

Traffic Impact Study

for the proposed

Westwood Mixed-Use Neighborhood

**Town of Amherst
Erie County, New York**

Project No. 36069

February 2017 Update

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EXECUTIVE SUMMARY

OVERVIEW

The purpose of this updated Traffic Impact Study (TIS) is to identify and evaluate the potential traffic impacts associated with the proposed Westwood mixed-use neighborhood in the Town of Amherst, New York. In an effort to define the potential traffic impacts, this analysis determines the extent of existing traffic conditions, projects background traffic flow and volumes including area growth, and projects changes in traffic flow on the roadway network in the study area associated with the proposed mixed-use neighborhood. This updated TIS also includes our firm's recommendations based on a comprehensive analysis of the potential traffic impacts associated with the proposed mixed-use neighborhood.

Until December 31, 2014, the approximately 170 acre project site was occupied by the Westwood Country Club, a private 18-hole golf course. The project site is bounded by: Maple Road to the north; the Audubon Par 3 Golf Course, Ellicott Creek, and North Forest Road to the east; Sheridan Drive to the south; and Frankhauser Road and Fairways Boulevard to the west. The proposed mixed-use neighborhood consists of the following land uses as depicted on the current Conceptual Master prepared by Wendel:

- Parcel I: Small Patio Homes – 57 lots
- Parcel II: Larger Patio Homes – 26 lots
- Parcel III: Single Family Home Subdivision – 41 lots
- Parcel IV: Multifamily Community – 180 units
- Parcel V: Publicly Accessible Park Area – 39.4 Acres
- Parcel VI: Westwood Neighborhood Center
 - Offices/Community Facility – 112,800 SF
 - Offices – 152,000 SF
 - Multifamily Buildings – 89 units
 - Townhomes along Frankhauser Road – 40 units
 - Mixed- Use Buildings – 166,000 SF commercial, 221 units multifamily residential
 - Hotel – 130 rooms
- Parcel VII - Senior Living
 - Assisted Living – 200 beds
 - Independent Living Apartments – 104 units

Access to the proposed mixed-use neighborhood will be provided via a new north/south roadway, to be dedicated to the Town as a public roadway, connecting Maple Road and Sheridan Drive. The northerly access point will form a new “T” intersection at Maple Road. The southerly access will intersect Sheridan Drive on the north side directly opposite the existing Fenwick Road intersection on the south side of Sheridan Drive. In addition, an “enter only” connection will be provided from Frankhauser Road into the Project Site as well a new full access connection at North Forest Road controlled by a roundabout.

Construction of the proposed mixed-use neighborhood is anticipated to reach full build-out in approximately 10 years and the build-out will occur over multiple phases. For purposes of this study, our firm's analysis takes into account the full redevelopment of the Project site. Town of

Amherst officials were contacted to discuss projects within the study area that are under construction and/or approved. There is a proposed 12 lot subdivision proposed by Elite Construction on several parcels located to the west of the project site at 4176-4188 Sheridan Drive. The environmental review of the small 12 lot subdivision resulted in the issuance of a negative declaration by the Town of Amherst Planning Board in 2016 followed by the issuance of a Preliminary Plat Approval. To account for normal increases in background traffic growth, including the aforementioned proposed patio home project, which is waiting final approved at this time, as well as any unforeseen developments in the project study area, a growth rate of 0.25% per year has been applied to the existing traffic volumes, based upon historical traffic growth derived from New York State Department of Transportation (NYSDOT) and Greater Buffalo-Niagara Regional Transportation Council (GBNRTC) traffic volume projections for the area, for the 10-year build-out period.

The operating characteristics of the site access roads and impacts to the adjacent roadway network are identified and mitigating measures, if any, are provided to minimize any capacity or safety concerns.

CONCLUSIONS & RECOMMENDATIONS

This updated Traffic Impact Study identifies and evaluates the potential traffic impacts resulting from full build-out of the proposed mixed-use neighborhood. This updated Traffic Impact Study provides the Town of Amherst Town Board, in its capacity as the designated lead agency for the coordinated environmental review of the proposed mixed-use redevelopment project pursuant to State Environmental Quality Review Act ("SEQRA"), along with involved and interested agencies including the NYSDOT and Erie County Department of Public Works (ECDPW), with information to allow a hard look to be taken at identified potential traffic impacts. Based upon the comprehensive traffic analysis contained in this report, it is our firm's professional opinion that the results indicate that the proposed mixed-use neighborhood can be accommodated by the existing roadway network with the recommendations below being in place. The following sets forth our firm's conclusions and recommendations based upon the results of the comprehensive traffic analyses that have been conducted:

1. The proposed mixed-use neighborhood is expected to generate approximately 1,034 (1,284) new trips during the AM (PM) peak hours respectively.
2. The new north-south roadway in combination with the new connection to North Forest Road will provide benefits to the overall area by allowing traffic that is currently using North Forest Road to divert to the new north-south roadway. The new roadway connections will provide a much more direct route between Sheridan Drive and Maple Road as compared to the curvy circuitous route provided by North Forest Road. This will in turn improve operating conditions at both North Forest Road intersections with Sheridan Drive and Maple Road. In addition, the proposed roundabout at North Forest Road and the east-west site roadway will provide direct access to the site from North Forest Road eliminating the need to use Sheridan Drive and will eliminate the existing sharp curve on North Forest Road. The roundabout will provide a traffic calming measure on North Forest Road resulting in reduced speeds and improved safety. The one-way enter only connection from Frankhauser Road will also provide direct access to site from the neighborhood to the west eliminating the need to use Sheridan Drive. Neighborhood residents would also ultimately be able to travel directly from the neighborhood to North Forest Road.

3. It is recommended that the northbound off-ramp from Millersport Highway to Maple Road (Study Intersection 2) be restriped to provide a right turn only lane and left/thru/right turn lane. This will both allow for dual right turn movements onto Maple Road eastbound as well as decrease queuing on the off-ramp. The two Millersport Highway ramp signals are coordinated and will require optimization of offsets as included in this analysis.
4. At the intersections of North Forest Road/Maple Road and Sheridan Drive/Mill Road, it is recommended that the signal timings are optimized based upon future traffic volumes.
5. Mitigation for the changes in levels of service at the Sheridan Drive intersection with North Forest Road include installing a westbound right turn lane, providing an additional northbound through lane by combining the northbound through and right turn movements in the curb lane, and optimizing the signal timings and coordination offsets. The southbound right-turn lane should be extended to the north to create additional capacity for southbound right-turning traffic and to reduce southbound queuing.
6. Recommended mitigation at Harlem Road and the I-290 off-ramp is to create dual westbound right turns by combining the right and left turn movements in the current left turn lane and optimizing signal timings. Providing additional turn capacity for right turn movements will decrease queuing on the off-ramp. This mitigation can be accomplished via pavement marking changes if NYSDOT agrees with this recommendation.
7. The proposed new roundabout intersection of the site driveway and North Forest Road will operate at LOS "A" on all approaches during both peak hours. The roundabout will eliminate the existing sharp curve on North Forest Road and will be an effective traffic calming measure that will reduce vehicle speeds and provide a means of accessing the Project Site from North Forest Road. The improvements at Sheridan Drive & North Forest Road will improve southbound queuing on North Forest Road such that spillback into the roundabout will not occur.
8. A left-turn lane warrant investigation was conducted along Maple Road and Sheridan Drive at the proposed driveways. However, two-way left-turn facilities already exist at the location of the proposed access roads. The two-way left-turn lanes should be restriped to accommodate dedicated left-turn lanes entering the proposed driveway along Maple Road and the existing Sheridan Drive/Fenwick Road intersection.
9. A right-turn lane investigation was conducted along Maple Road and Sheridan Drive at the proposed driveway locations. While the future volumes satisfy the right-turn lane guidelines at the intersection of Maple Road and the proposed driveway under full development during the AM and PM peak hours, no improvement is recommended given the location of adjacent residential properties. Right-turn guidelines were satisfied during both peak hours at the intersection of Sheridan Drive/Fenwick Road/Proposed Driveway. The right turn lane should provide 425' of storage space with a 75' taper.
10. Install a new traffic signal at the proposed public roadway connection on Maple Road when the new roadway is constructed.
11. Install a new traffic signal at the proposed public roadway on Sheridan Drive when the driveway is constructed. The new traffic signal should be coordinated with the existing traffic signal network along Sheridan Drive to the west of the project site.

12. A post-construction signal warrant analysis should be performed at the new roadway intersection with Sheridan Drive after the new north/south connector public roadway is completed and dedicated to the Town of Amherst and the development has reached approximately 20% of the projected full development trip generation to determine if signal warrants are met at that time.
13. In response to NYSDOT's direction allowing only one traffic signal at either Frankhauser Road or the proposed roadway intersection along Sheridan Drive, and upon evaluation of the signal warrants, future traffic volumes and overall corridor benefits, it is recommended that the traffic signal at the intersection of Frankhauser Road and Sheridan Drive be removed at the same time a traffic signal is installed at the intersection of the proposed north-south roadway connection and Sheridan Drive.
14. The proposed new north south public roadway connecting Sheridan Drive and Maple Road should be designed to provide two lanes of exiting traffic and two lanes of entering traffic to both facilitate traffic movements and to achieve the desired alignment with the existing Fenwick Road. The throat length of the driveway should be designed to accommodate vehicle queues exiting the site and reduce vehicle blockages of internal circulation roadways; therefore a minimum uninterrupted throat length of 200 ft. is recommended.
15. It is important to mention that our firm's capacity analysis and the resulting LOS information as provided above was based on an analysis during AM and PM weekday travel periods. This is the appropriate methodology for preparing a capacity analysis for inclusion in a TIS. However, the resulting Levels of Service during peak travel periods are not reflective of conditions during the non-peak travel periods, which comprise a large portion of each day and also include weekends. It is always advisable to evaluate mitigation measures for peak travel periods but lower Levels of Service during weekday peak travel period do not mean that intersections of roadways are not properly designed or are not functioning properly. It would not be feasible for all intersections in a large community, such as the Town of Amherst, to function at high rated Levels of Service during peak travel periods since this would result in excessive roadway infrastructure and would not be economically feasible for governmental agencies responsible for the expenditure of funds for roadways and their maintenance and repair.
16. Internal sidewalks should form an inter-connected pedestrian network allowing users to actively walk amongst the various land use components to be included in the mixed-use neighborhood. Additionally, internal paved recreational paths should be designed and installed to encourage bicycle use.
17. The southern portion of the mixed-use neighborhood as depicted on the Conceptual Master Plan consists of the commercial and office components, higher density residential units, and the hotel component. This portion of the Project Site should incorporate bicycle parking and related facilities into the design. Such facilities should include bicycle racks and consideration should be given to including bicycle lockers, as well as providing shower and changing facilities within the proposed office buildings.
18. Transportation demand management (TDM) strategies should be considered and implemented, when practical, to reduce off-site vehicular trips.

19. Consideration should be given to reducing the number of parking spaces constructed on-site given the mixed-use nature of the proposed neighborhood, potential for non-vehicular trips, and the potential for shared parking between different categories of land uses with differing peak parking demands. The use of shared parking reduces the amount of impervious surfaces and prevent parking areas from having more parking spaces than needed to service a project with a mixture of land uses with differing peak parking demands.

I. INTRODUCTION

The purpose of this updated TIS is to identify and evaluate the potential traffic impacts associated with the proposed Westwood Country Club Development in the Town of Amherst, New York. This updated TIS was prepared for the purpose of evaluating the potential traffic impacts resulting from the updated layout for the proposed mixed use neighborhood as depicted on the updated Conceptual Master Plan. The Conceptual Master Plan has been updated based upon input received in connection with the coordinated environmental review of the project pursuant to SEQRA, which has included input from the Planning Board, Town Departments, the Town's Traffic Safety Board, the New York State Department of Transportation (NYSDOT), the Erie County Department of Public Works (ECDPW) and the public. The operating characteristics of the proposed access points and impacts to the adjacent roadway network are identified and evaluated.

In an effort to define traffic impacts, this analysis determines the extent of existing traffic conditions, projects background traffic flow including area growth, and projects changes in traffic flow due to the proposed development.

II. LOCATION

The Project site is located between Maple Road and Sheridan Drive, west of North Forest Road and east of Fairways Boulevard in the Town of Amherst, Erie County, New York. The site location and study area are shown in **Figure I – Site Location and Study Area** (all figures are included at the end of this report).

Until December 31, 2014, the approximately 170 acre project site was occupied by the Westwood Country Club, a private 18-hole golf course. The project site is bounded by: Maple Road to the north; the Audubon Par 3 Golf Course, Ellicott Creek, and North Forest Road to the east; Sheridan Drive to the south; and Frankhauser Road and Fairways Boulevard to the west. In order to ensure a comprehensive analysis of potential traffic impacts, a geographically broad study area was selected consisting of the following 14 existing intersections:

- | | |
|-----------------------------------|--|
| 1. Maple Road/Millersport Hwy SB | 9. N. Forest Road/Existing Country Club Driveway |
| 2. Maple Road/Millersport Hwy NB | 10. Sheridan Drive/Fenwick Road |
| 3. Maple Road/S. Maplemere Road | 11. Sheridan Drive/Frankhauser Road |
| 4. Maple Road/Donna Lea Boulevard | 12. Sheridan Drive/I-290 WB |
| 5. Maple Road/Sandhurst Lane | 13. Sheridan Drive/Harlem Road |
| 6. Maple Road/N. Forest Road | 14. Harlem Road/I-290 EB |
| 7. Sheridan Drive/Mill Street | |
| 8. Sheridan Drive/N. Forest Road | |

III. EXISTING HIGHWAY SYSTEM

A. Existing Transportation Facilities

The following is a description of the roadway network in the vicinity of the project site that was evaluated by our firm in connection with the preparation of this updated TIS. It is important to mention that the Annual Average Daily Traffic (AADT) counts referenced below were obtained based upon the most recent traffic counts collected by the NYDOT and GBNRTC. All AADT data referenced below has been properly adjusted by the background

growth rate to account for current conditions as is the standard methodology for professionally prepared traffic impact studies.

Maple Road (CR 192) is functionally classified as an urban principal arterial roadway under the jurisdiction of Erie County Department of Public Works (ECDPW). Within the study area, motorists travel east and west using two travel lanes in each direction, a center two-way left-turn lane (2WLTL) and auxiliary turn lanes at the intersections with Millersport Highway, South Maplemere Road, and North Forest Road. Within the study area, AADT on Maple Road is approximately 21,913 vehicles per day (vpd) according to the most recent traffic counts collected by the NYSDOT in 2010. The posted speed limit on Maple Road is 45 miles per hour (MPH).

Sheridan Drive (NY 324) is functionally classified as an urban principal arterial roadway under the jurisdiction of the NYSDOT. Within the study area, motorists travel east and west using two travel lanes in each direction, a 2WLTL, and auxiliary turn lanes at the intersections with Harlem Road, I-290, Frankhauser Road, Fenwick Road, North Forest Road, and Mill Street. The AADT on Sheridan Drive is approximately 35,348 vpd according to the most recent traffic counts collected by NYSDOT in 2014. The posted speed limit is 45 MPH.

North Forest Road (CR 294) is functionally classified as an urban minor arterial roadway, under the jurisdiction of the ECDPW. Within the study area, motorists travel north and south using one travel lane in each direction with auxiliary turn lanes at the intersections of Maple Road and Sheridan Drive. The AADT on North Forest Road is approximately 11,817 vpd according to the most recent traffic counts collected by the NYSDOT in 2014 and 13,690 vpd in 2017 by SRF. The posted speed limit is 35 MPH.

Harlem Road (NY 240) is functionally classified as an urban minor arterial roadway under the jurisdiction of the NYSDOT. Within the study area, motorists travel north and south using two travel lanes in each direction and auxiliary turn lanes at the intersections with Sheridan Drive and the I-290. The AADT on Harlem Road is approximately 11,403 vpd, according to the most recent traffic counts collected by NYSDOT in 2014. The posted speed limit is 35 MPH.

Existing AADT information was obtained from the NYSDOT [Traffic Data Viewer](#), NYSDOT [Traffic Data Report](#), and GBNRTC [Highway Database](#). **Figure 2** illustrates the lane geometry at each of the study intersections and the AADT volumes on the study roadways.

B. *Planned/Programmed Highway Improvements*

The NYSDOT and the ECDPW were contacted to determine if there are any planned/future highway improvements on the roadways within the project study area. There were no ECDPW projects identified within the study area. The NYSDOT has indicated there is an in-development plan for a regional arterial management system along Sheridan Drive. The NYSDOT project involves the coordination of the traffic signals along Sheridan Drive. This project is expected to begin in late 2017, however the project will start at Grand Island Boulevard and move eastward. As such, it is anticipated that the section of Sheridan Drive will not be completed for approximately one year.

IV. EXISTING TRAFFIC CONDITIONS

A. Peak Intervals for Analysis

Given the functional characteristics of the mixture of land uses being proposed for the Project Site (residential; senior living; commercial/retail; office; and a hotel), the peak hours selected for analysis are the weekday commuter AM and PM peaks. The combination of site traffic and adjacent through traffic produces the greatest demand during these time periods.

B. Existing Traffic Volume Data

Weekday AM (7:00-9:00 AM) and PM (4:00-6:00 PM) peak hour volumes were collected by SRF & Associates (SRF) at the study area intersections listed in Section II above.

Turning movement count data was collected by SRF at the study intersections on Tuesday, January 31, 2017. All turning movement count data were collected on typical weekdays while local schools and colleges were in session. The traffic volumes were reviewed to confirm the accuracy and relative balance of the collective traffic counts. All traffic volumes were found to balance within the network within reasonable and expected variations and minor adjustments were made where necessary to derive 2017 Existing Conditions. The peak hour traffic periods generally occurred between 7:30-8:30 AM and 4:45-5:45 PM on weekdays at the study intersections.

The 2017 weekday AM and PM peak hour existing traffic volumes are reflected in **Figure 3**.

C. Field Observations

The study intersections were observed during both peak intervals to assess current traffic operations. Signal timing information was collected to determine peak hour phasing plans and phase durations during each interval.

D. Accident Investigation

An accident investigation was completed to assess the safety history at the fourteen existing study intersections. Accident data was compiled from November 2013 through October 2016. The data was obtained from NYSDOT.

A total of 167 accidents were documented at the 14 intersections during the investigation period (3 years). The severity of the 169 documented accidents is as follows:

- 51 – Reportable – Injury
- 79 – Reportable – Non-Injury
- 37 – Non-Reportable/Unknown

Accident rates were computed for the project study intersections and compared with the NYSDOT average accident rates for similar intersections, as summarized in the following table. Intersection rates are listed as accidents per million entering vehicles (Acc/MEV).

TABLE I: INTERSECTION ACCIDENT RATES

Intersection	Number of Accidents	Actual Project Rate Acc/MEV	NYSDOT Average Rate Acc/MEV
1. Maple Road /Millersport Hwy SB Off/on-ramp	0	0.00	0.14
2. Maple Road /Millersport Hwy NB Off/on-ramp	3	0.10	0.14
3. Maple Road/Maplemere Road	5	0.18	0.17
4. Maple Road/Donna Lea Boulevard	2	0.07	0.12
5. Maple Road/Sandhurst Lane	1	0.04	0.14
6. Maple Road/North Forest Road	42	1.01	0.17
7. Sheridan Drive/Mill Street	8	0.21	0.17
8. Sheridan Drive/North Forest Road	51	1.02	0.17
9. North Forest Road/Westwood C.C. Driveway	0	0.00	0.17
10. Sheridan Drive/Fenwick Road	2	0.05	0.14
11. Sheridan Drive/Frankhauser Road	12	0.30	0.14
12. Sheridan Drive/I-290 Off/on-ramp	4	0.09	0.14
13. Sheridan Drive/Harlem Road	37	0.89	0.14
14. Harlem Road/I-290 SB Off/on-ramp	0	0.00	0.14

As shown in **Table I**, six of the fourteen study intersections have accident rates higher than the state wide average accident rates for similar intersections. The intersection of Maple Road/North Forest Road and Sheridan Drive/North Forest both have an accident rate that is substantially higher than the state average. The majority of accidents at both of these intersections are rear end and left turn accidents.

