Hesketh

Civil & Traffic Engineers • Surveyors • Planners • Landscape Architects

F. A. Hesketh
& Associates, Inc.

September 16, 2024

RJOC & Associates, Inc.
80 Montvale Avenue, Suite 201
Stoneham, MA 02180

Attn: Mr. Roy Smith

RE: Traffic Impact Report
Proposed Residential Development
2268, 2280 & 2284 Route 32
Montville, Connecticut
Our file: 24203

Dear Mr. Smith:

Pursuant to your request our office has prepared this report to document our findings related to the potential traffic impact of a proposed 57-unit apartment development on property located at 2268, 2280 and 2284 Route 32, Norwich New London Turnpike, in the Town of Montville, Connecticut. The site location is presented in Figure 1 with respect to the surrounding roadway network. This report presents our findings.

Site Plan

The proposed development is depicted on site plans prepared by your office. The plan depicts a single four-story building located I the center of the lot. Parking is provided between the building and Roue 32 and on the west and north sides of the building. Access to the site is proposed by a single driveway to Route 32 opposite Fort Shantok Road. The intersection of Roue 32 and Fort Shantok Road operates under signalized control.

Existing Roadway Conditions

Route 32 is a State maintained highway that originates as Thames Street at Route 82 in downtown Norwich and extends southerly through Norwich and into the Town of Montville where the roadway takes on the name of the Norwich New London Turnpike. Route 32 continues in a southerly direction past the subject site and into Waterford and New London where it terminates at Interstate 95. Route 32 provides access to Route 2A a short distance south of the subject site.

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North of the site, Route 32 provides a single travel lane in each direction, but widens immediately south of the subject site, to provide two southbound lanes on its approach to Gallivan Lane. The intersection of Route 32 and Fort Shantok Road is a signalized intersection. The Route 32 southbound approach provides a dedicated left turn lane into Fort Shantok Road and a single through lane. Land use along Route 32 is a mix of residential and commercial uses. The posted speed limit in the vicinity of the site is 40 miles per hour.

Existing Traffic Conditions

Traffic Count data for Route 32 and for Fort Shantok Road was obtained from the Connecticut Department of Transportation (ConnDOT). Recent counts for Route 32, north of the Route 2A eastbound off ramp, were conducted during October 2023 and indicate an average daily traffic volume (ADT) of 17,600 vehicles. Peak hour volumes were recorded at 1,302 vehicles during the a.m. peak hour and 1,676 vehicles during the p.m. peak hour. The Fort Shantok Road count was also conducted during October 2023 and showed an ADT of 2,200 vehicles. Peak hour volumes were recorded at 160 vehicles during the a.m. peak hour and 217 vehicles during the p.m. peak hour. The counts outlined above are presented in Tables 1 and 2.

In addition to these counts, turning movement counts were conducted at the following intersections during November 2023.

- Route 32 at Route 2A EB Ramps
- Route 32 at Route 2A WB Ramps
- Route 32 at Gallivan Lane
- Route 32 at Fort Shantok Road
- Route 32 at Crow Hill Road

The counts were conducted during the morning, afternoon and Saturday peak hours. Figures 2, 3, and 4 present the ConnDOT counts along with the observed peak hour turning movement counts.

A review of recent ConnDOT counts indicates a decline in ADT on Route 32 between 2017 and 2023, pre and post Covid. To be conservative an annual growth rate of 2% was applied to these volumes to account for the ambient growth in traffic to a design year of 2025. To these volumes was added the site generated traffic for a proposed convenience store located on Route 32 south of the Route 2A eastbound ramps. The 2025 background traffic volumes for the a.m., p.m., and Saturday peak hours are presented in Figures 5, 6, and 7. Copies of the flow diagrams for the c-store are included in the appendix.

Site Generated Traffic

To determine the amount of traffic that will be generated by the site, *Trip Generation* Version 11, published by the Institute of Transportation Engineers, was used. *Trip Generation* estimates the number of trips to be generated by a development based on several independent variables. Included in the database is Land Use Code (LUC) 221: Multifamily Housing (Mid Rise). Trip generation estimates are based on the number of residential units. The proposed 57-unit development is estimated to generate a total of 259 trips daily, with a total of 21 trips during the morning peak hour and a total of 23 trips during the afternoon peak hour. A total of 282 trips is projected for Saturday with a peak hour volume of 23 trips. Table 3 provides a summary of the trips generated from the site.

