Ennis Francis Houses

206-254 West 124th Street
New York, New York 10027
Block 1929, Lots 17, 29 and 57
Manhattan Community District 10

ENVIRONMENTAL ASSESSMENT STATEMENT

Lead Agency:

Department of City Planning
120 Broadway, 31st Floor
Manhattan, NY 10271

Prepared for:

Carthage Real Estate Advisors, LLC

Prepared by:

Equity Environmental Engineering
500 International Drive, Suite 150
Mount Olive, NJ 07828

January 25, 2018

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APPENDICES

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

Please fill out and submit to the appropriate agency (see instructions)

Part I: GENERAL INFORMATION

PROJECT NAME Ennis Francis Houses

1. *Reference Numbers*

CEQR REFERENCE NUMBER (to be assigned by lead agency)	BSA REFERENCE NUMBER (if applicable)
19DCP041M	
ULURP REFERENCE NUMBER (if applicable)	OTHER REFERENCE NUMBER(S) (if applicable)
M840090(B) ZSM	(*e.g.*, legislative intro, CAPA) P2016M0199

2a. *Lead Agency Information*			**2b. *Applicant Information***		
NAME OF LEAD AGENCY Department of City Planning			NAME OF APPLICANT Carthage Real Estate Advisors LLC		
NAME OF LEAD AGENCY CONTACT PERSON Olga Abinader			NAME OF APPLICANT'S REPRESENTATIVE OR CONTACT PERSON Equity Environmental Engineering LLC		
ADDRESS 120 Broadway, 31st Floor			ADDRESS 500 International Drive #150		
CITY New York	STATE NY	ZIP 10271	CITY Mount Olive	STATE NJ	ZIP 07828
TELEPHONE 212-720-3493	EMAIL oabinad@planning.nyc.gov		TELEPHONE 973-527-7451	EMAIL kevin.williams@ equityenvironmental.com	

3. *Action Classification and Type*

SEQRA Classification

☐ UNLISTED ☒ TYPE I: Specify Category (see 6 NYCRR 617.4 and NYC Executive Order 91 of 1977, as amended): 617.4(b)(9)

Action Type (refer to Chapter 2, "Establishing the Analysis Framework" for guidance)

☒ LOCALIZED ACTION, SITE SPECIFIC ☐ LOCALIZED ACTION, SMALL AREA ☐ GENERIC ACTION

4. *Project Description*

The Applicant, Carthage Real Estate Advisors LLC, seeks a minor modification to Special Permit C840090 ZSM pursuant to Sections 78-312 and 78-313 of the Zoning Resolution of the City of New York ("ZR"). The Proposed Action would alter the bulk provisions of the Ennis Francis Houses Large Scale Residential Development (LSRD) plan, to facilitate the construction of a mixed-use building that complies with the underlying R8 zoning district. The LSRD area currently contains three residential buildings on Block 1929, Lots 29, 57, and 17 respectively ("The Project Area"). The Project area is bounded by West 123rd Street, Adam Clayton Powell Jr. Blvd., West 124th Street, and Fredrick Douglass Blvd. The original two buildings on Adam Clayton Powell Jr. Blvd and West 124th Street (Lots 29 and 57) were constructed in 1985 and contain a total of 231 dwelling units. The existing building on West 123rd Street (Lot 17) was constructed in 2012 and contains 60 dwelling units. The LSRD is known as Site 106 under the former Harlem East Harlem Urban Renewal Plan, which was designated for inclusion in the Harlem Gateway Urban Renewal Area.

To facilitate the Proposed Building on Lot 57 (Development Site) the following action is required: Minor Modification to C 840090 ZSM to (1a) remove Lot 17 from the LSRD, correcting an error made in 2010, and (1b) allow the construction of a mixed-use building (residential and community facility) that complies with the bulk regulations of the underlying R8 zoning district

The Proposed Buildings:
Pursuant to the Proposed Action, the existing 3-story vacant 65,020 zoning square foot residential building on lot 57 would be demolished and redeveloped. The Proposed Development will include a 17-story building (Building "A") and an 18-story building (Building "B") that will occupy a portion of Lot 57. Each of the Proposed Buildings will contain residential uses. Building "A" will contain ground floor community facility uses with dwelling units above. The floor area and dwelling unit density of the Proposed Buildings will comply with the R8 zoning district, as described below.

Building A
Building A is proposed to have a total of 164,856 gross square feet (114,522 zoning square feet) of floor area, of which 107,358 zoning square feet is for residential use and 7,164 zoning square feet is for community facility use. The

residential portion of the building would include up to 173 affordable dwelling units above ground-floor community facility space, which would extend into the rear yard of the Development Site. The residential units would be accessed from a ground floor lobby on West 124th Street. The residential floors above would have a depth of approximately 56 feet, which is sufficient for a double-loaded corridor plan for residential buildings. The cellar of Building A would contain required parking, as discussed below. Building A is proposed to be 17-stories tall (169 feet) with approximately 125 feet of street frontage. For design flexibility, the maximum possible height is 21 stories (210 feet). Regardless of the maximum height, Building A is proposed to have a 15-foot open area along the front lot line to allow the use of alternate front setbacks of Section 23-642 of the Zoning Resolution.

Building B
Building B is proposed to have a total of 184,480 gross square feet (161,526 zoning square feet) of residential floor area and up to 149 dwelling units, including up to 119 market-rate dwelling units and 30 dwelling units for households at 130% of average median income. The residential units would be accessed from a ground floor lobby on West 124th Street. The residential floors would have a depth of approximately 56 feet. The cellar of Building B would contain accessory residential recreation space. Building B is proposed to be 18-stories tall (190 feet, six inches) with approximately 175 feet of street frontage. For design flexibility, the maximum possible height is 20 stories (210 feet). Regardless of the maximum height, Building B is proposed to have a 15-foot open area along the front lot line to allow the use of alternate front setbacks of Section 23-642 of the Zoning Resolution.

Together, the Proposed Buildings would have a total of approximately 349,336 gross square feet, or 276,048 zoning square feet, including 268,884 zoning square feet of residential floor area and 7,164 zoning square feet of community facility floor area.

Project Location

BOROUGH Manhattan	COMMUNITY DISTRICT(S) 10	STREET ADDRESS 206-254 west 124th
TAX BLOCK(S) AND LOT(S) Block 1929, Lots 29, 57 and 17		ZIP CODE 10027

DESCRIPTION OF PROPERTY BY BOUNDING OR CROSS STREETS The Project Site is on the block bounded by West 123rd Street to the south, West 124th Street to the north, Adam Clayton Powell Jr. Boulevard to the east, and Frederick Douglass Boulevard to the west

EXISTING ZONING DISTRICT, INCLUDING SPECIAL ZONING DISTRICT DESIGNATION, IF ANY R8, R7A, R7A/C2-4 within the Ennis Francis LSRD	ZONING SECTIONAL MAP NUMBER 6a

5. *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 ZR 78-312, ZR 78-313

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: HPD's Extremely Low and Low-Income Affordability (ELLA) Program
☐ 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:

6. *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.): 89,765

Waterbody area (sq. ft.) and type:

Roads, buildings, and other paved surfaces (sq. ft.): 89,765

Other, describe (sq. ft.):

7. *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): 349,336

NUMBER OF BUILDINGS: 2

GROSS FLOOR AREA OF EACH BUILDING (sq. ft.): 164,856; 184,480

HEIGHT OF EACH BUILDING (ft.): 169, 190

NUMBER OF STORIES OF EACH BUILDING: 17, 18

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: 49,469 sf

The total square feet not owned or controlled by the applicant: 40,063 sf

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 disturbance (if known):

AREA OF TEMPORARY DISTURBANCE: 20,425 sq. ft. (width x length)

VOLUME OF DISTURBANCE: 408,500 cubic ft. (width x length x depth)

AREA OF PERMANENT DISTURBANCE: 20,425 sq. ft. (width x length)

8. *Analysis Year* CEQR Technical Manual Chapter 2

ANTICIPATED BUILD YEAR (date the project would be completed and operational): 2021

ANTICIPATED PERIOD OF CONSTRUCTION IN MONTHS: 18-24

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

BRIEFLY DESCRIBE PHASES AND CONSTRUCTION SCHEDULE:

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

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

DESCRIPTION OF EXISTING AND PROPOSED CONDITIONS

The information requested in this table applies to the directly affected area. The directly affected area consists of the project site and the area subject to any change in regulatory control. The increment is the difference between the No-Action and the With-Action conditions.

