-Existing, AM	NBP, AM	AC1, AM	Pre-Existing, MD	NBP, MD	AC1, MD	Pre-Existing, PM	NBP, PM	AC1, PM
0	0.0	120.0	1.5%	3.7%	3.3%	3.2%	8.5%	33.6%	28.5%	35.3%	26.9%
1	120.0	180.5	15.6%	16.2%	17.8%	19.7%	20.1%	44.0%	35.9%	45.0%	48.9%
2	180.5	270.5	27.7%	30.5%	25.2%	46.3%	40.9%	15.5%	18.4%	13.6%	16.3%
3	270.5	360.5	24.0%	23.4%	13.8%	17.5%	23.1%	2.1%	8.4%	2.1%	3.6%
4	360.5	450.5	18.2%	13.9%	9.7%	4.4%	3.2%	1.2%	3.3%	0.6%	1.4%
5	450.5	540.5	7.3%	6.4%	10.8%	2.9%	0.6%	0.6%	1.7%	0.4%	0.7%
6	540.5	630.5	1.5%	1.5%	9.1%	2.4%	0.5%	0.5%	0.8%	0.5%	0.1%
7	630.5	720.5	0.9%	1.0%	5.6%	0.7%	0.5%	0.3%	0.5%	0.3%	0.0%
7+	720.5	Infinity	3.4%	3.2%	4.7%	2.9%	2.6%	2.2%	2.6%	2.2%	2.2%
Number of Observations			2588	2687	877	2278	2487	1095	2427	2584	1001
Percentile		50%	293	268	297	246	239	134	142	132	138
Average TT			298	283	329	254	232	145	174	138	150
Standard Deviation			116	117	168	104	92	78	108	75	72
Variance			13390	13747	28330	10916	8378	6041	11573	5584	5186
Statistical Comparison			Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1	Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1	Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1
df			5273	3463	3562	4763	3371	3580	5009	3426	3583
Pooled Var			13572.3	17169.4	17333.6	9591.1	9334.1	7663.7	8484.7	9708.8	5472.7
t Stat			4.8	-5.9	-8.9	7.6	30.8	27.7	14.0	6.4	-4.6
t Critical (one tail)			1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
p Value (one tail)			8.07E-07	2.23E-09	4.75E-19	2.03E-14	7.93E-184	4.74E-153	6.39E-44	8.32E-11	2.11E-06
Mean Same?			Reject	Reject	Reject	Reject	Reject	Reject	Reject	Reject	Reject
Improvement?			Yes	No	No	Yes	Yes	Yes	Yes	Yes	No
% Improvement			-5%	10%	16%	-8%	-43%	-38%	-21%	-14%	9%

Note: "Rejecting" a hypothesis of "no difference" is desired in terms of concluding that an improvement exists.

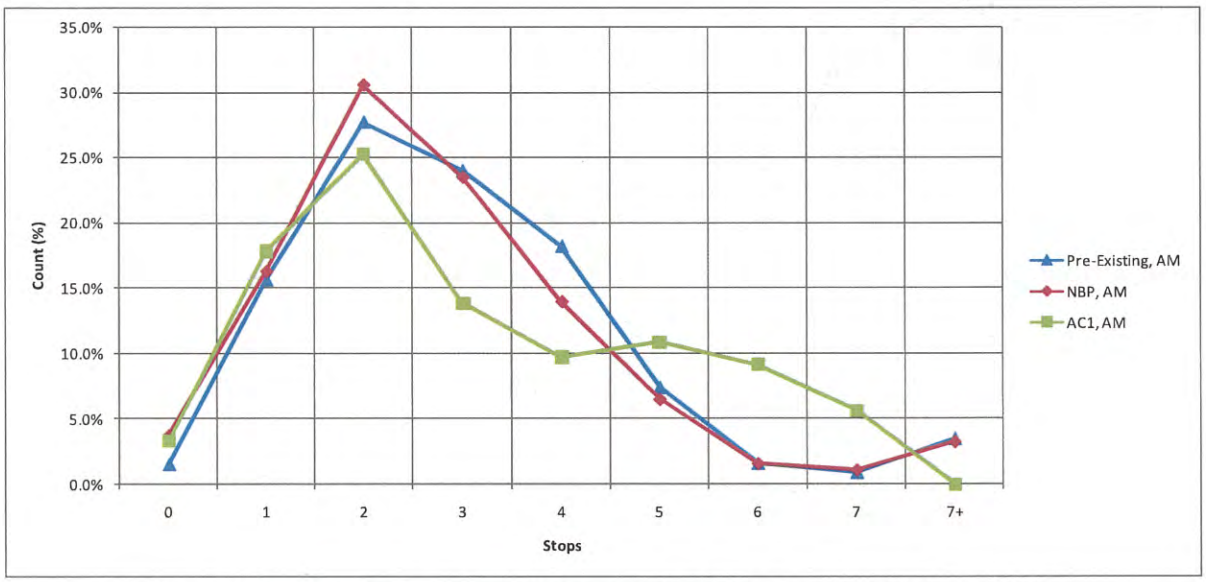

Figure C-4 – AM Stop Frequency Histogram, Lexington Ave (E. 57th to E. 49th)

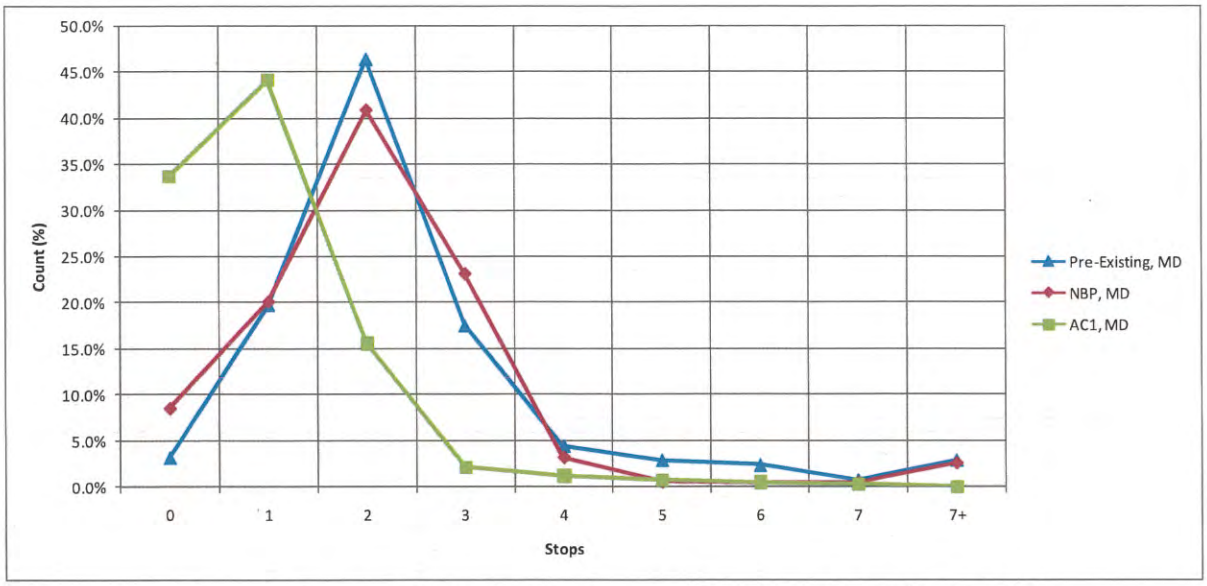

Figure C-5 – MD Stop Frequency Histogram, Lexington Ave (E. 57th to E. 49th)

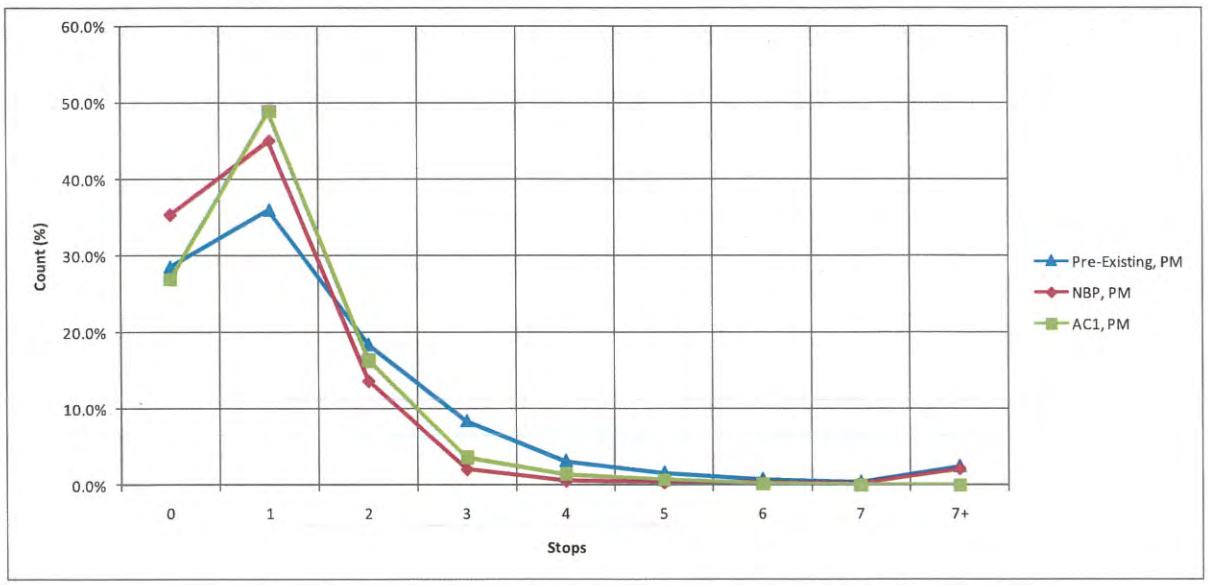

Figure C-6 – PM Stop Frequency Histogram, Lexington Ave (E. 57th to E. 49th)

Table C-4 – ETC Analysis Summary, 3rd (E. 42nd to E. 49th)