These trips were then distributed to the existing roadway network in general conformance with the existing traffic in the area. We project that 65% of the site traffic will arrive from and depart to the south along Route 32, with 20% to both the east and west along Route 2A and to Route 32 south of Route 2A. 30% of the site traffic will arrive from and depart to the north along Route 32. 5% is projected to utilize Fort Shantok Road, Gallivan Lane and Crow Hill Road. This distribution can be seen in Figure 8.

By applying the site generated traffic from Figure 4 to the directional distribution in Figure 8, the site generated traffic for individual movements can be determined. These volumes are presented in Figures 9, 10, and 11 for the morning, afternoon, and Saturday peak hours, respectively. By adding these volumes to the background volumes, the combined traffic volumes upon completion of the development can be determined. These volumes are presented in Figures 11, 12, and 14, respectively.

Capacity Analysis

A capacity analysis was conducted on the 2025 background "no build" conditions as well as the 2025 combined traffic conditions at each of the intersections within the study area. This analysis was conducted using the SYNCHRO computer program. For signalized intersections, the total capacity of the intersection is computed on a movement-by-movement basis. This represents the maximum number of vehicles that can utilize the intersection during an hour. A comparison with the total number of vehicles attempting to use the intersection yields the volume-to-capacity ratio (v/c) that is equivalent to the percentage of capacity utilized during the peak hour. As the v/c ratio approaches 1, the intersection nears capacity. A v/c ratio greater than 1 indicates that some cars are unable to proceed through the intersection and will be stored on an approach. In addition, the Level of Service (LOS) is determined for each of the intersections. Level of Service is a measure of the delay time experienced by stopped vehicles at the intersection. Level of Service is measured on a scale from A to F, with Level of Service A representing a delay of less than 10 seconds per vehicle, and Level

of Service F representing a delay of more than 80 seconds per vehicle. The LOS results are summarized in table 4 and discussed in detail below.

Route 32 at Route 2A Eastbound Ramps / Podurgel Lane - This is an existing signalized intersection with Route 32 oriented in the north/south direction. The Route 2A eastbound off ramp approaches from the west. The Route 2A on ramp departs to the east. Podurgel Lane approaches from the west and is located 90 feet south of the Route 2A off ramp. The Route 32 northbound approach provides a dedicated left turn lane at Podurgel Lane, two through lanes and an exclusive right turn lane to the Route 2A on ramp. The Route 32 southbound approach provides a dedicated left turn lane to the Route 2A on ramp, one through lane, and a shared through/right turn lane. The Route 2A off ramp provides a left turn lane and a right turn lane. Podurgel Lane provides a single lane approach. The signal operates with an advanced northbound/southbound left turn, followed by the northbound/southbound approaches, followed by Podurgel Lane, followed by the Route 2A off ramp. An analysis of background traffic conditions indicates that the intersections operate at a LOS B during the morning peak hour, at a LOS A or B during the p.m. peak hour and at a LOS A during the Saturday peak hour. With the addition of the site generated traffic the intersections will continue to operate at the same levels of service peak hours.

Route 32 at Route 2A Westbound Ramps - This is an existing signalized intersection with Route 32 oriented in the north/south direction. The Route 2A off ramp approaches from the east. The Route 2A on ramp departs to the west. The Route 32 northbound approach provides a dedicated left turn lane and a single through lane. The Route 32 southbound approach provides a single through lane and a shared through/right turn lane. The Route 2A off ramp provides a dedicated left turn lane, a shared through/left turn lane and an exclusive right turn lane. The signal operates with an advanced northbound left, followed by the northbound/southbound movements, followed by the westbound approach. An analysis of background traffic conditions indicates that the intersection operates at a LOS A during the morning peak hour and at a LOS B during the p.m. peak hour and Saturday peak hours. With the addition of the site generated traffic the intersection will continue to operate at the same levels of service as in the background conditions.

