City Environmental Quality Review
ENVIRONMENTAL ASSESSMENT STATEMENT (EAS) SHORT FORM

FOR UNLISTED ACTIONS ONLY • *Please fill out and submit to the appropriate agency* (see instructions)

Part I: GENERAL INFORMATION

1. *Does the Action Exceed Any Type I Threshold in 6 NYCRR Part 617.4 or 43 RCNY §6-15(A) (Executive Order 91 of 1977, as amended)?* ☐ YES ☒ NO

If "yes," **STOP** and **complete the FULL EAS FORM**.

2. *Project Name* 2031-2033 Fifth Avenue Rezoning

3. *Reference Numbers*

CEQR REFERENCE NUMBER (to be assigned by lead agency) 17DCP134M	BSA REFERENCE NUMBER (if applicable)
ULURP REFERENCE NUMBER (if applicable) 170442 ZMM; N170443 ZRM; 170444 ZSM	OTHER REFERENCE NUMBER(S) (if applicable) (*e.g.*, legislative intro, CAPA)

4a. *Lead Agency Information*			**4b. *Applicant Information***		
NAME OF LEAD AGENCY New York City Department of City Planning			NAME OF APPLICANT NBT Victory Development LLC		
NAME OF LEAD AGENCY CONTACT PERSON Robert Dobruskin, AICP, Director, EARD			NAME OF APPLICANT'S REPRESENTATIVE OR CONTACT PERSON Howard Goldman		
ADDRESS 120 Broadway, 30th Floor			ADDRESS 475 Park Avenue South		
CITY New York	STATE NY	ZIP 10271	CITY New York	STATE NY	ZIP 10016
TELEPHONE (212) 720-3423	EMAIL rdobrus@planning.nyc.gov		TELEPHONE (212) 935-1622	EMAIL hgoldman@goldmanharris.com	

5. *Project Description*

The applicant is seeking approval of Zoning Map and Zoning Text amendments (the "Proposed Actions"), to develop property located on Block 1750, Lot 1 at 2031-2033 Fifth Avenue. The entire area affected by the Proposed Actions, the rezoning area, is limited to the "development site" (the lot owned by the applicant), which is approximately 16,986 square feet (sf) and has approximately 200 feet of frontage along Fifth Avenue and 85 feet of frontage along both 125th Street and 126th Street.

The proposed rezoning area is located on the western border of the East Harlem neighborhood of Manhattan, Community District 11. The proposal would rezone the existing C4-4A site to the C4-7 a new Subdistrict A within the 125th Street Special District.

The requested actions would facilitate the construction of a new 241,677 gross square-foot (gsf), 20-story (plus mechanical bulkhead) mixed use building that would be developed with space for the National Black Theater (NBT), retail establishments (at the ground and second floor), and residential dwelling units (with an affordability component pursuant to the Mandatory Inclusionary Housing program (MIH)).

See Chapter 1.0, "Project Description," for a description of the proposed actions.

Project Location

BOROUGH Manhattan	COMMUNITY DISTRICT(S) 11	STREET ADDRESS 2031-2033 Fifth Avenue
TAX BLOCK(S) AND LOT(S) Block 1750, Lot 1		ZIP CODE 10035
DESCRIPTION OF PROPERTY BY BOUNDING OR CROSS STREETS Block bound by 125th Street, 126th Street, Fifth Avenue, and Madison Avenue		
EXISTING ZONING DISTRICT, INCLUDING SPECIAL ZONING DISTRICT DESIGNATION, IF ANY C4-4A within Special 125th Street District		ZONING SECTIONAL MAP NUMBER 6a

6. *Required Actions or Approvals* (check all that apply)

***City Planning Commission*:** ☒ YES ☐ NO ☒ UNIFORM LAND USE REVIEW PROCEDURE (ULURP)

☐ CITY MAP AMENDMENT	☒ ZONING CERTIFICATION	☐ CONCESSION
☒ ZONING MAP AMENDMENT	☐ ZONING AUTHORIZATION	☐ UDAAP
☒ ZONING TEXT AMENDMENT	☐ ACQUISITION—REAL PROPERTY	☐ REVOCABLE CONSENT
☐ SITE SELECTION—PUBLIC FACILITY	☐ DISPOSITION—REAL PROPERTY	☐ FRANCHISE
☐ HOUSING PLAN & PROJECT	☐ OTHER, explain:	

☐ SPECIAL PERMIT (if appropriate, specify type: ☐ modification; ☐ renewal; ☐ other); EXPIRATION DATE:

SPECIFY AFFECTED SECTIONS OF THE ZONING RESOLUTION 12-10, 97-31, 97-32, 97-34, 97-423, 98-442, 97-51, 97-511, 97-55, Appendix F, Appendix I

***Board of Standards and Appeals*:** ☐ YES ☒ NO

☐ VARIANCE (use)

☐ VARIANCE (bulk)

☐ SPECIAL PERMIT (if appropriate, specify type: ☐ modification; ☐ renewal; ☐ other); EXPIRATION DATE:

SPECIFY AFFECTED SECTIONS OF THE ZONING RESOLUTION

***Department of Environmental Protection*:** ☐ YES ☒ NO If "yes," specify:

Other City Approvals Subject to CEQR (check all that apply)

☐ LEGISLATION	☐ FUNDING OF CONSTRUCTION, specify:
☐ RULEMAKING	☐ POLICY OR PLAN, specify:
☐ CONSTRUCTION OF PUBLIC FACILITIES	☐ FUNDING OF PROGRAMS, specify:
☐ 384(b)(4) APPROVAL	☐ PERMITS, specify:
☐ OTHER, explain:	

Other City Approvals Not Subject to CEQR (check all that apply)

☐ PERMITS FROM DOT'S OFFICE OF CONSTRUCTION MITIGATION AND COORDINATION (OCMC)	☐ LANDMARKS PRESERVATION COMMISSION APPROVAL
	☐ OTHER, explain:

***State or Federal Actions/Approvals/Funding*:** ☐ YES ☒ NO If "yes," specify:

7. *Site Description:* *The directly affected area consists of the project site and the area subject to any change in regulatory controls. Except where otherwise indicated, provide the following information with regard to the directly affected area.*

***Graphics*:** *The following graphics must be attached and each box must be checked off before the EAS is complete. Each map must clearly depict the boundaries of the directly affected area or areas and indicate a 400-foot radius drawn from the outer boundaries of the project site. Maps may not exceed 11 x 17 inches in size and, for paper filings, must be folded to 8.5 x 11 inches.*

☒ SITE LOCATION MAP	☒ ZONING MAP	☒ SANBORN OR OTHER LAND USE MAP
☒ TAX MAP	☐ FOR LARGE AREAS OR MULTIPLE SITES, A GIS SHAPE FILE THAT DEFINES THE PROJECT SITE(S)	

☒ PHOTOGRAPHS OF THE PROJECT SITE TAKEN WITHIN 6 MONTHS OF EAS SUBMISSION AND KEYED TO THE SITE LOCATION MAP

Physical Setting (both developed and undeveloped areas)

Total directly affected area (sq. ft.): 16,986 Waterbody area (sq. ft) and type: 0

Roads, buildings, and other paved surfaces (sq. ft.): 0 Other, describe (sq. ft.): 0

8. *Physical Dimensions and Scale of Project* (if the project affects multiple sites, provide the total development facilitated by the action)

SIZE OF PROJECT TO BE DEVELOPED (gross square feet): 241,677

NUMBER OF BUILDINGS: 1 GROSS FLOOR AREA OF EACH BUILDING (sq. ft.): 241,677

HEIGHT OF EACH BUILDING (ft.): 240 NUMBER OF STORIES OF EACH BUILDING: 20

Does the proposed project involve changes in zoning on one or more sites? ☒ YES ☐ NO

If "yes," specify: The total square feet owned or controlled by the applicant: 16,986

The total square feet not owned or controlled by the applicant: 0

Does the proposed project involve in-ground excavation or subsurface disturbance, including, but not limited to foundation work, pilings, utility lines, or grading? ☒ YES ☐ NO

If "yes," indicate the estimated area and volume dimensions of subsurface permanent and temporary disturbance (if known):

AREA OF TEMPORARY DISTURBANCE: 16,986 sq. ft. (width x length) VOLUME OF DISTURBANCE: 271,776 cubic ft. (width x length x depth)

AREA OF PERMANENT DISTURBANCE: 16,986 sq. ft. (width x length)

Description of Proposed Uses (please complete the following information as appropriate)				
	Residential	***Commercial***	***Community Facility***	***Industrial/Manufacturing***
Size (in gross sq. ft.)	180,669	32,783	28,225	0
Type (*e.g.,* retail, office, school)	240 units	Retail	Theater	n/a

Does the proposed project increase the population of residents and/or on-site workers? ☒ YES ☐ NO

If "yes," please specify: NUMBER OF ADDITIONAL RESIDENTS: 502 NUMBER OF ADDITIONAL WORKERS: 0

Provide a brief explanation of how these numbers were determined: CT 198 average household size of 2.09, 240 units

Does the proposed project create new open space? ☐ YES ☒ NO If "yes," specify size of project-created open space: sq. ft.

Has a No-Action scenario been defined for this project that differs from the existing condition? ☒ YES ☐ NO

If "yes," see Chapter 2, "Establishing the Analysis Framework" and describe briefly: See Project Description

9. *Analysis Year* CEQR Technical Manual Chapter 2

ANTICIPATED BUILD YEAR (date the project would be completed and operational): 2020

ANTICIPATED PERIOD OF CONSTRUCTION IN MONTHS: 24

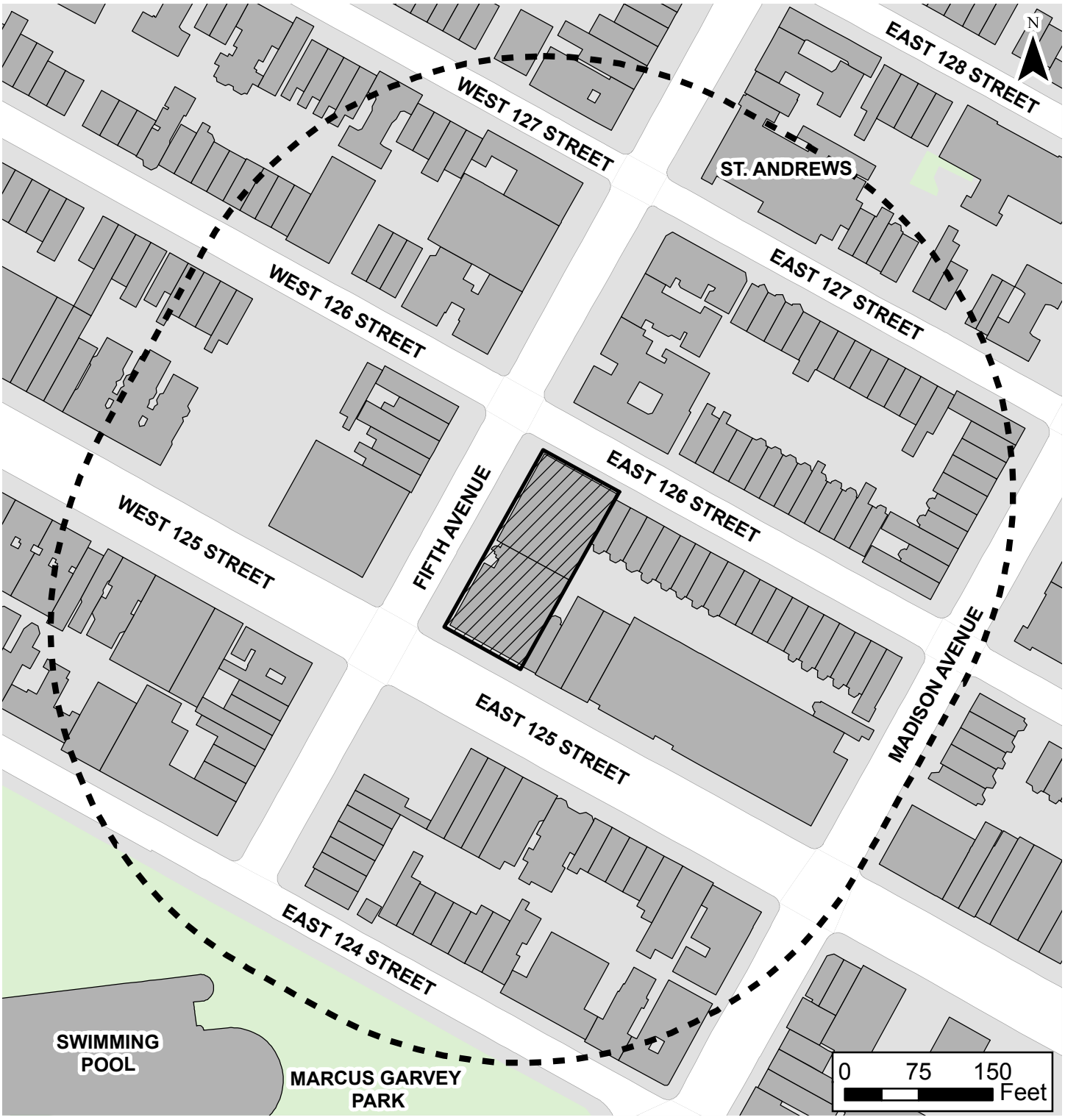
WOULD THE PROJECT BE IMPLEMENTED IN A SINGLE PHASE? ☒ YES ☐ NO IF MULTIPLE PHASES, HOW MANY?

BRIEFLY DESCRIBE PHASES AND CONSTRUCTION SCHEDULE: Assuming that the proposed actions are effective in 2018, the build year for the proposed project is 2020. Redevelopment of the project site is expected to commence by early 2018 and be completed by 2020, assuming a construction period of up to 24 months (3-4 months for demolition, excavation and foundation work, 9-10 months for building superstructure and exterior work, and 9-10 months for interior fit-out work).

10. *Predominant Land Use in the Vicinity of the Project* (check all that apply)

☒ RESIDENTIAL ☐ MANUFACTURING ☒ COMMERCIAL ☐ PARK/FOREST/OPEN SPACE ☐ OTHER, specify:

Date: 2/22/2017



2031-2033 Fifth Avenue
New York, New York

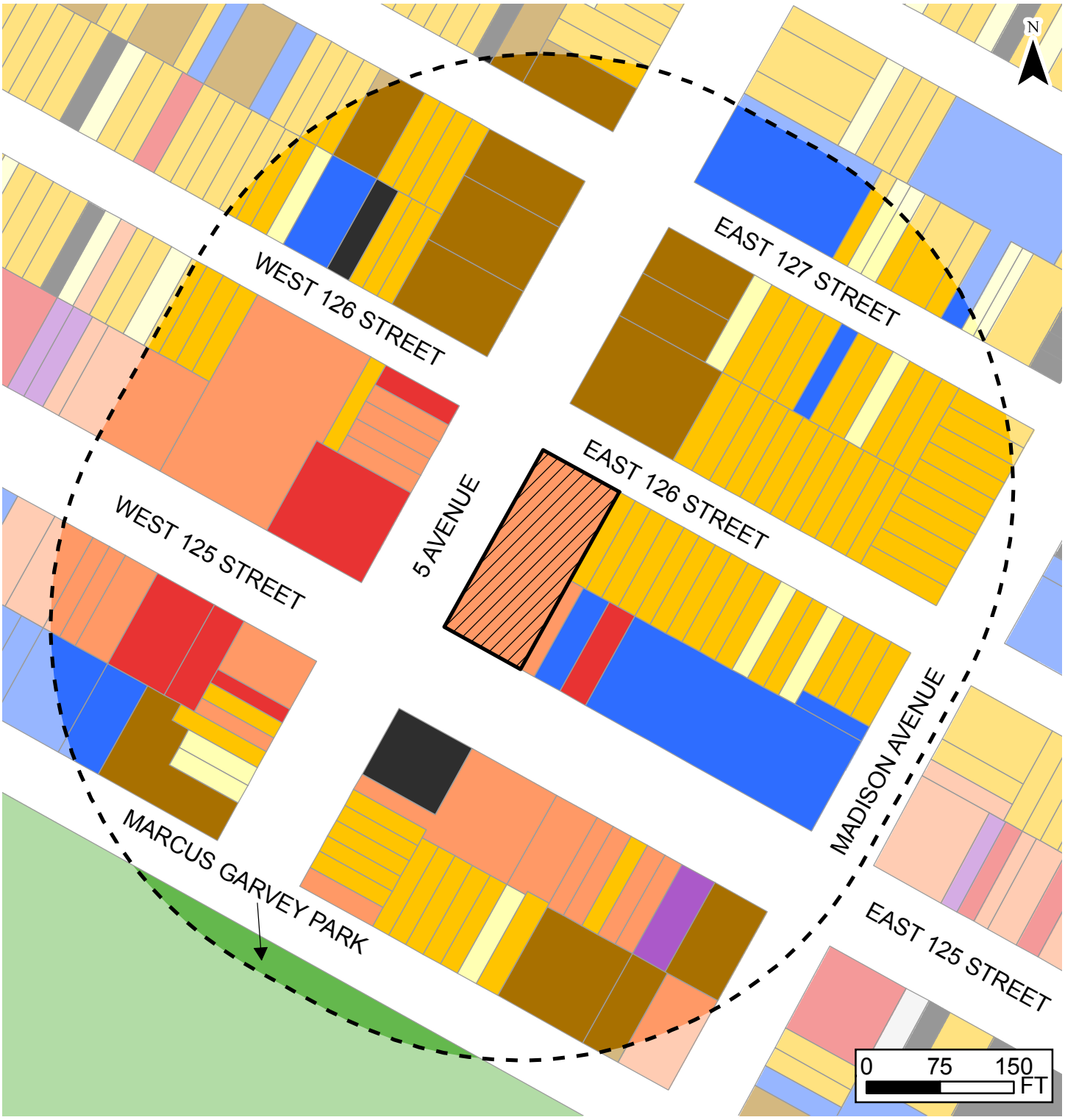
Site Location

Figure 1

Project Site

400-Foot Study Area Radius

Sources:



2031-2033 Fifth Avenue
New York, New York

Land Use

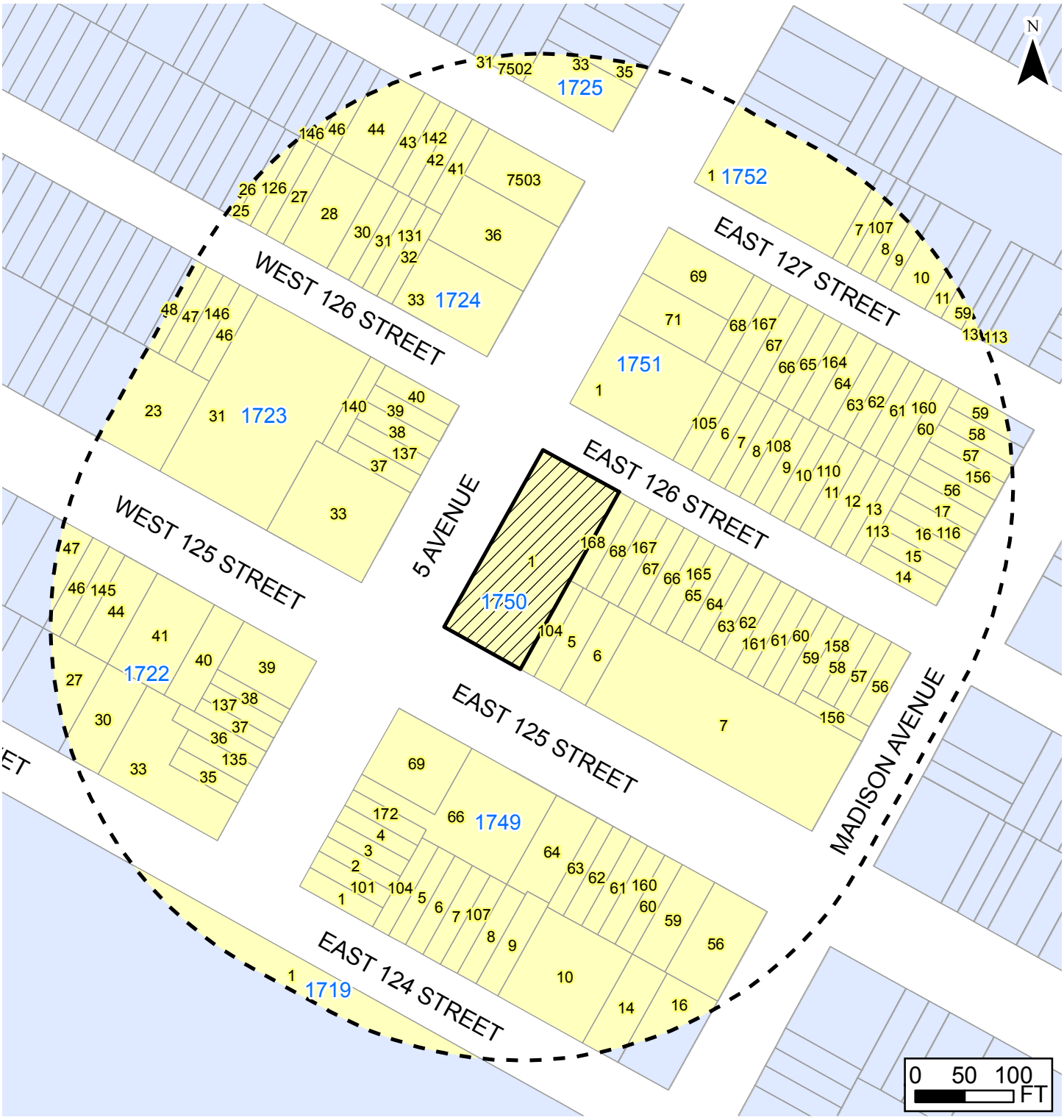
Figure 2

- Project Site
- 400-Foot Study Area Radius
- One & Two Family Buildings
- MultiFamily Walkup Buildings
- MultiFamily Elevator Buildings
- Mixed Commercial/Residential Buildings
- Commercial/Office Buildings
- Industrial/Manufacturing
- Transportation/Utility
- Public Facilities & Institutions
- Open Space
- Parking Facilities
- Vacant Land

Sources:

1. New York (City). Dept. of City Planning 2015. Manhattan MapPLUTO (Edition 15v1). New York City: NYC Department of City Planning.
2. New York (City). Dept. of City Planning 2015. LION (Edition 15B). New York City: NYC Department of City Planning.
3. New York (City). Dept. of City Planning 2015. New York City Borough Boundary (Edition 15B). New York City: NYC Department of City Planning.
4. New York (City). Dept. of City Planning 2015. New York City Community Districts (Edition 15B). New York City: NYC Department of City Planning.
5. New York (City). Dept. of City Planning 2015. NYC GIS Zoning Features (September 2015). New York City: NYC Department of City Planning.

Date: 6/14/2016



2031-2033 Fifth Avenue
New York, New York

Tax Map

Figure 3

Project Site

400-Foot Study Area Radius

16 Tax Lot

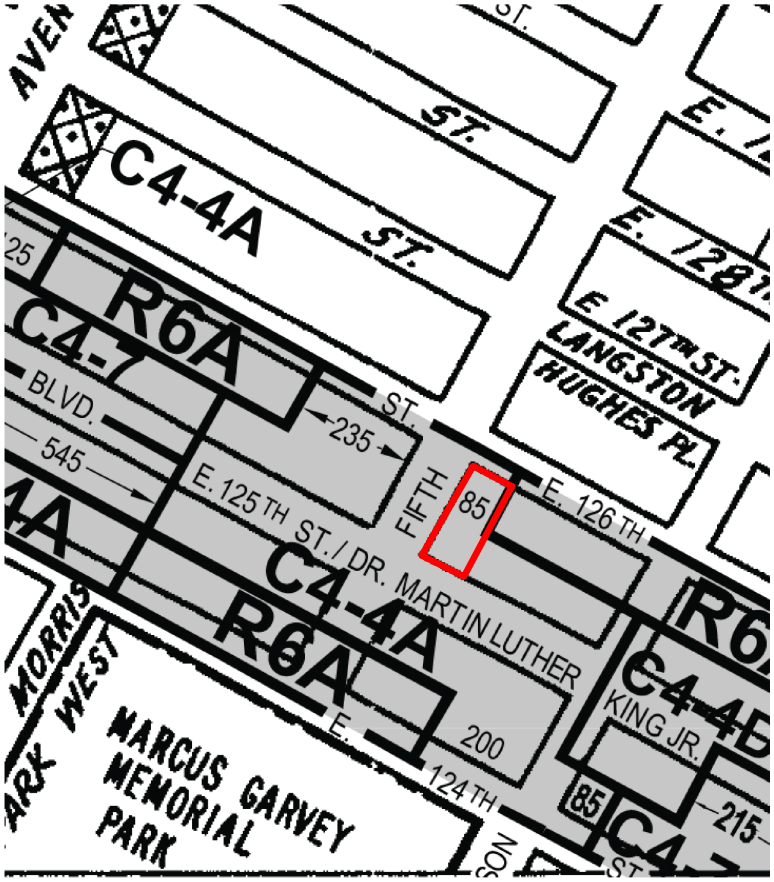
723 Tax Block

Sources:
1. New York (City). Dept. of City Planning 2015. Manhattan MapPLUTO (Edition 15v1). New York City: NYC Department of City Planning.
2. New York (City). Dept. of City Planning 2015. LION (Edition 15B). New York City: NYC Department of City Planning.
3. New York (City). Dept. of City Planning 2015. New York City Borough Boundary (Edition 15B). New York City: NYC Department of City Planning.
4. New York (City). Dept. of City Planning 2015. New York City Community Districts (Edition 15B). New York City: NYC Department of City Planning.
5. New York (City). Dept. of City Planning 2015. NYC GIS Zoning Features (September 2015). New York City: NYC Department of City Planning.

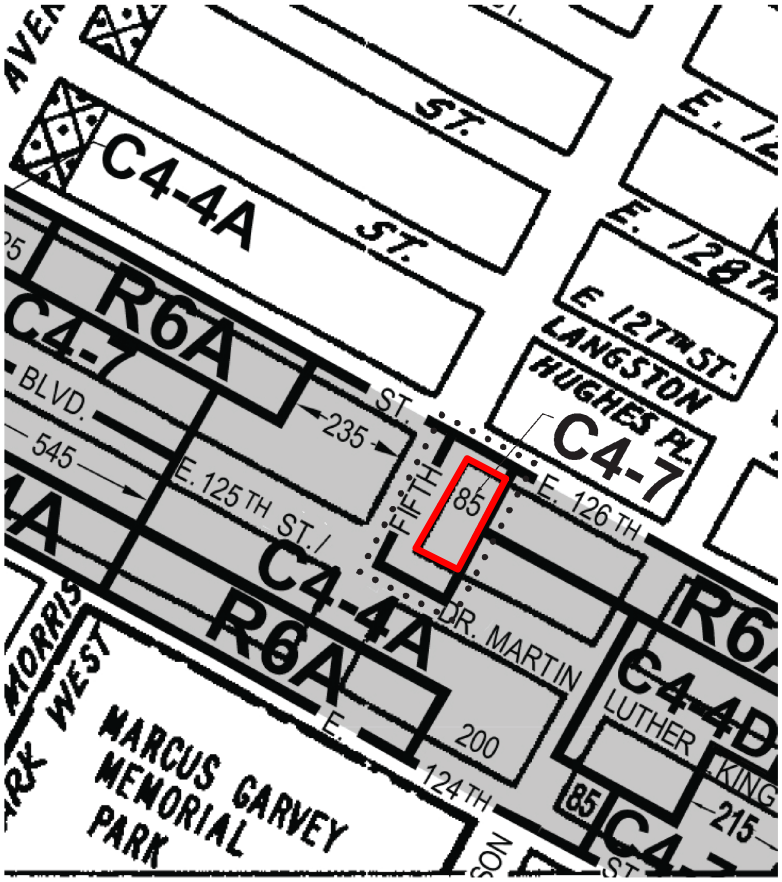
C1-1 C1-2 C1-3 C1-4 C1-5 C2-1 C2-2 C2-3 C2-4 C2-5

NOTE: Where no dimensions for zoning district boundaries appear on the zoning maps, such dimensions are determined in Article VII, Chapter 6 (Location of District Boundaries) of the Zoning Resolution.

ZONING CHANGE MAP



CURRENT ZONING MAP



PROPOSED ZONING MAP - Area being rezoned is outlined with dotted lines.
Changing a C4-4A district to a C4-7 district.

N

Note: Zoning Map exceprted from the City of the New York Zoning Map, Panel No. 6a

Project Site

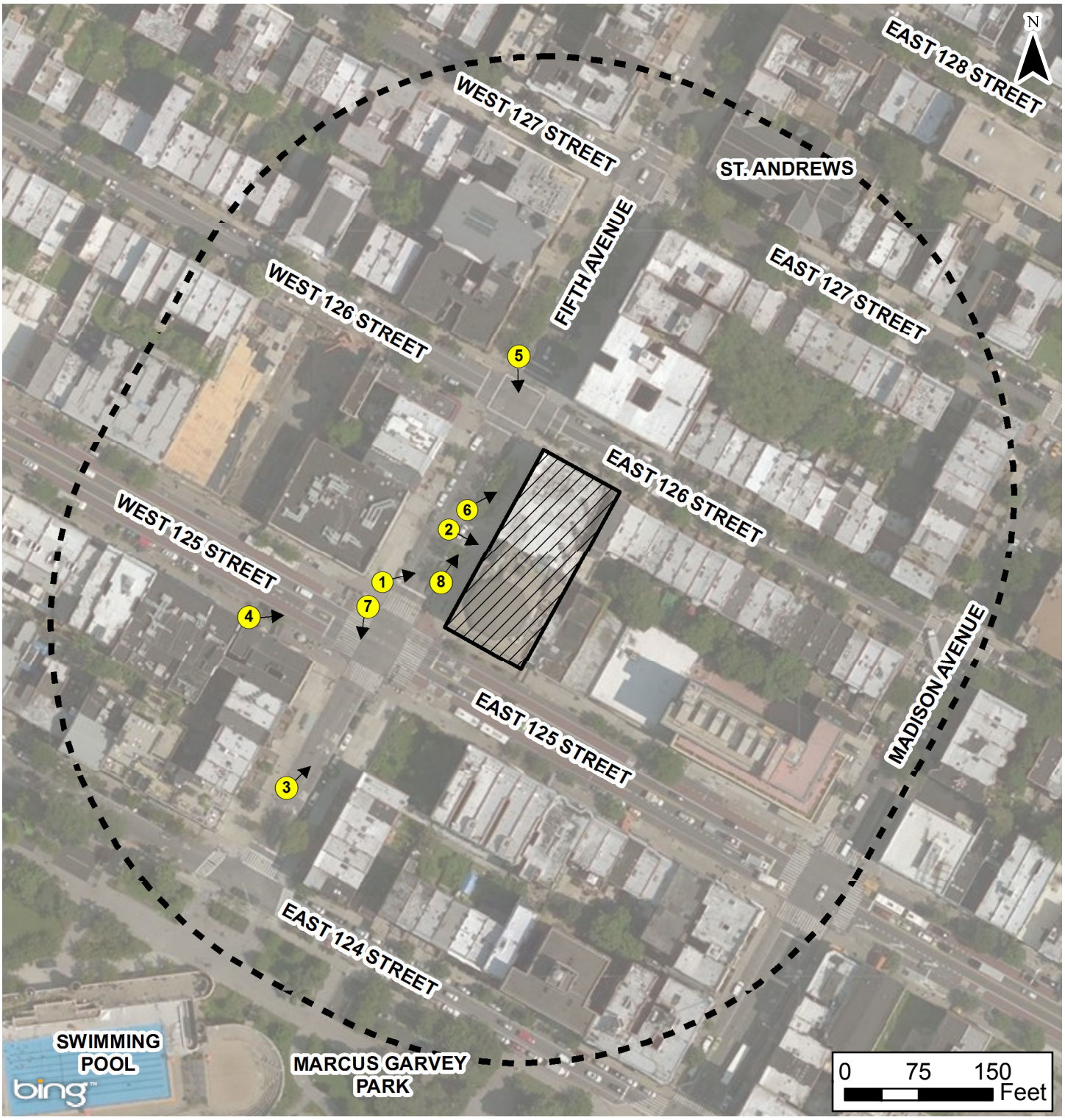
2031-2033 Fifth Avenue
New York, New York

Current and Proposed Zoning

Figure 4

vhb

Date: 2/22/2017



2031-2033 Fifth Avenue
New York, New York

Photograph Location Map

Figure 5

Project Site

400-Foot Study Area Radius

1 Photograph Location

Photo 1

View of Existing Building
Fifth Avenue frontage



Photo 2

View of National Black
Theatre entrance



2031-2033 Fifth Avenue
New York, New York

Views of Project Site and Study Area

Figure **5a**

Photo 3

View of Existing Building looking north on Fifth Avenue



Photo 4

View of Existing Building looking east on 125th Street



2031-2033 Fifth Avenue
New York, New York

Views of Project Site and Study Area

Figure **5b**

Photo 5

View of Existing Building looking southeast on 126th Street



Photo 6

View of Existing Building looking north on Fifth Avenue



2031-2033 Fifth Avenue
New York, New York

Views of Project Site and Study Area

Figure **5c**

Photo 7

View of Fifth Avenue and Marcus Garvey Park looking south on 125th Street

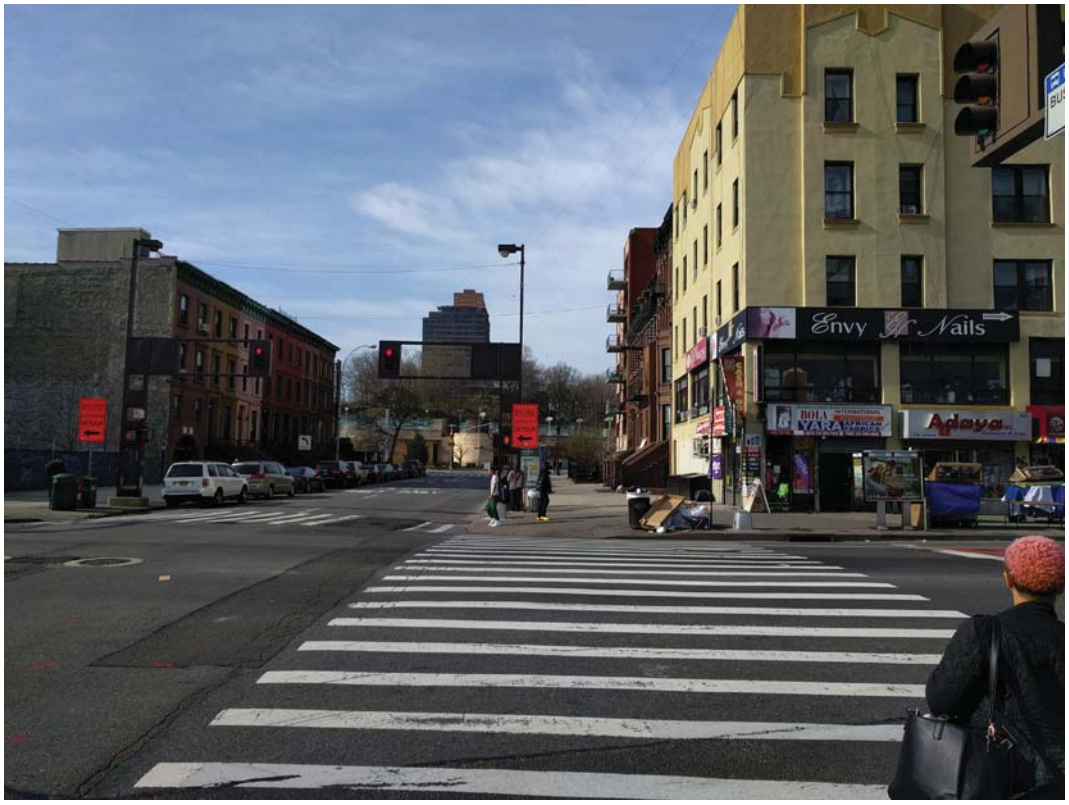


Photo 8

View of Fifth Avenue looking north on Fifth Avenue



2031-2033 Fifth Avenue
New York, New York

Views of Project Site and Study Area

Figure **5d**

Part II: TECHNICAL ANALYSIS

INSTRUCTIONS: For each of the analysis categories listed in this section, assess the proposed project's impacts based on the thresholds and criteria presented in the CEQR Technical Manual. Check each box that applies.

- If the proposed project can be demonstrated not to meet or exceed the threshold, check the "no" box.
- If the proposed project will meet or exceed the threshold, or if this cannot be determined, check the "yes" box.
- For each "yes" response, provide additional analyses (and, if needed, attach supporting information) based on guidance in the CEQR Technical Manual to determine whether the potential for significant impacts exists. Please note that a "yes" answer does not mean that an EIS must be prepared—it means that more information may be required for the lead agency to make a determination of significance.
- The lead agency, upon reviewing Part II, may require an applicant to provide additional information to support the Short EAS Form. For example, if a question is answered "no," an agency may request a short explanation for this response.

	YES	NO
1. *LAND USE, ZONING, AND PUBLIC POLICY*: CEQR Technical Manual Chapter 4		
(a) Would the proposed project result in a change in land use different from surrounding land uses?	☒	☐
(b) Would the proposed project result in a change in zoning different from surrounding zoning?	☒	☐
(c) Is there the potential to affect an applicable public policy?	☒	☐
(d) If "yes," to (a), (b), and/or (c), complete a preliminary assessment and attach. See attached		
(e) Is the project a large, publicly sponsored project?	☐	☒
o If "yes," complete a PlaNYC assessment and attach.		
(f) Is any part of the directly affected area within the City's Waterfront Revitalization Program boundaries?	☐	☒
o If "yes," complete the Consistency Assessment Form.		
2. *SOCIOECONOMIC CONDITIONS*: CEQR Technical Manual Chapter 5		
(a) Would the proposed project:		
o Generate a net increase of 200 or more residential units?	☒	☐
o Generate a net increase of 200,000 or more square feet of commercial space?	☐	☒
o Directly displace more than 500 residents?	☐	☒
o Directly displace more than 100 employees?	☐	☒
o Affect conditions in a specific industry?	☐	☒
3. *COMMUNITY FACILITIES*: CEQR Technical Manual Chapter 6		
(a) Direct Effects		
o Would the project directly eliminate, displace, or alter public or publicly funded community facilities such as educational facilities, libraries, hospitals and other health care facilities, day care centers, police stations, or fire stations?	☐	☒
(b) Indirect Effects		
o **Child Care Centers:** Would the project result in 20 or more eligible children under age 6, based on the number of low or low/moderate income residential units? (See Table 6-1 in Chapter 6)	☐	☒
o **Libraries:** Would the project result in a 5 percent or more increase in the ratio of residential units to library branches? (See Table 6-1 in Chapter 6)	☐	☒
o **Public Schools:** Would the project result in 50 or more elementary or middle school students, or 150 or more high school students based on number of residential units? (See Table 6-1 in Chapter 6)	☐	☒
o **Health Care Facilities and Fire/Police Protection:** Would the project result in the introduction of a sizeable new neighborhood?	☐	☒
4. *OPEN SPACE*: CEQR Technical Manual Chapter 7		
(a) Would the proposed project change or eliminate existing open space?	☐	☒
(b) Is the project located within an under-served area in the Bronx, Brooklyn, Manhattan, Queens, or Staten Island?	☐	☒
o If "yes," would the proposed project generate more than 50 additional residents or 125 additional employees?	☐	☐
(c) Is the project located within a well-served area in the Bronx, Brooklyn, Manhattan, Queens, or Staten Island?	☐	☒
o If "yes," would the proposed project generate more than 350 additional residents or 750 additional employees?	☐	☐
(d) If the project in located an area that is neither under-served nor well-served, would it generate more than 200 additional residents or 500 additional employees?	☒	☐

	YES	NO
5. *SHADOWS*: CEQR Technical Manual Chapter 8		
(a) Would the proposed project result in a net height increase of any structure of 50 feet or more?	☒	☐
(b) Would the proposed project result in any increase in structure height and be located adjacent to or across the street from a sunlight-sensitive resource?	☒	☐
6. *HISTORIC AND CULTURAL RESOURCES*: CEQR Technical Manual Chapter 9		
(a) Does the proposed project site or an adjacent site contain any architectural and/or archaeological resource that is eligible for or has been designated (or is calendared for consideration) as a New York City Landmark, Interior Landmark or Scenic Landmark; that is listed or eligible for listing on the New York State or National Register of Historic Places; or that is within a designated or eligible New York City, New York State or National Register Historic District? (See the GIS System for Archaeology and National Register to confirm)	☐	☒
(b) Would the proposed project involve construction resulting in in-ground disturbance to an area not previously excavated?	☒	☐
(c) If "yes" to either of the above, list any identified architectural and/or archaeological resources and attach supporting information on whether the proposed project would potentially affect any architectural or archeological resources.		
7. *URBAN DESIGN AND VISUAL RESOURCES*: CEQR Technical Manual Chapter 10		
(a) Would the proposed project introduce a new building, a new building height, or result in any substantial physical alteration to the streetscape or public space in the vicinity of the proposed project that is not currently allowed by existing zoning?	☒	☐
(b) Would the proposed project result in obstruction of publicly accessible views to visual resources not currently allowed by existing zoning?	☐	☒
8. *NATURAL RESOURCES*: CEQR Technical Manual Chapter 11		
(a) Does the proposed project site or a site adjacent to the project contain natural resources as defined in Section 100 of Chapter 11?	☐	☒
o If "yes," list the resources and attach supporting information on whether the proposed project would affect any of these resources.		
(b) Is any part of the directly affected area within the Jamaica Bay Watershed?	☐	☒
o If "yes," complete the Jamaica Bay Watershed Form, and submit according to its instructions.		
9. *HAZARDOUS MATERIALS*: CEQR Technical Manual Chapter 12		
(a) Would the proposed project allow commercial or residential uses in an area that is currently, or was historically, a manufacturing area that involved hazardous materials?	☒	☐
(b) Does the proposed project site have existing institutional controls (*e.g.*, (E) designation or Restrictive Declaration) relating to hazardous materials that preclude the potential for significant adverse impacts?	☐	☒
(c) Would the project require soil disturbance in a manufacturing area or any development on or near a manufacturing area or existing/historic facilities listed in Appendix 1 (including nonconforming uses)?	☒	☐
(d) Would the project result in the development of a site where there is reason to suspect the presence of hazardous materials, contamination, illegal dumping or fill, or fill material of unknown origin?	☒	☐
(e) Would the project result in development on or near a site that has or had underground and/or aboveground storage tanks (*e.g.*, gas stations, oil storage facilities, heating oil storage)?	☐	☒
(f) Would the project result in renovation of interior existing space on a site with the potential for compromised air quality; vapor intrusion from either on-site or off-site sources; or the presence of asbestos, PCBs, mercury or lead-based paint?	☒	☐
(g) Would the project result in development on or near a site with potential hazardous materials issues such as government-listed voluntary cleanup/brownfield site, current or former power generation/transmission facilities, coal gasification or gas storage sites, railroad tracks or rights-of-way, or municipal incinerators?	☐	☒
(h) Has a Phase I Environmental Site Assessment been performed for the site?	☒	☐
o If "yes," were Recognized Environmental Conditions (RECs) identified? Briefly identify: Historical use of site as manufacturing facility prior to 1970; dry cleaner use on site from 1968-1980s possible impact to downgradient portion of site.	☒	☐
10. *WATER AND SEWER INFRASTRUCTURE*: CEQR Technical Manual Chapter 13		
(a) Would the project result in water demand of more than one million gallons per day?	☐	☒
(b) If the proposed project located in a combined sewer area, would it result in at least 1,000 residential units or 250,000 square feet or more of commercial space in Manhattan, or at least 400 residential units or 150,000 square feet or more of commercial space in the Bronx, Brooklyn, Staten Island, or Queens?	☐	☒
(c) If the proposed project located in a separately sewered area, would it result in the same or greater development than the amounts listed in Table 13-1 in Chapter 13?	☐	☐
(d) Would the proposed project involve development on a site that is 5 acres or larger where the amount of impervious surface would increase?	☐	☒
(e) If the project is located within the Jamaica Bay Watershed or in certain specific drainage areas, including Bronx River, Coney	☐	☐

	YES	NO
Island Creek, Flushing Bay and Creek, Gowanus Canal, Hutchinson River, Newtown Creek, or Westchester Creek, would it involve development on a site that is 1 acre or larger where the amount of impervious surface would increase?		
(f) Would the proposed project be located in an area that is partially sewered or currently unsewered?	☐	☒
(g) Is the project proposing an industrial facility or activity that would contribute industrial discharges to a Wastewater Treatment Plant and/or generate contaminated stormwater in a separate storm sewer system?	☐	☒
(h) Would the project involve construction of a new stormwater outfall that requires federal and/or state permits?	☐	☒
11. *SOLID WASTE AND SANITATION SERVICES*: CEQR Technical Manual Chapter 14		
(a) Using Table 14-1 in Chapter 14, the project's projected operational solid waste generation is estimated to be (pounds per week): 24,446		
o Would the proposed project have the potential to generate 100,000 pounds (50 tons) or more of solid waste per week?	☐	☒
(b) Would the proposed project involve a reduction in capacity at a solid waste management facility used for refuse or recyclables generated within the City?	☐	☒
12. *ENERGY*: CEQR Technical Manual Chapter 15		
(a) Using energy modeling or Table 15-1 in Chapter 15, the project's projected energy use is estimated to be (annual BTUs): 37,057,733		
(b) Would the proposed project affect the transmission or generation of energy?	☐	☒
13. *TRANSPORTATION*: CEQR Technical Manual Chapter 16		
(a) Would the proposed project exceed any threshold identified in Table 16-1 in Chapter 16?	☒	☐
(b) If "yes," conduct the screening analyses, attach appropriate back up data as needed for each stage and answer the following questions:		
o Would the proposed project result in 50 or more Passenger Car Equivalents (PCEs) per project peak hour?	☐	☒
If "yes," would the proposed project result in 50 or more vehicle trips per project peak hour at any given intersection? ***It should be noted that the lead agency may require further analysis of intersections of concern even when a project generates fewer than 50 vehicles in the peak hour. See Subsection 313 of Chapter 16 for more information.*	☐	☐
o Would the proposed project result in more than 200 subway/rail or bus trips per project peak hour?	☐	☒
If "yes," would the proposed project result, per project peak hour, in 50 or more bus trips on a single line (in one direction) or 200 subway trips per station or line?	☐	☐
o Would the proposed project result in more than 200 pedestrian trips per project peak hour?	☒	☐
If "yes," would the proposed project result in more than 200 pedestrian trips per project peak hour to any given pedestrian or transit element, crosswalk, subway stair, or bus stop?	☒	☐
14. *AIR QUALITY*: CEQR Technical Manual Chapter 17		
(a) *Mobile Sources*: Would the proposed project result in the conditions outlined in Section 210 in Chapter 17?	☒	☐
(b) *Stationary Sources*: Would the proposed project result in the conditions outlined in Section 220 in Chapter 17?	☒	☐
o If "yes," would the proposed project exceed the thresholds in Figure 17-3, Stationary Source Screen Graph in Chapter 17? (Attach graph as needed)	☐	☒
(c) Does the proposed project involve multiple buildings on the project site?	☐	☒
(d) Does the proposed project require federal approvals, support, licensing, or permits subject to conformity requirements?	☐	☒
(e) Does the proposed project site have existing institutional controls (*e.g.*, (E) designation or Restrictive Declaration) relating to air quality that preclude the potential for significant adverse impacts?	☐	☒
15. *GREENHOUSE GAS EMISSIONS*: CEQR Technical Manual Chapter 18		
(a) Is the proposed project a city capital project or a power generation plant?	☐	☒
(b) Would the proposed project fundamentally change the City's solid waste management system?	☐	☒
(c) If "yes" to any of the above, would the project require a GHG emissions assessment based on the guidance in Chapter 18?	☐	☐
16. *NOISE*: CEQR Technical Manual Chapter 19		
(a) Would the proposed project generate or reroute vehicular traffic?	☒	☐
(b) Would the proposed project introduce new or additional receptors (see Section 124 in Chapter 19) near heavily trafficked roadways, within one horizontal mile of an existing or proposed flight path, or within 1,500 feet of an existing or proposed rail line with a direct line of site to that rail line?	☒	☐
(c) Would the proposed project cause a stationary noise source to operate within 1,500 feet of a receptor with a direct line of sight to that receptor or introduce receptors into an area with high ambient stationary noise?	☐	☒
(d) Does the proposed project site have existing institutional controls (*e.g.*, (E) designation or Restrictive Declaration) relating to noise that preclude the potential for significant adverse impacts?	☐	☒

	YES	NO
17. *PUBLIC HEALTH*: CEQR Technical Manual Chapter 20		
(a) Based upon the analyses conducted, do any of the following technical areas require a detailed analysis: Air Quality; Hazardous Materials; Noise?	☒	☐
(b) If "yes," explain why an assessment of public health is or is not warranted based on the guidance in Chapter 20, "Public Health." Attach a preliminary analysis, if necessary. According to the 2014 CEQR Technical Manual, for most projects, a public health analysis is not necessary where no significant unmitigated adverse impact is found in other CEQR analysis areas, such as air quality, water quality, hazardous materials, or noise. If, however, an unmitigated significant adverse impact is identified in these CEQR analysis areas, the lead agency may determine that a public health assessment is warranted for that specific technical area. Detailed hazardous materials, air quality, and noise analyses were performed, and it was determined that there would be no significant impacts in any of these areas as a result of the proposed project (see attached Supplemental Analyses), and no public health assessment is necessary.		
18. *NEIGHBORHOOD CHARACTER*: CEQR Technical Manual Chapter 21		
(a) Based upon the analyses conducted, do any of the following technical areas require a detailed analysis: Land Use, Zoning, and Public Policy; Socioeconomic Conditions; Open Space; Historic and Cultural Resources; Urban Design and Visual Resources; Shadows; Transportation; Noise?	☒	☐
(b) If "yes," explain why an assessment of neighborhood character is or is not warranted based on the guidance in Chapter 21, "Neighborhood Character." Attach a preliminary analysis, if necessary. The project does not have the potential for a significant adverse impact in the technical areas listed above. However, a detailed analysis is warranted for several of the technical areas. As such, an assessment of neighborhood character is provided belowas a supplemental analysis.		
19. *CONSTRUCTION*: CEQR Technical Manual Chapter 22		
(a) Would the project's construction activities involve:		
o Construction activities lasting longer than two years?	☐	☒
o Construction activities within a Central Business District or along an arterial highway or major thoroughfare?	☒	☐
o Closing, narrowing, or otherwise impeding traffic, transit, or pedestrian elements (roadways, parking spaces, bicycle routes, sidewalks, crosswalks, corners, *etc.*)?	☒	☐
o Construction of multiple buildings where there is a potential for on-site receptors on buildings completed before the final build-out?	☐	☒
o The operation of several pieces of diesel equipment in a single location at peak construction?	☒	☐
o Closure of a community facility or disruption in its services?	☒	☐
o Activities within 400 feet of a historic or cultural resource?	☒	☐
o Disturbance of a site containing or adjacent to a site containing natural resources?	☐	☒
o Construction on multiple development sites in the same geographic area, such that there is the potential for several construction timelines to overlap or last for more than two years overall?	☐	☒
(b) If any boxes are checked "yes," explain why a preliminary construction assessment is or is not warranted based on the guidance in Chapter 22, "Construction." It should be noted that the nature and extent of any commitment to use the Best Available Technology for construction equipment or Best Management Practices for construction activities should be considered when making this determination. See attachment		

20. *APPLICANT'S CERTIFICATION*

I swear or affirm under oath and subject to the penalties for perjury that the information provided in this Environmental Assessment Statement (EAS) is true and accurate to the best of my knowledge and belief, based upon my personal knowledge and familiarity with the information described herein and after examination of the pertinent books and records and/or after inquiry of persons who have personal knowledge of such information or who have examined pertinent books and records.

Still under oath, I further swear or affirm that I make this statement in my capacity as the applicant or representative of the entity that seeks the permits, approvals, funding, or other governmental action(s) described in this EAS.

APPLICANT/REPRESENTATIVE NAME	DATE
Celeste Evans, Senior Environmental Manager, VHB	1 June 2017

SIGNATURE Celeste Evans

PLEASE NOTE THAT APPLICANTS MAY BE REQUIRED TO SUBSTANTIATE RESPONSES IN THIS FORM AT THE DISCRETION OF THE LEAD AGENCY SO THAT IT MAY SUPPORT ITS DETERMINATION OF SIGNIFICANCE.

Part III: DETERMINATION OF SIGNIFICANCE (To Be Completed by Lead Agency)

INSTRUCTIONS: In completing Part III, the lead agency should consult 6 NYCRR 617.7 and 43 RCNY § 6-06 (Executive Order 91 or 1977, as amended), which contain the State and City criteria for determining significance.

1. For each of the impact categories listed below, consider whether the project may have a significant adverse effect on the environment, taking into account its (a) location; (b) probability of occurring; (c) duration; (d) irreversibility; (e) geographic scope; and (f) magnitude.

IMPACT CATEGORY	Potentially Significant Adverse Impact YES	NO
Land Use, Zoning, and Public Policy	☐	☒
Socioeconomic Conditions	☐	☒
Community Facilities and Services	☐	☒
Open Space	☐	☒
Shadows	☐	☒
Historic and Cultural Resources	☐	☒
Urban Design/Visual Resources	☐	☒
Natural Resources	☐	☒
Hazardous Materials	☐	☒
Water and Sewer Infrastructure	☐	☒
Solid Waste and Sanitation Services	☐	☒
Energy	☐	☒
Transportation	☐	☒
Air Quality	☐	☒
Greenhouse Gas Emissions	☐	☒
Noise	☐	☒
Public Health	☐	☒
Neighborhood Character	☐	☒
Construction	☐	☒

2. Are there any aspects of the project relevant to the determination of whether the project may have a significant impact on the environment, such as combined or cumulative impacts, that were not fully covered by other responses and supporting materials? ☐ YES ☒ NO

If there are such impacts, attach an explanation stating whether, as a result of them, the project may have a significant impact on the environment.

3. Check determination to be issued by the lead agency:

☐ **Positive Declaration**: If the lead agency has determined that the project may have a significant impact on the environment, and if a Conditional Negative Declaration is not appropriate, then the lead agency issues a *Positive Declaration* and prepares a draft Scope of Work for the Environmental Impact Statement (EIS).

☐ **Conditional Negative Declaration:** A *Conditional Negative Declaration* (CND) may be appropriate if there is a private applicant for an Unlisted action AND when conditions imposed by the lead agency will modify the proposed project so that no significant adverse environmental impacts would result. The CND is prepared as a separate document and is subject to the requirements of 6 NYCRR Part 617.

☒ **Negative Declaration:** If the lead agency has determined that the project would not result in potentially significant adverse environmental impacts, then the lead agency issues a *Negative Declaration*. The *Negative Declaration* may be prepared as a separate document (see template) or using the embedded Negative Declaration on the next page.

4. ***LEAD AGENCY'S CERTIFICATION***

TITLE	LEAD AGENCY
Deputy Director, Envionmental Assessment & Review Division	New York City Department of City Planning
NAME	**DATE**
Olga Abinader	June 2, 2017

SIGNATURE

Olga Abinader

1.0

Project Description

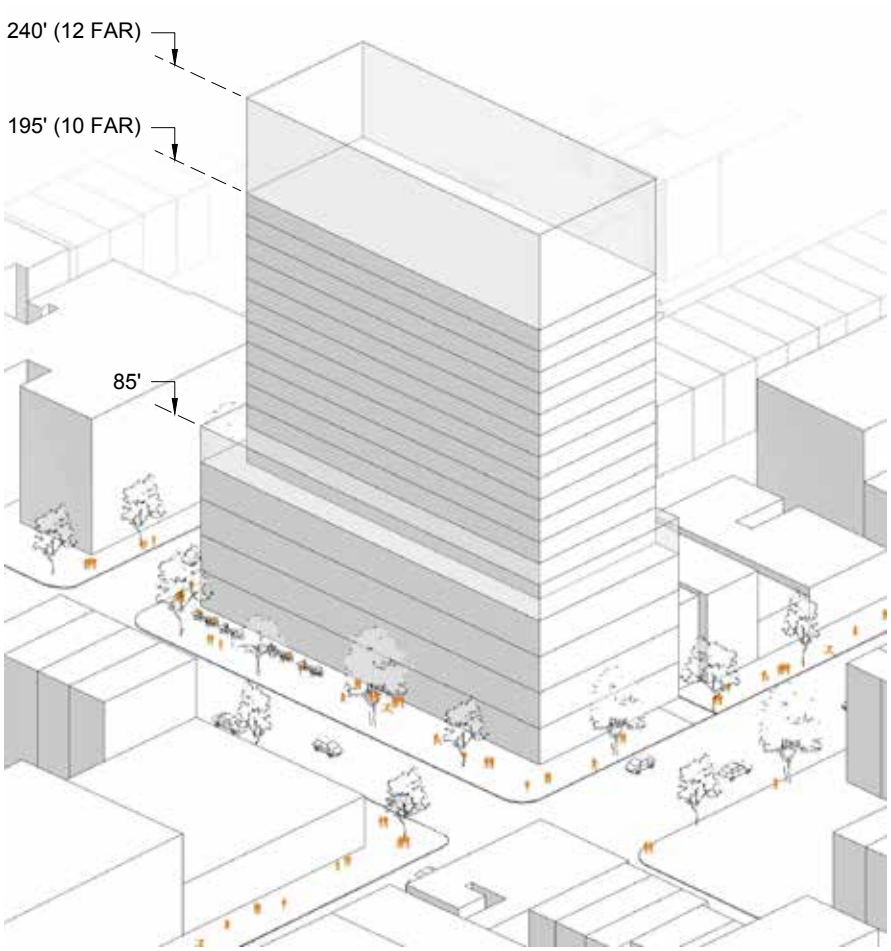
1.1 Introduction

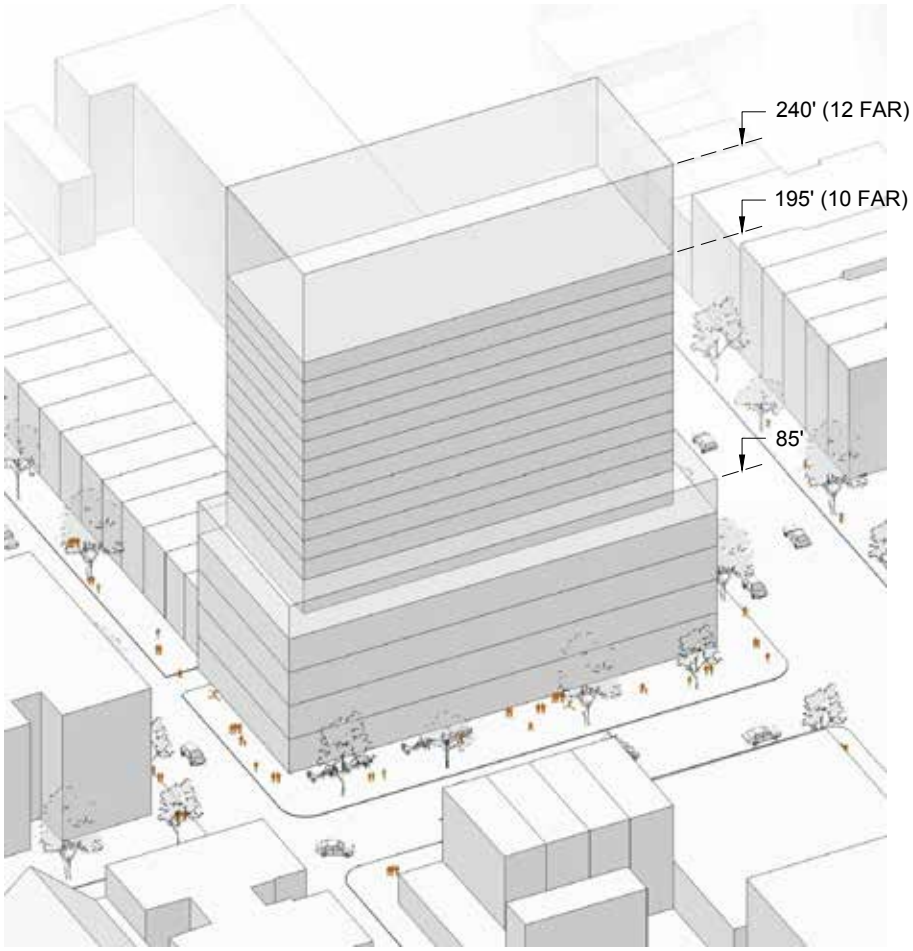
The applicant, NBT Victory Development 2012, is seeking approval of Zoning Map and Zoning Text amendments to develop a 20-story, 241,677 gross square foot (gsf) mixed use building (the "proposed project," see Figure 1-1) at Manhattan Block 1750 - Lot 1 (2031-2033 Fifth Avenue; the "project site").[1] The project site occupies the full eastern blockfront of Fifth Avenue between 125th and 126th Street within the Special 125th Street District ("the District"). The proposed project would include a permanent home for the National Black Theater ("NBT"), local retail use, and residential units (with an affordability component pursuant to Mandatory Inclusionary Housing [MIH]).

The applicant anticipates the submission of a follow-up application for a Chairperson's certification for a Floor Area Bonus for Visual or Performing Arts ("VPA") uses for the National Black Theater under the Special District text (ZR 97-422). The applicant is currently engaged in completing the remaining steps of the VPA certification, including establishment of a Local Arts Advisory Council ("LAAC"), confirmation of the sources of funding, and advancement of the design of the theater.

This section provides a description of the Proposed Actions and the resulting development, as well as the purpose and need for the proposed project. Section 2.0 of the attachment examines the potential for the proposed project to result in significant adverse impacts, based on the procedures set forth in the *2014 City Environmental Quality Review (CEQR) Technical Manual.*

[1] It is the applicant's intent to construct the RWCDS building described and analyzed throughout the EAS, utilizing the Visual Performing Arts (VPA) bonus, to reach a maximum of 12 FAR and a height of 240 feet. Due to the lengthy process for approving the VPA, it is expected to occur during the course of the ULURP process. The applicant has updated the ULURP application to reflect a 10.0 FAR Scenario, which deducts the 2.0 FAR VPA bonus at this time, with the understanding that the VPA bonus would be approved and applied at a later date. The difference created by the 10 FAR scenario as compared to the applicant's intended building would be limited to a reduction of approximately 48 units, for a total of 192 units, as compared to the RWCDS Scenario of 240 units, and a reduction in height from 240 feet to 195 feet. The remainder of the building program in the 10 FAR Scenario is assumed to remain the same, with the theater and retail space square footages staying constant; the theatre component of the project remains unchanged. As described further below, the EAS's analysis of the 12 FAR Scenario remains the RWCDS scenario, consisting of a larger "worst case" building with the additional 2.0 FAR, an additional height of 45 feet, and an additional 48 units.





For Illustrative Purposed Only

2031-2033 Fifth Avenue
New York, New York

With-Action Condition
Illustrative Rendering

Figure
1-1

1.2 Project Site

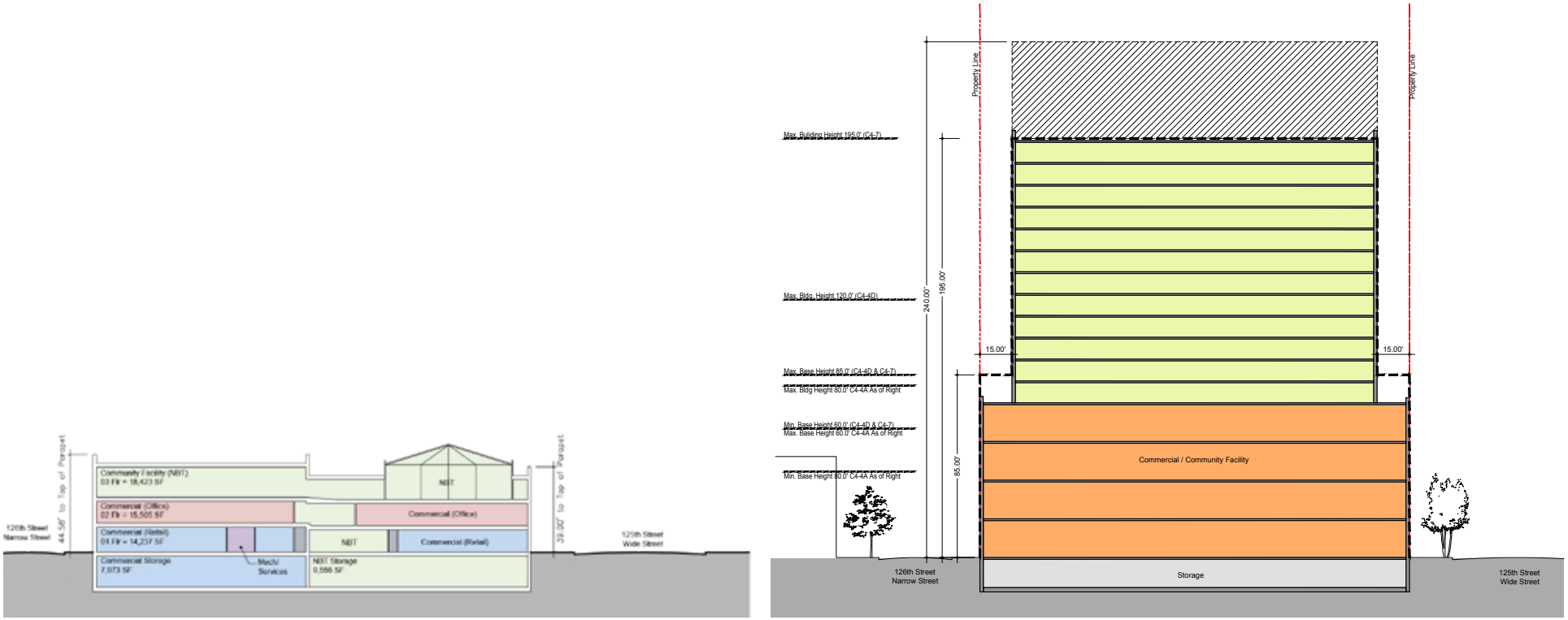
The proposed rezoning area (i.e. the project site), Block 1750 - Lot 1 (the lot owned by the applicant), is located on the western border of the East Harlem neighborhood of Manhattan, in Community District 11 (see EAS Figures 1 through 4). The entire area affected by the Proposed Actions is limited to the project site, which is approximately 16,986 square feet (sf) and has approximately 200 feet of frontage along Fifth Avenue (a one-way southbound street) and 85 feet of frontage along both 125th Street (two-way east-west bound) and 126th Street (one-way westbound). The site is currently developed with two attached and contiguous three-story 28-foot mixed use buildings which are mostly vacant. Together, the north building (with 85 feet of frontage on 126th Street and 100 feet on Fifth Avenue) and the south building (with 85 feet of frontage on 125th Street and 100 feet on Fifth Avenue) are developed with retail and commercial office space (approximately 29,742 sf) and performance venue and support space (approximately 18,423 sf) operated by the NBT at an overall FAR of 2.84 (Commercial FAR of 1.75 and Community Facility FAR of 1.09. The building also contains 17,529 sf of below grade, of which NBT has 9,556 sf of storage space. In sum, the site is developed with approximately 48,165 sf of floor area and 65,994 sf of gross floor area (see Figure 1-2). The existing building has egress along each of its bordering streets with its main entry midblock along the Fifth Avenue frontage. The northern portion of the existing building is slightly further setback as compared to the southern portion of the building with the main entry further recessed from the building line.

The National Black Theater was founded in 1968 by Dr. Barbara Ann Teer, an artist and entrepreneur; it is one of the longest running theater owned and operated by a woman of color. It's core mission is to produce transformational theater that helps shift the inaccuracy around African American identity by telling authentic stories of Black lifestyle; to use theater arts as a means to educate, enrich, entertain, empower, and inform the national conscience around current social issues; and provide a safe space for artists of color to practice their work. The theatre has produced over 300 original works and toured the world.

The NBT acquired the project site in 1983. Facing financial hurdles, the NBT conveyed ownership of the site in 2012 to the applicant, subject to assurances that it could remain on site. The current proposal includes a permanent home for the NBT.

The project site is located within a commercial C4-4A (R7A equivalent) contextual district, which allows residential, commercial and community facility uses at up to 4.0 FAR (see EAS Figure 4). C4-4A General Commercial districts permit Use Groups 1-6, 8-10, and 11. In C4-4A districts, buildings may have a street wall height of 40 to 65 feet, after which a minimum setback of 10 feet is required and a maximum building height of 80 feet is imposed. Parking is required for 50 percent of residential units, but may be waived or reduced for zoning lots of fewer than 10,000 square feet.

The project site is located within the Special 125th Street District, which was approved by the City Planning Commission in 2008 but is not within the 125th Street Core Subdistrict (see EAS Figure 4). The Special 125th Street District includes 24 blocks in East, Central and West Harlem, within an area generally bounded by 124th Street, 126th Street, Broadway and Second Avenue. The Special District is part of a City initiative to support the ongoing revitalization of 125th Street, Harlem's "Main Street." The Special District designation was intended to increase the density of the area, encourage more



Community Fac. H.C.Z.
Community Fac. N.B.T.
Commercial Retail
Residential
Circulation
Mechanical

Legend

Commercial / Community Facility
Residential
Storage

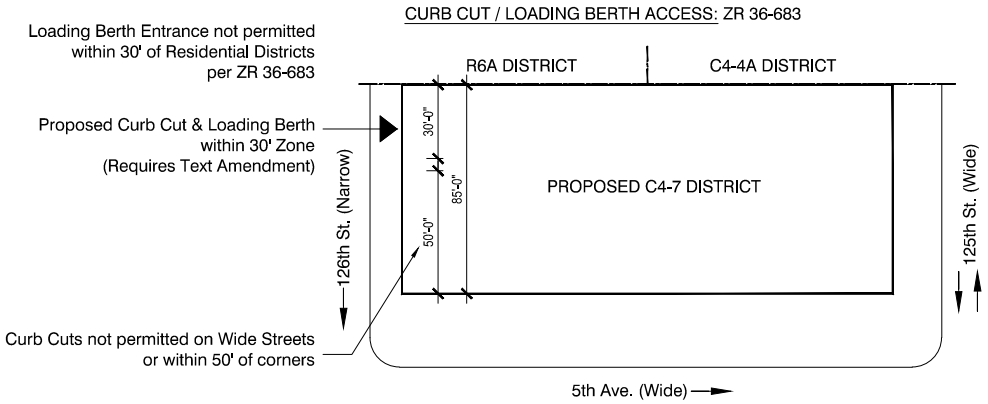
Additional Height for 12 FAR Building
Zoning Envelope
Illustrative Building
Property Line

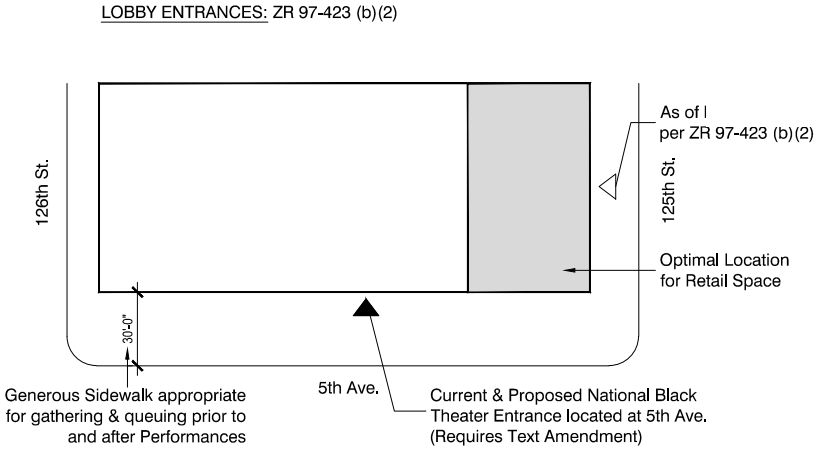
For Illustrive Purposed Only

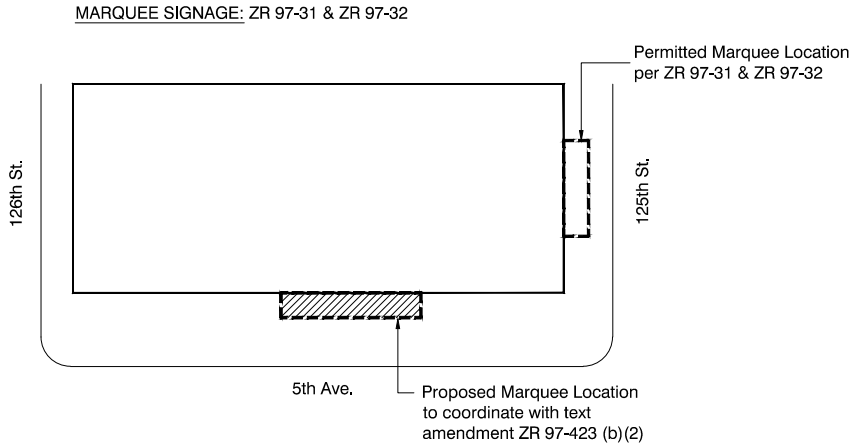
2031-2033 Fifth Avenue
New York, New York

Existing and Proposed:
Building North-South Section

Figure
1-2


CURB CUT / LOADING BERTH ACCESS: ZR 36-683
Loading Berth Entrance not permitted within 30' of Residential Districts per ZR 36-683
R6A DISTRICT
C4-4A DISTRICT
Proposed Curb Cut & Loading Berth within 30' Zone (Requires Text Amendment)
30'-0"
85'-0"
50'-0"
PROPOSED C4-7 DISTRICT
126th St. (Narrow)
125th St. (Wide)
Curb Cuts not permitted on Wide Streets or within 50' of corners
5th Ave. (Wide)


LOBBY ENTRANCES: ZR 97-423 (b)(2)
126th St.
As of I
per ZR 97-423 (b)(2)
125th St.
Optimal Location for Retail Space
30'-0"
Generous Sidewalk appropriate for gathering & queuing prior to and after Performances
5th Ave.
Current & Proposed National Black Theater Entrance located at 5th Ave. (Requires Text Amendment)


MARQUEE SIGNAGE: ZR 97-31 & ZR 97-32
Permitted Marquee Location per ZR 97-31 & ZR 97-32
126th St.
125th St.
5th Ave.
Proposed Marquee Location to coordinate with text amendment ZR 97-423 (b)(2)

residential uses, increase visitors and nighttime activity, promote a diverse mix of businesses including arts and entertainment establishments, generate career opportunities, and address cross-town transportation needs. The rezoning created incentives for mixed-use development but also provided protections for existing scale and character. Additionally, the rezoning included regulations to promote distinctive signage that would reinforce the cultural character of the streets.

The Special 125th Street District permits the use of a VPA Bonus, which is a zoning incentive for the creation of non-profit visual or performing arts spaces within new developments. The incentive makes available a floor area bonus in exchange for the creation of such space. The bonus is applicable in C4-7, C6-3 and C4-4D districts within the Special District (all these districts currently existing within the Special District). The maximum permitted FAR of these districts differ within and outside of the Special 125th Street Core Subdistrict. Specifically, outside the Core Subdistrict, the minimum base residential FAR is 9.0 and the maximum is 12.0, and inside the Core Subdistrict the minimum base residential FAR is 5.4 and maximum is 7.2. For commercial uses, outside the Core Subistrict the minimum base is 10 and the maximum is 12.0, while inside the Core Subdistrict the minimum is 7.2 for the base and 8.65 for the maximum. The project site would be permitted a maximum FAR of 12.0 if rezoned as a C4-7 district because it is outside the Core Subdistrict. Certification by the Chairperson of the City Planning Commission is required to qualify for the VPA Bonus.[2]

The VPA Bonus mechanism allows four square feet of bonus floor area for every one square foot of floor area provided for unfinished (i.e., "core and shell") visual or performing arts space within the bonused development, up to the maximum permitted FAR in C4-7, C6-3 and C4-4D districts.

The space for visual and performing arts provided through the VPA Bonus would be required to be occupied by qualifying non-profit visual and performing arts uses. A minimum of 60 percent of the total VPA Bonus space is required to be occupied by a qualifying primary use, such as a theater. The remaining 40 percent may be occupied by accessory spaces, as set forth in the text.

The project site is currently tenanted with retail, office, and community facility uses (including the NBT). The current tenants include: PLS Check Cashers of NY, Nicholas Variety Store, and Crepe Masters LLC. The sidewalk vault below Fifth Avenue is currently a Use Group 6 storage space for the building.[3] Remaining spaces at the buildings located at the project site are vacant.

1.3 Proposed Action

The applicant is seeking a zoning map amendment solely affecting the development site, which would be rezoned from C4-4A (R7A equivalent) to C4-7 (R10 equivalent). A maximum of 9.0 FAR for

[2] A maximum residential FAR of 12 is also possible pursuant to an Inclusionary Housing bonus, provided that 25% of the total number of dwelling units meet the Zoning Resolution's affordability and other requirements.

[3] In the With-Action condition, 32,783 sf of commercial space would be provided at the cellar, ground floor, and second floor level.

residential use (10.0 FAR for commercial and community facility use) would be bonusable to a 12.0 FAR exclusively with the Special 125th Street District Visual or Performing Arts (VPA) Bonus.

The anticipated floor area bonus provided by the VPA space can only be achieved by certification by the Chairperson of the City Planning Commission pursuant to ZR Section 97-423 provided several conditions have been met. Application requirements of the VPA space must include: (i) drawings designating the floor area resulting in the application of just bonused floor area; (ii) drawings indicating the floor area within the VPA space that has generated the bonus floor area (including orientation, minimum heights, glazing, signage, and other VPA characteristics); (iii) a letter from the Department of Cultural Affairs certifying the VPA operators proposed programs, out-reach, and community engagement; (iv) legal commitments between the owner and VPA operator to guarantee maintenance, operations, and availability of VPA programs to the public;[4] and (v) a legal commitment and recorded restrictive declaration to ensure VPA operation in conjunction with the associated bonused floor area within the proposed development.

It should be noted that because the VPA will be pursued after certification, two scenarios, one reflecting the current actions facilitating a 10 FAR building under the new C4-7 zoning, Special District, and text amendments, and one with the full 12 FAR building pursuant to the VPA bonus are presented on the EAS's figures, for comparison. However, in order to provide for a conservative analysis under CEQR, the maximum 12 FAR building is analyzed in each technical area.

The applicant is seeking a zoning text amendment to establish a Mandatory Inclusionary Housing (MIH). Additionally, the applicant is seeking several zoning text amendments to the Special 125th Street District to facilitate the proposed project, which would be the first development to utilize the VPA[5] bonus. Although this application does not include a Chairperson's Certification for the VPA Bonus, it is the applicant's intention to return to CPC for the VPA Certification after securing the necessary financing for a qualifying VPA space. The proposed text amendments are designed to allow the NBT to be a qualifying VPA.

The Special 125th Street District was adopted in 2008. At that time, there was no development proposal for the Development Site and an upzoning was deferred at the NBT's request. Now, with a conceptual design and a commitment for a permanent new home for the NBT, the following actions are requested:

Mandatory Inclusionary Housing

The proposed text amendment to Appendix F of the Zoning Resolution would establish an MIH Area coterminous with the rezoning area, subject to the affordability requirements of Option 1 and/or Option 2 of the MIH Program (see Appendix A). Option 1 would require that at least 25 percent of the residential floor area be reserved for residents with incomes averaging 60 percent of the Area Median Income (AMI), with ten percent of the units affordable at 40 percent of the AMI. Option 2 would require

4 Consultations with the DCA are currently ongoing.

5 Prior to certification, another project site within the corridor was identified as potentially pursuing the VPA bonus, however the status of that project is further behind the applicant's current proposal and negotiation process.

that at least 30 percent of the residential floor area be reserved for residents with incomes averaging 80 percent of the AMI. The applicant has not finalized a decision whether to map Option 1 or to map Option 2. Therefore, for the purpose of conservative analysis Option 2 will be analyzed as part of the RWCDS as it generates a greater potential for effects on day care services in the area due to a higher number of affordable units as compared to Option 1.

Zoning Text Amendments

The proposed text changes seek to fine-tune the almost 10-year old Special District to reflect changes in the Zoning Resolution and to facilitate the Proposed Project. It should be noted that since the Special District's adoption, no VPA space has yet to be certified for a floor area bonus. The amendments are contained in Appendix A, and are summarized as follows:

Subdistrict A

A new Subdistrict A would be created within the Special District through text amendments to ZR 97-411 and 97-412, covering a 200 feet by 85 feet frontage on the east side of Fifth Avenue between 125th Street to 126th Street. Within the Subdistrict, the maximum base height remains 85 feet, the maximum building height is 245 feet, and the setbacks are 15 feet on 126th Street and 10 feet on Fifth Avenue and 125th Street. This establishes a viable building envelope for projects taking advantage of the MIH floor area.

Marquee, Signage and Entrance Amendments

Text amendments to 97-32 would allow NBT's marquee, signage and entrance to be located on Fifth Avenue, their historic location. Fifth Avenue has a 30-foot wide sidewalk, making it well-suited for queuing NBT patrons, as opposed to 125th Street, which is more crowded with 20-foot sidewalks.

Glazing and Transparency Amendments

Text amendments to ZR 97-32 and ZR 97-34 would enable the modification of glazing, transparency and accessory signage regulations on 125th Street would to allow portions of the façade to be opaque. Historically, NBT's larger performing art spaces are the Theatre in the Round and the Black Box Theater. These spaces are generally "blind spaces" without windows. The building and envelop design, in conjunction with the signage and marquees, will take the place of windows in maintaining and attracting pedestrian interest.

Loading Berths

A new certification by the Chairperson of CPC under 97-55 would allow the location of entrances to loading berths to be modified. Currently, the Zoning Resolution requires an entrance to be at least 30 feet from a residence district and 50 feet from an intersection, while the Special District prohibits entrances along 125th Street and 5th Avenue. This leaves only the 126th Street frontage. At 85 feet in length, only five feet of this frontage could accommodate a loading dock, which is not viable. The certification will allow the CPC Chairperson to permit the location of loading berth entrances within 30 feet of a residential district boundary where certain findings are met, and would only be applicable within Subdistrict A.

MIH Text Amendment

Finally, an amendment to Appendix F of the Zoning Resolution would map the Development Site as an MIH Designated Area.

Parking Waiver Special Permit

The Proposed Project will provide up to 72 affordable dwelling units, depending on the MIH affordability option pursued (i.e., 20%, 25% or 30%). These units do not require accessory parking because the Proposed Project is located in the Transit Zone. The remaining market-rate dwelling units are subject to a 40 percent parking requirement (68 to 77 spaces). Given the narrowness of the site, this will require two below-grade parking levels entered on 126th Street. The special permit permits the Chair to waive the requirement for these spaces, avoiding the additional construction costs and disruption of 126th Street.

Applicability of Proposed Text Amendments

None of the text amendments extend beyond the project site or have the ability to affect sites outside of the applicant's site.

1.4 Proposed Project

The proposed actions would facilitate the development of a new 20-story mixed-use building. The building would be developed with approximately 180,669 gross square feet (gsf) of residential floor area (with an affordability component pursuant to MIH), approximately 32,783 gsf of retail space on the first and second floor, and approximately 28,225 gsf of non-profit theater (and theater-support) space for the National Black Theater, to be generated and developed through the VPA Bonus.[6] In total, the building would have approximately 241,677 gsf of floor area (203,128 total zoning floor area) and an FAR of 11.96 (Residential FAR of 8.76, Commercial FAR of 1.47, Community Facility FAR of 1.58, and Mechanical/Service FAR of 0.14).[7]

The project as envisioned would have 240 residential units at an average unit size of 753 gsf, which would subsidize the theater. The subject of the VPA bonus is new space for the National Black Theater (NBT), a Harlem legacy institution that has been operating at the site for nearly 50 years. The proposed new building would reach a base height of 70 feet, after which floors would be setback 15 feet until reaching a maximum height of 228 feet. The 228-foot height presumes 20 floors, but an additional floor and a maximum building height of 245 feet is requested to provide design flexibility. Above the maximum building height, a mechanical level is proposed with a setback of 12 feet and an additional height of 17 feet for a total height of 257 feet. The lobby and primary access to the theater would be

[6] Gross floor area was calculated for residential, commercial, community facility, and mechanical space. The 11,146 gsf of mechanical space was allocated to the existing gross floor area numbers based on use and was accounted for as 9,146 gsf of residential floor area, 1,000 gsf of commercial floor area, and 1,000 gsf of community facility floor area.

[7] The 10.0 FAR Scenario would result in a total gross floor area of approximately 193,000 gsf with the difference in floor area between the 10.0 FAR Scenario and the RWCDS consisting of a difference of approximately 48 fewer units. The 10.0 FAR Scenario would result in the same amount of floor area for commercial and theatre uses.

along Fifth Avenue, with a residential entrance along 126th Street and retail entrances on Fifth Avenue and 125th Street.

The establishment of the MIHA would result in 25-30 percent of the residential floor area (or approximately 60-72 units) being reserved as affordable housing units pursuant to ZR Sections 23-154 and 23-90. Under Option 1 approximately 60 units would be reserved as affordable averaging 60 percent Area Median Income (AMI), with ten percent of the units affordable at 40 percent of the AMI. Under Option 2 approximately 72 units would be reserved as affordable at 80 percent of the AMI. The applicant has not finalized a decision whether to map Option 1 or to map Option 2. For the purpose of conservative analysis Option 2 will be analyzed as part of the RWCDS as it generates a greater potential for effects on day care services in the area due to a higher number of affordable units as compared to Option 1. A total of 240 dwelling units (with 72 affordable units analyzed) at an average unit size of 753 gsf represents the maximum number of residential units that would be built as part of the proposed project. Pursuant to ZR Section 23-96 the proposed project would include affordable units in configurations of two or more bedrooms.

The few existing tenants remaining on the site have short-term leases only, and the retail spaces would vacate. The National Black Theater plans to go on tour during the building construction so that their performances would continue during this time until they can be re-established back within the new completed building.

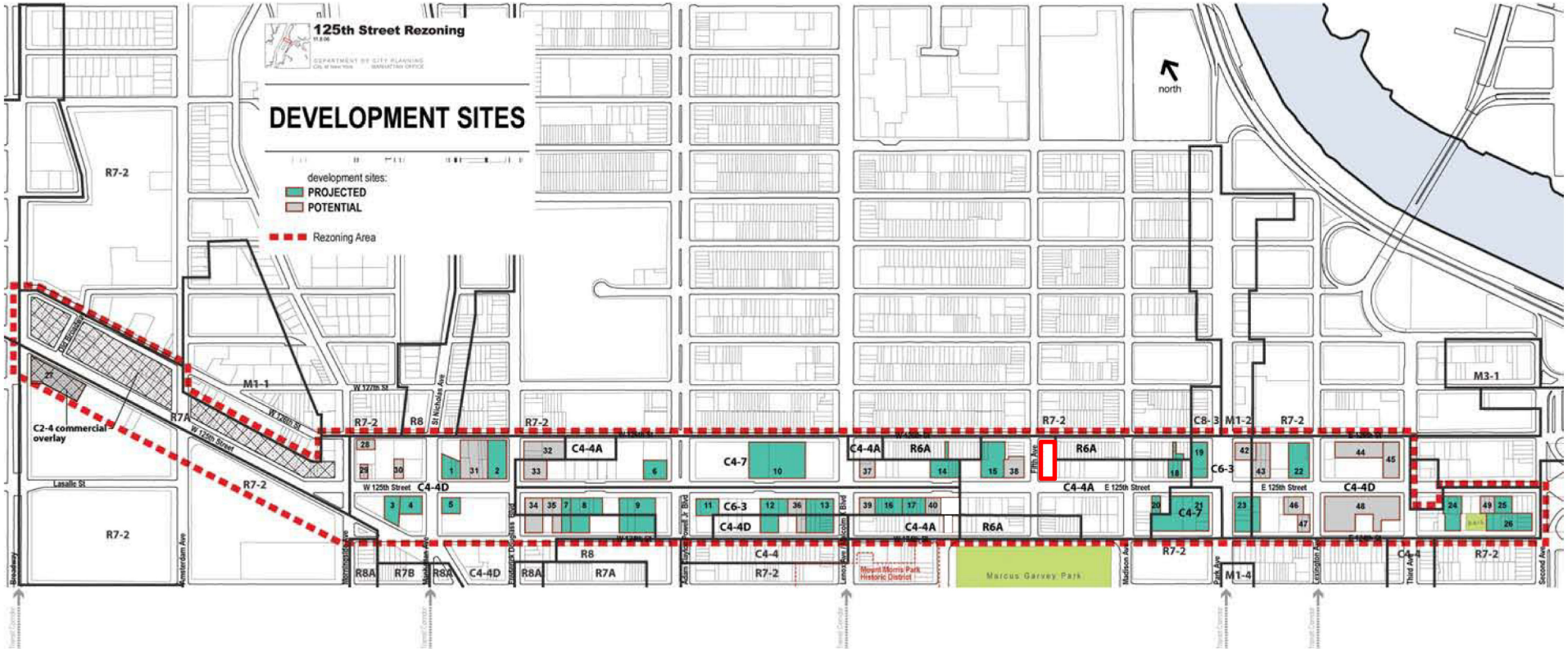
1.5 Project Purpose and Need

The Special 125th Street District was adopted in 2008 following several years of study by the Department of City Planning, other City agencies, and an Advisory Committee comprised of elected officials, local civic groups, cultural institutions, stakeholders, and Community Boards 9, 10 and 11. A key purpose of the Special District is to "sustain and enhance the ongoing revitalization of 125th Street as a unique Manhattan 'Main Street' and a premier arts, culture, and entertainment destination for residents and visitors alike."

The Special District includes a Core Subdistrict extending from the midblock between Fifth Avenue and Malcom X Boulevard/Lenox Avenue on the east to Fredrick Douglas Boulevard to the west. A large C4-7 district is mapped within this area. The NBT, located one-half block away, is a logical part of the C4-7 District but was not included when the Special District was adopted, at the NBT's request. The proposed development site was not listed and analyzed as projected, potential, or known development site in the February 29, 2008, 125th Street Corridor Rezoning and Related Actions FEIS (CEQR # 07DCP030M) (see Figure 1-4).[8]

The proposed action is consistent with all of the goals of the Special 125th Street District as set forth in the Zoning Resolution, as follows:

[8] See Table 2.0-4 "Projected, Potential, and Known Development Sites Data" pg. 2.0-20 of the FEIS.



2031-2033 Fifth Avenue
New York, New York

125th Street Corridor Rezoning and Related Actions EIS: Development Sites

Figure 1-4

a) "preserve, promote and protect the special character of 125th Street as Harlem's 'Main Street' and the role of 125th Street as Upper Manhattan's premier mixed-use corridor" – the proposed action will preserve the National Black Theater as an iconic cultural institution on 125th Street and will provide a mix of community facility, retail and residential uses.

b) "guide development on the 125th Street corridor" – the Development Site will be rezoned to C4-7, permitting mixed-use development of up to 12.0 FAR. While there may be possible future VPA venues east of the Development Site, the Site will mark the eastern most historic cultural institution within the Special District.

c) "expand the retail and commercial character of 125th Street" – the Development Site will include 32,783 square feet of retail use.

d) "provide incentives for the creation of visual and performing arts space and enhance the area's role as a major art, entertainment and cultural destination in the City" – the VPA bonus provides the incentive for the creation of a new, state of the art facility for the NBT, which will significantly enhance the area's role as a major art, entertainment and cultural destination.

e) "ensure that the form of new buildings is compatible with and relates to the character of the 125th Street corridor" – the proposed building has been designed to comply with the C4-7 regulations applicable within the Special 125th Street District, with a 70-foot base and 15 foot setbacks on Fifth Avenue, 125th Street and 126th Street. The rezoning will extend only 85 feet east of Fifth Avenue, thereby preserving the low-rise character of the R6A zoning district along 126th Street, east of the site.

f) "enhance the pedestrian environment through appropriate ground floor uses and regulations" – the ground floor will enhance the pedestrian environment through the addition of theater entrances on Fifth Avenue and 125th Street and ground floor retail on all three frontages.

g) "promote the most desirable use of land and thus conserve and enhance the value of land and buildings, and thereby protect the City's revenue" – the Proposed Development will greatly enhance the value of the site by facilitating the development of a major mixed-use building and thereby generate increased revenue for the City.

1.6 Analysis Framework

Build Year

Assuming that the proposed actions are effective in 2018, the applicant anticipates construction would start in 2018 following grant of VPA certification with completion in 2020. This timeframe assumes a construction period of up to 24 months (3-4 months for demolition, excavation and foundation work, 9-10 months for building superstructure and exterior work, and 9-10 months for interior fit-out work).

Reasonable Worst Case Development Scenario (RWCDS)

Per *CEQR Technical Manual* methodology, during the course of developing the Reasonable Worst Case Development Scenario (RWCDS) for analysis, several factors were considered to ensure a conservative environmental analysis including 1) the applicant's proposed project, 2) the restrictions built into the Proposed Actions, and 3) the current market trends in Harlem. While additional commercial uses and hotel uses are feasible under the proposed rezoning, there is a higher demand for residential use (as opposed to a large office or hotel building) in this neighborhood.

As noted earlier, because the VPA will be pursued after certification, two scenarios, one reflecting the current actions facilitating a 10 FAR building under the new C4-7 zoning, Special District, and text amendments, and one with the full 12 FAR building pursuant to the VPA bonus are discussed in this section, for comparison. Additionally, the two scenarios are shown on the figures in the EAS, again for comparison purposes. However, in order to provide for a conservative analysis under CEQR, the maximum 12 FAR building is analyzed in each CEQR technical area throughout the remainder of this EAS. The 12 FAR scenario is described first below and in Table 1, and the 10 FAR scenario is described second, in Table 2.

12.0 FAR Scenario

No-Action Condition[9]

Without the proposed actions, the project site would remain part of the existing C4-4A/R7A district and the space currently occupied by NBT would be vacated by NBT and converted to office space, of which 14,706 sf would be standard office space and 3,717 sf would be medical offices. The existing retail and office space would remain unchanged from existing conditions. The existing height of the building is 43 feet, the FAR is 3.76, and the GSF is 65,694. The overall development program under the No-Action scenario is shown in Table 1. Absent the proposed actions, NBT would not be able to continue operations at its current location and would attempt to find suitable alternative locations.

With-Action Condition

As described above, the proposed rezoning of the development site from C4-4A to C4-7 and the related text amendments would facilitate the redevelopment of the project site. The overall development program under the With-Action condition is shown in Table 1. The applicant has not finalized a decision whether to map MIH Option 1 or Option 2. For the purposes of conservative analysis, MIH Option 2 will be analyzed as part of the RWCDS. Thus the RWCDS would result in 180,669 gsf of residential floor area, consisting of 240 residential units of which 72 (30 percent of residential units) would be reserved as affordable at 80 percent of the AMI, 32,783 gsf of retail space, and 28,225 gsf of VPA theater space (see Figures 1-1, 1-2, and 1-3). The sidewalk vault under Fifth Avenue would be

[9] Note that all square footages for the RWCDS are shown in Gross Square Feet (GSF), while the FARs are calculated based on the Zoning Square Feet (ZSF).

filled in. The proposed site plan is shown on Figure 1-5. The proposed height of the building is 245 feet, the FAR is 11.96, and the GSF is 241,677.

Increment

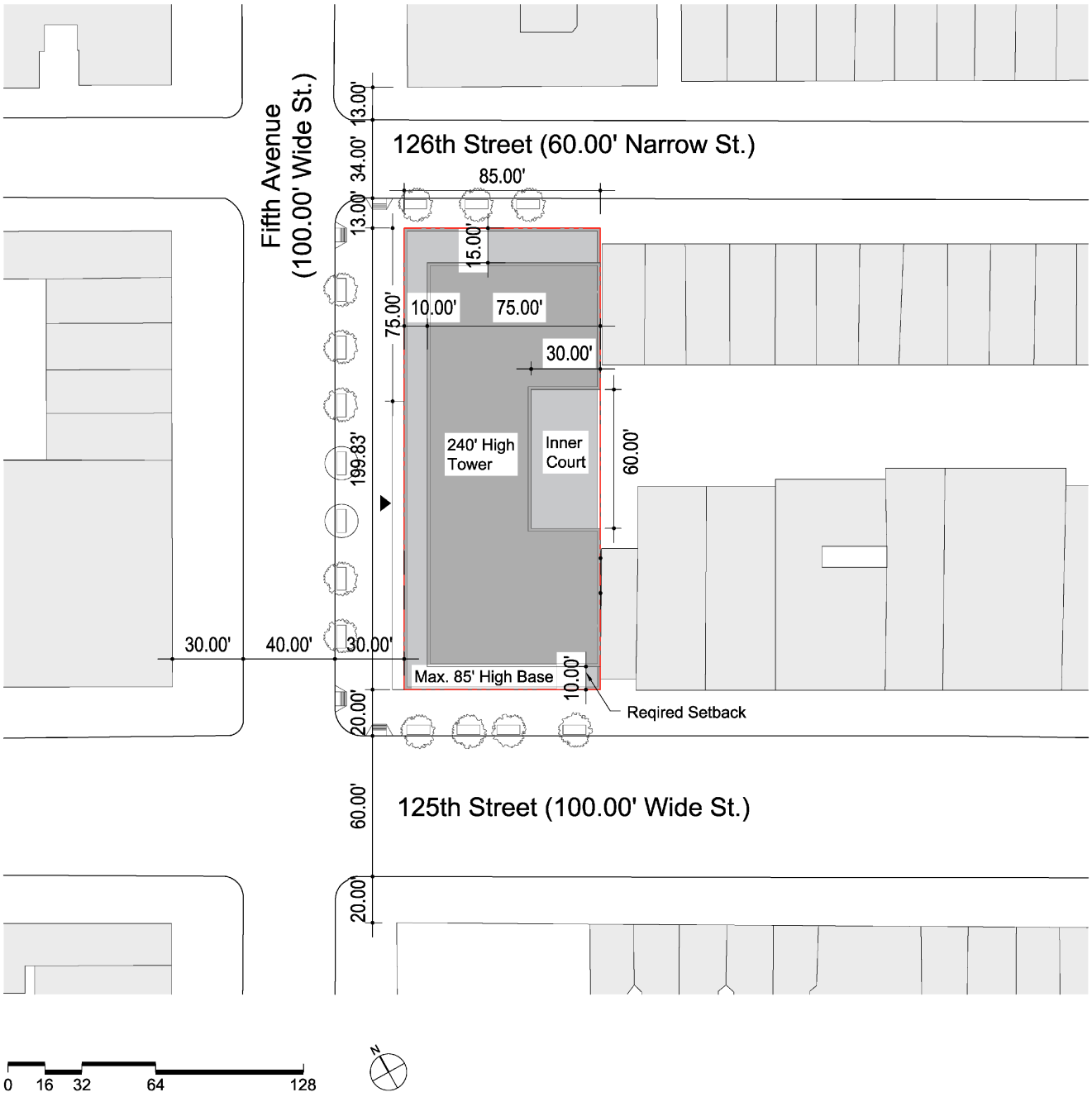
In each of the technical areas in Section 2.0 of the Supplemental Analyses, the With-Action condition is compared to the No-Action condition for the project site. Table 1 summarizes the increments for analysis. The incremental height of the building is 202 feet, the FAR is 8.2, and the GSF is 175,983.

