APPENDIX F

Transportation Information

(Also refer to CD for technical reports)

Appendix F1

NYSDOT County Traffic Counts

New York State Department of Transportation
Traffic Count Hourly Report

ROAD #: CR 0440 ROAD NAME: MOUNTAIN RD
DIRECTION: Eastbound FACTOR GROUP: 30
STATE DIR CODE: 1 WK OF YR: 23
DATE OF COUNT: 06/06/2012
NOTES LANE 1:

COUNT TAKEN BY: ORG CODE: ORG INITIALS: HWM

FROM: MONROE TL
REC. SERIAL #: BV33
PLACEMENT: CR 44 - east of Kiryas Joel
@ REF MARKER:
ADDL DATA: Class Speed
COUNT TYPE: VEHICLES
PROCESSED BY: ORG CODE: DOT INITIALS: HWM

TO: SEVENSPRINGS RD
FUNC. CLASS: 17
NHS: no
JURIS: County
CC Stn:
BATCH ID: DOT-2012

COUNTY: Orange
TOWN: MONROE
LION#:
BIN:
RR CROSSING:
HPMS SAMPLE:

DATE	DAY	12 TO 1 AM	1 TO 2 AM	2 TO 3 AM	3 TO 4 AM	4 TO 5 AM	5 TO 6 AM	6 TO 7 AM	7 TO 8 AM	8 TO 9 AM	9 TO 10 AM	10 TO 11 AM	11 TO 12 AM	12 TO 1 PM	1 TO 2 PM	2 TO 3 PM	3 TO 4 PM	4 TO 5 PM	5 TO 6 PM	6 TO 7 PM	7 TO 8 PM	8 TO 9 PM	9 TO 10 PM	10 TO 11 PM	11 TO 12 PM	DAILY TOTAL	DAILY HIGH COUNT	DAILY HIGH HOUR
1	F																											
2	S																											
3	S																											
4	M																											
5	T																											
6	W														78	81	120	95	97	118	95	54	44	54	40			
7	T	17	6	3	0	2	17	35	68	102	106	67	76	51	54	80	121	115	122	84	73	78	52	40	28	1397	122	17
8	F	19	5	2	2	6	10	39	68	92	112	70	98	98	98	119	132	108	100	97	78	65	38	28	23	1507	132	15
9	S	9	6	3	1	0	2	14	23	29	33	45	44	46	35	47	54	50	42	41	32	29	27	43	63	718	63	23
10	S	32	18	10	2	3	4	13	26	42	60	75	70	96	91	89	102	92	90	73	67	72	35	52	32	1246	102	15
11	M	10	5	1	0	3	11	29	76	82	95	81	79	72	84	105	123	96	112	87	71	65	47	31	26	1391	123	15
12	T	9	3	3	0	5	15	33	85	100	96	86	71	77	85	90	122	106	94	101	74	56	33	37	27	1408	122	15
13	W	9	7	0	3	3	11	34	90	87	90	75																
14	T																											
15	F																											
16	S																											
17	S																											
18	M																											
19	T																											
20	W																											
21	T																											
22	F																											
23	S																											
24	S																											
25	M																											
26	T																											
27	W																											
28	T																											
29	F																											
30	S																											

AVERAGE WEEKDAY HOURS (Axle Factored, Mon 6AM to Fri Noon)

14	5	2	1	4	13	34	77	93	100	76	81	67	75	89	122	103	106	98	78	63	44	40	30

ADT 1415

DAYS Counted	HOURS Counted	WEEKDAYS Counted	WEEKDAY Hours	AVERAGE WEEKDAY High Hour	AVERAGE WEEKDAY % of day	Axle Adj. Factor	Seasonal/Weekday Adjustment Factor
8	166	5	100	122	9%	1.000	1.100

ESTIMATED (one way)

AADT
1286

New York State Department of Transportation
Traffic Count Hourly Report

ROAD #: CR 0440 ROAD NAME: MOUNTAIN RD
DIRECTION: Westbound FACTOR GROUP: 30
STATE DIR CODE: 2 WK OF YR: 23
DATE OF COUNT: 06/06/2012
NOTES LANE 1:

COUNT TAKEN BY: ORG CODE: ORG INITIALS: HWM

FROM: MONROE TL
REC. SERIAL #: BV33
PLACEMENT: CR 44 - east of Kiryas Joel
@ REF MARKER:
ADDL DATA: Class Speed
COUNT TYPE: VEHICLES

PROCESSED BY: ORG CODE: DOT INITIALS: HWM

TO: SEVENSPRINGS RD
FUNC. CLASS: 17
NHS: no
JURIS: County
CC Stn:
BATCH ID: DOT-2012

COUNTY: Orange
TOWN: MONROE
LION#:
BIN:
RR CROSSING:
HPMS SAMPLE:

DATE	DAY	12 TO 1 AM	1 TO 2 AM	2 TO 3 AM	3 TO 4 AM	4 TO 5 AM	5 TO 6 AM	6 TO 7 AM	7 TO 8 AM	8 TO 9 AM	9 TO 10 AM	10 TO 11 AM	11 TO 12 AM	12 TO 1 PM	1 TO 2 PM	2 TO 3 PM	3 TO 4 PM	4 TO 5 PM	5 TO 6 PM	6 TO 7 PM	7 TO 8 PM	8 TO 9 PM	9 TO 10 PM	10 TO 11 PM	11 TO 12 PM	DAILY TOTAL	DAILY HIGH COUNT	DAILY HIGH HOUR
1	F																											
2	S																											
3	S																											
4	M																											
5	T																											
6	W														71	74	80	94	112	108	81	86	65	59	39			
7	T	17	10	5	5	5	14	40	90	104	76	72	67	37	15	59	117	120	122	110	78	90	52	45	35	1385	122	17
8	F	23	11	7	0	12	11	30	71	74	80	54	88	77	92	112	98	98	104	84	88	49	25	35	23	1346	112	14
9	S	7	8	4	3	2	2	11	16	23	30	35	43	48	33	43	45	44	37	42	31	31	36	55	38	667	55	22
10	S	32	17	14	9	10	4	9	17	47	41	48	59	68	77	64	85	95	91	98	66	77	45	63	29	1165	98	18
11	M	17	13	3	1	6	7	34	79	81	69	68	60	66	64	93	85	109	81	130	95	73	47	60	31	1372	130	18
12	T	16	10	4	1	5	10	26	83	71	68	62	70	72	89	88	102	86	104	104	85	72	50	40	26	1344	104	17
13	W	17	8	4	2	6	8	31	75	65	70	69																
14	T																											
15	F																											
16	S																											
17	S																											
18	M																											
19	T																											
20	W																											
21	T																											
22	F																											
23	S																											
24	S																											
25	M																											
26	T																											
27	W																											
28	T																											
29	F																											
30	S																											

AVERAGE WEEKDAY HOURS (Axle Factored, Mon 6AM to Fri Noon)

12 TO 1 AM	1 TO 2 AM	2 TO 3 AM	3 TO 4 AM	4 TO 5 AM	5 TO 6 AM	6 TO 7 AM	7 TO 8 AM	8 TO 9 AM	9 TO 10 AM	10 TO 11 AM	11 TO 12 AM	12 TO 1 PM	1 TO 2 PM	2 TO 3 PM	3 TO 4 PM	4 TO 5 PM	5 TO 6 PM	6 TO 7 PM	7 TO 8 PM	8 TO 9 PM	9 TO 10 PM	10 TO 11 PM	11 TO 12 PM	ADT
18	10	5	2	7	11	32	80	79	73	65	71	58	60	78	96	102	105	113	85	80	54	51	33	1368

DAYS Counted	HOURS Counted	WEEKDAYS Counted	WEEKDAY Hours	AVERAGE WEEKDAY High Hour	AVERAGE WEEKDAY % of day	Axle Adj. Factor	Seasonal/Weekday Adjustment Factor
8	166	5	100	113	8%	1.000	1.100

ESTIMATED (one way)

AADT
1244

New York State Department of Transportation
Traffic Count Hourly Report

ROAD #: CR 0640 ROAD NAME: DUNDERBERG RD
DIRECTION: Eastbound FACTOR GROUP: 30
STATE DIR CODE: 1 WK OF YR: 24
DATE OF COUNT: 06/13/2012
NOTES LANE 1:

COUNT TAKEN BY: ORG CODE: ORG INITIALS: HWM

FROM: CR105
REC. SERIAL #: 1815
PLACEMENT: CR 64 - 1000' east of CR 105
@ REF MARKER:
ADDL DATA: Class Speed
COUNT TYPE: VEHICLES

PROCESSED BY: ORG CODE: DOT INITIALS: HWM

TO: WOODBURY T/L
FUNC. CLASS: 19
NHS: no
JURIS: County
CC Stn:
BATCH ID: DOT-2012

COUNTY: Orange
TOWN: MONROE
LION#:
BIN:
RR CROSSING:
HPMS SAMPLE:

DATE	DAY	12 TO 1 AM	1 TO 2 AM	2 TO 3 AM	3 TO 4 AM	4 TO 5 AM	5 TO 6 AM	6 TO 7 AM	7 TO 8 AM	8 TO 9 AM	9 TO 10 AM	10 TO 11 AM	11 TO 12 AM	12 TO 1 PM	1 TO 2 PM	2 TO 3 PM	3 TO 4 PM	4 TO 5 PM	5 TO 6 PM	6 TO 7 PM	7 TO 8 PM	8 TO 9 PM	9 TO 10 PM	10 TO 11 PM	11 TO 12 PM	DAILY TOTAL	DAILY HIGH COUNT	DAILY HIGH HOUR
1	F																											
2	S																											
3	S																											
4	M																											
5	T																											
6	W																											
7	T																											
8	F																											
9	S																											
10	S																											
11	M																											
12	T																											
13	W													218	394	369	311	352	340	310	254	227	125	97				
14	T	87	60	25	17	15	19	68	178	239	220	287	307	266	255	360	367	345	344	370	388	350	273	135	114	5089	388	19
15	F	92	77	32	21	12	16	64	169	262	203	278	331	262	286	455	372	400	429	419	357	275	184	95	65	5156	455	14
16	S	42	24	27	6	7	6	15	47	83	171	189	242	205	158	185	152	172	158	136	137	132	170	112	132	2708	242	11
17	S	122	91	64	25	18	16	19	63	79	128	190	218	251	244	239	210	227	240	221	267	198	175	141	83	3529	267	19
18	M	74	35	13	14	12	16	76	142	258	202	222	262	274	235	364	291	298	331	347	428	267	194	131	107	4593	428	19
19	T	50	46	19	12	6	24	74	154	233	171	255	317	224	222	392	284	303	338	337	358	311	208	141	133	4612	392	14
20	W	115	59	22	22	19	22	78	155	260	189	399																
21	T																											
22	F																											
23	S																											
24	S																											
25	M																											
26	T																											
27	W																											
28	T																											
29	F																											
30	S																											

AVERAGE WEEKDAY HOURS (Axle Factored, Mon 6AM to Fri Noon)

12 TO 1 AM	1 TO 2 AM	2 TO 3 AM	3 TO 4 AM	4 TO 5 AM	5 TO 6 AM	6 TO 7 AM	7 TO 8 AM	8 TO 9 AM	9 TO 10 AM	10 TO 11 AM	11 TO 12 AM	12 TO 1 PM	1 TO 2 PM	2 TO 3 PM	3 TO 4 PM	4 TO 5 PM	5 TO 6 PM	6 TO 7 PM	7 TO 8 PM	8 TO 9 PM	9 TO 10 PM	10 TO 11 PM	11 TO 12 PM	ADT
86	60	24	18	13	20	72	160	250	197	288	304	255	232	378	328	314	341	348	371	296	226	133	113	4827

DAYS Counted	HOURS Counted	WEEKDAYS Counted	WEEKDAY Hours	AVERAGE WEEKDAY High Hour	AVERAGE WEEKDAY % of day	Axle Adj. Factor	Seasonal/Weekday Adjustment Factor
8	166	5	100	378	8%	1.000	1.100

ESTIMATED (one way)

AADT
4388

New York State Department of Transportation
Traffic Count Hourly Report

ROAD #: CR 0640 ROAD NAME: DUNDERBERG RD
DIRECTION: Westbound FACTOR GROUP: 30
STATE DIR CODE: 2 WK OF YR: 24
DATE OF COUNT: 06/13/2012
NOTES LANE 1:

COUNT TAKEN BY: ORG CODE: ORG INITIALS: HWM

FROM: CR105
REC. SERIAL #: 1815
PLACEMENT: CR 64 - 1000' east of CR 105
@ REF MARKER:
ADDL DATA: Class Speed
COUNT TYPE: VEHICLES

PROCESSED BY: ORG CODE: DOT INITIALS: HWM

TO: WOODBURY T/L
FUNC. CLASS: 19
NHS: no
JURIS: County
CC Stn:
BATCH ID: DOT-2012

COUNTY: Orange
TOWN: MONROE
LION#:
BIN:
RR CROSSING:
HPMS SAMPLE:

		AM												PM													
		12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	DAILY TOTAL	DAILY HIGH COUNT	DAILY HIGH HOUR
DATE	DAY																											
1	F																											
2	S																											
3	S																											
4	M																											
5	T																											
6	W																											
7	T																											
8	F																											
9	S																											
10	S																											
11	M																											
12	T																											
13	W													329	289	270	244	265	261	214	161	120	91	52				
14	T	20	8	6	14	23	49	216	309	290	247	281	288	281	260	262	298	267	289	244	254	204	115	98	70	4393	309	7
15	F	37	13	13	10	9	43	199	308	325	270	321	295	262	306	316	293	328	311	325	172	107	96	78	56	4493	328	16
16	S	29	18	5	4	13	12	39	101	164	231	198	211	191	176	178	146	137	133	108	117	101	85	97	164	2658	231	9
17	S	126	53	27	10	7	23	44	51	132	192	215	224	201	267	250	214	195	182	184	171	153	91	93	51	3156	267	13
18	M	28	8	6	9	19	48	189	269	275	244	261	321	289	296	254	251	221	274	324	186	138	111	61	52	4134	324	18
19	T	22	8	13	10	17	53	197	288	281	261	309	281	260	273	217	266	226	280	264	207	210	144	90	61	4238	309	10
20	W	20	10	12	12	22	53	174	244	507	266	340																
21	T																											
22	F																											
23	S																											
24	S																											
25	M																											
26	T																											
27	W																											
28	T																											
29	F																											
30	S																											

AVERAGE WEEKDAY HOURS (Axle Factored, Mon 6AM to Fri Noon)

25	10	11	12	18	50	195	284	336	258	302	296	277	290	256	271	240	277	273	215	178	122	85	59	ADT 4340

DAYS Counted	HOURS Counted	WEEKDAYS Counted	WEEKDAY Hours	AVERAGE WEEKDAY High Hour	AVERAGE WEEKDAY % of day	Axle Adj. Factor	Seasonal/Weekday Adjustment Factor
8	166	5	100	336	8%	1.000	1.100

ESTIMATED (one way)

AADT

3945

New York State Department of Transportation
Traffic Count Hourly Report

ROAD #: CR 1050 ROAD NAME: BAKERTOWN RD
DIRECTION: Northbound FACTOR GROUP: 30
STATE DIR CODE: 1 WK OF YR: 26
DATE OF COUNT: 06/27/2012
NOTES LANE 1:

COUNT TAKEN BY: ORG CODE: ORG INITIALS: HWM

FROM: CR 64
REC. SERIAL #: 1815
PLACEMENT: CR 105 - 500' south of Baker
@ REF MARKER:
ADDL DATA: Class Speed
COUNT TYPE: VEHICLES

PROCESSED BY: ORG CODE: DOT INITIALS: HWM

TO: BAKERTOWN RD
FUNC. CLASS: 17
NHS: no
JURIS: County
CC Stn:
BATCH ID: DOT-2012

COUNTY: Orange
TOWN: MONROE
LION#:
BIN:
RR CROSSING:
HPMS SAMPLE:

		AM												PM													
DATE	DAY	12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	DAILY TOTAL	DAILY HIGH COUNT	DAILY HIGH HOUR
27	W														358	396	391	449	460	462	406	459	393	285	207			
28	T	127	74	37	20	19	25	77	183	286	276	273	339	366	358	415	411	436	514	542	455	457	352	302	233	6577	542	18
29	F	123	52	45	29	19	21	70	188	258	299	351	362	434	482	477	540	572	620	487	354	251	188	137	77	6436	620	17
30	S	44	40	17	13	5	5	28	62	118	177	223	245	284	264	253	248	199	226	182	161	179	180	133	132	3418	284	12
1	S	170	112	83	35	24	20	47	102	146	170	292	358	491	450	433	411	415	471	386	377	384	270	220	155	6022	491	12
2	M	73	47	18	20	13	30	87	193	275	286	356	334	406	359	427	401	456	498	505	418	418	348	266	209	6443	505	18
3	T	118	37	29	28	16	24	82	209	277	266	368	363															
4	W																											
5	T																											
6	F																											
7	S																											
8	S																											
9	M																											

AVERAGE WEEKDAY HOURS (Axle Factored, Mon 6AM to Fri Noon)

12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	12 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6	6 TO 7	7 TO 8	8 TO 9	9 TO 10	10 TO 11	11 TO 12	ADT
123	54	37	26	18	23	79	193	274	282	337	350	386	358	413	401	447	491	503	426	445	364	284	216	6530

DAYS Counted	HOURS Counted	WEEKDAYS Counted	WEEKDAY Hours	AVERAGE WEEKDAY High Hour	AVERAGE WEEKDAY % of day	Axle Adj. Factor	Seasonal/Weekday Adjustment Factor
7	143	4	77	503	8%	1.000	1.100

ESTIMATED (one way)

AADT
5936

New York State Department of Transportation
Traffic Count Hourly Report

ROAD #: CR 1050 ROAD NAME: BAKERTOWN RD
DIRECTION: Southbound FACTOR GROUP: 30
STATE DIR CODE: 2 WK OF YR: 26
DATE OF COUNT: 06/27/2012
NOTES LANE 1:

COUNT TAKEN BY: ORG CODE: ORG INITIALS: HWM

FROM: CR 64
REC. SERIAL #: 1815
PLACEMENT: CR 105 - 500' south of Baker
@ REF MARKER:
ADDL DATA: Class Speed
COUNT TYPE: VEHICLES

PROCESSED BY: ORG CODE: DOT INITIALS: HWM

TO: BAKERTOWN RD
FUNC. CLASS: 17
NHS: no
JURIS: County
CC Stn:
BATCH ID: DOT-2012

COUNTY: Orange
TOWN: MONROE
LION#:
BIN:
RR CROSSING:
HPMS SAMPLE:

DATE	DAY	12 TO 1 AM	1 TO 2 AM	2 TO 3 AM	3 TO 4 AM	4 TO 5 AM	5 TO 6 AM	6 TO 7 AM	7 TO 8 AM	8 TO 9 AM	9 TO 10 AM	10 TO 11 AM	11 TO 12 AM	12 TO 1 PM	1 TO 2 PM	2 TO 3 PM	3 TO 4 PM	4 TO 5 PM	5 TO 6 PM	6 TO 7 PM	7 TO 8 PM	8 TO 9 PM	9 TO 10 PM	10 TO 11 PM	11 TO 12 PM	DAILY TOTAL	DAILY HIGH COUNT	DAILY HIGH HOUR
27	W														344	373	356	356	382	369	312	324	222	191	151			
28	T	69	29	16	15	24	73	162	236	325	399	332	381	392	317	390	362	390	403	353	287	298	196	232	196	5877	403	17
29	F	83	37	24	19	16	60	125	216	342	416	338	411	379	456	459	382	450	377	301	224	198	143	92	61	5609	459	14
30	S	30	32	14	10	18	14	37	98	186	187	242	232	230	197	185	185	187	172	177	145	163	135	121	206	3203	242	10
1	S	153	84	45	18	18	21	50	106	211	289	356	400	433	426	431	379	343	346	380	320	278	252	245	157	5741	433	12
2	M	75	26	15	16	26	59	150	233	368	430	371	392	414	399	370	408	356	409	380	368	289	234	250	136	6174	430	9
3	T	43	34	19	8	22	59	127	248	347	408	376	379															
4	W																											
5	T																											
6	F																											
7	S																											
8	S																											
9	M																											

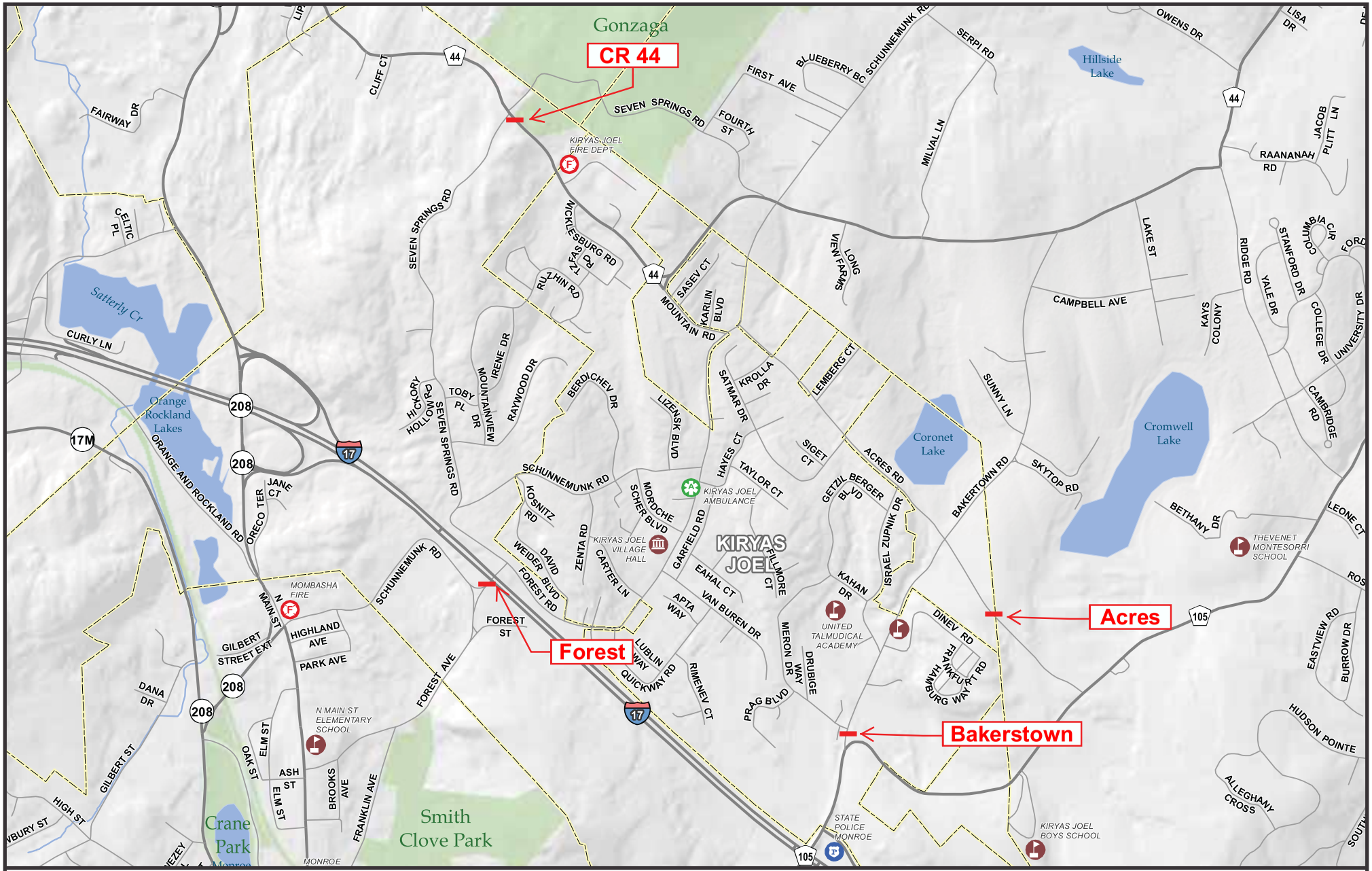
AVERAGE WEEKDAY HOURS (Axle Factored, Mon 6AM to Fri Noon)

12 TO 1 AM	1 TO 2 AM	2 TO 3 AM	3 TO 4 AM	4 TO 5 AM	5 TO 6 AM	6 TO 7 AM	7 TO 8 AM	8 TO 9 AM	9 TO 10 AM	10 TO 11 AM	11 TO 12 AM	12 TO 1 PM	1 TO 2 PM	2 TO 3 PM	3 TO 4 PM	4 TO 5 PM	5 TO 6 PM	6 TO 7 PM	7 TO 8 PM	8 TO 9 PM	9 TO 10 PM	10 TO 11 PM	11 TO 12 PM	ADT
65	33	20	14	21	64	141	233	346	413	354	391	403	353	378	375	367	398	367	322	304	217	224	161	5964

DAYS Counted	HOURS Counted	WEEKDAYS Counted	WEEKDAY Hours	AVERAGE WEEKDAY High Hour	AVERAGE WEEKDAY % of day	Axle Adj. Factor	Seasonal/Weekday Adjustment Factor	ESTIMATED (one way)
7	143	4	77	413	7%	1.000	1.100	**AADT 5422**

Appendix F2

Traffic Counts Location Map



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W E

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Appendix F2: Traffic Count Locations

Kiryas Joel Annexation

Town of Monroe and Vilage of Kiryas Joel

Orange County, NY

Base Map: Google Maps

Scale: NTS

File 14008 3/18/14
JS/14008

Tim Miller Associates, Inc.,10 North Street, Cold Spring, New York 10516 (845) 265-4400 Fax (845) 265-4418

Appendix F3

Traffic Tables

Table F3-1 Mode of Transportation To Work		
Project	**Census 2000** [1]	**2006-2012 ACS** [1]
Drive Alone	23%	29%
Carpool	20%	15%
Public Transit	19% (20%**)	24%
Walk	30%	26%
Bicycle	1% *	0%
Other (Taxi, Motorcycle)	4%	0%
Work At Home	4%	6%
[1] Figures for percentage of workers 16 years and older. Totals may not equal 100% due to rounding. Census data at a tenth of a percent has been rounded.		
* The Southeastern Orange County Traffic and Land Use Study did not include this category.		
** As shown in the Southeastern Orange County Traffic and Land Use Study.		

Table F3-2 Workers			
Project	**Census 2000**	**2006-2010 ACS**	**Increase**
Total Workers in Kiryas Joel	2,015	3,674	82%
Total Persons	13,214	19,089	44%
Households	2,273	3,437	51%
Workers Residing in Kiryas Joel	1,990	3,488	75%

Table F3-3 Park and Ride Lots	
Location	**Spaces**
Harriman Rt 17M/Rt 32 **	80
Monroe A*[1]	330
Monroe B*[1]	259
Monroe Village	36
Kiryas Joel***	188
Harriman-Woodbury [1]	229
* Museum Parking Rt 17/17M via NYS Route 208.	
** St. Anastasia Church.	
*** Based on count from aerial images for Bakertown Road, Garfield Road, and Mordche Scher Blvd. lots.	
[1] Shown in Figure 3.4-8.	

Table F3-4 Trip Generation Rates - Existing Condition						
Dwelling Units[1]	**Weekday AM Peak Hour**			**Weekday PM Peak Hour**		
{ITE Code} [5]	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Single Family {210} 127 dwelling units [4]	0.233	0.700	0.933	0.775	0.455	1.230
Condo [2] {230} 1060 dwelling units	0.055	0.267	0.322	0.263	0.130	0.393
Apartment [3] {220} 2903 dwelling units	0.098	0.393	0.491	0.361	0.195	0.556
[1] Number of dwelling by type based on 2010 Census distribution for 4027 units.						
[2] Owner occupied attached.						
[3] Rental dwelling units.						
[4] Additional 27 units not included from Monore. 164 acres.						
[5] Institute of Transportation Engineers, Trip Generation, Edition 9th, Washington DC, 2012.						

Table F3-5
Trip Generation Rates Without Annexation of 507 Acres

Dwelling Units[1]	Weekday AM Peak Hour			Weekday PM Peak Hour		
{ITE Code} [4]	In	Out	Total	In	Out	Total
Existing Village of Kiryas Joel						
Condo [2] {230} 693 dwelling units	0.060	0.291	0.351	0.284	0.140	0.424
Apartment [3] {220} 1701 dwelling units	0.098	0.394	0.492	0.364	0.196	0.560
Town of Monroe 164-Acre Annexation Territory						
Condo [2] {230} 109 dwelling units	0.086	0.421	0.507	0.397	0.195	0.592
Apartment [3] {220} 266 dwelling units	0.101	0.403	0.504	0.400	0.216	0.616
Town of Monroe 343-Acre Annexation Land (507 minus 164 acre area)						
Condo [2] {230} 306 dwelling units	0.070	0.343	0.413	0.330	0.162	0.492
Apartment [3] {220} 750 dwelling units	0.099	0.396	0.495	0.373	0.201	0.574

[1] Number of dwelling by type in Kiryas Joel based on 2010 Census distribution with single family houses as condominiums.
[2] Owner occupied attached.
[3] Rental attached dwelling units.
[4] Institute of Transportation Engineers, Trip Generation, Edition 9th, Washington DC, 2012.

Table F3-6
Trip Generation Summary - 507 Acres without Annexation & without Modal Split

	Weekday AM Peak Hour		Weekday PM Peak Hour	
Total 3825 dwelling units	**In** [1]	**Out** [1]	**In** [1]	**Out** [1]
Vehicle Trips unadjusted for modal split Kiryas Joel, 2394 dwelling units [2]	209	872	816	430
Vehicle Trips unadjusted for modal split Monroe, 164 acres, 375 dwelling units [3]	36	153	149	79
Vehicle Trips unadjusted for modal split Monroe, 343 acres, 1056 dwelling units [3]	95	402	381	201

[1] See Appendix F, Table F3-5, Trip Generation Rates.[2] Adjustment factors 0.50 a.m. and 0.425 p.m.
[3] Adjustment factors 0.75 a.m. and p.m.

Table F3-7
Trip Generation Rates With Annexation of 507 Acres

Dwelling Units	Weekday AM Peak Hour			Weekday PM Peak Hour		
{ITE Code} [3]	In	Out	Total	In	Out	Total
Town of Monroe 164-Acre Annexation Land						
Condo [1] {230} 290 dwelling units	0.071	0.346	0.417	0.332	0.164	0.496
Apartment [2] {220} 711 dwelling units	0.099	0.396	0.495	0.374	0.201	0.575
Town of Monroe 343-Acre Annexation Land (507 minus 164 acre area)						
Condo [1] {230} 817 dwelling units	0.058	0.281	0.339	0.276	0.136	0.412
Apartment [2] {220} 2007 dwelling units	0.098	0.398	0.492	0.363	0.196	0.559

[1] Owner occupied attached.
[2] Rental attached dwelling units.
[3] Institute of Transportation Engineers, Trip Generation, Edition 9th, Washington DC, 2012.

Table F3-8
Trip Generation Summary - 507 Acres
with Annexation & without Modal Split

	Weekday AM Peak Hour		Weekday PM Peak Hour	
3825 dwelling units	**In**	**Out**	**In**	**Out**
Vehicle Trips unadjusted for modal split Kiryas Joel, 0 dwelling units [1]	0	0	0	0
Vehicle Trips adjusted Kiryas Joel, 0 dwelling units [2]	**0**	**0**	**0**	**0**
Vehicle Trips unadjusted for modal split Monroe, 164 acres, 1001 dwelling units [1]	91	382	362	191
Vehicle Trips adjusted Monroe, 164 acres 1001 dwelling units [2]	**46**	**191**	**154**	**81**
Vehicle Trips unadjusted for modal split Monroe, 343 acres, 2824 dwelling units [1]	244	1021	954	504
Vehicle Trips adjusted Monroe, 343 acres 2824 dwelling units [2]	**122**	**511**	**405**	**214**

[1] See Appendix F, Table F3-7 for Trip Generation Rates.
[2] Adjustment factors removing modal split and internal only trips 0.50 a.m. and 0.425 p.m.