Due to the fact that the intersection accidents have rates that exceed state averages, further investigation was performed to identify higher incident areas and possible trends/causes of the accidents. The results of the investigation are discussed in the following section.

Maple Road/Maplemere Road:

A total of 5 accidents were documented during the investigation period (3 years). Right angle (2), other (2) and rear end (1) accidents accounted for the accidents at this location. The two right angle crashes occurred in the eastbound direction.

Maple Road/North Forest Road:

A total of 42 accidents were documented at this intersection. The calculated accident rate is about 6 times higher than the statewide average for other similar intersections. Rear end (14) and left turn (7) accidents accounted for the majority of the accidents at this location. The remaining accidents were categorized as overtaking (6), other (6), right angle (3), and right turn (2), head on (2), fixed object (1), bicycle/pedestrian (1), Notable accident clusters – locations greater than three (3) identifiable consistent accident patterns – at this location include:

- 10 rear end collisions (eastbound)
- 3 rear end collisions (northbound)
- 3 left turn collisions (westbound)

Sheridan Drive/Mill Street:

A total of 8 accidents were documented at this intersection. Rear end (3) accidents accounted for the majority of the accidents. The remaining accidents were categorized as other (2), right angle (1), and overtaking (1).

Sheridan Drive/North Forest Road:

A total of 51 accidents were documented at this intersection during the 3-year investigation period. The calculated accident rate is over 4 times higher than the statewide average for other similar intersections. Rear end (22) accidents and left turn (11) accidents accounted for the majority of the accidents. The remaining accidents were categorized as and other (7), right angle (4), right turn (3), overtaking (2), fixed object (1), and animal (1). Notable accident clusters at this location include:

- 9 rear end collisions (eastbound)
- 7 rear end collisions (westbound)
- 5 left turn (northbound)
- 4 rear end collisions (southbound)
- 4 left turn collisions (westbound)

Sheridan Drive/Frankhauser Road:

A total of 12 accidents were documented at this intersection during the 3-year investigation period. The calculated accident rate is over just barely higher than the statewide average for other similar intersections. Left turn (5) accidents accounted for the majority of the accidents. The remaining accidents were categorized as rear end (2), other (2), right angle (1), head on (1), and animal (1). Notable accident clusters at this location include:

- 4 left turn collisions (eastbound)

Sheridan Drive/Harlem Road:

A total of 37 accidents were documented at this intersection. The calculated accident rate is over 6 times higher than the statewide average for other similar intersections. Rear end (17) and other (9) accidents accounted for the majority of the accidents. The remaining accidents were categorized as overtaking (4), right angle (2), right turn (2), and fixed object (2), and bike/ped (1). Notable accident clusters at this location include:

- 7 rear end collisions (westbound)
- 5 rear end collisions (eastbound)
- 4 rear end collisions (northbound)

Most accidents were caused by either driver inattention, following too closely, or failure to yield to the right of way. Human error contributing factors were the most prevalent causes of the accidents.

Additional traffic from the proposed mixed-use neighborhood may increase the potential for collisions. Based upon the accident details at each intersection, there are identifiable patterns of rear-end collisions. These types of collisions are more common at traffic

signals on high volume roadways. Recommended mitigation countermeasures may include optimizing the change intervals at the traffic signals (to increase the length of time between phase intervals) and/or signal coordination.

In addition, the following studies were conducted by the NYSDOT: 1) 20% PIL Investigation on North Forest Road between Wiltshire Road and Sheridan Drive dated August 18, 2016; and 2) Safety Study on Sheridan Drive between Harlem Road and North Forest Road dated November 4, 2016. The following summarizes the results of these studies:

1) 20% PIL Investigation on North Forest Road between Wiltshire Road and Sheridan Drive dated August 18, 2016

- A PIL is a Priority Investigation Location.
- This study investigated crashes that occurred on North Forest Road in the roadway segment between Wiltshire Road and Sheridan Drive.
- It also included review of crash data at the three intersections of North Forest Road with Wiltshire Road, Tee Court and Sheridan Drive.
- The study included all crashes that occurred between November 1, 2012 and October 31, 2015 – a duration of three years total.
- 68 crashes occurred within the study limits over the three-year period.
- 65 of the 68 crashes in the study limits occurred at the intersection of North Forest Road and Sheridan Drive.
- There were no crashes at either Wiltshire Road or Tee Court.
- Crash rates are calculated for segments and intersections. The crash rate for the study segment was 25.27 ACC/MVM (ACC/MVM = accidents per million vehicle miles); while the average rate for this type of facility statewide is 4.23 ACC/MVM. Thus the crash rate for this segment is approximately 5 to 6 times greater than the statewide average.
- The intersection crash rate is 1.29 Acc/MEV (accidents per million entering vehicles, i.e. vehicles entering the intersection). The statewide average rate for similar intersections is 0.50 Acc/MEV. Thus the actual crash rate is approximately 2.5 times greater than the statewide average rate for similar intersections.
- The investigation evaluated types of crashes and their causes, with rear end accidents being the most common accident type.
- There were no fatal crashes and the number of injury crashes fell within the expected range for these types of intersections.
- No deficiencies were identified at the North Forest Road/Sheridan Drive intersection.
- NYSDOT is formulating a signal coordination plan for all of the signals along Sheridan Drive.
- No other recommendations were made in this study.

2) Safety Study on Sheridan Drive between Harlem Road and North Forest Road dated November 4, 2016

- The study includes the segment of Sheridan Drive between Harlem Road and a point west of North Forest Road.
- Seven intersections along Sheridan Drive were included in the study: Harlem Rd, I-290 ramps, I-290 on-ramp, Sunrise Blvd, Cranburne Lane, Frankhauser Rd, and Fenwick Dr.
- Three years of crash data were reviewed for the time period from November 1, 2012 through October 31, 2015.
- 105 crashes occurred in the study segment during this time period and were evaluated as part of this study.

- 14 crashes occurred in the segment west of Harlem Rd; mostly overtaking crashes.
- 48 crashes occurred between Harlem Rd and the I-290 ramps. Over 50% were left-turn crashes; 16% were rear-end crashes.
- 44 crashes occurred between the I-290 ramps and the end of the study area east of Fenwick Drive. 55% of these crashes were rear-ends and 25% were related to left turns.
- 82 of the 105 crashes occurred at the intersections: 27 at Harlem Road (12 rear-end, 4 left-turn), 35 at the I-290 ramps (23 left-turn, 9 rear-end), 3 at Sunrise Blvd (2 rear-end, 1 left-turn), 1 at Cranburne Lane (left-turn), 9 at Frankhauser Rd (5 rear-end, 2 left-turn), and 3 at Fenwick Drive (2 left-turn, 1 rear-end).
- There were no fatal crashes and the number of injury crashes fell within the expected range for these types of intersections.
- Crash rates were calculated for the three “zones/segments” of Sheridan Drive. The calculated crash rates were then compared to statewide averages for similar facilities. The segment west of Harlem Rd was above the statewide average, Harlem Rd to the I-290 ramps was significantly above the statewide average and between the I-290 ramps and east of Fenwick Drive was below the statewide average.
- Similarly, crash rates were calculated and compared to statewide averages at the intersections. The intersections of Harlem Rd and the I-290 ramps were above the statewide average rates while the intersections of Sunrise Blvd, Frankhauser Rd, and Fenwick Dr were all below the statewide average.
- The study recommends the following:
 - a. The eastbound left turn signal for Sheridan Drive at the I-290 WB on-ramp be converted to protected only phasing (i.e. a green arrow) during non-peak hours only.
 - b. Replace the I-290 bridge over Sheridan Drive with a clear-span bridge to improve sight distance when the bridge needs to be replaced.
 - c. Synchronize the signals along Sheridan Drive, especially during peak hours.
 - d. Enforce proper use of two-way left-turn lanes on Sheridan Drive.
 - e. Install missing signs in various locations as needed.

V. FUTURE AREA DEVELOPMENT AND LOCAL GROWTH

Construction of the proposed mixed-use neighborhood is anticipated to reach full build-out in approximately 10 years and the build-out will occur over multiple phases. However, for purposes of this study, our firm’s analysis takes into account the full development of the project site. Town of Amherst officials were contacted to discuss projects within the study area that are under construction and/or approved. There is a proposed 12 lot patio home project proposed by Elite Construction on several parcels located to the west of the project site at 4176-4188 Sheridan Drive. To account for normal increases in background traffic growth, including the aforementioned patio home project, which is under final approval at this time, as well as any unforeseen developments in the project study area, a growth rate of 0.25% per year has been applied to the existing traffic volumes, based upon historical traffic growth derived from NYSDOT and GBNRTC traffic volume projections for the area, for the 10-year build-out period. The background traffic volumes are depicted in **Figure 4**.

VI. PROPOSED DEVELOPMENT

A. Description

Until December 31, 2014, the Project Site was occupied by the Westwood Country Club with an 18-hole golf course on approximately 170 acres. The proposed development consists of the following land uses as depicted on the current Conceptual Master Plan prepared by Wendel:

- Parcel I: Small Patio Homes – 57 lots
- Parcel II: Larger Patio Homes – 26 lots
- Parcel III: Single Family Home Subdivision – 41 lots
- Parcel IV: Multifamily Community – 180 units
- Parcel V: Publicly Accessible Park Area – 39.4 Acres
- Parcel VI: Westwood Neighborhood Center
 - Offices/Community Facility – 112,800 SF
 - Offices – 152,000 SF
 - Multifamily Buildings – 89 units
 - Townhomes along Frankhauser Road – 40 units
 - Mixed- Use Buildings – 166,000 SF commercial, 221 units multifamily residential
 - Hotel – 130 rooms
- Parcel VII - Senior Living
 - Assisted Living – 200 beds
 - Independent Living Apartments – 104 units

Access to the proposed Westwood Country Club Development will be provided via a new north/south roadway that will be dedicated to the Town to become a new public roadway connecting Maple Road and Sheridan Drive. The northerly access point will form a new “T” intersection at Maple Road. The southerly access will intersect Sheridan Drive on the north side directly opposite the existing Fenwick Road intersection. In addition, an enter only connection will be provided from Frankhauser Road into the site as well a new full access connection at North Forest Road controlled by a roundabout. **Figure 5** illustrates the Preliminary Conceptual Master Plan.

The new north-south roadway in combination with the new connection to North Forest Road will provide benefits to the overall area by allowing traffic that is currently using North Forest Road to divert to the new north-south roadway. The new roadway connections will provide a much more direct route between Sheridan Drive and Maple Road as compared to the curvy circuitous route provided by North Forest Road. This will in turn improve operating conditions at both North Forest Road intersections with Sheridan Drive and Maple Road. In addition, the proposed roundabout at North Forest Road and the east-west site roadway will provide direct access to the site from North Forest Road eliminating the need to use Sheridan Drive and will eliminate the existing sharp curve on North Forest Road. The roundabout will provide a traffic calming measure on North Forest Road resulting in reduced speeds and improved safety. The one-way enter only connection from Frankhauser Road will also provide direct access to site from the neighborhood to the west eliminating the need to use Sheridan

Drive. Neighborhood residents would also ultimately be able to travel directly from the neighborhood to North Forest Road.

The Project Site has frontage on both Maple Road and Sheridan Drive. Both roadways currently have pedestrian sidewalks on each side of the road. In addition, Route #49 of the Niagara Frontier Transportation Authority (NFTA) metro-bus system operates along Sheridan Drive.

The proposed mixed-use neighborhood should take advantage of the existing pedestrian infrastructure system in place along Maple Road and Sheridan Drive. Internally, sidewalks should form an inter-connected network allowing users to actively walk amongst the various land uses. Additionally, internal circulation routes designed to encourage bicycle use are an amenity that can promote a more active lifestyle. The southern portion of the mixed-use redevelopment project as depicted on the Conceptual Master Plan consists of the commercial and office components, higher density residential units, and the hotel component should incorporate bicycle parking and related facilities into the design. Such facilities should include bicycle racks and consideration should be given to including bicycle lockers as well as providing shower and changing facilities within the proposed office buildings. Bicycle signage along the main north/south internal roadway can be used to increase driver's awareness of bicyclists as well as encourage bicycle ridership. Implementing, to the extent practicable, pedestrian and bicycle design features into the proposed mixed-use neighborhood can encourage a healthy, active lifestyle encouraging reduced vehicle trips generated by the proposed mixed-use neighborhood.

B. Site Traffic Generation

The next step in the evaluation is to determine the volume of traffic attributable to the mixed-use neighborhood as defined by vehicle trips entering and exiting the project site. Trip generation is an estimate of the number of trips generated by a specific building or land use. These trips represent the volume of traffic entering and exiting the development. The Trip Generation, 9th Edition is used as a reference for this information and is the accepted standard for determining the projected traffic volumes for a project. The trip rate for the peak hour of the generator may or may not coincide in time or volume with the trip rate for the peak hour of adjacent street traffic. Volumes generated during the peak hour of adjacent street traffic, in this case the weekday AM and PM commuter peaks, represent a more critical volume when analyzing the capacity of the system, and as such, those intervals will provide the basis of this analysis.

The volume of traffic generated by a site is dependent on the intended land use and size of the development. The volume of site-generated traffic has been estimated based on ITE rates, as shown in **Table II**. All trip generation calculations are included in the Appendix. The proposed mixed use neighborhood also includes a small potential future Fire Substation (3,600+/- square feet) to supplement the existing Snyder Fire Department Station on Main Street. The Project Sponsor will be providing the Snyder Fire Department with land for the potential future small substation but the anticipated timeframe for the possible construction of the small future substitution is not known at this time. The substation will not typically generate any trips during the AM or PM weekday peak hours, so trips from the potential future Fire Substation are not listed below.

TABLE II: SITE GENERATED TRIPS

DESCRIPTION	SIZE/ UNITS	AM PEAK		PM PEAK	
		ENTER	EXIT	ENTER	EXIT
Senior Housing	104 Units	7	14	14	12
Assisted Living	200 Beds	18	10	19	25
Smaller Patio Homes	57 Units	6	13	12	12
Multifamily Community Apartments	180 Units	18	74	76	41
Large Patio Homes (26) and Single Family Detached Housing (41)	67 Units	14	43	46	27
Multi-family Building Apartments	89 Units	9	38	44	23
Condominium Townhomes along Frankhauser Road	40 Units	4	21	19	9
Hotel	130 Rooms	41	28	40	38
Apartments in Commercial/Retail Buildings	221 Units	22	90	90	49
Commercial/Retail – Shopping Ctr	166,000 SF	131	81	404	437
Professional Office	264,800 SF	367	50	64	311
City Park	33 Acres of Land (6 Acres pond)	83	66	66	50
Total Projected Driveway Trips		720	528	894	1034

C. Determination of Multi-use and Pass-by Trips

Inherent in the trip generation estimate for the proposed development, is the “multi-use” traffic component of traffic entering and exiting the site. According to the Institute of Transportation Engineers, Trip Generation Handbook, 2001, “...a multi-use development is typically a single real-estate project that consists of two or more ITE land use classifications between which trips can be made without using the off-site road system. Because of the nature of these land uses, the trip-making characteristics are interrelated, and some trips are made among the on-site uses. This capture of trips internal to the site has the net effect of reducing vehicle trip generation between the overall development site and the external street system (compared to the total number of trips generated by comparable, standalone sites).” “In some multi-use developments, these internal trips can be made by walking or by vehicles entirely on internal pathways or internal roadways without using streets external to the site.”

The ITE Trip Generation Handbook indicates internal capture rates for trips within a multi-use development to vary between office, residential, and retail uses during the AM and PM peak hours. Given the area in which the project site is located, the proposed office, residential, and retail components, and interconnection between internal adjacent components, multi-use (or multiple purpose) total volume trips will occur. Therefore it is estimated, based on methods in the ITE Trip Generation Handbook that an approximate 16%-19% and 23% reduction in total trip generation for the site will occur during the AM and PM peak hours of analysis, respectively. This trip adjustment is calculated based upon ITE standards for multi-use trip reductions based on the varying uses and interconnections within the mixed-use neighborhood. This multi-use trip projection adjustment was applied to the total site generated trips and subtracted from the traffic entering and exiting the site for the AM and PM peak period. NYSDOT comments based on its review of our firm’s previous Traffic Impact Study dated February 2015 recommended the use of the 23% reduction for the PM peak hour volumes. The projections made by the ITE standards were proportionally reduced at the request of NYSDOT.

In addition, for certain types of developments, the total number of trips generated is different from the amount of new traffic added to the adjacent highway network by the generator. Retail-oriented developments (such as convenience stores, gas stations, shopping centers, discount stores, restaurants, service stations, and supermarkets) often locate adjacent to busy streets in order to attract the motorists already passing the site on the adjacent street. These sites attract a portion of their trips from traffic passing the site. The “pass-by” traffic refers to the amount of existing traffic already on the roadway adjacent to the site that, as it “passes by” the site, will enter the site driveways to patronize the project site.

The combination of “internal” and “pass-by” trips has the net result of reducing the volume of new traffic that is added to the site driveways and/or adjacent roadways. In the case of the proposed mixed-use neighborhood, there will be both “internal” and “pass-by” trips associated with the new land uses on the site.

ITE data indicates that pass-by rates for shopping centers/retail uses can vary from 10% to as high as 80% during the PM peak hour, e.g. restaurants typically exhibit pass-by rates of 45% during the PM peak hour. Given the composition of the proposed land uses and location of the project site with frontage along both Sheridan Drive and Maple Road, a conservative pass-by rate of 22%-25% was used during the PM peak hour. **Table III** shows the total site generated trips, internal trips, pass-by trips, driveway trips, and resulting primary trips that are added to the existing highway system for full development of the project.

TABLE III: SITE TRAFFIC VOLUMES & ADJUSTMENTS

PARCEL	DESCRIPTION	SIZE	AM PEAK		PM PEAK	
			ENTER	EXIT	ENTER	EXIT
VII	Senior Housing	104 Units	7	14	14	12
VII	Assisted Living	200 Beds	18	10	19	25
I	Smaller Patio Homes	57 Units	6	13	12	12
IV	Multifamily Community Apartments	180 Units	18	74	76	41
II & III	Large Patio Homes (26) and Single Family Detached Housing (41)	67 Units	14	43	46	27
VI	Multi-family Building Apartments	89 Units	9	38	44	23
VI	Condominium Townhomes along Frankhauser Road	40 Units	4	21	19	9
VI	Hotel	130 Rooms	41	28	40	38
VI	Apartments	221 Units	22	90	90	49
VI	Commercial/Retail	166,000 SF	131	81	404	437
VI	Professional Office	264,800 SF	367	50	64	311
V	City Park	33 Acres of Land (6 Acres pond)	83	66	66	50
	Sub-total		720	528	894	1034
	<i>Internal Trips</i>		<i>-113</i>	<i>-101</i>	<i>-206</i>	<i>-238</i>
	<i>Pass-by Trips</i>		<i>0</i>	<i>0</i>	<i>-102</i>	<i>-98</i>
	Total New Trips		607	427	586	698

D. Site Traffic Distribution

The cumulative effect of site traffic on the transportation network is dependent on the origins and destinations of that traffic and the location of the access drives serving the site.