Table 1: Existing, No-Action and With-Action Development Programs by Use for 12 FAR Building[1]

Use	Existing	No-Action	With-Action	Increment
Residential	0	0	180,669[2]	+180,669
			240 units (72 Affordable)[3]	+240 (72 Affordable)
Retail	14,237	14,237	32,783[8]	+18,546
Office	15,505	30,211[4]	0	-30,211
Medical Office	0	3,717	0	-3,717
Theater/Performance Space[7]	18,423	0	28,225	+28,225[5]
Storage (cellar)	7,973	17,529[6]	0	-17,529
Storage (for theater)	9,556	0	0	+0
TOTAL GSF	**65,694**	**65,694**	**241,677**	**+175,983**

Notes:

1. All values are in gross square feet (gsf). The applicant has not finalized a decision whether to map MIH Option 1 or to map Option 2. For the purpose of conservative analysis Option 2 will be analyzed as part of the RWCDS as it generates a greater potential for effects on day care services in the area due to a higher number of affordable units as compared to Option 1.
2. Gross floor area was calculated for residential, commercial, community facility, and mechanical space. The 11,146 gsf of mechanical space was allocated to the existing gross floor area numbers based on use and was accounted for as 9,146 gsf of residential floor area, 1,000 gsf of commercial floor area, and 1,000 gsf of community facility floor area.
3. The average apartment size for the proposed project is 753 gsf per unit.
4. In the No-Action Scenario, the Theater space would be converted to office space – of which 14,237 sf would be standard office space and 3,717 sf would be medical office.
5. The new building footprint and theater partial double-height design made the upstairs NBT use slightly larger than the existing building in the With-Action scenario.
6. The existing building's below grade level is 17,529 sf.
7. Includes lobby and office areas associated with theater.
8. Includes below-grade retail.



2031-2033 Fifth Avenue
New York, New York

Proposed Site Plan

Figure 1-5

10.0 FAR Scenario

It is the applicant's intent to construct the RWCDS building described and analyzed throughout the EAS, utilizing the Visual Performing Arts (VPA) bonus, to reach a maximum of 12 FAR and a height of 240 feet. Due to the lengthy process for approving the VPA, it is expected to occur during the course of the ULURP process. Therefore, the applicant has updated the ULURP application to reflect a 10.0 FAR Scenario, which deducts the 2.0 FAR VPA bonus at this time, with the understanding that the VPA bonus would be approved and applied at a later date. The 10 FAR Scenario would be limited to the existing height limit of 195 feet, and as illustrated in Figure 1-1 and 1-2, which would reduce the building height to 16 stories. The difference created by the 10 FAR scenario as compared to the applicant's intended building would be limited to a reduction of approximately 48 units, for a total of 192 units, as compared to the RWCDS Scenario of 240 units, and a reduction in height from 240 feet to 195 feet. The remainder of the building program in the 10 FAR Scenario is assumed to remain the same, with the theater and retail space square footages staying constant. The theatre component of the project would remain unchanged. The building program is outlined in Table 2, below.

Table 2: Existing, No-Action and With-Action Development Programs by Use for a 10 FAR Building[1]

Use	Existing	No-Action	With-Action	Increment
Residential	0	0	140,317[2]	+140,317
			192 units	192 units
Retail	14,237	14,237	32,783[8]	+18,546
Office	15,505	30,211[4]	0	-30,211
Medical Office	0	3,717	0	-3,717
Theater/Performance Space[7]	18,423	0	28,225	+28,225[5]
Storage (cellar)	7,973	17,529[6]	0	-17,529
Storage (for theater)	9,556	0	0	+0
TOTAL GSF	**65,694**	**65,694**	**201,325**	**+135,631**

Notes:

1. All values are in gross square feet (gsf). The applicant has not finalized a decision whether to map MIH Option 1 or to map Option 2. For the purpose of conservative analysis Option 2 will be analyzed as part of the RWCDS as it generates a greater potential for effects on day care services in the area due to a higher number of affordable units as compared to Option 1.
2. Gross floor area was calculated for residential, commercial, community facility, and mechanical space. The 11,146 gsf of mechanical space was allocated to the existing gross floor area numbers based on use and was accounted for as 9,146 gsf of residential floor area, 1,000 gsf of commercial floor area, and 1,000 gsf of community facility floor area.
3. The average apartment size for the proposed project is 753 gsf per unit.
4. In the No-Action Scenario, the Theater space would be converted to office space – of which 14,237 sf would be standard office space and 3,717 sf would be medical office.
5. The new building footprint and theater partial double-height design made the upstairs NBT use slightly larger than the existing building in the With-Action scenario.
6. The existing building's below grade level is 17,529 sf.
7. Includes lobby and office areas associated with theater.
8. Includes below-grade retail.

Therefore, the EAS's analysis of the 12 FAR Scenario remains the RWCDS scenario, consisting of a larger "worst case" building with the additional 2 FAR, an additional height of 45 feet, and an additional 48 units.

The differences in the CEQR analyses for a smaller building would be limited to the following categories: Socioeconomics, Open Space, Urban Design, Shadows, Transportation and Air Quality. Noise at the site and the experience of noise from new sensitive receptors would be the same with the 10 FAR building and 12 FAR building.

The effect on each area described above is discussed briefly in turn below:

Socioeconomics

In the 10 FAR Scenario, this analysis would not be triggered as the total amount of units would be less than 200 units which is the *CEQR Technical Manual* threshold for Socioeconomic analyses.

Open Space

With less residential units in the 10 FAR Scenario, there would be a slight decrease in the open space ratio. However, the open space ratio with the larger building was less than a 1% decrease, therefore this would only further reduce the small reduction in the open space ratio as created by the proposed project.

Shadows

With less height in the 10 FAR scenario, the overall shadow radius would be smaller (i.e. the area where shadows are expected to fall) and there would correspondingly be less shadows cast on surrounding sunlight sensitive resources. As with the 12 FAR Scenario, there were no potential for shadows impacts on surrounding resources, therefore likewise with the smaller scenario there would similarly be less shadowing effects.

Urban Design

As shown in Section 3, "Urban Design," Figures 3-6a to 3-6d, the base of the building would remain constant but the upper floors would not be built in the 10 FAR scenario. The building would be 45 feet shorter in height, however, the height difference is not expected to substantially change the experience from the pedestrian level at the sidewalk and the 12 FAR scenario still represents the "worst case" scenario from a height perspective.

Transportation

A reduction in 48 units with the 10 FAR scenario would not substantially change the transportation results as in this area of Manhattan there is a high mode split for public transit, and residential units in general do not have high trip generation rates. The results would be less than those disclosed in the 12 FAR scenario.

Air Quality

At a height of 195 feet, the 10 FAR building would remain the tallest building in the immediate vicinity and like the 12 FAR building would screen out from having stationary source air quality impacts on surrounding buildings.

2.0

Supplemental Analyses

2.1 Land Use, Zoning, and Public Policy

2.1.1 Introduction

This analysis of land use, zoning and public policy follows the guidelines set forth in the 2014 *CEQR Technical Manual*. It characterizes the Existing Conditions in the area surrounding the project site and addresses potential impacts to land use, zoning, and public policy that would be associated with the proposed action.

2.1.2 Methodology

This preliminary analysis of land use, zoning, and public policy follows the guidelines set forth in the *2014 CEQR Technical Manual* for a preliminary assessment (Section 320). According to the 2014 *CEQR Technical Manual,* a preliminary land use and zoning assessment includes a basic description of existing and future land uses and zoning information, and describes any changes in zoning that could cause changes in land use. It also characterizes the land use development trends in the area surrounding the project site that might be affected by the proposed action, and determines whether the proposed project is compatible with those trends or may alter them.

The 2014 *CEQR Technical Manual* stipulates that a preliminary assessment of public policy should identify and describe any public policies (formal plans, published reports) that pertain to the study area, and should determine whether the proposed project could conform or conflict with the identified policies. If so, a detailed assessment should be conducted; otherwise, no further assessment is needed.

The following land use, zoning, and public policy assessment follows this guidance and provides a description of the Existing Conditions of the project site and the surrounding area. This is followed by an assessment of the No-Action Condition and the With-Action Condition, and a conclusion that no further analysis is needed.

The land use study area is typically defined as the area within 400-feet of the project site, which for this project is generally bounded by East 127th Street to the north, Madison Avenue to the east, East 124th Street to the south, and approximately 340 feet west of the Fifth Avenue centerline to the west (see EAS Figure 2). Portions of the recently-certified East Harlem Rezoning (ULURP applications 170358 ZMM, N170359 ZRM, 170360 HUM, CEQR No.: 17DCP048M) are also located within the study area and are

therefore considered in this Land Use, Zoning, and Public Policy assessment.

2.1.3 Preliminary Assessment

Existing Conditions

Land Use and Zoning

Project Site

The project site comprises one tax lot improved with two building: Block 1750 – Lot 1 (house numbers range from 1-9 East 125th Street, 2023-2037 Fifth Avenue, and 2-4 East 126th Street). The project site is currently developed with a three-story 28-foot mixed-use building with two addresses (2023 Fifth Avenue and 2033 Fifth Avenue). The existing building contains approximately 35,954 square feet (sf) of commercial office and retail space and a 27,070 sf performance venue space operated by the National Black Theater (NBT). The building contains 17,529 sf of below grade storage and accessory storage space, 9,556 sf of which is used by the NBT. In sum, the project site is developed with approximately 48,165 sf of floor area and 65,994 sf of gross floor space. The semi-attached existing structure is built to 3.41 FAR with a full below-grade basement. The existing building has egress along each of its bordering streets and its recessed main entry midblock along Fifth Avenue.

The project site is currently tenanted with retail, office, and community facility uses (the NBT); see Figure 1-2 for illustrative representation of the existing building program. The existing retail tenants of the ground floor retail space include: PLS Check Cashers of NY, Nicholas Variety Store, Crepe Masters LLC, and Elizabeth Dee Gallery LLC. The Harlem Children's Zone occupies office space on the second floor of the project site. The 8,003 sf space is used as office in support of the Harlem Children Zone's youth development program "A Cut Above" (ACA).

The project site is located within a commercial C4-4A (R7A equivalent) contextual commercial district, which allows residential, commercial, and community facility uses at up to a 4.0 FAR (see EAS Figure 4). C4 districts are mapped in regional commercial centers, such as Flushing in Queens and the Hub in the Bronx, that are located outside of central business districts. In these areas, specialty and department stores, theater, and other commercial and office uses serve a large region and generate more traffic than neighborhood shopping area C4-4A General Commercial districts permit Use Groups 1-6, 8-10, and 12. In C4-4A districts, buildings may have a street wall height of 40 to 65 feet, after which a minimum setback of 10 feet is required, with a maximum building height of 80 feet. Parking is required for 50 percent of the residential units, but may be waived or reduced for zoning lots of less than 10,000 sf.

Signs within C4-4A districts are required to be on the same zoning lot as the use that they describe or publicize, with a maximum size of 500 sf. The maximum surface area for all signs on a zoning lot within C4-4A districts is five times the street frontage (this is the same regulation for illuminated or flashing signs). Signs are also restricted to a maximum height of 40 feet above the curb level.

The project site is located within the Special 125th Street District, which was established through the *125th Street Corridor Rezoning and Related Actions* project (CEQR #07DCP030M) approved by the City Planning Commission in 2008. The Site is not within the 125th Street Core Sub-district. The Special

125th Street District includes 24 blocks in East, Central and West Harlem, within an area generally bounded by 124th Street, 126th Street, Broadway, and Second Avenue. The Special District is part of a City initiative to support the ongoing revitalization of 125th Street, Harlem's "Main Street." The Special District designation was intended to increase the density of the area, encourage more residential uses, increase visitors and nighttime activity, promote a diverse mix of businesses including arts and entertainment establishments, generate career opportunities, and address cross-town transportation needs. The rezoning created incentives for mixed-use development but also provided protections for existing scale and character. Additionally, the rezoning included regulations to promote distinctive signage that would reinforce the cultural character of the streets.

The Special 125th Street District permits the use of a Visual or Performing Arts (VPA) Bonus, which is a zoning incentive for the creation of non-profit visual or performing arts spaces within new developments. The VPA space is required to be occupied by qualifying non-profit visual and performing arts uses. The VPA bonus mechanism allows four square feet of bonus floor area for every one square foot of floor area provided for unfinished (i.e., "core and shell") visual or performing arts space within the bonused development, up to the maximum permitted FAR in C4-7, C6-3 and C4-4D districts. Of the bonus-generating VPA space, a minimum of 60 percent of the total space is required to be occupied by a qualifying primary use, such as a theater. The remaining 40 percent may be occupied by permitted accessory, or non-primary, spaces such as dressing rooms and administrative offices. Certification by the Chairperson of the City Planning Commission is required to qualify for the VPA Bonus. The project site would be permitted a maximum FAR of 12.0 if rezoned as a C4-7 district because it is outside the Core Sub-district.

Study Area

The project site is located along the western border of the East Harlem neighborhood of Manhattan, which is generally bounded by the East River to the east, 96th Street to the south, Fifth Avenue to the west, and the Harlem River to the north. As shown in EAS Figure 2, the study area is predominantly characterized by residential, public facility / institutional, and commercial uses.

Throughout the study area, both on major corridors and local streets, most buildings are residential in all or part. Along Fifth Avenue, Madison Avenue, and 125th Street, the majority of residential buildings are mixed use. East 127th Street, West 127th Street, East 126th Street, West 126th Street, and East 124th Street are largely developed with regular row house style multifamily walkup buildings, as is Madison Avenue between East 126th Street and East 127th Street. 125th Street and Fifth Avenue are generally developed with mixed commercial and residential buildings with residential uses dominating farther from 125th Street.

125th Street is the major local and regional commercial corridor within Harlem. Harlem's, "Main Street," is one of the few areas zoned for commercial use in all of Harlem. Not only is the road a wide street which connects to the Robert F Kennedy Bridge, the Willis Avenue Bridge, the FDR Drive, and the Henry Hudson Parkway, but it also accommodates several bus routes, a major Metro-North station, and subway lines along Broadway, St. Nicholas Avenue, Malcolm X Boulevard, and Lexington Avenue.

Complementing the 125th Street transportation nexus, the street is a major pedestrian thoroughfare and thus retail location. Among the retail stores on 125th Street within the study area are The UPS Store, The Brownstone, Harlem Underground, Cricket Mobile, Edible Arrangements, Nicholas Variety,

and Jennifer Convertibles. Additionally, 125th Street is home to a large number of restaurants, bars, and grocery stores. Within the study area, restaurants include both chains (Applebee's, Taco Bell) and single-location (Casa Bonita, Uptown Veg and Juice Bar, Island Salad). The corridor is also served with extensive office space.

Fifth Avenue is also a major thoroughfare within the study area and is built with commercial uses concentrated in proximity to 125th Street. Both Fifth Avenue and 125th Street are characterized by larger lots compared to the row house style lots common in other portions of the study area, resulting in greater bulk commercial, multifamily residential elevator, mixed commercial and residential, or institutional uses. For example, the Harlem Children's Zone Promise Academy takes up almost the entire blockfront along the north side of 125th Street between Madison Avenue and Fifth Avenue. These two roads are the primary commercial corridors within the study area. However, the buildings fronting on Madison Avenue within the study area, while generally residential in use, typically are improved with ground floor retail uses.

Institutional / public facility uses are interspersed throughout the study area on large lots. This includes a number of religious institutions and public facilities such as St. Andrew Episcopal Church on a corner lot of East 127th Street and Fifth Avenue, Pilgrim Cathedral of Harlem on an interior lot of West 126th Street between Fifth Avenue and Malcom X Boulevard/Lenox Avenue; the New York Public Library and Handmaids of Mary Convent Church on interior lots fronting on Marcus Garvey Park, and the Harlem Children's Zone school described above. A small portion of Marcus Garvey Park is also located within the study area to the extreme south.

As shown in EAS Figure 4, the C4-4A district is mapped in a large portion of the study area. The study area is also mapped with contextual moderate-density residential R6A districts and a moderate-density residential R7-2 district. The C4-4A district that is mapped on the project site is also mapped along the commercial corridors of the study area including West / East 125th Street and portions of Fifth Avenue and Madison Avenue. Regulations for buildings within C4-4A districts are described above.

R6A contextual residential districts restrict residential and community facility buildings to a maximum FAR of 3.0 (3.6 with the Inclusionary Housing bonus) and to maximum lot coverages on corner lots of 80 percent and on interior/through lots of 65 percent. Quality Housing regulations are mandatory in R6A districts. Additionally, building base heights must be 40-60 feet with a total maximum building height of 70 feet. The street wall of a new building can be no closer to the street line than any building within 150 feet on the same block but need not be farther than 15 feet; the area between the street wall and the street line must be planted. Parking is required for a minimum of 50 percent of dwelling units except when fewer than five spaces are required. A rear yard depth of 30 feet is required. These contextual regulations as described above are intended to produce high lot coverage apartment buildings compatible with older buildings in medium-density neighborhoods. R6A districts permit residential Use Groups 1 and 2 in addition to Community Facility Use Groups 3 and 4 as-of-right.

R7-2 districts are medium-density apartment house districts which are governed by either Height Factor or Quality Housing Regulations. R7-2 districts also permit residential Use Groups 1 and 2 and Community Facility Use Groups 3 and 4. Height Factor regulations restrict residential buildings to an FAR of 0.87-3.44 and community facility uses to a maximum FAR of 6.5. Additionally, open space ratios of 15.5-25.5 are required and building height are governed by the sky exposure plane. Parking is required for 50 percent of dwelling units. Quality Housing regulations permit a maximum residential

FAR of 4.0 on wide streets, 3.44 on narrow streets, and a maximum Community Facility FAR of 6.5. On interior lots Quality Housing Regulations permit a maximum lot coverage of 65 percent and on corner lots of 80 percent. Base heights are required to be between 40-65 feet on wide streets outside the Manhattan core and 40-60 feet on narrow streets. The maximum permitted building height is 80 feet on wide streets and 75 feet on narrow streets. Minimum off-street parking is required for 50 percent of dwelling units. Both Height Factors and Quality Housing regulations require a minimum 30-foot rear yard depth.

The portion of the study area between East / West 124th Street and East / West 126th Street is mapped within the Special 125th District but is outside of the Core Sub-district. See Section 1.0, "Project Description," for details concerning the Special 125th District purpose and requirements.

Portions of the study area are coincident with the East Harlem Rezoning, which was certified on April 24, 2017. The land use actions sought by the East Harlem Rezoning build upon and respond to the land use and zoning recommendations in the East Harlem Neighborhood Plan (EHNP), which was developed through a holistic, community-based planning process. The East Harlem Rezoning is a city-lead initiative that seeks to achieve the following land use objectives:

- Create opportunities for requiring permanently affordable housing to ensure that the neighborhood continues to serve diverse housing needs;
- Modify the existing zoning, where appropriate, to preserve the built neighborhood character;
- Create opportunities for economic development while preserving the vitality of existing commercial and manufacturing uses;
- Establish a Special District that establishes urban design controls that balance new development in response to existing neighborhood context and scale and improves the pedestrian experience; and
- Ensure a successful neighborhood plan by establishing a planning framework that is inclusive of the relevant capital infrastructure needs and services to support current demand and future growth.

Within the land use, zoning and public policy study area, the East Harlem Rezoning seeks to zoning map an area to the northeast of the project site from an existing R7-2 district to an R7B zoning district at midblock locations, and to R7A along the western side of Madison Avenue.

Public Policy

The project site is located within a Food Retail Expansion to Support Health (FRESH) program-designated area for zoning and discretionary tax incentives. This program is open to grocery store operators renovating existing retail space or developers seeking to construct or renovate retail space in underserved neighborhoods to be leased by a full-line grocery store operator. Stores that benefit from the FRESH program must meet specific criteria related to minimum levels of fresh produce and grocery products intended for home preparation.

The project site is also located within the 125th Street Business Improvement District (BID). A BID is a formal organization made up of property owners and commercial tenants who are dedicated to promoting business development and improving an area's quality of life. BIDs deliver supplemental services such as sanitation and maintenance, public safety and visitor services, marketing and

promotional programs, capital improvements, and beautification for the area - all funded by a special assessment paid by property owners within the district. Additionally, the project site is partially located within New York State's East Harlem Empire Zone. The New York State Empire Zone Program encourages development in designated areas by offering a wide array of incentives in the form of employment, investment, real property, sales and wage tax credits, and utility discounts. The project site is also located within the Upper Manhattan Empowerment Zone. Businesses within Empowerment Zones are eligible for financial assistance including grants to non-profits, loans, loan guarantees, and equity investments.

The New York City Department of City Planning is currently carrying out an East Harlem Neighborhood Planning Study, and this study includes the project site. The purpose of the study is to examine key land use and zoning issues in the neighborhood in addition to taking a broader, more comprehensive look at current and future community needs to identify a wide range of strategies and investments for East Harlem's growth and vitality. The East Harlem Neighborhood Planning Study is a part of *Housing New York,* the Mayor's housing plan to build and preserve affordable housing through community developed initiatives that foster a more equitable and livable New York City.

The 400-Foot project study area encompasses several sites which are governed by City, State, and National landmarks law. The National Register (NR)-listed Mount Morris Park Historic District (94NR00708), NR-listed / Landmarks Preservation Commission (LPC)-designated Langston Hughes House (90NR00893; LP-01135), the NR-listed / LPC-designated St. Andrews Episcopal Church (90NR00635; LP-00294), and the NR-listed / LPC-designated Harlem Fire Watchtower (90NR00762; LP-00313) all fall within the study area. Additionally, several buildings within the study area are eligible for NR listing including 1944 Madison Avenue, 4-12 East 125th Street, 16 East 127th Street, and 2050 Fifth Avenue. The LPC currently has no other properties proposed for listing as a New York City Landmark.

The project site and study area are not located within the Coastal Zone Boundary (based on FEMA Advisory Base Flood Elevation) and thus not subject to the New York City Waterfront Revitalization Program.

No-Action Condition

Land Use and Zoning

As described in Section 1.0, "Project Description" under the No-Action Condition, it is projected that the existing NBT space would be converted to office space while existing retail and office space uses would remain unchanged. The new office space would be comprised of 14,706 sf of standard office and 3,717 sf of medical office.

Six additional projects are currently under construction within the study area; the no build projects, which build off of those identified in the East Harlem Rezoning DEIS and include additional known developments, are presented in Table 2.2-1, below.

Table 2.2-1: No-Build Projects

Block	Lot	Address	Land Use	Dwelling Units	Commercial Floor Area (Square Feet)
1723	3	5-15 West 125th Street	Residential/Commercial	30	75,611
1724	30	11 West 126th Street	Residential	6	N/A
1724	36	2050 Fifth Avenue	Residential	1	N/A
1749	1	2001 Fifth Avenue	Residential	2	N/A
1750	164	16 East 126th Street	Residential	2	N/A
1750	62	24 East 126th Street	Residential	2	N/A

A new steel building is being constructed on Block 1723 – Lot 3 (6-18 West 126th Street, 5-15 West 125th Street) from the merged lots 31, 45, and 144. The new building will be six-stories (76-feet) with the first three floors occupied by Use Group 6 commercial uses and the fourth through sixth floors occupied by Use Group 2 residential uses. In total, the Site would be developed with 74,611 sf of commercial floor area (2.90 FAR) and 26,797 sf of residential floor area (1.04 FAR, 30 dwelling units) for a total of 101,408 sf of floor area at an FAR of 3.94 with 100 percent lot coverage.

Additionally, a new masonry residential apartment house building is being constructed on Block 1724 – Lot 30 (11 West 126th Street). The new building will be six-stories (60-feet) with six floors occupied by Use Group 2 residential uses (six dwelling units). In total the site would be developed with 8,522 sf of residential floor area (3.41 FAR) with 63% lot coverage. The site would have a rear yard with a depth of 36-feet.

The structure at Block 1749 – Lot 1 (2001 Fifth Avenue), an existing one family residential dwelling is being converted into a two family dwelling and enlarged vertically by 11 feet. At Block 1750 – Lot 165 (16 East 126th Street) an existing 11-unit multi-family residential dwelling is being enlarged by one-story (13 feet) to modify the building into a new two family dwelling. Nearby at Block 1750 – Lot 62 (24 East 126th Street) another existing 12-unit multi-family residential dwelling is being enlarged at the rear and being converted to a two family dwelling.

2050 Fifth Avenue (Block 1724 - Lot 36) previously the Mount Moriah Baptist Church, built in 1887 in the Romanesque style, is being converted to a non-commercial gallery with one residential unit. The project would involve a change in use from a church to a residential one and two family home at an FAR of 1.88, with no change in total floor area. The building fronts on Fifth Avenue. The first floor and a portion of the second floor would be used as a non-commercial art gallery with one residential unity accessory to the art gallery for use by a private party. The non-commercial art gallery is considered residential floor area because the space is not open to the general public with admission solely by invitation or scheduled appointment with no signs or plaques.

Additionally, there are two large, mixed use planned projects that are not as-of-right which are outside of the land use study area but within urban design study area as shown in Figure 2.6-1. First, the Victoria Theatre, a State-owned, designated landmark located at 233 West 125th Street is currently in construction utilizing zoning overrides. The new development will be 28-story (326 feet in height), 191-unit residential tower at an FAR of 18.77. Second, a proposed mixed-use development would be a 21-story, 682-unit residential tower at an FAR of 11.14 at 1800 Park Avenue.

The No-Action project and the two new buildings described above would not introduce new uses to the study area. The mixed residential and commercial use building and the No-Action building would both front along commercial corridors (i.e. 125th Street and Fifth Avenue) and the residential building would front on the residential West 126th Street. There would be no change in zoning under the No-Action Condition.

The text amendments and Special District proposed by this project would not be instituted in the No Action Scenario.

Independent of the actions proposed by this project, it is assumed the East Harlem Rezoning would complete the ULURP process and adopted in its current form. The portions of the East Harlem Rezoning within 400 feet of the project site (located to the northeast of the project site) would be rezoned from R7-2 to R7B at midblock locations and R7A along the west side of Madison Avenue. The project site would also be mapped as part of the Transit Area Special Purpose District, which would modify the existing text and add new text to exclude floor area for any subway transit-related uses such as subway entrances and ancillary facilities (e.g., vent facilities, emergency egress) from the definition of zoning floor area.

Public Policy

There are no planned or proposed changes to public policy that would affect the study area under the No-Action Condition. The No-Action project would not introduce any new housing (affordable or market rate) and would result in the loss of the National Black Theater at the project site.

With-Action Condition

Land Use and Zoning

As described in Section 1.0, "Project Description," the proposed action would rezone the development site from C4-4A to C4-7 and map it as a Mandatory Inclusionary Area (MIHA) and modify VPA zoning text in order facilitate the redevelopment of the project site.

C4-7 districts (R10 equivalent) permit a residential, a commercial, and a community facility FAR of 10.0. The proposed text amendment to Appendix F of the Zoning Resolution would establish an MIHA coterminous with the rezoning area, subject to the affordability requirements of Option 1 or Option 2 of the MIH Program (see Appendix A). The only site affected by the rezoning would be the project site. The RWCDS consists of 32,783 gsf of retail space, 28,225 gsf of VPA theater space (to be home to NBT), and 180,669 gsf of residential space (240 units, 72 units reserved as affordable at 30 percent AMI).

As shown in the above land use analysis, the study area and particularly 125th, 126th, and Fifth Avenue are developed with commercial and residential use buildings. Land use patterns generally favor multifamily residential and commercial uses (retail and office). Neither the No-Action Condition nor the With-Action Condition would introduce new land uses to the study area. The No-Action Condition would entail the loss of the NBT theater, while the With-Action Condition would introduce housing stock, including affordable housing.

As the study area is already largely residential in nature, the new residential population is not likely to disrupt existing land use trends.

The proposed rezoning would only affect the project site. The proposed zoning text amendments would modify building height, waive parking and window glazing requirements, and modify entrance, marquee signage, and loading dock requirements. The majority of the proposed text amendments would solely affect the project site. The proposed rezoning and zoning text amendments would not be expected to cause changes in land use as they are generally only applicable to the project site. The project would result in additional affordable housing in the project area which would be a benefit to the area.

While the proposed actions would result in a building that is larger than buildings with the immediate study area of 400 feet, the height is consistent with the emerging pattern of high density nodes every one or two avenues along 125th street, including the Victoria Theater at 300 feet, the State office Building at 210 feet and the 1800 Park Avenue building (proposed) at 352 feet. .

As the project site is located wholly outside the East Harlem Rezoning area, the proposed actions would not conflict with the land use and/or zoning envisaged as part of the EHNP. Further, as the proposed actions, would map the project site as an MIH area, the proposed actions would be consistent with the affordable housing goals set forth in EHNP.[1]

See Section 1.0, "Project Description," for additional information concerning the zoning text amendments.

Public Policy

There are no planned or proposed changes to public policy that would affect the study area under the With-Action Condition. The RWCDS would provide additional housing and would be somewhat inconsistent with the Mayoral goal of providing greater affordable housing. However, the No-Action Condition would provide no housing whatsoever, as such the increment for comparison would be neither favorable nor unfavorable in terms of affordable housing. Additionally, as described above, the RWCDS would be consistent with the promulgated policy of protecting visual and performing arts cultural institutions along 125th Street.

While portions of the East Harlem Rezoning are located within 400 feet of the project site, the proposed actions and associated RWCDS would be consistent with the overarching goals and objectives of the East Harlem Rezoning.

[1] It should be noted that many of the projected development sites identified in the East Harlem Rezoning would be constructed and fully occupied after 2020, the analysis (build) year identified in the RWCDS.

2.1.4 Conclusion

As described above, the proposed action would result in the development of the project site with retail, office, visual and performing arts, and residential uses. The RWCDS would be consistent with existing and projected land use patterns within the study area and would preserve the National Black Theater. Additionally, the proposed actions are not expected to spur changes in land use or land use trends in the study area. The proposed zoning would be consistent with the purposes and intents of the 125th Street Rezoning, and the proposed zoning use and bulk modifications would pertain only the project site. Lastly, the proposed action is consistent with adopted public policies within the study area, including the EHNP and associated East Harlem Rezoning project. Therefore, the RWCDS would not have a significant adverse impact on land use, zoning, and public policy within the study area.

2.2 Socioeconomic Conditions

2.2.1 Introduction

According to the *2014 CEQR Technical Manual*, an analysis of socioeconomic conditions may be necessary when a project would directly or indirectly change an area's socioeconomic character (population, housing, and economic activity); the assessment usually considers the socioeconomic conditions of area residents separately from those of area businesses, although projects may affect both in similar ways. An assessment of socioeconomic conditions is warranted when a project would result in (1) direct displacement of residential population on a project site; (2) direct displacement of existing businesses or institutions on a project site, (3) indirect displacement of residential population in a study area; (4) indirect displacement of businesses or institutions in as study area; (5) indirect displacement of businesses due to retail market saturation; and (6) adverse effects on specific industries. As discussed further below, the proposed actions would not result in the direct displacement of residential population, the direct displacement of businesses, or the indirect displacement of businesses.

The threshold of development which triggers an analysis of direct residential population displacement is 500 residents. As described in Chapter 1.0, "Project Description," in the existing condition the project site is not and under the No-Action condition the project site would not be developed with residential uses. Therefore, no residents would be directly displaced as a result of the proposed actions and no analysis of direct residential displacement is warranted.

The threshold of development which triggers an analysis of direct business displacement is 100 employees. Under the No-Action condition the project site would be developed with retail and office uses. Based on the *Vanderbilt Corridor and One Vanderbilt FEIS* (2015) commercial employment is estimated at one worker per 333 square feet of retail space and of one worker per 250 square feet of office space. The No-Action condition would result in approximately 64 fewer employees than the With-Action condition.[1] Further, as described in Chapter 1.0, the loss of office space under the With-Action condition as compared to the No-Action condition would not result in the displacement of a business uniquely dependent on its location nor of a business subject to a public policies aimed at its preservation. Under the No-Action condition the project site would be developed with office and medical office space. It is assumed that the existing tenant of the project site's office space, the Harlem Children's Zone (HCZ), would continue to tenant the office space under the No-Action condition. (The HCZ operates the "Promise Academy II," a charter school, at 35 East 125th Street, on the same block as the project site.) In the With-Action condition, it is expected that the HCZ offices would relocate to another location within the Harlem community proximate to the Promise Academy II. The remaining projected office and medical office space under the No-Action condition is readily replaceable per existing market conditions within the study area. The retail tenants that currently occupy the project site and which might be expected to tenant the project site under both the No-Action and With-Action conditions are neither uniquely dependent on the location nor subject of policies aimed at their preservation. Therefore, an analysis of direct business displacement is not

[1] Assumes no change in the number of NBT employees.

warranted as fewer than 100 employees would be displaced, and no business which uniquely relies on its location nor which an applicable public policy aims to preserve would be displaced.

The proposed action would not introduce new development that is markedly different from existing uses, development, and activities in the study area. The proposed action would result in a reduction of commercial space relative to the No-Action Condition and in the preservation of 28,225 gsf of space for NBT, an incremental increase of 28,226 gsf of theater space relative to the No-Action Condition. The threshold of development which triggers an analysis of indirect business displacement is 200,000 gsf of commercial space. Therefore, an analysis of indirect business displacement due to increased rents is not warranted and no further analysis is necessary. Of the new commercial development at the project site, the incremental increase of retail space over the No-Action condition would be 18,546 gsf. The threshold for an indirect businesses displacement analysis due to retail market saturation is 200,000 sf. Therefore, an analysis of indirect business displacement is not warranted and no further analysis is necessary.

The proposed actions would result in an incremental increase in residential development of 240 dwelling units, accommodating an additional estimated 502 residents. This exceeds the threshold for analysis for potential to induce indirect residential displacement and as such, an analysis of potential for displacement is warranted.

2.2.2 Methodology

According to the *2014 CEQR Technical Manual* guidelines, a preliminary assessment of a project's potential to cause indirect residential displacement is necessary to determine whether the proposed project may either introduce a trend or accelerate a trend of changing socioeconomic conditions that may potentially displace a vulnerable population to the extent that the socioeconomic character of a neighborhood would change. Generally, an indirect residential displacement analysis is conducted only in cases in which the potential impact may be experienced by renters living in privately held units unprotected by rent control, rent stabilization, or other government regulations restricting rents, or whose incomes or poverty status indicate that they may not support substantial rent increases. In all cases, the potential for indirect displacement depends not only on the characteristics of the proposed project, but on the characteristics of the study area. Usually, the characteristics of the proposed project are known--the objective of the preliminary assessment, then, is to gather enough information about conditions in the study area so that the effect of the change in conditions with the proposed project relative to expected future conditions in the study area can be better understood.

The first step of the preliminary analysis is to determine if the proposed project would add new population with higher average incomes compared to the average incomes of the existing populations and any new population expected to reside in the study area without the project. If the project would introduce a costlier type of housing compared to existing housing and the housing expected to be built in the No-Action condition, then the new population may be expected to have higher incomes. In some cases, the study area may already be experiencing socioeconomic change and the housing to be developed under a proposed project represents a continuation of an existing trend, and not a new trend. If the expected average incomes of the new population would be similar to the average incomes of the study area populations, no further analysis is necessary. If the expected average incomes of the new population would exceed the average incomes of the study area populations, then the next step of the analysis is conducted.

Per the *CEQR Technical Manual*, the study area for the analysis of indirect residential displacement was calculated based on the U.S. Census Bureau's 2010 Census and 2009-2013 American Community Survey. As the analysis examines population and income data, the quarter-mile study area was adjusted to reflect census tracts with more than 50 percent of their area within a quarter mile (0.25) radius of the project site (see Figure 2.2-1). The population of these census tracts was aggregated with projected no-build project populations. The population added by the proposed project was determined to result in less than a five percent increase in population as compared to the No-Action population of the study area thus a quarter-mile study area for analysis is appropriate.

In order to establish long-term income and rent trends for the study area, in accordance with the *CEQR Manual* guidance, Manhattan, and New York City mean income and median gross rent for the year 1999 was collected from the Census 2000 database and data from 2010-2014 was collected from the American Community Survey 2010-2014.[2] The 2010-2014 data reflects five year averages of income distribution, mean income, and median rent for the trailing 12 months in 2014 inflation-adjusted dollars.[3] The mean income and median gross rent of each census tract was weighted based on the total number of households and averaged to determine an overall mean income and average median rent for the study area in 1999 and for the 2010-2014 averages.

All income and rent data were adjusted and normalized to April 2016 dollars in order to account for inflation based on New York-Northern New Jersey-Long Island, NY-NJ-CT-PT Consumer Price Index for All Urban Consumers: Owner's equivalent rent of primary residence (CPI).[4] 1999 Census statistics was considered to be 1999 dollars (the average of the all 1999 CPI indexes) and 2010-2014 statistics were considered to be the average of 2010-2014 dollars (the average of all indexes between 2010 and 2014). The CPI was then adjusted from the study year (or study year averages) to April 2016 figures. Thus income and rent trends were observed to change based on normalized figures. Similarly, income data for the years 2010-2014 was obtained from the American Community Survey and weighted where appropriate in order to compare income level breakdown.

Rental data was retrieved from StreetEasy.com listings by defining an area coterminous with that of the study area. A survey of market-rate prices of bedrooms by configuration was conducted for the study area. Based on outside surveys further described below, median rental rates obtained from the survey were deemed to be more representative of rental conditions for the study area than average rental rates.

Existing Conditions

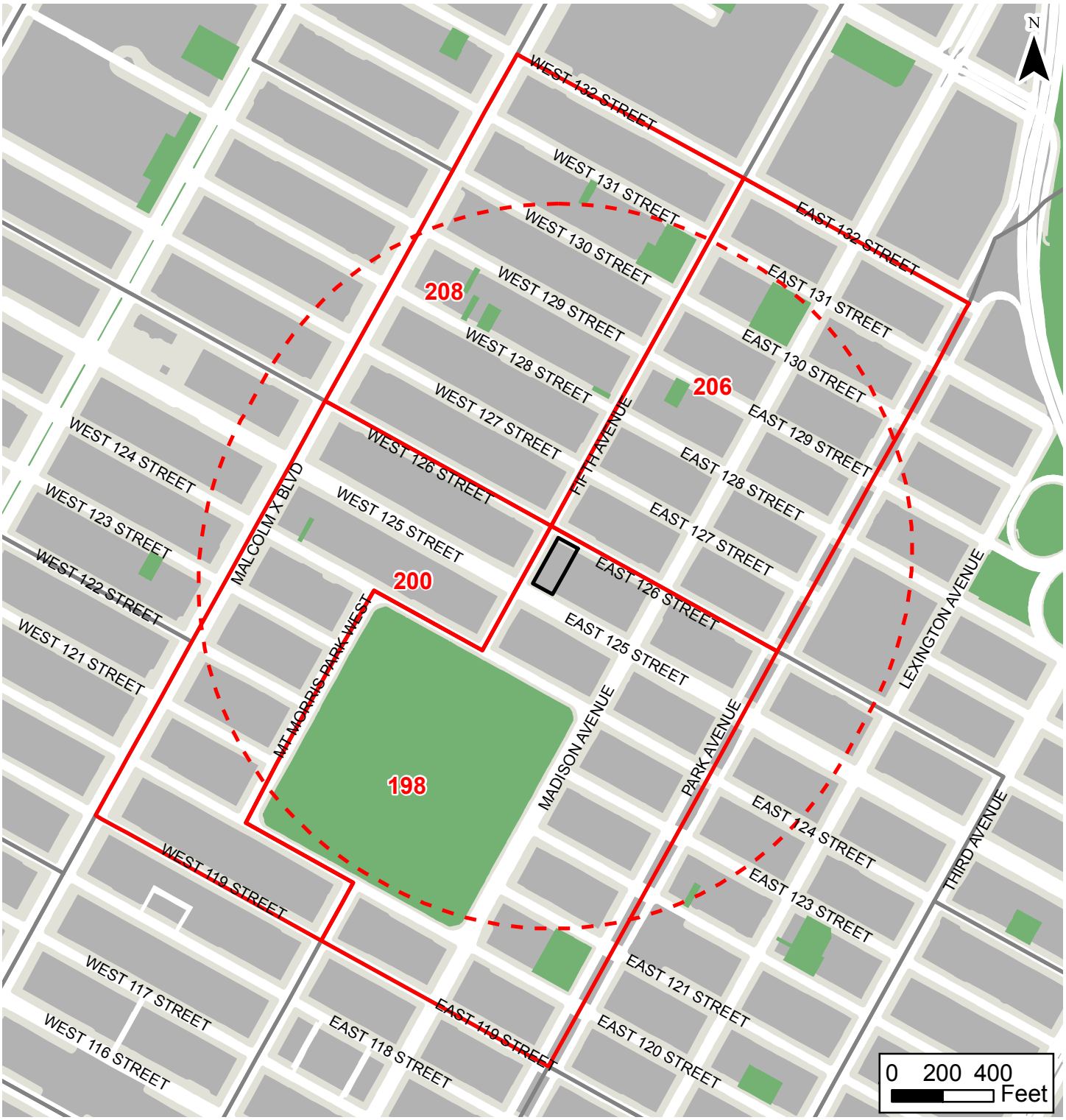
As described in the *2014 CEQR Technical Manual*, if the proposed project would introduce a costlier type of housing compared to existing housing and the housing expected to be built in the No-Action

[2] U.S. Census Bureau, Census 2000 Summary File 3, "QT-P32: Income Distribution in 1999 of Households and Families: 2000," *American FactFinder,* http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml, June 2, 2016.; U.S. Census Bureau, 2010-2014 American Community Survey 5-Year Estimates, "S1901: Income in the Past 12 Months (In 2014 Inflation-Adjusted Dollars)," *American FactFinder,* http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml, June 2, 2016.

[3] The American Community Survey (ACS) collects data throughout the period on an on-going monthly basis and asks for a respondent's income over the "past 12 months." The 2010-2014 ACS data reflects income over 2010-2014. Census data reflects income data over the prior calendar year (1999).

[4] U.S. Bureau of Labor Statistics, "Consumer Price Index for All Urban Consumers: Owners' equivalent rent of primary residence in New York-Northern New Jersey-Long Island, NY-NJ-CT-PA (CMSA) [CUURA101SEHC01]," *FRED, Federal Reserve Bank of St. Louis,* https://fred.stlouisfed.org/series/CUURA101SEHC01, June 21, 2016.

Date: 6/2/2016



2031-2033 Fifth Avenue
New York, New York

Socioeconomic Study Area

Figure 2.2-1

- Project Site
- 198 Quarter Mile Study Area
- Quarter Mile Radius
- Census Tracts

Sources:
1. New York (City). Dept. of City Planning 2015. Manhattan MapPLUTO (Edition 15v1). New York City: NYC Department of City Planning.
2. New York (City). Dept. of City Planning 2016. LION (Edition 16A). New York City: NYC Department of City Planning.
3. New York (City). Dept. of Information Technology & Telecommunications. Open Space (Parks), Mar 14, 2016. New York City: Dept. of Information Technology & Telecommunications.
4. New York (City). Dept. of Information Technology & Telecommunications. Building Footprints, Jan 26, 2016. New York City: Dept. of Information Technology & Telecommunications.
5. New York (City). Dept. of Information Technology & Telecommunications. Sidewalk, Mar 15, 2016. New York City: Dept. of Information Technology & Telecommunications.
6. New York (City). Dept. of City Planning. 2010 Census Tracts, Mar 22, 2016. New York City: Dept. of City Planning.

condition, then the new population may be expected to have higher incomes. An analysis of whether the proposed project would add new population with higher average incomes as compared to the average incomes of existing populations and the average income of any new population expected to reside in the study area is conducted below (in accordance with Step 1 of a preliminary assessment of indirect residential displacement outlined in the *CEQR Technical Manual*).

The With-Action condition would result in a population increase of less than five percent within a quarter-mile study area as compared to the No-Action condition. Therefore, a quarter-mile study area was analyzed for indirect residential displacement. The quarter-mile socioeconomic study area includes Census Tracts 198, 200, 206, and 208 and is roughly bounded by Park Avenue to the east, East/West 132nd Street to the north, Malcolm X Boulevard to the west, and East/West 119th Street to the south (see Figure 2.2-1).

As of 2010-2014, the study area exhibits slightly below average income levels as compared to New York City average income levels and significantly below average as compared to Manhattan average income levels. Within the study area, Census Tracts 198, 200, and 208 exhibit higher levels of household income as compared to Census Tract 206 reflecting high property values around Marcus Garvey Park and along residential cross streets, particularly south of 125th Street (South Harlem).

As shown in Table 2.2-1, in 2016 dollars, the average household income in the study area was $84,594 in 2010-2014, which is fairly consistent with the New York City-wide average of $87,711, but only approximately 60 percent of the Manhattan-wide average. Since 1999, the average household income in the study area has increased by approximately 31.4 percent (see Table 2.2-1), while average household incomes in Manhattan as a whole decreased by 5.1 percent and average household income in New York City decreased by 9.5 percent. The incommensurate growth in study area average household income as compared to Manhattan and New York City indicate that the demographics of the study area have changed significantly. The change cannot be accounted for by the growth in income of the existing population (as that has not been the case for Manhattan and New York City), but is likely due to the introduction of a significant new population of differing income levels. Thus, the increase in average household income indicates that there is an existing trend toward higher incomes in the study area especially as compared to Manhattan and New York City.

Table 2.2-1
Average Household Income

Area	Year 1999	Years 2010-2014	Percent Change
Study Area	$64,372	$84,594	31.4%
Manhattan	$146,107	$138,717	-5.1%
New York City	$96,962	$87,711	-9.5%
Notes: Income levels presented in inflation-adjusted April 2016 dollars.			

As shown in Table 2.2-2, the increase in study area median gross rent has outpaced both that of Manhattan and New York City, (although both areas exhibit initial and current median gross rent levels that are greater than the study area's). As the increase is median gross rent is commensurate with that of Manhattan, the trend can be attributed to larger Manhattan market conditions. The slightly greater rent growth in the study area as compared to Manhattan could be attributed to both lower initial average household income levels and to lower initial gross rent levels.

Table 2.2-2
Median Gross Rent

Area	Year 1999	Year 2010-2014	Percent Change
Study Area	$881	$1,081	22.7%
Manhattan	$1,319	$1,546	17.2%
New York City	$1,201	$1,335	11.2%
Notes: Rent prices presented in inflation-adjusted April 2016 dollars.			

The distribution of average household income within the study area indicates the presence of both market-rate and rent-protected housing. As shown in Table 2.2-3, nearly 30 percent of households within the study area made less than $25,000 a year between 2010 and 2014, similar to New York City as a whole (27.2 percent) but substantially more than Manhattan (23.3 percent); income levels from $25,000-$49,999 are comparable to rates in Manhattan and New York City. The prevalence of these two lower income brackets, particularly at higher rates than Manhattan and New York City, is an indicator of a rent-protected housing within the study area. Similarly, the number of households with incomes of $150,000 or greater (14.9 percent) as compared to New York City as a whole (13.1 percent) is an indicator of a significant supply of market rate housing within the quarter-mile study area, albeit not yet at the level of Manhattan.

Table 2.2-3
Income Distribution

Area	<$25,000	$25,000-$49,999	$50,000-$99,999	$100,000-$149,999	$150,000 or greater
Study Area	29.4%	19.0%	26.1%	10.5%	14.9%
Manhattan	23.3%	15.6%	22.5%	13.4%	25.3%
New York City	27.2%	20.6%	26.4%	12.6%	13.1%

Data was collected from a variety of real estate and rental sources to get an accurate assessment of market-rate conditions within the study area presented in Table 2.2-4 below. The data presented below is for Central Harlem specifically, or the greater Harlem area. As such, the data presented indicates weaker rental market-conditions than that of the study area. The below data is useful in understanding price differentials between unit configurations and in choosing the metric to categorize survey data collected, further described below.

Table 2.2-4
Median Rent by Unit Type (Harlem)

Unit Configuration	Studio	One-Bedroom	Two-Bedrooms
StreetEasy Neighborhood Guide[1]	$1,550	$1,850	$2,300
MNS Brands (doorman)[2]	$2,455	$3,058	$3,853

MNS Brands (non-doorman)[2]	$1,815	$2,245	$2,727
CitiHabitats[3]	$1,544	$2,008	$2,461

Notes: 1) "Harlem Neighborhood Guide," *StreetEasy.com,* visited June 3, 2016, http://streeteasy.com/neighborhoods/harlem/#by-the-numbers.

Data reflects the Central Harlem, the area generally bounded by 110th Street to the south, Park Avenue and the Harlem River to the East, St. Nicholas Avenue to the West, and 155th Street to the north

2) "The Manhattan Rental Market Report April 2016," *MNS.com,* April 2016, http://www.mns.com/manhattan_rental_market_report.

Data reflects the East, Central, and West Harlem.

3) "Manhattan Residential Rental Market Report, First Quarter 2016," *CitiHabitats.com,* https://mediarouting.vestahub.com/Media/39158141.

Data reflects the East, Central, and West Harlem.

A survey of listings on StreetEasy.com within the study area indicates that average rent was $2,050 for studios, $2,404 for one bedrooms, and $3,081 for two bedrooms. Median rents were found to be: $2,100 for studios, $2,500 for one bedrooms, and $2,845 for two bedrooms.[5] As the data exhibited high degrees of skew and because median rates are more reflective of the rental trends presented in the market guide pricings shown above, median rents were determined to be more representative of market-rate rent conditions within the study area and used for the below analysis.

Based on this data, using the U.S. Department of Housing and Urban Development's guideline of a 30 percent rent-to-income rate, renters in the study area would be expected to earn between $84,000 and $113,800 annually, depending on apartment configuration. As detailed in Alan Lightfeldt's, "State of New York City Rent Affordability in 2016" report, rent burden is significantly higher than 30 percent in New York City and Manhattan.[6] New York City's and Manhattan's projected overall rent burden for 2016 is 65.2 percent and 49.1 percent, respectively. Thus, the imputed income levels, presented below in Table 2.2-5 based on HUD's 30 percent rent-to-income guidelines, are conservative, with actual income levels likely far closer to the 49.1 or 65.2 percent levels (also presented in Table 2.2-5).

Table 2.2-5
Imputed Household Income by Unit Type/Median Rental Rates

	Studio	One-Bedroom	Two-Bedroom
Study Area Median Rental Rates	$2,100	$2,500	$2,845
Imputed Household Income at 30 percent rent-to-income	$84,000	$100,000	$113,800

[5] Survey conducted Friday June 3, 2016. Sample size of 3 studios, 17 one-bedrooms, and 32 two-bedrooms. Data exhibited a high degree of dispersion with one standard deviation as follows: studios $460, one-bedroom $587, and two-bedrooms $818.

[6] Alan Lightfeldt, "The State of New York City Rent Affordability in 2016," *StreetEasy Blog*, http://streeteasy.com/blog/new-york-city-rent-affordability-2016/, April 21, 2016.

Imputed Household Income at 49.1 percent rent-to-income	$51,324	$61,100	$69,531
Imputed Household Income at 65.2 percent rent-to-income	$38,650	$46,012	$52,362

Notes: 1) "Affordable Housing," *Housing Preservation & Development*, visited May 12, 2016, http://www1.nyc.gov/site/hpd/about/what-is-affordable-housing.page

Affordable housing rental rates based on 2016 New York City Area Median Income. Imputed rent was calculated based on a weighted average of the price of affordable units and market rate units.

No-Action Condition

Under the No-Action condition, there would be no new residential development on the project site, and, therefore, no potential for indirect residential displacement. However, as described in Chapter 2,1, "Land Use, Zoning, and Public Policy," within a 400-foot radius of the project site 43 dwelling units are slated to be constructed by the 2019 build year. Due to the limited amount of development within the 400-foot study area under the No-Action condition, it is assumed that average income levels within the quarter-mile study area under the No-Action condition would not significantly differ from existing conditions and, if they did change at all, they would be assumed to increase based on the observed trends presented above.

With-Action Condition

Under the With-Action condition, the project site would be developed with mixed use building with residential, retail and visual and performing arts space. The proposed building would have 240 dwelling units, with 30 percent of the units currently proposed at 80 percent Area Median Income (AMI) through application of the Mandatory Inclusionary Housing (MIH) program. The MIH program also allows the option to set-aside 25 percent of dwelling units for households earning up to 60 percent AMI with 10 percent of that number allocated for households making up to 40 percent AMI. Although the current proposal includes the 30 percent set-aside, the project could elect the 25 percent MIH option as final plans progress. Average household income of the new residents of the market-rate and affordable units cannot be estimated at this time because the final mix of units and levels of affordability is not known. Further, the levels of affordability are established by the U.S. Department of Housing and Urban Development (HUD) and are subject to change. The table below presents the 2017 AMI levels by family size for the New York City region.

Table 2.2-6
2017 New York City Area Median Income (AMI)

Family Size	30% AMI	40% AMI	50% AMI	60% AMI	80% AMI	100% AMI	130% AMI	165% AMI
1	$22,040	$26,720	$33,400	$40,080	$53,440	$66,800	$86,840	$110,220
2	$22,920	$30,560	$38,200	$45,840	$61,120	$76,400	$99,320	$126,060
3	$25,770	$34,360	$42,950	$51,540	$68,720	$85,900	$111,670	$141,735
4	$28,620	$38,160	$47,700	$57,240	$76,320	$95,400	$124,020	$157,410
5	$30,930	$41,240	$51,550	$61,860	$82,480	$103,100	$134,030	$170,115

Source: U.S. Department of Housing and Urban Development (HUD)

Although average household income for the proposed residential units is not known, it is assumed that the proposed project's overall population would have a higher average household income than the existing study area population because of the study area trend of increasing household income and increasing median rent (see Tables 2.2-1 and 2.2-2 above). According to the *CEQR Technical Manual*, if the proposed project is expected to introduce new population with higher average incomes than the existing average income of the study area, Step 2 of the preliminary assessment should be conducted.

Step 2 of a preliminary assessment of indirect residential displacement, as outlined in the *CEQR Technical Manual,* is to determine the proposed project's increase in population relative to the study area. As noted above, the proposed project would generate approximately 502 residents. This increase in population represents an increase less than 5 percent over the existing study area population aggregated with the projected No-Build project populations. According to the CEQR Technical Manual, a population increase less than 5 percent would not be expected to affect real estate market conditions. Therefore, no further analysis is warranted.

2.2.3 Conclusion

The quarter-mile study area has already experienced and continues to experience a readily observable trend towards increasing rents and income. In particular, income levels have far outpaced that of Manhattan and New York City in terms of growth (adjusted for CPI) demonstrating the changing demographics of the study area. Although the proposed project would introduce residents with higher household incomes than the existing average household income in the study area, the increase in population would be less than 5 percent of the estimated No-Build population and would not be expected to affect economic conditions in the study area. The proposed project is not expected to introduce or accelerate a trend of changing socioeconomic conditions that would potentially lead to the displacement of vulnerable populations. Therefore, the proposed project would not have the potential for significant adverse socioeconomic impacts and no further analysis is warranted.

2.3 Open Space

2.3.1 Introduction

According to the *2014 CEQR Technical Manual*, an open space analysis may be necessary if the project could potentially have a direct or indirect effect on open space. A direct effect on an open space resource occurs when the proposed actions results in the physical loss of open space or a change in the use of open space so that it no longer serves the same user population, limits public access, or causes increased noise or air pollutant emissions, odors, or shadows on a public open space, thus affecting its usefulness (whether on a permanent or temporary basis).

The proposed actions would not result in the physical loss or displacement of publicly accessible open space, and are not anticipated to cause increased emissions, odors, or shadows (as described in Chapters 2.9, "Air Quality," and 2.10, "Noise"). Therefore, the proposed actions would not result in any direct effects on open space and no further analysis of direct effects is required.

An indirect effect on open space can occur when a project adds enough population to the area to noticeably diminish the ability of an area's open space to serve the future population. For most projects (those located in neither a well-served nor underserved area for open space), if the proposed actions would result in the introduction of 200 or more residents or 500 or more non-residents to an area, an assessment is performed to determine if the project would have an indirect effect on open space.[1] The RWCDS is projected to generate 99 non-residents and 502 residents at the project site (assuming full build out and occupancy of the proposed mixed-use building).[2] This exceeds the minimum threshold for triggering a residential open space analysis (200 or more residents); therefore, a preliminary open space assessment was performed to determine whether the proposed actions would have the potential to have an indirect effect on open space in the area. The number of non-residents would not change substantially under the With-Action condition as compared to the No-Action condition; as described in Chapter 1.0, "Project Description," the total increment between the No-Action condition and the With-Action condition for retail floor area is an increase of 18,546 gsf and for office (including medical office) floor area is a decrease of 33,928 gsf. As office uses are more employee-intensive than retail uses and based on the total loss of commercial floor area, a non-residential open space assessment is not warranted and the RWCDS would not reach any CEQR threshold where an effect on the non-residential open space ratio would be expected.

2.3.2 Methodology

According to the *2014 CEQR Technical Manual* guidelines, a preliminary assessment of a project's effect on open space entails determining a study area, identifying all open spaces within that area, and calculating the total open space acreage, taking into account any potential changes to open space

[1] A non-residential population is comprised of the total worker, student, and visitor population that frequent a selected geography. Theatre attendees were not considered to be visitors for the purposes of this open space analysis as theatre attendees would largely visit the theatre after sunset when parks are less likely to be frequented.

[2] Based on estimates from the *Vanderbilt Corridor and One Vanderbilt FEIS* (2015) of one worker per 333 square feet of retail space. No incremental change in NBT employees is assumed.

under the No-Action condition. Then, that acreage is compared with the total expected future population within the area for the No-Action condition to determine a No-Action open space ratio. The total expected future population is determined through the identification of residential developments within the open space study area projected to be constructed and operational by the proposed project's build year. The next step is to add the population generated by the proposed actions, taking into account any potential changes to open space under the With-Action condition and determine the resulting change to the open space ratio under the With-Action Condition as compared to the No-Action condition.

Typically, if the decrease in the open space ratio is greater than five percent, it is generally considered to be a substantial change and would warrant more detailed analysis. If the study area exhibits a low open space ratio (less than the citywide average of 1.5 acres per 1,000 residents or 0.15 acres per 1,000 non-residential users) in the Existing condition, then a decrease of less than five percent between the No-Action and With-Action conditions may require detailed analysis. For projects in which the open space ratio for non-residential users remains above 1.5-acre per 1,000 residents after project completion, a detailed analysis is generally not necessary.

2.3.3 Assessment

Existing Conditions

As described in the *2014 CEQR Technical Manual*, an open space study area for residential populations is defined by the reasonable walking distance such users would travel to reach open spaces and recreational areas—typically 0.5 miles. According to the *2014 CEQR Technical Manual* guidelines, all census tracts that have at least 50 percent of their area within the half-mile radius are entirely included in the study area, and all census tracts with less than 50 percent within the radius are entirely excluded.

The project site is located in Manhattan Census Tract 198, which is generally bounded by East 126th Street to the north, Park Avenue to the east, East 119th Street to the south, and Fifth Avenue to the west. Census Tracts with more than 50 percent of their area within the half-mile radius of the project site include Manhattan Census Tracts 184, 190, 196, 198, 200, 206, 208, 212, 220, 222, 224, 226, and 242. While Manhattan Census Tracts 180, 182, 194, 210, and 218 fall within the half-mile study area radius, less than 50 percent of their area falls within that radius. Additionally, as no major public open spaces to attract residents at the project site are located within those five tract boundaries, there is no reason to consider their inclusion. Thus, the open space study area for the proposed actions is comprised of 13 census tracts, as shown in Figure 2.3-1. The residential population is shown in Table 2.3-1, following.

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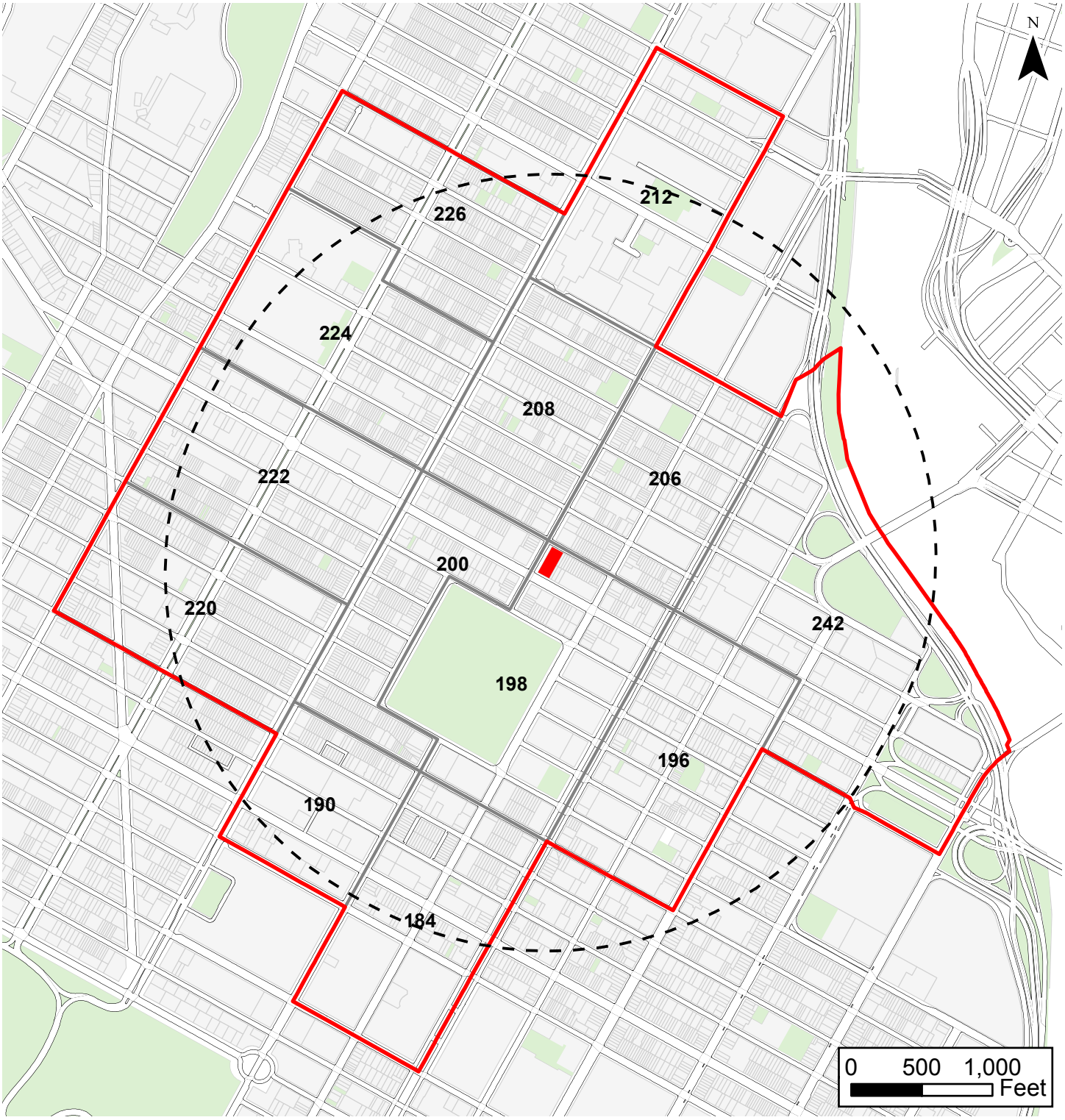

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Open Space Study Area

Figure 2.3-1

Project Site

Half-Mile Search Radius

Open Space Study Area

Study Area Census Tract (w/ Tract No.)

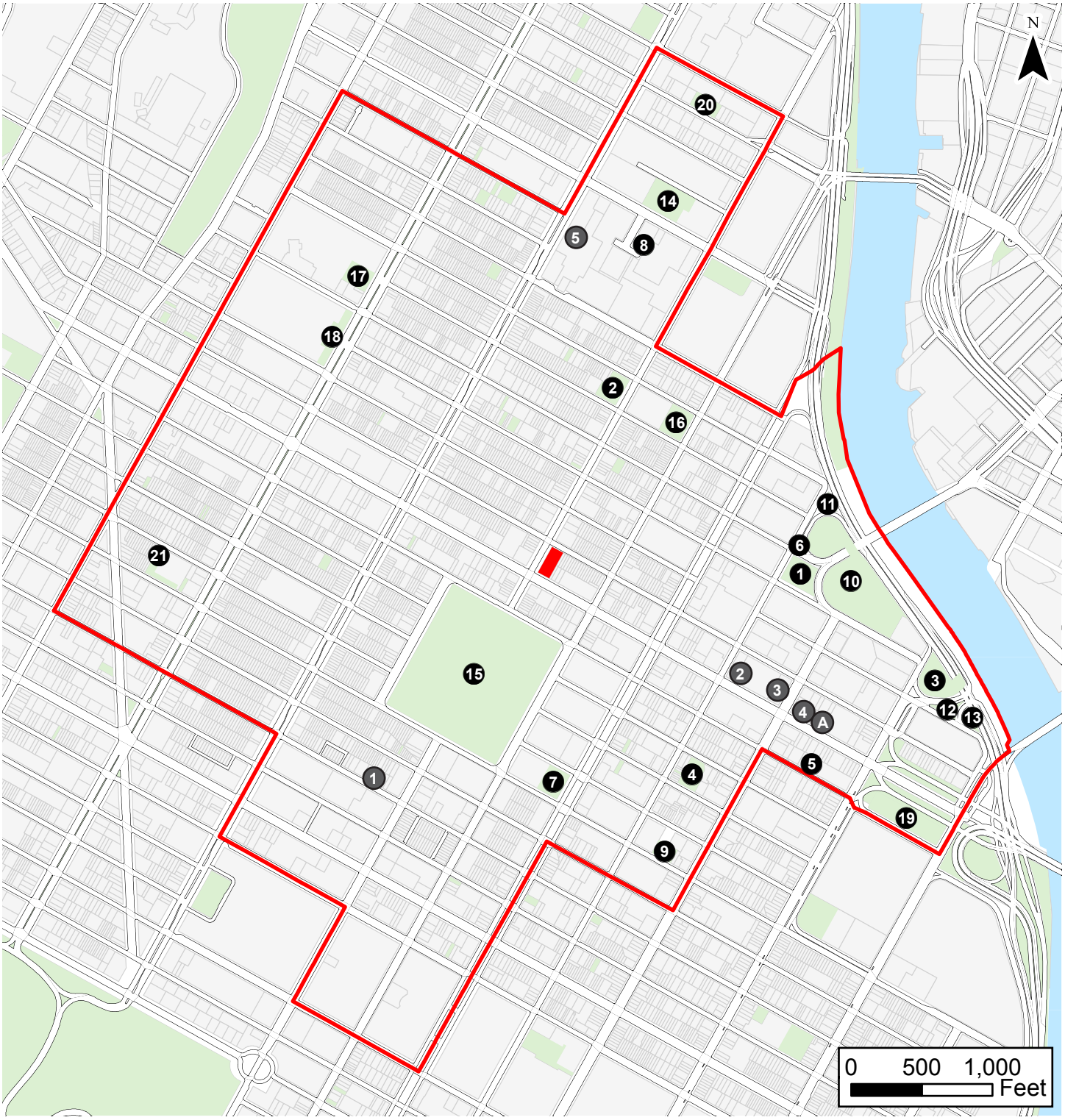
Table 2.3-1: Existing Study Area Residential Population

Census Tract	2010 Residential Population[1]	2014 Residential Population Estimate[2]
Manhattan 184	7,835	8,274
Manhattan 190	3,083	3,010
Manhattan 196	3,931	4,245
Manhattan 198	1,914	2,465
Manhattan 200	2,581	3,018
Manhattan 206	2,942	3,025
Manhattan 208	4,591	5,443
Manhattan 212	4,412	4,211
Manhattan 220	5,370	5,577
Manhattan 222	2,644	3,069
Manhattan 224	6,427	7,344
Manhattan 226	3,778	4,053
Manhattan 242	3,396	3,709
TOTAL:	**52,904**	**57,443**

Notes:
[1] 2010 Census Data
[2] 2014 American Community Survey (ACS) 5-year Estimate

As depicted in Figure 2.3-2 and as described in Table 2.3-2, there are 21 publicly-accessible open spaces within the study area totaling 37.83 acres of open space. These open spaces vary in type and include community/neighborhood parks, gardens, playgrounds, and recreation areas/centers and range from 0.06-acre to 20.17 acres in size.

Date: 5/2/2017



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Existing Open Space Inventory and No-Build Projects

Figure 2.3-2

Project Site

Open Space Study Area

1 Open Space & Recreation (w/ I.D. Label)

1 No-Build Development

A No-Build Open Space

Table 2.3-2: Existing Study Area Open Space

Map ID Number:	Name:	Size (Acres):
1	Alice Kornegay Triangle	0.88
2	Courtney Callender Playground	0.65
3	Crack Is Wack Playground	1.37
4	Dr. Ronald E. McNair Playground	0.60
5	Dream Street Park	0.25
6	Each One Teach One	0.06
7	Eugene McCabe Field	0.79
8	Hansborough Recreation Center	0.29
9	Harlem Art Park	0.35
10	Harlem River Park	5.76
11	Harlem River Park	0.20
12	Harlem River Park	0.27
13	Harlem River Park	0.35
14	Howard Bennett Playground	1.23
15	Marcus Garvey Park	20.17
16	Moore Playground	0.77
17	St. Nicholas Playground North	0.66
18	St. Nicholas Playground South	0.67
19	Wagner Houses Pool	1.64
20	William McCray Playground	0.46
21	P.S. 76 Playground	0.42
TOTAL:		**37.84**

The total acreage of open space was then compared to the study areas residential population to determine the open space ratio. The estimated current residential population in the open space study area is 57,443 persons (see Table 2.3-1), resulting in an existing open space ratio of 0.659 acres per 1,000 residents. This open space ratio is well below the City's planning goal of 1.5-acres of open space per 1,000 residents. However, as stated in the *2014 CEQR Technical Manual*, it is recognized that these planning goals are often not feasible in extremely dense urban areas (such as Central Harlem), and therefore represent guidelines and not absolute thresholds.

No-Action Condition

Under the No-Action condition, five residential developments within the open space study area are projected to be constructed and operational by the project's build year, as detailed in Table 2.3-3. In addition, one additional open space resource would be constructed, as detailed in Table 2.3-4.

Table 2.3-3: No-Build Development within the Open Space Study Area[1]

Map ID No.:	Name / Location:	Type:	Build Year:	Projected Residential Population:[2]
1	17-21 West 118th Street	Residential/Commercial	2017	75
2	149 East 125th Street	Residential/Commercial	2020	615
3	2306 3rd Avenue	Residential/Community Facility	2020	615
4	The 125th Street Development	Residential/Commercial/Community Facility/Hotel	2020	2,640
5	Lenox Terrace	Residential/Commercial/Community Facility	2019	4,477
TOTAL NO-BUILD DEVELOPMENT POPULATION:				**8,439**
2014 RESIDENTIAL POPULATION ESTIMATE:				**57,443**
FUTURE NO-ACTION CONDITION RESIDENTIAL POPULATION ESTIMATE				**65,882**

Notes:
[1] Projects that are not subject to discretionary approval or include fewer than 50 residential units are not included as part of this analysis.
[2] Residential population based on the average household size of 2.64 for the East Harlem North Neighborhood Tabulation Area, 2014 ACS 5-year Estimate.

Table 2.3-4: No-Build Open Space Resources within the Open Space Study Area

Map ID No.:	Name / Location:	Build Year:	Open Space Acreage:
A	The 125th Street Development	2020	0.28
TOTAL NO-BUILD OPEN SPACE:			**0.28**
2014 TOTAL OPEN SPACE RESOURCES:			**37.84**
FUTURE NO-ACTION CONDITION OPEN SPACE RESOURCES			**38.12**

Absent the proposed actions, it is assumed the existing building on the project site would be occupied with commercial uses. Based on the foregoing, the open space ratio in the No-Action condition is projected to be 0.579 acres of open space per 1,000 residents, significantly lower than the ratio calculated for the existing condition.

With-Action Condition

The RWCDS would include 240 units and generate 520 residents. As shown in Table 2.3-5, the project-generated residential population increase would result in an open space ratio of 0.574 acres per 1,000 residents, resulting in a decrease of the open space ratio by 0.86 percent compared to the No-Action condition. This projected open space ratio continues to be below New York City's planning goal of 1.5-acres of open space per 1,000 residents, which is consistent with the Existing and No-Action conditions for the open space study area.

Table 2.3-5: With-Action Changes to Open Space Ratio

	Residential Population	Total Open Space (Acres)	Open Space Ratio (Acres per 1,000 Residents)
No-Action	65,882	38.12	0.579
With-Action Increment	520	0.0	-
Total With-Action	66,402	38.12	0.574
Percent Change			-0.86

As indicated in Table 2.3-5, the open space ratio in the With-Action condition would decrease by less than one percent, and remain below New York City's goals as indicated in the *2014 CEQR Technical Manual*.

2.3.4 Conclusion

Currently, the open space ratio in the study area for residential users is below New York City guidelines as indicated in the *2014 CEQR Technical Manual*, and would remain below the City guidelines in the No-Action and With-Action conditions. However, given the dense urban nature of the study area and the resultant infeasibility of meeting New York City's open space ratio guidelines, the extremely small projected numerical decrease in the open space ratio in the With-Action condition, and the proximity of the project site to Marcus Garvey Park, the largest open space resource within a half-mile radius, the proposed actions are not anticipated to generate significant adverse open space impacts, and further analysis is not required.

2.4 Shadows

2.4.1 Introduction

A shadow is defined in the *2014 CEQR Technical Manual* as the circumstance in which a building or other built structure blocks the sun from the land. An adverse shadow impact is considered to occur when the incremental shadow from a proposed action falls on a sunlight sensitive resource and substantially reduces or completely eliminates direct sunlight exposure, thereby significantly altering the public's use of the resource or threatening the viability of vegetation or other resources. Sunlight-sensitive resources include publicly accessible open space, historic architectural resources that contain features that depend on direct sunlight for their enjoyment by the public, and greenstreet spaces (landscaped pervious space within the road right-of-way). Shadows on city streets and sidewalks or on other buildings are not considered significant. In addition, shadows occurring within an hour and a half of sunrise or sunset generally are also not considered significant.

2.4.2 Methodology

According to the *2014 CEQR Technical Manual*, the longest shadow a structure will cast in New York City is 4.3 times its height. For actions resulting in structures less than 50 feet high, a shadows assessment is generally not necessary unless the site is adjacent to a park, historic resource, or important sunlight dependent natural feature. As shown in Figures 1-1 and 1-2 in Section 1.0, "Project Description," the proposed action would allow for the development of a new 20-story mixed-use residential, commercial, and community facility building at the project site, with a maximum height of 257 feet (including bulkheads). Therefore, the RWCDS is anticipated to have a maximum shadow radius of approximately 1,105.1 feet (see Figure 2.4-1).

There are five potential sunlight-sensitive resources, including two open spaces and three sunlight sensitive historic resources, within the maximum potential shadow radius (as shown in Figure 2.4-1) of the RWCDS, including:

- **Courtney Callender Playground** – north of the project site on the north side of West 130th Street.
- **Marcus Garvey Park** – south of the project site along the south side of West 124th Street.
- **St. Andrews Episcopal Church** – north of the project side along the east side of 5th Avenue (Landmarks Preservation Commission [LPC]-designated and S/NR-eligible).
- **All Saints Church** – northeast of the project site along the east side of Madison Avenue (LPC-designated and S/NR-eligible).
- **Metropolitan Community United Methodist Church** – east of the project site along the east side of Madison Avenue (S/NR-eligible).

Therefore, the following provides a shadow assessment to determine whether the RWCDS would result in incremental shadows that could have significant adverse impacts.

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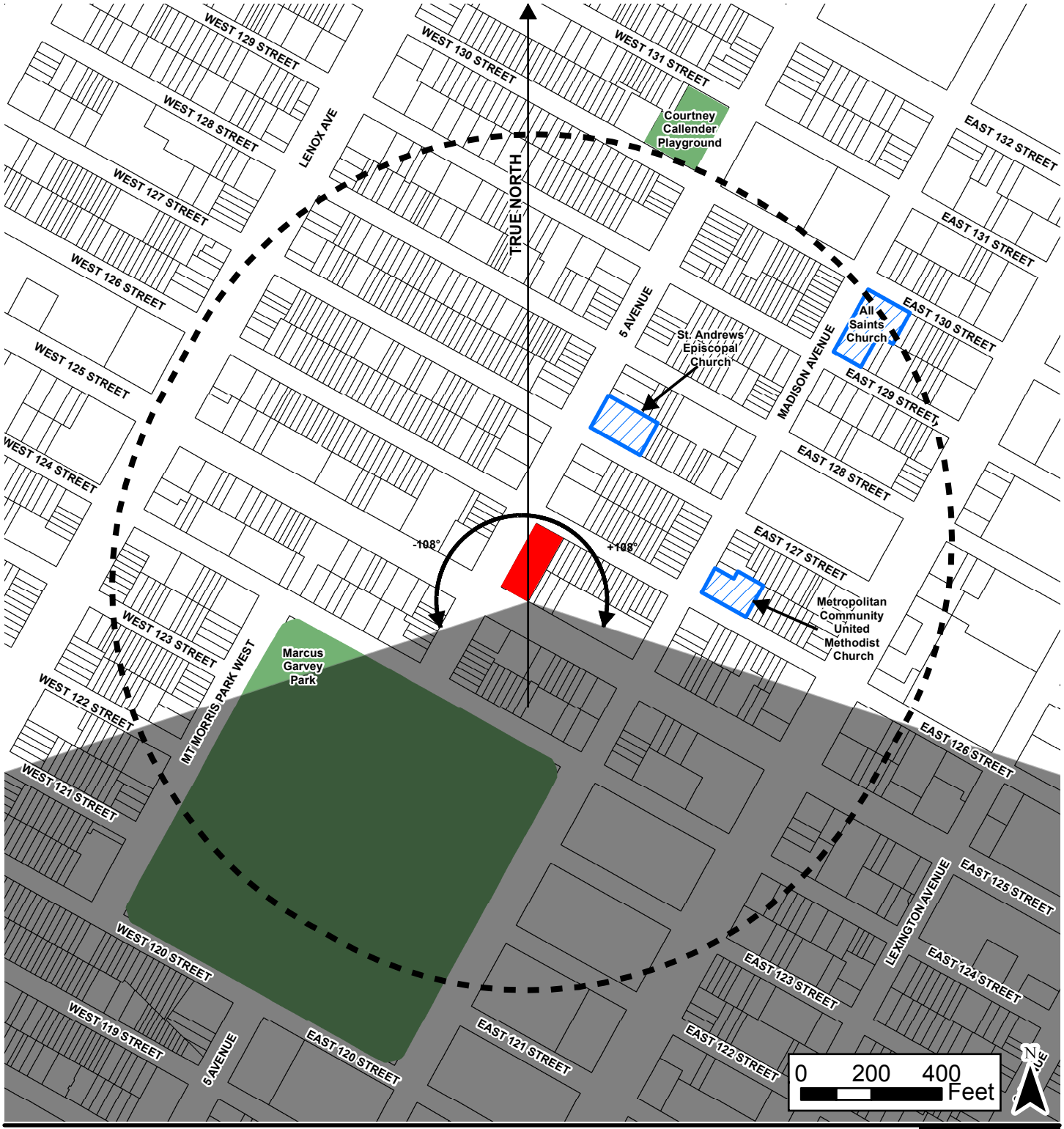

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Tier 1 and 2
Shadow Screening Assessment

Figure
2.4-1

- Project Site
- 1105.1-Foot Shadow Screening Radius*
- Area that Cannot be Shaded by the Proposed Development
- Open Space and Recreation
- Sunlight Sensitive Historic Resource

*Represents the Longest Shadow Study Area for the Proposed Project

Sources:
1. New York (City). Dept. of City Planning 2015. Manhattan MapPLUTO (Edition 15v1). New York City: NYC Department of City Planning.
2. New York (City). Dept. of Parks and Recreation 2015. Parks Properties. New York City: NYC Department of Parks and Recreation.
3. New York (City). Dept. of City Planning 2015. LION (Edition 15C). New York City: NYC Department of City Planning.

2.4.3 Assessment

Because of the path that the sun travels across the sky in the northern hemisphere, no shadow can be cast in a triangle area south of any given project area. In New York City, this area lies between -108 and +108 degrees from true north. Therefore, sunlight-sensitive resources located in the area to the south of the project site (where no project shadows could fall) are excluded from further assessment.

In accordance with the *2014 CEQR Technical Manual*, Tier 1 and Tier 2 shadow screening assessments were first undertaken to: 1) establish a base map that illustrates the selected buildings in relation to the location of sunlight-sensitive resources; 2) determine the longest shadow study area; and 3) locate the triangular area that cannot be shaded by the RWCDS. The results of the Tier 1 and Tier 2 screening assessments are illustrated in Figure 2.4-1.

Tier 1 and Tier 2 Screening

Open Space

As illustrated in Figure 2.4-1, two open space resources fall within the maximum shadow screening radius for the RWCDS, including small portions of both Marcus Garvey Park and the Courtney Callender Playground, both of which are owned and operated by the New York City Department of Parks and Recreation (DPR). The Courtney Callender Playground is a 0.67-acre open space facility containing playground equipment and basketball and handball courts, as well and landscaping elements. The maximum shadow screening radius for the RWCDS only captures a very small portion of this facility (i.e. 0.002 acres, or approximately 0.3 percent of its total area), where its basketball courts are situated. Marcus Garvey Park, over 20 acres in size, contains active recreation components (e.g., basketball courts baseball fields, playground equipment, and fitness equipment, etc.), passive recreation amenities (e.g., landscaped areas, walking paths, etc.), as well as a recreation center. The portion of Marcus Garvey Park within the maximum shadow screening radius from the RWCDS includes landscaped areas in the northwest portion of the park (comprising approximately 0.75-acre, or approximately 3.7 percent of the total park area). As such, a Tier 3 analysis was undertaken for both of these open space resources.

Historic Resources

This section will describe the historic resources in the area and will identify if the resources contain sunlight-sensitive features, and determine those that would be affected by the RWCDS. According to the *2014 CEQR Technical Manual*, historic resources are considered sunlight-sensitive if the features that make the resource significant depend on sunlight. The following architectural features are identified by the *2014 CEQR Technical Manual* as being sunlight sensitive: (a) buildings containing design elements that are part of a recognized architectural style that depends on the contrast between light and dark design elements (e.g., deep recesses or voids such as open galleries, arcades, recessed balconies, deep window reveals, and prominent rustication); (b) buildings distinguished by elaborate, highly carved ornamentation; (c) buildings with stained glass windows; (d) exterior materials and color that depends on direct sunlight for visual character; (e) historic landscapes; and (f) features in structures where the effect of direct sunlight is described as playing a significant role in the structure's significance as a historic resource.

Based on the criteria described above and as illustrated in Figure 2.4-1, there are three historic resources with sunlight sensitive features within the maximum shadow screening radius for the RWCDS, described below in Table 2.4-1.

Table 2.4-1: Sunlight Sensitive Historic Resource

Resource Name	Address	Sunlight Sensitive Features	Designation Status
St. Andrew's Episcopal Church	2067 Fifth Avenue	Stained Glass Windows, Belfry Arches	LPC-Designated; S/NR-Listed
All Saints Church	52 East 129th Street	Stained Glass Windows, Recessed Arcades	LPC-Designated; S/NR-Eligible
The Metropolitan Community United Methodist Church	1975 Madison Avenue	Stained Glass Windows	S/NR-Eligible

As illustrated in Figure 2.4-1, all of these resources fall entirely within the maximum shadow screening radius for the RWCDS with the exception of the All Saint Church, more than half of which is located within the maximum shadow screening radius. Based on the foregoing, a Tier 3 analysis was undertaken for the St. Andrew's Episcopal Church, All Saints Church, and the Metropolitan Community United Methodist Church.

It is noted that the State and National Register eligible Mount Moriah Baptist Church, located within the maximum shadow screening radius for the proposed project, was excluded from this analysis as it was determined on May 30, 2017 that it was no longer eligible for inclusion in the State and National Registers of Historic Places by the New York State Historic Preservation Officer (NY SHPO). The NY SHPO based this determination on observed recent renovations to the building, including changes to the exterior, partial removal of the stained glass windows, and removal of significant interior features, including the open auditorium plan, original pews, and horseshoe shaped balcony, as delineated in the SHPO Determination of Eligibility dated 1999 (see the Agency Correspondence in Appendix B).

Tier 3 Screening

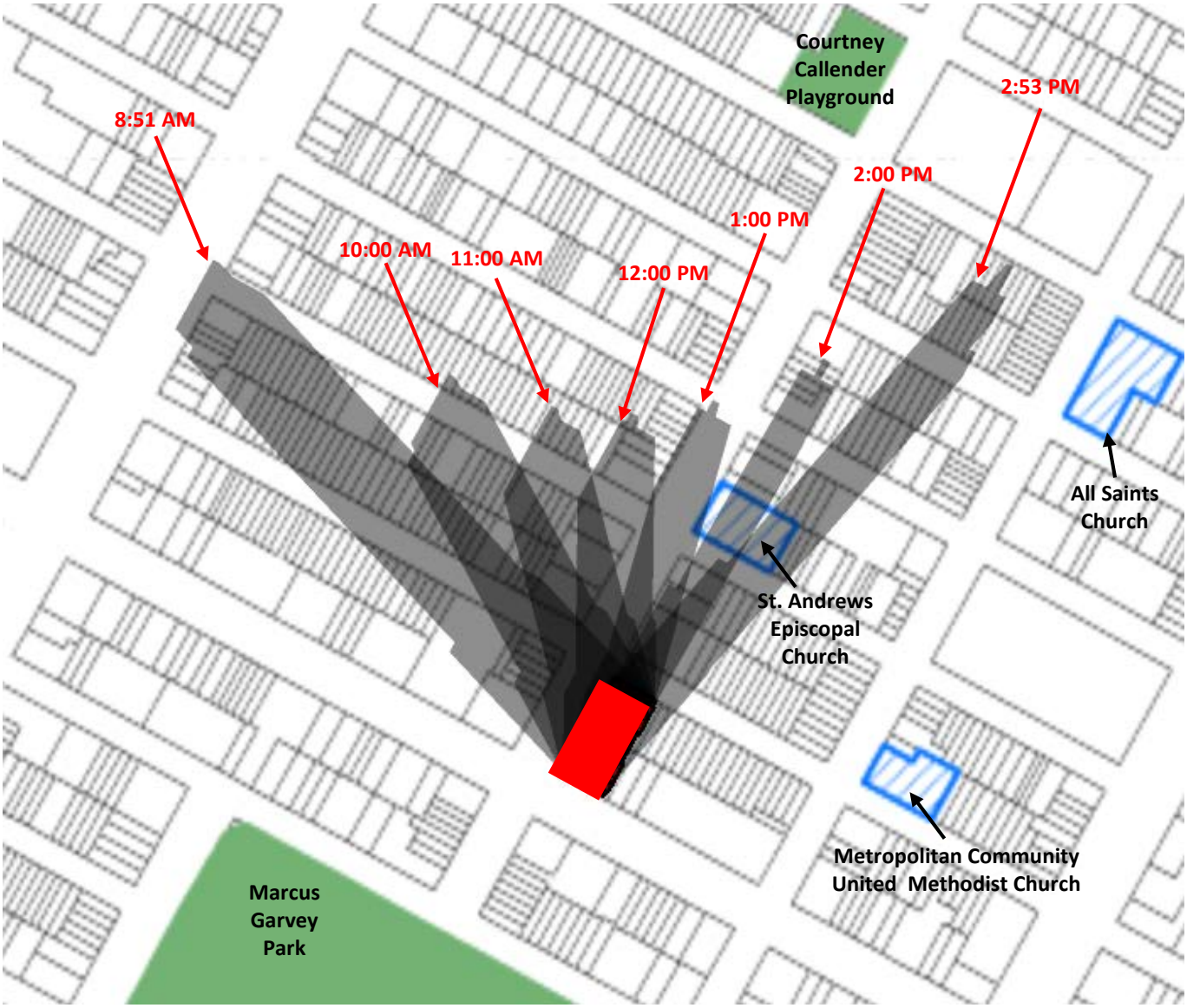
In accordance with the *2014 CEQR Technical Manual*, a Tier 3 screening assessment was performed because the Tier 1 and Tier 2 assessments identified four resources of concern within the RWCDS's shadow screening study area, as listed and described in Table 2.4-1.

As the sun travels across the sky during the day, shadows fall in a curve on the ground opposite the sun. When the sun rises, shadows fall to the west. Because the sun rises in the east and travels across the southern part of the sky throughout the day to set in the west, a project's earliest shadows would be cast almost entirely westward. Throughout the day, shadows would shift clockwise, until sunset, when they would fall east. Midday shadows are always shorter than those at other times of the day because the sun is highest in the sky at that time. Further, because of the tilt of the earth's axis, the angle at which the sun's rays strike the earth varies throughout the year, so that during the summer, the sun is higher in the sky and shadows are shorter than during the winter. Winter shadows, although the longest, move the most quickly along their paths and do not affect the growing season of outdoor trees and plants.

The Tier 3 screening assessment was performed for the four representative days of the year set forth in the *2014 CEQR Technical Manual*: December 21, the winter solstice and shortest day of the year; March 21/September 21, the equinoxes; May 6/August 6, the midpoints between the summer solstice and the equinoxes; and June 21, the summer solstice and the longest day of the year. The *2014 CEQR Technical Manual* defines the temporal limits of a shadow analysis period to fall from an hour and a half after sunrise to an hour and a half before sunset. A three-dimensional computer model was developed to represent the RWCDS. Surrounding buildings are not included in the Tier 3 shadow assessment model. The results of the Tier 3 shadow assessment for the RWCDS are illustrated in Figures 2.4-2a through 2.4-2d.

Open Space

As illustrated in Figures 2.4-2a through 2d, no new shadows associated with the proposed project fall on the Courtney Callender Playground during any of the required analysis periods. Further, Figures 2.4-2c



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Tier 3 Shadow Screening Assessment: December 21

Figure 2.4-2a

- Project Site
- Projected Project-Generated Shadow
- Open Space and Recreation
- Sunlight Sensitive Historic Resource

Sources:
1. New York (City). Dept. of City Planning 2015. Manhattan MapPLUTO (Edition 15v1). New York City: NYC Department of City Planning.
2. New York (City). Dept. of Parks and Recreation 2015. Parks Properties. New York City: NYC Department of Parks and Recreation.
3. New York (City). Dept. of City Planning 2015. LION (Edition 15C). New York City: NYC Department of City Planning.



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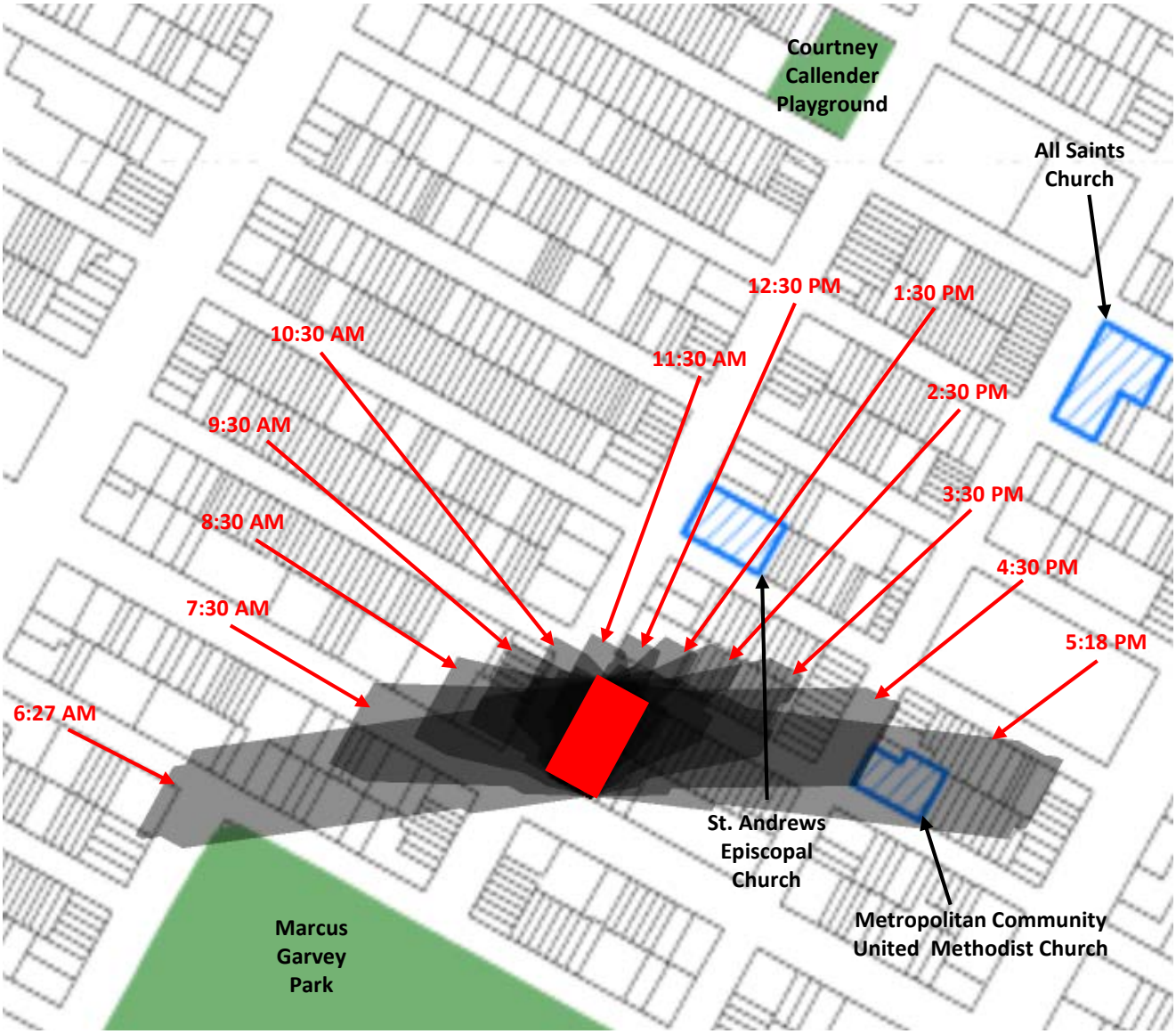
Tier 3 Shadow Screening Assessment: March 21 / September 21

Figure 2.4-2b

- Project Site
- Projected Project-Generated Shadow
- Open Space and Recreation
- Sunlight Sensitive Historic Resource

Sources:
1. New York (City). Dept. of City Planning 2015. Manhattan MapPLUTO (Edition 15v1). New York City: NYC Department of City Planning.
2. New York (City). Dept. of Parks and Recreation 2015. Parks Properties. New York City: NYC Department of Parks and Recreation.
3. New York (City). Dept. of City Planning 2015. LION (Edition 15C). New York City: NYC Department of City Planning.



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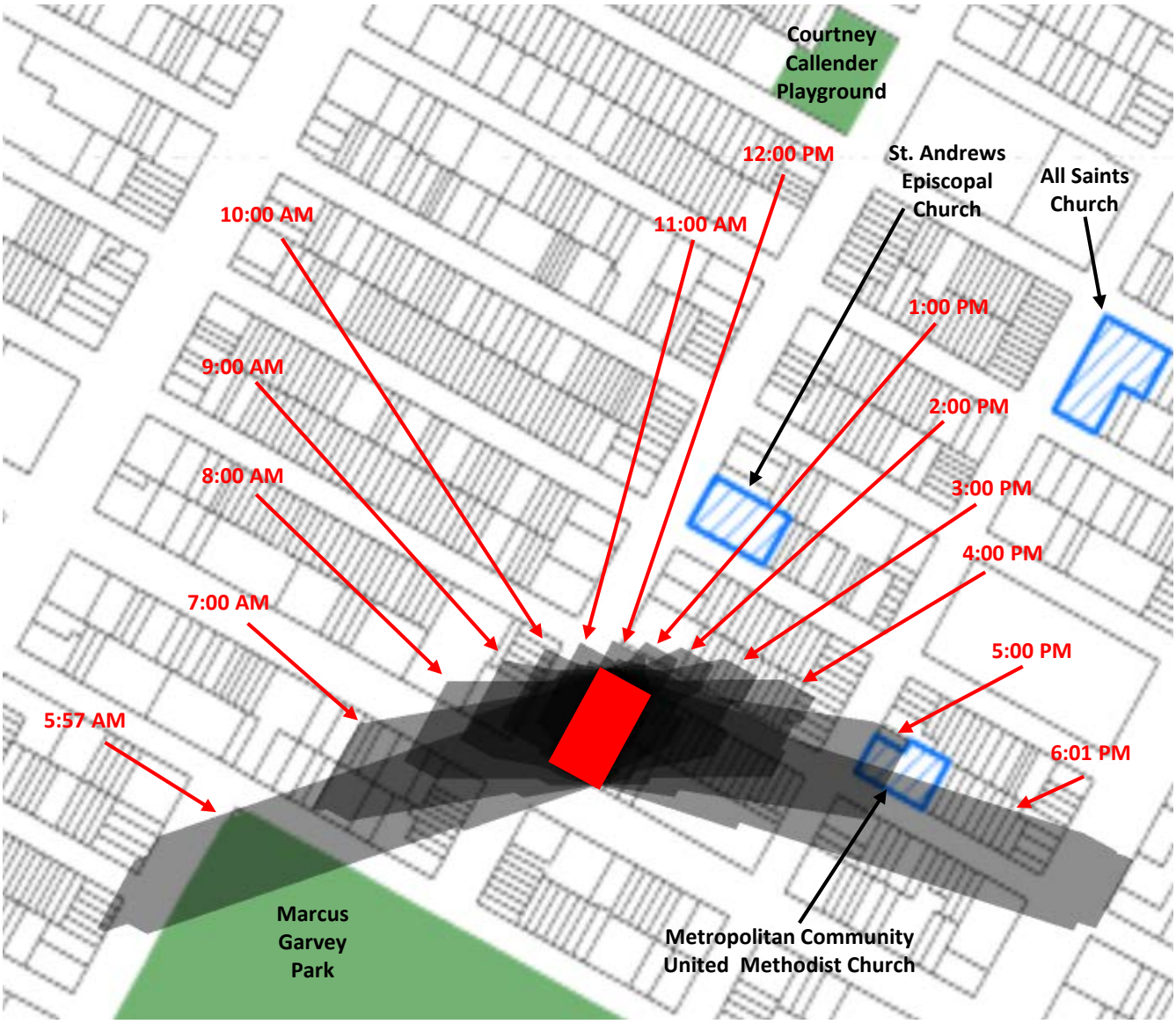
Tier 3 Shadow Screening Assessment: May 6 / August 6

Figure 2.4-2c

- Project Site
- Projected Project-Generated Shadow
- Open Space and Recreation
- Sunlight Sensitive Historic Resource

Sources:
1. New York (City). Dept. of City Planning 2015. Manhattan MapPLUTO (Edition 15v1). New York City: NYC Department of City Planning.
2. New York (City). Dept. of Parks and Recreation 2015. Parks Properties. New York City: NYC Department of Parks and Recreation.
3. New York (City). Dept. of City Planning 2015. LION (Edition 15C). New York City: NYC Department of City Planning.