Table F3-9 Trips Generation and Total Future Volumes				
Scenario	**Trips Generated**		**Future Volume**	
Routing	**AM** [1]	**PM** [1]	**AM** [1]	**PM** [1]
***No* Annexation 507 acres** [2]				
Bakertown Road	332	346	885	864
Acres Road	43	46	121	120
Forest Road	444	485	873	924
CR 44	237	260	456	465
Total	**1056**	**1137**	**2336**	**2374**
With Annexation 507 acres [2]				
Bakertown Road	165	164	718	682
Acres Road	19	19	97	93
Forest Road	432	422	861	861
CR 44	254	249	473	454
Total	**870**	**854**	**2150**	**2091**
No Annexation 164 acres [3]				
Bakertown Road	438	434	991	952
Acres Road	52	52	130	126
Forest Road	265	261	694	700
CR 44	129	127	348	332
Total	**884**	**874**	**2164**	**2111**
With Annexation 164 acres [3]				
Bakertown Road	486	479	1039	997
Acres Road	53	51	131	125
Forest Road	240	216	649	655
CR 44	114	112	333	317
Total	**873**	**858**	**2153**	**2095**
[1] Weekday Peak Hour.				
[2] See DGEIS Section 3.4.				
[3] See DGEIS Section 6.3.4.				

Table F3-10 Trip Generation Rates Without Annexation of 164 Acres						
Dwelling Units[1]	**Weekday AM Peak Hour**			**Weekday PM Peak Hour**		
{ITE Code} [4]	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Village of Kiryas Joel						
Condo [2] {230} 846 dwelling units	0.057	0.280	0.337	0.274	0.135	0.409
Apartment [3] {220} 2076 dwelling units	0.098	0.394	0.492	0.363	0.195	0.559
Town of Monroe**						
Condo [2] {230} 332 dwelling units	0.069	0.337	0.406	0.324	0.160	0.484
Apartment [3] {220} 571 dwelling units	0.099	0.398	0.497	0.378	0.203	0.581
[1] Number of dwelling by type in Kiryas Joel based on 2010 Census distribution with single family houses as condominiums.						
[2] Owner occupied attached.						
[3] Rental attached dwelling units.						
[4] Institute of Transportation Engineers, Trip Generation, Edition 9th, Washington DC, 2012.						
** Annexation lands.						

Table F3-11
Trip Generation Summary - 164 Acres
without Annexation & without Modal Split

	Weekday AM Peak Hour			Weekday PM Peak Hour		
Dwelling Units[1]	**In [4]**	**Out [4]**	**Total**	**In [4]**	**Out [4]**	**Total [1]**
Village of Kiryas Joel						
Condo [2] {230} 846 dwelling units	48	237	285	232	114	346
Apartment [3] {220} 2076 dwelling units	203	818	1021	754	407	1161
Total Unadjusted **2922 dwelling units**	**251**	**1055**	**1306**	**986**	**521**	**1507**
Town of Monroe 164-Acre Annexation Territory						
Condo [2] {230} 332 dwelling units	23	112	135	108	53	161
Apartment [3] {220} 571 dwelling units	57	227	284	216	116	332
Total Unadjusted **903 dwelling units**	**80**	**339**	**419**	**324**	**169**	**493**

[1] Number of dwelling types based on 2010 Census distribution.

[2] Owner occupied attached.

[3] Rental attached dwelling units.

[4] See Appendix F Table F3-10 Trip Generation Rates.

Table F3-12
Trip Generation Summary - 164 Acres without Annexation & with Modal Split

	Weekday AM Peak Hour			Weekday PM Peak Hour		
Dwelling Units[1]	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Village of Kiryas Joel						
Total Unadjusted [2] 2922 dwelling units	251	1055	1306	986	521	1507
Vehicle Trips adjusted for modal split [3] 2922 dwelling units	**126**	**528**	**654**	**419**	**221**	**640**
Town of Monroe 164-Acre Annexation Territory						
Total Unadjusted [2] 903 dwelling units	80	339	419	324	169	493
Vehicle Trips adjusted for modal split [4] 1952 dwelling units	**44**	**186**	**230**	**154**	**80**	**234**

[5] Adjusted vehicle trips represents a reduction based on modal split (walkers, carpooling, public transit) and internal trips.
[2] From Table F3-11
[3] The adjustment factors 0.50 in the a.m. peak and 0.425 in the p.m. peak.
[4] The adjustment factors 0.55 in the a.m. peak and 0.475 in the p.m. peak.

Table F3-13
Trip Generation Rates With Annexation of 164 Acres

Dwelling Units	Weekday AM Peak Hour			Weekday PM Peak Hour		
{ITE Code} [4]	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Existing Village of Kiryas Joel [1]						
Condo [2] {230} 542 dwelling units	0.063	0.305	0.368	0.297	0.146	0.443
Apartment [3] {220} 1331 dwelling units	0.099	0.394	0.493	0.366	0.197	0.563
164-Acre Annexation Territory						
Condo [2] {230} 565 dwelling units	0.062	0.303	0.365	0.295	0.145	0.440
Apartment [3] {220} 1387 dwelling units	0.099	0.394	0.493	0.366	0.197	0.563

[1] Number of dwelling by type in Kiryas Joel based on 2010 Census distribution with single family houses as condominiums.
[2] Owner occupied attached.
[3] Rental attached dwelling units.
[4] Institute of Transportation Engineers, Trip Generation, Edition 9th, Washington DC, 2012.

Table F3-14
Trip Generation Summary - 164 Acres
with Annexation & without Modal Split

	Weekday AM Peak Hour			Weekday PM Peak Hour		
Dwelling Units[1]	**In [4]**	**Out [4]**	**Total**	**In [4]**	**Out [4]**	**Total [1]**
Existing Village of Kiryas Joel						
Condo [2] 542 dwelling units	34	165	199	161	79	240
Apartment [3] 1331 dwelling units	132	524	656	487	262	749
Total Unadjusted 1873 dwelling units	**166**	**689**	**855**	**648**	**341**	**989**
164-Acre Annexation Territory						
Condo [2] 565 dwelling units	35	171	206	167	82	249
Apartment [3] 1387 dwelling units	137	546	683	508	273	781
Total Unadjusted 1952 dwelling units	**172**	**717**	**889**	**675**	**355**	**1030**

[1] Number of dwelling types based on 2010 Census distribution.

[2] Owner occupied attached.

[3] Rental attached dwelling units.

[4] See Appendix F Table F3-13 Trip Generation Rates.

Table F3-15 Trip Generation Summary - 164 Acres with Annexation & with Modal Split						
	Weekday AM Peak Hour			Weekday PM Peak Hour		
Dwelling Units[1]	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Existing Village of Kiryas Joel						
Total Unadjusted [2] 1873 dwelling units	166	689	855	648	341	989
Vehicle Trips adjusted for modal split [3] 1873 dwelling units	**83**	**345**	**428**	**275**	**145**	**420**
164-Acre Annexation Territory						
Total Unadjusted [2] 1952 dwelling units	172	717	889	675	355	1030
Vehicle Trips adjusted for modal split [3] 1952 dwelling units	**86**	**359**	**445**	**287**	**151**	**438**

[1] Adjusted vehicle trips represents a reduction based on modal split (walkers, carpooling, public transit) and internal trips.
[2] From Table F3-14
[3] The adjustment factors 0.50 in the a.m. peak and 0.425 in the p.m. peak.

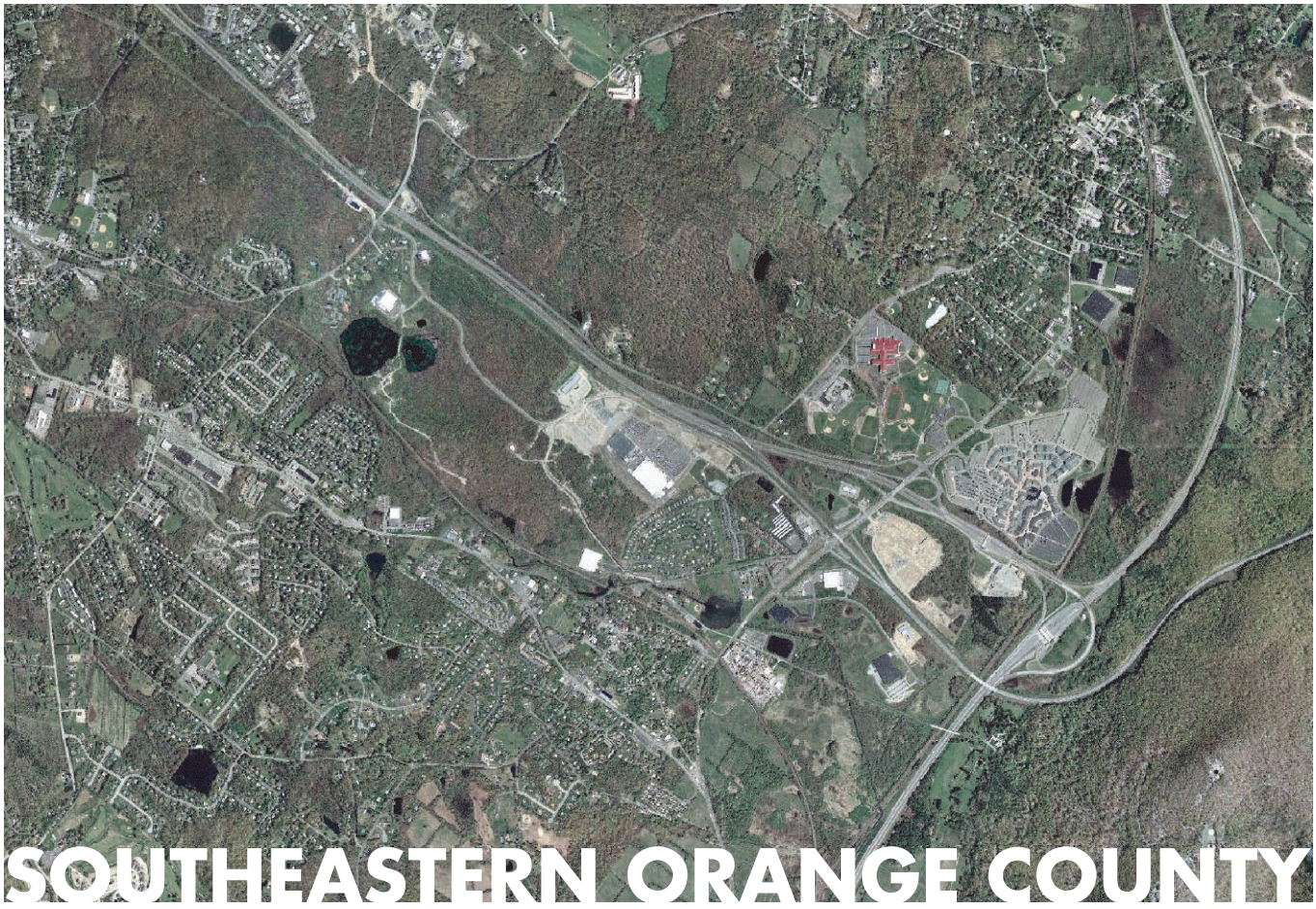
Appendix F4

Reports

Appendix F4.1

Southeastern Orange County Traffic and Land Use Study*****

*****Appendices contain partial copy of the referenced document.
See accompanying CD for full copy.



SOUTHEASTERN ORANGE COUNTY TRAFFIC AND LAND USE STUDY

Executive Summary

Prepared for:
Orange County Department of Planning

Prepared by:
AKRF

December 2004

Southeastern Orange County Traffic and Land Use Study - 2005

Orange County Department of Planning
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David Church, AICP, Commissioner
Chris Campany, Deputy Commissioner
Fred Budde, Senior Planner (Study Director)

Community & Technical Advisory Group
Michael Amo, County Legislator, 1st District (Study Chair)

Hon. Sue W. Kelly, Member of Congress – Jerry Nappi
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Spencer M. McLaughlin, County Legislator, 7th District
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Village of Harriman – G. Bruce Chichester, Village Trustee
Village of Kiryas Joel – Gedalye Szegedin, Village Clerk & Ari Felberman
Town of Monroe – Sandy Leonard, Supervisor; Peter Martin, Town Board
& Charles Finnerty, Planning Board Chair
Village of Monroe – Joseph C. Mancuso, Mayor
Town of Woodbury – Sheila Conroy, Supervisor & Michael Queenan, Planning Board Chair
Orange County Department of Public Works, Edmund A. Fares, Commissioner
Monroe-Woodbury School District – Cliff Berchtold, Director of Transportation
New York State Department of Transportation – Richard Peters, Regional Planning Director
New York State Police – Captain Martin Hansen
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Table of Contents

A. INTRODUCTION

Orange County has undergone a period of tremendous growth over the past thirty years as it has been transformed from a predominantly rural environment to a mixed suburban, rural and, in places, urban setting that has become a part of the greater New York metropolitan area. The Towns and Villages in the southeastern portion of the County are at the leading edge of the development cycle. These communities have become the logical place to settle for people and businesses moving away from the older, more densely developed areas of downstate New York. As more people move into this area, the demand for the roadways, schools, and infrastructure will also increase. One of the most visible impacts of this increased demand is traffic congestion. With segments of the main thoroughfares already operating at or above their design capacity, the growth projections and the subsequent effect on the transportation systems are major concerns for both the residents, businesses, and elected officials in these municipalities.

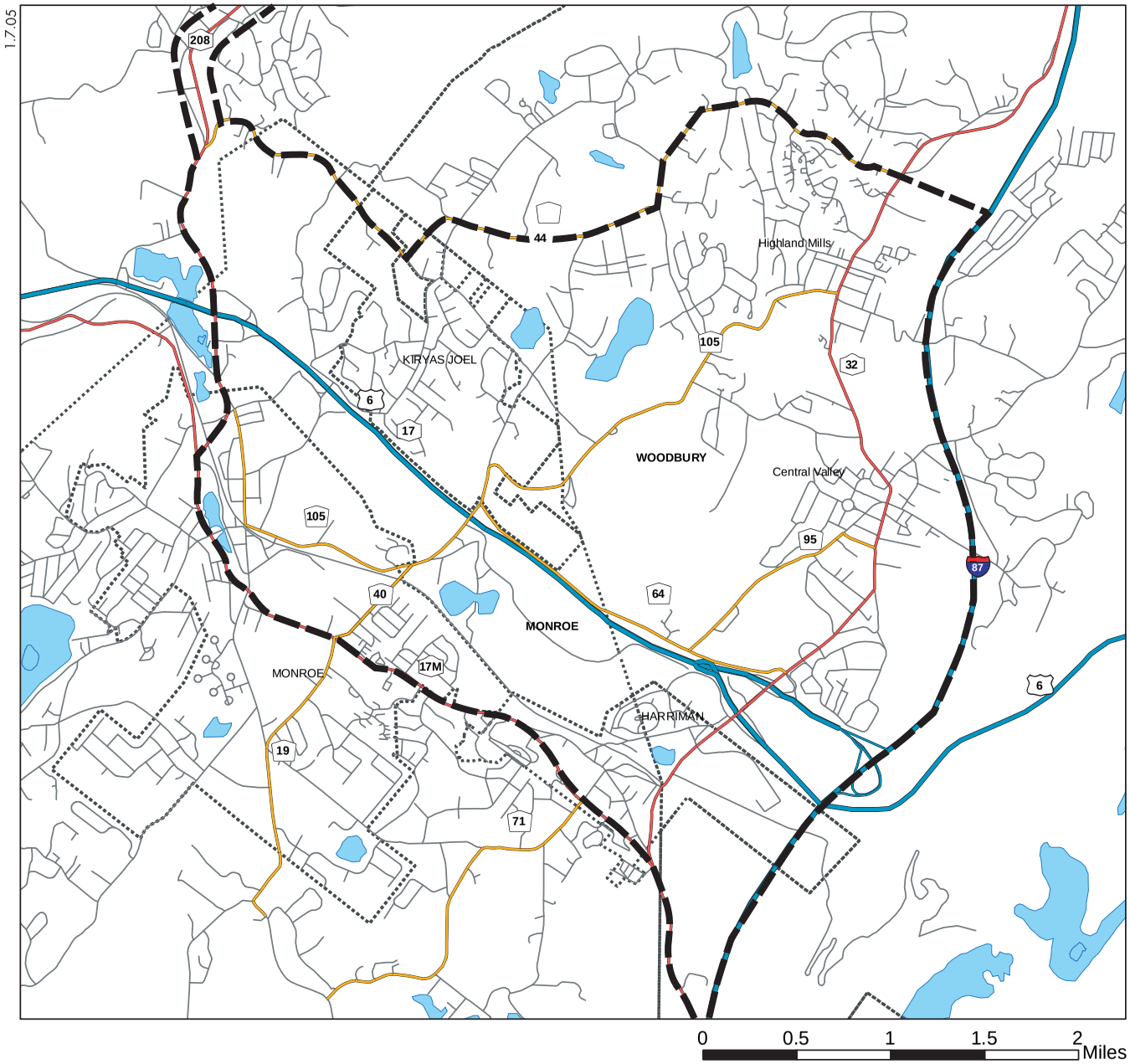
B. PROJECT EVOLUTION AND STAKEHOLDERS

In 1998 a grass roots Traffic Task Force was formed focusing on traffic congestion in the Monroe-Woodbury area and the types of regional, inter-municipal, solutions that could be advanced to address these issues. The Task Force consisted primarily of elected officials and planning and zoning board members representing the Towns of Monroe and Woodbury, as well as from the Villages of Harriman, Kiryas Joel, and Monroe. Meeting on a monthly basis, the Traffic Task Force discussed potential transportation improvement measures and land use controls that could be initiated to help preserve the area's unique character and maintain the quality of life that makes this portion of Orange County such an attractive place to live and do business. Responsible development and smart growth became important issues.

Building from the Task Force's work, Orange County and New York State Department of Transportation agreed to sponsor and fund unique, new research. The Southeastern Orange County Traffic and Land Use Study involves a detailed analysis of traffic conditions on the state-owned corridors in the area including Route 17, Route 17M, Route 208, Route 32, and the heavily traveled Route 17/6/32 interchange area (see Figure S-1). The study also evaluates potential solutions that include modifications to the New York State Thruway and County Route 105 as well as improvements to transit and pedestrian operations and the provision of multi-modal transportation centers.

A number of goals were established as part of this Federally funded study including:

- Determining the current operational characteristics and deficiencies of the transportation system;
- Forecasting future conditions of the transportation system;



Legend

- STUDY AREA BOUNDARY
- MUNICIPAL BOUNDARIES
- LAKES

ROADS

- INTERSTATES/ US HIGHWAYS
- STATE HIGHWAYS
- COUNTY HIGHWAYS
- OTHER ROADS

SOUTHEASTERN ORANGE COUNTY
TRAFFIC AND LAND USE STUDY

Study Area Location
Figure S-1

- Recommending improvements to enhance the efficiency and safety of the transportation system;
- Developing and recommending sustainable development guidelines that are compatible with and help preserve the capacity of future transportation improvements;
- Building a consensus for proposed transportation improvements and sustainable development through public forums.

C. STUDY FINDINGS

LAND USE PATTERNS AND TRENDS

The most intense development in Orange County in recent years has been concentrated in the southeastern portion of the county, particularly near the New York State Thruway and Route 17. In addition, there has been a significant increase in residential subdivision and commercial development in the Towns of Monroe, Woodbury, and Blooming Grove although Monroe and Woodbury have seen significantly more recent development than Blooming Grove. The Villages of Monroe and Harriman are older centers, and although mostly built-out under current zoning rules, have experienced the impacts of increased traffic as a result of growth in the adjacent municipalities. The rapid growth of the Village of Kiryas Joel over the past two decades into a new community has also added new population to the area.

The growth in population that the southeastern portion of the county has experienced in recent decades has resulted in a substantial boom in commercial development along the Route 17 corridor. Woodbury Common is a regional retail center that has served as an anchor for other new retail construction around Routes 32 and 17. Subsequently, undeveloped land in this area has been increasingly developed for retail and commercial uses as market demand has increased. Southeastern Orange County still has large tracts of open space, as well as numerous tracts of undeveloped, forested, and wetland properties. Demand for residential property has led to new construction in the remaining countryside.

CURRENT TRAFFIC PATTERNS

The Southeastern Orange County study area is connected to other parts of Orange County and the rest of New York State via an established regional highway network that converges at its towns of Woodbury and Harriman. The New York State Thruway (I-87), as the primary north-south highway in the area, connects regionally to adjacent counties and points east of the Hudson River. Access to I-87 is provided via its Woodbury/Harriman toll interchange at Exit 16, which feeds west directly into the limited access Quickway (overlap of State Route 17 and US Route 6) and connects to State Route (SR) 17 and SR 32 via interchange ramps. Due to the rapid population and economic growth over recent years, travel to and from the area has increased, both in volume and in average distance. On a typical weekday, commuter travel generally peaks southbound in the morning and northbound in the evening. On the weekends, directional travel is more homogeneous, with significant peaking of traffic volumes along SR 17/32 near the Thruway interchange. This condition is attributed mainly to the continual growth of destination retail activities from Woodbury Common, the newly opened Woodbury Center and others in the area.

Traffic data were collected along three key corridors in fall 2002 to assess existing traffic conditions within the study area. A combination of automatic traffic recorder (ATR) and manual

counts were conducted to formulate existing peak hour traffic volumes along SR 17/32 between SR 17M and Ridge Road, SR 17M between SR 17 and SR 208, and SR 208 and County Route (CR) 105 between CR 44 and Bakertown Road. Based on the collected data, the weekday 7:30 to 8:30 AM and 5:00 to 6:00 PM, and the Saturday noon to 1 PM peak hours were selected for analysis. These hours represent the typical peak commuter and weekend travel periods within the study area. The *Synchro 5 Traffic Signal Coordination Software*, which was developed based on the *2000 Highway Capacity Manual (HCM)* methodologies, was used to evaluate individual analysis locations and provide simulations of peak hour traffic flows along each of the above corridors.

Of the three study area corridors, traffic volumes are the highest along SR 17/32, with peak bi-directional hourly volumes nearing 2,800 vehicles, and lowest along SR 17M. On a typical weekday, directional peaking generally occurs southbound in the morning and northbound in the evening. Along SR 17M, which has more of an east-west alignment, weekday traffic is heavier eastbound towards SR 17 in the morning and westbound towards SR 208 in the evening. Weekend traffic is more homogeneous in both north-south and east-west directions.

Operational characteristics reflecting the travel conditions at individual intersections along the Route 17/32 corridor were summarized based on analysis results from the Synchro simulation of existing peak hour traffic. These results indicate how existing peak hour volumes compare to roadway capacities, the amount of average vehicle delays at intersection controls, and the levels of service of specific lane groups, approaches or intersections. Level of Service (LOS) is categorized from A through F. LOS A and B signify good operating conditions with minimal delay. At LOS C, the number of vehicles stopping is higher, but congestion is still fairly light. LOS D describes a condition at which congestion levels are more noticeable and individual cycle failures (motorists having to wait for more than one green phase to clear the intersection) at signalized intersections can occur or available gaps for minor street movements at unsignalized intersections are diminished. Conditions at LOS E and F reflect poor service levels, where cycle breakdowns are frequent or extended waits are needed for one or more turning movements. Under ideal suburban settings, the boundary between LOS C and LOS D is generally considered the threshold of acceptable operations.

Existing Levels of Service within each of the study area corridors are summarized in Tables S-1.

Table S-1
2002 Existing Levels of Service – SR32 Signalized Intersections

Cross Street	Dir	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		Move	Delay (sec)	LOS	Move	Delay (sec)	LOS	Move	Delay (sec)	LOS
CR 105	EB	LR	29.7	C	LR	29.4	C	LR	34.5	C
	NB	LT	4.2	A	LT	6.8	A	LT	8.7	A
	SB	TR	7.5	A	TR	4.8	A	TR	6.0	A
		Int.	**9.5**	**A**	**Int.**	**8.6**	**A**	**Int.**	**11.1**	**B**
Smith Clove Road	WB	LR	20.7	C	LR	35.6	D_a	LR	21.0	C
	NB	TR	8.0	A	TR	48.2	D_u	TR	12.1	B
	SB	LT	11.7	B	LT	53.7	D_u	LT	9.1	A
		Int.	**12.7**	**B**	**Int.**	**48.1**	**D_u**	**Int.**	**12.5**	**B**
Woodbury Common North	WB	LTR	55.3	E	LTR	52.2	D_u	LTR	55.5	E
	NB	LTR	2.0	A	LTR	2.9	A	LTR	24.4	C
	SB	LTR	4.2	A	LTR	6.7	A	LTR	15.2	B
		Int.	**4.3**	**A**	**Int.**	**10.4**	**B**	**Int.**	**23.2**	**C**
Woodbury Common South	EB	LR	49.6	D_u	LR	50.8	D_u	LR	52.8	D_u
	WB	LR	47.8	D_u	LR	45.8	D_u	LR	45.1	D_u
	NB	T	5.8	A	T	13.2	B	T	10.7	B
	SB	T	5.5	A	T	11.3	B	T	13.6	B
		Int.	**8.4**	**A**	**Int.**	**18.7**	**B**	**Int.**	**16.0**	**B**
SR 17 WB Off Ramp / Nininger Road	EB	LR	82.1	F	LR	76.5	E	LR	129.1	F
	WB	LTR	73.9	E	LTR	116.6	F	LTR	57.5	E
	NB	LT	11.9	B	LT	6.7	A	LT	16.4	B
	SB	TR	13.8	B	TR	20.9	C	TR	16.7	B
		Int.	**32.0**	**C**	**Int.**	**44.1**	**D_a**	**Int.**	**33.2**	**C**
SR 17 EB On/Off Ramps	EB	LTR	34.3	C	LTR	36.7	D_a	LTR	72.4	E
	NB	TR	44.4	D_a	TR	27.9	C	TR	14.1	B
	SB	LT	81.2	F	LT	62.7	E	LT	82.6	F
		Int.	**60.7**	**E**	**Int.**	**44.8**	**D_a**	**Int.**	**57.1**	**E**
Locey Lane / Woodbury Center	EB	LTR	50.4	D_u	LTR	55.4	E	LTR	92.1	F
	WB	LTR	51.6	D_u	LTR	49.9	D_u	LTR	89.9	F
	NB	LTR	4.1	A	LTR	7.0	A	LTR	7.1	A
	SB	LTR	16.3	B	LTR	27.5	C	LTR	32.2	C
		Int.	**12.6**	**B**	**Int.**	**19.3**	**B**	**Int.**	**28.0**	**C**
US Route 6 Off Ramp	WB	LR	75.0	E	LR	51.9	D_u	LR	74.7	E
	NB	T	0.2	A	T	1.0	A	T	3.3	A
	SB	T	0.7	A	T	5.3	A	T	3.0	A
		Int.	**7.9**	**A**	**Int.**	**10.3**	**B**	**Int.**	**18.9**	**B**
Larkin Drive / US Route 6 On Ramp	EB	LTR	55.6	D_u	LTR	61.5	E	LTR	70.7	E
	NB	LTR	25.2	C	LTR	29.3	C	LTR	21.6	C
	SB	LT	16.4	B	LT	12.1	B	LT	20.2	C
		Int.	**27.5**	**C**	**Int.**	**29.9**	**C**	**Int.**	**36.7**	**D_a**

Note: SR 32 is oriented NB/SB, while cross streets are oriented EB/WB.
D_a = marginally acceptable LOS (delay ≤ 45 seconds); D_u = marginally unacceptable LOS (delay > 45 seconds)

Table S-2
2002 Existing Levels of Service – SR 32 Unsignalized Intersections

Cross Street	Dir	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		Move	Delay (sec)	LOS	Move	Delay (sec)	LOS	Move	Delay (sec)	LOS
Ridge Road	EB	LR	16.0	C	LR	17.7	C	LR	15.6	C
	NB	LT	0.5	A	LT	1.2	A	LT	1.0	A
	SB	TR	--	--	TR	--	--	TR	--	--
		Int.	**2.1**	**A**	**Int.**	**1.8**	**A**	**Int.**	**1.7**	**A**
Dunderberg Road / Estrada Road	EB	LTR	26.7	D_a	LTR	391.1	F	LTR	44.2	E
	WB	LTR	327.4	F	LTR	332.2	F	LTR	49.2	E
	NB	LTR	0.2	A	LTR	1.1	A	LTR	0.6	A
	SB	LTR	0.5	A	LTR	1.1	A	LTR	0.5	A
		Int.	**21.9**	**C**	**Int.**	**25.0**	**C**	**Int.**	**3.0**	**A**

Note: SR 32 is oriented NB/SB, while cross streets are oriented EB/WB.
D_a = marginally acceptable LOS (delay ≤ 30 seconds); D_u = marginally unacceptable LOS (delay > 30 seconds)

Table S-3
2002 Existing Levels of Service – SR 17M Intersections

Cross Street	Dir	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		Move	Delay (sec)	LOS	Move	Delay (sec)	LOS	Move	Delay (sec)	LOS
SR 17	EB	R	10.9	B	R	6.4	A	R	8.0	A
	NB	LT	3.8	A	LT	4.5	A	LT	3.7	A
	SB	TR	9.0	A	TR	8.9	A	TR	6.9	A
		Int.	**8.5**	**A**	**Int.**	**5.3**	**A**	**Int.**	**5.5**	**A**
Harriman Heights Road / Church Street	EB	LTR	6.9	A	LTR	5.8	A	LTR	6.1	A
	WB	LTR	5.6	A	LTR	7.3	A	LTR	5.7	A
	NB	LTR	15.5	B	LTR	19.8	B	LTR	13.4	B
	SB	LTR	14.4	B	LTR	16.5	B	LTR	13.3	B
		Int.	**10.2**	**B**	**Int.**	**10.8**	**B**	**Int.**	**8.7**	**A**
North Main Street (unsignalized)	EB	LT	4.1	A	LT	4.7	A	LT	3.7	A
	WB	TR	--	--	TR	--	--	TR	--	--
	SB	LR	10.8	B	LR	22.6	C	LR	16.9	C
		Int.	**4.0**	**A**	**Int.**	**7.3**	**A**	**Int.**	**5.5**	**A**
K-Mart / Vista Lane	EB	LTR	10.3	B	LTR	18.3	B	LTR	18.8	B
	WB	LTR	3.2	A	LTR	7.1	A	LTR	6.7	A
	NB	LTR	21.9	C	LTR	23.4	C	LTR	26.0	C
	SB	LTR	24.5	C	LTR	23.9	C	LTR	22.8	C
		Int.	**9.8**	**A**	**Int.**	**13.3**	**B**	**Int.**	**15.3**	**B**
Still Road / Freeland Street	EB	LTR	28.7	C	LTR	51.1	D_u	LTR	40.3	D_a
	WB	LTR	17.6	B	LTR	59.3	E	LTR	33.5	C
	NB	LTR	29.9	C	LTR	32.5	C	LTR	21.3	C
	SB	LTR	25.4	C	LTR	25.6	C	LTR	29.5	C
		Int.	**26.6**	**C**	**Int.**	**43.7**	**D_a**	**Int.**	**33.2**	**C**
Stage Road	EB	LTR	9.3	A	LTR	8.9	A	LTR	8.3	A
	WB	LTR	6.4	A	LTR	13.4	B	LTR	9.5	A
	NB	LTR	32.9	C	LTR	39.4	D_a	LTR	30.5	C
	SB	LTR	26.0	C	LTR	26.3	C	LTR	29.7	C
		Int.	**12.9**	**B**	**Int.**	**17.0**	**B**	**Int.**	**13.0**	**B**
Lakes Street/Road	EB	LTR	23.8	C	LTR	33.4	C	LTR	24.7	C
	WB	LTR	17.6	B	LTR	60.4	E	LTR	28.3	C
	NB	LTR	28.0	C	LTR	44.0	D_a	LTR	38.4	D_a
	SB	LTR	17.8	B	LTR	29.6	C	LTR	30.5	C
		Int.	**23.5**	**C**	**Int.**	**44.6**	**D_a**	**Int.**	**29.7**	**C**
Shop Rite	EB	TR	10.3	B	TR	16.2	B	TR	20.5	C
	WB	LT	3.2	A	LT	7.8	A	LT	13.5	B
	NB	LR	30.8	C	LR	33.3	C	LR	69.2	E
		Int.	**7.9**	**A**	**Int.**	**13.8**	**B**	**Int.**	**25.2**	**C**
SR 208	EB	LT	19.6	B	LT	30.7	C	LT	74.5	E
	WB	T	12.4	B	T	17.6	B	T	15.4	B
	SB	LR	18.8	B	LR	33.7	C	LR	30.6	C
		Int.	**18.2**	**B**	**Int.**	**29.1**	**C**	**Int.**	**41.2**	**D_a**

Note: SR 17M is oriented EB/WB, while cross streets are oriented NB/SB.