Time Period			AM	AM	AM	MD	MD	MD	PM	PM	PM
Control Plan			Pre-Existing	NBP	AC1	Pre-Existing	NBP	AC1	Pre-Existing	NBP	AC1
Stops	Lower TT	Upper TT	Pre-Existing, AM	NBP, AM	AC1, AM	Pre-Existing, MD	NBP, MD	AC1, MD	Pre-Existing, PM	NBP, PM	AC1, PM
0	0.0	120.0	34.5%	29.5%	31.3%	6.4%	3.1%	39.1%	63.2%	52.0%	45.5%
1	120.0	180.5	24.2%	23.3%	26.6%	41.4%	20.1%	24.4%	10.4%	12.2%	13.6%
2	180.5	270.5	14.2%	18.3%	15.2%	22.3%	12.1%	12.8%	4.8%	9.9%	14.8%
3	270.5	360.5	6.2%	6.2%	2.0%	8.0%	11.1%	2.3%	3.2%	6.0%	4.7%
4	360.5	450.5	4.8%	3.8%	4.1%	5.7%	15.6%	4.9%	6.2%	6.6%	6.2%
5	450.5	540.5	2.8%	2.8%	4.1%	3.5%	17.1%	5.3%	2.9%	3.4%	3.5%
6	540.5	630.5	3.5%	4.0%	4.4%	2.4%	7.3%	2.3%	0.7%	2.4%	1.9%
7	630.5	720.5	2.4%	2.9%	4.1%	2.0%	1.9%	1.9%	2.0%	1.2%	1.2%
7+	720.5	Infinity	7.4%	9.2%	8.2%	8.2%	11.8%	7.1%	6.5%	6.3%	8.6%
Number of Observations			796	579	342	735	578	266	691	588	257
Percentile		50%	156	176	165	184	406	159	105	115	153
Average TT			204	215	214	235	344	195	163	182	189
Standard Deviation			149	154	169	137	164	146	139	143	141
Variance			22155	23617	28430	18654	26868	21325	19194	20457	19772
Statistical Comparison			Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1	Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1	Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1
df			1373	1136	919	1311	999	842	1277	946	843
Pooled Var			22770.6	24039.0	25403.0	22269.3	19362.6	25123.2	19774.9	19350.7	20249.2
t Stat			-1.4	-1.0	0.2	-13.1	4.1	12.7	-2.5	-2.6	-0.7
t Critical (one tail)			1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
p Value (one tail)			0.0758	0.1586	0.4345	3.74E-37	2.20E-05	2.44E-34	0.0061	0.0042	0.2548
Mean Same?			Not Reject	Not Reject	Not Reject	Reject	Reject	Reject	Reject	Reject	Not Reject
Improvement?			No	No	No	No	Yes	Yes	No	No	No
% Improvement			6%	5%	-1%	46%	-17%	-43%	12%	17%	4%

Note: "Rejecting" a hypothesis of "no difference" is desired in terms of concluding that an improvement exists.

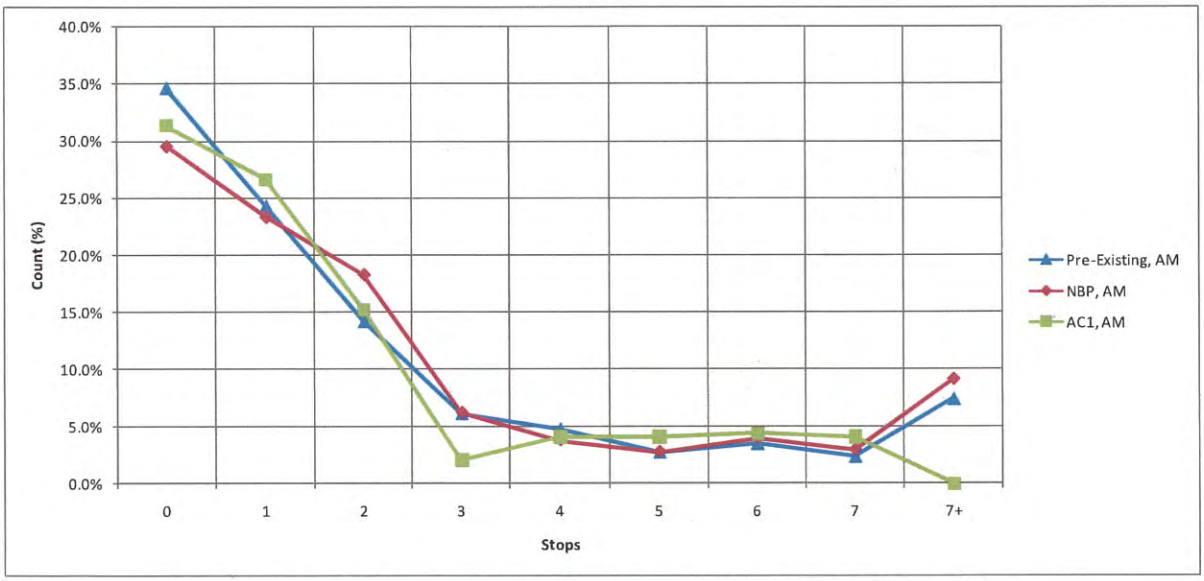

Figure C-7 – AM Stop Frequency Histogram, 3rd Ave (E. 42nd to E. 49th)

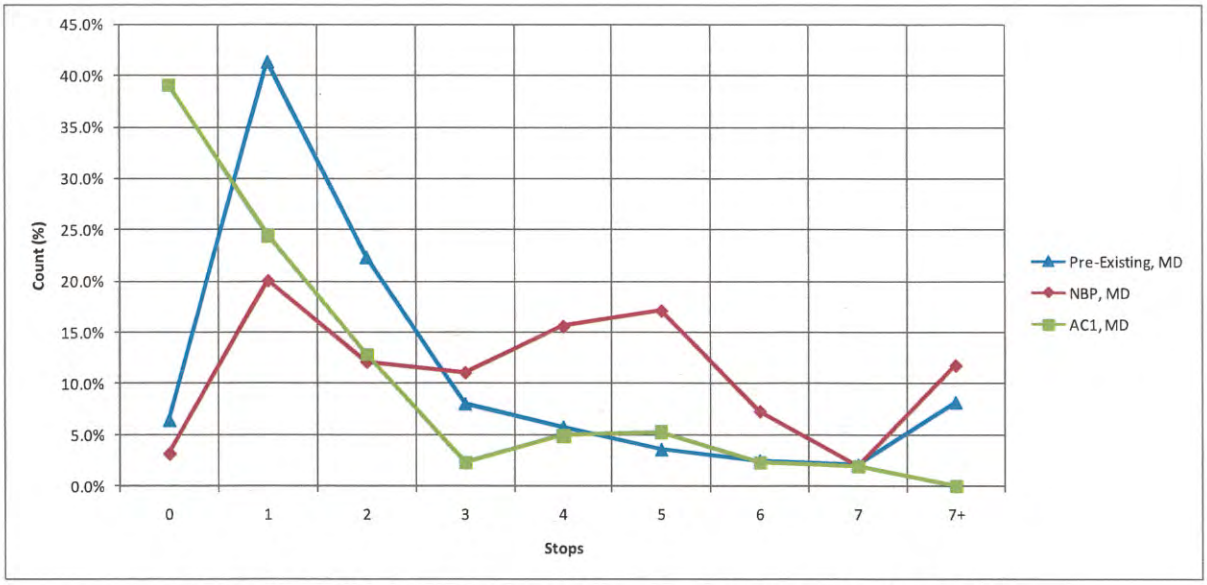

Figure C-8 – MD Stop Frequency Histogram, 3rd Ave (E. 42nd to E. 49th)

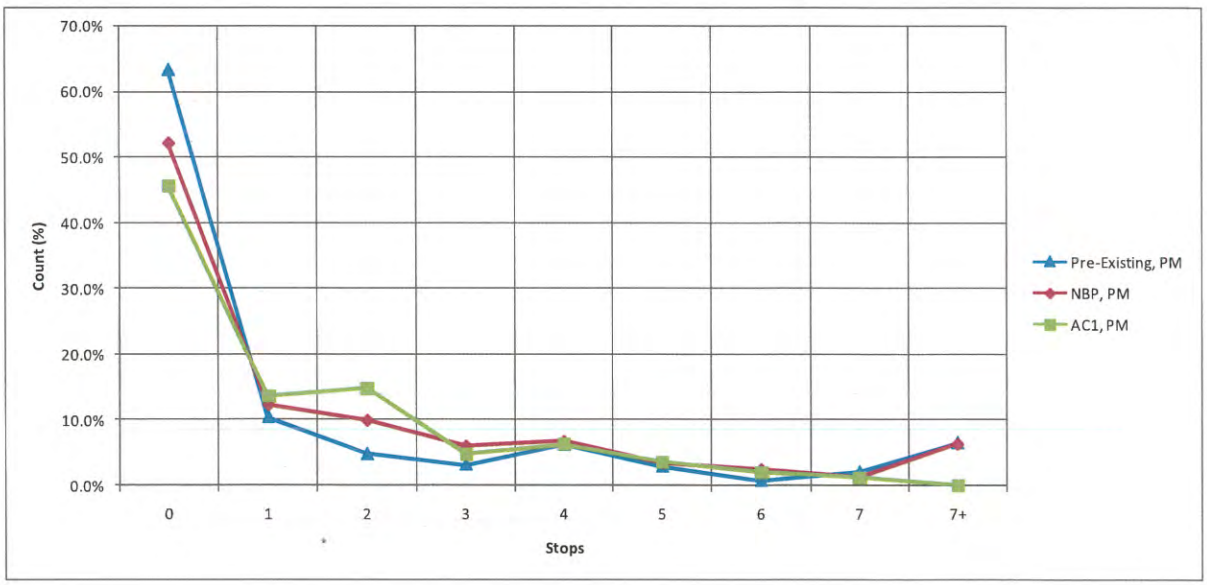

Figure C-9 – PM Stop Frequency Histogram, 3rd Ave (E. 42nd to E. 49th)

Table C-5 – ETC Analysis Summary, 3rd (E. 49th to E. 57th)

