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HARTZ

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February 9, 2022

Via Hand Delivery

Mayor Prunty and Township Committee
Cranford Township
8 Springfield Avenue
Cranford, New Jersey 07016-0543

Re: 750 Walnut Avenue Redevelopment Plan Compliance Review

Dear Mayor Prunty and Members of the Township Committee,

On behalf of Hartz Mountain Industries, Inc., we submit nine (9) copies of each of the following documents for review by the Township Committee acting as redevelopment entity on behalf of Cranford Township, pursuant to Section 5.6.B of the Redevelopment Plan for property at 750 Walnut Avenue:

- Boundary and Topographic Survey prepared by Control Layouts, Inc., dated July 2, 2021 (3 sheets)
- Preliminary Subdivision Plan prepared by Control Layouts, Inc., dated November 15, 2021 (1 sheet)
- Civil Site Plan set prepared by Stonefield Engineering & Design, dated January 12, 2022 (16 sheets)
- Landscape Design Plan set prepared by Arterial, dated January 28, 2022 (17 sheets)
- Architectural Plan set (residential) prepared by Minno Wasko, dated January 28, 2022 (13 sheets)
- Architectural Plan set (commercial) prepared by Vincent Antonacci, Jr., dated January 14, 2022 (2 sheets)
- Traffic Impact Study prepared by Stonefield Engineering & Design, dated February 2, 2022

Please note that copies of the foregoing are being sent directly to the Township's planning and engineering consultants.

RECEIVED
FEB 10 2022
TOWNSHIP CLERK

We request the opportunity to present the project plans to the Township Committee at the Committee's earliest convenience.

Thank you.

Very truly yours,

HARTZ MOUNTAIN INDUSTRIES, INC.

James P. Rhatican
Vice President of Land Use and Development
Assistant General Counsel

Enc.
cc: Ryan Cooper, Esq. (via hand delivery)(w/enc.)
Michael Ash, Esq. (via Federal Express)(w/enc.)
Annie Hindenlang AICP, P.P. (via Federal Express)(w/enc.)
Maurice Rached, P.E. (via Federal Express)(w/enc.)
Henry Kent-Smith, Esq. (via Federal Express)(w/enc.)

TRAFFIC IMPACT STUDY

PROPOSED RESIDENTIAL & INDUSTRIAL DEVELOPMENT

Proposed Residential &
Industrial Development

Block 541, Lot 2
Township of Cranford,
Union County, New Jersey

Prepared For:
Hartz Mountain Industries Inc.

February 2, 2022
SE&D Job No. T-16509

John R. Corak, PE
Project Manager
NJ P.E. License #54973

Matthew J. Seckler, PE, PP, PTOE
Principal
NJ P.E. License #48731

STONEFIELD

92 Park Avenue, Rutherford, NJ 07070

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EXECUTIVE SUMMARY

This Traffic Impact Study was prepared for the proposed residential and industrial development located along Walnut Avenue in the Township of Cranford, Union County, New Jersey:

1. The proposed residential and industrial development is located along Walnut Avenue southbound, bounded by the Consolidated Rail Corporation Main Stem to the north and the Hyatt Hills Golf Complex to the south, in the Township of Cranford, Union County, New Jersey. The existing site is occupied by an approximate 315,000-square-foot office building. Under the proposed development program, the existing structures would be razed, and two (2) residential buildings consisting of 250 total residential dwelling units would be constructed on the southerly portion of the property and two (2) flex buildings totaling 241,200 square feet would be constructed on the northerly portion of the property.

2. Access is presently provided via two (2) full-movement driveways along Walnut Avenue. Access to the residential portion of the site is proposed via one (1) full-movement driveway that would serve as the fourth leg of the intersection of Walnut Avenue and Behnert Place and one (1) right-out only driveway along Walnut Avenue. Access to the industrial portion of the site is proposed via one (1) full-movement driveway serving as the fourth leg of the intersection of Walnut Avenue and Lexington Avenue.

3. Turning movement counts were conducted at 12 intersections throughout the Township of Cranford and Clark Township on Thursday, November 18, 2021 and Saturday, November 20, 2021.

4. The turning movement counts conducted were compared to pre-pandemic counts to compare the traffic volume difference at the intersection of Walnut Avenue and Raritan Road. The as-counted traffic volumes were within 10% of the increased 2016 turning movement counts and as such, no adjustments were made to the turning movement counts.

5. The proposed mixed-use development is expected to generate significantly less trips compared to the existing office building during the weekday morning and weekday evening peak hours.

6. Slight signal timing mitigations are proposed at the intersection of Central Avenue and Raritan Road during the weekday evening and Saturday midday peak hours.

7. A right-turn gap study was conducted at the intersection of Chester Lang Place and Walnut Avenue in order to assess the number of gaps in traffic for vehicles to turn from Chester Lang

Place onto Walnut Avenue. It was found that a sufficient number of gaps are available along Walnut Avenue to accommodate the projected turning movements from Chester Lang Place.

8. Based on the proximity of the intersection of Walnut Avenue and Raritan Road, it is anticipated that gaps created by the adjacent signalized intersection will provide ample opportunity for turning movements out of the site driveways. During the critical weekday evening peak hour, it is calculated that there would be approximately one (1) left-turn every 5.5 minutes from the residential site driveway and one (1) left-turn every 2.5 minutes from the industrial site driveway. As such, the proposed development would not have a significant adverse impact on the adjacent roadway network

9. Traffic calming measures are proposed within the residential community to discourage drivers from utilizing the residential side streets as a cut-through. Specifically, all-way stop-controlled intersections are proposed at the intersection of Lexington Avenue and Behnert Place and at the intersection of Lexington Avenue and Colin Kelly Street. Speed humps are also proposed along Lexington Avenue and Mohawk Drive.