The proposed arrival/departure distribution of traffic to be generated at this site is considered a function of several parameters, including the following:

- Employment centers;
- Existing highway network;
- Proximity and access to I-290;
- Population centers;
- Location of land uses on proposed site plan; and
- Existing traffic patterns, traffic conditions, and controls

Figures 6A (hotel), 6B-1 (residential senior living), 6B-2 (residential patio homes, single family and multi-family), 6B-3 (residential apartments and townhomes), and 6C (commercial/office and Town park) show the anticipated trip distribution pattern percentages for full build-out of the proposed mixed-use neighborhood. **Figures 7A, 7B-1 through 7B-3, and 7C** show the resulting total site generated traffic as assigned to the study area intersections for the weekday AM and PM peak hour periods under full build-out conditions. **Figure 7D** shows the total site generated trips for all uses combined and **Figure 7E** shows the existing trip diversions that are anticipated as a result of the new roadway connections and travel patterns.

VII. FULL DEVELOPMENT VOLUMES

The projected design hour traffic volumes were developed for the weekday AM and PM peak hours by combining the future background traffic conditions (Figure 4), and projected site generated volumes for full build-out of the proposed mixed-use neighborhood (Figures 7A-7D) in order to yield the total traffic conditions expected at full development. **Figure 8** illustrates the total weekday AM and PM peak hour volumes anticipated for the proposed development under full build-out conditions.

VIII. CAPACITY ANALYSIS

Capacity analysis is a technique used for determining a measure of effectiveness for a section of roadway and/or intersection based on the number of vehicles during a specific time period. The measure of effectiveness used for the capacity analysis is referred to as a Level of Service (LOS). Levels of Service are calculated to provide an indication of the amount of delay that a motorist experiences while traveling along a roadway or through an intersection. Since the most amount of delay to motorists usually occurs at intersections, capacity analysis focuses on intersections, as opposed to highway segments.

Six Levels of Service are defined for analysis purposes. They are assigned letter designations, from "A" to "F", with LOS "A" representing the best conditions and LOS "F" the worst. Suggested ranges of service capacity and an explanation of Levels of Service are included in the Appendix.

The standard procedure for capacity analysis of signalized and un-signalized intersections is outlined in the Highway Capacity Manual (HCM 2010) published by the Transportation Research Board. Traffic analysis software, Synchro 7, which is based on procedures and methodologies contained in the HCM, was used to analyze operating conditions at study area intersections. The procedure yields a Level of Service based on the HCM 2010 as an indicator of how well intersections operate.

Existing and background operating conditions during the peak study periods are evaluated to determine a basis for comparison with the projected future conditions. The projected future traffic volumes generated by the proposed development were analyzed to assess the operations of the intersections in the study area. Signal timings were optimized under the background conditions and it was assumed that changes anticipated to be implemented by NYSDOT as a result of the Safety Study will be in place under the background conditions. Full development conditions were then analyzed using the phasing, timing and coordination plans determined for background conditions. Mitigation includes optimizing signal timings and intersection offsets among other improvements as noted. Capacity results for existing, background, and full development conditions are listed in **Table IV**. The discussion following the table summarizes capacity conditions. All capacity analysis calculations are included in the Appendices.

The proposed mixed-use development includes a one-way in-only roadway connection from Frankhauser Road into the Project Site as depicted on the updated Conceptual Master Plan. Because this proposed intersection is one-way in-only, it is not included in Table IV below since it will not result in any delays during the weekday peak travel periods. It is noted that no analysis was performed to evaluate retaining the signal at Frankhauser Road and not signaling the proposed roadway intersection at Sheridan Drive as this is not a viable alternative for the proposed development. In addition, the full build out scenario was not modeled with stop sign control at the proposed site roadway intersection with Sheridan Drive as previous studies for this site have already indicated the need for signalization at this intersection and the signal warrant analyses (see below) indicate that a signal is warranted at, or before, full build out of the site.

TABLE IV: CAPACITY ANALYSIS RESULTS

INTERSECTION	EXISTING		BACKGROUND		FULL DEVELOPMENT		FULL DEVELOPMENT W/ MITIGATION	
	AM	PM	AM	PM	AM	PM	AM	PM
Maple Road/Millersport Hwy SB (S)								
Eastbound Left – Maple Road	A(2.4)	A(4.1)	A(2.7)	A(4.1)	A(2.7)	A(4.4)	A(2.7)	A(4.9)
Eastbound Thru – Maple Road	A(2.9)	A(4.4)	A(3.0)	A(4.5)	A(3.1)	A(4.9)	A(3.1)	A(5.4)
Westbound Thru – Maple Road	A(5.5)	A(9.8)	A(5.9)	B(10.3)	A(6.2)	B(10.3)	A(1.5)	A(1.7)
Westbound Right – Maple Road	A(0.2)	A(0.2)	A(0.2)	A(0.2)	A(0.2)	A(0.2)	A(0.2)	A(0.2)
Southbound Left – Millersport Hwy SB	C(29.2)	C(28.6)	C(28.6)	C(28.8)	C(29.3)	C(28.2)	C(29.3)	C(26.7)
Southbound Right – Millersport Hwy SB	B(12.2)	B(19.2)	B(11.8)	B(18.8)	B(12.0)	C(21.5)	B(12.0)	C(24.5)
Overall LOS/Delay (sec/veh)	A(4.2)	A(8.1)	A(4.4)	A(8.1)	A(4.7)	A(8.5)	A(2.6)	A(5.4)
Maple Road/Maplemere Road (S)								
Eastbound Left – Maple Road	B(16.9)	D(37.6)	B(18.3)	D(51.3)	C(21.2)	E(57.0)	B(13.1)	C(24.8)
Eastbound Thru – Maple Road	B(10.6)	B(17.9)	B(10.9)	B(16.9)	B(11.6)	B(15.0)	A(7.6)	A(9.0)
Westbound Thru/Right – Maple Road	B(12.8)	B(18.7)	B(13.4)	B(18.6)	B(14.4)	B(18.2)	B(11.9)	B(14.5)
Northbound Left – Millersport Hwy NB	B(18.7)	B(13.4)	B(18.5)	B(15.1)	B(18.2)	B(15.9)	C(26.9)	C(28.1)
Northbound Thru/Right – Millersport Hwy NB	C(28.7)	C(31.0)	C(30.5)	D(51.9)	C(33.8)	E(74.2)	B(18.6)	C(27.6)
Overall LOS/Delay (sec/veh)	B(16.2)	C(21.7)	B(16.9)	C(27.2)	B(18.0)	C(31.5)	B(13.8)	B(16.8)

INTERSECTION	EXISTING		BACKGROUND		FULL DEVELOPMENT		FULL DEVELOPMENT WI MITIGATION	
	AM	PM	AM	PM	AM	PM	AM	PM
Eastbound Left – Maple Road	A(5.0)	A(7.1)	A(5.0)	A(5.7)	A(4.9)	A(5.9)	N/A	
Eastbound Thru/Right – Maple Road	A(5.7)	A(10.0)	A(5.7)	A(7.2)	A(5.8)	A(7.4)		
Westbound Left – Maple Road	A(4.9)	B(10.3)	A(4.9)	A(7.6)	A(4.9)	A(8.2)		
Westbound Thru/Right – Maple Road	A(5.8)	A(7.7)	A(5.8)	A(5.9)	A(5.9)	A(6.0)		
Northbound – Maplemere Road	B(14.3)	B(13.3)	B(14.6)	B(14.3)	B(15.5)	B(14.7)		
Southbound – Maplemere Road	B(15.1)	C(24.2)	B(15.6)	C(22.3)	B(16.6)	C(22.2)		
Overall LOS/Delay (sec/veh)	A(6.2)	B(10.1)	A(6.3)	A(7.5)	A(6.4)	A(7.6)		
Maple Road/Donna Lea Boulevard (U)								
Westbound Left – Maple Road	B(11.1)	B(13.4)	B(11.3)	C(18.8)	B(11.7)	C(20.3)	N/A	
Northbound – Donna Lea Boulevard	C(23.8)	C(21.4)	C(24.8)	E(35.0)	D(27.3)	E(39.5)		
Maple Road/Sandhurst Lane (U)								
Eastbound Left – Maple Road	N/A	B(10.5)	N/A	B(10.7)	N/A	B(11.0)	N/A	
Westbound Left – Maple Road	B(10.9)	B(12.5)	B(11.0)	B(13.1)	B(11.3)	B(13.3)		
Northbound – Sandhurst Lane	F(60.2)	F(103.0)	F(65.6)	F(147.7)	F(81.6)	F(158.4)		
Southbound Audubon Golf Course	F(88.9)	N/A	F(95.2)	N/A	F(114.4)	N/A		
Maple Road/North Forest Road (S)								
Eastbound Left – Maple Road	B(17.1)	C(26.5)	B(17.5)	C(29.3)	B(19.2)	D(40.4)	B(19.2)	D(39.3)
Eastbound Thru – Maple Road	D(41.1)	D(41.4)	D(42.5)	D(43.6)	D(43.7)	D(47.4)	D(47.9)	D(51.2)
Eastbound Right – Maple Road	A(1.6)	A(4.1)	A(1.8)	A(4.9)	A(0.7)	A(5.4)	A(0.7)	A(3.4)
Westbound Left – Maple Road	D(48.7)	D(35.6)	D(52.1)	D(38.5)	F(81.0)	D(53.7)	E(58.6)	D(51.2)
Westbound Thru – Maple Road	C(26.6)	C(34.5)	C(26.9)	C(34.2)	C(26.8)	D(35.7)	C(26.1)	D(39.2)
Westbound Right – Maple Road	B(13.2)	B(16.5)	B(13.4)	B(16.4)	B(13.1)	B(16.8)	B(12.8)	B(16.7)
Northbound Left – North Forest Road	D(41.7)	D(35.3)	D(45.3)	D(39.1)	C(34.3)	C(31.8)	D(36.3)	C(33.8)
Northbound Thru – North Forest Road	D(45.9)	E(56.7)	D(46.5)	E(56.7)	D(47.8)	E(62.0)	D(49.4)	E(73.9)
Northbound Right – North Forest Road	A(9.7)	B(15.4)	A(9.9)	B(15.4)	B(12.2)	B(19.6)	B(11.5)	B(16.0)
Southbound Left – North Forest Road	C(30.4)	D(47.3)	C(31.4)	D(47.3)	C(31.4)	E(66.1)	C(34.3)	D(52.8)
Southbound Thru - North Forest Road	D(51.8)	D(45.5)	D(53.4)	D(45.5)	C(32.4)	D(48.7)	E(56.5)	D(45.7)
Southbound Right – North Forest Road	A(6.1)	A(7.5)	A(6.4)	A(7.5)	B(10.5)	B(11.8)	B(10.8)	B(10.5)
Overall LOS/Delay (sec/veh)	C(34.2)	D(36.0)	D(35.4)	D(36.0)	D(38.1)	D(41.1)	D(37.4)	D(42.4)
Sheridan Drive/Mill Street (S)								
Eastbound Left – Sheridan Drive	C(25.0)	D(47.9)	C(21.7)	D(35.2)	C(23.0)	D(42.7)	C(21.3)	D(40.9)
Eastbound Thru/Right – Sheridan Drive	D(51.4)	F(106.9)	D(47.7)	E(62.5)	E(60.7)	F(93.4)	D(51.5)	F(73.5)
Westbound Left – Sheridan Drive	D(38.4)	D(48.1)	D(37.3)	D(40.2)	D(37.8)	D(40.3)	D(51.9)	D(50.5)
Westbound Thru/Right – Sheridan Drive	B(16.2)	D(53.0)	B(14.3)	C(29.8)	B(15.4)	C(33.8)	B(15.9)	C(31.9)
Northbound Left – Mill Street	C(30.9)	C(22.6)	C(34.3)	C(31.8)	D(36.0)	C(32.7)	C(34.9)	C(33.9)
Northbound Thru/Right – Mill Street	C(29.5)	C(22.7)	C(30.1)	C(30.5)	C(29.9)	C(30.6)	C(30.0)	C(31.6)
Southbound Left – Mill Street	D(47.6)	C(35.0)	D(44.1)	D(35.6)	D(43.6)	D(35.7)	D(44.6)	D(36.5)
Southbound Thru/Right – Mill Street	E(56.2)	C(33.3)	D(52.1)	C(33.9)	D(52.2)	C(33.4)	D(53.4)	C(34.1)
Overall LOS/Delay (sec/veh)	D(37.7)	E(68.2)	D(35.2)	D(43.0)	D(40.9)	E(57.2)	D(37.9)	D(49.1)
Sheridan Drive/North Forest Road (S)								
Eastbound Left – Sheridan Drive	B(18.2)	D(51.9)	C(23.3)	D(52.0)	C(26.5)	D(46.0)	B(18.2)	D(41.3)
Eastbound Thru – Sheridan Drive	D(38.5)	C(33.8)	C(24.6)	C(24.8)	D(45.1)	C(27.4)	D(37.4)	C(24.6)
Eastbound Right – Sheridan Drive	B(12.1)	A(8.9)	A(2.4)	A(4.2)	B(15.4)	A(5.7)	B(13.9)	A(5.7)
Westbound Left – Sheridan Drive	D(52.3)	C(25.5)	D(53.6)	D(45.5)	D(53.8)	D(50.4)	D(54.2)	D(47.5)
Westbound Thru/Right – Sheridan Drive	C(28.9)	E(74.6)	C(26.3)	E(78.7)	C(28.5)	F(105.9)	N/A	
Westbound Thru – Sheridan Drive	N/A		N/A		N/A		C(28.0)	E(72.9)
Westbound Right – Sheridan Drive	N/A		N/A		N/A		A(2.4)	A(0.9)
Northbound Left – North Forest Road	D(35.4)	D(41.3)	C(34.7)	D(42.2)	D(36.0)	D(45.5)	D(35.5)	D(52.0)
Northbound Thru – North Forest Road	D(47.9)	E(55.7)	D(48.1)	D(54.5)	D(54.9)	E(61.9)	N/A	
Northbound Thru/Right – North Forest Road	N/A		N/A		N/A		D(35.7)	D(44.5)
Northbound Right – North Forest Road	A(7.6)	A(6.8)	A(5.5)	A(6.2)	A(6.1)	A(9.7)	N/A	
Southbound Left – North Forest Road	C(30.4)	C(30.0)	C(28.8)	C(29.4)	C(32.2)	E(57.5)	C(32.6)	D(41.4)
Southbound Thru - North Forest Road	D(53.6)	D(54.3)	D(54.0)	D(52.4)	D(54.9)	D(52.1)	D(55.9)	D(54.6)
Southbound Right – North Forest Road	A(9.3)	A(9.8)	B(14.8)	A(9.7)	A(9.2)	A(6.4)	A(9.3)	A(6.6)

INTERSECTION	EXISTING		BACKGROUND		FULL DEVELOPMENT		FULL DEVELOPMENT WI MITIGATION	
	AM	PM	AM	PM	AM	PM	AM	PM
Overall LOS/Delay (sec/veh)	C(33.6)	D(47.6)	C(28.7)	D(47.5)	D(37.3)	E(58.9)	C(33.5)	D(45.9)
North Forest Road/Country Club Driveway (U)								
Eastbound Left – Country Club Driveway	B(14.7)	C(17.9)	B(14.7)	C(17.2)	REMOVED UNDER FULL DEVELOPMENT			
Northbound – North Forest Road	A(9.5)	A(9.2)	A(9.5)	A(9.1)				
Sheridan Drive/Fenwick Road/Proposed Driveway (U)					Signalized			
Eastbound Left – Sheridan Drive	N/A		N/A		C(23.3)	E(73.9)	C(22.4)	E(74.2)
Eastbound Thru/Right – Sheridan Drive	N/A		N/A		B(16.8)	A(5.7)	B(11.4)	A(7.2)
Westbound Left – Sheridan Drive	C(15.7)	B(13.9)	C(16.2)	C(16.1)	B(11.4)	A(8.3)	B(11.4)	A(9.9)
Westbound Thru – Sheridan Drive	N/A		N/A		B(15.4)	D(39.0)	A(9.5)	D(43.4)
Westbound Right – Sheridan Drive	N/A		N/A		A(3.1)	A(0.5)	A(1.2)	A(0.6)
Northbound – Fenwick Road	F(63.0)	E(36.8)	F(71.2)	E(46.1)	E(59.3)	E(59.6)	E(59.3)	E(59.6)
Southbound Left/Thru – Proposed Driveway	N/A		N/A		E(68.5)	E(58.2)	E(68.5)	E(58.2)
Southbound Right – Proposed Driveway	N/A		N/A		C(27.2)	C(30.8)	C(25.9)	C(30.8)
Overall LOS/Delay (sec/veh)	N/A		N/A		C(21.1)	C(29.1)	B(16.7)	C(31.4)
Sheridan Drive/Frankhauser Road (S)					Unsignalized		Unsignalized	
Eastbound Left – Sheridan Drive	A(1.3)	A(4.0)	A(1.3)	A(7.0)	B(10.9)	C(17.9)	B(10.9)	C(17.9)
Eastbound Thru – Sheridan Drive	A(7.7)	A(2.4)	A(6.1)	A(2.9)	N/A		N/A	
Westbound Thru/Right – Sheridan Drive	A(3.6)	A(4.3)	A(5.2)	A(4.9)	N/A		N/A	
Southbound Left – Frankhauser Road	E(62.0)	E(61.1)	E(62.1)	E(61.2)	D(30.2)	E(42.1)	D(30.2)	E(48.9)
Southbound Right – Frankhauser Road	B(17.8)	C(34.9)	B(17.7)	D(42.0)	B(14.7)	D(27.1)	B(14.7)	D(27.1)
Overall LOS/Delay (sec/veh)	A(7.1)	A(4.7)	A(7.0)	A(5.3)	N/A		N/A	
Sheridan Drive/I-290 WB (S)								
Eastbound Left – Sheridan Drive	D(47.7)	F(116.4)	E(66.8)	E(75.8)	E(73.7)	E(78.3)	E(76.5)	E(75.5)
Eastbound Thru – Sheridan Drive	A(8.1)	A(7.1)	A(8.2)	A(8.4)	A(9.0)	A(9.5)	A(7.5)	A(7.9)
Westbound Thru/Right – Sheridan Drive	B(11.2)	B(12.1)	B(16.3)	B(10.2)	B(19.2)	B(15.7)	B(14.2)	B(15.7)
Northbound Left – I-290 WB	E(64.5)	E(69.8)	E(64.5)	E(70.8)	E(63.3)	E(75.0)	E(63.3)	E(75.0)
Northbound Left/Thru/Right – I-290 WB	D(39.0)	D(40.1)	D(38.9)	D(42.5)	D(40.9)	D(54.0)	D(36.2)	D(54.0)
Northbound Right – I-290 WB	D(36.9)	D(38.4)	D(36.4)	D(40.8)	D(38.8)	D(50.3)	C(34.1)	D(50.3)
Overall LOS/Delay (sec/veh)	B(16.5)	C(23.0)	B(19.6)	C(20.3)	C(21.3)	C(24.2)	B(18.5)	C(23.6)
Sheridan Drive/Harlem Road (S)								
Eastbound Thru – Sheridan Drive	C(22.0)	B(17.8)	C(27.7)	C(20.9)	C(31.8)	C(23.7)	C(29.8)	C(22.5)
Eastbound Right – Sheridan Drive	B(19.7)	A(8.6)	C(24.9)	B(10.0)	C(26.3)	B(11.2)	C(25.0)	A(8.9)
Westbound Left – Sheridan Drive	E(55.8)	D(42.5)	D(46.6)	C(31.6)	D(47.8)	C(30.6)	C(26.6)	C(34.3)
Westbound Thru – Sheridan Drive	A(4.8)	A(3.6)	A(2.8)	A(6.5)	A(2.0)	A(8.0)	A(0.6)	A(2.5)
Northbound Left – Harlem Road	D(48.7)	E(60.1)	D(53.9)	E(59.7)	D(53.9)	E(59.7)	D(54.0)	D(52.1)
Northbound Right – Harlem Road	C(32.1)	C(27.5)	C(28.8)	C(27.4)	C(31.1)	C(30.3)	C(34.0)	C(33.4)
Overall LOS/Delay (sec/veh)	C(26.2)	B(19.8)	C(26.0)	C(21.0)	C(27.7)	C(22.8)	C(24.8)	C(21.4)
Harlem Road/I-290 EB (S)								
Westbound Left – I-290 EB	C(33.9)	C(28.1)	C(34.6)	D(39.1)	D(41.3)	D(44.3)	N/A	
Westbound Left/Right – I-290 EB	N/A		N/A		N/A		D(51.7)	D(44.3)
Westbound Right – I-290 EB	B(15.9)	A(8.6)	B(17.5)	B(18.8)	C(22.5)	C(24.4)	B(11.5)	B(11.3)
Northbound Thru/Right – Harlem Road	C(28.7)	C(22.0)	C(29.8)	C(29.4)	C(33.7)	C(33.0)	D(36.6)	C(33.0)
Southbound Left – Harlem Road	B(13.2)	B(12.3)	B(14.1)	C(23.8)	B(16.2)	C(32.4)	C(31.1)	C(32.4)
Southbound Thru – Harlem Road	A(9.2)	A(6.1)	A(9.4)	A(7.8)	A(9.1)	A(7.7)	B(13.2)	A(7.7)
Overall LOS/Delay (sec/veh)	C(20.1)	B(14.4)	C(21.0)	C(22.8)	C(24.6)	C(27.0)	C(29.7)	C(23.6)
North Forest Drive/Proposed Driveway (RA)								
Eastbound – Proposed Driveway	N/A		N/A		A(9.4)	A(9.4)	N/A	
Northbound – North Forest Drive	N/A		N/A		A(3.5)	A(4.4)	N/A	
Southbound – North Forest Drive	N/A		N/A		A(3.6)	A(3.2)	N/A	