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Tier 3 Shadow Screening Assessment: June 21

Figure 2.4-2d

- Project Site
- Projected Project-Generated Shadow
- Open Space and Recreation
- Sunlight Sensitive Historic Resource

Sources:
1. New York (City). Dept. of City Planning 2015. Manhattan MapPLUTO (Edition 15v1). New York City: NYC Department of City Planning.
2. New York (City). Dept. of Parks and Recreation 2015. Parks Properties. New York City: NYC Department of Parks and Recreation.
3. New York (City). Dept. of City Planning 2015. LION (Edition 15C). New York City: NYC Department of City Planning.

and 2d indicate that new shadows would fall on Marcus Garvey Playground briefly during the early morning hours (when utilization would be lowest) of the May 6 and June 21 analysis periods (14 minutes and 47 minutes, respectively). As such, shadows cast from the proposed project would not create significant adverse impacts to open space resources considered in this study, and no further analysis is necessary.

Historic Resources

Figure 2.4-2a indicates that shadows from the RWCDS would fall on the St. Andrew's Episcopal Church during the December 21 analysis day, while the other identified sunlight sensitive historic resources would not receive shadows from the RWCDS. As such, further analysis is warranted.

As illustrated in Figure 2.4-2b, shadows from the RWCDS would not fall on any identified sunlight sensitive historic resources during the March 21 / September 21 analysis day. Therefore, no further analysis is necessary.

As shown in Figures 2.4-2c and 2.4-2d, shadows generated from the RWCDS would fall on the Metropolitan Community United Methodist Church during both the May 6 / August 6 and June 21 analysis periods. No projected shadows are anticipated to fall on the other identified sunlight sensitive resources during these analysis periods. Based on the foregoing, further analysis is necessary.

Detailed Analysis

For the detailed analysis, the computer model used in the Tier 3 assessment was used to compare existing shadow conditions at these sunlight sensitive historic resources generated by existing development in the community (including the project site, representing the No-Action condition) versus the proposed building (With-Action condition), to determine the incremental shadow on these resources created by the RWCDS. The detailed analysis indicates that new incremental shadows would be cast on all three sunlight sensitive historic resources identified in the Tier 3 analysis for portions of various analysis days. Table 2.4-2 below shows the entry and exit times and total durations of incremental shadows from the RWCDS on the identified sunlight-sensitive historic resources.

Table 2.4-2: Projected Shadow Duration from RWCDS on Identified Resources

Analysis Day	December 21	March 21 / September 21	May 6 / August 6	June 21
Analysis Timeframe Window	8:51 AM – 2:53 PM	7:36 AM – 4:29 PM	6:27 AM – 5:18 PM	5:57 AM – 6:01 PM
St. Andrew's Episcopal Church				
Shadow Enter – Exit Times	1:05 PM – 2:53 PM	No Incremental Shadow	No Incremental Shadow	No Incremental Shadow
Shadow Duration	1 Hour 48 Minutes	-	-	-
Metropolitan Community United Methodist Church				
Shadow Enter – Exit Times	No Incremental Shadow	No Incremental Shadow	4:33 PM – 5:18 PM	4:51 PM – 6:01 PM
Shadow Duration	-	-	45 Minutes	1 Hour 10 Minutes

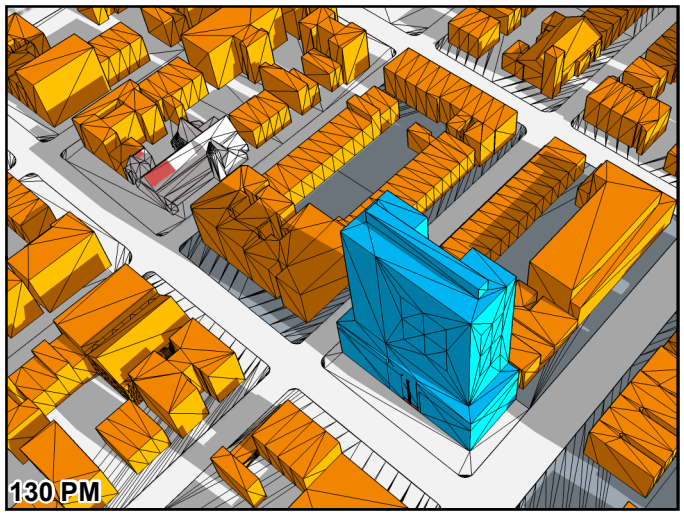
Notes: (1) Daylight savings time not used; times shown are eastern standard time (EST)
(2) All times are approximate

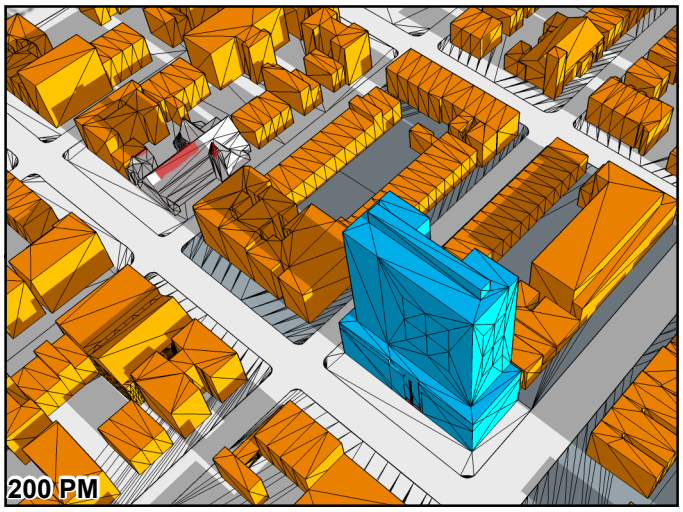
As illustrated in Figure 2.4-3a, new incremental shadows from the proposed development during the December 21 analysis day would primarily fall on roof of the St. Andrew's Episcopal Church as well as the belfry and the eastern portion of the building's southern-facing facade during the identified shadow duration period (i.e., 1:05 PM to 2:53 PM). The projected areas of new incremental shadows do not feature any stained glass windows. Further, the duration of incremental shadows on the church belfry would be relatively minimal (i.e., approximately 54 minutes), such that the public's enjoyment of this architectural feature would not be significantly diminished as a result of shadows generated from the proposed development during the December 21 analysis period.

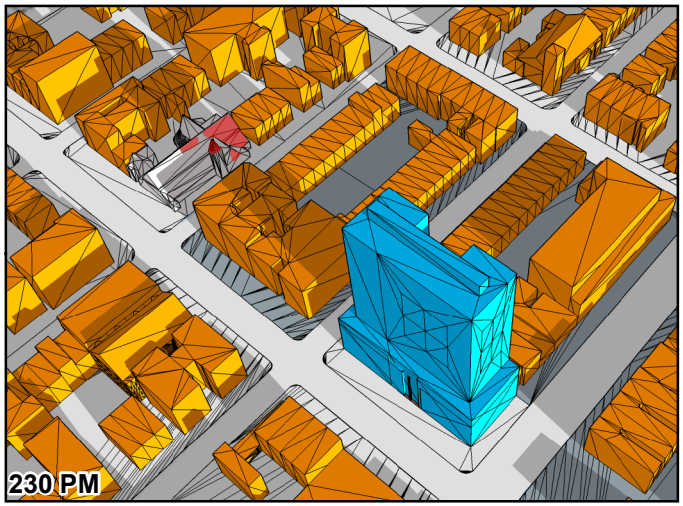
With regard to the Metropolitan Community United Methodist Church, during both the May 6 and June 21 analysis days, new incremental shadows during the shadow duration periods (4:33 PM to 5:18 PM and 4:51 PM to 6:01 PM, respectively) would fall on the western and southern building facades and portions of the roof (see Figures 2.4-3b and 2.4-3c). Multiple stained glass windows are found on both of these facades within the projected new incremental shadow areas during both periods. However, the duration of these incremental shadows would be short relative to their analysis periods (45 minute and 1 hour, 10 minutes during the May 6 / August 6 and June 21 analysis periods, respectively). Further, based on field observations, services at the church are held from 9:00 AM to 12:00 PM on Sundays, 7:00 PM to 8:00 PM on Wednesdays, and Thursday from 7:00 PM to 9:00 PM. The timing of all of these services fall outside that of the projected incremental shadows. The church does not appear accessible outside of the listed services hours. Based on the foregoing, anticipated shadows from the proposed development during the May 6 / August 6 and June 21 analysis period would not be expected to create significant adverse impacts regarding stained glass windows at the Metropolitan Community United Methodist Church.

2.4.4 Conclusion

The projected incremental shadows that would be cast on the St. Andrew's Episcopal Church during the December 21 analysis day and the Metropolitan Community United Methodist Church during the May 6 / August 6 and June 21 analysis days are anticipated to primarily fall on features of these buildings that are non-sunlight sensitive and/or be of relatively short duration. Therefore, there would be no significant impacts related to shadows on these sunlight sensitive historic resources.







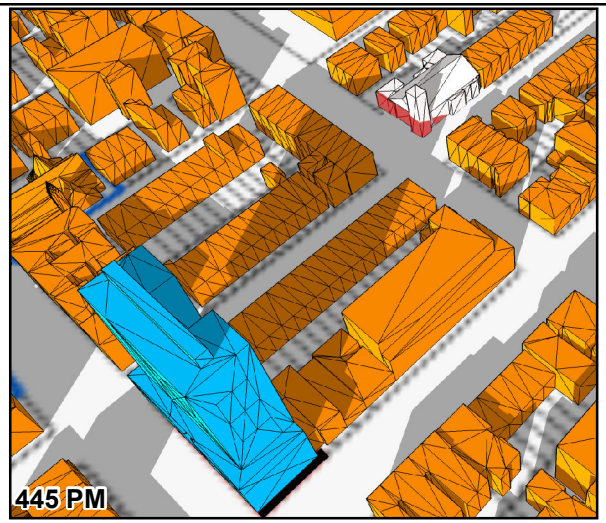
2031 - 2033 Fifth Avenue
New York, New York

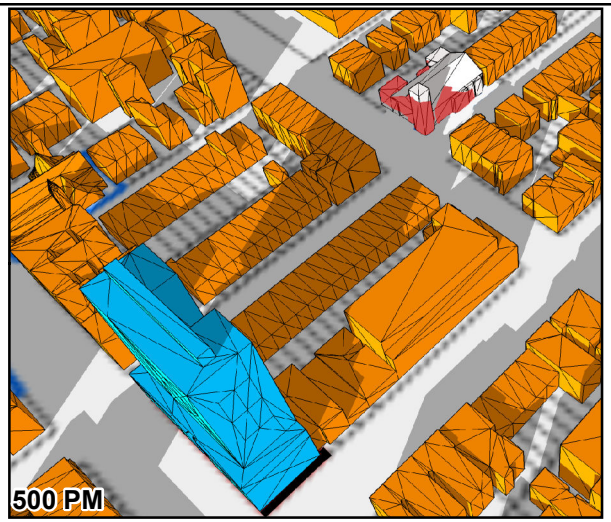
Detailed Shadows Analysis - December 21
St. Andrew's Episcopal Church

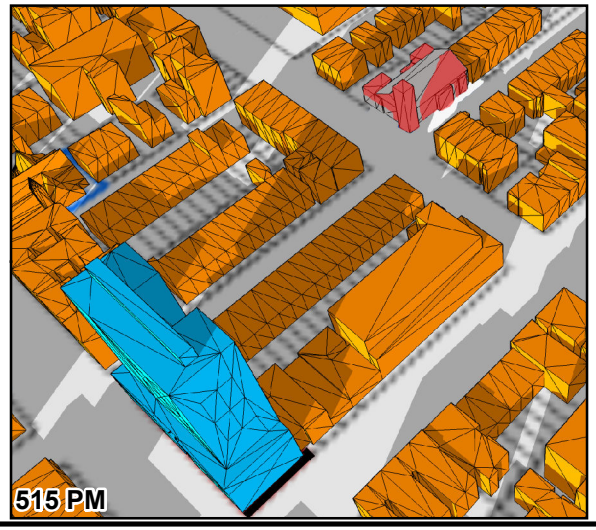
Figure
2.4-3a

Proposed Development
Existing Building
St. Andrew's Episcopal Church
Existing Shadow
Projected Incremental Shadow

Sources:
1. New York (City). Dept. of City Planning 2015. Manhattan MapPLUTO (Edition 15v1). New York City: NYC Department of City Planning.
2. New York (City). Dept. of Parks and Recreation 2015. Parks Properties. New York City: NYC Department of Parks and Recreation.







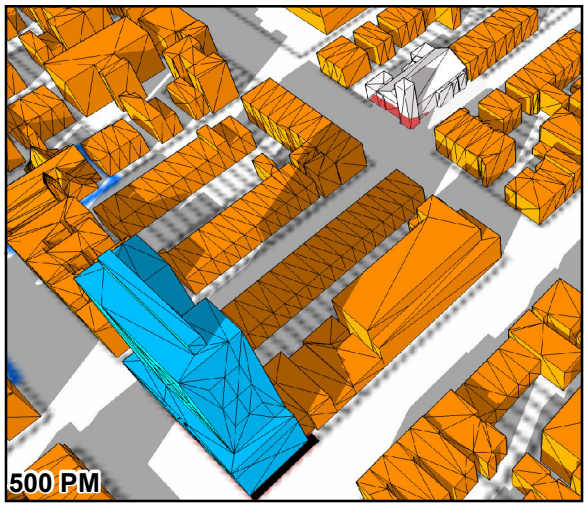
2031 - 2033 Fifth Avenue
New York, New York

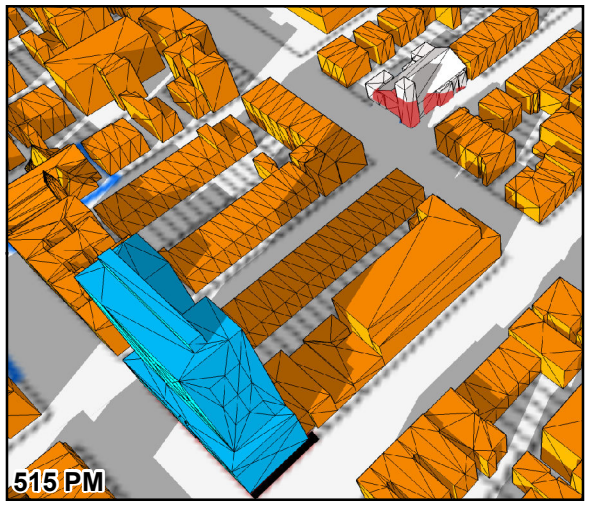
Detailed Shadows Analysis - May 6
Metropolitan Community United Methodist Church

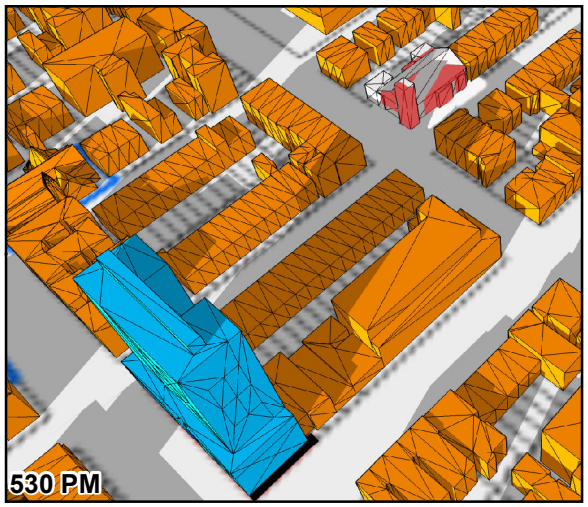
Figure
2.4-3b

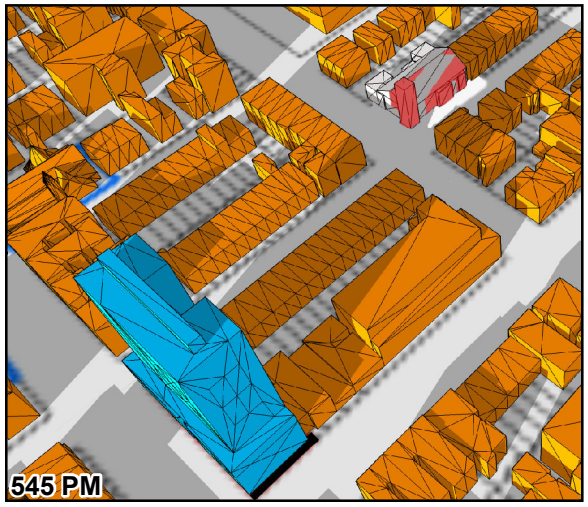
- Proposed Development
- Existing Building
- Metropolitan Community United Methodist Church
- Existing Shadow
- Projected Incremental Shadow

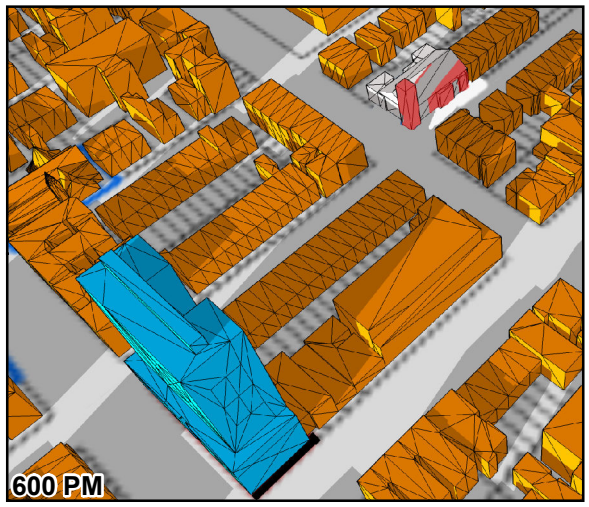
Sources:
1. New York (City). Dept. of City Planning 2015. Manhattan MapPLUTO (Edition 15v1). New York City: NYC Department of City Planning.
2. New York (City). Dept. of Parks and Recreation 2015. Parks Properties. New York City: NYC Department of Parks and Recreation.











2031 - 2033 Fifth Avenue
New York, New York

Detailed Shadows Analysis - June 21
Metropolitan Community United Methodist Church

Figure
2.4-3c

- Proposed Development
- Existing Building
- Metropolitan Community United Methodist Church
- Existing Shadow
- Projected Incremental Shadow

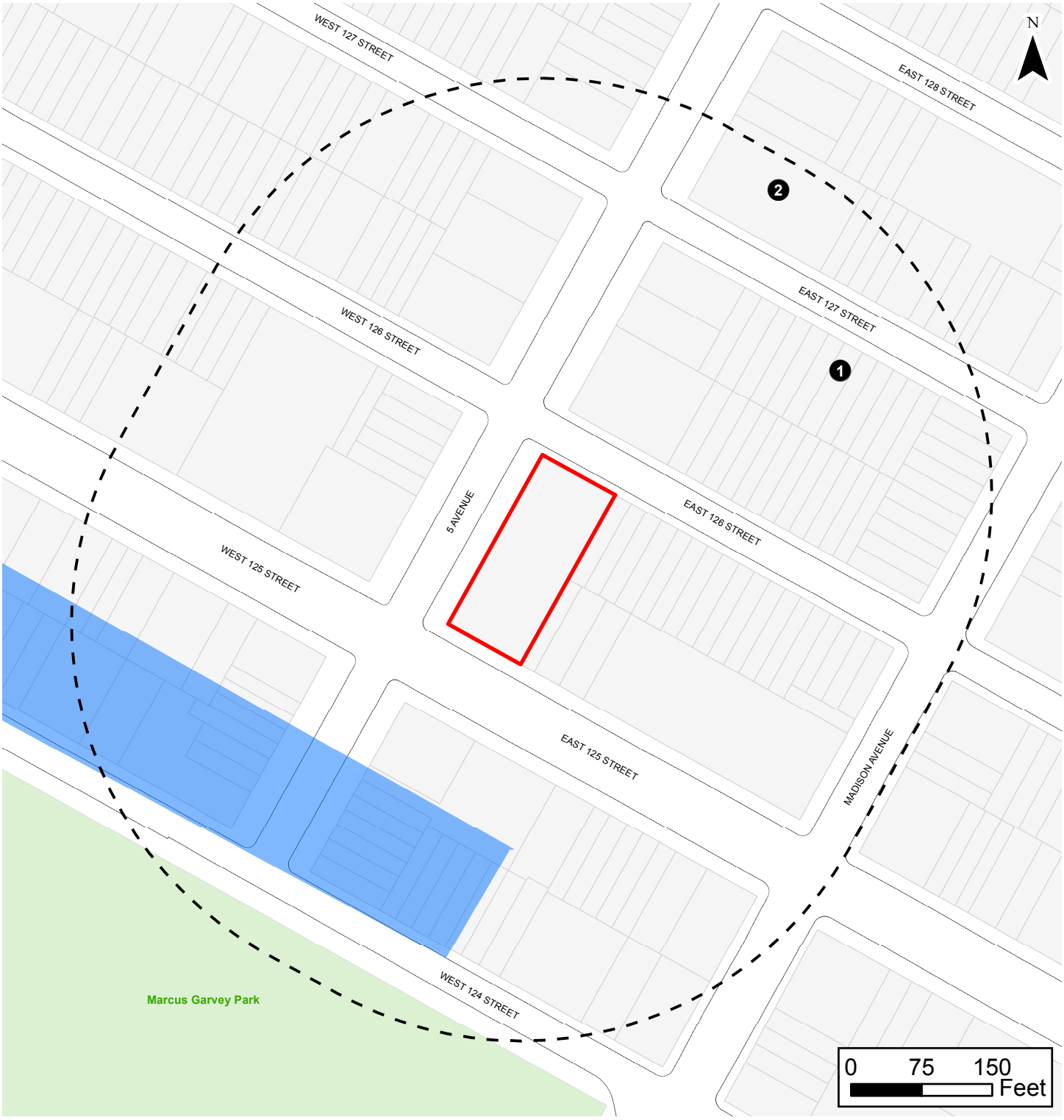
Sources:
1. New York (City). Dept. of City Planning 2015. Manhattan MapPLUTO (Edition 15v1). New York City: NYC Department of City Planning.
2. New York (City). Dept. of Parks and Recreation 2015. Parks Properties. New York City: NYC Department of Parks and Recreation.

2.5 Historic and Cultural Resources

Pursuant to the *2014 CEQR Technical Manual,* a historic and cultural resources assessment is warranted if there is the potential to affect either archaeological or architectural resources. Archaeological resources usually need to be assessed for projects that would result in any in-ground disturbance. An in-ground disturbance is any disturbance to an area not previously excavated, including new excavation that is deeper and/or wider than previous excavation on-site. The proposed project would result in an increase in-ground disturbance. The New York City Landmarks Preservation Commission (LPC) found that the project site has no archaeological significance (see Appendix B). Therefore, the proposed project would not result in a significant adverse impact on archaeological resources.

Generally, architectural resources should be surveyed and assessed if the proposed project would result in any of the following, whether or not any known historic resources are located near the project site: new construction, demolition, or significant physical alteration to any building, structure, or object; a change in scale, visual prominence, or visual context of any building, structure, or object or landscape feature; construction, including but not limited to, excavating vibration, subsidence, dewatering, and the possibility of falling objects; additions to or significant removal, grading, or replanting of significant historic landscape features; screening or elimination of publicly accessible views; introduction of significant new shadows or significant lengthening of the duration of existing shadows on a historic landscape or on a historic structure if the features that make the structure significant depending on sunlight. The project site is not located on or adjacent to a site containing any architectural or archaeological resources that is eligible or has been designated (or is been calendared for consideration) as a New York City Landmark, Interior Landmark, or Scenic Landmark; nor that is listed or eligible for listing on the New York State or National Register of Historic Places; or that is within a designated or eligible New York City, New York State, or National Register Historic District. The LPC found that the project site has no architectural significance (see Appendix B). In addition, the LPC noted that the project site is within the radius of the State/National Register-Listed Mount Morris Park Historic District Boundary Increase. The project site is within 400-feet of the historic district; however, the site is substantially separated from the district by West 125th Street (see Figure 2.5-1). Similarly, the project site is within 400-feet of but substantially separated from two LPC- and National Register-designated historic landmarks, including the Langston Hughes House and St. Andrew's Church (see Figure 2.5-1). As the project site has no architectural significance and is not located adjacent to the historic district; the proposed project would not result in a significant adverse impact on architectural resources and no further analyses are warranted.

Date: 4/27/2017



2031-2033 Fifth Avenue
New York, New York

Historic Resources

Figure 2.5-1

Project Site

400-Foot Study Area Radius

Mount Morris Park Historic District

Historic Landmark

1. Langston Hughes House
2. St. Andrew's Church

Sources:

1. New York (City). Dept. of City Planning 2015. Manhattan MapPLUTO (Edition 16v2). New York City: NYC Department of City Planning.
2. New York (City). Dept. of City Planning 2016. LION (Edition 16D). New York City: NYC Department of City Planning.
3. New York (City). Dept. of Information Technology & Telecommunications. Open Space (Parks), Mar 14, 2016. New York City: Dept. of Information Technology & Telecommunications.
4. New York (City). Landmarks Preservation Commission. Individual Landmarks, December 21, 2016. New York City: Dept. of Information Technology & Telecommunications.
5. New York State Office of Parks, Recreation, and Historic Preservation Cultural Resources Information System, Accessed April 27, 2017.

2.6 Urban Design and Visual Resources

2.6.1 Introduction

Urban design is the totality of components that may affect a pedestrian's experience of public space. To determine if a proposed action has the potential to change the pedestrian experience, an urban design assessment under CEQR guidelines focuses on the components of a proposed action that may have the potential to alter the arrangement, appearance, and functionality of the built environment from the pedestrian's perspective. In accordance with the *2014 CEQR Technical Manual*, a preliminary assessment of urban design is appropriate when there is the potential for a pedestrian to observe, from the street level, a physical alteration beyond that allowed by existing zoning regulations.

A visual resource is the connection from the public realm to significant natural or built features, including views of the waterfront, public parks, landmark structures or districts, otherwise distinct buildings or groups of buildings, or natural resources. Marcus Garvey Park and the National Register (NR)-designated Mount Morris Park Historic District are visual resources visible from the project site, and analyzed below. There are no unobstructed visual connections to any visual resources outside the study area.

The following assessment is limited to the urban design analysis of the proposed project.

2.6.2 Methodology

In accordance with the *CEQR Technical Manual* guidelines, the following preliminary urban design and visual resources assessment considers a 400-foot radius study area where the proposed action would be most likely to influence the built environment. As stipulated in the *CEQR Technical Manual*, since the purpose of the preliminary assessment is to determine whether any physical changes proposed by the project would significantly impact elements of urban design and visual resources, the following information, if known, is included in a preliminary assessment:

- A concise narrative of the existing project area, and conditions under the future No-Action and With-Action conditions;
- An aerial photograph of the study area and ground-level photographs of the site area with immediate context;
- Zoning and floor area calculations of the existing and future With-Action conditions;
- Lot and tower coverage, and building heights; and
- A three-dimensional representation of the future With-Action and No-Action (if relevant) condition streetscape.

If the preliminary assessment determines that a change to the pedestrian experience is minimal and unlikely to disturb the vitality, walkability or the visual character of the area, then no further assessment is necessary. However, if it shows that changes to the pedestrian environment and/or visual resources are significant enough to require greater explanation and further study, then a detailed analysis may be appropriate.

The following preliminary urban design and visual resources assessment follows these guidelines and provides a characterization of existing conditions followed by a description of urban design and visual resources under the future No-Action and With-Action conditions, and an analysis determining the extent to which physical changes resulting from the proposed action would alter the pedestrian experience.

The urban design study area encompasses the 125th Street corridor blocks on either side of the project site as well as the area within 400-feet of the project site. The urban design study area is generally bounded by East 127th Street to the north, Park Avenue to the east, East 124th Street to the south, and Malcolm X Boulevard to the west. 125th Street is a major corridor with its own urban design character separate from that of adjacent streets. The 125th Street Corridor Rezoning which was approved in 2008 facilitated further development and reinforced the distinct urban design character of 125th Street. As such, the urban design study area includes buildings with frontage on 125th Street from Park Avenue to Malcolm X Boulevard (see Figure 2.6-1). This is the area in which the proposed action would be most likely to have effects in terms of urban design.

2.6.3 Assessment

Existing Conditions

Project Site

The project site comprises one tax lot (Manhattan Block 1750 – Lot 1) which is currently developed with two attached and contiguous three-story buildings. Lot 1 is 16,986 square feet (sf) with 200 feet of frontage on Fifth Avenue and 85 feet of frontage on both East 125th Street and East 126th Street. Together, the north building (with 85 feet of frontage on 126th Street and 100 feet on Fifth Avenue) and the south building (with 85 feet of frontage on 125th Street and 100 feet on Fifth Avenue) are developed with retail and commercial office space (approximately 29,742 sf) and performance venue and support space (approximately 18,423 sf) operated by the NBT at an overall FAR of 2.84 (Commercial FAR of 1.75 and Community Facility FAR of 1.09 (see Figures 2.6-2 and 2.6-2a). Lot 1 is developed along the full frontage of Fifth Avenue and the corners of East 125th and East 126th Street. The project site falls within a C4-4A commercial zoning district with a maximum commercial and community facility FAR of 4.0.

The existing buildings are located on two major streets, East 125th Street and Fifth Avenue, and along a local residential street, East 126th Street. The southern buildings rises approximately 40 feet to its parapet and the northern buildings rises approximately 45 feet to its parapet. The buildings are built

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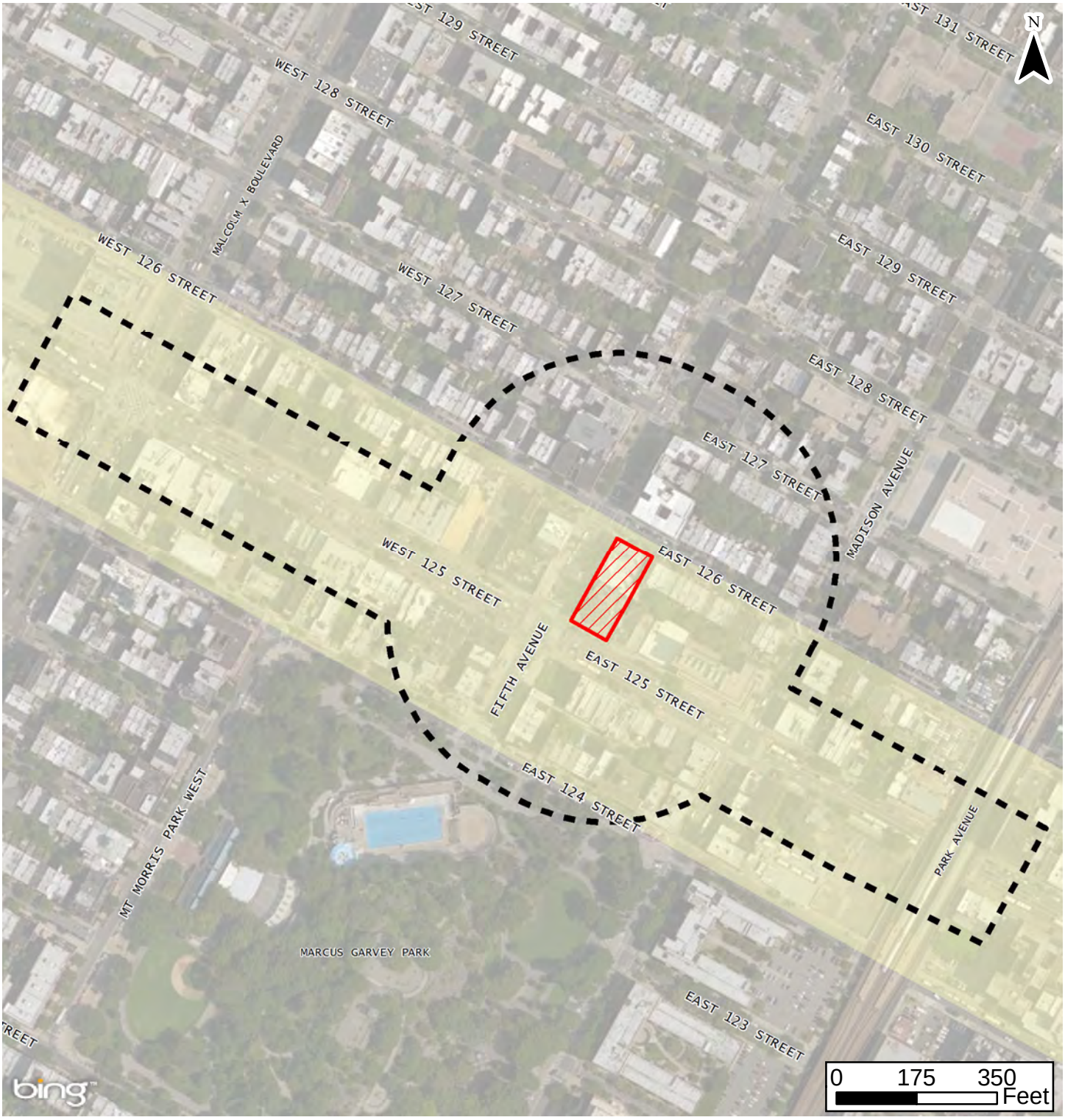

2031-2033 Fifth Avenue
New York, New York

Study Area

Figure 2.6-1

Urban Design Study Area

Project Site

Special 125th Street District

Sources:
1. New York (City). Dept. of City Planning 2015. Manhattan MapPLUTO (Edition 15v1). New York City: NYC Department of City Planning.
2. New York (City). Dept. of City Planning 2016. LION (Edition 16A). New York City: NYC Department of City Planning.
3. Service Layer Credits: Image courtesy of USGS Earthstar Geographics SIO © 2016 Microsoft Corporation

to the lot line along all frontages. A recessed entrance to the south building is located midblock along Fifth Avenue. The south building is developed with ground floor retail storefronts along its entire frontage, with the exception of the recessed NBT entrance; the north building is developed with storefronts along its Fifth Avenue frontage. The south tower forms a continuous streetwall at three-stories with its neighbor on East 125th Street; the north tower is set closer to its lot line and is separated by a side yard from neighbor along East 126th Street, breaking the streetwall continuity.

The north building and the original south building were constructed in 1909, however subsequent to a fire in the 1980s the south tower was demolished and reconstructed. The north building is improved with a stone curtain wall at the first and second floor levels and a brick façade at the third floor level with a denticulated cornice at the roofline. The south building and NBT entrance is improved with a tiled stone exterior façade with metal vertical accents culminating at the second floor level with a wide metal band. The south building is also improved with a distinct octagonal dome at the roof level and with a distinct sidewalk materials and pattern leading from the NBT entrance to the street (see Photos 1-4).

While generally symmetrical in terms of massing, the ornamentation, particularly the coloring of the ornamentation, of the two structures on the site are disparate. Both at the ground floor and above the ground floor the featuring of the façade and the design of windows are disparate and the two buildings rise to different heights. Additionally, the presence of the theater in the round on the south building roof, the prominent cornice on the north building, and the asymmetric recessed entrance to the south building render the two buildings distinct.

Sidewalks on all frontages are planted with trees. The sidewalk along East 125th Street (approximately 18 feet) and Fifth Avenue (approximately 27 feet) are wide and extra-wide while the sidewalk at East 126th Street is narrower (approximately 10 feet) (see Photo 5). The corner of the sidewalk at East 125th Street and Fifth Avenue is improved with red brick with depressed lips at the cross walk; the corner at East 126th Street and Fifth Avenue features a depressed lip and coloration, but not red brick. See Figures 2.6-2a through 2.6-2e for representative views of the project site and study area.

Study Area

Urban Design

Overall, the study area is characterized by a mixture of low-rise residential townhouses on interior lots of local residential streets, mid-rise multifamily apartment buildings on corner lots of residential streets, and mid-rise multifamily, commercial, and mixed use buildings with ground floor retail along 125th Street. Corner lots along 125th Street are generally developed with mixed or fully commercial high-rise buildings. The study area street network is defined by a typical grid pattern. Fifth Avenue, Madison Avenue, and East 126th Street serve as wide thoroughfare and East 124th Street and East 126th Street serve as narrow local streets. Fifth Avenue is a one-way south-bound street, Park Avenue is a one-way north-bound street, and East 125th Street is a two-way east/west-bound street. East 124th Street is one-way east-bound and East 126th Street is one-way westbound. As is typical for New York City, all streets have complete sidewalks with crosswalks at every intersection.

The portion of 125th Street within the study area is developed with a mixture of building uses, forms, and types. Throughout the corridor buildings tend to be developed more densely and to greater heights

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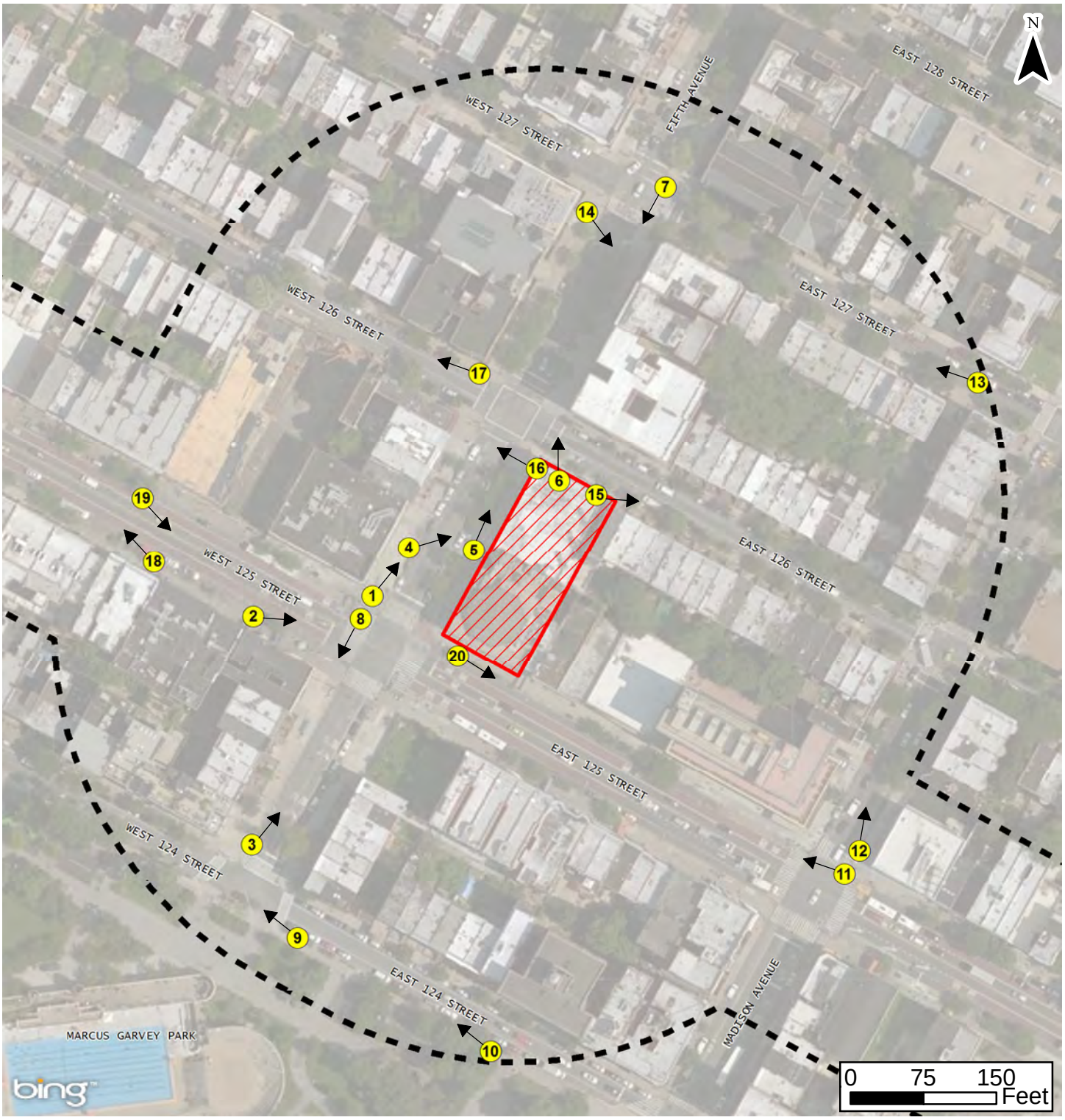

2031-2033 Fifth Avenue
New York, New York

Photograph Location Map

Figure 2.6-2

Project Site

Urban Design Study Area

1 Photograph Location

Sources:
1. New York (City). Dept. of City Planning 2015. Manhattan MapPLUTO (Edition 15v1). New York City: NYC Department of City Planning.
2. New York (City). Dept. of City Planning 2016. LION (Edition 16A). New York City: NYC Department of City Planning.
3. Service Layer Credits: © 2016 Microsoft Corporation



Photo 1 View of project site (south building to the right and north building to the left) looking northeast on corner of Fifth Avenue and 125th Street



Photo 2 View of project site and mid-rise community facility use building looking east on West 125th Street



Photo 3 View of project site and low-rise residential rowhouses looking north on Fifth Avenue and 124th Street



Photo 4 View of project site, mid-rise multifamily residential building, and low-rise rowhouses looking north on corner of Fifth Avenue and 125th Street

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New York, New York

Site and Study Area Photos

Figure
2.6-2a



Photo 5 View of project site ground floor retail, Fifth Avenue sidewalk, and mid-rise multifamily buildings looking north on Fifth Avenue



Photo 6 View of mid-rise multifamily residential buildings looking north-west from corner of East 126th Street and Fifth Avenue.



Photo 7 View of mid-rise multifamily residential buildings looking south on Fifth Avenue



Photo 8 View of low-rise rowhouses and Marcus Garvey Park looking south on corner of Fifth Avenue and 125th Street

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New York, New York

Site and Study Area Photos

Figure
2.6-2b



Photo 9 View of low-rise rowhouses and mid-rise multifamily residential building looking northwest at Fifth Avenue and West 124th Street



Photo 10 View of low-rise residential rowhouses looking north on East 124th Street



Photo 11 View of mid-rise community facility and multifamily residential buildings with groundfloor retail looking west on Madison Avenue



Photo 12 View of low-rise residential rowhouses looking northeast on Madison Avenue and East 125th Street



Photo 13 View of low-rise rowhouses looking west on East 127th Street



Photo 14 View of mid-rise multifamily residential apartment buildings looking east on East 127th and Fifth Avenue



Photo 15 View of low-rise rowhouses looking east on Fifth Avenue and East 126th Street



Photo 16 View of mid-rise multifamily residential buildings looking west on Fifth Avenue and East 126th Street

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Site and Study Area Photos

Figure
2.6-2d



Photo 17 View of development site and low-rise residential townhouses looking west on West 126th Street



Photo 18 View of mid-rise multifamily apartment buildings looking west on West 125th Street



Photo 19 View of mid-rise multifamily residential and commercial buildings with groundfloor retail looking east on West 125th Street



Photo 20 View of mid-rise multifamily residential buildings with ground-floor retail on East 125th Street

than surrounding neighborhoods. The corridor is almost entirely developed with and activated by ground floor retail uses and buildings are generally set at their lot lines. Building setback and height is fairly continuous with little interruption to street wall continuity, lot coverage is high, and FAR ranges from 3.0 to 11.0. Larger corner lots are generally densely developed with taller buildings set at their lot lines. Buildings range from three to five stories on interior lots with taller buildings along avenue frontages such as 35 East 125th Street on Madison Avenue (approximately 84 feet), 103 East 125th Street on Park Avenue (approximately 140 feet) and 105 West 125th Street on Malcolm X Boulevard (approximately 160 feet). Furthermore, just outside the study area are two additional tall buildings on 125th Street developed along avenues: Hotel Theresa (approximately 170 feet), and the Adam Clayton Powell Jr. State Office Building (approximately 290 feet) both of which are developed along the intersection of Adam Clayton Powell Jr. Boulevard and 125th Street. Interior lots are generally developed with pre-1920s mixed commercial and residential use mid-rise buildings (see Photo 2, 11, and 18-20). These buildings are developed both on small lots as row houses and on larger lots as standard apartment buildings. Along 125th Street row houses generally do not have front yards or stoops as such elements would intrude on the sidewalk. Sidewalks are extra-wide along 125th Street and the street sees a large volume of both pedestrian and vehicular traffic.

Within the study area, Fifth Avenue is generally developed with a mix of low-rise residential brownstone row houses and mixed commercial and residential use buildings on small (often interior) lots (approximately 2,000 sf) that are generally low-rise at three- or four- stories; on larger (often corner) lots (4,000 - 17,500 sf) commercial use and multifamily residential use buildings that are range from low-rise at two-stories to mid-rises at nine-stories are prevalent (see Photos 3-9 and 14). Fifth Avenue, within the study area, is generally developed with ground floor retail space with the exception of older large apartment or row house buildings. Row house-style buildings are generally older having been constructed pre-1920 while the mixed use buildings on larger lots vary in age from 1920 to the present; both styles of buildings generally are developed to an FAR of 2.0. Building setback and street walls are fairly continuous along this portion of Fifth Avenue.

Brownstone low-rise residential row houses are generally developed on small interior lots (approximately 1,500 sf) north of the midblock of East 125th Street along Madison Avenue. Mid-rise buildings (five to seven-stories) are generally developed on large corner lots (see Photo 12). As a reflection of this the built floor area ratio (FAR) for row house-style buildings is generally between 1.0 and 2.7 FAR while those buildings on larger lots are generally built to an FAR of 3.5 or more. This portion of Madison Avenue was almost entirely developed between 1900-1920 with the majority of buildings constructed around 1916-1920. South of East 126th Street, Madison Avenue is generally developed with ground floor retail uses; north of East 126th Street the street level is generally with the stoop and yards of brownstone row houses. The building setback and street wall are fairly continuous with the exception of the frontage between East 125th Street and East 126th Street.

Within the study area on 124th Street, 126th Street, and 127th Street interior lots are generally developed with low-rise residential use row houses while corner lots are generally larger, and as such, developed with mid-rise commercial, mixed commercial and residential, and multifamily residential use buildings (see Photos 9-10, 13, and 15-17). East 124th Street exhibits a slightly higher level of density with a few higher-rise multifamily residential and public facilities use buildings on larger lots as is typical for streets bordering on parks (in this case Marcus Garvey Park). Row houses typically have front yards and stoops extending onto the sidewalks. These residential streets are generally not

developed with ground floor retail uses. Street walls are generally continuous with buildings setback from their lot line and corner lot buildings often break the street wall continuity. With the exception of several corner lot buildings, almost all of the buildings along these three streets were built pre-1920. row house style buildings are generally developed at FARs between 1.5 and 2.2 while buildings developed on larger lots range from FARs of 2.5 to 6.0. These streets are generally fairly narrow with the exception of 124th Street and are generally local residential streets.

Visual Resources

Marcus Garvey Park and the National Register (NR)-designated Mount Morris Park Historic District are the only visual resource visible from the project site. Thus, Fifth Avenue represent visual corridors from which Marcus Garvey Park and the Mount Morris Park Historic District can be viewed.

No-Action Condition

As described in Section 1.0, "Project Description" under the No-Action Condition, the existing NBT space would be converted to office space; the ground floor retail space and the existing office and commercial space would remain as per existing conditions. The overall FAR would remain at 2.84 (48,165 sf), but the building would be entirely commercial use. The exterior featuring of the two buildings themselves would remain as per existing conditions. The south building would continue to rise approximately 40 feet to its parapet and the north building would rise approximately 45 feet to its parapet. The south building would have 85 feet of frontage along East 125th Street, the north building would have 85 feet of frontage on East 126th Street, and both buildings would have 100 feet of frontage along Fifth Avenue. The buildings are built to the lot line along all frontages. The prominent recessed entrance to the south building would remain located along Fifth Avenue marking the separation of the north and south structure (see Figures 2.6-3a through 2.6-3d).

The south tower would form a continuous streetwall at three-stories with its neighbor on East 125th Street; the north tower is set closer to its lot line and is separated by a side yard from its neighbor along East 126th Street, breaking the streetwall continuity. The two buildings would remain inconsistent in terms of design. The streetscape and sidewalks along all frontages would remain developed as per existing conditions.

The No-Build project within the study area which are expected to be completed by the project build year (refer to Section 2.1, "Land Use, Zoning, and Public Policy,") are generally consistent with the urban design character of the study area. The majority of the No-Build projects are brownstone row houses on interior lots along residential streets. 5-15 West 125th Street will be six-stories (76-feet), set at the lot line and will be mixed use with full lot coverage. In addition to these projects, one further No-Build project which is located outside the land use study area but within the urban design study area (to the west) is being developed at 100 West 125th Street. The structure at 100 West 125th Street is located at the intersection of 125th Street and Lenox Avenue/Malcolm X Boulevard along a larger corner lot which takes up the full frontage along the Avenue. The six-story building will rise to 103 feet at a FAR of 4.92.

Date: 5/25/2017



2031-2033 Fifth Avenue
New York, New York

No-Action vs. With-Action
Superimposed View Location Map

Figure
2.6-3

Project Site

1 View Location

Sources:
1. New York (City). Dept. of City Planning 2015. Manhattan MapPLUTO (Edition 15v1). New York City: NYC Department of City Planning.
2. New York (City). Dept. of City Planning 2016. LION (Edition 16A). New York City: NYC Department of City Planning.
3. Service Layer Credits: © 2017 Microsoft Corporation



2031-2033 Fifth Avenue
New York, New York

No-Action vs. With-Action Superimposed View
Looking Northeast from 5th Avenue

Figure
2.6-3a

vhb



2031-2033 Fifth Avenue
New York, New York

No-Action vs. With-Action Superimposed View
Looking East from 126th Street

Figure
2.6-3b

vhb



2031-2033 Fifth Avenue
New York, New York

No-Action vs. With-Action Superimposed View
Looking East from 125th Street

Figure
2.6-3c

vhb



2031-2033 Fifth Avenue
New York, New York

No-Action vs. With-Action Superimposed View
Looking East from 125th Street

Figure
2.6-3d

vhb

Additionally, there are two large, planned mixed use projects within the linear 125th Street corridor but outside of the land use study area. First, the Victoria Theatre, a State-owned, designated landmark located at 233 West 125th Street is currently in construction utilizing zoning overrides. The new development includes enlarging the existing theatre and a new 28-story (326 feet in height), 191-unit residential tower at an FAR of 18.77. The underlying zoning district permits a maximum height of 195 feet and an FAR of 8.65 FAR. Second, 1800 Park Avenue is currently proposed, utilizing zoning overrides. The proposed mixed-use development would be a 21-story (239 feet in height), 682-unit residential tower at an FAR of 11.14. The BSA granted bulk and parking waivers based on sub-surface conditions and adjacent structures. The maximum height and maximum allowable FAR of the underlying zoning district is 330 feet and 8.00 FAR respectively.

Visual Resources

As noted above Marcus Garvey Park and the Mount Morris Historic District are the only visual resources visible from the project site. Because the No-Action Condition is the existing building at the site, there would be no effect on visual resources.

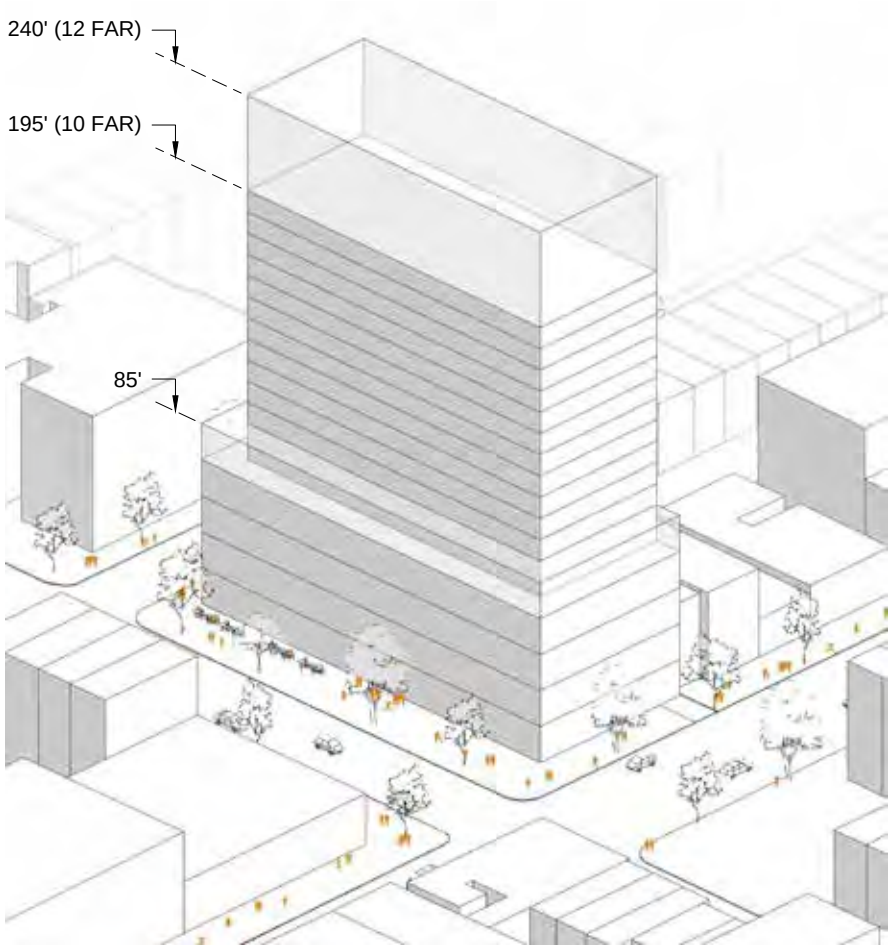
With-Action Condition

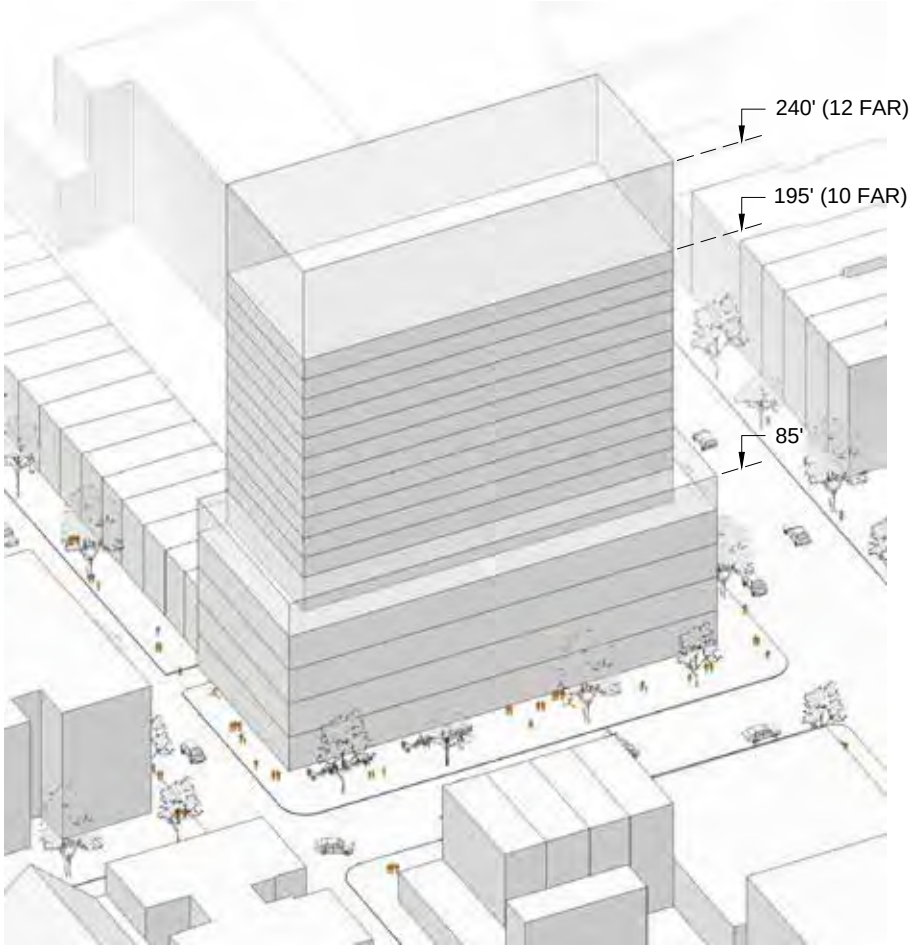
As detailed in Section 1.0, "Project Description," the proposed actions would facilitate the development of a new 20-story mixed-use building. The proposed new building would reach a base height of 85 feet, after which floors would be setback 15 feet until reaching a maximum height of 240 feet (see Figures 2.6-3 through 2.6-4). The proposed project would be consistent with development along the linear 125th Street corridor.

While the proposed actions would result in a building that is larger than buildings with the immediate study area of 400 feet, the height is consistent with the emerging pattern of high density nodes every one or two avenues along 125th street, including the Victoria Theater at 300 feet, the State office Building at 210 feet and the 1800 Park Avenue building (proposed) at 352 feet.

The building would be constructed in a regular arrangement with respect to its lot and would be built to its lot lines. The building would break the street wall continuity as both the adjacent building on East 125th Street and on East 126th Street are setback from their lot lines. The lobby and primary access to the theater would be along Fifth Avenue, with a residential entrance along 126th Street and retail entrances on Fifth Avenue and 125th Street. A loading bay would be located along the buildings East 126th Street frontage.

As illustrated in Figures 2.6-5 and 2.6-6, which provide east- and west-looking axonometric views of the With-Action condition in the context of the surrounding built environment, as well as Figures 2.6-3a through 3d, which depict views of the proposed building superimposed over the No-Action Condition, the street hierarchy, street pattern, and streetscape elements would remain as per existing conditions.



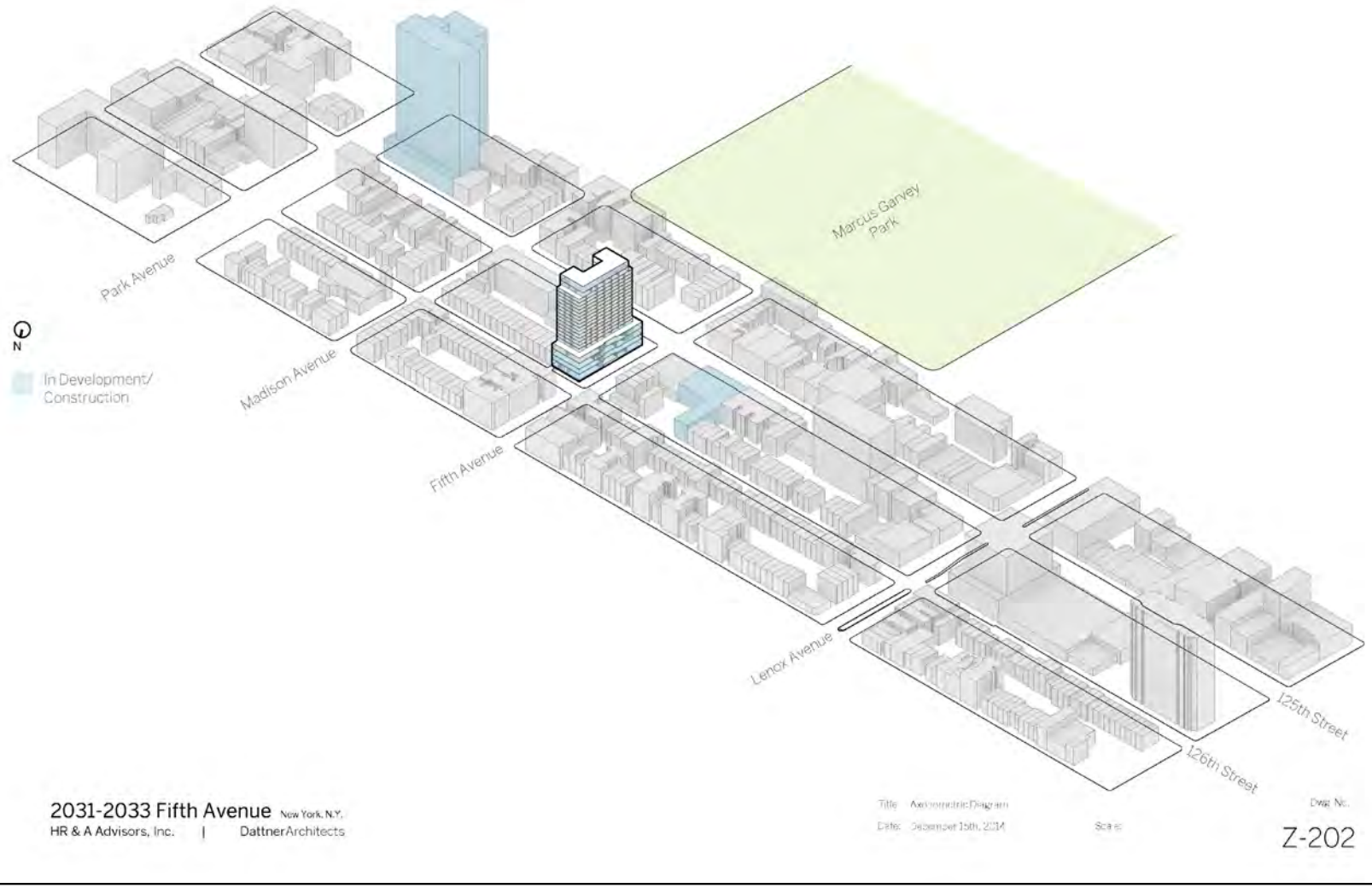


For Illustrative Purposed Only

2031-2033 Fifth Avenue
New York, New York

With-Action Condition
Illustrative Rendering

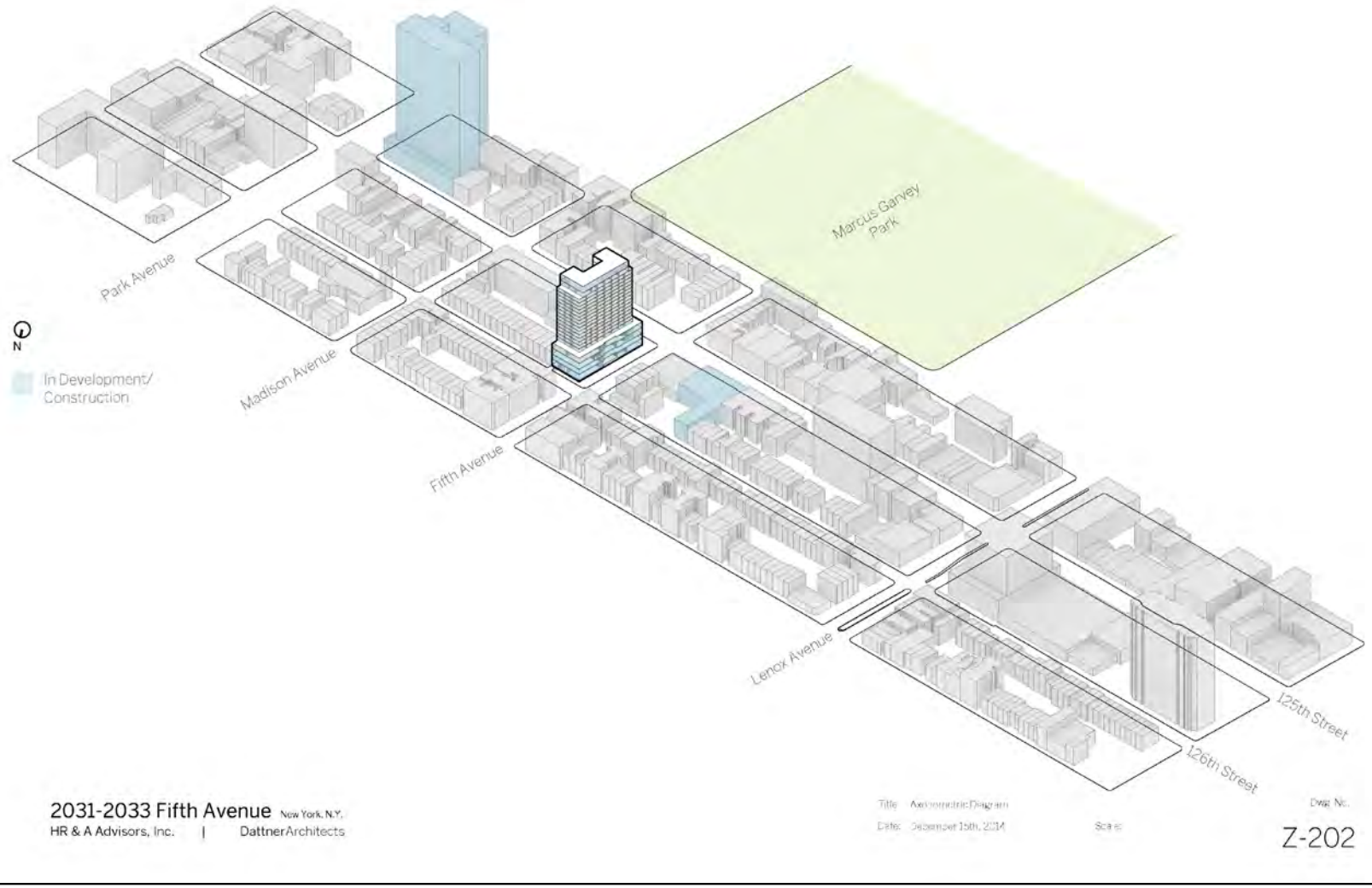
Figure
2.6-4



2031-2033 Fifth Avenue
New York, New York

Proposed Project Axonometric Diagram (Looking East)

Figure 2.6-5



2031-2033 Fifth Avenue
New York, New York

Proposed Project Axonometric Diagram (Looking East)

Figure 2.6-6

Visual Resources

The proposed project would not impact the visual corridors to Marcus Garvey Park and the Mount Morris Park Historic District. There are no public viewing areas of Marcus Garvey Park or the Mount surrounding the project site that would be blocked by the proposed project. All of the visual resources would remain visible along the existing public view corridors to the resources, particularly the sidewalks along Fifth Avenue, and there would be no effect on the visual resources.

2.6.4 Conclusion

The proposed project would result in a residential tower at a major intersection along two major corridors within the study area. As described above, dense development is typical along the intersection of 125th Street and north/south running avenues. Both the commercial character of the No-Action project, which is the existing building on the site, and the mixed use character of the proposed project would be consistent with the mixed use character of the study area. Both buildings would activate the streetscape with ground-floor retail or lobby frontages and would have no effect on the street hierarchy, street pattern, and streetscape elements of the study area. The existing building is largely massed in a way consistent with that of the podium of the proposed project. The proposed project's podium, while taller than adjacent structures, would be consistent with the mid-rise structures developed along Fifth Avenue and East 125th Street. The 15-foot setback of the proposed project would result in a residential tower that is deferential to the podium, that would emphasize the scale of the podium rather than the tower, and that is consistent with the high-rise character of buildings on corner lots along the 125th Street corridor.

As described above, there are several mid- and high-rise structures that have been developed or are slated for development with dense massing on corner or through lots along the major thoroughfares within or just outside of the urban design study area. These include the 103 East 125th Street on Park Avenue; 35 East 125th Street on the corner of East 125th Street and Madison Avenue; 1 West 125th Street structure opposite the project site on Fifth Avenue and West 125th Street; 115 West 125th Street which takes up the entire frontage of Malcolm X Boulevard between West 125th and 126th Street; the Adam Clayton Powell Jr. State Office Building on the other side of the block with a plaza and frontage on Adam Clayton Powell Jr. Boulevard and West 126th Street; Hotel Theresa on Adam Clayton Powell Boulevard; the under construction 233 West 125th Street development on West 125th Street; and the planned 1800 Park Avenue development.

It is the applicant's opinion that the project site is particularly well suited for dense and tall development. Within the vicinity of the project site both Fifth Avenue and East 125th Street are developed with mid-rise and high-rise buildings on corner and through lots. The massing of the proposed project is consistent with multi-family residential buildings on Fifth Avenue and with commercial and community facility use buildings along East 125th Street, particularly those sited on corner lots. The podium of the proposed project echoes the massing and structure of the No-Action project and the tower is designed to defer to the podium. The proposed project would be consistent with the scale of existing development on corner lots along 125th Street. Therefore, the character of the

study area would not be impacted by the proposed project and the proposed project would not result in a significant adverse impact on urban design within the study area and no further analysis is necessary. Additionally, the proposed project would not impact the visual corridor to Marcus Garvey Park and the Mount Morris Park Historic District. Therefore, the proposed project would not result in a significant adverse impact on visual resources and no further analysis is necessary.

2.7 Hazardous Materials

2.7.1 Introduction

A hazardous material is any substance that poses a threat to human health or the environment. Substances that can be of concern include, but are not limited to, heavy metals, volatile and semi-volatile organic compounds, methane, polychlorinated biphenyls, and hazardous wastes (defined as substances that are chemically reactive, ignitable, corrosive or toxic). According to the *2014 CEQR Technical Manual*, the potential for significant impacts from hazardous materials can occur when: a) hazardous materials exist on a site; b) an action would increase pathways to their exposure; or c) an action would introduce new activities or processes using hazardous materials.

This section presents the findings of the hazardous materials assessment and identifies potential issues of concern with respect to workers, the community, and/or the environment during construction and after implementation of the proposed action.

2.7.2 Methodology

As described in the *2014 CEQR Technical Manual*, the goal of a hazardous materials assessment is to determine whether a proposed action would lead to a potential for increased exposure of hazardous materials to people or the environment, or whether the increased exposure would lead to significant public health or environmental impacts. The proposed project would result in an demolition of the existing buildings and subsequent redevelopment, which would involve soil disturbance and/or excavation. This may create the potential for exposure of future site occupants to potentially toxic chemicals that may exist in the soils and underlying groundwater, therefore a hazardous materials assessment was undertaken.

As indicated in the *2014 CEQR Technical Manual*, the hazardous materials (E) designation is an institutional control that may be placed on a site to establish a hazardous materials review and approval framework. It provides a mechanism to ensure that testing for and remediation of hazardous materials, if necessary, are completed prior to future development of an affected site, thereby eliminating the potential for a hazardous materials impact. (E) designated parcels are administered under the authority of the New York City Mayor's Office of Environmental Remediation (OER).

The potential for hazardous materials was evaluated based on a Phase I Environmental Site Assessment (ESA), prepared by ALC Environmental (ALC), dated April 29, 2016. The Phase I ESA was prepared in accordance with the American Society for Testing and Materials (ASTM) Practice E1527-13, inclusive of the "All Appropriate Inquiry" requirement amended in the Federal Register on December 30, 2013. The USEPA "All Appropriate Inquiry" requirement establishes specific regulatory requirements for conducting appropriate inquiries into the previous ownership, uses, and environmental conditions of a property for the purposes of qualifying for certain landowner liability protections under Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The goal of the

Phase I ESA process is to identify "Recognized Environmental Conditions" (RECs), which means the presence or likely presence of hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater or surface water of the property.

2.7.3 Assessment

Existing Conditions

The project site is located at 2031-2033 Fifth Avenue in the Harlem neighborhood of the Borough of Manhattan. The project site occupies the entire eastern block of Fifth Avenue between 125th Street to the south, and 126th Street to the north within the Special 125th Street District.

The site is currently developed with two attached and contiguous three-story 28-foot mixed use buildings (the "north building" and "south building"). Together, the north building (with 85 feet of frontage on 126th Street and 100 feet on Fifth Avenue) and the south building (with 85 feet of frontage on 125th Street and 100 feet on Fifth Avenue) are developed with retail and commercial office space (approximately 29,742 sf) and performance venue and support space (approximately 18,423 sf) operated by the National Black Theatre (NBT). The building also contains 17,529 sf of below grade storage space, 9,556 sf of which is used by the NBT. In sum, the site is developed with approximately 48,165 sf of floor area and 65,994 sf of gross floor area.

The proposed rezoning area (i.e. the project site), Block 1750 - Lot 1 (the lot owned by the applicant), is located on the western border of the East Harlem neighborhood of Manhattan, in Community District 11.

Phase I Environmental Site Assessment

As previously indicated, a Phase I ESA for the project site was produced by ALC, dated April 29, 2016. The following findings with respect to the project site were provided in the ALC Phase I ESA:

- The project site is located at a surface elevation of approximately 24 feet above mean sea level (amsl). Groundwater beneath the projects site is estimated to be within 24-feet below grade surface. Groundwater flow is assumed to follow topography, east-northeast, toward the Harlem River.
- The project site is improved with two adjacent three-story multi-tenant commercial buildings with six street-level commercial units, located on a rectangular-shaped parcel that is approximately 0.39-acres in size. The buildings total approximately 58,000 square feet (sf) of floor space and occupy the entire footprint of the parcel. NO landscape areas are present.
- The "North Tower" consists of a three-story building with basement. The building features two (2) street-level commercial units. The North Tower was constructed circa 1909. Cooling and heating is provided to sections of the building via a central heating, ventilation and air

conditioning (HVAC) unit. Heat is generated by natural gas and distributed to the building via forced air. Hot water is generated by small individual electric hot water heaters located within each restroom.

- The "South Tower" consists of a three-story building with basement. The building features four (4) street-level commercial units. Based upon the ALC Phase I ESA, the South Tower was damaged by a fire that occurred in 1982 and the building was demolished and redeveloped in 1989 as the existing three-story commercial building. Cooling and heating is provided to sections of the building via a central HVAC unit. Heat is generated by natural gas and distributed to the building via forced air. Hot water is generated by small individual electric hot water heaters located within each restroom.
- The site was listed in the Environmental Data Resources, Inc. (EDR) on the Resource Conservation and Recovery Act (RCRA) No Longer Regulated Hazardous Waste Generators federal regulatory database (RCRA-NonGen), and MANIFEST databases for unspecified hazardous wastes that were transported from the site in 2013 from an on-site/adjacent ConEdison utility vault.
- The site was listed with a New York State Department of Environmental Conservation (NYSDEC) spill incident (Spill No. 11-09973) associated with 80-gallons of transformer oil and 200-gallons of water discovered in an on-site/adjacent ConEdison manhole. The manhole was reportedly drained and cleaned to standards and the spill issue was closed out.
- The site was erroneously listed on the list of historic auto stations (HIST Auto Station) under the name "The Body Shop," which was ultimately determined to be a beauty retail store and not an auto repair facility.
- No electronic transformers suspect of containing polychlorinated biphenyl (PCB) containing dielectric fluid was observed at the project site.
- Historic Sanborn Fire Insurance maps reviewed in the Phase I ESA revealed a dry cleaning facility operated within the South Tower from at least 1968 until the late 1980's. The South Tower was reportedly redeveloped in 1989. Impacts associated with the former dry cleaning facility were probably addressed during redevelopment activities. However, impacts (including a vapor encroachment condition) may be present at the North Tower.
- A review of historical city directories indicated that from at least 1920 to 1923, a printing facility identified as "Cranston Wm Printing" and a facility identified as "Automatic Engraving & Manufacturing Co. Inc. NY" operated at the North Tower. Hazards associated with printing and engraving activities include generation of spent solvents and inks, as well as impacted wastewaters.
- The South Tower was reportedly constructed circa 1989 and the North Tower was constructed prior to 1979. Therefore, there is a potential for asbestos-containing materials to be present within the North Tower.
- Working quantities of hazardous materials in the form of janitorial and building maintenance products were identified in the buildings.
- No evidence of aboveground or underground storage tanks, fill pipes, or access ways indicative of underground storage tanks were visually observed by ALC. However, municipal

records indicated oil burner applications associated with the South Tower dated 1960, 1963 and 1973, and a Certificate of Occupancy (C/O) issued in October 1953, noting the fuel oil burner installation was approved in 1952. ALC presumed that any previously above or underground storage tanks in the South Tower were removed during site redevelopment activities, and no further investigation is warranted.

- The site is connected to municipal sewer. Floor drains were observed and reportedly discharge into the municipal sewer.

Based upon the findings of the ALC Phase I ESA, the following RECs and additional concerns were identified in association with the project site:

- According to historical city directories reviewed, former uses of the subject North Tower include a printing facility identified as "Cranston Wm Printing" and a facility identified as "Automatic Engraving & Manufacturing Co. Inc. NY," listed between 1920 and 1923. In addition, the subject North Tower appears to have historically been utilized for various manufacturing purposes from at least 1920 until the late 1960's. Environmental hazards associated with printing and engraving activities include generation of spent solvents and inks, and contaminated wastewater. Potential hazards associated with general manufacturing activities include the generation of hazardous wastes. Therefore, the historical uses of the North Tower as printing, engraving, and manufacturing facilities, as well as the lack of hazardous waste disposal regulations prior to the 1970's constitutes a REC.
- As per historical Fire Insurance Maps (Sanborn maps) reviewed, a dry cleaning facility operated at the subject South Tower from at least 1968 until the late 1980's. According to the Facility Manager, the South Tower was redeveloped in 1989, therefore, impacts associated with the former dry cleaning facility would have been addressed during redevelopment activities. However, due to the downgradient location of the North Tower, there is a possibility that the North Tower was impacted by the former dry cleaning facility in the South Tower.

No-Action Condition

Without the proposed actions, the project site would remain part of the existing C4-4A/R7A district and the space currently occupied by NBT would be converted to office space. Given this condition, it is likely that any potential impacts relating to current and historic dry cleaning or manufacturing uses would go uninvestigated, and therefore, unmitigated. Furthermore, absent the proposed action, it is likely that any asbestos-containing building materials, lead-based paint or PCB-containing building materials would not be abated/removed in accordance with applicable regulations and/or demolition procedures.

With-Action Condition

The future with the proposed action (the With-Action Condition) would facilitate the development of a new 20-story mixed use building. The proposed action would result in demolition of the existing buildings on-site. As such, existing building materials may be present that are considered ACM or contain lead-based paint, which would be subject to standard abatement procedures and would be

remediated in accordance with applicable regulations as part of redevelopment. In addition, any PCB-containing building materials that may be present would be identified during the demolition activities and would be removed in accordance with applicable federal regulations.

To preclude the potential for significant adverse impacts related to hazardous materials, an (E) designation (E-435) would be incorporated into the rezoning proposal for Block 1750 Lot 1. The text for the (E) designations related to hazardous materials is as follows:

Task 1-Sampling Protocol

The applicant submits to OER, for review and approval, a Phase I of the site along with a soil, groundwater and soil vapor testing protocol, including a description of methods and a site map with all sampling locations clearly and precisely represented. If site sampling is necessary, no sampling should begin until written approval of a protocol is received from OER. The number and location of samples should be selected to adequately characterize the site, specific sources of suspected contamination (i.e., petroleum based contamination and non-petroleum based contamination), and the remainder of the site's condition. The characterization should be complete enough to determine what remediation strategy (if any) is necessary after review of sampling data. Guidelines and criteria for selecting sampling locations and collecting samples are provided by OER upon request.

Task 2-Remediation Determination and Protocol

A written report with findings and a summary of the data must he submitted to OER after completion of the testing phase and laboratory analysis for review and approval. After receiving such results, a determination is made by OER if the results indicate that remediation is necessary. If OER determines that no remediation is necessary, written notice shall be given by OER.

If remediation is indicated from test results, a proposed remediation plan must be submitted to OER for review and approval. The applicant must complete such remediation as determined necessary by OER. The applicant should then provide proper documentation that the work has been satisfactorily completed.

A construction-related health and safety plan should be submitted to OER and would be implemented during excavation and construction activities to protect workers and the community from potentially significant adverse impacts associated with contaminated soil, groundwater and/or soil vapor. This plan would be submitted to OER prior to implementation.

With this (E) designation in place, no significant adverse impacts related to hazardous materials are expected, and no further analysis is warranted.

Conclusion

As previously indicated, any potential impacts relating to hazardous materials would be identified and investigated prior to subsurface disturbance as required by an (E) designation for hazardous materials. Any potential remedial action that may be required would also be administered as part of the (E) designation protocol under the regulatory oversight of OER. In order to reduce the potential for exposure to future site occupants, during and following construction, regulatory requirements

pertaining to ACM, LBP, PCBs and chemical use and storage would be followed. With the implementation of these measures, no significant adverse impacts related to hazardous materials would result from the proposed action.

2.8 Transportation

2.8.1 Introduction

According to the *2014 CEQR Technical Manual*, the objective of a transportation analysis is to determine if a proposed project may result in significant adverse impacts on the transportation network within the area surrounding the proposed project, and to identify measures to mitigate any resulting impacts.

The extent to which transportation analyses are needed depends on the specific use or combination of uses and degree of development being proposed. As detailed in Section 1.0, "Project Description", the RWCDS would include residential, local retail, and theater space. As indicated in the EAS checklist, the RWCDS would exceed the minimum development density thresholds requiring transportation analysis set forth in Table 16-1 of the *CEQR Technical Manual*; therefore, further transportation analysis is required.

2.8.2 Methodology and Analytical Framework

According to 2014 *CEQR Technical Manual* procedures for transportation analysis, a two-step screening process is to be undertaken to determine whether a quantified analysis is necessary. The first step, the Level 1 (Trip Generation) screening, determines whether the number of peak hour person and vehicle trips generated by the RWCDS would be below the thresholds for further study:

- 50 peak hour vehicle trips ends;
- 200 peak hour subway/rail or bus transit rider trips; and
- 200 peak hour pedestrian trips.

When these thresholds are exceeded, the 2014 *CEQR Technical Manual* recommends that detailed trip assignments (Level 2) be performed to estimate the incremental trips resulting from the RWCDS and to identify potential locations for further analyses. If the trip assignments show that the RWCDS would result in 50 or more peak hour vehicle trip ends at an intersection, 200 or more peak hour subway trips at a station, 50 or more peak hour bus trips in one direction along a bus route, or 200 or more peak hour pedestrian trips traversing a pedestrian element, then further quantified analyses may be warranted to assess the potential for significant adverse impacts on traffic, transit, pedestrians, parking, and vehicular and pedestrian safety.

A trip generation effort was performed for both the No-Action condition and With-Action condition land uses to quantify the volume of person trips by travel mode (auto, taxi, bus and walk) in each scenario, as well as vehicle trips. The net person and vehicle trips generated by the RWCDS would be the difference between total trips generated by the uses under the With-Action condition and the No-Action (subtracting the No-Action trip generation from the With-Action trip generation).

2.8.3 Level 1 Screening Assessment (Trip Generation)

Trip generation, modal split, and other travel demand assumptions were developed for each land use to determine the volume of trips that would be generated by the project during weekday peak hours (AM, midday and PM), as well as the Saturday midday peak hour. These estimates were based on data obtained from: the *2014 CEQR Technical Manual*; *American Community Survey (ACS*) journey to work and reverse journey to work data; recent New York City Environmental Impact Statements (EISs) (such as the *125th Street Corridor Rezoning FEIS* [2008] and the *Pier 57 Redevelopment Project* [2013]), and reasonable planning assumptions. Travel demand factors used to calculate trips generated by each land use are summarized in Table 2.8-1 and described in detail below.

Residential

For residential use, the weekday and Saturday daily person trip generation rates of 8.075 and 9.6 person trips per dwelling unit (DU), respectively, were based on the *2014 CEQR Technical Manual*. The temporal distributions of 10 percent for the weekday AM peak hour, 5 percent for the weekday midday peak hour, 11 percent for the weekday PM peak hour, 8 percent for the Saturday midday peak hour, and 7 percent for the Saturday PM peak hour were also obtained from the *2014 CEQR Technical Manual*. A directional distribution of 15 percent "in" during the weekday AM peak hour, 50 percent "in" during the weekday midday peak hour, 70 percent "in" during the weekday PM peak hour, 50 percent "in" during the Saturday midday and PM peak hours were obtained from the *125th Street Corridor Rezoning FEIS (2008)*. A modal split of 8.3 percent by auto, 2.0 percent by taxi, 10.2 percent by bus, 61.8 percent by subway or rail and 17.7 percent by walk, and vehicle occupancy rates of 1.10 persons per auto or taxi were based on the 2009 – 2014 ACS journey to work data for Manhattan census tracts 198, 200, 206, and 208.

For truck deliveries, weekday and Saturday daily trip generation rates of 0.06 and 0.02 trips per DU, respectively, were obtained from the *2014 CEQR Technical Manual*. A temporal distribution of 12 percent during the weekday AM peak hour, 9 percent during the weekday midday peak hour, 2 percent during the weekday PM peak hour, and 9 percent during the Saturday midday and PM peak hours, as well as directional distribution assumptions (50 percent "in" during all peak hours) were obtained from the *2014 CEQR Technical Manual*.

Table 2.8-1: Travel Demand Characteristics

Rates	Residential	Local Retail	Theater	Office	Medical Office
Person Trip Generation Rate (Weekday)	8.075[1]	205[1]	2.68[4,5]	18.0[1]	127[7]
	per DU	*per 1,000 sf*	*per seat*	*per 1,000 sf*	*per 1,000 sf*
Person Trip Generation Rate (Saturday)	9.6[1]	240[1]	5.36[4,5]	3.9[1]	127[7]
	per DU	*per 1,000 sf*	*per seat*	*per 1,000 sf*	*per 1,000 sf*
Linked Trip Credit	0%	25%[3]	0%	0%	0%
Temporal Distribution					
Weekday AM Peak	10%[1]	3%[1]	0%[4,5]	12%[1]	4%[7]
Weekday Midday Peak	5%[1]	19%[1]	0%[4,5]	15%[1]	11%[7]
Weekday PM Peak	11%[1]	10%[1]	32%[4,5]	14%[1]	12%[7]
Saturday Midday/PM Peaks	8%/7%[1]	10%/10%[1]	16%/16%[4,5]	17%/15%[1]	11%/11%[7]
Modal Split (Weekday AM, PM, Saturday Midday, and Saturday PM Peaks/Weekday Midday Peak)					
Auto	8.3%/8.3%[2]	2%/2%[3]	9%/9%[5]	16.4%/2.0%[3,6]	30%/30%[7]
Taxi	2.0%/2.0%[2]	3%/3%[3]	2%/2%[5]	2.1%/1.0%[3,6]	2%/2%[7]
Bus	10.2%/10.2%[2]	6%/6%[3]	3%/3%[5]	17.4%/7.0%[3,6]	33%/33%[7]
Subway	61.8%/61.8%[2]	6%/6%[3]	49%/49%[5]	47.1%/7.0%[3,6]	18%/18%[7]
Walk	17.7%/17.7%[2]	83%/83%[3]	37%/37%[5]	17.0%/83.0%[3,6]	17%/17%[7]
Vehicle Occupancy					
Auto	1.10[2]	2.00[3]	2.90[5]	1.14[6]	1.50[7]
Taxi	1.10[2]	2.00[3]	2.30[5]	1.14[6]	1.50[7]
Directional Split (In/Out)					
Weekday AM Peak	15%/85%[3]	50%/50%[3]	50%/50%[4]	96%/4%[3]	89%/9%[7]
Weekday Midday Peak	50%/50%[3]	50%/50%[3]	50%/50%[4]	39%/61%[3]	51%/49%[7]
Weekday PM Peak	70%/30%[3]	50%/50%[3]	100%/0%[4]	5%/95%[3]	48%/52%[7]
Saturday Midday/PM Peaks	50%/50%; 50%/50%[3]	50%/50%; 55%/45%[3]	100%/0%; 0%/100%[4]	60%/40%; 15%/85%[3]	41%/59%; 41%/59%[7]
Truck Trip Generation (Weekday)	0.06[1]	0.35[1]	0.01[5]	0.32[1]	0.29[7]
	per DU	*per 1,000 sf*	*per seat*	*per 1,000 sf*	*per 1,000 sf*
Truck Trip Generation (Saturday)	0.02[1]	0.04[1]	0.01[5]	0.01[1]	0.29[7]
	per DU	*per 1,000 sf*	*per seat*	*per 1,000 sf*	*per 1,000 sf*
Truck Temporal Distribution					
Weekday AM Peak	12%[1]	8%[1]	6%[5]	10%[1]	3%[7]
Weekday Midday Peak	9%[1]	11%[1]	6%[5]	11%[1]	11%[7]
Weekday PM Peak	2%[1]	2%[1]	1%[5]	2%[1]	1%[7]
Saturday Midday/PM Peaks	9%/9%[1]	11%/11%[1]	0%/0%[5]	11%/11%[1]	0%/0%[7]
Truck Trip Directional Split - 50% in/ 50% out					

Sources:

(1) *2014 CEQR Technical Manual*

(2) *2009 – 2014 American Community Survey (ACS) journey to work data for Manhattan Census Tracts 198, 200, 206, and 208*

(3) *125th Street Corridor Rezoning FEIS (2008)*

(4) Based on one night show during the weekday and two shows (matinee and night) during Saturday, assume showtime arrival during weekday PM and Saturday midday peak hours, and end of show during the Saturday PM peak hour

(5) *Pier 57 Redevelopment Project FEIS (2013)*

(6) *2006 – 2010 American Community Survey (ACS) Special Tabulation: Transportation Planning (NYCDCP)* reverse journey to work for Manhattan Census Tracts 198, 200, 206, and 208

(7) Based on survey of medical office space provided by NYCDOT

Local Retail

For local retail, the weekday and Saturday daily person trip generation rates of 205 and 240 person trips per 1,000 square feet, respectively, were based on the *2014 CEQR Technical Manual*. The temporal distributions of 3 percent for the weekday AM peak hour, 19 percent for the weekday midday peak hour, 10 percent for the weekday PM peak hour, and 10 percent for the Saturday midday and PM peak hours were also obtained from the *2014 CEQR Technical Manual*. A directional distribution of 50 percent "in" during all peak hours was applied, which is typically assumed in New York City EISs for local retail uses. A modal split of 2 percent by auto, 3 percent by taxi, 6 percent by bus, 6 percent by subway, and 83 percent by walk was based on the *125th Street Corridor Rezoning FEIS (2008)*. Vehicle occupancy rates of 2.00 persons per auto or taxi during all peak hours, and a 25 percent linked trip credit for all local trips were based on the *125th Street Corridor Rezoning FEIS (2008)*.

For truck deliveries, weekday and Saturday daily trip generation rates of 0.35 and 0.04 trips per 1,000 square feet, respectively, were obtained from the *2014 CEQR Technical Manual*. A temporal distribution of 8 percent during the weekday AM peak hour, 11 percent during the weekday midday peak hour, 2 percent during the weekday PM peak hour, and 11 percent during the Saturday midday and PM peak hours, as well as directional distribution assumptions (50 percent "in" during all peak hours) were obtained from the *2014 CEQR Technical Manual*.

Since the local retail land use pertains to both the No-Action and proposed conditions, the size differential between the two was computed to determine the net local retail trip generation for the future With-Action condition.

Theater

Based on recent production schedules for the existing theater operations and discussions with the theater operators, performances will be regularly scheduled on weeknights (show starting at 7:30 PM), and during the matinee (show starting at 2 PM) and evening (show starting at 7:30 PM) for a typical Saturday. There is an evening show (show starting at 4 PM) on a typical Sunday. There is a potential that both theaters would be in use concurrently for performances, events, or for workshops. For trip generation purposes, it is conservatively assumed that both theatres would be in use concurrently.

The trip generation rates and temporal distributions were based on similar uses found in the *Pier 57 Redevelopment Project FEIS (2013)*. A weekday person trip generation rate of 2.68 daily trips per seat and a Saturday person trip generation rate of 5.36 daily trips per seat were used. Temporal distributions of 32 percent was used for the weekday PM peak hour and 16 percent for the Saturday midday and PM peak hour, accounting for event arrivals and departures (directional distribution of 100 percent "in" were assumed for the Saturday midday peak hour and 0 percent "in" for the Saturday PM peak hour). While weekday night event arrivals would occur after the weekday peak hours, to be conservative, arrival trips were overlaid onto the weekday PM peak hour.

Modal splits of 9 percent by auto, 2 percent by taxi, 3 percent by bus, 49 percent by subway or rail, and 37 percent by walk and vehicle occupancies of 2.90 persons per auto and 2.30 person per taxi were obtained from the *Pier 57 Redevelopment Project FEIS (2013)*, and are comparable to modal splits used for theater uses in areas well-served by transit in other previously certified

EISs such as the *Hudson Square Rezoning FEIS (2013)*. For truck delivery trips, a daily trip generation rate of 0.01 trips per 1,000 square feet and temporal distributions of 6 percent during the weekday AM and midday peak hours, and 1 percent during the weekday PM peak hour (it was assumed that there will be no delivery trips during the Saturday midday and PM peak hours) were obtained from the *Pier 57 Redevelopment Project FEIS (2013)*.

Office

For office use, weekday and Saturday trip generation rates of 18.0 and 3.9 daily person trips per 1,000 square feet, respectively, were obtained from the *2014 CEQR Technical Manual*. A temporal distribution of 12 percent during the weekday AM peak hour, 15 percent during the weekday midday peak hour, 14 percent during the weekday PM peak hour, 17 percent during the Saturday midday peak hour, and 15 percent during the Saturday PM peak hour, was also obtained from the *2014 CEQR Technical Manual*. A directional distribution of 96 percent "in" during the weekday AM peak hour, 39 percent "in" during the weekday midday peak hour, 5 percent "in" during the weekday PM peak hour, 60 percent "in" during the Saturday midday peak hour, and 15 percent "in" during the Saturday PM peak hour was obtained from the *125th Street Corridor Rezoning FEIS (2008).* A modal split of 16.4 percent by auto, 2.1 percent by taxi, 17.4 percent by bus, 47.1 percent by subway or rail, and 17.0 percent by walk was used for the weekday AM and PM peak hours based on reverse journey to work data from the 2006–2010 ACS Special Tabulation: Census Transportation Planning by NYCDCP for Manhattan census tracts 198, 200, 206, and 208. A weekday and Saturday midday peak hours modal split of 2 percent by auto, 1 percent by taxi, 7 percent by bus, 7 percent by subway or rail, and 83 percent by walk was based on the *125th Street Corridor Rezoning FEIS (2008)*. A vehicle occupancy of 1.14 for auto or taxi was based on data from the 2006 – 2010 ACS Special Tabulation: Census Transportation Planning.

For truck delivery trips, weekday and Saturday trip generation rates of 0.32 and 0.01 daily trips per 1,000 square feet, respectively, were based on the *2014 CEQR Technical Manual*. A temporal distribution of 10 percent during the weekday AM peak hour, 11 percent during the weekday midday peak hour, 2 percent during the weekday PM peak hour, and 11 percent during the Saturday midday and PM peak hours were also based on the *2014 CEQR Technical Manual*.

Medical Office

Trip generation assumptions for the medical office use were based on surveys conducted by NYCDOT. The weekday and Saturday trip generation rates of 127 daily person trips per 1,000 square feet and temporal distributions of 4 percent during the weekday AM peak hour, 11 percent during the weekday midday peak hour, 12 percent during the weekday PM peak hour, and 11 percent during the Saturday midday and PM peak hour were used. The directional distributions used were 89 percent "in" during the weekday AM peak hour, 51 percent "in" during the weekday midday peak hour, 48 percent "in" during the weekday PM peak hour, and 41 percent "in" during the Saturday midday and PM peak hour. The modal splits assumed were 30 percent by auto, 2 percent by taxi, 33 percent by bus, 18 percent by subway or rail, and 17 percent by walk with weekday and Saturday vehicle occupancies of 1.50 persons per auto or taxi.

For truck delivery trips, weekday and Saturday trip generation rates of 0.29 daily trips per 1,000 square feet were based also based on the surveys conducted by NYCDOT. A temporal

distribution of 3 percent during the weekday AM peak hour, 11 percent during the weekday midday peak hour, and 1 percent during the weekday PM peak hour (no delivery trips were assumed for the Saturday midday and PM peak hours) was used for this analysis.

Level 1 Screening Results

Transit and Pedestrians

Table 2.8-2 summarizes the net increment of person trips that would be generated during peak hours as a result of the RWCDS. The table also shows the breakdown of the anticipated number of trips to be removed from the future No-Action condition and trips from the RWCDS under the With-Action condition. This table indicates that the largest increase in hourly bus and subway passenger trips would occur during the Saturday midday peak hour with about 25 trips by bus, which is below the 200 hourly threshold, and 224 trips by subway or rail, which although is above the 200 hourly threshold would screen out due to the number of subway and rail options within the project site vicinity. However, the pedestrian trips (walk trips plus transit trips and auto trips from parking facilities within the project site vicinity) would exceed the 200 hourly pedestrian trip threshold during the weekday midday (491 person trips), PM (542 person trips), Saturday midday (610 person trips), and Saturday PM (576 person trips) peak hours, warranting a Level 2 screening for pedestrian analysis. The weekday AM peak hour pedestrian trips would only be 192 trips per peak hour and would be screened out.