Table S-4
2002 Existing Levels of Service – SR 208/CR105 Intersections

Cross Street	Dir	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		Move	Delay (sec)	LOS	Move	Delay (sec)	LOS	Move	Delay (sec)	LOS
CR 44 (unsignalized)	WB	LR	35.1	E	LR	54.7	F	LR	42.7	E
	NB	TR	--	--	TR	--	--	TR	--	--
	SB	LT	0.9	A	LT	1.0	A	LT	1.0	A
		Int.	**2.3**	**A**	**Int.**	**3.8**	**A**	**Int.**	**1.7**	**A**
SR 17 WB Ramps	EB	LTR	42.8	D_a	LTR	27.5	C	LTR	43.0	D_a
	WB	LT	53.2	D_u	LT	96.2	F	LT	65.1	E
	NB	LT	0.6	A	LT	7.1	A	LT	0.7	A
	SB	LTR	28.0	C	LTR	8.2	A	LTR	6.6	A
		Int.	**25.7**	**C**	**Int.**	**29.3**	**C**	**Int.**	**13.1**	**B**
SR 17 EB Ramps	WB	L	52.7	D_u	L	50.3	D_u	L	51.5	D_u
	NB	T	36.1	D_a	T	82.2	F	T	79.8	E
	SB	LT	39.4	D_a	LT	12.5	B	LT	30.8	C
		Int.	**38.9**	**D_a**	**Int.**	**50.1**	**D_u**	**Int.**	**53.5**	**D_u**
Schunnemunk Street / SR 208 Extension	EB	LTR	25.6	C	LTR	30.4	C	LTR	23.6	C
	WB	LTR	29.3	C	LTR	42.0	D_a	LTR	27.4	C
	NB	LTR	26.1	C	LTR	31.7	C	LTR	26.9	C
	SB	LT	23.3	C	LT	30.4	C	LT	22.9	C
		Int.	**25.5**	**C**	**Int.**	**31.7**	**C**	**Int.**	**24.4**	**C**
Freeland Street (unsignalized)	WB	R	--	--	R	--	--	R	--	--
	NB	L	33.7	D_u	L	171.7	F	L	504.8	F
	SB	LT	--	--	LT	--	--	LT	--	--
		Int.	**8.3**	**A**	**Int.**	**23.8**	**C**	**Int.**	**100.3**	**F**
Larkin Drive	WB	LR	11.3	B	LR	13.1	B	LR	16.9	B
	NB	TR	9.1	A	TR	9.9	A	TR	12.2	B
	SB	LT	7.2	A	LT	12.6	B	LT	22.3	C
		Int.	**8.7**	**A**	**Int.**	**11.6**	**B**	**Int.**	**17.2**	**B**
Dunderberg Road (unsignalized)	WB	LR	31.5	D_u	LR	129.0	F	LR	94.6	F
	NB	TR	--	--	TR	--	--	TR	--	--
	SB	LT	2.8	A	LT	3.6	A	LT	0.7	A
		Int.	**8.6**	**A**	**Int.**	**22.0**	**C**	**Int.**	**28.8**	**D_a**
CR 105 Extension / Bakertown Road (unsignalized)	NEB	LT	1.8	A	LT	3.3	A	LT	1.5	A
	SWB	TR	--	--	TR	--	--	TR	--	--
	SB	LR	10.1	B	LR	48.1	E	LR	11.6	B
		Int.	**2.9**	**A**	**Int.**	**15.9**	**C**	**Int.**	**3.4**	**A**

Note: SR 208 and CR 105 are oriented NB/SB, while cross streets are oriented EB/WB.

D. TRAFFIC AND LAND USE FORECASTING

Projections of traffic conditions on the study area corridors for the horizon year 2020 and for full build-out (maximum development permitted by current zoning) were developed by the Orange County Department of Planning utilizing a four-step travel demand model for several future scenarios and a No-Build Scenario, which assumes that no significant changes to land use regulations or the current transportation system are made beyond those currently committed to by the transportation providers and local municipalities. Potential visions for future development, building off comments and recommendations from the public visioning sessions, were developed. These scenarios were then assembled into a matrix for comparative purposes using the County's four-step travel demand model (see Figure S-2).

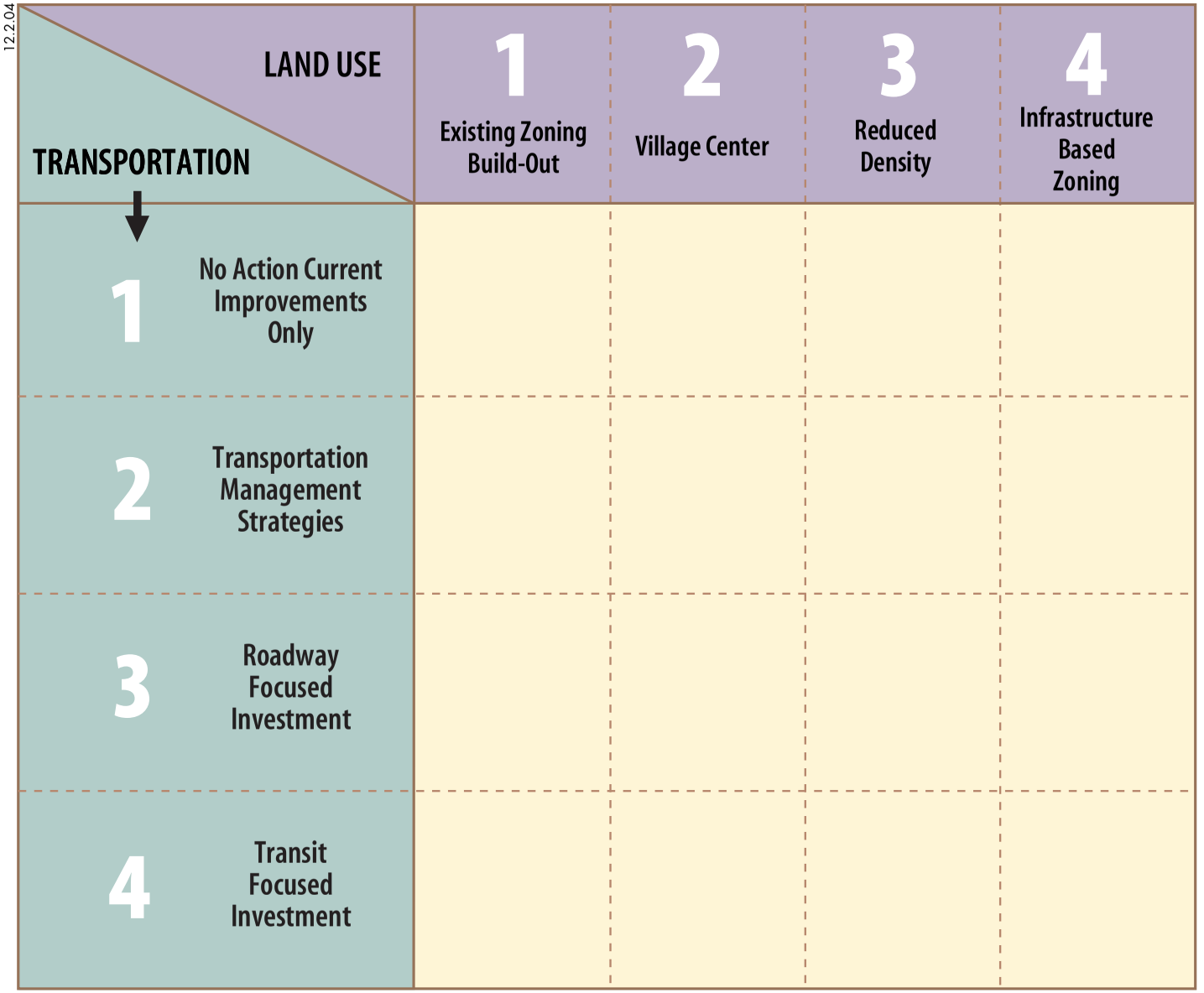
LAND USE SCENARIOS

- ***Existing Zoning –*** Development of existing vacant or underdeveloped parcels according to existing zoning codes.
- ***Village Center Scenario –*** Changing land use patterns to increase densities and expand the limits of the villages and hamlets in the study area while reducing the amount of developable land in the outlying areas.
- ***Reduced Density Scenario –*** Limit commercial development to the established business zones with no expansions allowed beyond the existing commercial boundaries. Reduce residential development by increasing required lot sizes.
- ***Infrastructure-Based Zoning Scenario*** – Concentrate both commercial and residential development in the areas that contain sufficient sewer infrastructure. Development outside of these areas would be required to install, and/or make financial provisions for, the utilities and services necessary to support the additional expansion.

TRANSPORTATION SCENARIOS

- ***No Action- Current Improvements Only*** – The existing transportation network supplemented with improvement projects currently under consideration or in construction.
- ***Transportation Management Strategies*** – Maximize the effectiveness of the existing transportation network without major changes or construction. Key elements include small improvements to the transit system (i.e. better interconnections to and from existing bus and rail), signal optimization, bikeways and other bicycle-use incentives, pedestrian safety and circulation improvements.
- ***Roadway Focused Investment*** – Invest in roadway improvements designed to alleviate congestion using a range of roadway capacity enhancements and new roadway links, such as roadway improvements to circumvent key congestion points and adding travel lanes on major corridors.
- ***Transit Focused Investments*** – Increase the efficiency and frequency of the transit systems along with improvements that would facilitate multi-modal transit connections. A system of regional park-and-ride facilities would be coordinated with new regional and intra-county transit services.

12.2.04



SOUTHEASTERN ORANGE COUNTY
TRAFFIC AND LAND USE STUDY

Scenario Matrix
Figure S-2

Based upon the land use development projections, trip generation values and trip distribution values were assigned to the roadway network depending on: a) the amount of development, and b) the likely path that vehicles generated by that development would take within the roadway network. T-MODEL2, a multi-dimensional traffic modeling tool customized by Orange County Department of Planning for the Study Area, was used to model the entire Study Area network. The results of T-MODEL2 are reported in the number of vehicles during the modeled peak hour (in this case the PM peak hour) on any one link (roadway segment between key intersections) within the network. These volumes were then inserted into a second traffic modeling software, Synchro, to analyze the Level of Service (LOS) at each intersection.

T-MODEL2 analyses were completed for both the 2020 analysis year and for full land use build-out to provide an overall picture of traffic conditions. From those results, a more detailed Synchro analysis was performed for 2020 and the full land use build-out within each corridor for certain conditions. Based upon the T-MODEL2 results, it was determined that the 14 modeling runs could be narrowed down to five different conditions for purposes of Synchro analysis. Specifically, it was found that the Infrastructure Based Zoning did not constrain land use development as much as had been anticipated and that the Reduced Density Zoning scenario was a more likely approximate of lower range of land use development. It was also determined that the Transit Focused Investment scenario should only be analyzed with the Village Center land use scenario.

Thus, five different conditions were analyzed using Synchro to evaluate the range of potential operating conditions within the roadway network:

- Modeling Run No. 1)—Build-out under Existing Zoning with Current traffic improvements; and
- Modeling Run No. 2)—Land use build-out under Existing Zoning with Transportation Management Systems improvements; and
- Modeling Run No. 3)—Land use build-out under Reduced Density Zoning with Transportation Management Systems improvements; and
- Modeling Run No. 4)—Land use build-out under Reduced Density Zoning with Roadway Focused Investment improvements; and
- Modeling Run No. 5)—Land use build-out under Existing Zoning with Roadway Focused Investment improvements.

Following the capacity analysis, an even more detailed analysis was performed for select links within the network to understand how travel patterns might be affected by certain improvements. This “Select Link Analysis” (SLA) is used within T-MODEL2 to isolate a particular link in the roadway network and identify where traffic using that link originates and to where it is distributed. This tool is particularly useful in identifying potential answers for intersections or sections of the roadway network where poor operating levels of service persist, even with capital improvements.

Six locations were selected for this analysis:

- SL1: Route 17 westbound off-ramp to Route 32
- SL2: Cornwall Interchange – northbound off-ramp
- SL3: CR 105 Interchange/Collector-Distributor Road off-ramp
- SL4: Bailey Farm Road/Route 17M Bypass

- SL5: Route 208 Bypass
- SL6: Larkin Drive Extension

Each location was analyzed with current capacity on Route 17 and assuming Route 17 is widened to 3 lanes in each direction.

E. RECOMMENDATIONS

From these analyses, a number of conclusions could be reached regarding the interaction of land use planning and transportation infrastructure planning. Several sets of recommendations were developed including generic recommendations that can be applied throughout the study area and community specific recommendations.

GENERIC RECOMMENDATIONS

TRANSPORTATION IMPROVEMENTS

- Enhance the utilization and safety of bike and pedestrian facilities.
- Encourage use of trip management and access management techniques to reduce numbers of trips made within the study area and direct access away from heavily traveled corridors.
- Coordinate street connections between new development and the existing road network to provide multiple access options.
- Install traffic calming devices on major and minor roads to reduce speeds of vehicles.
- Consider roadway design and streetscape/aesthetic improvements at strategic locations to enhance the pedestrian/bicycle environment and to encourage reinvestment in existing centers.
- Consider the spacing and timing of existing signalized traffic signals to see if vehicular flow can be optimized and whether new signals are warranted.

LAND USE IMPROVEMENTS

The analysis clearly indicates that the existing zoning and pattern of growth within the study area is not sustainable and that the towns and villages need to make some change to better guide new development. The Village Center concept described in this report, which emphasizes mixed-use and higher densities, is considered a preferred approach; but any other zoning modifications that reduce overall levels of development and direct new growth toward existing built areas would be an improvement over the existing zoning.

- At a minimum, amend current zoning to eliminate standard zoning and subdivision practices that mandate uniform development on large lots.
- Encourage mixed-use development throughout the study area to reduce vehicle trips.
- Encourage conservation subdivision design to increase preservation of open spaces.
- Encourage village in-fill development of mixed-uses at strategic locations.

COMMUNITY SPECIFIC LAND USE RECOMMENDATIONS

This section identifies specific land use recommendations for each of the towns and villages in the study area.

TOWN OF WOODBURY

- Continue updating the Town Comprehensive Plan and land development regulations (e.g., zoning, subdivision, wetland protection). Include the Village Center concept in the Comprehensive Plan to focus development in the Highland Mils and Central Valley areas.
- Use the Official Map language of New York State Town Law §270 to identify the transportation improvements and open spaces recommended by this study or the comprehensive plan for Woodbury. Once established on the Official Map of a municipality, transportation improvements (or planned open spaces) must be recognized when evaluating new land use changes or can be implemented in phases by private property owners making improvements on their land.
- Incorporate access management language into the zoning code and plan review standards to properly manage driveway spacing, shared parking, rear access between adjoining properties, and interconnections between commercial properties for pedestrians.
- Establish a Transportation Improvement District (TID)[1] to finance transportation improvements within the area roughly defined as the land Lands Town of Monroe line on the west and Interstate 87 on the east extending from the Metro-North Harriman Train Station to the south to and including the Woodbury Common outlet center to the north.
- Redevelop area bounded roughly by Smith Clove Road, Estrada Road, the railroad tracks, and Route 32 with a mix of residential, retail, and office space. Integrate public parking with private parking to create a defined hamlet center of higher density (roughly 8 dwelling units per acre).
- Provide enhanced pedestrian amenities such as sidewalks, crosswalks with pedestrian signals, and landscaping to create a defined hamlet center.
- Develop the area north of the Harriman Train Station with a mix of residential and office uses. Establish vehicular and pedestrian connections into the Village of Harriman where appropriate.
- Identify select locations along Route 32 in Highland Mills for increased residential density (up to 8 dwelling units per acre) and mixed-use infill development. Such development must be compatible with the adjoining single-family residential areas and the environmental constraints (predominantly wetlands).
- Reduce permitted intensity of residential development on land located along the north side of Dunderberg Road/Nininger Road and minimize the number of permitted curb-cuts onto

[1] A TID requires enaction of enabling legislation by the NYS Legislature and preparation of a Map, Plan, and Report identifying the boundaries of the TID, proposed transportation improvements and mechanisms for funding improvements, and relevant data identifying the need for such improvements.

the new collector-distributor road. Coordinate low-density residential development with ridgeline protection provisions (see below).

- Adopt Conservation Subdivision regulations Town-wide to base development on the suitability of lands to handle septic systems and development on steep slopes and ridgelines.
- Adopt Ridgeline Protection regulations to minimize residential development on the upper portions of significant ridgelines. Prohibit excessive clearing or grading activities within the regulated Ridgeline to protect near-field and far-field views of the ridges.
- Consider possible road connections between subdivisions to reduce the number of vehicles utilizing collector roads.
- Retain the existing hotel and gas station on Route 32 where the new loop ramp is proposed between southbound Route 32 and eastbound Route 17/6.
- Enter into an Intermunicipal Agreement with the Town of Monroe and Village of Harriman for creation of a Transportation Improvement District (see above).

TOWN OF MONROE

- Continue updating the Town Comprehensive Plan and land development regulations (e.g., zoning, subdivision, wetland protection). Include the Village Center concept in the Comprehensive Plan to focus development toward the Village of Monroe.
- Use the Official Map language of New York State Town Law §270 to identify the transportation improvements and open spaces recommended by this study or the Comprehensive Plan for Monroe. Once established on the Official Map of a municipality, transportation improvements (or planned open spaces) must be recognized when evaluating new land use changes or can be implemented in phases by private property owners making improvements on their land.
- Incorporate access management language into the zoning code and plan review standards to properly manage driveway spacing, shared parking, rear access between adjoining properties, and interconnections between commercial properties for pedestrians.
- Establish a Transportation Improvement District (TID) to finance transportation improvements within the area roughly defined as between Forest Avenue on the west and the Town of Woodbury line on the east, NYS Route 17 on the north, and the Village of Monroe line on the south.
- Reduce residential density on lands outside the Village of Monroe. Adopt Conservation Subdivision regulations and Transfer of Development Rights to minimize future traffic congestion in areas outside of the Village and encourage pedestrian trips between the Town and the Village.
- Rezone lands along the proposed Larkin Drive extension from Light Industrial (LI) to office park (also consider senior housing senior housing). Develop strong design guidelines to ensure adequate site design and buffering between Route 17 and new uses. Minimize curb-cuts onto the Larkin Drive extension to two points of connection to new uses. Provide interior connections between different uses to limit vehicular use of Larkin Drive extension. Consider landscaped median along length of Larkin Drive extension to enhance visual appeal of new development.

- Enter into an Intermunicipal Agreement with the Town of Woodbury and Village of Harriman for creation of a Transportation Improvement District (see above).

TOWN OF BLOOMING GROVE

- Continue updating the Town Comprehensive Plan and land development regulations (e.g., zoning, subdivision, wetland protection). Include the Village Center concept in the Comprehensive Plan to focus development at strategic locations along Route 208 and near the Village of Washingtonville.
- Use the Official Map language of New York State Town Law §270 to identify the transportation improvements and open spaces recommended by this study or the Comprehensive Plan. Once established on the Official Map of a municipality, transportation improvements (or planned open spaces) must be recognized when evaluating new land use changes or can be implemented in phases by private property owners making improvements on their land.
- Incorporate access management language into the zoning code and plan review standards to properly manage driveway spacing, shared parking, rear access between adjoining properties, and interconnections between commercial properties for pedestrians.
- Consider medium-density housing (4 to 8 dwelling units per acre) and small-scale commercial retail/office on the east side of Route 208 near Clove Road.
- Enhance the existing commercial uses at Worley Heights to form more of a hamlet focus.
- Focus new commercial uses along Route 17M and lower portions of Route 208. Reduce the extent of the ORI zoning district in the Oxford Depot area.
- Consider Conservation Subdivision and/or Transfer of Development Rights program to direct new residential development toward areas of existing development (and wastewater infrastructure) and allow for more vehicular and pedestrian connections between subdivisions and hamlet areas.

VILLAGE OF HARRIMAN

- Update the Village Comprehensive Plan and land development regulations (e.g., zoning, subdivision, wetland protection). Include the Village Center concept in the Comprehensive Plan to focus development within the existing village pattern.
- Use the Official Map language of New York State Village Law §7-724 to identify the transportation improvements and open spaces recommended by this study or the Comprehensive Plan for Harriman. Once established on the Official Map of a municipality, transportation improvements and open spaces must be recognized when evaluating new land use changes or can be implemented in phases by private property owners making improvements on their land.
- Incorporate access management language into the zoning code and plan review standards to properly manage driveway spacing, shared parking, rear access between adjoining properties, and interconnections between commercial properties for pedestrians.
- Integrate vehicular and pedestrian connections with potential future mixed-use development north of Harriman Train Station (see recommendations for Town of Woodbury, above) into existing roadway network.

- Establish a Transportation Improvement District (TID) to finance transportation improvements within the area roughly defined as those lands east of Route 17 as described above in the Town of Woodbury.
- Enter into an Intermunicipal Agreement with the Town of Woodbury and Town of Monroe for creation of a Transportation Improvement District (see above).

VILLAGE OF MONROE

- Continue updating the Village Comprehensive Plan and land development regulations (e.g., zoning, subdivision, wetland protection). Include the Village Center concept in the Comprehensive Plan to focus development within the existing village center
- Use the Official Map language of New York State Village Law §7-724 to identify the transportation improvements and open spaces recommended by this study or the Comprehensive Plan. Once established on the Official Map of a municipality, transportation improvements (or planned open spaces) must be recognized when evaluating new land use changes or can be implemented in phases by private property owners making improvements on their land.
- Incorporate access management language into the zoning code and plan review standards to properly manage driveway spacing, shared parking, rear access between adjoining properties, and interconnections between commercial properties for pedestrians.
- Conduct a design charrette for the redevelopment of the large block bordered by Lake Street, Stage Road, and Mill Pond Parkway. Consider higher density residential and mix of office and retail uses. Include provisions for public space (joint Village/Town office space or library), shared parking, and open space.
- Conduct a Route 17M Corridor Management Plan and design charrette to further evaluate the potential effects of widening.
- Consider creating a more pedestrian-scale/pedestrian-friendly retail node along Route 17M east of Stage Road.

VILLAGE OF KIRYAS JOEL

- Continue updating the Village Comprehensive Plan and land development regulations (e.g., zoning, subdivision, wetland protection). Include the Village Center concept in the Comprehensive Plan to focus development within the existing village center.
- Use the Official Map language of New York State Village Law §7-724 to identify the transportation improvements and open spaces recommended by this study or the Comprehensive Plan. Once established on the Official Map of a municipality, transportation improvements (or planned open spaces) must be recognized when evaluating new land use changes or can be implemented in phases by private property owners making improvements on their land.
- Incorporate access management language into the zoning code and plan review standards to properly manage driveway spacing, shared parking, rear access between adjoining properties, and interconnections between commercial properties for pedestrians.
- Enhance facilities for pedestrians within the Village.
- Create a park-and-ride at the intersection of Bakertown Road and CR 105.

TRANSPORTATION RECOMMENDATIONS

Based on the results of the T-Model2, Synchro, and Select Link Analysis, a number of transportation improvements would benefit traffic flow and mobility within the Study Area. Some of these projects are easily implemented while others require greater capital investment, community acceptance, and detailed study. Improvements are organized below according to their "feasibility." "Feasibility" is determined by a combination of an analysis of available financing versus potential traffic benefits, environmental constraints, land use compatibility, and community consensus.

EARLY ACTION ITEMS

By virtue of the initial analysis and findings of this study, Orange County was able to advance certain "Early Action Items" to relieve congestion and address safety issues at the following locations:

- Synchronization of traffic signals on Route 32 near Woodbury Common and Route 6/17.
- Widening of NYS Thruway off-ramp from Harriman toll plaza to Route 32.
- New Traffic signal at the intersection of CR 105 and Dunderberg Road

In addition, the study identified other actions that can be implemented very quickly by Orange County:

- Establishment of consistent speed limits on Route 32
- Reduced speed limit (from 55 MPH to 45 MPH) on Route 17 Harriman near the old Railroad Bridge.
- Realignment of dangerous curve at the corner of Bakerstown Road and CR 105
- New turning lanes on SR 32 at CR 105.
- Advancement and refinement of SR 32 streetscape, parking and traffic improvements through central Valley by NYSDOT

HIGH FEASIBILITY PROJECTS

- Route 32 Loop Ramp to Route 17
- Additional capacity on Route 17
- Larkin Drive Extension (Route 208 to CR 105)
- Access Management, Driveway Consolidation, and Rear Service Roads on Route 17M
- Traffic Calming on Residential Streets
- Reduce speed limits along Route 17 south of Route 6.
- Safety improvements along Route 208 including realignment of Clove Road intersection
- Park and Rides with Improved Bus Scheduling
- Expanded Transit Service
- Facilitate expansion of existing privately-operated jitney service between the Harriman train station and Woodbury Common to include more connections to weekend trains.
- Replace Stop sign at southbound CR 105 and Spring Street with Yield sign.
- Implementation of a Transportation Improvement District in the Towns of Woodbury and Monroe and the Village of Harriman.
- Re-route intermunicipal bus-line down Route 17M (off of Freeland and Larkin) into the Village.

MID-LEVEL FEASIBILITY PROJECTS

- Collector-Distributor road between I-87 and CR 105 along Dunderberg/Nininger Road north of Route 17
- CR 105 Interchange
- Widening of Route 17M
- Route 208 Bypass Roadway
- EZ Pass Ramp from Woodbury Common to I-87 southbound
- Remove railroad overpass on Route 17 south of Nepara

LOW FEASIBILITY PROJECTS

- Bailey Farm Road/Route 17M bypass connector in vicinity of North Main Street
- Additional Travel Lanes on CR 105, Route 208, Route 32
- New Thruway Interchange between Exit 16 and Exit 17
- Additional Transit Hubs. Metro-North Railroad would consider providing additional weekend service to a privately financed station at Woodbury Common.

Two large projects listed as low feasibility were found to provide some improvements to traffic flow but would require additional detailed studies: Creation of a new intermodal transportation facility at Woodbury Common, and a new Thruway interchange between Exits 16 and 17.

The creation of a new intermodal transportation facility at Woodbury Common serving primarily regional bus service could alleviate some pressure on the Route 32 network during weekend hours. Coach USA/ShortLine currently makes a stop at Woodbury Common for its New York to Binghamton service. This route can also be used by riders within Orange County. Charter buses from New York City currently bring tourists and day-shoppers to Woodbury Common. Enhanced service, especially to shoppers, may make bus access to Woodbury Common more attractive thereby reducing the number of vehicles using the roadway network, especially on weekends. Linking Woodbury Common with Harriman Common and Woodbury Centre, while possible, may not attract large ridership as the markets serving each of these large shopping centers is essentially different (specialty shopping versus convenience/discount shopping).

With respect to commuter bus or rail service, provision of an enhanced regional bus facility or a new Metro-North Railroad station at Woodbury Common would remove a portion of the southbound AM peak hour traffic from Route 32 between Nininger Road and Route 17M now bound for the Harriman station. Similarly, a portion of the northbound PM peak hour traffic on Route 32 between Nininger Road and Route 17M may be reduced as well. Weekend train service aimed at shoppers has the potential to also reduce automobile traffic along Route 32 at this critical location. , Additional detailed analysis would be necessary to determine the full benefit derived from an enhanced regional bus facility or a new Metro North Railroad station on traffic operations along Route 32 and the region.

A new Thruway interchange between Exits 16 and 17 was studied to determine if significant volumes would be diverted off of Route 32, but the model revealed that relatively few vehicles took advantage of this route to points north of Woodbury. A more specific study of an additional interchange would have to be completed to determine the exact extent of any benefit. ✷

Chapter 1: Background and Overview

A. PURPOSE AND NEED

Orange County has undergone a tremendous period of growth over the past thirty years as it has been transformed from a predominantly rural environment to a suburban setting that has become a part of the greater New York metropolitan area. Since 1970 the population in Orange County has increased by over 50 percent. In the 1990s, Orange County's population has grown from just over 307,600 people in 1990 to over 341,400 people, as reported in the 2000 Census. This 11 percent increase in population is the fourth largest in the entire state, with Putnam being the only county, outside the five boroughs of New York City that exceeded Orange County's ten year growth rate. This trend of increased growth is expected to continue, with projections from the Orange County Department of Planning estimating that by the year 2025 the County's population is expected to grow by an additional 36 percent to over 464,000 people.

The Towns and Villages in the southeastern portion of the County are at the leading edge of the development cycle as these communities have become the logical place to settle for people and businesses moving away from the older, more densely developed areas of downstate New York. The populations in the Towns of Blooming Grove, Monroe, and Woodbury have increased by more than 21percent over the past ten years, which is almost double the County's rate of growth. Projections by the County's Planning Department indicate that the populations in the Towns and Villages making up the southeast portion of Orange County are all anticipated to undergo substantial growth over the next twenty-five years, with many of these municipalities faced with a doubling of its population by 2025. As more people move into this area the demand for the roadways, schools, and infrastructure will also increase. One of the most visible impacts of this increased demand is traffic congestion. With segments of the main thoroughfares already operating at or above their design capacity, the growth projections and the subsequent effect on the transportation systems are major concerns for both the residents and elected officials in these municipalities.

B. PROJECT EVOLUTION AND STAKEHOLDERS

In 1998 a grass roots Traffic Task Force was formed focusing on traffic congestion in the Monroe-Woodbury area and the types of regional, inter-municipal, solutions that could be advanced to address these issues. The Task Force consists of elected officials and planning and zoning board members representing the Towns of Monroe and Woodbury, as well as from the Villages of Harriman, Kiryas Joel, and Monroe. Meeting on a monthly basis, the Traffic Task Force discussed potential transportation improvement measures and land use controls that could be initiated to help preserve the area's unique character and maintain the quality of life that makes this portion of Orange County such an attractive place to live and do business. By 2000, the Task Force had gained the attention of the County Executive's Office and the major agencies and providers of transportation services in the region, including the New York State Department

of Transportation (NYSDOT), the New York State Thruway Authority (NYSTA), MTA Metro-North Railroad (MNR), and the Monroe-Woodbury School District. These agencies became members of the Task Force. In addition, the scope of the group's effort was expanded to include the growing concern over the demand for water, sewer, and the limited capacity of the area's existing infrastructure and how development in the surrounding Towns would affect these services. Recognizing the magnitude of the challenges facing the Traffic Task Force, Orange County and NYSDOT issued a Request for Proposals for consulting firms in March of 2001 to conduct a comprehensive study of the transportation system within the Towns of Monroe and Woodbury.

Responsible development and smart growth became an important issue in the November 2001 elections. These same issues formed a portion of newly elected County Executive Edward Diana's platform and by the middle of 2002 a consultant for the Monroe-Woodbury Transportation Study was selected and introduced to the Traffic Task Force. The project study area was expanded to include the Town of Blooming Grove so that a truly regional approach to both land use and transportation solutions could be studied and representatives from the Town of Blooming Grove were added to the Task Force. To more accurately reflect the size and scope of the project it was renamed the Southeastern Orange County Traffic and Land Use Study. As a "home-rule" State, the participation by each of the municipalities in the study area made the Traffic Task Force the likely organization to act as the project's Steering Committee, since the Towns and Villages will ultimately be responsible for initiating and implementing any future land use recommendations. For a complete list of the Project Advisory Group, see Table 1-1.