10. The possibility of shifting the industrial site driveway approximately 100 feet to the south was observed and analyzed. The turning movements at the unsignalized intersection of Walnut Avenue and the offset industrial site driveway would operate at improved Levels of Service compared to the current Build Condition. Union County standards recommend aligning new streets or driveways with existing streets or driveways and, if the driveway is not aligned, recommends a 150-foot offset between the site driveway and opposite street. A driveway shift would also misalign the internal drive aisles on-site and would introduce hooking left-turns between the driveway and Lexington Avenue. To remain consistent with Union County standards and avoid potential safety hazards on and off the site, the proposed industrial site driveway is recommended to be aligned with Lexington Avenue.

11. A traffic signal was observed and analyzed at the intersection of Walnut Avenue, Behnert Place, and the residential site driveway. A traffic signal warrant analysis was conducted, and it was found that Warrants 1-3 were not met during any of the peak hours studied. The traffic volumes generated by the proposed development would not have a significant impact on the traffic operations of the existing intersection. As such, a traffic signal is not recommended at the Walnut Avenue, Behnert Place, and residential site driveway intersection. It is proposed to align the residential site driveway with Behnert Place, as the traffic calming measures proposed within the residential neighborhood would deter vehicles from using the intersection as a cut-through.

INTRODUCTION

This Traffic Impact Study was prepared to investigate the potential impacts of the proposed residential and industrial development on the adjacent roadway network. The subject property is located along Walnut Avenue southbound, bounded by the Consolidated Rail Corporation Main Stem to the north and the Hyatt Hills Golf Complex to the south, in the Township of Cranford, Union County, New Jersey. The site location is shown on appended **Figure 1**.

The subject property is designated as Block 541, Lot 2 as depicted on the Township of Cranford Tax Map. The site has approximately 2,292 feet of frontage along Walnut Avenue. The existing site is occupied by an approximate 315,000-square-foot office building. Access is presently provided via two (2) full-movement driveways along Walnut Avenue. Under the proposed development program, the existing structures would be razed, and two (2) residential buildings consisting of 250 total residential dwelling units would be constructed on the southerly portion of the property and two (2) flex buildings totaling 241,200 square feet would be constructed on the northerly portion of the property. Access to the residential portion of the site is proposed via one (1) full-movement driveway that would serve as the fourth leg of the intersection of Walnut Avenue and Behnert Place and one (1) right-out only driveway along Walnut Avenue. Access to the industrial portion of the site is proposed via one (1) full-movement driveway serving as the fourth leg of the intersection of Walnut Avenue and Lexington Avenue.

METHODOLOGY

Stonefield Engineering & Design, LLC has prepared this Traffic Impact Study in accordance with the recommended guidelines and practices outlined by the Institute of Transportation Engineers (ITE) within Transportation Impact Analyses for Site Development. A detailed field investigation was performed to assess the existing conditions of the adjacent roadway network. A data collection effort was completed to identify the existing traffic volumes at the study intersections to serve as a base for the traffic analyses. Capacity analysis, a procedure used to estimate the traffic-carrying ability of roadway facilities over a range of defined operating conditions, was performed using the Highway Capacity Manual, 6th Edition (HCM) and the Synchro 10 Software for all study conditions to assess the roadway operations.

For an unsignalized intersection, Level of Service (LOS) A indicates operations with delay of less than 10 seconds per vehicle, while LOS F describes operations with delay in excess of 50 seconds per vehicle. For a signalized intersection, LOS A indicates operations with delay of less than 10 seconds per vehicle, while LOS F describes operations with delay in excess of 80 seconds per vehicle. The Technical Appendix contains the Highway Capacity Analysis Detail Sheets for the study intersections analyzed in this assessment. The traffic

signal timing utilized within the signalized analysis is based on field recordings and timing directives provided from the Traffic Impact Study prepared by Langan, dated March 20, 2017.

EXISTING CONDITION

EXISTING ROADWAY CONDITIONS

The proposed residential and industrial development is located along Walnut Avenue southbound, bounded by the Consolidated Rail Corporation Main Stem to the north and the Hyatt Hills Golf Complex to the south, in the Township of Cranford, Union County, New Jersey. The subject property is designated as Block 541, Lot 2 as depicted on the Township of Cranford Tax Map. The site has approximately 2,292 feet of frontage along Walnut Avenue. Land uses in the area are a mix of residential, retail, commercial, and industrial uses.

Walnut Avenue (County Road 632) is classified as an Urban Minor Arterial roadway with a general north-south orientation and is under the jurisdiction of Union County. Along the site frontage, the roadway provides one (1) lane of travel in each direction, with additional turning lanes provided at key intersections to facilitate turning movements and provide additional capacity. Walnut Avenue has a posted speed limit of 35 mph. Curb and sidewalk are provided along both sides of the roadway, shoulders are provided along both sides of the roadway, and on-street parking is permitted along the easterly side of the roadway. Walnut Avenue provides north-south mobility throughout the Township of Cranford and surrounding municipalities and provides access to NJSH Route 28 to the north of the site for a mix of residential, retail, commercial, and industrial uses along its length.

Raritan Road (County Road 607) is classified as an Urban Minor Arterial roadway with a general east-west orientation and is under the jurisdiction of Union County. In the vicinity of the site, the roadway provides one (1) lane of travel in each direction to the east of Walnut Avenue and two (2) lanes of travel in each direction to the west of Walnut Avenue with additional lanes provided at key intersections to facilitate turning movements and provide additional capacity. Raritan Road has a posted speed limit of 35 mph. Curb and sidewalk are provided along both sides of the roadway, shoulders are provided along both sides of the roadway to the east of Walnut Avenue, and on-street parking is not permitted. Raritan Road provides east-west mobility throughout Township of Cranford and surrounding municipalities for a mix of residential, retail, and commercial uses along its length.