Route 32 at Gallivan Lane - This is an existing signalized "T" intersection with Route 32 oriented in the north/south direction. Gallivan Lane approaches from the west. The Route 32 northbound approach provides a dedicated left turn lane and a single through lane. The Route 32 southbound approach provides one through lane and a shared through/right turn lane. The Gallivan Lane approach provides a single Lane. The signal operates with an advanced northbound left turn, followed by the northbound/southbound approaches, followed by the Gallivan Lane approach. There is an exclusive pedestrian phase as well. An analysis of background traffic conditions indicates that the intersection operates at a LOS A during the morning and Saturday

peak hours and at a LOS B during the p.m. peak hour. With the addition of the site generated traffic the intersection will operate at a LOS A during peak hours.

Route 32 at Fort Shantok Road / Site Driveway - This is an existing signalized "T" intersection with Route 32 oriented in the north/south direction. Fort Shantok Road approaches from the east. The northbound and westbound approaches each provide a single lane. The southbound approach provides a dedicated left turn lane and a single through lane. The signal operates with an advanced southbound left turn, followed by the northbound/southbound approaches, followed by the westbound approach. An analysis of the background traffic volumes indicates that the intersection operates at a LOS B during the morning and afternoon peak hours and at a LOS A during the Saturday peak hour.

With the proposed development in place, the intersection will become a four-way intersection with the site driveway located opposite Fort Shantok Road. The proposed site driveway will provide a single lane approach. The Route 32 northbound approach will be widened/re-striped to provide a dedicated left turn lane into the site driveway, minor widening will be done on the southbound lane to provide continuous lane widths. With these improvements in place the intersection will operate at LOS A during peak hours.

Route 32 at Crow Hill Road - This is an existing signalized "T" intersection with Route 32 oriented in the north/south direction. Crow Hill Road approaches from the east. The Route 32 northbound approach provides a single through lane and an exclusive right turn lane. The Route 32 southbound approach provides a dedicated left turn lane and a single through lane. The Crow Hill Road approach provides a left turn lane and a right turn lane. The signal operates with an advance southbound left turn, followed by the northbound/southbound approaches followed by the westbound approach. An analysis of background traffic conditions indicates that the intersection operates at a LOS A during the morning and Saturday peak hours, and at a LOS C during the afternoon peak hour. With the addition of the site generated traffic the intersection will continue to operate at the same levels of service as in the background conditions.

Sight Distance Analysis

The Connecticut Department of Transportation has published its requirements for the application of sight distances at intersections and driveways - Intersection Sight Distance (ISD). The Department requires that sight lines be measured against the design speed of the roadway or against the 85th percentile speed. The 85th percentile speed is defined as the speed at or below which 85 percent of free-flowing drivers have been observed. The Department also requires that sight lines be available from the edge of pavement to a point within the side road or driveway up to 15 feet from the edge

of travel way. The sight lines are measured from the height of eye in the driveway at 3'6" above the pavement to an object in the roadway 3'6" above the pavement.

Our observations at the proposed site driveway indicate that the sight lines are greater than 500 feet in each direction. The 500 foot sight lines meet the Department of Transportation's minimum sight line requirement for a design approach speed of 45 miles per hour. Route 32 in the vicinity of the site is posted at 40 mph. Recent ConnDOT speed counts on Route 32 south of Fitch Hill Rod indicate 85% speeds of 42 mph northbound and 42 mph southbound.

Accident Analysis

The University of Connecticut collects and maintains accident data for the State of Connecticut. Accident data for Route 32 was collected from mile marker 8.86 (Podurgiel Lane) to mile marker 9.51 (Crow Hill Road), for the time period between June 1, 2021 and June 1, 2024. The data indicates that there was a total of 41 accidents involving a total of 85 vehicles recorded during that time. Of the 41 accidents recorded, three occurred at the Route 2A eastbound ramps, one at the Route 2A westbound ramps, nine at Gallivan Lane, and 7 at Fort Shantok Road. The remaining accidents occurred between intersections or commercial driveways. Eighteen of the accidents were rear end accidents, there were six sideswipe accidents, thirteen angled accidents, one fixed object accident and three listed as other or unknown. There were 30 property damage only accidents, seven with possible injuries, and four that involved suspected minor injuries. There were no fatalities reported.

State Approval

Because the development has frontage to and proposed access onto Route 32, a State Highway, it will be necessary to obtain an encroachment permit from the ConnDOT District II Administration office prior to the start of Construction. The development requires a widening/restriping of Route 32 to provide a dedicated northbound left turn lane and revisions to the signal to accommodate the proposed left turn lane.

