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March 21, 2022

Mr. Bryan Healy
Village Manager
Village of Croton on Hudson
1 Van Wyck Street
Croton on Hudson, NY 10520
Email: bhealy@crotononhudson-ny.gov

Re: **Extra Work Authorization for PO #2200075 (Croton Zoning Study – Traffic)**

Dear Mr. Healy:

AKRF, Inc. ("AKRF" or the "Consultant") is pleased to present this proposal to the Village of Croton-on-Hudson ("the Village" or the "Client") to prepare a Traffic Impact Study (TIS) related to the theoretical maximum buildout projected under the proposed Harmon/South Riverside Gateway (HSRG) Overlay and Light Industrial (LI) District zoning amendments. For reference, Scenario B of the Traffic task in AKRF's contract dated June 16, 2021, noted the potential for a quantified traffic analysis to satisfy State Environmental Quality Review (SEQR) requirements should the increase in traffic resulting from the theoretical maximum buildout generate 100 or more vehicle trips during the weekday peak hours.

The preliminary trip generation numbers (summarized in the attached February 25, 2022 memorandum), indicated the incremental trip generation numbers associated with the theoretical maximum buildout exceeded the 100 vehicle-trip threshold for any given peak hour. Therefore, this proposal has been prepared seeking authorization to perform a quantified traffic analysis. It is noted that it is unlikely the entirety of the Project Area would be fully redeveloped under the parameters of the proposed zoning amendments. Nevertheless, the quantified analysis would support the requisite "hard look" necessary to assess the potential for traffic impacts under SEQR as assumed through the conservative buildout calculations.

The Scope of Work for the Traffic Impact Study ("TIS") is presented below.

TASK 1: DATA COLLECTION

Turning Movement Counts (TMCs) and Vehicle Classification Counts (VCC) would be collected at the following locations for the weekday AM (6:30 to 9:30 AM) and PM (4:00 to 6:00 PM) periods:

1. Croton Point Ave. and Veterans Plaza (TMC)
2. Croton Point Ave. and Rt. 9/9A Southbound Ramps (TMC/VCC)
3. Croton Point Ave. and Rt. 9/9A Northbound Ramps (TMC/VCC)
4. Croton Point Ave. and S. Riverside Ave. (TMC/VCC)

5. S. Riverside Ave. and Benedict Blvd. (TMC)
6. S. Riverside Ave. and Clifton St. (TMC)

Roadway characteristics would be observed including travel lanes by direction, pavement markings, pavement widths, traffic control devices (e.g. signals, stop signs).

Traffic signal timing plans for the signalized intersections would be obtained from NYSDOT or the appropriate agency.

TASK 2: TRAFFIC IMPACT STUDY (TIS)

Prior to the commencement of the preparation of the TIS, AKRF would conduct a preliminary screening analysis to estimate the likelihood of traffic impacts occurring at of any of the intersections proposed for analysis. This screening would be based on an assessment of the collected traffic volumes and proposed trip assignments. Based on the results of this screening, the number of intersections analyzed as part of the TIS may be reduced, thereby potentially reducing the cost of the TIS outlined below. The scope of work and cost for the TIS outlined below assumes that none of the counted intersections would screen-out and represents the maximum effort/cost for the TIS. In the event one or more intersections screen-out, the effort and cost outlined below would be reduced.

AKRF would complete capacity analyses for six intersections (identified in Task 1) for the Existing and Build Conditions[1] (i.e., at maximum theoretical buildout under the proposed zoning amendments) and prepare Level of Service (LOS) results for the weekday AM and PM peak periods. The analyses would be conducted using the latest NYSDOT approved methodology and traffic analysis software.

Trip generation (see attached memorandum) was based on data presented in the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition.* These data would be used to estimate the potential increase in traffic as a result of the proposed zoning amendments. Existing traffic data and available parcel information (theoretical building programs, theoretical site access points) would be used to develop theoretical buildout-generated trip assignments to the adjacent public roadways. The analyses would include assumptions regarding potential driveway locations to develop trip assignments for the theoretical maximum buildout. The driveway locations utilized for the analysis would be determined based consultation with the Village.

Trips generated by the theoretical maximum buildout would be overlaid onto the Existing volumes to develop the capacity analysis for the future Build Conditions. Potential traffic impacts resulting from the theoretical maximum buildout would be identified, and a range of potential mitigation measures would be recommended.

AKRF would qualitatively assess public transportation, pedestrian, and bicycle conditions in the study area.