	EXISTING CONDITION	NO-ACTION CONDITION	WITH-ACTION CONDITION	INCREMENT
LAND USE				
Residential	☒ YES ☐ NO	☒ YES ☐ NO	☒ YES ☐ NO	
If "yes," specify the following:				
Describe type of residential structures	hi and mid rise multifamily elevator buildings	hi and mid rise multifamily elevator buildings	hi and mid rise multifamily elevator buildings	
No. of dwelling units	292	292	559	267
No. of low- to moderate-income units	292	292	423	131
Gross floor area (sq. ft.)	318,726	318,726	454,584	135,858
Commercial	☒ YES ☐ NO	☒ YES ☐ NO	☒ YES ☐ NO	
If "yes," specify the following:				
Describe type (retail, office, other)	retail	retail	retail	
Gross floor area (sq. ft.)	3200	3200	3200	0
Manufacturing/Industrial	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," specify the following:				
Type of use				
Gross floor area (sq. ft.)				
Open storage area (sq. ft.)				
If any unenclosed activities, specify:				
Community Facility	☐ YES ☒ NO	☐ YES ☒ NO	☒ YES ☐ NO	
If "yes," specify the following:				
Type			medical office	
Gross floor area (sq. ft.)			30,990	30,990
Vacant Land	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," describe:				
Publicly Accessible Open Space	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," specify type (mapped City, State, or Federal parkland, wetland—mapped or otherwise known, other):				
Other Land Uses	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," describe:				
PARKING				
Garages	☒ YES ☐ NO	☒ YES ☐ NO	☒ YES ☐ NO	
If "yes," specify the following:				
No. of public spaces	0	0	0	
No. of accessory spaces	37	37	103	66
Operating hours	24/7	24/7	24/7	
Attended or non-attended	na	na	attended	
Lots	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," specify the following:				
No. of public spaces				
No. of accessory spaces				
Operating hours				
Other (includes street parking)	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," describe:				
POPULATION				
Residents	☒ YES ☐ NO	☒ YES ☐ NO	☒ YES ☐ NO	
If "yes," specify number:	683	683	1308	625

	EXISTING CONDITION	NO-ACTION CONDITION	WITH-ACTION CONDITION	INCREMENT
Briefly explain how the number of residents was calculated:	Using 2014 ACS profile 2.34 persons per household in census tract 222 and multiplying by number of units			
Businesses	☒ YES ☐ NO	☒ YES ☐ NO	☒ YES ☐ NO	
If "yes," specify the following:				
No. and type	1 restaurant, 1 retail store	1 restaurant, 1 retail store	1 restaurant, 1 retail store, 20 medical offices, 5 general offices	16
No. and type of workers by business	3 retail, 6 restaurant	3 retail, 6 restaurant	3 retail, 6 restaurant, 50 medical office, 10 general	60
No. and type of non-residents who are not workers	retail and restaurant patrons, 150 daily	retail and restaurant patrons, 150 daily	medical office, general office = 1,628; retail and restaurant patrons = 150 = 1778 total patrons daily	1628
Briefly explain how the number of businesses was calculated:	Assumes average medical office and general office size of 1,700 SF			
Other (students, visitors, concert-goers, *etc.*)	☐ YES ☒ NO	☐ YES ☒ NO	☒ YES ☐ NO	
If any, specify type and number:			patrons and general office	
Briefly explain how the number was calculated:	70 patrons per 1,000 SF per day average for medical office, and 20 for general office per 1,000 SF			
ZONING				
Zoning classification	LSRD - R7A and R8/C2-4 (LSRD restrictions override underlying zoning)	LSRD - R7A and R8/C2-4 (LSRD restrictions override underlying zoning)	R8 and R8/C2-4 (the area zoned R7A would be removed from the LSRD, and the LSRD would be modified to allow development pursuant to its underlying R8 and R8/C2-4 zoning district	
Maximum amount of floor area that can be developed	4.15 FAR under LSRD (372,805.6 SF)	4.15 FAR under LSRD (372,805.6 SF)	463,360 SF	90,554
Predominant land use and zoning classifications within land use study area(s) or a 400 ft. radius of proposed project	Residential/commercial; R8/R8-A/R7/C4-4A/C4-4D/C6-3/R6A/C4-4/C4-7/R7-2/C2-4/C1-4	Residential/commercial; R8/R8-A/R7/C4-4A/C4-4D/C6-3/R6A/C4-4/C4-7/R7-2/C2-4/C1-4	Residential/commercial; R8/R8-A/R7/C4-4A/C4-4D/C6-3/R6A/C4-4/C4-7/R7-2/C2-4/C1-4	
Attach any additional information that may be needed to describe the project. If your project involves changes that affect one or more sites not associated with a specific development, it is generally appropriate to include total development projections in the above table and attach separate tables outlining the reasonable development scenarios for each site.				

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 Full 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.		
(e) Is the project a large, publicly sponsored project?	☐	☒
○ 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?	☐	☒
○ If "yes," complete the Consistency Assessment Form.		
2. *SOCIOECONOMIC CONDITIONS*: CEQR Technical Manual Chapter 5		
(a) Would the proposed project:		
○ Generate a net increase of more than 200 residential units *or* 200,000 square feet of commercial space?	☒	☐
▪ If "yes," answer *both* questions 2(b)(ii) and 2(b)(iv) below.		
○ Directly displace 500 or more residents?	☐	☒
▪ If "yes," answer questions 2(b)(i), 2(b)(ii), and 2(b)(iv) below.		
○ Directly displace more than 100 employees?	☐	☒
▪ If "yes," answer questions under 2(b)(iii) and 2(b)(iv) below.		
○ Affect conditions in a specific industry?	☐	☒
▪ If "yes," answer question 2(b)(v) below.		
(b) If "yes" to any of the above, attach supporting information to answer the relevant questions below. If "no" was checked for each category above, the remaining questions in this technical area do not need to be answered.		
i. Direct Residential Displacement		
○ If more than 500 residents would be displaced, would these residents represent more than 5% of the primary study area population?	☐	☐
○ If "yes," is the average income of the directly displaced population markedly lower than the average income of the rest of the study area population?	☐	☐
ii. Indirect Residential Displacement		
○ Would expected average incomes of the new population exceed the average incomes of study area populations?	☒	☐
○ If "yes:"		
▪ Would the population of the primary study area increase by more than 10 percent?	☐	☒
▪ Would the population of the primary study area increase by more than 5 percent in an area where there is the potential to accelerate trends toward increasing rents?	☐	☒
○ If "yes" to either of the preceding questions, would more than 5 percent of all housing units be renter-occupied and unprotected?	☐	☐
iii. Direct Business Displacement		
○ Do any of the displaced businesses provide goods or services that otherwise would not be found within the trade area, either under existing conditions or in the future with the proposed project?	☐	☐
○ Is any category of business to be displaced the subject of other regulations or publicly adopted plans to preserve,	☐	☐

