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PLANNING, TRANSPORTATION, ENVIRONMENT AND DEVELOPMENT
RYE, NEW YORK FAIRFIELD, CONNECTICUT

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HUDSON VALLEY

LONG ISLAND

LIMITED TRAFFIC ACCESS & IMPACT STUDY

Proposed Residential Housing
Barrett Hill (Mount Ebo Lot 6)
41 Mount Ebo Road North
Southeast, New York

Prepared for:
Covington Development LLC

May 2016

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LIMITED TRAFFIC ACCESS & IMPACT STUDY

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May 6, 2016

Mr. Harold Lepler
Covington Development LLC
322 Clock Tower Commons
Brewster, New York 10509

Subject: **Limited Updated Traffic Impact and Access Study – Proposed Residential Housing – Barrett Hill (Mount Ebo Lot 6), 41 Mount Ebo Road North, Southeast, New York**

Dear Mr. Lepler:

As requested, we have completed a Limited Traffic Impact and Access Study as an update to the 2005 Traffic Impact and Access Study conducted for the proposed residential Housing Development on Mount Ebo Lot 6 and in response to the Town Planning Consultant's comments. This Study addresses the following items:

- New turning movement counts needed at the intersection of Doansburg Road and Powers Lane/Mount Ebo Road South during the weekday morning and weekday afternoon peak periods to develop a 2016 baseline traffic condition for this intersection;

- Conduct an automatic traffic recorder (ATR) count on NYS Route 22 to determine recent traffic volume trends in the area. Contact the New York State Department of Transportation (NYSDOT) to obtain their most recent traffic data for NYS Route 22 for comparison purposes;

- Complete capacity analyses for existing, no-build and build traffic conditions at the intersection of Doansburg Road at Powers Lane/Mount Ebo Road South using the latest SYNCHRO model; and,

- Trip generation rates for the proposed development comprising 64 one-bedroom and 104 two-bedroom units should be based on trip generation rates provided by the Institute of Transportation Engineers (ITE) and published in "Trip Generation," 9th Edition, 2012.

New Turning Movement Counts

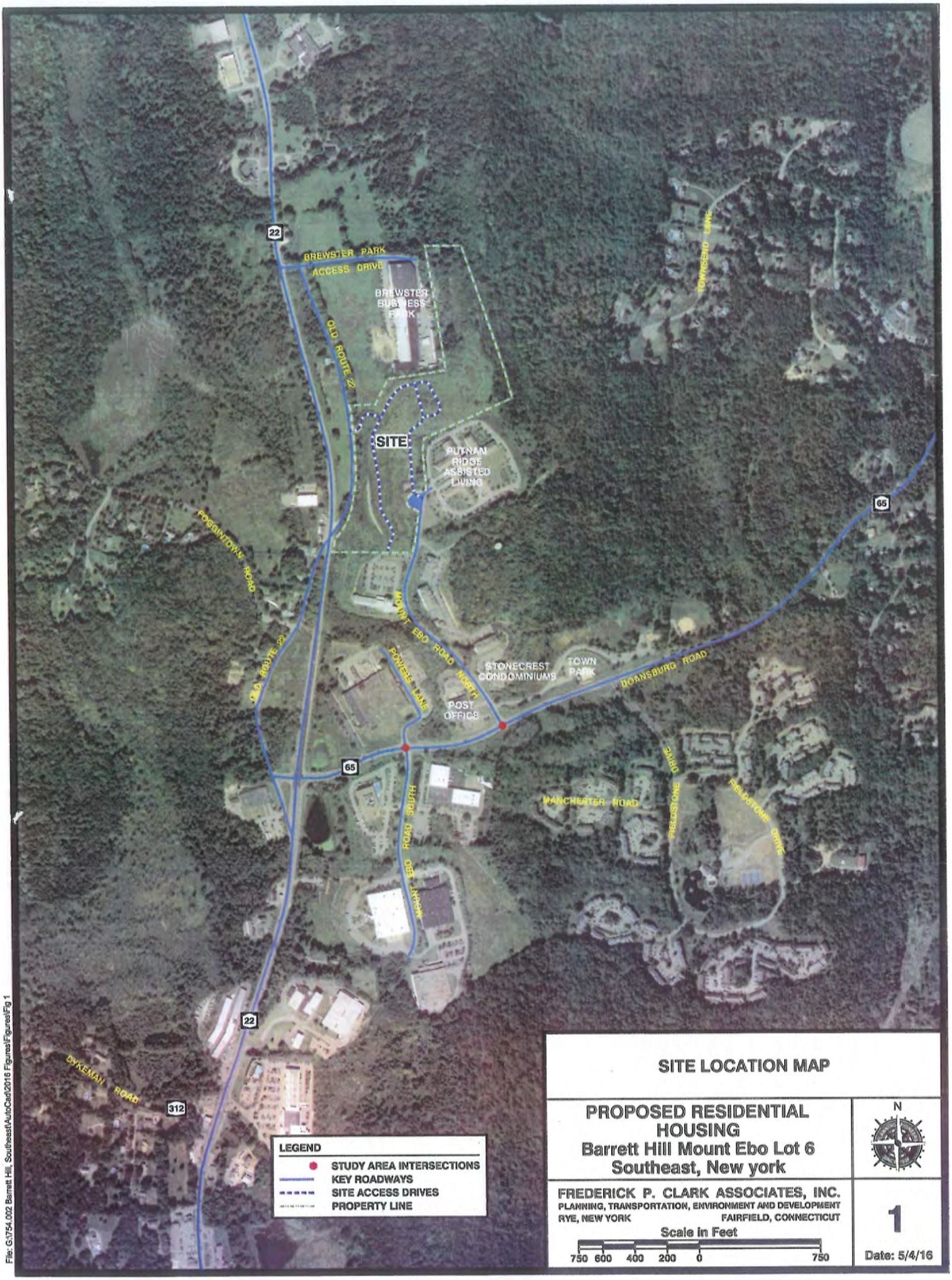
At the request of the Town's Planning Consultant, manual turning movement counts were conducted by Frederick P. Clark Associates, Inc. on Tuesday, March 29, 2016 from 7:00 to 9:00 A.M. and 4:00 to 6:00 P.M. Automatic Traffic Recorder (ATR) counts were also conducted by Clark Associates on Doansburg Road to the west of the Mount Ebo Road South/Powers Lane intersection for a one week period beginning Wednesday, April 13, and continuing through Thursday, April 21, 2016.

Figure 1 graphically illustrates the Study Area and Figure 2 graphically illustrates the Study Area intersection at which counts where conducted and the relative location of the ATR.

The results of the traffic counting program are provided in Table 1 and the 2016 baseline traffic volumes are graphically illustrated in Figures 3 and 4 for the weekday morning and weekday afternoon peak hours, respectively. The 2016 baseline traffic volumes were adjusted and balanced (where necessary) to both Clark Associates and New York State Department of Transportation (NYSDOT) ATR data collected for Doansburg Road within the area. Figure 5 graphically illustrates the hourly traffic volumes collected by Clark Associates for Doansburg Road, West of Mount Ebo Road on a typical weekday. Figure 6 graphically illustrates the hourly traffic volumes collected by NYSDOT for Doansburg Road, approximately 0.4 of a mile south of Gage Road on a typical weekday.

Recent Traffic Volume Trends within the Area

As anticipated two-way daily and peak hour traffic volumes on Doansburg Road, specifically west of Mount Ebo Road North have not increased significantly since the 2005 Traffic Impact and Access Study for the proposed residential Housing Development on Mount Ebo Lot 6 was conducted. For reference an annual growth rate of 0.8 percent per year is typically employed for this region as per the 2010 to 2015 New York Metropolitan Transportation Plan, Chapter 2, Socio-Economic and Demographic Forecasts. For comparison purposes, during the weekday afternoon peak hour, the two-way total traffic volume on Doansburg Road was found to have only increased by 4.7 percent over an 11 year period, which is much less than predicted by the Metropolitan Transportation Plan. Table 2 provides a comparison of two-way daily and peak hour traffic volumes for Doansburg Road, west of Mount Ebo Road North. Figures 7 and 8



SITE LOCATION MAP

PROPOSED RESIDENTIAL HOUSING
Barrett Hill Mount Ebo Lot 6
Southeast, New york

N

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Scale in Feet
750 600 400 200 0 750

1

Date: 5/4/16

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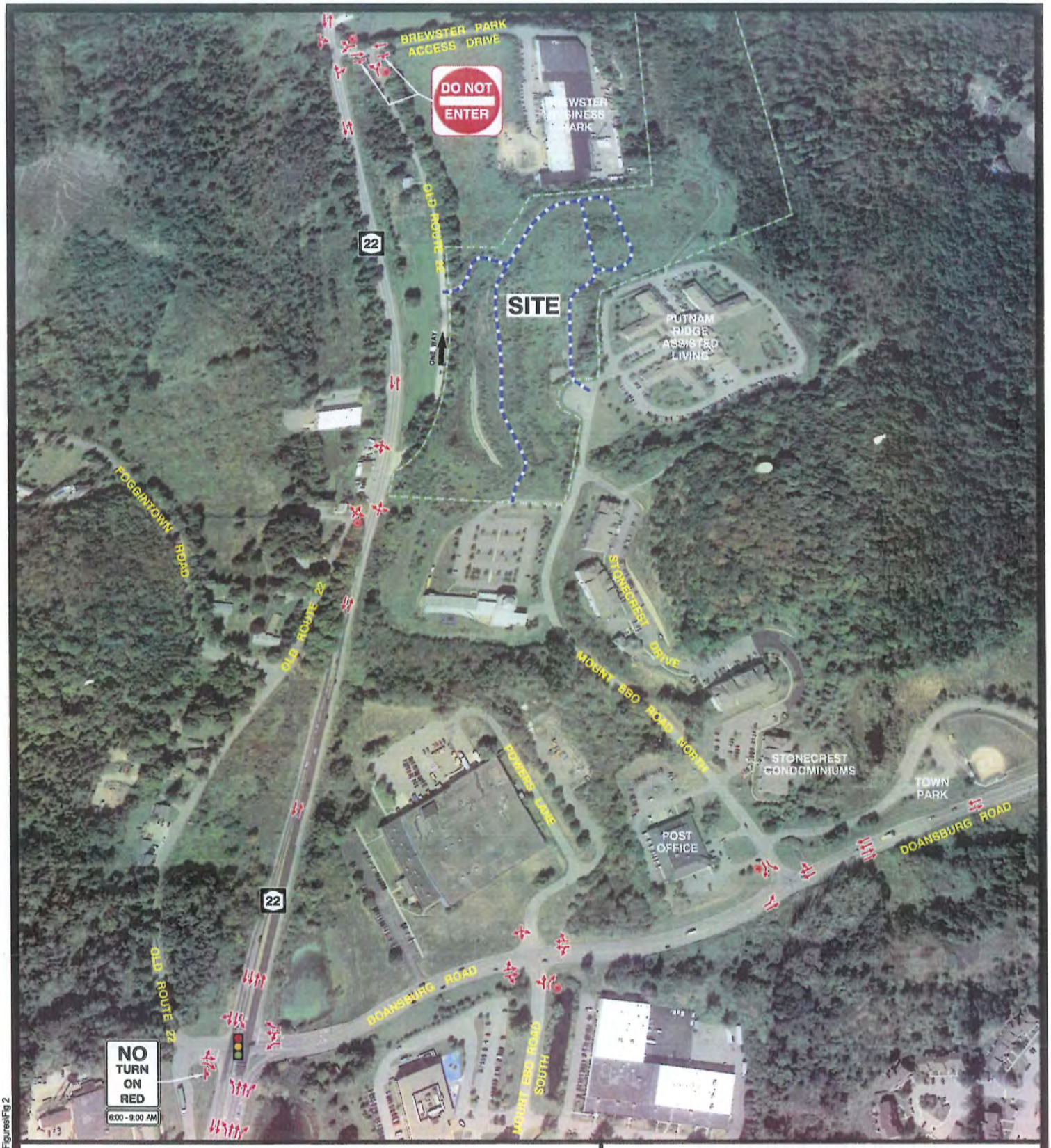