AKRF would compare parking requirements and demand for the existing zoning versus the proposed amendments utilizing the latest version of the *ITE Parking Generation Handbook* and the Village parking requirements for each zoning district.

FEE SCHEDULE

AKRF would complete the above referenced scope of work for a not to exceed budget of **$19,450** (including expenses) as shown in **Table 1** and in accordance with our Standard Terms and Conditions, included as Appendix A to our contract dated June 16, 2021. **This fee includes one round of team comments that does not require any additional quantified analysis.** A separate scope and fee would be provided to respond to any comments beyond the one round of team comments indicated above.

[1] The Village has agreed that a No Build scenario analysis will not be required as part of the TIS. Therefore, the analyses would be performed for the Existing and Build conditions.

Direct/Out-of-pocket expenses (e.g., travel expenses, copying, overnight delivery, etc.) are not included in this fee and would be billed separately at cost, in accordance with our contract dated June 16, 2021. The proposed cost also assumes that there would be no changes to the project that would require AKRF to redo work already performed.

If this proposal is acceptable, we would request that the $43,000 budget authorized by the Village through PO# 2200075, which covers the previously authorized (completed) trip generation analysis ($5,000), meetings/coordination ($13,500), the other SEQRA forms and studies for the zoning amendments ($24,500) be increased to $61,950.

Thank you for the opportunity to submit this proposal and we look forward to continuing to work with you on this project.

Table 1
Budget by Task Breakdown

Task	Cost
Task 1 – Data Collection	$3,000 (Lump Sum)
Task 2 – Traffic Impact Study	$15,950* (Lump Sum)
Expenses	$500 (Time and Materials)
TOTAL BUDGET	**$19,450**

Note:
*This is the maximum (not to exceed) TIS budget assuming that none of the six intersections proposed for analysis would screen-out and all six intersections would be analyzed.

Sincerely,
AKRF, Inc.

Nina Peek, AICP
Vice President, Hudson Valley
Office Director

Aaron Werner, AICP
Technical Director/Project
Manager

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Memorandum

To:	Village of Croton-on-Hudson
From:	AKRF, Inc.
Date:	February 25, 2022
Re:	Trip Generation Summary – Proposed HSRG Overlay and LI District Zoning Amendments

AKRF has completed trip generation calculations for the theoretical maximum buildout projected under the proposed HSRG Overlay and LI District zoning amendments. The calculations are based on trip generation rates and data provided in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition (the most recent edition available at this time). The results of the trip generation calculations are presented in **Table 1**.

To generate a theoretical maximum buildout scenario for the HSRG Overlay area, it was assumed that all parcels within the existing HSRG Overlay district and proposed expansion area would be redeveloped with multifamily residential buildings with a floor area ratio (FAR) of 0.8, a maximum height of three stories/35 feet, and compliance with on-site (off-street) parking requirements as per the proposed zoning amendments. The theoretical maximum buildout scenario for the HSRG Overlay resulted in a total of 383 residential units and 583 off-street parking spaces.

To generate a theoretical maximum buildout scenario for the LI district parcels, the calculations assumed that each of the three parcels (48, 49, and 50) would be redeveloped with a 1.2 FAR mixed-use building containing ground floor commercial space with residential space above, at a maximum height of five stories, while also meeting the on-site parking requirements as per the proposed zoning amendments. The theoretical maximum buildout scenario for the LI district parcels resulted in a total of 87 residential units, 21,831 square feet of ground floor commercial space, and 142 off-street parking spaces (55 spaces for commercial uses and 87 spaces for residential uses).

Off-street parking requirements for any new multifamily residential uses in the HSRG Overlay area are expected to be the same as what is currently permitted for mixed-use buildings through Section 230-20.3(d) of the Village Zoning Code (one parking space per unit, plus one additional parking space for each bedroom in the unit in excess of one bedroom). However, because the buildout calculations did not account for bedrooms and assumed each residential unit would be

1,000 square feet in area, a ratio of 1.5 parking spaces per projected unit was applied for the HSRG Overlay, which is considered conservative. Due to the Village's desire to introduce a Transit-Oriented Development (TOD) concept to the LI district parcels included in the study, which are within close proximity to public transit and municipal parking lots, off-street parking requirements for mixed-use development on the three LI district parcels was assumed to be 1 parking space per residential unit and 1 parking space per 400 square feet of commercial floor area. For context, the Village's C-2 (General Commercial) district currently permits the greater of 1 space per 300 square feet of office floor area or 1 space per 250 square feet of retail/service area.