INTERSECTION	EXISTING		BACKGROUND		FULL DEVELOPMENT		FULL DEVELOPMENT W/ MITIGATION	
	AM	PM	AM	PM	AM	PM	AM	PM
Overall LOS/Delay (sec/veh)					A(4.1)	A(4.7)		
Maple Road/Proposed Driveway (S)								
Eastbound Right – Maple Road					A(5.4)	A(6.3)		
Westbound Left – Maple Road					A(4.5)	A(7.7)		
Westbound Thru – Maple Road					A(5.2)	A(4.9)		
Northbound Left – Proposed Driveway					B(19.7)	C(24.1)		
Northbound Right – Proposed Driveway					A(7.9)	A(9.8)		
Overall LOS/Delay (sec/veh)					A(5.8)	A(6.4)		

NOTES:

1. A(2.8) = Level of Service (Delay in seconds per vehicle)
2. (S) = Signalized; (U) = Unsignalized
3. N/A = Approach does not exist and/or was not analyzed during this condition

Maple Road / Millersport Hwy SB

All approaches operate at level of service “C” or better during the AM and PM peak hours between existing, background, and full development conditions. No changes in level of service are expected as a result of the proposed development with the exception of the southbound right turn movement that changes from LOS “B” to “C” during the PM peak hour between background and full development. Mitigation includes optimization of signal offsets resulting from mitigation at the northbound ramp noted below.

Maple Road / Millersport Hwy NB

All approaches operate at LOS “D” or better during the AM and PM peak hours between existing and background conditions. The level of service during the PM peak hour for eastbound left turn and northbound through/right turn movements are expected to decrease from “D” to “E” between background and full development conditions. It is recommended that the northbound ramp be restriped to provide a right turn only lane and left/thru/right turn lane. This will both allow for dual right turn movements onto Maple Road eastbound as well as decrease queuing on the off-ramp. The two ramp signals are coordinated and will require optimization of offsets as included in this analysis.

Maple Road / Maplemere Road

All approaches are expected to operate at LOS “C” or better between existing, background, and full development conditions. The overall level of service is projected to be “A” during all conditions under both peak hours. Therefore, no mitigation is warranted or recommended.

Maple Road / Donna Lea Boulevard

All approaches are expected to operate at level of service “E” or better between existing, background, and full development conditions. There are no changes in LOS between background and full development conditions. No mitigation is warranted or recommended at this intersection

Maple Road / Sandhurst Lane

The northbound and southbound approaches operate at LOS “F” with delays on the order of one to two and a half minutes during both peak hours under all conditions. These delays are characteristic of unsignalized side roads intersecting high volume arterials such as Maple Road. The traffic volumes exiting Sandhurst Lane are very low during the peak hours (25 and 13 vehicles during the AM and PM peak hours respectively). No mitigation is warranted or recommended.

Maple Road / North Forest Road

All approaches are expected to operate at LOS “E” or better during both peak hours under existing and background conditions. Decreases in LOS are anticipated on the eastbound left turn, westbound left turn, westbound through, northbound left turn, northbound through, and southbound left turn movements between background and full development conditions. This is a result of both existing traffic diverted to the new north-south development roadway as well as new traffic generated by the development. Optimizing signal timings will improve all levels of service to “E” or better and the overall intersection will continue to operate at LOS “D” during both peak hours. No additional mitigation is recommended.

Sheridan Drive / Mill Street

All approaches operate at level of service “E” or better during the AM and PM peak hours under existing and background conditions. Between background and full development conditions, the overall level of service during the PM peak hour is expected to decrease from “D” to “E”. In addition, during the AM peak hour, the LOS for the northbound left turn movement and the eastbound thru/right turn movement each decrease one letter grade to “D” and “E” respectively. The eastbound thru/right turn movement also decreases from LOS “E” to “F” during the PM peak hour. Signal timing optimization improves the LOS during the AM peak hour such that operating conditions similar to background conditions are achieved. During the PM peak hour, delays are improved although the eastbound through/right turn movement remains at LOS “F”.

Sheridan Drive / North Forest Road

The eastbound through and northbound left turn movement LOS is projected to change from “C” to “D” during the AM peak hour between background and full development conditions. During the PM peak hour the westbound through/right turn movement is projected to decrease from LOS “E” to “F” and the northbound and southbound left turn movements are projected to change from LOS “D” to “E”. Observations of existing conditions noted southbound queues extending beyond the existing Westwood Country Club driveway on North Forest Road. Additionally, during the PM peak hour, westbound queues extend beyond Fleetwood Terrace. It is important to note that the proposed new roadway connections through the mixed use neighborhood will relieve traffic volumes along North Forest Road and at the intersections with Maple Road and Sheridan Drive by providing motorists with an alternate connection between Maple Road and Sheridan Drive. Estimated traffic diversions are included in the full development conditions. Mitigation for the changes in levels of service includes installing a westbound right turn lane, providing an additional northbound through lane by combining the northbound through and right turn movements in the curb lane, and optimizing the signal timings and coordination offsets. The southbound right-turn lane should be extended to the north to create additional capacity for southbound right-turning traffic and to reduce southbound queuing.

Southbound queuing at the intersection was also evaluated to insure that queues will not impact operating conditions at the new upstream roundabout intersection. Based upon the analyses, 95th percentile queues on the order of 275’ to 335’ during the AM peak hour and 240’ to 288’ during the PM peak hour are anticipated. Average queue lengths will be shorter during the peak hours and considerably shorter during other times of the day.

North Forest Road / Country Club Driveway

The eastbound exiting approach from Westwood Country Club currently operates at LOS “C” and “E” during the AM peak hours between existing and background conditions. This driveway is expected to be removed upon full development of the site. A new intersection will be created in approximately the location of the Country Club Driveway and is discussed below.

Sheridan Drive / Fenwick Road / Proposed Driveway

Between existing and background conditions, the westbound left turn movement operates at level of service “C” or better during both peak hours while the northbound Fenwick Road approach operates at LOS “F” during the AM peak hour and LOS “E” during the PM peak hour. This intersection will be signalized as part of a four-way intersection with the new north-south roadway that will bi-sect the proposed development. Based on the expected delays under full development conditions and a traffic signal warrant analysis, a three-colored traffic signal is recommended for this intersection. The traffic signal should be designed to provide a permitted/protected eastbound left-turn phase as well as a southbound right-turn overlap phase. Southbound left and through traffic should be phased as permitted/protected. In addition, a westbound right-turn only lane should be constructed on Sheridan Drive to provide storage space for vehicles entering the site. The lane should provide 425’ of storage space with a 75’ taper. The existing two-way left-turn lane should be restriped to provide a westbound left-turn only lane entering the site. 350’ of storage space should be provided. In addition, this signal should be coordinated with other traffic signals to the west on Sheridan Drive.

Sheridan Drive / Frankhauser Road

All approaches operate at level of service “E” or better during both peak hours under existing, background, and full development conditions. At the recommendation of NYSDOT, a signal warrant analysis was conducted to determine if existing conditions meet warrants for a traffic signal at this location. The warrant analysis indicates that none of the warrants outlined in the MUTCD are currently satisfied. In light of the close proximity between Frankhauser Road and the proposed new north-south roadway through the site, the NYSDOT has indicated that only one signal will be permitted. Based upon the signal warrant investigations, traffic volume projections and operational benefits, it is recommended that the signal is located at the proposed new roadway intersection opposite Fenwick Road. Therefore, the existing signal at Frankhauser Road should be removed and a stop sign should be installed. There will be a one-way entrance to the proposed site from Frankhauser Road which will continue to provide signalized access to Sheridan Drive from the Frankhauser Road neighborhood.

Sheridan Drive / I-290 WB

All approaches are projected to operate at LOS “E” or better under background conditions with the NYSDOT planned protected left turn phasing and coordination. No changes in levels of service are anticipated as a result of the proposed development, however mitigation will require optimizing intersection offsets to accommodate the signal coordination throughout the corridor.

Sheridan Drive / Harlem Road

The overall level of service remains “C” during both peak hours between all conditions. All approaches operate at LOS “E” or better during both peak hours under full development conditions. Levels of service shown in the “Full Development with Mitigation” column of the table are a result of coordination of the signals and optimization of intersection offsets.

Harlem Road / I-290 EB

All approaches operate at level of service “D” or better during both peak hours between existing, background, and full development conditions. The westbound left approach is projected to decrease in level of service from “C” to “D” during the AM peak hour between background and full development conditions. The westbound right turn movement is projected to decrease from LOS “B” to “C” during both peak hours between background and full development conditions. Recommended mitigation is to create dual westbound right turns by combining the right and left turn movements in the current left turn lane and optimizing signal timings. Providing additional turn capacity for right turn movements will decrease queuing on the off-ramp. This mitigation can be accomplished via pavement marking changes if NYSDOT agrees with this recommendation.

Maple Road / Proposed Driveway

Based on the expected delays under full development conditions and a traffic signal warrant analysis, a three-colored traffic signal is recommended for this intersection. The traffic signal should be designed to provide two signal phases for eastbound/westbound and northbound traffic. The existing two-way left-turn lane should be restriped to provide a westbound left-turn only lane entering the site.

North Forest Road/Proposed New Site driveway

The proposed roundabout was analyzed using Sidra Intersection 7.0. It is anticipated the roundabout can function with LOS "A" on all approaches during the peak hours under full build conditions with a single lane design.

It is important to mention that our firm's capacity analysis and the resulting LOS information as provided above was based on an analysis during AM and PM weekday travel periods. This is the appropriate methodology for preparing a capacity analysis for inclusion in a TIS. However, the resulting Levels of Service during peak travel periods are not reflective of conditions during the non-peak travel periods, which comprise a large portion of each day and also include weekends. It is always advisable to evaluate mitigation measures for peak travel periods but lower Levels of Service during weekday peak travel period do not mean that intersections of roadways are not properly designed or are not functioning properly. It would not be feasible for all intersections in a community, such as the Town of Amherst, to function at high rated Levels of Service during peak travel periods since this would result in excessive roadway infrastructure and would not be economically feasible for governmental agencies responsible for the expenditure of funds for roadways and their maintenance and repair.

IX. AUXILIARY TURN LANE WARRANT INVESTIGATION

Volume warrants for left-turn treatments on Maple Road and Sheridan Drive at the proposed access roads were evaluated using the Transportation Research Board's NCHRP Report 279, Intersection Channelization Design Guide, 1985. According to this Design Guide, provisions for left-turn lane facilities should be established where traffic volumes are high enough and safety considerations are sufficient to warrant the additional lane. This investigation analyzes warrants during the AM and PM peak hours. However, two-way left-turn facilities already exist at the location of the proposed access roads. Therefore, this study includes the existing lane geometry in the analysis.

Right-turn lane volume guidelines were also examined at the proposed intersections along Maple Road and Sheridan Drive. While the future volumes satisfy the right-turn lane guidelines at the intersection of Maple Road and the proposed driveway under full development during the AM and PM peak hours, no improvement is recommended given the location of adjacent residential properties. Right-turn guidelines are satisfied during both peak hours at the intersection of Sheridan Drive/Fenwick Road/Proposed Driveway. All supporting calculations are included in the Appendix of this report.

X. TRAFFIC SIGNAL WARRANT INVESTIGATION

A traffic signal warrant analysis was conducted at the proposed driveway on Maple Road and the intersection of Sheridan Drive/Fenwick Road/Proposed Driveway. In addition, at the request of NYSDOT, traffic signal warrants were investigated for existing conditions at the signalized Sheridan Drive/Frankhauser Road intersection.

The need for a traffic signal is determined by comprehensive investigation of existing and projected traffic conditions and physical characteristics at the location. The *Standard Specifications Update for the adoption of the National MUTCD (“FHWA”) and the New York State Supplement* were reviewed to investigate the need for a traffic control signal at this location. There are nine (9) warrants and they are as follows:

Warrant 1	Eight-Hour vehicular volume
Warrant 2	Four-Hour vehicular volume
Warrant 3	Peak Hour
Warrant 4	Pedestrian Volume
Warrant 5	School Crossing
Warrant 6	Coordinated Signal System
Warrant 7	Crash Experience
Warrant 8	Roadway Network
Warrant 9	Intersection Near a Grade Crossing

Detailed signal warrant calculations are included in Appendix A2 of the Report. Prior to applying warrants, the MUTCD suggests consideration of the effects of right turn volumes on the minor street approach, and a reduction taken in the number of right turning vehicles, where appropriate. A certain number of right turn vehicles will execute a right turn on the red indication without actuating a traffic signal (if one were in place). For purposes of this analysis, it is projected that 20% of the right turning vehicles exiting the proposed driveways along Maple Road and Sheridan Drive would execute a right turn on red maneuver and should therefore be subtracted for the purposes of the warrant analysis. Right turn traffic was included in total for the Frankhauser Road evaluation. The posted speed limit on Maple Road and Sheridan Drive is 45 miles per hour and therefore, 70 percent thresholds in Table 4C-1, Figure 4C-2 and Figure 4C-4 is used as a basis for analysis.

Warrant 1 is subdivided into Condition A and Condition B. The Minimum Vehicular Volume, Condition A, is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal. The Interruption of Continuous Traffic, Condition B, is intended for application at locations where Condition A is not satisfied and where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street. These conditions are satisfied when, for each of any eight hours of an average day, anticipated volumes on the artery and side road are in excess of the minimum values presented in Tables 4C-1 in the MUTCD. Hourly traffic volumes along Maple Road and Sheridan Drive at the proposed access driveways were projected based on the hourly traffic distribution measured by NYSDOT along Maple Road in 2010 and Sheridan Drive in 2014. Hourly traffic volumes expected to exit the proposed driveways were projected based on the hourly distribution for North Sheridan Drive based on the NYSDOT 2014 ADT counts. Based upon these calculations, Condition A is not met for any of the eight hours at the proposed driveways along Maple Road, however more than eight hours (16) are satisfied at the proposed Sheridan Drive intersection. Condition B for Warrant 1 is satisfied for 9 hours at the proposed driveway along Maple Road, while it is satisfied for 17 hours

at the proposed driveway along Sheridan Drive under full development conditions. Neither warrant is currently satisfied at Frankhauser Road.

Warrant 2, the Four-Hour Vehicular Volume signal warrant conditions, are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal. This warrant stipulates that for any four hours of a day, minimum threshold volumes are met on the artery and side road. Based on the projected hourly traffic volumes on the proposed driveways, this warrant is met under full development conditions for both proposed driveways. This warrant is not currently met at Frankhauser Road.

Warrant 3 is intended for application where minor street traffic suffers undue delay in entering or crossing the major street for one hour of the day. It stipulates that the warrant shall be applied in unusual cases (high-occupancy vehicle facilities) where a large number of vehicles discharge over a short period of time. Based on the current uses (office, retail, residential, hotel) at the proposed driveways along Maple Road and Sheridan Drive, this warrant is not met in Figure 4C-4 under full development conditions. This warrant is not currently met at Frankhauser Road.

Warrant 4 is met when pedestrians experience excessive delay in crossing the major street (Maple Road and Sheridan Drive) because the traffic volumes are so heavy. The intersections have infrequent pedestrian activity. This warrant is not met at any of the intersections evaluated.

Warrant 5 is met when a sufficient number of gaps in traffic do not exist for certain size and frequency of school children to cross the major roadway. Based on the current conditions and low pedestrian activity, this warrant is not applicable at these locations.

Warrant 6 is met when a traffic signal is needed to maintain progressive movement and vehicle platooning in a coordinated signal system. Based on the current signal system along Maple Road, this warrant is not met; however, it is met for Sheridan Drive.

Warrant 7 is met when the severity, frequency, and types of crashes are such that it is a condition susceptible to correction by a traffic signal. Accident data at the proposed Maple Road location shows three accidents at the bordering intersections and exiting Sheridan Drive/Fenwick Road only two accidents during the three-year study period. Therefore, this warrant is not currently met. There were 12 accidents at Frankhauser Road during the three-year study period. This warrant requires that five or more reported crashes, of types susceptible to correction by a traffic control signal, have occurred within a 12-month period, each crash involving personal injury or property damage apparently exceeding the applicable requirements for a reportable crash. Evaluation of the accidents that occurred indicate that this warrant is not met at Frankhauser Road.

Warrant 8 is met when a traffic signal might encourage concentration and organization of traffic flow on a roadway network. This warrant primarily focuses on two major intersecting roadways, which is not the case at the proposed driveways. Therefore, this warrant is not met.

Warrant 9 is applicable when an intersection is located near an at-grade rail crossing. This warrant is not applicable to the proposed driveway locations and therefore is not met.

Based on the traffic signal warrant investigation, the traffic signal warrants dealing solely with traffic volumes (Warrants 1-2) are met under full development conditions at the proposed driveway along Sheridan Drive. Warrants 1-2 are met for the proposed driveway along Maple Road. None of the traffic signal warrants are currently met at Frankhauser Road. **Table VI** describes each warrant and the result of our firm's signal warrant investigation.