LEGEND

- TRAFFIC LANE
- TRAFFIC SIGNAL
- STOP SIGN
- TRAFFIC SIGN
- PROPERTY LINE

CURRENT STREET SYSTEM CHARACTERISTICS

PROPOSED RESIDENTIAL HOUSING
Barrett Hill Mount Ebo Lot 6
Southeast, New york

N

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Scale in Feet

350 280 210 140 70 0 350

2

Date: 5/4/16

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Table 1
2016 TWO-WAY HOURLY TRAFFIC VOLUMES – PEAK HOURS
Proposed Residential Housing
Barrett Hill - Mount Ebo Lot 6
41 Mount Ebo Road North
Southeast, New York

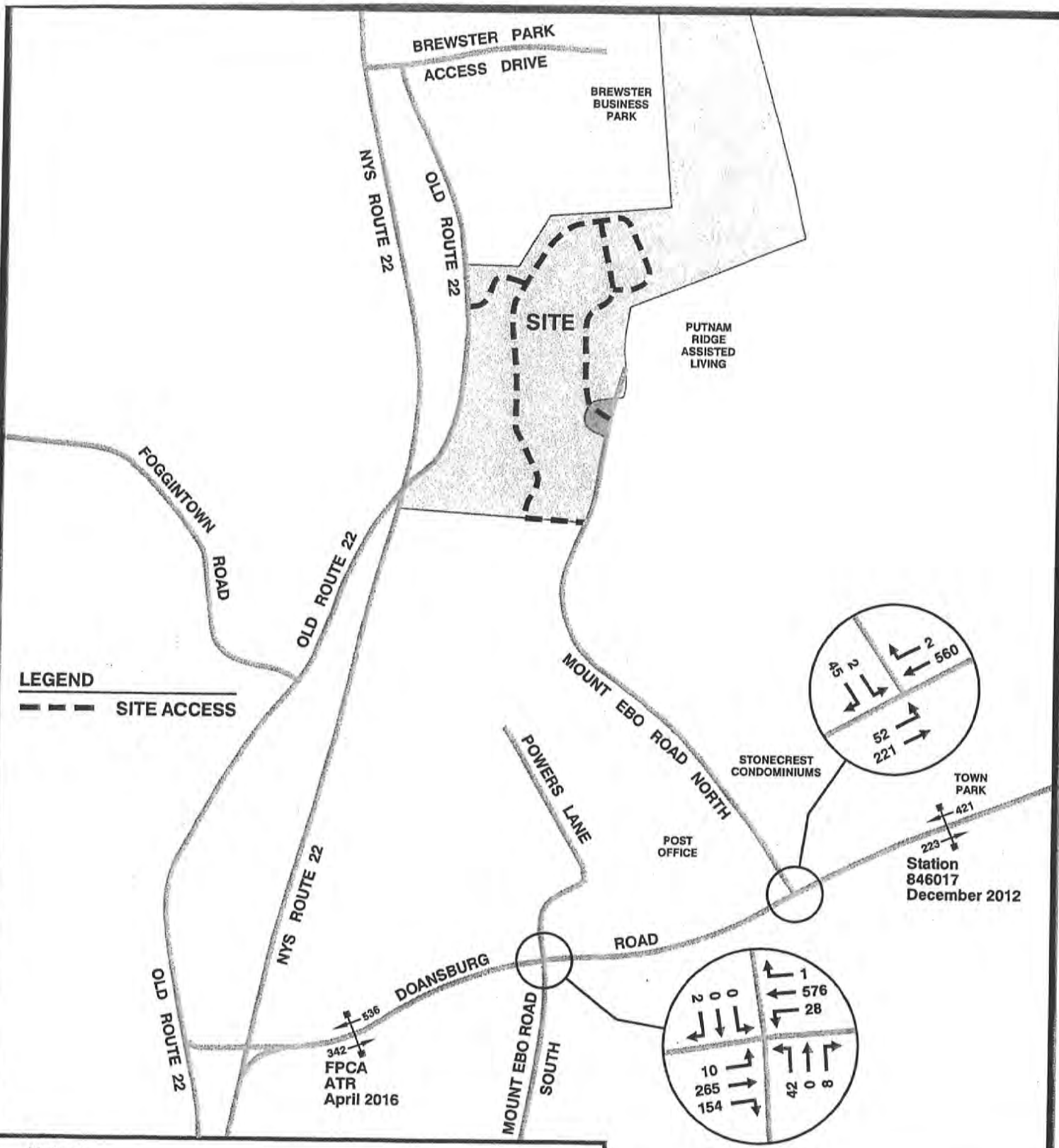
LOCATION	VEHICLES	
	Weekday Morning (8:00 – 9:00 A.M.)	Weekday Afternoon (4:30 – 5:30 P.M.)
Doansburg Road, East of Mount Ebo Road South/Powers Lane	878	1,088
Doansburg Road, West of Mount Ebo Road South/Powers Lane	1,049	1,221
Powers Lane, North of Doansburg Road	13	20
Mount Ebo Road South, South of Doansburg Road	232	243

Source: Manual turning movement counts conducted by Frederick P. Clark Associates, Inc. on Tuesday, March 29, 2016 from 7:00 to 9:00 A.M. and 4:00 to 6:00 P.M.

Notes:

1. The 2016 existing traffic volumes were adjusted and balanced (where necessary) to New York State Department of Transportation (NYSDOT) Automatic Traffic Recorder (ATR) data collected within the Study Area.

2. The 2016 existing traffic volumes entering and exiting Mount Ebo Road North were extracted from the Mount Ebo Corporate Center – Lot 6 Traffic Impact and Access Study conducted by Frederick P. Clark Associates, Inc. in March 2005.



Notes:

1- Manual turning movement counts conducted by Frederick P. Clark Associates, Inc. on Tuesday, March 29, 2016 from 7:00 to 9:00 A.M.

2- Manual turning movement counts were adjusted and balanced to New York State Department of Transportation (NYSDOT) Automatic Traffic Recorder (ATR) data collected within the Study Area.

3- Existing Traffic Volumes entering and exiting Mount Ebo Road North were extracted from the Mount Ebo Corporate Center - Lot 6, Traffic Impact and Access Study conducted in 2005.

2016 EXISTING TRAFFIC VOLUMES
WEEKDAY MORNING PEAK HOUR
(8:00 - 9:00 A.M.)

PROPOSED RESIDENTIAL HOUSING
Barrett Hill Mount Ebo Lot 6
Southeast, New york

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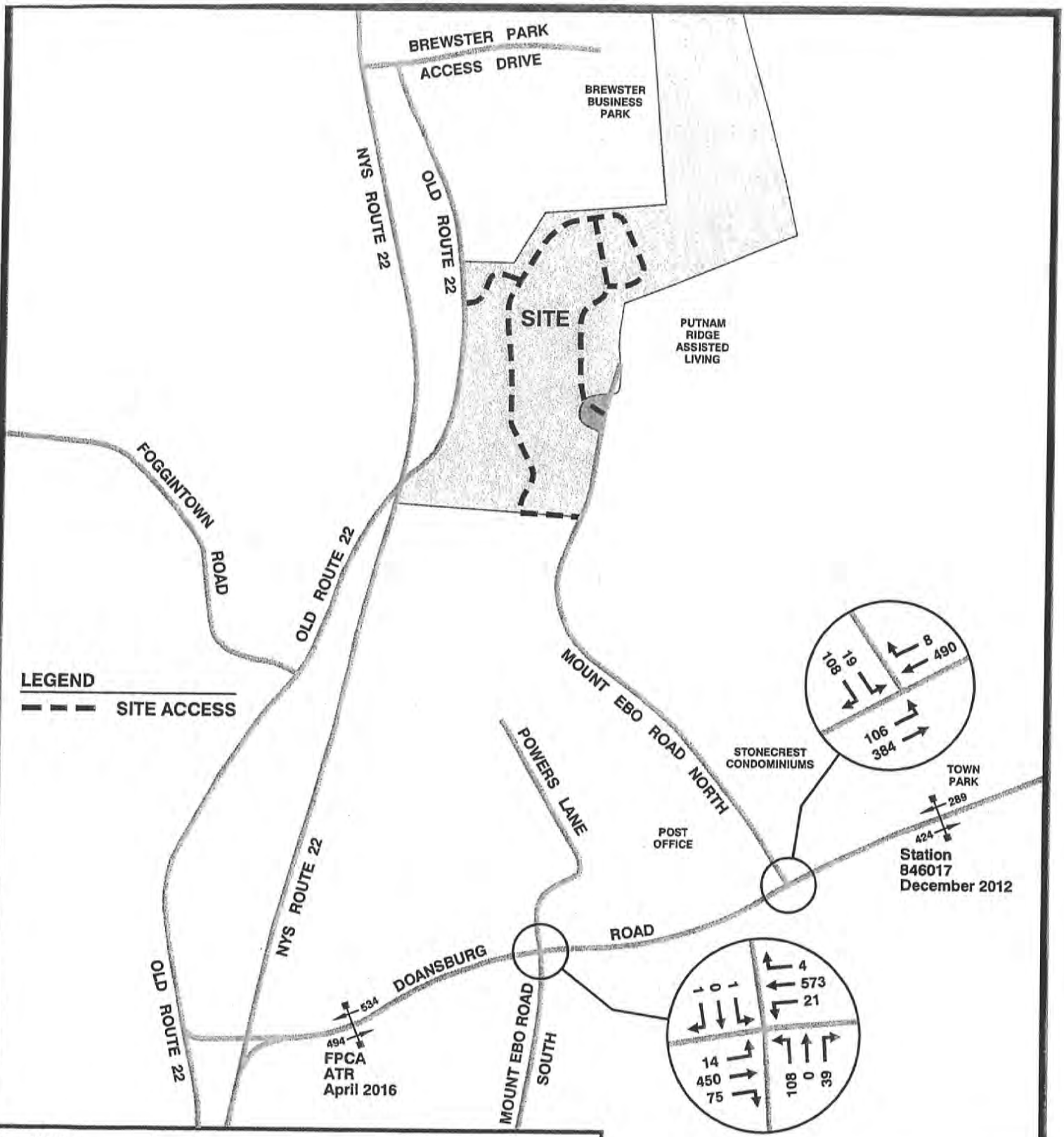

Notes:

1- Manual turning movement counts conducted by Frederick P. Clark Associates, Inc. on Tuesday, March 29, 2016 from 4:00 to 6:00 P.M.