For both the HSRG Overlay and LI district parcels included in the study, projected uses were assumed to be accommodated within one building per parcel, with the projected amount of required parking accommodated on each parcel as well. The area calculation for the required number of parking spaces assumed that one space requires 325 sf. This was calculated by adding the area of a typical parking space (10 ft. x 20 ft. = 200 sf) to the area equal to half the circulation aisle (10 ft. x 12.5 ft = 125 sf).

The complete lists of assumptions utilized to complete the buildout and parking calculations, which have been vetted through the Village, will be included in the FEAF Part 3 Supplemental Narrative being prepared by AKRF.

Trip generation calculations were performed for the Weekday AM, Weekday PM, and Saturday Midday peak hours. Credits were taken account for internal trips between the land uses (i.e., pedestrian trips between land uses that would not generate additional vehicle trips) within the Project Area, and for mass transit usage. In addition, pass-by trip[1] credits were taken for the retail and restaurant land uses. As shown in **Table 1**, the total trip generation numbers would be 165, 241, and 216 trips for the Weekday AM, Weekday PM, and Saturday Midday peak hours.

Since the number of trips for each peak hour examined exceeds 100 trips, it is anticipated that a quantified analysis at key intersections will be required. The quantified analysis would assist the Village in assessing the potential for traffic impacts, in the unlikely event that the entirety of the Project Area is fully redeveloped under the parameters of the proposed zoning amendments, as assumed through the conservative buildout calculations. Selection of any intersections to be included in the analysis would be determined based on consultation with the Village.

Figure 1 shows the nine intersections proposed for quantified analysis and also illustrates the general trip distribution pattern percentages to and from the Project Area. **Figures 2, 3,** and **4** illustrate the estimated net trips (i.e., less any trip credits such as pass-by or transit credits) that would be distributed across the roadway network based on the percentages shown in **Figure 1**. It is important to note that the illustrated study area intersections, trip distribution patterns, and trip assignments are for preliminary discussion purposes only and are subject to modification based on consultation with the Village and any traffic data that would be collected in support of the quantified analysis (e.g., traffic counts).

[1] A pass-by trip is a trip already present in the traffic stream and is made as an intermediate stop on the way from an origin to a separate primary trip destination without a route diversion. Pass-by trips are not considered as new trips to the overall roadway network.

Table 1
Trip Generation*
Croton Zoning Study

Building Component	Zoning Component	Land Use Description	ITE Land Use Code #	ITE Land Use	Size	Weekday AM Peak Hour In	Weekday AM Peak Hour Out	Weekday AM Peak Hour Total	Weekday PM Peak Hour In	Weekday PM Peak Hour Out	Weekday PM Peak Hour Total	Saturday Midday Peak Hour In	Saturday Midday Peak Hour Out	Saturday Midday Peak Hour Total
Residential	HSRG	Multifamily Housing (3 story max.)	220	Multifamily Housing (Low-Rise) - Not Close to Rail Transit (1)	383 Units	34	108	142	117	68	185	79	78	157
	LI TOD	Multifamily Housing (5 story max.)	221	Multifamily Housing (Mid-Rise) - Not Close to Rail Transit(2)	87 Units	6	21	27	21	13	34	18	17	35
	Subtotal Residential				*470 Units*	*40*	*129*	*169*	*138*	*81*	*219*	*97*	*95*	*192*
	Internal Trips (6)					*-4*	*-13*	*-17*	*-14*	*-8*	*-22*	*-10*	*-9*	*-19*
	Mass Transit Credit (7)					*-4*	*-11*	*-15*	*-12*	*-8*	*-20*	*-9*	*-8*	*-17*
	Total Residential				**470 Units**	**32**	**105**	**137**	**112**	**65**	**177**	**78**	**78**	**156**
Commercial	LI TOD	Office	712 / 710	Small Office Building (AM, PM) / General Office Building (Sat.)(3)	*7.423 kSF (8)*	*10*	*2*	*12*	*5*	*11*	*16*	*2*	*2*	*4*
					Internal Trips (6)	*-1*	*0*	*-1*	*-1*	*-1*	*-2*	*0*	*0*	*0*
					Mass Transit Credit (7)	*-1*	*0*	*-1*	*0*	*-1*	*-1*	*0*	*0*	*0*
					Total Office	***8***	***2***	***10***	***4***	***9***	***13***	***2***	***2***	***4***
		Retail	822	Strip Retail Plaza (<40k)(4)	*7.859 kSF (8)*	*11*	*8*	*19*	*26*	*26*	*52*	*27*	*25*	*52*
					Internal Trips (6)	*-1*	*-1*	*-2*	*-3*	*-2*	*-5*	*-3*	*-2*	*-5*
					Mass Transit Credit (7)	*-1*	*-1*	*-2*	*-2*	*-3*	*-5*	*-2*	*-3*	*-5*
					Pass-by Trips (9)	*-2*	*-1*	*0*	*-7*	*-7*	*-14*	*-6*	*-5*	*-11*
					Total Retail	***7***	***5***	***15***	***14***	***14***	***28***	***16***	***15***	***31***
		Restaurant	931	Fine Dining Restaurant(5)	*6.549 kSF (6)*	*3*	*2*	*5*	*34*	*17*	*51*	*41*	*29*	*70*
					Internal Trips (6)	*0*	*-1*	*-1*	*-3*	*-2*	*-5*	*-4*	*-3*	*-7*
					Mass Transit Credit (7)	*0*	*0*	*0*	*-3*	*-2*	*-5*	*-4*	*-2*	*-6*
					Pass-by Trips (10)	*-1*	*0*	*-1*	*-12*	*-6*	*-18*	*-19*	*-14*	*-32*
					Total Restaurant	***2***	***1***	***3***	***16***	***7***	***23***	***14***	***10***	***25***
	Total Commercial				**21.831 kSF**	**17**	**8**	**28**	**34**	**30**	**64**	**32**	**27**	**60**
TOTAL TRIP GENERATION						**49**	**113**	**165**	**146**	**95**	**241**	**110**	**105**	**216**