	YES	NO
enhance, or otherwise protect it?		
iv. Indirect Business Displacement		
○ Would the project potentially introduce trends that make it difficult for businesses to remain in the area?	☐	☒
○ Would the project capture retail sales in a particular category of goods to the extent that the market for such goods would become saturated, potentially resulting in vacancies and disinvestment on neighborhood commercial streets?	☐	☒
v. Effects on Industry		
○ Would the project significantly affect business conditions in any industry or any category of businesses within or outside the study area?	☐	☒
○ Would the project indirectly substantially reduce employment or impair the economic viability in the industry or category of businesses?	☐	☒
3. *COMMUNITY FACILITIES*: CEQR Technical Manual Chapter 6		
(a) Direct Effects		
○ Would the project directly eliminate, displace, or alter public or publicly funded community facilities such as educational facilities, libraries, health care facilities, day care centers, police stations, or fire stations?	☐	☒
(b) Indirect Effects		
i. 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)	☐	☒
○ If "yes," would the project result in a collective utilization rate of the group child care/Head Start centers in the study area that is greater than 100 percent?	☐	☐
○ If "yes," would the project increase the collective utilization rate by 5 percent or more from the No-Action scenario?	☐	☐
ii. 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)	☐	☒
○ If "yes," would the project increase the study area population by 5 percent or more from the No-Action levels?	☐	☐
○ If "yes," would the additional population impair the delivery of library services in the study area?	☐	☐
iii. 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)	☐	☒
○ If "yes," would the project result in a collective utilization rate of the elementary and/or intermediate schools in the study area that is equal to or greater than 100 percent?	☐	☐
○ If "yes," would the project increase this collective utilization rate by 5 percent or more from the No-Action scenario?	☐	☐
iv. Health Care Facilities		
○ Would the project result in the introduction of a sizeable new neighborhood?	☐	☒
○ If "yes," would the project affect the operation of health care facilities in the area?	☐	☐
v. Fire and Police Protection		
○ Would the project result in the introduction of a sizeable new neighborhood?	☐	☒
○ If "yes," would the project affect the operation of fire or police protection in the area?	☐	☐
4. *OPEN SPACE*: CEQR Technical Manual Chapter 7		
(a) Would the 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?	☐	☒
(c) If "yes," would the project generate more than 50 additional residents or 125 additional employees?	☐	☐
(d) Is the project located within a well-served area in the Bronx, Brooklyn, Manhattan, Queens, or Staten Island?	☐	☒
(e) If "yes," would the project generate more than 350 additional residents or 750 additional employees?	☐	☐
(f) If the project is located in an area that is neither under-served nor well-served, would it generate more than 200 additional residents or 500 additional employees?	☒	☐
(g) If "yes" to questions (c), (e), or (f) above, attach supporting information to answer the following:		
○ If in an under-served area, would the project result in a decrease in the open space ratio by more than 1 percent?	☐	☐
○ If in an area that is not under-served, would the project result in a decrease in the open space ratio by more than 5	☐	☒

	YES	NO
percent?		
○ If "yes," are there qualitative considerations, such as the quality of open space, that need to be considered? Please specify:	☐	☐
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?	☒	☐
(c) If "yes" to either of the above questions, attach supporting information explaining whether the project's shadow would reach any sunlight-sensitive resource at any time of the year.		
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. The Affected Area is across 124th Street from the Hotel Theresa, which is on the National Register of Historic Places. LPC determined that Lot 57, the Development Site, has the potential to contain archaeological resources, specifically human remains. As such, The Applicant shall enter into a restrictive declaration which requires that prescribed archaeological work be conducted in accordance with the CEQR Technical Manual and LPC Guidelines for archaeological work in New York City.		
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?	☐	☒
(c) If "yes" to either of the above, please provide the information requested in Chapter 10. see attached		
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?	☐	☒
○ If "yes," list the resources and attach supporting information on whether the project would affect any of these resources.		
(b) Is any part of the directly affected area within the Jamaica Bay Watershed?	☐	☒
○ 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?	☒	☐
○ If "yes," were Recognized Environmental Conditions (RECs) identified? Briefly identify: Yes, see attached	☐	☐
(i) Based on the Phase I Assessment, is a Phase II Investigation needed?	☒	☐
10. *WATER AND SEWER INFRASTRUCTURE*: CEQR Technical Manual Chapter 13		

	YES	NO
(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 that listed in Table 13-1 in Chapter 13?	☐	☐
(d) Would the 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 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 contribute contaminated stormwater to a separate storm sewer system?	☐	☒
(h) Would the project involve construction of a new stormwater outfall that requires federal and/or state permits?	☐	☒
(i) If "yes" to any of the above, conduct the appropriate preliminary analyses and attach supporting documentation.		
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): 13,093		
○ 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?	☐	☒
○ If "yes," would the proposed project comply with the City's Solid Waste Management Plan?	☐	☐
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): 46,442,417		
(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 appropriate screening analyses, attach back up data as needed for each stage, and answer the following questions:		
○ 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.***	☐	☐
○ 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/rail trips per station or line?	☐	☒
○ 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?	☒	☐
○ 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?	☐	☒
(f) If "yes" to any of the above, conduct the appropriate analyses and attach any supporting documentation. see attached		
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?	☐	☒

	YES	NO
(c) Would the proposed project result in the development of 350,000 square feet or more?	☐	☒
(d) If "yes" to any of the above, would the project require a GHG emissions assessment based on guidance in Chapter 18?	☐	☐
○ If "yes," would the project result in inconsistencies with the City's GHG reduction goal? (See Local Law 22 of 2008; § 24-803 of the Administrative Code of the City of New York). Please attach supporting documentation.	☐	☐
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?	☐	☒
(e) If "yes" to any of the above, conduct the appropriate analyses and attach any supporting documentation. see attached		
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. see attached		
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. see attached		
19. *CONSTRUCTION*: CEQR Technical Manual Chapter 22		
(a) Would the project's construction activities involve:		
○ Construction activities lasting longer than two years?	☐	☒
○ Construction activities within a Central Business District or along an arterial highway or major thoroughfare?	☐	☒
○ Closing, narrowing, or otherwise impeding traffic, transit, or pedestrian elements (roadways, parking spaces, bicycle routes, sidewalks, crosswalks, corners, *etc.*)?	☒	☐
○ Construction of multiple buildings where there is a potential for on-site receptors on buildings completed before the final build-out?	☒	☐
○ The operation of several pieces of diesel equipment in a single location at peak construction?	☐	☒
○ Closure of a community facility or disruption in its services?	☐	☒
○ Activities within 400 feet of a historic or cultural resource?	☒	☐
○ Disturbance of a site containing or adjacent to a site containing natural resources?	☐	☒
○ 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 attached. All construction activities would be performed pursuant to relevant DOB and DOT regulations		

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	SIGNATURE	DATE
Robert Greene	Robert Greene	1/8/2019

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
Acting Director, Environemntal Assessment and Review Division	Department of City Planning, acting on behalf of the City Planning Commission
NAME: Olga Abinader	DATE: 1/25/2019
SIGNATURE: Olga Abinader	

NEGATIVE DECLARATION

Statement of No Significant Effect

Pursuant to Executive Order 91 of 1977, as amended, and the Rules of Procedure for City Environmental Quality Review, found at Title 62, Chapter 5 of the Rules of the City of New York and 6 NYCRR, Part 617, State Environmental Quality Review, the Department of City Planning, acting on behalf of the City Planning Commission assumed the role of lead agency for the environmental review of the proposed project. Based on a review of information about the project contained in this environmental assessment statement and any attachments hereto, which are incorporated by reference herein, the lead agency has determined that the proposed project would not have a significant adverse impact on the environment.

Reasons Supporting this Determination

The above determination is based on information contained in this EAS, which finds the proposed actions sought before the City Planning Commission would have no significant effect on the quality of the environment. Reasons supporting this determination are noted below.

Hazardous Materials and Air Quality

1. An (E) designation (E-521) for hazardous materials and air quality has been incorporated into the proposed action. Refer to "Determination of Significance Appendix: (E) Designation" for a list of the sites affected by the proposed (E) designation and applicable (E) designation requirements. With these measures in place, the proposed action would not result in significant adverse impacts to hazardous materials or air quality.

Prior Actions

2. As part of a prior minor modification proposal affecting Block 1929, Lots 57, 17 and 29, within the Ennis Francis Large Scale Residential Development (LSRD), an Environmental Assessment Statement (EAS) and Conditional Negative Declaration (CND) were issued (CEQR number 10DCP028M) in September 2010. The 2010 CND accounted for a Restrictive Declaration related to hazardous materials and archaeological resources affecting development in the LSRD. The hazardous materials and archaeological resources concerns have been resolved as they pertain to Lots 17 and 29, and development has occurred within the LSRD. As noted below under "Historic and Cultural Resources," the Applicant agrees to record and execute a new Restrictive Declaration to address the remaining archaeological concerns affecting Lot 57. As noted above, an (E) designation for hazardous materials has been incorporated into the proposal affecting Lot 57. The proposed action is not anticipated to affect the conclusions of the prior environmental review.

Historic and Cultural Resources

3. The proposed action is classified as a Type I pursuant to SEQRA as the development site is substantially contiguous to Hotel Theresa, a designated individual landmark building.

Architectural Resources

The proposed action would not result in any types of visual or contextual impacts to the known historic resources within the study area. As all of the new buildings that could be developed under the proposed action would be residential, commercial, or community facility structures of heights and bulk consistent with those urban design features of the area, the proposed action would not introduce any incompatible visual, audible, or atmospheric elements to the settings of historic resources.