Time Period			AM	AM	AM	MD	MD	MD	PM	PM	PM
Control Plan			Pre-Existing	NBP	AC1	Pre-Existing	NBP	AC1	Pre-Existing	NBP	AC1
Stops	Lower TT	Upper TT	Pre-Existing, AM	NBP, AM	AC1, AM	Pre-Existing, MD	NBP, MD	AC1, MD	Pre-Existing, PM	NBP, PM	AC1, PM
0	0.0	120.0	31.3%	20.9%	10.3%	3.9%	1.1%	14.3%	10.3%	7.0%	1.4%
1	120.0	180.5	46.8%	27.7%	28.3%	29.7%	2.5%	51.2%	24.6%	24.9%	22.0%
2	180.5	270.5	14.7%	15.6%	20.1%	50.5%	6.6%	24.6%	25.3%	29.6%	29.1%
3	270.5	360.5	2.6%	10.6%	13.0%	9.7%	32.6%	6.0%	19.6%	19.7%	19.5%
4	360.5	450.5	0.7%	7.8%	10.9%	1.8%	32.8%	0.7%	7.6%	7.7%	11.6%
5	450.5	540.5	0.8%	5.3%	9.6%	1.0%	14.4%	0.7%	4.2%	3.6%	8.2%
6	540.5	630.5	0.7%	4.5%	4.2%	0.7%	4.7%	0.5%	2.4%	2.4%	4.2%
7	630.5	720.5	0.2%	2.2%	1.0%	0.3%	1.3%	0.4%	1.7%	2.0%	0.3%
7+	720.5	Infinity	2.1%	5.4%	2.6%	2.5%	4.0%	1.6%	4.3%	3.0%	3.7%
Number of Observations			2897	1298	1045	2644	915	849	2844	1724	354
Percentile		50%	142	213	232	196	385	144	244	244	250
Average TT			150	242	265	222	390	171	260	265	285
Standard Deviation			85	163	151	76	103	82	136	131	127
Variance			7145	26666	22662	5747	10661	6682	18410	17201	16046
Statistical Comparison			Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1	Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1	Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1
df			4193	3940	2341	3557	3491	1762	4566	3196	2076
Pooled Var			13182.9	11256.2	24879.9	7010.1	5974.4	8746.0	17953.9	18149.0	17004.7
t Stat			-23.9	-30.0	-3.5	-52.4	16.8	49.2	-1.4	-3.4	-2.6
t Critical (one tail)			1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
p Value (one tail)			5.16E-119	5.34E-179	0.0002	0.00E+00	6.20E-61	0.00E+00	0.0838	0.0003	0.0041
Mean Same?			Reject	Reject	Reject	Reject	Reject	Reject	Not Reject	Reject	Reject
Improvement?			No	No	No	No	Yes	Yes	No	No	No
% Improvement			61%	77%	10%	76%	-23%	-56%	2%	10%	8%

Note: "Rejecting" a hypothesis of "no difference" is desired in terms of concluding that an improvement exists.

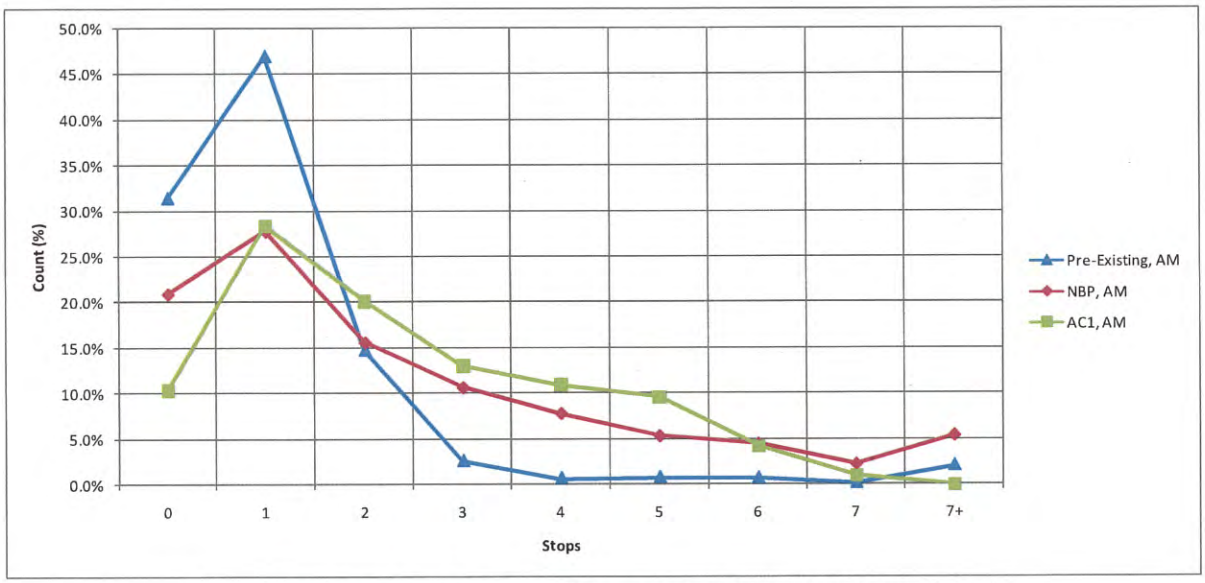

Figure C-10 – AM Stop Frequency Histogram, 3rd Ave (E. 49th to E. 57th)

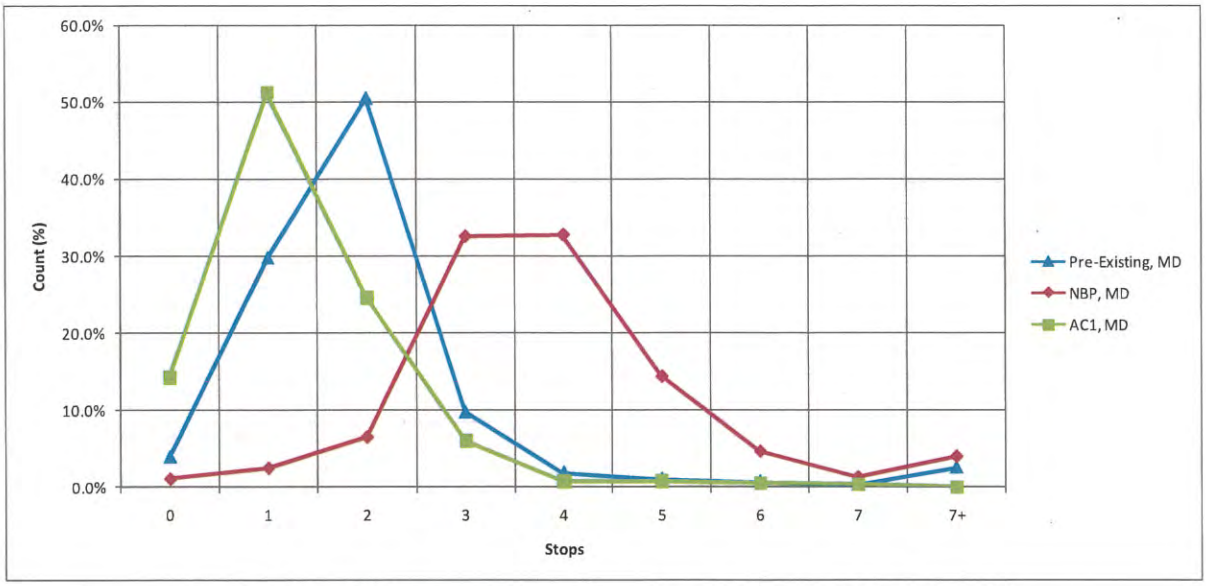

Figure C-11 – MD Stop Frequency Histogram, 3rd Ave (E. 49th to E. 57th)

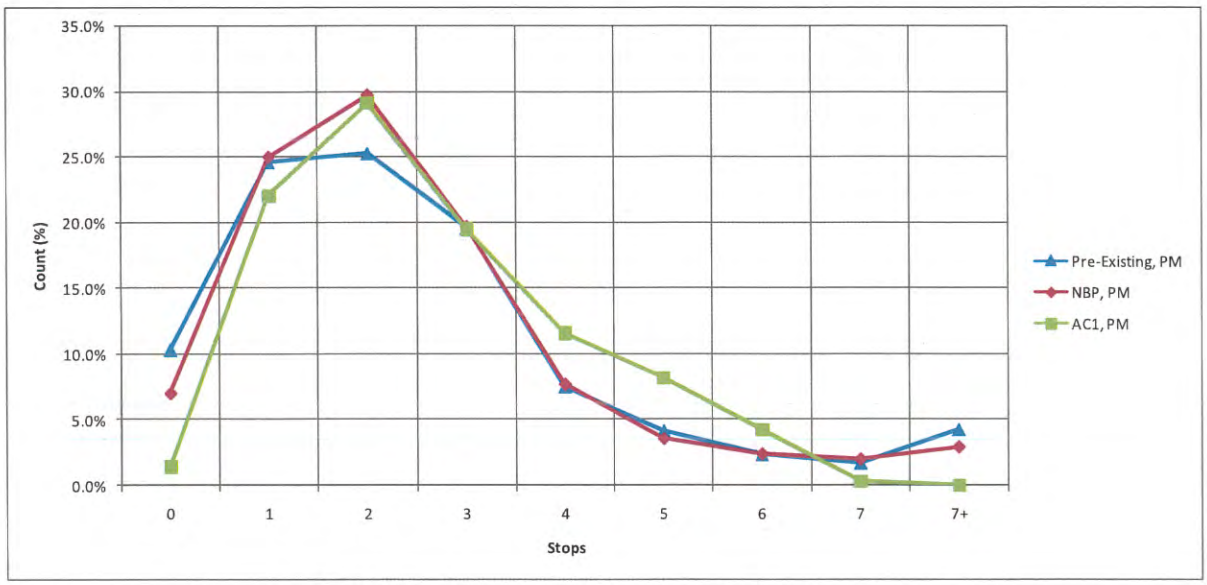

Figure C-12 – PM Stop Frequency Histogram, 3rd Ave (E. 49th to E. 57th)