Notes:

(1) ITE equation T = 0.31(X) + 22.85 (24% entering, 76% exiting) was used for the Weekday AM Peak Hour
ITE equation T = 0.43(X) + 20.55 (63% entering, 37% exiting) was used for the Weekday PM Peak Hour
ITE rate of 0.41 trips/dwelling unit (50% entering, 50% exiting) was used for the Saturday Midday Peak Hour.

(2) ITE equation T = 0.44(X) - 11.61 (23% entering, 77% exiting) was used for the Weekday AM Peak Hour
ITE equation T = 0.39(X) + 0.34 (61% entering, 39% exiting) was used for the Weekday PM Peak Hour
ITE Equation Ln(T) = 1.00 Ln(x) - 0.91 (51% entering, 49% exiting) was used for the Saturday Midday Peak Hour.

(3) ITE rate of 1.67 trips/1,000 SF (82% entering, 18% exiting) was used for the Weekday AM Peak Hour
ITE rate of 2.16 trips/1,000 SF (34% entering, 66% exiting) was used for the Weekday PM Peak Hour
ITE rate of 0.53 trips/1,000 SF (54% entering, 46% exiting) was used for the Saturday Midday Peak Hour. ITE Rates unavailable for the "Small Office Building" land use for the Saturday Midday Peak Hour, therefore, "General Office Building" land use rates were utilized instead.

(4) ITE rate of 2.36 trips/1,000 SF (60% entering, 40% exiting) was used for the Weekday AM Peak Hour
ITE rate of 6.59 trips/1,000 SF (50% entering, 50% exiting) was used for the Weekday PM Peak Hour
ITE rate of 6.57 trips/1,000 SF (51% entering, 49% exiting) was used for the Saturday Midday Peak Hour

(5) ITE rate of 0.73 trips/1,000 SF (50% entering, 50% exiting) was used for the Weekday AM Peak Hour
ITE rate of 7.80 trips/1,000 SF (67% entering, 33% exiting) was used for the Weekday PM Peak Hour
ITE rate of 10.68 trips/1,000 SF (59% entering, 41% exiting) was used for the Saturday Midday Peak Hour

(6) Internal trips calculated utilizing an internal trip credit of 10%.