Table 1-1
Project Advisory Group

Name	Affiliation	Title
Michael Amo	County Legislature	County Legislator, 1st District
Roxanne Donnery	County Legislature	County Legislator, 14th District
Frank A. Fornario, Jr.	County Legislature	County Legislator, 5th District
Spencer M. McLaughlin	County Legislature	County Legislator, 7th District
Charles J. Bohan	Town of Blooming Grove	Supervisor
Sandy Leonard	Town of Monroe	Supervisor
Sheila Conroy	Town of Woodbury	Supervisor
G. Bruce Chichester	Village of Harriman	Councilman
Gedalye Szegedin	Village of Kiryas Joel	Village Clerk
Joseph Mancuso	Village of Monroe	Mayor
Captain Martin Hansen	New York State Police	Zone Commander
Richard A. Peters	NYS Dept. of Transportation	Regional Planning Manager
Ramesh Mehta	NYS Thruway Authority	Division Director
Wai Cheung, PE	NYS Thruway Authority	Traffic Systems Engineer
Edmund A. Fares	Orange County DPW	Commissioner
David Church	Orange County Department of Planning	Commissioner
Clifford Berchtold	Monroe-Woodbury School District	Director of Transportation
Robyn Hollander	MTA Metro-North Railroad	Capital & Long Range Planning
Jean Shanahan	Newburgh-Orange County Transportation Council	Staff Director
Patricia Gilchrest	Orange County Citizens Foundation	Executive Director
Tom Falzer	The Chelsea Group	

The Southeastern Orange County Traffic and Land Use Study involves a detailed analysis of traffic conditions on the state-owned corridors in the area including Route 17, Route 17M, Route 208, Route 32, and the heavily traveled Route 17/6/32 interchange area. The study also evaluates potential solutions that include modifications to the New York State Thruway and County Route 105 as well as improvements to transit and pedestrian operations and the provision of multi-modal transportation centers.

C. GOALS AND OBJECTIVES

A number of goals were established as part of this Federally funded study including:

- Determining the current operational characteristics and deficiencies of the transportation system;
- Forecasting future conditions of the transportation system;
- Recommending improvements to enhance the efficiency, capacity, and safety of the transportation system;
- Developing and recommending sustainable development guidelines that are compatible with and help preserve the capacity of future transportation improvements; and
- Building a consensus for proposed transportation improvements and sustainable development through public forums.

D. STUDY AND CONSENSUS BUILDING PROCESS

Throughout the study process the consultant team met monthly with the Traffic Task Force and solicited input from the public through three visioning sessions, the project web site, and a public opinion survey that was distributed to over 1,000 residents of the study area. The insight gained from the public's comments was combined with traditional data collection efforts regarding traffic volumes, safety, highway characteristics, physical features of the corridor, bicycle and pedestrian facilities, transit systems and other relevant features to develop a comprehensive analysis of existing and future travel conditions and to identify deficiencies and problems with the transportation infrastructure. The analysis of the existing transportation systems and recommendations to improve future operations were reviewed by a Study Technical Group consisting of Orange County, NYSDOT, NYSTA, and Metro-North. Each of the Towns and Villages in the study area were also consulted, with their input being an instrumental component in the development of transportation and land use solutions that could be administered within their jurisdictions. Upon concurrence by the Study Technical Group and the involved municipalities, the analyses and resulting improvement options were presented to the Traffic Task Force. Acting in its role as the project's Steering Committee, the Traffic Task Force was used to build public consensus for potential improvement alternatives.

E. TRAFFIC AND LAND USE FORECASTING

EARLY ACTION INITIATIVES

As part of the project, short term transportation management strategies (0-3 years) were developed to address the impact of trips being generated by existing and approved development, as well as the growth of through traffic in the study area. These short-term solutions were generally lower cost improvements focusing on existing safety and operational problems along the project corridors. The majority of these early action projects maximize the effectiveness of the existing roadway infrastructure by optimizing signal timings and coordinating the phasing of adjacent traffic lights to allow for a smooth progression of flow. Additional turning lanes at high volume intersections along with the establishment of consistent speed limits, safe passing zones, and landscape design features are also being proposed to alleviate congestions bottlenecks while respecting the land uses and character of the adjacent areas.

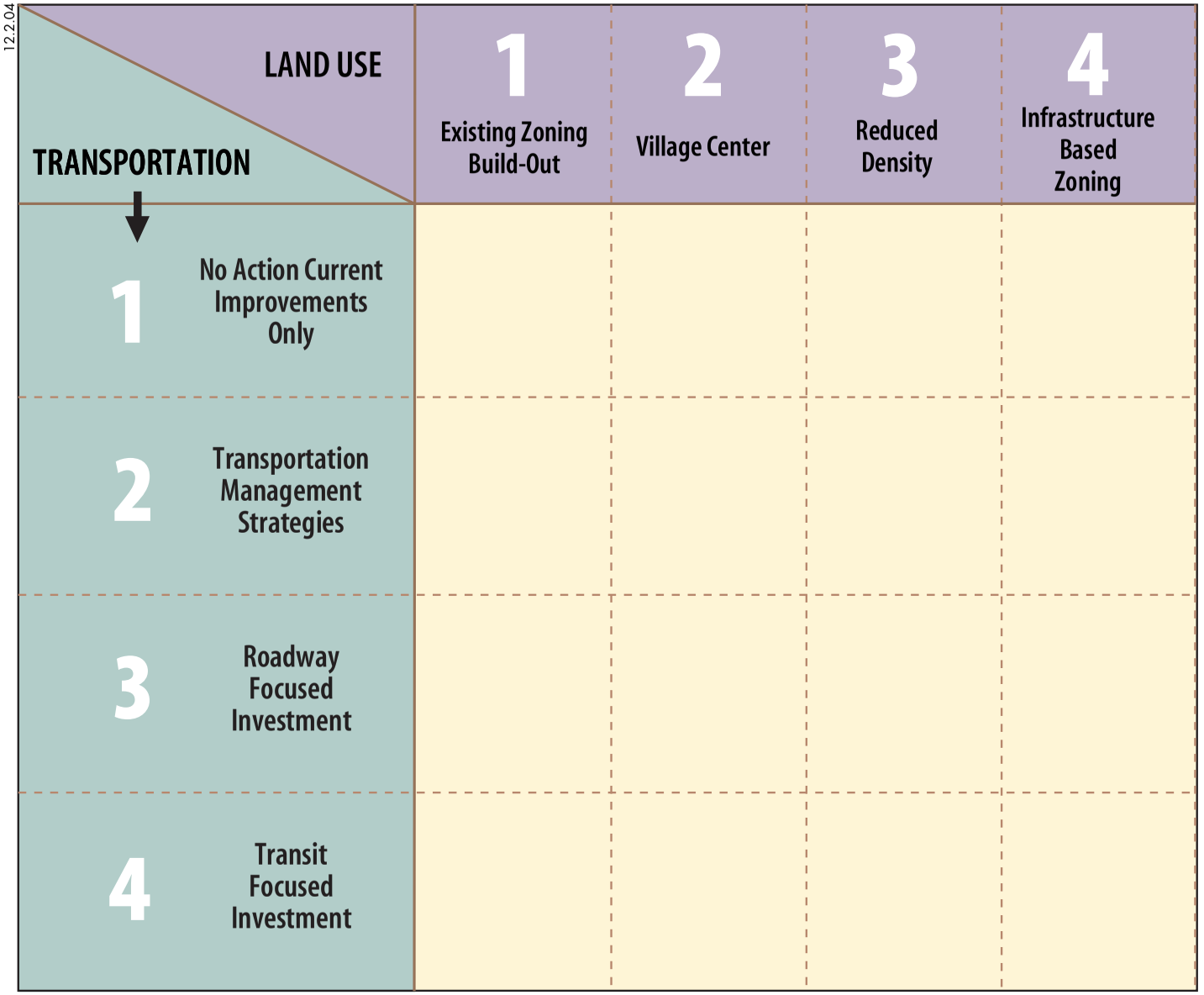
LONG-TERM MODELING

Projections of traffic conditions on the study area corridors for the horizon year 2020 and for full build-out (maximum development permitted by zoning) were developed by the Orange County Department of Planning utilizing a four-step travel demand model for several future scenarios and a No-Build Scenario, which assumes that no significant changes to land use regulations or the current transportation system are made beyond those currently committed to by the transportation providers and local municipalities. Potential visions for future development, building off of comments and recommendations from the public visioning sessions, were developed. These scenarios were then assembled into a matrix for comparative purposes using the County's four-step travel demand model (see Figure 1-1). The Land Use and Transportation Scenarios are described briefly below and in more detail in Chapter 3.

LAND USE SCENARIOS

- ***Existing Zoning –*** Development of existing vacant or underdeveloped parcels according to existing zoning codes.
- ***Village Center Scenario –*** Changing land use patterns to increase densities and expand the limits of the villages and hamlets in the study area while reducing the amount of developable land in the outlying areas.
- ***Reduced Density Scenario –*** Limit commercial development to the established business zones with no expansions allowed beyond the existing commercial boundaries. Reduce residential development by increasing required lot sizes.
- ***Infrastructure-Based Zoning Scenario*** – Concentrate both commercial and residential development in the areas that contain sufficient sewer infrastructure. Development outside of these areas would be required to install, and/or make financial provisions for, the utilities and services necessary to support the additional expansion.

12.2.04



SOUTHEASTERN ORANGE COUNTY
TRAFFIC AND LAND USE STUDY

Scenario Matrix
Figure 1-1

TRANSPORTATION SCENARIOS

- ***No Action- Current Improvements Only*** – The existing transportation network supplemented with improvement projects currently under consideration or in construction.
- ***Transportation Management Strategies*** – Maximize the effectiveness of the existing transportation network without major changes or construction. Key elements include small improvements to the transit system (i.e. better interconnections to and from existing bus and rail), signal optimization, bikeways and other bicycle-use incentives, pedestrian safety and circulation improvements.
- ***Roadway Focused Investment*** – Invest in roadway improvements designed to alleviate congestion using a range of roadway capacity enhancements and new roadway links, such as roadway improvements to circumvent key congestion points and adding travel lanes on major corridors.
- ***Transit Focused Investments*** – Increase the efficiency and frequency of the transit systems along with improvements that would facilitate multi-modal transit connections. A system of regional park-and-ride facilities would be coordinated with new regional and intra-county transit services.

F. FORMAT OF REPORT

This report and the accompanying appendices present the analyses and studies conducted to evaluate the effectiveness of both the short-term and long-term solutions at reducing congestion in the southeastern Orange County study area. These analyses were undertaken to narrow down and reconfigure the land use and transportation scenarios and reach consensus among the Community Advisory Group and the Technical Steering Committee on the potential strategies that would merit further study and ultimately be implemented by the project stakeholders.

This report summarizes the following major tasks associated with this comprehensive study:

- Existing transportation and land use conditions.
- Transportation and land use conditions in the future without major changes to zoning and the transportation infrastructure.
- Transportation and land use conditions in the future with different scenarios of zoning and transportation improvements.
- Recommendations for the study area and individual communities with respect to transportation improvements and zoning and land use changes. ✷

Appendix F4.2

Long Range Transportation Plan*****

*****Appendices contain partial copy of the referenced document.
See accompanying CD for full copy.

Orange County Transportation Council

Long Range Transportation Plan

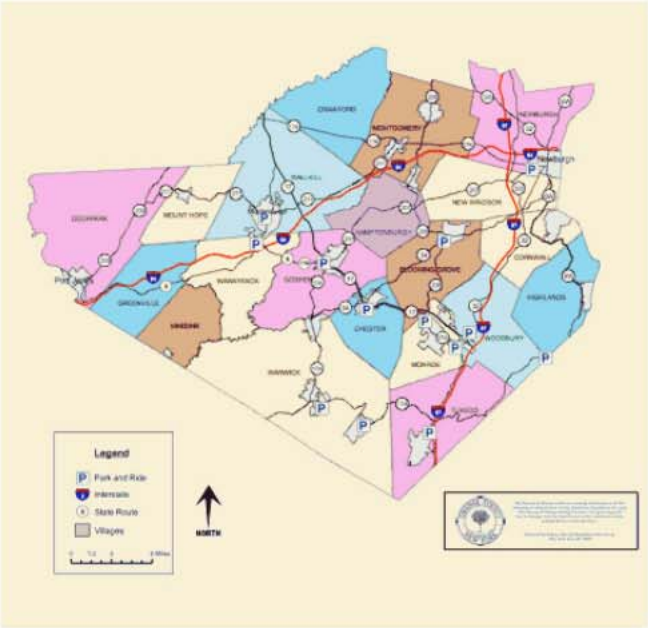
2011-2040

Orange County Transportation Council
Long Range Transportation Plan
(2011 – 2040)

TABLE OF CONTENTS

Chapter 1 – Introduction

In recent years Orange County has been one of the fastest growing counties in New York State. Increasing residential development, population growth, commercial development, and all the cars and trucks that come along with those things have contributed to making Orange County a visibly different place than it was not very long ago. Of late there has been substantial slowing in the pace of development with the recession and other factors. Orange County is in an important phase of land development and evolution of its regional identity. A combination of features -- notably varied and attractive landscapes, ready accessibility to metropolitan New York and a four State region, and high quality, safe communities -- have made the County a leader in growth and development in recent decades. Recently, the pace of new home and retail center construction seemed to have never been quicker. Job growth, retail sales, and real estate values were strong. Several large regional projects -- highway and commuter rail improvements, medical facilities and distribution centers, new housing -- all symbolized opportunity and prosperity.



Yet growth has real costs. Several of our historic cities and villages still struggle for a role in that prosperity, and six of these historic centers had losses of population in the last decade. Relative affordability stimulated significant in-migration, but diminished housing affordability. Economic realities continue to force more and more farm families to consider the option of selling their farms. A growing number of people complain about traffic congestion, the rising cost of providing education and other public services.

Orange County received its charter as one of the original counties of New York State in 1687. Today, the County has 20 towns, 19 villages and 3 cities. Transportation is deeply rooted in its history, beginning with Henry Hudson's exploration of the river bearing his name and his anchorage off Cornwall Landing on a September night in 1609. A progression of transportation systems has defined the county's settlement pattern and, from an overall perspective, the framework for its continued evolution.

Located at the geographic center of the Boston to Washington corridor of 40 million people and the northern fringe of the 20-million New York-northern New Jersey-Long Island, NY-NJ-CT-PA Consolidated Metropolitan Statistical Area (CMSA), Orange County has both regional and metropolitan transportation connections.

Transportation is defined as the physical movement of people and goods from one place to another. Dispersed origins and destinations for freight and the desire of people to reside away from where they work and trade has fostered the expanded use of motor vehicles. This evolution in demand has resulted in the continuous call to expand capacity on the highway network. It has both contributed to and has been fostered by dispersed land use patterns in residential and non-residential development, commonly

characterized as sprawl. One view is that today's settlement patterns are simply the response to a fundamental human desire for personal space, realized only because freedom of movement is provided by the individual vehicle.

Regardless of the basic causes, the dispersion of activity and development, from central cities to suburbs, has been apparent in Orange County. Population increased from 221,647 in 1970, to 307,647 in 1990, and to 372,813 in 2010.

The nature of activity in the County has also defined the character of its development. It is not simply a "bedroom suburb" of the New York City Metropolitan area; Orange County has its own employment base. Residents fill about 65.2 percent of these jobs. Much of the employment, housing and shopping is dispersed, making transit and other modes of travel difficult and therefore reinforcing dependence on personal vehicles for work trips. There is on average one vehicle available for every licensed driver in Orange County. This is typical of most suburban counties in New York State. For now, the primary exception to reliance on personal vehicles is for commuting trips to New York City, Westchester County and New Jersey. These trips are made on a variety of modes.

As shown in this figure, New York City is about 50 miles from the Village of Goshen (the County seat and approximate geographic center of the county). Proximity to the largest metropolitan center on the East Coast, as well as higher wage jobs and higher housing prices in areas in the more immediate New York metropolitan area, have fostered growth in Orange County's population.

Increasingly, Orange County is being integrated into the larger New York metropolitan region. The continued expansion of regional transportation systems, coupled with the relative affordability of housing and the attractive, safe living environment, have encouraged the in-migration of a population that often works in Westchester and Rockland Counties, New York City, and northern New Jersey. These same transportation systems, notably three interstate highways, a passenger rail line, and an international airport poised for growth, have also helped to attract businesses into the County seeking buildable, affordable sites with ready access to the largest market in the United States.

Orange County is indeed at a crossroads, figuratively (land use / economy) as well as literally. It has what few counties and regions, and many states, don't have, three intersecting interstate highways: Interstate 84, Interstate 87 (the NYS Thruway) and future Interstate 86 (NYS 17). These highways give Orange County unparalleled highway access to the Northeast, the Midwest and the South. A byproduct of the County's interstate road access is a clustering of big box distribution and retail uses near the interstate highways. This clustering provides important economic benefits as well as challenges regarding truck access and safety, and a reminder of the need to maintain economic diversity. Three regional shopping center areas have been built at the strategic locations near the intersections of these interstate arterials:

- Woodbury Common Premium Outlet Center (1985; expanded twice; 800,000 sq.ft.) at the intersection of I-87 and NYS Route 17
- Galleria at Crystal Run (1992; 1,100,000 sq. ft.) at the intersection of I-84 and NYS 17.
- Newburgh Mall

The areas around each of these large commercial developments have seen additional commercial development including smaller shopping centers and "big box" retail stores. Another large regional shopping mall ('Marketplace Mall') proposed near the intersection of I-87 and I-84 adjacent to the

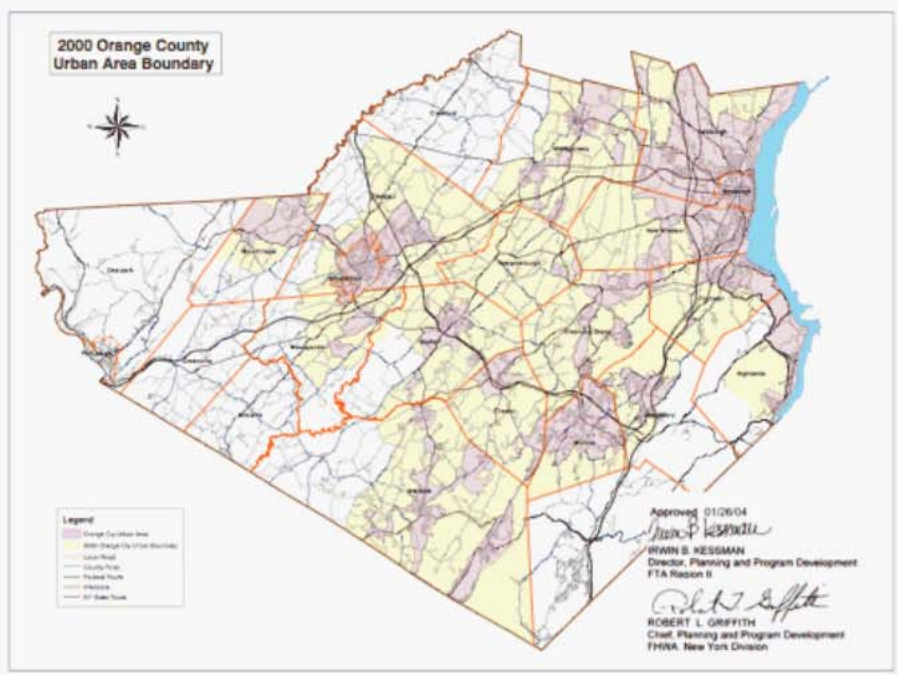
Newburgh Mall received development approval but has yet to begin construction due to the state of the economy. These commercial developments have altered shopping patterns, challenging efforts to reinvigorate the commercial centers of traditional downtowns and weakening older suburban shopping centers.

Many towns have experienced significant residential and commercial development, with development often encroaching on the surrounding country-side. New housing in the county was being occupied as quickly as it could be built, though the residential construction and real estate markets have slumped. The pace of redevelopment of older housing has slowed. Redevelopment efforts in the cities and older villages in Orange County are ongoing with notable success in Cornwall, Warwick, Goshen, Montgomery, and Washingtonville among others. The City of Newburgh, which recently updated its master plan, hosted a week-long planning charette focused on waterfront redevelopment, added to a surge for overall city revitalization; however that waterfront development has not occurred

Fortunately, past development patterns in the county mostly extended historic patterns focusing on areas served by central water and sewer systems. This left significant undeveloped areas, including prime agricultural lands, undisturbed forests and other environmentally sensitive areas along with significant rolling, rural landscapes. This pattern may serve the County well in the future.

Chapter 2 -- OCTC & the Long Range Transportation Plan

Urbanized areas, as defined by the Census Bureau, with a population of over 50,000 are currently required to form or be part of a Metropolitan Planning Organization (MPO). The U.S. Census Bureau defines an Urbanized Area as a central place(s) and adjacent territory with a general population density of at least 1,000 people per square mile of land area that together have a minimum residential population of at least 50,000 people.



The Orange County Transportation Council (OCTC) is the MPO for Orange County, NY. It was formed in July 1982 with the name Newburgh Orange County Transportation Council, but was shortened to OCTC when the 2000 Census determined that the Middletown urban area exceeded a population of 50,000 (instead of adding a city name, the existing city name was dropped).

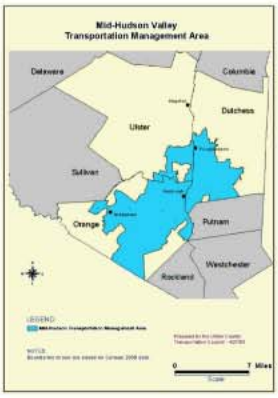
Like all other MPOs in the country, OCTC is a multi-agency consortium which is tasked with certain responsibilities in accordance with Federal transportation legislation. The most recent legislation took effect in August 2005; the bill was titled the Safe, Accountable, Flexible, Efficient Transportation Equity Act of 2005 or SAFETEA. This legislation was effectuated by the US Department of Transportation through Federal regulations. Development of a new five year extension is overdue.

Like previous Federal transportation legislation, SAFETEA requires that MPOs produce three major products: a Long Range Transportation Plan; a Transportation Improvement Program (TIP) that sets out a schedule of capital projects to be funded and built/undertaken; and a Unified Planning Work Program (UPWP). Given that the consortium is not an entity which can enter into agreements, each MPO has a host agency; here it is Orange County.

While there are numerous urbanized locations in Orange County, the transportation council together with the State and Federal governments developed a generalized urbanized area boundary which includes all the urban areas as of the 2000 Census plus those areas which were reasonably expected to become urbanized over the subsequent twenty year period. Nevertheless, the OCTC planning area comprises all of Orange County. Update of this generalized urban boundary follows each decennial census.

Mid-Hudson Valley Transportation Management Area

Due to the nature of Census urban area designations, the urbanized areas on either side of the Hudson River in Orange and Dutchess Counties are connected. This area is known as the Poughkeepsie-Newburgh Urbanized Area. With the 2000 Census, this multi-county urbanized area was found to have grown to encompass parts of Ulster County, across the Hudson from the City of Poughkeepsie in Dutchess County. The population of the Poughkeepsie-Newburgh urbanized area was 351,000 in 2000 according to the Census Bureau. A population of 200,000 is the threshold the Federal government has set for establishing a Transportation Management Area (TMA). The Mid-Hudson TMA is a joint activity of the Orange, Dutchess, and Ulster County Transportation Councils. There is no separate governing entity for the TMA; the three MPOs coordinate actions, primarily through their staff.



TMA activities include the sub-allocation of certain Federal transit funds, improved coordination of inter-county transit operations, and undertaking a Congestion Management Process which was initiated in 2005. The FHWA and FTA completed the first TMA certification review in 2005 and another in 2010. The findings of the certifications can be fairly summarized as being generally positive with some recommendations for improvement. These certification reports are posted on the OCTC website (www.orangecountygov.com/planning/octc).

OCTC Structure

Two documents set forth the makeup of OCTC and how it operates: (1) An agreement between New York State and host agency Orange County and (2) the OCTC Operating Procedures which were last revised in November 2007. The Council meets as necessary during the year. A Technical Committee comprised of staff from the various OCTC members meets monthly. The Executive Committee (voting body or 'policy board' as termed by other MPOs) of the Council is comprised of the following members and voting representatives:

1. Permanent Voting Members:
   - Orange County Executive, Permanent Chairperson
   - NYSDOT Region 8 Director, Permanent Secretary
   - Metropolitan Transportation Authority Executive Director
   - NYS Thruway Authority Executive Director
   - City of Middletown Mayor
   - City of Newburgh City Manager
   - City of Port Jervis Mayor

2. Two Town Supervisors from the following areas on a 2-year rotating basis:

- Newburgh Urbanized Area (Cornwall, Montgomery, New Windsor, Newburgh)
- Southern Area (Blooming Grove, Chester, Highlands, Monroe, Tuxedo, Warwick, Woodbury)
- Western Gateway Area (Crawford, Deerpark, Goshen, Greenville, Hamptonburgh, Minisink, Mt. Hope, Wallkill, Wawayanda)

3. Two Mayors from any two of Orange County's Villages for a 2-year rotating term. [Though co-located Villages and Towns cannot be voting members at the same time.]

Non-Voting Members of the Council are:

- All other Towns and Villages
- NYS Bridge Authority Director
- Federal Transit Administration Regional Administrator
- Federal Highway Administration Division Administrator
- Port Authority of New York and New Jersey

The Technical Committee is responsible for assisting the Council and staff regarding proposed programs and projects to be addressed in the Long-range Transportation Plan, the UPWP and the TIP, and for making recommendations to the Council regarding policy issues. The Committee is made up of technical staff from each of OCTC's members.

The OCTC Staff functions are performed by the Orange County Planning Department and the NYSDOT Regional Office in Poughkeepsie. The OCTC County Planning Staff assumes primary responsibility for the development and administration of the UPWP and the coordination of data collection activities. While all members participate in TIP development, NYSDOT Regional Office staff play a key role in development and are responsible for TIP maintenance. Long-range transportation planning, including the maintenance/update of the Long Range Transportation Plan, is the joint responsibility of both agencies in coordination with the Transportation Council.

OCTC has a public participation plan which is part of the OCTC Operating Procedures. This plan is integrated with the voting representation structure for the Council. In addition to general county level participation opportunities (i.e. single events or meetings for the entire planning area), the participation plan outlines three geographic sub-regions for outreach. The towns in the county are represented on the MPO for voting purposes based on these same sub-regions (two town votes per sub-region). In completing this plan update, OCTC will conduct sub-regional public meetings in these areas, in addition to planning meetings of the Executive and Technical Committees. Materials are also posted at the OCTC website.

OCTC staff and member agencies routinely use visualization techniques in their planning efforts and public participation activities. These include standard techniques such as graphs, charts, photographs and maps. Newer techniques include software presentation tools, video, and static photo simulations. Software travel simulations using VISSIM, Synchro and others are also valuable for enabling the display of visual, animated simulations of current and alternative, potential future traffic and roadway configuration scenarios.

OCTC is a member of the New York State Association of MPOs (NYSAMPO). Through collaboration and joint work activities, all MPOs in New York are able to enhance their transportation planning efforts. NYSMPO activities are supported directly with FHWA and FTA planning funding which is matched by New York State. In addition to monthly staff director meetings, NYSAMPO has formed staff working

groups to address common issues and annually undertakes shared cost initiatives (SCI's) to examine specific topics from which all MPOs in New York will benefit. The New York State Department of Transportation participates in the selection of SCI projects and customarily provides half of the funding for such initiatives. The UPWP provides for the participation of OCTC members and staff in NYSAMPO activities which further its overall transportation planning efforts and capacity. Staff participate in monthly MPO Director's meetings, participate in the various staff level working groups as necessary, assist and participate with the conduct of SCI's as necessary and able, and otherwise collaborate with other NY MPOs and NYSDOT through this avenue. More information is available at the NYSAMPO website (www.nysmpos.org).

Long Range Transportation Planning Process

Transportation provides the linkages among the places in which we live, work and play. The Orange County Transportation Council provides a forum for ensuring that transportation planning and program decisions address the needs of the County's residents and visitors. The overall goal of the planning process is to provide safe, balanced and efficient transportation in Orange County as well as complementary transportation connections to the rest of the world. Guidance for how the transportation planning process is to be carried out and what, at a minimum, is to be examined is provided in Federal legislation. This legislation includes eight planning factors which are to be considered in State and Metropolitan transportation planning programs and projects. The OCTC Long Range Transportation Plan was last updated in 2007, and must be updated every four years.

The 1995 Long Range Transportation Plan ("2020 Vision Plan") considered a number of questions related to transportation and patterns of development in Orange County. That plan was updated in 1998 to provide new information where it was available and to continue to address those questions related to the interaction between transportation and land development patterns in the County. The 1998 update formed a framework for identifying studies and projects to be undertaken. The 2003 plan update reaffirmed the previous plans and was entitled "Vision 2025". The 2007 update of the OCTC Long Range Transportation Plan built on the foundation of earlier transportation plans and generally reaffirmed the previous plan policies and recommendations. It updated information and fiscal outlooks based on budget assumptions at the time. In addition to revised organization, the 2007 plan update also differed in the following ways:

- Presented a single future development (not three) based on the County Comprehensive Plan
- Updated to reflect new Federal surface transportation legislation (SAFETEA)
- Plan horizon year pushed from 2025 to 2035
- Recognition of partnership with Dutchess and Ulster Counties through the TMA including the implementation of a Congestion Management Process
- Goals and objectives – a distinct chapter with recommendations added by topic
- Eight planning factors instead of seven (security emphasized by being made its own factor; separated from safety)

As with the previous plans, the 2007 plan update acknowledged the significant and substantial interrelationship between transportation systems and the land uses and activities which they connect. It also acknowledged the planning of the multiple entities and agencies in and serving Orange County. These include the agency plans and funding outlooks of the major transportation agencies which utilize Federal funding as well as the planning which is supported by Federal funding (through the Unified Planning

Work Program or UPWP). The UPWP efforts are coordinated by the OCTC host agency staff at the Orange County Planning Department. The foundation for that planning is Orange County's Comprehensive Planning program and its priority growth area strategies. Major transportation agency planning is discussed in part within the chapters describing the various components of the transportation system. UPWP planning and related activities are discussed in Chapter 11.

This 2011 update of the OCTC Long Range Transportation Plan has relied on the document structure created in 2007. It most respects this is essentially a minor update, with the planning effort working primarily to update the information in the document, while extending the planning horizon to 2040 and developing new air quality conformity analyses. At the same time, however, due to the fiscal and economic problems in the state and nation, the program planning of its member agencies and related factors, this plan has been revised to acknowledge the increased fiscal constraints on transportation funding. The reduced levels of funding and acknowledgement that maintenance of the present transportation system infrastructure and services is outpacing that funding, there is only a single system expansion project explicitly noted in the plan and which was included as one of the four non-exempt projects in the accompanying air quality conformity analysis. That project (the Schutt Road Extension between the Galleria and Orange Plaza) is currently on the TIP and in design. The other three non-exempt projects are transportation demand management related programs, not physical infrastructure projects.

Appendix F4.3

Route 17 Transportation
Corridor Study*****

*****Appendices contain partial copy of the referenced document.
See accompanying CD for full copy.

FINAL

Route 17
Transportation Corridor Study

Sullivan County & Orange County

May 2013

Prepared for:

Prepared by:

HDR

WSP · SELLS

ASC

Table of Contents

APPENDICES

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EXECUTIVE SUMMARY

The New York State Department of Transportation has conducted a Transportation Corridor Study for an approximately 47-mile segment of New York State Route 17 between Monticello, Sullivan County, and Interstate 87 in Harriman, Orange County.

The objective of the Study was to examine the need for capacity improvements along the Route 17 corridor in Orange and Sullivan Counties. The principal result of the Study, as documented in the attached Transportation Corridor Study, was the recommendation of a corridor preferred alternative for improving existing and future capacity needs.