Table C-6 – ETC Analysis Summary, Madison Ave (E. 42nd to E. 49th)

Time Period			AM	AM	AM	MD	MD	MD	PM	PM	PM
Control Plan			Pre-Existing	NBP	AC1	Pre-Existing	NBP	AC1	Pre-Existing	NBP	AC1
Stops	Lower TT	Upper TT	Pre-Existing, AM	NBP, AM	AC1, AM	Pre-Existing, MD	NBP, MD	AC1, MD	Pre-Existing, PM	NBP, PM	AC1, PM
0	0.0	120.0	42.9%	27.3%	-	17.2%	35.2%	-	56.3%	70.3%	-
1	120.0	180.5	25.1%	28.4%	-	40.7%	36.3%	-	19.0%	13.1%	-
2	180.5	270.5	13.8%	26.2%	-	24.9%	12.1%	-	2.3%	5.7%	-
3	270.5	360.5	3.0%	8.2%	-	2.3%	3.3%	-	1.7%	1.7%	-
4	360.5	450.5	0.0%	0.5%	-	1.8%	1.6%	-	2.3%	0.6%	-
5	450.5	540.5	0.5%	1.1%	-	1.4%	1.6%	-	2.3%	1.1%	-
6	540.5	630.5	2.0%	1.6%	-	1.4%	1.6%	-	1.1%	1.1%	-
7	630.5	720.5	2.0%	0.5%	-	2.3%	0.5%	-	2.9%	0.6%	-
7+	720.5	Infinity	10.8%	6.0%	-	8.1%	7.7%	-	12.1%	5.7%	-
Number of Observations			203	183	-	221	182	-	174	175	-
Percentile		50%	122	147	-	173	141	-	116	106	-
Average TT			152	178	-	197	163	-	147	118	-
Standard Deviation			121	104	-	114	111	-	141	100	-
Variance			14633	10832	-	13012	12384	-	20005	10091	-
Statistical Comparison			Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1	Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1	Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1
df			384	-	-	401	-	-	347	-	-
Pooled Var			12831.1	-	-	12728.6	-	-	15033.9	-	-
t Stat			-2.2	-	-	3.0	-	-	2.2	-	-
t Critical (one tail)			1.6	-	-	1.6	-	-	1.6	-	-
p Value (one tail)			0.0147	-	-	0.0015	-	-	0.0141	-	-
Mean Same?			Reject	-	-	Reject	-	-	Reject	-	-
Improvement?			No	-	-	Yes	-	-	Yes	-	-
% Improvement			17%	-	-	-17%	-	-	-20%	-	-

Note: "Rejecting" a hypothesis of "no difference" is desired in terms of concluding that an improvement exists.

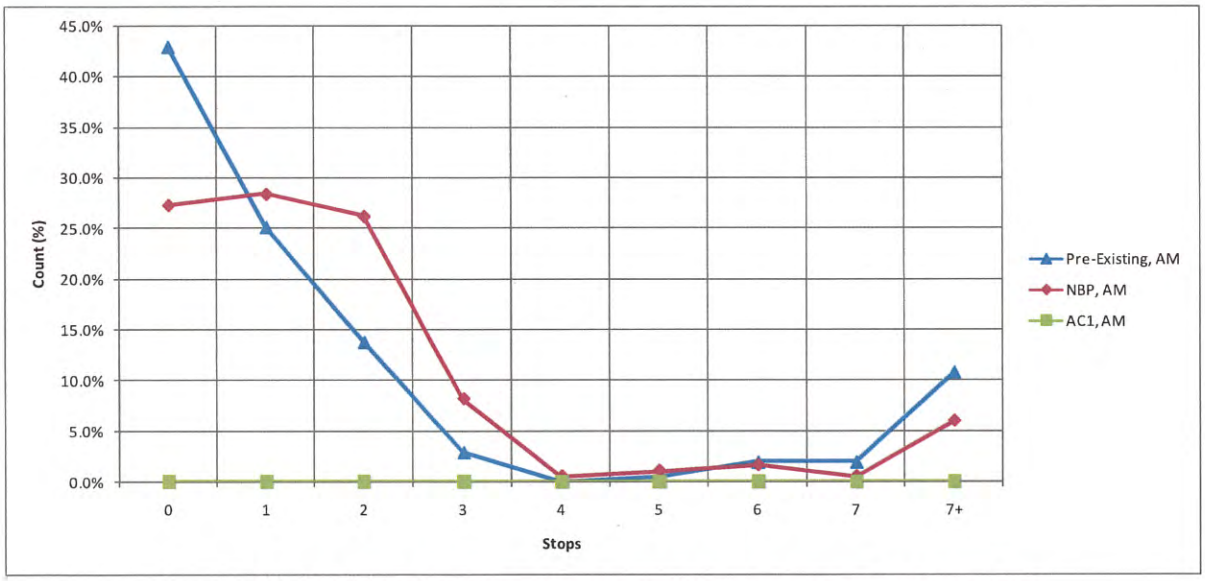

Figure C-13 – AM Stop Frequency Histogram, Madison Ave (E. 42nd to E. 49th)

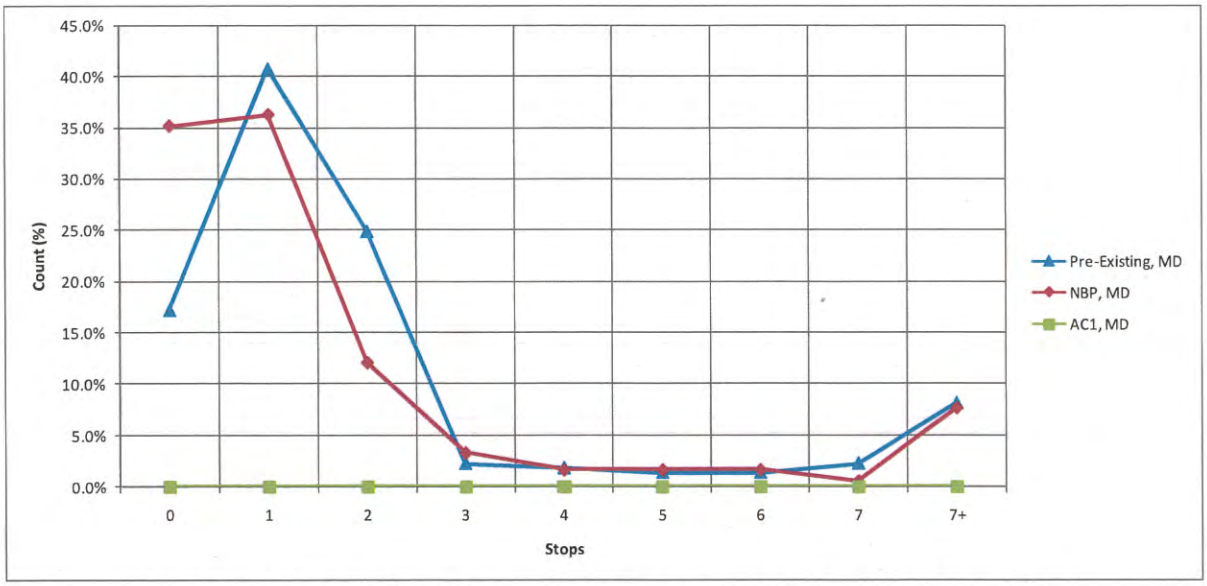

Figure C-14 – MD Stop Frequency Histogram, Madison Ave (E. 42nd to E. 49th)

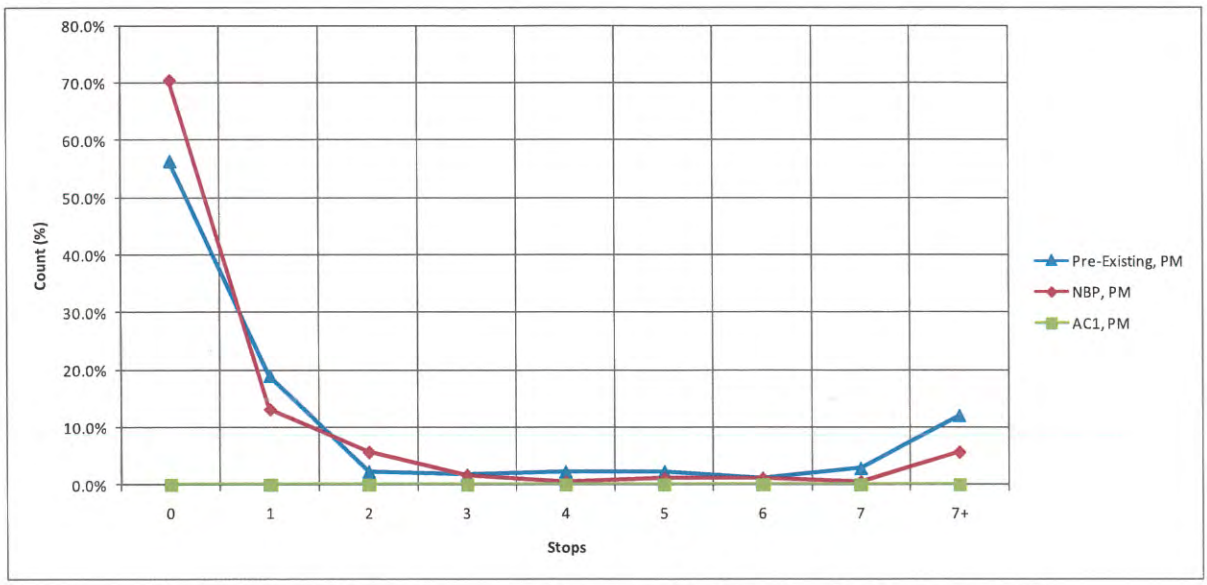

Figure C-15 – PM Stop Frequency Histogram, Madison Ave (E. 42nd to E. 49th)

Table C-7 – ETC Analysis Summary, Madison Ave (E. 49th to E. 57th)