Table 2.8-2: Trip Generation Summary – Person Trips

No-Action Condition															
Mode	Weekday AM			Weekday Midday			Weekday PM			Saturday Midday			Saturday PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	16	2	18	13	13	26	11	23	34	9	12	21	9	11	20
Taxi	2	1	3	7	7	14	4	6	10	4	5	9	4	4	8
Bus	19	3	22	23	23	46	17	30	47	16	19	35	15	18	33
Subway/	35	3	38	19	20	39	14	46	60	13	15	28	12	14	26
Walk	41	27	68	204	218	422	97	108	205	120	118	238	117	108	225
Total	113	36	149	266	281	547	143	213	356	162	169	331	157	155	312
With-Action Condition															
Mode	Weekday AM			Weekday Midday			Weekday PM			Saturday Midday			Saturday PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	4	16	20	14	14	28	36	10	46	33	14	47	13	32	45
Taxi	3	5	8	15	15	30	15	9	24	15	11	26	10	14	24
Bus	8	22	30	34	34	68	36	22	58	33	27	60	25	31	56
Subway/	23	107	130	59	59	118	209	55	264	177	75	252	67	169	236
Walk	68	92	160	406	406	812	312	220	532	338	261	599	247	324	571
Total	106	242	348	528	528	1056	608	316	924	596	388	984	362	570	932
Net Total (With-Action Condition minus No-Action Condition)															
Mode	Weekday AM			Weekday Midday			Weekday PM			Saturday Midday			Saturday PM		
	In	Out	Total	In	Out	In	In	Out	Total	In	Out	Total	In	Out	Total
Auto	**-12**	**14**	**2**	**1**	**1**	**2**	**25**	**-13**	**12**	**24**	**2**	**26**	**4**	**21**	**25**
Taxi	**1**	**4**	**5**	**8**	**8**	**16**	**11**	**3**	**14**	**11**	**6**	**17**	**6**	**10**	**16**
Bus	**-11**	**19**	**8**	**11**	**11**	**22**	**19**	**-8**	**11**	**17**	**8**	**25**	**10**	**13**	**23**
Subway/	**-12**	**104**	**92**	**40**	**39**	**79**	**195**	**9**	**204**	**164**	**60**	**224**	**55**	**155**	**210**
Walk	**27**	**65**	**92**	**202**	**188**	**390**	**215**	**112**	**327**	**218**	**143**	**361**	**130**	**216**	**346**
Total	**-7**	**206**	**199**	**262**	**247**	**509**	**465**	**103**	**568**	**434**	**219**	**653**	**205**	**415**	**620**

Traffic and Parking

As shown in Table 2.8-3, the net increase in vehicle trip ends ("ins" plus "outs") would not exceed the 50 peak hour trip threshold for vehicles during any of the weekday or Saturday peak hours. The number of hourly net vehicle trips generated by the RWCDS would be 8 in the weekday AM peak hour, 14 in the weekday midday peak hour, 10 in weekday PM peak hour, 27 in the Saturday midday peak hour, and 26 in the Saturday PM peak hour. Since the volume of new vehicle trips that would be generated by the RWCDS would not exceed the 50 vehicle trip threshold, no further analysis is required.

A detailed breakdown of person and vehicle trips by land use is provided in Appendix C.

Table 2.8-3: Trip Generation Summary – Vehicle Trips

No-Action Condition															
Type	Weekday AM			Weekday Midday			Weekday PM			Saturday Midday			Saturday PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	13	2	15	8	8	16	7	18	25	6	8	14	6	7	13
Taxi	2	2	4	6	6	12	6	6	12	4	4	8	4	4	8
Truck	1	1	2	1	1	2	0	0	0	0	0	0	0	0	0
Total	16	5	21	15	15	30	13	24	37	10	12	22	10	11	21
With-Action Condition															
Type	**Weekday AM**			**Weekday Midday**			**Weekday PM**			**Saturday Midday**			**Saturday PM**		
	In	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Auto	3	14	17	9	9	18	21	8	29	17	10	27	9	16	25
Taxi	5	5	10	12	12	24	9	9	18	11	11	22	11	11	22
Truck	1	1	2	1	1	2	0	0	0	0	0	0	0	0	0
Total	9	20	29	22	22	44	30	17	47	28	21	49	20	27	47
Net Total (With-Action Condition minus No-Action Condition)															
Type	**Weekday AM**			**Weekday Midday**			**Weekday PM**			**Saturday Midday**			**Saturday PM**		
	In	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Auto	**-10**	**12**	**2**	**1**	**1**	**2**	**14**	**-10**	**4**	**11**	**2**	**13**	**3**	**9**	**12**
Taxi	**3**	**3**	**6**	**6**	**6**	**12**	**3**	**3**	**6**	**7**	**7**	**14**	**7**	**7**	**14**
Truck	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total	**-7**	**15**	**8**	**7**	**7**	**14**	**17**	**-7**	**10**	**18**	**9**	**27**	**10**	**16**	**26**

2.8.4 Level 2 Screening Assessment (Trip Assignment)

As described above, pedestrian trips resulting from the RWCDS would exceed the CEQR Level 1 screening threshold for pedestrian trips during the weekday midday, PM, Saturday midday and PM peak hours. The peak hour pedestrian trips were assigned through the pedestrian network based on logical and direct travel routes to and from the project site, as described below, to determine if the number of additional pedestrian trips generated by the RWCDS would exceed 200 peak hour pedestrian trips at any single pedestrian element (e.g. crosswalk, sidewalk, corner reservoir area) approaching the site – the threshold for detailed pedestrian analysis.

Since the project site would not be providing parking on-site, auto trips would be expected to park at off-street parking facilities in the project vicinity. There are several transit options within walking distance from the project site including the Bx15, M1, M7, B60 SBS, M100, M101, and M102 bus routes which has stops along 125th Street, Madison Avenue, and Lenox Avenue, subways stations along 125th Street at Lenox Avenue (for the 2 and 3 subway lines) and at Lexington Avenue (for the 4, 5, and 6 subway lines), and the Harlem-125th Street MetroNorth railroad station at Park Avenue.

Residential

The residential entrance for the project site will be located along the East 126th Street side of the site. Residential walk trips were distributed to commercial attractions in the neighborhood (predominately along 125th Street), and to local attractions in the surrounding areas such as Marcus Garvey Park to the south of the project site. Residential transit trips were assigned to the

nearby bus stops, subway stations, and railroad. Auto trips were assigned to the project site from off-street parking facilities within the project vicinity.

Local Retail

Local retail access is provided along the Fifth Avenue and East 125th Street sides of the project site. The vast majority of local retail trips would be walk only trips which were generally evenly distributed throughout the surrounding areas. Transit trips were assigned to the nearby bus stops and subway stations, and auto trips were assigned to the project from off-street parking facilities with the project vicinity.

Theater

The entrance to the theater would be located along Fifth Avenue. Theater walk trips were distributed throughout the surrounding areas, with the majority of trips arriving via 125th Street and 126th Street. Since the theater's catchment area would extend outside the neighborhood, it is expected that a sizeable amount of walk trips would be linked to commercial establishments (e.g. restaurants) in the area. Transit walk trips were assigned to arrive to the project site using the local bus routes, and subway and railroad lines. Auto trips were assigned to the project site from off-street parking facilities within the project vicinity.

Office

Office trips were assigned to the entrance along Fifth Avenue. Office walk trips makes up the vast majority of weekday midday and Saturday midday peak hour trips when office workers are leaving or coming back from lunch or running of errands. Walk trips were assigned throughout the surrounding areas with a larger concentration of trips being assigned to the commercial corridors within the area such as along 125th Street, Lenox Avenue, and Lexington Avenue. Transit walk trips were assigned to use the local bus routes, and subway and railroad lines, and auto trips were assigned to off-street parking facilities nearby the project site.

Medical Office

The entrance to the medical office use is located along Fifth Avenue. Medical office walk trips were generally evenly distributed throughout the surrounding areas. Transit trips were assigned to the nearby bus stops and subway stations, and auto trips were assigned to the project from off-street parking facilities with the project vicinity.

Level 2 Screening Results

The net pedestrian trip increments for the weekday midday, PM, Saturday midday, and Saturday PM peak hours are shown in Tables 2.8-4 through 2.8-7 below, and detailed No-Action condition, With-Action condition, and net increment pedestrian volume maps are included in Appendix C. These net increments reflect the increase in pedestrian trips under the With-Action condition (with the RWCDS in place) as compared to the No-Action condition (with local retail, medical office, and office land uses in place).

As shown in the table, the total number of pedestrian trips generated at the sidewalk elements fronting the project site would exceed 200 trips per hour for at least one peak hour analyzed. Pedestrian analyses were needed for the sidewalk elements fronting the project site along East 125th Street, East 126th Street, and Fifth Avenue, and at the adjacent corner reservoir elements. The analyses would need to be performed for the weekday midday and PM peak hours to determine if there is potential for significant adverse pedestrian impacts as a result of the RWCDS. A Saturday peak hour analysis would also need to be performed, and would be developed by adding pedestrian trips generated by the Saturday midday peak hour (which would generate more pedestrian trips than the Saturday PM peak hour) to the Saturday background peak hour.

Table 2.8-4: Pedestrian Trip Increments – Weekday Midday Peak Hour

Location	Pedestrian Element	No-Action Increments	With-Action Increments	Net Increment (With-Action minus No-Action)
Fifth Avenue and 125th Street	North Crosswalk	72	132	60
	East Crosswalk	123	225	102
	Northeast Corner	168	329	161
	North Sidewalk – East Side	332	710	**378 ***
	East Sidewalk – North Side	254	434	180
Fifth Avenue and 126th Street	East Crosswalk	106	198	92
	South Crosswalk	102	203	101
	Southeast Corner	47	93	46
	South Sidewalk – East Side	47	215	168
* Net increment of pedestrian trips exceeds Level 2 screening threshold				

Table 2.8-5: Pedestrian Trip Increments – Weekday PM Peak Hour

Location	Pedestrian Element	No-Action Increments	With-Action Increments	Net Increment (With-Action minus No-Action)
Fifth Avenue and 125th Street	North Crosswalk	56	99	43
	East Crosswalk	70	164	94
	Northeast Corner	118	222	105
	North Sidewalk – East Side	205	421	**216 ***
	East Sidewalk – North Side	184	354	170
Fifth Avenue and 126th Street	East Crosswalk	51	120	69
	South Crosswalk	68	171	103
	Southeast Corner	28	83	55
	South Sidewalk – East Side	28	276	**248 ***
* Net increment of pedestrian trips exceeds Level 2 screening threshold				

Table 2.8-6: Pedestrian Trip Increments – Saturday Midday Peak Hour

Location	Pedestrian Element	No-Action Increments	With-Action Increments	Net Increment (With-Action minus No-Action)
Fifth Avenue and 125th Street	North Crosswalk	45	111	66
	East Crosswalk	73	183	110
	Northeast Corner	105	251	146
	North Sidewalk – East Side	208	486	**278 ***
	East Sidewalk – North Side	155	389	**234 ***
Fifth Avenue and 126th Street	East Crosswalk	60	138	78
	South Crosswalk	62	176	114
	Southeast Corner	28	86	58
	South Sidewalk – East Side	28	261	**233 ***
* Net increment of pedestrian trips exceeds Level 2 screening threshold				

Table 2.8-7: Pedestrian Trip Increments – Saturday PM Peak Hour

Location	Pedestrian Element	No-Action Increments	With-Action Increments	Net Increment (With-Action minus No-Action)
Fifth Avenue and 125th Street	North Crosswalk	42	106	64
	East Crosswalk	69	176	107
	Northeast Corner	100	202	102
	North Sidewalk – East Side	197	460	**263 ***
	East Sidewalk – North Side	147	373	**226 ***
Fifth Avenue and 126th Street	East Crosswalk	56	132	76
	South Crosswalk	59	162	103
	Southeast Corner	26	86	60
	South Sidewalk – East Side	26	237	**211 ***
* Net increment of pedestrian trips exceeds Level 2 screening threshold				

2.8.5 Transportation Analysis

The Level 1 and Level 2 screening assessments show that there is a potential for significant pedestrian impacts. Hence, further analysis is necessary and was performed using methodologies presented in the *2010 Highway Capacity Manual (HCM 2010)* as detailed in the *2014 CEQR Technical Manual*.

Methodology

Analyses of pedestrian conditions in urban areas are based on the time and space available for pedestrians and the levels of service is defined by the average pedestrian space (sf/p). The level of service criteria is presented in Table 2.8-8 below. Due to the nature of the trips traveling to and from the theater use, sidewalk element level of service will be determined based on a platoon flow criterion.

Table 2.8-8: Level of Service Criteria for Pedestrian Elements

LOS	Sidewalks		Corner Reservoirs and Crosswalks
	Non-Platoon Flow	Platoon Flow	
A	> 60 sf/p	> 530 sf/p	> 60 sf/p
B	> 40 and ≤ 60 sf/p	> 90 and ≤ 530 sf/p	> 40 and ≤ 60 sf/p
C	> 24 and ≤ 40 sf/p	> 40 and ≤ 90 sf/p	> 24 and ≤ 40 sf/p
D	> 15 and ≤ 24 sf/p	> 23 and ≤ 40 sf/p	> 15 and ≤ 24 sf/p
E	> 8 and ≤ 15 sf/p	> 11 and ≤ 23 sf/p	> 8 and ≤ 15 sf/p
F	≤ 8 sf/p	≤ 11 sf/p	≤ 8 sf/p
Source: New York City Mayor's Office of Environmental Coordination, *CEQR Technical Manual* (March 2014 edition).			

Existing Volumes and Levels of Service

Existing pedestrian volume counts were conducted in June 2016 for the weekday midday, PM, and Saturday peak hours. The weekday midday peak hour of 11:45 AM to 12:45 PM, weekday PM peak hour of 6:30 PM to 7:30 PM (theater arrival peak), and Saturday peak hour of 1 PM to 2 PM (theater arrival peak) were selected for this analysis. As discussed earlier, the weekday PM and Saturday peak hours were determined based on the theater's arrival peak hour, and project generated trips for these times were overlaid on the background peak hour of 5:15 PM to 6:15 PM for the weekday PM peak hour, and during 2:45 PM to 3:45 PM for the Saturday peak hour.

The pedestrian analysis determined that all the pedestrian facilities analyzed operate at LOS B or better during each of the peak hours analyzed. The existing peak hour volumes and levels of service for each pedestrian element analyzed are presented in Table 2.8-9 below.

Table 2.8-9: Pedestrian Volumes – Existing Condition

Location	Pedestrian Element	Weekday Midday Peak Hour		Weekday PM Peak Hour		Saturday Peak Hour	
		Volume (ped/hr)	LOS (sf/p)	Volume (ped/hr)	LOS (sf/p)	Volume (ped/hr)	LOS (sf/p)
Fifth Avenue and 125th Street	Northeast Corner	113	210.8 LOS A	91	178.4 LOS A	26	274.0 LOS A
	North Sidewalk – East Side	620	240.3 LOS B	782	159.0 LOS B	809	167.8 LOS B
	East Sidewalk – North Side	228	960.4 LOS A	258	838.0 LOS A	145	1,682.3 LOS A
Fifth Avenue and 126th Street	Southeast Corner	55	345.1 LOS A	53	403.6 LOS A	20	706.2 LOS A
	South Sidewalk – East Side	109	647.3 LOS A	156	418.3 LOS B	121	422.7 LOS B

Future No Action Volumes and Levels of Service

This section establishes the baseline (No Action) condition against which potential impacts of the project can be identified. Future year pedestrian conditions were analyzed for the build year.[1] No Action traffic volumes were established by applying a background growth rate of 0.25 percent per year in accordance with the *2014 CEQR Technical Manual* guidelines for Manhattan projects to account for planned projects that are modest in size. One planned project, 149 East 125th Street, would consist of 233 residential dwelling units and 22,868 square feet of retail space and is expected to be moderate traffic generator. However, only a modest number of trips would be assumed to pass through study area analysis locations and therefore was included as part of

[1] Directly prior to certification, the build year was moved from 2019 to 2020 which is reflected throughout the rest of this document. The pedestrian analysis is based off 2019, however adding one additional year of background growth to update the technical analysis contained herein to 2020 would not materially affect the results and would not change the conclusions.

the background growth; this project is located three avenue blocks away and has a number of bus and transit opportunities within its vicinity. Absent the proposed action, the existing theater space would be converted to office and medical office uses. Pedestrian volume increments generated by the conversion were included to the growth existing volumes to develop the 2019 No Action pedestrian volumes. The pedestrian conditions would continue to operate at LOS B or better for the pedestrian elements analyzed during each peak hour. The No Action peak hour volumes and levels of service for each pedestrian element analyzed are presented in Table 2.8-10 below.

Table 2.8-10: Pedestrian Volumes – No Action Condition

Location	Pedestrian Element	Weekday Midday Peak Hour		Weekday PM Peak Hour		Saturday Peak Hour	
		Volume (ped/hr)	LOS (sf/p)	Volume (ped/hr)	LOS (sf/p)	Volume (ped/hr)	LOS (sf/p)
Fifth Avenue and 125th Street	Northeast Corner	282	150.8 LOS A	210	144.3 LOS A	131	203.7 LOS A
	North Sidewalk – East Side	957	155.5 LOS B	993	125.1 LOS B	1,023	132.6 LOS B
	East Sidewalk – North Side	484	452.4 LOS B	444	486.9 LOS B	301	810.4 LOS A
Fifth Avenue and 126th Street	Southeast Corner	102	197.5 LOS A	81	271.1 LOS A	48	382.3 LOS A
	South Sidewalk – East Side	156	452.2 LOS B	185	352.7 LOS B	149	343.2 LOS B

Future With-Action Volumes and Levels of Service

The project-generated increase in pedestrian volumes shown in Tables 2.8-4 through 2.8-7 were incorporated into the 2019 No Action pedestrian volume to develop the 2019 With Action pedestrian volumes. The With Action peak hour volumes and levels of service for each pedestrian element analyzed are presented in Table 2.8-11 below.

Table 2.8-11: Pedestrian Volumes – With Action Condition

Location	Pedestrian Element	Weekday Midday Peak Hour		Weekday PM Peak Hour		Saturday Midday Peak Hour	
		Volume (ped/hr)	LOS (sf/p)	Volume (ped/hr)	LOS (sf/p)	Volume (ped/hr)	LOS (sf/p)
Fifth Avenue and 125th Street	Northeast Corner	443	120.4 LOS A	314	121.8 LOS A	277	149.5 LOS A
	North Sidewalk – East Side	1,335	111.3 LOS B	1,209	102.6 LOS B	1,301	104.2 LOS B
	East Sidewalk – North Side	664	329.7 LOS B	614	352.0 LOS B	535	455.9 LOS B
Fifth Avenue and 126th Street	Southeast Corner	148	139.8 LOS A	136	182.6 LOS A	106	214.4 LOS A
	South Sidewalk – East Side	324	217.6 LOS B	433	150.5 LOS B	382	133.7 LOS B

As shown in Table 2.8-11, pedestrian levels of service in the With Action condition would continue to operate at LOS B or better. Therefore, the proposed actions would not result in any significant adverse pedestrian impacts.

2.8.6 Conclusion

The number of vehicle and transit trips generated under the With-Action condition compared to the No-Action condition would not exceed CEQR Level 1 (trip generation) screening thresholds for traffic and transit analysis requiring no further analysis. The number of pedestrian trips generated would exceed Level 1 screening thresholds during the weekday midday, PM, and Saturday peak hours. The trips generated were assigned through the pedestrian network (Level 2 screening), and these additional trips would exceed the screening threshold for the sidewalks fronting the project site along East 125th Street, East 126th Street, and Fifth Avenue, and the two adjacent corners. Pedestrian analyses were performed for the pedestrian elements identified which determined that there would be no potential for significant adverse transportation impacts as a result of the proposed actions.

2.9 Air Quality

2.9.1 Introduction

This section examines the potential for air quality impacts from the proposed action. According to the *2014 CEQR Technical Manual*, air quality impacts can be characterized as either direct or indirect impacts. Direct impacts result from emissions generated by stationary sources, such as stack emissions from on-site fuel burned for boilers and heating, ventilation, and air conditioning (HVAC) systems. Indirect effects are caused by off-site emissions associated with a project, such as emissions from on-road motor vehicles ("mobile sources") traveling to and from a project site. An assessment of traffic associated with the RWCDS was conducted to determine if the proposed action would have potential air quality mobile sources concerns.

Pollutants of Concern

Air pollution is of concern because of its demonstrated effects on human health. Of special concern are the respiratory effects of the pollutants and their potential toxic effects, as described below.

Carbon Monoxide

Carbon monoxide (CO) is a colorless and odorless gas that is a product of incomplete combustion. Carbon monoxide is absorbed by the lungs and reacts with hemoglobin to reduce the oxygen carrying capacity of the blood. At low concentrations, CO has been shown to aggravate the symptoms of cardiovascular disease. It can cause headaches, nausea, and at sustained high concentration levels, can lead to coma and death.

Particulate Matter

Particulate matter is made up of small solid particles and liquid droplets. PM_{10} refers to particulate matter with a nominal aerodynamic diameter of 10 micrometers or less, and $PM_{2.5}$ refers to particulate matter with an aerodynamic diameter of 2.5 micrometers or less. Particulates can enter the body through the respiratory system. Particulates over 10 micrometers in size are generally captured in the nose and throat and are readily expelled from the body. Particles smaller than 10 micrometers, and especially particles smaller than 2.5 micrometers, can reach the air ducts (bronchi) and the air sacs (alveoli) in the lungs. Particulates are associated with increased incidence of respiratory diseases, cardiopulmonary disease, and cancer.

Nitrogen Oxides

When combustion temperatures are extremely high, such as in engines, atmospheric nitrogen gas may combine with oxygen gas to form various oxides of nitrogen. Of these, nitric oxide (NO) and nitrogen dioxide (NO_2) are the most significant air pollutants. This group of pollutants is generally referred to as nitrogen oxides or NO_X. Nitric oxide is relatively harmless to humans but quickly converts to NO_2. Nitrogen dioxide has been found to be a lung irritant and can lead to respiratory illnesses. Nitrogen oxides, along with VOCs, are also precursors to ozone formation.

Sulfur Dioxide

Sulfur Dioxide (SO_2) emissions are the main components of the "oxides of sulfur," a group of highly reactive gases from fossil fuel combustion at power plants, other industrial facilities, industrial processes, and burning of high sulfur containing fuels by locomotives, large ships, and non-road equipment. High concentrations of SO_2 will lead to formation of other sulfur oxides. By reducing the SO_2 emissions, other forms of sulfur oxides are also expected to decrease. When oxides of sulfur react with other compounds in the atmosphere, small particles that can affect the lungs can be formed. This can lead to respiratory disease and aggravate existing heart disease.

Non-criteria Pollutants

In addition to the criteria pollutants discussed above, non-criteria pollutants may be of concern. Non-criteria pollutants are emitted by a wide range of man-made and naturally occurring sources. These pollutants are sometimes referred to as hazardous air pollutants (HAP) and when emitted from mobile sources, as Mobile Source Air Toxics (MSATs). Emissions of non-criteria pollutants from industrial sources are regulated by the United States Environmental Protection Agency (USEPA).

Federal ambient air quality standards do not exist for non-criteria pollutants; however, the New York State Department of Environmental Conservation (NYSDEC) has issued standards for certain non-criteria compounds, including beryllium, gaseous fluorides, and hydrogen sulfide. NYSDEC has also developed guidance document DAR-1 (February 2014). DAR-1 contains a compilation of annual and short term (1-hour) guideline concentrations for these compounds. The NYSDEC guidance thresholds represent ambient levels that are considered safe for public exposure. EPA has also developed guidelines for assessing exposure to non-criteria pollutants. These exposure guidelines are used in health risk assessments to determine the potential effects to the public.

Impact Criteria

The predicted concentrations of pollutants of concern associated with a proposed project are compared with either the National Ambient Air Quality Standards (NAAQS) for criteria air pollutants or ambient guideline concentrations for non-criteria pollutants. In general, if a project would cause the standards for any pollutant to be exceeded, it would likely result in a significant adverse air quality impact. In addition, for CO from mobile sources and for $PM_{2.5}$, the *de minimis* criteria are also used to determine significance of impacts.

National Ambient Air Quality Standards

The Clean Air Act (CAA) requires the USEPA to set standards on the pollutants that are considered harmful to public health and the environment. The NAAQS were implemented as a result of the CAA, amended in 1990 (see Table 2.9-1).[1] The NAAQS applies to six principal ("criteria") pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter 10 (PM_{10}), particulate matter 2.5 ($PM_{2.5}$), sulfur dioxide (SO_2), and ozone.

[1] United States Environmental Protection Agency (October 2011). *National Ambient Air Quality Standards*. Retrieved from http://www.epa.gov/air/criteria.html

Table 2.9-1 National and New York State Ambient Air Quality Standards

Pollutant	Averaging Time	Standard
Carbon Monoxide (CO)	1-Hour	35 ppm (40,000 μg/m^3)
	8-Hour	9 ppm (10,000 μg/m^3)
Nitrogen Dioxide (NO_2)	Annual	53 ppb (100 μg/m^3)
	1-Hour	100 ppb (188 μg/m^3)
Ozone	8-Hour	0.075 ppm
Particulate Matter (PM_{10})	24-Hour	150 μg/m^3
Particulate Matter ($PM_{2.5}$)	Annual	12.0 μg/m^3
	24-Hour	35.0 μg/m^3
Sulfur Dioxide (SO_2)	Annual	0.03 ppm (80 μg/m^3)
	24-Hour	0.14 ppm (365 μg/m^3)
	3-Hour	0.5 ppm (1,300 μg/m^3)
	1-Hour	75 ppb (196 μg/m^3)

Source: *2014 CEQR Technical Manual*

Non-criteria Pollutant Thresholds

Non-criteria, or toxic, air pollutants include a multitude of pollutants of ranging toxicity. No federal ambient air quality standards have been promulgated for toxic air pollutants. However, USEPA and NYSDEC have issued guidelines that establish acceptable ambient levels for these pollutants based on human exposure.

The NYSDEC DAR-1 guidance document presents guideline concentrations in micrograms per cubic meter (μg/m^3) for the one-hour and annual average time periods for various air toxic compounds. These values are provided in Table 2.9-2 for the compounds affecting receptors located at projected and potential development sites. The compounds listed are those emitted by existing sources of air toxics in the rezoning area.

In order to evaluate impacts of non-carcinogenic toxic air emissions, USEPA developed a methodology called the "Hazard Index Approach." The acute hazard index is based on short-term exposure, while the chronic non-carcinogenic hazard index is based on annual exposure limits. If the combined ratio of pollutant concentration divided by its respective short-term or annual exposure threshold for each of the toxic pollutants is found to be less than 1.0, no significant adverse air quality impacts are predicted to occur due to these pollutant releases.

Table 2.9-2: Industrial Source Analysis, Relevant NYSDEC Air Guideline Concentrations

Pollutant	CAS Number	SGC (µg/m³)	AGC (µg/m³)
Ethanol	00064-17-5	---	45,000
Isopropyl Alcohol	00067-63-0	98,000	7,000
Acetone	00067-64-1	180,000	30,000
1-Butanol	00071-36-3	---	1,500
Propane	00074-98-6	---	43,000
Isobutyl Alcohol	00078-83-1	---	360
Methyl Ethyl Ketone	00078-93-3	13,000	5,000
Butyl BenzylPhthalate	00085-68-7	---	0.42
Ethylbenzene	00100-41-4	---	1,000
Butane	00108-88-3	238,000	---
Toluene	00108-88-3	37,000	5,000
Ethylenglycolmonobutyl	00111-76-2	14,000	1,600
Butyl Carbitol	00112-34-5	370	200
Butyl Acetate	00123-86-4	95,000	17,000
Tetrachloroethylene	00127-18-4	300	4
Ethylacetate	00141-78-6	---	3,400
Carbon Monoxide	00630-08-0	14,000	---
Ethyl 3-Ethoxyproprioanate	00763-69-9	140	64
Xylene M,O&P Mix	01330-20-7	22,000	100
Sulfur Dioxide	07446-09-5	197	80
Oil Mist (Mineral)	08012-95-1	380	12
Mineral Spirits	08032-32-4	---	900
Stoddard Solvents	08052-41-3	---	900
Aliphatic Hydrocarbons	64742-89-8	---	3,200
Aromatic Petroleum Distillates	64742-94-5	---	100
Particulates[1]	NY075-02-5[2]	88	12
Liquid Mist NEC	NY105-00-0	380	12
Oxides of Nitrogen	NY210-00-0	188.1	100
Misc. VOC	NY990-00-0	98,000	7,000

Notes: 1) Pollutant includes emissions from both Particulates (NY075-00-0) and Total Solid Particulate (NY079-00-0).
2) Conservatively assumes all particulate emissions would be PM2.5.
Source: NYSDEC, DAR-1 AGC/SGC Tables.

In addition, USEPA has developed unit risk factors for carcinogenic pollutants. USEPA considers an overall incremental cancer risk from a proposed action of less than one-in-one million to be insignificant. Using these factors, the potential cancer risk associated with each carcinogenic pollutant, as well as the total cancer risk of the releases of all of the carcinogenic toxic pollutants combined, can be estimated. If the total incremental cancer risk of all the carcinogenic toxic pollutants combined is less than one-in-one million, no significant adverse air quality impacts are predicted to occur due to these pollutant releases.

CO De Minimis Criteria

New York City has developed *de minimis* criteria to assess the significance of the increase in CO concentrations that would result from the impact of proposed projects or actions on mobile sources, as set forth in the *2014 CEQR Technical Manual*. These criteria set the minimum change in CO concentration that defines a significant environmental impact. Significant increases of CO

concentrations in New York City are defined as: (i) an increase of 0.5 ppm or more in the maximum eight-hour average CO concentration at a location where the predicted No-Action eight-hour concentration is equal to or between 8.0 and 9.0 ppm; or (ii) an increase of more than half the difference between baseline (i.e., No-Action) concentrations and the eight-hour standard, when No-Action concentrations are below 8.0 ppm.

$PM_{2.5}$ De Minimis Criteria

New York City uses *de minimis* criteria to determine the potential for significant adverse $PM_{2.5}$ impacts under CEQR. The *de minimis* criteria are as follows:

- Predicted increase of more than half the difference between the background concentration and the 24-hour standard;
- Annual average $PM_{2.5}$ concentration increments which are predicted to be greater than 0.1 $\mu g/m^3$ at ground level on a neighborhood scale (i.e., the annual increase in concentration representing the average over an area of approximately 1 square kilometer, centered on the location where the maximum ground-level impact is predicted for stationary sources; or at a distance from a roadway corridor similar to the minimum distance defined for locating neighborhood scale monitoring stations); or
- Annual average $PM_{2.5}$ concentration increments which are predicted to be greater than 0.3 $\mu g/m^3$ at a discrete receptor location (elevated or ground level).

2.9.2 Methodology

Mobile Sources

According to the *2014 CEQR Technical Manual* guidelines, microscale analyses of mobile sources may be required if a project would increase or cause a redistribution of traffic, create any other mobile sources of pollutants (e.g. diesel trains, helicopters, boats), or add new uses near mobile sources (e.g. roadways, garages, parking lots) and consequently may result in significant mobile source air quality impacts. In addition, projects that would substantially increase the vehicle miles traveled in a large area (a borough, the city, or large) may require mesoscale analyses.

A mobile source screening analysis is usually conducted to determine the potential for air quality impacts if a project would add new vehicles to the roads within the study area and would result in increases in localized CO, $PM_{2.5}$ and PM_{10} levels. The levels of project-generated peak hour autos and heavy-duty diesel vehicles are predicted based on a project-specific traffic assessment and compared with thresholds set forth in Section 210 in Chapter 17 of *2014 CEQR Technical Manual*. If the project would cause any of the thresholds to be exceeded, further analysis of on-street mobile source emissions is warranted.

Parking Facilities

As described in Section 210 and Section 321 in Chapter 17 of the *2014 CEQR Technical Manual*, an air quality assessment is required to determine potential air quality impacts from parking facilities' emissions when a project would result in new sensitive uses (particularly schools, hospitals, parks and residence) adjacent to large existing parking facilities or parking garage exhaust vents. Estimates of the emissions from parking facilities are evaluated on a case-by-case basis using the methodologies set

forth in the *2014 CEQR Technical Manual* depending on whether the facility would be open and at-grade (a parking lot), multilevel and open-sided (therefore, naturally ventilated), or totally enclosed (parking garage).

Stationary Sources

According to the *2014 CEQR Technical Manual* guidelines, air quality analyses of stationary sources may be warranted if a project would (i) create new stationary sources of pollutants – such as emission stacks of industrial plants, hospitals, other large institutional uses, or even a building's boilers – that may affect surrounding uses; (ii) introduce certain new uses near existing or planned emissions stacks that may affect the use, or (iii) introduce structures near such stacks so that changes in the dispersion of emissions from the stacks may affect surrounding uses.

HVAC Systems Analysis

As described in Section 220 and Section 321 in Chapter 17 of the *2014 CEQR Technical Manual*, for single-building projects that would use fossil fuels (i.e., fuel oil or natural gas) for HVAC systems, a preliminary stationary source screening analysis is typically warranted to evaluate the potential for impacts on existing buildings from HVAC systems emissions for the proposed project. The *2014 CEQR Technical Manual* provides screening nomographs based on fuel type, stack height, minimum distance from the source to the nearest receptor buildings with similar or greater heights, and floor area of development resulting from the proposed project. There are three different curves representing three different stack heights (30 feet, 100 feet and 165 feet) on the figures, and the number closest to but not higher than the proposed stack height should be selected. Locate a point on the appropriate chart by plotting the size of the development against the distance to the nearest building of similar or greater height. If the plotted point is on or above the curve, there is the potential for a significant air quality impact from the project's boilers, and further analysis needs to be conducted using the USEPA's AERSCREEN and/or AERMOD model.

Industrial Source Analysis

As described in Section 220 and Section 321 in Chapter 17 of the *2014 CEQR Technical Manual*, an air quality assessment is required to evaluate the potential impacts of emissions from ventilation exhaust systems of manufacturing or processing facilities when a project would result in new sensitive uses (particularly schools, hospitals, parks, and residences) within a 400-foot radius. A screening analysis is usually performed based on Table 17-3 in Chapter 17 of *2014 CEQR Technical Manual*. The screen table provides the maximum 1-hour, 8-hour, 24-hour and annual average modeled values based on a generic emission rate of 1 gram per second of a pollutant from a 20-foot tall point source for the distances from 30 feet to 400 feet from the receptor of same height. Predicted impact from the industrial source of concern based on the screen table will be compared with the short-term guideline concentrations (SGCs) and annual guideline concentration (AGCs) recommended in NYSDEC's DAR-1 AGC/SGC Tables. If a proposed project fails the above screening analysis, further refined analysis using the USEPA's AERSCREEN and/or AERMOD model will be warranted to determine any potential for significant adverse impacts.

Large or Major Source Analysis

As described in Section 220 and Section 321 in Chapter 17 of the *2014 CEQR Technical Manual*, an air quality assessment is required to evaluate the potential impacts of emissions from a large or major emission source when a project would result in new uses within a 1000-foot radius. Major sources are identified as those sources located at Title V facilities that require Prevention of Significant

Deterioration permits. Large sources are identified as sources located at facilities that require a State Facility Permit. A detailed analysis is usually performed for such sources to determine any potential for significant adverse impact.

2.9.3 Assessment

Existing Conditions

The total concentrations experienced at receptors include background concentrations from existing surrounding emission sources. Background concentrations are ambient pollution levels associated with existing stationary, mobile, and other area emission sources. The NYSDEC maintains an air quality monitoring network and produces annual air quality reports that include monitoring data for CO, NO_x, PM_{10}, $PM_{2.5}$, and SO_2. To develop background levels, the latest available pollutant concentrations from monitoring sites located closest to the project site (Bronx Botanical Garden and two local schools for PM concentrations) were used.

$PM_{2.5}$ impacts are assessed on an incremental basis and compared with the $PM_{2.5}$ *de minimis* criteria, without considering the annual background. Therefore the annual $PM_{2.5}$ background is not presented in the table.

Table 2.9-3 summarizes the background concentrations for each of the pollutants.

Table 2.9-3: Background Concentrations

Pollutant	Averaging Time	Monitoring Location	Background Concentration
Carbon Monoxide (CO)	1-Hour[1]	Botanical Garden, Bronx	2.2 ppm
	8-Hour[1]	Botanical Garden, Bronx	1.3 ppm
Nitrogen Dioxide (NO_2)	1-Hour[2]	Botanical Garden, Bronx	109.3 µg/m^3
	Annual[3]	Botanical Garden, Bronx	35.8 µg/m^3
Particulate Matter (PM_{10})	24-Hour[4]	IS 52, Bronx	29 µg/m^3
Particulate Matter ($PM_{2.5}$)	24-Hour[5]	JHS 45, Manhattan	22.3 µg/m^3
Sulfur Dioxide (SO_2)	1-Hour[6]	Botanical Garden, Bronx	58.2 µg/m^3
	3-Hour[7]	Botanical Garden, Bronx	162 µg/m^3

Notes: 1) 1-hour CO and 8-hour CO background concentrations are based on the highest 2nd max value from the latest 5 years of available monitoring data from NYSDEC (2010-2014)
2) 1-hour NO_2 background concentration is based on three-year average (2012-2014) of the 98th percentile of daily maximum 1-hour concentrations from available monitoring data from NYSDEC.
3) Annual NO_2 background concentration is based on the maximum annual average from the latest 5 years of available monitoring data from NYSDEC (2010-2014).
4) 24-hour PM_{10} is based on the highest 2nd max value from the latest 3 years of available monitoring data from NYSDEC (2012-2014).
5) The 24-hour $PM_{2.5}$ background concentration is based on maximum 98th percentile concentration averaged over three years of data from NYSDEC (2012-2014).
6) 1-hour SO_2 background concentration is based on the highest 2nd max value from the latest 3 years of available monitoring data from NYSDEC (2012-2014).
7) 3-hour SO_2 background concentration is based on the highest 2nd max value from the latest 5 years of available monitoring data from NYSDEC (2008-2012).
Source: *2014 CEQR Technical Manual*; NYSDEC Ambient Air Quality Report, 2010-2014

Future No-Action Condition

As described in Section 1.0, "Project Description," without the proposed action, the project site would remain zoned C4-4A/R7A and the space currently occupied by NBT would be converted to office space, while existing retail and office spaces would remain unchanged.

No new sensitive receptors would be introduced to the study area in the No-Action condition. Therefore, no air quality analysis is warranted.

Future With-Action Condition

The proposed rezoning of the development site from C4-4A to C4-7 and the related text amendments would facilitate the redevelopment of the project site. The program would result in a 20-story mixed-use building.

Mobile Sources

As indicated in the EAS short form (Section 2, Question 13), the RWCDS would not result in 50 or more incremental vehicle trips. It's unlikely that the number of incremental trips generated by the proposed action at any given intersection would exceed the *2014 CEQR Technical Manual* CO-based screening threshold of 170 vehicles per hour, as well as the $PM_{2.5}$-based screening threshold of 23 or more Heavy Duty Diesel Vehicles (HDDV). Therefore, traffic from the proposed action would not result in a significant adverse impact on mobile source air quality and a quantified assessment of on-street mobile source emissions is not warranted.

Parking Facilities

The proposed text amendment to ZR Section 97-51 would waive accessory parking requirements for new dwellings within C4-7 zoning districts within the Special 125th Street District, provided that the zoning lot is located within a quarter mile of a subway entrance. Therefore, no significant adverse impact would be anticipated associated with parking facilities and no analysis is warranted.

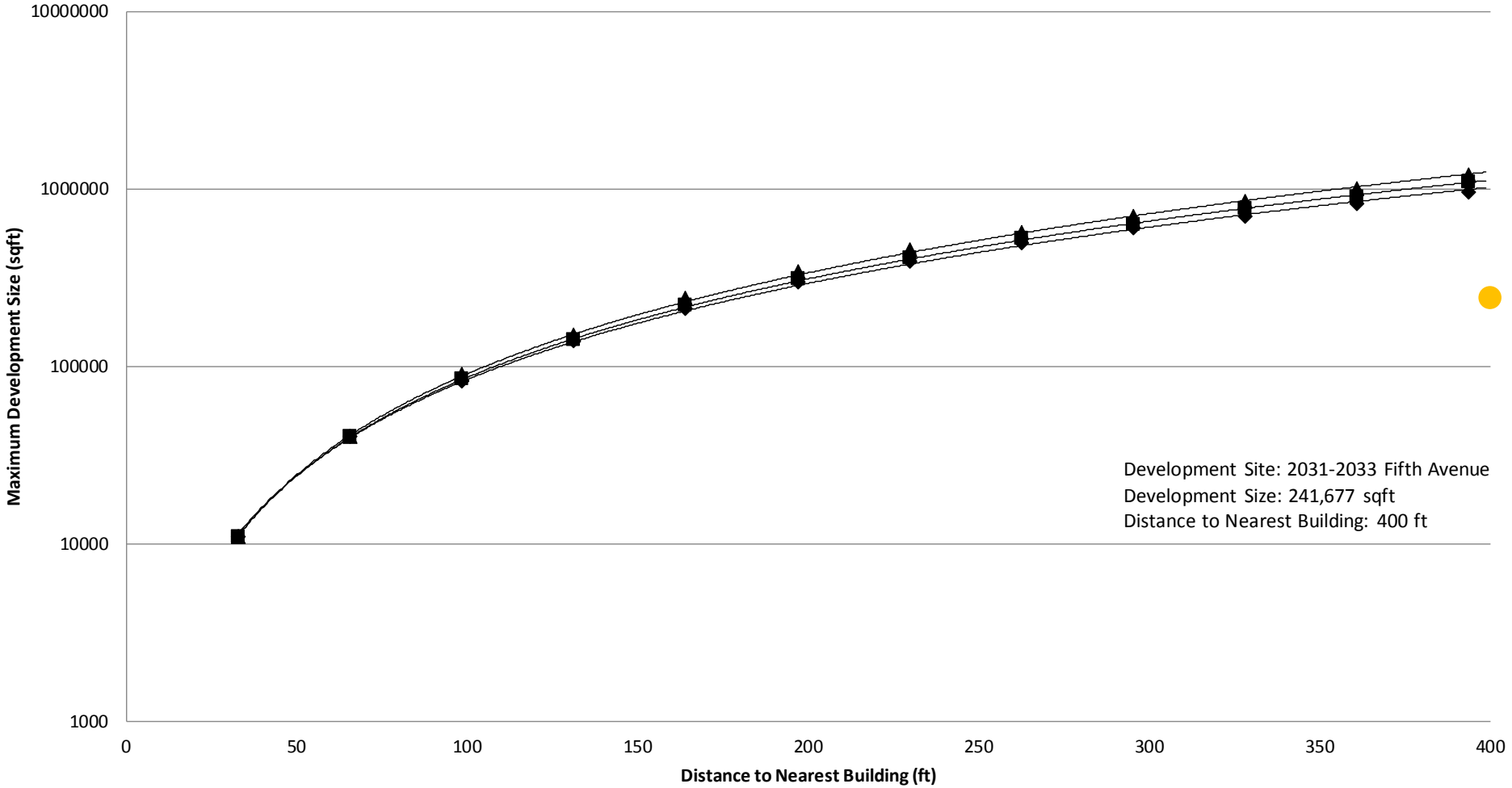
Stationary Sources

HVAC Screening Analysis

A screening analysis was conducted using the methodology previously described to evaluate the potential for impacts on existing buildings from emissions from HVAC systems for the RWCDS. It was assumed that the proposed mixed-use residential building will use No. 2 fuel oil for HVAC systems. Figure 17-5 SO_2 Boiler Screen from *2014 CEQR Technical Manual Air Quality Appendix* was used to determine if any significant adverse impact would be expected. The project site consists of a building which would have a roof reaching a maximum height of approximately 240 feet above grade level. It is assumed that the stack would rise three feet above the roof for a total height of approximately 243 feet. The curve with stack height of 165 feet would be selected from Figure 17-5 per the *2014 CEQR Technical Manual*. All buildings within 400 feet of the project site are shorter than the proposed stack height. The tallest building within 400 feet of the project site is the 89-foot tall building at 2000 Fifth Avenue, approximately 285 feet from the proposed building. Per the *2014 CEQR Technical Manual*, as there are no buildings of similar or greater height within 400 feet of the project site, a distance of 400 feet will be used for screening purposes.

Based on the nomograph screening (see Figure 2.9-1), the plotted point is under the curve corresponding to stack height of 165 feet. Therefore, there would be no significant adverse impacts related to the RWCDS's HVAC systems and no further analysis is necessary.

Sulphur Dioxide Boiler Screen for Mix Use Residential Development
#2 Fuel Oil



2031-2033 Fifth Avenue
New York, New York

Air Quality Stationary Source HVAC Screen

Figure
2.9-1

To ensure that there are no significant adverse impacts from HVAC system of the proposed building, certain restriction would be required though the mapping of an (E) designation (E-435) for air quality.

The text of the (E) designation would be as follows:

Block 1750, Lot 1: Any new residential and/or commercial development on the above-referenced properties must ensure that the heating, ventilating and air conditioning stack is located at the highest tier or at least 243 feet above grade to avoid any potential significant adverse air quality impacts.

Industrial Source Analysis

To assess air quality impacts on the proposed project associated with emissions from nearby industrial sources, an investigation of industrial sources was conducted. Initially, land use maps were reviewed to identify potential sources of emissions from commercial, manufacturing/industrial or transportation/utility operations. Table 2.9-4 shows the list of all emissions sources with air toxics concerns within a 400-foot radius of the project site.

To identify facilities listed above, a preliminary survey was conducted including online searches of NYCDEP's Clean Air Tracking System (DEP CATS), New York City's Open Accessible Space Information System Cooperative (OASIS) database, telephone directory listings, available aerial photos provided by Google and Bing, internet websites, etc. No active industrial permits associated with air toxics emissions were found for any of the sites listed above. A field survey was conducted afterwards on April 1st, 2016 to determine the actual current use and operating status of the sites, as well as other potential sites not identified from the land use maps. The last column in Table 2.9-4 summarizes the findings of the current uses of the sites. The NYC Laundromat at 2040 Fifth Avenue doesn't provide dry cleaning services. The property at 12 West 125th Street is a furniture store, without concerns of air toxics emissions such as spraying services. Therefore, no concerns associated with air toxics emissions will be expected and no further analysis is needed.

Table 2.9-4: Industrial Sources within 400 feet of the Project Site

Block	Lot	Address	Land Use	Owner Name	DEP CATS[1]	Current Land Use
1749	59	26 East 125th Street	06	26 East 125 LLC	No industrial permit found	Currently vacant
1750	6	17 East 125th Street	05	17-19 East 125th Street ETA	No record found	Furniture store
1722	41	8 West 125th Street	05	Rosen & Gordon	No industrial permit found	Currently vacant
1723	33	1 West 125th Street	05	Three West 125th Street	No industrial permit found	Restaurant
1723	40	2040 Fifth Avenue	05	Erdak INC	No record found	NYC Laundromat. No dry cleaning services
1722	40	4 West 125th Street	05	Olam Trading CORP	No industrial permit found	Office building, retail
1722	38	2014 Fifth Avenue	05	2014 Fifth Avenue REA	No record found	Office building
1722	41	12 West 125th Street*	05	Rosen & Gordon	No industrial permit found	Furniture store

Notes: *Additional property with potential air toxics concerns not identified from the land use maps.
[1]NYCDEP's Clean Air Tracking System. https://a826-web01.nyc.gov/DEP.BoilerInformationExt/

Large or Major Source Analysis

To assess the potential impacts of these large or major sources on the projected and potential development sites, a review of existing permitted facilities was conducted. Sources of information

reviewed include the NYSDEC Title V and State Facility Permit websites and available aerial photos provided by Google and Bing.[2]

Review of available information indicated that no large or major sources were found within a 1000-foot radius of the project site. Therefore, no impact associated with large or major emission sources would be anticipated and no analysis is needed.

2.9.4 Conclusion

The air quality analysis demonstrates that the potential pollutant concentrations and/or concentration increments from mobile sources associated with the proposed action would meet the CEQR ambient air quality thresholds, as the project would not generate enough vehicle trips to cause air quality impacts.

At the project site, all buildings within 400 feet of the project site are shorter than the RWCDS, and thus no adverse air quality impacts are expected due to the project's stationary HVAC systems. In addition, no industrial sources or large or major sources were identified in the vicinity of the project site.

Therefore, there are no adverse air quality impacts as a result of the proposed action.

[2] NYSDEC Title V- http://www.dec.ny.gov/dardata/boss/afs/issued_atv.html;
State Permit- http://www.dec.ny.gov/dardata/boss/afs/issued_asf.html.

2.10 Noise

2.10.1 Introduction

The purpose of a noise assessment under CEQR is to determine (i) if a proposed project would increase sound levels from mobile and stationary sources at existing adjacent noise-sensitive receptors including residential, commercial, and institutional facilities and (ii) whether With-Action ambient sound levels on new sensitive uses introduced by the proposed project would be acceptable considering interior noise conditions.

According to the *2014 CEQR Technical Manual*, a noise assessment is appropriate if an action would generate mobile or stationary sources of noise or would be located in an area with high ambient noise levels. Mobile sources include vehicular traffic generated by the proposed action and stationary sources include rooftop equipment such as emergency generators, cooling towers, and other mechanical equipment.

The following analysis includes an evaluation of the ambient sound levels that would exist at new receptor locations at the project site and an assessment of the potential for significant changes in mobile source or new stationary source noise to affect existing sensitive receptors in the study area.

Noise Background

Noise is defined as unwanted or excessive sound. Sound becomes unwanted when it interferes with normal activities such as sleep, work, or recreation. How people perceive sound depends on several measurable physical characteristics. These factors include:

- Level - Sound level is based on the amplitude of sound pressure fluctuations and is often equated to perceived loudness.
- Frequency - Sounds are comprised of acoustic energy distributed over a variety of frequencies. Acoustic frequencies, commonly referred to as tone or pitch, are typically measured in Hertz (Hz). Pure tones have energy concentrated in a narrow frequency range and can be more audible to humans than broadband sounds.

Sound levels are most often measured on a logarithmic scale of decibels (dB). The decibel scale compresses the audible acoustic pressure levels which can vary from the threshold of hearing (0 dB) to the threshold of pain (120 dB). Because sound levels are measured in dB, the addition of two sound levels is not linear. Adding two equal sound levels results in a 3 dB increase in the overall level. Research indicates the following general relationships between sound level and human perception:

- A 3 dB increase is a doubling of acoustic energy and is the threshold of perceptibility to the average person.
- A 10 dB increase is a tenfold increase in acoustic energy and is perceived as a doubling in loudness to the average person.

Audible sound is comprised of acoustic energy over a range of frequencies typically from 20 to 20,000 Hz. The human ear does not perceive sound levels at each frequency equally loud. To compensate for

this phenomenon in perception, a frequency filter known as A-weighting (dBA) is used to evaluate environmental noise levels. Table 2.10-1 presents a list of common outdoor and indoor sound levels.

Table 2.10-1: Common Indoor and Outdoor Sound Levels

Outdoor Sound Levels	Sound Pressure μPa		Sound Level dBA	Indoor Sound Levels
	6,324,555	-	110	Rock Band at 5 m
Jet Over-Flight at 300 m		-	105	
	2,000,000	-	100	Inside New York Subway Train
Gas Lawn Mower at 1 m		-	95	
	632,456	-	90	Food Blender at 1 m
Diesel Truck at 15 m		-	85	
Noisy Urban Area—Daytime	200,000	-	80	Garbage Disposal at 1 m
		-	75	Shouting at 1 m
Gas Lawn Mower at 30 m	63,246	-	70	Vacuum Cleaner at 3 m
Suburban Commercial Area		-	65	Normal Speech at 1 m
	20,000	-	60	
Quiet Urban Area—Daytime		-	55	Quiet Conversation at 1 m
	6,325	-	50	Dishwasher Next Room
Quiet Urban Area—Nighttime		-	45	
	2,000	-	40	Empty Theater or Library
Quiet Suburb—Nighttime		-	35	
	632	-	30	Quiet Bedroom at Night
Quiet Rural Area—Nighttime		-	25	Empty Concert Hall
Rustling Leaves	200	-	20	
		-	15	Broadcast and Recording Studios
	63	-	10	
		-	5	
Reference Pressure Level	20	-	0	Threshold of Hearing

Notes: μPA MicroPascals describe pressure. The pressure level is what sound level monitors measure.
dBA A-weighted decibels describe pressure logarithmically with respect to 20 μPa (the reference pressure level).
Source: Highway Noise Fundamentals, Federal Highway Administration, September 1980.

Because sound levels change over time, a variety of sound level metrics can be used to describe environmental noise. The following is a list of sound level descriptors that are used in the noise analysis:

- L_{10} is the sound level which is exceeded for 10 percent of the time during a given time period. Therefore, it represents the higher end of the range of sound levels. The L_{10} is typically representative of noise exposure when a relatively constant sound source such as vehicular traffic is the most predominant source of ambient sound. The L_{10} is a metric that is commonly used to evaluate acceptable thresholds for noise exposure for new receptors that would be introduced by a proposed action according to the *2014 CEQR Technical Manual.*
- L_{eq} is the energy-average A-weighted sound level. The L_{eq} is a single value that is equivalent in sound energy to the fluctuating levels over a period of time. Therefore, the L_{eq} takes into account how loud noise events are during the period, how long they last, and how many times they occur. L_{eq} is commonly used to describe environmental noise and relates well to human annoyance. In accordance with the *2014 CEQR Technical Manual*, the L_{eq} sound level is used to assess the potential for significant increases in noise due to a proposed action at existing receptors in the study area.

2.10.2 Methodology

According to the *2014 CEQR Technical Manual*, noise impact on existing nearby sensitive receptors in the study area is assessed according to the relative increase in L_{eq} sound level between future No-Action condition and future With-Action condition as well as the absolute noise level from With-Action condition. No-Action condition and With-Action condition are projected and analyzed based on Existing condition, which is established through a noise measurement program. If mobile or stationary sources of noise generated by the proposed action would increase sound levels by 3 dBA L_{eq} or more and absolute levels would exceed 65 dBA L_{eq}, the proposed action would cause a significant adverse impact prior to mitigation. Additionally, if No-Action noise levels are 60 dBA L_{eq} or less, a 5 dBA increase would be considered a significant adverse noise impact.

For new sensitive receptors introduced by the proposed project, significant adverse impact would occur when a proposed project is within an area where the project noise level exceeds the marginally acceptable limit shown in the Noise Exposure Guidelines set forth in Table 19-2 in Chapter 19 of the *2014 CEQR Technical Manual*, which would be mitigated by providing a composite building attenuation that would be sufficient to reduce these levels to an acceptable interior noise level.

Proportional Modeling

Proportional modeling technique is generally used to predict future noise levels as recommended in the *2014 CEQR Technical Manual* when traffic is the dominant noise. Future noise levels are determined based on a calculation using measured existing noise levels and predicted changes in traffic volumes. Vehicular traffic volumes are converted into Noise Passenger Car Equivalent (Noise PCE) values, for which one medium-duty truck (having a gross weight between 9,900 and 26,400 pounds) is assumed to generate the noise equivalent of 13 cars, and one heavy-duty truck (having a gross weight of more than 26,400 pounds) is assumed to generate the noise equivalent of 47 cars, and one bus (vehicles designed to carry more than nine passengers) is assumed to generate the noise equivalent of 18 cars. Future noise levels are calculated using the following equation:

$$F\ NL - E\ NL = 10 * \log_{10} (F\ PCE / E\ PCE)$$

Where:

F NL = Future Noise Level

E NL = Existing Noise Level

F PCE = Future Noise PCEs

E PCE = Existing Noise PCEs

According to Section 2.7, "Transportation," the future No-Action condition and With-Action condition would result in minimal trip generations. Considering the sound levels increase logarithmically based on the above equation, and the background growth of traffic is negligible, existing noise levels would serve as the future noise levels to determine the significance of adverse noise impact.

2.10.3 Assessment

The following section presents the results of the noise impact assessment for existing receptors and potential increases in ambient sound levels due to mobile sources and stationary sources.

Existing Conditions

Mobile Sources

Vehicular Noise

As described in Section 211 in Chapter 19 of the *2014 CEQR Technical Manual*, initial noise assessment may be appropriate if the project will generate or reroute vehicular traffic; or introduce a new receptor near a heavily trafficked thoroughfare.

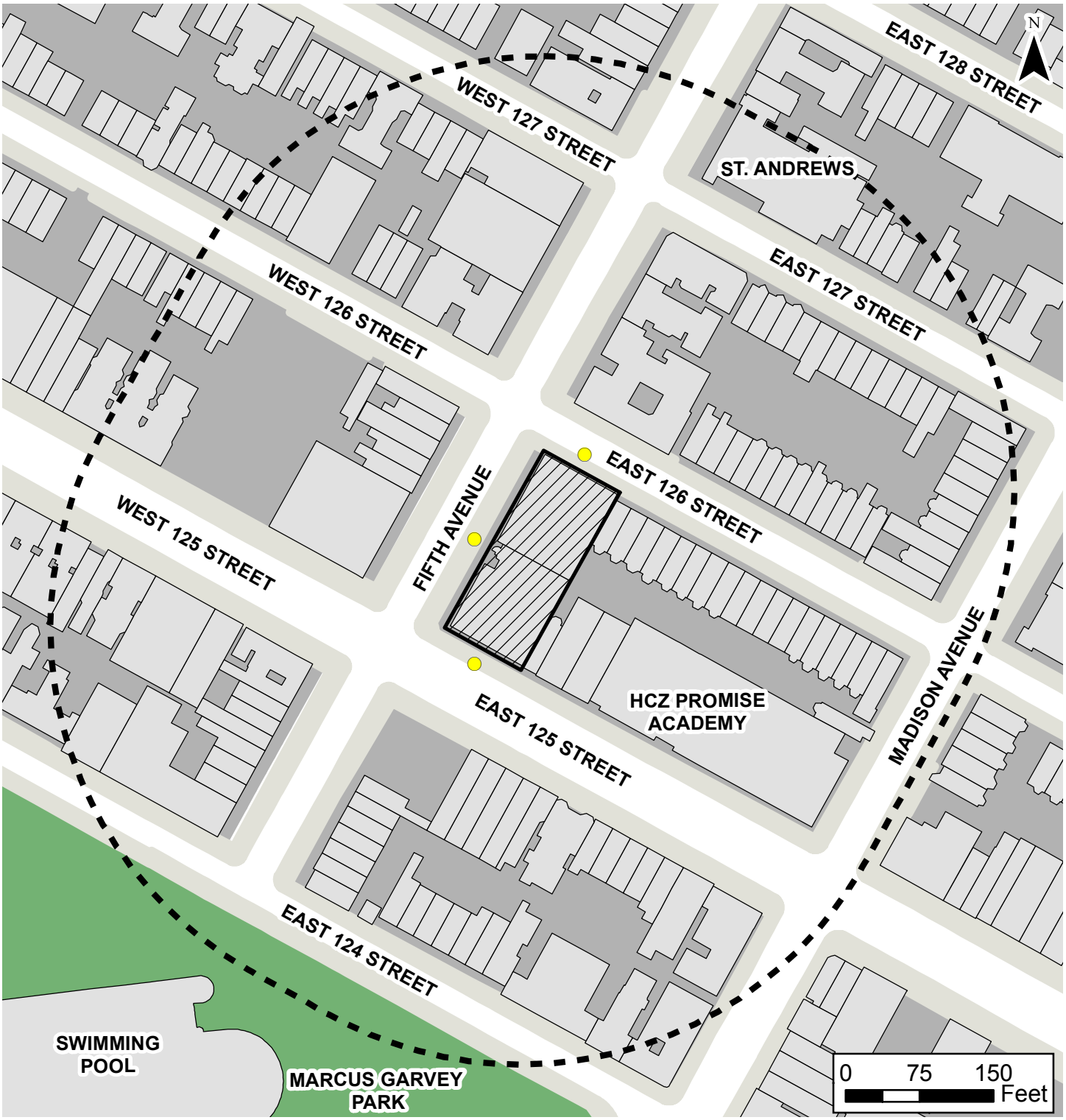
As described in Section 1.0, "Project Description," project sitethe With-Action condition would not generate sufficient vehicular traffic to exceed the threshold for a transportation analysis according to Table 16-1 in the *2014 CEQR Technical Manual*. Thus, the proposed action would not result in a doubling of Noise PCEs, which would be necessary to cause a 3 dBA increase in noise levels. Therefore, the proposed action would not cause a significant adverse vehicular noise impact, and noise assessment at existing receptors is not needed.

To determine the potential for significant adverse impact at new sensitive receptors introduced by the proposed project, a sound level monitoring program was conducted on Wednesday April 13, 2016 following the procedures outlined in the *2014 CEQR Technical Manual*. As shown in Figure 2.10-1, noise monitoring locations were selected at the midpoint of the northern façade of the project site facing East 126th Street (receptor location 1), the midpoint of the western façade of the project site facing Fifth Avenue (receptor location 2) and the midpoint of the southern façade of the project site facing East 125th Street (receptor location 3). A Larson Davis LxT sound level meter meeting the appropriate Type I ANSI standards was used. The sound level meter was placed at a height of five feet above the ground surface on a tripod and approximately six feet away from any sound-reflecting surfaces to avoid major interference with source sound level that was being measured. The data was digitally recorded by the sound level meter and displayed at the end of the measurement period in units of dBA. Measured quantities included L_{eq}, L_1, L_{10}, L_{50}, and L_{90}. A windscreen was used during all sound measurements except for calibration. Only traffic-related noise was measured; noise from other sources (e.g. emergency sirens, extremely loud vehicles, etc.) was excluded from the measured noise readings.

Sound measurements were conducted for 20 minutes during the morning peak period (8:00 – 9:00 AM), mid-day peak period (12:00 PM – 1:00 PM), and evening peak period (5:00 PM – 6:00 PM). The measurements represent exterior sound levels surrounding the project site and are typical of an urban area, where the predominant sources consist of local roadway vehicular activities and typical urban area activities. Table 2.10-2 summarizes the sound level data measured at three locations.

As shown in Table 2.10-2, existing L_{eq} levels at receptor location 1 range from 64.5 dBA to 67.1 dBA during the three weekday peak hours, with the highest monitored noise levels during the morning peak hour. Existing L_{eq} levels at receptor location 2 range from 63.7 dBA to 68.8 dBA in the three weekday peak hours, with the highest monitored noise levels during the morning peak hour. Existing L_{eq} levels at receptor location 3 range from 70.8 dBA to 73.2 dBA in the three weekday peak hours, with the highest monitored noise levels during the midday peak hour.

Date: 10/10/2016



2031-2033 Fifth Avenue
New York, New York

Noise Monitor Location Map

Figure 2.10-1

Project Site

400-Foot Study Area Radius

Noise Monitor Location

Sources:
1. New York (City). Dept. of City Planning 2015. Manhattan MapPLUTO (Edition 15v1). New York City: NYC Department of City Planning.
2. New York (City). Dept. of City Planning 2016. LION (Edition 16A). New York City: NYC Department of City Planning.
3. New York (City). Dept. of Information Technology & Telecommunications. Open Space (Parks), Mar 14, 2016. New York City: Dept. of Information Technology & Telecommunications.
4. New York (City). Dept. of Information Technology & Telecommunications. Building Footprints, Jan 26, 2016. New York City: Dept. of Information Technology & Telecommunications.
5. New York (City). Dept. of Information Technology & Telecommunications. Sidewalk, Mar 15, 2016. New York City: Dept. of Information Technology & Telecommunications.

Table 2.10-2: Existing Ambient Sound Levels Measured at Ground Level, dBA

Receptor	Monitoring Location	Time Period	Duration	L_{eq}	L_{min}	L_{max}	L_1	L_{10}	L_{50}	L_{90}
1	The north side of the project site on the sidewalk on East 126th Street	AM	20 min	67.1	58.3	78.3	74.2	70.1	65.5	60.7
		MD	20 min	66.6	54.2	77.8	74.3	**70.4**	62.8	58.7
		PM	20 min	64.5	53.0	75.1	71.0	68.8	62.1	57.3
2	The west side of the project site on the sidewalk on Fifth Avenue	AM	20 min	68.8	60.1	82.3	78.1	**71.1**	66.7	63.5
		MD	20 min	66.5	59.3	75.4	74.0	69.6	64.7	61.8
		PM	20 min	63.7	57.4	72.5	70.5	66.0	62.8	59.3
3	The south side of the project site on the sidewalk on East 125th Street	AM	20 min	71.0	59.7	82.4	80.3	73.5	69.1	64.2
		MD	20 min	73.2	61.5	83.3	81.3	**76.4**	71.1	66.2
		PM	20 min	70.8	59.5	86.7	81.6	73.2	67.9	63.9

Note: Highest L_{10} value at each receptor location indicated in **bold**.
Source: Measurements conducted by VHB on April 13, 2016.

Train Noise

As described in Section 213 in Chapter 19 of the *2014 CEQR Technical Manual*, a detailed analysis may be appropriate if the proposed project would be located within 1,500 feet of existing rail activity and have a direct line of sight to that rail facility; or add rail activity to existing or new rail lines within 1,500 feet of a receptor with a direct line of sight to that receptor.

The project site is located to the west and approximately 880 feet from the Metro-North Railroad. However, it doesn't have a direct line of sight to the rail facility with other existing buildings providing shielding between the project site the rail facility. Additionally, negligible noise contributions were identified during the noise monitoring. Therefore, no further detailed analysis is required.

Stationary Sources

As described in Section 220 in Chapter 19 of *2014 CEQR Technical Manual*, a detailed stationary source analysis is generally performed if the proposed action would cause a substantial stationary source (e.g., unenclosed equipment for building ventilation purposes) to be operating within 1,500 feet of a receptor with a direct line of sight to that receptor; or introduce a receptor in an area with high ambient noise levels resulting from stationary sources, such as unenclosed manufacturing activities or other loud uses.

The proposed project would not meet either of these criteria. It is expected that the proposed building will include mechanical equipment inside an enclosed room on the penthouse level. The specific design and specifications for the mechanical equipment, such as heating, ventilation, and air conditioning, are not known at this time. However, the building mechanical systems would be designed to meet all applicable noise regulations (i.e., Subchapter 5, §24-227 of the New York City Noise Control Code and the New York City Department of Building Code) and to avoid producing levels that would result in any significant increase in ambient noise levels.

No-Action Condition

As described in the Methodology section, future noise levels are generally determined using proportional modeling technique as recommended in the *2014 CEQR Technical Manual*. However, according to Section 2.7, "Transportation," the No-Action condition would only generate a maximum of 37 peak hour vehicle trips (25 autos and 12 taxis) compared to the Existing conditions. Considering the background growth of traffic is minimal and the sound levels increase logarithmically, the contribution from the trip generation under No-Action condition would be negligible and no further analysis is warranted.

With-Action Condition

According to Section 2.8, "Transportation," the With-Action condition would generate a maximum of 27 peak hour vehicle trips (13 autos and 14 taxis) compared to the No-Action condition. Considering the background growth of traffic is minimal and the sound levels increase logarithmically, the contribution from the trip generation under With-Action condition would be negligible and no further analysis is warranted. As described in the Methodology section, therefore, the existing noise levels would serve as the predicted future noise levels to determine the significance of adverse noise impact.

Impact Thresholds

For developments introducing new sensitive receptors, the *2014 CEQR Technical Manual* requires an evaluation of existing ambient sound levels from surrounding sources. Significant adverse impact would occur when a proposed project is within an area where the project noise level exceeds the marginally acceptable limit shown in the Noise Exposure Guidelines from Table 19-2 in Chapter 19 of The *2014 CEQR Technical Manual*, as presented in Table 2.10-3.

Table 2.10-3: Noise Exposure Guidelines for Use in City Environmental Impact Review[1]

Receptor Type	Time Period	Acceptable General External Exposure	Airport[3] Exposure	Marginally Acceptable General External Exposure	Airport[3] Exposure	Marginally Unacceptable External Exposure	Airport[3] Exposure	Clearly Unacceptable External Exposure	Airport[3] Exposure
Outdoor area requiring serenity and quiet[2]		$L_{10} \leq 55$ dBA	$L_{dn} \leq 60$ dBA		60 < $L_{dn} \leq 65$ dBA		(I)65 < $L_{dn} \leq 70$ dBA (II) $L_{dn} \geq 70$ dBA		$L_{dn} \leq 75$ dBA
Hospital, Nursing Home		$L_{10} \leq 55$ dBA		55 < $L_{10} \leq 70$ dBA		65 < $L_{10} \leq 80$ dBA		$L_{10} > 80$ dBA	
Residence, residential hotel, or motel	7 AM to 10 PM[1]	$L_{10} \leq 65$ dBA		65 < $L_{10} \leq 70$ dBA		70 < $L_{10} \leq 80$ dBA		$L_{10} > 80$ dBA	
	10 PM to 7 AM[1]	$L_{10} \leq 55$ dBA		55 < $L_{10} \leq 70$ dBA		70 < $L_{10} \leq 80$ dBA		$L_{10} > 80$ dBA	
School, museum, library, court, house of worship, transient hotel or motel, public meeting room, auditorium, out-patient public health facility		Same as Residential Day		Same as Residential Day		Same as Residential Day		Same as Residential Day	
Commercial or office		Same as Residential Day		Same as Residential Day		Same as Residential Day		Same as Residential Day	
Industrial, public areas only[4]	Note 4	Note 4		Note 4		Note 4		Note 4	

Notes:

(I) In addition, any new activity shall not increase the ambient noise level by 3 dB(A) or more.

[1] Measurements and projections of noise exposures are to be made at appropriate heights above site boundaries as given by American National Standards Institute (ANSI) Standards; all values are for the worst hour in the time period.

[2] Tracts of land where serenity and quiet are extraordinarily important and serve as important public need, and where the preservation of these qualities is essential for the area to serve its intended purpose. Such areas could include amphitheaters, particular parks or portions of parks, or open spaces dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet. Examples are grounds for ambulatory hospital patients and patients and residents of sanitariums and nursing homes.

[3] One may use the FAA-approved Ldn contours supplied by the Port Authority, or the noise contours may be computed from the federally approved INM Computer Model using flight data supplied by the Port Authority of New York and New Jersey.

[4] External Noise Exposure standards for industrial areas of sounds produced by industrial operations other than operating motor vehicles or other transportation facilities are spelled out in the New York City Zoning Resolution, Sections 42-20 and 42-21. The referenced standards apply to M1, M2, and M3 manufacturing districts and to adjoining residence districts (performance standards are octave band standards).

Source: New York City Department of Environmental Protection (adopted policy 1983).

According to these noise exposure guidelines, potential impact of ambient noise levels has been assessed based on the highest L_{10} sound level at each measurement location to determine the level of acceptability for new sensitive receptors in the proposed building, as summarized in Table 2.10-4.

Table 2.10-4: Sound Level Acceptability, dBA

Receptor	Measurement Location	Sound Level (L_{10})	CEQR Noise Exposure Category
1	The north side of the project site on the sidewalk on East 126th Street	70.4	Marginally Unacceptable
2	The west side of the project site on the sidewalk on Fifth Avenue	71.1	Marginally Unacceptable
3	The south side of the project site on the sidewalk on East 125th Street	76.4	Marginally Unacceptable

As shown in Table 2.10-4, the proposed project would experience ambient L_{10} sound levels ranging from 70.4 dBA to 76.4 dBA. The sound levels at all three receptor locations are considered marginally unacceptable according to the *2014 CEQR Technical Manual.* Because sound levels would be marginally unacceptable at the new receptors, there is a need to consider mitigation to reduce the potential effects of ambient noise conditions. When noise from vehicles contribute to the sound environment and it is not feasible to reduce the noise at the source or in the path between the source and receptors, it is necessary for the building to be designed to provide sufficient outdoor-to-indoor sound attenuation to maintain acceptable interior conditions.

Window/Wall Composite Sound Attenuation

As shown in Table 2.10-4, measured sound levels from all three receptor locations would be marginally unacceptable based on exterior L_{10} sound levels and the proposed building must be designed to provide a minimum window/wall attenuation level to maintain interior sound conditions of 45 dBA L_{10} or lower for residential receptors and 50 dBA or lower for commercial or office space. The composite outdoor-to-indoor transmission classification (OITC) value of the composite window-wall structure is used to determine the necessary sound attenuation. Sound attenuation measures would be achieved through construction materials and techniques with sufficient OITC-rated windows and walls. Table 2.10-5 presents the minimum sound attenuation levels, in OITC, that are required depending on L_{10} levels. For the proposed building, a minimum of 28 dBA window/wall attenuation along the project site's northern façade and western façade, and a minimum of 33 dBA window/wall attenuation along the project site's southern façade would be required for residential and community facility floors (third floor through twentieth floor); a minimum of 23 dBA window/wall attenuation along the project site's northern façade and western façade, and a minimum of 28 dBA window/wall attenuation along the project site's southern façade would be required for commercial floors (first floor and second floor).

Table 2.10-5: Required Attenuation Values to Achieve Acceptable Interior Noise Levels

	Marginally Unacceptable				Clearly Unacceptable
Noise Level with Proposed Project	$70 < L_{10} \leq 73$	$73 < L_{10} \leq 76$	$76 < L_{10} \leq 78$	$78 < L_{10} \leq 80$	$80 < L_{10}$
Attenuation [A]	(I) 28 dBA	(II) 31 dBA	(III) 33 dBA	(IV) 35 dBA	$36 + (L_{10}-80)^B$ dBA

Notes:
[A] The above composite window-wall attenuation values are for residential dwellings and community facility development. Commercial office spaces and meeting rooms would be 5 dBA less in each category. All of the above categories require a closed window situation and hence an alternate means of ventilation.
[B] Required attenuation values increase by 1 dBA increments for L10 values greater than 80 dBA.
Source: New York City Department of Environmental Protection

2.10.4 Conclusion

A noise impact assessment was conducted for existing receptors near the proposed project. The assessment concluded that the vehicular traffic generated by the proposed action would not have the potential to result in significant sound level increases at receptors in the vicinity of the project site. The stationary source assessment concluded that any mechanical equipment associated with the proposed action would be designed to meet all applicable noise regulations (i.e., Subchapter 5, §24-227 of the New York City Noise Control Code and the New York City Department of Building Code) and would not result in a significant adverse noise impact.

An ambient sound level monitoring program was conducted to characterize the existing conditions in the study area. According to the noise exposure guidelines in the *2014 CEQR Technical Manual*, existing L_{10} sound levels at all three measurement locations are considered marginally unacceptable. As shown above, the *2014 CEQR Technical Manual* has set noise attenuation requirements for buildings based on exterior L_{10} noise levels. Recommended noise attenuation values for buildings are designed to maintain a maximum interior noise level of 45 dBA or lower for residential and community facility uses and 50 dBA or lower for commercial uses, and are determined based on exterior L_{10} noise levels.

Per findings from the readings above, the following (E) designation (E-435) is proposed to be assigned to the project site:

Block 1750, Lot 1: To ensure an acceptable interior noise environment, future residential/commercial uses on the above-referenced properties must provide a closed-window condition with a minimum of 33 dBA window/wall attenuation along the southern façade and a minimum of 28 dBA on all other façades to maintain an interior noise level of 45 dBA. To maintain a closed-window condition, an alternate means of ventilation must also be provided. Alternate means of ventilation includes, but is not limited to, central air conditioning.

With the (E) designation, no significant adverse impacts related to noise are expected and no further analysis is warranted.

2.11 Neighborhood Character

2.11.1 Introduction

This analysis of neighborhood character follows the guidelines set forth in the *2014 CEQR Technical Manual*. As defined within the manual, neighborhood character is an amalgam of various elements that give neighborhoods a distinct "personality," including land use, urban design and visual resources, historic resources, socioeconomic conditions, transportation, and noise (all of which are separate technical areas of analysis within the EAS). According to the *CEQR Technical Manual*, neighborhood character impacts are rare and only occur under unusual circumstances.

A neighborhood character assessment is generally needed, per the *CEQR Technical Manual*, when a proposed project is projected to generate significant adverse impacts to one or more of the contributing elements of neighborhood character. In the absence of an impact on any of the relevant technical areas, a combination of moderate effects to the neighborhood could result in an impact to neighborhood character. Moreover, a significant impact identified in one of the technical areas that contribute to a neighborhood's character is not necessarily equivalent to a significant impact on neighborhood character. Therefore, an assessment of neighborhood character is generally appropriate if a proposed project has the potential to result in any significant adverse impacts in the following technical areas:

- Land Use, Zoning, and Public Policy
- Socioeconomic Conditions
- Open Space
- Historic and Cultural Resources
- Urban Design and Visual Resources
- Shadows
- Transportation
- Noise

Preliminary analyses were undertaken for land use, zoning and public policy; socioeconomic conditions; open space; urban design and visual resources; shadows; and noise pursuant to *CEQR Technical Manual* methodology. A preliminary screening analysis was conducted for all transportation components and a detailed analysis was performed for pedestrian elements. A detailed analysis was also performed for shadows. Therefore, a preliminary neighborhood character assessment was performed.

2.11.2 Methodology

This preliminary assessment describes the defining features of the neighborhood and then assesses the potential for the proposed project to affect these defining features, either by having a significant adverse impact on a defining feature or through a combination of moderate effects. As

recommended in the *CEQR Technical Manual*, the study area for the neighborhood character analysis is consistent with the study areas in the relevant technical areas assessed under CEQR that contribute to the defining elements of the neighborhood.

2.11.3 Preliminary Assessment

Existing Conditions

The areas that comprise Neighborhood Character are briefly summarized each in turn below in terms of the neighborhood's defining features. However, it should be noted that none of these analysis areas have the potential for significant adverse impacts. The defining features of the surrounding area's neighborhood character are principally: the physical setting along the busy West 125th Street corridor, the distinct commercial land uses along 125th Street as compared to residential uses on 124th Street and 126th Street, the proximity of the study area to Marcus Garvey Park, and the study area's location as a major transportation nexus.

Land Use

The neighborhood includes a range of land uses and building types which generally follow the grid system. Residential uses are located along 124th Street and 125th Street and are typically defined by low-rise row houses. On corner lots and along Fifth Avenue multifamily apartment buildings are more common. 125th Street is to a greater extend varied in terms of use and building type. Residential, commercial, and institutional uses are all found along the corridor and almost all of these uses feature ground floor retail. Institutional uses can be found throughout the study area and include cultural establishments, schools, and a large number of churches. There has been a trend towards commercial and residential redevelopment along the 125th Street corridor and greater residential development south of 125th Street. In particular, the ground floor retail uses on 125th Street and residential uses located on 124th Street and 126th Street contribute to the area's mixed neighborhood character.

Socioeconomics

The socioeconomic character of the neighborhood and surrounding census tracts would be classified as mixed income. The area has experienced and continues to experience a readily observable trend towards increasing rents and incomes and new market rate development and have done so at rates that exceed those of both Manhattan and New York City.

Open Space

The dominant open space feature in the study area is Marcus Garvey Park which is located just south of the project site and extends from 124th to 122nd street. The park features a children's playground, walking paths, theater space, and playing courts and fields. Marcus Garvey Park contributes to the residential feel of the neighborhood, particularly the residential area to the south.

Shadows

Sunlight sensitive resources within the study area include Marcus Garvey Park, Courtney Callender Playground, and several churches including: Mount Moriah Baptist Church, St. Andrews Episcopal, All Saints Church, and the Metropolitan Community United Methodist Church.

Historic and Cultural Resources

There are several historic and cultural resources located throughout the study area including the churches described above and the LPC-designated Marcus Garvey Park. Additionally, the Mount Morris historic district located to the southwest of the study area informs 124th Street's residential character.

Urban Design and Visual Resources

Along the 125th Street corridor, the streetwall is generally continuous. Within the immediate vicinity of the project site along 125th Street buildings vary in height from 3 to 6-stories, however, as described in Section 2.6, "Urban Design," buildings vary to a much greater degree in height, from 1- to twenty-stories along the corridor, beyond 400-feet of the project site. Taller buildings frame the avenues while lower brownstones line the east-west blocks of 124th and 126th Streets. FAR generally ranges from 2.7 to 11.0 on 125th Street and 1.0 to 6.0 on 124th and 126th Street.

Brownstone residential buildings with stoops are the dominant building form along 124th and 126th street and street trees are generally found on these streets. 125th Street is, to a far greater extent, defined by ground floor retail and larger multifamily, commercial, and institutional use buildings. Fifth Avenue is mixed in character with both brownstone row houses, multifamily buildings, and large institutional uses such as the project site. To the south of the site is Marcus Garvey Park, a defining neighborhood feature which contributes to the residential character of the study area, particularly along 124th Street.

Marcus Garvey Park and the Mount Morris Historic District are the only visual resources located within the study area. Marcus Garvey Park is generally visible along Fifth Avenue while the historic district is not visible beyond its immediate vicinity.

Transportation

The transportation character of the area is defined by heavy pedestrian and vehicular use along 125th Street. Additionally, the study area is defined by access to the subway, local and express buses, and the metro-north railroad. Bus stops are located along 125th Street in addition to Fifth Avenue and Madison Avenue. Subways are located along Malcolm X Blvd with service by the 2 and 3 lines and Lexington Avenue by the 4, 5, and 6 lines. The metro-north station is located at Park Avenue and 125th Street. 125th Street is heavily trafficked by both pedestrians and vehicles and Fifth Avenue and 125th Street is a major intersection within the area. The roadway system generally consists of one-way running streets and one- or two-way running avenues with the

exception of 125th Street which is two-way. Pedestrian elements within the study area generally operate at a level of service A or B.

Noise

Measured noise levels at the project site are considered to be marginally unacceptable, typical of areas where the major noise source is vehicular traffic. Noise levels are moderate to relatively high and reflect the level of vehicular activity on 125th Street. Levels are marginally unacceptable for residential uses and window wall attenuation is necessary for any new receptors at the project site.

Future No-Action Condition

As described in Section 1.0, "Project Description," under the future No-Action Condition, the existing NBT space would be converted to office space while existing retail and office space uses would remain unchanged. The new office space would be comprised of 14,706 sf of standard office and 3,717 sf of medical office. In addition, six additional No-Build projects are currently under construction within the study area and are projected to be completed by the proposed projects 2019 build year (these project are described further in Section 2.1, "Land Use, Zoning, and Public Policy,"). Additionally, two further No-Build projects consisting of large mixed use buildings are also planned along 125th Street and described further in Section 2.6, "Urban Design and Visual Resources." Neither the No-Action development of the project site nor the No-Build development within the study area are expected to change the neighborhood character of the study area. The No-Action development on the project site would not modify the existing building on the project site and would introduce new office uses along a corridor that is already characteristically developed with office uses. The No-Build projects within the study area are almost entirely small-scale redevelopment of row houses either on Fifth Avenue or 126th Street in addition to a more moderate development on 125th Street and the two large-scale developments on 125th Street. These projects would reinforce the existing mix of land uses and building types that are a defining features of this neighborhood and reinforce the trend towards taller large scale mixed use and institutional development along 125th Street. Other defining features of the neighborhood including Marcus Garvey Park and pedestrian and vehicular activity along 125th Street are not expected to substantially change under the future No-Action condition

Future With-Action Condition

The proposed actions would facilitate the development of a new 20-story mixed-use building. The RWCDS does not have the potential to affect the defining features of the area's neighborhood character. The RWCDS would be consistent with existing land use and socioeconomic tends; would have little impact on the utilization of open space; is not located adjacent to any historic and cultural resources; would reinforce the urban design character of 125th Street while respecting the visual corridor along Fifth Avenue and residential enclaves along 124th and 126th Street; would not introduce new incremental shadows that would affect sunlight sensitive resources; and would have little measurable impact on transportation level-of-service and noise levels. The RWCDS would not result in a significant adverse impact in any of the technical areas which contribute to neighborhood character

Consideration of Moderate Effects

The *CEQR Technical Manual* states that even if a project does not have the potential to result in a significant adverse impact to neighborhood character in a certain technical area, the project may result in a combination of moderate effects to several elements that may cumulatively affect an area's neighborhood character. A moderate effect is generally defined as an effect considered reasonably close to a significant adverse impact threshold for a particular technical area. The proposed actions would not result in adverse effects that are reasonably close to significant adverse impacts in any of the above technical areas. Even when considered together the moderate effects of the RWCDS would not result in a significant adverse impact to neighborhood character.

2.11.4 Conclusion

This preliminary assessment identified no potential significant adverse impacts to the study area's neighborhood character resulting from the proposed actions. Therefore, a detailed neighborhood character analysis is not necessary. Overall, development resulting from the proposed actions would be consistent with the existing development trends within the study area and the study area's mixed-use neighborhood character.

2.12 Construction

The significance of construction impacts and associated need for mitigation is generally based upon the duration and magnitude of the impacts. According to the *2014 CEQR Technical Manual*, construction duration is often broken down into short term (less than two years) and long term (two or more years). Where the duration of construction is expected to be short term, impacts resulting from such short-term construction typically do not require detailed construction impact analyses.

Construction activities are expected to be standard in nature and fewer than two years in length and any effects from the construction of the project would be considered brief. While some temporary parking lane closures may be required, they would be short-term and all travel lanes would remain open during construction. In the event that any closure of any portion of sidewalk elements is needed, it would be fully addressed by a permit and a Pedestrian Access Plan as required by the New York City Department of Transportation's Office of Construction Mitigation and Coordination prior to the closure so that impacts would not occur. Because the construction would be considered typical of other buildings in the City, the period of construction is relatively short term, and the standard construction provisions mentioned above would minimize effects of construction in the area, a preliminary construction assessment is not needed.

APPENDIX A

PROPOSED TEXT AMENDMENTS

ZR1: Text Amendments
2031-2033 Fifth Avenue, New York, NY
June 2, 2017

Matter in underline is new, to be added;
Matter in ~~strikeout~~ is to be deleted;
Matter with # # is defined in Section 12-10;
* * * indicates where unchanged text appears in the Zoning Resolution

[NOTE: Section titles and provisions in the following Chapter may reflect the proposed text amendment, East Harlem Rezoning (ULURP No. N 170359 ZRM).]

ARTICLE IX: SPECIAL PURPOSE DISTRICTS
Chapter 7 – Special 125th Street District

97-00
GENERAL PURPOSES

* * *

97-03
District Plan and Maps

The regulations of this Chapter are designed to implement the #Special 125th Street District# Plan. The District Plan, including Map 1 (Special 125th Street District and ~~Core~~ Subdistricts) and Map 2 (Permitted Small Sidewalk Cafe Locations), is set forth in Appendix A of this Chapter and is hereby incorporated as part of this Resolution for the purpose of specifying locations where the special regulations and requirements set forth in this Chapter apply.

97-04
Establishment of ~~Core~~ Subdistricts

In order to carry out the purposes and provisions of this Chapter, ~~the~~ ~~Core~~ two ~~S~~subdistricts ~~is~~ are established within the #Special 125th Street District# ~~and~~: the Core Subdistrict and Subdistrict A. Each subdistrict includes specific regulations designed to support an arts and entertainment environment and other relevant planning objectives along 125th Street. The boundaries of the ~~Core S~~subdistricts are shown on Map 1 in Appendix A of this Chapter.

* * *

97-06
Applicability of ~~Special Transit Land Use~~ District Regulations

[Note: existing provisions moved to Section 97-061]

97-061
Applicability of Special Transit Land Use District Regulations

[Note: existing provisions moved from Section 97-06 and modified]

Wherever the #Special 125th Street District# includes an area which also lies within the #Special Transit Land Use District#, the requirements of the #Special Transit Land Use District#, as set forth in Article IX, Chapter 5, shall apply, subject to the modifications described in paragraphs ~~(e)~~ (a)(5) and ~~(f)~~ (a)(6) of Section 97-~~433 (Street wall location)~~ 432 (Height and setback regulations in the Core Subdistrict and areas outside of a subdistrict).

~~The #Special Transit Land Use District# includes the area within the #Special 125th Street District# bounded by a line 50 feet west of Second Avenue from 124th Street midway to 125th Street where such area widens to a line 100 feet west of Second Avenue.~~

97-062
Applicability of the Quality Housing Program

[Note: Existing Quality Housing provisions moved from Section 97-40 (SPECIAL BULK REGULATIONS)]

In the #Special 125th Street District#, #buildings# containing #residences# shall be #developed# or #enlarged# in accordance with the Quality Housing Program, and the regulations of Article II, Chapter 8 shall apply. The #bulk# regulations of this Chapter shall be considered the applicable #bulk# regulations for #Quality Housing buildings#.

97-063
Applicability of Inclusionary Housing Program

[Note: Existing provision moved from Section 97-421 (Inclusionary Housing) and changed to include Mandatory Inclusionary Housing applicability]

For the purposes of applying the Inclusionary Housing Program provisions set forth in Sections 23-154 and 23-90, inclusive, #Inclusionary Housing designated areas# and #Mandatory Inclusionary Housing areas# within the #Special 125th Street District# are shown on the maps in APPENDIX F of this Resolution.

* * *

97-30
SPECIAL SIGN REGULATIONS

* * *

97-31
Definitions

Marquee
A "marquee" is a permanent structure or canopy located above the primary entrance to an arts #use# fronting on 125th Street or Fifth Avenue, that projects over the sidewalk and is attached to, and entire supported from, the #street wall# of the #building#. The location and dimensions of the #marquee# shall be determined by the requirements of Sections 97-32.

* * *

97-32
Location, Height and Width of Marquees and Marquee Signs

For the purposes of this Chapter, #marquees# shall be permitted only above the primary entrance to one of the following #uses# fronting upon 125th Street or Fifth Avenue:

Museums
Performance spaces

Theaters

* * *

97-34
Accessory Signs for Visual or Performing Arts Uses

Notwithstanding the regulations of paragraph (b) of Section 32-653 (Additional regulations for projecting signs) and the relevant provisions of the Administrative Code, only the following visual or performing arts #uses# fronting on 125th Street or Fifth Avenue within the #Special 125th Street District# shall be permitted to erect a #marquee sign# on or above a #marquee#:

Museums
Performance spaces
Theaters
#Flashing signs# shall not be permitted as #accessory signs# for arts #uses#

* * *

97-40
SPECIAL BULK REGULATIONS

Within the #Special 125th Street District#, ~~all~~ for #developments# or #enlargements#, ~~containing #residences# shall comply with the requirements of Article II, Chapter 8 (Quality Housing), and~~ the applicable #bulk# regulations of the underlying districts shall apply, except as modified ~~in~~ by the provisions of this Section, inclusive.

97-41
Special Floor Area Regulations

The maximum #floor area ratio#, #open space ratio# and #lot coverage# requirements of the applicable underlying district shall apply within the #Special 125th Street District#, unless modified by the following regulations.

97-411
Maximum floor area ratio ~~in C4-4D, C4-7 and C6-3 Districts~~ within the Core Subdistrict and areas outside of a subdistrict

In C4-4D, C4-7 or C6-3 Districts in the Core Subdistrict, as shown on Map 1 in Appendix A of this Chapter and in such Districts in areas outside of any subdistrict, the maximum permitted #floor area ratios# shall be as listed in the following table for #residential#, #commercial# and #community facility uses#, and may only be increased pursuant to Section 97-42 (Additional Floor Area ~~Bonuses~~ and Lot Coverage Regulations), inclusive.

* * *

97-412
Maximum floor area ratio in Subdistrict A

In Subdistrict A, the maximum #residential floor area ratio# shall be 9.0 and the maximum #floor area ratio# for non-#residential uses# shall be10.0. Such maximum non-#residential floor area# may only be increased pursuant to paragraph (b) of Section 97-422 (Floor area bonus for visual or performing arts uses).

97-42
Additional Floor Area and Lot Coverage ~~Bonuses~~ Regulations

Within #Inclusionary Housing designated areas#, as specified in APPENDIX F of this

Resolution, ~~T~~the maximum #floor area ratio# may be increased ~~by a~~ pursuant to the #floor area# ~~bonus, pursuant to~~ provisions of Sections ~~23-154 (Inclusionary Housing)~~ 97-421 (Inclusionary Housing) or paragraph (a) of Section 97-422 (Floor area bonus for visual or performing arts uses), which may be used concurrently.

Within #Mandatory Inclusionary Housing areas#, as specified in APPENDIX F of this Resolution, the maximum #floor area ratio# may be increased pursuant to the provisions of paragraph (b) of Section 97-422.

97-421
Inclusionary Housing

[NOTE: existing Inclusionary Housing applicability provision moved to Section 97-063]

~~Within the #Special 125th Street District#,~~ In #Inclusionary Housing designated areas# within C4-4D, C4-7 and C6-3 Districts in the Core Subdistrict or areas outside of a subdistrict, ~~shall be #Inclusionary Housing designated areas#, pursuant to Section 12-10 (DEFINITIONS), for the purpose of making the Inclusionary Housing Program regulations of Section 23-90(INCLUSIONARY HOUSING), inclusive, and this Section, applicable within the Special District. Within such #Inclusionary Housing designated areas#,~~ the #residential floor area ratio# may be increased by an Inclusionary Housing bonus, pursuant to the provisions of Section 23-154 (Inclusionary Housing).

97-422
Floor area bonus for visual or performing arts uses

(a) In C4-4D, C4-7 or C6-3 Districts within the ~~#Special 125th Street District#~~ Core Subdistrict or areas outside of a subdistrict, for a #development# or #enlargement# with frontage on 125th Street, the maximum #floor area ratio# otherwise permitted for #residential# or #commercial uses# listed in Section 97-411 may be increased up to the maximum #floor area ratio# specified in the table in this Section, provided that for every four square feet of bonused #floor area#, an amount of space equivalent to one square foot of such bonused #floor area# shall be used for those visual or performing arts #uses# designated in paragraph (b) of Section 97-11 (Special Arts and Entertainment Uses). Such bonused #floor area# shall be permitted only upon certification by the Chairperson of the City Planning Commission to the Commissioner of Buildings that the conditions set forth in Section 97-423 have been met.

MAXIMUM PERMITTED FLOOR AREA RATIO (FAR)
FOR RESIDENTIAL AND COMMERCIAL USES WITH
FLOOR AREA BONUS FOR VISUAL OR PERFORMING ARTS USES

~~Outside the Core District~~ Within areas outside of a subdistrict		Within the Core Subdistrict	
#Residential Floor Area Ratio#	#Commercial Floor Area Ratio#	#Residential Floor Area Ratio#	#Commercial Floor Area Ratio#

* * *

(b) In C4-7 Districts within Subdistrict A, for a #development# or #enlargement#, the maximum #floor area ratio# permitted in Section 97-412 (Maximum floor area ratio in Subdistrict A) may be increased up to a maximum #floor area ratio# of 12.0, provided that for every four square feet of bonused #floor area#, an amount of space equivalent to one square foot of #floor area# shall be used for those visual or performing arts #uses# designated in paragraph (b) of Section 97-11 (Special Arts and Entertainment Uses). Such bonused #floor area# shall be permitted only upon certification by the Chairperson

of the City Planning Commission to the Commissioner of Buildings that the conditions set forth in Section 97-423 have been met.

97-423
Certification for floor area bonus for visual or performing arts uses

The #floor area# bonus provisions of Section 97-422 shall apply only upon certification by the Chairperson of the City Planning Commission to the Commissioner of Buildings that the following conditions have been met:

(a) Drawings have been provided that clearly designate all #floor area# that will result from the permitted increase in #floor area ratio# pursuant to Section 97-422, including the location of such #floor area#.

(b) Drawings also have been provided that clearly designate all #floor area# and/or below grade floor space for any new visual or performing arts #uses# for which a bonus is to be received pursuant to Section 97-422.

Such drawings shall be of sufficient detail to show that such designated space shall be designed, arranged and used for the new visual arts or performing arts #uses#, and shall also show that:

(1) all such visual or performing arts #uses# are located at or above the ground floor level of the #building#, except that performance space meeting the requirements of paragraph (b)(4) of this Section may be located below grade, and #accessory uses# may be located below grade, subject to the requirements of paragraph (b)(5) of this Section;

(2) all bonused #floor area# or below grade space occupied by visual or performing arts #uses# is primarily accessed from 125th Street~~;~~, except that all bonused #floor area# or below grade space occupied by visual or performing arts #uses# within a #development# may be primarily accessed from Fifth Avenue, provided the following conditions are met:

(i) the #zoning lot# must have at least 150 feet of Fifth Avenue frontage where such primary entrance is provided; and

(ii) signage that identifies the visual or performing arts #uses# shall be provided at both the primary entrance on Fifth Avenue and on 125th Street.

(3) in the case of primary rehearsal space, where such space does not consist of #accessory uses# subject to the requirements of paragraph (b)(4), such space:

(i) can be adapted for rehearsals or performances open to the public;

(ii) is located on the first #story# of the #building# or on any higher #story# with a ceiling height not greater than 60 feet above grade;

(iii) has a #street wall# with at least 50 feet of frontage along 125th Street, except for visual or performing arts #uses# with primary entrances provided pursuant to (b)(2)(i) of this Section, and has a minimum area of 2,000 square feet, with a floor-to-ceiling height of not less than nine feet six inches; and

(iv) complies with the following glazing requirements, except for visual or performing arts #uses# with primary entrances provided pursuant to

(b)(2)(i) of this Section,: At least 70 percent of the total surface area of the #street wall# abutting the primary rehearsal space, measured from finished floor to ceiling shall be glazed. Furthermore, at least 90 percent of such area shall be transparent from within one foot of the finished floor level to at least eight feet above such level. For primary rehearsal spaces located at the corner of 125th Street and an intersecting #street#, the glazing requirements of this Section shall be applied separately for each #street wall#, and up to 100 feet along such intersecting #street#;

(4) for performance space which is exclusively designed and arranged for the presentation of live drama, music, dance and interactive or multidisciplinary performances open to the public, such space may be below grade provided it has a minimum area of 2,000 square feet of column-free space with a floor-to-ceiling height of not less than 16 feet;

(5) #Accessory# space

(i) For primary rehearsal spaces, no more than 25 percent of such minimum required #floor area# or equivalent below grade floor space, or such bonused #floor area# or below grade floor space shall be occupied by #uses accessory# to such primary rehearsal spaces. #Accessory uses# shall include but are not limited to educational and classroom space, administrative offices, circulation space, restrooms and equipment space;

(ii) For visual or performing arts #uses# other than a primary rehearsal space, no more than 40 percent of such minimum required #floor area# or equivalent below grade floor space, or such bonused #floor area# or below grade floor space, shall be occupied by #uses accessory# to such visual or performing arts #uses#, provided no single #accessory use# occupies more than 25 percent of such total minimum required #floor area# or equivalent below grade floor space, or bonused #floor area# or below grade floor space. #Accessory uses# shall include but are not limited to educational and classroom space, non-primary rehearsal space, administrative offices, lobbies, circulation space, ticket offices, restrooms, dressing rooms, other backstage areas and equipment space; and

(6) Signage

(i) Signage that identifies the visual or performing arts facility shall be provided at the 125th Street entrance of the visual or performing arts facility, subject to the requirements of Section 97-30, inclusive, except where such visual or performing arts #uses# comply with (b)(2)(i) of this Section; and

* * *

97-~~43~~ 424
Special Lot Coverage Regulations

The maximum #lot coverage# for #residential use# in C6-3 Districts within the #Special 125th Street District# shall be 70 percent for #interior# or #through# lots and 100 percent for #corner# lots.

97-~~44~~ 43
Special Height and Setback Regulations

Within the #Special 125th Street District#, the underlying height and setback regulations shall be modified in accordance with the provisions of this Section, inclusive.

97-~~441~~ 431
Permitted obstructions

The provisions of Section 33-42 (Permitted Obstructions) shall apply, except that dormers may penetrate a maximum base height in accordance with the provisions of paragraph (b)(1) of Section 23-621 (Permitted obstructions in certain districts).