As part of the Study's development, a public outreach process was used to help gather input from affected stakeholders and provide an opportunity for the Department to provide stakeholders with valuable information about the corridor. The outreach process included:

- **Elected Officials Meeting** - A meeting with elected officials was held on April 24, 2012 where the Study's objectives and public involvement process was presented for discussion.
- **Public Workshops** - A series of public workshops were held to provide Study stakeholders with information on the Study's development and to receive valuable input.
- **Transportation Partnering Committee (TPC) Meetings** - The TPC was a working committee formed of volunteers to help provide direction and guidance in the development of the Study. The committee was comprised of local and State government officials with a direct transportation link to the Route 17 corridor. Members included representatives from the Town of Mamakating, Town of Thompson, Orange County Planning, Orange County Department of Public Works, Sullivan County Department of Public Works, Town of Goshen, Town of Blooming Grove, Village of Monroe, Town of Woodbury, MTA Metro-North Railroad and NYS Thruway Authority.

The Study was developed in a four step process. Step I included the development of corridor goal statements, a corridor vision statement, and collecting existing conditions data regarding the traffic, environment and land use.

During Step II of the Study's development, *corridor concepts* were evaluated that included:

- Taking no action;
- An additional General Use Third Lane;
- An additional High Occupancy Vehicle (HOV) Lane;
- An additional lane dedicated to bus rapid transit and;

- Light rail transit.

During Step III of the Study's development, the following concepts were progressed as *corridor feasible alternatives* and evaluated more closely:

- General Use Third Lane from I-87 to just west of Middletown and;
- High Occupancy Vehicle Lane from I-87 to just west of Middletown.

Ultimately, the *Corridor Preferred Alternative*, to addressing existing and future capacity needs, was determined during Step IV of the Study's development as follows:

- General Use Third Lane from I-87 to just west of Middletown.

The Study also considered, at a planning level of analysis, improvements to key interchanges in both Orange and Sullivan Counties, future locations for park-and-ride facilities, and provisions for future transit.

REPORT SUMMARY

RS-1 Introduction

The New York State Department of Transportation (NYSDOT) has conducted a Transportation Corridor Study (the Study) for an approximately 47-mile segment of New York State Route 17 (Route 17/Future I-86) extending between Exit 103 (Rapp Road) in Sullivan County and Exit 131 (I-87 – Harriman) in Orange County. The Study was completed under Congressional Earmark #4615 sponsored by Senator Charles Schumer, (D-NY), the stated intent of which was to examine the need for capacity improvements in the Route 17/I-86 corridor in Orange and Sullivan Counties. As documented in this Transportation Corridor Study Report (the Report), the principal result of the Study is the identification of a preferred transportation alternative that addresses the identified capacity needs of the corridor for future development by NYSDOT.

RS-2 Background

Route 17 within the Study corridor is generally a four-lane expressway, with two travel lanes in each direction, with the exception of portions of the roadway between Exit 112 (Masten Lake/Yankee Lake/Mountaindale) and Exit 115 (Burlingham Road) in Sullivan County, and between Exit 122A (Fletcher Street/Goshen) and Exit 125 (NY Route 17M/South Street) in Orange County, where segments of the roadway include three travel lanes. The distance between interchanges in the corridor ranges between 0.5 and 3 miles.

Route 17 serves as both a major commuter route and a primary recreational route. Commuter use results in significant levels of traffic congestion on weekdays, while recreational use results in significant levels of congestion on Friday and Sunday evenings. Traffic congestion is particularly severe between Exit 121 (I-84 – Newburgh/Port Jervis) and Exit 131 (Harriman) at the eastern end of the corridor. Congestion and delay on Route 17 causes a significant amount of traffic to divert to other state highways and local roads, and results in traffic congestion within the larger Route 17 Study corridor.

It is projected that traffic congestion on Route 17 will worsen over the near-term and long-term planning horizons as a consequence of projected population growth and development within the corridor. Projections by the Cornell Program of Applied Demographics indicate that the population of Sullivan County will surpass 79,300 people in 2020, a 2.3% increase over the population of the County in 2010. Estimates of projected growth in population developed by the Orange County Planning Department indicate that the population of Orange County will reach 400,000 by the end of 2013 and will exceed 430,500 in 2020, a 7.6% increase over the seven intervening years. Congestion is also anticipated to worsen in the future as a consequence of new development in both Orange and Sullivan Counties, including the expansion of the Center for Discovery and EPT Concord Projects in Sullivan County, both of which have been supported by the Mid-Hudson Economic Development Council.

The Route 17 Corridor is served by a number of transit services, including commuter rail, commuter and intercity bus, and local bus transit. Despite the increasing use of these services, traffic volumes and levels of congestion on Route 17 continue to increase. Consequently, additional transportation capacity is needed to address existing and projected levels of congestion in the corridor, provide for enhanced mobility, and allow for future economic growth in both Sullivan and Orange Counties.

Currently planned improvements to Route 17 in the corridor are limited to the needed reconstruction of the Exit 122 (Crystal Run Road) Interchange starting in 2013 and the reconstruction of Exit 131 (Harriman) Interchange to be completed by 2022. While these improvements address local operational needs they do not provide for overall needed corridor capacity needs.

In addition to the need for additional transportation system capacity, there is also the need for improvements at selected interchanges to address existing high accident locations, to support existing and projected development, and to provide new and expanded park-and-ride facilities in the corridor. Existing park-and-ride facilities are substantially limited to a number of park-and-ride facilities in eastern Orange County.

RS-3 Purpose of Study

Based on the identified need for increased transportation capacity described above, the purpose of the Study is to identify one or more transportation improvements that will address projected increases in population in the corridor and provide for anticipated levels of development through the year 2045.

RS-4 Vision for the Route 17 Corridor and Corridor Goals

Based on the identified need for the Study, and public input garnered through completion of the Study public participation process, the following vision statement has been developed for the NYS Route 17 corridor:

> *The Route 17 corridor in Orange and Sullivan Counties will support a robust, economic future with safe, efficient access for all users while preserving its scenic beauty and natural resources. Freight commerce, recreational travelers, and daily commuters will travel between New York City and the Hudson Valley-Catskill Mountain region along a well managed and maintained, modern facility that simultaneously supports long distance access to the southern tier of New York State and provides enhanced mobility for local trips among adjoining communities.*

Based on the identified vision for the corridor and public input obtained through the Study public participation process, the following goal statements were established for the corridor:

- Improve corridor safety for all users and stakeholders.

- Provide a reliable transportation corridor that accommodates public transit, minimizes delay and accommodates current and future travel demand for all.
- Preserve corridor infrastructure investments in a fiscally sustainable manner.
- Modernize corridor roadway and interchanges while maintaining the quality of life and preserving the scenic beauty and natural resources.
- Provide a transportation corridor that supports and enhances the opportunity for continued economic development.

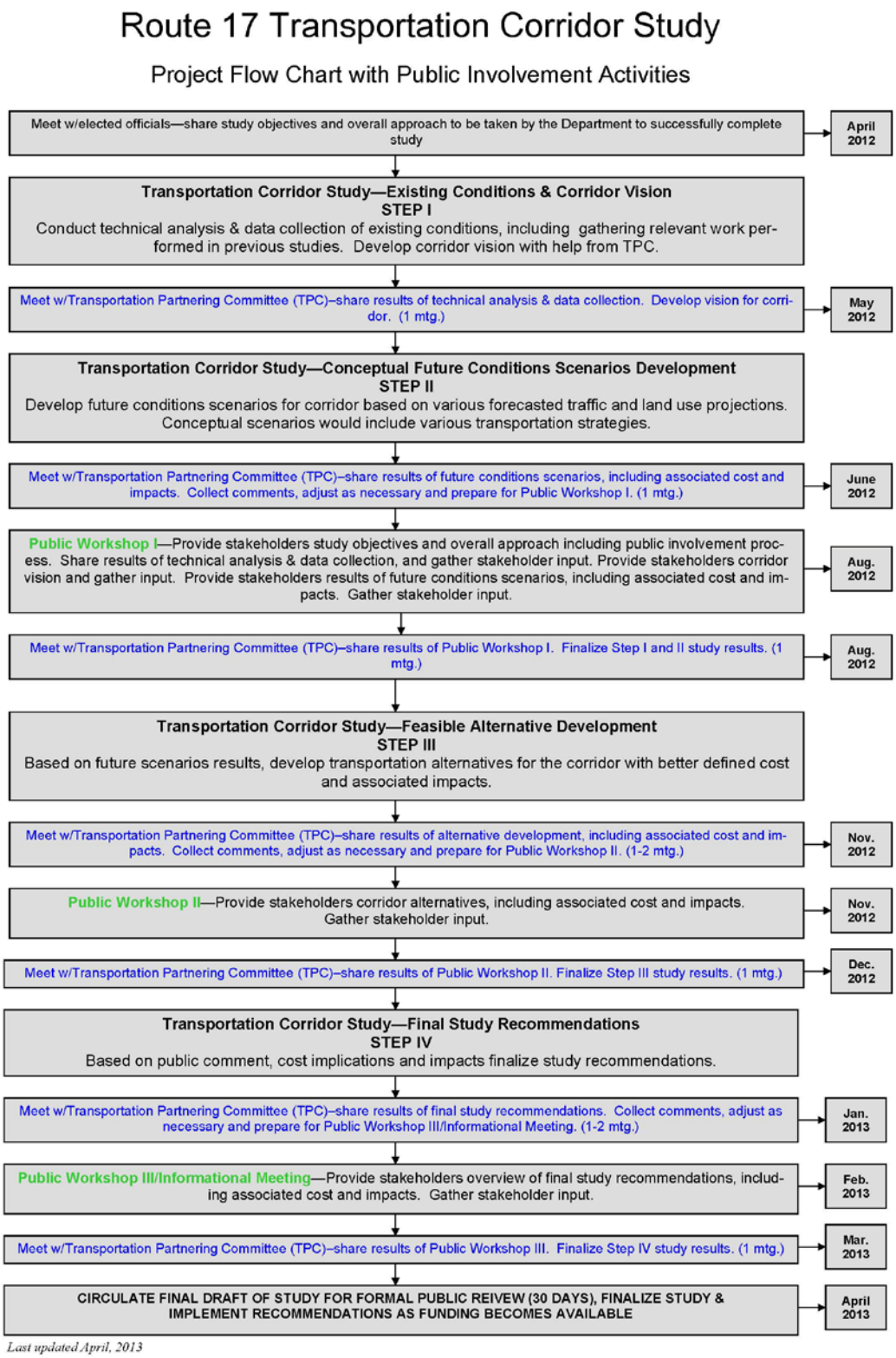
These goal statements were developed to help guide the Department in its planning and programming of future projects for the Route 17/Future I-86 corridor.

RS-5 Study Development Process

As shown in Figure RS-1, the Study was completed through the following four-step process:

- **Step I "Existing Conditions and Corridor Vision"** included collection of data on existing (Year 2010) transportation, land use, demographic, and environmental conditions in the Study corridor for Sullivan and Orange Counties, and the development of the vision statement and goal statements for the corridor.
- **Step II "Conceptual Future Conditions Scenarios Development"** included the development of a description of future (Year 2045) "baseline" conditions, which incorporated projected growth in the corridor, including anticipated major development projects and planned and programmed improvements to the regional transportation system. Transportation concepts were then identified to address the anticipated travel demand that would be generated in the Route 17 corridor by projected growth. These transportation concepts were screened to identify those solutions that had the greatest potential to meet corridor vision and goals, and warranted further development and evaluation.
- **Step III "Feasible Alternative Development and Analysis"** included the further development of the "shortlist" of transportation alternatives that survived the screening evaluation in Step II to better define their costs and their relative ability to address corridor transportation goals and development needs.
- **Step IV "Final Study Recommendations"** included the development of final Study recommendations based on the ability of each solution to satisfy the vision and goals for the corridor, public comment on each solution, the capital costs of each solution, and the impact of each solution on traffic, land use, economics and the environment.

Figure RS-1: Project Flow Chart



RS-6 Public Participation Process

Each step in the study development process was supported by the results of a robust public participation process that involved key stakeholders in Sullivan and Orange Counties. This process included four major elements:

- **Elected Officials Meeting.** A kickoff meeting was held with key elected officials to provide an overview of the Study, and to provide opportunity for officials to identify the critical concerns that warranted evaluation in the Study.
- **Public Workshops**. A total of six public workshops were held in Sullivan and Orange Counties to provide information on the Study to the general public and to provide an opportunity for the general public to comment on all aspects of the Study. Workshops were scheduled to coincide with the completion of the major milestones of the Study.
- **Transportation Partnering Committee (TPC) Meetings.** The TPC was a working committee comprised of government volunteers from the Town of Mamakating, Orange County Planning, Orange County Department of Public Works, Sullivan County Department of Public Works, Town of Goshen, Town of Blooming Grove, Village of Monroe, NYS Thruway, Town of Woodbury, and MTA Metro-North Railroad that provided direction and guidance in the development of the Study. As with the public workshops, TPC meetings were scheduled to coincide with completion of the major milestones of the Study.
- **Direct Meetings with Key Stakeholders**. In addition to the public workshops and TPC meetings, meetings were held with local government representatives and business leaders in the corridor to discuss future development plans, local zoning, growth issues, and possible impacts that may result from the proposed transportation improvements.

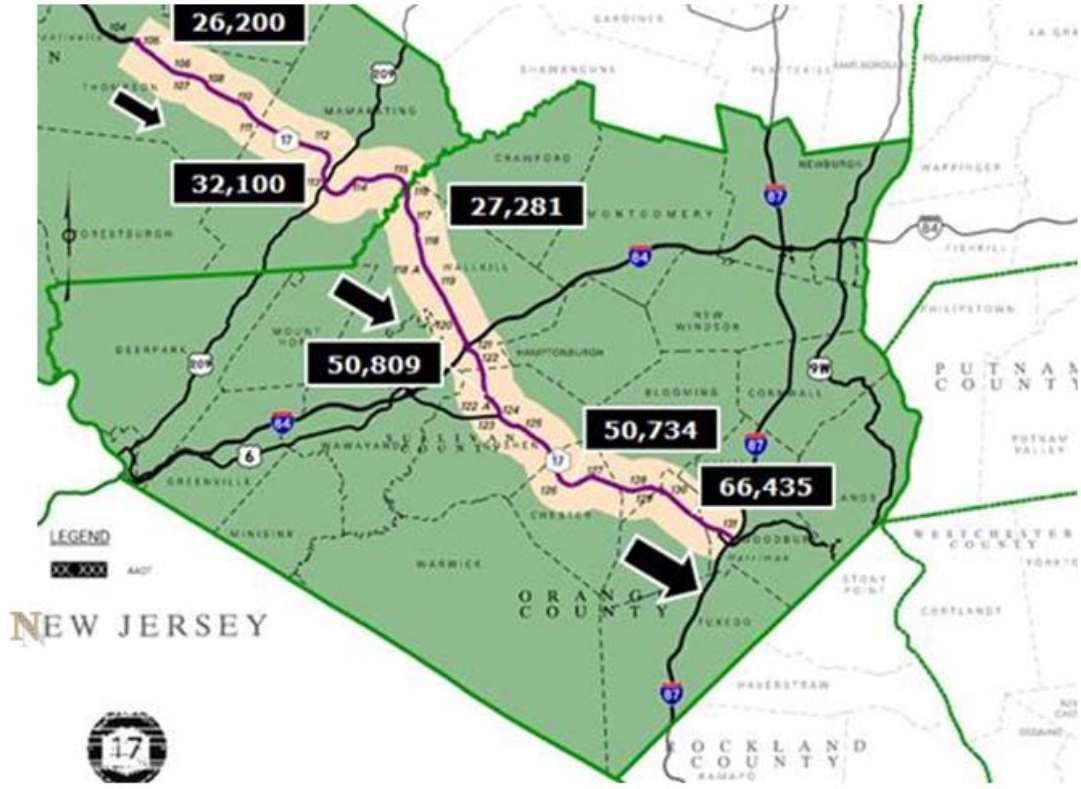
RS-7 Existing (Year 2010) Conditions in the Study Corridor

As summarized below, a key element of the initial step of the Study was the development of a description of existing transportation, land use, demographics, and environmental conditions in the corridor.

RS-7.1 Transportation Conditions

- **Traffic Volumes**. As depicted in Figure RS-2, current (2010) Average Annual Daily Traffic (AADT) traffic volumes in the Study corridor range from approximately 26,000 vehicles per day (VPD) at the western end of the corridor to over 66,000 VPD at the eastern end of the corridor.

Figure RS-2: Existing AADT



- **Level of Service (LOS).** Level of Service is a qualitative measure of operational conditions that is used to describe the degree of congestion on a roadway. Level of Service ratings range from LOS A (free flow condition) to LOS F (breakdown conditions). Existing (2010) LOS on Route 17 during the peak AM commuting period in the eastbound direction range between LOS A and B throughout Sullivan County and the western portions of Orange County, to LOS C and D near the I-84 interchange at Exit 122 (Crystal Run Road/East Main Street) in Orange County, to LOS E and F at the eastern end of the Study corridor between Exit 130 (NY Route 208 – Monroe/Washingtonville) and 131 (Harriman). Similar conditions to those in the AM peak commuting period occur in the westbound direction during the PM peak commuting period.
- **Frequency of Accidents in the Study Corridor.** High Accident Locations (HALs) are defined by NYSDOT as areas with an unusually high rate of accidents and/or fatalities compared to the rates of accidents and fatalities on other roadways in New York State with the same functional classification. A number of HALs exist along the study corridor at locations near major interchanges at " traffic weaving" sections, in which there are high levels of merging and diverging traffic.
- **Rail and Bus Transit Services.** Sullivan County is served by the Sullivan County Transportation Department, which provides two round-trip routes, one of which operates on Thursdays from Lumberland/Bethel to Monticello, and the other operates

on Fridays from Callicoon to Monticello. The ShortLine bus service operates local routes from the Village of Monticello, and regional commuter bus service to the Port Authority Bus Terminal in Manhattan.

- Orange County is served by the MTA Metro-North Port Jervis commuter rail line, and a number of regional, local, para-transit, and dial-a-bus services. Data collected by Metro-North in the spring of 2010 showed a total of 1,880 riders during the AM peak period on the Port Jervis Line. The regional bus routes generally provide commuter service by ShortLine/Coach to New York City. Local bus routes are largely limited to service to commercial and retail areas in the cities of Newburgh and Middletown and the Villages of Monroe and Kiryas Joel. Approximately 5.3% of Orange County residents use public transit to commute to work.
- **Commuting Patterns.** Based on available U.S. Census Bureau journey-to-work data for Orange County for the period 2005 through 2009, approximately 55.5% of daily work trips have both origin and destination within the county borders, and 29.6% of daily work trips are by county residents to locations outside county borders. Of all workers commuting out of Orange County, 19% were headed to Manhattan, 17% to Rockland County, 14% to Bergen County, and 11% each to Westchester and Dutchess Counties. In Sullivan County, nearly 72% of commuters work within the County. Of all workers commuting out of Sullivan County, approximately 57% were headed to Orange County, 9% to Ulster County, 8% to Manhattan, 4% to Rockland County, and significantly lower percentages to all other destinations.
- **Freight**. Interstates I-87 and I-84 are the primary freight roadways linking the Mid-Hudson region to locations in the Northeast, Canada, the Midwest, and South. I-84 connects the region with New England to the east and Pennsylvania to the west, while I-87 connects the region with New York City and the Capital Region. Route 17 connects the region with the Southern Tier of New York State and carries substantially less freight than either I-84 or I-87. There are no truck rest areas along the Route 17 Study corridor.

RS-7.2 Land Use

The approximately 47-mile corridor passes through eight towns and a number of additional municipalities. The large geographic extent of the Study corridor is reflected in a diverse range of land uses in the corridor. Overall, land uses in the area are predominantly suburban residential and rural, with higher densities in village, town and city centers. Mixed commercial uses are primarily concentrated around municipal centers. Woodbury Common Premium Outlets, located off of Exit 131 (Harriman) at the eastern end of the Study corridor, is a major destination retail center drawing consumers from the New York Metropolitan Region. Land uses of regional significance in Sullivan County include the Center for Discovery, the largest employer in the county, and Bethel Woods Center for the Arts.

RS-7.3 Demographics

- **Orange and Sullivan County Population.** The U.S. Census Bureau reports that the population of Sullivan County was 77,547 individuals in 2010, a 4.8% increase from the year 2000, and the population of Orange County was 372,813 individuals in 2010, a 9.2% increase from the year 2000.
- **Environmental Justice Populations.** Minority and low-income populations ("Environmental Justice" populations) are protected against disproportionately high and adverse impacts from public actions by both federal and state orders and related regulations. In New York State, "Potential Environmental Justice" (PEJ) Areas have been identified by the New York State Department of Environmental Conservation (NYSDEC). Within the Study corridor in Sullivan County PEJ areas have been designated in the Village of Monticello and the Town of Thompson, while in Orange County, PEJ areas have been designated by NYSDEC in the Town of Monroe, the Village and Town of Chester, the Village and Town of Goshen, the Town of Wallkill, and the City of Middletown.

RS-7.4 Environmental Conditions

- **Noise & Air Quality.** A review of land uses in the Study corridor indicates that there are numerous noise- and air quality-sensitive land uses in the corridor. In addition, Orange County has been named as part of a non-attainment area for fine particulate matter ($PM_{2.5}$) and ozone. Effective December 14, 2009, the New York-New Jersey-Connecticut metropolitan area was classified non-attainment by the U.S. Environmental Protection Agency (USEPA) for the 24-hour $PM_{2.5}$ standard.
- **General Ecology and Endangered Species**. A number of threatened and endangered species have been identified by the U.S. Fish and Wildlife to be present in Sullivan and Orange Counties and are identified in the main body of this report.
- **Wetlands.** National Wetland Inventory (NWI) freshwater wetlands and NYSDEC wetlands are present along major portions of the Study corridor, including the Basha Kill Wildlife Management Area south of Exit 113 (NY Route 209 – Wurtsboro/Ellenville). NWI wetlands are under the jurisdiction of the U.S. Army Corps of Engineers (USACE). Additional jurisdictional wetlands may potentially be located within the Study corridor, but would require site reconnaissance for their identification.
- **Navigable Waters and Wild, Scenic, and Recreational Rivers.** Watercourses located within the Study corridor are generally classified by the NYSDEC as either Class B (indicating waters supporting contact recreation) or Class C (indicating waters supporting fisheries and suitable for non-contact activities). There are no Wild, Scenic, or Recreational river segments within one mile of the Study corridor.
- **Parks, Cultural Resources and Farmland.** Several historic sites listed on or eligible for listing on the State or National Registers of Historic Places are located in proximity to the Study corridor. In addition, a review of the New York State Office of Parks,

Recreation and Historic Preservation (OPRHP) online database indicates the potential presence of archaeologically significant areas throughout the Study corridor. A substantial portion of the Study corridor is in agricultural use. Prime farmland soils exist in several parts of this area.

RS-8 Corridor Conceptual Future (Year 2045) Conditions

Conditions in the future (year 2045) were identified to establish the traffic, transit and land use conditions that would be present in the corridor without any corridor-level improvements to Route 17.

- **Future (Year 2045) Traffic Conditions.** Future (Year 2045) traffic conditions within the Study Corridor in Orange County were estimated through the use of a regional transportation model maintained by the Orange County Planning Department. Since this regional transportation model does not extend into the Sullivan County portion of the corridor, future year estimates of travel for the segment of the corridor in Sullivan County were taken from Route 17/I-86 Conversion Design Study Reports.
- These projections indicate that traffic volumes on Route 17 in Sullivan County will increase from 0.3% to almost 2% per year throughout the section of corridor between Exits 103 (Rapp Road) and 115 (Burlingham Road), and that traffic volumes in Orange County will increase between 22% and 200% over the 35-year 2010-2045 period depending on the section of the corridor. This is equivalent to an increase of 0.5% to almost 3% per year throughout the corridor. The results of the assessment further indicate that congestion along the easternmost segment of Route 17 in Orange County will operate at unacceptable levels of congestion (LOS E and F), and that eastbound and westbound segments of Route 17 between Exit 120 (NY Route 211/Middletown) and Exit 121 (I-84 –Newburgh/Port Jervis) will worsen to LOS E and F.
- **Future (Year 2045) Transit Improvements.** The West of Hudson Regional Transit Access Study (WHRTAS), currently underway, is expected to recommend long-term improvements to transit service along the I-87 and Route 17 corridors. In the near term, a number of transit projects are listed in the 2011-2015 *Transportation Improvement Program (TIP)* for Orange County, including park-and-ride facilities at the Village of Kiryas Joel and the Village of Monroe, rehabilitation of existing transit facilities in the City of Middletown, operational improvements to the MTA Metro-North Port Jervis Line, travel demand management program activities in Orange County, and enhancements to existing bus service.
- **Future (Year 2045) Land Use.** By 2045, much of Orange County will be substantially "built out" as allowed under existing zoning controls of the jurisdictions within the County. Major planned development projects in Orange County include a three-story 1,000 space parking garage at Woodbury Common, and a 45-acre warehouse development on NY Route 17M. Major proposed development projects along the Study corridor in Sullivan County include expansion of the Center for Discovery, the EPT Concord Resort, and the Shawaga Lodge Road Development project.

RS-9 Transportation Corridor Concepts and Identification of Corridor Feasible Alternatives

Five transportation concepts have been identified as having the potential to meet the vision and goals of the Study and to serve projected future (Year 2045) traffic levels. The concepts were developed to a schematic level of design, including the preparation of typical plans and cross sections identifying the nominal number of lanes, lane and shoulder widths, and other geometric characteristics. Cost estimates for each concept were based on per lane mile costs for similar types of facilities in the nation with similar cross sections. The "per lane mile" costs were consistently applied to the full project limits to provide comparable cost estimates for each of the five transportation concepts.

The five transportation concepts with the potential to meet the study's vision and goals and to address projected future (Year 2045) traffic needs were evaluated on the basis of their relative cost, operational and design features, right-of-way requirements, support to economic development, and environmental effects. In addition, the concepts were reviewed by the TPC and in public workshops in Sullivan and Orange Counties, during which the general public was given the opportunity to comment on each of the competing concepts.

Provided below is a description of each concept and the results of this evaluation process.

- **No Build**. Under this concept, there would be no significant improvements beyond those currently planned and programmed in the corridor. These currently planned and programmed improvements include enhancements to Exits 122 (US Route 6– Middletown/Port Jervis) and 131 (Harriman), and standard maintenance activities. The No Build concept would require relatively minor capital investment, but would not result in needed corridor capacity or safety improvements or provide adequate support to economic development in the region. As a consequence, it was eliminated from further consideration, but was used as the baseline against which other identified concepts were evaluated.
- **General Use Third Lane.** Under this concept a third lane would be added in the median of Route 17. Since the design of the existing Route 17 provides sufficient room for the development of a third lane in the median of the roadway, a third lane has already been developed in certain segments of Route 17 within the corridor. This concept would include the introduction of a median barrier and the development of new storm water infrastructure. Widening of the roadway would be required in certain areas where there are sight distance obstructions or to correct existing safety or operational problems that would be exacerbated by the addition of a new lane. The General Use Third Lane would be developed between Exits 120 (NY Route 211 – Middletown) and 131 (Harriman), a distance of approximately 22 miles, and the segment of the corridor that is projected to experience the highest levels of congestion in the year 2045.

  The widened roadway would improve capacity, address identified HALs, and support regional economic development through improved access to the corridor. It would also provide additional capacity for use by trucks carrying freight within and through the

corridor. Potential environmental effects of this concept would be minimal compared to other concepts since it would generally not require construction beyond that of the existing roadway alignment. Therefore, this concept was advanced for further evaluation since it would have the potential to achieve the Study vision and goals.

- **High Occupancy Vehicle Lane.** High Occupancy Vehicle (HOV) lanes are managed lanes that provide a dedicated lane that separates high occupancy vehicles (i.e., busses and private automobiles occupied by more than one person) from general use traffic. For the Route 17 corridor, an HOV lane would be developed on each side of the roadway in the existing median area. Similar to the General Use Third Lane concept, the HOV lane would be developed between Exits 120 (NY Route 211 – Middletown) and 131 (Harriman), a distance of approximately 22 miles and the segment of Route 17 projected to experience the highest levels of congestion in the year 2045. The HOV lane would be separated from general use traffic by a painted buffer. Widening would be required at the access points so that an auxiliary lane could be provided to allow vehicles to safely transition between the HOV lane and general use lanes. The HOV lane concept would have the potential to provide needed additional capacity, address identified safety concerns and could encourage regional economic development in Sullivan and Orange Counties. Implementation of this concept could potentially result in some adverse environmental effects since its footprint would extend outside the existing roadway alignment. This concept was advanced for further evaluation since it had the potential to achieve the Study vision and goals.

- **Bus Rapid Transit.** Bus Rapid Transit (BRT) is a public transportation mode that uses buses to provide faster and more efficient service than ordinary bus service. For the Route 17 corridor, barrier separated BRT lanes with eight feet wide shoulders would be placed in the median of the highway between Exit 120 (NY Route 211 – Middletown) and Exit 131 (Harriman). The BRT concept in the western part of the corridor could be implemented as a future initiative since, in the 2045 planning year, it would be significantly faster to travel by automobile on the existing general purpose lanes through this uncongested segment of Route 17 rather than on BRT. Stations would also be developed in the median and would require additional widening and the installation of overhead walkways to provide pedestrian access. This concept would have the potential to result in improved capacity, address safety concerns, and could encourage regional economic development through improved access to Route 17 in the vicinity of planned development projects. Implementation of this concept could potentially result in adverse environmental effects since its footprint would extend outside the existing roadway alignment. However, it is projected that existing and projected population densities in Sullivan and Orange Counties would not be sufficient to support cost-effective investment in the BRT concept. In addition, the BRT concept would not connect with a supporting regional transit system at its eastern limit. As a consequence, this concept was eliminated from further consideration since it would not achieve the Study vision and goals.

- **Light Rail Transit.** Light rail transit (LRT) is a form of public transit that utilizes electric train cars operating on fixed guide rails. For the Study corridor, an LRT system would be developed between Exit 120 (NY Route 211 – Middletown) and Exit 131 (Harriman). The LRT concept in the western part of the corridor could be implemented as a future initiative since it would be significantly faster to travel by automobile on the existing general purpose lanes through this uncongested segment of Route 17 rather than on LRT. The LRT concept would be developed outside the highway right-of-way rather than within the median of the roadway, to provide convenient access to nearby city, town and village centers. However, it is projected that existing and projected population densities in Sullivan and Orange Counties would not be sufficient to support cost-effective investment in the LRT concept. In addition, the system would not connect with a supporting regional transit system at its eastern limit. As a consequence, this concept was eliminated from further consideration since it would not achieve the Study vision and goals.

The results of these assessments indicate that the General Use Third Lane and HOV Lane Alternatives are feasible alternatives with the potential to address future corridor capacity needs and warrant further detailed evaluation.

Travel Demand Management (TDM) and Transportation Systems Management (TSM) Measures In addition to the five identified concepts described previously, there are a range of Travel Demand Management and Transportation System Management strategies that could be potentially applied to the Study corridor, either alone or in conjunction with one or more of the transportation concepts identified above, to improve corridor traffic operational conditions. These include the following concepts:

- **TDM** programs focus on changing or reducing travel demand, particularly at peak commuting hours, instead of increasing roadway capacity. Some of the most promising TDM programs emphasize coordination with local employers on measures such as car or vanpooling programs, bus pass subsidies, alternative work schedules, telecommuting options, parking management, and providing financial incentives for the use of public transit.
- **TSM** programs constitute a separate but closely related set of strategies to TDM programs. TSM strategies are low-cost in nature, and include such measures as intersection and signal improvements, freeway bottleneck removal programs, and real-time transportation system monitoring and response systems.

TDM and TSM programs are most effective when linked to regional land use and growth strategies that focus growth near available transit facilities, and would require close coordination with municipal jurisdictions within Sullivan and Orange Counties.