TABLE V: TRAFFIC SIGNAL WARRANT SUMMARY

WARRANT #	DESCRIPTION	EXISTING CONDITIONS	FULL BUILD CONDITONS	
		Sheridan Dr/Frankhauser Road	Maple Rd/Proposed North Driveway	Sheridan Dr/Proposed South Driveway
1	<i>Eight-Hour vehicular volume</i>	NOT MET	MET	MET
2	<i>Four-Hour vehicular volume</i>	NOT MET	MET	MET
3	<i>Peak Hour</i>	NOT MET	NOT MET	NOT MET
4	<i>Pedestrian Volume</i>	NOT MET	NOT MET	NOT MET
5	<i>School Crossing</i>	NOT MET	NOT MET	NOT MET
6	<i>Coordinated Signal System</i>	NOT MET	NOT MET	MET
7	<i>Crash Experience</i>	NOT MET	NOT MET	NOT MET
8	<i>Roadway Network</i>	NOT MET	NOT MET	NOT MET
9	<i>Intersection Near a Grade Crossing</i>	NOT MET	NOT MET	NOT MET

Discussions with the Project Sponsor indicated that the initial construction phases will include installing the north/south connector public roadway between Maple Road and Sheridan Drive. Based on the expected delays under full development conditions and the results of the traffic signal warrant analysis, a three-colored traffic signal is recommended for both intersections. Therefore, it is recommended that the proposed driveway on Sheridan Drive be installed with a three-colored traffic signal. A protected/permitted eastbound left-turn phase is recommended given the volume of left-turns entering the site. The signal should be coordinated with the existing traffic signal network to the west along Sheridan Drive as well as North Forest Road to the east. Meanwhile, the proposed driveway on Maple Road should be installed with a three-color traffic signal.

Based upon the capacity analysis results and traffic signal warrant analysis, installation of a traffic signal is recommended at the proposed driveway along Maple Road and proposed driveway on Sheridan Drive. In response to NYSDOT's direction allowing only one traffic signal at either Frankhauser Road or the proposed roadway intersection along Sheridan Drive, and upon evaluation of the signal warrants, future traffic volumes and overall corridor benefits, it is recommended that the signal at Frankhauser Road is removed at the time of signal installation at the proposed driveway on Sheridan Drive.

Although traffic signal installation is recommended for the proposed access points on Maple Road and Sheridan Drive, a post-construction signal warrant analysis should be performed after the new north/south connector public roadway is completed and dedicated to the Town of Amherst and the development has reached approximately 20% of the projected full development trip generation. The purpose of studying the proposed access locations after the roadway is open for public use is to determine at what point in the future of the proposed build-out of the mixed-use neighborhood a traffic signal should be installed. The proposed north/south public roadway at its connection to Sheridan Drive should be designed to provide two lanes of exiting traffic and two lanes of entering traffic to both facilitate traffic movements and to achieve the desired alignment with the existing Fenwick Road on the south side of Sheridan Drive. The throat length of the driveway should be designed to accommodate vehicle queues exiting the site and reduce vehicle blockages of internal circulation roadways. Therefore, a minimum uninterrupted throat length of 200 feet is recommended.

XI. TRANSPORTATION DEMAND MANAGEMENT RECOMMENDATIONS

Transportation Demand Management (TDM), if implemented strategically, can have a noticeable impact on reducing trips from a project. TDM is the application of strategies and policies to reduce Single Occupant Vehicle (SOV) travel demand, or to redistribute this demand in space or in time. By definition, TDM includes various strategies that produce a more efficient use of transportation resources and increase the efficiency of a transportation system.

TDM programs have many potential benefits. They can reduce the total number of vehicle miles traveled by promoting alternatives to driving alone. Fewer vehicle miles traveled results in less ozone pollution. TDM programs can be used by employers to reduce overhead costs, enhance productivity and reduce employee turnover. TDM programs can improve the use of public transit services, bikeways, sidewalks and carpool lanes by educating users about their travel options and coordinating trips between users with similar trip patterns. Implementing an effective TDM program can also reduce the required number of parking spaces for a project and/or eliminate the need to consider building costly multi-story parking structures. The following table summarizes some of the benefits that can be realized from an effective TDM program.

TABLE VI: BENEFITS OF TDM PROGRAMS

BENEFIT	DESCRIPTION
Congestion Reduction	Reduces traffic congestion delays and associated costs.
Road & Parking Savings	Reduces road and parking facility costs.
Consumer Savings	Helps consumers save money by reducing their need to own and operate motor vehicles.
Transport Choice	Improved travel options, particularly for non-drivers.
Road Safety	Reduced crash risk
Environmental Protection	Reduced air, noise and water pollution, wildlife crashes and other types of environmental damages.
Efficient Land Use	Supports strategic land use planning objectives, such as reduced sprawl, urban redevelopment and reduced habitat fragmentation.
Community Livability	Improved local environmental quality and community cohesion.
Economic development	Supports a community's economic objectives, such as increased productivity, employment, wealth, property values and tax revenues.
Physical Fitness and Health	Improved public fitness and health due to more physical activity, usually through increased daily walking and cycling.

The following TDM strategies are recommended for consideration in connection with the proposed mixed-use neighborhood:

1. **Transit Coordination** – Coordinating transit routes and marketing the Sheridan Route 49 bus line will boost ridership through increased awareness coupled with improved service.
2. **Route Expansion** – New expanded bus service through the Westwood project site provides an opportunity for greater mode choice resulting in trip and parking reductions.

3. **Bus Stop Amenities** – A clean, well-lit, informative bus stop with shelters and seating greatly improves the image of the transit serving an area. Station amenities make taking the bus a comfortable experience, while proper maintenance tells people that transit makes up an important part of the neighborhood. New bus stops should have the following elements:
 - A level concrete pad, unobstructed by street furniture, landscaping, or signage
 - Reliable pedestrian access with clear sidewalks providing direct access to the bus loading area
 - Clear sight lines allowing travelers to see around the stop and drivers to see around corners to make turns
 - Adequate lighting
 - Pedestrian amenities such as a bench and trash receptacle
 - Route, schedule and information
 - Bicycle rack
4. **Employer Carpooling** – carpooling can be encouraged by providing incentives and other services such as ridematching.
5. **Emergency Ride Home** – In case of a personal emergency during the day, transportation is provided at no cost to one's vehicle, residence, or other place such as childcare, doctor's office, etc.
6. **Preferential carpool/vanpool parking**
7. **Transportation Alternatives Information** – bus schedules and bike maps.
8. **Telecommuting and compressed work schedules** – employee vehicle trips are reduced by the percentage of employees that telecommute, or have a "free" day gained through a compressed schedule, on an average day

These programs must be coupled with improvements in transit service, pedestrian and bicycle accommodations.

XII. CONCLUSIONS & RECOMMENDATIONS

This updated Traffic Impact Study identifies and evaluates the potential traffic impacts resulting from full build-out of the proposed mixed-use neighborhood. This updated Traffic Impact Study provides the Town of Amherst Town Board, in its capacity as the designated lead agency for the coordinated environmental review of the proposed mixed-use redevelopment project pursuant to State Environmental Quality Review Act ("SEQRA"), along with involved and interested agencies including the NYSDOT and Erie County Department of Public Works (ECDPW), with information to allow a hard look to be taken at identified potential traffic impacts. Based upon the comprehensive traffic analysis contained in this report, it is our firm's professional opinion that the results indicate that the proposed mixed-use neighborhood can be accommodated by the existing roadway network with the recommendations below being in place. The following sets forth our firm's conclusions and recommendations based upon the results of the comprehensive traffic analyses that have been conducted:

- I. The proposed mixed-use neighborhood is expected to generate approximately 1,034 (1,284) new trips during the AM (PM) peak hours respectively.

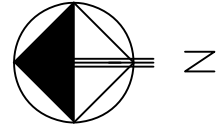
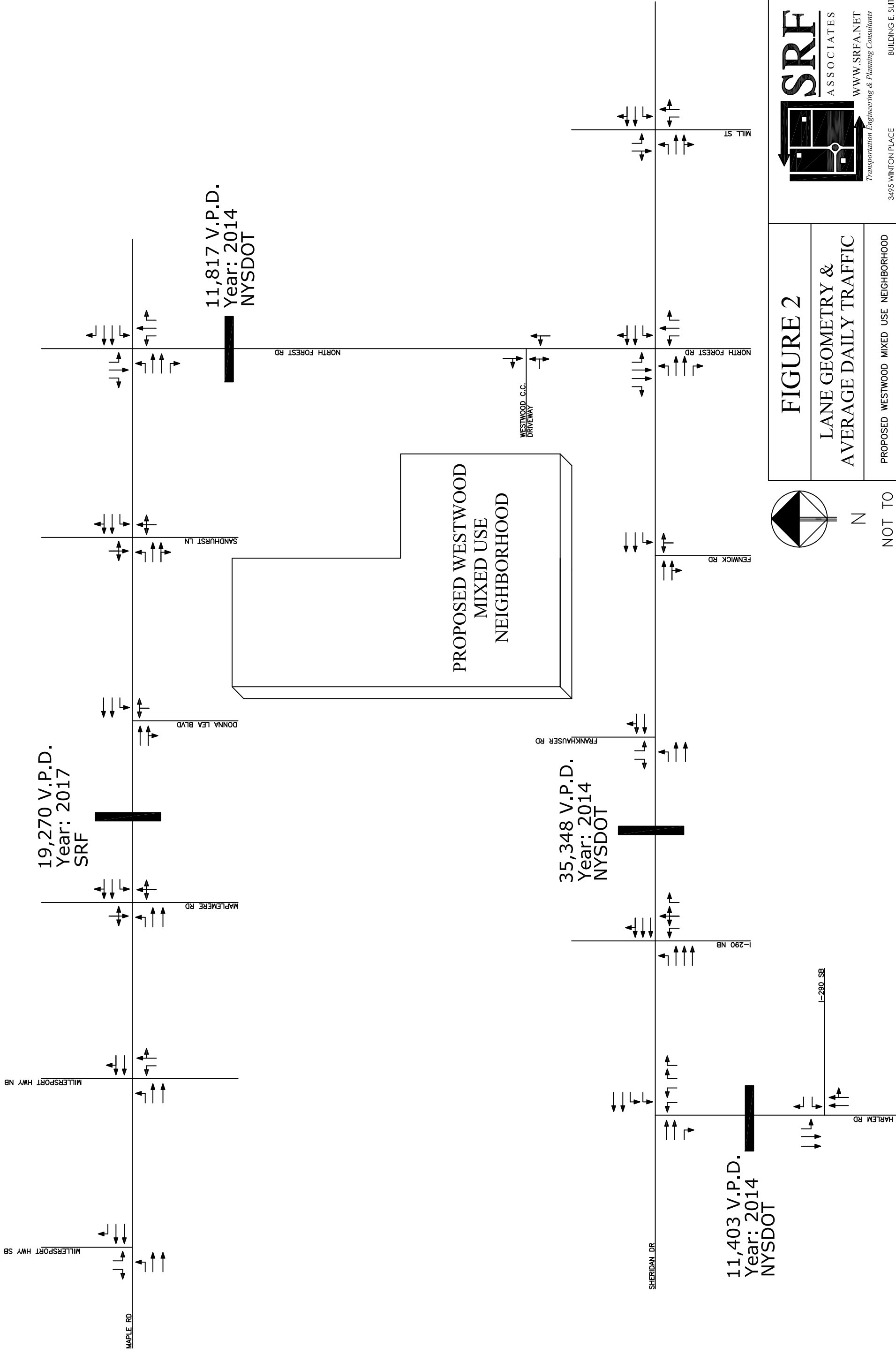
2. The new north-south roadway in combination with the new connection to North Forest Road will provide benefits to the overall area by allowing traffic that is currently using North Forest Road to divert to the new north-south roadway. The new roadway connections will provide a much more direct route between Sheridan Drive and Maple Road as compared to the curvy circuitous route provided by North Forest Road. This will in turn improve operating conditions at both North Forest Road intersections with Sheridan Drive and Maple Road. In addition, the proposed roundabout at North Forest Road and the east-west site roadway will provide direct access to the site from North Forest Road eliminating the need to use Sheridan Drive and will eliminate the existing sharp curve on North Forest Road. The roundabout will provide a traffic calming measure on North Forest Road resulting in reduced speeds and improved safety. The one-way enter only connection from Frankhauser Road will also provide direct access to site from the neighborhood to the west eliminating the need to use Sheridan Drive. Neighborhood residents would also ultimately be able to travel directly from the neighborhood to North Forest Road.
3. It is recommended that the northbound off-ramp from Millersport Highway to Maple Road (Study Intersection 2) be restriped to provide a right turn only lane and left/thru/right turn lane. This will both allow for dual right turn movements onto Maple Road eastbound as well as decrease queuing on the off-ramp. The two Millersport Highway ramp signals are coordinated and will require optimization of offsets as included in this analysis.
4. At the intersections of North Forest Road/Maple Road and Sheridan Drive/Mill Road, it is recommended that the signal timings are optimized based upon future traffic volumes.
5. Mitigation for the changes in levels of service at the Sheridan Drive intersection with North Forest Road include installing a westbound right turn lane, providing an additional northbound through lane by combining the northbound through and right turn movements in the curb lane, and optimizing the signal timings and coordination offsets. The southbound right-turn lane should be extended to the north to create additional capacity for southbound right-turning traffic and to reduce southbound queuing.
6. Recommended mitigation at Harlem Road and the I-290 off-ramp is to create dual westbound right turns by combining the right and left turn movements in the current left turn lane and optimizing signal timings. Providing additional turn capacity for right turn movements will decrease queuing on the off-ramp. This mitigation can be accomplished via pavement marking changes if NYSDOT agrees with this recommendation.
7. The proposed new roundabout intersection of the site driveway and North Forest Road will operate at LOS "A" on all approaches during both peak hours. The roundabout will eliminate the existing sharp curve on North Forest Road and will be an effective traffic calming measure that will reduce vehicle speeds and provide a means of accessing the Project Site from North Forest Road. The improvements at Sheridan Drive & North Forest Road will improve southbound queuing on North Forest Road such that spillback into the roundabout will not occur.
8. A left-turn lane warrant investigation was conducted along Maple Road and Sheridan Drive at the proposed driveways. However, two-way left-turn facilities already exist at the location of the proposed access roads. The two-way left-turn lanes should be restriped to accommodate dedicated left-turn lanes entering the proposed driveway along Maple Road and the existing Sheridan Drive/Fenwick Road intersection.

9. A right-turn lane investigation was conducted along Maple Road and Sheridan Drive at the proposed driveway locations. While the future volumes satisfy the right-turn lane guidelines at the intersection of Maple Road and the proposed driveway under full development during the AM and PM peak hours, no improvement is recommended given the location of adjacent residential properties. Right-turn guidelines were satisfied during both peak hours at the intersection of Sheridan Drive/Fenwick Road/Proposed Driveway. The right turn lane should provide 425' of storage space with a 75' taper.
10. Install a new traffic signal at the proposed public roadway connection on Maple Road when the new roadway is constructed.
11. Install a new traffic signal at the proposed public roadway on Sheridan Drive when the driveway is constructed. The new traffic signal should be coordinated with the existing traffic signal network along Sheridan Drive to the west of the project site.
12. A post-construction signal warrant analysis should be performed at the new roadway intersection with Sheridan Drive after the new north/south connector public roadway is completed and dedicated to the Town of Amherst and the development has reached approximately 20% of the projected full development trip generation to determine if signal warrants are met at that time.
13. In response to NYSDOT's direction allowing only one traffic signal at either Frankhauser Road or the proposed roadway intersection along Sheridan Drive, and upon evaluation of the signal warrants, future traffic volumes and overall corridor benefits, it is recommended that the traffic signal at the intersection of Frankhauser Road and Sheridan Drive be removed at the same time a traffic signal is installed at the intersection of the proposed north-south roadway connection and Sheridan Drive.
14. The proposed new north south public roadway connecting Sheridan Drive and Maple Road should be designed to provide two lanes of exiting traffic and two lanes of entering traffic to both facilitate traffic movements and to achieve the desired alignment with the existing Fenwick Road. The throat length of the driveway should be designed to accommodate vehicle queues exiting the site and reduce vehicle blockages of internal circulation roadways; therefore a minimum uninterrupted throat length of 200 ft. is recommended.
15. It is important to mention that our firm's capacity analysis and the resulting LOS information as provided above was based on an analysis during AM and PM weekday travel periods. This is the appropriate methodology for preparing a capacity analysis for inclusion in a TIS. However, the resulting Levels of Service during peak travel periods are not reflective of conditions during the non-peak travel periods, which comprise a large portion of each day and also include weekends. It is always advisable to evaluate mitigation measures for peak travel periods but lower Levels of Service during weekday peak travel period do not mean that intersections of roadways are not properly designed or are not functioning properly. It would not be feasible for all intersections in a large community, such as the Town of Amherst, to function at high rated Levels of Service during peak travel periods since this would result in excessive roadway infrastructure and would not be economically feasible for governmental agencies responsible for the expenditure of funds for roadways and their maintenance and repair.
16. Internal sidewalks should form an inter-connected pedestrian network allowing users to actively walk amongst the various land use components to be included in the mixed-use

- neighborhood. Additionally, internal paved recreational paths should be designed and installed to encourage bicycle use.
17. The southern portion of the mixed-use neighborhood as depicted on the Conceptual Master Plan consists of the commercial and office components, higher density residential units, and the hotel component. This portion of the Project Site should incorporate bicycle parking and related facilities into the design. Such facilities should include bicycle racks and consideration should be given to including bicycle lockers, as well as providing shower and changing facilities within the proposed office buildings.
 18. Transportation demand management (TDM) strategies should be considered and implemented, when practical, to reduce off-site vehicular trips.
 19. Consideration should be given to reducing the number of parking spaces constructed on-site given the mixed-use nature of the proposed neighborhood, potential for non-vehicular trips, and the potential for shared parking between different categories of land uses with differing peak parking demands. The use of shared parking reduces the amount of impervious surfaces and prevent parking areas from having more parking spaces than needed to service a project with a mixture of land uses with differing peak parking demands.