97-~~442~~ 432
Height and setback regulations ~~for C4-7 and C6-3 Districts~~ in the Core Subdistrict and areas outside of a subdistrict

(a) Street wall location

[NOTE: the existing street wall provisions, moved from Section 97-443]

In all #Commercial Districts# within the Core Subdistrict and areas outside of a subdistrict, the #street wall# shall be located on the #street line# of 125th Street and extend along the entire #street# frontage of the #zoning lot# up to at least the applicable minimum base height of the underlying district, or the height of the #building#, whichever is less.

The #street wall# location provisions of such #Commercial Districts# shall be modified, as follows:

~~(a)~~(1) On Park Avenue, within 10 feet of its intersection with any #street#, the #street wall# may be located anywhere within 10 feet of the Park Avenue #street line#. However, to allow articulation of the #street walls# pursuant to the provisions of paragraph (b) of this Section, the #street walls# may be located anywhere within an area bounded by a #street line#, the #street wall# on Park Avenue and a line connecting these two lines 15 feet from their intersection.

~~(b)~~(2) To allow articulation of #street walls# at the intersection of any two #streets# within the Special District, the #street wall# may be located anywhere within an area bounded by the two #street lines# and a line connecting such #street lines# at points 15 feet from their intersection.

~~(c)~~(3) Recesses, not to exceed three feet in depth from the #street line#, shall be permitted on the ground floor where required to provide access to the #building#. Above a height of the second #story# and up to the applicable maximum base height, recesses are permitted for #outer courts# or balconies, provided that the aggregate width of such recesses does not exceed 30 percent of the width of the #street wall# at any level, and the depth of such recesses does not exceed five feet. No recesses shall be permitted within 20 feet of an adjacent #building# or within 30 feet of the intersection of two #street lines#, except in compliance with corner articulation rules.

~~(d)~~(4) The #street wall# location and minimum #street wall# height provisions of this Section shall not apply to any existing #buildings# that are to remain on the #zoning lot#.

~~(e)~~(5) For any #development# or #enlargement# ~~within the #Special 125th Street District#~~ that is partially within the #Special Transit Land Use District# and

located directly over the planned Second Avenue subway line tunnel, the #residential# portion of such #development# or #enlargement# may be constructed pursuant to the R8A #street wall# requirements and the #commercial# portion of such #development# or #enlargement# may be constructed pursuant to the C4-4D #street wall# requirements in lieu of the requirements of this Section.

~~(f)~~(6) The requirements of this Section shall apply within the #Special Transit Land Use District# except that, for the area of the #Special Transit Land Use District# that is also within the #Special 125th Street District#, a #street wall# of a #development# or #enlargement# located on the #street line# of a #zoning lot# need not exceed 15 feet if that portion of the #development# or #enlargement# is located directly over the planned Second Avenue subway line tunnel.

(b) Maximum height of building and setback

[NOTE: existing height and setback provisions, moved from Section 97-442]

The following modifications of the underlying district regulations shall apply for C4-7 and C6-3 Districts within ~~the Special District~~ the Core Subdistrict and areas outside of a subdistrict:

~~(a)~~(1) The minimum and maximum base height of the #street wall# and the maximum height of a #building or other structure# shall be as set forth in the following table:

* * *

~~(b)~~(2) Special regulations for certain C4-7 Districts

~~(1)~~(i) For the area located within 50 feet of the 126th Street frontage and between 200 feet east of Adam Clayton Powell Boulevard and 150 feet west of Lenox Avenue/Malcolm X Boulevard, the height of any portion of a #building or other structure# shall be limited to 80 feet.

~~(2)~~(ii) For #zoning lots# bounded by 125th Street, Park Avenue and 124th Street, the maximum height of a #building or other structure# shall be 330 feet.

~~(3)~~(iii) For Lots 1 and 7501 on Block 1910, the requirements of City Environmental Quality Review (CEQR) Environmental Designation Number (E-102) have been modified, as set forth in the Technical Memorandum to the Final Environmental Impact Statement for CEQR Number 07DCP030M, dated July 18, 2008.

~~(c)~~(3) In C6-3 Districts, the maximum length of any #story# located above a height of 85 feet shall not exceed 150 feet. Such length shall be measured by inscribing within a rectangle the outermost walls at the level of each #story# entirely above a height of 85 feet. No side of such rectangle shall exceed a width of 150 feet.

* * *

97-~~443~~ 433
~~Street wall location~~
Height and setback regulations in Subdistrict A

Within Subdistrict A, as shown on Map 1 in Appendix A of this Chapter, the underlying height and setback regulations for #Quality Housing buildings# shall apply, except that in C4-7 Districts, the minimum and maximum base heights and the overall maximum #building# height provisions of Section 35-65, inclusive, shall be modified in accordance with the following table:

Maximum height of #buildings.

MINIMUM BASE HEIGHT, MAXIMUM BASE HEIGHT AND MAXIMUM BUILDING HEIGHT

District	#Street Wall# Height (in feet)		Maximum Height of #Building or Other Structure# (in feet)
	Minimum Base Height	Maximum Base Height	
C4-7	60	85	245

Above the maximum base height, a setback shall be provided in accordance with the provisions of paragraph (c) of Section 23-662.

* * *

97-~~45~~ 44
Special Provisions for Zoning Lots Divided by District Boundaries

* * *

97-50
SPECIAL OFF-STREET PARKING AND OFF-STREET LOADING REGULATIONS

* * *

97-55
Certification for Access to Required Uses

If access to a required #accessory residential# parking facility or loading berth is not possible because of the requirements of Section 97-53 or for #developments# in Subarea A the requirements of Section 36-683, a curb cut may be allowed if the City Planning Commission certifies to the Commissioner of Buildings that such location is:

(a) the only possible location for the facility or loading berth;

(b) not hazardous to traffic safety;

(c) located not less than 50 feet from the intersection of any two #street lines#; and

(d) constructed and maintained so as to have a minimal effect on the streetscape.

Such curb cut, if granted, shall be no greater than 20 feet in width.

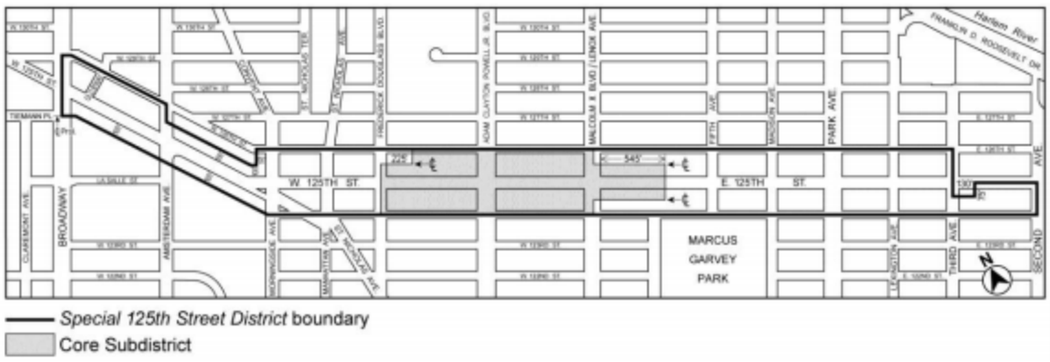
The Commissioner may refer such matter to the Department of Transportation, or its successor, for a report and may base the determination on such report.

* * *

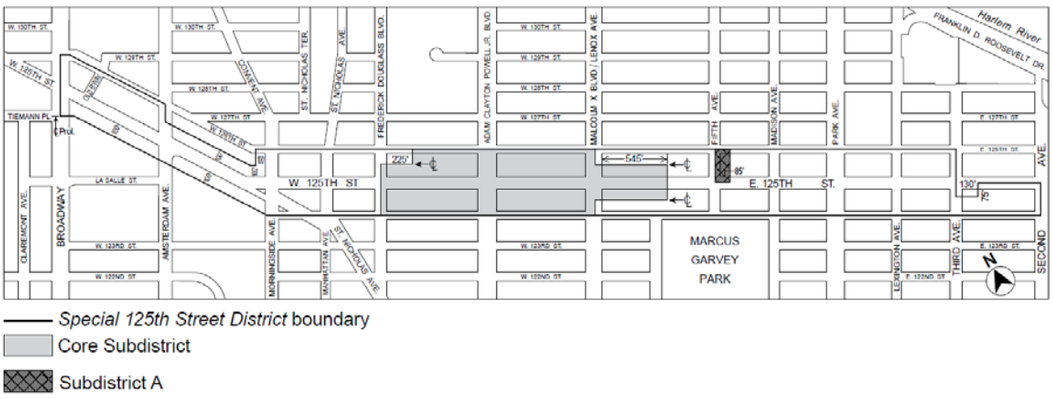
Appendix A
Special 125th Street District Plan

Map 1: #Special 125th Street District# and ~~Core~~ Subdistricts

[existing map]



[proposed map]



* * *

Appendix F:
Inclusionary Housing Designated Areas and Mandatory Inclusionary Housing Area

* * *

MANHATTAN

* * *

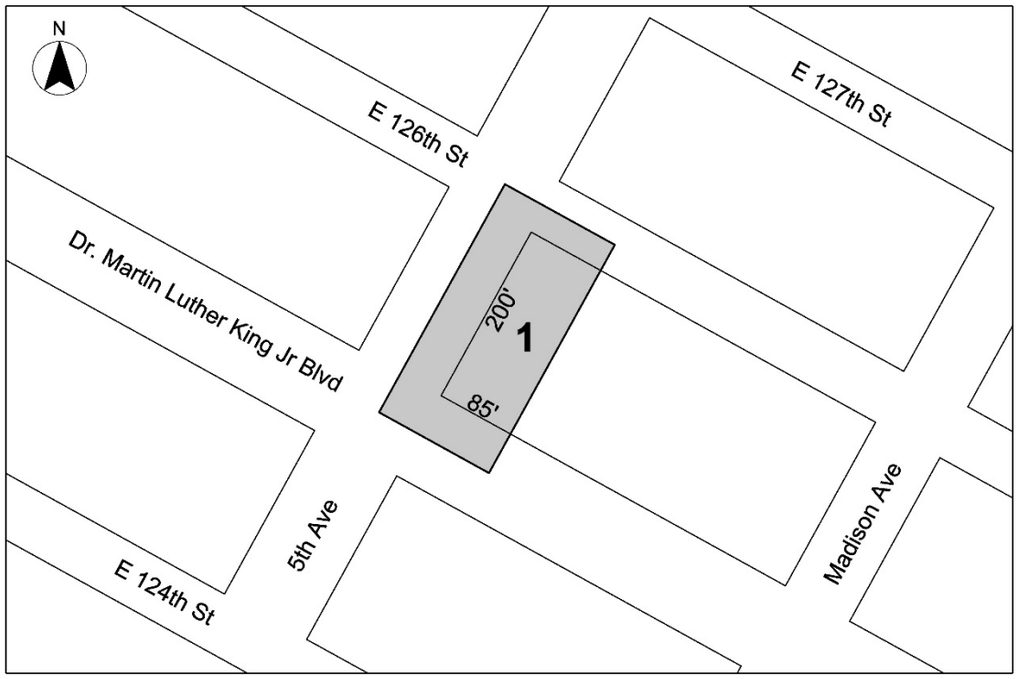
Manhattan Community District 9

* * *

In portions of the #Special 125th Street District# in the C4-7 (R10 equivalent) District within the areas shown on the following Map 1:

Map 1 - [date of adoption]

[PROPOSED MAP]



Mandatory Inclusionary Housing area *see Section 23-154(d)(3)*

Area **1** [date of adoption] - MIH Program Option 1 and Option 2

Portion of Community District 9, Manhattan

* * *

APPENDIX B

AGENCY CORRESPONDENCE

Landmarks Preservation Commission

1 Centre Street
9th Floor North
New York, NY 10007

Voice (212)-669-7700
Fax (212)-669-7960
http://nyc.gov/landmarks

ENVIRONMENTAL REVIEW

Project number: DEPARTMENT OF CITY PLANNING / LA-CEQR-M
Project: NATIONAL BLACK THEATRE
Address: 2023 5 AVENUE, **BBL:** 1017500001
Date Received: 4/26/2016

---

[x] No architectural significance

[X**] No archaeological significance**

[ ] Designated New York City Landmark or Within Designated Historic District

[x] In radius Listed on National Register of Historic Places

[ ] Appears to be eligible for National Register Listing and/or New York City Landmark Designation

[ ] May be archaeologically significant; requesting additional materials

Comments: Within the radius: S/NR listed Mt. Morris Park Historic District Boundary Increase.

Gina Santucci 5/17/2016

SIGNATURE DATE
Gina Santucci, Environmental Review Coordinator

File Name: 31424_FSO_GS_05172016.doc

Landmarks Preservation Commission

1 Centre Street
9th Floor North
New York, NY 10007

Voice (212)-669-7700
Fax (212)-669-7960
http://nyc.gov/landmarks

ENVIRONMENTAL REVIEW

Project number: DEPARTMENT OF CITY PLANNING / 17DCP134M
Project: NATIONAL BLACK THEATRE
Address: 2023 5 AVENUE, **BBL:** 1017500001
Date Received: 5/30/2017

The LPC is in receipt of photographs of the exterior of 2050 Fifth Ave., the former Mt. Moriah Church, dated 5/30/17 from the lead agency. Additionally, LPC has provided both the photographs and photos of the interior: (https://www.wmagazine.com/story/ugo-rondinone-artist-home-harlem-church) to the NYS SHPO for review and comment.

Based on this documentation, the SHPO has determined that 2050 Fifth Ave. no longer appears eligible for listing on the State/National Registers. This is due to the changes to the exterior, partial removal of the stained glass windows, and removal of significant interior features, including the open auditorium plan, original pews, and horseshoe shaped balcony, as delineated in the SHPO Determination of Eligibility dated 1999.

There are no further concerns regarding impacts to this property as a result of 17DCP134M.

Cc: SHPO

Gina Santucci 5/31/2017

SIGNATURE DATE
Gina Santucci, Environmental Review Coordinator

File Name: 31424_FSO_GS_05312017.doc

APPENDIX C

TRANSPORTATION BACKUP

With Action Increment:
Proposed - 240 DU Residential
Proposed - 242 seats Performance Art Theater
Proposed - 32.783 ksf Local Retail

2033 Fifth Avenue

Proposed - Residential Vehicle Trips

	AM			Midday			PM			SAT MD			SAT PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	2	13	15	4	4	8	11	5	16	7	7	14	6	6	12
Taxi	1	3	4	1	1	2	3	1	4	2	2	4	2	2	4
Truck	1	1	2	1	1	2	0	0	0	0	0	0	0	0	0
Total	4	17	21	6	6	12	14	6	20	9	9	18	8	8	16

Residential Person Trips

	AM			MD			PM			SAT MD			SAT PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	2	14	16	4	4	8	12	5	17	8	8	16	7	7	14
Taxi	1	3	4	1	1	2	3	1	4	2	2	4	2	2	4
Bus	3	17	20	5	5	10	15	7	22	9	9	18	8	8	16
Subway/Rail	18	102	120	30	30	60	92	40	132	57	57	114	50	50	100
Walk	5	29	34	9	9	18	26	11	37	16	16	32	14	14	28
Total	29	165	194	49	49	98	148	64	212	92	92	184	81	81	162

Proposed - Performance Art Theater Vehicle Trips

	AM			Midday			PM			SAT MD			SAT PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	0	0	0	0	0	0	7	0	7	7	0	7	0	7	7
Taxi	0	0	0	0	0	0	2	0	2	2	0	2	0	2	2
Truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	9	0	9	9	0	9	0	9	9

Performance Art Theater Person Trips

	AM			MD			PM			SAT MD			SAT PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	0	0	0	0	0	0	19	0	19	19	0	19	0	19	19
Taxi	0	0	0	0	0	0	4	0	4	4	0	4	0	4	4
Bus	0	0	0	0	0	0	6	0	6	6	0	6	0	6	6
Subway/Rail	0	0	0	0	0	0	102	0	102	102	0	102	0	102	102
Walk	0	0	0	0	0	0	77	0	77	77	0	77	0	77	77
Total	0	0	0	0	0	0	208	0	208	208	0	208	0	208	208

Proposed - Local Retail Vehicle Trips

	AM			Midday			PM			SAT MD			SAT PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	1	1	2	5	5	10	3	3	6	3	3	6	3	3	6
Taxi	1	1	2	7	7	14	4	4	8	5	5	10	4	4	8
Truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	2	4	12	12	24	7	7	14	8	8	16	7	7	14

Local Retail Person Trips

	AM			MD			PM			SAT MD			SAT PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	2	2	4	10	10	20	5	5	10	6	6	12	6	6	12
Taxi	2	2	4	14	14	28	8	8	16	9	9	18	8	8	16
Bus	5	5	10	29	29	58	15	15	30	18	18	36	17	17	34
Subway/Rail	5	5	10	29	29	58	15	15	30	18	18	36	17	17	34
Walk	63	63	126	397	397	794	209	209	418	245	245	490	233	233	466
Total	77	77	154	479	479	958	252	252	504	296	296	592	281	281	562

Total Vehicle Trips (Balanced for Taxis)

	AM			Midday			PM			SAT MD			SAT PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	**3**	**14**	**17**	**9**	**9**	**18**	**21**	**8**	**29**	**17**	**10**	**27**	**9**	**16**	**25**
Taxi	**5**	**5**	**10**	**12**	**12**	**24**	**9**	**9**	**18**	**11**	**11**	**22**	**11**	**11**	**22**
Truck	**1**	**1**	**2**	**1**	**1**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total	**9**	**20**	**29**	**22**	**22**	**44**	**30**	**17**	**47**	**28**	**21**	**49**	**20**	**27**	**47**

Total Person Trips

	AM			MD			PM			SAT MD			SAT PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	**4**	**16**	**20**	**14**	**14**	**28**	**36**	**10**	**46**	**33**	**14**	**47**	**13**	**32**	**45**
Taxi	**3**	**5**	**8**	**15**	**15**	**30**	**15**	**9**	**24**	**15**	**11**	**26**	**10**	**14**	**24**
Bus	**8**	**22**	**30**	**34**	**34**	**68**	**36**	**22**	**58**	**33**	**27**	**60**	**25**	**31**	**56**
Subway/Rail	**23**	**107**	**130**	**59**	**59**	**118**	**209**	**55**	**264**	**177**	**75**	**252**	**67**	**169**	**236**
Walk	**68**	**92**	**160**	**406**	**406**	**812**	**312**	**220**	**532**	**338**	**261**	**599**	**247**	**324**	**571**
Total	**106**	**242**	**348**	**528**	**528**	**1056**	**608**	**316**	**924**	**596**	**388**	**984**	**362**	**570**	**932**

No Build Increment:
No-Action - 30.211 ksf Office
No-Action - 14.237 ksf Local Retail
No-Action - 3.717 ksf Medical Office

No-Action - Office Vehicle Trips

	AM			Midday			PM			SAT MD			SAT PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	9	0	9	1	1	2	1	11	12	0	0	0	0	0	0
Taxi	1	0	1	0	0	0	0	2	2	0	0	0	0	0	0
Truck	1	1	2	1	1	2	0	0	0	0	0	0	0	0	0
Total	11	1	12	2	2	4	1	13	14	0	0	0	0	0	0

Office Person Trips

	AM			MD			PM			SAT MD			SAT PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	10	0	10	1	1	2	1	12	13	0	0	0	0	0	0
Taxi	1	0	1	0	0	0	0	2	2	0	0	0	0	0	0
Bus	11	0	11	2	3	5	1	13	14	1	1	2	0	1	1
Subway/Rail	30	1	31	2	3	5	2	34	36	1	1	2	0	1	1
Walk	11	0	11	26	41	67	1	12	13	10	7	17	2	12	14
Total	63	1	64	31	48	79	5	73	78	12	9	21	2	14	16

No-Action - Local Retail Vehicle Trips

	AM			Midday			PM			SAT MD			SAT PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	1	1	2	2	2	4	1	1	2	2	2	4	2	1	3
Taxi	1	1	2	3	3	6	2	2	4	2	2	4	2	2	4
Truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	2	4	5	5	10	3	3	6	4	4	8	4	3	7

Local Retail Person Trips

	AM			MD			PM			SAT MD			SAT PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	1	1	2	4	4	8	2	2	4	3	3	6	3	2	5
Taxi	1	1	2	6	6	12	3	3	6	4	4	8	4	3	7
Bus	2	2	4	12	12	24	7	7	14	8	8	16	8	7	15
Subway/Rail	2	2	4	12	12	24	7	7	14	8	8	16	8	7	15
Walk	27	27	54	173	173	346	91	91	182	106	106	212	111	91	202
Total	33	33	66	207	207	414	110	110	220	129	129	258	134	110	244

No-Action - Medical Office Vehicle Trips

	AM			Midday			PM			SAT MD			SAT PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	3	1	4	5	5	10	5	6	11	4	6	10	4	6	10
Taxi	0	0	0	1	1	2	1	1	2	0	1	1	0	1	1
Truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3	1	4	6	6	12	6	7	13	4	7	11	4	7	11

Medical Office Person Trips

	AM			MD			PM			SAT MD			SAT PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	5	1	6	8	8	16	8	9	17	6	9	15	6	9	15
Taxi	0	0	0	1	1	2	1	1	2	0	1	1	0	1	1
Bus	6	1	7	9	8	17	9	10	19	7	10	17	7	10	17
Subway/Rail	3	0	3	5	5	10	5	5	10	4	6	10	4	6	10
Walk	3	0	3	5	4	9	5	5	10	4	5	9	4	5	9
Total	17	2	19	28	26	54	28	30	58	21	31	52	21	31	52

Total Vehicle Trips (Balanced for Taxis)

	AM			Midday			PM			SAT MD			SAT PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	**13**	**2**	**15**	**8**	**8**	**16**	**7**	**18**	**25**	6	8	14	**6**	**7**	**13**
Taxi	**2**	**2**	**4**	**6**	**6**	**12**	**6**	**6**	**12**	4	4	8	**4**	**4**	**8**
Truck	**1**	**1**	**2**	**1**	**1**	**2**	**0**	**0**	**0**	0	0	0	**0**	**0**	**0**
Total	**16**	**5**	**21**	**15**	**15**	**30**	**13**	**24**	**37**	10	12	22	**10**	**11**	**21**

Total Person Trips

	AM			MD			PM			SAT MD			SAT PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	**16**	**2**	**18**	**13**	**13**	**26**	**11**	**23**	**34**	**9**	**12**	**21**	**9**	**11**	**20**
Taxi	**2**	**1**	**3**	**7**	**7**	**14**	**4**	**6**	**10**	**4**	**5**	**9**	**4**	**4**	**8**
Bus	**19**	**3**	**22**	**23**	**23**	**46**	**17**	**30**	**47**	**16**	**19**	**35**	**15**	**18**	**33**
Subway/Rail	**35**	**3**	**38**	**19**	**20**	**39**	**14**	**46**	**60**	**13**	**15**	**28**	**12**	**14**	**26**
Walk	**41**	**27**	**68**	**204**	**218**	**422**	**97**	**108**	**205**	**120**	**118**	**238**	**117**	**108**	**225**
Total	**113**	**36**	**149**	**266**	**281**	**547**	**143**	**213**	**356**	**162**	**169**	**331**	**157**	**155**	**312**

No-Action - 30.211 ksf Office
No-Action - 14.237 ksf Local Retail
No-Action - 3.717 ksf Medical Office

2033 Fifth Avenue

Total Vehicle Trips

	AM			Midday			PM			SAT MD			SAT PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	13	2	15	8	8	16	7	18	25	6	8	14	6	7	13
Taxi	2	2	4	6	6	12	6	6	12	4	4	8	4	4	8
Truck	1	1	2	1	1	2	0	0	0	0	0	0	0	0	0
Total	16	5	21	15	15	30	13	24	37	10	12	22	10	11	21

Total Person Trips

	AM			MD			PM			SAT MD			SAT PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	16	2	18	13	13	26	11	23	34	9	12	21	9	11	20
Taxi	2	1	3	7	7	14	4	6	10	4	5	9	4	4	8
Bus	19	3	22	23	23	46	17	30	47	16	19	35	15	18	33
Subway/Rail	35	3	38	19	20	39	14	46	60	13	15	28	12	14	26
Walk	41	27	68	204	218	422	97	108	205	120	118	238	117	108	225
Total	113	36	149	266	281	547	143	213	356	162	169	331	157	155	312

Proposed - 240 DU Residential
Proposed - 242 seats Performance Art Theater
Proposed - 32.783 ksf Local Retail

Total Vehicle Trips

	AM			Midday			PM			SAT MD			SAT PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	3	14	17	9	9	18	21	8	29	17	10	27	9	16	25
Taxi	5	5	10	12	12	24	9	9	18	11	11	22	11	11	22
Truck	1	1	2	1	1	2	0	0	0	0	0	0	0	0	0
Total	9	20	29	22	22	44	30	17	47	28	21	49	20	27	47

Total Person Trips

	AM			MD			PM			SAT MD			SAT PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	4	16	20	14	14	28	36	10	46	33	14	47	13	32	45
Taxi	3	5	8	15	15	30	15	9	24	15	11	26	10	14	24
Bus	8	22	30	34	34	68	36	22	58	33	27	60	25	31	56
Subway/Rail	23	107	130	59	59	118	209	55	264	177	75	252	67	169	236
Walk	68	92	160	406	406	812	312	220	532	338	261	599	247	324	571
Total	106	242	348	528	528	1056	608	316	924	596	388	984	362	570	932

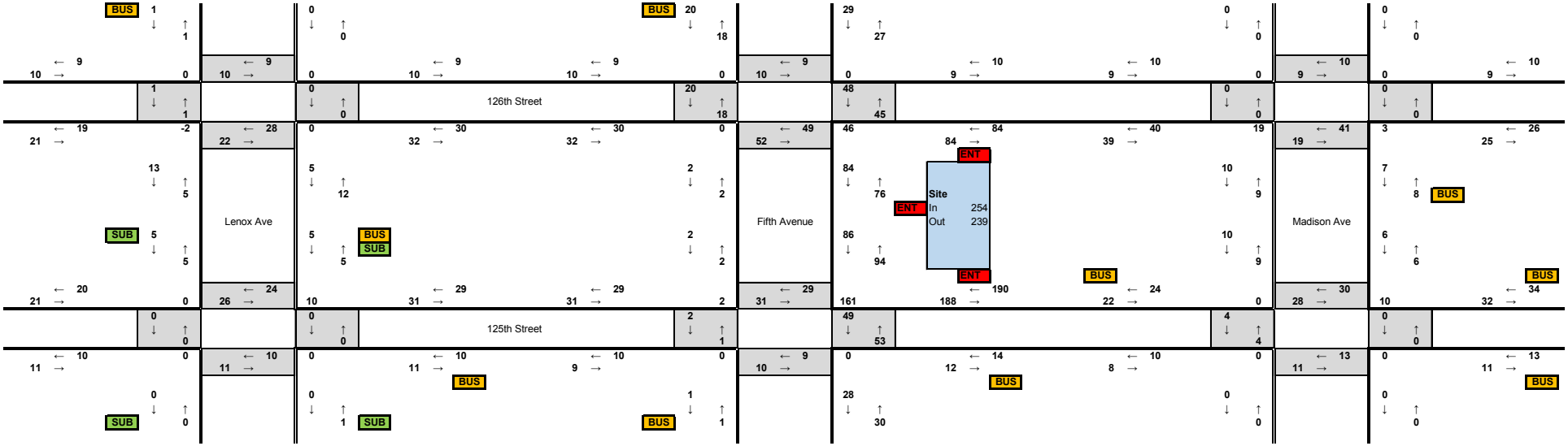
With Action Increment

Total Vehicle Trips

	AM			Midday			PM			SAT MD			SAT PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	-10	12	2	1	1	2	14	-10	4	11	2	13	3	9	12
Taxi	3	3	6	6	6	12	3	3	6	7	7	14	7	7	14
Truck	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	-7	15	8	7	7	14	17	-7	10	18	9	27	10	16	26

Total Person Trips

	AM			MD			PM			SAT MD			SAT PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Auto	-12	14	2	1	1	2	25	-13	12	24	2	26	4	21	25
Taxi	1	4	5	8	8	16	11	3	14	11	6	17	6	10	16
Bus	-11	19	8	11	11	22	19	-8	11	17	8	25	10	13	23
Subway/Rail	-12	104	92	40	39	79	195	9	204	164	60	224	55	155	210
Walk	27	65	92	202	188	390	215	112	327	218	143	361	130	216	346
Total	-7	206	199	262	247	509	465	103	568	434	219	653	205	415	620



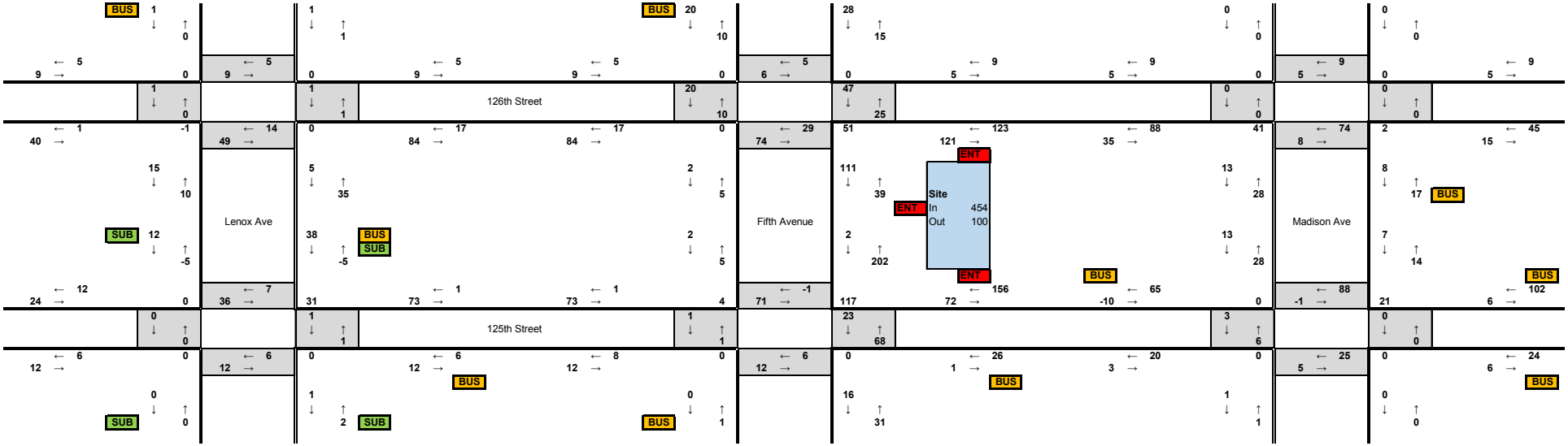
With-Action Increment: 493 Trips
Weekday Midday Peak Hour

ENT Project Site Entrance
BUS Bus Stop
SUB Subway Station Stairway

2031-2033 Fifth Avenue
New York, New York

Weekday Midday Peak Hour
Pedestrian Trip Assignments

Figure
1



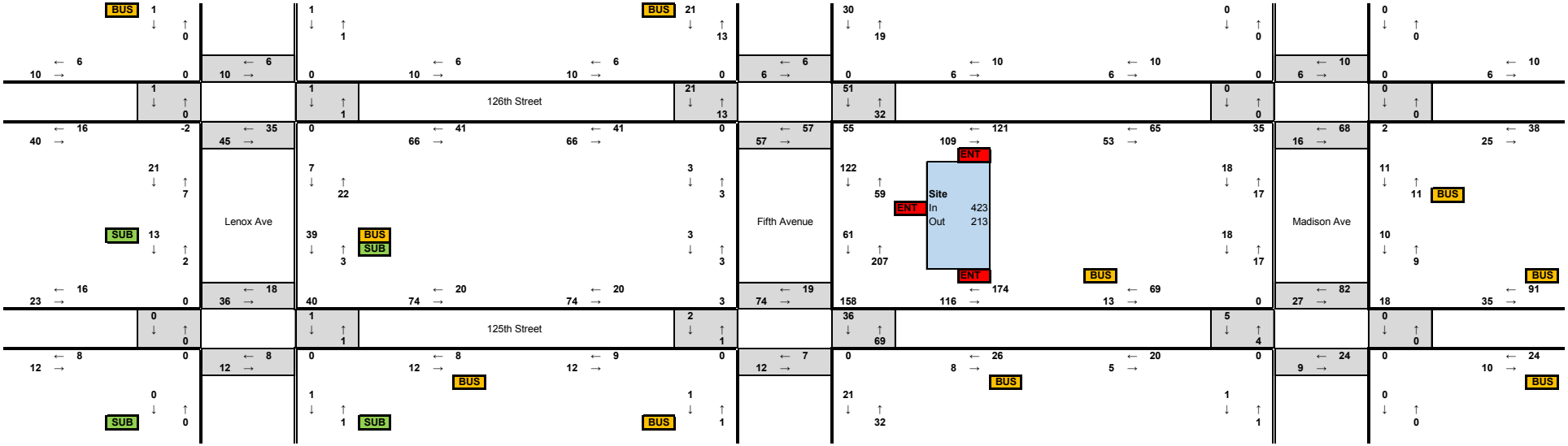
With-Action Increment: 554 Trips
Weekday PM Peak Hour

ENT Project Site Entrance
BUS Bus Stop
SUB Subway Station Stairway

2031-2033 Fifth Avenue
New York, New York

Weekday PM Peak Hour
Pedestrian Trip Assignments

Figure
2



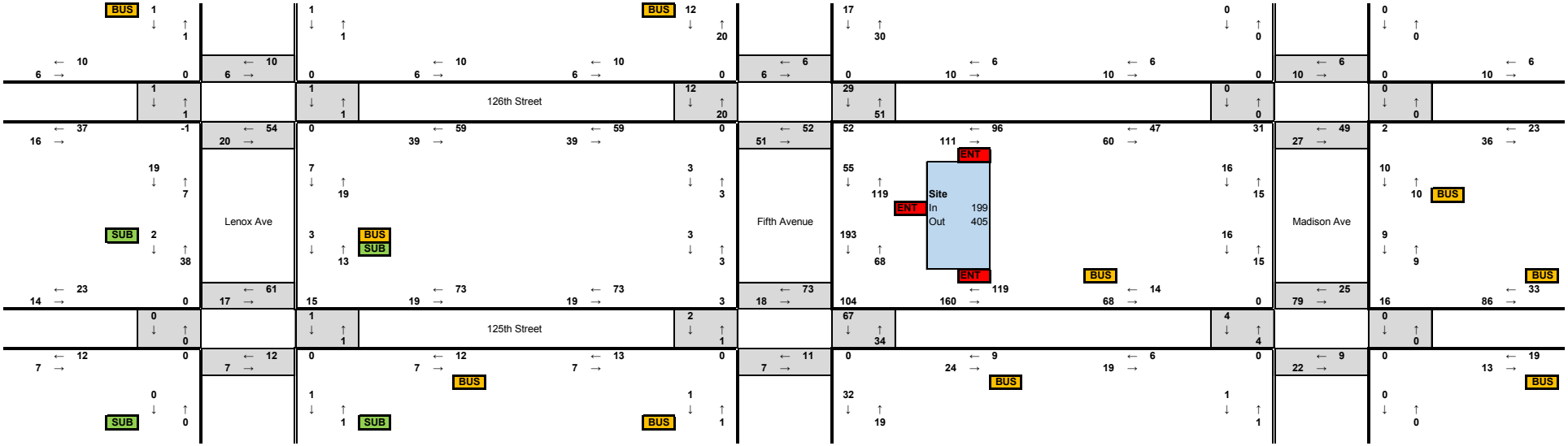
With-Action Increment: 636 Trips
Saturday Midday Peak Hour

ENT Project Site Entrance
BUS Bus Stop
SUB Subway Station Stairway

2031-2033 Fifth Avenue
New York, New York

Saturday Midday Peak Hour
Pedestrian Trip Assignments

Figure
3



With-Action Increment: 604 Trips
Saturday PM Peak Hour

ENT Project Site Entrance
BUS Bus Stop
SUB Subway Station Stairway

2031-2033 Fifth Avenue
New York, New York

Saturday PM Peak Hour
Pedestrian Trip Assignments

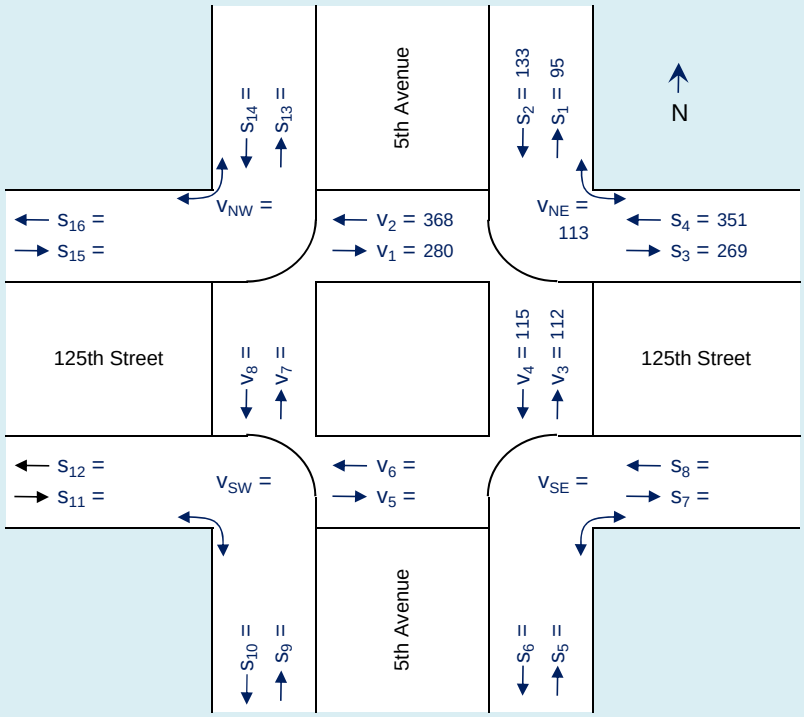
Figure
4

PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	Weekday Midday
Date:	28-Jun-16	Analysis Year:	2016

PEDESTRIAN PEAK HOUR VOLUMES

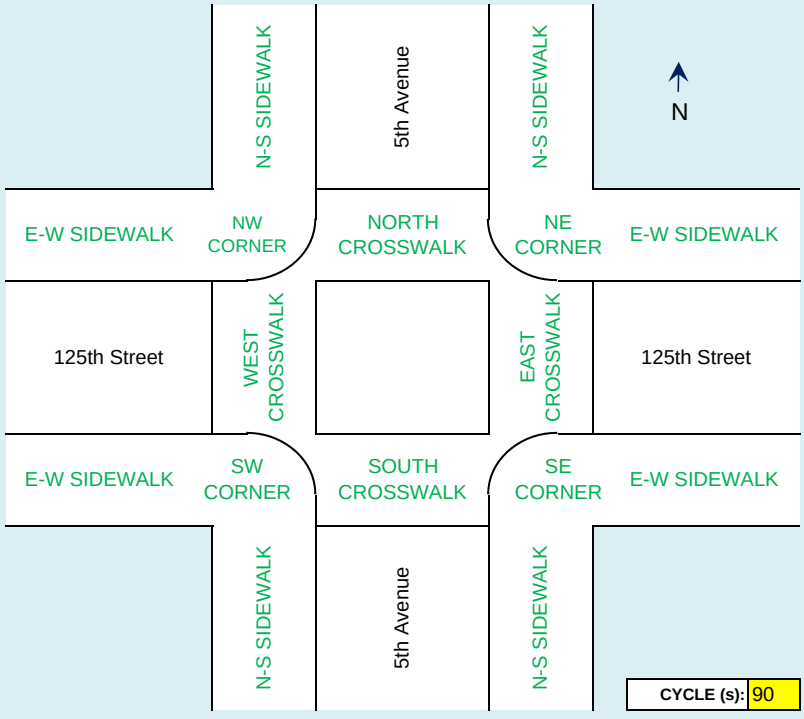


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	S_1	95	0.79
		S_2	133	
	E-W	S_3	269	0.91
		S_4	351	
SE	N-S	S_5		
		S_6		
	E-W	S_7		
		S_8		
SW	N-S	S_9		
		S_{10}		
	E-W	S_{11}		
		S_{12}		
NW	N-S	S_{13}		
		S_{14}		
	E-W	S_{15}		
		S_{16}		

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	V_1	280	0.85
	V_2	368	0.84
E	V_3	112	0.72
	V_4	115	0.93
S	V_5		
	V_6		
W	V_7		
	V_8		

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	V_{NE}	113	0.81
SE	V_{SE}		
SW	V_{SW}		
NW	V_{NW}		

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



CYCLE (s): 90

SIDEWALKS				
CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S	30.0	8.0	3.5
	E-W	20.0	7.0	3.5
SE	N-S			
	E-W			
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Sum of widths and shy distances from obstructions.

CORNERS				
CORNER	SIDEWALK	TOTAL WIDTH*, W (ft)	RADIUS, R (ft)	OBSTRUCTIONS, Ob (ft^2)
NE	N-S	24.0	28.0	19.32
	E-W	20.0		
SE	N-S			
	E-W			
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Override if corner width is different than sidewalk width.

CROSSWALKS										
CROSS-WALK	LENGTH, L (ft)	WIDTH, W (ft)	WALK SPEED, S_p (ft/s)	CROSSING TIME (sec)				CONFL VEH		
				WALK	FDW	DW*	PHASE TOTAL	V_{rt}	$V_{lt,perm}$	
N	40.0	19.0	3.5	30	10	5	45	0	0	
E	60.0	26.0	3.5	24	16	5	45	0	185	
S	0.0	0.0	0.0	30	10	5	45	0	0	#DIV/0!
W	0.0	0.0	0.0	24	16	5	45	0	0	#DIV/0!

* DW clearance for phase, not total DW time for entire cycle. Usually 5 sec.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	125th Street
Time Period:	Weekday Midday
Analysis Year:	2016

INPUTS

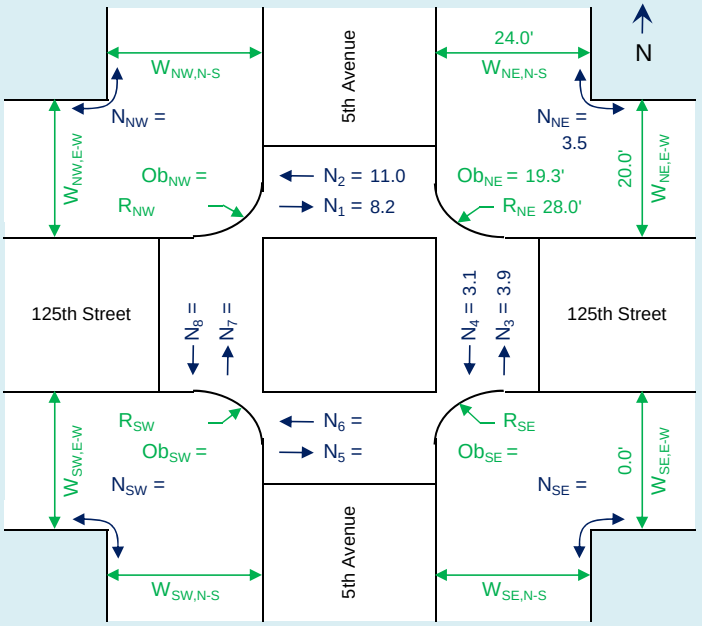
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 280	0.85	N_1 = 8.2
v_2 = 368	0.84	N_2 = 11.0
v_3 = 112	0.72	N_3 = 3.9
v_4 = 115	0.93	N_4 = 3.1
v_5 =		N_5 =
v_6 =		N_6 =
v_7 =		N_7 =
v_8 =		N_8 =
v_{NE} = 113	0.81	N_{NE} = 3.5
v_{SE} =		N_{SE} =
v_{SW} =		N_{SW} =
v_{NW} =		N_{NW} =

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	30	$g_{Walk,N}$ = 34
E	24	$g_{Walk,E}$ = 28
S	30	$g_{Walk,S}$ = 34
W	24	$g_{Walk,W}$ = 28

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW}$ = $C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW})$ = #VALUE! ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 143.5 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} \text{ \#VALUE!}$$

$TS_{c,NW}$ = $TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W})$ = #VALUE! ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = #VALUE! LOS #

NORTHEAST CORNER

$TS_{corner,NW}$ = $C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE})$ = 26,290.8 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 190.8 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 66.0 \text{ s}$$

$TS_{c,NE}$ = $TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E})$ = 25,006.6 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 210.8 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW}$ = $C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW})$ = #VALUE! ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} \text{ \#VALUE!}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} \text{ \#VALUE!}$$

$TS_{c,SW}$ = $TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W})$ = #VALUE! ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = #VALUE! LOS #

SOUTHEAST CORNER

$TS_{corner,SE}$ = $C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE})$ = #VALUE! ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} \text{ \#VALUE!}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 83.0 \text{ s}$$

$TS_{c,SE}$ = $TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E})$ = #VALUE! ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = #VALUE! LOS #

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	Weekday Midday
Date:	42549	Analysis Year:	2016

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 280	0.85	N_1 = 8.2
v_2 = 368	0.84	N_2 = 11.0
v_3 = 112	0.72	N_3 = 3.9
v_4 = 115	0.93	N_4 = 3.1
v_5 =		N_5 =
v_6 =		N_6 =
v_7 =		N_7 =
v_8 =		N_8 =

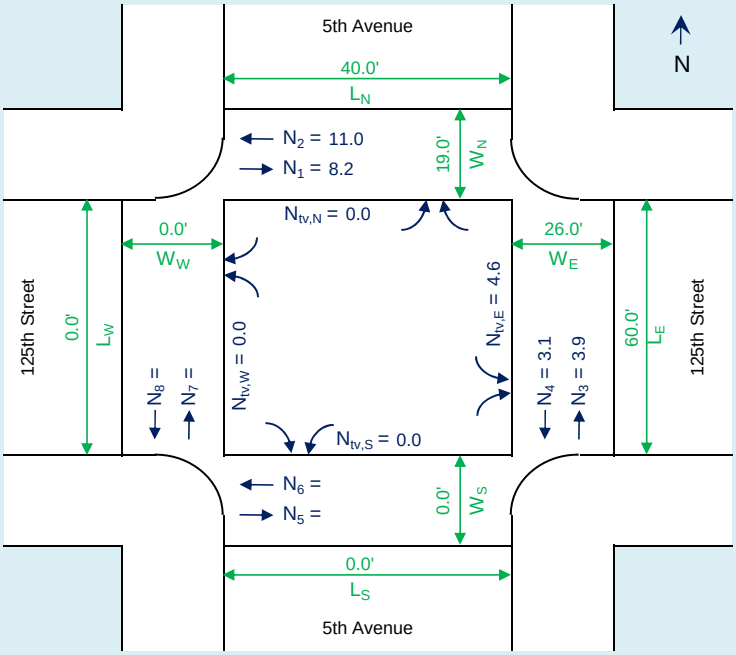
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ = 0	$N_{tv,N}$ = 0.0
$v_{rt,N}$ = 0	
$v_{lt,perm,E}$ = 185	$N_{tv,E}$ = 4.6
$v_{rt,E}$ = 0	
$v_{lt,perm,S}$ = 0	$N_{tv,S}$ = 0.0
$v_{rt,S}$ = 0	
$v_{lt,perm,W}$ = 0	$N_{tv,W}$ = 0.0
$v_{rt,W}$ = 0	

WALKING SPEED & CROSSING TIME

CROSS-WALK	S_p (ft/s)	WALK (s)	g_{Walk} = WALK + 4 (s)
N	3.5	30	$g_{Walk,N}$ = 34
E	3.5	24	$g_{Walk,E}$ = 28
S	0.0	30	$g_{Walk,S}$ = 34
W	0.0	24	$g_{Walk,W}$ = 28

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 25{,}840.0$ ft^2-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 0.0$ ft^2-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 25{,}840.0$ ft^2-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 5.1$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 6.8$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 15.4$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 15.6$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 297.3$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 86.9 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 43{,}680.0$ ft^2-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 4{,}810.0$ ft^2-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 38{,}870.0$ ft^2-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 2.7$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 2.1$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 20.6$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 20.6$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 143.8$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 270.4 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 0.0$ ft^2-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 0.0$ ft^2-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 0.0$ ft^2-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$=$ #VALUE!

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$=$ #VALUE!

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$=$ #DIV/0!

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$=$ #DIV/0!

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$=$ #DIV/0!

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = #DIV/0! LOS #

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 0.0$ ft^2-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 0.0$ ft^2-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 0.0$ ft^2-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$=$ #VALUE!

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$=$ #VALUE!

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$=$ #DIV/0!

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$=$ #DIV/0!

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$=$ #DIV/0!

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

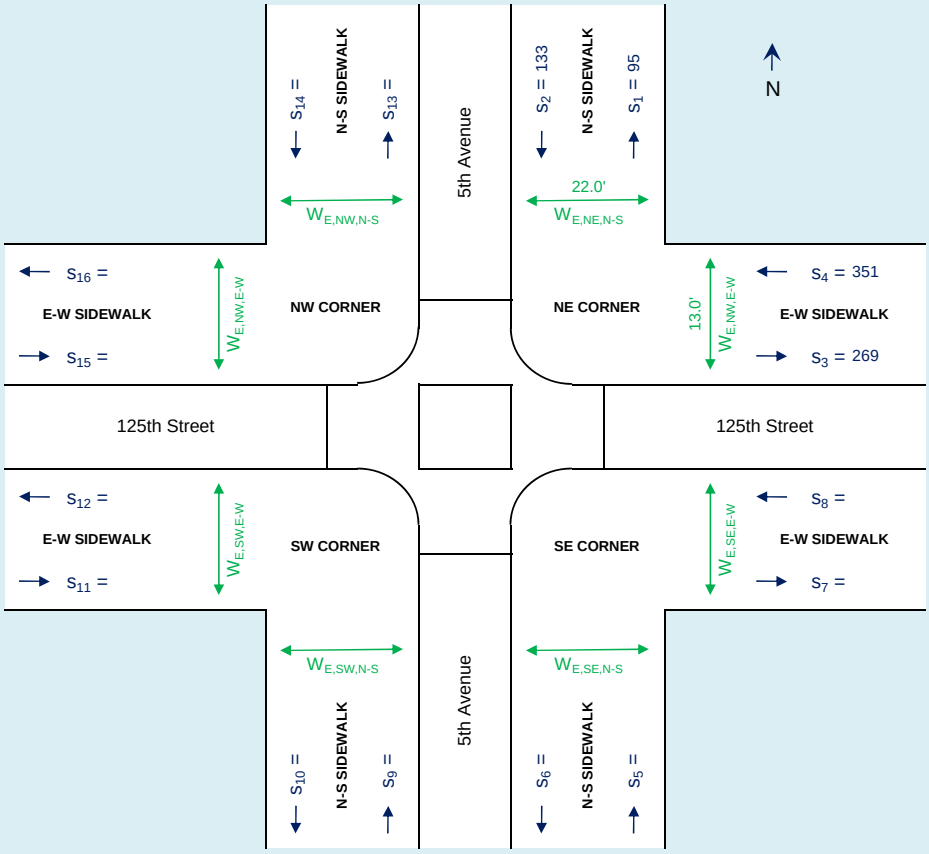
$M_{cw,W}$ = #DIV/0! LOS #

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	Weekday Midday
Date:	42549	Analysis Year:	2016

INPUTS



ANALYSIS

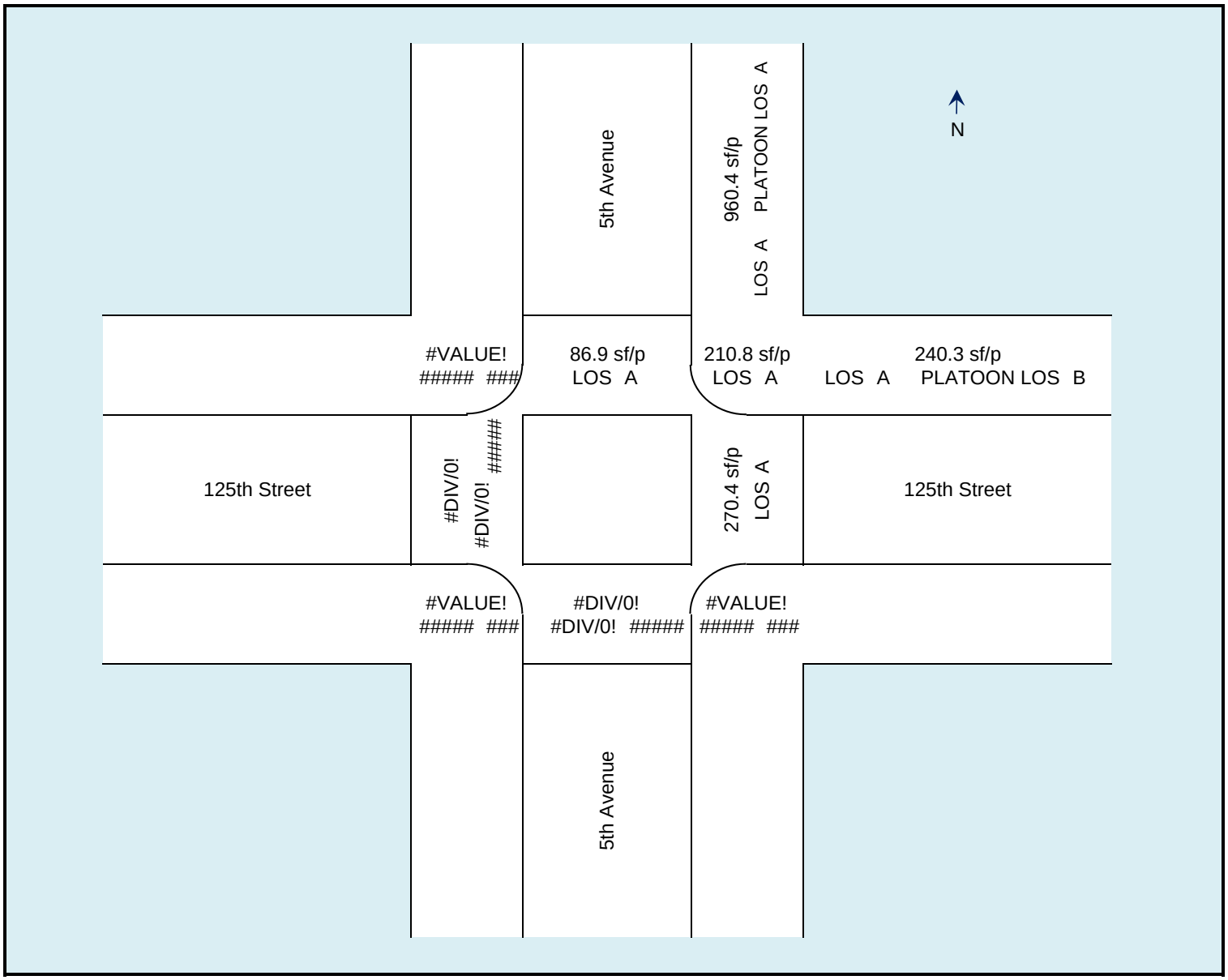
CORNER	MOVEMENT		VOLUME EACH DIR, s (p/hr)	VOLUME BOTH DIR, v_{ped} (p/hr)	PHF	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS, Ob (ft)	EFFECTIVE WIDTH, $W_E = W_T - Ob$ (ft)	FLOW RATE PER UNIT WIDTH, $v_p = \frac{v_{ped}}{60\ W_E\ PHF}$ (p/ft/min)	FREE FLOW WALK SPEED, S_{pf} (ft/s)	ADJUSTED WALK SPEED, $S_p = (1 - 0.0078\ v_p^2)\ S_{pf}$ (ft/s)	AVG PED SPACE, $A_p = 60\ \frac{S_p}{v_p}$ (ft^2/p)	LOS	PLATOON ADJ LOS
NE	N-S	s_1	95	228	0.79	30.0	8.0	22.0	0.2	3.5	3.5	960.4	A	A
		s_2	133											
	E-W	s_3	269	620	0.91	20.0	7.0	13.0	0.9	3.5	3.5	240.3	A	B
		s_4	351											
SE	N-S	s_5												
		s_6												
	E-W	s_7												
		s_8												
SW	N-S	s_9												
		s_{10}												
	E-W	s_{11}												
		s_{12}												
NW	N-S	s_{13}												
		s_{14}												
	E-W	s_{15}												
		s_{16}												

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	125th Street
Time Period:	Weekday Midday
Analysis Year:	2016

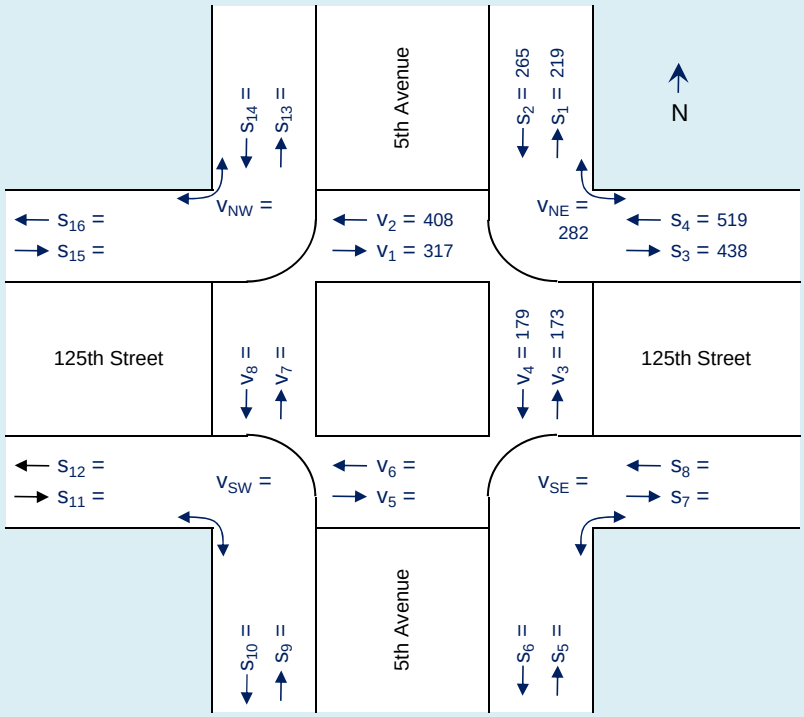


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	No Build Midday
Date:	28-Jun-16	Analysis Year:	2016

PEDESTRIAN PEAK HOUR VOLUMES

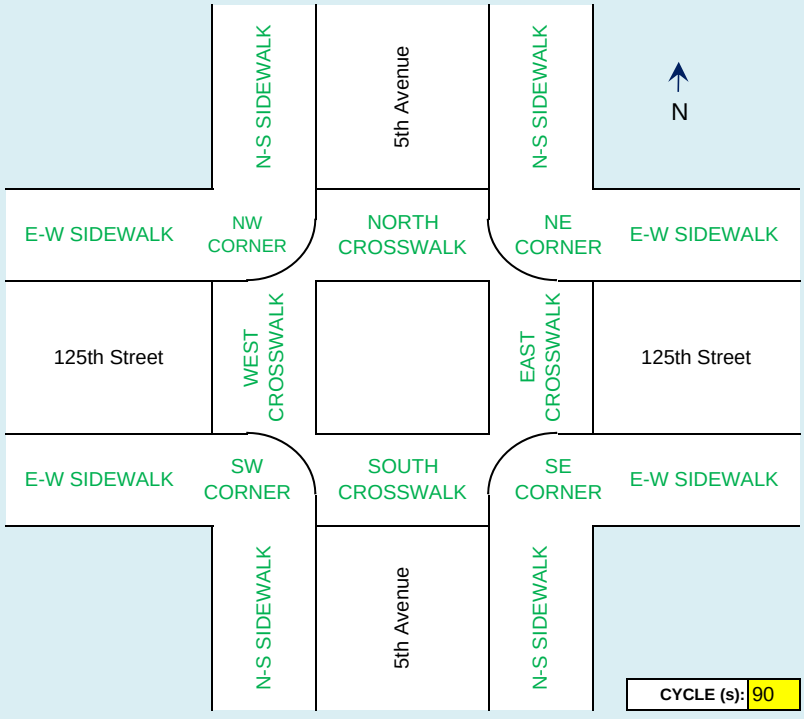


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	S_1	219	0.79
		S_2	265	
	E-W	S_3	438	0.91
		S_4	519	
SE	N-S	S_5		
		S_6		
	E-W	S_7		
		S_8		
SW	N-S	S_9		
		S_{10}		
	E-W	S_{11}		
		S_{12}		
NW	N-S	S_{13}		
		S_{14}		
	E-W	S_{15}		
		S_{16}		

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	V_1	317	0.85
	V_2	408	0.84
E	V_3	173	0.72
	V_4	179	0.93
S	V_5		
	V_6		
W	V_7		
	V_8		

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	V_{NE}	282	0.81
SE	V_{SE}		
SW	V_{SW}		
NW	V_{NW}		

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



CYCLE (s): 90

SIDEWALKS				
CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S	30.0	8.0	3.5
	E-W	20.0	7.0	3.5
SE	N-S			
	E-W			
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Sum of widths and shy distances from obstructions.

CORNERS				
CORNER	SIDEWALK	TOTAL WIDTH*, W (ft)	RADIUS, R (ft)	OBSTRUCTIONS, Ob (ft^2)
NE	N-S	24.0	28.0	19.32
	E-W	20.0		
SE	N-S			
	E-W			
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Override if corner width is different than sidewalk width.

CROSSWALKS									
CROSS-WALK	LENGTH, L (ft)	WIDTH, W (ft)	WALK SPEED, S_p (ft/s)	CROSSING TIME (sec)				CONFL VEH	
				WALK	FDW	DW*	PHASE TOTAL	V_{rt}	$V_{lt,perm}$
N	40.0	19.0	3.5	30	10	5	45	0	0	
E	60.0	26.0	3.5	24	16	5	45	0	186	
S	0.0	0.0	0.0	30	10	5	45	0	0	#DIV/0!
W	0.0	0.0	0.0	24	16	5	45	0	0	#DIV/0!

* DW clearance for phase, not total DW time for entire cycle. Usually 5 sec.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	125th Street
Time Period:	No Build Midday
Analysis Year:	2016

INPUTS

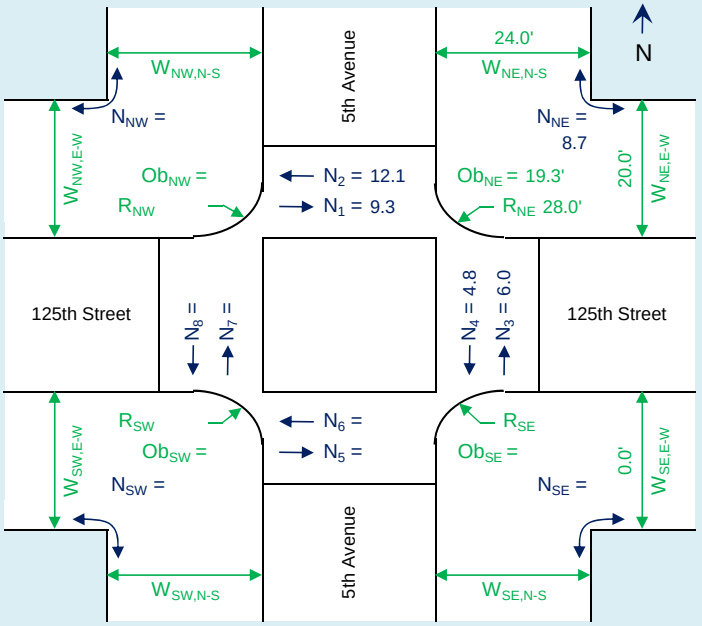
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 317	0.85	N_1 = 9.3
v_2 = 408	0.84	N_2 = 12.1
v_3 = 173	0.72	N_3 = 6.0
v_4 = 179	0.93	N_4 = 4.8
v_5 =		N_5 =
v_6 =		N_6 =
v_7 =		N_7 =
v_8 =		N_8 =
v_{NE} = 282	0.81	N_{NE} = 8.7
v_{SE} =		N_{SE} =
v_{SW} =		N_{SW} =
v_{NW} =		N_{NW} =

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	30	$g_{Walk,N}$ = 34
E	24	$g_{Walk,E}$ = 28
S	30	$g_{Walk,S}$ = 34
W	24	$g_{Walk,W}$ = 28

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW}$ = $C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW})$ = #VALUE! ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 162.4 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} \text{ \#VALUE!}$$

$TS_{c,NW}$ = $TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W})$ = #VALUE! ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = #VALUE! LOS #

NORTHEAST CORNER

$TS_{corner,NW}$ = $C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE})$ = 26,290.8 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 211.6 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 102.8 \text{ s}$$

$TS_{c,NE}$ = $TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E})$ = 24,719.2 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 150.8 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW}$ = $C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW})$ = #VALUE! ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} \text{ \#VALUE!}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} \text{ \#VALUE!}$$

$TS_{c,SW}$ = $TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W})$ = #VALUE! ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = #VALUE! LOS #

SOUTHEAST CORNER

$TS_{corner,SE}$ = $C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE})$ = #VALUE! ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} \text{ \#VALUE!}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 128.3 \text{ s}$$

$TS_{c,SE}$ = $TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E})$ = #VALUE! ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = #VALUE! LOS #

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	No Build Midday
Date:	42549	Analysis Year:	2016

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 317	0.85	N_1 = 9.3
v_2 = 408	0.84	N_2 = 12.1
v_3 = 173	0.72	N_3 = 6.0
v_4 = 179	0.93	N_4 = 4.8
v_5 =		N_5 =
v_6 =		N_6 =
v_7 =		N_7 =
v_8 =		N_8 =

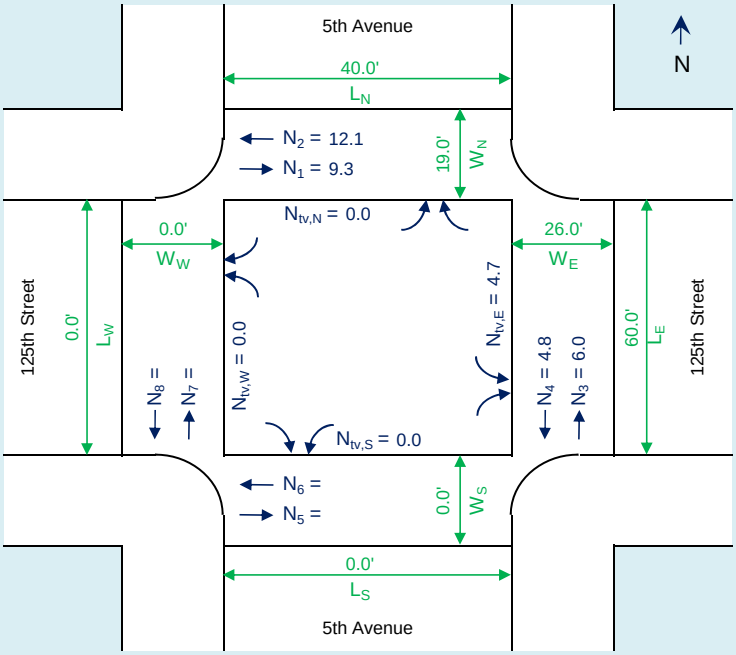
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ = 0	$N_{tv,N}$ = 0.0
$v_{rt,N}$ = 0	
$v_{lt,perm,E}$ = 186	$N_{tv,E}$ = 4.7
$v_{rt,E}$ = 0	
$v_{lt,perm,S}$ = 0	$N_{tv,S}$ = 0.0
$v_{rt,S}$ = 0	
$v_{lt,perm,W}$ = 0	$N_{tv,W}$ = 0.0
$v_{rt,W}$ = 0	

WALKING SPEED & CROSSING TIME

CROSS-WALK	S_p (ft/s)	WALK (s)	g_{Walk} = WALK + 4 (s)
N	3.5	30	$g_{Walk,N}$ = 34
E	3.5	24	$g_{Walk,E}$ = 28
S	0.0	30	$g_{Walk,S}$ = 34
W	0.0	24	$g_{Walk,W}$ = 28

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 25{,}840.0$ ft^2-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 0.0$ ft^2-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 25{,}840.0$ ft^2-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 5.8$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 7.6$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 15.5$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 15.7$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 334.7$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 77.2 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 43{,}680.0$ ft^2-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 4{,}836.0$ ft^2-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 38{,}844.0$ ft^2-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 4.1$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 3.3$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 20.8$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 20.7$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 224.3$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 173.2 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 0.0$ ft^2-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 0.0$ ft^2-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 0.0$ ft^2-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$=$ #VALUE!

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$=$ #VALUE!

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$=$ #DIV/0!

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$=$ #DIV/0!

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$=$ #DIV/0!

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = #DIV/0! LOS #

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 0.0$ ft^2-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 0.0$ ft^2-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 0.0$ ft^2-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$=$ #VALUE!

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$=$ #VALUE!

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$=$ #DIV/0!

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$=$ #DIV/0!

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$=$ #DIV/0!

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

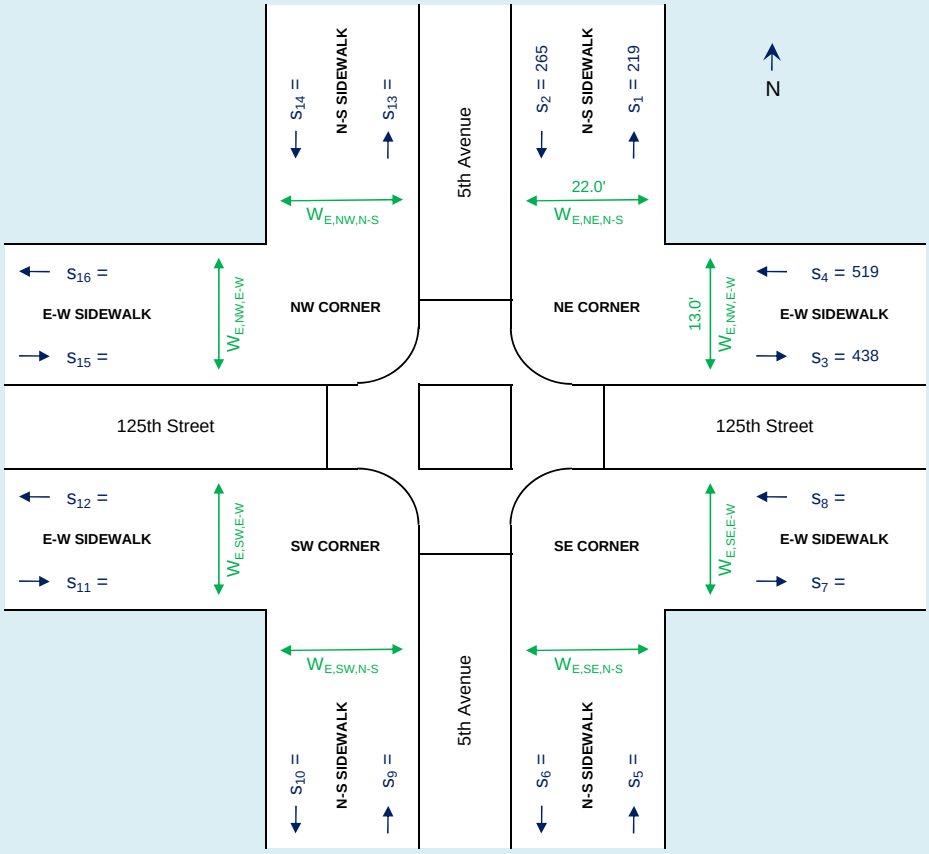
$M_{cw,W}$ = #DIV/0! LOS #

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	No Build Midday
Date:	42549	Analysis Year:	2016

INPUTS



ANALYSIS

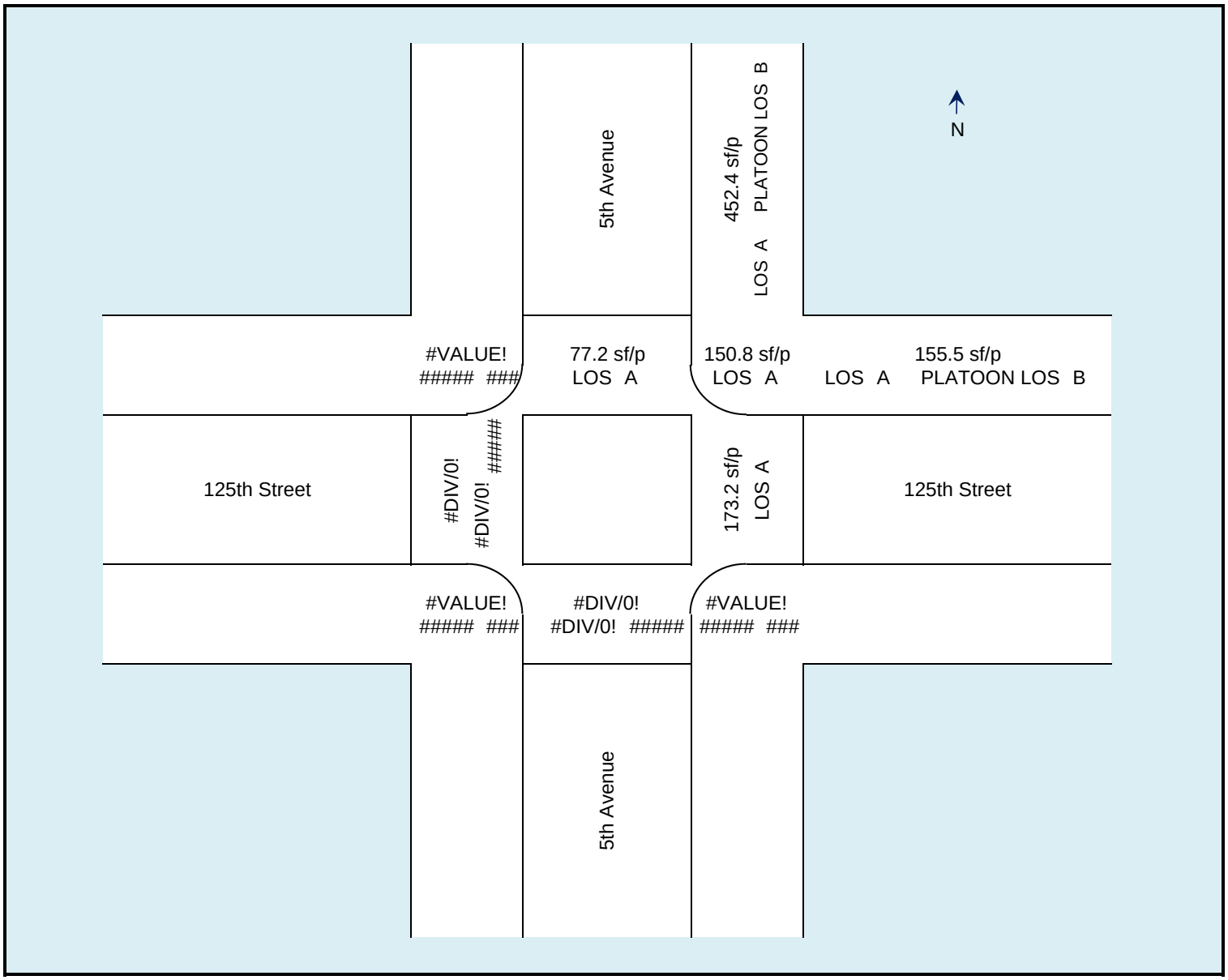
CORNER	MOVEMENT		VOLUME EACH DIR, s (p/hr)	VOLUME BOTH DIR, v_{ped} (p/hr)	PHF	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS, Ob (ft)	EFFECTIVE WIDTH, $W_E = W_T - Ob$ (ft)	FLOW RATE PER UNIT WIDTH, $v_p = \frac{v_{ped}}{60\ W_E\ PHF}$ (p/ft/min)	FREE FLOW WALK SPEED, S_{pf} (ft/s)	ADJUSTED WALK SPEED, $S_p = (1 - 0.0078\ v_p^2)\ S_{pf}$ (ft/s)	AVG PED SPACE, $A_p = 60\ \frac{S_p}{v_p}$ (ft^2/p)	LOS	PLATOON ADJ LOS
NE	N-S	s_1	219	484	0.79	30.0	8.0	22.0	0.5	3.5	3.5	452.4	A	B
		s_2	265											
	E-W	s_3	438	957	0.91	20.0	7.0	13.0	1.3	3.5	3.5	155.5	A	B
		s_4	519											
SE	N-S	s_5												
		s_6												
	E-W	s_7												
		s_8												
SW	N-S	s_9												
		s_{10}												
	E-W	s_{11}												
		s_{12}												
NW	N-S	s_{13}												
		s_{14}												
	E-W	s_{15}												
		s_{16}												

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	125th Street
Time Period:	No Build Midday
Analysis Year:	2016

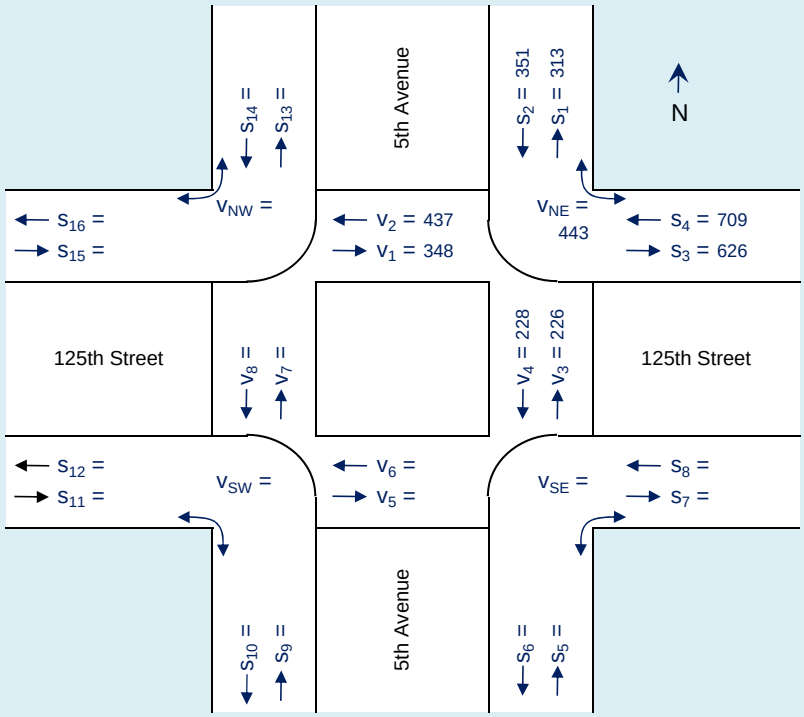


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	Build Midday
Date:	28-Jun-16	Analysis Year:	2016

PEDESTRIAN PEAK HOUR VOLUMES

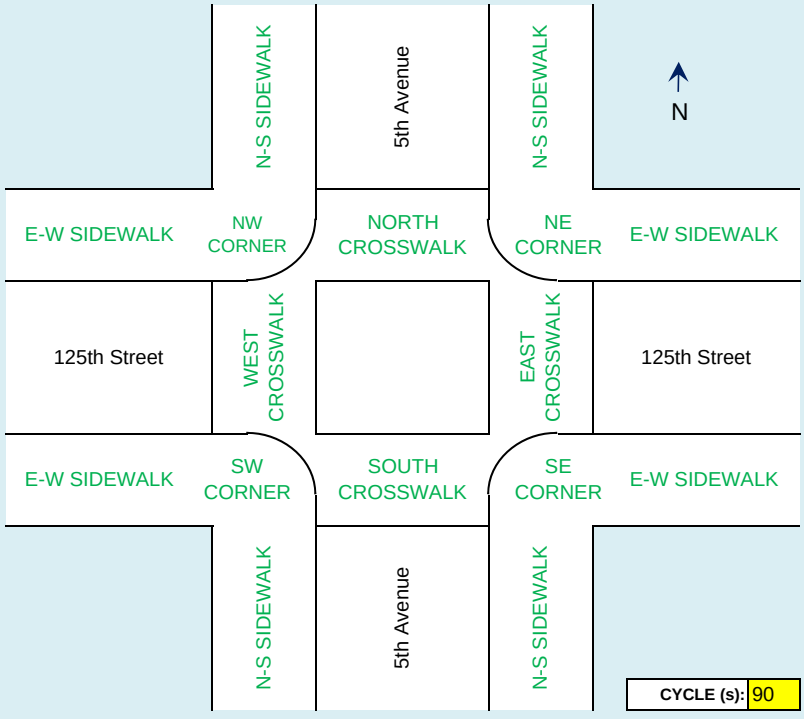


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	S_1	313	0.79
		S_2	351	
	E-W	S_3	626	0.91
		S_4	709	
SE	N-S	S_5		
		S_6		
	E-W	S_7		
		S_8		
SW	N-S	S_9		
		S_{10}		
	E-W	S_{11}		
		S_{12}		
NW	N-S	S_{13}		
		S_{14}		
	E-W	S_{15}		
		S_{16}		

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	V_1	348	0.85
	V_2	437	0.84
E	V_3	226	0.72
	V_4	228	0.93
S	V_5		
	V_6		
W	V_7		
	V_8		

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	V_{NE}	443	0.81
SE	V_{SE}		
SW	V_{SW}		
NW	V_{NW}		

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



CYCLE (s): 90

SIDEWALKS				
CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S	30.0	8.0	3.5
	E-W	20.0	7.0	3.5
SE	N-S			
	E-W			
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Sum of widths and shy distances from obstructions.

CORNERS				
CORNER	SIDEWALK	TOTAL WIDTH*, W (ft)	RADIUS, R (ft)	OBSTRUCTIONS, Ob (ft^2)
NE	N-S	24.0	28.0	19.32
	E-W	20.0		
SE	N-S			
	E-W			
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Override if corner width is different than sidewalk width.

CROSSWALKS									
CROSS-WALK	LENGTH, L (ft)	WIDTH, W (ft)	WALK SPEED, S_p (ft/s)	CROSSING TIME (sec)				CONFL VEH	
				WALK	FDW	DW*	PHASE TOTAL	V_{rt}	$V_{lt,perm}$
N	40.0	19.0	3.5	30	10	5	45	0	0	
E	60.0	26.0	3.5	24	16	5	45	0	186	
S	0.0	0.0	0.0	30	10	5	45	0	0	#DIV/0!
W	0.0	0.0	0.0	24	16	5	45	0	0	#DIV/0!

* DW clearance for phase, not total DW time for entire cycle. Usually 5 sec.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	125th Street
Time Period:	Build Midday
Analysis Year:	2016

INPUTS

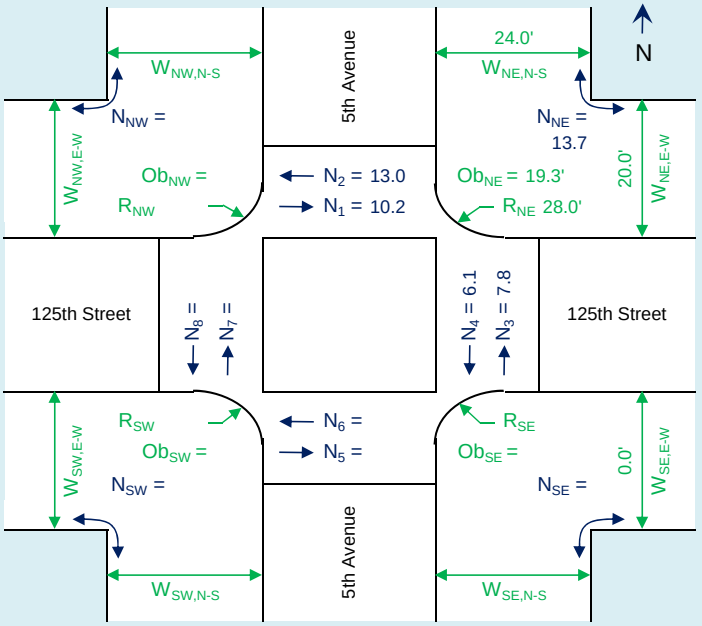
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 348	0.85	N_1 = 10.2
v_2 = 437	0.84	N_2 = 13.0
v_3 = 226	0.72	N_3 = 7.8
v_4 = 228	0.93	N_4 = 6.1
v_5 =		N_5 =
v_6 =		N_6 =
v_7 =		N_7 =
v_8 =		N_8 =
v_{NE} = 443	0.81	N_{NE} = 13.7
v_{SE} =		N_{SE} =
v_{SW} =		N_{SW} =
v_{NW} =		N_{NW} =

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	30	$g_{Walk,N}$ = 34
E	24	$g_{Walk,E}$ = 28
S	30	$g_{Walk,S}$ = 34
W	24	$g_{Walk,W}$ = 28

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW}$ = $C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW})$ = #VALUE! ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 178.3 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} \text{ \#VALUE!}$$

$TS_{c,NW}$ = $TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W})$ = #VALUE! ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = #VALUE! LOS #

NORTHEAST CORNER

$TS_{corner,NW}$ = $C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE})$ = 26,290.8 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 226.6 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 130.9 \text{ s}$$

$TS_{c,NE}$ = $TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E})$ = 24,503.4 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 120.4 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW}$ = $C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW})$ = #VALUE! ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} \text{ \#VALUE!}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} \text{ \#VALUE!}$$

$TS_{c,SW}$ = $TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W})$ = #VALUE! ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = #VALUE! LOS #

SOUTHEAST CORNER

$TS_{corner,SE}$ = $C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE})$ = #VALUE! ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} \text{ \#VALUE!}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 167.6 \text{ s}$$

$TS_{c,SE}$ = $TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E})$ = #VALUE! ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = #VALUE! LOS #

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	Build Midday
Date:	42549	Analysis Year:	2016

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 348	0.85	N_1 = 10.2
v_2 = 437	0.84	N_2 = 13.0
v_3 = 226	0.72	N_3 = 7.8
v_4 = 228	0.93	N_4 = 6.1
v_5 =		N_5 =
v_6 =		N_6 =
v_7 =		N_7 =
v_8 =		N_8 =

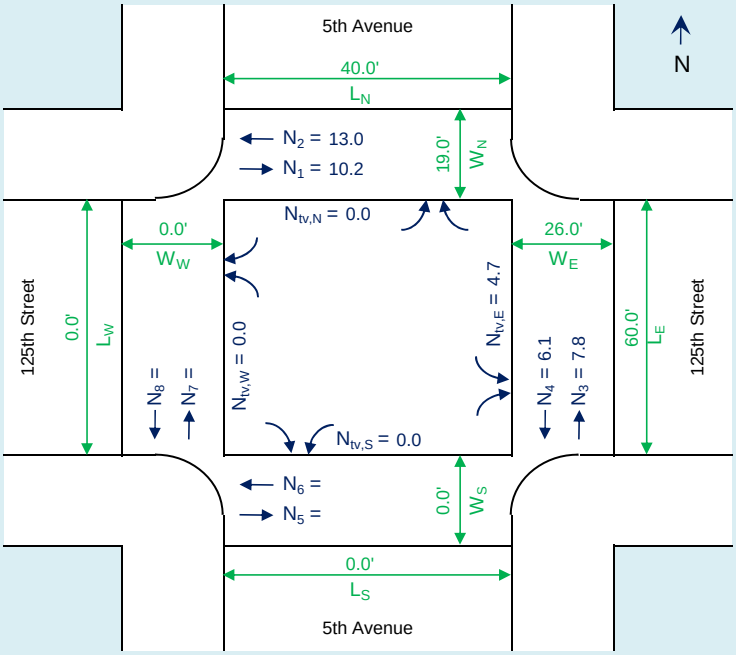
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ = 0	$N_{tv,N}$ = 0.0
$v_{rt,N}$ = 0	
$v_{lt,perm,E}$ = 186	$N_{tv,E}$ = 4.7
$v_{rt,E}$ = 0	
$v_{lt,perm,S}$ = 0	$N_{tv,S}$ = 0.0
$v_{rt,S}$ = 0	
$v_{lt,perm,W}$ = 0	$N_{tv,W}$ = 0.0
$v_{rt,W}$ = 0	

WALKING SPEED & CROSSING TIME

CROSS-WALK	S_p (ft/s)	WALK (s)	g_{Walk} = WALK + 4 (s)
N	3.5	30	$g_{Walk,N}$ = 34
E	3.5	24	$g_{Walk,E}$ = 28
S	0.0	30	$g_{Walk,S}$ = 34
W	0.0	24	$g_{Walk,W}$ = 28

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 25{,}840.0$ ft^2-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 0.0$ ft^2-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 25{,}840.0$ ft^2-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 6.4$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 8.1$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 15.5$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 15.8$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 364.2$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 70.9 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 43{,}680.0$ ft^2-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 4{,}836.0$ ft^2-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 38{,}844.0$ ft^2-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 5.4$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 4.2$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 20.9$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 20.8$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 291.4$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 133.3 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 0.0$ ft^2-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 0.0$ ft^2-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 0.0$ ft^2-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$=$ #VALUE!

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$=$ #VALUE!

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$=$ #DIV/0!

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$=$ #DIV/0!

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$=$ #DIV/0!

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = #DIV/0! LOS #

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 0.0$ ft^2-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 0.0$ ft^2-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 0.0$ ft^2-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$=$ #VALUE!

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$=$ #VALUE!

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$=$ #DIV/0!

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$=$ #DIV/0!

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$=$ #DIV/0!

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

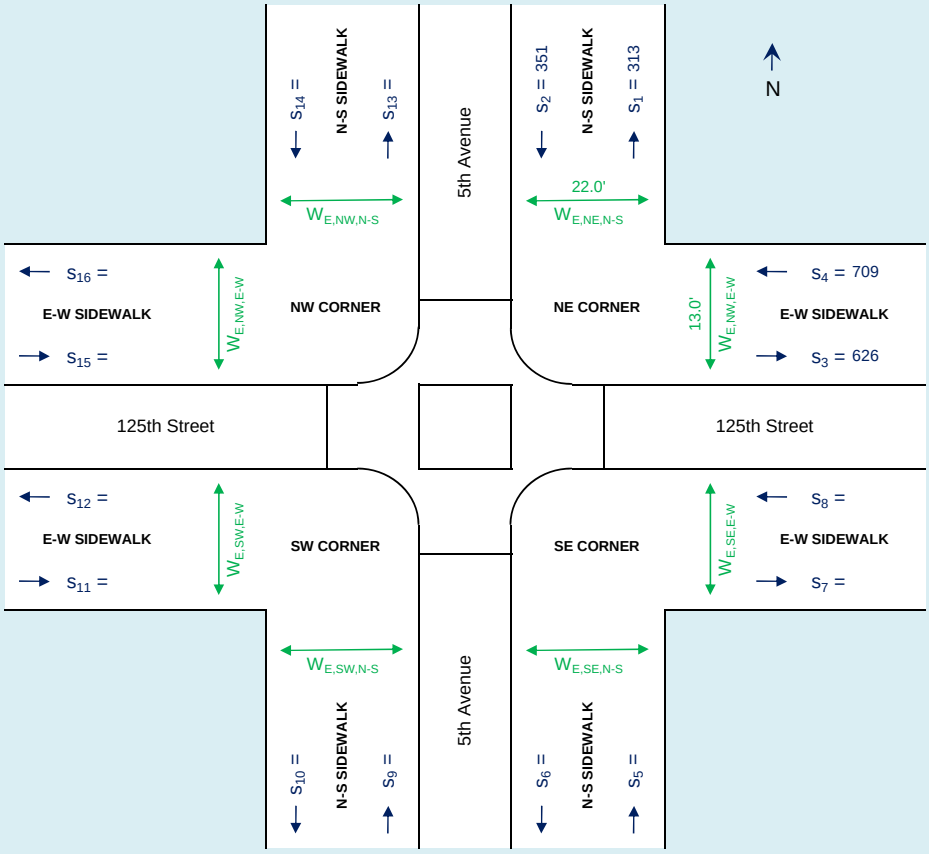
$M_{cw,W}$ = #DIV/0! LOS #

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	Build Midday
Date:	42549	Analysis Year:	2016

INPUTS



ANALYSIS

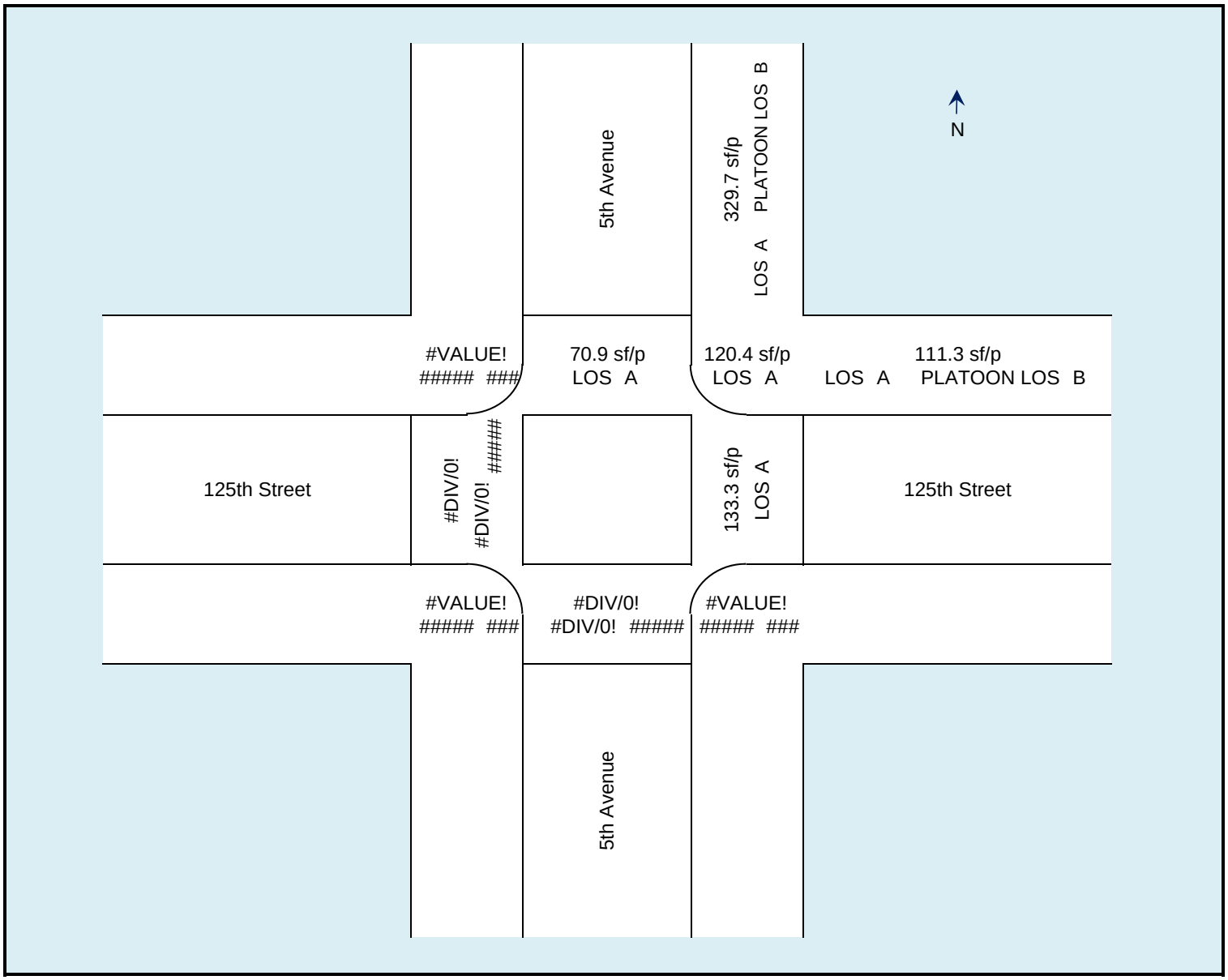
CORNER	MOVEMENT		VOLUME EACH DIR, s (p/hr)	VOLUME BOTH DIR, v_{ped} (p/hr)	PHF	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS, Ob (ft)	EFFECTIVE WIDTH, $W_E = W_T - Ob$ (ft)	FLOW RATE PER UNIT WIDTH, $v_p = \frac{v_{ped}}{60\ W_E\ PHF}$ (p/ft/min)	FREE FLOW WALK SPEED, S_{pf} (ft/s)	ADJUSTED WALK SPEED, $S_p = (1 - 0.0078\ v_p^2)\ S_{pf}$ (ft/s)	AVG PED SPACE, $A_p = 60\ \frac{S_p}{v_p}$ (ft^2/p)	LOS	PLATOON ADJ LOS
NE	N-S	s_1	313	664	0.79	30.0	8.0	22.0	0.6	3.5	3.5	329.7	A	B
		s_2	351											
	E-W	s_3	626	1335	0.91	20.0	7.0	13.0	1.9	3.5	3.5	111.3	A	B
		s_4	709											
SE	N-S	s_5												
		s_6												
	E-W	s_7												
		s_8												
SW	N-S	s_9												
		s_{10}												
	E-W	s_{11}												
		s_{12}												
NW	N-S	s_{13}												
		s_{14}												
	E-W	s_{15}												
		s_{16}												

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	125th Street
Time Period:	Build Midday
Analysis Year:	2016

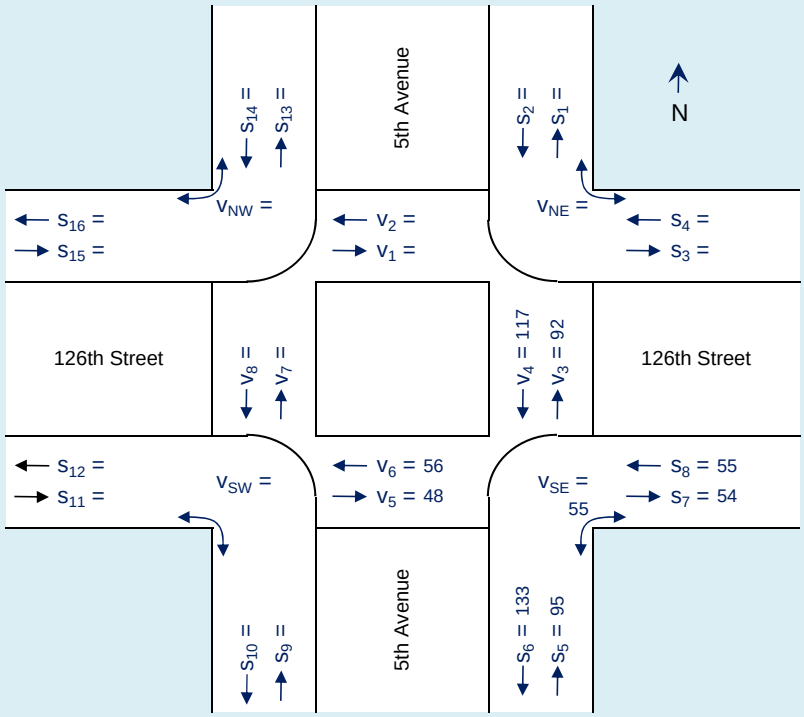


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	126th Street
Analyst:	CV	Time Period:	Weekday Midday
Date:	28-Jun-16	Analysis Year:	2016

PEDESTRIAN PEAK HOUR VOLUMES

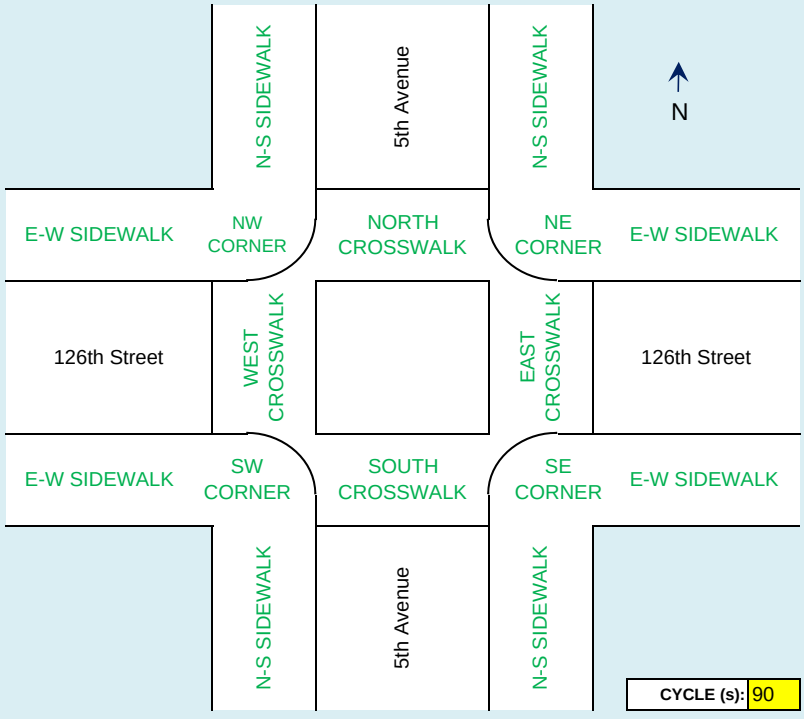


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	S_1		
		S_2		
	E-W	S_3		
		S_4		
SE	N-S	S_5	95	0.79
		S_6	133	
	E-W	S_7	54	0.80
		S_8	55	
SW	N-S	S_9		
		S_{10}		
	E-W	S_{11}		
		S_{12}		
NW	N-S	S_{13}		
		S_{14}		
	E-W	S_{15}		
		S_{16}		

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	V_1		
	V_2		
E	V_3	92	0.77
	V_4	117	0.75
S	V_5	48	0.52
	V_6	56	0.74
W	V_7		
	V_8		

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	V_{NE}		
SE	V_{SE}	55	0.72
SW	V_{SW}		
NW	V_{NW}		

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



CYCLE (s): 90

SIDEWALKS				
CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S			
	E-W			
SE	N-S	30.0	8.0	3.5
	E-W	13.0	6.0	3.5
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Sum of widths and shy distances from obstructions.