2- Manual turning movement counts were adjusted and balanced to New York State Department of Transportation (NYSDOT) Automatic Traffic Recorder (ATR) data collected within the Study Area.

3- Existing Traffic Volumes entering and exiting Mount Ebo Road North were extracted from the Mount Ebo Corporate Center - Lot 6, Traffic Impact and Access Study conducted in 2005.

2016 EXISTING TRAFFIC VOLUMES
WEEKDAY AFTERNOON PEAK HOUR
(4:30 - 5:30 P.M.)

PROPOSED RESIDENTIAL HOUSING
Barrett Hill Mount Ebo Lot 6
Southeast, New york

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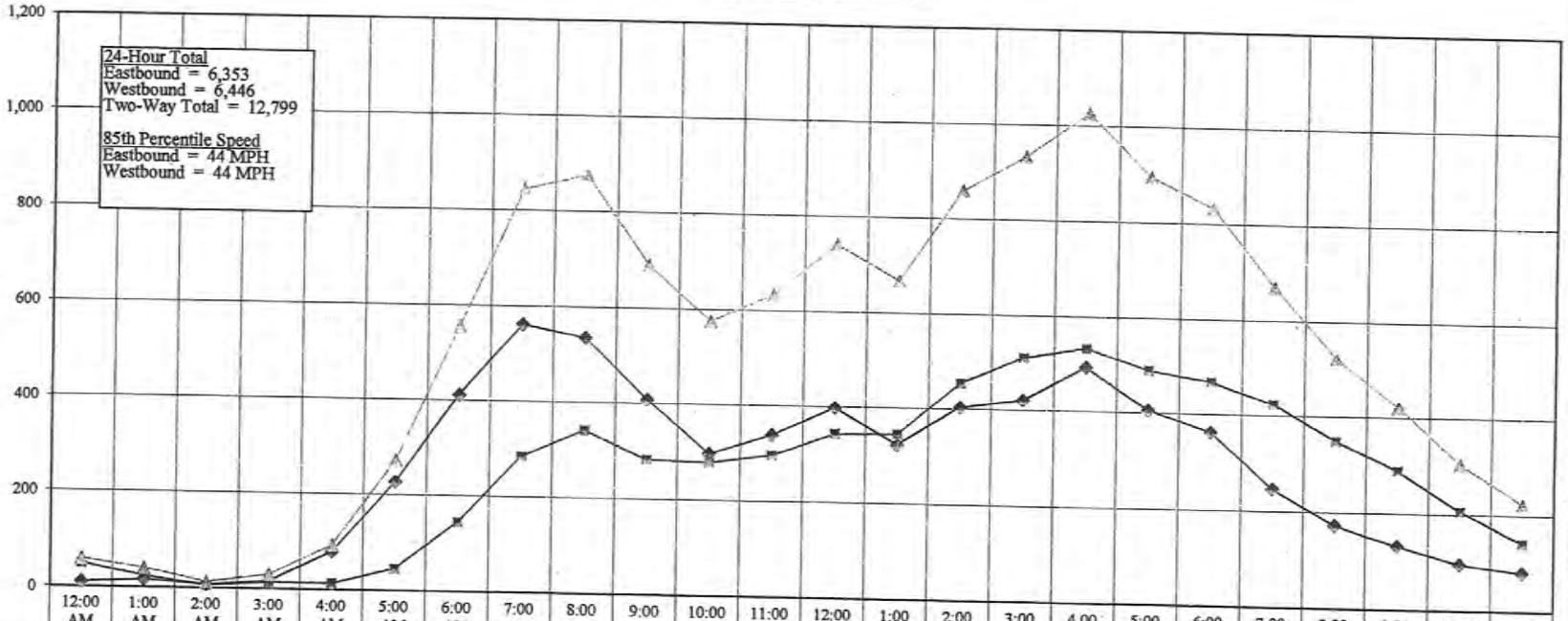
TWO-WAY HOURLY TRAFFIC VOLUMES FRIDAY, APRIL 15, 2016
DOANSBURG ROAD, WEST OF MOUNT EBO ROAD SOUTH
Proposed Residential Housing, Barrett Hill (Mount Ebo - Lot 6)
41 Mount Ebo Road North
Southeast, New York



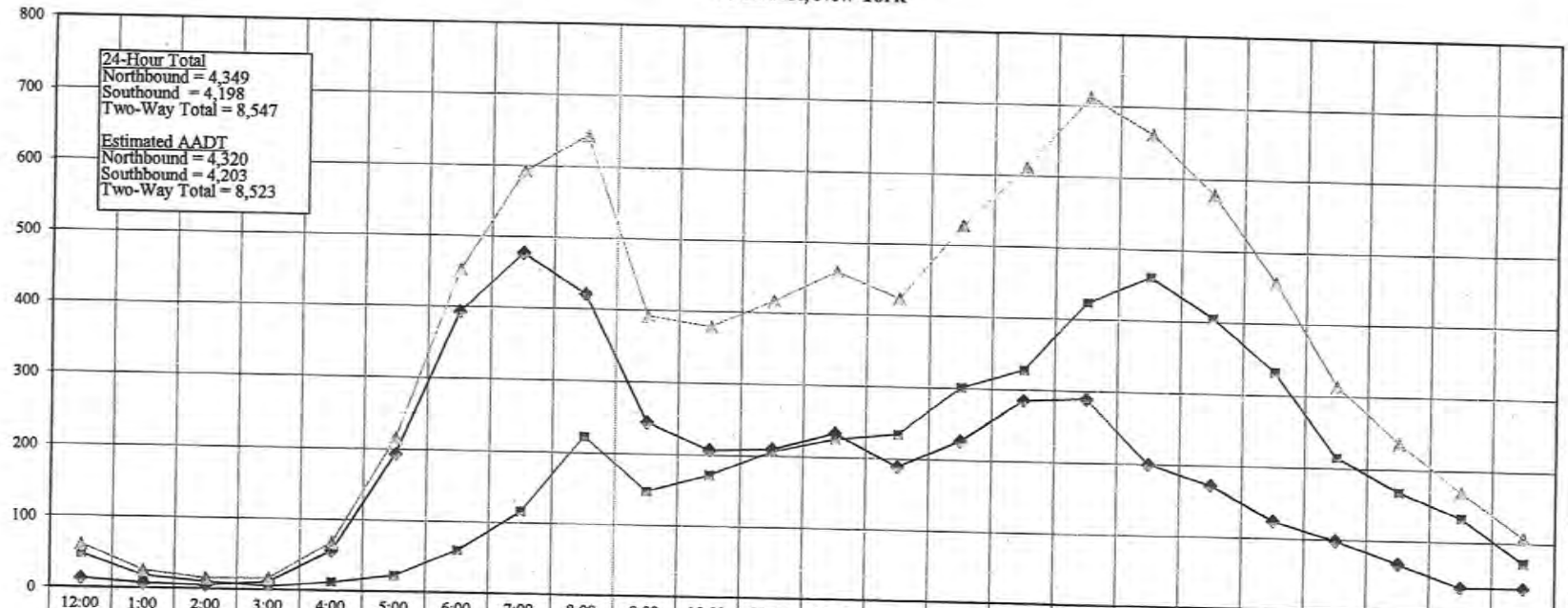
	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM
Eastbound	49	24	6	14	14	46	145	285	342	283	279	297	344	346	456	512	534	491	470	425	350	290	208	143
Westbound	10	16	7	16	79	226	411	561	536	408	297	338	398	323	404	422	494	406	363	247	173	133	97	81
Two-Way	59	40	13	30	93	272	556	846	878	691	576	635	742	669	860	934	1,028	897	833	672	523	423	305	224

Source: Automatic Traffic Recorders conducted by Frederick P. Clark Associates, Wednesday, April 13 to Thursday, April 21, 2016.

Frederick P. Clark Associates, Inc.
April 2016

Figure 5

TWO-WAY HOURLY TRAFFIC VOLUMES THURSDAY, DECEMBER 6, 2012
DOANSBURG ROAD, 0.388 MILES SOUTH OF GAGE ROAD
Proposed Residential Housing, Barrett Hill (Mount Ebo - Lot 6)
41 Mount Ebo Road North
Southeast, New York



	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM
Northbound	48	18	10	5	12	23	60	116	223	148	172	207	226	235	302	328	424	462	406	333	216	169	134	72
Southbound	13	7	5	11	56	193	393	477	421	244	207	210	234	189	227	285	289	200	173	125	99	68	36	36
Two-Way	61	25	15	16	68	216	453	593	644	392	379	417	460	424	529	613	713	662	579	458	315	237	170	108

Source: Roadway Traffic Counts conducted by New York State Department of Transportation (NYSDOT), Tuesday, December 4 to Tuesday, December 11, 2012.