Archaeological Resources

In a letter dated November 14, 2017, the NYC Landmarks Preservation Commission (LPC) determined that there is a reasonable likelihood, based on the sites' location and characteristics, that it contains significant archaeological resources. As part of the Proposed Project, the Applicant will enter into a Restrictive Declaration agreeing to conduct archaeological identification, investigation, and mitigation in accordance with the CEQR Technical Manual and NYC LPC guidelines for archaeological work in New York City.

The Restrictive Declaration is binding on the Applicant, and the property's successors and assigns and serves as a mechanism to assure the archaeological testing be conducted and that any necessary mitigation measures be undertaken prior to any site disturbance (i.e., site grading, excavation, demolition, or building construction). The Restrictive Declaration will be prepared in a form acceptable to LPC and recorded with the City's Department of Finance at a future date. Consequently, no significant adverse impact to archaeological resources are expected to result from the proposed action.

Land Use, Zoning and Public Policy

4. This EAS includes a detailed Land Use, Zoning and Public Policy section, which analyzes the potential significance of the proposed minor modification to the existing LSRD on land use, zoning and public policy in the study area. The proposed action would allow development in accordance with the adjusted zoning districts underlying the LSRD area to facilitate the development of two new contiguous buildings. The development site is located entirely within an R8 zoning district and will develop in accordance with R8 as of right regulations. In regard to public policy, the proposed action is found to be consistent with the intent of the Harlem East Harlem Urban Renewal Plan, as well as consistent with the City's policies to provide new affordable housing opportunities in areas where residents would have access to economic opportunity, social services, and local commercial services. The analysis concludes that the proposed actions would not result in significant adverse impacts on land use, zoning or public policy.

Shadows

5. This EAS includes a detailed Shadows analysis. This analysis concludes that incremental shadows would be cast on the Adam Clayton Powell Jr. Boulevard Malls and the Harriet Tubman Memorial; neither of which contain any active or passive resources, and therefore, any incremental shadows would not impact the Open Space Utilization of these resources. The analysis concludes that the proposed actions would not result in significant adverse impacts related to urban design or visual resources. The shadows cast on Harriet Tubman Memorial would not reach vegetation. The Adam Clayton Powell Jr. Boulevard Malls area that is covered in shadow by the proposed buildings is a median directly across from existing 11- and 12-story buildings. The intervening shadow cast by the proposed buildings affects a small portion of the southern tip of the median. Further, the shadows cast on Adam Clayton Powell Jr. Boulevard Malls on March 21st, May 6th and June 21st occur in the evening hours for 13 minutes on March 21st, 2 hours and 8 minutes on May 6th and 2 hours and 42 minutes on June 21st—lengths of time that would not reduce direct sunlight exposure to less than the minimum time necessary for the survival of the street trees that are affected during growing season. As such, the proposed action would not affect the vitality or usage of the sunlight sensitive resources identified in the study area, and significant adverse impacts from shadows would not result from the proposed action.

Community Facilities and Services

6. A detailed analysis of Community Facilities and Services was conducted for Public Schools and no significant adverse impacts are expected as a result of the proposed action.

Public Schools

Pursuant to CEQR Technical Manual methodology, a significant impact on schools may occur if the collective utilization rate of the elementary and/or intermediate schools in the sub-district area that is equal to or greater than 100 percent in the With-Action condition, and if the project results in an increase of five percent or more in the collective utilization rate between the No-Action and the With-Action conditions. The analysis concludes that with the proposed action, the collective utilization rate for both elementary and intermediate schools would be below 100 percent. Further, the proposed action would result in a one percent increase in utilization from the no-action condition for primary schools and zero percent increase in utilization from the no-action condition for intermediate schools. Therefore, pursuant to the CEQR Technical Manual methodology, the proposed action would not result in significant adverse impacts related to public schools.

Transportation

7. The EAS includes a detailed transportation analysis for vehicle, transit, and pedestrian trips generated by the proposed action. The proposed action would not result in an increase of 50 or more vehicular-trip ends either cumulatively, or individually, to any one intersection within the study area. Therefore, the proposed action would not result in significant adverse impacts related to traffic, parking or circulation. The proposed action would not lead to an increase of 200 or more subway or bus trips to any one transit line, stop, station, or platform. Therefore, the proposed action would not lead to any significant adverse subway or bus impacts related to circulation or capacity. The results of the pedestrian LOS analyses indicate that no significant adverse pedestrian impacts are projected to occur at any of the crosswalks, street corners, or sidewalks as a result of the proposed action.

No other significant effects upon the environment that would require the preparation of a Draft Environmental Impact Statement are foreseeable. This Negative Declaration has been prepared in accordance with Article 8 of the New York State Environmental Conservation Law (SEQRA).

TITLE	LEAD AGENCY
Acting Director, Environmental Assessment and Review Division	Department of City Planning, acting on behalf of the City Planning Commission
NAME: Olga Abinader	DATE: 1/25/2018
SIGNATURE	

TITLE	
Chair, City Planning Commission	
NAME: Marisa Lago	DATE: 1/28/2018
SIGNATURE	

Project Name: Ennis Francis Houses LSRD
CEQR #: 19DCP041M
SEQRA Classification: Type I

Determination of Significance Appendix: (E) Designation (E-521)

To ensure that there would be no significant adverse hazardous materials or air quality impacts associated with the proposed project, an (E) designation (E-521) will be placed on the project site (Block 1929, Lot 57).

Hazardous Materials

Task 1
The applicant submits to OER, for review and approval, a Phase 1A of the site along with a soil and groundwater 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 sample sites should be selected to adequately characterize the site, the specific source 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
A written report with findings and a summary of the data must be 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 the 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.

An OER-approved construction-related health and safety plan would be implemented during evacuation and construction and activities to protect workers and the community from potentially significant adverse impacts associated with contaminated soil and/or groundwater. This plan would be submitted to OER for review and approval prior to implementation.

Project Name: Ennis Francis Houses LSRD
CEQR #: 19DCP041M
SEQRA Classification: Type I

Air Quality

Scenario 1, The Reasonable Worst Case Development:

(Block 1929, Lot 57): Any new residential or commercial development on the above-referenced property must exclusively use natural gas as the type of fuel for heating, ventilating, air conditioning (HVAC) systems and hot water systems, ensure that the stack(s) is located at the highest tier and at least 213 feet above grade to avoid any potential significant air quality impacts.

Scenario 2, Proposed Development:

Building A (Block 1929, Lot 57): Any new residential or commercial development on the above-referenced property must exclusively use natural gas as the type of fuel for heating, ventilating, air conditioning (HVAC) systems and hot water systems, ensure that the stack(s) is located at the highest tier and at least 192 feet above grade, and at least 393 feet from the lot line facing Fredrick Douglass Boulevard to avoid any potential significant air quality impacts.

Building B (Block 1929, Lot 57): Any new residential or commercial development on the above-referenced property must exclusively use natural gas as the type of fuel for heating, ventilating, air conditioning (HVAC) systems and hot water systems, ensure that the stack(s) is located at the highest tier and at least 209 feet above grade to avoid any potential significant air quality impacts.