XIII. FIGURES

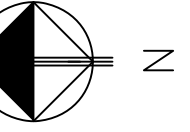
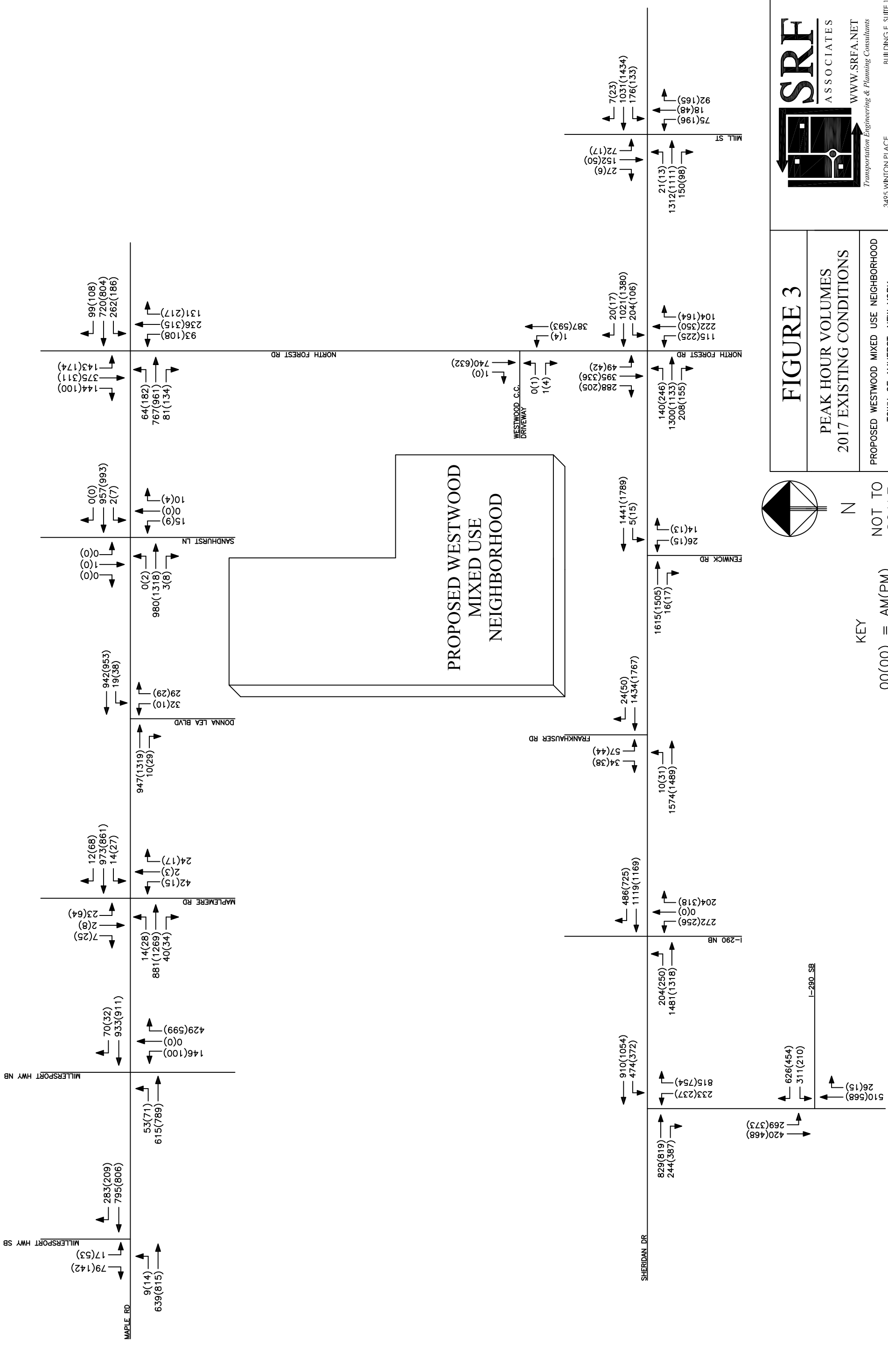
Figures 1 through 8 are included on the following pages.



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FIGURE 2
LANE GEOMETRY & AVERAGE DAILY TRAFFIC
 PROPOSED WESTWOOD MIXED USE NEIGHBORHOOD
 TOWN OF AMHERST, NEW YORK

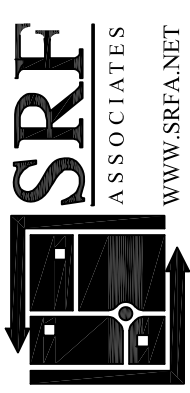
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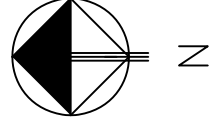
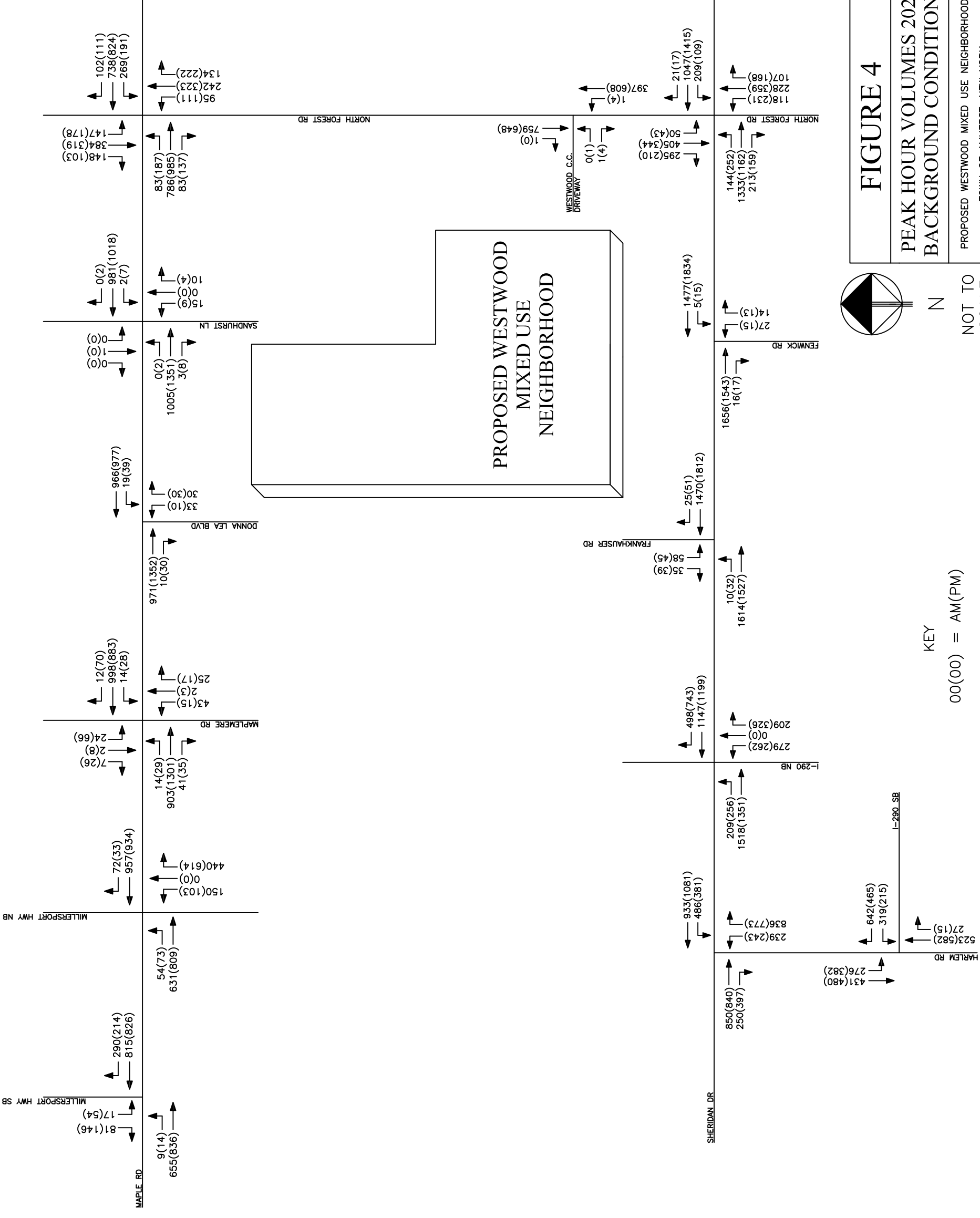
KEY
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FIGURE 3
 PEAK HOUR VOLUMES
 2017 EXISTING CONDITIONS

PROPOSED WESTWOOD MIXED USE NEIGHBORHOOD
 TOWN OF AMHERST, NEW YORK



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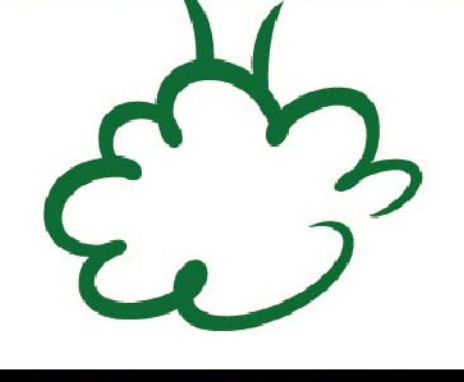
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KEY
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FIGURE 4
PEAK HOUR VOLUMES 2023
BACKGROUND CONDITIONS
 PROPOSED WESTWOOD MIXED USE NEIGHBORHOOD
 TOWN OF AMHERST, NEW YORK

A Traditional Neighborhood
in the heart of Amherst.

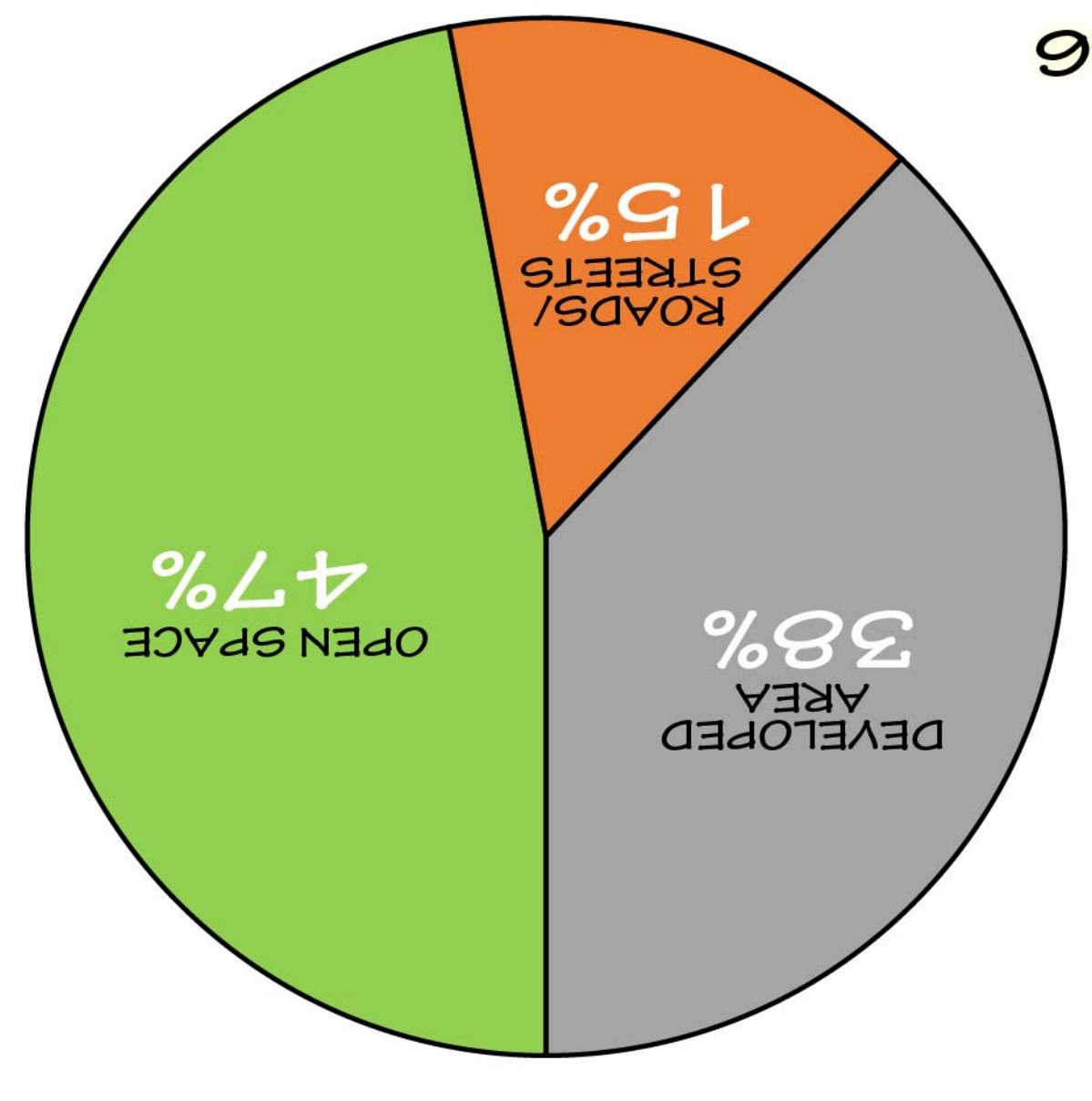
Westwood



Prepared by:
MENSCH
Capital Partners, LLC
wendel

December 19, 2016

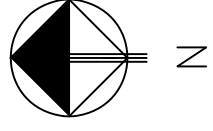
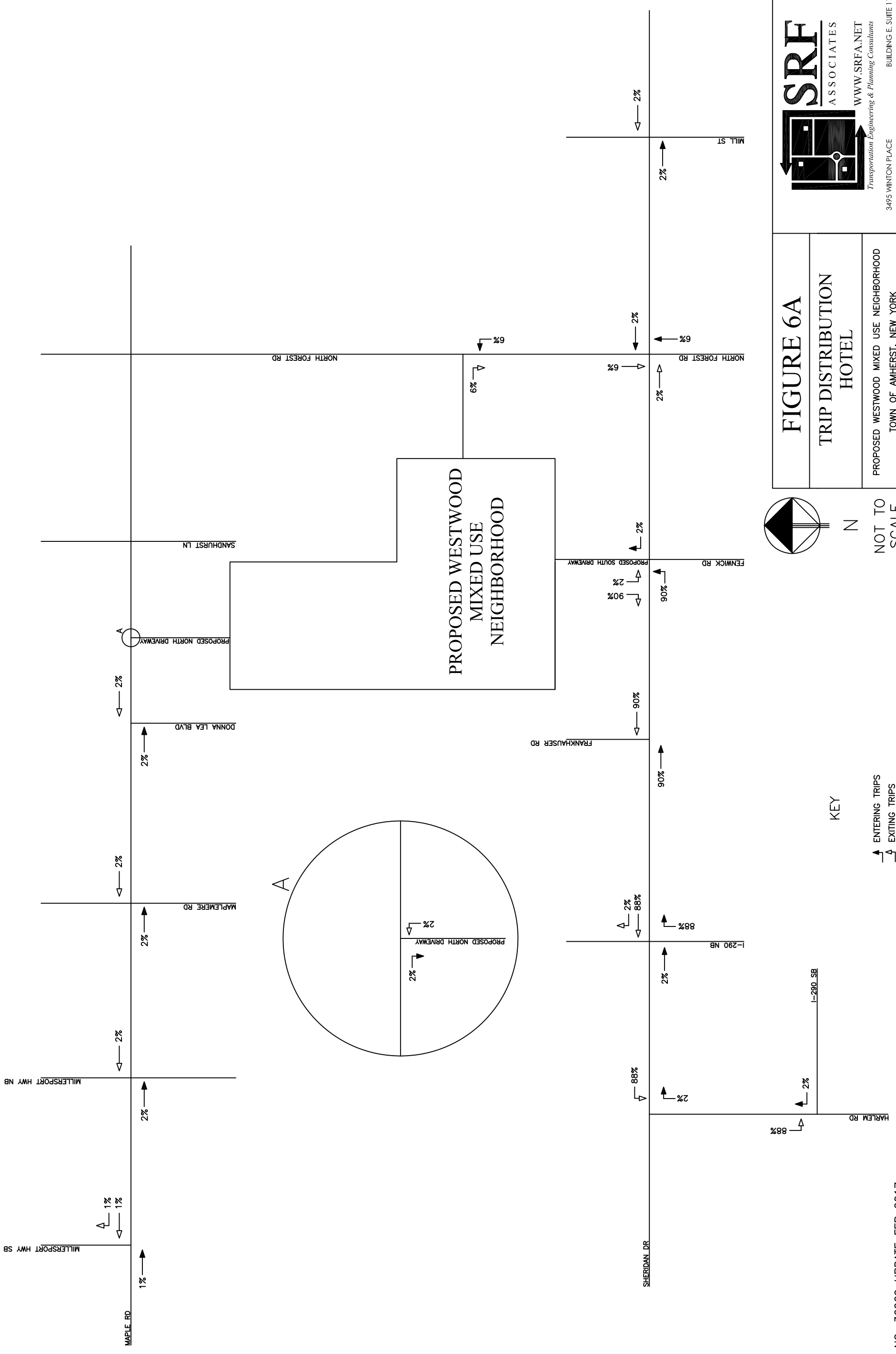
CONCEPTUAL MASTER PLAN



AREA	BUILDING TYPES	COLOR KEY
112,800 sf (3 stories)	a. Potential Offices/ Community Facility b. Office Buildings	Orange
18,000 sf (3 stories) per building	a. Multi-Family Community - Condo/Apartments b. Residential (Multi-Family Structures) c. Townhomes	Yellow
89,600 sf (4 stories)	a. Inn/ Boutique Hotel b. Fire Substation (Snyder Service Area)	Pink
498,000 sf (3 stories)	a. Mixed-Use Structures b. Community Clubhouse	Light Green
17,400 sf (2 stories)	Patio Home and Single-Family Home Lots	Light Blue
Varies per lot type	Senior Living Development with Garages	Light Purple
216,800 sf (2 stories)	Open/ Green Space	Light Green
68.5 Acres	Ponds/ Stormwater Features	Blue
13.1 Acres	Streets and Parking Lots	Grey



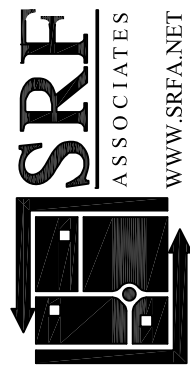
FIGURE 5: CONCEPTUAL MASTER PLAN



NOT TO SCALE

KEY

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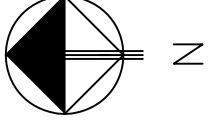
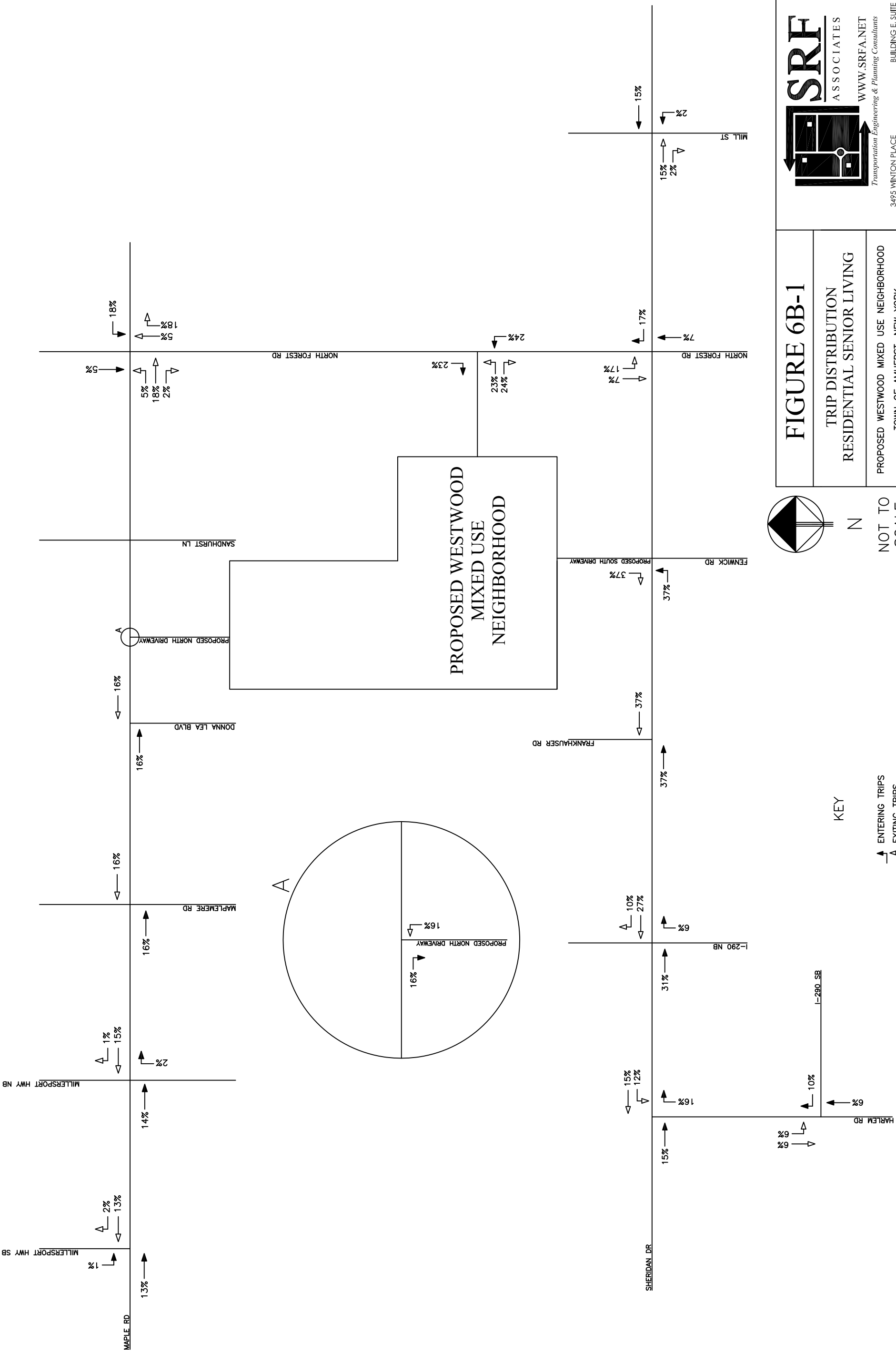