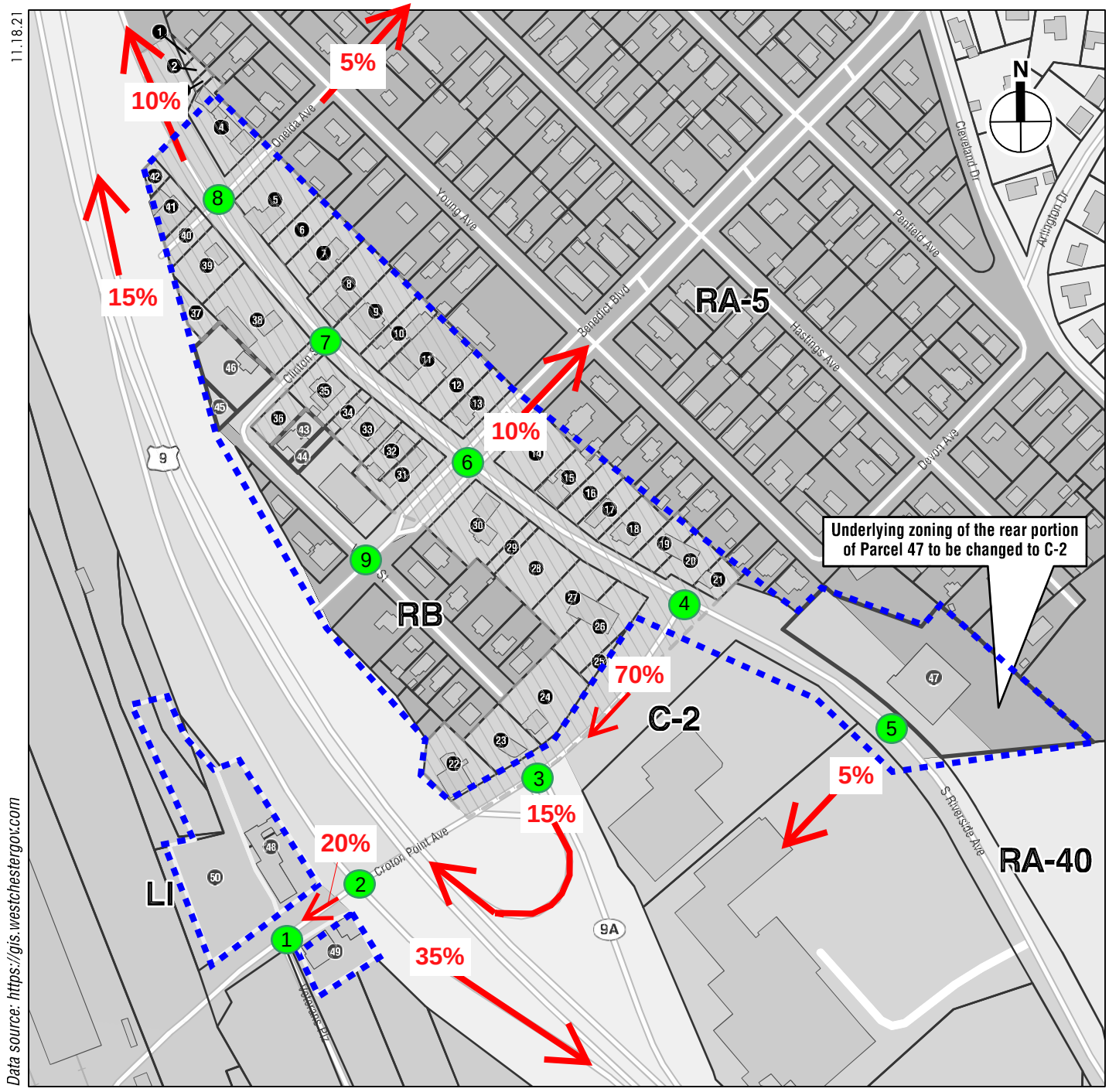
(7) Mass Transit credit calculated utilizing a 10% mass transit credit.

(8) The commercial square footage was assumed to be 34% office, 36% retail, and 30% restaurant.

(9) Pass-by trip percentage of 34% utilized for the Weekday PM peak hour and 26% utilized for the Saturday Midday peak hour, based on average of pass-by trip percentages presented in the Institute of Transportation Engineers (ITE) Trip Generation Handbook, 3rd Edition for ITE Land Use Code 820 "Shopping Center". ITE Pass-by trip percentage unavailable for Land Use 820 for the Weekday AM peak hour and was developed from the ratio of Weekday AM to Weekday PM peak hour trips yielding a pass-by trip percentage of 20%.

(10) Pass-by trip percentage of 44% utilized for the Weekday PM peak hour, based on average of pass-by trip percentages presented in the Institute of Transportation Engineers (ITE) Trip Generation Handbook, 3rd Edition for ITE Land Use Code 931 "Quality Restaurant". ITE Pass-by trip percentages unavailable for Land Use 931 for the Weekday AM and Saturday Midday peak hours and were developed from the ratio of Weekday AM and Saturday Midday to Weekday PM peak hour trips yielding pass-by trip percentages of 24% and 57% for the Weekday AM and Saturday Midday peak hours, respectively.