Lincoln Avenue East is classified as an Urban Major Collector roadway with a general east-west orientation and is under the jurisdiction of the Township of Cranford. In the vicinity of the site, the roadway provides one (1) lane of travel in each direction and has a posted speed limit of 25 mph. Curb and sidewalk are provided

along both sides of the roadway, shoulders are not provided, and on-street parking is not permitted. Lincoln Avenue East provides east-west mobility throughout the Township of Cranford and surrounding municipalities for a mix of residential, religious, and recreational uses along its length.

Chester Lang Place is a local roadway with a general east-west orientation and is under the jurisdiction of the Township of Cranford. In the vicinity of the site, the roadway provides one (1) lane of travel for each direction and has a posted speed limit of 15 mph. Curb and sidewalk are provided along both sides of the roadway, shoulders are not provided, and on-street parking is permitted along both sides of the roadway. Chester Lang Place provides mobility from Walnut Avenue at its easterly terminus to Lexington Avenue at its southerly terminus for predominantly residential uses along its length.

Lexington Avenue is a local roadway with a general east-west orientation and is under the jurisdiction of the Township of Cranford. In the vicinity of the site, the roadway provides one (1) lane of travel in each direction and has a posted speed limit of 25 mph. Curb and sidewalk are generally provided along both sides of the roadway, shoulders are not provided, and on-street parking is permitted along both sides of the roadway. Lexington Avenue provides east-west mobility from Raritan Road at its easterly terminus to Walnut Avenue at its westerly terminus for predominantly residential uses along its length.

Behnert Place is a local roadway with a general east-west orientation and is under the jurisdiction of the Township of Cranford. In the vicinity of the site, the roadway provides one (1) lane of travel in each direction. Curb and sidewalk are provided along both sides of the roadway, shoulders are not provided, and on-street parking is permitted along both sides of the roadway. Behnert Place provides east-west mobility from Lexington Avenue at its easterly terminus to Walnut Avenue at its westerly terminus for predominantly residential uses along its length.

Mitchell Place is a local roadway with a general east-west orientation and is under the jurisdiction of the Township of Cranford. In the vicinity of the site, the roadway provides one (1) lane of travel in each direction. Curb and sidewalk are provided along both sides of the roadway, shoulders are not provided, and on-street parking is permitted along both sides of the roadway. Mitchell Place provides east-west mobility from MacArthur Street at its easterly terminus to Walnut Avenue at its westerly terminus for predominantly residential uses along its length.

Florence Drive is a local roadway with a general east-west orientation and is under the jurisdiction of Clark Township. In the vicinity of the site, the roadway provides one (1) lane of travel in the eastbound/southbound direction. Curb and sidewalk are provided along both sides of the roadway, shoulders are not provided, and on-street parking is permitted along both sides of the roadway. Florence Drive provides one-way mobility connecting to Walnut Avenue at its terminuses for predominantly residential uses along its length.

Central Avenue is classified as an Urban Principal Arterial roadway with a general north-south orientation and is under the jurisdiction of Union County. In the vicinity of the site, the roadway provides two (2) lanes of travel in each direction, separated by a two-way left-turn lane, with additional lanes provided at key intersections to facilitate turning movements and provide additional capacity. Central Avenue has a posted speed limit of 25 mph. Curb and sidewalk are provided along both sides of the roadway, shoulders are not provided, and on-street parking is not permitted. Central Avenue provides east-west mobility throughout the City of Clark and surrounding municipalities and provides access to the Garden State Parkway to the south of the site and provides access to NJSH Route 28 to the north of the site for a mix of residential, retail, and commercial, uses along its length.

Shoprite Way is a local roadway with a general north-south orientation and is under the jurisdiction of Clark Township. In the vicinity of the site, the roadway provides one (1) lane of travel in each direction. Curb is provided along both sides of the roadway, sidewalk is provided along the northerly side of the roadway, shoulders are not provided, and on-street parking is not permitted. Shoprite Way provides mobility from Raritan Road at its northerly terminus to the ShopRite parking lot at its southerly terminus.

New York Avenue is classified as a local roadway with a general east-west orientation and is under the jurisdiction of the Township of Cranford. New York Avenue becomes Colin Kelly Court to the north of Raritan Road. In the vicinity of the site, the roadway provides one (1) lane of travel in each direction. Curb is provided along both sides of the roadway, sidewalk and shoulders are not provided, and on-street parking is permitted along both sides of the roadway. New York Avenue provides one-way mobility north south mobility from Raritan Road at ither northerly terminus to its southerly terminus for predominantly residential uses along its length. It is noted that New York Avenue is gated at its southerly terminus and does not provide a connection to the Garden State Parkway.

Walnut Avenue and Lincoln Avenue intersect to form a four (4)-leg intersection controlled by a four (4)-phase traffic signal operating on a 90-second fixed background cycle. The eastbound and westbound approaches of Lincoln Avenue each provide one (1) exclusive left-turn lane and one (1) shared through/right-turn lane. The northbound approach of Walnut Avenue provides one (1) exclusive left-turn lane and one (1) shared through/right-turn lane and the southbound approach of Walnut Avenue provides one (1) full-movement lane. Crosswalks and pedestrian signals are provided across each of the intersection legs.

Walnut Avenue and Chester Lang Place intersect to form an unsignalized T-intersection with the eastbound approach of Chester Lang Place operating under stop control. The eastbound approach of Chester Lang Place provides one (1) left-turn/right-turn lane. The northbound approach of Walnut Avenue provides one (1) shared

left-turn/through lane and the southbound approach of Walnut Avenue provides one (1) shared through/right-turn lane. Crosswalks are provided across the western and northern legs of the intersection.