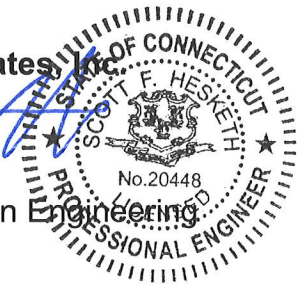
Conclusion

Based on the analysis contained within this report, it is our opinion that the site generated traffic related to the construction of a proposed 57-unit apartment complex can be readily accommodated into the existing traffic flow on Route 32 without a significant impact on the existing traffic operations with the proposed improvements in place. These improvements include a re-stripping of Route 32 to provide a dedicated northbound left turn lane at the site driveway, and the inclusion of the site driveway into the existing traffic signal at Fort Shantok Road.

The proposed site driveway is properly located with respect to available sight distances and adjacent roadways and designed to accommodate the anticipated traffic flows expected to be generated by this facility.

We appreciate the opportunity to provide this analysis to you. A representative from our office will be available, upon your request, to present testimony before local commissions in support of your application. If you require any additional information regarding this project, please do not hesitate to contact our office.

Sincerely,
F. A. Hesketh & Associates, Inc.



Scott F. Hesketh, P.E.
Manager of Transportation Engineering

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Google Maps

Map data ©2024 500 ft

Table 1
ConnDOT TRAFFIC VOLUMES
Route 32 north of Avery Road
Station No.38

	11-Oct-23 Wednesday			12-Oct-23 Thursday			13-Oct-23 Friday		
	NB	SB	Total	NB	SB	Total	NB	SB	Total
12:00				69	75	144	81	108	189
1:00				44	22	66	44	58	102
2:00				28	40	68	27	38	65
3:00				28	63	91	36	60	96
4:00				71	120	191	77	129	206
5:00				130	219	349	135	202	337
6:00				250	377	627	242	350	592
7:00				620	556	1176	541	575	1116
8:00				**671**	**631**	**1302**	612	633	1245
9:00				571	554	1125	493	601	1094
10:00	500	562	1062	500	547	1047			
11:00	535	558	1093	513	595	1108			
12:00	580	605	1185	538	586	1124			
1:00	553	534	1087	558	606	1164			
2:00	608	650	1258	585	644	1229			
3:00	771	673	1444	711	686	1397			
4:00	731	775	1506	**901**	**775**	**1676**			
5:00	649	659	1308	798	664	1462			
6:00	469	489	958	499	498	997			
7:00	347	402	749	393	411	804			
8:00	347	287	634	315	276	591			
9:00	197	174	371	220	202	422			
10:00	134	134	268	128	145	273			
11:00	135	111	246	152	127	279			
Total	6556	6613	13169	9293	9419	18712	2288	2754	5042

2023 ADT for Station 38 in Montville, CT = 17,000

Table 2
ConnDOT TRAFFIC VOLUMES
Fort Shantok Road southeast of Route 32
Station No. 1

	11-Oct-23 Wednesday			12-Oct-23 Thursday			13-Oct-23 Friday		
	EB	WB	Total	EB	WB	Total	EB	WB	Total
12:00				4	0	4	5	2	7
1:00				4	4	8	9	4	13
2:00				3	3	6	4	2	6
3:00				3	3	6	6	0	6
4:00				3	7	10	6	14	20
5:00				12	25	37	9	17	26
6:00				50	45	95	43	47	90
7:00				71	53	124	76	71	147
8:00				91	65	156	**89**	**71**	**160**
9:00				77	64	141	58	51	109
10:00				74	55	129	60	74	134
11:00				84	79	163	77	87	164
12:00	101	89	190	105	105	210			
1:00	90	82	172	86	104	190			
2:00	92	84	176	83	94	177			
3:00	84	115	199	84	103	187			
4:00	96	101	197	**93**	**124**	**217**			
5:00	97	72	169	79	93	172			
6:00	52	43	95	55	58	113			
7:00	37	72	109	45	26	71			
8:00	37	35	72	34	16	50			
9:00	26	13	39	26	14	40			
10:00	15	14	29	11	13	24			
11:00	13	8	21	12	8	20			
Total	740	728	1468	1189	1161	2350	442	440	882