Frederick P. Clark Associates, Inc.
April 2016

Figure 6

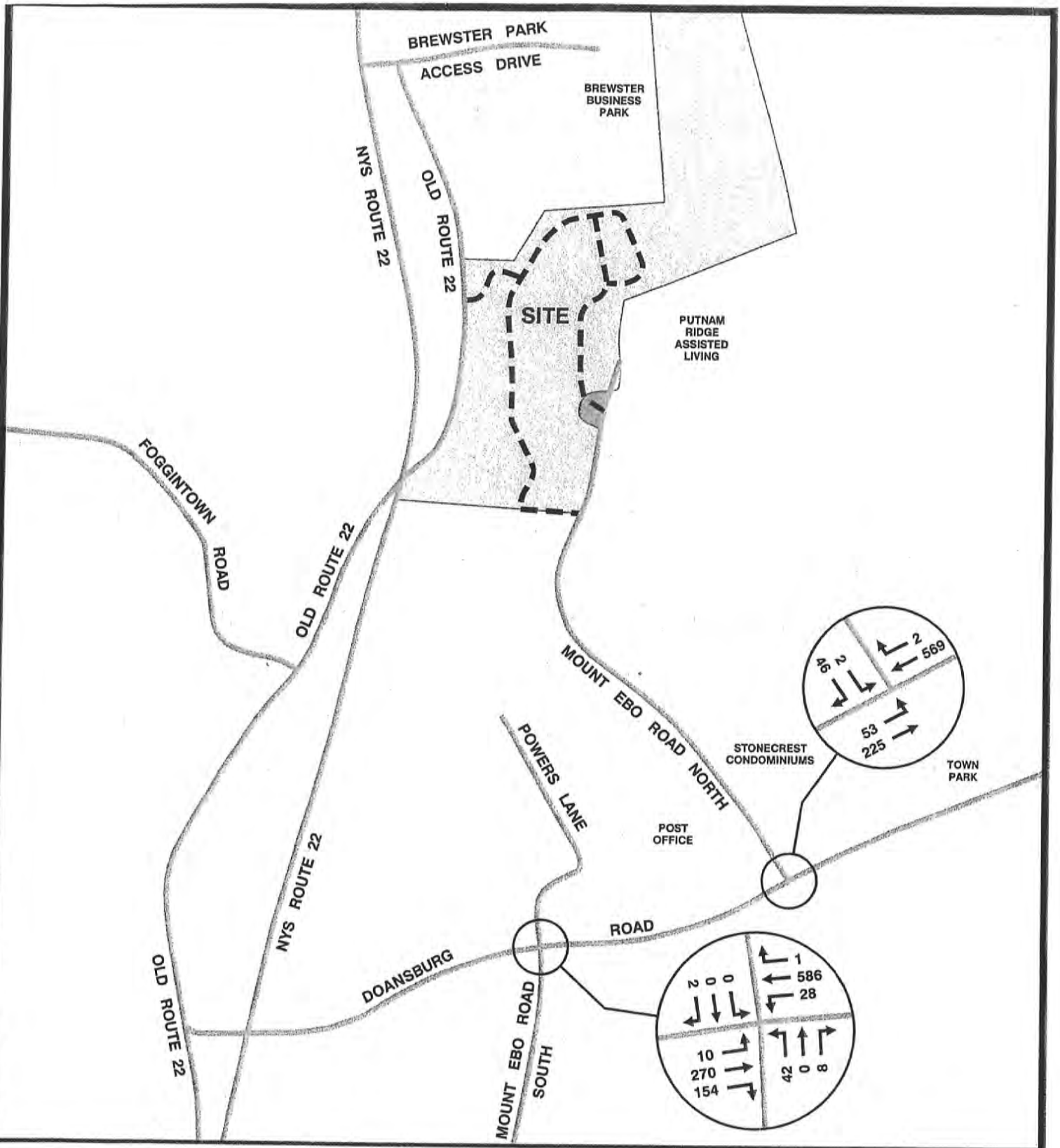
Table 2
TWO-WAY DAILY AND PEAK HOUR TRAFFIC VOLUME COMPARISON
Proposed Residential Housing
Barrett Hill – Mount Ebo Lot 6
41 Mount Ebo Road North
Southeast, New York

DOANSBURG ROAD, WEST OF MOUNT EBO ROAD NORTH									
	VEHICLES								
	Weekday Morning[1]			Weekday Afternoon[2]			Daily[3]		
DIRECTION	2016 (8 to 9 A.M.)	2005 (8 to 9 A.M.)	Percent Change	2016 (4 to 5 P.M.)	2005 (5 to 6 P.M.)	Percent Change	2016	2005	Percent Change
Eastbound	342	229	49.3	534	674	-20.8	6,353	6,306	0.7
Westbound	536	539	-0.6	494	343	44.0	6,446	5,993	7.6
Two-Way	878	768	14.3	1,028	1,017	1.1	12,799	12,229	4.7

Source: Automatic Traffic Recorder (ATR) data collected by the Frederick P. Clark Associates, Inc in March 2005 and April 2016.

Notes:

1. Weekday morning peak hour traffic volumes represent the highest one-hour traffic volumes recorded between 12:00 A.M. and 12:00 Noon on the date that the respective traffic counts were conducted.
2. Weekday afternoon peak hour traffic volumes represent the highest one-hour, two-way traffic volumes recorded between 12:00 Noon and 12:00 A.M. on the date that the respective traffic counts were conducted.
3. Daily traffic volumes represent a one-day period.



Notes:

1- A 0.8 percent growth rate per year was employed to the horizon year 2018 as per 2010 to 2015 New York Metropolitan Transportation Plan, Chapter 2, Socio-Economic and Demographic Forecast, Table 2.5, Page 2-13.

2- The majority of traffic generated by any vacancy in the Brewster Business Park will utilize NYS Route 22 and will therefore have limited impact on Doansburg Road.

LEGEND

SITE ACCESS

2018 NO-BUILD TRAFFIC VOLUMES
WEEKDAY MORNING PEAK HOUR

PROPOSED RESIDENTIAL HOUSING
Barrett Hill Mount Ebo Lot 6
Southeast, New york

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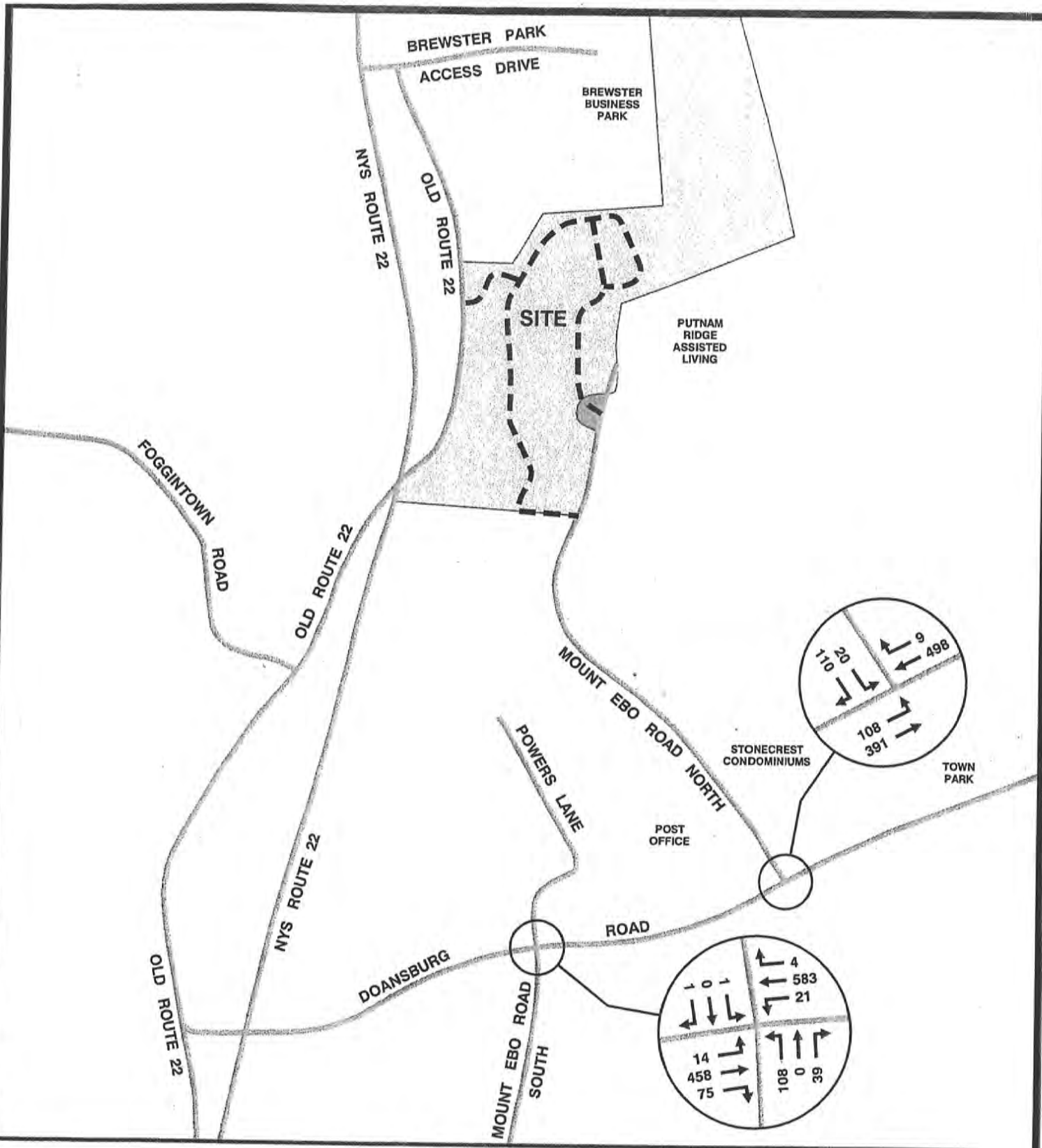

Notes:

1- A 0.8 percent growth rate per year was employed to the horizon year 2018 as per 2010 to 2015 New York Metropolitan Transportation Plan, Chapter 2, Socio-Economic and Demographic Forecast, Table 2.5, Page 2-13.

2- The majority of traffic generated by any vacancy in the Brewster Business Park will utilize NYS Route 22 and will therefore have limited impact on Doansburg Road.

LEGEND

SITE ACCESS

2018 NO-BUILD TRAFFIC VOLUMES
WEEKDAY AFTERNOON PEAK HOUR

PROPOSED RESIDENTIAL HOUSING
Barrett Hill Mount Ebo Lot 6
Southeast, New york

N

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graphically illustrate the 2018 no-build (base) traffic volumes for Doansburg Road at Mount Ebo Road South/Powers Lane in addition to Doansburg Road at Mount Ebo Road North for the weekday morning and weekday afternoon peak hours, respectively. The 2018 no-build traffic volumes utilized the annual growth rate provided by the New York Metropolitan Transportation Plan to provide the most conservative analysis. Table 3 provides a comparison of two-way peak hour traffic volumes for NYS Route 22, south of Doansburg Road, between 2005 and 2015. The 2015 traffic volumes for NYS Route 22 were obtained from the Crossroads 312 Traffic Impact and Access Study conducted by Clark Associates in 2013. New York State Route 22 traffic volumes are provided for reference purposes only as this roadway was not part of the 2016 limited updated Traffic Impact and Access Analysis for the proposed residential housing development.

Trip Generation Rates for the Proposed Development Based on Apartments Type Land Use

The proposal is for a residential housing development comprising 64 one-bedroom and 104 two-bedroom units. Assuming a worst case for site traffic estimated, the trip rates used in the analysis do not include any reduction to account for seniors, disabled Veterans or those who may not drive. Based on trip generation rates provided by the Institute of Transportation Engineers (ITE) and published in "Trip Generation," 9th Edition, 2012, a 168 dwelling unit, apartment type land use is estimated to generate 86 and 110 vehicle trip ends during the weekday morning and weekday afternoon peak hours, respectively. The 168 dwelling unit senior adult housing development approved in 2005, was estimated to generate 45 and 52 vehicle trip ends during the weekday morning and weekday afternoon peak hours, respectively. Table 4 provides a more detailed breakdown of the entering and exiting levels of site traffic anticipated for each of the peak hours for both the previously approved senior adult housing development and the proposed unrestricted apartment rental development. A comparison between the approved senior adult housing development and the proposed unrestricted rental apartment development indicates a net increase in site traffic generation of 41 and 58 vehicle trip ends during the two peak hours, respectively.