Walnut Avenue and Lexington Avenue intersect to form an unsignalized T-intersection with the westbound approach of Lexington Avenue operating under stop control. The westbound approach of Lexington Avenue provides one (1) shared left-turn/right-turn lane. The northbound approach of Walnut Avenue provides one (1) shared through/right-turn lane and the southbound approach of Walnut Avenue provides one (1) shared left-turn/through lane. A crosswalk is provided across the eastern leg of the intersection.

Walnut Avenue and Behnert Place intersect to form an unsignalized T-intersection with the westbound approach of Behnert Place operating under stop control. The westbound approach of Behnert Place provides one (1) shared left-turn/right-turn lane. The northbound approach of Walnut Avenue provides one (1) shared through/right-turn lane and the southbound approach of Walnut Avenue provides one (1) shared left-turn/through lane. Crosswalks are not provided.

Walnut Avenue and Mitchell Place intersect to form an unsignalized T-intersection with the westbound approach of Mitchell Place operating under stop control. The westbound approach of Mitchell Place provides one (1) shared left-turn/right-turn lane. The northbound approach of Walnut Avenue provides one (1) shared through/right-turn lane and the southbound approach of Walnut Avenue provides one (1) shared left-turn/through lane. Crosswalks are not provided

Raritan Road and Walnut Avenue intersect to form a four (4)-leg intersection controlled by a four (4)-phase traffic signal operating on a variable cycle length. The eastbound and westbound approaches of Raritan Road each provide one (1) exclusive left-turn lane, one (1) exclusive through lane, and one (1) shared through/right-turn lane. The northbound approach of Walnut Avenue provides one (1) exclusive left-turn lane, one (1) exclusive through lane, and one (1) exclusive right-turn lane and the southbound approach of Walnut Avenue provides one (1) exclusive left-turn lane, one (1) exclusive through lane, and one (1) shared through/right-turn lane. Crosswalks and pedestrian signals are provided across each of the intersection legs.

Walnut Avenue and Florence Drive intersect to form an unsignalized T-intersection. The northbound approach of Raritan Road provides two (2) exclusive through lanes and one (1) shared through/right-turn lane and the southbound approach of Walnut Avenue provides one (1) shared left-turn/through lane and one (1) exclusive through lane. Florence Drive provides one (1) receiving lane.

Raritan Road, New York Avenue, and Colin Kelly Court intersect to form an unsignalized four (4)-leg intersection with the northbound approach of New York Avenue and southbound approach of Colin Kelly Court operating under stop control. The eastbound approach of Raritan Road provides one (1) shared left-

turn/through lane and one (1) shared through/right-turn lane and the westbound approach of Raritan Road provides one (1) full-movement lane. The northbound approach of New York Avenue provides one (1) full-movement lane. The southbound approach of Colin Kelly Court provides one (1) full-movement lane. Crosswalks are provided across the northern and western legs of the intersection.

Raritan Road, Shoprite Way, and the shopping center driveway intersect to form a four (4)-leg intersection controlled by a three (3)-phase traffic signal operating on a 75-second fixed background cycle. The eastbound and westbound approaches of Raritan Road each provide one (1) exclusive left-turn lane, one (1) exclusive through lane, and one (1) shared through/right-turn lane. The northbound approach of Shoprite Way provides one (1) shared left-turn/through lane and one (1) exclusive right-turn lane. The southbound approach of the shopping center driveway provides one (1) full-movement lane. Crosswalks and pedestrian signals are provided across the eastern and southern legs of the intersection.

Raritan Road and Central Avenue intersected to form a four (4)-leg intersection controlled by a four (4)-phase traffic signal operating on a 150-second fixed background cycle. The eastbound and westbound approaches of Raritan Road each provide one (1) exclusive left-turn lane, two (2) exclusive through lanes, and one (1) exclusive right-turn lane. The northbound approach of Central Avenue provides two (2) exclusive left-turn lanes, two (2) exclusive through lanes, and one (1) channelized right-turn lane and the southbound approach of Central Avenue provides two (2) exclusive left-turn lanes, one (1) exclusive through lane, and one (1) shared through/right-turn lane. Crosswalks and pedestrian signals are provided across each of the intersection legs.

2021 EXISTING TRAFFIC VOLUMES

Turning movement counts were collected during the typical weekday morning, weekday evening, and Saturday midday time periods to evaluate existing traffic conditions and identify the specific hours when traffic activity on the adjacent roadways is at a maximum and could be potentially impacted by the development of the site. Turning movement counts were collected at the following intersections:

- Intersection of Lincoln Avenue and Walnut Avenue
- Intersection of Chester Lang Place and Walnut Avenue
- Intersection of Lexington Avenue and Walnut Avenue
- Intersection of Walnut Avenue and the northerly site driveway
- Intersection of Behnert Place and Walnut Avenue
- Intersection of Mitchell Place and Walnut Avenue
- Intersection of Walnut Avenue and the southerly site driveway
- Intersection of Raritan Road and Walnut Avenue

- Intersection of Florence Drive and Walnut Avenue
- Intersection of Raritan Road, New York Avenue, and Colin Kelly Court
- Intersection of Raritan Road, Shoprite Way, and the shopping center driveway
- Intersection of Raritan Road and Central Avenue

Specifically, turning movement counts were conducted on the following dates and during the following times:

- Thursday, November 18, 2021, from 7:00 a.m. to 9:00 a.m. and from 4:00 p.m. to 7:00 p.m.
- Saturday, November 20, 2021, from 11:00 a.m. to 2:00 p.m.