2023 ADT for Station 1 in Montville, CT = 2,200

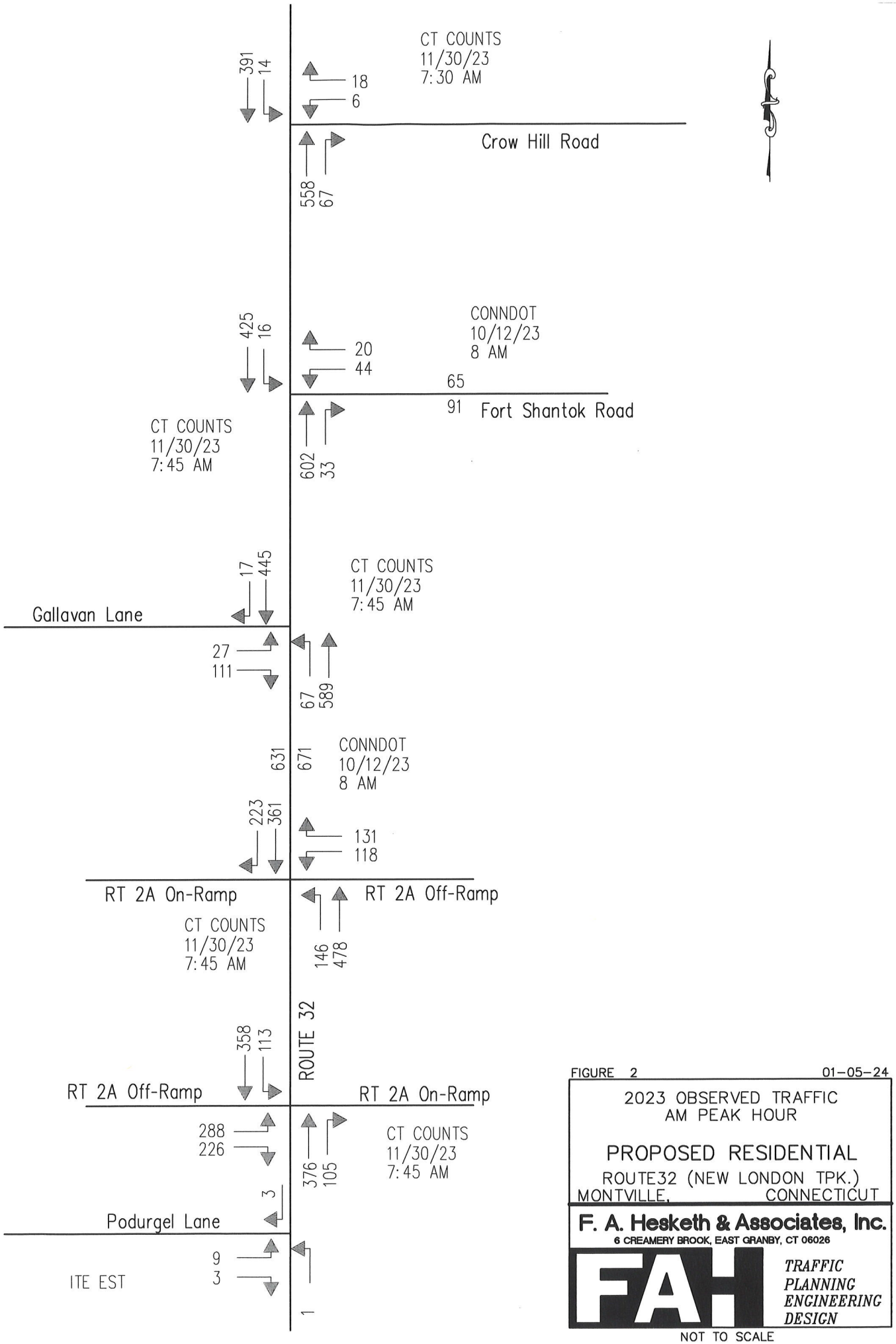

FIGURE 2 01-05-24

2023 OBSERVED TRAFFIC
AM PEAK HOUR

PROPOSED RESIDENTIAL
ROUTE32 (NEW LONDON TPK.)
MONTVILLE, CONNECTICUT

F. A. Hesketh & Associates, Inc.
6 CREAMERY BROOK, EAST GRANBY, CT 06026