Figure 1-1: Land Use

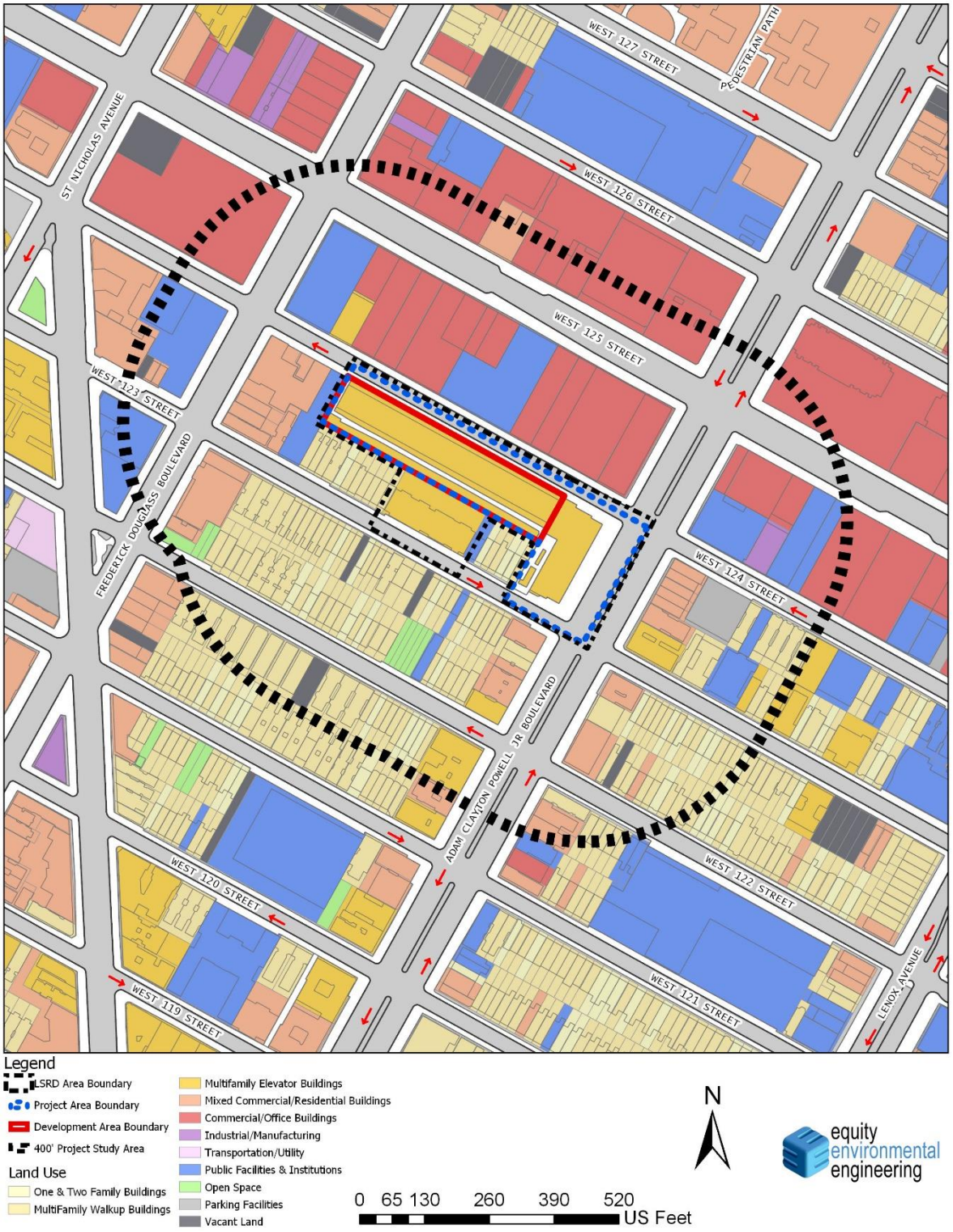


Figure 1-2: Tax Map

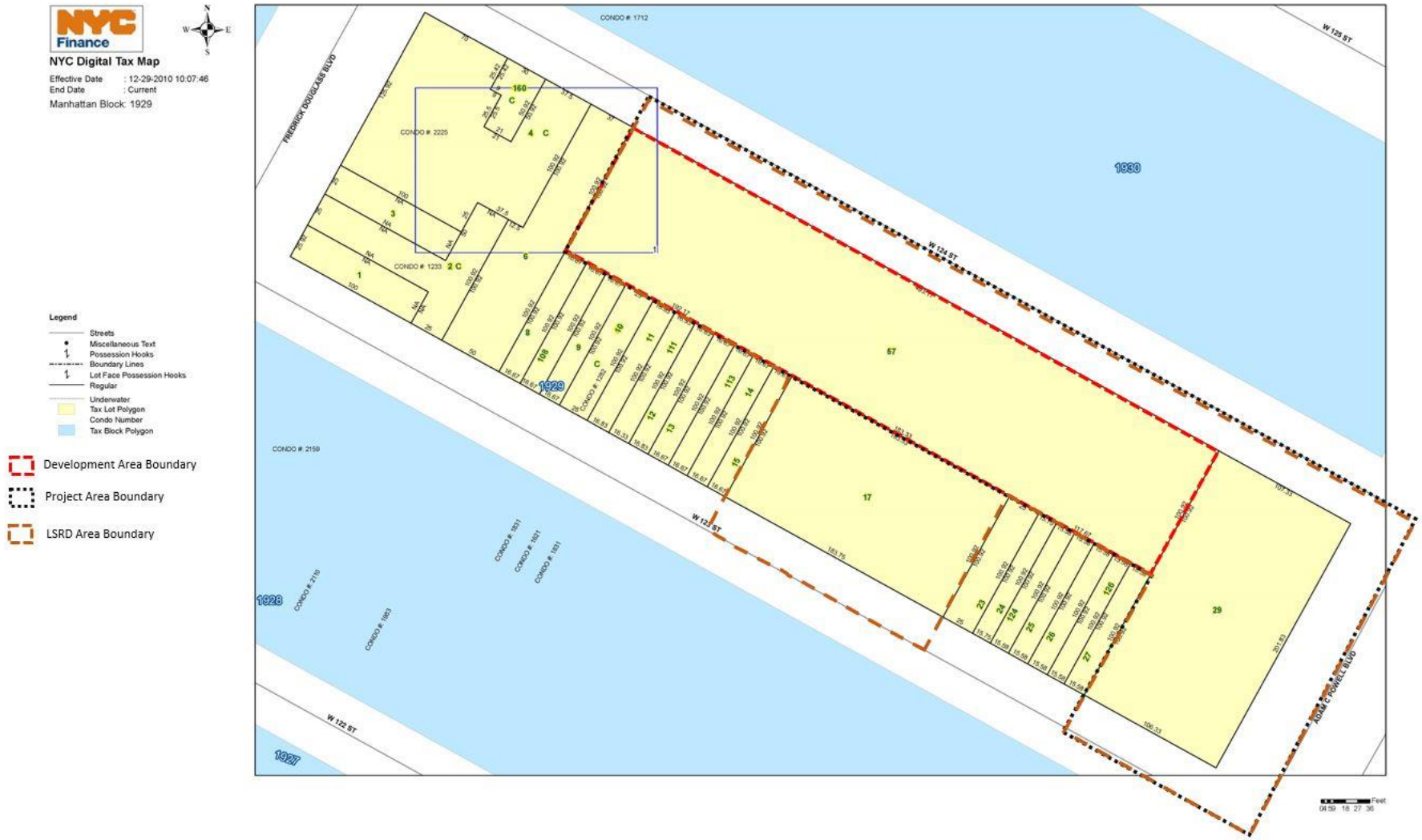


Figure 1-3: Zoning Map

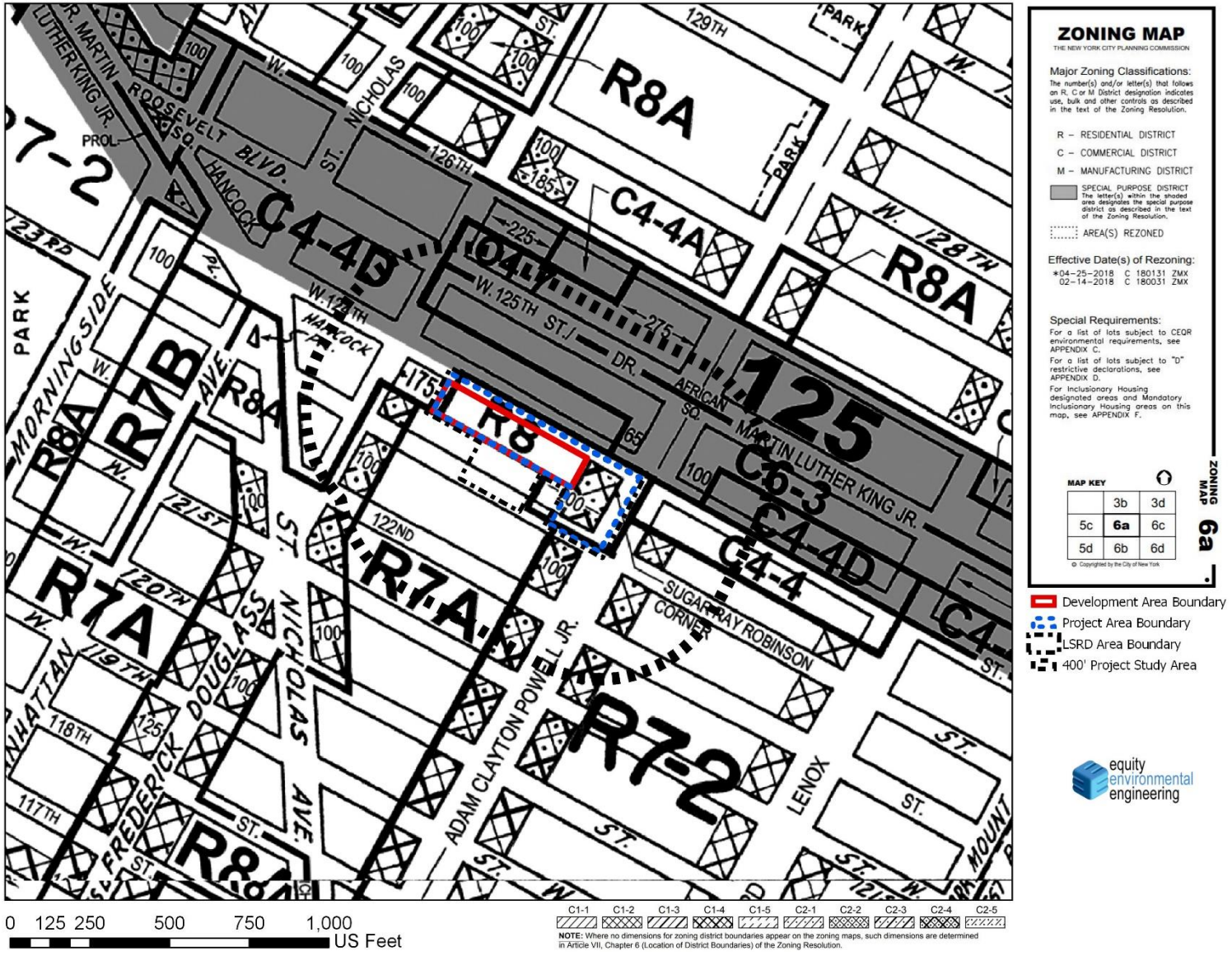


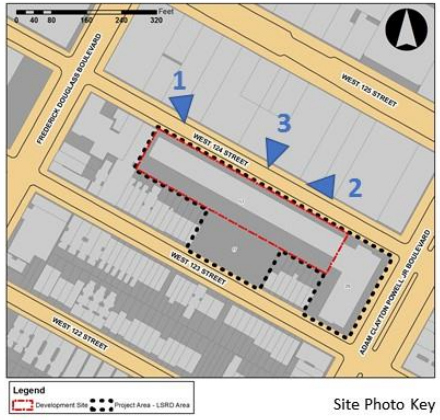
Figure 1-4: Photographs

Photos Taken on 1/20/19

1. Looking SE on W 124th Street – View of Development Site

2. Looking west on W 124th Street – View of Development Site

3. Looking SE on W 124th Street – Full Frontage Shot of Development Site – Ennis Francis Houses



Site Photo Key

Ennis Francis Houses – Minor Modification
Site Area Photos

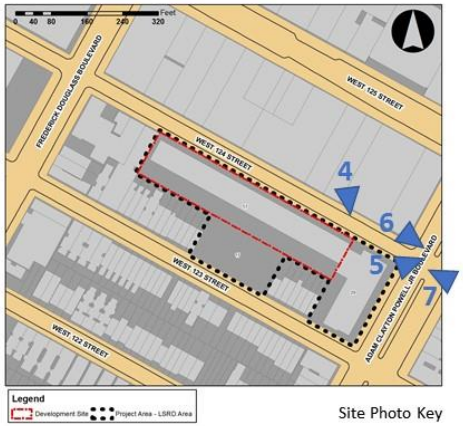
Photos Taken on 1/20/19

4. Looking SE near corner with Adam Clayton Powell Jr. Blvd toward Ennis Francis Houses

5. Looking north on Corner of Adam Clayton Powell Jr Blvd and 124th Street

6. Looking East from west side of W 124th Street and Adam Clayton Powell Jr Blvd

7. Looking west from east side of W 124th Street and Adam Clayton Powell Jr Blvd



Site Photo Key

Ennis Francis Houses – Minor Modification
Site Area Photos

Photo Taken on 1/20/19

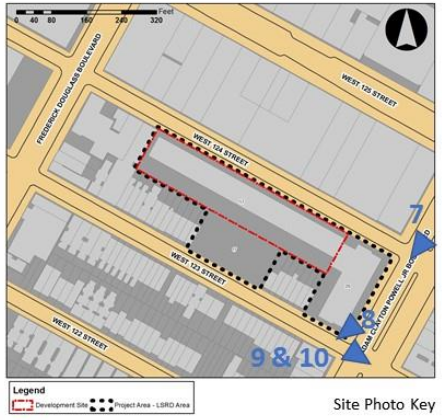
7. Looking SW at intersection of 124th Street and Adam Clayton Powell Jr Blvd toward Project Site – Ennis Francis Houses

Photos Taken on 7/18/18

8. Looking SW down 123rd Street from intersection of Adam Clayton Powell JR and 123rd St

Photos Taken on 7/18/18

9 & 10. Looking east from intersection of Adam Clayton Powell Jr Blvd and 123rd Street