Park-and-Ride Facilities and Improvements to Existing Corridor Interchanges In addition to the identified corridor concepts, potential locations for additional park-and-ride facilities were

identified, as were potential modifications to interchanges in Sullivan and Orange Counties to address HALs and to support existing and anticipated new development in the counties.

RS-10 Feasible Corridor Alternative Development and Evaluation

The General Use Third Lane and HOV Alternatives were evaluated in greater detail based on transportation modeling studies using the Orange County Regional Travel Demand Model, I-86 traffic projections, and available mapping from previous Route 17/I-86 Conversion studies. The results of this assessment are provided below.

RS-10.1 Transportation System Impacts

- **General Use Third Lane.** The results of the detailed transportation modeling indicate that the General Use Third Lane Alternative would provide the capacity needed on Route 17 between Exit 120 (NY Route 211/Middletown) and 131 (Harriman) to operate at acceptable LOS, and would eliminate all of the segments that were projected to operated at LOS E/F in the year 2045. Overall, the General Use Third Lane Alternative would provide sufficient capacity to address projected traffic volumes in the corridor, however, it would not encourage transit use or support other regional smart growth initiatives.
    - The capital cost of the General Use Third Lane was estimated to be approximately $291 million (2013 dollars).
- **High Occupancy Vehicle Lane**. It is projected that introducing an HOV lane would result in a modest shift of approximately 10-15% of vehicles from the general use lanes to the HOV lane. (A greater shift to the HOV Lane could potentially occur if the HOV Lane was linked to a regional system of HOV lanes along the I-87 and I-287 corridor in Orange, Rockland and Westchester Counties.) Based on the projected modest shift from the existing general purpose lanes to the new HOV Lane, an assessment was completed of the degree of congestion that would occur in the future (2045) with the HOV Lane alternative. The detailed modeling studies indicate that, although the HOV Lane would operate at free flow conditions (i.e., LOS A/B), the existing general use lanes would operate at congested LOS along the corridor in peak travel directions during both the AM and PM peak commuting periods.
    - The capital cost of the HOV Lane Alternative was estimated to be approximately $366 million (2013 dollars).

RS 10.2 Potential for Significant Environmental Impacts

- The General Use Third Lane Alternative would have little potential to result in significant environmental impacts since it would be substantially located within the existing right-of-way of Route 17, while the HOV Lane alternative would have a greater potential to result in impacts since it would require the use of land outside of the existing right-of-way.

RS 10.3 Right-of-Way Impacts

- It is anticipated that the General Use Third Lane Alternative would require minimal additional right-of-way since the average widening would be approximately six feet, while the greatest widening would be approximately eleven feet on the westbound roadway near Exit 121 (I-84 Newburgh/Port Jervis). The HOV Lane Alternative would require additional right-of-way and extend outside the existing alignment along some portions of Route 17 by approximately 13 feet, and, up to approximately 18 feet on the eastbound roadway near Exit 122 (Crystal Run Road/East Main Street).

RS 10.4 Impact on Land Use and Support to Economic Development

- Both the General Use Third Lane Alternative and the HOV Lane Alternative would support existing and projected land use in the corridor and related economic development by providing additional transportation capacity. However, the General Use Third Lane Alternative, as a consequence of its greater improvement in project congestion levels in the corridor, would have the ability to have a greater overall benefit to the transfer of goods and commute time to a larger segment of the population than with the HOV Lane Alternative.

RS 10.5 Provision for Park-and-Ride Facilities

- In addition to the development of additional corridor capacity through the development of a General Use Third Lane or HOV Lane, consideration was given to the provision of additional park-and-ride facilities throughout the corridor since the majority of existing park-and-ride facilities are located at the eastern end of the study corridor in Orange County. Based on a review of the location of existing facilities and the locations of existing and planned development projects in the corridor, additional park-and-ride locations were identified to be needed in the vicinity of Exits 104 (17B - Raceway/Monticello), 106 (Rt. 173 – East Broadway), 109 (Rock Hill/Woodridge), 113 (Rt. 209 – Wurtsboro/Ellenville), and 118 (Fair Oaks).

RS 10.6 Conceptual Interchange Planning Scenarios

- Potential modifications to existing interchanges along the corridor were considered in addition to the General Use Third Lane and HOV Lane Alternatives. The development of interchange scenarios focused on providing surrounding communities with better access to the corridor, while taking into consideration optimal interchange spacing and geometric requirements that would be associated with a future conversion Route 17 to Interstate I-86 and known development projects along the study corridor. Modifications to or elimination of existing interchanges in the corridor were identified for three scenarios:
    - Address existing safety concerns;
    - Maintain the quality of life and preserve the scenic beauty of the corridor; or
    - Support to existing and planned development.

Identified conceptual interchange planning scenarios were evaluated by the TPC and at public workshops in both Sullivan and Orange Counties.

As detailed in the main body of this study, a total of 15 conceptual interchange planning scenarios were considered for interchanges in Sullivan and Orange Counties. Based on these reviews and comments received from the TPC and the public, it is recommended that scenarios be developed that would accommodate future development and preserve the quality of life in both Sullivan and Orange Counties. In Sullivan County, the following three areas were identified as candidates for future interchange improvements:

- Exit 103 (Rapp Road) - Full interchange in the vicinity of the Center for Discovery.
- Exit 104 (NY Route 17B, Monticello Raceway) – Additional capacity to accommodate peak demand during special events.
- Exit 107 (South Fallsburg, Bridgeville) to Exit 109 (Rock Hill, Woodridge) – Full interchange at Exit 107 with closure of ramps at Exit 108 (Bridgeville). Improve local roads to enhance connectivity to interchanges with Route 17.

It is recognized that additional outreach and planning are needed to address the access and traffic operational issues between Exit 110 (Lake Louise Marie; Wanaksink Lake) and Exit 111 (Wolf Lake) and between Exit 114 (Highview, Wurtsboro) and Exit 116 (NY Route 17K, Bloomingburg, Newburgh).

Two areas were identified in Orange County for future interchange improvements: the area between Exit 130 in the Village of Monroe and Exit 127 in the Village of Chester, an area in which there are currently four interchanges within a 3.5 mile section of highway, and the area between Exits 125 and 123 in Goshen, an area in which there are three sets of eastbound and westbound ramps within a 1.25 mile section of Route 17. The solutions developed for these areas would consolidate access to the highway and enhance local connections to the areas that are currently serviced by ramps that could be affected by future I-86 conversion projects.

RS-11 Final Study Recommendations

Based on the results of the study technical analyses, and the overwhelming support of the TPC and the general public as enunciated at the project public workshops in Sullivan and Orange Counties, it is recommended that a new General Use Third Lane be developed along the 22-mile segment of Route 17 between just west of NY Route 211 at Exit 120 (Middletown), and Exit 131 (Harriman). While the traffic projections do not indicate the need to extend the third lane further west, future projects initiated in the western part of Orange County or in Sullivan County should not preclude the future extension of the third lane should travel patterns or demand change in the future. The future extension of the third lane provides opportunities for

partnerships with private organizations and individuals that may want to invest in development of property in this portion of the corridor.

As more fully described in the main body of this study, and based on guidance from the TPC and comments provided at project public workshops in Sullivan and Orange Counties, it is recommended that:

- Interchange modifications identified in "Scenario II - Accommodate Future Development and Preserve Quality of Life" be used to guide future projects in Orange County.
- Interchange modifications identified in "Scenario III: Accommodate Future Development and Preserve Quality of Life" be used to guide future projects in Sullivan County.

It is recommended that additional park-and-ride facilities in Sullivan and Orange Counties should be explored, including potential new park-and-ride facilities in the vicinity of Exits 104 (NY Route 17B – Raceway/Monticello), 106 (NY Route 173/East Broadway), 109 (Rock Hill/Woodridge), 113 (NY Route 209 – Wurtsboro/Ellenville), and 118 (Fair Oaks).

It is recommended that continued coordination be progressed with the ongoing West of Hudson Regional Transit Study being undertaken by MTA Metro-North and the New York State Thruway Authority, in cooperation with the Port Authority of New York & New Jersey, New Jersey Transit, and NYSDOT, to identify additional opportunities to provide improved transit service on the Port Jervis Line and to develop a regional HOV Lane system, of which an HOV Lane on Route 17 could potentially be an element.

A recurring theme throughout the public outreach process was the need for rest areas and commercial traffic amenities along the Route 17 corridor. The provision of these services would help to modernize the corridor and enhance economic development opportunities by attracting more commercial traffic to the Route 17 corridor. The location of these areas would need to be coordinated with surrounding communities so as not to adversely impact businesses that currently rely on providing these services. Identification of future projects throughout the corridor should include participation by the public and surrounding businesses.

RS-12 Next Steps and Project Development and Environmental Review Process

NYSDOT will pursue the recommended improvements either individually or collectively as funding becomes available, at which time the proposed capital improvements will undergo required environmental reviews in accordance with State Environmental Quality Review Act (SEQRA) and/or National Environmental Policy Act (NEPA) depending on the source of necessary funding. Additionally, any future corridor projects will be coordinated with FHWA and implemented such that the improvements meet Interstate standards.

Appendix F4.4

Kiryas Joel Roadway and Pedestrian Improvements Design Report*****

*****Appendices contain partial copy of the referenced document.
See accompanying CD for full copy.

TRANSPORTATION

FINAL DESIGN REPORT

July 2013

P.I.N. 8759.65 and 8780.20

Kiryas Joel Roadway and Pedestrian Improvements

Village of Kiryas Joel

Orange County

U.S. Department of Transportation Federal Highway Administration

NEW YORK STATE DEPARTMENT OF TRANSPORTATION

PROJECT REPORT

TABLE OF CONTENTS

ATTACHED APPENDICES

I. INTRODUCTION

This design report has been prepared to evaluate the alternatives for the proposed rehabilitation/ widening of Orange County Route 44, Mountain Road, Bakertown Road, Acres Road and Forest Road, in the Village of Kiryas Joel, Orange County.

Included in this report are the project descriptions and needs for the project, a study of the various alternatives, and discussion of the social, economic, and environmental effects on the community and highway users resulting from implementation of the alternatives presently under consideration.

The project is classified as a National Environmental Policy Act (NEPA) Categorical Exclusion with Documentation. These requirements apply to projects that do not individually or cumulatively have a significant environmental impact on the human environment. They are categorically excluded from the requirement to prepare a NEPA Environmental Assessment or Environmental Impact Statement.

This document has been developed in accordance with the requirements of the New York State Department of Transportation (NYSDOT) Highway Design Manual. Classification under the New York State Environmental Quality Review Act (SEQRA) Part 617, Title 6 of the Official Compilation of Codes, Rules and Regulations of New York State (6 NYCRR Part 617) is a Type II project. A SEQR Type II project is one that is not likely to have a significant effect on the environment. Due to the nature of this project, which is reconstruction mainly on existing alignment, no significant environmental impacts are anticipated.

This project proposes to widen and resurface Orange County Route 44, Mountain Road, Bakertown Road, Acres Road and Forest Road, improve pedestrian accommodations, upgrade roadway drainage systems, and improve the overall safety of both motorist and pedestrian routes within the project limits

The following alternatives and options, representing possible engineering solutions, are presented in this report:

- No Build/ Maintenance Alternative
- Build/Reconstruction Alternative

Descriptions of the Reconstruction Alternative options are included in Chapter III, Alternatives.

The estimated construction cost is $13.5 million. Due to funding constraints the project will be constructed in phases. It is anticipated that Construction Phase 1 ($5.20 million) will include the intersection of Mountain Road with County Route 44, the intersection of Mountain Road, Acres Road and Forest Road, all of Mountain Road between Chevron Drive and Forest Road, and new sidewalks along portions of Bakertown Road. A second $3.39 million phase will be progressed after 2018 along Bakertown Road and Upper Forest Road as post-TIP funds in this amount have been allocated. When the last $4.90 million in funding becomes available, the remaining sections of the overall project, Acres Road and Lower Forest Road will be constructed as a third and final phase.

The project will be constructed using State, Municipal, and Federal funds. Additional information regarding this project may be obtained by contacting:

Gedalye Szegedin, Village Administrator
Village of Kiryas Joel
PO Box 566
Monroe, NY 10949
845-783-8300
gskj@thejnet.com

or

Robert Cartwright, P.E. - Project Manager
Stantec Consulting Services, Inc.
3 Columbia Circle, Suite 6
Albany, NY 12203
518-452-4358
robert.cartwright@stantec.com

II. PROJECT IDENTIFICATION, EVOLUTION, CONDITIONS AND NEEDS, AND OBJECTIVES

A. PROJECT IDENTIFICATION

1. Project Type

The project is a roadway rehabilitation/widening with drainage upgrades and pedestrian accommodation improvements.

2. Project Location/Description

Most of this project is located in the Village of Kiryas Joel, with some portions located in the Town of Monroe, Orange County. Refer to Figure 1 – General Location Map and Figure 2 – Project Location Map.

Roadway and sidewalk improvements are proposed on the following roads:

- Orange County Route 44
- Mountain Road
- Forest Road
- Bakertown Road
- Acres Road

B. PROJECT EVOLUTION

The Initial Project Proposal (IPP) for PIN 8759.65 was approved by the NYSDOT Region 8 Regional Director in November 2006. Noted in the IPP was the need to widen the existing roadways of County Route 44, Mountain Road, Forest Road, Bakertown Road and Acres Road to accommodate current traffic volumes, provide provisions to pass vehicles legally parked on these roadways, and provide turn lanes at intersections.

PIN 8780.20 was selected to receive Transportation Enhancement Program (TEP) funds in November 2006. As noted in the project application, the Village of Kiryas Joel has a higher than normal percentage of the population that walks due to women in the community not driving and the fact that many low income families do not own cars. This combined with the residential and commercial growth along both Mountain Road and Bakertown Road resulted in the need to both improve existing deteriorated sidewalks and install new sidewalks where none currently exist.

In June 2008, Stantec Consulting Services, Inc. developed a Scoping Document for the Village outlining various conceptual alternatives. These alternatives addressed the needs of the Village and broke the overall project up into various segments to allow for a logical staged construction of the improvements as funding became available. This report was submitted to both NYSDOT and Orange County for review. While this report addresses all of the proposed work along the project roadways, project funding availability will require the project to be constructed in stages.

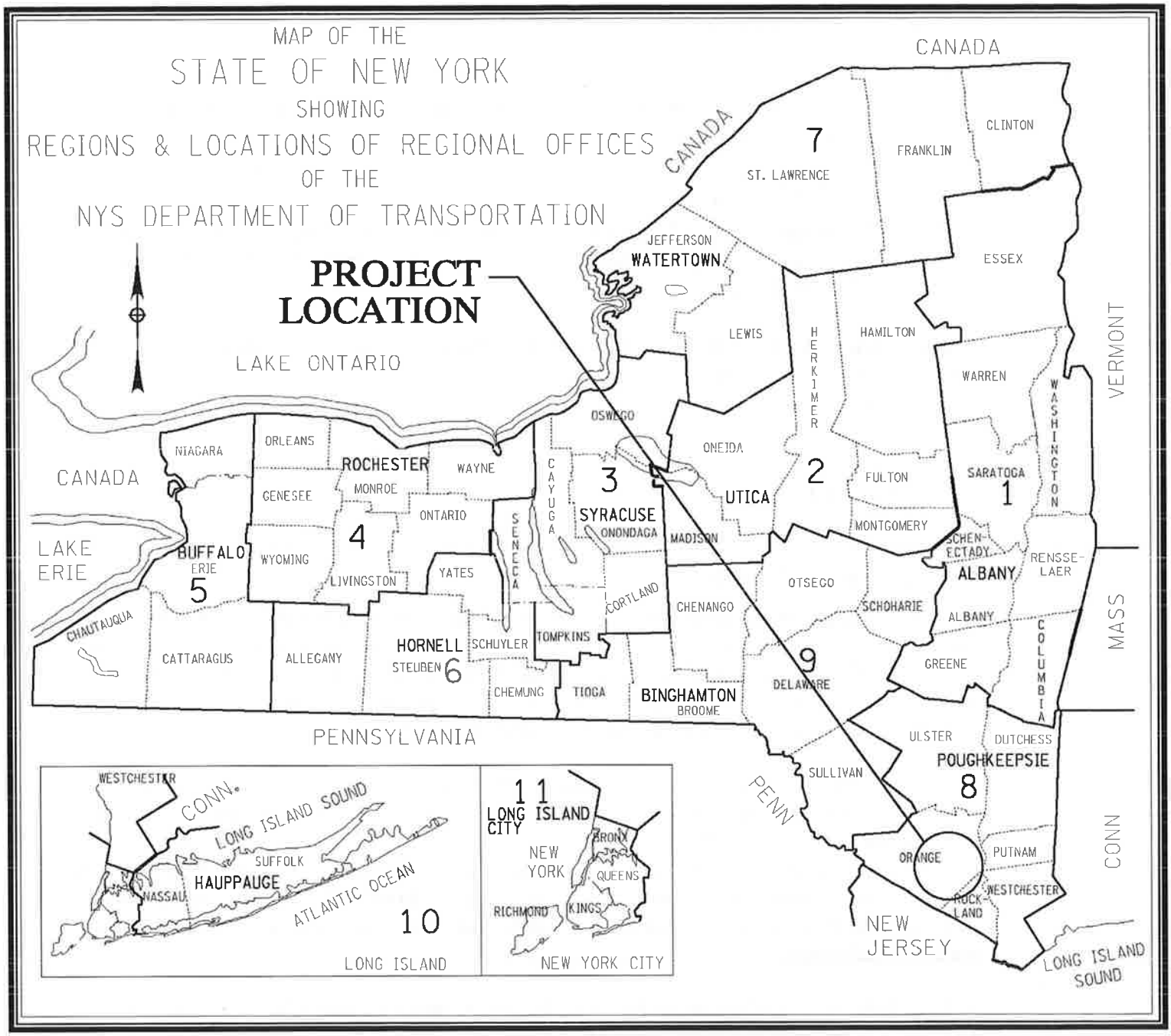


FIGURE 1 – GENERAL LOCATION MAP

Village of Kiryas Joel
P.I.N.'s 8759.65 & 8780.20

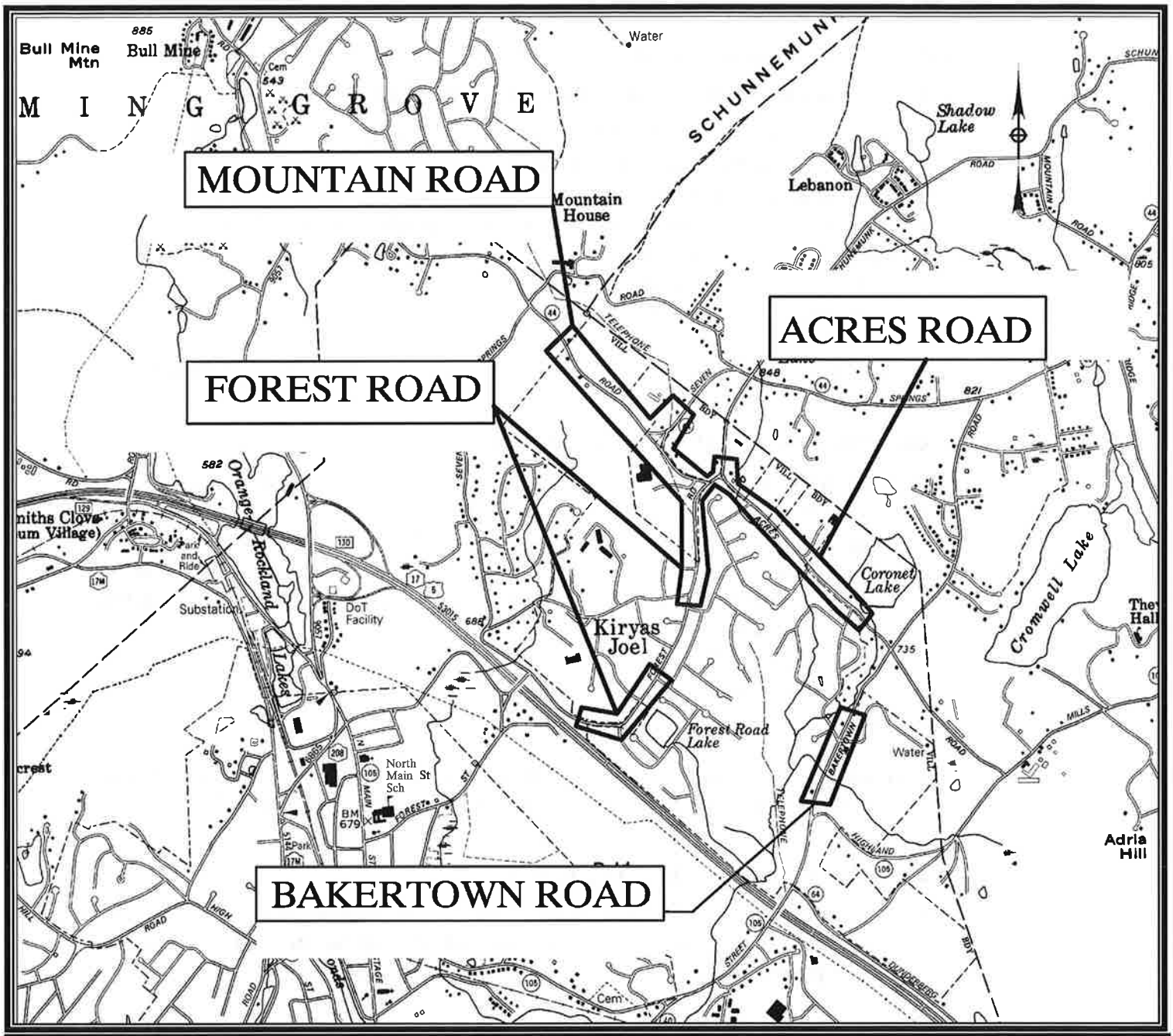


FIGURE 2 – PROJECT LOCATION MAP

Village of Kiryas Joel
P.I.N.'s 8759.65 & 8780.20

C. CONDITIONS AND NEEDS

1. Transportation Conditions, Deficiencies and Engineering Considerations

a. Functional Classification and National Highway System (NHS)

The functional classifications of the roadways in the project area are as follows:

- County Route 44 – Urban Local Street
- Mountain Road (Chevron Drive to County Route 44) - Urban Local Street
- Mountain Road (County Route 44 to Forest Road) - Urban Collector
- Forest Road – Urban Collector
- Bakertown Road - Urban Collector
- Acres Road – Urban Collector

None of the roadways are on the National Highway System or part of a Designated Truck Access Highway.

b. Ownership and Maintenance Jurisdiction

Ownership and maintenance responsibilities of the roadways are as follow:

- County Route 44 – Orange County
- Mountain Road - Orange County north of CR44 intersection.
- Mountain Road – Town of Monroe south of CR44 intersection to Forest Rd. An Intermunicipal Agreement has been signed by the Village and the Town for this section of roadway.
- Forest Road – Village of Kiryas Joel
- Bakertown Road - Village of Kiryas Joel
- Acres Road – Village of Kiryas Joel

Ownership and maintenance for all of the sidewalks, waterlines and sanitary sewers within the project limits are the responsibility of the Village of Kiryas Joel.

c. Culture, Terrain and Climatic Conditions

1. Area Type – The project is primarily located within the Village of Kiryas Joel. Land use within the project area primarily consists of commercial and residential development. Future land use is expected to remain as it is today.

2. Terrain – The terrain throughout the project area is classified as rolling.

3. Climatic Conditions – There are no unusual weather conditions that would affect any construction. It is not anticipated that any special design features will be implemented due to climatic conditions.

d. Control of Access

Access along all of the roadways is uncontrolled with several driveway openings and intersecting side roads.

e. Existing Highway Section

This Design Report has been prepared to evaluate roadway and sidewalk improvements along several roadways within the Village of Kiryas Joel, Orange County. Roads included in this study are County Route 44, Mountain Road, Forest Road, Acres Road, and Bakertown Road.

TABLE 1
County Route 44

Characteristics	Description
Right of Way (ROW)	The ROW width is approximately 70 ft.
Travel Lane & Shoulders	Travel Lanes – 2 – 10 ft. Shoulders – 1.5 ft average width
Curbing	Sporadic locations of 6" ± high concrete curb.
Median	There are no medians within the project limits.
Grades & Curves	Vertical Alignment – Maximum Grade of 7%. Horizontal Alignment – Minimum radius of 206 ft.
Intersections	Mountain Road - While the orientation of the two roads is approximately 90 degrees, the actual intersection is a Y-configuration, with the two CR 44 lanes having a continuous movement to and from Mountain Road to the north of the intersection. Movements from the southern portion of Mountain Road to CR 44 and continuing on Mountain Road to the north are stop sign controlled (See Figure 3 on page II-23).
Parking Regulations	There are no regulations that restrict parking within the project limits.
Roadside Elements	a. Snow storage is accommodated by using the area adjacent to the pavement. b. Sidewalks – There are no sidewalks. c. Utility Strips - There are no utility strips. d. Bikeways - There are no dedicated bike lanes. e. Bus Stops - There are no bus stops f. Driveways – Proposed residential development will result in four driveways connecting to CR 44. These will be located on the north side, east of the intersection with Mountain Road. g. Clear Zone – Approximately 5ft

TABLE 2
Mountain Road

Characteristics	Description
Right of Way (ROW)	The ROW width varies from 40 ft. to 50 ft.
Travel Lane & Shoulders	Travel Lanes – 2 – Varies, 10 ft. to 12 ft. Shoulders – 1 ft. each side
Curbing	Sporadic locations of 6" ± high concrete curb.
Median	There are no medians within the project limits.
Grades & Curves	Vertical Alignment – Maximum Grade of 12% Horizontal Alignment – Minimum radius of 280 ft.
Intersections	• County Route 44 - While the orientation of the two roads is approximately 90 degrees, the actual intersection is a Y-configuration, with the two CR 44 lanes having a continuous movement to and from Mountain Road to the north of the intersection. Movements from the south portion of Mountain Road to CR 44 and to Mountain Road to the north are stop sign controlled (See Figure 3 on page II-23). • Forest Road - T-configuration intersection (50° skew) with all approaches controlled by flashing red traffic signal. • Sasev Court and Karlin Blvd. – Stop sign controlled side streets leading to multi-family residential developments
Parking Regulations	There are no regulations that restrict parking within the project limits.
Roadside Elements	a. Snow storage is accommodated by using the area adjacent to the pavement. b. Sidewalks – Concrete sidewalks exist along portions of the east side of the roadway with several breaks in the sidewalk network. There is a 780 foot long wood decking sidewalk located on the west side of the roadway. There is a midblock pedestrian crossing from the wood sidewalk on the west to the concrete sidewalk on the east. c. Utility Strips - There are no utility strips d. Bikeways - There are no dedicated bike lanes. e. Bus Stops – Several bus stops exist between County Route 44 and Forest Road. They are used by the local bus service, are signed, but have no dedicated bus pull-off area. f. Driveways – There is one driveway opening to a parking area for a multi-family residential housing unit. This is located on the east side of the roadway, near the northern project limit. g. Clear Zone – Approximately 4 ft.

TABLE 3
Forest Road (Upper Section)

Characteristics	Description
Right of Way (ROW)	The ROW width varies from 40 ft. to 50 ft.
Travel Lane & Shoulders	Travel Lanes – 2 – 12 ft. Shoulders – 1 ft. each side
Curbing	Concrete curbing exists on both sides of the roadway between Acres Road and Mountain Road. South of Mountain Road, curbing exists on the eastern side of Forest Road.
Median	There are no medians within the project limits.
Grades & Curves	Vertical Alignment – Maximum Grade of 8.4% Horizontal Alignment – Minimum radius of 275 ft
Intersections	• Acres Road – T-configuration intersection with all approaches controlled by flashing red traffic signal. • Mountain Road – T-configuration intersection (50° skew) with all approaches controlled by flashing red traffic signal. • Schunnemunk Road – Side street stop sign controlled.
Parking Regulations	There are no regulations that restrict parking within the project limits.
Roadside Elements	a. Snow storage is accommodated by using the area adjacent to the pavement. b. Sidewalks – Concrete sidewalks exist on both sides of the roadway between Acres Road and Mountain Road. South of Mountain Road, sidewalks exists on the east side of Forest Road. c. Utility Strips – There are no existing utility strips. Utility poles are located behind the sidewalks d. Bikeways - There are no dedicated bike lanes. e. Bus Stops - Several bus stops exist along this roadway corridor. They are used by the local bus service, are signed, but have no dedicated bus pull-off area. f. Driveways - There are two driveway openings along Forest Road within the project limits; one serving a multi-family residential development opening within the intersection of Forest and Acres Roads. The other driveway opening is just north of this intersection serving a single family residence. g. Clear Zone – Approximately 12 ft.

TABLE 4
Forest Road (Lower Section)

Characteristics	Description
Right of Way (ROW)	The ROW width is 50 ft.
Travel Lane & Shoulders	Travel Lanes – 2 – width varies 12 ft. to 15 ft. Shoulders – None
Curbing	Concrete curbing exists on both sides of the roadway between D.A. Wieder Blvd. and Van Buren Drive.
Median	There are no medians within the project limits.
Grades & Curves	Vertical Alignment – Maximum Grade of 6.8% Horizontal Alignment – Minimum radius of 145 ft
Intersections	• D.A. Wieder Boulevard – T-configuration intersection with side street stop sign controlled. • Presheburg Boulevard – T-configuration intersection with side street stop sign controlled (70° skew). • Quickway Road – T-configuration intersection with side street stop sign controlled. • Carter Lane – T-configuration intersection with side street stop sign controlled. • Van Buren Drive/Business Center Driveway – T- configuration intersection with all approaches controlled by a traffic signal.
Parking Regulations	There are no regulations that restrict parking within the project limits.
Roadside Elements	a. Snow storage is accommodated by using the area adjacent to the pavement. b. Sidewalks – Concrete sidewalk exist on the north side of the roadway from D.A. Wieder Boulevard to Van Buren Drive and along the south side between Quickway Road and Van Buren Drive. c. Utility Strips – There are no existing utility strips. Utility poles are located behind the sidewalks d. Bikeways - There are no dedicated bike lanes. e. Bus Stops - Several bus stops exist along this roadway corridor. They are used by the local bus service, are signed, but have no dedicated bus pull-off area. f. Driveways - Several residential and commercial driveways exist throughout the roadway segment. g. Clear Zone – Approximately 10 ft.

TABLE 5
Bakertown Road

Characteristics	Description
Right of Way (ROW)	The ROW width is approximately 50 ft.
Travel Lane & Shoulders	Travel Lanes – 2 – 10 ft. Shoulders – 1 ft each side
Curbing	Concrete curbing exists in various locations. The curbing has been installed to provide a 40 foot wide pavement section.
Median	There are no medians within the project limits.
Grades & Curves	Vertical Alignment – Maximum Grade of 9.2% Horizontal Alignment – Minimum radius of 750 ft.
Intersections	• Hamaspik Way - 75 degree skewed T-intersection. Stop sign controlled on Hamaspik Way. • Israel Zupnick Drive – 55 degree skewed T-intersection. Stop sign controlled on Israel Zupnick Drive and Bakertown Road. • Dinev Court - 90 degree T-intersection. Stop sign controlled on Dinev Court and Bakertown Road.
Parking Regulations	There are no regulations that restrict parking within the project limits.
Roadside Elements	a. Snow storage is accommodated by using the area adjacent to the pavement. b. Sidewalks – Sidewalks exist along recently developed properties. A continuous sidewalk does not exist along the entire roadway. c. Utility Strips – There are no existing utility strips. d. Bikeways - There are no dedicated bike lanes. e. Bus Stops – Both the Monroe Bus Company and the local bus service have designated bus stops at the intersection with Israel Zupnick Drive, on Israel Zupnick Drive. Additionally, bus stops on each side of the road were recently constructed just south of the southern project limit at the intersection with CR 105. f. Driveways - Several residential and commercial driveways exist throughout the roadway segment. g. Clear Zone – Approximately 2 ft.