***Source:** ITE *Trip Generation Manual, 11th Edition*



Proposed Study Area Intersections

1. Croton Point Ave. and Veterans Plaza
2. Croton Point Ave. and Rt. 9/9A Southbound Ramps
3. Croton Point Ave. and Rt. 9/9A Northbound Ramps
4. Croton Point Ave. and S. Riverside Ave.
5. S. Riverside Ave. and Shopping Center Driveway
6. S. Riverside Ave. and Benedict Blvd.
7. S. Riverside Ave. and Clifton St.
8. S. Riverside Ave. and Oneida Ave.
9. Benedict Blvd. and Wayne St.

Proposed Turning Movement Count (TMC) Time Periods

Weekday AM: 7:00 AM - 10:00 AM
Weekday PM: 4:00 PM - 7:00 PM
Saturday Midday: 11:00 AM - 2:00 PM

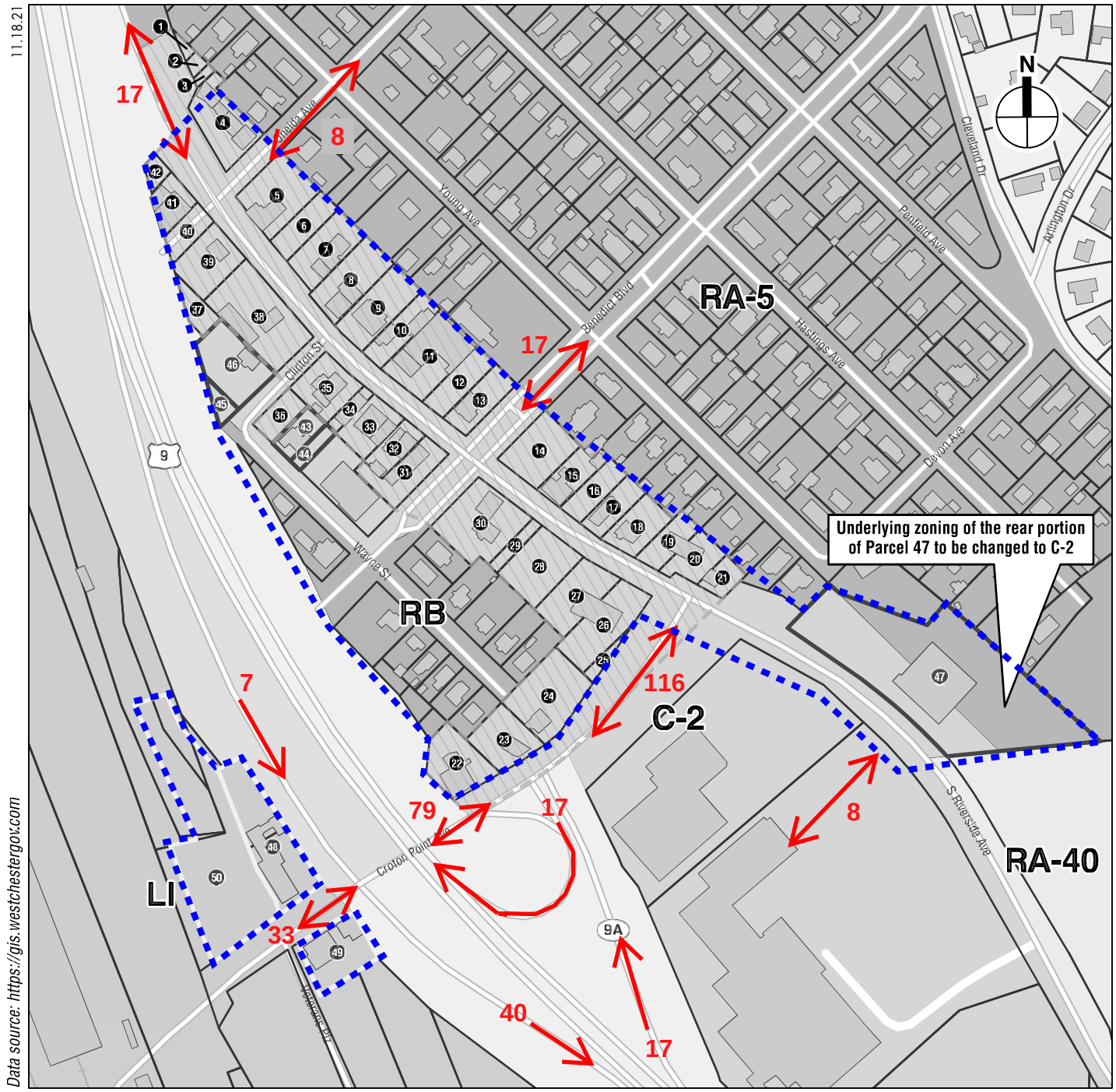
0 500 FEET

15% Exiting Trip Distribution Percentages (Reverse for entering trips)