Site Photo Key

Ennis Francis Houses – Minor Modification

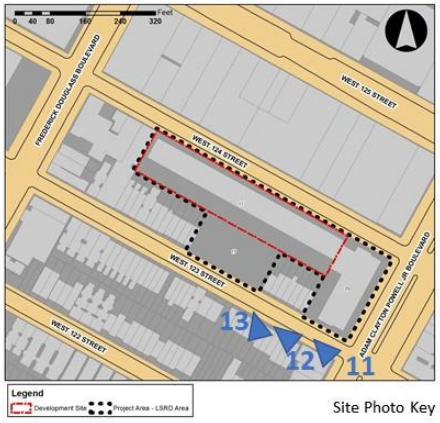
Site Area Photos

Photos Taken on 7/18/18

11. Looking north toward Lot 17 on Block 1929 toward Project Site – Ennis Francis Houses LSRD Area

12. Looking NW down 123rd Street from intersection with Adam Clayton Powell JR Blvd

13. Looking NW at partial frontage Lot 17 on Block 1929 toward Project Site – Ennis Francis Houses LSRD Area and 123rd Street



Site Photo Key

Ennis Francis Houses – Minor Modification
Site Area Photos

Photos Taken on 1/20/19

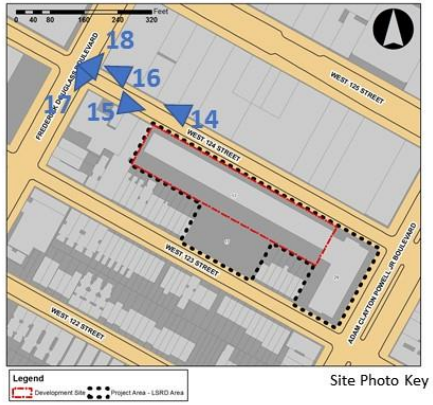
14. Looking NW down 124th Street near intersection with Frederick Douglass Blvd

15. Looking SE down 124th St from intersection with Frederick Douglass Blvd

16. Looking west from 124th St intersection with Federick Douglass Blvd

17. Looking SW from intersection of 124th St and Frederick Douglass Blvd

18. Looking north from SE side of 124th St and Frederick Douglass Blvd



Site Photo Key

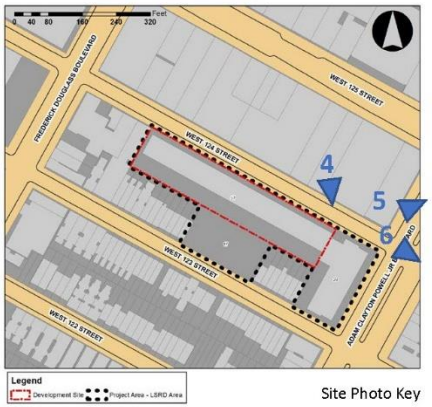
Ennis Francis Houses – Minor Modification
Site Area Photos

Photos Taken on 5/28/17

4. Looking SE near corner with Adam Clayton Powell Jr. Blvd toward Enis Francis Houses

5. Looking north on Corner of Adam Clayton Powell Jr Blvd and 124th Street

6. Looking East from west side of W 124th Street and Adam Clayton Powell Jr Blvd



Site Photo Key

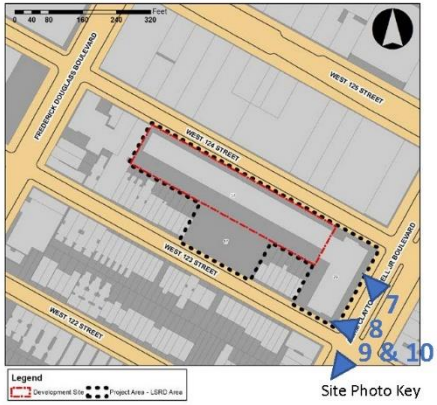
Ennis Francis Houses – Minor Modification
Site Area Photos