TABLE 6
Acres Road

Characteristics	Description
Right of Way (ROW)	The ROW width is approximately 50 ft.
Travel Lane & Shoulders	Travel Lanes – 1-14 ft. (Eastbound) 1-11 ft. (Westbound) Shoulders – 2 ft. average width
Curbing	Concrete curbing exists along the eastbound lane from Forest Road to Israel Zupnick Drive. A short section of curbing exists along the westbound lane across from Satmar Drive. The curbing has been installed to provide a 40 foot wide pavement section.
Median	There are no medians within the project limits.
Grades & Curves	Vertical Alignment – Maximum Grade of 6.6% Horizontal Alignment – Minimum radius of 520 ft.
Intersections	• Forest Road – T-configuration intersection with all approaches controlled by flashing red traffic signal. • Krollas Drive - T-configuration intersection with side street stop sign controlled. • Lemburg Court - T-configuration intersection with side street stop sign controlled. • Satmar Drive - T-configuration intersection with side street stop sign controlled. • Israel Zupnick Drive - T-configuration (73° skew) intersection with side street stop sign controlled.
Parking Regulations	There are no regulations that restrict parking within the project limits.
Roadside Elements	a. Snow storage is accommodated adjacent to the pavement. b. Sidewalks –Concrete sidewalk exists along the eastbound travel lane from Forest Road to Israel Zupnick Drive and a small section exists along the westbound lane across from Satmar Drive. c. Utility Strips – There are no existing utility strips. d. Bikeways - There are no dedicated bike lanes. e. Bus Stops - Several bus stops exist along this roadway corridor. They are used by the Monroe Bus Company and the local bus service, are signed, but have no dedicated bus pull-off area. f. Driveways - Several residential and commercial driveways exist throughout the roadway segment. g. Clear Zone – Approximately 10 ft.

f. Abutting Highway Segments and Future Plans for Abutting Highway Segments

County Route 44

At the eastern limit of CR 44 the roadway section consists of 2 – 10' lanes with 1 ft. shoulders. The proposed 2 – 13' lanes with curbing will be tapered to match the existing section and curbing will be flared away from the roadway and terminated. The proposed sidewalk on each side of the roadway will connect to existing sidewalk from housing developments prior to the eastern project limit. There are no future plans to rehabilitate, reconstruct, or widen CR 44 east of the project limit.

At the western limit of CR 44, the roadway intersects with Mountain Road.

Mountain Road

At the northern limit of Mountain Road the roadway section consists of 2 – 10' lanes with 1 ft. shoulders. The proposed 3 lane roadway section will be tapered down from a point just north of the intersection with Chevron Drive to match the existing section. Both sidewalk and curbing will connect to existing at Chevron Drive. There are no future plans to rehabilitate, reconstruct, or widen Mountain Road north of the project limit.

At the southern limit of Mountain Road, the roadway intersects with Forest Road.

Forest Road (Upper Section)

At the southern limit of Forest Road the roadway section consists of 2 – 13' lanes with 2 ft. shoulders. The proposed 3 lane roadway section will be tapered down to match the existing. Long term plans for the Village include widening Forest Road south of the project limits.

At the northern limit of Forest Road the roadway section consists of 2 - 12' lanes with 2' shoulders on the east side and sidewalk and curbing on the west side. The proposed 3 lane roadway section will be tapered down to match the existing section. There are no future plans to rehabilitate, reconstruct or widen Forest Road north of the project limit.

Forest Road (Lower Section)

At the western limit of Forest Road the roadway section consists of 2 – 12' lanes with 2 ft. shoulders. The proposed 3 lane roadway section will be tapered down to match the existing. There are no future plans to rehabilitate, reconstruct or widen Forest Road north of the project limit.

At the eastern limit of Forest Road the roadway section consists of 2 - 12' lanes with 2' shoulders; sidewalk and curbing exist on both sides of the roadway. The proposed 3

lane roadway section will be tapered down to match the existing section. Long term plans for the Village include widening Forest Road east of the project limit.

Bakertown Road

Bakertown Road at the southern project limit will be a 3-lane section with curbing and will match the roadway section recently constructed under PIN 8759.16.

Between the northern limit of Bakertown Road and Acres Road the roadway section consists of 2 – 10' lanes with 1 ft. shoulders. Long term plans include widening this roadway section to match the proposed 3 lane roadway section.

Acres Road

The western limit of Acres Road consists of 1 – 14' lane (eastbound) and 1- 11 ft lane with 2ft shoulder (westbound). The proposed 3 lane roadway section will be terminated at the intersection with Forest Road.

At the eastern project limit Forest Road consists of 2 - 11' lanes with 2' shoulders. Long term plans include widening this roadway section between Israel Zupnick Drive to Bakertown Road to match the proposed 3 lane roadway section.

g. Speeds and Delay

1. Existing Speed Limit –
   County Route 44 – Posted Speed Limit is 30 mph
   Mountain Road – Posted Speed Limit is 30 mph
   Forest Road (Upper and Lower Sections) – Posted Speed Limit is 30 mph
   Bakertown Road – Posted Speed Limit is 30 mph
   Acres Road – Posted Speed Limit is 30 mph

2. Actual Operating Speed
   The "floating car" method was used to determine actual operating speeds. The analysis was conducted on Wednesday, September 1, 2010 for Mountain and Bakertown Roads and on Tuesday, September 13, 2011 for Acres and Forest Roads, during non-peak traffic periods. A minimum of five runs were conducted on each roadway in each direction. The average actual operating speed for each roadway is as follows:

TABLE 5
ACTUAL OPERATING SPEEDS

County Route 44	36 mph eastbound 30 mph westbound
Mountain Road	34 mph northbound 38 mph southbound
Forest Road (Upper)	35 mph northbound 33 mph southbound
Forest Road (Lower)	33 mph eastbound 30 mph westbound
Acres Road	39 mph eastbound 35 mph westbound
Bakertown Road	34 mph northbound 37 mph southbound

3. Travel time and delay runs for existing conditions: Based on field observations there are no major delays on County Route 44, Mountain Road, Forest Road or Bakertown Road. There are minor delays at both the Forest Road/Mountain Road and Forest Road/Acres Road intersections during the AM peak hours. This is confirmed by the Level of Service (LOS) analysis for these intersections. For each intersection the WB movement for Forest Road has a LOS C, with an average delay of 16.4 seconds. Other legs of these intersections are mainly LOS B, with average delays between 11.3 and 14.8 seconds.

   There are also minor delays at the Acres Road/Israel Zupnick Drive intersection during both the AM and PM peak hours. For this intersection the EB movement for Israel Zupnick Drive has a LOS C, with an average delay of 20 seconds. Other legs of this intersection are LOS A with delays less than 2 seconds.

   The Level of Service computations for existing conditions were calculated using Synchro 7.0 software. The program is based on methods presented in the Highway Capacity Manual 2000 that describes the operations of intersections regulated by stop signs. The calculations are included in the Separate Appendix, Traffic Capacity Analysis.

TABLE 6
EXISTING (2010) INTERSECTION DELAY SUMMARY

	Forest Road/Mountain Road			Forest Road/Acres Road		
Approach	**Movement**	**AM**	**PM**	**Movement**	**AM**	**PM**
Eastbound	L-T	11.6(B)	11.3(B)	L-R	12.1(B)	11.0(B)
Westbound	T-R	16.4(C)	13.3(B)	L-R	16.3(C)	14.8(B)
Northbound	--			L-R	8.8(A)	8.3(A)
Southbound	L-R	12.6(B)	10.5(B)	--	--	--

Acres Road/Israel Zupnick Drive			
Approach	**Movement**	**AM**	**PM**
Eastbound	L-R	22.0 (C)	18.9 (C)
Northbound	L-T	0.7 (A)	0.2 (A)
Southbound	T-R	0.0 (A)	0.0 (A)

4. Travel Time and Delay Estimates for the Future No Build Design Year: The existing delays at the Forest Road/Mountain Road and Forest Road/Acres Road will continue to get worse as traffic volumes increase. Assuming no improvement, each intersection will fail in the design year (2032) with a majority of the approaches having a LOS E or F and delays ranging from 40 to 274 seconds. Peak period delays for the future no-build design year would result in several of the approaches failing. The results of this analysis are summarized in Table 7.

TABLE 7
FUTURE (2032) NO BUILD INTERSECTION DELAY SUMMARY

	Forest Road/Mountain Road			Forest Road/Acres Road		
Approach	**Movement**	**AM**	**PM**	**Movement**	**AM**	**PM**
Eastbound	L-T	39.8(E)	42.7(E)	L-R	68.4(F)	48.8(E)
Westbound	T-R	273.6(F)	170.1(F)	L-R	187.7(F)	169.5(F)
Northbound	--			L-R	12.1(B)	10/9(B)
Southbound	L-R	51.9(F)	20.5(C)	--	--	--

Acres Road/Israel Zupnick Drive			
Approach	**Movement**	**AM**	**PM**
Eastbound	L-R	381.1(F)	227.0(F)
Northbound	L-T	1.1 (A)	0.4 (A)
Southbound	T-R	0.0 (A)	0.0 (A)

h. Traffic Volumes

Turning movement counts were taken on Wednesday, September 1, 2010 at the following intersections:

Chevron Drive/Nickleburg Road/Mountain Road
Mountain Road/County Route 44
Mountain Road/Forest Road
Forest Road/Acres Road
Acres Road/Bakertown Road
Bakertown Road/Israel Zupnick Drive/Dinev Court

Additional intersection counts were taken on Tuesday, September 13, 2011 at the following intersections:

Acres Road/Israel Zupnick Drive
Forest Road/Schunnemunk Road/Hayes Court
Forest Road/D.A. Weider Boulevard.
Forest Road/Van Buren Drive

The counts were taken between the hours of 7:30 to 9:30 AM and 4:15 to 6:15 PM. Based on totals recorded every 15 minutes, it was determined that the AM peak hour was between 8:30 and 9:30, and the PM peak hour was between 5:15 and 6:15.

Peak hour counts for the existing traffic volumes (2010) are shown in Appendix C. There are two subdivisions, Vintage Vista and Forest Edge, currently planned or under construction which will add traffic to several of the intersections that were counted. The additional traffic generated from these subdivisions is shown in Appendix C. The anticipated volumes for each subdivision were taken from the respective Environmental Impact Statements.

Traffic volumes were projected to the ETC (2014) and ETC+20 (Design Year 2034). To calculate the 2014 traffic volumes, the 2010 traffic volumes were projected forward using a 2.5% annual growth rate and then adding in the projected subdivision development. The 2034 traffic volumes were projected from the 2014 traffic volumes using a 2.5% annual growth rate. Projected traffic volumes for 2014 and 2034 are shown in Appendix C.

Vehicle Mix: As part of the traffic counts that were performed on September 1, 2010 school buses and trucks were recorded at each intersection. During the AM timeframe, buses and trucks accounted for 12.1% of the overall traffic with 95% of these larger vehicles being buses. The percentage of buses and trucks during the PM timeframe was 7.3%, with buses accounting for 95% of these larger vehicles.

i. Level of Service

All of the major unsignalized intersections in the study area were analyzed using the Synchro 7.0 software program. This program is based on methods presented in the 2000 Highway Capacity Manual that describes the operations of intersections regulated by stop signs. While the intersections of Mountain Road/Forest Road and Forest Road/Acres Road currently have traffic signals installed, these signals are currently set as flashing red in all directions. As such, the intersections were analyzed as stop sign controlled for all approaches.

Level of Service for stop-controlled intersections is defined in terms of delay. A stop-controlled approach with a Level of Service below 'E' is generally considered unacceptable. For a stop-controlled intersection with a movement and/or approach below 'E', the average delay per vehicle exceeds 50 seconds. The following is a complete break down for each Level of Service Threshold:

A – (</= 10.0 sec)
B – (10.1 to 15.0 sec)
C – (15.1 to 225.0 sec)
D – (25.1 to 35.0 sec)
E – (35.1 to 50.0 sec)
F – (>/= 50.1 sec)

TABLE 8
INTERSECTION LEVEL OF SERVICE SUMMARY
MORNING (EVENING) PEAK HOUR

Intersection	Existing Year (2010)	ETC (2014)	ETC+20 (2034)
Mountain Road (MR)/ Chevron Drive (CD) (Stop Sign on Chevron Drive)			
CD – WB (L-R)	B (A)	B (A)	B (B)
MR – NB (T-R)	A (A)	A (A)	A (A)
MR – SB (L-T)	A (A)	A (A)	A (A)
Mountain Road (MR) Nickleburg Road (NR) (Stop Sign on Nickleburg)			
NR – EB (L-R)	B (A)	B (B)	C (B)
MR – NB (L-T)	A (A)	A (A)	A (A)
MR – SB (T-R)	A (A)	A (A)	A (A)
Mountain Road (MR) / County Route 44 (CR44) (Existing Stop Sign on Mountain Road south of CR44) (Future stop sign controlled CR44) and Forest Edge Driveway (FE)			
FE – EB (L-T-R)	--	B (C)	D (D)
CR44 – WB (L-T-R)	A (A)	B (B)	C (C)
MR – NB (L-T-R)	A (A)	A (A)	A (A)
MR – SB (L-T-R)	A (A)	A (A)	A (A)
Mountain Road (MR) / Forest Road (FR) (Flashing Red Signal - All way stop)			
FR – EB (L-T)	B (B)	B (B)	E (E)
FR – WB (T-R)	C (B)	C (C)	F (F)
MR – SB (L-R)	B (B)	B (B)	F (C)
Forest Road (FR) / Acres Road (AR)) (Flashing Red Signal – All way stop)			
FR – EB (L-RT)	B (B)	B (B)	F (E)
FR – WB (L-R)	C (B)	C (C)	F (F)
AR – SB (L-R)	A (A)	A (A)	B (B)
Acres Road (AR) / Bakertown Road (BR) (4 way stop)			
AR – EB (L-T-R)	B (B)	B (B)	D (D)
AR – WB (L-T-R)	A (A)	A (A)	B (B)
BR – NB (L-T-R)	A (A)	A (A)	B (B)
BR – SB (L-T-R)	A (A)	B (A)	C (B)
Bakertown Road (BR) / Israel Zupnick Drive (IZD) / Deniv Court (DC) (4 way stop)			

Intersection	Existing Year (2010)	ETC (2014)	ETC+20 (2034)
IZD – EB (L-T-R)	A (A)	A (A)	A (A)
DC - WB (L-T-R)	A (A)	A (A)	A (A)
BR – NB (L-T-R)	B (B)	B (B)	D (C)
BR – SB (L-T-R)	B (B)	C (B)	E (C)
Forest Road (FR) / Van Buren Drive (VB) / Commercial Center Driveway (CC) (Traffic Signal)			
CC – EB (L-T-R)	A (A)	A (A)	B (C)
VB – WB (L-T-R)	A (A)	A (A)	B (B)
FR – NB (L-T-R)	B (A)	B (A)	B (A)
FR – SB (L-T-R)	B (B)	B (B)	B (B)
Forest Road (FR) / Schunnemunk Road (SR) (Side Street Stop)			
SR – EB (L-R)	B (C)	C (C)	E (F)
FR – NB (L-T)	A (A)	A (A)	A (A)
FR – SB (T-R)	A (A)	A (A)	A (A)
Forest Road (FR) / D.A. Weider Blvd (DA) (Side Street Stop)			
FR – EB (L-T)	A (A)	A (A)	A (A)
FR – WB (T-R)	A (A)	A (A)	A (A)
DA – SB (L-R)	B (B)	B (B)	C (C)
Acres Road (AR) / Israel Zupnick Drive (IZ) (Side Street Stop)			
IZ – EB (L-R)	C (C)	D (C)	F (F)
AR – NB (L-T)	A (A)	A (A)	A (A)
AR – SB (T-R)	A (A)	A (A)	A (A)

j. Non-Standard Features and Non-Conforming Features

The existing roadways were reviewed to identify existing non-standard features based upon design criteria in Chapter 2 of the Highway Design Manual for the appropriate roadway classification. The following non-standard features are present:

County Route 44

Urban Local Street - Design Speed 30 mph

1. Travel Lane Width: 10 feet provided (11 feet standard for uncurbed)
2. Shoulder Width: 1 foot provided (6 feet standard for uncurbed)
3. Stopping Sight Distance (SSD): 172 ft. through the intersection with Mountain Road traveling west to north (standard SSD is 200 feet for 30 mph).

4. Horizontal Curvature: Radius of 206 ft. at the intersection with Mountain Road (standard is 250 feet for 30 mph).

Mountain Road (Chevron Drive to County Route 44)
Urban Local Street – Design Speed 40 mph

1. Travel Lane Width: 10 to 12 feet provided (11 feet standard for uncurbed) (12 feet standard for curbed)
2. Shoulder Width: 1 foot provided (8 feet standard for uncurbed) (2 feet standard for curbed)
3. Stopping Sight Distance (SSD): Standard SSD is 305 feet for 40 mph

PVI Location	SSD Provided
Sta. 10+00	161 ft.
Sta. 12+36	167 ft.
Sta. 15+60	248 ft.
Sta. 17+20	218 ft.
Sta. 19+66	121 ft.
Sta. 21+83	190 ft.
Sta. 24+10	218 ft.

4. Superelevation: Varies throughout, maximum of 10% (4% standard)
5. Pavement Crown Rollover: Varies throughout, maximum of 10% (4% standard)

Mountain Road (County Route 44 to Forest Road)
Urban Collector – Design Speed 30 mph

1. Stopping Sight Distance (SSD): Standard SSD is 200 feet for 30 mph

PVI Location	SSD Provided
Sta 36+69	146 ft

2. Roadway Grade: 12% between sta. 34+86 and 36+69 (Standard is 11%)

Forest Road (Upper Section)
Urban Collector – Design Speed 30 mph

1. Pavement Crown Rollover: Varies throughout, maximum of 8% (4% standard)
2. Superelevation: Varies throughout, normal crown provided (4% standard)
3. Stopping Sight Distance (SSD): Standard SSD is 200 feet for 30 mph

PVI Location	SSD Provided
Sta. 31+14	122 ft.

Forest Road (Lower Section)
Urban Collector – Design Speed 30 mph

1. Pavement Crown Rollover: Varies throughout, maximum of 8% (4% standard)
2. Horizontal Curvature: Radius of 145 ft (Standard is 250 ft for 30 mph).
3. Superelevation: Varies throughout, normal crown provided (4% standard)
4. Stopping Sight Distance (SSD): Standard SSD is 200 feet for 30 mph

PVI Location	SSD Provided
Sta 22+50	131 ft

Bakertown Road
Urban Collector – Design Speed 30 mph

1. Travel Lane Width: 10 feet provided (11 feet standard for uncurbed)
   (12 feet standard for curbed)
2. Shoulder Width: 1 foot provided (8 feet standard for uncurbed)
   (2 feet standard for curbed)
3. Stopping Sight Distance (SSD): Standard SSD is 200 feet for 30 mph

PVI Location	SSD Provided
Sta B 20+25	142 ft

4. Superelevation: Varies throughout, maximum of 10%
   (4% standard)
5. Pavement Crown Rollover: Varies throughout, maximum of 10%
   (4% standard)

Acres Road
Urban Collector – Design Speed 40 mph

1. Pavement Crown Rollover: Varies throughout, maximum of 8% (4% standard)
2. Travel Lane Cross Slope: Varies throughout, manimum of 4% (2% standard)
3. Shoulder Width: 1 foot provided (8 feet standard for uncurbed)
   (2 feet standard for curbed)
4. Superelevation: Varies throughout, normal crown provided (4% standard)
5. Stopping Sight Distance (SSD): Standard SSD is 305 feet for 40 mph

PVI Location	SSD Provided
Sta. A 13+48	151 ft.
Sta. A 23+56	205 ft.
Sta. A 26+64	187 ft.
Sta. A 30+50	197 ft.
Sta. A 38+25	256 ft.

k. Safety Considerations and Accident History and Analysis

Accident data information for all roadways within the project area was obtained from NYSDOT. This data was for a three year study period from January 1, 2008 to December 31, 2011. The average accident rate for similar type facilities is 2.88

accidents per million vehicles miles (acc/mvm). A summary of the accident data for the various roadways and intersections is as follows:

County Route 44:
There were a total of three (3) accidents on County Route 44 between the eastern limit of construction and the intersection with Mountain Road, including the intersection, resulting in an average accident rate of 14.87 acc/mvm. Of these three accidents one resulted in an injury, one was property damage only, and the last was non-reportable.

Mountain Road:
There were a total of 26 accidents on Mountain Road between the intersections of Forest Road (southern project limit) and Chevron Drive (northern project limit), including these intersections, resulting in an average accident rate of 7.36 acc/mvm. Of these 26 accidents 6 resulted in an injury, 15 were property damage only, while 5 were non-reportable.

Forest Road (Upper Section):
There were a total of 17 accidents along Forest Road within the project limits resulting in an average accident rate of 6.98 acc/mvm. Of these 17 accidents two resulted in an injury, 14 were property damage only, and one was non-reportable.

Forest Road (Lower Section):
There were a total of 44 accidents along Forest Road within the project limits resulting in an average accident rate of 25.46 acc/mvm. Of these 44 accidents 10 resulted in an injury, 18 were property damage only, and 16 were non-reportable.

Bakertown Road
There were a total of 16 accidents on Bakertown Road between the intersection of Meron Drive (southern project limit) and Israel Zupnick Drive (northern project limit) resulting in an average accident rate of 11.26 acc/mvm. Of these 16 accidents four resulted in an injury, four were property damage only, and six were non-reportable.

Acres Road:
There were a total of 58 accidents along Acres Road within the project limits resulting in an average accident rate of 10.94 acc/mvm. Of these 58 accidents 13 resulted in an injury, 31 were property damage only, and 14 were non-reportable.

The majority of accidents involve collisions between motor vehicles and appear to be relatively evenly distributed along Bakertown, Acres, Mountain and Forest Roads, as well as County Route 44. The project roadway corridors can feel tight to motorists, and do not provide drivers with much space to maneuver to avoid accidents. While rear end accidents are the most common type of accidents, overtaking, right angle, and sideswipe accidents are also common throughout the project area. Improper lane use, following too closely, and failure to yield right-of-way are the most common contributing factors; unsafe speed, traffic control device disregard, backing up unsafely, and driver inattention are also common contributing factors.

Based on the accident map in Appendix D it appears that the accidents are uniformly spread along each roadway within the project area. Accident Reports are included in Appendix D.

l. Pavement and Shoulder Conditions

A pavement field distress survey was conducted on May 6, 2011 in accordance with the NYS Comprehensive Pavement Design Manual, Appendix 2A.

The pavement conditions on most of the roadways within the project limits can be classified as fair. The primary pavement distress observed on all roadways was settlement and minor pavement raveling. Minor edge cracking, longitudinal cracking, and sporadic transverse cracking were also observed.

Along Mountain Road, between County Route 44 and Forest Road, and within the Forest Road/Mountain Road/Acres Road intersection the roadway section was observed to be in poor condition. Settlement and heaving was severe and multiple transverse cracking, longitudinal cracking and wheel path cracking with potholes were observed.

Pavement cores were taken at various points of Mountain Road, Forest Road and Bakertown Road. Asphalt thicknesses vary from 3 to 8-1/2 inches. Subbase material had an approximate thickness of 6 inches and was very silty.

m. Guide Rail, Median Barrier, Impact Attenuators

There are two sections of guide rail within the project limits. Location, type and condition are as follows:

Station	Type	Condition
County Route 44 CR 14+90 to CR 19+80 LT	Box Beam	Good
Bakertown Road B 18+77 to B 19+40 RT	W-Beam	Fair

n. Traffic Control Devices

There are three traffic signals within the project limits. The two located at the intersections of Forest Road/Mountain Road and Forest Road/Acres Road were installed in 2008 and currently operate under a red flashing light for all approaches. There are no detection loops associated with the signals. The signals are separated by 240 feet and while they are not currently interconnected, empty conduit between the two controllers has been installed. Each signal has separate pedestrian push buttons and signal heads; however, these are not currently active due to the flashing red mode of the signals. The signal poles were installed to accommodate the proposed intersection widening.

The third signal is located at the intersection of Forest Road with Van Buren Drive and the KJ central business center. The signal is fully activated but does not appear to have loop detectors or other detection devices installed. There are pedestrian push buttons and signal heads.

The Y-intersection of Mountain Road and County Route 44 is currently signed to allow free flow traffic from CR 44 to the northern part of Mountain Road. The southern portion of Mountain Road is controlled by stop signs. See figure below:

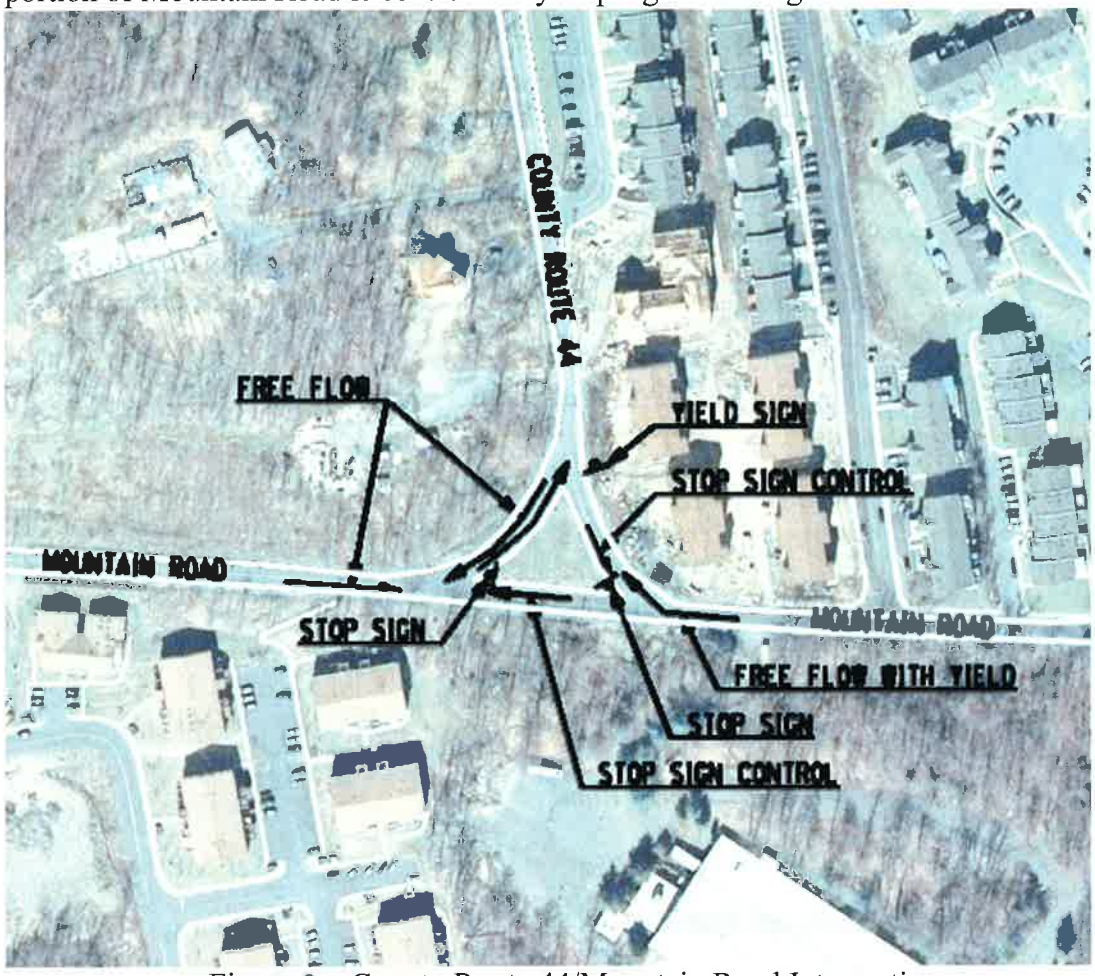


Figure 3 – County Route 44/Mountain Road Intersection

The 4 way intersection of Bakertown Road and Israel Zupnick/Dinev Drive is controlled by stop signs on all four approaches to the intersections. All other intersections along Mountain Road, Bakertown Road, Forest Road, and Acres Road are controlled with stop signs on the side road.

Pavement markings and signs in the project area are generally in fair to poor condition.

o. Structures

There are no structures along any of the roadways within the project limits.

p. Hydraulics of Bridges and Culverts

Most of the culverts located within the project limits are small diameter pipes conveying runoff from roadside ditches under the roadway. Larger diameter culverts located within the project limits are described below:

A 60" CMP located at sta. B 19+05 which conveys a small, unnamed stream under Bakertown Road from east to west.

A 36" CMP located at sta. A 13+25 which conveys the outlet of a small, unnamed pond to the north of Acres Road, under Acres Road from north to south. This pond is part of a larger stream system which originates at Amdur Park Lake.

The following is a list of the smaller diameter culverts within the project limits. The condition of the RCP culverts are generally good, although each of these culverts will be further evaluated during final design. If they are found to be in poor condition they will be replaced. At a minimum, each culvert will be cleaned.

Culvert Location	Size	Type
Mountain Road		
12+40	15"	RCP
24+05	18"	RCP
27+22	24"	RCP
Bakertown Road		
B 19+05	60"	CMP
Acres Road		
A 13+25	36"	CMP

q. Drainage Systems

Drainage systems throughout the project area are a combination of open and closed drainage systems. The closed drainage systems exist mainly in the areas that have been developed. These systems generally serve various multi-family developments located adjacent to the roadway and do not provide a continuous roadway drainage system.

Two private underground detention systems are located on the north side of Mountain Road, between County Route 44 and Sasev Court. These systems, which are outside of the R.O.W., provide stormwater management for the multi-family developments located here. These systems are interconnected and outlet to a closed drainage system flowing southeast, along Mountain Road which outlets into a wetland area at the corner of Mountain Road and Forest Road.

Due to the incremental development of multi-family dwellings along the roadway corridors and the lack of a centralized drainage system there are several drainage outlets located throughout the roadway segments. The following is a brief discussion of the major outlets within the project limits.

Mountain Road North

This drainage outlet consists of two drainage outlets passing under Mountain Road at sta. 10+50 and 13+50. These two outlets combine approximately 500 feet downstream of the crossings. Drainage at this outlet originates within the Vaad Mountain Condominiums Phase IV development. Drainage passes under Mountain Road within two closed systems, outlets into open channels passing through wetland areas, and leaves the project area to the south.

County Route 44

This drainage outlet, located on Mountain Road, at sta. 27+20, provides drainage relief for approximately 900 feet of County Route 44 and adjacent properties to the north/west. The Vintage Vista and Niederman subdivisions will also outlet at this point. The existing condition consists of an open channel system flowing adjacent to County Route 44 which is collected in a drainage structure at the intersection with Mountain Road. Runoff then crosses under Mountain Road and leaves the project area in this closed system to the southwest.

Forest Road Middle

Drainage at this outlet point, located at sta. F 14+50, includes runoff from the lower sections of Mountain Road (County Route 44 to Forest Road), Forest Road (from Mountain Road south), and the area to the south and west of Mountain and Forest Road. The upper drainage limit includes the multi-family developments at Sasev Court. Runoff from within this development flows through an underground detention system, into a closed drainage system flowing along Mountain Road, and outlets at the intersection of Mountain and Forest Roads into a small wetland area. This area is drained by a small open channel which flows south, adjacent to Forest Road, and flows into a larger wetland area. This area continues flowing south, crosses under Forest Road, and leaves the project area to the south, eventually terminating in Forest Road Lake.

Forest Road Lower

This drainage outlet, located just north of Carter Lane, provides drainage relief for the majority of the lower section of Forest Road. Runoff is collected in a closed drainage system along Forest Road and leaves the project area to the west.

Acres Road West

Drainage at this outlet point, located at sta. A 13+80, includes runoff from the subdivision located adjacent to Mountain Road, Karlin Boulevard, and the upper sections of Forest Road. Runoff is collected in a series of closed drainage systems located within the development, flows through a detention pond, and leaves the

development under Forest Road at sta. F 31+00. Runoff flows in a closed drainage system for approximately 400 feet before leaving the project area to the south of Acres Road. This runoff combines with runoff from Abdur Park Lake, located approximately 2500 ft. north of the project limit on Forest Road. Localized roadway flooding has been observed in this location during heavy rainfall events. Village officials have indicated that downstream closed drainage systems may be inadequately sized.