The study time periods were chosen as they are representative of the peak periods of both the adjacent roadway network and the proposed development. The traffic volume data was collected and analyzed to identify the design peak hour in accordance with HCM and ITE guidelines. Based on the review of the count data the weekday morning peak hour occurred from 7:45 a.m. to 8:45 a.m.; the weekday evening peak hour occurred from 4:45 p.m. to 5:45 p.m.; and the Saturday midday peak hour occurred from 11:45 a.m. to 12:45 p.m. The Technical Appendix contains a summary of the turning movement count data.

TRAFFIC VOLUME COMPARISON

The 2021 turning movement counts at the intersection of Walnut Avenue and Raritan Road were compared to turning movement counts collected at the intersection on October 25, 2016 to compare the traffic volume difference at the intersection. Specifically, the total intersection weekday morning and weekday evening peak hour traffic volumes were compared between the 2016 and 2021 turning movement counts. The 2016 traffic volumes were increased by 0.5% for five (5) years in accordance with North Jersey Transportation Planning Authority Demographic Forecasts to calculate the 2021 traffic volumes. **Table 1** compares the 2016 increased traffic volumes and 2021 as-counted traffic volumes.

TABLE 1 – TRAFFIC VOLUME COUNT COMPARISON

Land Use	2016 TMC	2021 Increased TMC	2021 As-Counted TMC	Percent Difference
Weekday Morning Peak Hour	2493	2556	2408	-6.1%
Weekday Evening Peak Hour	3209	3290	3389	+3.0%

As shown in Table 1, the as-counted traffic volumes were within 10% of the increased 2016 turning movement counts. As such, no adjustments were made to the as counted traffic volumes. The 2021 Existing weekday morning, weekday evening, and Saturday midday peak-hour volumes are summarized on appended **Figure 2**.

2021 EXISTING LOS/CAPACITY ANALYSIS

A Level of Service and Volume/Capacity analysis was conducted for the 2021 Existing Condition during the weekday morning, weekday evening, and Saturday midday peak hours at the study intersections and existing site driveways. Under the existing conditions, the signalized intersection of Lincoln Avenue and Walnut Avenue is calculated to operate at overall Level of Service C during the peak hours studied. The signalized intersection of Raritan Road and Walnut Avenue is calculated to operate at overall Level of Service C during the peak hours studied. The signalized intersection of Raritan Road, Shoprite Way, and the shopping center driveway is calculated to operate at overall Level of Service A during the weekday morning peak hour and overall Level of Service B during the weekday evening and Saturday midday peak hours. The signalized intersection of Raritan Road and Central Avenue is calculated to operate at overall Level of Service D during the weekday morning and weekday evening peak hours and overall Level of Service E during the Saturday midday peak hour. The eastbound left-turn movement, westbound left-turn movement, and northbound left-turn movement are calculated to operate under capacity constraints during the peak hours studied. The eastbound left-turn movement at the intersection Walnut Avenue and Chester Lang Place is calculated to operate under capacity constraints during the weekday evening peak hour. The remaining turning movements at the unsignalized intersections throughout the roadway network are calculated to operate at acceptable Levels of Service.

2023 NO-BUILD CONDITION

BACKGROUND GROWTH

The 2021 Existing Condition traffic volume data was grown to a future horizon year of 2023, which is a conservative estimate for when the proposed residential and industrial development is expected to be fully constructed. In accordance with industry guidelines, the existing traffic volumes at the study intersections were increased by 1.00% annually for two (2) years. The 1.00% background growth rate was obtained from NJ: the New Jersey Department of Transportation (NJDOT) Annual Background Growth Rate Table.

OTHER PLANNED DEVELOPMENT PROJECTS

To evaluate the future traffic conditions, it is important to consider the potential site-generated traffic of other projects that could influence the traffic volume at the study intersections. Other planned development projects include those that are either in the entitlement process or have recently been approved for building permits in proximity to the proposed development. Based on the Township of Cranford Planning Board meeting minutes and agendas, there are no planned development projects within the area of the subject site. As such, the application of the background growth rate would be adequate to account for background traffic growth.

2023 NO-BUILD TRAFFIC VOLUMES

The background growth rate was applied to the 2021 Existing Traffic Volumes to calculate the 2023 No-Build Traffic Volumes for the weekday morning, weekday evening, and Saturday midday peak hours. These volumes are summarized on appended **Figure 3**.

2023 NO-BUILD LOS/CAPACITY ANALYSIS

A Level of Service and Volume/Capacity analysis was also conducted for the 2023 No-Build Condition during the weekday morning, weekday evening, and Saturday midday peak hours at the study intersections and existing site driveways. The signalized intersection of Lincoln Avenue and Walnut Avenue is calculated to operate generally consistent with the findings of the Existing Condition during the studied peak hours. The signalized intersection of Raritan Road and Walnut Avenue is calculated to operate generally consistent with the findings of the Existing Condition during the studied peak hours. The signalized intersection of Raritan Road, Shoprite Way, and the shopping center driveway is calculated to operate generally consistent with the findings of the Existing Condition during the studied peak hours. The signalized intersection of Raritan Road and Central Avenue is calculated to operate generally consistent with the findings of the Existing Condition during the studied peak hours. The eastbound left-turn movement, westbound left-turn movement, and northbound left-turn movement are calculated to operate under capacity constraints during the peak hours studied. The eastbound left-turn movement at the intersection Walnut Avenue and Chester Lang Place is calculated to operate under capacity constraints during the weekday evening peak hour. The remaining turning movements at the unsignalized intersections throughout the roadway network are calculated to operate at acceptable Levels of Service.

2023 BUILD CONDITION

The site-generated traffic volume of the proposed residential and industrial development was estimated to identify the potential impacts of the project. For the purpose of this analysis, a complete project "build out" is assumed within two (2) years of the preparation of this study.