Photos Taken on 5/28/17

7. Looking NW at intersection of 123rd Street and Adam Clayton Powell Jr Blvd toward Project Site – Enis Francis Houses

8. Looking NW down 123rd Street from intersection of Adam Clayton Powell JR and 123rd St

9 & 10. Looking south down Adam Clayton Powell JR Blvd from intersection of Adam Clayton Powell Jr Blvd and 123rd Street



Ennis Francis Houses – Minor Modification
Site Area Photos

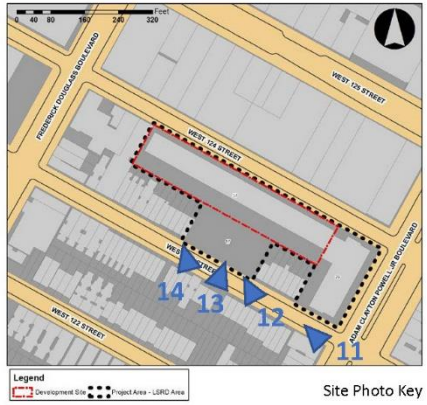
Photos Taken on 5/28/17

11. Looking NW down 123rd Street from intersection with Adam Clayton Powell JR Blvd

12. Looking north toward Lot 17 on Block 1929 toward Project Site – Enis Francis Houses LSRD Area

13. Looking north at full frontage of Lot 17 on Block 1929 toward Project Site – Enis Francis Houses LSRD Area

14. Looking NW at partial frontage Lot 17 on Block 1929 toward Project Site – Enis Francis Houses LSRD Area and 123rd Street



Site Photo Key

Ennis Francis Houses – Minor Modification
Site Area Photos

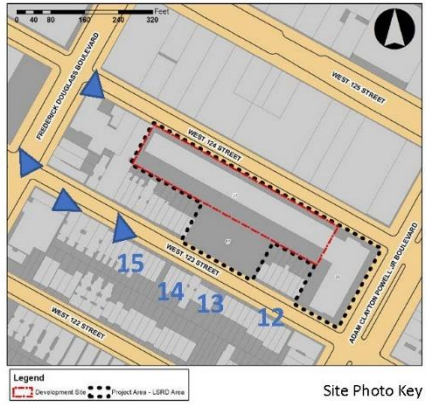
Photos Taken on 5/28/17

15. Looking NW down 123rd Street near intersection with Fredrick Douglas Blvd

16. Looking SE down 123 Street from intersection with Fedrick Douglas Blvd

17. Looking NW from intersection of 123rd St and Fredrick Douglas Blvd

18. Looking north from SE side of 124th St and Fredrick Douglas Blvd



Site Photo Key

Ennis Francis Houses – Minor Modification
Site Area Photos

1.0 PROJECT DESCRIPTION

1.1 Introduction

The Applicant, Carthage Real Estate Advisors LLC, seeks a minor modification to a Large Scale Residential Development (LSRD)(Special Permit C840090 ZSM) pursuant to Sections 78-312 and 78-313 of the Zoning Resolution ("ZR") of the City of New York ("The Proposed Action"). The Proposed Action would alter provisions of the 1983 Ennis Francis Houses LSRD Plan established under ZR 78-06, which governs a single zoning lot consisting of Tax Block 1929, Tax Lots 17, 29, and 57 (**Figure 1-2**) or "The Affected Area". The Affected Area (**Figure 1-1**) currently contains three residential buildings, one building on each tax lot. The Proposed Action would allow development within the LSRD to comply with the underlying zoning. The LSRD's zoning consists of areas mapped R8, R7A, and R8/C2-4. Additionally, the Proposed Action would modify the boundaries of the LSRD to remove Lot 17. The proposed changes to the LSRD plans will allow development in accordance with the adjusted zoning districts underlying the LSRD area. FAR would still be transferrable throughout the modified LSRD area per the original Special Permit based on blended FAR that is factored from the zoning districts underlying the lots that would make up the modified LSRD area. However, land use, height, setback and other bulk characteristics would be subject to the zoning controls underlying each individual lot within the LSRD.

The Proposed Action would facilitate the development of two new contiguous buildings (the "Proposed Buildings") at 206-254 West 124th Street (Block 1929, Lot 57; the "Development Site") within the Harlem neighborhood of Manhattan Community District 10. The Proposed buildings would contain a total of approximately 349,336 GSF, or 276,048 ZSF, including 268,884 ZSF of residential floor area and 7,164 ZSF of community facility floor area. The Proposed Buildings would contain 322 dwelling units, 173 of which would be affordable. The Applicant has coordinated with HPD on the Site Plan and is seeking HPD's Extremely Low and Low-Income Affordability (ELLA) Program funds for the 173 units. Additionally, 30 units of 'workforce' housing would be provided. Workforce housing is an affordability option that is part of Mandatory Inclusionary Housing. The Workforce Option requires 30% of the total residential floor area to be for housing units for residents with incomes averaging 115% AMI; that no units could go to residents with incomes above 135% AMI; and that no direct subsidies could be used for these affordable housing units. The Applicant has coordinated with HPD on the range of incomes and unit sizing to be provided.

1.2 Background

The current LSRD consists of three residential buildings. 2070 Adam Clayton Powell Jr. Blvd. (Lot 29) has 160 dwelling units, 225 West 123rd Street (Lot 17) has 60 dwelling units. They are owned by Abyssinian Development Corporation and will remain on Lots 17 and 29. They are entirely affordable, serving very low-income tenants and the chronically homeless. 218-250 West 124th Street (Lot 57) is a three-story building with 72 dwelling units that are currently vacant. It was constructed in 1985. It has been bought by Carthage Advisors LLC and will be demolished prior to the construction of a new development with 60% affordable and workforce housing.

The LSRD was known as Site 106 under the former Harlem East Harlem Urban Renewal Plan. In 2000, Site 106 was included in the Harlem Gateway Urban Renewal Area, but any restrictions from the Harlem-East Harlem URP expired in 2008. As originally approved under the 1983 LSRD, the two buildings were permitted to have an FAR of 4.15, based on the application of height factor regulations, and were granted additional allowances for height, setback, and space between

buildings contrary to the underlying zoning's bulk regulations. The 4.15 FAR that was approved appears to be descriptive of the original approved residential floor area divided by its lot coverage, not a cap imposed by the LSRD. The actual floor area that was constructed in 1983 was 211,800 square feet (2.36 FAR).

In September of 2010, a Conditional Negative Declaration was issued for CEQR No. 10DCP028M, for a minor modification of the Ennis Francis LSRD. The proposed action modified the LSRD to allow a building count in the LSRD to change from three to four buildings, the unit count to increase from 231 to 292 units, an increase in the residential floor area allowed, an increase in use of available commercial floor area, and a decrease in the required parking spaces from 49 to 27 spaces. The purpose of the modification was to facilitate a proposal to construct an 8-story, 60-unit residential development on Lot 17 of the LSRD. The City Planning Commission determined that the proposed action would have no significant effect on the quality of the environment, if it is modified to include the following requirements. 1. To perform a Phase II ESA and perform necessary remediation as identified by the Phase II. 2. Agree to a restrictive declaration to conduct archaeological identification and mitigation per CEQR Technical Manual and LPC guidelines for archaeological work in NYC. It is not known if the Phase II ESA was prepared, but the restrictive declaration was finalized and the proposed development on Lot 17 has since taken place. As amended in 2010, the LSRD was amended to permit a quality housing bulk building to be constructed on Lot 17 that complied with the underlying R7A bulk regulations. The building was consistent with the (descriptive) height factor FAR and calculations of the 1983 LSRD. Nevertheless, it has been determined that since a quality housing building may not be within a LSRD, Lot 17 should be deleted from this LSRD.