Time Period			AM	AM	AM	MD	MD	MD	PM	PM	PM
Control Plan			Pre-Existing	NBP	AC1	Pre-Existing	NBP	AC1	Pre-Existing	NBP	AC1
Stops	Lower TT	Upper TT	Pre-Existing, AM	NBP, AM	AC1, AM	Pre-Existing, MD	NBP, MD	AC1, MD	Pre-Existing, PM	NBP, PM	AC1, PM
0	0.0	120.0	15.9%	19.8%	-	4.0%	30.4%	-	13.7%	26.3%	-
1	120.0	180.5	49.3%	41.6%	-	26.5%	27.1%	-	37.3%	43.8%	-
2	180.5	270.5	25.1%	20.6%	-	49.8%	24.9%	-	29.6%	17.7%	-
3	270.5	360.5	0.9%	3.5%	-	8.7%	5.8%	-	8.9%	4.4%	-
4	360.5	450.5	0.9%	1.4%	-	1.1%	1.3%	-	1.0%	2.0%	-
5	450.5	540.5	0.0%	1.4%	-	2.2%	0.8%	-	1.7%	0.7%	-
6	540.5	630.5	1.8%	1.4%	-	0.7%	0.0%	-	1.1%	0.6%	-
7	630.5	720.5	1.8%	0.4%	-	1.1%	2.0%	-	1.4%	0.8%	-
7+	720.5	Infinity	4.4%	9.8%	-	5.8%	7.8%	-	5.2%	3.7%	-
Number of Observations			227	490	-	275	398	-	706	859	-
Percentile		50%	143	145	-	198	162	-	171	135	-
Average TT			173	169	-	223	171	-	192	160	-
Standard Deviation			104	98	-	93	110	-	108	94	-
Variance			10866	9580	-	8633	12074	-	11631	8907	-
Statistical Comparison			Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1	Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1	Pre-Existing vs NBP	Pre-Existing vs AC1	NBP vs AC1
df			715	-	-	671	-	-	1563	-	-
Pooled Var			9986.3	-	-	10668.8	-	-	10135.9	-	-
t Stat			0.5	-	-	6.4	-	-	6.4	-	-
t Critical (one tail)			1.6	-	-	1.6	-	-	1.6	-	-
p Value (one tail)			0.3176	-	-	1.79E-10	-	-	1.19E-10	-	-
Mean Same?			Not Reject	-	-	Reject	-	-	Reject	-	-
Improvement?			No	-	-	Yes	-	-	Yes	-	-
% Improvement			-2%	-	-	-23%	-	-	-17%	-	-

Note: "Rejecting" a hypothesis of "no difference" is desired in terms of concluding that an improvement exists.

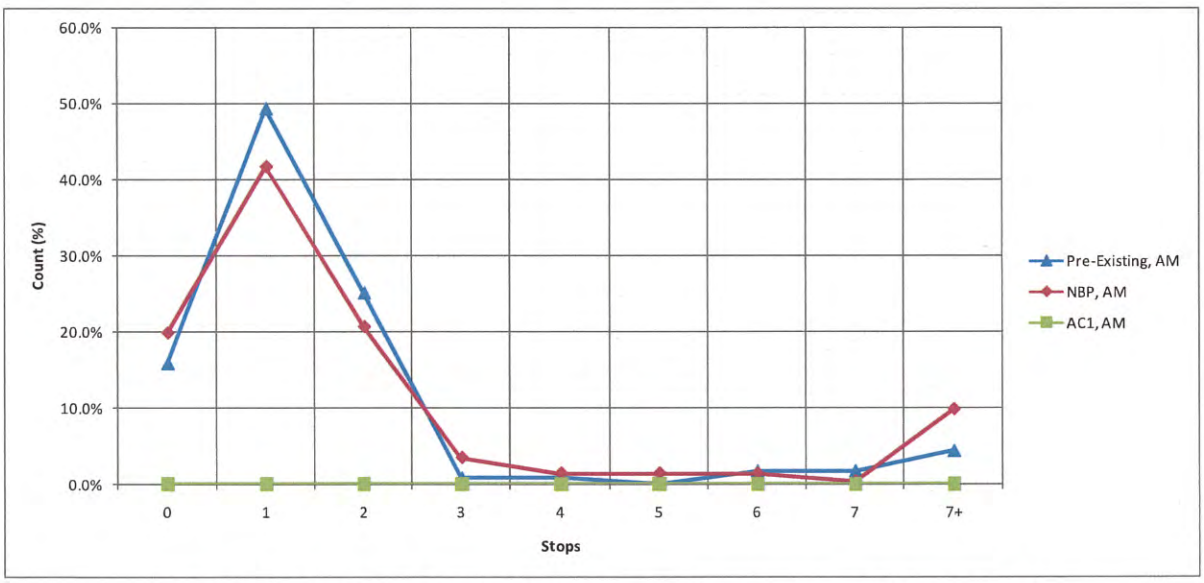

Figure C-16 – AM Stop Frequency Histogram, Madison Ave (E. 49th to E. 57th)

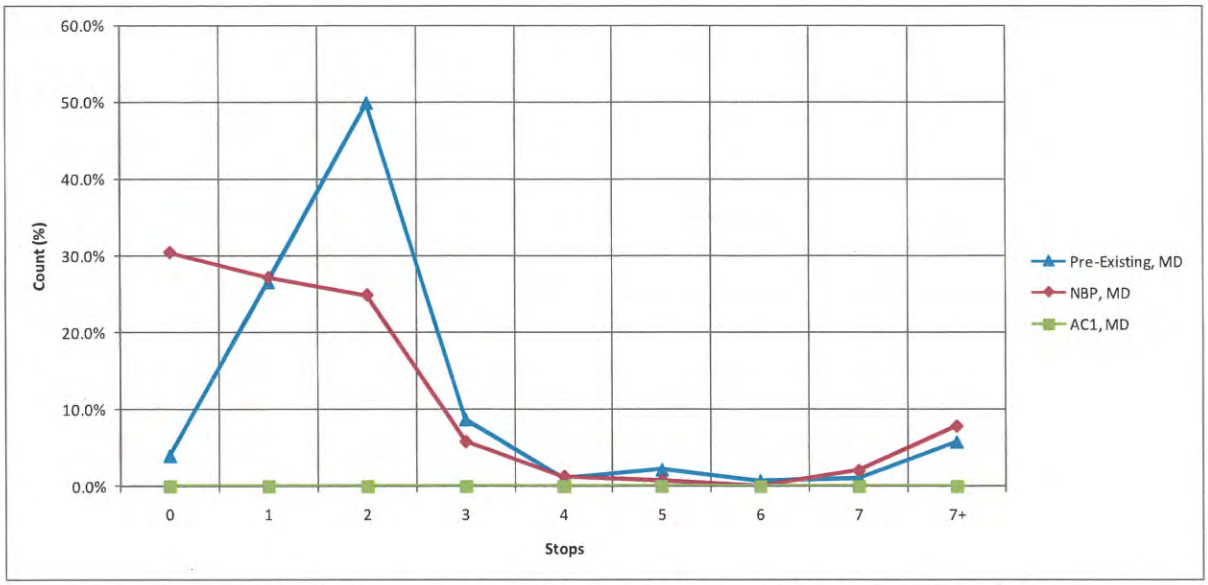

Figure C-17 – MD Stop Frequency Histogram, Madison Ave (E. 49th to E. 57th)

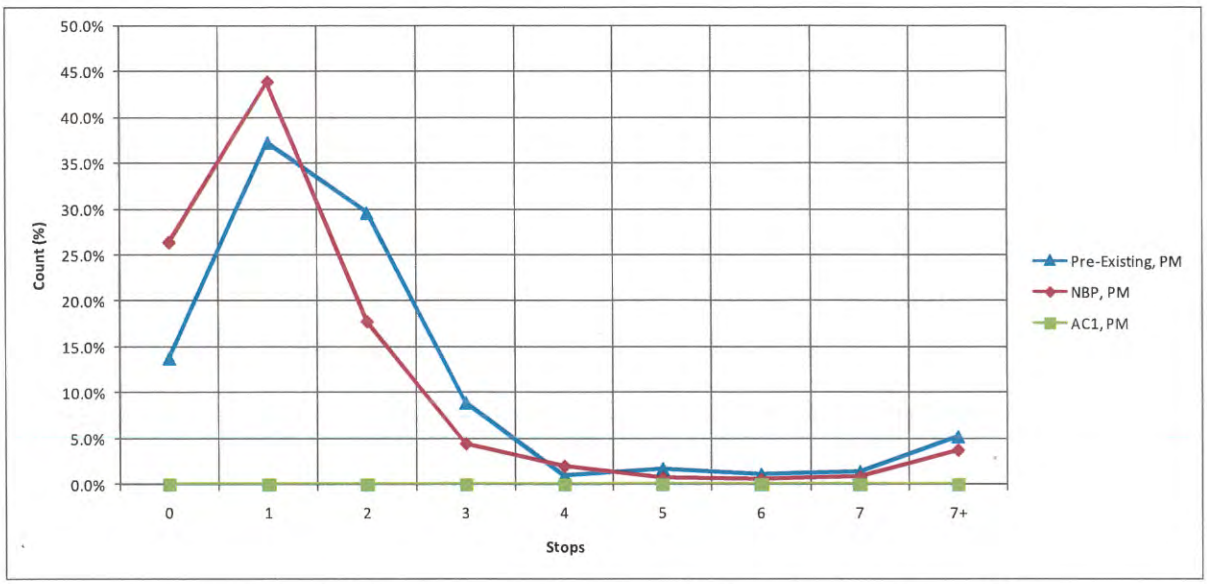

Figure C-18 – PM Stop Frequency Histogram, Madison Ave (E. 49th to E. 57th)

APPENDIX D – OPERATING INSTRUCTIONS

This Appendix includes a copy of the user documentation provided to the TMC supervisors.

Generation 1, MIM Control (Signal-Related)

April 22, 2011

Refer to the attached figure, and note the location of microwave sensor detectors and ETC Travel Time readers.