TRIP GENERATION

Trip generation projections for the existing office building and proposed residential and industrial development were prepared utilizing the ITE's Trip Generation Manual, 11th Edition. Trip generation rates associated with Land Use 710 "General Office Building" were cited for the existing 315,000-square-foot office building. Trip generation rates associated with Land Use 130 "Industrial Park" and Land Use 221 "Multifamily Housing (Mid-Rise)" were cited for the proposed development consisting of 241,200 square feet of industrial space and 250 residential dwelling units, respectively. It is noted that ITE's Trip Generation Manual, 11th Edition

only provides two (2) data points for the Saturday midday peak hour. As such, 10% of the daily Saturday trip generation was utilized for this analysis. To provide a conservative analysis, no trip reduction was applied for the existing uses on site. **Table 2** provides the weekday morning and weekday evening peak hour trip generation volumes associated with the proposed development.

TABLE 2 – PROPOSED TRIP GENERATION

	Weekday Morning Peak Hour			Weekday Evening Peak Hour			Saturday Midday Peak Hour		
Land Use	**Enter**	**Exit**	**Total**	**Enter**	**Exit**	**Total**	**Enter**	**Exit**	**Total**
Existing 315,000 SF General Office Building *ITE Land Use 710*	421	58	479	77	377	454	90	77	167
Proposed 241,200 SF Industrial Park *ITE Land Use 130*	66	16	82	18	64	82	31	30	61
Proposed 250 Unit Multifamily Housing (Mid-Rise) *ITE Land Use 221*	21	72	93	59	39	98	50	48	98
Total	**87**	**88**	**175**	**77**	**103**	**180**	**81**	**78**	**159**
Trip Generation Difference	**-344**	**+30**	**-304**	**0**	**-274**	**-274**	**-9**	**+1**	**-8**

As shown in Table 1, the proposed development is expected to generate 175 trips during the weekday morning peak hour, 180 trips during the weekday evening peak hour, and 159 trips during the Saturday midday peak hour. The proposed development is expected to generate 304 less trips during the weekday morning peak hour, 274 less trips during the weekday evening peak hour, and eight (8) less trips during the Saturday midday peak hour compared to the existing office building. It is noted that the existing traffic volumes at the site driveways were removed from the roadway network. These volumes are summarized in appended **Figure 4**.

TRIP ASSIGNMENT/DISTRIBUTION

The trips generated by the proposed development were distributed according to Journey-To-Work Models prepared for the site using 2010 census data. The Township of Cranford was used as a place of residence for the residential portion of the site and used as a place of work for the industrial portion of the site to determine the trip assignment along the adjacent roadway network. The methodology used in the preparation of the Journey-To-Work Model utilizes the location of resident's jobs and the location of employee's homes identified through 2010 Census Data published by the US Census Bureau, divided by municipality, in the surrounding area to determine the trip distribution. The Journey-To-Work Models,

restricted to the top 25 surrounding municipalities, is in the Appendix. The results of the Journey-To-Work Model for the residential portion of the site and the industrial portion of the site were used to distribute the site-generated traffic along the adjacent roadway network and are summarized in **Tables 3** and **4**, respectively. **Figures 5** and **6** illustrate the Residential Site-Generated Traffic Volumes and Industrial Site-Generated Traffic Volumes, respectively. The Total Site-Generated Traffic Volumes are shown on appended **Figure 7.**

TABLE 3 – RESIDENTIAL JOURNEY-TO-WORK MODEL TRIP DISTRIBUTION

Destination	To	Origin	From
To GSP North – Raritan Road	28%	From GSP South – Central Avenue	55%
To GSP North – Central Avenue	28%	From Northwest – Lincoln Avenue	7%
To Northwest – Chester Lang Place	13%	From Northeast – Lincoln Avenue	10%
To Northeast – Lincoln Avenue	10%	From North – Lincoln Avenue	6%
To North - Lincoln Avenue	6%	From East – Raritan Road	3%
To South – Walnut Avenue	13%	From South – Walnut Avenue	12%
To West – Raritan Road	2%	From Northwest – Chester Lang Place	5%
		From West – Raritan Road	2%
TOTAL	**100%**	**Total**	**100%**

TABLE 4 – INDUSTRIAL JOURNEY-TO-WORK MODEL TRIP DISTRIBUTION

Destination	To	Origin	From
To GSP North – Raritan Road	19%	From GSP South – Central Avenue	28%
To GSP North – Central Avenue	19%	From Northwest – Lincoln Avenue	6%
To Northwest – Chester Lang Place	11%	From Northeast – Lincoln Avenue	24%
To Northeast – Lincoln Avenue	24%	From North – Lincoln Avenue	3%
To North - Lincoln Avenue	3%	From East – Raritan Road	19%
To South – Walnut Avenue	22%	From South – Walnut Avenue	12%
To West – Raritan Road	2%	From Northwest – Chester Lang Place	6%
		From West – Raritan Road	2%
TOTAL	**100%**	**Total**	**100%**

2023 BUILD TRAFFIC VOLUMES

The site-generated trips were added to the 2023 No-Build Traffic Volumes to calculate the 2023 Build Traffic Volumes and are shown on appended **Figure 8.**

2023 BUILD LOS/CAPACITY ANALYSIS

A Level of Service and Volume/Capacity analysis was also conducted for the 2023 Build Condition during the weekday morning, weekday evening, and Saturday midday peak hours at the study intersections and

proposed site driveways. Appended **Table A1** compares the Existing, No-Build, and Build Conditions Level of Service and delay values.