Site traffic volumes were graphically illustrated based on the site traffic distribution provided in the 2005 Traffic Impact and Access Study. Figure 9 graphically illustrates the unchanged site traffic distribution patterns, while Figures 10 and 11 graphically illustrate

Table 3
NYS ROUTE 22 TWO-WAY TRAFFIC VOLUME COMPARISON – PEAK HOURS
Proposed Residential Housing
Barrett Hill - Mount Ebo Lot 6
41 Mount Ebo Road North
Southeast, New York

NYS ROUTE 22, SOUTH OF DOANSBURG ROAD						
	VEHICLES					
	Weekday Morning			Weekday Afternoon		
DIRECTION	2015[1]	2005[2]	Percent Change	2015[1]	2005[2]	Percent Change
Northbound	521	458	13.8	1,368	1,262	8.4
Southbound	1,658	1,009	64.3	1,108	921	20.3
Two-way	2,179	1,467	48.5	2,476	2,183	13.4

Source:

1. 2005 Existing Traffic Volumes obtained from the Mount Ebo Corporate Center – Lot 6 Traffic Impact and Access Study conducted by Frederick P. Clark Associates Inc. in March 2005.
2. 2015 Projected Traffic Volumes obtained from the Crossroads 312 Traffic Impact and Access Study conducted by Frederick P. Clark Associates, Inc. in 2013.

Table 4
SITE TRAFFIC GENERATION COMPARISON – WEEKDAY PEAK HOURS
Proposed Residential Housing Development
Barrett Hill – Mount Ebo Lot 6
41 Mount Ebo Road North
Southeast, New York

LAND USE	SIZE	TRAFFIC DIRECTION	VEHICLE TRIP ENDS	
			Morning	Afternoon
Approved 2005 Senior Adult Housing – Attached[1]	168 Dwelling Units	Enter	20	32
		Exit	25	20
		Total	45	52
Proposed Apartments – Rental Units[2]	168 Dwelling Units	Enter	17	72
		Exit	69	38
		Total	86	110
Net Difference	0 Dwelling Units	Enter	-3	40
		Exit	44	18
		Total	41	58

Sources:

1. Mount Ebo Corporate Center – Lot 6 Traffic Impact and Access Study conducted by Frederick P. Clark Associates, Inc. in March 2005.
2. "Trip Generation," 9th Edition, published by the Institute of Transportation Engineers (ITE), 2012, using Senior Adult Housing – Attached, Code #252 Fitted Curve Equation based on the number of Dwelling Units.

Note: The 2005 Approved site traffic generation volumes were obtained utilizing "Trip Generation," 7th Edition, published by the ITE in 2003.

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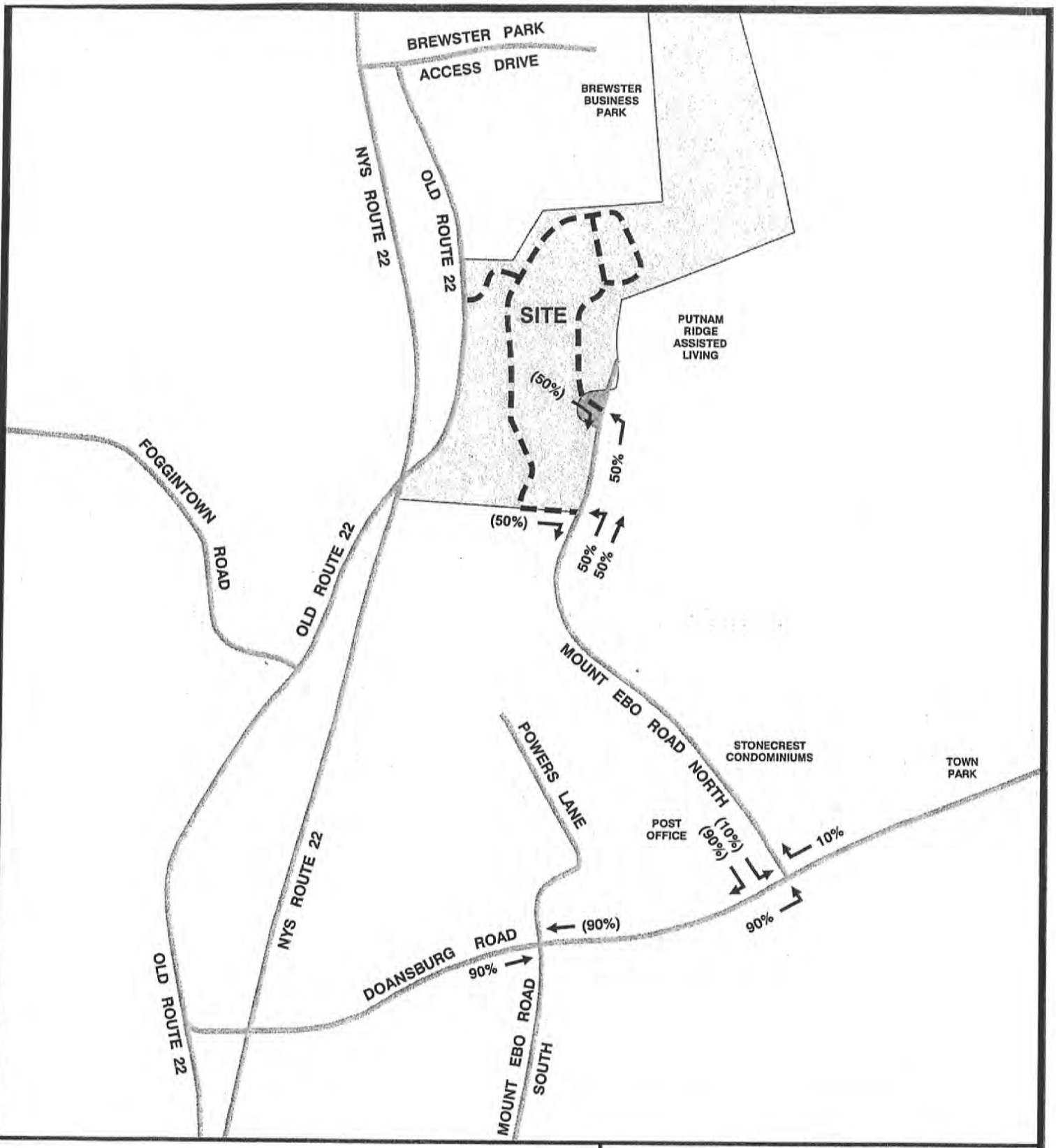

SITE TRAFFIC
Enter 00%
Exit (00%)

LEGEND
SITE ACCESS

SITE TRAFFIC DISTRIBUTION

PROPOSED RESIDENTIAL HOUSING
Barrett Hill Mount Ebo Lot 6
Southeast, New york

N

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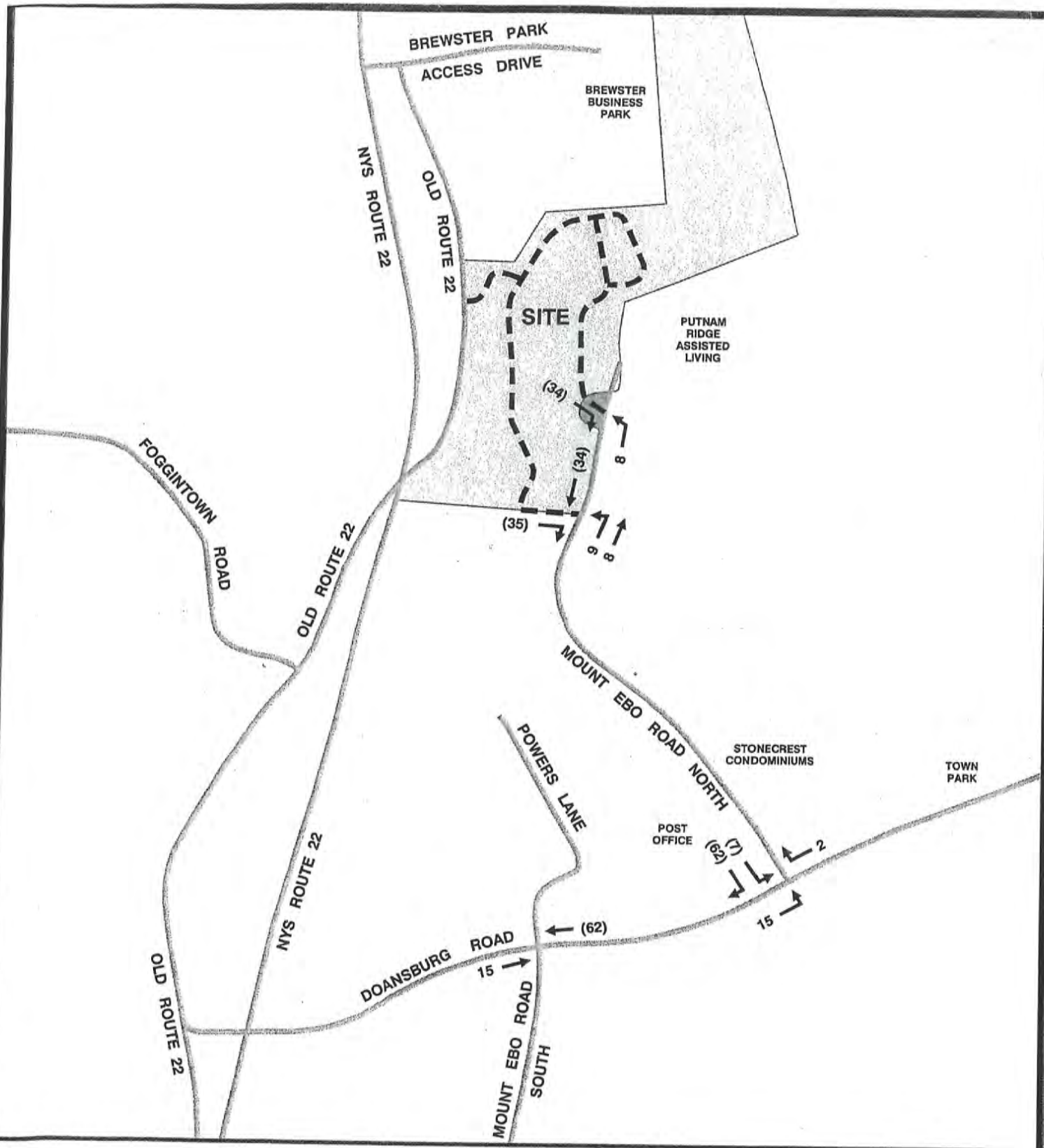