Level 1 control is based upon selecting an appropriate control plan (Existing[5], NBP, AC1, AC2) for each arterial based upon

a) Travel times within the box on the given, as observed each 6 minutes using an average over the last 15 minutes, tracking the median (i.e. the 50th percentile) of the travel time observations and "tagging" them into 4 color-coded regimes;
b) Severity index[6] on each arterial link for which an microwave sensor is present, computed each 3 signal cycles (4.5 minutes) and displayed in color-coded regimes;
c) Recommendations to the operator based upon the measures in "a" and "b", with action (i.e. change of balancing plan – NBP, AC1, AC2) based upon
   - ETC display crossing into a different regime;
   - Microwave sensor display showing a shorter term pre-cursor problem (some operational experience needed, to fine-tune this);

d) The guidance to the operator is:
- **The microwave sensor detectors are early indicators of plan change – when the color codes go upscale, the operator should be attentive to upcoming travel time segment changes, and possibly tighter control;**
- **The same is true as the microwave sensor colors go downscale: the operator should be attentive to upcoming travel time segment changes, and possibly less tight control;**
- **The buttons at the bottom of the screen show recommended plan changes, based upon the underlying control rules;**
- **The recommendations are by arterial, and the decisions are made for each one, individually;**
- **The operator needs to consider three things before implementing a control change:**
  a. **Existing operational issues that might be influencing the change recommendation, such as special events (Easter Sunday), accident reports, video inspection (if available);**

[5] Existing is the base plan from 8pm to 8am, weekdays and all day weekends. NBP is the base plan from 8am to 8pm, weekdays.
[6] The "severity index" at a given microwave sensor considers flow, occupancy, estimated link queueing, estimated available link storage.

b. Experience --- which will develop over the days after April 22, 2011 – on the effects with and without implementing the recommendation;

c. The preference to implement the recommendation during the test mode that begins on April 22, 2011.

e) During the test mode, a TMC supervisor will be monitoring and confirming the initial test decisions, particularly in the 8am-8pm weekday periods.

f) When the operator chooses to implement a recommendation, no further change of plan on that arterial is allowed for "N" minutes. The present setting is N = 30 minutes. It can be overridden (release / drop control) by the operator.

Now that ETC readers are available outside the box, they will be integrated into checking the travel times outside the box that result from the above actions.

With the microwave sensors as shown in Figure 1 generally available, the Generation 2 control will be implemented within a month after Generation 1, and use the patterns and clusters of microwave sensor displays (i.e. colors, severity levels) to upgrade the control recommendations.

Level 2 control is based upon allocating the split at specific critical intersections based upon the relative severity indices on the two competing directions (arterial, cross streets), making a sequence of small split changes so as to benefit the traffic during the short term local fluctuations. This will be done at one intersection initially, with another key intersections being brought on line thereafter. More sophisticated LEVEL 2 control – affecting pairs or groups of intersections – will be developed as the project proceeds.

Because actual traffic conditions are changed by implementing control, an "after" evaluation will have to be based upon comparisons of what would have happened in the absence of action, compared to the actual observed condition. This will be done in conjunction with A/C Marsico and the MTM modeling, as well as select "with" and "without" control days (i.e. actual best estimates of before-after).

Later guidance and displays will include Madison, 5th and 6th Avenues.

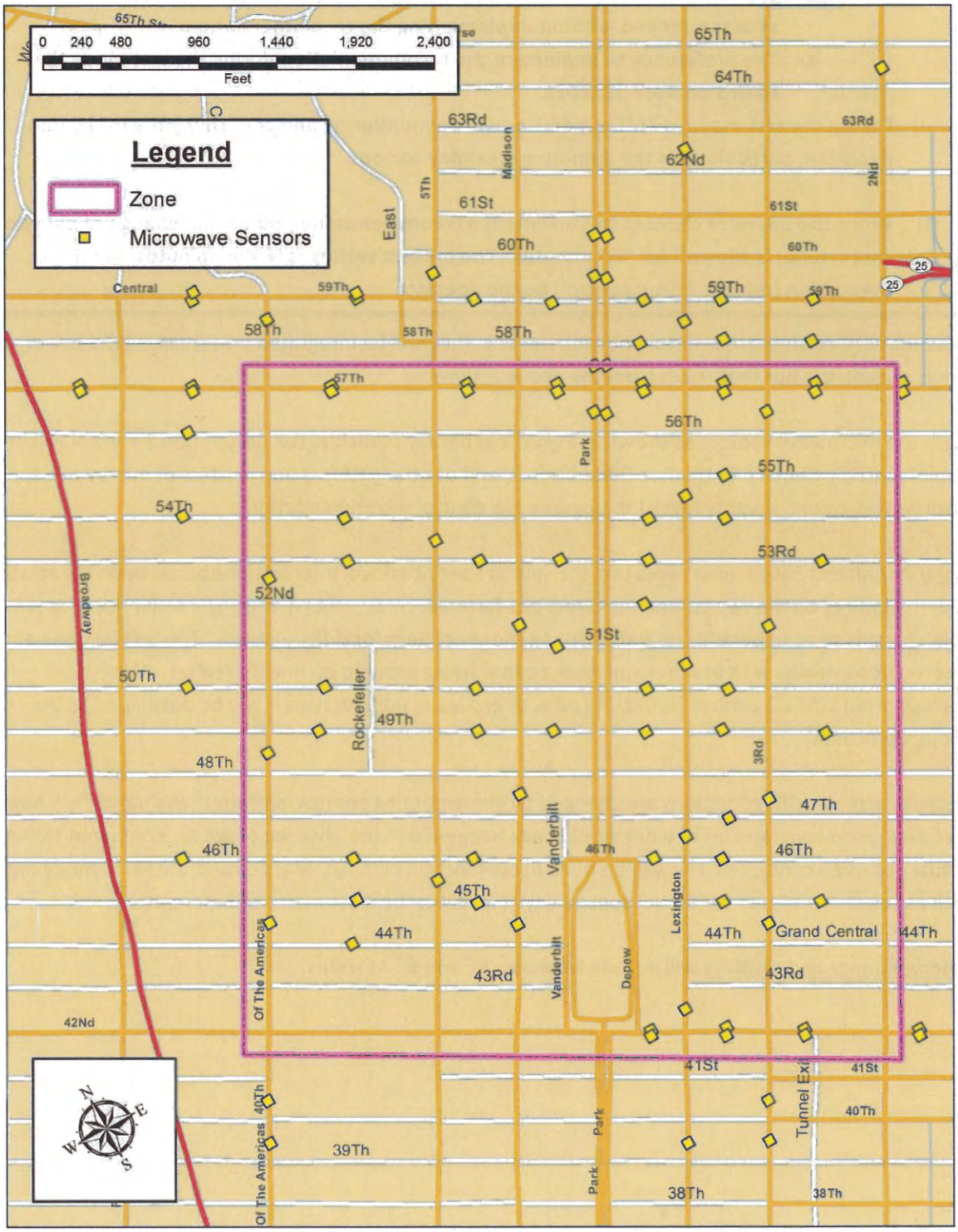

Figure D-1 – MIM Study Area and Microwave Sensors

Current Software Set-up (April 22, 2011)

The software is currently installed on the KLD rack mounted PC and also on the following TransCore Workstation (IP 192.168.1.81).

The connection to this machine is based on the following credentials:

- User: testMIM
- Pass: testMIM

The files are under a directory called -- ACDSS-MIM - Testing Apr 22 2011 – that is approximately 100 MB and the main application is -- acdssmim.exe.

There is a desktop shortcut for this tool 

Figure 2 is a screen shot from the tool. Please ensure the "connect" to the travel time server is enabled before launching the Level 1 Control Display.

The configuration settings shown in Figure 2 are the recommended defaults.

At the end of the session, the log can be saved as a text file for future reference.