General Project Area Outline

PROPOSED STUDY AREA INTERSECTIONS AND TRIP DISTRIBUTION PERCENTAGES

Figure 1



33 — Estimated Two-Way Project Generated Traffic Volumes

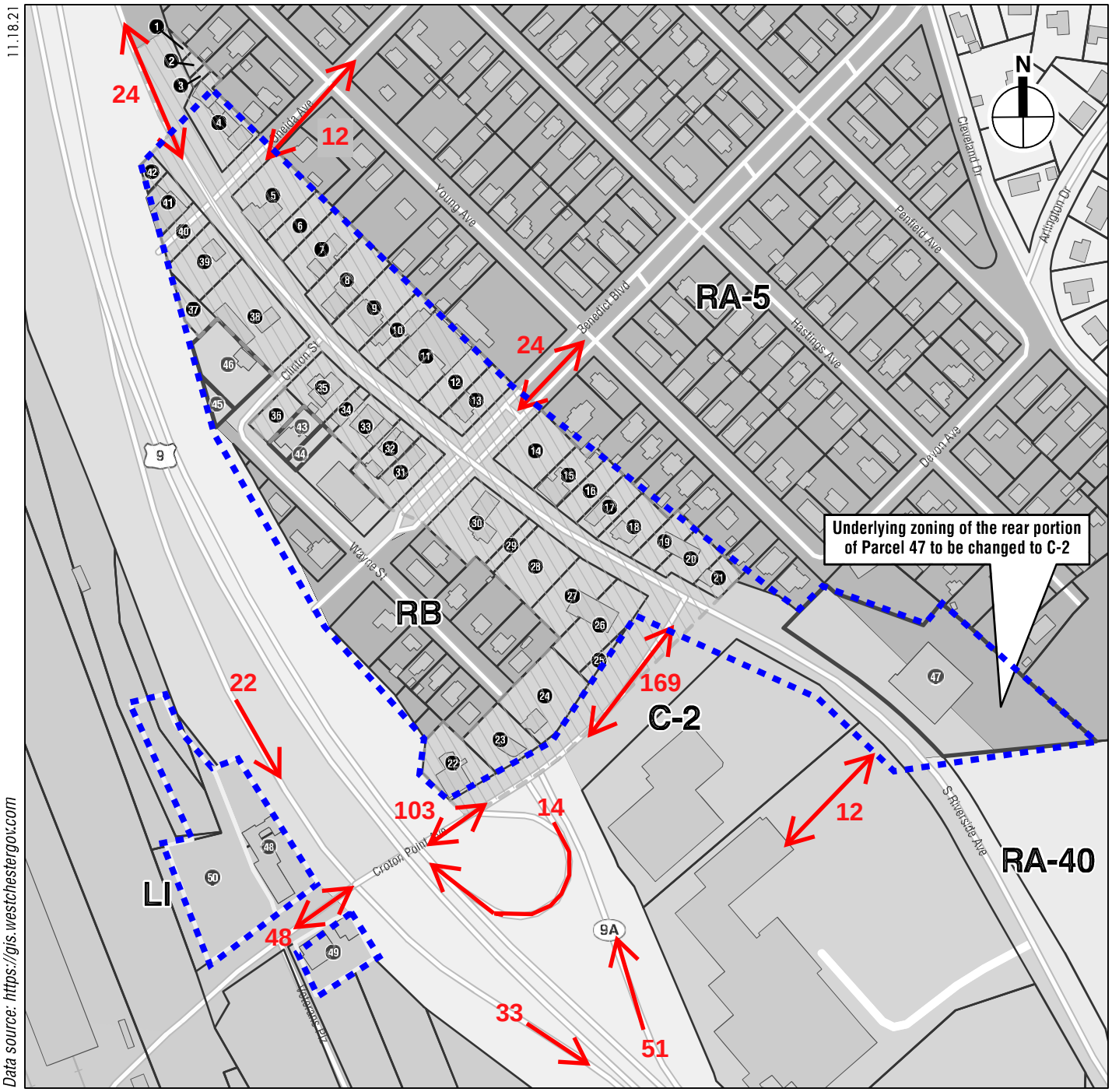
7 — Estimated One-Way Project Generated Traffic Volumes