SITE TRAFFIC
Enter 17
Exit (69)
Total 86 Vehicle Trip Ends

LEGEND
SITE ACCESS

SITE TRAFFIC GENERATION AND ASSIGNMENT WEEKDAY MORNING PEAK HOUR

PROPOSED RESIDENTIAL HOUSING
Barrett Hill Mount Ebo Lot 6
Southeast, New york

N

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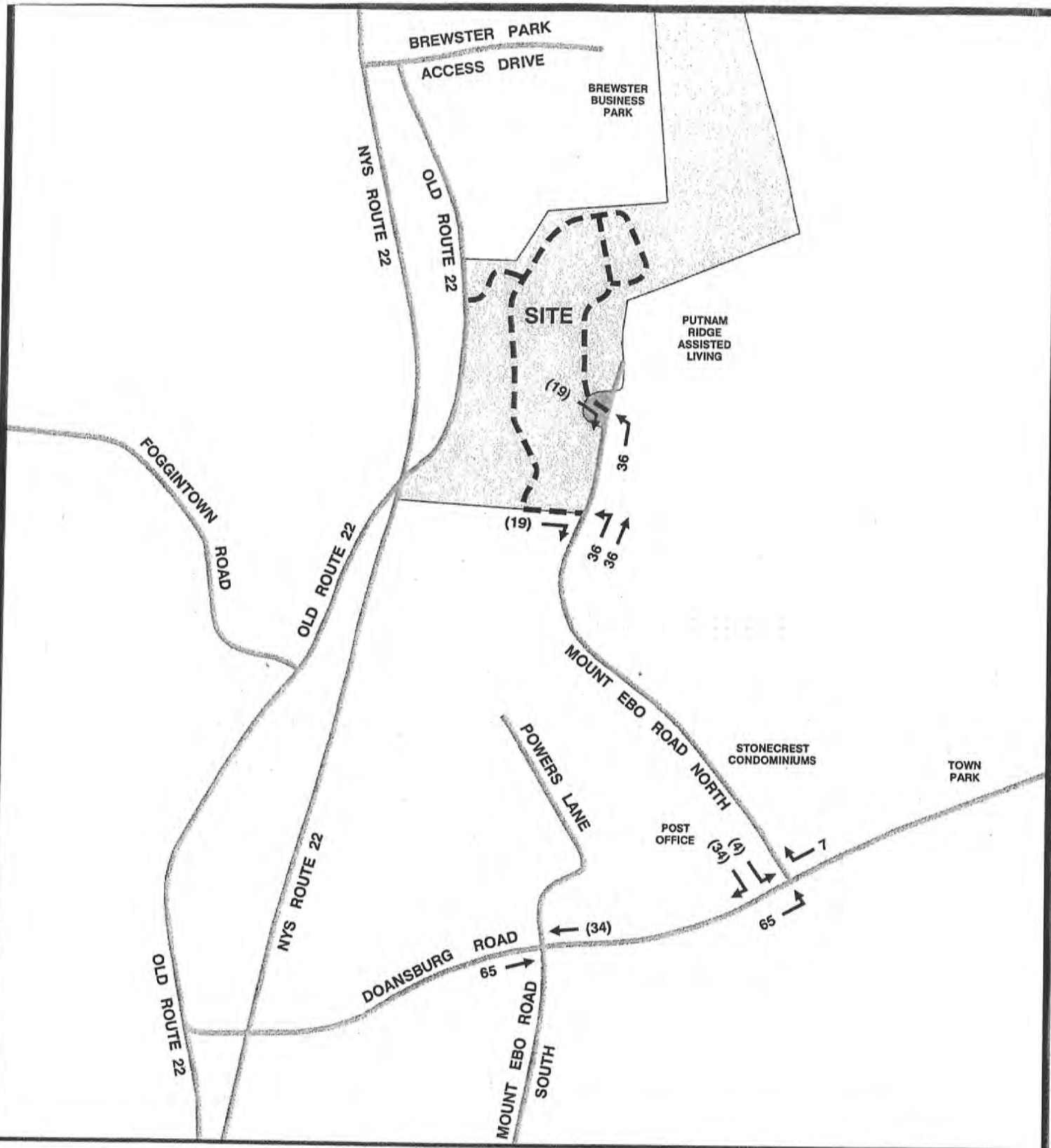

SITE TRAFFIC
Enter 72
Exit (38)
Total 110 Vehicle Trip Ends

LEGEND
SITE ACCESS

SITE TRAFFIC GENERATION AND ASSIGNMENT WEEKDAY AFTERNOON PEAK HOUR

PROPOSED RESIDENTIAL HOUSING
Barrett Hill Mount Ebo Lot 6
Southeast, New york

N

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the assignment of this traffic for the weekday morning and weekday afternoon peak hours, respectively.

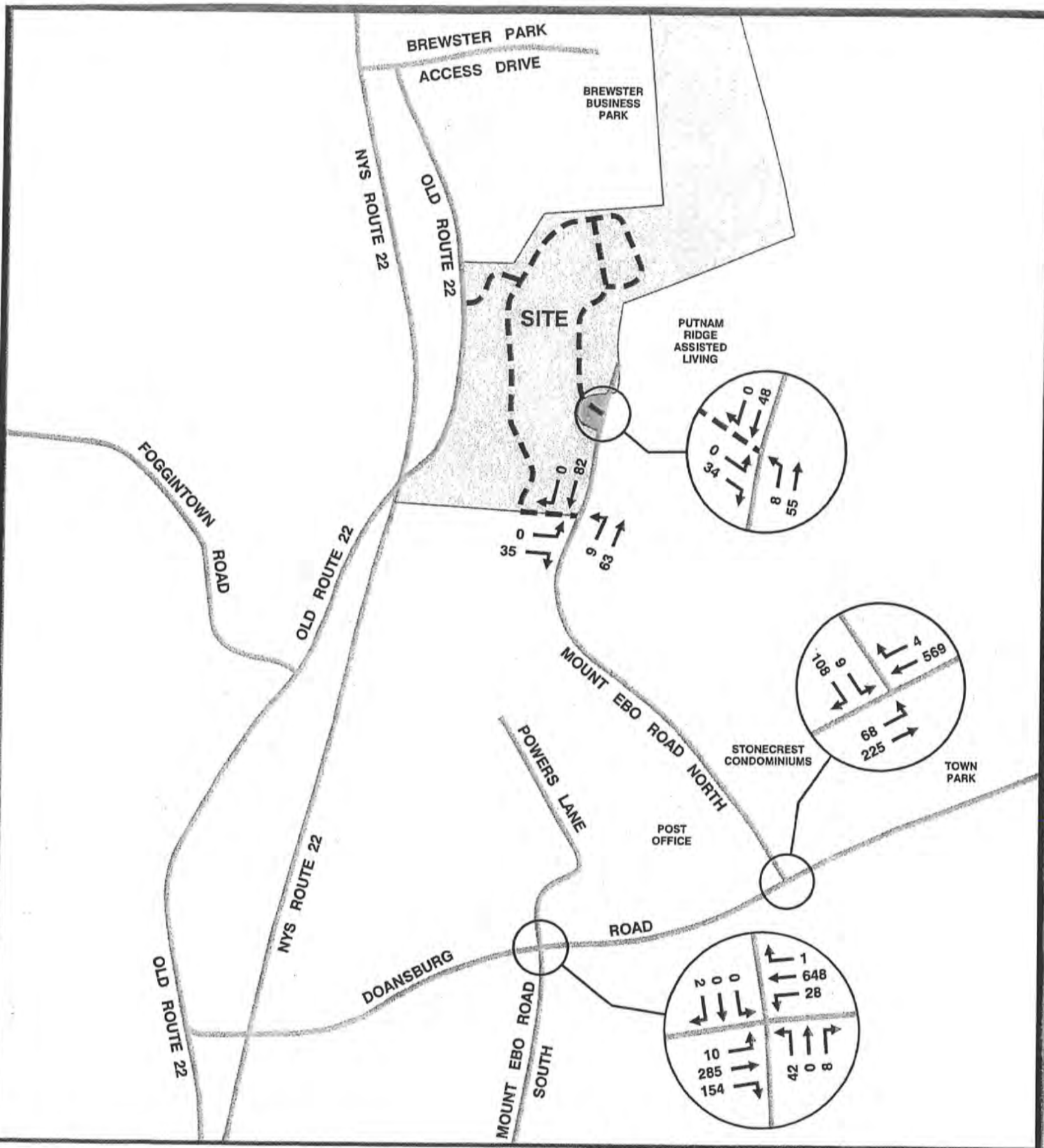
The build traffic volumes were subsequently developed by adding the no-build traffic volumes to the site traffic generation, as described above. These volumes are graphically illustrated for the limited Study Area and a 2018 condition in Figures 12 and 13 for the weekday morning and weekday afternoon peak hours, respectively.

Complete Capacity Analyses for Existing, No-Build and Build Conditions Using the Latest SYNCHRO Analysis

SYNCHRO 8.0/HCM 2010 capacity analyses for the STOP controlled intersection of Doansburg Road at Mount Ebo Road South/Powers Lane were completed for the 2016 existing, 2018 no-build and 2018 build conditions during the weekday morning and weekday afternoon peak hours in response to the Town's Planning Consultant's comments.

Results of the analysis indicate that the eastbound and westbound left-turn movements from Doansburg Road to Powers Lane and Mount Ebo Road South, respectively, operate/will operate at Level of Service "A" during both peak hours and under all conditions. The STOP controlled Powers Lane southbound lane group (left-through-right movement) operates/will operate at Level of Service "B" and "C" during the weekday morning and weekday afternoon peak hours, respectively, under all conditions. The STOP controlled Mount Ebo Road South northbound right-turn lane group operates/will operate at Level of Service "A" and "B" during the weekday morning and weekday afternoon peak hours, respectively, under all conditions. The STOP controlled Mount Ebo Road South northbound left-through lane group operates/will operate at Level of Service "C" during the weekday morning peak hour under all conditions; the northbound left-through lane group will decrease in Level of Service, from "E" to "F," during the weekday afternoon peak hour from the no-build to build conditions.

Average control delay per vehicle on the northbound left-through lane group will increase by only 14.0 seconds and vehicle queuing will not exceed available storage. Furthermore, SimTraffic micro-simulation of the Doansburg Road at the Mount Ebo Road South/Powers Lane intersection for the weekday afternoon peak hour under 2018 build conditions suggests that the average control delay per vehicle of all movements and



Note: The 2018 Build Traffic Volumes include the 2018 No-Build Traffic Volumes and the Site Traffic Generation.