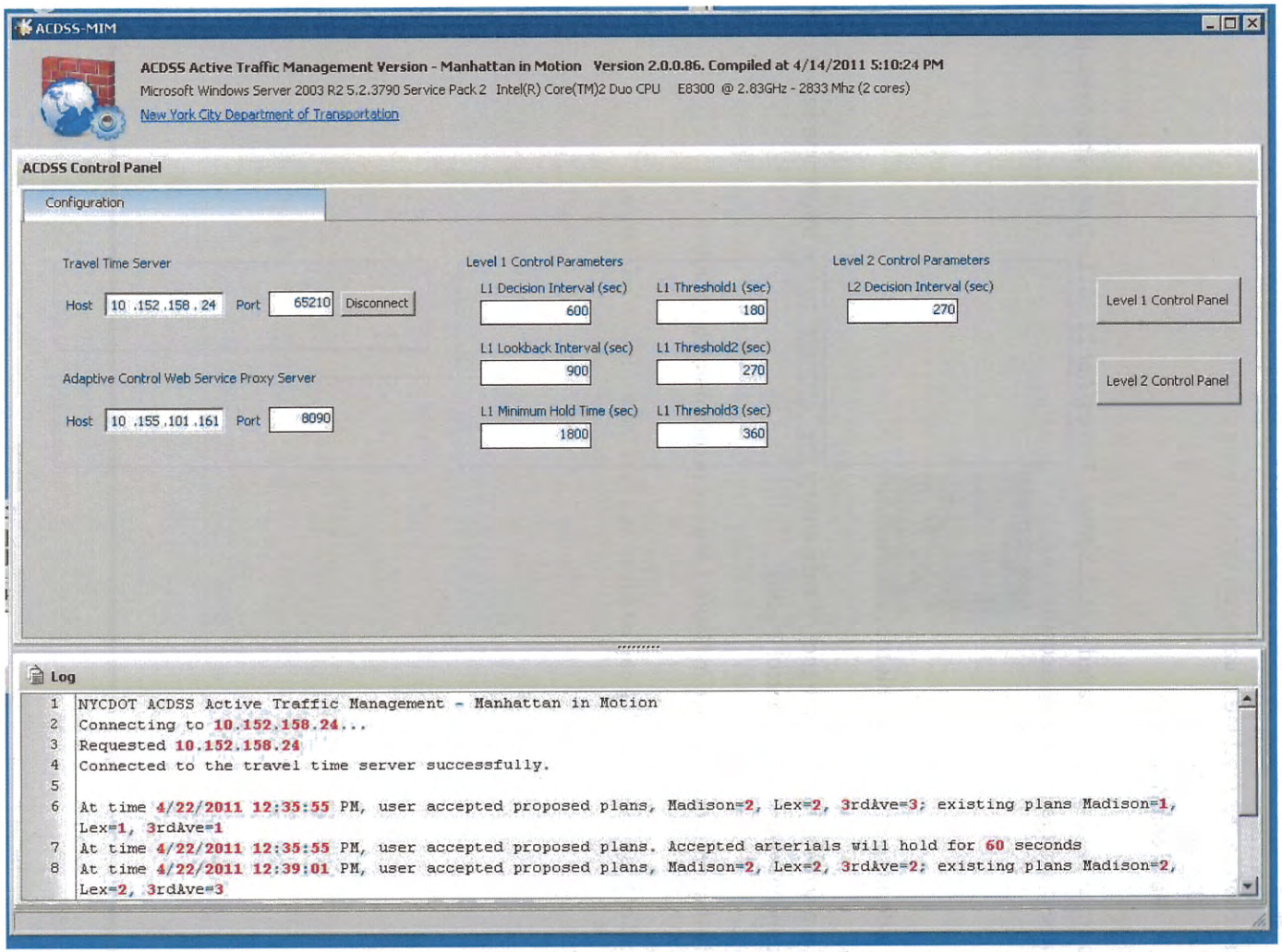

Figure D-2 – ACDSS MIM Screen Shot – Main Display

APPENDIX E – GPS TRAVEL TIME DATA

Travel time data from GPS-equipped test vehicles that provide detailed trajectories, including stops, areas of slower speeds, and a complete "bread crumb" history of their trip has been made available. Figure E-1 shows representative vehicle trajectories recorded and Table E-1 through Table E-5 contain a summary of the GPS data analysis for the respective arterial. The trajectories plotted show some variability of travel times. Furthermore, the small number of observations precludes a reliable comparison. While the GPS data provides insight in vehicle movements at a granular level, ETC data provides a more reliable source when comparing the performance of the proposed control plans.

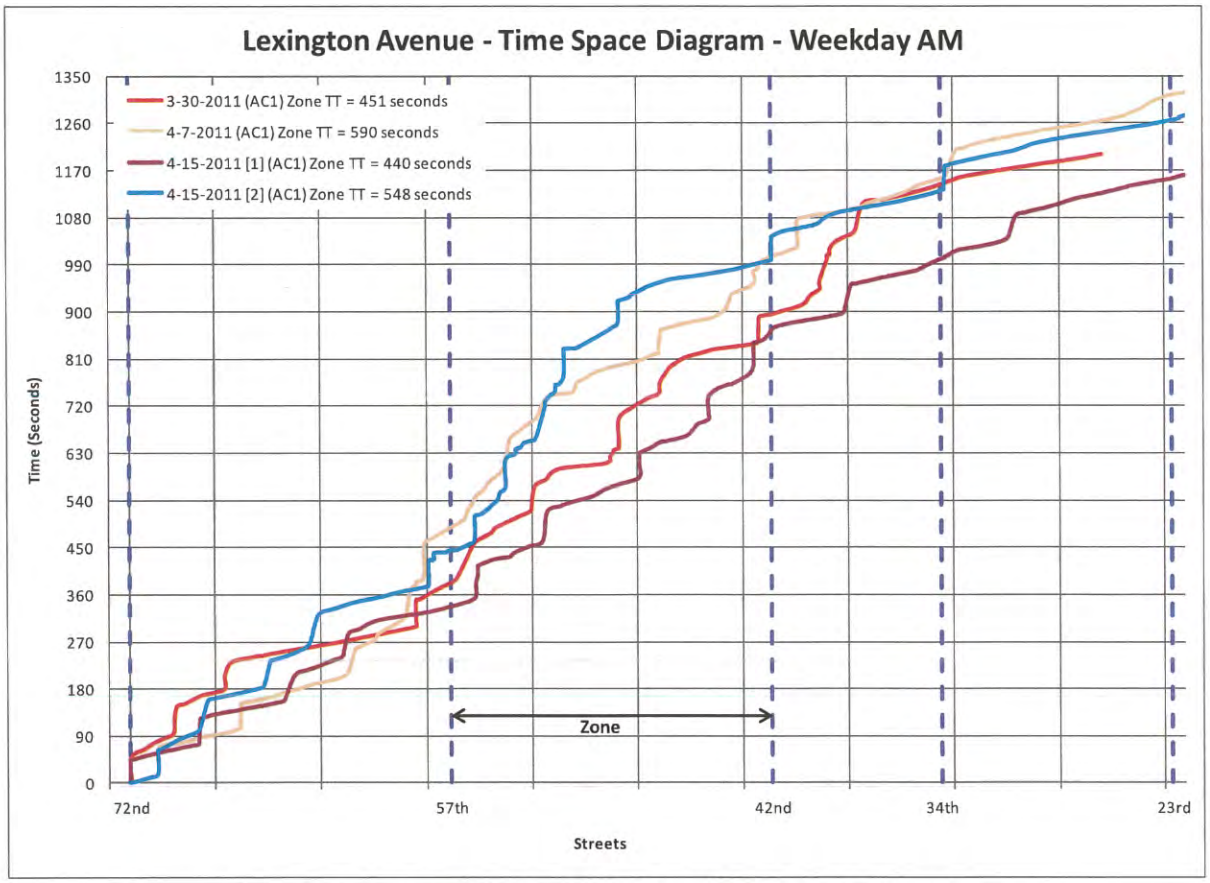

Figure E-1 – Lexington Avenue, Weekday AM, Vehicle Trajectories

Table E-1 – 3rd Avenue GPS Data Summary

3rd Avenue		Travel Time (sec)			Samples		
		Pre Existing	NBP	AC1	Pre Existing	NBP	AC1
AM	E. 23rd - E. 42nd	-	-	542	0	0	4
	E. 42nd - E. 57th	-	-	357	0	0	3
	E. 57th - E. 72nd	-	-	195	0	0	3
MD	E. 23rd - E. 42nd	-	-	476	0	0	5
	E. 42nd - E. 57th	-	-	379	0	0	6
	E. 57th - E. 72nd	-	-	258	0	0	5
PM	E. 23rd - E. 42nd	-	-	267	0	0	1
	E. 42nd - E. 57th	-	-	878	0	0	1
	E. 57th - E. 72nd	-	-	-	0	0	0

Table E-2 – Lexington Avenue GPS Data Summary

Lexington Avenue		Travel Time (sec)			Samples		
		Pre Existing	NBP	AC1	Pre Existing	NBP	AC1
AM	E. 42nd - E. 23rd	-	-	283	0	0	4
	E. 57th - E. 42nd	-	-	520	0	0	5
	E. 72nd - E. 57th	-	-	531	0	0	5
MD	E. 42nd - E. 23rd	-	-	235	0	0	6
	E. 57th - E. 42nd	-	-	259	0	0	7
	E. 72nd - E. 57th	-	-	489	0	0	8
PM	E. 42nd - E. 23rd	-	-	214	0	0	1
	E. 57th - E. 42nd	-	-	167	0	0	2
	E. 72nd - E. 57th	-	-	325	0	0	1

Table E-3 – Madison Avenue GPS Data Summary

Madison Avenue		Travel Time (sec)			Samples		
		Pre Existing	NBP	AC1	Pre Existing	NBP	AC1
AM	E. 23rd - E. 42nd	-	416	-	0	6	0
	E. 42nd - E. 57th	-	403	-	0	5	0
	E. 57th - E. 72nd	-	216	-	0	3	0
MD	E. 23rd - E. 42nd	-	411	-	0	9	0
	E. 42nd - E. 57th	-	243	-	0	10	0
	E. 57th - E. 72nd	-	278	-	0	8	0
PM	E. 23rd - E. 42nd	-	409	-	0	1	0
	E. 42nd - E. 57th	-	245	-	0	1	0
	E. 57th - E. 72nd	-	109	-	0	1	0

Table E-4 – 5th Avenue GPS Data Summary

5th Avenue		Travel Time (sec)			Samples		
		Pre Existing	NBP	AC1	Pre Existing	NBP	AC1
AM	E. 42nd - E. 23rd	215	-	-	1	0	0
	E. 57th - E. 42nd	248	-	-	1	0	0
	E. 72nd - E. 57th	338	-	-	2	0	0
MD	E. 42nd - E. 23rd	249	-	-	5	0	0
	E. 57th - E. 42nd	316	-	-	4	0	0
	E. 72nd - E. 57th	508	-	-	4	0	0
PM	E. 42nd - E. 23rd	283	-	-	1	0	0
	E. 57th - E. 42nd	190	-	-	1	0	0
	E. 72nd - E. 57th	315	-	-	1	0	0

Table E-5 – 6th Avenue GPS Data Summary

6th Avenue		Travel Time (sec)			Samples		
		Pre Existing	NBP	AC1	Pre Existing	NBP	AC1
AM	E. 23rd - E. 42nd	319	-	-	1	0	0
	E. 42nd - E. 57th	264	-	-	1	0	0
MD	E. 23rd - E. 42nd	420	-	-	3	0	0
	E. 42nd - E. 57th	494	-	-	3	0	0
PM	E. 23rd - E. 42nd	265	-	-	1	0	0
	E. 42nd - E. 57th	339	-	-	1	0	0

APPENDIX F – ATR AND ETC TAG READER COMPARISON

This Appendix presents the ATR data and ETC Tag Reader data in April 2011. This data was provided by NYCDOT. There was 1 reader (# 36) installed at 3rd Ave/34St and two readers (# 39 and # 40) installed at 6th Ave/34 St.