Acres Road Middle

Numerous drainage outlets exist throughout this section of roadway. The closed drainage systems were primarily installed during the construction of the housing developments located along this section of roadway. Behind the properties along the southwestern side of Acres Road there is a perennial stream and wetland area. This stream conveys runoff from the upper sections of Forest Road, Acres Road and Mountain Road, flowing from northwest to southeast. The various closed drainage systems collect runoff from the roadway and adjacent land and discharge to this stream.

Bakertown/Israel Zupnick Drive

This drainage outlet, located at sta. B 25+00, at provides drainage relief for the lower section of Dinev Court and the Bakertown Road Condominiums. Runoff is collected in a closed drainage system, flows under Bakertown Road from east to west, and leaves the project area west, along Israel Zupnick Drive.

Bakertown Road Lower

This drainage outlet, located at sta. B 19+50, includes runoff from Bakertown Road condominiums, the lower sections of Bakertown Road, the Kiryas Joel Business Center, as well as a large upstream area adjacent to County Route 105. The main drainage pattern originates on Adria Hill, approximately 5000 ft upstream from the drainage crossing. Runoff is collected in a small stream, flowing from east to west. It crosses under Bakertown Road via a 60" CMP culvert, leaving the project area to the west. This runoff eventually combines with runoff from the Acres Road West and East drainage outlets.

r. Geotechnical

Based on the Soil Conservation Service Maps of Orange County the soils within the project area consist of silt loam and gravelly silt loam soils. The hydrologic soil groups are primarily C and D type soils with the depth to water table ranging from 0.5 to 6.0 feet. These types of soils are moderately well drained soils. It is not anticipated that these soil types would result in any unique roadway design requirements. Infiltration testing will be required if stormwater management practices utilizing infiltration are proposed.

Soil borings were taken on November 3, 2010. The borings were progressed to a depth of 7 feet and no rock was encountered. The general stratigraphy encountered by the test borings consisted of a surficial asphalt ground surface overlying a gravelly fill material. Asphalt depths were measured in the range of 3 to 8 in. thick. The fill material beneath the asphalt surface consisted of a brown and moist fine to course

gravel and fine to course sand type soils with trace amounts of plastics. Some locations had a layer of sandy silt with little to some fine gravel underlying the fill material.

s. Utilities

Overhead utilities exist along County Route 44, Mountain Road, Forest Road, Bakertown Road, and Acres Road. The following utility companies have overhead lines located within these roadway corridors:

- Orange and Rockland Utilities, Inc.
- Frontier Telephone
- Cablevision of Warwick

Underground utilities include water, sanitary sewer, and gas. Waterlines and sanitary sewer, which are owned by the Village of Kiryas Joel, are located under County Route 44, Mountain Road, Forest Road, Bakertown Road, and Acres Road. Underground gas service, owned by Orange and Rockland Utilities Inc., is located along Mountain, Forest, Bakertown, and Acres Roads.

t. Railroads

There are no railroads within or adjacent to the project limits.

u. Visual Environment

The existing landscape is a mix of residential, commercial and undeveloped land. The following is a summary of the characteristics of each roadway.

County Route 44

The south side of CR 44 consists mainly of multi-family dwellings and a large asphalt parking area. Minimal landscaping exists around the buildings. The north side of CR 44 is currently undeveloped; however, two residential developments have been approved in this area, and are currently under construction. The developments include a mix of both single family and multi-family units.

Mountain Road

Development along Mountain Road is a mix of multi-family dwellings and undeveloped land. Due to the topography of the area the buildings on the west side of Mountain Road (north of CR44) are at the toe of slope and located approximately 20 feet below the roadway elevation. A row of pine trees at the top of the embankment provide some screening between the roadway and the homes. On the east side of Mountain Road the buildings are at approximately the same elevation as the roadway. Similar to CR 44, there are large asphalt parking areas associated with the multi-family homes and minimal landscaping.

The area on the west side of Mountain Road, between the intersection of Forest Road and CR 44, is currently undeveloped. There are plans; however, to build single family homes in this area. The backyards of the homes would abut Mountain Road and there are no proposed driveway openings to Mountain Road.

Forest Road (Upper Section)

Forest Road within the project limits consists of a mixture of multi-family dwellings and undeveloped properties. The northern section of this segment, from Mountain Road north, consists of multi-family and single family dwellings with sidewalks along each side of the roadway.

The buildings on the north side are set back approximately 40 to 50 feet and there is a grass/lawn area between the sidewalk and the buildings. The buildings on the south side are set approximately 10 feet below the roadway elevation. There is minimal landscaping throughout this area.

South of Mountain Road the roadway consists of single and multi-family dwellings on the east side of the roadway with undeveloped land on the western side. Curb and sidewalk exist along the east side of the roadway for this segment of roadway. There is minimal landscaping throughout this area.

The extreme southern portion of this roadway segment consists of a mixture of residential and commercial properties. Curb and sidewalk exists on both sides of the roadway and there is minimal landscaping throughout this area.

Forest Road (Lower Section)

This section of Forest Road consists of a mixture of single and multi-family dwellings and commercial properties. The buildings are set back approximately 40 to 50 feet and there is a grass/lawn area between the sidewalk and the buildings. Curb and sidewalk can be found along most sections of the roadway.

The commercial properties located within this roadway can be found at the western edge of the project limit. The properties consist of a used car dealership and a bus parking area for the Monroe Bus Company.

The eastern section of this roadway segment consists of large, single family houses with many landscape features. These include decorative fencing, segmented block and brick walls and planting beds, decorative tress and hedge rows, and brick pillars and light posts.

Bakertown Road

Bakertown Road from Meron Drive to approximately 500 feet north of Dinev Court is a mix of commercial and single and multi-family residential building. The one exception is a small wetland area located just south of Hamaspik Way on each side of the road. The commercial businesses have parking located in front of the buildings and overall there is very little landscaping throughout the developed portion of the corridor. The one exception is a single family home located just north of Israel Zupnick Drive. This home is set back off the roadway and has a row of trees screening the roadway.

Acres Road

This section of Acres Road consists of a mixture of single and multi-family dwellings, commercial, and undeveloped properties.

The multi-family dwellings are primarily located along the southern side of the roadway with curb and sidewalk adjacent to the roadway. The buildings are set back approximately 40 to 50 feet and there is a grass/lawn area between the sidewalk and the buildings.

The northern side of the roadway consists of a mixture of large, single family dwellings and undeveloped properties. The single family dwellings are set back from the roadway, separated by wooded areas, and are not directly visible from the roadway. The undeveloped properties are heavily wooded with two of them containing small ponds.
A small café is located at the eastern end of this roadway segment. The café's parking area is open along the entire property limit with uncontrolled access to the roadway.

v. Provisions for Pedestrians and Bicyclists

As development has occurred along the roadways within the project area, sidewalks have been constructed along the frontage. As a result there are several sections of discontinuous concrete sidewalk along all roadway sections within the project limits. There is also a 780 foot section of temporary wooden sidewalk along the west side of Mountain Road.

A large portion of the population of Kiryas Joel walks as their primary mode of transportation. With the noted discontinuous sidewalk network, pedestrians currently use the travel lanes and limited shoulder area for walking in areas where sidewalk does not exist.

There are no provisions for bicyclists along any of the roadways. Bicycle use throughout the Village is minimal.

w. Planned Development for Area

There are several housing developments within the project area that are either under construction or in the planning/design stages. A summary of those is as follows:

Hakiryah II - Located at the northern project limit of Mountain Road. This development includes 120 multi-family units. Access onto Mountain Road will be directly across from Chevron Drive, forming a four way intersection.

Vintage Vista – Located at the eastern project limit of County Route 44. This development includes 29 single family residential homes. Access onto County Route 44 is located approximately 600 feet east of the County Route 44/Mountain Road intersection.

Niedermann Development – Located on the north side of County Route 44 between the intersection with Mountain Road and the entrance to Vintage Vista. This development includes 4 single family homes with driveway access directly to County Route 44.

Forest Edge Development – Located on the west side of Mountain Road between the intersection with Forest Road and County Route 44 and adjacent to a large section along the western side of Forest Road. This development includes 57 single family homes. Access onto Mountain Road will be directly across from County Route 44 with

secondary access onto Forest Road approximately 500 ft. south of the intersection with Mountain Road.

x. System Elements and Conditions

This project will have a positive impact on the mobility of people through the project area. As previously noted, the Village of Kiryas Joel has a large percentage of pedestrians. This project will provide connections between pedestrian generators and destination points. The combination of roadway and sidewalk improvements will also eliminate potential motorist/pedestrian conflict points and improve safety.

y. Environmental Integration

There are no existing parks within the project limits.

There are no appropriate locations for the installation of pocket parks or other environmental enhancements within the project limits.

2. Needs

Based on existing conditions, the following needs have been identified.

a. Project Level Needs

1. Capacity Deficiencies – There are currently no capacity deficiencies in the study area. Based on level of service analysis results for ETC (2014) and ETC +20 (2034), the intersections of Mountain Road/Forest Rod and Forest Road/Acres Road will be at capacity or failing in the design year.

2. Pavement Needs – The existing pavement is in fair condition. Ride quality is poor due to waviness in the pavement, and cross slope which exceeds standard values in many areas.

3. Safety – With the exception of the Forest Road/Acres Road intersection, accidents associated with geometric deficiencies along the project roadways are minimal. The Forest Road/Acres Road intersection is a T –configuration with a flashing red signal in all directions. The addition of appropriate turn lanes and activation of the traffic signal should reduce the number of accidents at this intersection. In general, the project roadways are constrained and do not provided drivers with much space to avoid collisions. The wider pavement section constructed under this project should reduce the overall number of accidents on the project roadways.

   While there were no reported vehicle/pedestrian accidents, there is a potential safety issue in areas where there are no sidewalks and pedestrians currently have to walk on the shoulder/travel lane.

4. Pedestrian and Bicycle Needs –

Due to the large percentage of the population that walks as their major mode of transportation, there is a need to complete the sidewalk network on all of the roadways within the project area.

There are currently no provisions for bicyclists; however, bicycle use throughout the Village is minimal and there is not a need to provide designated bicycle accommodations.

5. Bridge Structural Needs – Not applicable.

6. Drainage Needs –

   Aside from the localized roadway flooding during heavy rainfall events at the Forest Road/Acres Road intersection, there are no apparent drainage problems within the project study area. The downstream pipes from the closed drainage system will be investigated during final design and replaced if deemed undersized. As the project is designed and impermeable areas added, the capacity of the remaining existing closed drainage systems and culverts will be evaluated.

7. Environmental Needs – There are currently no environmental needs.

b. Area or Corridor Level Needs

1. Capacity Needs – All roadways and intersections currently operate at acceptable LOS. Based on projected traffic growth, several intersections will exceed capacity in the Design Year 2034.

2. Modal Interrelationship – Due to the high percentage of pedestrians, there is a need to separate pedestrian and vehicle traffic.

3. System Needs – Due to the high percentage of pedestrian traffic, there is a need to provide a continuous sidewalk network.

4. Mobility Needs – There are currently no vehicle mobility deficiencies.

5. Social Demands and Economic Development – Continued development along County Route 44, Mountain Road and Bakertown Road has/will continue to result in the need to increase intersection capacity by adding appropriate turn lanes and the need to provide a continuous sidewalk network.

c. Transportation Plans

This project is part of the Statewide Transportation Improvement Plan.

D. PROJECT OBJECTIVES

The following objectives have been established for this project:

Appendix F4.5

Kiryas Joel Roadway and Pedestrian Improvements Design Plans*****

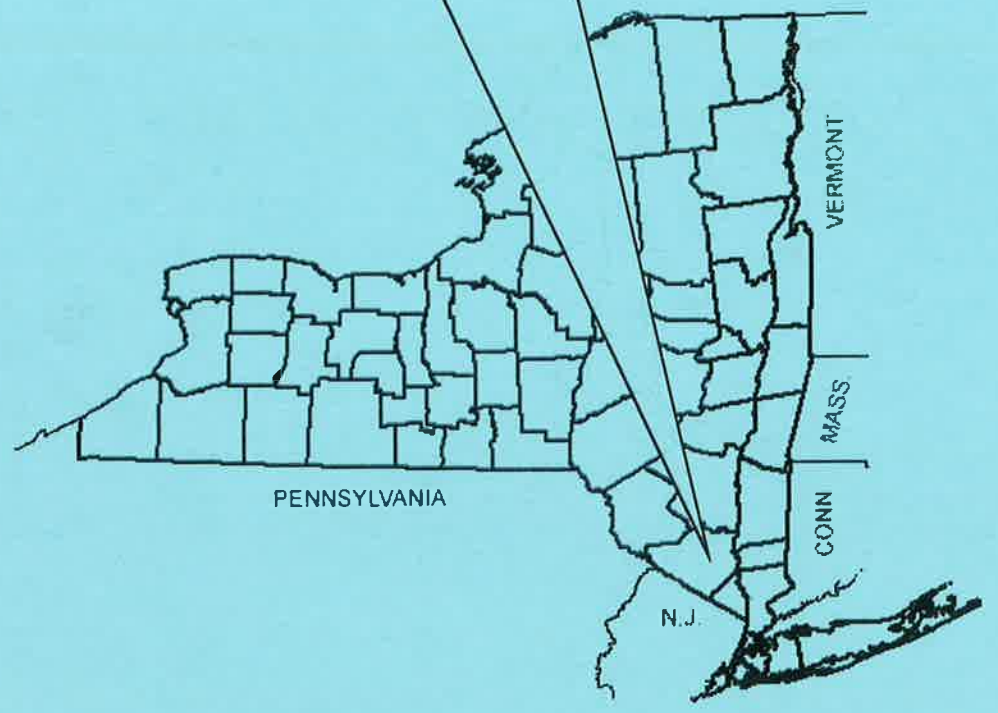
*****Appendices contain partial copy of the referenced document.
See accompanying CD for full copy.

TRANSPORTATION

Volume II – Plans, Profiles, & Typical Sections

July 2013

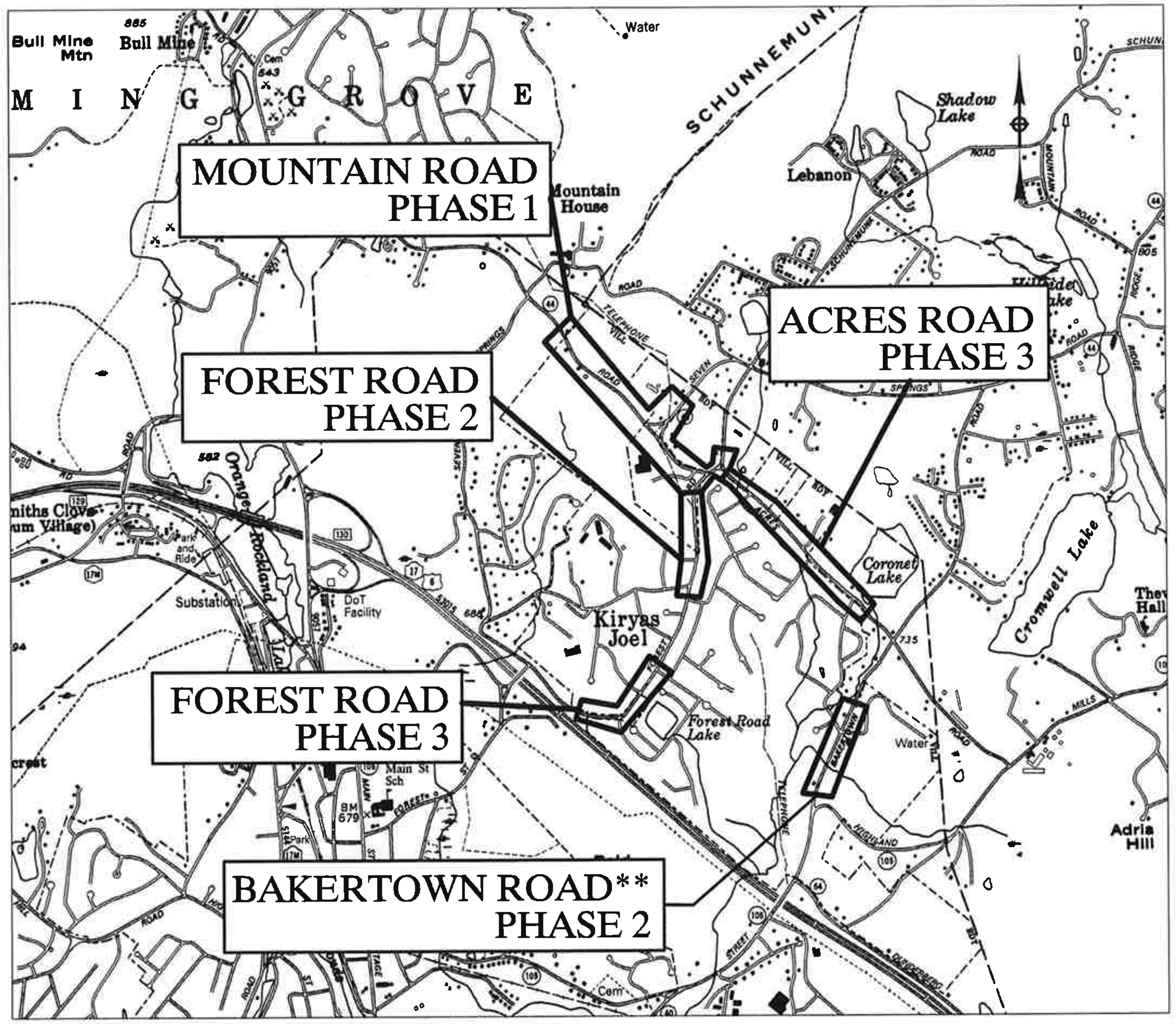
P.I.N. 8759.65 and 8780.20
Kiryas Joel Roadway and Pedestrian Improvements
Village of Kiryas Joel
Orange County



U.S. Department of Transportation Federal Highway Administration

NEW YORK STATE DEPARTMENT OF TRANSPORTATION
ANDREW M. CUOMO, Governor
JOAN MCDONALD, Acting Commissioner

PROJECT REPORT



**SIDEWALK CONSTRUCTION ALONG BAKERTOWN ROAD TO BE COMPLETED IN PHASE 1 CONTRACT

PREPARED BY: ON:	ALTERED BY: ON:

AS BUILT REVISIONS
DESCRIPTION OF WORK:

SIGNATURE DATE

COUNTY: ORANGE

DOCUMENT NAME: ConstructionPhaseFigure.dgn

PINS: 8759.65/8780.20

PS&E DATE

BRIDGES | CULVERTS

ALL DIMENSIONS IN FT UNLESS OTHERWISE NOTED

PROJECT OVERVIEW MAP
CONSTRUCTION PHASE DIAGRAM

VILLAGE OF KIRYAS JOEL
ROADWAY AND SIDEWALK IMPROVEMENTS

CONTRACT NUMBER

Stantec

DRAWING NO.
SHEET NO.

NEW YORK STATE DEPARTMENT OF TRANSPORTATION REGION 8

DESIGN SUPERVISOR — JOB MANAGER — DESIGNED BY — CHECKED BY — ESTIMATED BY — DRAFTED BY — CHECKED BY

Plotting Parameters
Plotted By: mpachand
Design File: U:\192810158\general\reports\ConstructionPhaseFigure.dgn
Plotted: 7/3/2013 10:17:16 AM
Plot Config: $pltcfg$

Appendix F5

Town and Village Road
Maintenance Agreement

AGREEMENT made as of the 1st day of June, 2010 between the Town of Monroe, a municipal corporation having its principal offices at 11 Stage Road, Monroe, New York and ROBERT PICINOTTI, the Deputy Highway Superintendent of the Town of Monroe, both parties being hereinafter referred to as the "Town" and the Village of Kiryas Joel, a municipal corporation, having its principal offices at Village Hall, P.O. Box 566, Monroe, New York, hereinafter called the "Village."

WHEREAS, the TOWN and the VILLAGE are desirous of entering into a mutual agreement under the authority of Section 142-c of the Highway Law of the State of New York and Article 5-G of the General Municipal Law whereby the Town of Monroe Highway Superintendent and the employees in his department and equipment under his control would be utilized to repair, re-pave, and maintain the streets and roads in the Village of Kiryas Joel and to remove snow and ice therefrom as provided for herein.

WHEREAS, the Town Board of the Town of Monroe and the Village Board of Trustees of the Village of Kiryas Joel have agreed upon the terms and conditions of such a contract and are now desirous of setting forth the same in this agreement.

NOW, UPON mutual promises given herein to each party hereto respectively, it is agreed as follows:

1. The term "streets" as used herein shall mean such streets, roads, ways and other means of public access that have been offered to and accepted by the Village of Kiryas Joel as Village streets either by formal conveyance to the Village or by actual use for a fixed period of

time as set forth in Section 189 of the Highway Law together with storm drainage facilities such as tiles, culverts, catch basins, swales, ditches and the like that are utilized to catch and drain run-off from said highways and that are located within the right-of-way and appurtenant easements, but shall not include drainage ditches, culverts, swales, channels, streams or easements that are not appurtenant to such streets. For the purposes of this Agreement, the word "streets" as used herein, does not include sidewalks.

2. That the Town of Monroe, through the Town of Monroe Highway Superintendent and the employees of the Town of Monroe under his control together with the equipment at his disposal, shall maintain, clean, re-pave, and repair all Village streets in the Village of Kiryas Joel and shall remove snow and ice therefrom in the same manner as repairs, cleaning and maintenance are made and snow and ice removed from Town of Monroe highways. Excluded from this Agreement is the provision of street sweeping services without any reduction of the payments required hereunder. Re-paving shall be limited to re-paving the roads, streets, and drives open to the public for motor vehicle traffic and listed on Exhibit B at a maximum cost of $50,000 per year as reasonably determined by the Town Superintendent of Highways (or if such position is vacant, by the Deputy Town Superintendent of Highways). The parties recognize that there is no promise or guarantee that all roads, streets, drives, and ways listed on Exhibit B shall be re-paved during the duration of this contract, or any extension thereof.

3. That in consideration for such services to be rendered by the Town, the Village shall pay to the Town $216,000 for the first contract year to be paid as follows:

(a) payments of equal installments to be made on or before June 20th, August 20th,

October 20th and December 20th.

That in consideration for such services to be rendered by the Town, the Village shall pay to the Town $222,000 for the second year, $228,000 for the third year, $234,000 for the fourth year and $240,000 for the fifth year to be paid in equal installments on or before June 20th, August 20th, October 20th and December 20th of each contract year. In the event it is determined that this contract is for a period of time longer than is otherwise legally permissible, the contract shall be extended to the longest period of time permissible, up to five years, and may be renewed as otherwise provided for herein.

Failure of the Village to pay the contract sum by the dates indicated herein, shall constitute grounds for the Town to delay or postpone performance of the services covered by this agreement until such payments are made.

During any such periods of time in which services are delayed or postponed due to the Village's failure to pay the contract amounts by the dates indicated herein, the Town shall be relieved of all liabilities arising out of the conditions of the Village streets and the Village agrees to indemnify and hold harmless the Town against any and all such liabilities of whatever kind and of whatever nature.

4. Notwithstanding any provisions to the contrary, the Town and Village agree that the services to be performed by the Town Highway Superintendent shall apply only to these streets to which the Village has legal title as evidenced by recorded deeds in the Orange County Clerk's Office as of the date of execution of this agreement and to those streets to which the Village may hereinafter acquire title subject to the conditions contained in paragraph 11 herein.

Attached hereto and made a part hereof as Exhibit "A" is a complete list of all village streets and roadways covered by this agreement. Exhibit "B" relates solely to re-paving. As stated above, re-paving shall be limited to those roads, streets, and drives as provided for, along with the conditions provided for in paragraph "2," above. Said lists may be amended from time to time, to include newly acquired streets by the Village upon the concurrence of the Town and Village Boards and the Town Highway Superintendent. Such concurrence shall not be unreasonably withheld.

5. The Town Superintendent of Highways shall have the same rights of removal of vehicles from Village streets as is set forth in Chapter 50 of the Code of the Town of Monroe and said section of law shall be applicable to all Village streets serviced by the Town Superintendent of Highways and it is further agreed that the applicable provisions of Sections 43-10, 51-3.1 and 51-4 of the Code of the Town of Monroe shall be applicable to all Village streets serviced by the Town Superintendent of Highways. All such provisions of the Code of the Town of Monroe shall be enforceable by the issuance of appearance tickets in the Town Court.

Additionally, the Village agrees during the term of this agreement and any extensions hereto, to prohibit the excavation or opening of any Village street or roadway without a permit in accordance with Chapter 124 of the Code of the Village of Kiryas Joel.

6. The Village shall indemnify and hold the Town and the Town Superintendent of Highways harmless from any claim, action or judgment against them for damages for personal injury and/or property damage arising from the acts and/or omissions of the Village in allowing activities

in such streets such as, but not limited to, excavations, curb cuts and the parking of vehicles over which the Town and the Town Superintendent of Highways have no control or discretion which may give rise to such claim and further agreed to maintain and keep in force a policy of liability insurance in the amount of at least $3,000,000 naming the Town and the Town Superintendent of Highways as additional insured to protect against such losses. 'The Town shall have no obligation to perform hereunder unless a certificate of such insurance is first presented to the Town Clerk which certificate shall also have a provision for at least ten (10) days prior to notice to the Town in the event of the cancellation of such insurance for any reason whatsoever.

7. That the effect and purpose of this contract shall render the Town of Monroe primarily and exclusively responsible for the maintenance and repair of Village streets in the Village of Kiryas Joel and for the removal of snow and ice therefrom as if such Village streets were part of the Town of Monroe highway system. Notwithstanding the foregoing, the Town shall not be responsible for the maintenance and repair of Village sidewalks nor shall it be responsible for the removal of snow or ice from said sidewalks including such situations where the snow is deposited on said sidewalks by the Town while carrying out its duties under this contract. The Village agrees that it will indemnify and hold harmless the Town and the Highway Superintendent from any claim, action or judgment for personal injuries or property damage resulting from the condition of any Village sidewalk.

In rendering the services agreed upon hereunder, the Town of Monroe Highway Superintendent shall use such discretion and ability as he would ordinarily use in maintaining,

cleaning, repairing, re-paving, and removing snow and ice from the Town of Monroe highways and he shall have the sole discretion and control in undertaking such maintenance, cleaning and repair and snow and ice removal services. If the Highway Superintendent determines that D.A. Wieder Boulevard Ext. cannot be plowed or ice removed without unreasonable risk to Town equipment, the Highway Superintendent and Village shall discuss and negotiate a solution to the liking of the Highway Superintendent and Village prior to the end of 2010._

8. This contract is intended to provide the Village with highway services for snow and ice removal and ordinary repairs, cleaning and maintenance (as well as re-paving as provided for in paragraph "2"). In the event the Village requests the Town to undertake major or substantial repairs or capital improvements to any Village streets, such services shall be performed at the option to the Town for an additional price agreed to by the Village and the Town. The Village may, at its option, use funds from the New York State Consolidated Highway Improvement Program (CHIPS) or any other similar federal or state program to pay, in whole or in part, for such substantial repairs or capital improvements.

9. The Village agrees, during the term of this contract, that it shall develop and implement a capital improvement plan for the streets within the Village which are covered by this Agreement. Such capital improvement plan shall include, but not be limited to, reclamation of many of the older streets in the Village and the widening of through streets as specified by Chapter 124 of the Code of the Village of Kiryas Joel.

10. That the term of this contract shall be from June 1, 2010 until May 31, 2015

and the same shall not be renewed or extended unless explicitly authorized by joint resolutions of the Town and the Village. At the option of the Village, this agreement may be extended and renewed for a period of an additional five years with annual increase of $6,000.00 per year. If the Village intends to renew such agreement, it shall notify the Town Clerk in writing of such intent, prior to November 1, 2014.

11. The Village agrees that all undedicated streets or roads, prior to their acceptance by the Village Board, and all streets and roads which shall hereinafter be constructed, shall conform with the standards and requirements set forth in Chapter A63 of the Town Code or some other similar provisions now or hereinafter promulgated by the Village Board.

By: _____
SANDY LEONARD
TOWN SUPERVISOR, TOWN OF MONROE

By: _____
ROBERT PICINOTTI
DEPUTY SUPERINTENDENT OF HIGHWAYS[1]
TOWN OF MONROE

By: _____
ABRAHAM WIEDER, MAYOR
VILLAGE OF KIRYAS JOEL

[1] At the time this contract was executed, there was no Superintendent of Highways for the Town of Monroe. The Deputy Highway Superintendent was functioning as the Town Highway Superintendent.

STATE OF NEW YORK)

ss.:

COUNTY OF ORANGE)

On the 25 day of JUNE '10, before me personally came ~~SANDY LEONARD~~, to me known, who being by me duly sworn, did depose and say that she resides at 48 Post Road, Monroe, New York, that she is the Supervisor of the Town of Monroe, the corporation described in and which executed the foregoing instrument; that she knows the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the Town Board of said corporation, and that she signed her name thereto by like order.

Notary Public

ARON SCHREIBER
Notary Public, State of New York
No. 01SC6219044
Qualified in Orange County
Commission Expires March 22, 2014

STATE OF NEW YORK)

ss.:

COUNTY OF ORANGE)

On the, 29 day of June 2010 before me personally came ROBERT PICINOTTI to me known, who being by me duly sworn, did depose and say that he resides at Cornwall, New York, that he is the Deputy Superintendent of Highways of the Town of Monroe, the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the Town Board of said corporation, and that he signed his name thereto by like order.

Notary Public

MARILYN KARLICH
NOTARY PUBLIC, State of New York
No. 4872654
Qualified in Orange County
Commission Expires October 6, 2010

STATE OF NEW YORK)

ss.:

COUNTY OF ORANGE)

On the 25 day of JUNE 2010, before me personally came ABRAHAM WIEDER, to me known, who being by me duly sworn, did depose and say that he resides at Monroe, New York, that he is the Mayor of the Village of Kiryas Joel, the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the Town Board of said corporation, and that he signed his name thereto by like order.

Notary Public

ARON SCHREIBER
Notary Public, State of New York
No. 01SC6219044
Qualified in Orange County
Commission Expires March 22, 2014

Exhibit A (snow removal and road maintenance list)

Acres Road
Anipoli Drive
Bakertown Road
Berdichev Road
Buchanan Court
Carter Lane
Chernobyl Court
Chevron Road
County Route 44
Dinev Road
D.A. Wieder Blvd.
D.A. Wieder Blvd. Extention
Eahal Court
Fillmore Court
Forest Road
Garfield Road
Getzel Berger Blvd.
Hayes Court
Israel Zupnick Drive
Kahan Drive
Karlin Blvd.
Koznitz Road
Krakow Blvd.
Krolla Drive
Lember Court
Lipa Friedman Lane
Lizensk Blvd.
Meron Drive
Mezabish Place
Mordche Scher Blvd.
Mountain Road
Nickelsburg Road
Orshava Court
Prag Blvd.
Premishlan Way
Preshburg Blvd.
Quickway Road
Riminev Court
Ruzhin Road
Sanz Court
Sasev Court
Satmar Drive
Schunnemunk Road
Shinev Court
Siget Court
Stropkov Court
Taitch Court
Taylor Court

Teverya Way
Tzfas Road
Van Buren Drive
Vayoel Moshe Court
Yoel Klein Blvd.
Zenta Road

Exhibit B
List of roads to be repaved as part of this contract

Acres Road
Carter Lane
Eahal Court
Fillmore Court
Forest Road
Getzel Berger Blvd.
Israel Zupnick Drive
Kahan Drive
Lizensk Blvd.
Quickway Road
Riminev Court
Satmar Drive
Stropkov Court
Taylor Court
Van Buren Drive (old);
Zenta Road