The signalized intersection of Lincoln Avenue and Walnut Avenue is calculated to operate generally consistent with the findings of the No-Build Condition during the peak hours studied. The signalized intersection of Raritan Road and Walnut Avenue is calculated to operate at overall Level of Service C during the weekday morning and Saturday midday peak hours and at overall Level of Service D during the weekday evening peak hour. The signalized intersection of Raritan Road, Shoprite Way, and the shopping center driveway is calculated to operate generally consistent with the findings of the No-Build Condition during the peak hours studied. The signalized intersection of Raritan Road and Central Avenue is calculated to operate at overall Level of Service D during the weekday morning peak hour and at overall Level of Service E during the weekday evening and Saturday midday peak hours. The eastbound left-turn movement, westbound left-turn movement, and northbound left-turn movement are calculated to operate under capacity constraints during the peak hours studied.

The eastbound left-turn/right-turn movement at the intersection of Walnut Avenue and Chester Lang Place is calculated to operate under capacity constraints during the weekday evening peak hour. The eastbound left-turn/through/right-turn movement at the intersection of Walnut Avenue, Lexington Avenue, and the industrial site driveway is calculated to operate under capacity constraints during the weekday evening peak hour. The eastbound left-turn/through/right-turn movement at the intersection of Walnut Avenue, Behnert Place, and the northerly residential site driveway is calculated to operate under capacity constraints during the weekday evening peak hour.

POTENTIAL DRIVEWAY MITIGATIONS

HCM methodology considers each intersection as part of an independent network, and queuing and platooning associated with adjacent intersections is not considered within the HCM analysis. Based on the proximity of the intersection of Walnut Avenue and Raritan Road, it is anticipated that gaps created by the adjacent signalized intersection will provide ample opportunity for turning movements out of the site driveways. During the weekday evening peak hour, there are a total 11 left-turns from the residential site driveway onto Walnut Avenue and a total 24 left-turns from the industrial site driveway onto Walnut Avenue. This equates to approximately one (1) left-turn every 5.5 minutes from the residential site driveway and one (1) left-turn every 2.5 minutes from the industrial site driveway. As such, the proposed development would not have a significant adverse impact on the adjacent roadway network.

The possibility of shifting the industrial site driveway approximately 100 feet to the south was observed and analyzed. It is noted that a shift of the industrial site driveway to form an unsignalized T-intersection with

Walnut Avenue would remove conflicting turning movements between Lexington Avenue and industrial site driveway. The turning movements at the unsignalized intersection of Walnut Avenue and the offset industrial site driveway would operate at Level of Service C or better during the weekday morning and Saturday midday peak hours and Level of Service D or better during the weekday evening peak hour. It is noted that Union County standards recommend aligning new streets or driveways with existing streets or driveways, similar to the alignment proposed for the industrial site driveway. For a nonaligned driveway, Union County standards recommend a 150-foot offset between the site driveway and opposite street. A driveway shift would also misalign the internal drive aisles on-site and would introduce hooking left-turns between the driveway and Lexington Avenue. To remain consistent with Union County standards and avoid potential safety hazards on and off the site, the proposed industrial site driveway is recommended to be aligned with Lexington Avenue.

A traffic signal was observed and analyzed at the intersection of Walnut Avenue, Behnert Place, and the residential site driveway. A traffic signal warrant analysis was conducted during the weekday morning, weekday evening, and Saturday midday peak hours using the Manual on Uniform Traffic Control Devices (MUTCD) published by the Federal Highway Administration (FHWA). It was found that Warrants 1-3 (8-hour Warrant, 4-hour Warrant, and Peak Hour Warrant) were not met during any of the peak hours studied. The traffic signal warrant calculations can be found in the Technical Appendix. The traffic volumes generated by the proposed development would not have a significant impact on the traffic operations of the existing intersection movements. As such, a traffic signal is not recommended at the Walnut Avenue, Behnert Place, and residential site driveway intersection. It is proposed to align the residential site driveway with Behnert Place, as the traffic calming measures proposed within the residential neighborhood would deter vehicles from using the intersection as a cut-through.

SIGNAL TIMING MITIGATIONS

Under the 2023 Build Condition, the eastbound left-turn and westbound left-turn movements at the intersection of Raritan Road and Central Avenue are calculated to operate under capacity constraints and increase delay during the weekday morning and weekday evening peak hours. To mitigate the impacts of the proposed development, signal timing changes are recommended at the intersection. Specifically, three (3) seconds of green time during the weekday evening peak hour and one (1) second of green time during the Saturday midday peak hour would be reallocated from the eastbound/westbound through movements to the eastbound/westbound left-turn movements. With the proposed retiming, the turning movements at the intersection would operate generally consistent with the findings in the No-Build Condition.

GAP STUDY ANALYSIS

The eastbound left-turn/right-turn movement at the intersection of Walnut Avenue and Chester Lang Place is calculated to operate under capacity constraints during the weekday morning and weekday evening peak hours. It is noted that 88% of turning movements from Chester Lang Place during the weekday morning peak hour and 97% of the turning movements from Chester Lang Place during the weekday evening peak hour consist of right-turn movements. In order to assess the number of gaps in traffic for vehicles to turn from Chester Lang Place onto Walnut Avenue, a right-turn gap study was conducted at the intersection. Specifically, the gap study was conducted during the critical weekday evening peak hour.

The data was analyzed using minimum gap acceptance rates as specified within the HCM. An available gap, or critical headway, represents the minimum time interval between oncoming vehicles that a motorist will accept to execute a turning movement. The critical headway times utilized in the analysis are specified within HCM for completing a right-turn on a two (2)-lane roadway. Specifically, the base critical headway required for a single vehicle to complete a left-turn is 6.2 seconds, the minimum follow-up headway required for additional vehicles to complete a left-turn is 3.3 seconds per additional vehicle. The gap count summary and analysis results can be found in the Technical Appendix.