CORNERS				
CORNER	SIDEWALK	TOTAL WIDTH*, W (ft)	RADIUS, R (ft)	OBSTRUCTIONS, Ob (ft^2)
NE	N-S			
	E-W			
SE	N-S	20.0	20.0	10.64
	E-W	15.0		
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Override if corner width is different than sidewalk width.

CROSSWALKS									
CROSS-WALK	LENGTH, L (ft)	WIDTH, W (ft)	WALK SPEED, S_p (ft/s)	CROSSING TIME (sec)				CONFL VEH	
				WALK	FDW	DW*	PHASE TOTAL	V_{rt}	$V_{lt,perm}$
N				23	8	5	36			#DIV/0!
E	34.0	20.0	3.5	43	6	5	54	0	0	
S	40.0	13.0	3.5	23	8	5	36	0	118	
W				43	6	5	54			#DIV/0!

* DW clearance for phase, not total DW time for entire cycle. Usually 5 sec.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	126th Street
Time Period:	Weekday Midday
Analysis Year:	2016

INPUTS

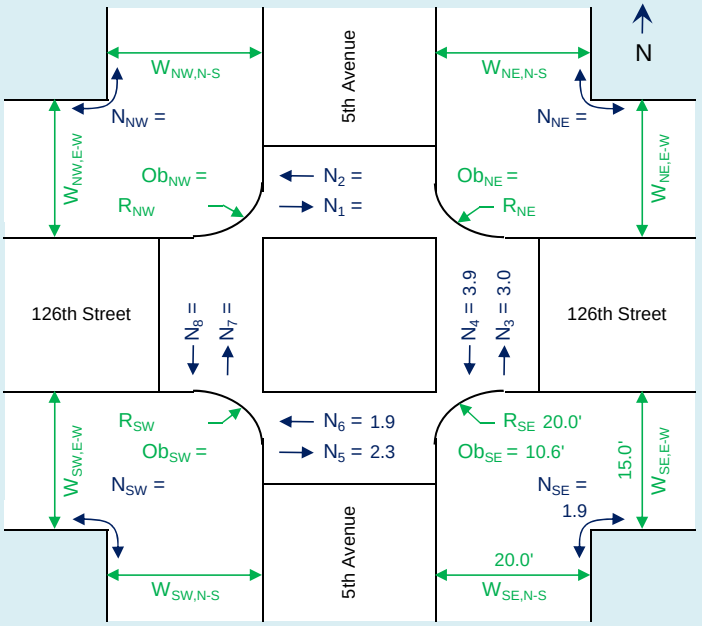
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 =		N_1 =
v_2 =		N_2 =
v_3 = 92	0.77	N_3 = 3.0
v_4 = 117	0.75	N_4 = 3.9
v_5 = 48	0.52	N_5 = 2.3
v_6 = 56	0.74	N_6 = 1.9
v_7 =		N_7 =
v_8 =		N_8 =
v_{NE} =		N_{NE} =
v_{SE} = 55	0.72	N_{SE} = 1.9
v_{SW} =		N_{SW} =
v_{NW} =		N_{NW} =

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	23	$g_{Walk,N}$ = 27
E	43	$g_{Walk,E}$ = 47
S	23	$g_{Walk,S}$ = 27
W	43	$g_{Walk,W}$ = 47

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ #VALUE! ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = \text{\#VALUE!}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} = \text{\#VALUE!}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ #VALUE! ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = #VALUE! LOS #

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ #VALUE! ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = \text{\#VALUE!}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 40.1 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ #VALUE! ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = #VALUE! LOS #

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ #VALUE! ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 50.9 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} = \text{\#VALUE!}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ #VALUE! ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = #VALUE! LOS #

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 18,302.4 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 41.7 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 30.7 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 17,940.4 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 345.1 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	126th Street
Analyst:	CV	Time Period:	Weekday Midday
Date:	42549	Analysis Year:	2016

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 =		N_1 =
v_2 =		N_2 =
v_3 = 92	0.77	N_3 = 3.0
v_4 = 117	0.75	N_4 = 3.9
v_5 = 48	0.52	N_5 = 2.3
v_6 = 56	0.74	N_6 = 1.9
v_7 =		N_7 =
v_8 =		N_8 =

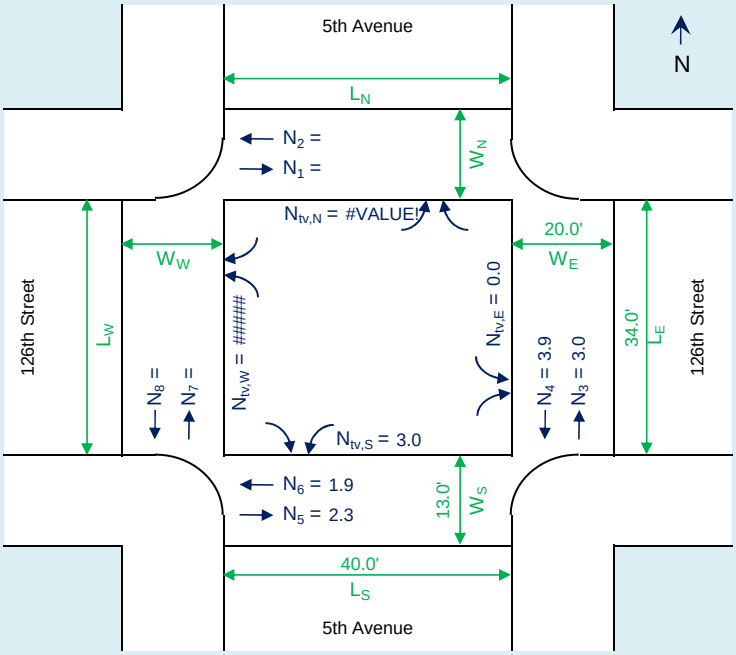
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ =	$N_{tv,N}$ = #######
$v_{rt,N}$ =	
$v_{lt,perm,E}$ = 0	$N_{tv,E}$ = 0.0
$v_{rt,E}$ = 0	
$v_{lt,perm,S}$ = 118	$N_{tv,S}$ = 3.0
$v_{rt,S}$ = 0	
$v_{lt,perm,W}$ =	$N_{tv,W}$ = #######
$v_{rt,W}$ =	

WALKING SPEED & CROSSING TIME

CROSS-WALK	S_p (ft/s)	WALK (s)	g_{Walk} = WALK + 4 (s)
N		23	$g_{Walk,N}$ = 27
E	3.5	43	$g_{Walk,E}$ = 47
S	3.5	23	$g_{Walk,S}$ = 27
W		43	$g_{Walk,W}$ = 47

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
= #VALUE! ft^2-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
= #VALUE! ft^2-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
= #VALUE! ft^2-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
= #VALUE!

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
= #VALUE!

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
=

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
=

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
=

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = LOS

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
= 31,960.0 ft^2-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
= 0.0 ft^2-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
= 31,960.0 ft^2-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
= 1.4 p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
= 1.9 p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
= 13.1 s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
= 13.2 s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
= 90.5 s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 353.2 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
= 14,040.0 ft^2-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
= 1,534.0 ft^2-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
= 12,506.0 ft^2-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
= 1.6 p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
= 1.3 p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
= 15.0 s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
= 14.9 s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
= 62.7 s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = 199.4 sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
= #VALUE! ft^2-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
= #VALUE! ft^2-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
= #VALUE! ft^2-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
= #VALUE!

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
= #VALUE!

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
=

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
=

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
=

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

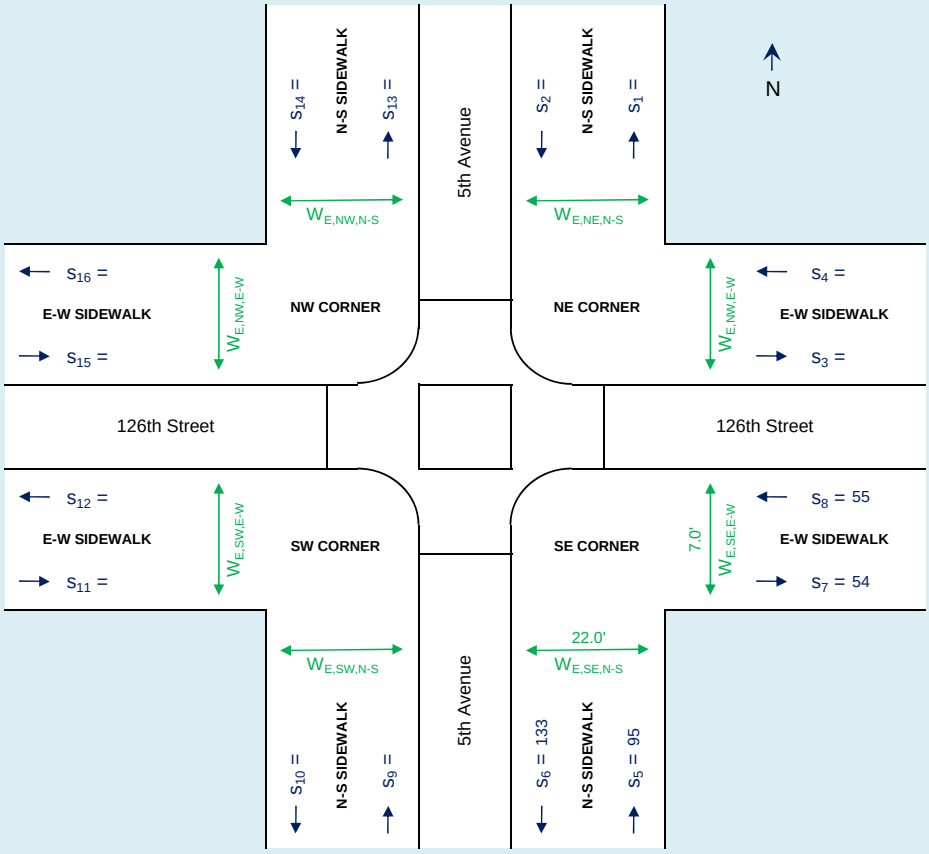
$M_{cw,W}$ = LOS

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	126th Street
Analyst:	CV	Time Period:	Weekday Midday
Date:	42549	Analysis Year:	2016

INPUTS



ANALYSIS

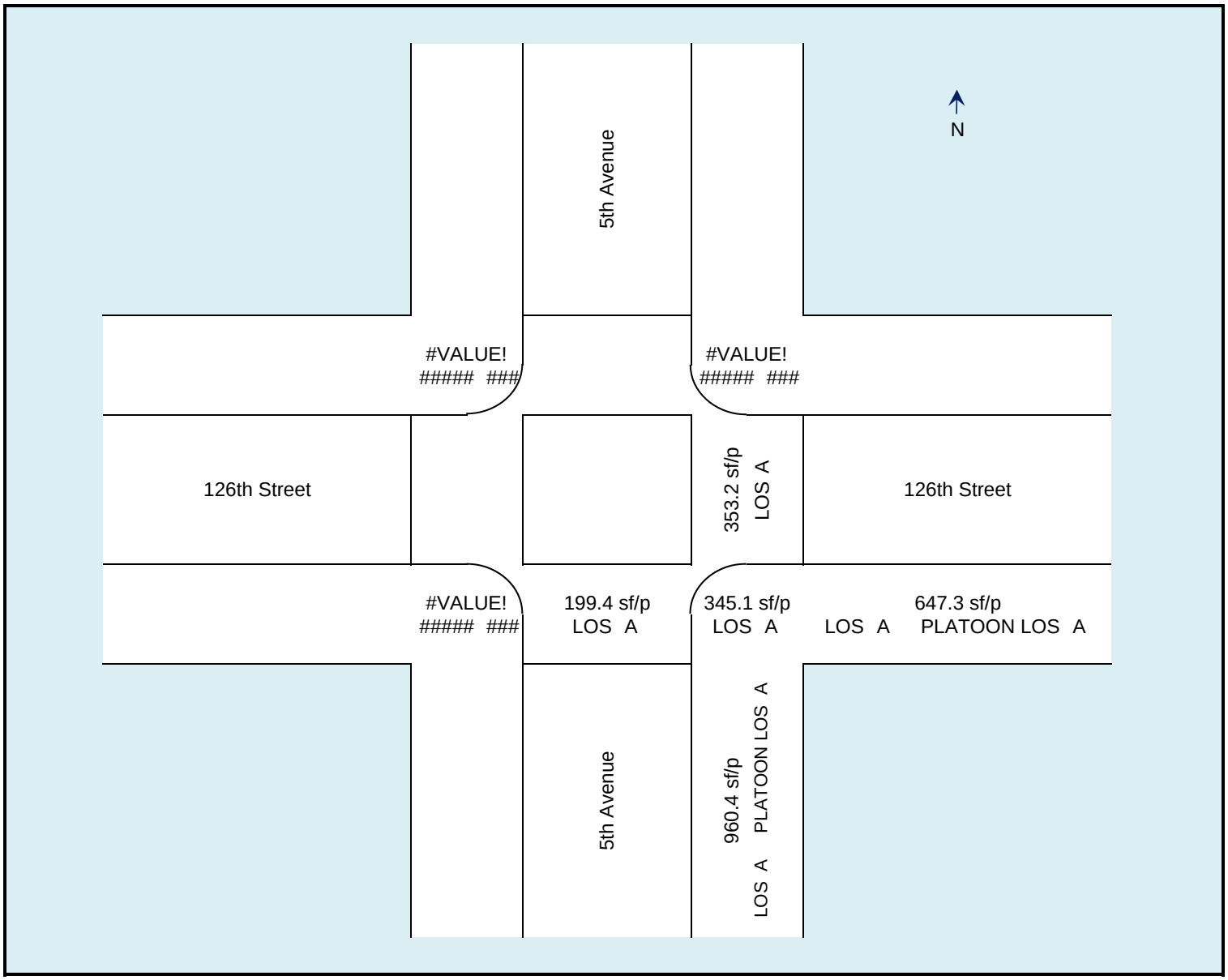
CORNER	MOVEMENT		VOLUME EACH DIR, s (p/hr)	VOLUME BOTH DIR, v_{ped} (p/hr)	PHF	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS, Ob (ft)	EFFECTIVE WIDTH, $W_E = W_T - Ob$ (ft)	FLOW RATE PER UNIT WIDTH, $v_p = \frac{v_{ped}}{60\ W_E\ PHF}$ (p/ft/min)	FREE FLOW WALK SPEED, S_{pf} (ft/s)	ADJUSTED WALK SPEED, $S_p = (1 - 0.0078\ v_p^2)\ S_{pf}$ (ft/s)	AVG PED SPACE, $A_p = 60\ \frac{S_p}{v_p}$ (ft^2/p)	LOS	PLATOON ADJ LOS
NE	N-S	s_1												
		s_2												
	E-W	s_3												
		s_4												
SE	N-S	s_5	95	228	0.79	30.0	8.0	22.0	0.2	3.5	3.5	960.4	A	A
		s_6	133											
	E-W	s_7	54	109	0.80	13.0	6.0	7.0	0.3	3.5	3.5	647.3	A	A
		s_8	55											
SW	N-S	s_9												
		s_{10}												
	E-W	s_{11}												
		s_{12}												
NW	N-S	s_{13}												
		s_{14}												
	E-W	s_{15}												
		s_{16}												

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	126th Street
Time Period:	Weekday Midday
Analysis Year:	2016

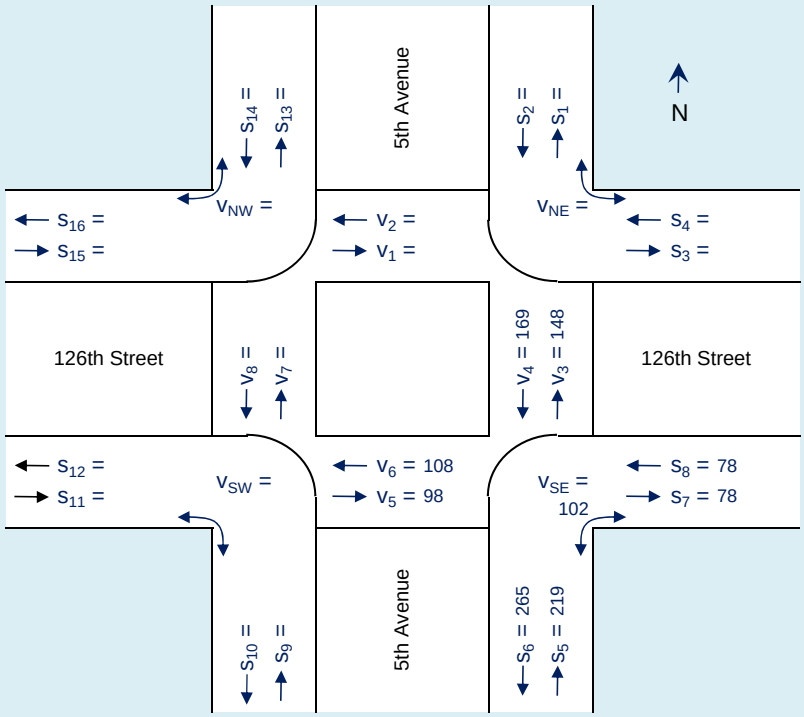


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	126th Street
Analyst:	CV	Time Period:	NB Weekday Midday
Date:	28-Jun-16	Analysis Year:	2016

PEDESTRIAN PEAK HOUR VOLUMES

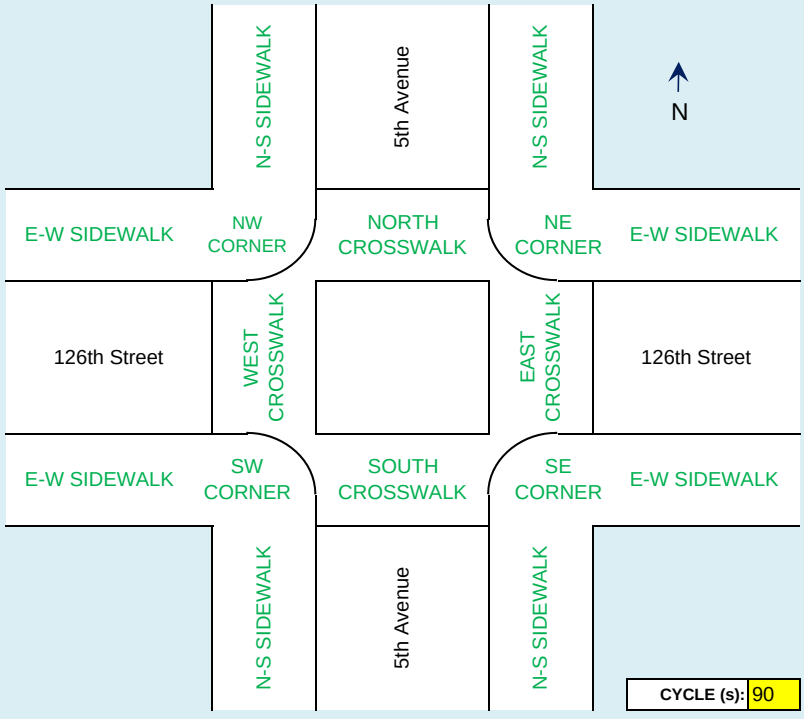


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	S_1		
		S_2		
	E-W	S_3		
		S_4		
SE	N-S	S_5	219	0.79
		S_6	265	
	E-W	S_7	78	0.80
		S_8	78	
SW	N-S	S_9		
		S_{10}		
	E-W	S_{11}		
		S_{12}		
NW	N-S	S_{13}		
		S_{14}		
	E-W	S_{15}		
		S_{16}		

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	V_1		
	V_2		
E	V_3	148	0.77
	V_4	169	0.75
S	V_5	98	0.52
	V_6	108	0.74
W	V_7		
	V_8		

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	V_{NE}		
SE	V_{SE}	102	0.72
SW	V_{SW}		
NW	V_{NW}		

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



CYCLE (s): 90

SIDEWALKS				
CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S			
	E-W			
SE	N-S	30.0	8.0	3.5
	E-W	13.0	6.0	3.5
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Sum of widths and shy distances from obstructions.

CORNERS				
CORNER	SIDEWALK	TOTAL WIDTH*, W (ft)	RADIUS, R (ft)	OBSTRUCTIONS, Ob (ft^2)
NE	N-S			
	E-W			
SE	N-S	20.0	20.0	10.64
	E-W	15.0		
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Override if corner width is different than sidewalk width.

CROSSWALKS									
CROSS-WALK	LENGTH, L (ft)	WIDTH, W (ft)	WALK SPEED, S_p (ft/s)	CROSSING TIME (sec)				CONFL VEH	
				WALK	FDW	DW*	PHASE TOTAL	V_{rt}	$V_{lt,perm}$
N				23	8	5	36			#DIV/0!
E	34.0	20.0	3.5	43	6	5	54	0	0	
S	40.0	13.0	3.5	23	8	5	36	0	119	
W				43	6	5	54			#DIV/0!

* DW clearance for phase, not total DW time for entire cycle. Usually 5 sec.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	126th Street
Time Period:	NB Weekday Midday
Analysis Year:	2016

INPUTS

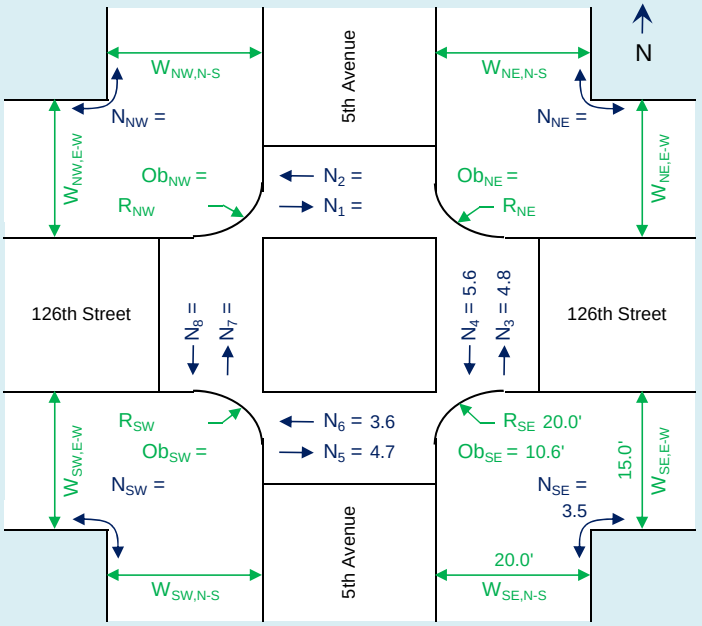
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 =		N_1 =
v_2 =		N_2 =
v_3 = 148	0.77	N_3 = 4.8
v_4 = 169	0.75	N_4 = 5.6
v_5 = 98	0.52	N_5 = 4.7
v_6 = 108	0.74	N_6 = 3.6
v_7 =		N_7 =
v_8 =		N_8 =
v_{NE} =		N_{NE} =
v_{SE} = 102	0.72	N_{SE} = 3.5
v_{SW} =		N_{SW} =
v_{NW} =		N_{NW} =

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	23	$g_{Walk,N}$ = 27
E	43	$g_{Walk,E}$ = 47
S	23	$g_{Walk,S}$ = 27
W	43	$g_{Walk,W}$ = 47

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ #VALUE! ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} \text{ #VALUE!}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} \text{ #VALUE!}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ #VALUE! ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = #VALUE! LOS #

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ #VALUE! ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} \text{ #VALUE!}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 57.9 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ #VALUE! ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = #VALUE! LOS #

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ #VALUE! ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 103.9 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} \text{ #VALUE!}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ #VALUE! ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = #VALUE! LOS #

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 18,302.4 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 80.5 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 49.4 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 17,653.3 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 197.5 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	126th Street
Analyst:	CV	Time Period:	NB Weekday Midday
Date:	42549	Analysis Year:	2016

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 =		N_1 =
v_2 =		N_2 =
v_3 = 148	0.77	N_3 = 4.8
v_4 = 169	0.75	N_4 = 5.6
v_5 = 98	0.52	N_5 = 4.7
v_6 = 108	0.74	N_6 = 3.6
v_7 =		N_7 =
v_8 =		N_8 =

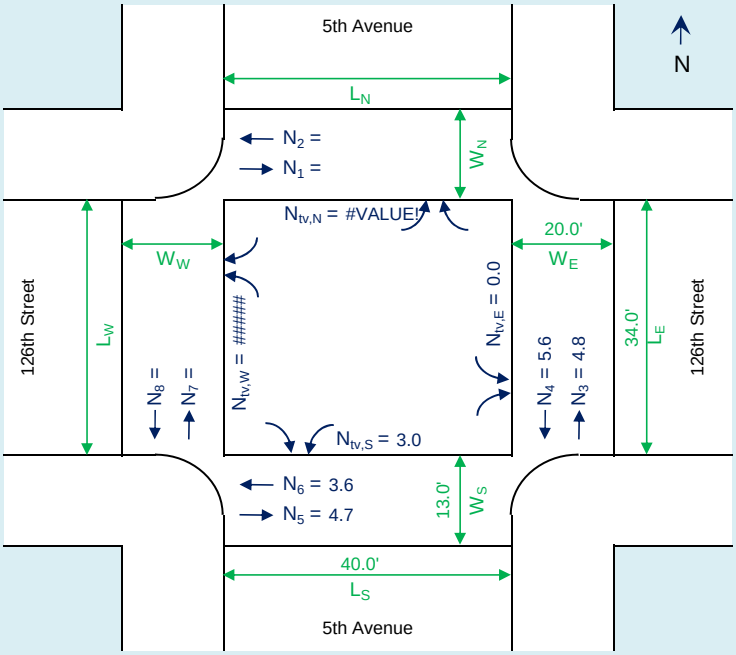
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ =	$N_{tv,N}$ = #######
$v_{rt,N}$ =	
$v_{lt,perm,E}$ = 0	$N_{tv,E}$ = 0.0
$v_{rt,E}$ = 0	
$v_{lt,perm,S}$ = 119	$N_{tv,S}$ = 3.0
$v_{rt,S}$ = 0	
$v_{lt,perm,W}$ =	$N_{tv,W}$ = #######
$v_{rt,W}$ =	

WALKING SPEED & CROSSING TIME

CROSS-WALK	S_p (ft/s)	WALK (s)	g_{Walk} = WALK + 4 (s)
N		23	$g_{Walk,N}$ = 27
E	3.5	43	$g_{Walk,E}$ = 47
S	3.5	23	$g_{Walk,S}$ = 27
W		43	$g_{Walk,W}$ = 47

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
= #VALUE! ft^2-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
= #VALUE! ft^2-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
= #VALUE! ft^2-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
= #VALUE!

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
= #VALUE!

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
=

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
=

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
=

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = LOS

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
= 31,960.0 ft^2-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
= 0.0 ft^2-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
= 31,960.0 ft^2-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
= 2.3 p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
= 2.7 p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
= 13.2 s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
= 13.3 s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
= 138.3 s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 231.0 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
= 14,040.0 ft^2-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
= 1,547.0 ft^2-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
= 12,493.0 ft^2-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
= 3.3 p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
= 2.6 p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
= 15.3 s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
= 15.2 s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
= 127.5 s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = 98.0 sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
= #VALUE! ft^2-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
= #VALUE! ft^2-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
= #VALUE! ft^2-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
= #VALUE!

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
= #VALUE!

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
=

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
=

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
=

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

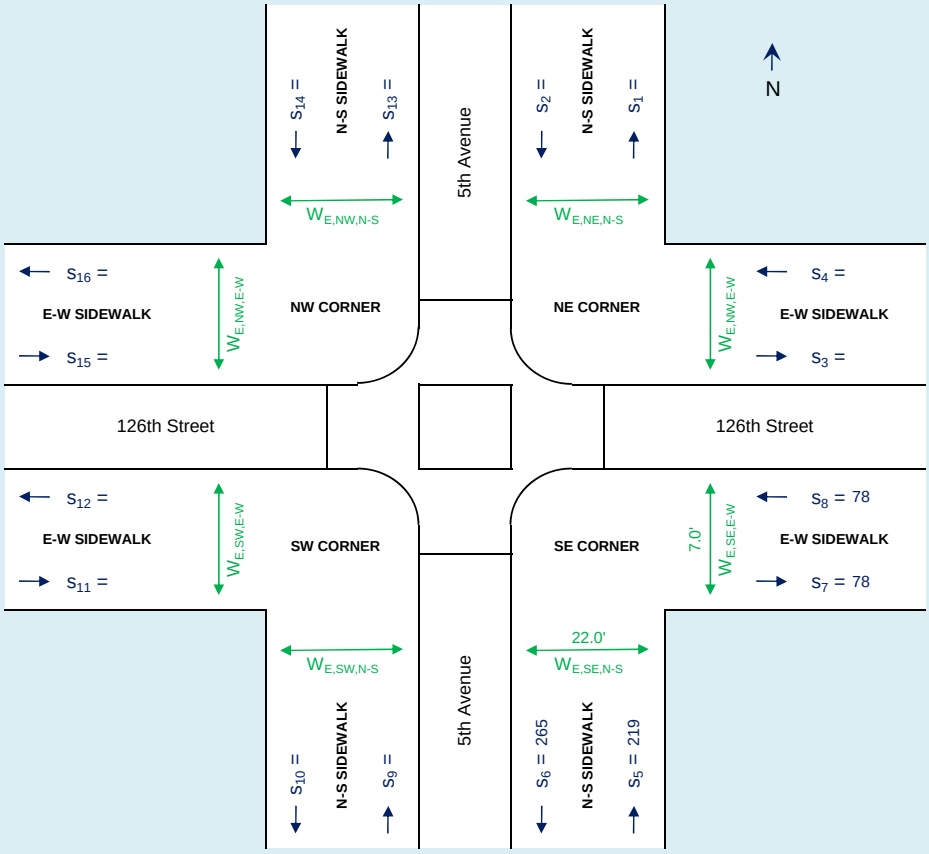
$M_{cw,W}$ = LOS

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	126th Street
Analyst:	CV	Time Period:	NB Weekday Midday
Date:	42549	Analysis Year:	2016

INPUTS



ANALYSIS

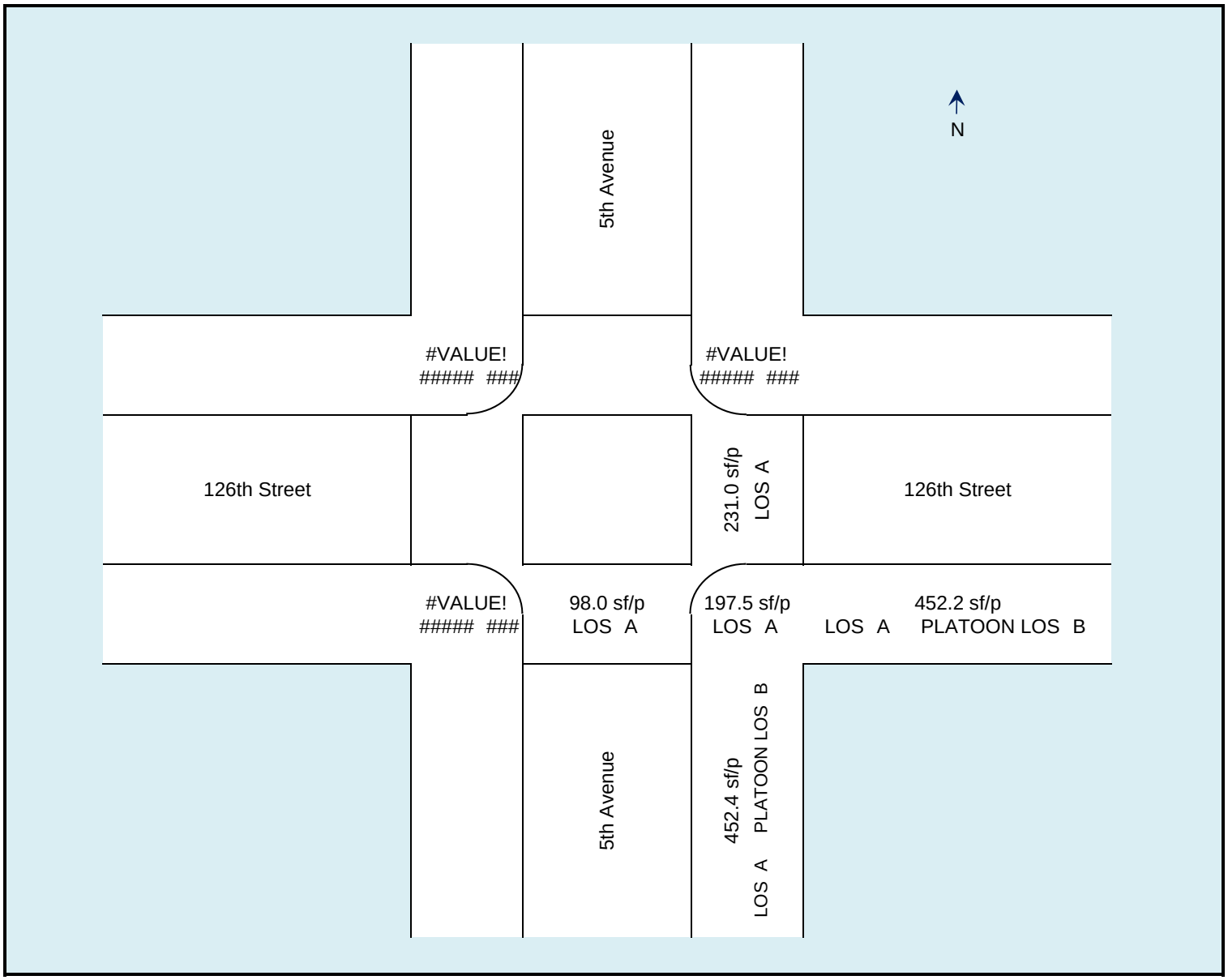
CORNER	MOVEMENT		VOLUME EACH DIR, s (p/hr)	VOLUME BOTH DIR, v_{ped} (p/hr)	PHF	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS, Ob (ft)	EFFECTIVE WIDTH, $W_E = W_T - Ob$ (ft)	FLOW RATE PER UNIT WIDTH, $v_p = \frac{v_{ped}}{60\ W_E\ PHF}$ (p/ft/min)	FREE FLOW WALK SPEED, S_{pf} (ft/s)	ADJUSTED WALK SPEED, $S_p = (1 - 0.0078\ v_p^2)\ S_{pf}$ (ft/s)	AVG PED SPACE, $A_p = 60\ \frac{S_p}{v_p}$ (ft^2/p)	LOS	PLATOON ADJ LOS
NE	N-S	s_1												
		s_2												
	E-W	s_3												
		s_4												
SE	N-S	s_5	219	484	0.79	30.0	8.0	22.0	0.5	3.5	3.5	452.4	A	B
		s_6	265											
	E-W	s_7	78	156	0.80	13.0	6.0	7.0	0.5	3.5	3.5	452.2	A	B
		s_8	78											
SW	N-S	s_9												
		s_{10}												
	E-W	s_{11}												
		s_{12}												
NW	N-S	s_{13}												
		s_{14}												
	E-W	s_{15}												
		s_{16}												

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	126th Street
Time Period:	NB Weekday Midday
Analysis Year:	2016

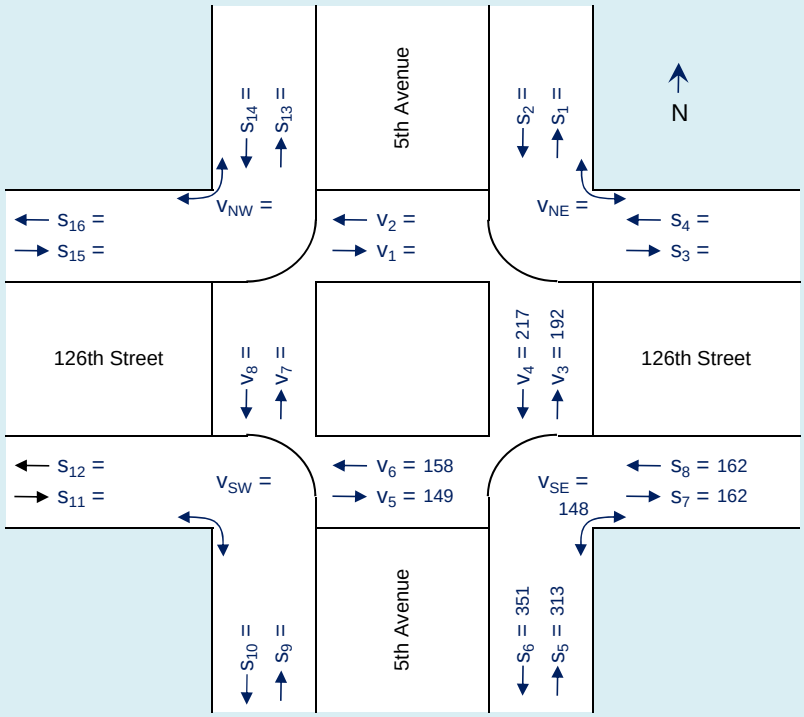


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	126th Street
Analyst:	CV	Time Period:	NB Weekday Midday
Date:	28-Jun-16	Analysis Year:	2016

PEDESTRIAN PEAK HOUR VOLUMES

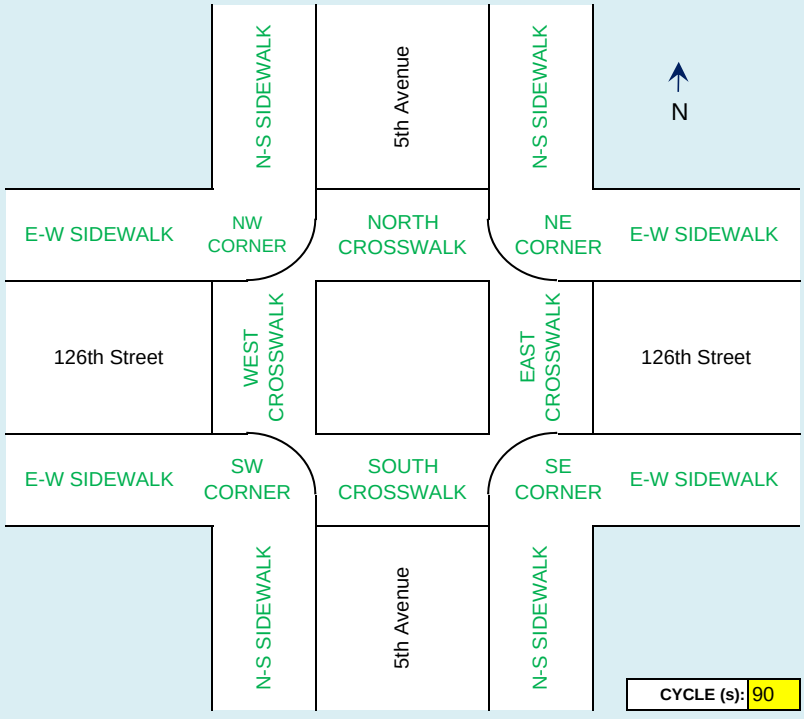


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	S_1		
		S_2		
	E-W	S_3		
		S_4		
SE	N-S	S_5	313	0.79
		S_6	351	
	E-W	S_7	162	0.80
		S_8	162	
SW	N-S	S_9		
		S_{10}		
	E-W	S_{11}		
		S_{12}		
NW	N-S	S_{13}		
		S_{14}		
	E-W	S_{15}		
		S_{16}		

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	V_1		
	V_2		
E	V_3	192	0.77
	V_4	217	0.75
S	V_5	149	0.52
	V_6	158	0.74
W	V_7		
	V_8		

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	V_{NE}		
SE	V_{SE}	148	0.72
SW	V_{SW}		
NW	V_{NW}		

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



CYCLE (s): 90

SIDEWALKS				
CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S			
	E-W			
SE	N-S	30.0	8.0	3.5
	E-W	13.0	6.0	3.5
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Sum of widths and shy distances from obstructions.

CORNERS				
CORNER	SIDEWALK	TOTAL WIDTH*, W (ft)	RADIUS, R (ft)	OBSTRUCTIONS, Ob (ft^2)
NE	N-S			
	E-W			
SE	N-S	20.0	20.0	10.64
	E-W	15.0		
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Override if corner width is different than sidewalk width.

CROSSWALKS									
CROSS-WALK	LENGTH, L (ft)	WIDTH, W (ft)	WALK SPEED, S_p (ft/s)	CROSSING TIME (sec)				CONFL VEH	
				WALK	FDW	DW*	PHASE TOTAL	V_{rt}	$V_{lt,perm}$
N				23	8	5	36			#DIV/0!
E	34.0	20.0	3.5	43	6	5	54	0	0	
S	40.0	13.0	3.5	23	8	5	36	0	119	
W				43	6	5	54			#DIV/0!

* DW clearance for phase, not total DW time for entire cycle. Usually 5 sec.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	126th Street
Time Period:	NB Weekday Midday
Analysis Year:	2016

INPUTS

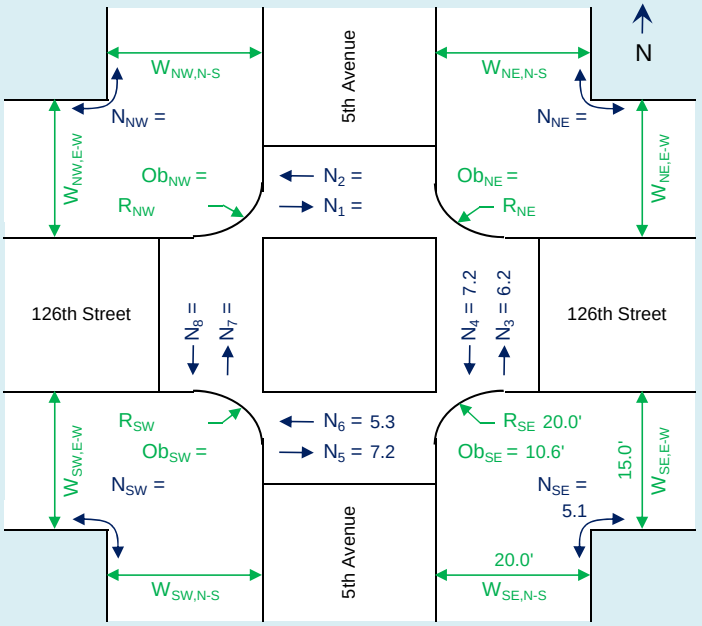
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 =		N_1 =
v_2 =		N_2 =
v_3 = 192	0.77	N_3 = 6.2
v_4 = 217	0.75	N_4 = 7.2
v_5 = 149	0.52	N_5 = 7.2
v_6 = 158	0.74	N_6 = 5.3
v_7 =		N_7 =
v_8 =		N_8 =
v_{NE} =		N_{NE} =
v_{SE} = 148	0.72	N_{SE} = 5.1
v_{SW} =		N_{SW} =
v_{NW} =		N_{NW} =

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	23	$g_{Walk,N}$ = 27
E	43	$g_{Walk,E}$ = 47
S	23	$g_{Walk,S}$ = 27
W	43	$g_{Walk,W}$ = 47

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ #VALUE! ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} \text{ #VALUE!}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} \text{ #VALUE!}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ #VALUE! ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = #VALUE! LOS #

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ #VALUE! ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} \text{ #VALUE!}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 74.3 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ #VALUE! ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = #VALUE! LOS #

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ #VALUE! ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 158.0 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} \text{ #VALUE!}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ #VALUE! ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = #VALUE! LOS #

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 18,302.4 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 117.7 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 64.0 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 17,393.7 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 139.8 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	126th Street
Analyst:	CV	Time Period:	NB Weekday Midday
Date:	42549	Analysis Year:	2016

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 =		N_1 =
v_2 =		N_2 =
v_3 = 192	0.77	N_3 = 6.2
v_4 = 217	0.75	N_4 = 7.2
v_5 = 149	0.52	N_5 = 7.2
v_6 = 158	0.74	N_6 = 5.3
v_7 =		N_7 =
v_8 =		N_8 =

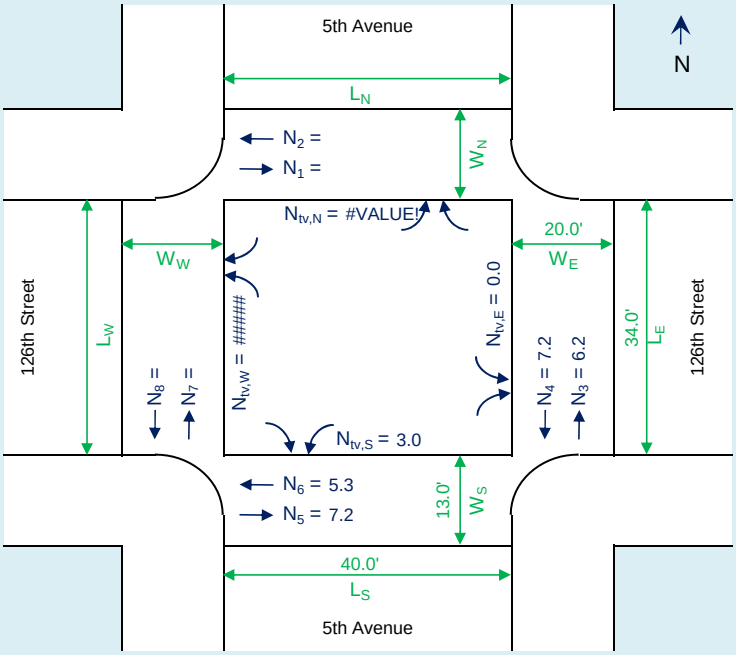
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ =	$N_{tv,N}$ = #######
$v_{rt,N}$ =	
$v_{lt,perm,E}$ = 0	$N_{tv,E}$ = 0.0
$v_{rt,E}$ = 0	
$v_{lt,perm,S}$ = 119	$N_{tv,S}$ = 3.0
$v_{rt,S}$ = 0	
$v_{lt,perm,W}$ =	$N_{tv,W}$ = #######
$v_{rt,W}$ =	

WALKING SPEED & CROSSING TIME

CROSS-WALK	S_p (ft/s)	WALK (s)	g_{Walk} = WALK + 4 (s)
N		23	$g_{Walk,N}$ = 27
E	3.5	43	$g_{Walk,E}$ = 47
S	3.5	23	$g_{Walk,S}$ = 27
W		43	$g_{Walk,W}$ = 47

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
= #VALUE! ft^2-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
= #VALUE! ft^2-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
= #VALUE! ft^2-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
= #VALUE!

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
= #VALUE!

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
=

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
=

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
=

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = LOS

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
= 31,960.0 ft^2-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
= 0.0 ft^2-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
= 31,960.0 ft^2-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
= 3.0 p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
= 3.5 p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
= 13.3 s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
= 13.4 s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
= 179.8 s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 177.8 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
= 14,040.0 ft^2-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
= 1,547.0 ft^2-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
= 12,493.0 ft^2-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
= 5.0 p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
= 3.7 p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
= 15.7 s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
= 15.4 s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
= 194.5 s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = 64.2 sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
= #VALUE! ft^2-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
= #VALUE! ft^2-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
= #VALUE! ft^2-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
= #VALUE!

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
= #VALUE!

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
=

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
=

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
=

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

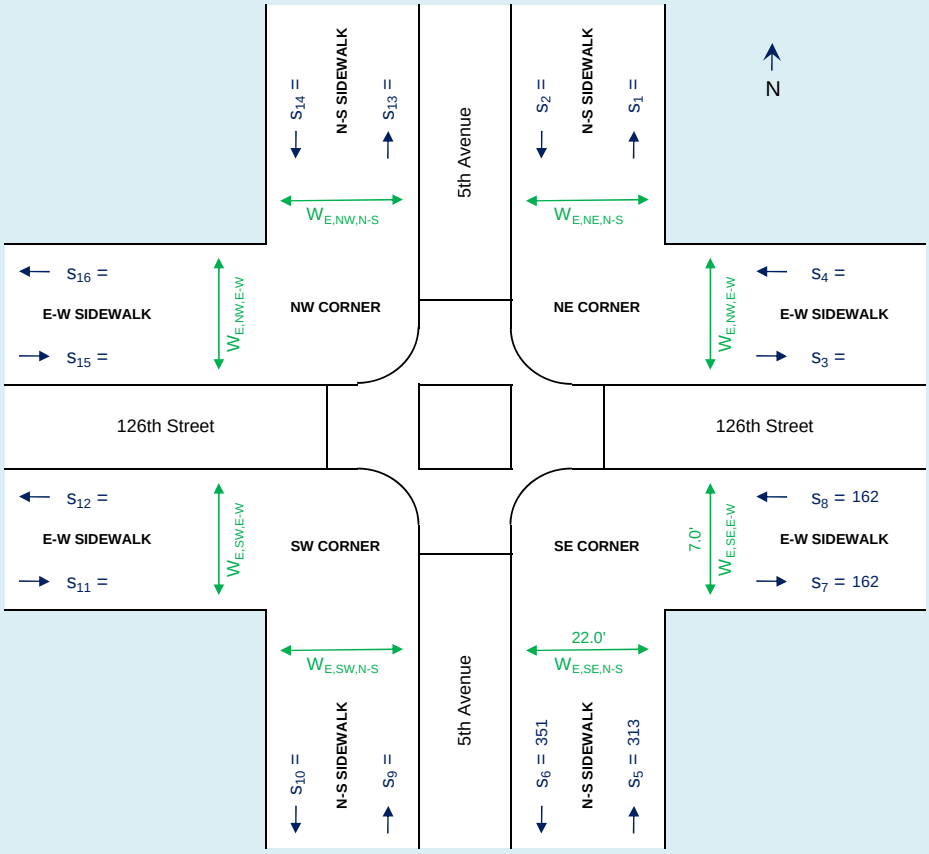
$M_{cw,W}$ = LOS

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	126th Street
Analyst:	CV	Time Period:	NB Weekday Midday
Date:	42549	Analysis Year:	2016

INPUTS



ANALYSIS

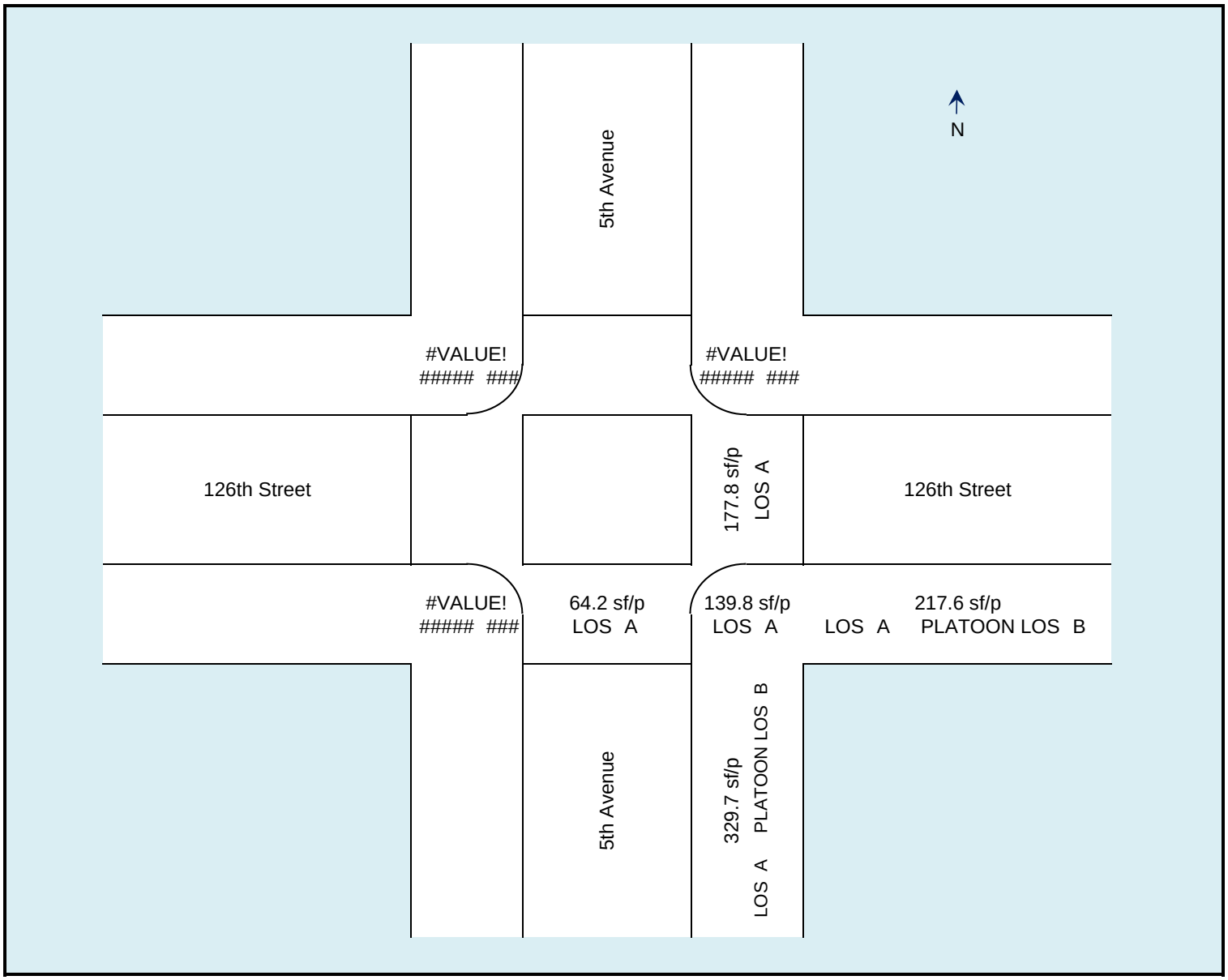
CORNER	MOVEMENT		VOLUME EACH DIR, s (p/hr)	VOLUME BOTH DIR, v_{ped} (p/hr)	PHF	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS, Ob (ft)	EFFECTIVE WIDTH, $W_E = W_T - Ob$ (ft)	FLOW RATE PER UNIT WIDTH, $v_p = \frac{v_{ped}}{60\ W_E\ PHF}$ (p/ft/min)	FREE FLOW WALK SPEED, S_{pf} (ft/s)	ADJUSTED WALK SPEED, $S_p = (1 - 0.0078\ v_p^2)\ S_{pf}$ (ft/s)	AVG PED SPACE, $A_p = 60\ \frac{S_p}{v_p}$ (ft^2/p)	LOS	PLATOON ADJ LOS
NE	N-S	s_1												
		s_2												
	E-W	s_3												
		s_4												
SE	N-S	s_5	313	664	0.79	30.0	8.0	22.0	0.6	3.5	3.5	329.7	A	B
		s_6	351											
	E-W	s_7	162	324	0.80	13.0	6.0	7.0	1.0	3.5	3.5	217.6	A	B
		s_8	162											
SW	N-S	s_9												
		s_{10}												
	E-W	s_{11}												
		s_{12}												
NW	N-S	s_{13}												
		s_{14}												
	E-W	s_{15}												
		s_{16}												

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	126th Street
Time Period:	NB Weekday Midday
Analysis Year:	2016

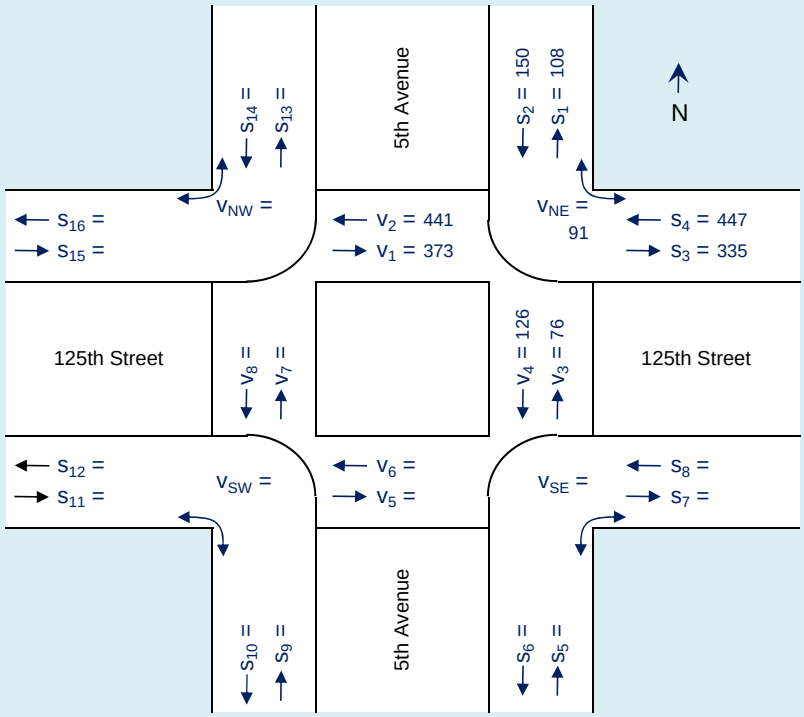


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	Weekday PM
Date:	28-Jun-16	Analysis Year:	2016

PEDESTRIAN PEAK HOUR VOLUMES

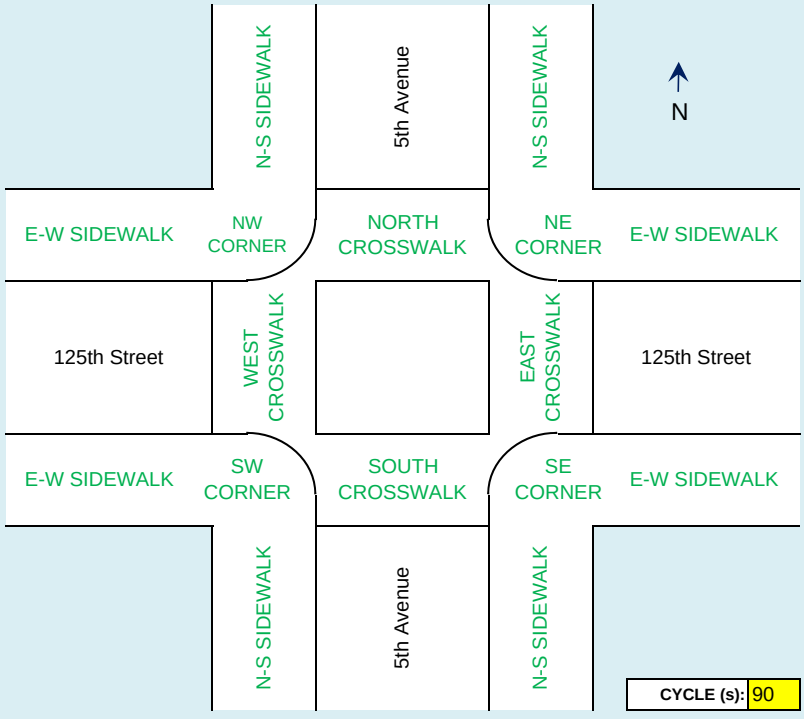


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	S_1	108	0.78
		S_2	150	
	E-W	S_3	335	0.76
		S_4	447	
SE	N-S	S_5		
		S_6		
	E-W	S_7		
		S_8		
SW	N-S	S_9		
		S_{10}		
	E-W	S_{11}		
		S_{12}		
NW	N-S	S_{13}		
		S_{14}		
	E-W	S_{15}		
		S_{16}		

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	V_1	373	0.88
	V_2	441	0.76
E	V_3	76	0.61
	V_4	126	0.83
S	V_5		
	V_6		
W	V_7		
	V_8		

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	V_{NE}	91	0.91
SE	V_{SE}		
SW	V_{SW}		
NW	V_{NW}		

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



CYCLE (s): 90

SIDEWALKS				
CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S	30.0	8.0	3.5
	E-W	20.0	7.0	3.5
SE	N-S			
	E-W			
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Sum of widths and shy distances from obstructions.

CORNERS				
CORNER	SIDEWALK	TOTAL WIDTH*, W (ft)	RADIUS, R (ft)	OBSTRUCTIONS, Ob (ft^2)
NE	N-S	24.0	28.0	19.32
	E-W	20.0		
SE	N-S			
	E-W			
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Override if corner width is different than sidewalk width.

CROSSWALKS									
CROSS-WALK	LENGTH, L (ft)	WIDTH, W (ft)	WALK SPEED, S_p (ft/s)	CROSSING TIME (sec)				CONFL VEH	
				WALK	FDW	DW*	PHASE TOTAL	V_{rt}	$V_{lt,perm}$
N	40.0	19.0	3.5	30	10	5	45	0	0	
E	60.0	26.0	3.5	24	16	5	45	0	196	
S	0.0	0.0	0.0	30	10	5	45	0	0	#DIV/0!
W	0.0	0.0	0.0	24	16	5	45	0	0	#DIV/0!

* DW clearance for phase, not total DW time for entire cycle. Usually 5 sec.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	125th Street
Time Period:	Weekday PM
Analysis Year:	2016

INPUTS

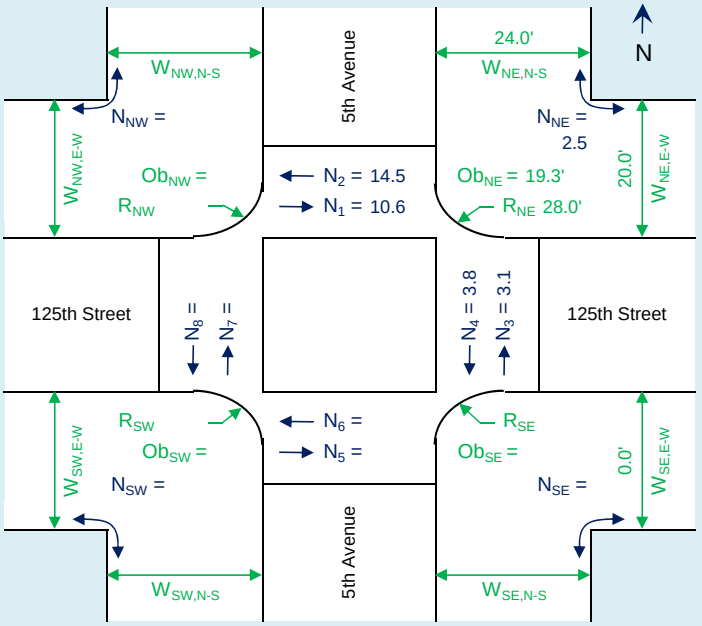
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 373	0.88	N_1 = 10.6
v_2 = 441	0.76	N_2 = 14.5
v_3 = 76	0.61	N_3 = 3.1
v_4 = 126	0.83	N_4 = 3.8
v_5 =		N_5 =
v_6 =		N_6 =
v_7 =		N_7 =
v_8 =		N_8 =
v_{NE} = 91	0.91	N_{NE} = 2.5
v_{SE} =		N_{SE} =
v_{SW} =		N_{SW} =
v_{NW} =		N_{NW} =

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	30	$g_{Walk,N}$ = 34
E	24	$g_{Walk,E}$ = 28
S	30	$g_{Walk,S}$ = 34
W	24	$g_{Walk,W}$ = 28

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW}$ = $C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW})$ = #VALUE! ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 184.6 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} \text{ \#VALUE!}$$

$TS_{c,NW}$ = $TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W})$ = #VALUE! ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = #VALUE! LOS #

NORTHEAST CORNER

$TS_{corner,NW}$ = $C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE})$ = 26,290.8 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 252.7 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 81.0 \text{ s}$$

$TS_{c,NE}$ = $TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E})$ = 24,621.9 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 178.4 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW}$ = $C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW})$ = #VALUE! ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} \text{ \#VALUE!}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} \text{ \#VALUE!}$$

$TS_{c,SW}$ = $TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W})$ = #VALUE! ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = #VALUE! LOS #

SOUTHEAST CORNER

$TS_{corner,SE}$ = $C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE})$ = #VALUE! ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} \text{ \#VALUE!}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 66.5 \text{ s}$$

$TS_{c,SE}$ = $TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E})$ = #VALUE! ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = #VALUE! LOS #

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	Weekday PM
Date:	42549	Analysis Year:	2016

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 373	0.88	N_1 = 10.6
v_2 = 441	0.76	N_2 = 14.5
v_3 = 76	0.61	N_3 = 3.1
v_4 = 126	0.83	N_4 = 3.8
v_5 =		N_5 =
v_6 =		N_6 =
v_7 =		N_7 =
v_8 =		N_8 =

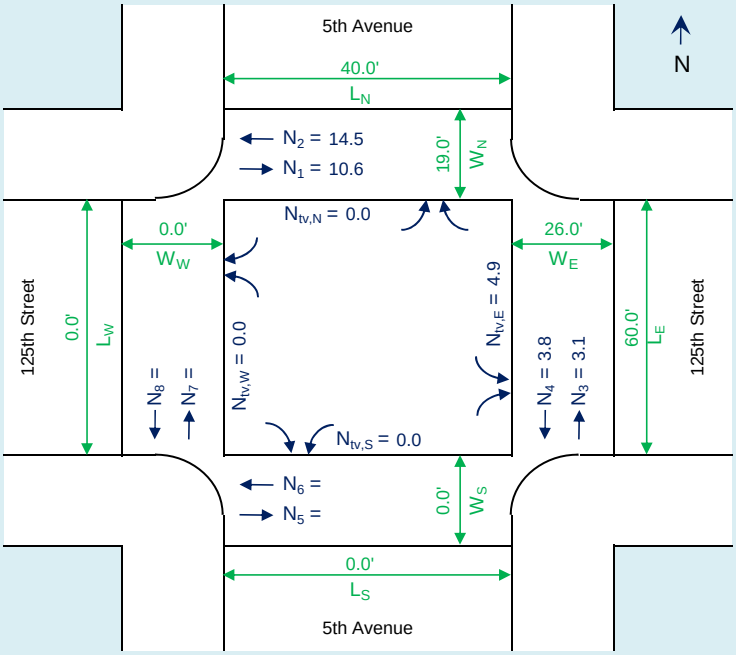
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ = 0	$N_{tv,N}$ = 0.0
$v_{rt,N}$ = 0	
$v_{lt,perm,E}$ = 196	$N_{tv,E}$ = 4.9
$v_{rt,E}$ = 0	
$v_{lt,perm,S}$ = 0	$N_{tv,S}$ = 0.0
$v_{rt,S}$ = 0	
$v_{lt,perm,W}$ = 0	$N_{tv,W}$ = 0.0
$v_{rt,W}$ = 0	

WALKING SPEED & CROSSING TIME

CROSS-WALK	S_p (ft/s)	WALK (s)	g_{Walk} = WALK + 4 (s)
N	3.5	30	$g_{Walk,N}$ = 34
E	3.5	24	$g_{Walk,E}$ = 28
S	0.0	30	$g_{Walk,S}$ = 34
W	0.0	24	$g_{Walk,W}$ = 28

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 25{,}840.0$ ft^2-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 0.0$ ft^2-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 25{,}840.0$ ft^2-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 6.6$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 9.0$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 15.6$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 15.9$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 395.8$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 65.3 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 43{,}680.0$ ft^2-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 5{,}096.0$ ft^2-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 38{,}584.0$ ft^2-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 2.1$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 2.6$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 20.6$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 20.6$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 142.3$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 271.2 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 0.0$ ft^2-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 0.0$ ft^2-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 0.0$ ft^2-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$=$ #VALUE!

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$=$ #VALUE!

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$=$ #DIV/0!

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$=$ #DIV/0!

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$=$ #DIV/0!

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = #DIV/0! LOS #

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 0.0$ ft^2-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 0.0$ ft^2-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 0.0$ ft^2-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$=$ #VALUE!

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$=$ #VALUE!

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$=$ #DIV/0!

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$=$ #DIV/0!

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$=$ #DIV/0!

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

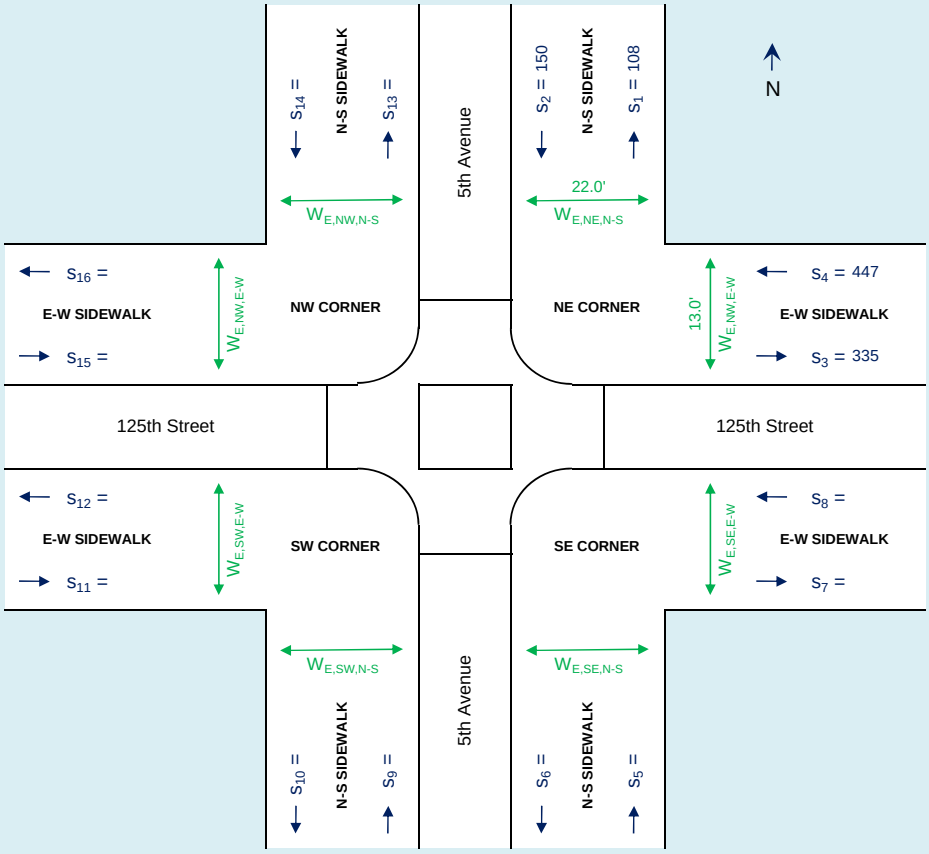
$M_{cw,W}$ = #DIV/0! LOS #

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	Weekday PM
Date:	42549	Analysis Year:	2016

INPUTS



ANALYSIS

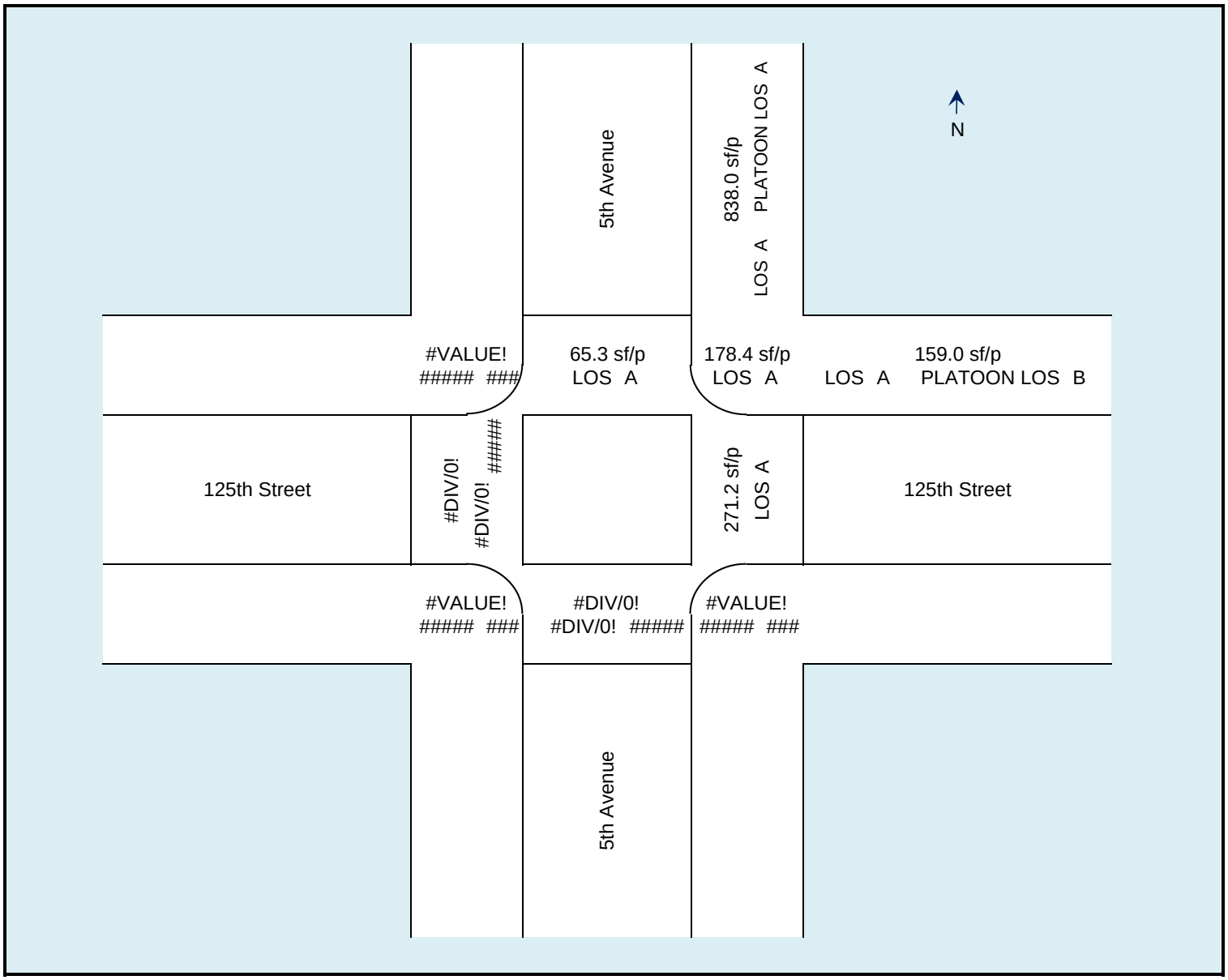
CORNER	MOVEMENT		VOLUME EACH DIR, s (p/hr)	VOLUME BOTH DIR, v_{ped} (p/hr)	PHF	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS, Ob (ft)	EFFECTIVE WIDTH, $W_E = W_T - Ob$ (ft)	FLOW RATE PER UNIT WIDTH, $v_p = \frac{v_{ped}}{60\ W_E\ PHF}$ (p/ft/min)	FREE FLOW WALK SPEED, S_{pf} (ft/s)	ADJUSTED WALK SPEED, $S_p = (1 - 0.0078\ v_p^2)\ S_{pf}$ (ft/s)	AVG PED SPACE, $A_p = 60\ \frac{S_p}{v_p}$ (ft^2/p)	LOS	PLATOON ADJ LOS
NE	N-S	s_1	108	258	0.78	30.0	8.0	22.0	0.3	3.5	3.5	838.0	A	A
		s_2	150											
	E-W	s_3	335	782	0.76	20.0	7.0	13.0	1.3	3.5	3.5	159.0	A	B
		s_4	447											
SE	N-S	s_5												
		s_6												
	E-W	s_7												
		s_8												
SW	N-S	s_9												
		s_{10}												
	E-W	s_{11}												
		s_{12}												
NW	N-S	s_{13}												
		s_{14}												
	E-W	s_{15}												
		s_{16}												

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	125th Street
Time Period:	Weekday PM
Analysis Year:	2016

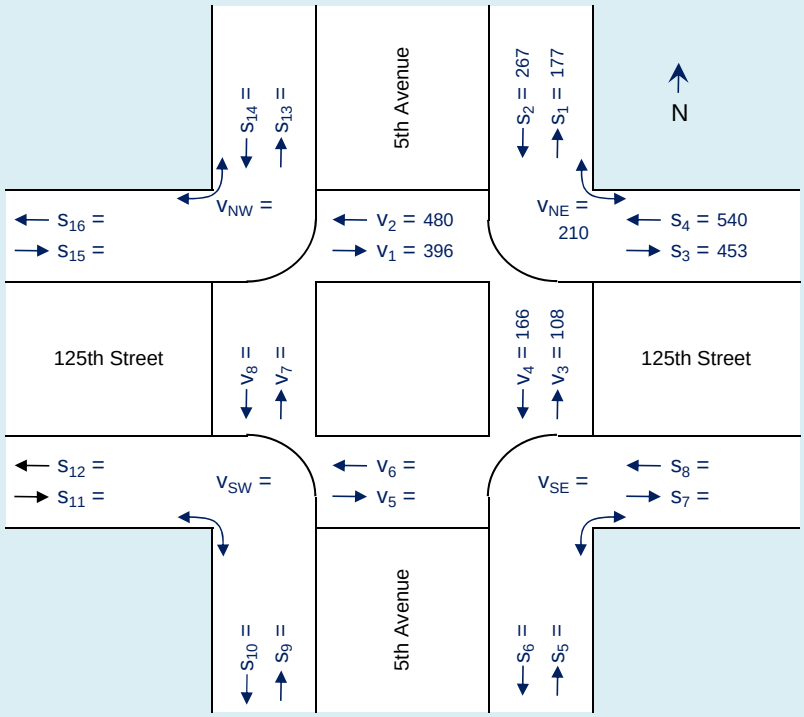


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	NB PM
Date:	28-Jun-16	Analysis Year:	2016

PEDESTRIAN PEAK HOUR VOLUMES



SIDEWALKS

CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	S_1	177	0.78
		S_2	267	
	E-W	S_3	453	0.76
		S_4	540	
SE	N-S	S_5		
		S_6		
	E-W	S_7		
		S_8		
SW	N-S	S_9		
		S_{10}		
	E-W	S_{11}		
		S_{12}		
NW	N-S	S_{13}		
		S_{14}		
	E-W	S_{15}		
		S_{16}		

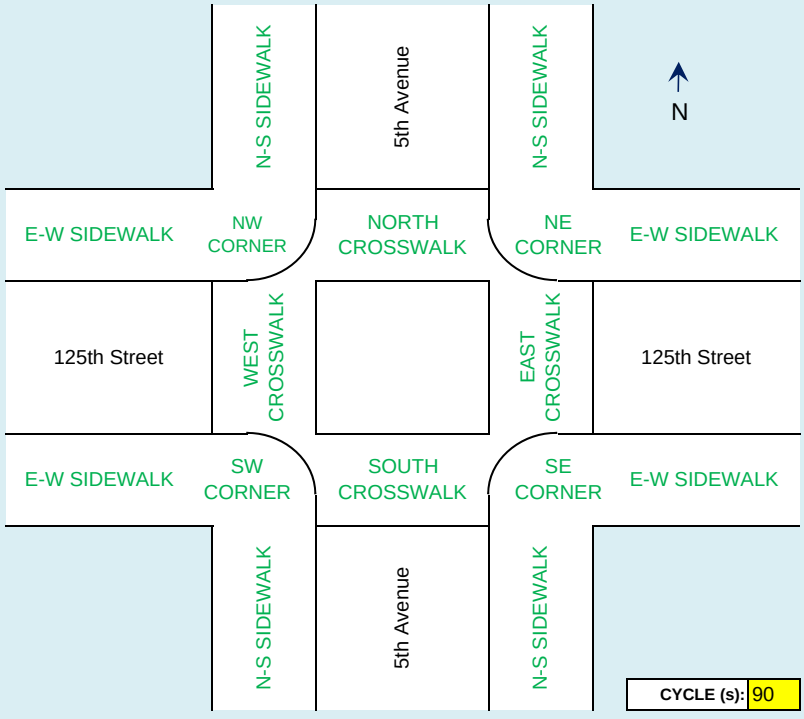
CROSSWALKS

CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	V_1	396	0.88
	V_2	480	0.76
E	V_3	108	0.61
	V_4	166	0.83
S	V_5		
	V_6		
W	V_7		
	V_8		

CORNERS

CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	V_{NE}	210	0.91
SE	V_{SE}		
SW	V_{SW}		
NW	V_{NW}		

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



CYCLE (s): 90

SIDEWALKS

CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S	30.0	8.0	3.5
	E-W	20.0	7.0	3.5
SE	N-S			
	E-W			
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Sum of widths and shy distances from obstructions.

CORNERS

CORNER	SIDEWALK	TOTAL WIDTH*, W (ft)	RADIUS, R (ft)	OBSTRUCTIONS, Ob (ft^2)
NE	N-S	24.0	28.0	19.32
	E-W	20.0		
SE	N-S			
	E-W			
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Override if corner width is different than sidewalk width.

CROSSWALKS

CROSS-WALK	LENGTH, L (ft)	WIDTH, W (ft)	WALK SPEED, S_p (ft/s)	CROSSING TIME (sec)				CONFL VEH		
				WALK	FDW	DW*	PHASE TOTAL	V_{rt}	$V_{lt,perm}$	
N	40.0	19.0	3.5	30	10	5	45	0	0	
E	60.0	26.0	3.5	24	16	5	45	0	197	
S	0.0	0.0	0.0	30	10	5	45	0	0	#DIV/0!
W	0.0	0.0	0.0	24	16	5	45	0	0	#DIV/0!

* DW clearance for phase, not total DW time for entire cycle. Usually 5 sec.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	125th Street
Time Period:	NB PM
Analysis Year:	2016

INPUTS

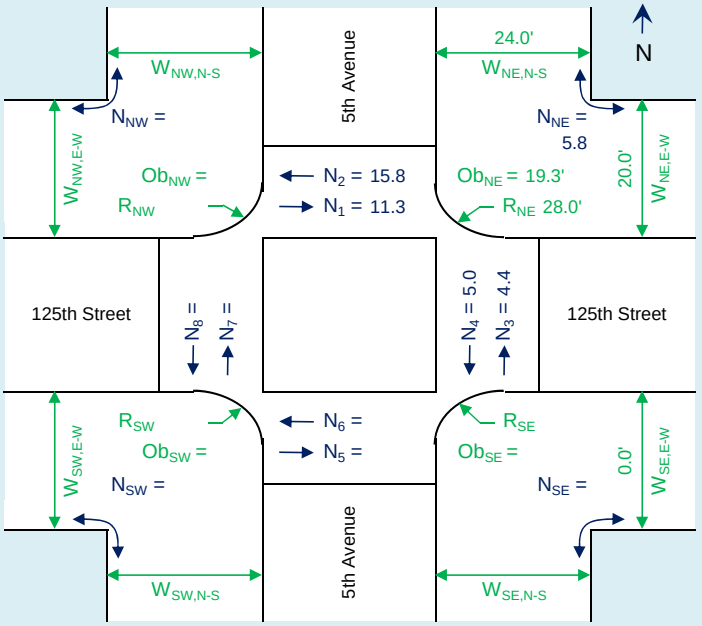
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 396	0.88	N_1 = 11.3
v_2 = 480	0.76	N_2 = 15.8
v_3 = 108	0.61	N_3 = 4.4
v_4 = 166	0.83	N_4 = 5.0
v_5 =		N_5 =
v_6 =		N_6 =
v_7 =		N_7 =
v_8 =		N_8 =
v_{NE} = 210	0.91	N_{NE} = 5.8
v_{SE} =		N_{SE} =
v_{SW} =		N_{SW} =
v_{NW} =		N_{NW} =

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	30	$g_{Walk,N}$ = 34
E	24	$g_{Walk,E}$ = 28
S	30	$g_{Walk,S}$ = 34
W	24	$g_{Walk,W}$ = 28

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW}$ = $C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW})$ = #VALUE! ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 196.0 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} \text{ \#VALUE!}$$

$TS_{c,NW}$ = $TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W})$ = #VALUE! ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = #VALUE! LOS #

NORTHEAST CORNER

$TS_{corner,NW}$ = $C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE})$ = 26,290.8 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 275.1 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 106.8 \text{ s}$$

$TS_{c,NE}$ = $TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E})$ = 24,381.5 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 144.3 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW}$ = $C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW})$ = #VALUE! ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} \text{ \#VALUE!}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} \text{ \#VALUE!}$$

$TS_{c,SW}$ = $TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W})$ = #VALUE! ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = #VALUE! LOS #

SOUTHEAST CORNER

$TS_{corner,SE}$ = $C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE})$ = #VALUE! ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} \text{ \#VALUE!}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 94.5 \text{ s}$$

$TS_{c,SE}$ = $TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E})$ = #VALUE! ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = #VALUE! LOS #

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	NB PM
Date:	42549	Analysis Year:	2016

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 396	0.88	N_1 = 11.3
v_2 = 480	0.76	N_2 = 15.8
v_3 = 108	0.61	N_3 = 4.4
v_4 = 166	0.83	N_4 = 5.0
v_5 =		N_5 =
v_6 =		N_6 =
v_7 =		N_7 =
v_8 =		N_8 =

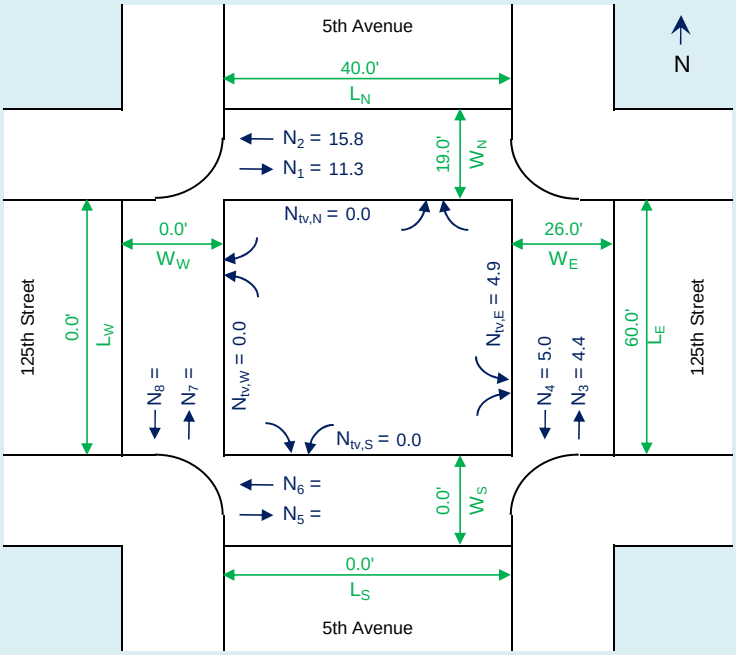
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ = 0	$N_{tv,N}$ = 0.0
$v_{rt,N}$ = 0	
$v_{lt,perm,E}$ = 197	$N_{tv,E}$ = 4.9
$v_{rt,E}$ = 0	
$v_{lt,perm,S}$ = 0	$N_{tv,S}$ = 0.0
$v_{rt,S}$ = 0	
$v_{lt,perm,W}$ = 0	$N_{tv,W}$ = 0.0
$v_{rt,W}$ = 0	

WALKING SPEED & CROSSING TIME

CROSS-WALK	S_p (ft/s)	WALK (s)	g_{Walk} = WALK + 4 (s)
N	3.5	30	$g_{Walk,N}$ = 34
E	3.5	24	$g_{Walk,E}$ = 28
S	0.0	30	$g_{Walk,S}$ = 34
W	0.0	24	$g_{Walk,W}$ = 28

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 25{,}840.0$ ft^2-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 0.0$ ft^2-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 25{,}840.0$ ft^2-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 7.0$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 9.8$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 15.6$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 16.0$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 428.8$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 60.3 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 43{,}680.0$ ft^2-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 5{,}122.0$ ft^2-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 38{,}558.0$ ft^2-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 3.0$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 3.4$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 20.7$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 20.7$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 194.9$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 197.8 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 0.0$ ft^2-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 0.0$ ft^2-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 0.0$ ft^2-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$=$ #VALUE!

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$=$ #VALUE!

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$=$ #DIV/0!

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$=$ #DIV/0!

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$=$ #DIV/0!

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = #DIV/0! LOS #

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 0.0$ ft^2-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 0.0$ ft^2-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 0.0$ ft^2-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$=$ #VALUE!

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$=$ #VALUE!

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$=$ #DIV/0!

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$=$ #DIV/0!

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$=$ #DIV/0!

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

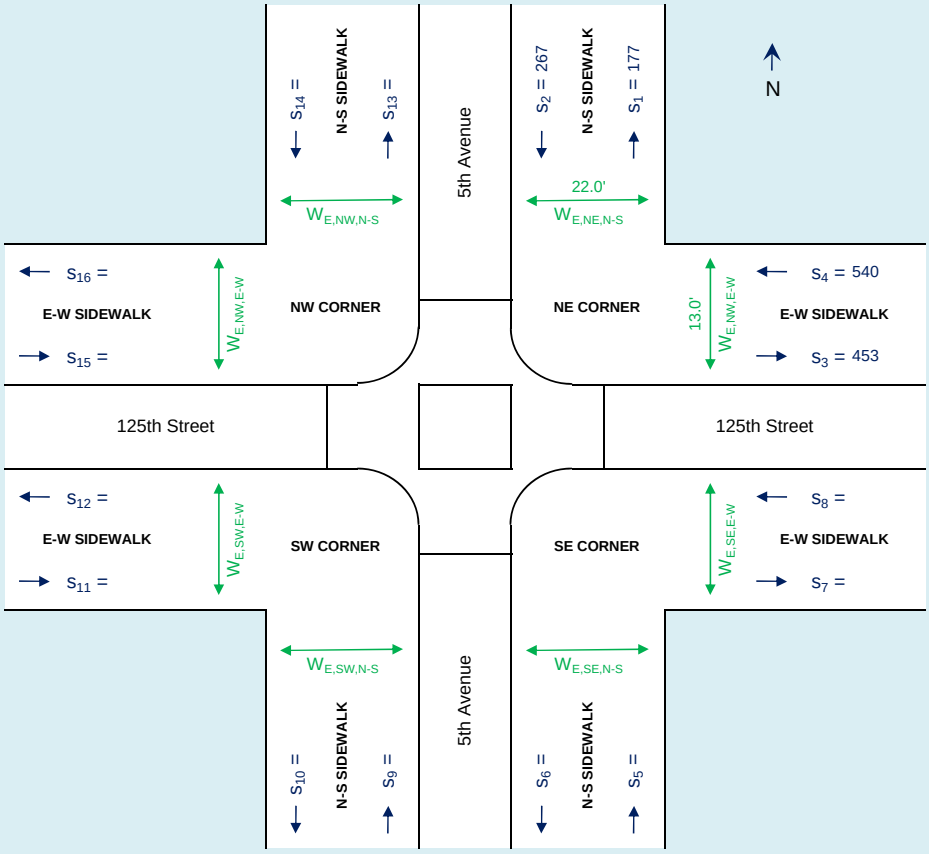
$M_{cw,W}$ = #DIV/0! LOS #

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	NB PM
Date:	42549	Analysis Year:	2016

INPUTS



ANALYSIS

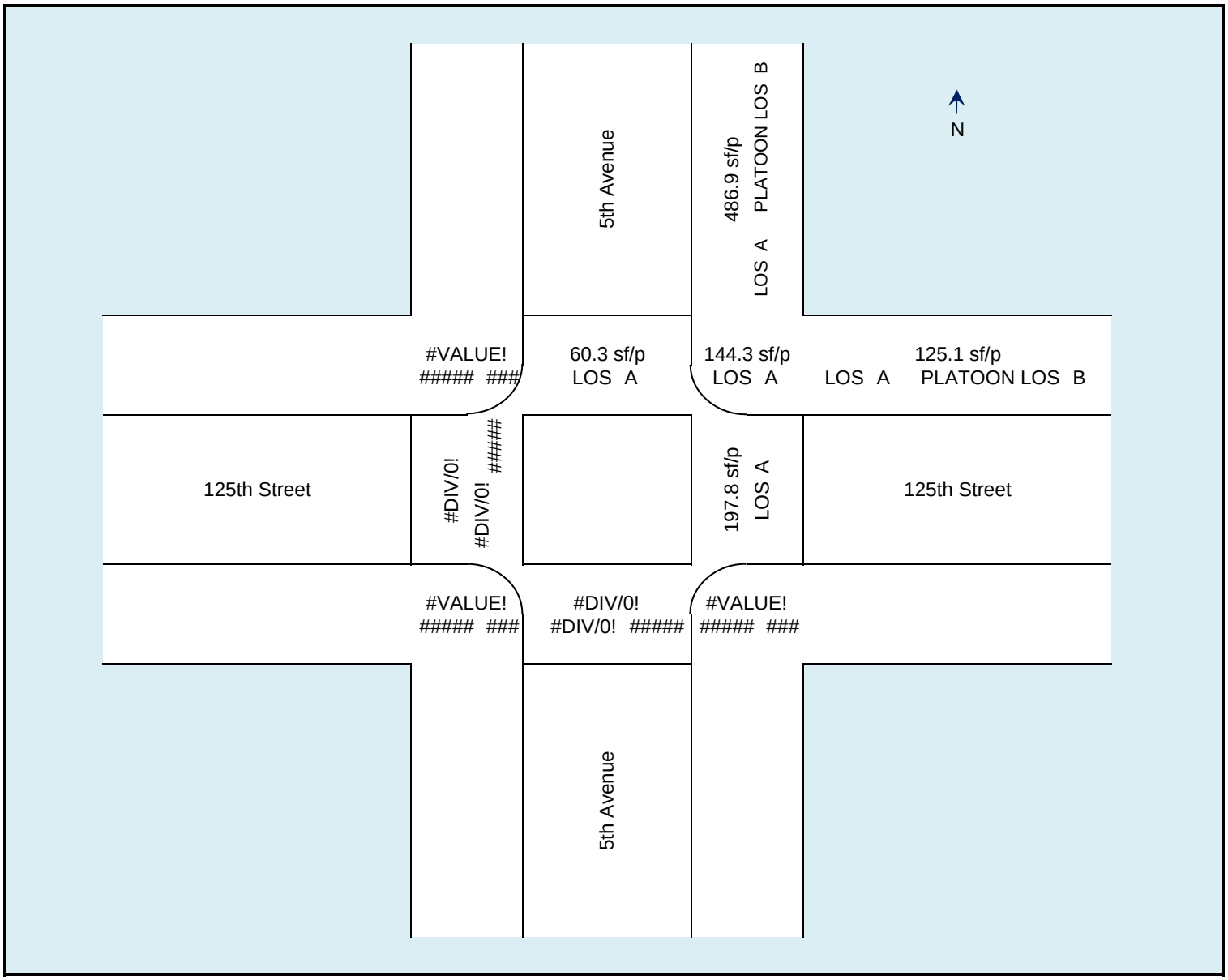
CORNER	MOVEMENT		VOLUME EACH DIR, s (p/hr)	VOLUME BOTH DIR, v_{ped} (p/hr)	PHF	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS, Ob (ft)	EFFECTIVE WIDTH, $W_E = W_T - Ob$ (ft)	FLOW RATE PER UNIT WIDTH, $v_p = \frac{v_{ped}}{60\ W_E\ PHF}$ (p/ft/min)	FREE FLOW WALK SPEED, S_{pf} (ft/s)	ADJUSTED WALK SPEED, $S_p = (1 - 0.0078\ v_p^2)\ S_{pf}$ (ft/s)	AVG PED SPACE, $A_p = 60\ \frac{S_p}{v_p}$ (ft^2/p)	LOS	PLATOON ADJ LOS
NE	N-S	S_1	177	444	0.78	30.0	8.0	22.0	0.4	3.5	3.5	486.9	A	B
		S_2	267											
	E-W	S_3	453	993	0.76	20.0	7.0	13.0	1.7	3.5	3.5	125.1	A	B
		S_4	540											
SE	N-S	S_5												
		S_6												
	E-W	S_7												
		S_8												
SW	N-S	S_9												
		S_{10}												
	E-W	S_{11}												
		S_{12}												
NW	N-S	S_{13}												
		S_{14}												
	E-W	S_{15}												
		S_{16}												

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	125th Street
Time Period:	NB PM
Analysis Year:	2016

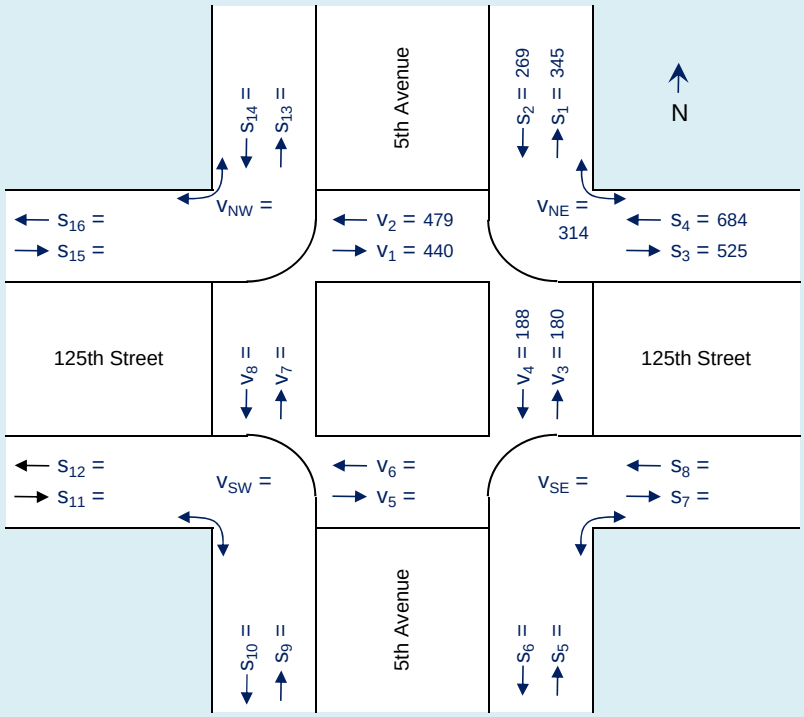


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	Build PM
Date:	28-Jun-16	Analysis Year:	2016

PEDESTRIAN PEAK HOUR VOLUMES

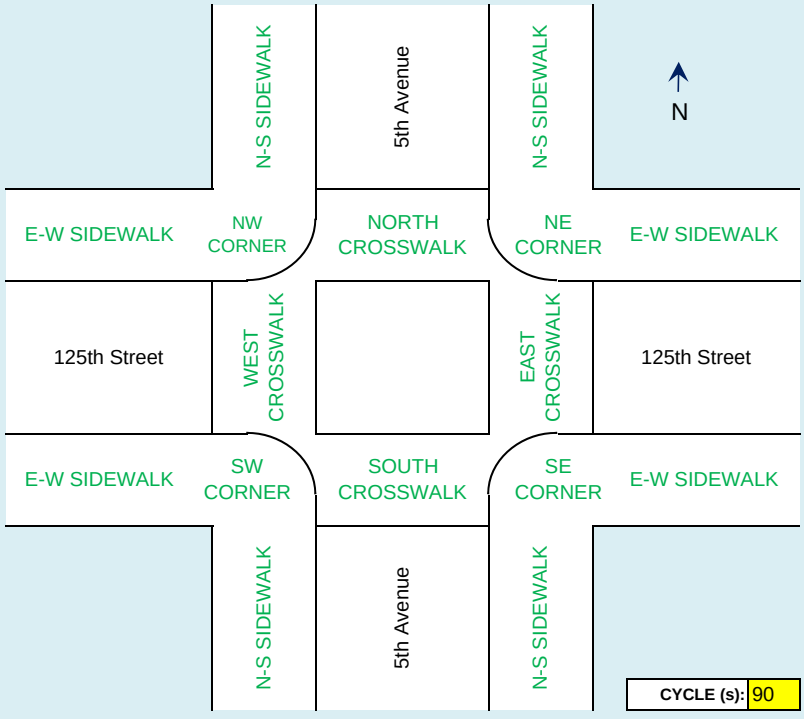


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	S_1	345	0.78
		S_2	269	
	E-W	S_3	525	0.76
		S_4	684	
SE	N-S	S_5		
		S_6		
	E-W	S_7		
		S_8		
SW	N-S	S_9		
		S_{10}		
	E-W	S_{11}		
		S_{12}		
NW	N-S	S_{13}		
		S_{14}		
	E-W	S_{15}		
		S_{16}		

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	V_1	440	0.88
	V_2	479	0.76
E	V_3	180	0.61
	V_4	188	0.83
S	V_5		
	V_6		
W	V_7		
	V_8		

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	V_{NE}	314	0.91
SE	V_{SE}		
SW	V_{SW}		
NW	V_{NW}		

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



CYCLE (s): 90

SIDEWALKS				
CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S	30.0	8.0	3.5
	E-W	20.0	7.0	3.5
SE	N-S			
	E-W			
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Sum of widths and shy distances from obstructions.