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FIGURE 6A
 TRIP DISTRIBUTION
 HOTEL

PROPOSED WESTWOOD MIXED USE NEIGHBORHOOD
 TOWN OF AMHERST, NEW YORK

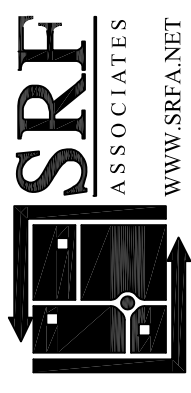


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FIGURE 6B-1

TRIP DISTRIBUTION
RESIDENTIAL SENIOR LIVING

PROPOSED WESTWOOD MIXED USE NEIGHBORHOOD
TOWN OF AMHERST, NEW YORK

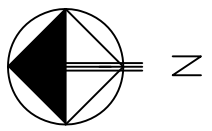
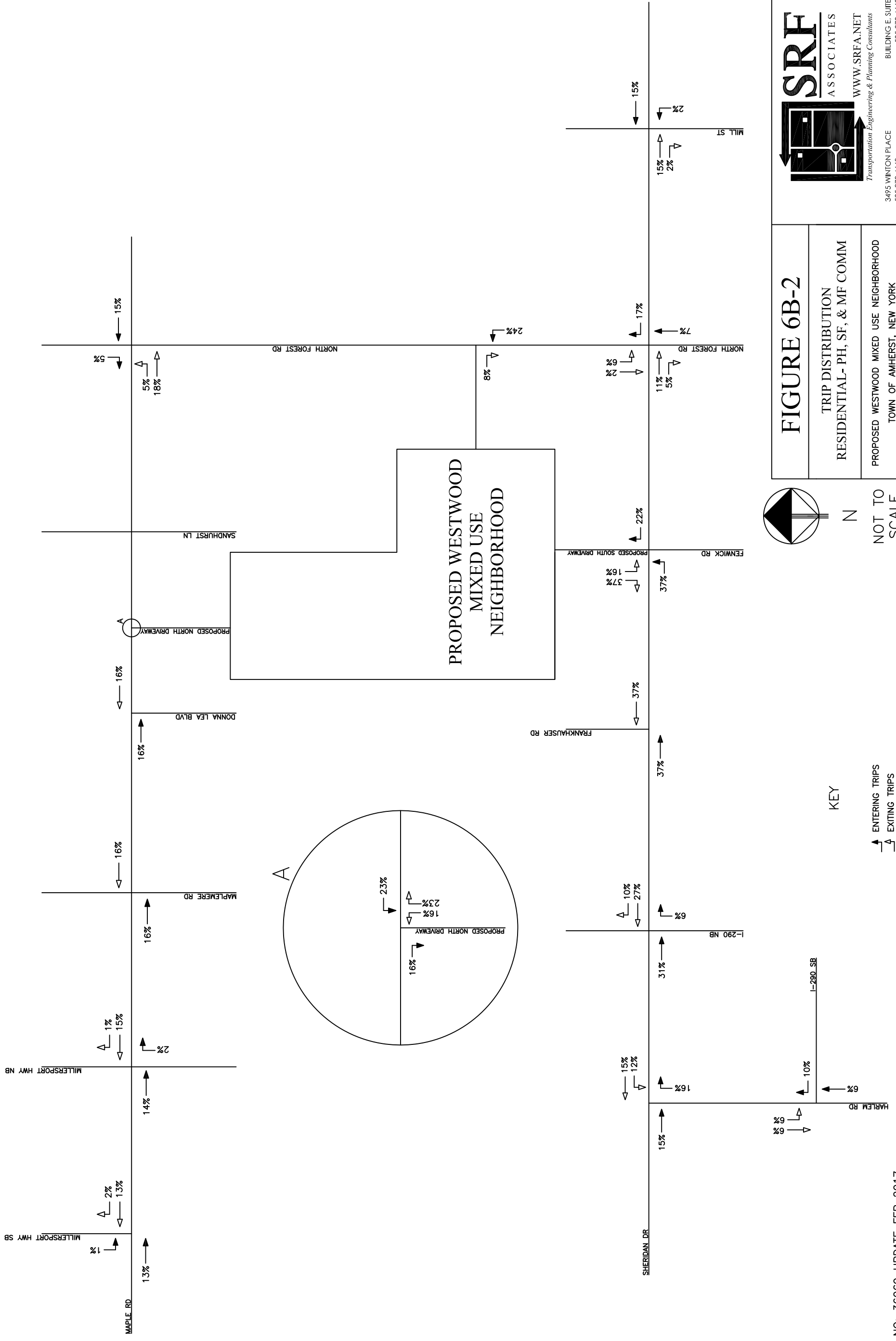


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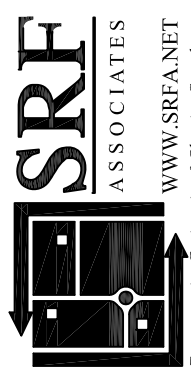
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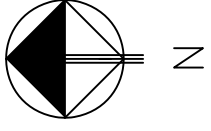
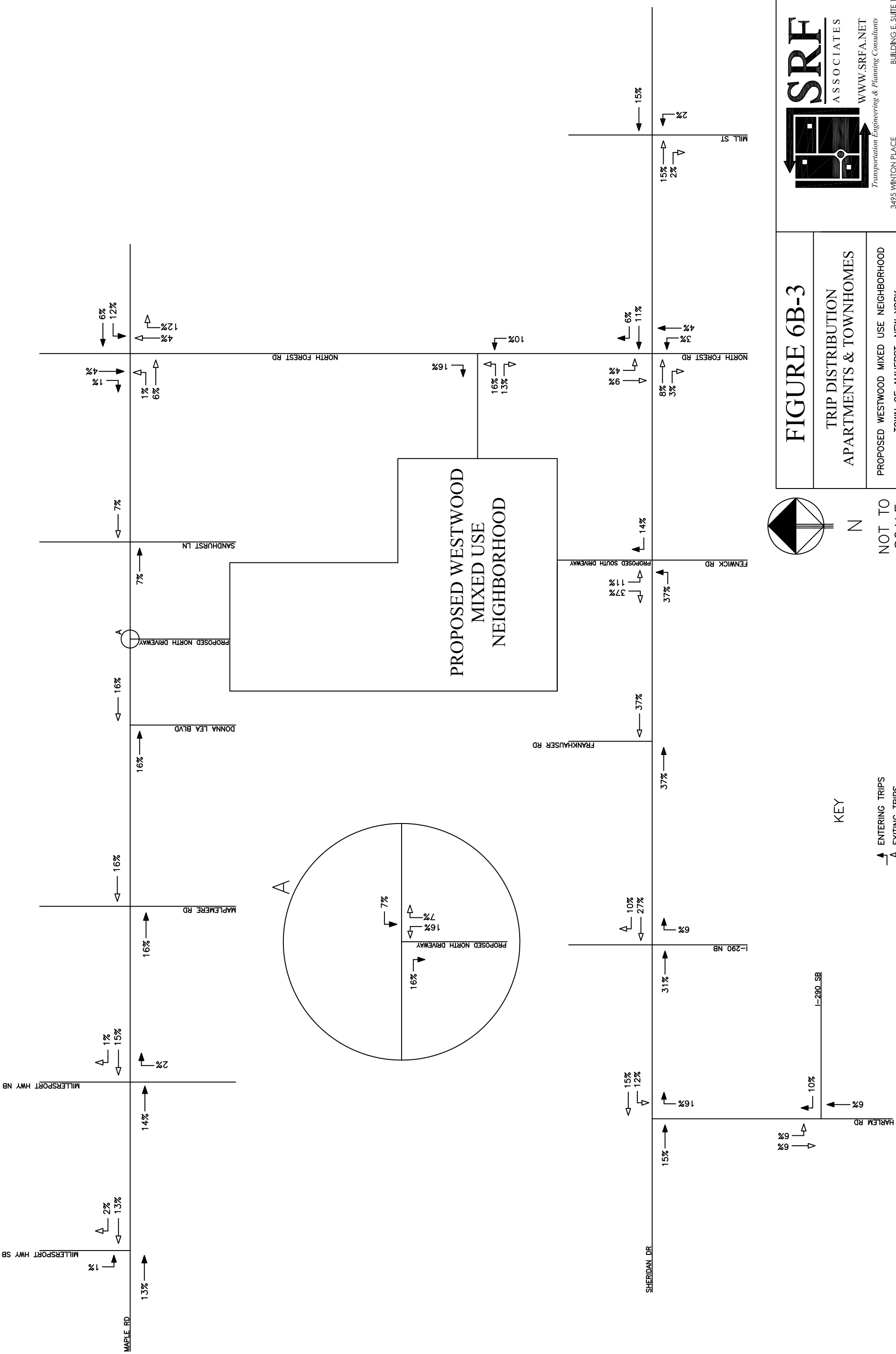
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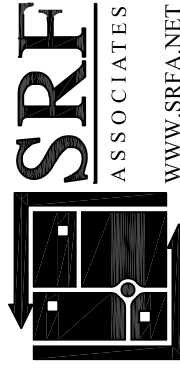


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FIGURE 6B-3

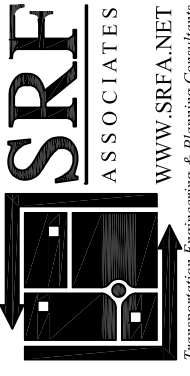
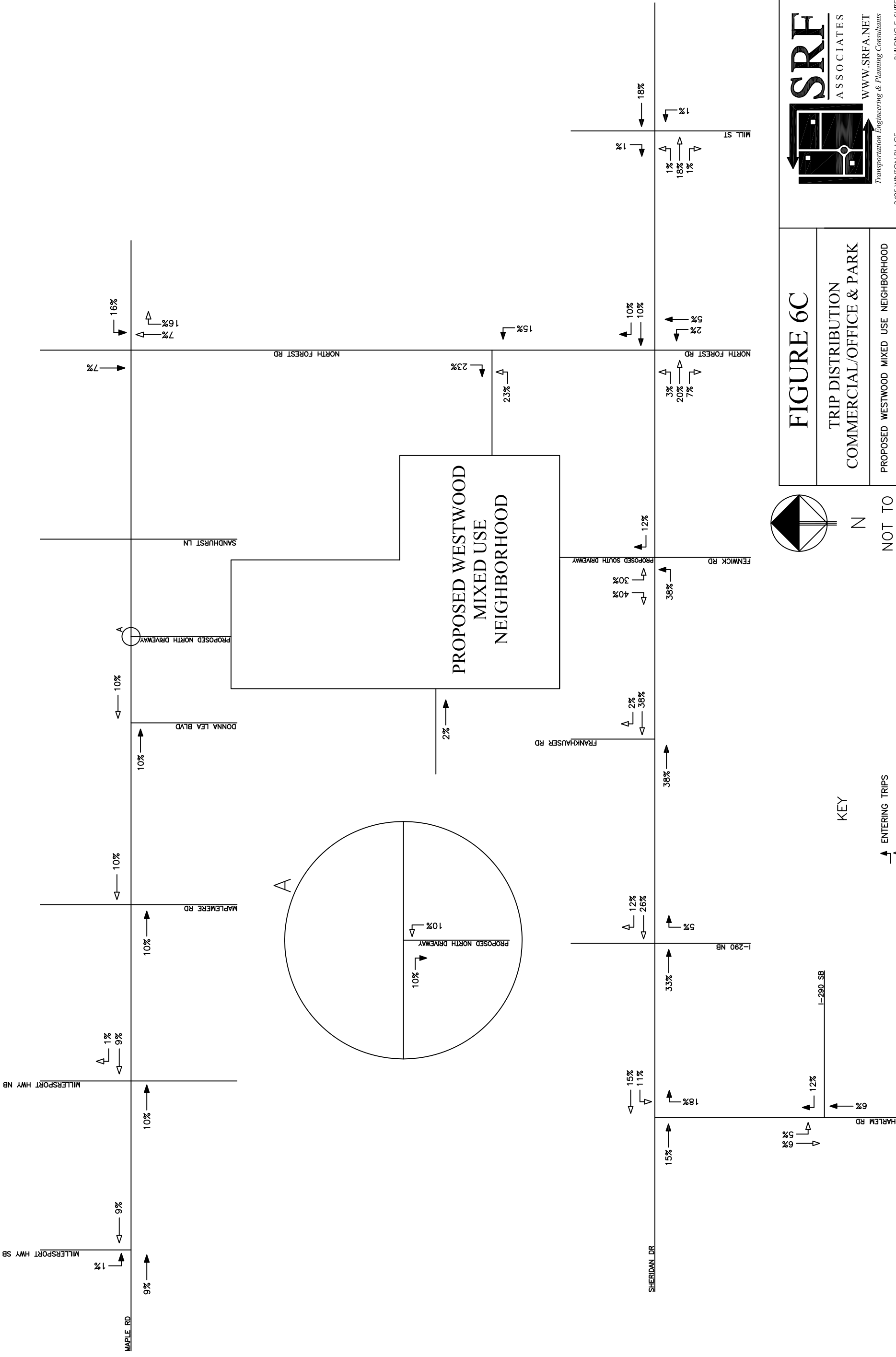
TRIP DISTRIBUTION APARTMENTS & TOWNHOMES