Based on the gap count conducted, there would be 432 available gaps in traffic during the critical weekday evening peak hour. It is anticipated that 378 vehicles would make right-turns onto Walnut Avenue from Chester Lang Place. As such, there would be a sufficient number of available gaps along Walnut Avenue to accommodate the projected turning movements from Chester Lang Place. It is noted that the weekday evening peak hour is the critical peak hour. As such, it is expected that the weekday morning and Saturday midday peak hours would provide sufficient gaps in traffic to accommodate the projected turning movements from Chester Lang Place. It is also noted that the proposed development only increases the Chester Lang Avenue traffic volumes by 1% and only increases the Walnut Avenue southbound traffic volume by 3% during the critical weekday evening peak hour.

POTENTIAL TRAFFIC CALMING MEASURES

Based on the percentage of right turns from the residential side-streets onto Walnut Avenue, it is likely that the residential community is used as a cut-through between Walnut Avenue and Raritan Road. As such, traffic calming measures are proposed within the residential community to discourage drivers from utilizing the residential side streets as a cut-through. Specifically, all-way stop-controlled intersections are proposed at the intersection of Lexington Avenue and Behnert Place and at the intersection of Lexington Avenue and Colin Kelly Street. Speed humps are also proposed along Lexington Avenue and Mohawk Drive as potential traffic calming measure. The proposed all-way stop-controlled intersections and speed humps would increase the

travel time utilizing the residential side-streets and would encourage drivers to utilize the county roadways. The Technical Appendix contains a potential Traffic Calming Measures Exhibit.

SITE CIRCULATION/PARKING SUPPLY

A review was conducted of the proposed residential and industrial development using the Site Plan prepared by our office, dated January 12, 2022. In completing this review, particular attention was focused on the site access, circulation, and parking supply.

Under the proposed development plan, the southerly portion of the site would be developed with two (2) residential buildings consisting of 250 total residential dwelling units. Each of the residential buildings would consist of 125 total dwelling units and a ground-floor parking garage. Access to the residential portion of the site is proposed via one (1) full-movement driveway that would serve as the fourth leg of the intersection of Walnut Avenue and Behnert Place and one (1) right-out only driveway along Walnut Avenue. Residential parking would be provided along the drive aisles throughout the site and a surface parking lot would be provided to the east of the proposed buildings. Vehicular circulation throughout the site would be facilitated via a minimum of 24-foot-wide two-way drive aisles.

Under the proposed development plan, the northerly portion of the site would be developed with two (2) flex buildings totaling 241.200 square feet. The northerly building would consist of a 132,000-square-foot flex building and the southerly building would consist of a 109,200-square-foot flex building. Access to the industrial portion of the site is proposed via one (1) full-movement driveway serving as the fourth leg of the intersection of Walnut Avenue and Lexington Avenue. Standard parking spaces would be located along the northern and southern drive aisles. Loading spaces would be located between the two (2) flex buildings. Circulation throughout the site would be facilitated via a minimum of 24-foot-wide two-way drive aisles.

Regarding the parking requirements for the residential portion of the proposed development, the 750 Walnut Avenue Redevelopment Plan requires 1.8 parking spaces per residential dwelling unit. For the proposed development consisting of 250 dwelling units, this equates to 450 required parking spaces. The residential portion of the site would provide 450 parking spaces, inclusive of 16 ADA-accessible spaces, which meets the parking requirement and would be sufficient to support the residential portion of this projects parking demand. The spaces would be nine (9) feet wide by 18 feet deep in accordance with the 750 Walnut Avenue Redevelopment Plan and industry standards.

Regarding the parking requirements for the industrial portion of the proposed development, the Township of Cranford Ordinance requires one (1) space per 4,000 square feet of flex building space and one (1) space per 250 square feet of office space. It is assumed that 10% of the proposed flex buildings would consist of

office space. As such, the proposed development with 217,080 square feet of industrial space and 24,120 square feet of office space, this equates to 153 required parking spaces. The industrial portion of the site would provide 157 total passenger vehicle parking spaces, which meets the parking requirement and would be sufficient to support the industrial portion of this project's passenger vehicle parking demand. The spaces would be nine 8.5 feet wide by 18 feet deep in accordance with industry standards.

The 750 Walnut Avenue Redevelopment Plan also requires one (1) loading berth per 10,000 square feet of flex building space. For the proposed 241,200 square feet of flex space, this equates to 24 loading berths. The site would provide 32 loading berths with the potential for 78 total loading berths, which meets the requirements and would be sufficient to support the industrial portion of this projects loading demand. The spaces would be nine 13 feet wide by 65 feet deep in accordance with industry standards.

CONCLUSIONS

This report was prepared to examine the potential traffic impact of the proposed residential and industrial development. The proposed mixed-use development would generate significantly less trips compared to the existing office building during the weekday morning and weekday evening peak hours. Slight signal timing mitigations at the signalized intersection of Raritan Road with Central Avenue would improve the overall Levels of Service and individual movement delay compared to the No-Build Condition. The site is not expected to add a significant amount of traffic to the intersection of Walnut Avenue and Chester Lang Place and sufficient gaps in traffic are provided along Walnut Avenue for vehicles turning from Chester Lang Place. As such, the analysis findings, which have been based on industry-standard guidelines, indicate that the proposed development would not have a significant impact on the traffic operations of the adjacent roadway network with the mitigations proposed. The site driveways and on-site layout have been designed to provide for effective access to and from the subject property. Based on industry data, the 750 Walnut Avenue Redevelopment Plan, and local characteristics of the site and surrounding area, the parking supply for both the residential and industrial portions of the development would be sufficient to support this project's parking demand.