CORNERS				
CORNER	SIDEWALK	TOTAL WIDTH*, W (ft)	RADIUS, R (ft)	OBSTRUCTIONS, Ob (ft^2)
NE	N-S	24.0	28.0	19.32
	E-W	20.0		
SE	N-S			
	E-W			
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Override if corner width is different than sidewalk width.

CROSSWALKS									
CROSS-WALK	LENGTH, L (ft)	WIDTH, W (ft)	WALK SPEED, S_p (ft/s)	CROSSING TIME (sec)				CONFL VEH	
				WALK	FDW	DW*	PHASE TOTAL	V_{rt}	$V_{lt,perm}$
N	40.0	19.0	3.5	30	10	5	45	0	0	
E	60.0	26.0	3.5	24	16	5	45	0	197	
S	0.0	0.0	0.0	30	10	5	45	0	0	#DIV/0!
W	0.0	0.0	0.0	24	16	5	45	0	0	#DIV/0!

* DW clearance for phase, not total DW time for entire cycle. Usually 5 sec.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	125th Street
Time Period:	Build PM
Analysis Year:	2016

INPUTS

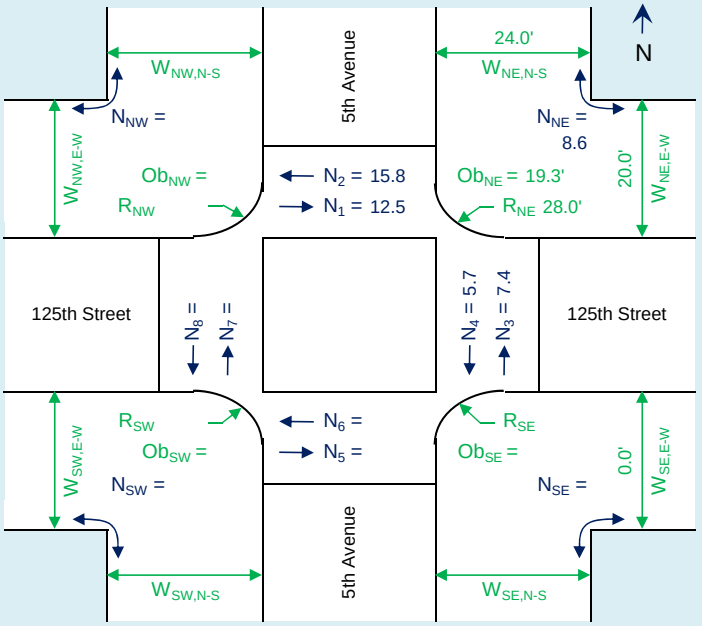
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 440	0.88	N_1 = 12.5
v_2 = 479	0.76	N_2 = 15.8
v_3 = 180	0.61	N_3 = 7.4
v_4 = 188	0.83	N_4 = 5.7
v_5 =		N_5 =
v_6 =		N_6 =
v_7 =		N_7 =
v_8 =		N_8 =
v_{NE} = 314	0.91	N_{NE} = 8.6
v_{SE} =		N_{SE} =
v_{SW} =		N_{SW} =
v_{NW} =		N_{NW} =

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	30	$g_{Walk,N}$ = 34
E	24	$g_{Walk,E}$ = 28
S	30	$g_{Walk,S}$ = 34
W	24	$g_{Walk,W}$ = 28

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW}$ = $C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW})$ = #VALUE! ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 217.8 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} \text{ \#VALUE!}$$

$TS_{c,NW}$ = $TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W})$ = #VALUE! ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = #VALUE! LOS #

NORTHEAST CORNER

$TS_{corner,NW}$ = $C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE})$ = 26,290.8 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 274.5 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 120.9 \text{ s}$$

$TS_{c,NE}$ = $TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E})$ = 24,313.6 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 121.8 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW}$ = $C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW})$ = #VALUE! ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} \text{ \#VALUE!}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} \text{ \#VALUE!}$$

$TS_{c,SW}$ = $TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W})$ = #VALUE! ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = #VALUE! LOS #

SOUTHEAST CORNER

$TS_{corner,SE}$ = $C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE})$ = #VALUE! ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} \text{ \#VALUE!}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 157.5 \text{ s}$$

$TS_{c,SE}$ = $TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E})$ = #VALUE! ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = #VALUE! LOS #

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	Build PM
Date:	42549	Analysis Year:	2016

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 440	0.88	N_1 = 12.5
v_2 = 479	0.76	N_2 = 15.8
v_3 = 180	0.61	N_3 = 7.4
v_4 = 188	0.83	N_4 = 5.7
v_5 =		N_5 =
v_6 =		N_6 =
v_7 =		N_7 =
v_8 =		N_8 =

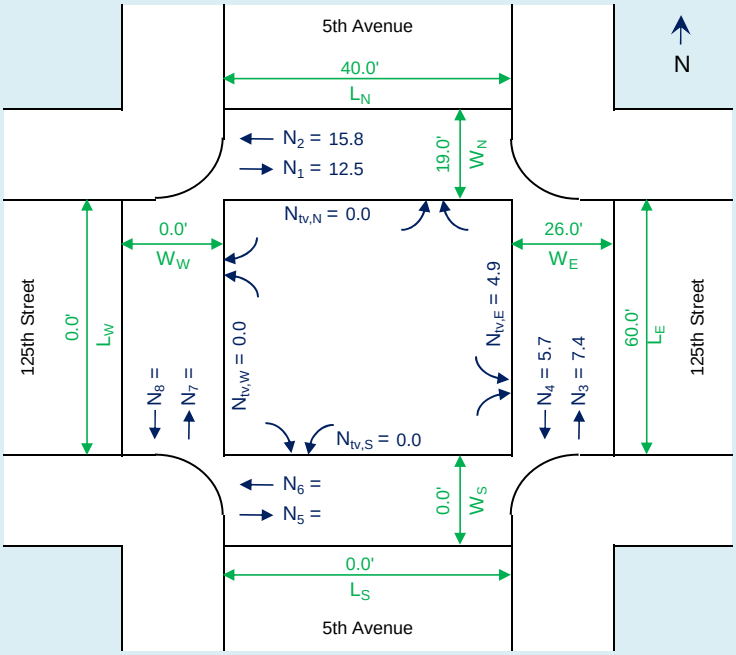
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ = 0	$N_{tv,N}$ = 0.0
$v_{rt,N}$ = 0	
$v_{lt,perm,E}$ = 197	$N_{tv,E}$ = 4.9
$v_{rt,E}$ = 0	
$v_{lt,perm,S}$ = 0	$N_{tv,S}$ = 0.0
$v_{rt,S}$ = 0	
$v_{lt,perm,W}$ = 0	$N_{tv,W}$ = 0.0
$v_{rt,W}$ = 0	

WALKING SPEED & CROSSING TIME

CROSS-WALK	S_p (ft/s)	WALK (s)	g_{Walk} = WALK + 4 (s)
N	3.5	30	$g_{Walk,N}$ = 34
E	3.5	24	$g_{Walk,E}$ = 28
S	0.0	30	$g_{Walk,S}$ = 34
W	0.0	24	$g_{Walk,W}$ = 28

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 25{,}840.0$ ft^2-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 0.0$ ft^2-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 25{,}840.0$ ft^2-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 7.8$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 9.8$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 15.7$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 16.0$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 449.1$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 57.5 sf/p LOS B

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 43{,}680.0$ ft^2-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 5{,}122.0$ ft^2-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 38{,}558.0$ ft^2-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 5.1$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 3.9$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 20.9$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 20.7$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 271.5$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 142.0 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 0.0$ ft^2-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 0.0$ ft^2-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 0.0$ ft^2-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$=$ #VALUE!

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$=$ #VALUE!

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$=$ #DIV/0!

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$=$ #DIV/0!

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$=$ #DIV/0!

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = #DIV/0! LOS #

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 0.0$ ft^2-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 0.0$ ft^2-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 0.0$ ft^2-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$=$ #VALUE!

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$=$ #VALUE!

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$=$ #DIV/0!

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$=$ #DIV/0!

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$=$ #DIV/0!

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

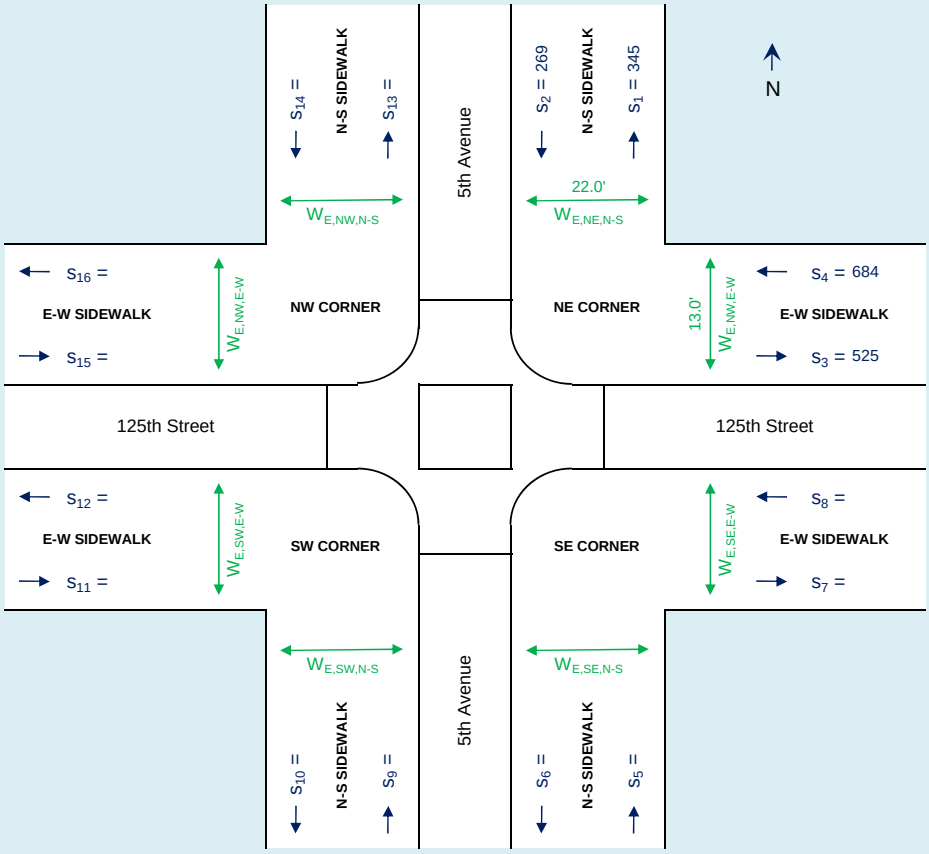
$M_{cw,W}$ = #DIV/0! LOS #

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	Build PM
Date:	42549	Analysis Year:	2016

INPUTS



ANALYSIS

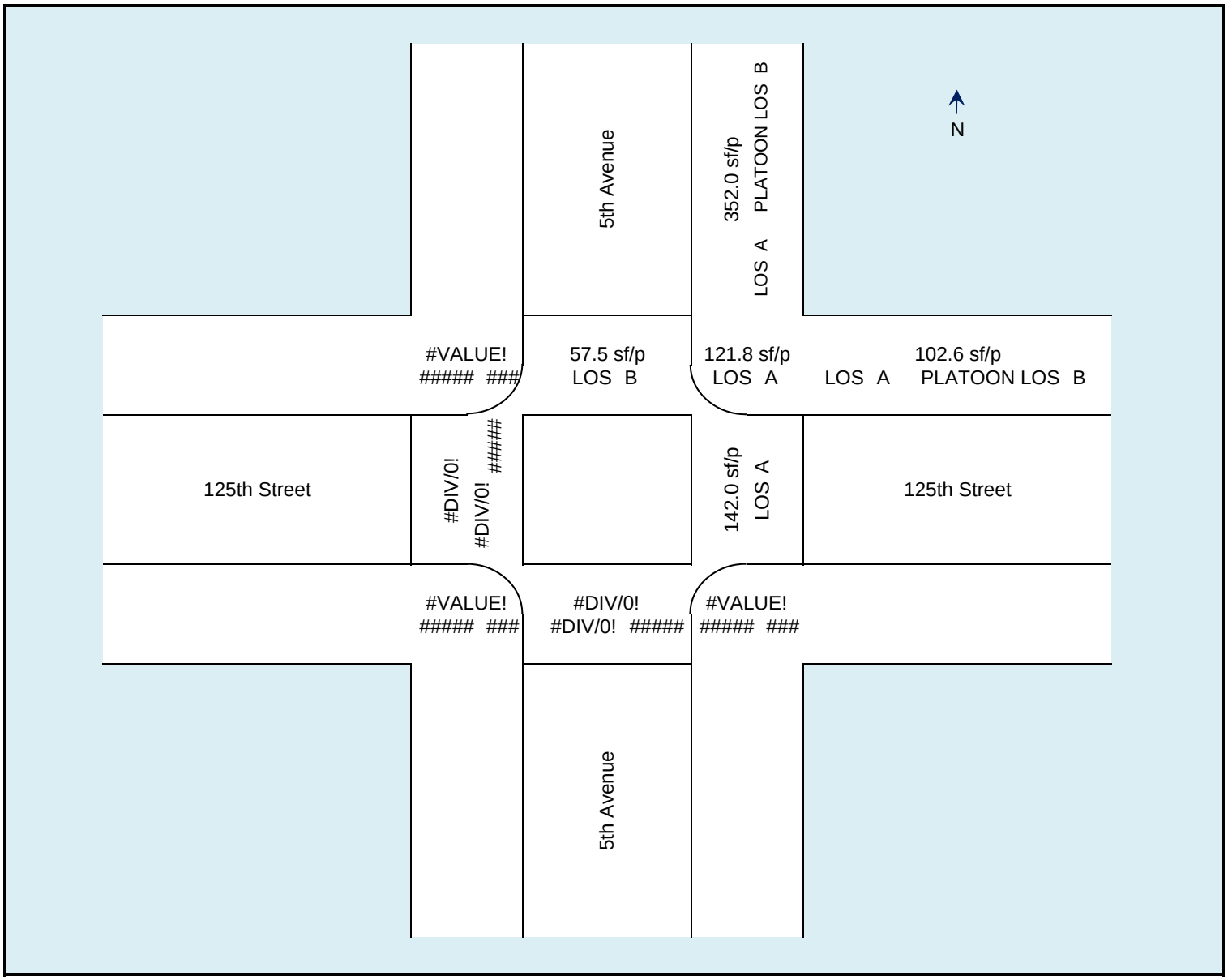
CORNER	MOVEMENT		VOLUME EACH DIR, s (p/hr)	VOLUME BOTH DIR, v_{ped} (p/hr)	PHF	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS, Ob (ft)	EFFECTIVE WIDTH, $W_E = W_T - Ob$ (ft)	FLOW RATE PER UNIT WIDTH, $v_p = \frac{v_{ped}}{60\ W_E\ PHF}$ (p/ft/min)	FREE FLOW WALK SPEED, S_{pf} (ft/s)	ADJUSTED WALK SPEED, $S_p = (1 - 0.0078\ v_p^2)\ S_{pf}$ (ft/s)	AVG PED SPACE, $A_p = 60\ \frac{S_p}{v_p}$ (ft^2/p)	LOS	PLATOON ADJ LOS
NE	N-S	S_1	345	614	0.78	30.0	8.0	22.0	0.6	3.5	3.5	352.0	A	B
		S_2	269											
	E-W	S_3	525	1209	0.76	20.0	7.0	13.0	2.0	3.5	3.5	102.6	A	B
		S_4	684											
SE	N-S	S_5												
		S_6												
	E-W	S_7												
		S_8												
SW	N-S	S_9												
		S_{10}												
	E-W	S_{11}												
		S_{12}												
NW	N-S	S_{13}												
		S_{14}												
	E-W	S_{15}												
		S_{16}												

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	125th Street
Time Period:	Build PM
Analysis Year:	2016

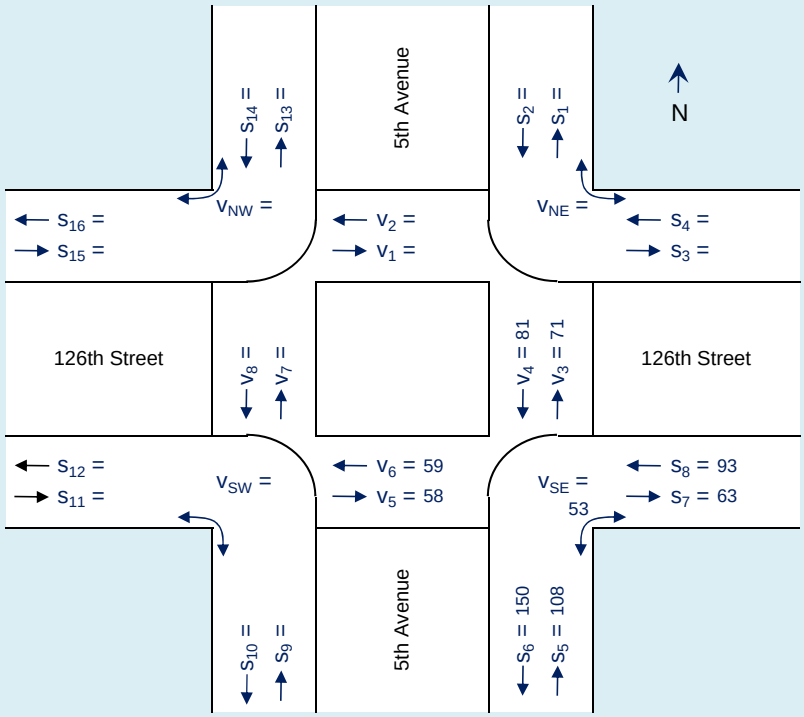


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	126th Street
Analyst:	CV	Time Period:	Weekday PM
Date:	28-Jun-16	Analysis Year:	2016

PEDESTRIAN PEAK HOUR VOLUMES

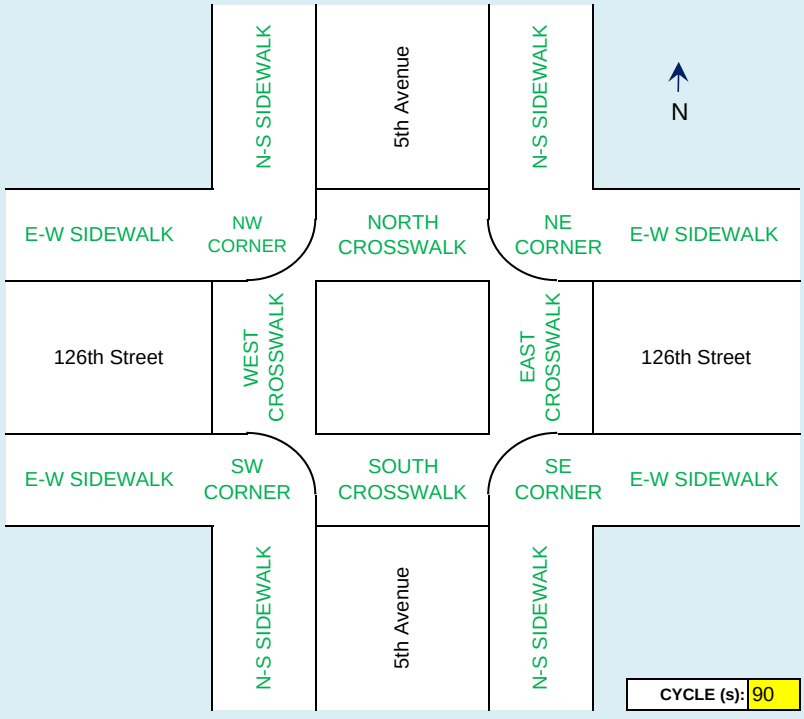


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	S_1		
		S_2		
	E-W	S_3		
		S_4		
SE	N-S	S_5	108	0.78
		S_6	150	
	E-W	S_7	63	0.74
		S_8	93	
SW	N-S	S_9		
		S_{10}		
	E-W	S_{11}		
		S_{12}		
NW	N-S	S_{13}		
		S_{14}		
	E-W	S_{15}		
		S_{16}		

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	V_1		
	V_2		
E	V_3	71	0.81
	V_4	81	0.70
S	V_5	58	0.85
	V_6	59	0.61
W	V_7		
	V_8		

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	V_{NE}		
SE	V_{SE}	53	0.70
SW	V_{SW}		
NW	V_{NW}		

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



CYCLE (s): 90

SIDEWALKS				
CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S			
	E-W			
SE	N-S	30.0	8.0	3.5
	E-W	13.0	6.0	3.5
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Sum of widths and shy distances from obstructions.

CORNERS				
CORNER	SIDEWALK	TOTAL WIDTH*, W (ft)	RADIUS, R (ft)	OBSTRUCTIONS, Ob (ft^2)
NE	N-S			
	E-W			
SE	N-S	20.0	20.0	10.64
	E-W	15.0		
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Override if corner width is different than sidewalk width.

CROSSWALKS									
CROSS-WALK	LENGTH, L (ft)	WIDTH, W (ft)	WALK SPEED, S_p (ft/s)	CROSSING TIME (sec)				CONFL VEH	
				WALK	FDW	DW*	PHASE TOTAL	V_{rt}	$V_{lt,perm}$
N				23	8	5	36			#DIV/0!
E	34.0	20.0	3.5	43	6	5	54	0	0	
S	40.0	13.0	3.5	23	8	5	36	0	86	
W				43	6	5	54			#DIV/0!

* DW clearance for phase, not total DW time for entire cycle. Usually 5 sec.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	126th Street
Time Period:	Weekday PM
Analysis Year:	2016

INPUTS

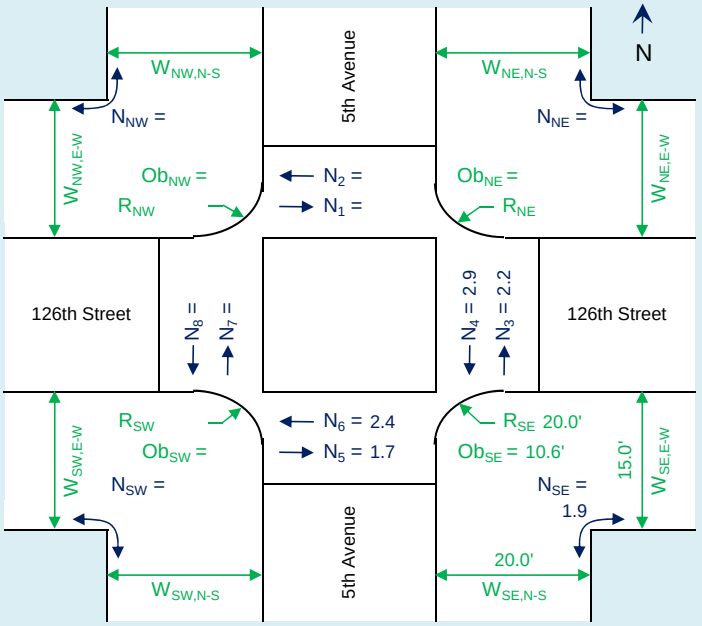
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 =		N_1 =
v_2 =		N_2 =
v_3 = 71	0.81	N_3 = 2.2
v_4 = 81	0.7	N_4 = 2.9
v_5 = 58	0.85	N_5 = 1.7
v_6 = 59	0.61	N_6 = 2.4
v_7 =		N_7 =
v_8 =		N_8 =
v_{NE} =		N_{NE} =
v_{SE} = 53	0.7	N_{SE} = 1.9
v_{SW} =		N_{SW} =
v_{NW} =		N_{NW} =

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	23	$g_{Walk,N}$ = 27
E	43	$g_{Walk,E}$ = 47
S	23	$g_{Walk,S}$ = 27
W	43	$g_{Walk,W}$ = 47

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ #VALUE! ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = \text{\#VALUE!}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} = \text{\#VALUE!}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ #VALUE! ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = #VALUE! LOS #

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ #VALUE! ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = \text{\#VALUE!}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 29.7 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ #VALUE! ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = #VALUE! LOS #

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ #VALUE! ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 37.6 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} = \text{\#VALUE!}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ #VALUE! ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = #VALUE! LOS #

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 18,302.4 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 53.3 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 22.5 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 17,923.3 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 403.6 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	126th Street
Analyst:	CV	Time Period:	Weekday PM
Date:	42549	Analysis Year:	2016

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 =		N_1 =
v_2 =		N_2 =
v_3 = 71	0.81	N_3 = 2.2
v_4 = 81	0.7	N_4 = 2.9
v_5 = 58	0.85	N_5 = 1.7
v_6 = 59	0.61	N_6 = 2.4
v_7 =		N_7 =
v_8 =		N_8 =

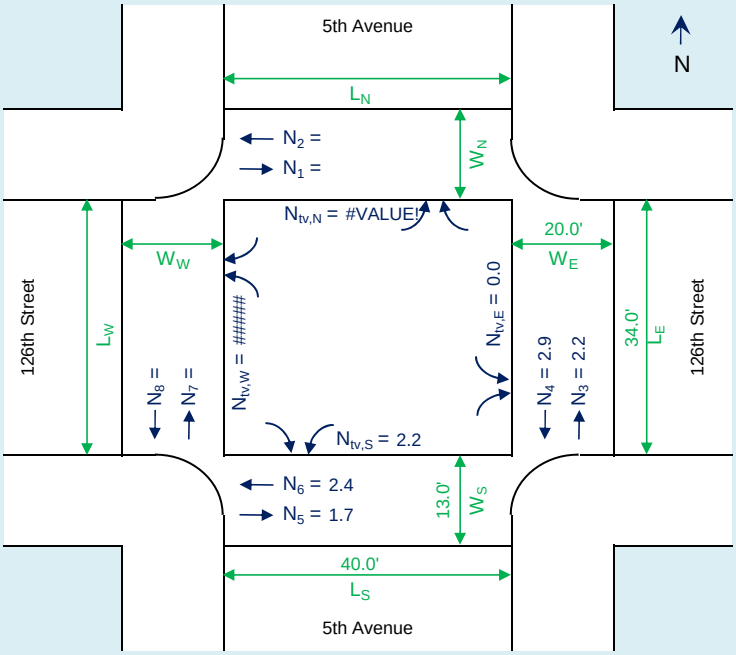
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ =	$N_{tv,N}$ = #######
$v_{rt,N}$ =	
$v_{lt,perm,E}$ = 0	$N_{tv,E}$ = 0.0
$v_{rt,E}$ = 0	
$v_{lt,perm,S}$ = 86	$N_{tv,S}$ = 2.2
$v_{rt,S}$ = 0	
$v_{lt,perm,W}$ =	$N_{tv,W}$ = #######
$v_{rt,W}$ =	

WALKING SPEED & CROSSING TIME

CROSS-WALK	S_p (ft/s)	WALK (s)	g_{Walk} = WALK + 4 (s)
N		23	$g_{Walk,N}$ = 27
E	3.5	43	$g_{Walk,E}$ = 47
S	3.5	23	$g_{Walk,S}$ = 27
W		43	$g_{Walk,W}$ = 47

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= $ #VALUE! ft^2-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= $ #VALUE! ft^2-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= $ #VALUE! ft^2-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= $ #VALUE!

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= $ #VALUE!

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$=$

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$=$

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$=$

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = LOS

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 31{,}960.0$ ft^2-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 0.0$ ft^2-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 31{,}960.0$ ft^2-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 1.0$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 1.4$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 13.1$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 13.1$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 66.5$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E} = 480.5$ sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 14{,}040.0$ ft^2-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 1{,}118.0$ ft^2-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 12{,}922.0$ ft^2-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$= 1.2$ p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$= 1.7$ p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$= 14.9$ s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$= 15.0$ s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$= 61.6$ s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S} = 209.8$ sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= $ #VALUE! ft^2-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= $ #VALUE! ft^2-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= $ #VALUE! ft^2-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$= $ #VALUE!

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$= $ #VALUE!

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$=$

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$=$

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$=$

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

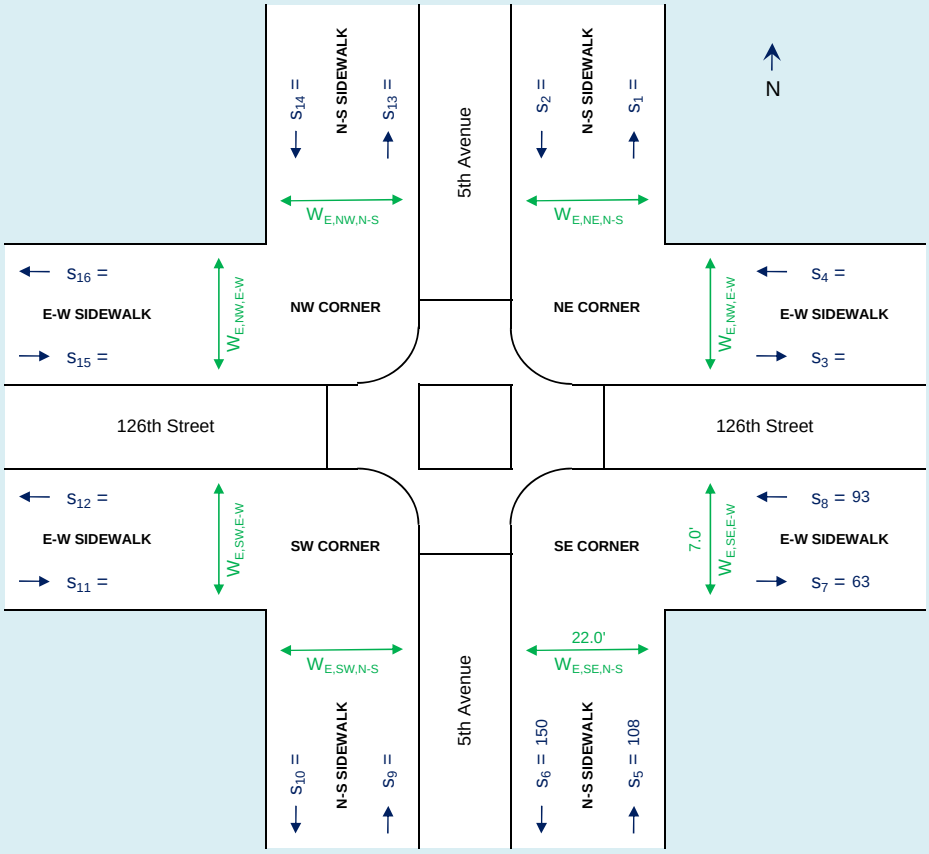
$M_{cw,W}$ = LOS

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	126th Street
Analyst:	CV	Time Period:	Weekday PM
Date:	42549	Analysis Year:	2016

INPUTS



ANALYSIS

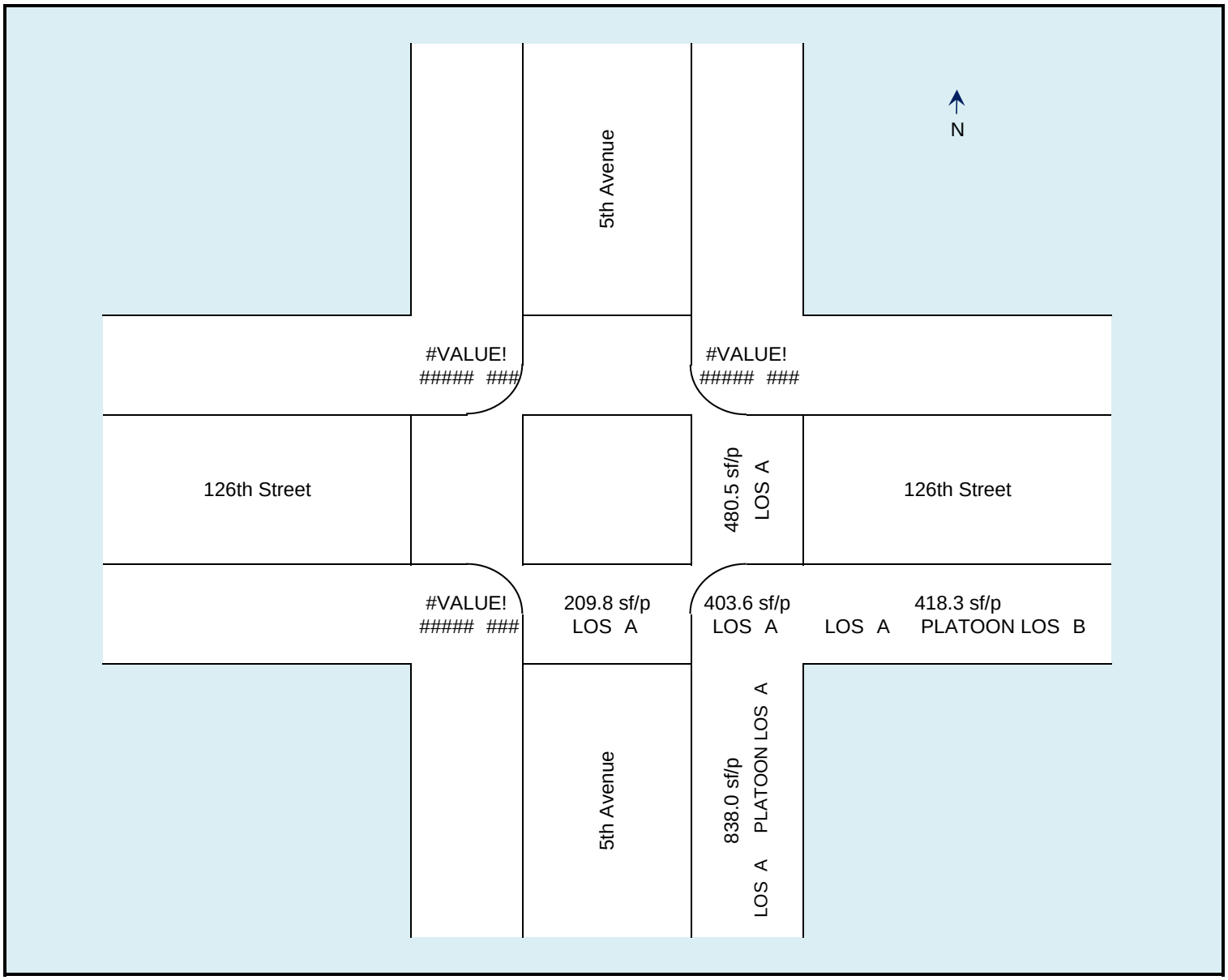
CORNER	MOVEMENT		VOLUME EACH DIR, s (p/hr)	VOLUME BOTH DIR, v_{ped} (p/hr)	PHF	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS, Ob (ft)	EFFECTIVE WIDTH, $W_E = W_T - Ob$ (ft)	FLOW RATE PER UNIT WIDTH, $v_p = \frac{v_{ped}}{60\ W_E\ PHF}$ (p/ft/min)	FREE FLOW WALK SPEED, S_{pf} (ft/s)	ADJUSTED WALK SPEED, $S_p = (1 - 0.0078\ v_p^2)\ S_{pf}$ (ft/s)	AVG PED SPACE, $A_p = 60\ \frac{S_p}{v_p}$ (ft^2/p)	LOS	PLATOON ADJ LOS
NE	N-S	s_1												
		s_2												
	E-W	s_3												
		s_4												
SE	N-S	s_5	108	258	0.78	30.0	8.0	22.0	0.3	3.5	3.5	838.0	A	A
		s_6	150											
	E-W	s_7	63	156	0.74	13.0	6.0	7.0	0.5	3.5	3.5	418.3	A	B
		s_8	93											
SW	N-S	s_9												
		s_{10}												
	E-W	s_{11}												
		s_{12}												
NW	N-S	s_{13}												
		s_{14}												
	E-W	s_{15}												
		s_{16}												

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	126th Street
Time Period:	Weekday PM
Analysis Year:	2016

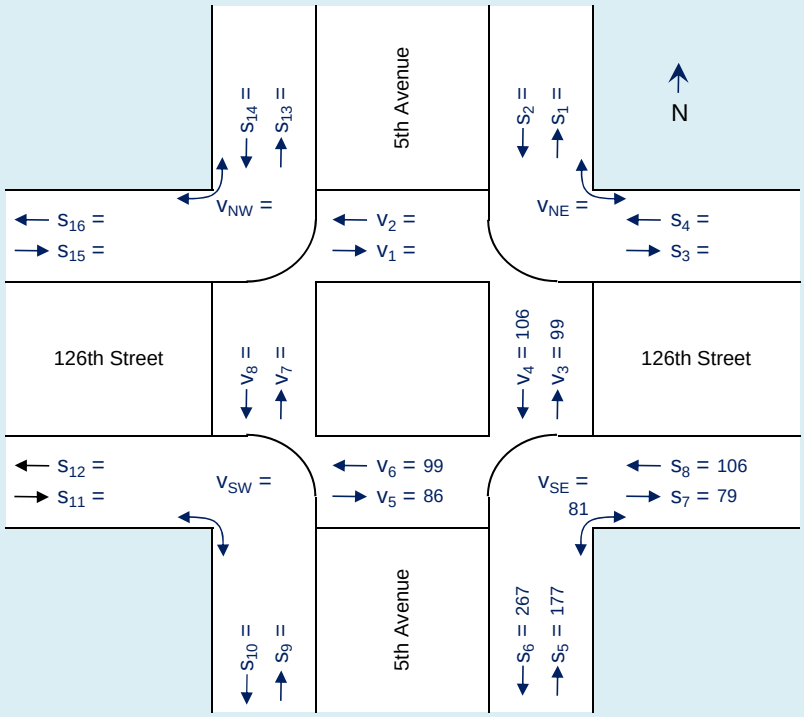


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	126th Street
Analyst:	CV	Time Period:	NB PM
Date:	28-Jun-16	Analysis Year:	2016

PEDESTRIAN PEAK HOUR VOLUMES

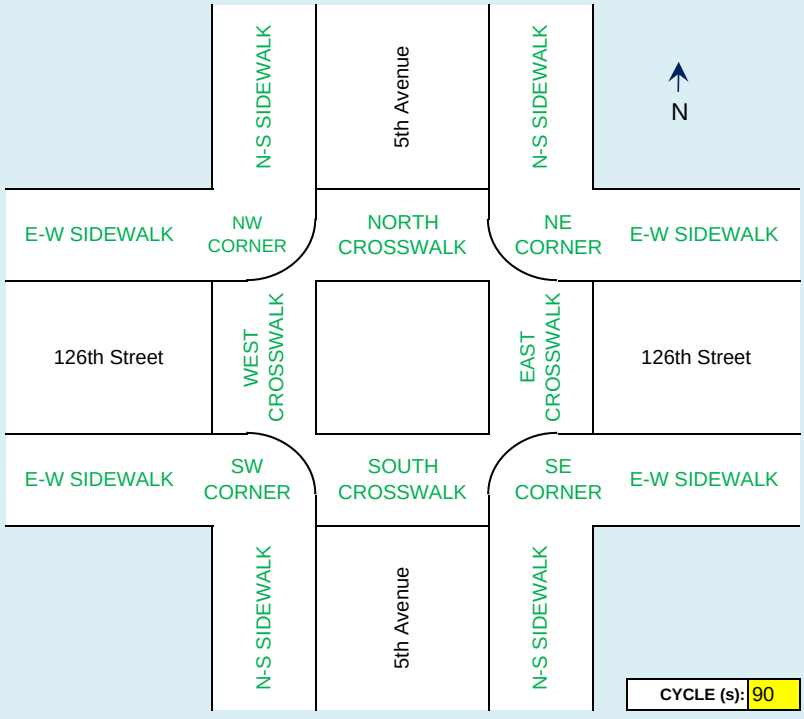


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	S_1		
		S_2		
	E-W	S_3		
		S_4		
SE	N-S	S_5	177	0.78
		S_6	267	
	E-W	S_7	79	0.74
		S_8	106	
SW	N-S	S_9		
		S_{10}		
	E-W	S_{11}		
		S_{12}		
NW	N-S	S_{13}		
		S_{14}		
	E-W	S_{15}		
		S_{16}		

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	V_1		
	V_2		
E	V_3	99	0.81
	V_4	106	0.70
S	V_5	86	0.85
	V_6	99	0.61
W	V_7		
	V_8		

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	V_{NE}		
SE	V_{SE}	81	0.70
SW	V_{SW}		
NW	V_{NW}		

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



CYCLE (s): 90

SIDEWALKS				
CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S			
	E-W			
SE	N-S	30.0	8.0	3.5
	E-W	13.0	6.0	3.5
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Sum of widths and shy distances from obstructions.

CROSSWALKS									
CROSS-WALK	LENGTH, L (ft)	WIDTH, W (ft)	WALK SPEED, S_p (ft/s)	CROSSING TIME (sec)				CONFL VEH	
				WALK	FDW	DW*	PHASE TOTAL	V_{rt}	$V_{lt,perm}$
N				23	8	5	36			#DIV/0!
E	34.0	20.0	3.5	43	6	5	54	0	0	
S	40.0	13.0	3.5	23	8	5	36	0	87	
W				43	6	5	54			#DIV/0!

* DW clearance for phase, not total DW time for entire cycle. Usually 5 sec.

CORNERS				
CORNER	SIDEWALK	TOTAL WIDTH*, W (ft)	RADIUS, R (ft)	OBSTRUCTIONS, Ob (ft^2)
NE	N-S			
	E-W			
SE	N-S	20.0	20.0	10.64
	E-W	15.0		
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Override if corner width is different than sidewalk width.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	126th Street
Time Period:	NB PM
Analysis Year:	2016

INPUTS

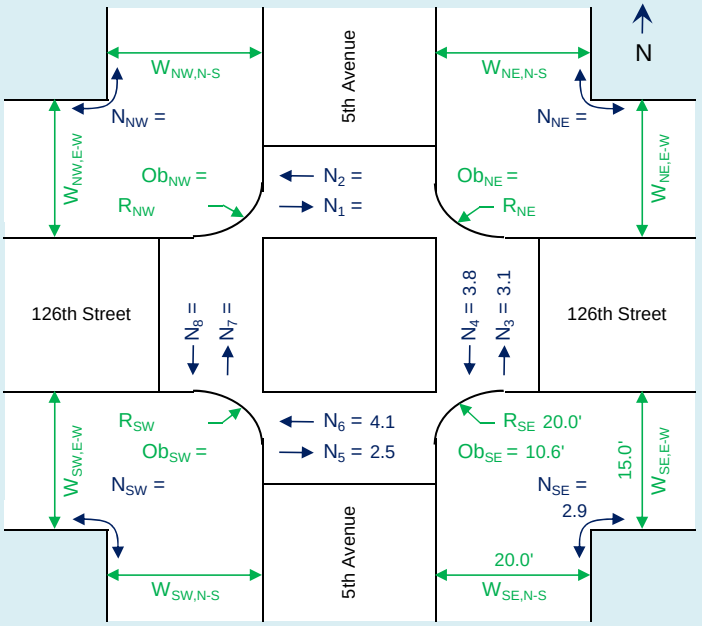
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 =		N_1 =
v_2 =		N_2 =
v_3 = 99	0.81	N_3 = 3.1
v_4 = 106	0.7	N_4 = 3.8
v_5 = 86	0.85	N_5 = 2.5
v_6 = 99	0.61	N_6 = 4.1
v_7 =		N_7 =
v_8 =		N_8 =
v_{NE} =		N_{NE} =
v_{SE} = 81	0.7	N_{SE} = 2.9
v_{SW} =		N_{SW} =
v_{NW} =		N_{NW} =

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	23	$g_{Walk,N}$ = 27
E	43	$g_{Walk,E}$ = 47
S	23	$g_{Walk,S}$ = 27
W	43	$g_{Walk,W}$ = 47

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ #VALUE! ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} \text{ #VALUE!}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} \text{ #VALUE!}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ #VALUE! ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = #VALUE! LOS #

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ #VALUE! ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} \text{ #VALUE!}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 38.9 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ #VALUE! ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = #VALUE! LOS #

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ #VALUE! ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 55.8 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} \text{ #VALUE!}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ #VALUE! ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = #VALUE! LOS #

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 18,302.4 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 89.5 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 31.4 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 17,698.1 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 271.1 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	126th Street
Analyst:	CV	Time Period:	NB PM
Date:	42549	Analysis Year:	2016

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 =		N_1 =
v_2 =		N_2 =
v_3 = 99	0.81	N_3 = 3.1
v_4 = 106	0.7	N_4 = 3.8
v_5 = 86	0.85	N_5 = 2.5
v_6 = 99	0.61	N_6 = 4.1
v_7 =		N_7 =
v_8 =		N_8 =

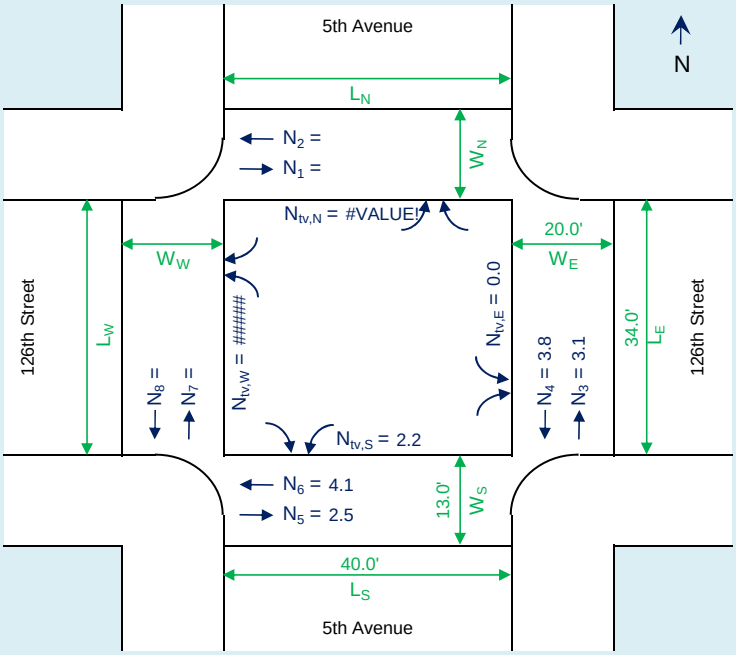
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ =	$N_{tv,N}$ = #######
$v_{rt,N}$ =	
$v_{lt,perm,E}$ = 0	$N_{tv,E}$ = 0.0
$v_{rt,E}$ = 0	
$v_{lt,perm,S}$ = 87	$N_{tv,S}$ = 2.2
$v_{rt,S}$ = 0	
$v_{lt,perm,W}$ =	$N_{tv,W}$ = #######
$v_{rt,W}$ =	

WALKING SPEED & CROSSING TIME

CROSS-WALK	S_p (ft/s)	WALK (s)	g_{Walk} = WALK + 4 (s)
N		23	$g_{Walk,N}$ = 27
E	3.5	43	$g_{Walk,E}$ = 47
S	3.5	23	$g_{Walk,S}$ = 27
W		43	$g_{Walk,W}$ = 47

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
= #VALUE! ft^2-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
= #VALUE! ft^2-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
= #VALUE! ft^2-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
= #VALUE!

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
= #VALUE!

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
=

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
=

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
=

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = LOS

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
= 31,960.0 ft^2-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
= 0.0 ft^2-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
= 31,960.0 ft^2-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
= 1.5 p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
= 1.8 p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
= 13.1 s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
= 13.2 s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
= 89.9 s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 355.6 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
= 14,040.0 ft^2-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
= 1,131.0 ft^2-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
= 12,909.0 ft^2-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
= 1.8 p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
= 2.8 p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
= 15.0 s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
= 15.2 s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
= 99.7 s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = 129.5 sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
= #VALUE! ft^2-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
= #VALUE! ft^2-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
= #VALUE! ft^2-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
= #VALUE!

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
= #VALUE!

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
=

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
=

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
=

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

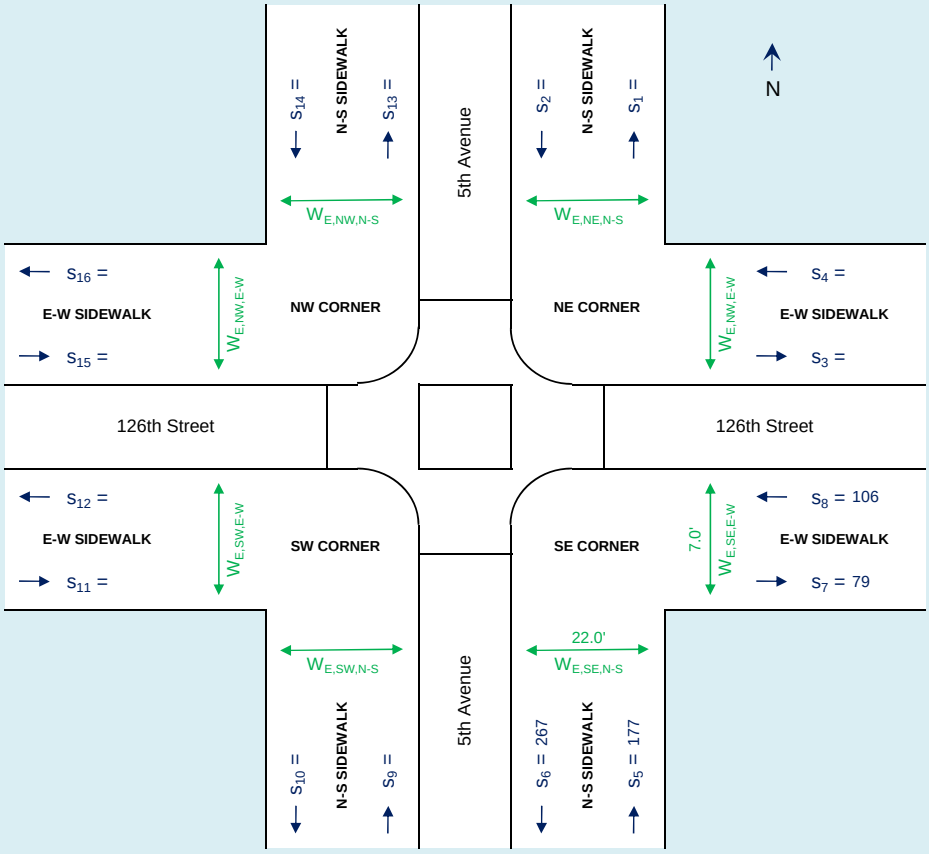
$M_{cw,W}$ = LOS

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	126th Street
Analyst:	CV	Time Period:	NB PM
Date:	42549	Analysis Year:	2016

INPUTS



ANALYSIS

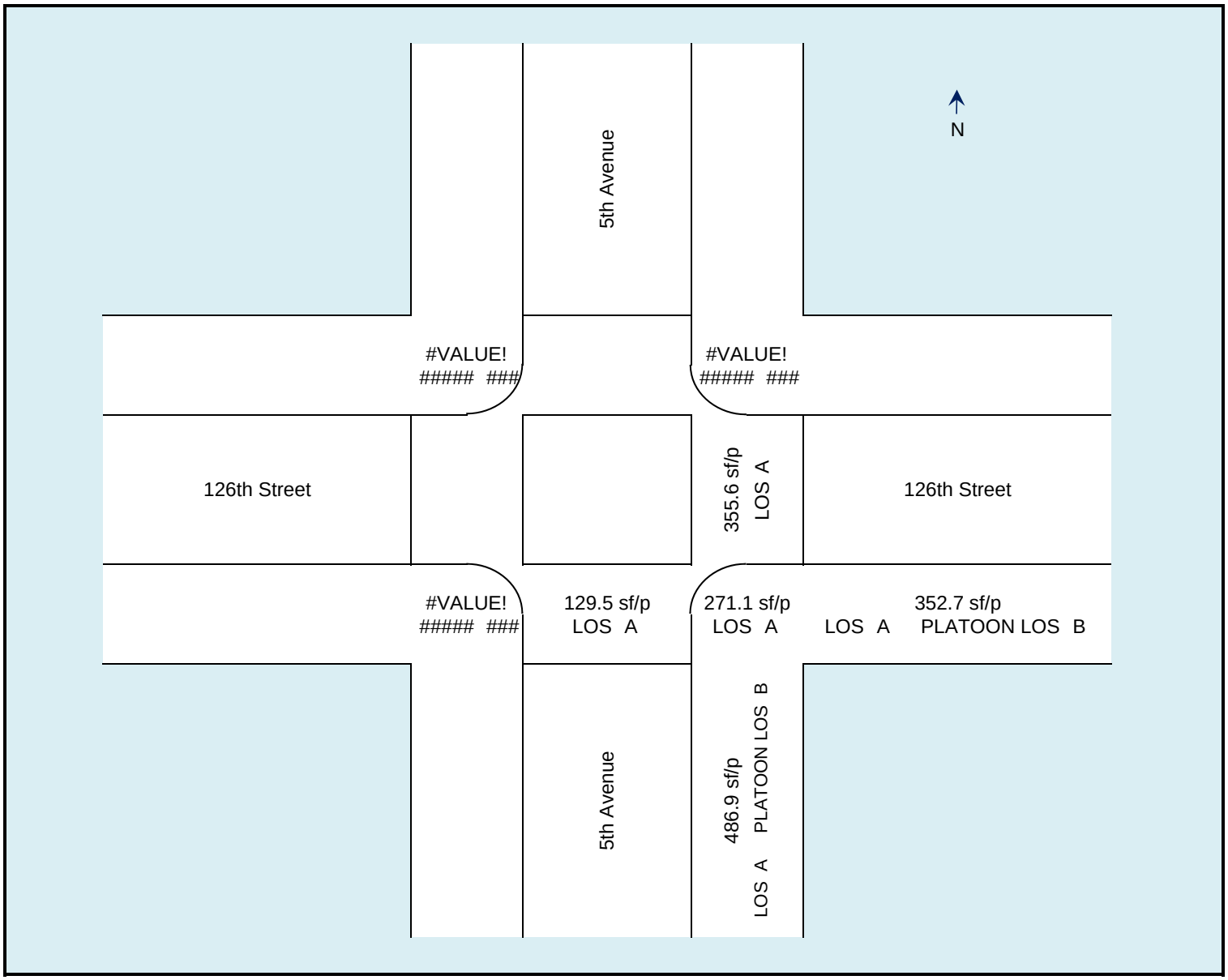
CORNER	MOVEMENT		VOLUME EACH DIR, s (p/hr)	VOLUME BOTH DIR, v_{ped} (p/hr)	PHF	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS, Ob (ft)	EFFECTIVE WIDTH, $W_E = W_T - Ob$ (ft)	FLOW RATE PER UNIT WIDTH, $v_p = \frac{v_{ped}}{60\ W_E\ PHF}$ (p/ft/min)	FREE FLOW WALK SPEED, S_{pf} (ft/s)	ADJUSTED WALK SPEED, $S_p = (1 - 0.0078\ v_p^2)\ S_{pf}$ (ft/s)	AVG PED SPACE, $A_p = 60\ \frac{S_p}{v_p}$ (ft^2/p)	LOS	PLATOON ADJ LOS
NE	N-S	s_1												
		s_2												
	E-W	s_3												
		s_4												
SE	N-S	s_5	177	444	0.78	30.0	8.0	22.0	0.4	3.5	3.5	486.9	A	B
		s_6	267											
	E-W	s_7	79	185	0.74	13.0	6.0	7.0	0.6	3.5	3.5	352.7	A	B
		s_8	106											
SW	N-S	s_9												
		s_{10}												
	E-W	s_{11}												
		s_{12}												
NW	N-S	s_{13}												
		s_{14}												
	E-W	s_{15}												
		s_{16}												

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	126th Street
Time Period:	NB PM
Analysis Year:	2016

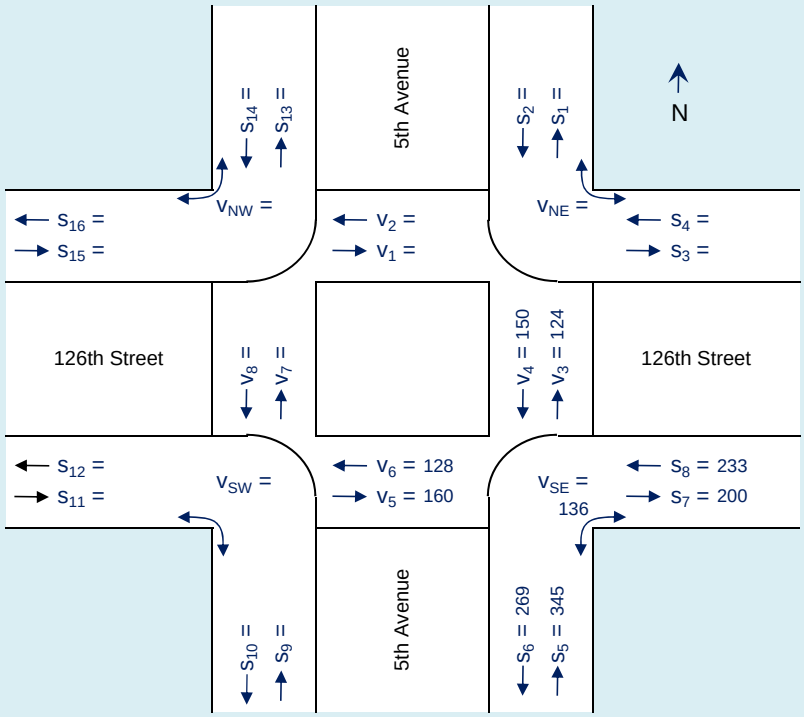


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	126th Street
Analyst:	CV	Time Period:	Build PM
Date:	28-Jun-16	Analysis Year:	2016

PEDESTRIAN PEAK HOUR VOLUMES

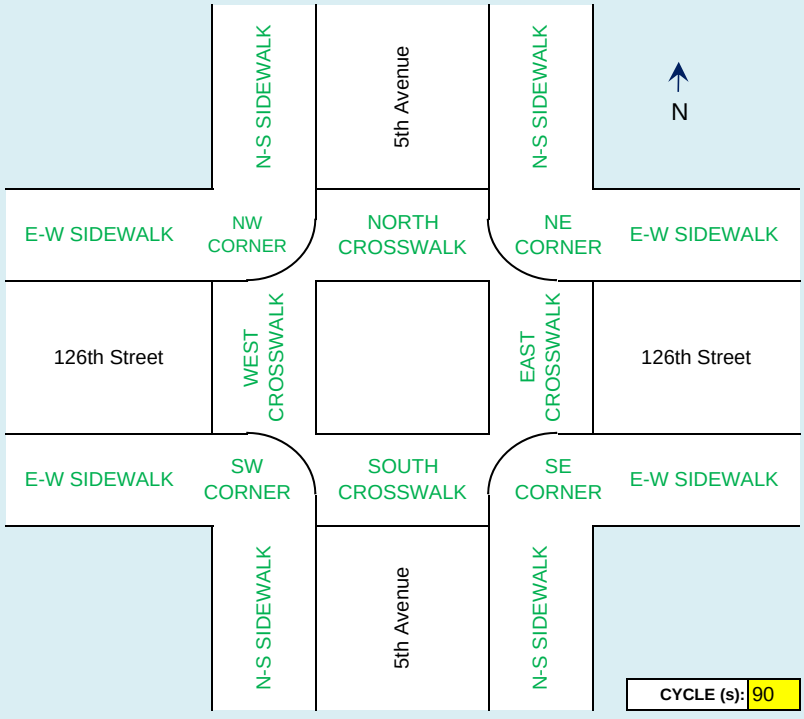


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	S_1		
		S_2		
	E-W	S_3		
		S_4		
SE	N-S	S_5	345	0.78
		S_6	269	
	E-W	S_7	200	0.74
		S_8	233	
SW	N-S	S_9		
		S_{10}		
	E-W	S_{11}		
		S_{12}		
NW	N-S	S_{13}		
		S_{14}		
	E-W	S_{15}		
		S_{16}		

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	V_1		
	V_2		
E	V_3	124	0.81
	V_4	150	0.70
S	V_5	160	0.85
	V_6	128	0.61
W	V_7		
	V_8		

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	V_{NE}		
SE	V_{SE}	136	0.70
SW	V_{SW}		
NW	V_{NW}		

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



CYCLE (s): 90

SIDEWALKS				
CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S			
	E-W			
SE	N-S	30.0	8.0	3.5
	E-W	13.0	6.0	3.5
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Sum of widths and shy distances from obstructions.

CROSSWALKS									
CROSS-WALK	LENGTH, L (ft)	WIDTH, W (ft)	WALK SPEED, S_p (ft/s)	CROSSING TIME (sec)				CONFL VEH	
				WALK	FDW	DW*	PHASE TOTAL	V_{rt}	$V_{lt,perm}$
N				23	8	5	36			#DIV/0!
E	34.0	20.0	3.5	43	6	5	54	0	0	
S	40.0	13.0	3.5	23	8	5	36	0	87	
W				43	6	5	54			#DIV/0!

* DW clearance for phase, not total DW time for entire cycle. Usually 5 sec.

CORNERS				
CORNER	SIDEWALK	TOTAL WIDTH*, W (ft)	RADIUS, R (ft)	OBSTRUCTIONS, Ob (ft^2)
NE	N-S			
	E-W			
SE	N-S	20.0	20.0	10.64
	E-W	15.0		
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Override if corner width is different than sidewalk width.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	126th Street
Time Period:	Build PM
Analysis Year:	2016

INPUTS

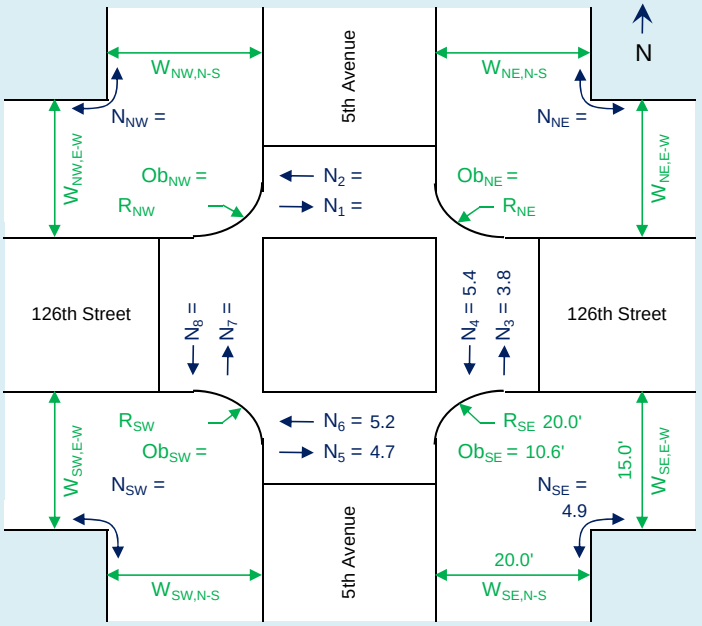
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 =		N_1 =
v_2 =		N_2 =
v_3 = 124	0.81	N_3 = 3.8
v_4 = 150	0.7	N_4 = 5.4
v_5 = 160	0.85	N_5 = 4.7
v_6 = 128	0.61	N_6 = 5.2
v_7 =		N_7 =
v_8 =		N_8 =
v_{NE} =		N_{NE} =
v_{SE} = 136	0.7	N_{SE} = 4.9
v_{SW} =		N_{SW} =
v_{NW} =		N_{NW} =

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	23	$g_{Walk,N}$ = 27
E	43	$g_{Walk,E}$ = 47
S	23	$g_{Walk,S}$ = 27
W	43	$g_{Walk,W}$ = 47

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW}$ = $C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW})$ = #VALUE! ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} \text{ \#VALUE!}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} \text{ \#VALUE!}$$

$TS_{c,NW}$ = $TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W})$ = #VALUE! ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = #VALUE! LOS #

NORTHEAST CORNER

$TS_{corner,NW}$ = $C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE})$ = #VALUE! ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} \text{ \#VALUE!}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 55.0 \text{ s}$$

$TS_{c,NE}$ = $TS_{corner,NE} - 5.0(Q_{t+NE,N} + Q_{t,NE,E})$ = #VALUE! ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = #VALUE! LOS #

SOUTHWEST CORNER

$TS_{corner,SW}$ = $C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW})$ = #VALUE! ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 103.8 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} \text{ \#VALUE!}$$

$TS_{c,SW}$ = $TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W})$ = #VALUE! ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = #VALUE! LOS #

SOUTHEAST CORNER

$TS_{corner,SE}$ = $C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE})$ = 18,302.4 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 115.7 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 39.3 \text{ s}$$

$TS_{c,SE}$ = $TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E})$ = 17,527.5 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 182.6 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	126th Street
Analyst:	CV	Time Period:	Build PM
Date:	42549	Analysis Year:	2016

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 =		N_1 =
v_2 =		N_2 =
v_3 = 124	0.81	N_3 = 3.8
v_4 = 150	0.7	N_4 = 5.4
v_5 = 160	0.85	N_5 = 4.7
v_6 = 128	0.61	N_6 = 5.2
v_7 =		N_7 =
v_8 =		N_8 =

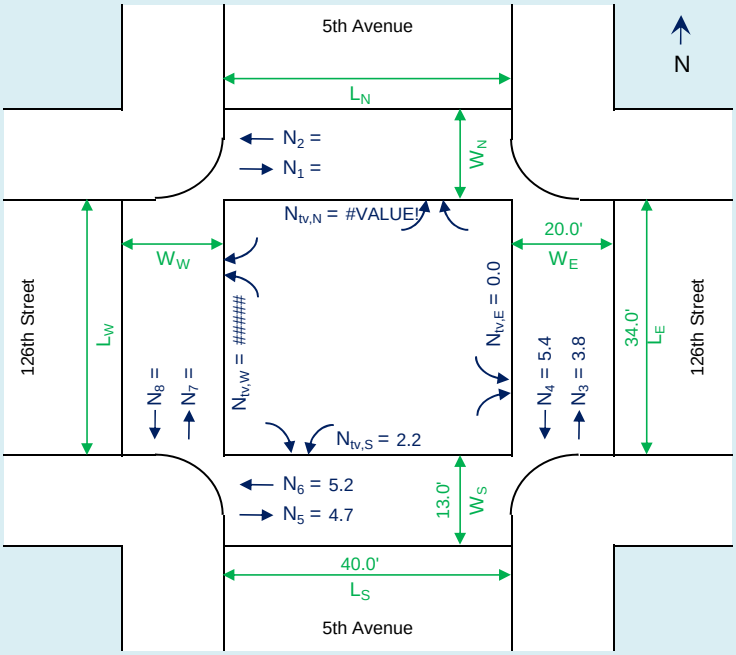
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ =	$N_{tv,N}$ = #######
$v_{rt,N}$ =	
$v_{lt,perm,E}$ = 0	$N_{tv,E}$ = 0.0
$v_{rt,E}$ = 0	
$v_{lt,perm,S}$ = 87	$N_{tv,S}$ = 2.2
$v_{rt,S}$ = 0	
$v_{lt,perm,W}$ =	$N_{tv,W}$ = #######
$v_{rt,W}$ =	

WALKING SPEED & CROSSING TIME

CROSS-WALK	S_p (ft/s)	WALK (s)	g_{Walk} = WALK + 4 (s)
N		23	$g_{Walk,N}$ = 27
E	3.5	43	$g_{Walk,E}$ = 47
S	3.5	23	$g_{Walk,S}$ = 27
W		43	$g_{Walk,W}$ = 47

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= $ #VALUE! ft^2-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= $ #VALUE! ft^2-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= $ #VALUE! ft^2-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= $ #VALUE!

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= $ #VALUE!

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$=$

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$=$

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$=$

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = LOS

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 31{,}960.0$ ft^2-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 0.0$ ft^2-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 31{,}960.0$ ft^2-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 1.8$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 2.6$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 13.2$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 13.3$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 121.4$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E} = 263.3$ sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 14{,}040.0$ ft^2-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 1{,}131.0$ ft^2-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 12{,}909.0$ ft^2-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$= 3.3$ p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$= 3.7$ p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$= 15.3$ s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$= 15.4$ s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$= 152.8$ s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S} = 84.5$ sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= $ #VALUE! ft^2-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= $ #VALUE! ft^2-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= $ #VALUE! ft^2-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$= $ #VALUE!

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$= $ #VALUE!

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$=$

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$=$

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$=$

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

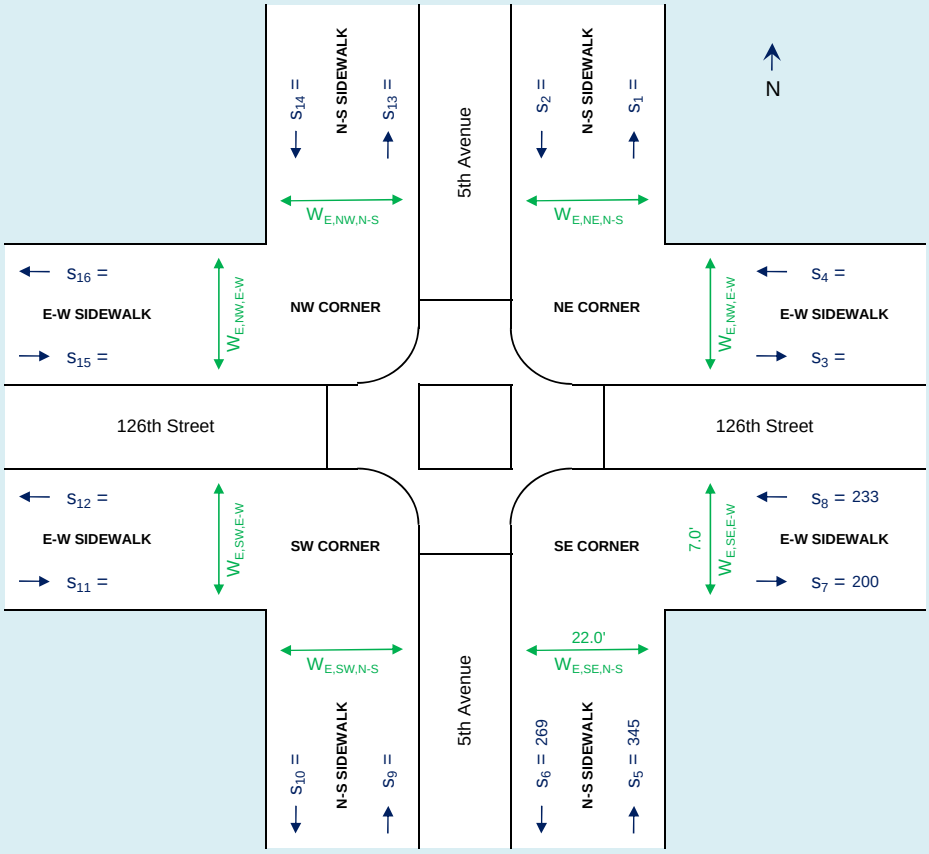
$M_{cw,W}$ = LOS

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	126th Street
Analyst:	CV	Time Period:	Build PM
Date:	42549	Analysis Year:	2016

INPUTS



ANALYSIS

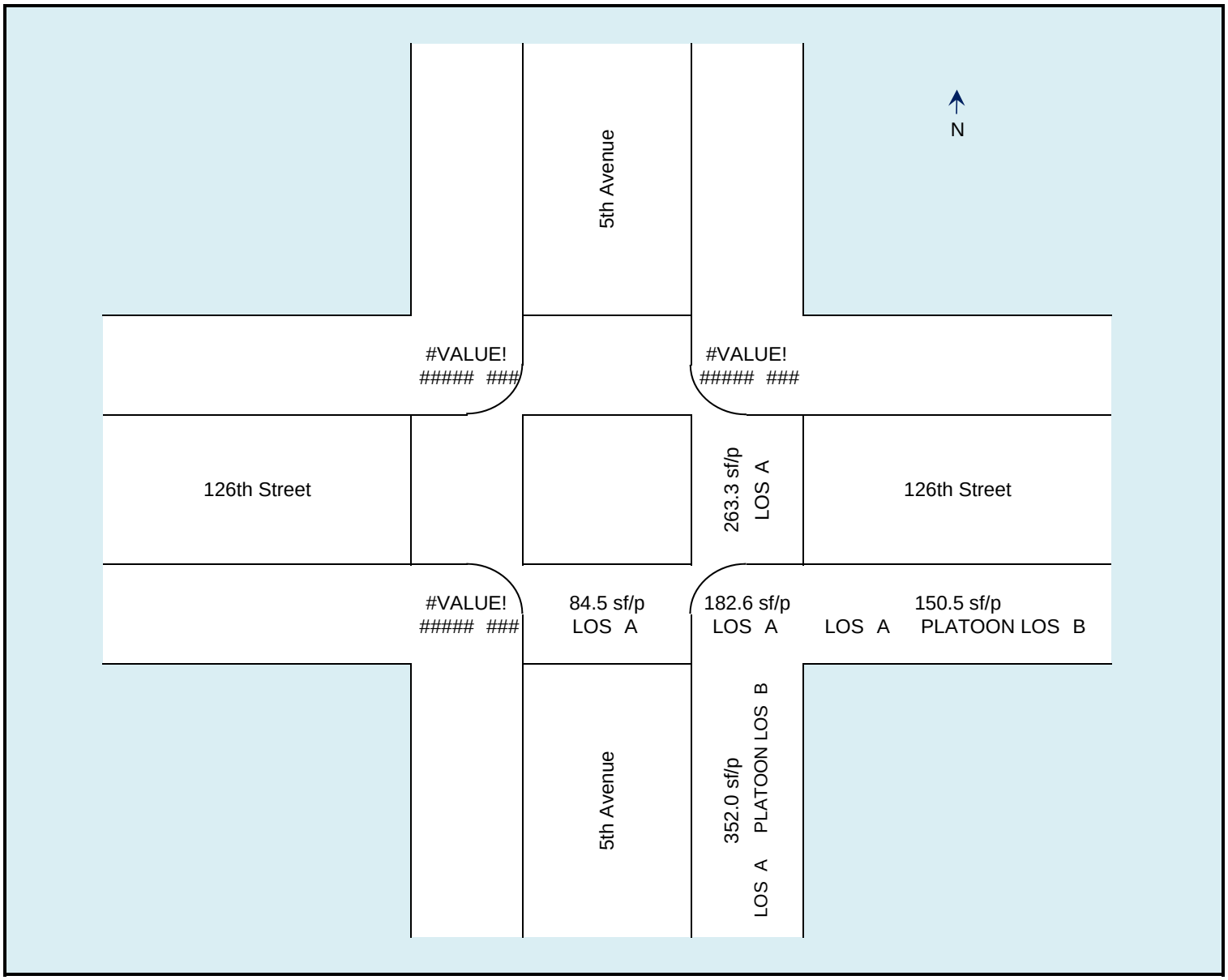
CORNER	MOVEMENT		VOLUME EACH DIR, s (p/hr)	VOLUME BOTH DIR, v_{ped} (p/hr)	PHF	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS, Ob (ft)	EFFECTIVE WIDTH, $W_E = W_T - Ob$ (ft)	FLOW RATE PER UNIT WIDTH, $v_p = \frac{v_{ped}}{60\ W_E\ PHF}$ (p/ft/min)	FREE FLOW WALK SPEED, S_{pf} (ft/s)	ADJUSTED WALK SPEED, $S_p = (1 - 0.0078\ v_p^2)\ S_{pf}$ (ft/s)	AVG PED SPACE, $A_p = 60\ \frac{S_p}{v_p}$ (ft^2/p)	LOS	PLATOON ADJ LOS
NE	N-S	S_1												
		S_2												
	E-W	S_3												
		S_4												
SE	N-S	S_5	345	614	0.78	30.0	8.0	22.0	0.6	3.5	3.5	352.0	A	B
		S_6	269											
	E-W	S_7	200	433	0.74	13.0	6.0	7.0	1.4	3.5	3.5	150.5	A	B
		S_8	233											
SW	N-S	S_9												
		S_{10}												
	E-W	S_{11}												
		S_{12}												
NW	N-S	S_{13}												
		S_{14}												
	E-W	S_{15}												
		S_{16}												

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	126th Street
Time Period:	Build PM
Analysis Year:	2016

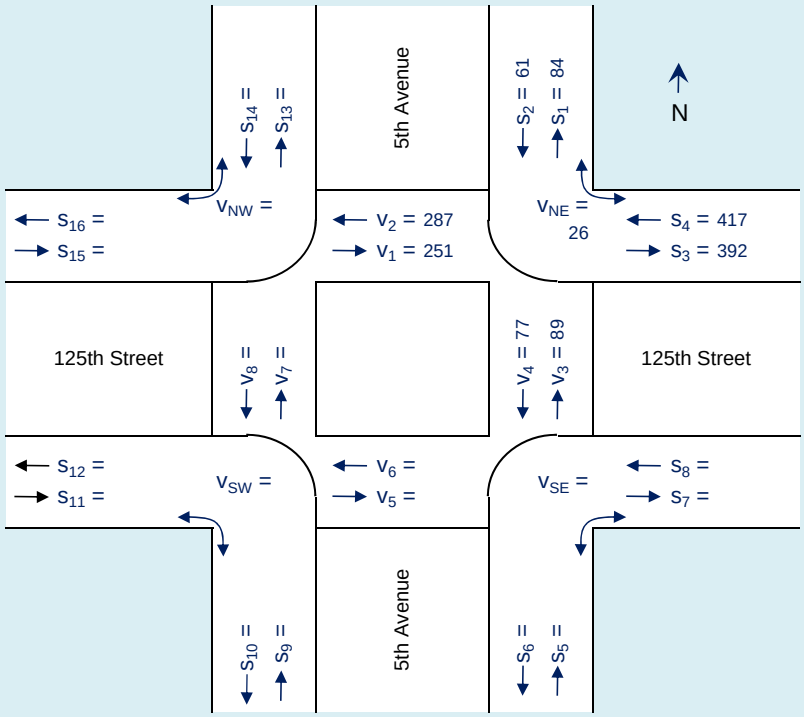


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	Saturday Midday
Date:	28-Jun-16	Analysis Year:	2016

PEDESTRIAN PEAK HOUR VOLUMES

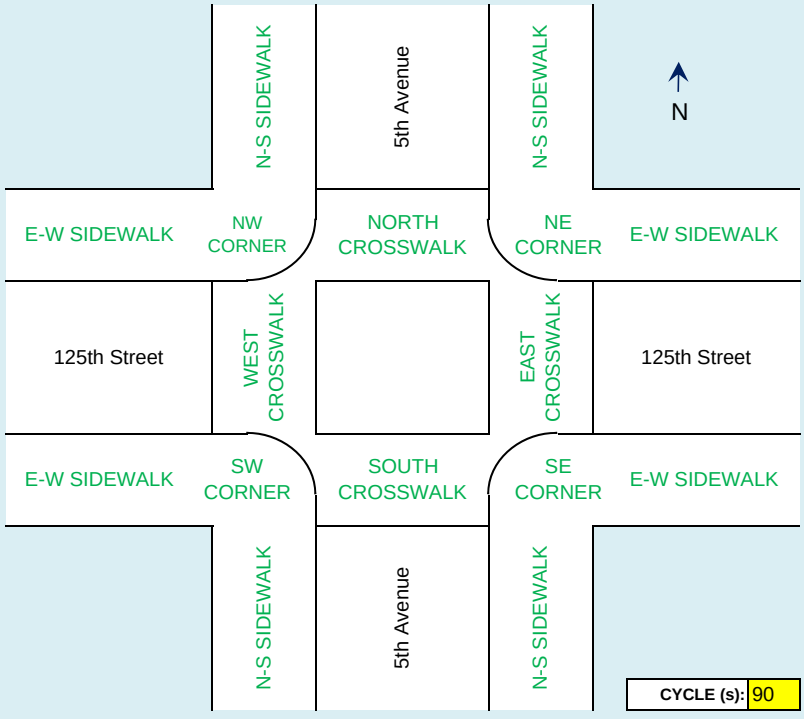


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	S_1	84	0.88
		S_2	61	
	E-W	S_3	392	0.83
		S_4	417	
SE	N-S	S_5		
		S_6		
	E-W	S_7		
		S_8		
SW	N-S	S_9		
		S_{10}		
	E-W	S_{11}		
		S_{12}		
NW	N-S	S_{13}		
		S_{14}		
	E-W	S_{15}		
		S_{16}		

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	V_1	251	0.90
	V_2	287	0.76
E	V_3	89	0.70
	V_4	77	0.77
S	V_5		
	V_6		
W	V_7		
	V_8		

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	V_{NE}	26	0.72
SE	V_{SE}		
SW	V_{SW}		
NW	V_{NW}		

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



CYCLE (s): 90

SIDEWALKS				
CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S	30.0	8.0	3.5
	E-W	20.0	7.0	3.5
SE	N-S			
	E-W			
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Sum of widths and shy distances from obstructions.

CORNERS				
CORNER	SIDEWALK	TOTAL WIDTH*, W (ft)	RADIUS, R (ft)	OBSTRUCTIONS, Ob (ft^2)
NE	N-S	24.0	28.0	19.32
	E-W	20.0		
SE	N-S			
	E-W			
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Override if corner width is different than sidewalk width.

CROSSWALKS									
CROSS-WALK	LENGTH, L (ft)	WIDTH, W (ft)	WALK SPEED, S_p (ft/s)	CROSSING TIME (sec)				CONFL VEH	
				WALK	FDW	DW*	PHASE TOTAL	V_{rt}	$V_{lt,perm}$
N	40.0	19.0	3.5	30	10	5	45	0	0	
E	60.0	26.0	3.5	24	16	5	45	0	100	
S	0.0	0.0	0.0	30	10	5	45	0	0	#DIV/0!
W	0.0	0.0	0.0	24	16	5	45	0	0	#DIV/0!

* DW clearance for phase, not total DW time for entire cycle. Usually 5 sec.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	125th Street
Time Period:	Saturday Midday
Analysis Year:	2016

INPUTS

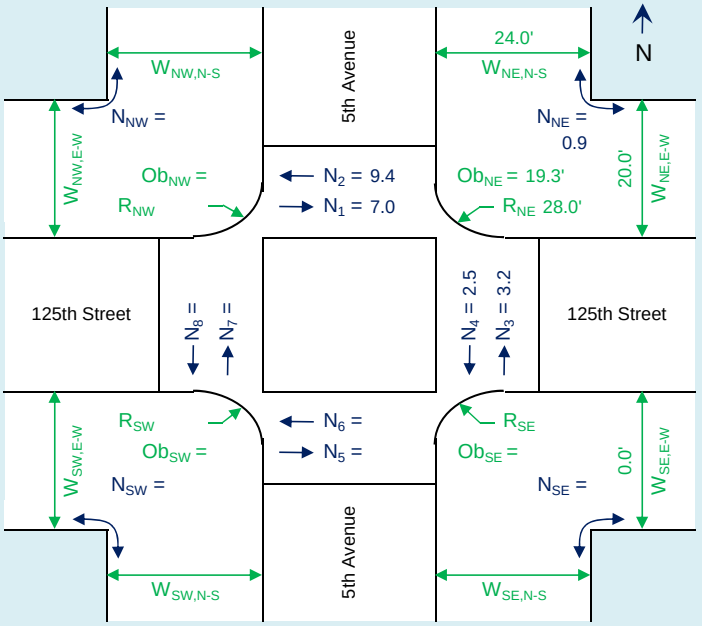
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 251	0.9	N_1 = 7.0
v_2 = 287	0.76	N_2 = 9.4
v_3 = 89	0.7	N_3 = 3.2
v_4 = 77	0.77	N_4 = 2.5
v_5 =		N_5 =
v_6 =		N_6 =
v_7 =		N_7 =
v_8 =		N_8 =
v_{NE} = 26	0.72	N_{NE} = 0.9
v_{SE} =		N_{SE} =
v_{SW} =		N_{SW} =
v_{NW} =		N_{NW} =

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	30	$g_{Walk,N}$ = 34
E	24	$g_{Walk,E}$ = 28
S	30	$g_{Walk,S}$ = 34
W	24	$g_{Walk,W}$ = 28

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW}$ = $C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW})$ = #VALUE! ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 121.5 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} \text{ \#VALUE!}$$

$TS_{c,NW}$ = $TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W})$ = #VALUE! ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = #VALUE! LOS #

NORTHEAST CORNER

$TS_{corner,NW}$ = $C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE})$ = 26,290.8 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 164.5 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 53.4 \text{ s}$$

$TS_{c,NE}$ = $TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E})$ = 25,201.5 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 274.0 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW}$ = $C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW})$ = #VALUE! ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} \text{ \#VALUE!}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} \text{ \#VALUE!}$$

$TS_{c,SW}$ = $TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W})$ = #VALUE! ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = #VALUE! LOS #

SOUTHEAST CORNER

$TS_{corner,SE}$ = $C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE})$ = #VALUE! ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} \text{ \#VALUE!}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 67.9 \text{ s}$$

$TS_{c,SE}$ = $TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E})$ = #VALUE! ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = #VALUE! LOS #

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	Saturday Midday
Date:	42549	Analysis Year:	2016

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 251	0.9	N_1 = 7.0
v_2 = 287	0.76	N_2 = 9.4
v_3 = 89	0.7	N_3 = 3.2
v_4 = 77	0.77	N_4 = 2.5
v_5 =		N_5 =
v_6 =		N_6 =
v_7 =		N_7 =
v_8 =		N_8 =

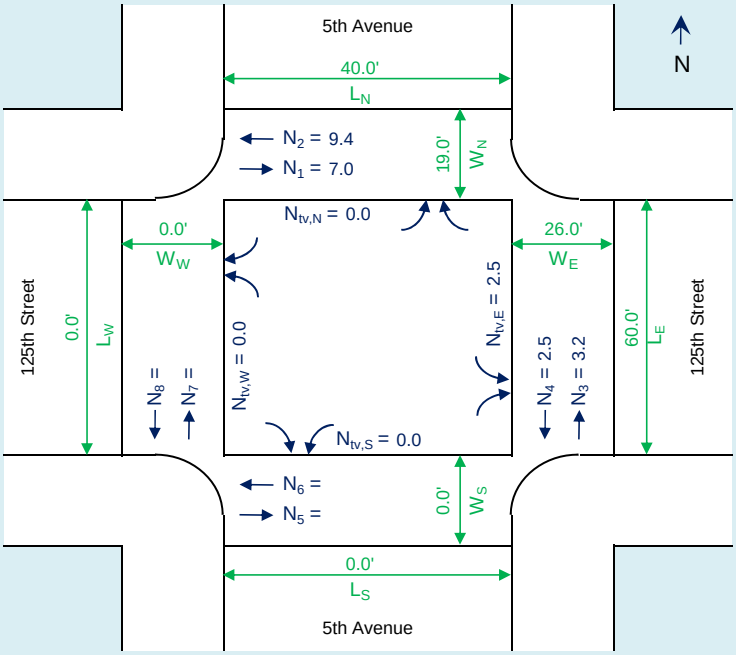
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ = 0	$N_{tv,N}$ = 0.0
$v_{rt,N}$ = 0	
$v_{lt,perm,E}$ = 100	$N_{tv,E}$ = 2.5
$v_{rt,E}$ = 0	
$v_{lt,perm,S}$ = 0	$N_{tv,S}$ = 0.0
$v_{rt,S}$ = 0	
$v_{lt,perm,W}$ = 0	$N_{tv,W}$ = 0.0
$v_{rt,W}$ = 0	

WALKING SPEED & CROSSING TIME

CROSS-WALK	S_p (ft/s)	WALK (s)	g_{Walk} = WALK + 4 (s)
N	3.5	30	$g_{Walk,N}$ = 34
E	3.5	24	$g_{Walk,E}$ = 28
S	0.0	30	$g_{Walk,S}$ = 34
W	0.0	24	$g_{Walk,W}$ = 28

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 25{,}840.0$ ft²-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 0.0$ ft²-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 25{,}840.0$ ft²-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 4.3$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 5.9$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 15.2$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 15.5$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 252.3$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 102.4 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 43{,}680.0$ ft²-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 2{,}600.0$ ft²-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 41{,}080.0$ ft²-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 2.2$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 1.7$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 20.6$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 20.5$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 116.7$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 352.0 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 0.0$ ft²-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 0.0$ ft²-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 0.0$ ft²-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$=$ #VALUE!

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$=$ #VALUE!

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$=$ #DIV/0!

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$=$ #DIV/0!

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$=$ #DIV/0!

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = #DIV/0! LOS #

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 0.0$ ft²-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 0.0$ ft²-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 0.0$ ft²-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$=$ #VALUE!

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$=$ #VALUE!

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$=$ #DIV/0!

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$=$ #DIV/0!

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$=$ #DIV/0!

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

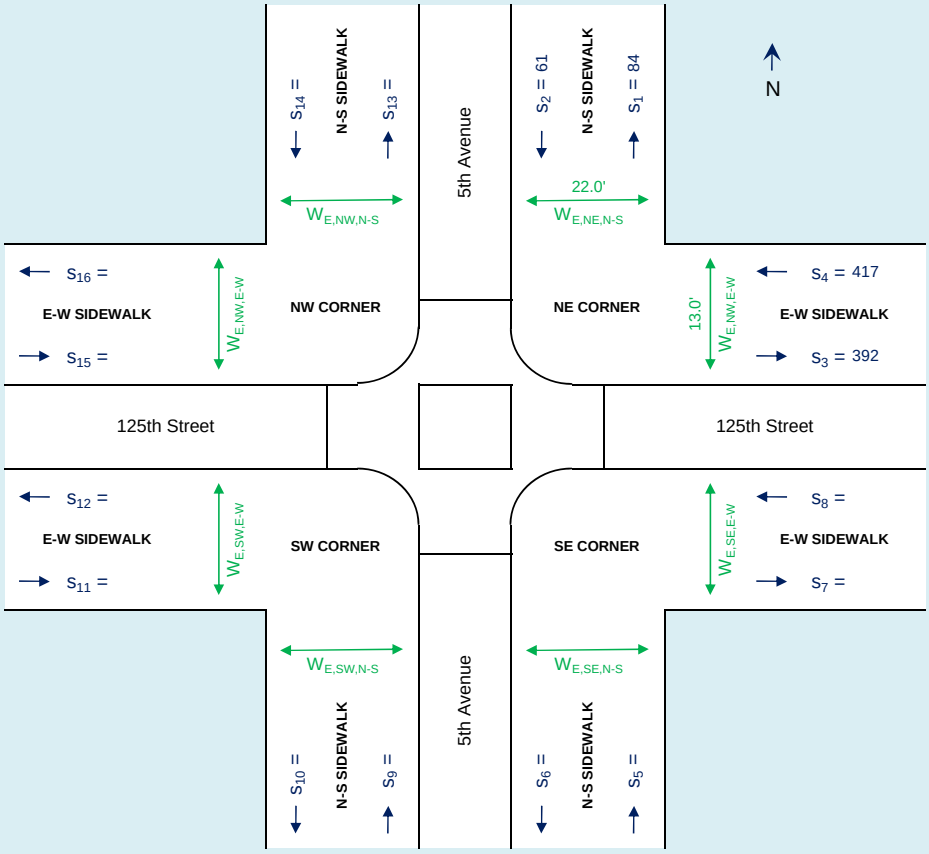
$M_{cw,W}$ = #DIV/0! LOS #

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	Saturday Midday
Date:	42549	Analysis Year:	2016

INPUTS



ANALYSIS

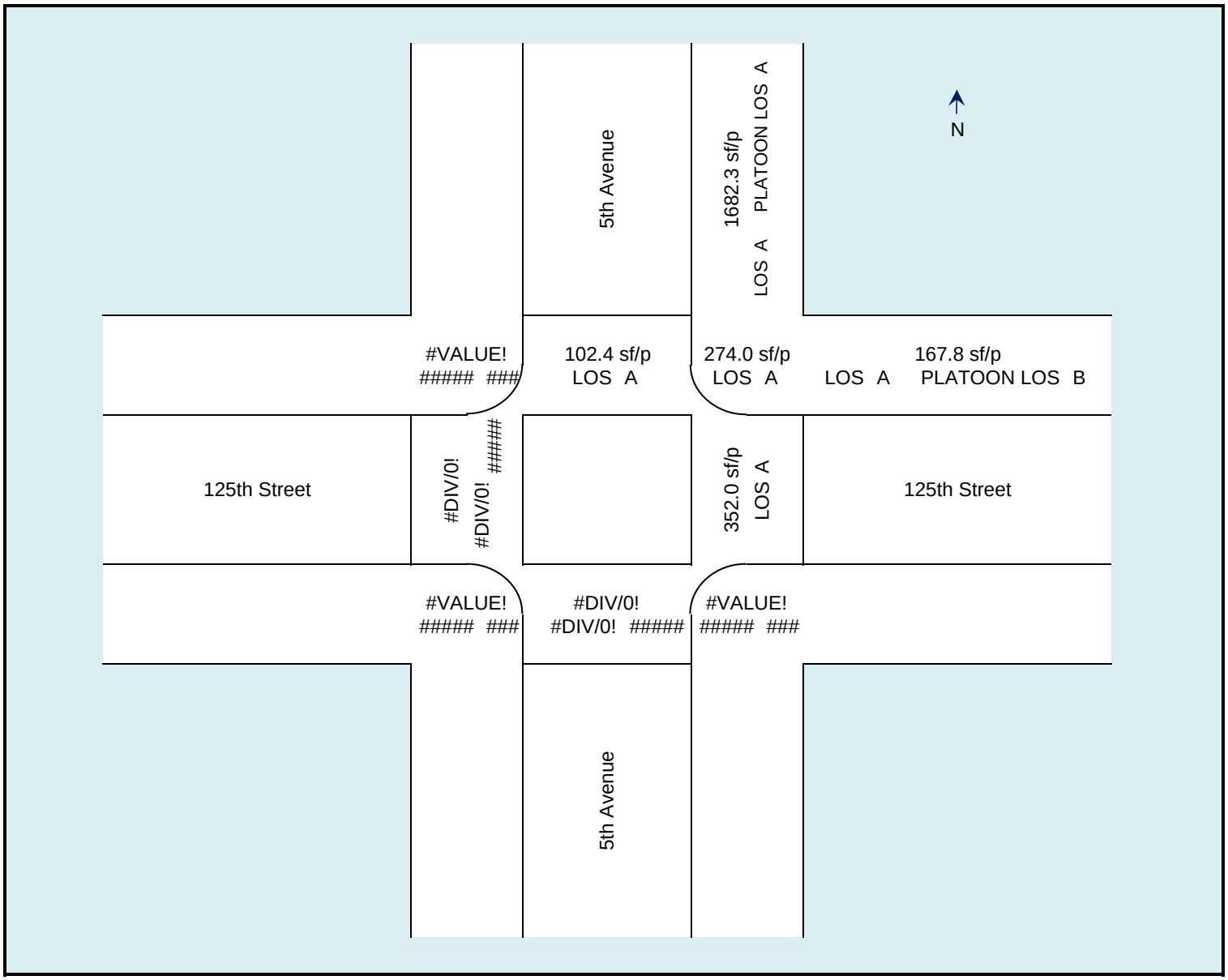
CORNER	MOVEMENT		VOLUME EACH DIR, s (p/hr)	VOLUME BOTH DIR, v_{ped} (p/hr)	PHF	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS, Ob (ft)	EFFECTIVE WIDTH, $W_E = W_T - Ob$ (ft)	FLOW RATE PER UNIT WIDTH, $v_p = \frac{v_{ped}}{60\ W_E\ PHF}$ (p/ft/min)	FREE FLOW WALK SPEED, S_{pf} (ft/s)	ADJUSTED WALK SPEED, $S_p = (1 - 0.0078\ v_p^2)\ S_{pf}$ (ft/s)	AVG PED SPACE, $A_p = 60\ \frac{S_p}{v_p}$ (ft^2/p)	LOS	PLATOON ADJ LOS
NE	N-S	s_1	84	145	0.88	30.0	8.0	22.0	0.1	3.5	3.5	1682.3	A	A
		s_2	61											
	E-W	s_3	392	809	0.83	20.0	7.0	13.0	1.2	3.5	3.5	167.8	A	B
		s_4	417											
SE	N-S	s_5												
		s_6												
	E-W	s_7												
		s_8												
SW	N-S	s_9												
		s_{10}												
	E-W	s_{11}												
		s_{12}												
NW	N-S	s_{13}												
		s_{14}												
	E-W	s_{15}												
		s_{16}												

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	125th Street
Time Period:	Saturday Midday
Analysis Year:	2016

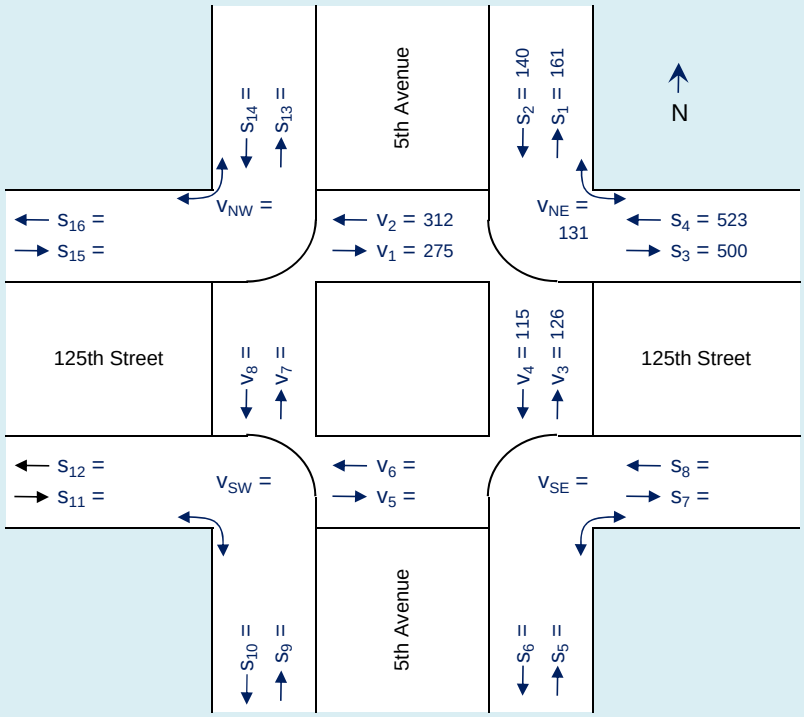


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	NB Saturday Midday
Date:	28-Jun-16	Analysis Year:	2016

PEDESTRIAN PEAK HOUR VOLUMES

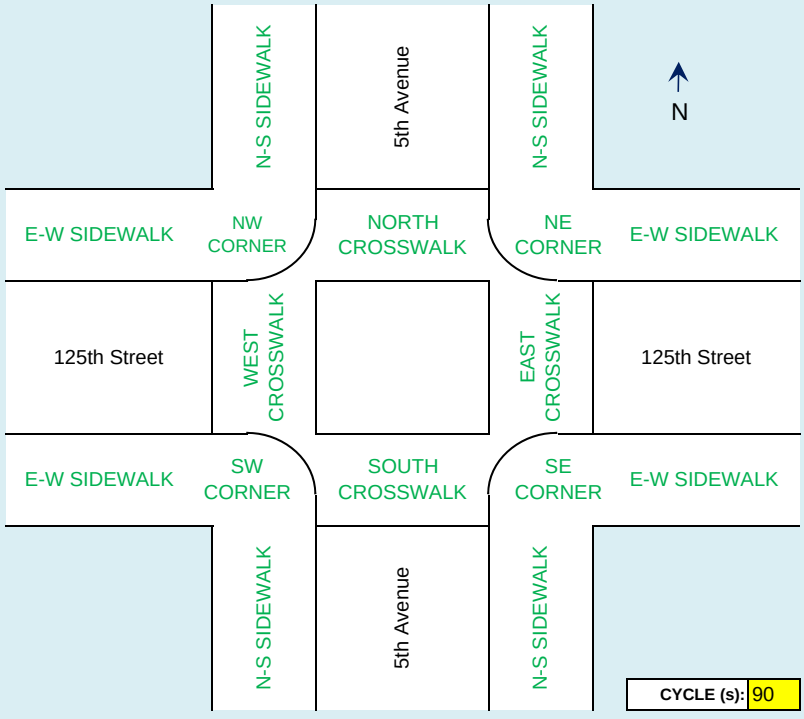


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	S_1	161	0.88
		S_2	140	
	E-W	S_3	500	0.83
		S_4	523	
SE	N-S	S_5		
		S_6		
	E-W	S_7		
		S_8		
SW	N-S	S_9		
		S_{10}		
	E-W	S_{11}		
		S_{12}		
NW	N-S	S_{13}		
		S_{14}		
	E-W	S_{15}		
		S_{16}		

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	V_1	275	0.90
	V_2	312	0.76
E	V_3	126	0.70
	V_4	115	0.77
S	V_5		
	V_6		
W	V_7		
	V_8		

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	V_{NE}	131	0.72
SE	V_{SE}		
SW	V_{SW}		
NW	V_{NW}		

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



CYCLE (s): 90

SIDEWALKS				
CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S	30.0	8.0	3.5
	E-W	20.0	7.0	3.5
SE	N-S			
	E-W			
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Sum of widths and shy distances from obstructions.