LEGEND

— — — SITE ACCESS

2018 BUILD TRAFFIC VOLUMES
WEEKDAY MORNING PEAK HOUR

PROPOSED RESIDENTIAL HOUSING
Barrett Hill Mount Ebo Lot 6
Southeast, New york

N

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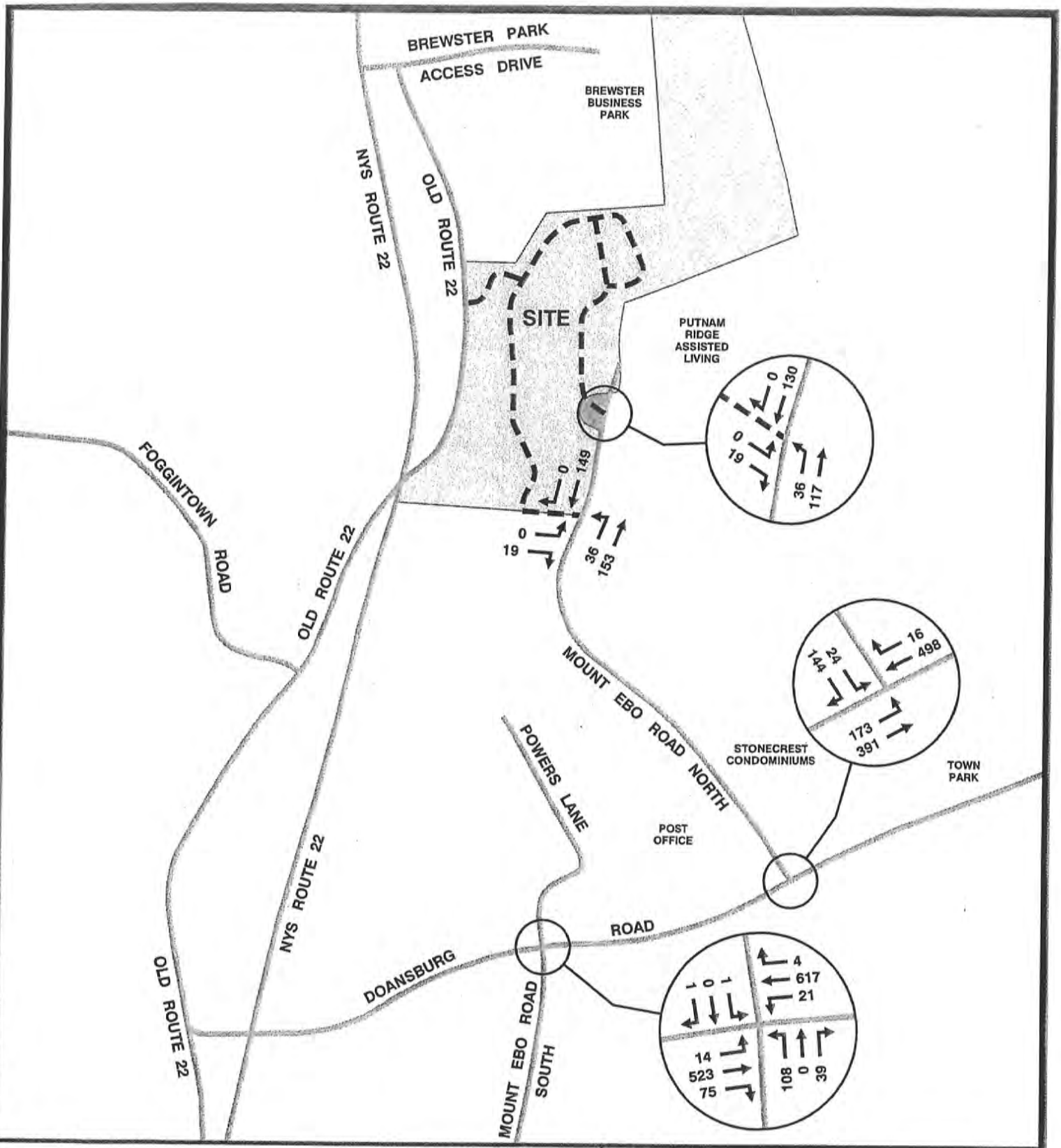

Note: The 2018 Build Traffic Volumes include the 2018 No-Build Traffic Volumes and the Site Traffic Generation.

LEGEND

SITE ACCESS

2018 BUILD TRAFFIC VOLUMES
WEEKDAY AFTERNOON PEAK HOUR

PROPOSED RESIDENTIAL HOUSING
Barrett Hill Mount Ebo Lot 6
Southeast, New york

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lanes groups will be significantly lower than estimates provided using the SYNCHRO 8.0/HCM 2010 analysis. Specifically, the SimTraffic micro-simulation for this condition indicates that average control delay on the Mount Ebo Road South northbound left-through lane group will be approximately 35.0 seconds per vehicle. Although this limited SimTraffic micro-simulation model does not account for the upstream signalized intersections; it is our opinion that results of the analysis would be more favorable (decreased delay on the Mount Ebo Road South northbound left-through lane group) if the gaps created on westbound Doansburg Road by the traffic signal at Mount Ebo Road North were accounted for in the analysis. SimTraffic micro-simulation results for the 2018 build conditions weekday afternoon peak hour are provided in the Appendix of this report. Table 5 provides a more detailed summary of the results of the capacity analysis including Level of Service, volume-to-capacity ratio, and control-delay per vehicle. Table 6 provides a more detailed summary of the results of the storage/queue analysis.

Table 7 provides a comparison between the capacity analysis results for the approved senior adult housing development as obtained from the 2005 Traffic Study and the currently proposed rental apartment development based on the most recent traffic volumes obtained for Doansburg Road. It should be noted that the capacity analyses completed in 2005 utilized Synchro 6.0 software and HCM 2000 methodology. The 2016 analyses utilized Synchro 8.0 software and HCM 2010 methodology. Therefore a final comparison was made between the build conditions with the approved senior adult housing development and the proposed rental apartment development utilizing the most recent (2016) traffic volumes as a baseline and only the most current Synchro 8.0 and HCM 2010 methodology. The analysis indicates that there will be no deterioration in the Level of Service of lane groups or critical movements for the STOP controlled intersection of Doansburg Road at Powers Lane/Mount Ebo Road South during either the weekday morning or weekday afternoon peak hours; with the exception of the Mount Ebo Road South northbound left-through lane group, which will decrease in Level of Service from "E" to "F" as a part of the proposed rental apartment development. However, average control delay per vehicle on the northbound left-through lane group will increase by only 8.7 seconds when compared to the approved senior adult housing development approved in 2005. Table 8 provides a comparison between the capacity analyses for the 2016 build conditions for both the approved senior adult housing development and the proposed rental apartment development using current methodologies.

Table 5
SYNCHRO 8.0/HCM 2010 CAPACITY ANALYSIS RESULTS – MEASURES OF EFFECTIVENESS (MOE) – PEAK HOURS
Proposed Residential Housing Development
Barrett Hill - Mount Ebo Lot 6
41 Mount Ebo Road North
Southeast, New York

INTERSECTION	CONTROL TYPE	APPROACH	PHYSICAL UNITS	2016 EXISTING CONDITIONS (BASELINE)				2018 NO-BUILD CONDITIONS (BASE)				2018 BUILD CONDITIONS				PROJECT IMPACTS (NO-BUILD TO BUILD)			
				Weekday Morning		Weekday Afternoon		Weekday Morning		Weekday Afternoon		Weekday Morning		Weekday Afternoon		Weekday Morning		Weekday Afternoon	
				LOS/ Delay	V/C Ratio	LOS/ Delay	V/C Ratio	LOS/ Delay	V/C Ratio	LOS/ Delay	V/C Ratio	LOS/ Delay	V/C Ratio	LOS/ Delay	V/C Ratio	Deterio-ration in LOS	Project Delay (Sec.)	Deterior-ation in LOS	Project Delay (Sec.)
Doansburg Road at Mount Ebo Road South/ Power's Lane	TWSC	Doansburg Road	EB L	A/8.9	0.01	A/8.8	0.02	A/8.9	0.01	A/8.9	0.02	A/9.1	0.01	A/9.0	0.02	No	0.2	No	0.1
		Doansburg Road	WB L	A/8.4	0.03	A/8.7	0.02	A/8.4	0.03	A/8.7	0.02	A/8.4	0.03	A/9.0	0.02	No	0.0	No	0.3
		Mount Ebo Road South	NB Ln1 (LT)	C/20.9	0.17	E/39.6	0.54	C/21.3	0.17	E/41.6	0.56	C/23.1	0.19	F/55.6	0.65	No	1.8	E – F	14.0
			Ln2 (R)	A/9.7	0.01	B/10.4	0.06	A/9.7	0.01	B/10.4	0.06	A/9.8	0.01	B/10.7	0.06	No	0.1	No	0.3
		Power's Lane	SB Ln1 (LTR)	B/10.3	0.00	C/17.0	0.01	B/10.4	0.00	C/17.3	0.01	B/10.7	0.00	C/18.7	0.01	No	0.1	No	1.4

Notes:

1. Synchro 8.0/HCM 2010 is used for capacity analysis.
2. Level of Service determining parameter is called the service measure.
3. TWSC = Two-Way STOP Control.
4. For TWSC Intersections: Level of Service/Average Control delay per vehicle (seconds/vehicle).
5. ITE publication for Traffic Access and Impact Studies for site development "A Recommended Practice" indicated that overall Level of Service ratings of A to D are normally considered acceptable for signalized intersections (Level C or better are considered desirable). Levels of Service E and F are normally undesirable.
6. V/C ratio indicates the amount of congestion for each Movement. Any V/C ratio greater than or equal to one indicates that the Movement is operating at above capacity.
7. Physical Units consist of Lane Group and Critical Movement for TWSC Intersections.

NB = Northbound EB = Eastbound SB = Southbound WB = Westbound
L = Left Turn T = Through R = Right Turn Ln = Lane

Table 6
SYNCHRO 8.0/HCM 2010 STORAGE/QUEUE ANALYSIS RESULTS – PEAK HOURS
Proposed Residential Housing Development
Barrett Hill - Mount Ebo Lot 6
41 Mount Ebo Road North
Southeast, New York

INTERSECTION	CONTROL TYPE	APPROACH	STORAGE/ LINK LENGTH (VEHICLES)	PHYSICAL UNITS	2016 EXISTING CONDITIONS (BASELINE)		2018 NO–BUILD CONDITIONS (BASE)		2018 BUILD CONDITIONS	
					Weekday Morning	Weekday Afternoon	Weekday Morning	Weekday Afternoon	Weekday Morning	Weekday Afternoon
					Queue Length (Feet)	Queue Length (Feet)	Queue Length (Feet)	Queue Length (Feet)	Queue Length (Feet)	Queue Length (Feet)
Doansburg Road at Mount Ebo Road South/ Power's Lane	TWSC	Doansburg Road	28	EB L	0.0	0.0	0.0	0.0	0.0	0.1
		Doansburg Road	26.4	WB L	0.1	0.1	0.1	0.1	0.1	0.1
		Mount Ebo Road South	14.8	NB Ln1 (LT)	0.6	2.9	0.6	3.0	0.7	3.8
			7.0	Ln2 (R)	0.0	0.2	0.0	0.2	0.0	0.2
		Power's Lane	10.0	SB Ln1 (LR)	0.0	0.0	0.0	0.0	0.0	0.0

Notes:

- Synchro 8.0/HCM 2010 is used for storage/queue analysis.
- The Queue Length rows show the 95th percentile maximum queue length in vehicles.
- The Queue Length is for each lane. The total queue length is divided by the number of lanes and the lane utilization factor.
- The 95th percentile queue is the maximum back of the queue with the 95th percentile traffic volumes.
- **Bolded** 95th percentile queue exceeds the storage available.
- TWSC = Two-Way STOP Control.
- Physical Units consist of Lane Group and Critical Movement for TWSC Intersections.