FAH
TRAFFIC
PLANNING
ENGINEERING
DESIGN

NOT TO SCALE

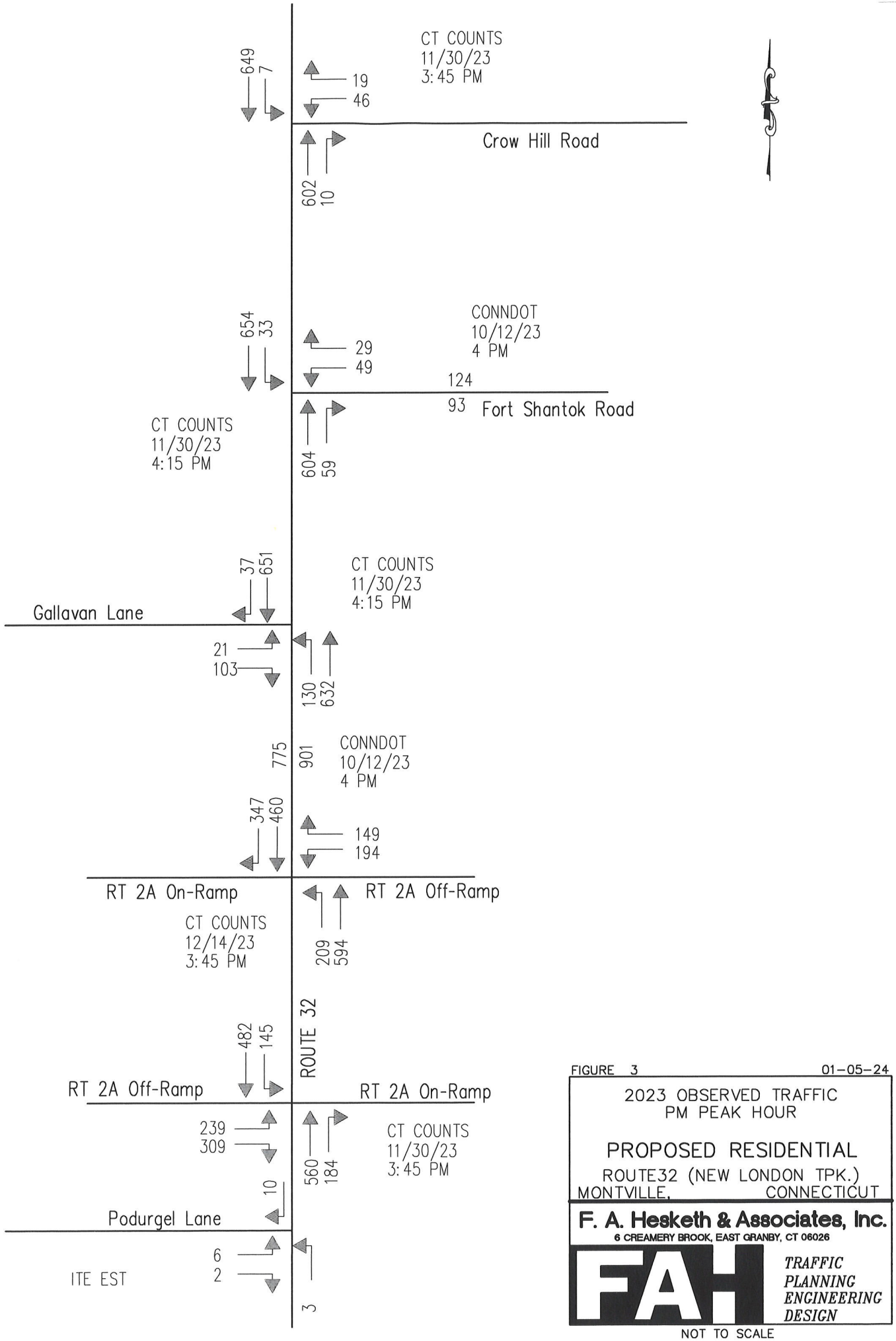

FIGURE 3 01-05-24

2023 OBSERVED TRAFFIC
PM PEAK HOUR

PROPOSED RESIDENTIAL
ROUTE32 (NEW LONDON TPK.)
MONTVILLE, CONNECTICUT

F. A. Hesketh & Associates, Inc.
6 CREAMERY BROOK, EAST GRANBY, CT 06026