Table F-1 – ETC Tag Reader Data and ATR Data

Location	Date	Hour	ATR Totals	Reader Totals	Percent
3rd Ave/34 St	**4/15/2011**	0	2272	66	3%
		1	1850	45	2%
		2	1321	44	3%
		3	1143	45	4%
		4	1125	32	3%
		5	1337	33	2%
		6	2088	22	1%
		7	2797	50	2%
		8	2899	46	2%
		9	2746	42	2%
		10	3000	97	3%
		11	3097	107	3%
		12	3123	99	3%
		13	2984	68	2%
		14	3022	93	3%
		15	2805	28	1%
		16	2997	102	3%
		17	2988	47	2%
		18	3128	71	2%
		19	3004	32	1%
		20	3349	16	0%
		21	3310	54	2%
		22	3404	21	1%
		23	3281	35	1%
	4/16/2011	0	3017	58	2%
		1	2733	72	3%
		2	2494	72	3%
		3	2033	68	3%
		4	1790	65	4%
		5	1295	68	5%
		6	1635	97	6%
		7	1948	64	3%
		8	2251	77	3%

Table F-1 – ETC Tag Reader Data and ATR Data

Location	Date	Hour	ATR Totals	Reader Totals	Percent
		9	2601	128	5%
		10	2787	66	2%
		11	2811	115	4%
		12	3132	179	6%
		13	3103	162	5%
		14	2809	262	9%
		15	3496	243	7%
		16	3107	269	9%
		17	3061	224	7%
		18	3112	200	6%
		19	3209	256	8%
		20	3255	247	8%
		21	3146	244	8%
		22	3178	208	7%
		23	3177	173	5%
	4/17/2011	0	2632	114	4%
		1	2791	93	3%
		2	2691	37	1%
		3	2525	58	2%
		4	1805	26	1%
		5	1130	33	3%
		6	1247	61	5%
		7	1396	71	5%
		8	1665	99	6%
		9	2050	127	6%
		10	2435	125	5%
		11	2687	113	4%
		12	2968	78	3%
		13	2676	59	2%
		14	2760	60	2%
		15	2984	204	7%
		16	2949	196	7%
		17	2991	225	8%
		18	3199	16	1%
		19	3212	88	3%
		20	2993	162	5%
		21	2878	123	4%
		22	2588	91	4%
		23	2140	52	2%

Table F-1 – ETC Tag Reader Data and ATR Data

Location	Date	Hour	ATR Totals	Reader Totals	Percent
	4/18/2011	0	1423	13	1%
		1	1033	16	2%
		2	712	3	0%
		3	540	14	3%
		4	733	7	1%
		5	1146	26	2%
		6	2091	69	3%
		7	2628	69	3%
		8	2675	123	5%
		9	2835	41	1%
		10	2035	77	4%
		11	539	4	1%
		12	0	19	0%
		13	0	192	0%
		14	0	123	0%
		15	0	14	0%
		16	0	54	0%
		17	0	28	0%
		18	0	47	0%
		19	0	23	0%
		20	0	93	0%
		21	0	98	0%
		22	0	26	0%
		23	0	99	0%
	4/9/2011	0	2771	79	3%
		1	2536	81	3%
		2	2337	43	2%
		3	2093	28	1%
		4	1665	55	3%
		5	1143	35	3%
		6	1486	39	3%
		7	1802	31	2%
		8	2205	25	1%
		9	2525	36	1%
		10	2730	65	2%
		11	2819	67	2%
		12	2987	68	2%
		13	2874	20	1%
		14	3067	131	4%

Table F-1 – ETC Tag Reader Data and ATR Data

Location	Date	Hour	ATR Totals	Reader Totals	Percent
		15	2973	107	4%
		16	3166	40	1%
		17	3095	117	4%
		18	3207	134	4%
		19	3088	181	6%
		20	3205	77	2%
		21	3070	113	4%
		22	2645	130	5%
		23	3301	137	4%
	4/10/2011	0	2920	81	3%
		1	2918	115	4%
		2	2729	95	3%
		3	2564	90	4%
		4	2054	90	4%
		5	1199	24	2%
		6	1201	14	1%
		7	1389	60	4%
		8	1645	54	3%
		9	2076	41	2%
		10	2608	106	4%
		11	2743	133	5%
		12	2784	73	3%
		13	2973	135	5%
		14	2963	99	3%
		15	3084	100	3%
		16	3134	219	7%
		17	3014	176	6%
		18	3101	104	3%
		19	2989	175	6%
		20	2991	126	4%
		21	2776	93	3%
		22	2496	79	3%
		23	2066	71	3%
	4/11/2011	0	1417	29	2%
		1	967	17	2%
		2	720	24	3%
		3	578	5	1%
		4	758	7	1%
		5	1205	37	3%

Table F-1 – ETC Tag Reader Data and ATR Data

Location	Date	Hour	ATR Totals	Reader Totals	Percent
		6	2097	35	2%
		7	2569	47	2%
		8	2697	35	1%
		9	2805	82	3%
		10	2843	2	0%
		11	2721	6	0%
		12	2765	16	1%
		13	2880	39	1%
		14	2851	63	2%
		15	2904	44	2%
		16	2791	110	4%
		17	2898	54	2%
		18	2878	59	2%
		19	2869	53	2%
		20	2868	25	1%
		21	2796	93	3%
		22	2362	29	1%
		23	2256	30	1%
	4/12/2011	0	1716	57	3%
		1	1183	52	4%
		2	779	29	4%
		3	675	22	3%
		4	736	27	4%
		5	1000	38	4%
		6	2164	41	2%
		7	2769	64	2%
		8	2746	80	3%
		9	2809	53	2%
		10	2794	30	1%
		11	2762	100	4%
		12	2696	74	3%
		13	2714	184	7%
		14	2898	231	8%
		15	2959	261	9%
		16	2866	172	6%
		17	2752	119	4%
		18	2816	174	6%
		19	2859	175	6%
		20	3096	154	5%

Table F-1 – ETC Tag Reader Data and ATR Data

Location	Date	Hour	ATR Totals	Reader Totals	Percent
		21	2999	165	6%
		22	2874	231	8%
		23	2464	184	7%
	4/13/2011	0	1794	102	6%
		1	1331	43	3%
		2	846	48	6%
		3	726	23	3%
		4	841	41	5%
		5	1189	117	10%
		6	2006	166	8%
		7	2461	279	11%
		8	2436	302	12%
		9	2539	244	10%
		10	2613	110	4%
		11	2922	243	8%
		12	2788	243	9%
		13	2802	262	9%
		14	2889	126	4%
		15	2994	242	8%
		16	2917	174	6%
		17	2964	133	4%
		18	3172	115	4%
		19	3121	98	3%
		20	3180	94	3%
		21	3112	107	3%
		22	2941	135	5%
		23	2663	136	5%
	4/14/2011	0	2061	77	4%
		1	1751	72	4%
		2	1088	36	3%
		3	911	33	4%
		4	911	50	5%
		5	1330	98	7%
		6	2131	81	4%
		7	2741	114	4%
		8	2628	91	3%
		9	2787	139	5%
		10	2964	263	9%
		11	3043	168	6%

Table F-1 – ETC Tag Reader Data and ATR Data

Location	Date	Hour	ATR Totals	Reader Totals	Percent
		12	2783	116	4%
		13	3246	123	4%
		14	3341	36	1%
		15	3020	100	3%
		16	3105	125	4%
		17	2998	208	7%
		18	3077	92	3%
		19	2951	101	3%
		20	3325	56	2%
		21	3507	57	2%
		22	3223	61	2%
		23	3039	93	3%
6th Ave/34 St	**4/15/2011**	0	0	0	0%
		1	0	0	0%
		2	0	0	0%
		3	0	0	0%
		4	0	0	0%
		5	0	0	0%
		6	0	0	0%
		7	0	0	0%
		8	0	0	0%
		9	0	0	0%
		10	2860	366	13%
		11	2935	640	22%
		12	2819	648	23%
		13	2734	663	24%
		14	2786	671	24%
		15	2957	658	22%
		16	2829	680	24%
		17	2728	597	22%
		18	2889	664	23%
		19	2733	561	21%
		20	2890	528	18%
		21	2816	482	17%
		22	2915	510	17%
		23	2809	486	17%
	4/16/2011	0	2590	401	15%
		1	2306	331	14%
		2	2036	244	12%

Table F-1 – ETC Tag Reader Data and ATR Data

Location	Date	Hour	ATR Totals	Reader Totals	Percent
		3	1801	201	11%
		4	1501	188	13%
		5	1127	159	14%
		6	1447	255	18%
		7	1744	326	19%
		8	2071	370	18%
		9	2429	460	19%
		10	2721	439	16%
		11	2838	529	19%
		12	2865	530	18%
		13	3027	619	20%
		14	3000	555	19%
		15	2890	515	18%
		16	2645	589	22%
		17	2710	609	22%
		18	2873	429	15%
		19	2752	586	21%
		20	2773	458	17%
		21	2803	492	18%
		22	2775	412	15%
		23	2785	469	17%
	4/17/2011	0	2526	350	14%
		1	2226	270	12%
		2	2044	202	10%
		3	1712	184	11%
		4	1399	145	10%
		5	798	109	14%
		6	963	157	16%
		7	1261	206	16%
		8	1484	253	17%
		9	1957	311	16%
		10	2397	462	19%
		11	2780	470	17%
		12	2904	559	19%
		13	3018	647	21%
		14	3065	621	20%
		15	3034	685	23%
		16	2804	717	26%
		17	2801	698	25%

Table F-1 – ETC Tag Reader Data and ATR Data

Location	Date	Hour	ATR Totals	Reader Totals	Percent
		18	2915	729	25%
		19	2846	580	20%
		20	2877	495	17%
		21	2665	442	17%
		22	2444	402	16%
		23	2146	299	14%
	4/18/2011	0	1512	206	14%
		1	1064	108	10%
		2	720	85	12%
		3	613	73	12%
		4	724	101	14%
		5	1158	213	18%
		6	2211	428	19%
		7	2885	582	20%
		8	2851	558	20%
		9	2939	638	22%
		10	2136	636	30%
		11	2130	649	30%
		12	0	0	0%
		13	0	0	0%
		14	0	0	0%
		15	0	0	0%
		16	0	0	0%
		17	0	0	0%
		18	0	0	0%
		19	0	0	0%
		20	0	0	0%
		21	0	0	0%
		22	0	0	0%
		23	0	0	0%