NB = Northbound EB = Eastbound SB = Southbound WB = Westbound
L = Left Turn T = Through R = Right Turn Ln = Lane

Table 7
APPROVED VS. PROPOSED RESIDENTIAL HOUSING DEVELOPMENT CAPACITY ANALYSIS RESULTS COMPARISON – LEVEL OF SERVICE AND DELAY – PEAK HOURS
Proposed Residential Housing Development
Barrett Hill - Mount Ebo Lot 6
41 Mount Ebo Road North
Southeast, New York

INTERSECTION	CONTROL TYPE	APPROACH	PHYSICAL UNITS	2005 EXISTING CONDITIONS (APPROVED)		2016 EXISTING CONDITIONS (BASELINE)		2007 NO-BUILD CONDITIONS (APPROVED)		2018 NO-BUILD CONDITIONS (BASE)	
				Weekday Morning	Weekday Afternoon	Weekday Morning	Weekday Afternoon	Weekday Morning	Weekday Afternoon	Weekday Morning	Weekday Afternoon
				LOS/ Delay	LOS/ Delay	LOS/ Delay	LOS/ Delay	LOS/ Delay	LOS/ Delay	LOS/ Delay	LOS/ Delay
Doansburg Road at Mount Ebo Road South/ Power's Lane	TWSC	Doansburg Road	EB L	A/0.2	A/0.1	A/8.9	A/8.8	A/0.2	A/0.1	A/8.9	A/8.9
		Doansburg Road	WB L	A/0.4	A/0.1	A/8.4	A/8.7	A/0.4	A/0.1	A/8.4	A/8.7
		Mount Ebo Road South	NB Ln1 (LT)	B/13.3	D/29.1	C/20.9	E/39.6	B/13.6	D/32.2	C/21.3	E/41.6
			Ln2 (R)	A/9.0	B/10.9	A/9.7	B/10.4	A/9.0	B/11.0	A/9.7	B/10.4
		Power's Lane	SB Ln1 (LTR)	B/13.4	C/17.2	B/10.3	C/17.0	B/13.8	C/17.9	B/10.4	C/17.3

INTERSECTION	CONTROL TYPE	APPROACH	PHYSICAL UNITS	2007 BUILD CONDITIONS (APPROVED)		2018 BUILD CONDITIONS (CURRENT PROPOSAL)		PROJECT IMPACTS (2007 TO 2018)			
				Weekday Morning	Weekday Afternoon	Weekday Morning	Weekday Afternoon	Weekday Morning		Weekday Afternoon	
				LOS/ Delay	LOS/ Delay	LOS/ Delay	LOS/ Delay	Deterioration in LOS	Project Delay (Sec.)	Deterioration in LOS	Project Delay (Sec.)
Doansburg Road at Mount Ebo Road South/ Power's Lane	TWSC	Doansburg Road	EB L	A/0.2	A/0.1	A/9.1	A/9.0	No	8.9	No	8.9
		Doansburg Road	WB L	A/0.4	A/0.1	A/8.4	A/9.0	No	8.0	No	8.9
		Mount Ebo Road South	NB Ln1 (LT)	B/14.4	E/35.6	C/23.1	F/55.6	B – C	8.7	E – F	20.0
			Ln2 (R)	A/9.1	B/11.2	A/9.8	B/10.7	No	0.7	No	0.0
		Power's Lane	SB Ln1 (LTR)	B/14.1	C/18.7	B/10.7	C/18.7	No	0.0	No	0.0

Notes:
1. Synchro 6.0 was utilized for the capacity analysis approved in 2005.
2. Synchro 8.0/HCM 2010 is used for capacity analysis of the proposed 2016 Application.
3. Level of Service determining parameter is called the service measure.
4. TWSC = Two-Way STOP Control.
5. For TWSC Intersections: Level of Service/Average Control delay per vehicle (seconds/vehicle).
6. ITE publication for Traffic Access and Impact Studies for site development "A Recommended Practice" indicated that overall Level of Service ratings of A to D are normally considered acceptable for intersections (Level C or better are considered desirable). Levels of Service E and F are normally undesirable.
7. Physical Units consist of Lane Group and Critical Movement for TWSC Intersections

NB = Northbound EB = Eastbound SB = Southbound WB = Westbound
L = Left Turn T = Through R = Right Turn Ln = Lane

Table 8
APPROVED VS. PROPOSED RESIDENTIAL HOUSING DEVELOPMENT COMPARISON
SYNCHRO 8.0/ HCM 2010 CAPACITY ANALYSIS RESULTS – LEVEL OF SERVICE AND DELAY – PEAK HOURS
Proposed Residential Housing Development
Barrett Hill - Mount Ebo Lot 6
41 Mount Ebo Road North
Southeast, New York

INTERSECTION	CONTROL TYPE	APPROACH	PHYSICAL UNITS	2016 BUILD CONDITIONS (APPROVED DEVELOPMENT)		2018 BUILD CONDITIONS (CURRENT PROPOSAL)		PROJECT IMPACTS			
				Weekday Morning	Weekday Afternoon	Weekday Morning	Weekday Afternoon	Weekday Morning		Weekday Afternoon	
				LOS/ Delay	LOS/ Delay	LOS/ Delay	LOS/ Delay	Deterioration in LOS	Project Delay (Sec.)	Deterioration in LOS	Project Delay (Sec.)
Doansburg Road at Mount Ebo Road South/ Power's Lane	TWSC	Doansburg Road	EB L	A/9.0	A/9.0	A/9.1	A/9.0	No	0.1	No	0.0
		Doansburg Road	WB L	A/8.4	A/8.8	A/8.4	A/9.0	No	0.0	No	0.0
		Mount Ebo Road South	NB Ln1 (LT)	C/22.2	E/47.1	C/23.1	F/55.6	No	0.9	E – F	8.7
			Ln2 (R)	A/9.8	B/10.6	A/9.8	B/10.7	No	0.0	No	0.1
		Power's Lane	SB Ln1 (LTR)	B/10.5	C/17.9	B/10.7	C/18.7	No	0.2	No	0.8

Notes:

1. Synchro 8.0/HCM 2010 is used for capacity analysis of both the approved and proposed developments.
2. Level of Service determining parameter is called the service measure.
3. TWSC = Two-Way STOP Control.
4. For TWSC Intersections: Level of Service/Average Control delay per vehicle (seconds/vehicle).
5. ITE publication for Traffic Access and Impact Studies for site development "A Recommended Practice" indicated that overall Level of Service ratings of A to D are normally considered acceptable for intersections (Level C or better are considered desirable). Levels of Service E and F are normally undesirable.
6. Physical Units consist of Lane Group and Critical Movement for TWSC Intersections

NB = Northbound EB = Eastbound SB = Southbound WB = Westbound
L = Left Turn T = Through R = Right Turn Ln = Lane

Conclusions

This updated traffic analysis is based upon recent traffic counts conducted by Frederick P. Clark Associates, Inc., as requested by the Town's Planning Consultant at the Doansburg Road/Mt. Ebo Road South/Power's Lane and on NYS Route 22 for a typical weekday condition. Results of the analyses to determine potential impact of this proposed residential development are based on the 2016 traffic volumes. However, as requested this analysis and recent traffic volumes are compared to traffic data obtained by our office in 2005.

A comparison of the traffic volumes on Doansburg Road, west of the Mt. Ebo Road North intersection indicates that during the weekday morning peak hour the eastbound volume increased significantly and the westbound increased very little. However, overall the two-way volume during the 11-year period increased by 14.3 percent during the weekday morning peak hour.

During the weekday afternoon peak hour the eastbound volume decreased by almost 21 percent; however, increased by 44 percent westbound during the same one-hour period. Overall the two-way volume only increased by 1.1 percent.

For comparison purposes the daily volume on Doansburg Road indicated an increase in the two-way volume of 4.7 percent. A comparison of the traffic volumes on NYS Route 22, south of the Doansburg Road intersection, indicated an increase of 48.5 percent during the 11-year period during the weekday morning peak hour and 13.4 percent during the weekday afternoon peak hour.

For comparison purposes and a worst case scenario for the purposes of completing this analysis, the proposed 168-unit development is based on trip generation rates provided by the most recent publication from the Institute of Transportation Engineers (ITE) and indicates that a development of this type and size could generate 86 and 110 vehicle trip ends during a typical weekday morning and weekday afternoon peak hour, respectively. Although it is assumed this development will include senior citizens, potentially Town employees, potentially Veterans with disabilities, to represent a worst case analysis, credits have not been applied to these estimates to reduce the potential site traffic generation. It is possible that depending on the mix of residents the level of site traffic could decrease during peak hours.

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The results of the analyses of the one STOP sign controlled intersection of Doansburg Road at Mt. Ebo Road South/Power's Lane indicates that under existing conditions this intersection operates at acceptable Levels of Service, except for the northbound left/through movement during the weekday afternoon peak hour. Under a no-build condition for 2018 this approach would continue to operate at Level of Service "E," although all other approaches to the intersection would operate at acceptable Levels of Service. With the increase in traffic based on adding site traffic generation to this intersection, which would be along Doansburg Road there would be no change in Level of Service during the weekday morning peak hour and an insignificant, if any, increase in vehicle delay due to site traffic. However, during the weekday afternoon peak hour the northbound left/through movement from Mt. Ebo Road South changed from Level of Service "E" to "F" due to an increase in vehicle delay of 14.0 seconds. Although this may be considered significant by general standards since it is a change in Level of Service from "E" to "F" the increase in delay per vehicle is only 14.0 seconds. For a STOP sign controlled intersection motorists entering Doansburg Road, which is a busy east-west, collector-arterial-type of roadway serving the entire area, this increase in delay may not be considered significant.

Based on the results of the analysis, which includes a comparison to traffic volume data and analyses conducted 11 years ago the increase in traffic on Doansburg Road will have an impact on motorists exiting Mt. Ebo Road South during only the weekday afternoon peak hour and result in an increase in delay of 14.0 seconds per vehicle.

Sincerely,

Michael A. Galante
Executive Vice President

Enclosure

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