FAH
TRAFFIC
PLANNING
ENGINEERING
DESIGN

NOT TO SCALE

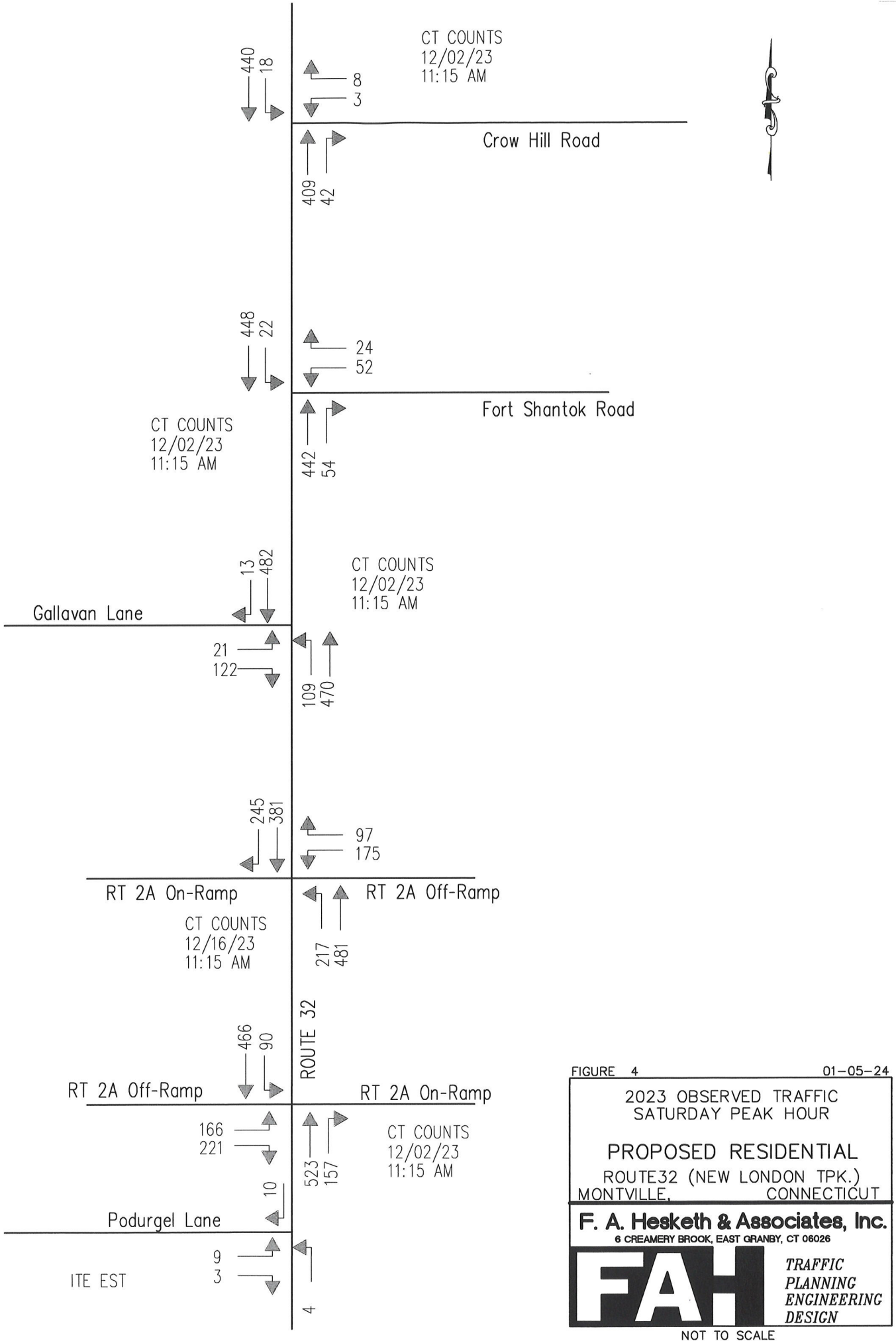

FIGURE 4 01-05-24

2023 OBSERVED TRAFFIC
SATURDAY PEAK HOUR

PROPOSED RESIDENTIAL

ROUTE32 (NEW LONDON TPK.)
MONTVILLE, CONNECTICUT

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