CORNERS				
CORNER	SIDEWALK	TOTAL WIDTH*, W (ft)	RADIUS, R (ft)	OBSTRUCTIONS, Ob (ft^2)
NE	N-S	24.0	28.0	19.32
	E-W	20.0		
SE	N-S			
	E-W			
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Override if corner width is different than sidewalk width.

CROSSWALKS									
CROSS-WALK	LENGTH, L (ft)	WIDTH, W (ft)	WALK SPEED, S_p (ft/s)	CROSSING TIME (sec)				CONFL VEH	
				WALK	FDW	DW*	PHASE TOTAL	V_{rt}	$V_{lt,perm}$
N	40.0	19.0	3.5	30	10	5	45	0	0	
E	60.0	26.0	3.5	24	16	5	45	0	101	
S	0.0	0.0	0.0	30	10	5	45	0	0	#DIV/0!
W	0.0	0.0	0.0	24	16	5	45	0	0	#DIV/0!

* DW clearance for phase, not total DW time for entire cycle. Usually 5 sec.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	125th Street
Time Period:	NB Saturday Midday
Analysis Year:	2016

INPUTS

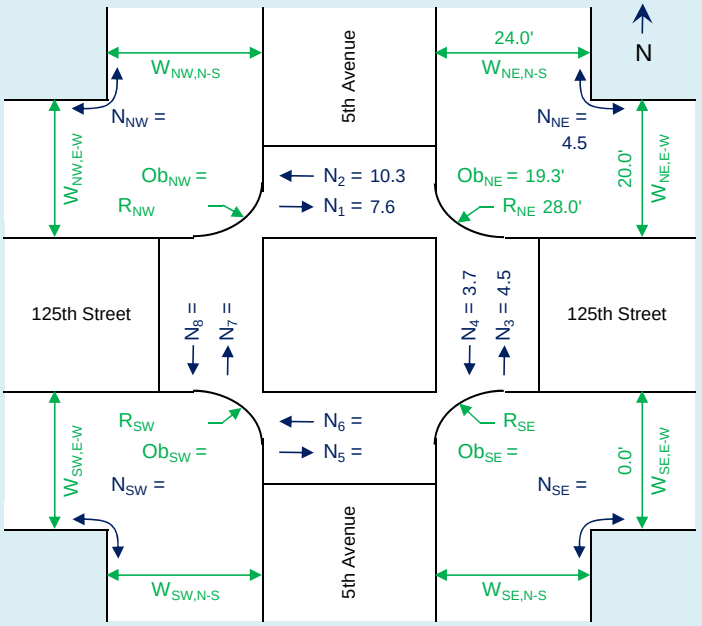
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 275	0.9	N_1 = 7.6
v_2 = 312	0.76	N_2 = 10.3
v_3 = 126	0.7	N_3 = 4.5
v_4 = 115	0.77	N_4 = 3.7
v_5 =		N_5 =
v_6 =		N_6 =
v_7 =		N_7 =
v_8 =		N_8 =
v_{NE} = 131	0.72	N_{NE} = 4.5
v_{SE} =		N_{SE} =
v_{SW} =		N_{SW} =
v_{NW} =		N_{NW} =

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	30	$g_{Walk,N}$ = 34
E	24	$g_{Walk,E}$ = 28
S	30	$g_{Walk,S}$ = 34
W	24	$g_{Walk,W}$ = 28

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW}$ = $C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW})$ = #VALUE! ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 133.1 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} \text{ \#VALUE!}$$

$TS_{c,NW}$ = $TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W})$ = #VALUE! ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = #VALUE! LOS #

NORTHEAST CORNER

$TS_{corner,NW}$ = $C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE})$ = 26,290.8 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 178.8 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 79.7 \text{ s}$$

$TS_{c,NE}$ = $TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E})$ = 24,998.1 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 203.7 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW}$ = $C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW})$ = #VALUE! ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} \text{ \#VALUE!}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} \text{ \#VALUE!}$$

$TS_{c,SW}$ = $TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W})$ = #VALUE! ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = #VALUE! LOS #

SOUTHEAST CORNER

$TS_{corner,SE}$ = $C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE})$ = #VALUE! ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} \text{ \#VALUE!}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 96.1 \text{ s}$$

$TS_{c,SE}$ = $TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E})$ = #VALUE! ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = #VALUE! LOS #

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	NB Saturday Midday
Date:	42549	Analysis Year:	2016

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 275	0.9	N_1 = 7.6
v_2 = 312	0.76	N_2 = 10.3
v_3 = 126	0.7	N_3 = 4.5
v_4 = 115	0.77	N_4 = 3.7
v_5 =		N_5 =
v_6 =		N_6 =
v_7 =		N_7 =
v_8 =		N_8 =

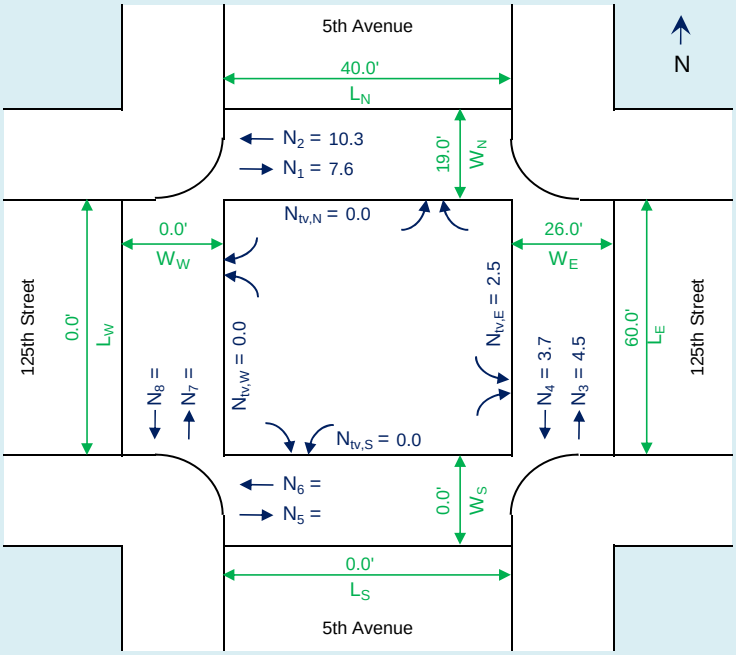
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ = 0	$N_{tv,N}$ = 0.0
$v_{rt,N}$ = 0	
$v_{lt,perm,E}$ = 101	$N_{tv,E}$ = 2.5
$v_{rt,E}$ = 0	
$v_{lt,perm,S}$ = 0	$N_{tv,S}$ = 0.0
$v_{rt,S}$ = 0	
$v_{lt,perm,W}$ = 0	$N_{tv,W}$ = 0.0
$v_{rt,W}$ = 0	

WALKING SPEED & CROSSING TIME

CROSS-WALK	S_p (ft/s)	WALK (s)	g_{Walk} = WALK + 4 (s)
N	3.5	30	$g_{Walk,N}$ = 34
E	3.5	24	$g_{Walk,E}$ = 28
S	0.0	30	$g_{Walk,S}$ = 34
W	0.0	24	$g_{Walk,W}$ = 28

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 25{,}840.0$ ft²-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 0.0$ ft²-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 25{,}840.0$ ft²-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 4.8$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 6.4$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 15.3$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 15.5$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 276.4$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 93.5 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 43{,}680.0$ ft²-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 2{,}626.0$ ft²-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 41{,}054.0$ ft²-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 3.1$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 2.6$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 20.7$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 20.6$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 169.9$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 241.6 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 0.0$ ft²-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 0.0$ ft²-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 0.0$ ft²-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$=$ #VALUE!

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$=$ #VALUE!

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$=$ #DIV/0!

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$=$ #DIV/0!

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$=$ #DIV/0!

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = #DIV/0! LOS #

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 0.0$ ft²-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 0.0$ ft²-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 0.0$ ft²-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$=$ #VALUE!

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$=$ #VALUE!

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$=$ #DIV/0!

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$=$ #DIV/0!

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$=$ #DIV/0!

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

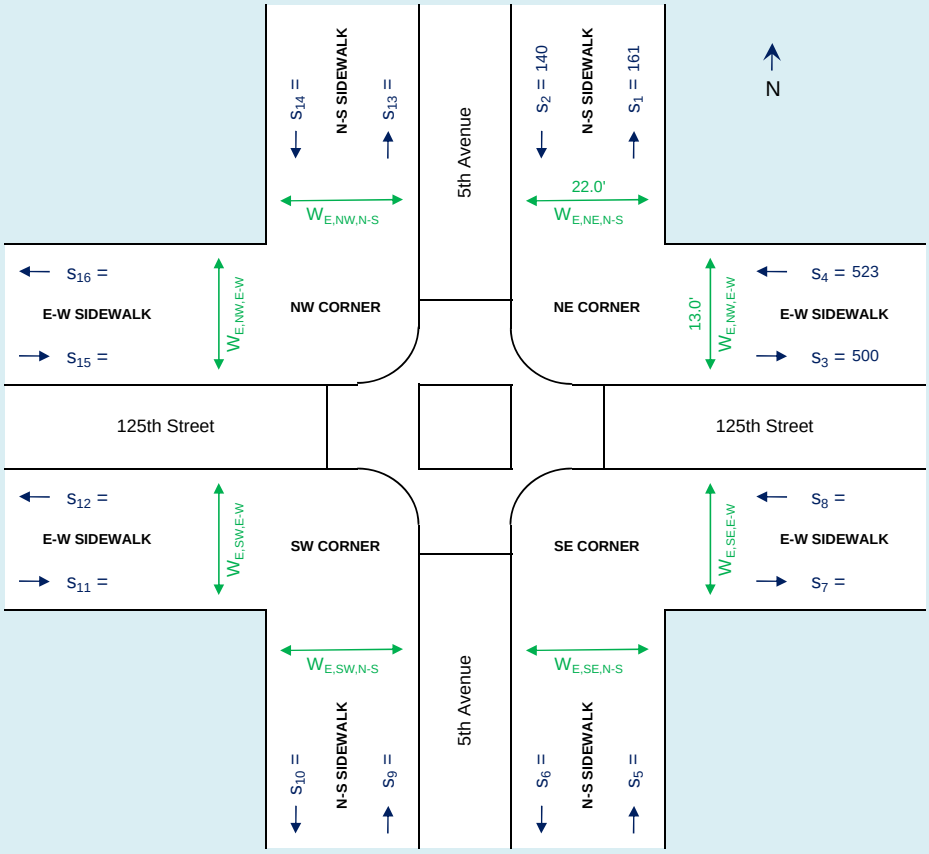
$M_{cw,W}$ = #DIV/0! LOS #

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	NB Saturday Midday
Date:	42549	Analysis Year:	2016

INPUTS



ANALYSIS

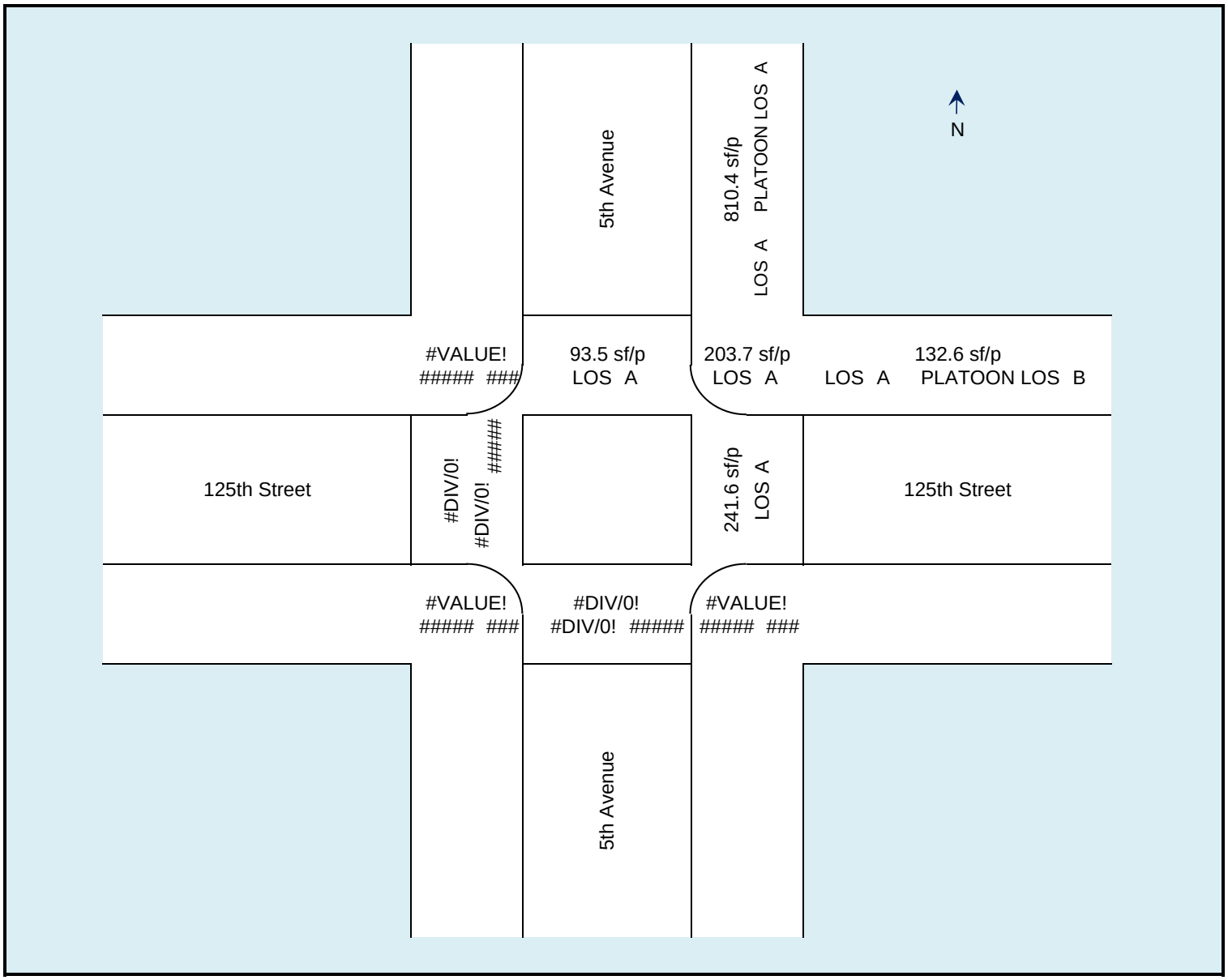
CORNER	MOVEMENT		VOLUME EACH DIR, s (p/hr)	VOLUME BOTH DIR, v_{ped} (p/hr)	PHF	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS, Ob (ft)	EFFECTIVE WIDTH, $W_E = W_T - Ob$ (ft)	FLOW RATE PER UNIT WIDTH, $v_p = \frac{v_{ped}}{60\ W_E\ PHF}$ (p/ft/min)	FREE FLOW WALK SPEED, S_{pf} (ft/s)	ADJUSTED WALK SPEED, $S_p = (1 - 0.0078\ v_p^2)\ S_{pf}$ (ft/s)	AVG PED SPACE, $A_p = 60\ \frac{S_p}{v_p}$ (ft^2/p)	LOS	PLATOON ADJ LOS
NE	N-S	s_1	161	301	0.88	30.0	8.0	22.0	0.3	3.5	3.5	810.4	A	A
		s_2	140											
	E-W	s_3	500	1023	0.83	20.0	7.0	13.0	1.6	3.5	3.5	132.6	A	B
		s_4	523											
SE	N-S	s_5												
		s_6												
	E-W	s_7												
		s_8												
SW	N-S	s_9												
		s_{10}												
	E-W	s_{11}												
		s_{12}												
NW	N-S	s_{13}												
		s_{14}												
	E-W	s_{15}												
		s_{16}												

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	125th Street
Time Period:	NB Saturday Midday
Analysis Year:	2016

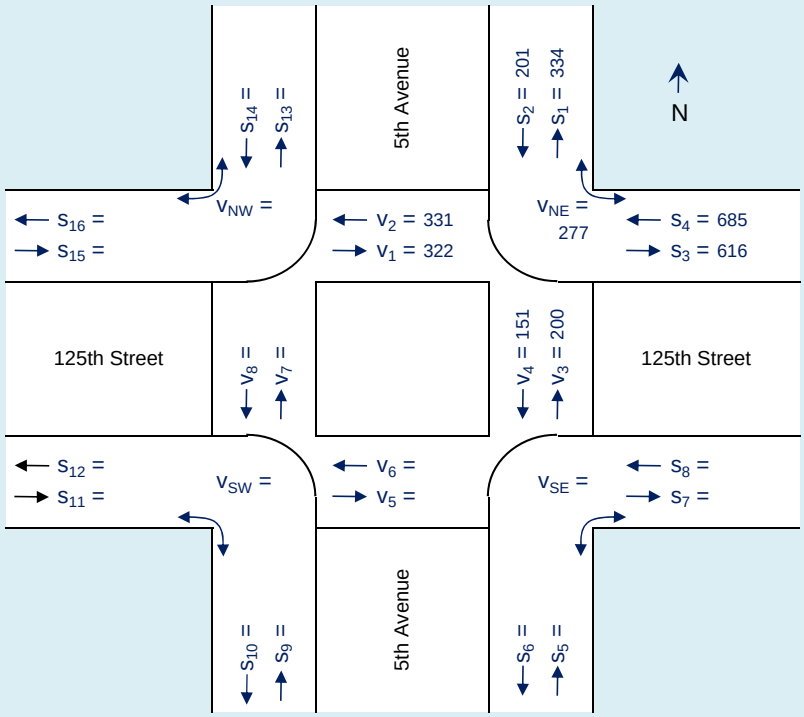


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	Saturday Midday
Date:	28-Jun-16	Analysis Year:	2016

PEDESTRIAN PEAK HOUR VOLUMES

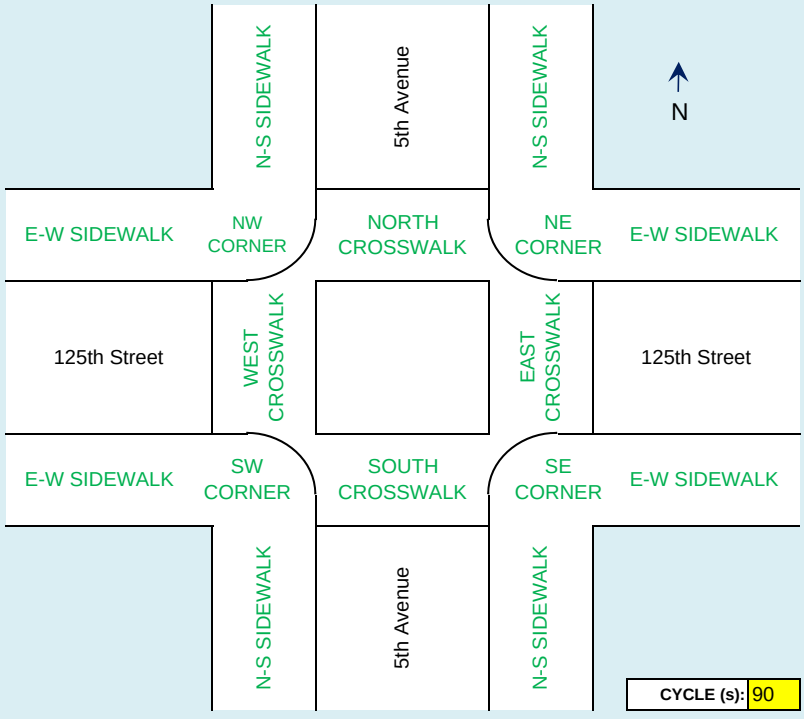


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	S_1	334	0.88
		S_2	201	
	E-W	S_3	616	0.83
		S_4	685	
SE	N-S	S_5		
		S_6		
	E-W	S_7		
		S_8		
SW	N-S	S_9		
		S_{10}		
	E-W	S_{11}		
		S_{12}		
NW	N-S	S_{13}		
		S_{14}		
	E-W	S_{15}		
		S_{16}		

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	V_1	322	0.90
	V_2	331	0.76
E	V_3	200	0.70
	V_4	151	0.77
S	V_5		
	V_6		
W	V_7		
	V_8		

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	V_{NE}	277	0.72
SE	V_{SE}		
SW	V_{SW}		
NW	V_{NW}		

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



CYCLE (s): 90

SIDEWALKS				
CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S	30.0	8.0	3.5
	E-W	20.0	7.0	3.5
SE	N-S			
	E-W			
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Sum of widths and shy distances from obstructions.

CORNERS				
CORNER	SIDEWALK	TOTAL WIDTH*, W (ft)	RADIUS, R (ft)	OBSTRUCTIONS, Ob (ft^2)
NE	N-S	24.0	28.0	19.32
	E-W	20.0		
SE	N-S			
	E-W			
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Override if corner width is different than sidewalk width.

CROSSWALKS									
CROSS-WALK	LENGTH, L (ft)	WIDTH, W (ft)	WALK SPEED, S_p (ft/s)	CROSSING TIME (sec)				CONFL VEH	
				WALK	FDW	DW*	PHASE TOTAL	V_{rt}	$V_{lt,perm}$
N	40.0	19.0	3.5	30	10	5	45	0	0	
E	60.0	26.0	3.5	24	16	5	45	0	101	
S	0.0	0.0	0.0	30	10	5	45	0	0	#DIV/0!
W	0.0	0.0	0.0	24	16	5	45	0	0	#DIV/0!

* DW clearance for phase, not total DW time for entire cycle. Usually 5 sec.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	125th Street
Time Period:	Saturday Midday
Analysis Year:	2016

INPUTS

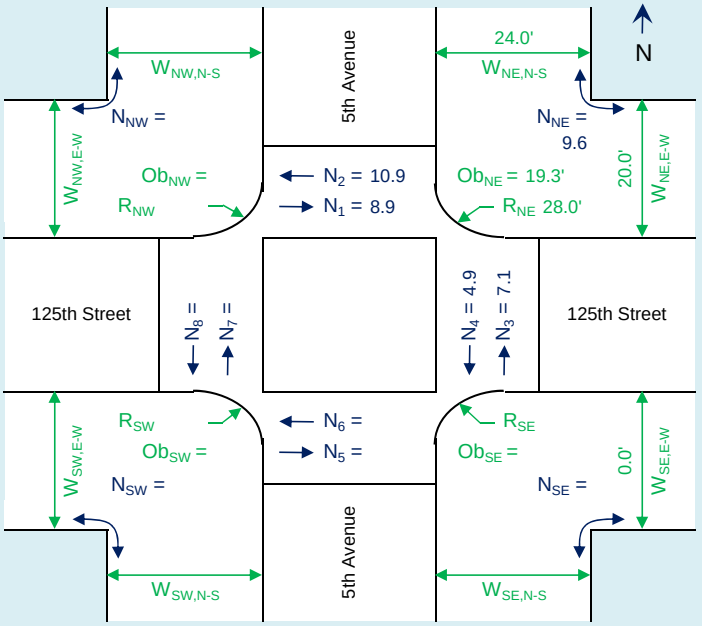
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 322	0.9	N_1 = 8.9
v_2 = 331	0.76	N_2 = 10.9
v_3 = 200	0.7	N_3 = 7.1
v_4 = 151	0.77	N_4 = 4.9
v_5 =		N_5 =
v_6 =		N_6 =
v_7 =		N_7 =
v_8 =		N_8 =
v_{NE} = 277	0.72	N_{NE} = 9.6
v_{SE} =		N_{SE} =
v_{SW} =		N_{SW} =
v_{NW} =		N_{NW} =

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	30	$g_{Walk,N}$ = 34
E	24	$g_{Walk,E}$ = 28
S	30	$g_{Walk,S}$ = 34
W	24	$g_{Walk,W}$ = 28

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW}$ = $C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW})$ = #VALUE! ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 155.8 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} \text{ \#VALUE!}$$

$TS_{c,NW}$ = $TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W})$ = #VALUE! ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = #VALUE! LOS #

NORTHEAST CORNER

$TS_{corner,NW}$ = $C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE})$ = 26,290.8 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 189.7 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 104.7 \text{ s}$$

$TS_{c,NE}$ = $TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E})$ = 24,818.8 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 149.5 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW}$ = $C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW})$ = #VALUE! ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} \text{ \#VALUE!}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} \text{ \#VALUE!}$$

$TS_{c,SW}$ = $TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W})$ = #VALUE! ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = #VALUE! LOS #

SOUTHEAST CORNER

$TS_{corner,SE}$ = $C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE})$ = #VALUE! ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} \text{ \#VALUE!}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 152.5 \text{ s}$$

$TS_{c,SE}$ = $TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E})$ = #VALUE! ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = #VALUE! LOS #

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	Saturday Midday
Date:	42549	Analysis Year:	2016

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 322	0.9	N_1 = 8.9
v_2 = 331	0.76	N_2 = 10.9
v_3 = 200	0.7	N_3 = 7.1
v_4 = 151	0.77	N_4 = 4.9
v_5 =		N_5 =
v_6 =		N_6 =
v_7 =		N_7 =
v_8 =		N_8 =

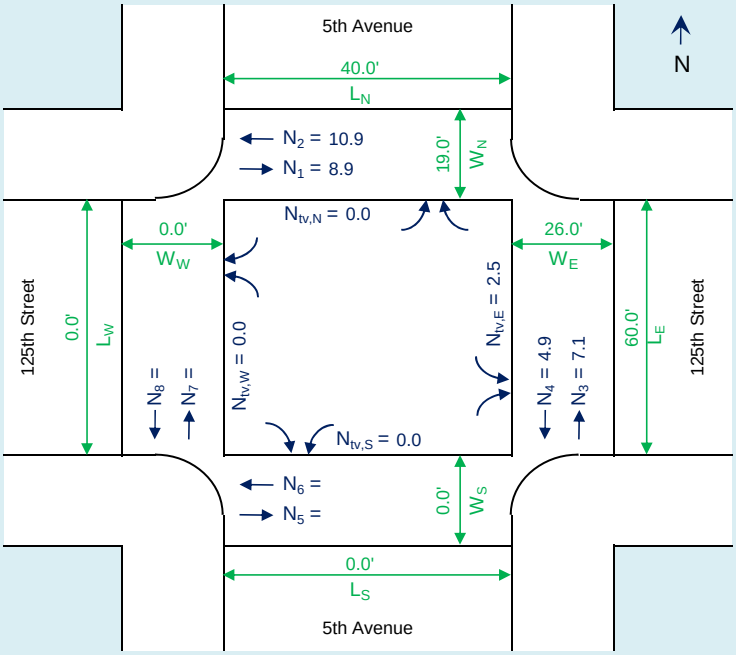
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ = 0	$N_{tv,N}$ = 0.0
$v_{rt,N}$ = 0	
$v_{lt,perm,E}$ = 101	$N_{tv,E}$ = 2.5
$v_{rt,E}$ = 0	
$v_{lt,perm,S}$ = 0	$N_{tv,S}$ = 0.0
$v_{rt,S}$ = 0	
$v_{lt,perm,W}$ = 0	$N_{tv,W}$ = 0.0
$v_{rt,W}$ = 0	

WALKING SPEED & CROSSING TIME

CROSS-WALK	S_p (ft/s)	WALK (s)	g_{Walk} = WALK + 4 (s)
N	3.5	30	$g_{Walk,N}$ = 34
E	3.5	24	$g_{Walk,E}$ = 28
S	0.0	30	$g_{Walk,S}$ = 34
W	0.0	24	$g_{Walk,W}$ = 28

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 25{,}840.0$ ft^2-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 0.0$ ft^2-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 25{,}840.0$ ft^2-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 5.6$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 6.8$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 15.4$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 15.6$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 307.7$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 84.0 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 43{,}680.0$ ft^2-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 2{,}626.0$ ft^2-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 41{,}054.0$ ft^2-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 4.9$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 3.4$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 20.9$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 20.7$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 250.4$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 163.9 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 0.0$ ft^2-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 0.0$ ft^2-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 0.0$ ft^2-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$=$ #VALUE!

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$=$ #VALUE!

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$=$ #DIV/0!

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$=$ #DIV/0!

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$=$ #DIV/0!

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = #DIV/0! LOS #

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 0.0$ ft^2-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 0.0$ ft^2-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 0.0$ ft^2-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$=$ #VALUE!

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$=$ #VALUE!

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$=$ #DIV/0!

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$=$ #DIV/0!

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$=$ #DIV/0!

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

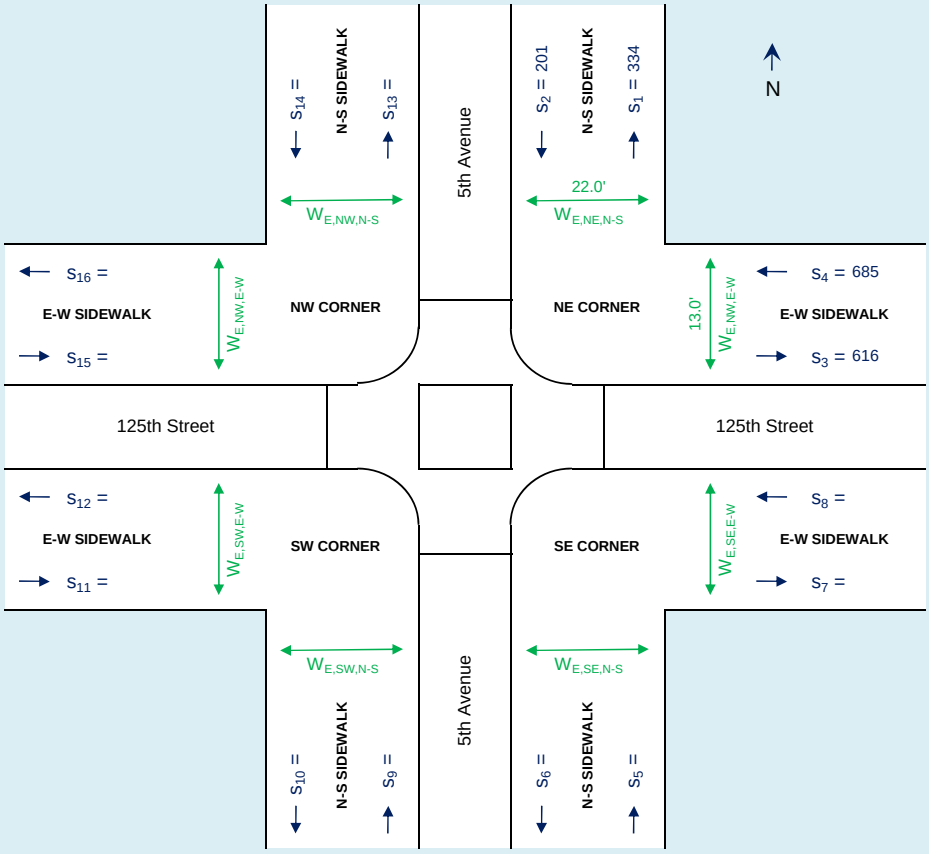
$M_{cw,W}$ = #DIV/0! LOS #

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	125th Street
Analyst:	CV	Time Period:	Saturday Midday
Date:	42549	Analysis Year:	2016

INPUTS



ANALYSIS

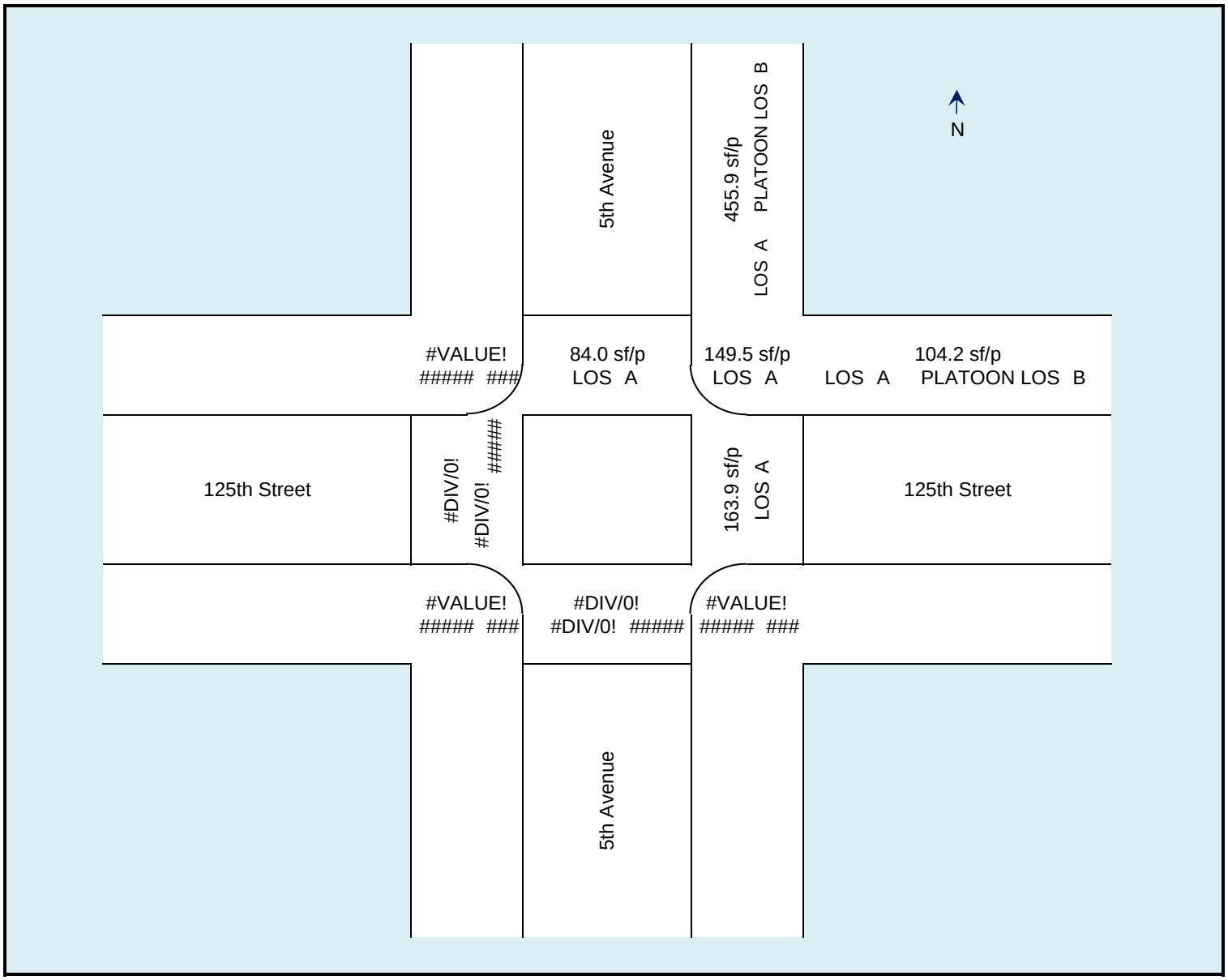
CORNER	MOVEMENT		VOLUME EACH DIR, s (p/hr)	VOLUME BOTH DIR, v_{ped} (p/hr)	PHF	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS, Ob (ft)	EFFECTIVE WIDTH, $W_E = W_T - Ob$ (ft)	FLOW RATE PER UNIT WIDTH, $v_p = \frac{v_{ped}}{60\ W_E\ PHF}$ (p/ft/min)	FREE FLOW WALK SPEED, S_{pf} (ft/s)	ADJUSTED WALK SPEED, $S_p = (1 - 0.0078\ v_p^2)\ S_{pf}$ (ft/s)	AVG PED SPACE, $A_p = 60\ \frac{S_p}{v_p}$ (ft^2/p)	LOS	PLATOON ADJ LOS
NE	N-S	s_1	334	535	0.88	30.0	8.0	22.0	0.5	3.5	3.5	455.9	A	B
		s_2	201											
	E-W	s_3	616	1301	0.83	20.0	7.0	13.0	2.0	3.5	3.5	104.2	A	B
		s_4	685											
SE	N-S	s_5												
		s_6												
	E-W	s_7												
		s_8												
SW	N-S	s_9												
		s_{10}												
	E-W	s_{11}												
		s_{12}												
NW	N-S	s_{13}												
		s_{14}												
	E-W	s_{15}												
		s_{16}												

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	125th Street
Time Period:	Saturday Midday
Analysis Year:	2016

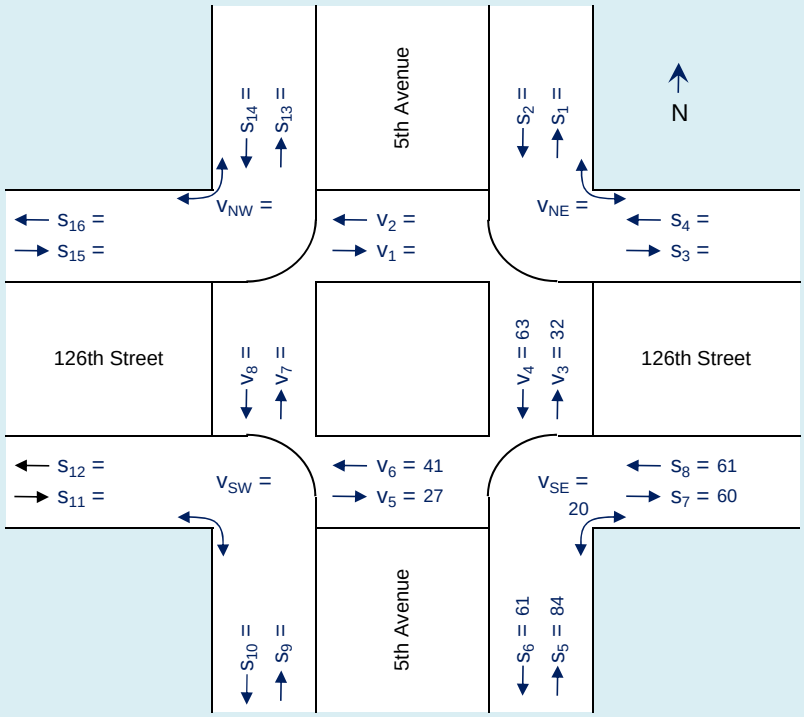


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	126th Street
Analyst:	CV	Time Period:	Saturday Midday
Date:	28-Jun-16	Analysis Year:	2016

PEDESTRIAN PEAK HOUR VOLUMES



SIDEWALKS

CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	S_1		
		S_2		
	E-W	S_3		
		S_4		
SE	N-S	S_5	84	0.88
		S_6	61	
	E-W	S_7	60	0.58
		S_8	61	
SW	N-S	S_9		
		S_{10}		
	E-W	S_{11}		
		S_{12}		
NW	N-S	S_{13}		
		S_{14}		
	E-W	S_{15}		
		S_{16}		

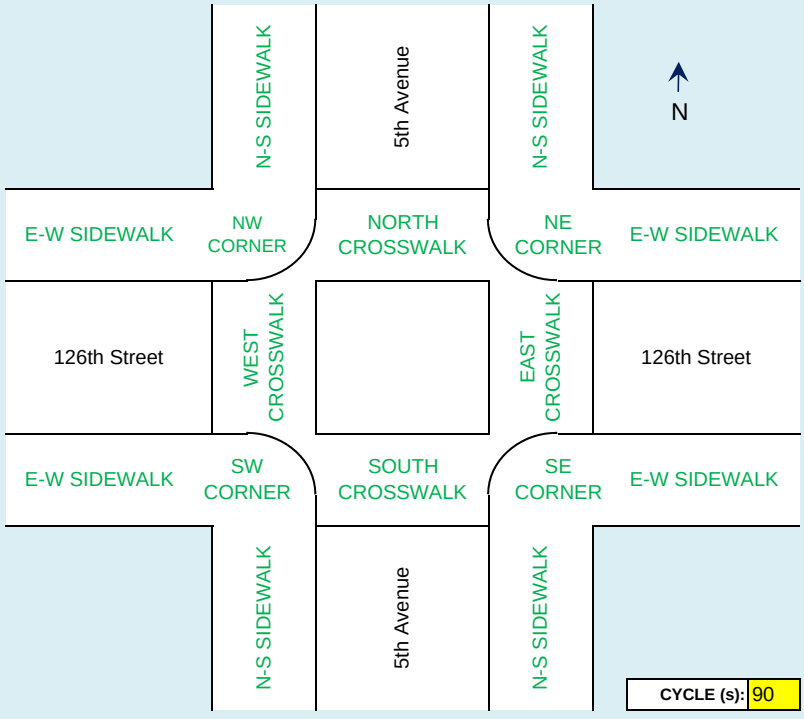
CROSSWALKS

CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	V_1		
	V_2		
E	V_3	32	0.67
	V_4	63	0.75
S	V_5	27	0.84
	V_6	41	0.68
W	V_7		
	V_8		

CORNERS

CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	V_{NE}		
SE	V_{SE}	20	0.63
SW	V_{SW}		
NW	V_{NW}		

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



CYCLE (s): 90

SIDEWALKS

CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S			
	E-W			
SE	N-S	30.0	8.0	3.5
	E-W	13.0	6.0	3.5
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Sum of widths and shy distances from obstructions.

CORNERS

CORNER	SIDEWALK	TOTAL WIDTH*, W (ft)	RADIUS, R (ft)	OBSTRUCTIONS, Ob (ft^2)
NE	N-S			
	E-W			
SE	N-S	20.0	20.0	10.64
	E-W	15.0		
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Override if corner width is different than sidewalk width.

CROSSWALKS

CROSS-WALK	LENGTH, L (ft)	WIDTH, W (ft)	WALK SPEED, S_p (ft/s)	CROSSING TIME (sec)				CONFL VEH		
				WALK	FDW	DW*	PHASE TOTAL	V_{rt}	$V_{lt,perm}$	
N				23	8	5	36			#DIV/0!
E	34.0	20.0	3.5	43	6	5	54	0	0	
S	40.0	13.0	3.5	23	8	5	36	0	70	
W				43	6	5	54			#DIV/0!

* DW clearance for phase, not total DW time for entire cycle. Usually 5 sec.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	126th Street
Time Period:	Saturday Midday
Analysis Year:	2016

INPUTS

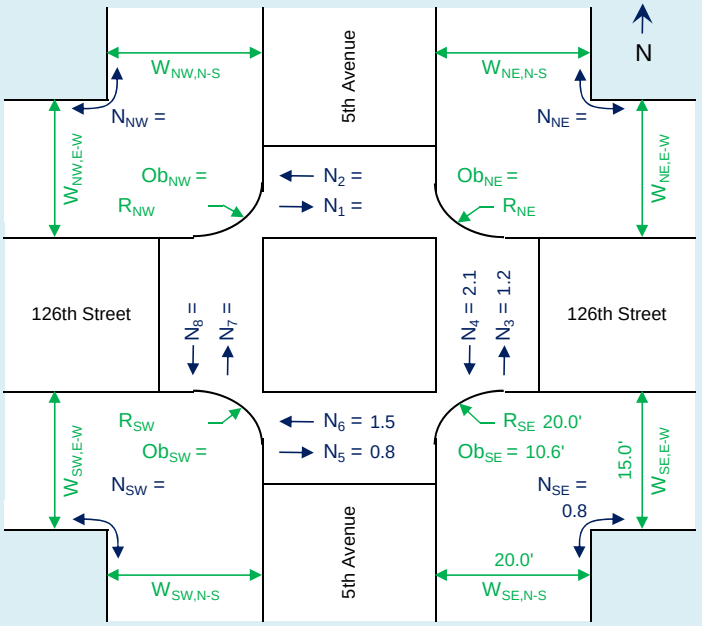
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 =		N_1 =
v_2 =		N_2 =
v_3 = 32	0.67	N_3 = 1.2
v_4 = 63	0.75	N_4 = 2.1
v_5 = 27	0.84	N_5 = 0.8
v_6 = 41	0.68	N_6 = 1.5
v_7 =		N_7 =
v_8 =		N_8 =
v_{NE} =		N_{NE} =
v_{SE} = 20	0.63	N_{SE} = 0.8
v_{SW} =		N_{SW} =
v_{NW} =		N_{NW} =

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	23	$g_{Walk,N}$ = 27
E	43	$g_{Walk,E}$ = 47
S	23	$g_{Walk,S}$ = 27
W	43	$g_{Walk,W}$ = 47

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ #VALUE! ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = \text{\#VALUE!}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} = \text{\#VALUE!}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ #VALUE! ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = #VALUE! LOS #

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ #VALUE! ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = \text{\#VALUE!}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 21.6 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ #VALUE! ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = #VALUE! LOS #

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ #VALUE! ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 17.7 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} = \text{\#VALUE!}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ #VALUE! ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = #VALUE! LOS #

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 18,302.4 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 33.2 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 12.3 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 18,074.9 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 706.2 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	126th Street
Analyst:	CV	Time Period:	Saturday Midday
Date:	42549	Analysis Year:	2016

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 =		N_1 =
v_2 =		N_2 =
v_3 = 32	0.67	N_3 = 1.2
v_4 = 63	0.75	N_4 = 2.1
v_5 = 27	0.84	N_5 = 0.8
v_6 = 41	0.68	N_6 = 1.5
v_7 =		N_7 =
v_8 =		N_8 =

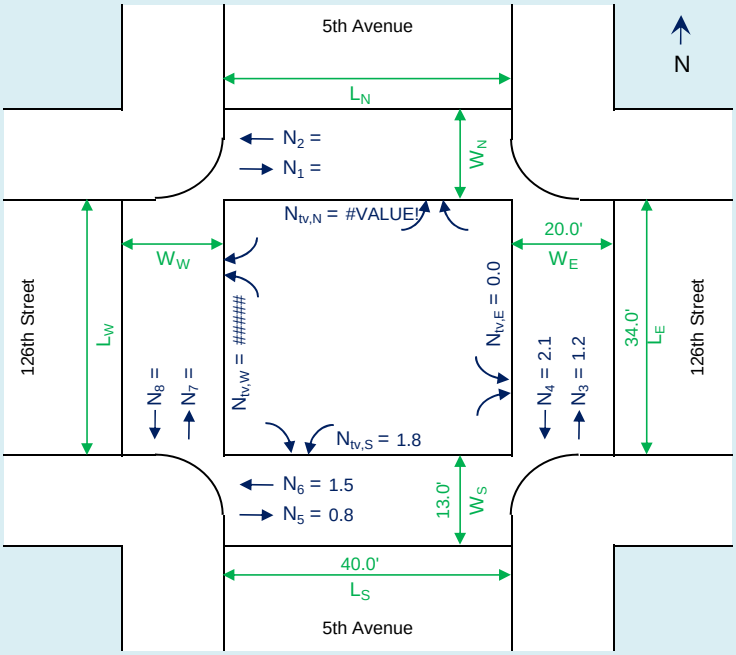
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ =	$N_{tv,N}$ = #######
$v_{rt,N}$ =	
$v_{lt,perm,E}$ = 0	$N_{tv,E}$ = 0.0
$v_{rt,E}$ = 0	
$v_{lt,perm,S}$ = 70	$N_{tv,S}$ = 1.8
$v_{rt,S}$ = 0	
$v_{lt,perm,W}$ =	$N_{tv,W}$ = #######
$v_{rt,W}$ =	

WALKING SPEED & CROSSING TIME

CROSS-WALK	S_p (ft/s)	WALK (s)	g_{Walk} = WALK + 4 (s)
N		23	$g_{Walk,N}$ = 27
E	3.5	43	$g_{Walk,E}$ = 47
S	3.5	23	$g_{Walk,S}$ = 27
W		43	$g_{Walk,W}$ = 47

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
= #VALUE! ft^2-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
= #VALUE! ft^2-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
= #VALUE! ft^2-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
= #VALUE!

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
= #VALUE!

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
=

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
=

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
=

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = LOS

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
= 31,960.0 ft^2-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
= 0.0 ft^2-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
= 31,960.0 ft^2-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
= 0.6 p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
= 1.0 p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
= 13.0 s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
= 13.0 s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
= 42.9 s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 744.7 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
= 14,040.0 ft^2-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
= 910.0 ft^2-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
= 13,130.0 ft^2-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
= 0.6 p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
= 1.1 p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
= 14.7 s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
= 14.8 s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
= 34.2 s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = 383.6 sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
= #VALUE! ft^2-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
= #VALUE! ft^2-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
= #VALUE! ft^2-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
= #VALUE!

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
= #VALUE!

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
=

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
=

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
=

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

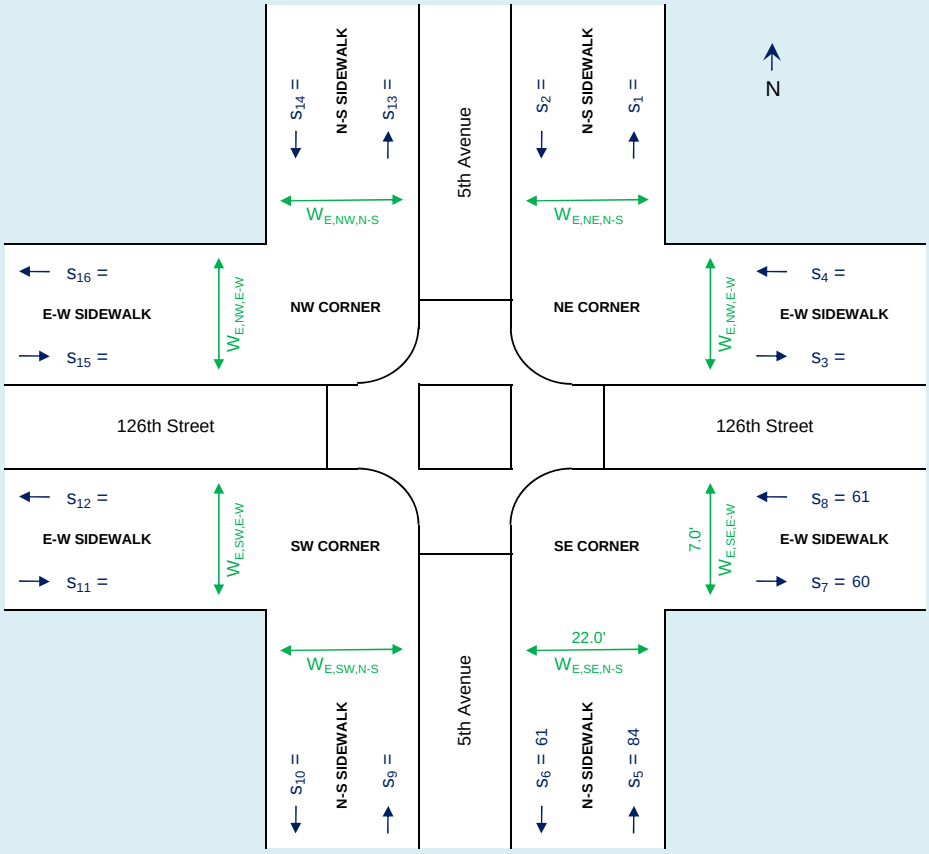
$M_{cw,W}$ = LOS

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	126th Street
Analyst:	CV	Time Period:	Saturday Midday
Date:	42549	Analysis Year:	2016

INPUTS



ANALYSIS

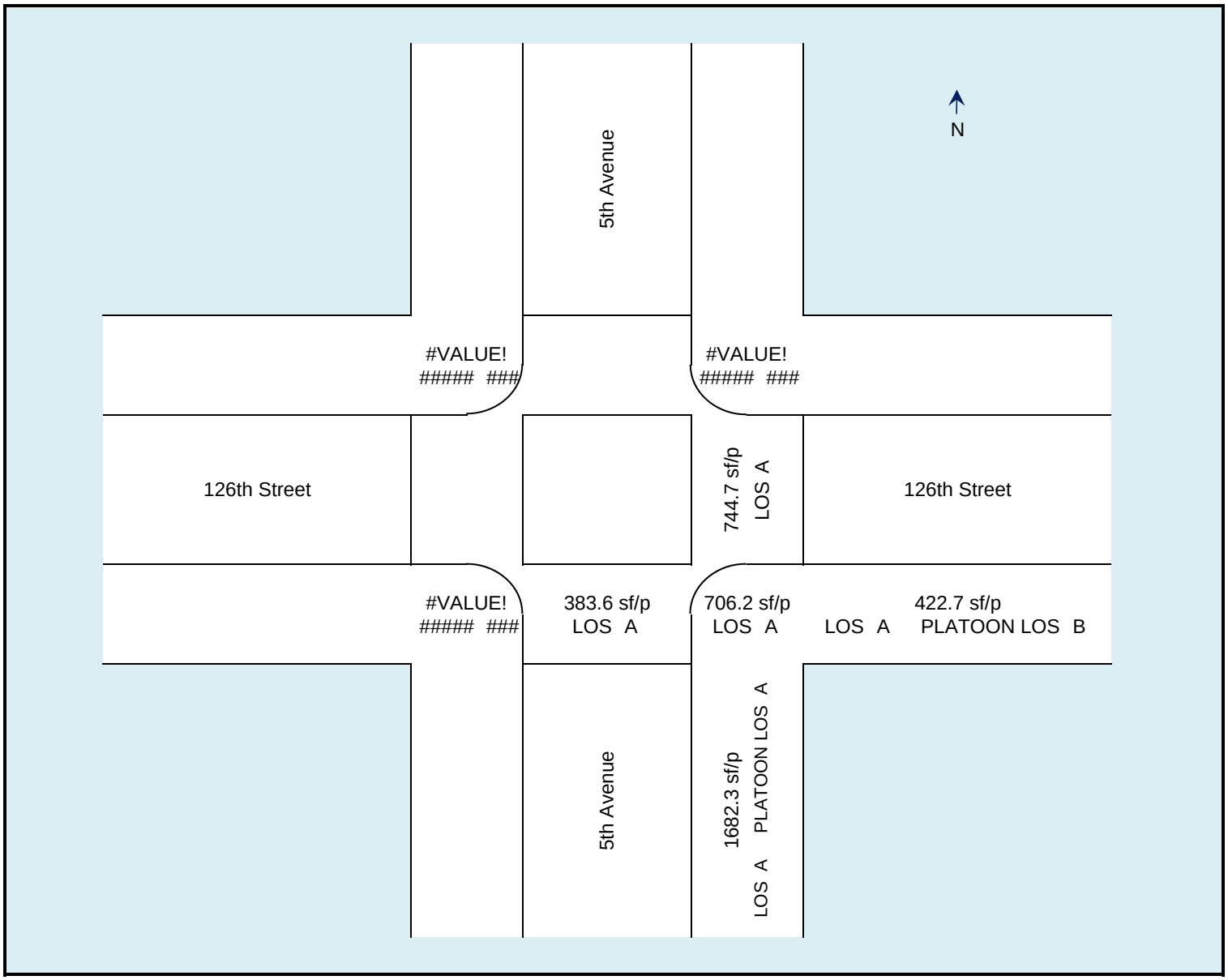
CORNER	MOVEMENT		VOLUME EACH DIR, s (p/hr)	VOLUME BOTH DIR, v_{ped} (p/hr)	PHF	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS, Ob (ft)	EFFECTIVE WIDTH, $W_E = W_T - Ob$ (ft)	FLOW RATE PER UNIT WIDTH, $v_p = \frac{v_{ped}}{60\ W_E\ PHF}$ (p/ft/min)	FREE FLOW WALK SPEED, S_{pf} (ft/s)	ADJUSTED WALK SPEED, $S_p = (1 - 0.0078\ v_p^2)\ S_{pf}$ (ft/s)	AVG PED SPACE, $A_p = 60\ \frac{S_p}{v_p}$ (ft^2/p)	LOS	PLATOON ADJ LOS
NE	N-S	s_1												
		s_2												
	E-W	s_3												
		s_4												
SE	N-S	s_5	84	145	0.88	30.0	8.0	22.0	0.1	3.5	3.5	1682.3	A	A
		s_6	61											
	E-W	s_7	60	121	0.58	13.0	6.0	7.0	0.5	3.5	3.5	422.7	A	B
		s_8	61											
SW	N-S	s_9												
		s_{10}												
	E-W	s_{11}												
		s_{12}												
NW	N-S	s_{13}												
		s_{14}												
	E-W	s_{15}												
		s_{16}												

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	126th Street
Time Period:	Saturday Midday
Analysis Year:	2016

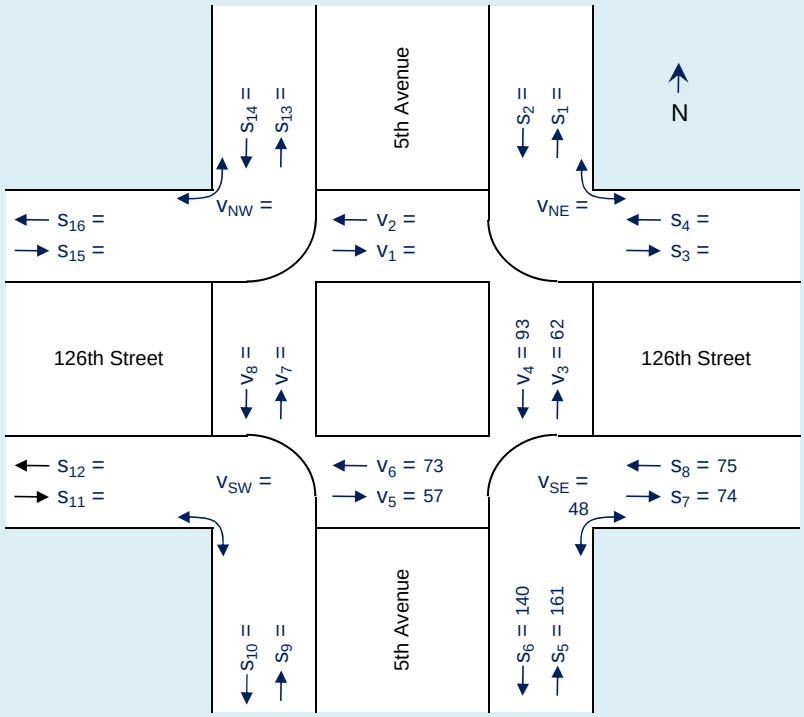


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	126th Street
Analyst:	CV	Time Period:	NB Saturday Midday
Date:	28-Jun-16	Analysis Year:	2016

PEDESTRIAN PEAK HOUR VOLUMES

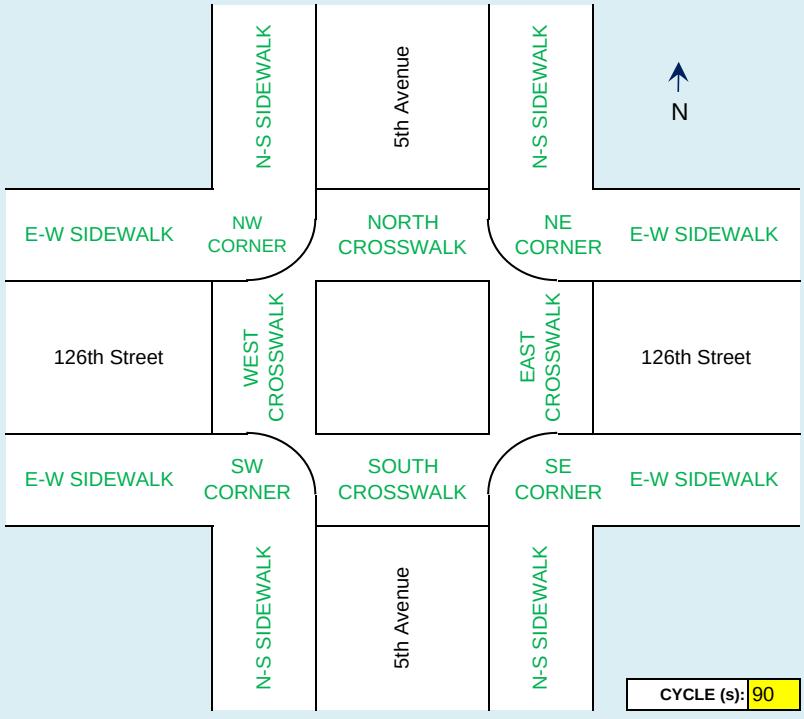


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	S_1		
		S_2		
	E-W	S_3		
		S_4		
SE	N-S	S_5	161	0.88
		S_6	140	
	E-W	S_7	74	0.58
		S_8	75	
SW	N-S	S_9		
		S_{10}		
	E-W	S_{11}		
		S_{12}		
NW	N-S	S_{13}		
		S_{14}		
	E-W	S_{15}		
		S_{16}		

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	V_1		
	V_2		
E	V_3	62	0.67
	V_4	93	0.75
S	V_5	57	0.84
	V_6	73	0.68
W	V_7		
	V_8		

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	V_{NE}		
SE	V_{SE}	48	0.63
SW	V_{SW}		
NW	V_{NW}		

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



CYCLE (s): 90

SIDEWALKS				
CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S			
	E-W			
SE	N-S	30.0	8.0	3.5
	E-W	13.0	6.0	3.5
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Sum of widths and shy distances from obstructions.

CORNERS				
CORNER	SIDEWALK	TOTAL WIDTH*, W (ft)	RADIUS, R (ft)	OBSTRUCTIONS, Ob (ft^2)
NE	N-S			
	E-W			
SE	N-S	20.0	20.0	10.64
	E-W	15.0		
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Override if corner width is different than sidewalk width.

CROSSWALKS									
CROSS-WALK	LENGTH, L (ft)	WIDTH, W (ft)	WALK SPEED, S_p (ft/s)	CROSSING TIME (sec)				CONFL VEH	
				WALK	FDW	DW*	PHASE TOTAL	V_{rt}	$V_{lt,perm}$
N				23	8	5	36			#DIV/0!
E	34.0	20.0	3.5	43	6	5	54	0	0	
S	40.0	13.0	3.5	23	8	5	36	0	71	
W				43	6	5	54			#DIV/0!

* DW clearance for phase, not total DW time for entire cycle. Usually 5 sec.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393
Project Name:	2033 Fifth Avenue
Analyst:	CV
Date:	42549

N-S Street:	5th Avenue
E-W Street:	126th Street
Time Period:	NB Saturday Midday
Analysis Year:	2016

INPUTS

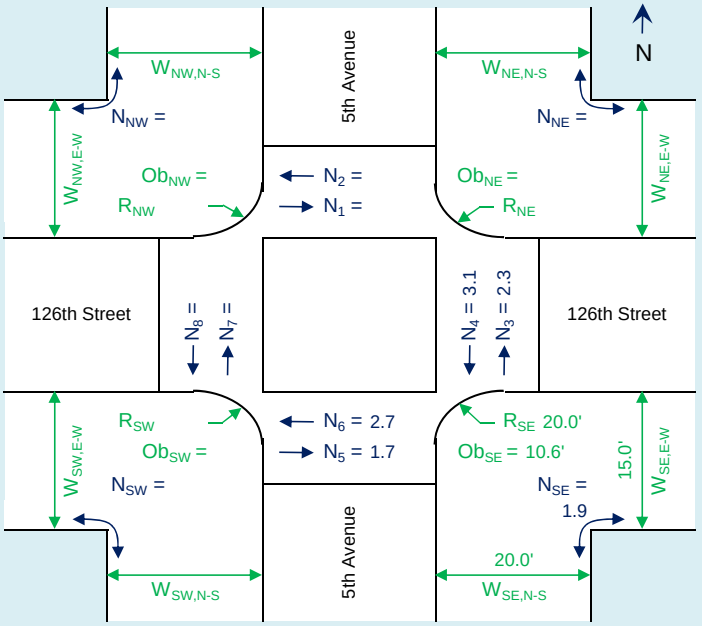
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 =		N_1 =
v_2 =		N_2 =
v_3 = 62	0.67	N_3 = 2.3
v_4 = 93	0.75	N_4 = 3.1
v_5 = 57	0.84	N_5 = 1.7
v_6 = 73	0.68	N_6 = 2.7
v_7 =		N_7 =
v_8 =		N_8 =
v_{NE} =		N_{NE} =
v_{SE} = 48	0.63	N_{SE} = 1.9
v_{SW} =		N_{SW} =
v_{NW} =		N_{NW} =

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	23	$g_{Walk,N}$ = 27
E	43	$g_{Walk,E}$ = 47
S	23	$g_{Walk,S}$ = 27
W	43	$g_{Walk,W}$ = 47

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW}$ = $C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW})$ = #VALUE! ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} \text{ \#VALUE!}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} \text{ \#VALUE!}$$

$TS_{c,NW}$ = $TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W})$ = #VALUE! ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = #VALUE! LOS #

NORTHEAST CORNER

$TS_{corner,NW}$ = $C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE})$ = #VALUE! ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} \text{ \#VALUE!}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 31.8 \text{ s}$$

$TS_{c,NE}$ = $TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E})$ = #VALUE! ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = #VALUE! LOS #

SOUTHWEST CORNER

$TS_{corner,SW}$ = $C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW})$ = #VALUE! ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 37.4 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} \text{ \#VALUE!}$$

$TS_{c,SW}$ = $TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W})$ = #VALUE! ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = #VALUE! LOS #

SOUTHEAST CORNER

$TS_{corner,SE}$ = $C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE})$ = 18,302.4 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 59.2 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 23.8 \text{ s}$$

$TS_{c,SE}$ = $TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E})$ = 17,887.7 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 382.3 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
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Analyst:	CV	Time Period:	NB Saturday Midday
Date:	42549	Analysis Year:	2016

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 =		N_1 =
v_2 =		N_2 =
v_3 = 62	0.67	N_3 = 2.3
v_4 = 93	0.75	N_4 = 3.1
v_5 = 57	0.84	N_5 = 1.7
v_6 = 73	0.68	N_6 = 2.7
v_7 =		N_7 =
v_8 =		N_8 =

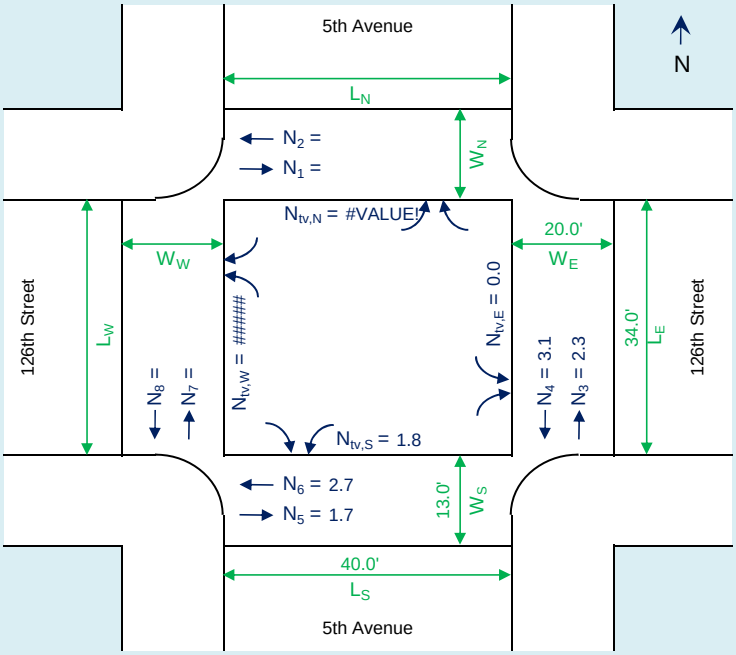
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ =	$N_{tv,N}$ = #######
$v_{rt,N}$ =	
$v_{lt,perm,E}$ = 0	$N_{tv,E}$ = 0.0
$v_{rt,E}$ = 0	
$v_{lt,perm,S}$ = 71	$N_{tv,S}$ = 1.8
$v_{rt,S}$ = 0	
$v_{lt,perm,W}$ =	$N_{tv,W}$ = #######
$v_{rt,W}$ =	

WALKING SPEED & CROSSING TIME

CROSS-WALK	S_p (ft/s)	WALK (s)	g_{Walk} = WALK + 4 (s)
N		23	$g_{Walk,N}$ = 27
E	3.5	43	$g_{Walk,E}$ = 47
S	3.5	23	$g_{Walk,S}$ = 27
W		43	$g_{Walk,W}$ = 47

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
= #VALUE! ft^2-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
= #VALUE! ft^2-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
= #VALUE! ft^2-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
= #VALUE!

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
= #VALUE!

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
=

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
=

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
=

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = LOS

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
= 31,960.0 ft^2-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
= 0.0 ft^2-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
= 31,960.0 ft^2-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
= 1.1 p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
= 1.5 p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
= 13.1 s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
= 13.1 s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
= 70.9 s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 450.9 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
= 14,040.0 ft^2-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
= 923.0 ft^2-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
= 13,117.0 ft^2-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
= 1.2 p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
= 1.9 p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
= 14.9 s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
= 15.0 s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
= 65.5 s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = 200.1 sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
= #VALUE! ft^2-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
= #VALUE! ft^2-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
= #VALUE! ft^2-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
= #VALUE!

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
= #VALUE!

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
=

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
=

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
=

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

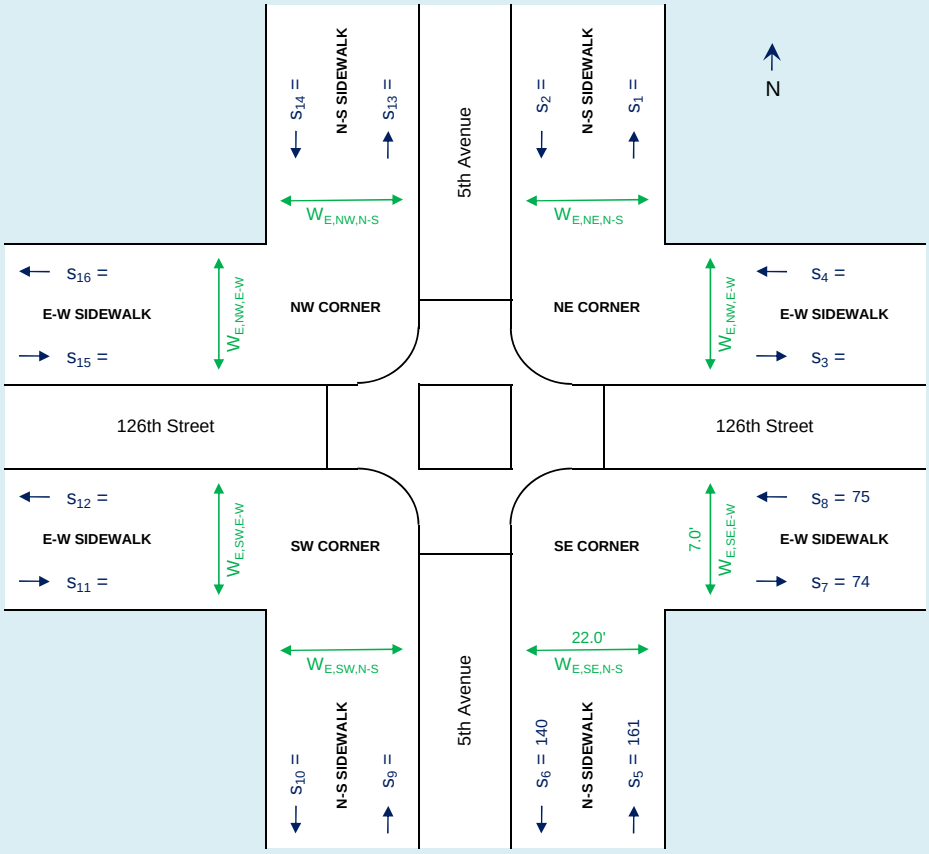
$M_{cw,W}$ = LOS

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	29393	N-S Street:	5th Avenue
Project Name:	2033 Fifth Avenue	E-W Street:	126th Street
Analyst:	CV	Time Period:	NB Saturday Midday
Date:	42549	Analysis Year:	2016

INPUTS



ANALYSIS

CORNER	MOVEMENT		VOLUME EACH DIR, s (p/hr)	VOLUME BOTH DIR, v_{ped} (p/hr)	PHF	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS, Ob (ft)	EFFECTIVE WIDTH, $W_E = W_T - Ob$ (ft)	FLOW RATE PER UNIT WIDTH, $v_p = \frac{v_{ped}}{60\ W_E\ PHF}$ (p/ft/min)	FREE FLOW WALK SPEED, S_{pf} (ft/s)	ADJUSTED WALK SPEED, $S_p = (1 - 0.0078\ v_p^2)\ S_{pf}$ (ft/s)	AVG PED SPACE, $A_p = 60\ \frac{S_p}{v_p}$ (ft^2/p)	LOS	PLATOON ADJ LOS
NE	N-S	s_1												
		s_2												
	E-W	s_3												
		s_4												
SE	N-S	s_5	161	301	0.88	30.0	8.0	22.0	0.3	3.5	3.5	810.4	A	A
		s_6	140											
	E-W	s_7	74	149	0.58	13.0	6.0	7.0	0.6	3.5	3.5	343.2	A	B
		s_8	75											
SW	N-S	s_9												
		s_{10}												
	E-W	s_{11}												
		s_{12}												
NW	N-S	s_{13}												
		s_{14}												
	E-W	s_{15}												
		s_{16}												

LOS SUMMARY MAP

IDENTIFYING INFORMATION

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Analyst:	CV
Date:	42549

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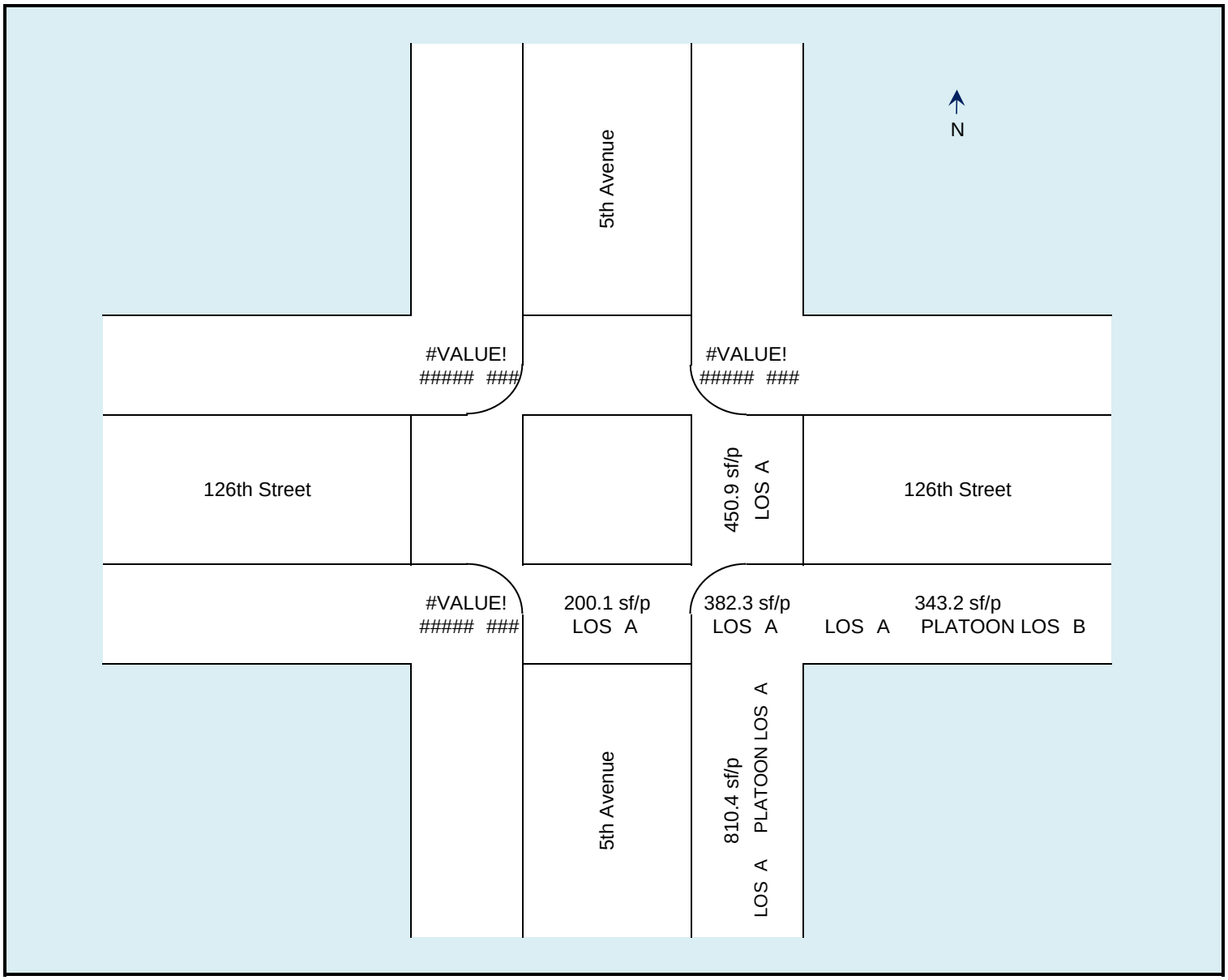

PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

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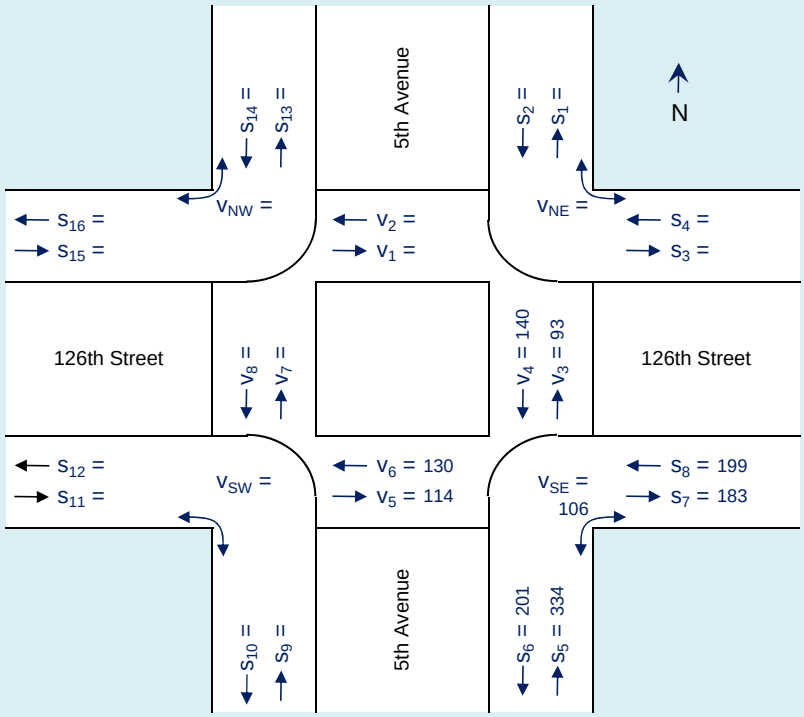
Project Name:	2033 Fifth Avenue	E-W Street:	126th Street
Analyst:	CV	Time Period:	Build Saturday Midday
Date:	28-Jun-16	Analysis Year:	2016

PEDESTRIAN PEAK HOUR VOLUMES

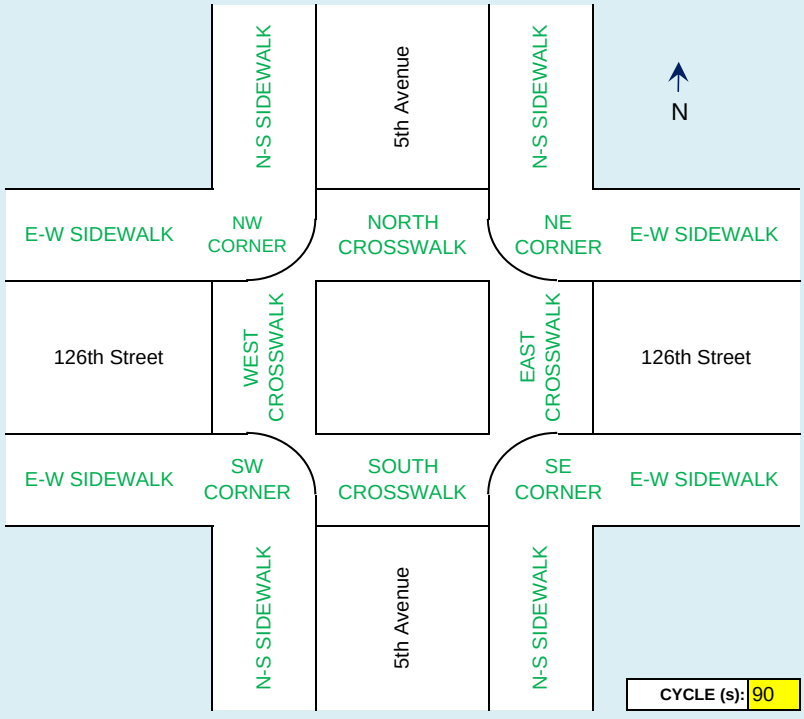


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	S_1		
		S_2		
	E-W	S_3		
		S_4		
SE	N-S	S_5	334	0.88
		S_6	201	
	E-W	S_7	183	0.58
		S_8	199	
SW	N-S	S_9		
		S_{10}		
	E-W	S_{11}		
		S_{12}		
NW	N-S	S_{13}		
		S_{14}		
	E-W	S_{15}		
		S_{16}		

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	V_1		
	V_2		
E	V_3	93	0.67
	V_4	140	0.75
S	V_5	114	0.84
	V_6	130	0.68
W	V_7		
	V_8		

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	V_{NE}		
SE	V_{SE}	106	0.63
SW	V_{SW}		
NW	V_{NW}		

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



CYCLE (s): 90

SIDEWALKS				
CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S			
	E-W			
SE	N-S	30.0	8.0	3.5
	E-W	13.0	6.0	3.5
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Sum of widths and shy distances from obstructions.

CORNERS				
CORNER	SIDEWALK	TOTAL WIDTH*, W (ft)	RADIUS, R (ft)	OBSTRUCTIONS, Ob (ft^2)
NE	N-S			
	E-W			
SE	N-S	20.0	20.0	10.64
	E-W	15.0		
SW	N-S			
	E-W			
NW	N-S			
	E-W			

* Override if corner width is different than sidewalk width.

CROSSWALKS									
CROSS-WALK	LENGTH, L (ft)	WIDTH, W (ft)	WALK SPEED, S_p (ft/s)	CROSSING TIME (sec)				CONFL VEH	
				WALK	FDW	DW*	PHASE TOTAL	V_{rt}	$V_{lt,perm}$
N				23	8	5	36		
E	34.0	20.0	3.5	43	6	5	54	0	0
S	40.0	13.0	3.5	23	8	5	36	0	71
W				43	6	5	54		

#DIV/0!
#DIV/0!

* DW clearance for phase, not total DW time for entire cycle. Usually 5 sec.

CORNER WORKSHEET

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Date:	42549

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Time Period:	Build Saturday Midday
Analysis Year:	2016

INPUTS

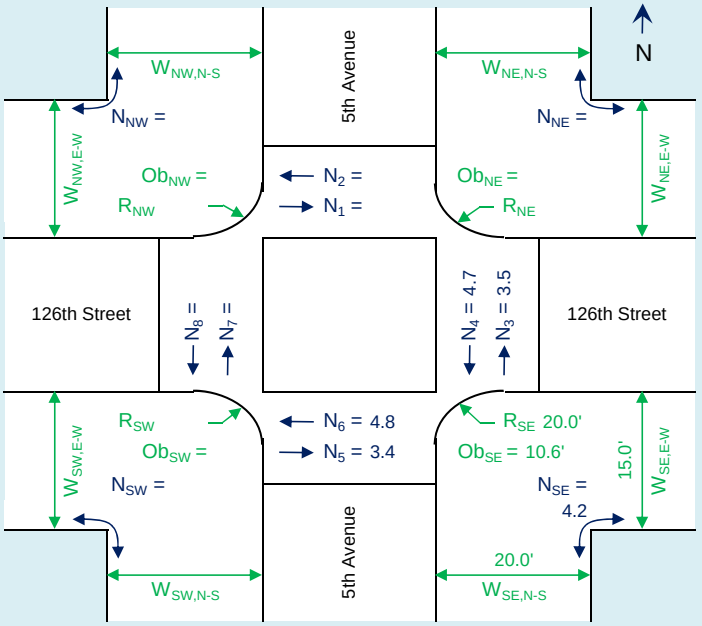
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 =		N_1 =
v_2 =		N_2 =
v_3 = 93	0.67	N_3 = 3.5
v_4 = 140	0.75	N_4 = 4.7
v_5 = 114	0.84	N_5 = 3.4
v_6 = 130	0.68	N_6 = 4.8
v_7 =		N_7 =
v_8 =		N_8 =
v_{NE} =		N_{NE} =
v_{SE} = 106	0.63	N_{SE} = 4.2
v_{SW} =		N_{SW} =
v_{NW} =		N_{NW} =

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	23	$g_{Walk,N}$ = 27
E	43	$g_{Walk,E}$ = 47
S	23	$g_{Walk,S}$ = 27
W	43	$g_{Walk,W}$ = 47

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ #VALUE! ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = \text{\#VALUE!}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} = \text{\#VALUE!}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ #VALUE! ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = #VALUE! LOS #

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ #VALUE! ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = \text{\#VALUE!}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 47.9 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ #VALUE! ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = #VALUE! LOS #

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ #VALUE! ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 74.8 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} = \text{\#VALUE!}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ #VALUE! ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = #VALUE! LOS #

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 18,302.4 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 105.4 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 35.6 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 17,597.2 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 214.4 sf/ped LOS A

CROSSWALK WORKSHEET

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Date:	42549	Analysis Year:	2016

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 =		N_1 =
v_2 =		N_2 =
v_3 = 93	0.67	N_3 = 3.5
v_4 = 140	0.75	N_4 = 4.7
v_5 = 114	0.84	N_5 = 3.4
v_6 = 130	0.68	N_6 = 4.8
v_7 =		N_7 =
v_8 =		N_8 =

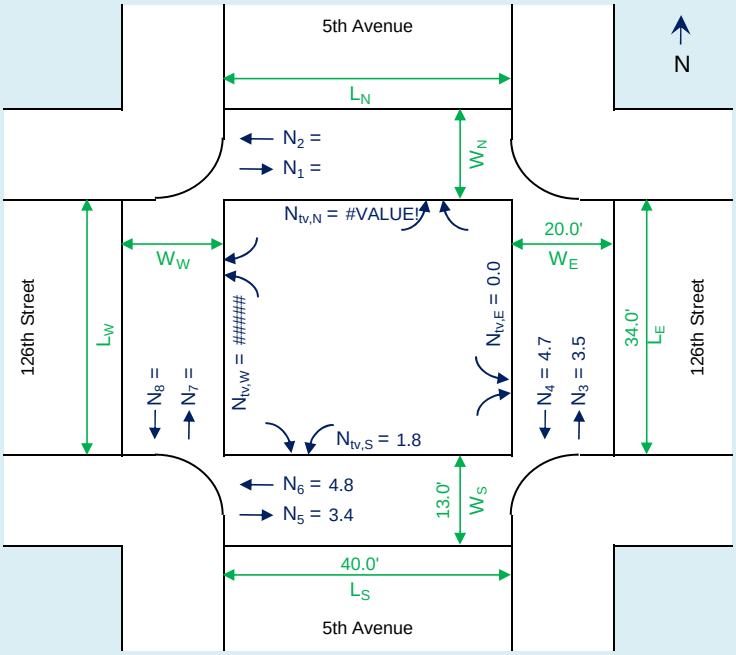
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ =	$N_{tv,N}$ = #######
$v_{rt,N}$ =	
$v_{lt,perm,E}$ = 0	$N_{tv,E}$ = 0.0
$v_{rt,E}$ = 0	
$v_{lt,perm,S}$ = 71	$N_{tv,S}$ = 1.8
$v_{rt,S}$ = 0	
$v_{lt,perm,W}$ =	$N_{tv,W}$ = #######
$v_{rt,W}$ =	

WALKING SPEED & CROSSING TIME

CROSS-WALK	S_p (ft/s)	WALK (s)	g_{Walk} = WALK + 4 (s)
N		23	$g_{Walk,N}$ = 27
E	3.5	43	$g_{Walk,E}$ = 47
S	3.5	23	$g_{Walk,S}$ = 27
W		43	$g_{Walk,W}$ = 47

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= $ #VALUE! ft^2-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= $ #VALUE! ft^2-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= $ #VALUE! ft^2-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= $ #VALUE!

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= $ #VALUE!

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$=$

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$=$

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$=$

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = LOS

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 31{,}960.0$ ft^2-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 0.0$ ft^2-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 31{,}960.0$ ft^2-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 1.7$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 2.2$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 13.1$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 13.2$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 107.3$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E} = 298.0$ sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 14{,}040.0$ ft^2-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 923.0$ ft^2-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 13{,}117.0$ ft^2-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$= 2.4$ p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$= 3.3$ p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$= 15.1$ s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$= 15.3$ s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$= 124.5$ s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S} = 105.3$ sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= $ #VALUE! ft^2-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= $ #VALUE! ft^2-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= $ #VALUE! ft^2-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$= $ #VALUE!

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$= $ #VALUE!

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$=$

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$=$

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$=$

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

$M_{cw,W}$ = LOS

SIDEWALK WORKSHEET

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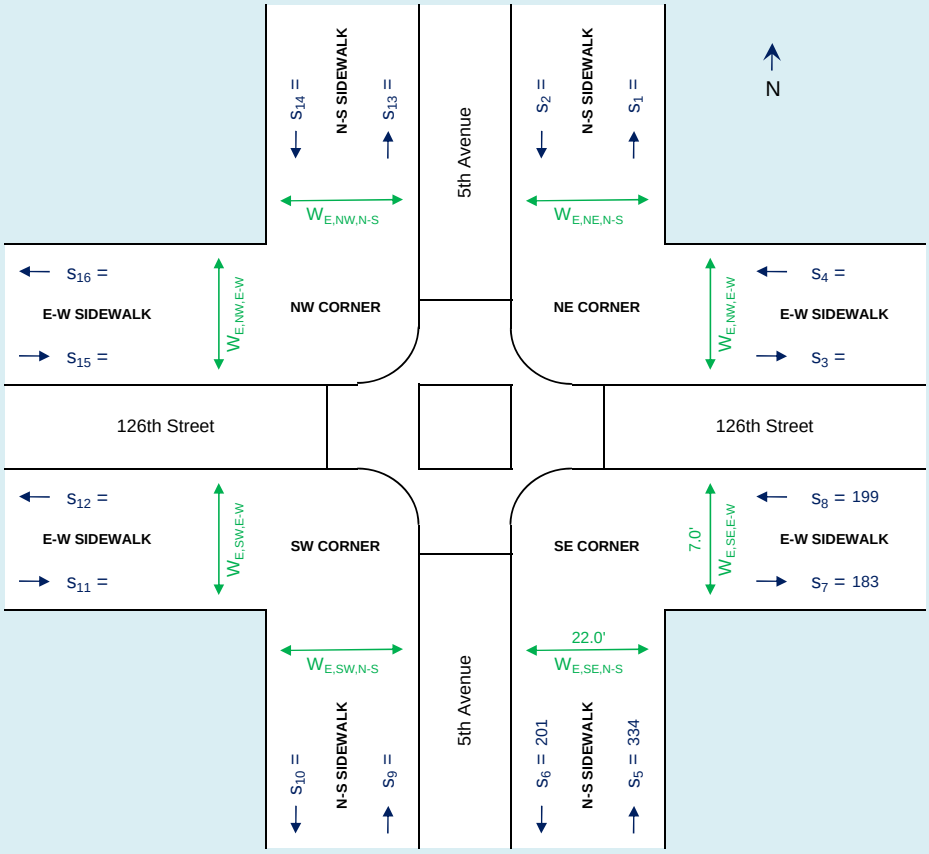

ANALYSIS

CORNER	MOVEMENT		VOLUME EACH DIR, s (p/hr)	VOLUME BOTH DIR, v_{ped} (p/hr)	PHF	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS, Ob (ft)	EFFECTIVE WIDTH, $W_E = W_T - Ob$ (ft)	FLOW RATE PER UNIT WIDTH, $v_p = \frac{v_{ped}}{60\ W_E\ PHF}$ (p/ft/min)	FREE FLOW WALK SPEED, S_{pf} (ft/s)	ADJUSTED WALK SPEED, $S_p = (1 - 0.0078\ v_p^2)\ S_{pf}$ (ft/s)	AVG PED SPACE, $A_p = 60\ \frac{S_p}{v_p}$ (ft^2/p)	LOS	PLATOON ADJ LOS
NE	N-S	s_1												
		s_2												
	E-W	s_3												
		s_4												
SE	N-S	s_5	334	535	0.88	30.0	8.0	22.0	0.5	3.5	3.5	455.9	A	B
		s_6	201											
	E-W	s_7	183	382	0.58	13.0	6.0	7.0	1.6	3.5	3.5	133.7	A	B
		s_8	199											
SW	N-S	s_9												
		s_{10}												
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