PROPOSED WESTWOOD MIXED USE NEIGHBORHOOD
TOWN OF AMHERST, NEW YORK



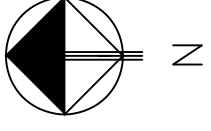
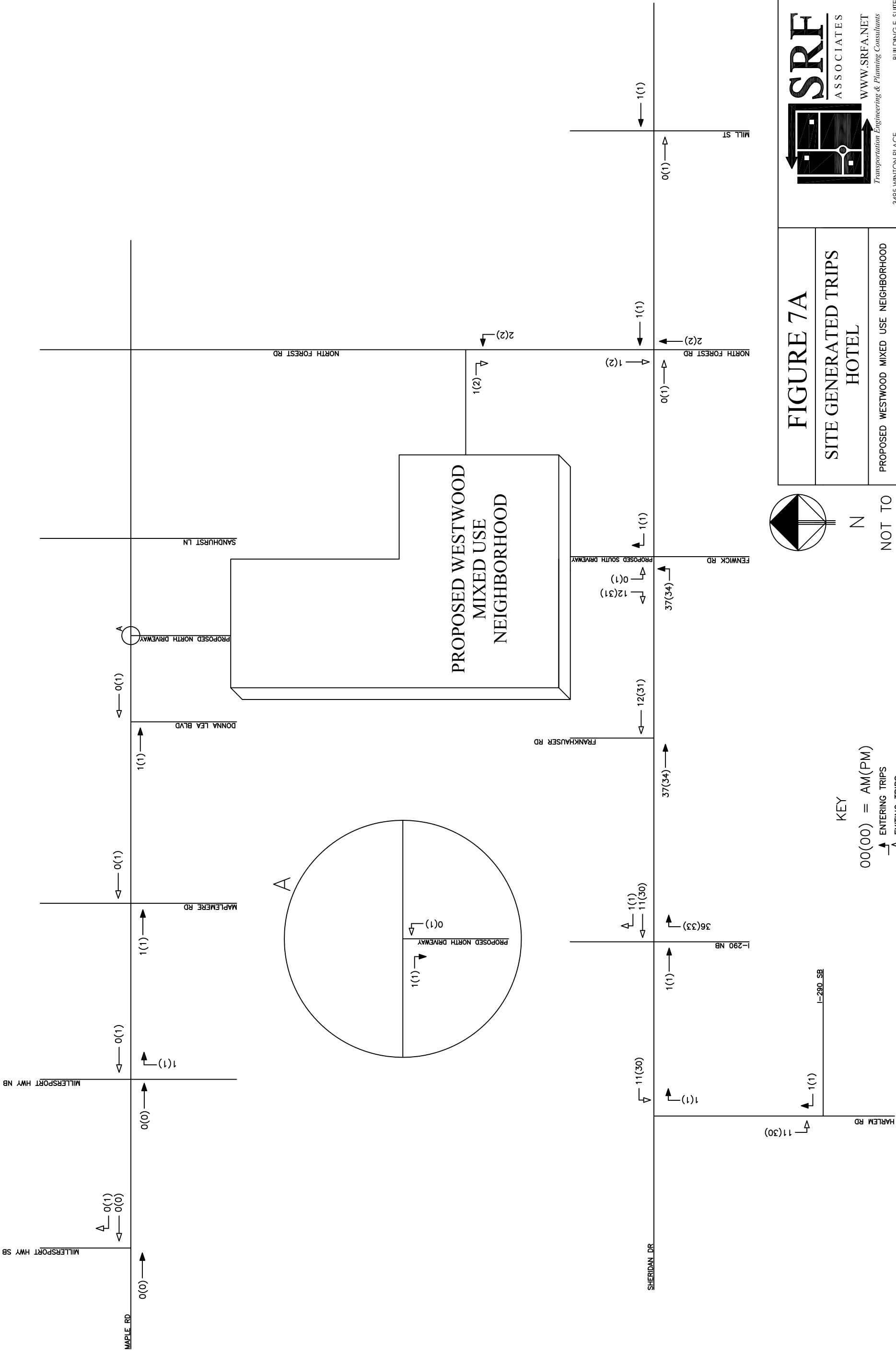
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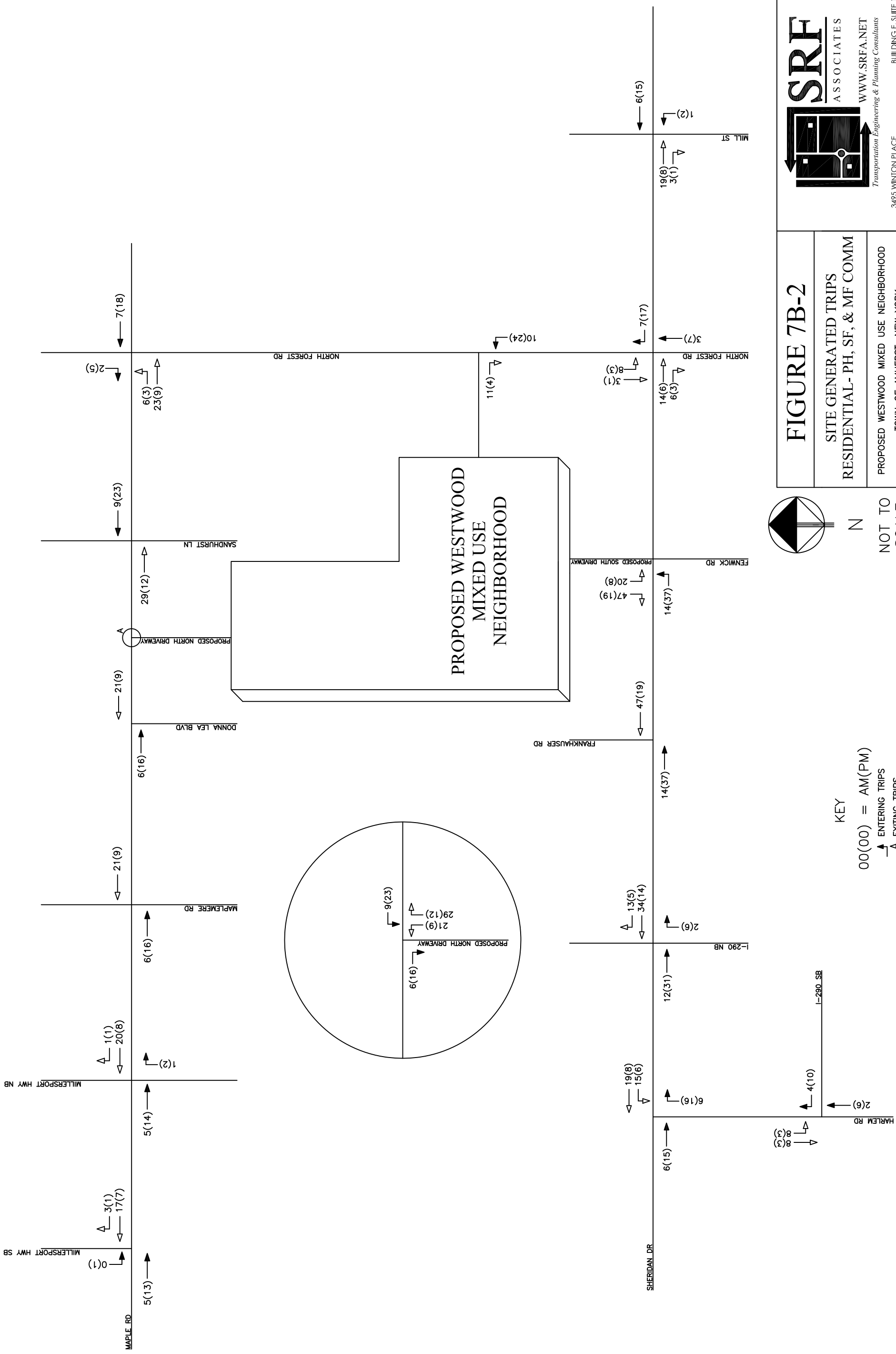
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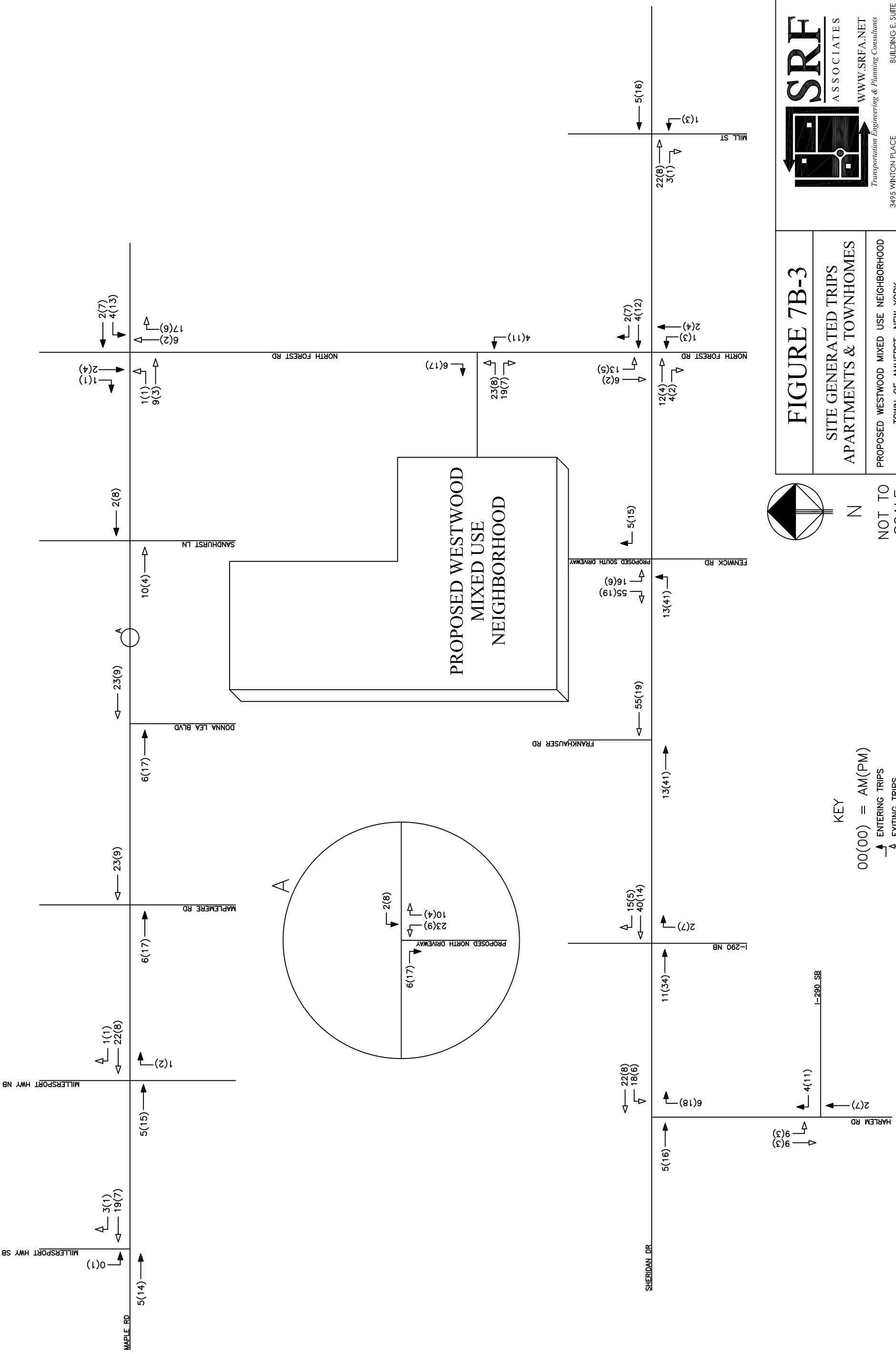


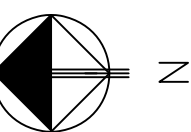
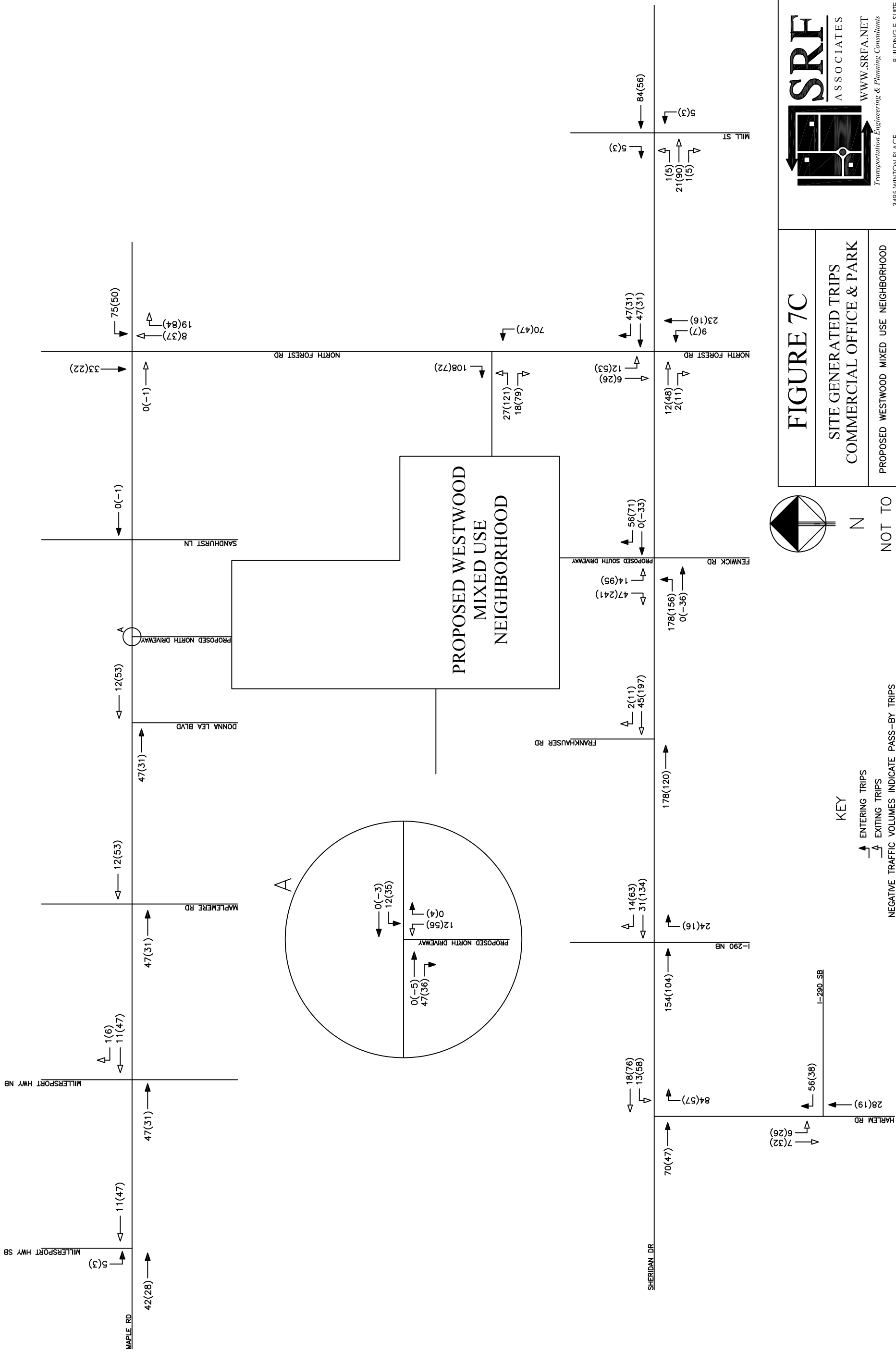
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 ↗ ENTERING TRIPS
 ↘ EXITING TRIPS

FIGURE 7A
 SITE GENERATED TRIPS
 HOTEL
 PROPOSED WESTWOOD MIXED USE NEIGHBORHOOD
 TOWN OF AMHERST, NEW YORK







KEY
 ▲ ENTERING TRIPS
 △ EXITING TRIPS
 NEGATIVE TRAFFIC VOLUMES INDICATE PASS-BY TRIPS

FIGURE 7C
 SITE GENERATED TRIPS
 COMMERCIAL OFFICE & PARK
 PROPOSED WESTWOOD MIXED USE NEIGHBORHOOD
 TOWN OF AMHERST, NEW YORK

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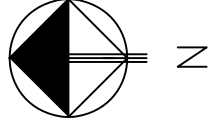
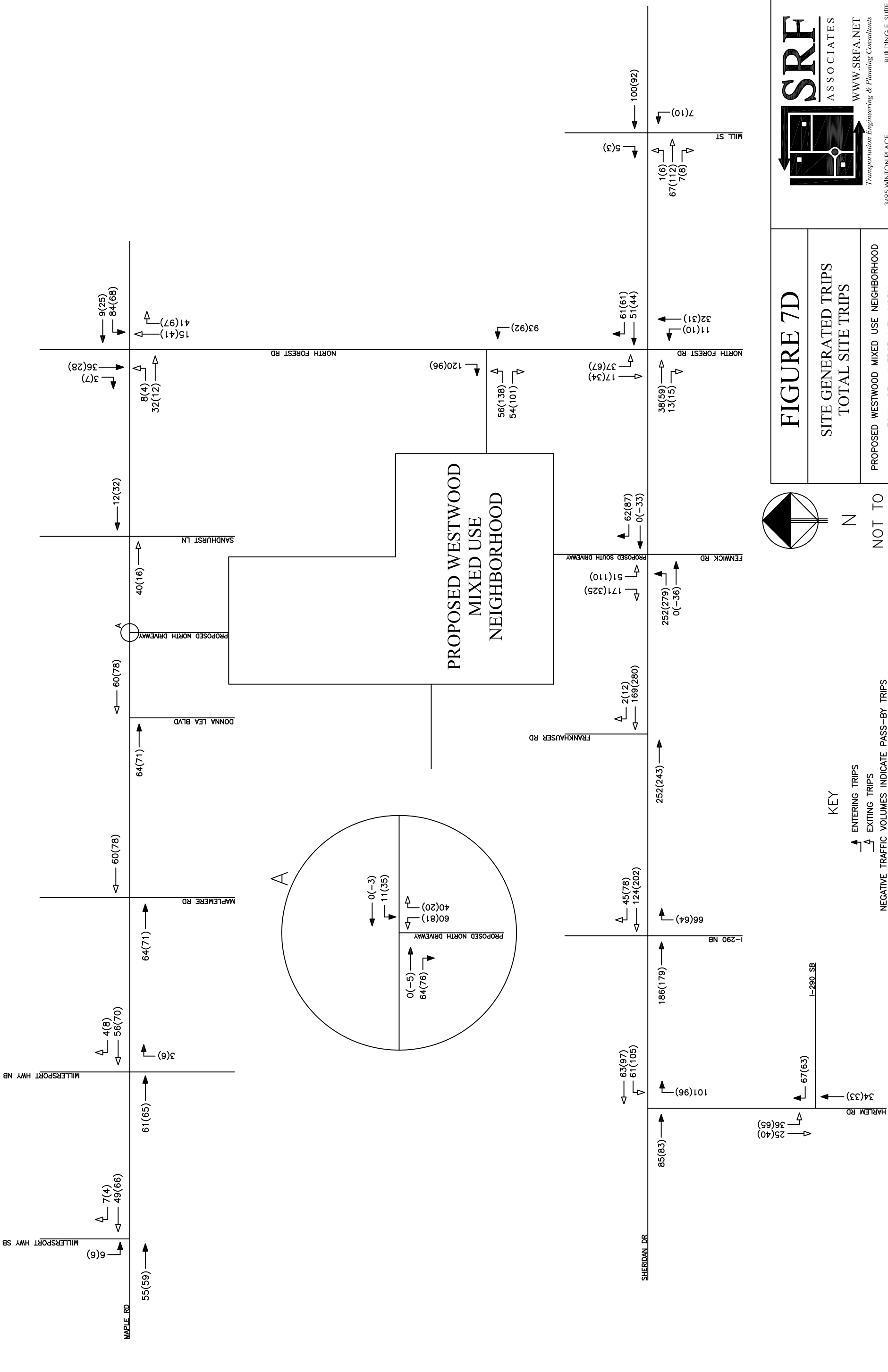
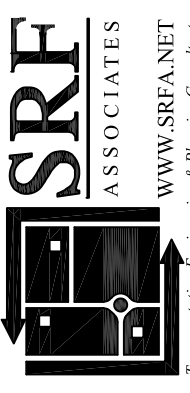


FIGURE 7D

**SITE GENERATED TRIPS
TOTAL SITE TRIPS**

PROPOSED WESTWOOD MIXED USE NEIGHBORHOOD
TOWN OF AMHERST, NEW YORK



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NEGATIVE TRAFFIC VOLUMES INDICATE PASS-BY TRIPS

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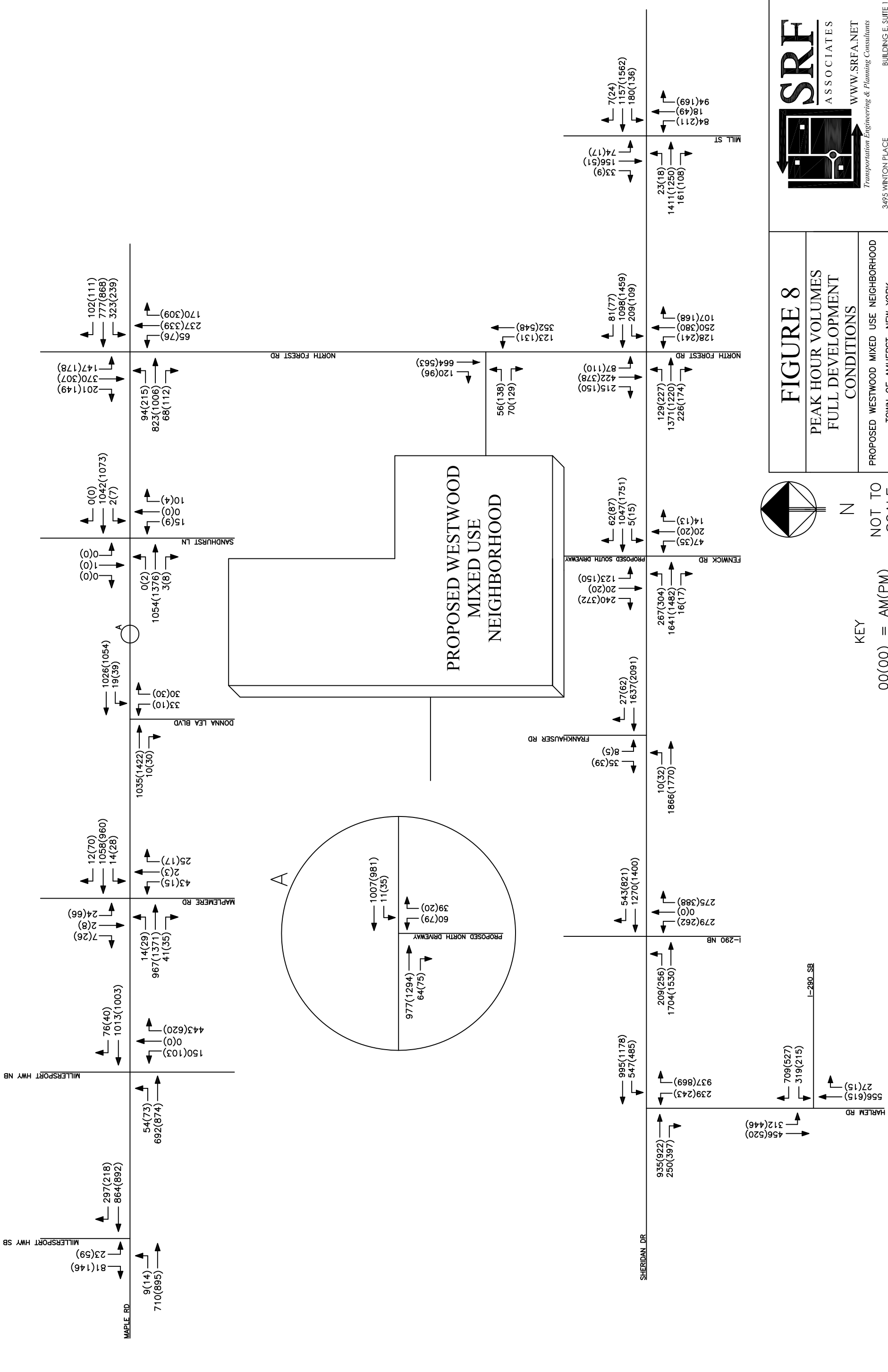
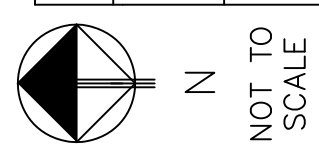


FIGURE 8
PEAK HOUR VOLUMES
FULL DEVELOPMENT
CONDITIONS
PROPOSED WESTWOOD MIXED USE NEIGHBORHOOD
TOWN OF AMHERST, NEW YORK



NOT TO SCALE

KEY
00(00) = AM(PM)