General Project Area Outline

ESTIMATED NET TRIP ASSIGNMENT VOLUMES - WEEKDAY AM PEAK HOUR

VILLAGE OF CROTON-ON-HUDSON PROPOSED ZONING AMENDMENTS

Figure 2



48 — Estimated Two-Way Project Generated Traffic Volumes

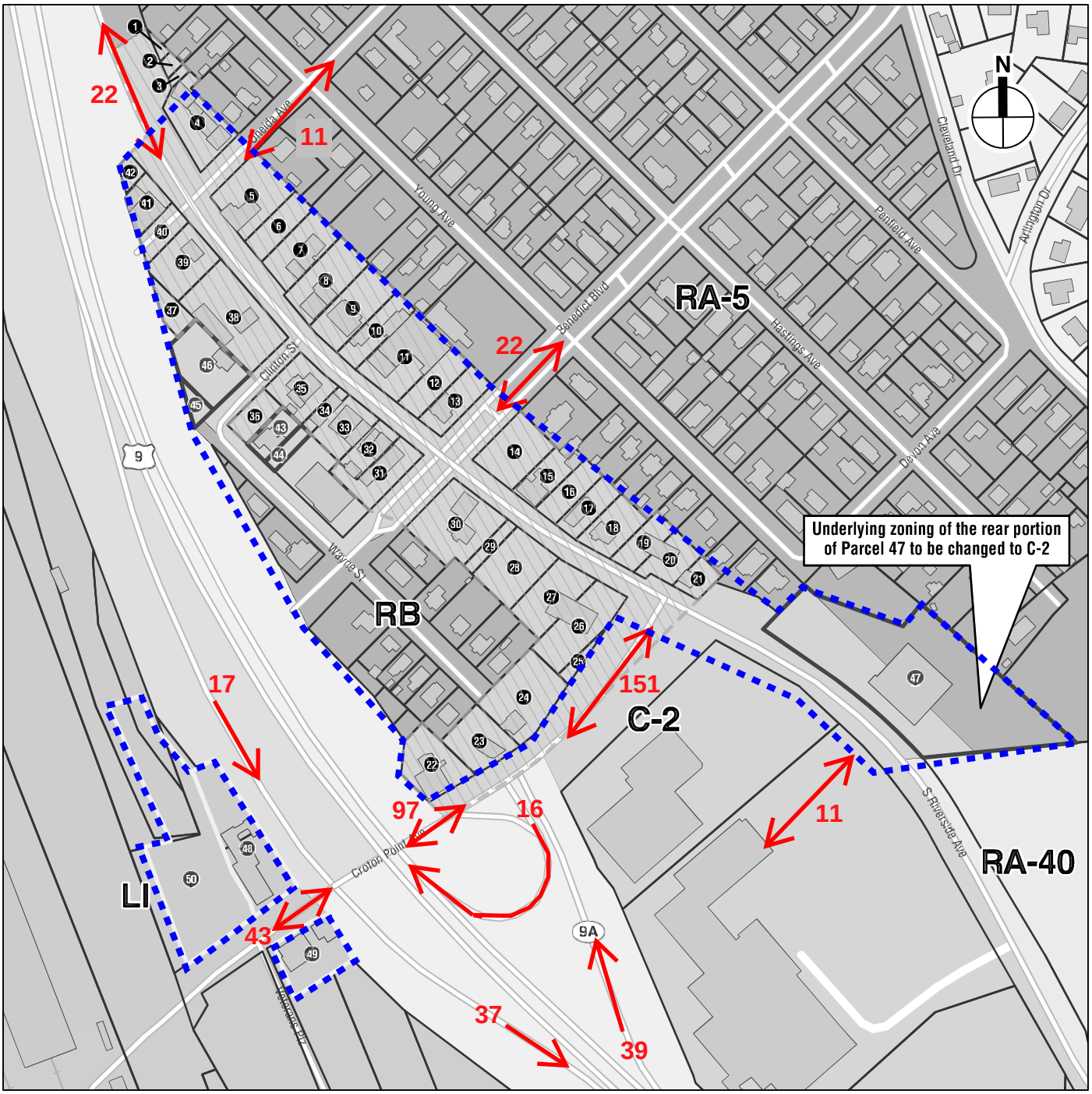
22 — Estimated One-Way Project Generated Traffic Volumes

General Project Area Outline

ESTIMATED NET TRIP ASSIGNMENT VOLUMES - WEEKDAY PM PEAK HOUR

VILLAGE OF CROTON-ON-HUDSON PROPOSED ZONING AMENDMENTS

Figure 3



43 Estimated Two-Way Project Generated Traffic Volumes

17 Estimated One-Way Project Generated Traffic Volumes

General Project Area Outline

ESTIMATED NET TRIP ASSIGNMENT VOLUMES - SATURDAY PEAK HOUR