Per a Regulatory Agreement, recorded and filed on 2-02-2012 (CRFN 2012000048291), among NYS Housing Finance Agency, ADC/Ennis Francis Owner, L.P. and ADC/Ennis Francis II Housing Development Fund Company, INC. relating to Lots 17 and 29 requires that in exchange for Affordable Housing Revenue Bonds utilized to fund mortgage payments related to the development of improvements at Lots 17 and 29 – namely the construction of a new 60 unit residential development on Lot 17, 96% of the Project's (Lot 17 and 29) revenue units are set aside for households in which incomes are at or below 60% of the Area Median Income (AMI). The existing total units on Lots 17 and 29 is 220, and therefore 212 are required to be available at or below 60% of AM—effectively restricting development on the two parcels to the current number of units (220).

Per a Regulatory Agreement entered into on December 19, 2017, between NYC Department of Housing Preservation and Development "HPD" and the Applicant, Carthage 124th LP, a restriction on Lot 57 was created requiring that 60% of units constructed on the Lot be "Low Income Units," and that of these, at least 34 of the units be for tenants with incomes that do not exceed 50% of AMI, and that no more than 10% of the units be available to incomes that do not exceed 130% AMI, and that the balance of the low-income units be for tenants whose annual incomes do not exceed 80% of AMI.

1.3 Description of Affected Area

The Affected Area is located on Block 1929 (Lots 17, 29, and 57) in the Central Harlem neighborhood of Manhattan Community District 10. The combined lot area of the Affected Area/LSRD is 89,832 square feet and contains a total of 321,926 total GSF or 285,592 ZSF of existing development. 318,726 GSF (282,392 ZSF) of the total floor area within the Affected Area is residential with 292 affordable dwelling units (including 72 vacant dwelling units within the

vacant residential building on Lot 57) and 3,200 GSF of the total floor area is commercial. The Affected Area contains a total of 37 enclosed parking spaces (12,000 GSF) and a combined FAR of 3.18. The underlying zoning in the Affected Area is split between R7A, R8, and R8/C2-4.

- ***Lot 17 (Residential Building):*** Lot 17 is located at 225 West 123rd Street and is improved with an 8-story (85'), 98,955 GSF (73,792 ZSF) building with 60 affordable dwelling units. The lot area is approximately 18,501 square feet. There are 37 enclosed accessory parking spaces provided on Lot 17, according to the latest certificate of occupancy. Lot 17 has a total FAR OF 3.99 and is located within an underlying R7A zoning district.

- ***Lot 29 (Mixed-Use Building):*** Lot 29 is located at 2070 Adam Clayton Powell Jr. Blvd and is improved with an 11-story (124') 146,780 GSF (143,908 ZSF) mixed-use building with 143,580 GSF (140,708 ZSF) of residential use (160 affordable dwelling units) and 3,200 GSF/ZSF of ground floor commercial retail space fronting Adam Clayton Powell Jr. Blvd. The lot area is approximately 21,562 square feet. Lot 29 has a total FAR of 6.67 (6.52 residential FAR and 0.15 commercial FAR) and is located within an underlying R8/C2-4 district.

- ***Lot 57 (Vacant Residential Building "The Proposed Development Site"):*** The Development Site consists of Lot 57. Lot 57 is located at 206-254 West 124th Street. It has 493'-2" of frontage along West 124th Street, a narrow street as defined under the Zoning Resolution. The Development Site currently includes a vacant 3- story (29'-6"), 76,191 GSF (67,892 ZSF) residential building with 72 dwelling units on a 49,769-square foot lot. The building is in poor condition and has been vacant since 2015. No parking is provided on the Development Site, which is located in the Transit Zone. Lot 57 has an FAR of 1.21 and is located entirely within an underlying R8 zoning district.

The affected area is located within R7A, R8 and R8/C2-4 zoning districts. Lot 17, which would be removed from the LSRD under the proposed action, is located within an R7A district, which allows residential and community facility uses up to 4.0 FAR, within a contextual building envelope. Lot 29 is located in an R8 district with a portion of the lot on Adam Clayton Powell Jr. Boulevard in a C2-4 commercial overlay. The proposed development site falls exclusively within the R8 zoning district. R8 districts are height factor districts that allow residential development up to 6.02 FAR and community facility uses up to 6.5 FAR.

The breakdown of the composition of the entire LSRD in terms of allocation of square footage by zone and the associated FAR allowable and total FAR allowable with a blended zoning coverage is identified below in **Table 1-1**:

Table 1-1: Total Allowable FAR by underlying zoning within the Affected Area

Residential	**R7A** – 20.6% at 4.0 FAR = 0.8238
	R8/C2-4 – 24.0% @ 6.02 FAR = 1.4449
	R8 – 55.40% @ 6.02 FAR = 3.335
	Adjusted Max Residential FAR = 5.604
Community Facility	**R7A** – 20.6% @ 4.0 FAR = 0.8238
	R8/C2-4 – 24.0% @ 6.5 FAR = 1.56
	R8 – 55.40% @ 6.5 FAR = 3.601
	Adjusted Max Community Facility FAR = 5.985

Commercial	***2.0 FAR***
Total	***5.985***

1.4 Description of Surrounding Area

The Affected Area is on the block bounded by West 123rd Street, Adam Clayton Powell Jr. Boulevard, West 124th Street, and Frederick Douglass Blvd.

Land Use/Built Form
The area surrounding the Affected Area ("The Surrounding Area") consists of residential, institutional, retail or service establishment uses. North of 124th street is predominantly developed with 2- to 11-story commercial and residential buildings and South of 124th street consists primarily of 4- and 5-story tenement buildings and townhomes. Commercial overlays have facilitated mixed-use residential and commercial development along Frederick Douglass Boulevard and Adam Clayton Powell Jr. Blvd, to the west and east of the Affected Area, respectively, and on 125th Street one block to the north. There are also several institutional buildings and houses of worship within the Surrounding Area. The Surrounding Area has two public community gardens: the Joseph Daniel Wilson Memorial Garden and Our Little Green Acre (Garden Eight) both front 122nd Street.

Transportation
The Surrounding Area, and the Affected Area, are located within a Transit Zone. The area is "transit-rich" with multiple subway and bus lines. The B/D line runs along St. Nicholas Avenue with entrances at 125th Street. Multiple bus lines run through the Surrounding Area with routes on Frederick Douglass Blvd., Adam Clayton Powell Jr. Blvd., and 125th Street. The M10 and M2 buses run north/south on Frederick Douglass Blvd. and Adam Clayton Powell Jr. Blvd. respectively. The M60, M100, M101 and BX15 run east/west along 125th Street with service within Manhattan and to the Bronx and Queens.

Zoning Districts; Special Districts
The Affected Area is mapped within zoning districts R7A, R8, and R8/C2-4 (**Figure 1-3**). The surrounding area to the west of the Affected Area, along Frederick Douglass Blvd., is mapped R8A/C2-4 and C4-4D districts, which were the result of the Frederick Douglass Blvd. Rezoning adopted in 2003 to encourage contextual building. The blocks to the north of West 124th Street form a portion of the Special 125th Street District and are mapped with C6-3 and C4-7 commercial districts. There is an Inclusionary Housing Designated Area mapped to the north of the Proposed Development Site above West 124th Street. C4-4D districts allow a wide range of commercial uses, in addition to residential and community facility uses. R8A districts allow residential and community facility up to 6.02 FAR and 6.5 FAR respectively. The blocks located north of West 124th Street are included in the Special 125th Street District and are zoned C6-3 and C4-7, which allow medium and high-density commercial and residential uses.

1.5 Description of Proposed Development

The Proposed Development will include two buildings (Buildings "A" and "B") that will occupy a portion of Lot 57. Each of the Proposed Buildings will contain residential uses. Building "A" will contain ground floor community facility uses with dwelling units above. The floor area and dwelling unit density of the Proposed Buildings will comply with the R8 zoning district.

Together, the Proposed Buildings will have a total of approximately 349,336 GSF (276,048 ZSF), of which 268,884 ZSF is residential floor area and 7,164 ZSF is community facility floor area. When combined with the 143,908 ZSF building on Lot 29, this will increase the total floor area of the modified LSRD to 419,956 ZSF and an estimated FAR of 6.50. This would increase the total residential floor area of the modified LSRD to 412,792 ZSF and an estimated FAR of 6.02, equal to the maximum residential floor area of 6.02 FAR (by height factor). The total amount of floor area, including the maximum residential floor area of 6.02 FAR (by height factor), complies with the maximum community facility floor area of 6.5 FAR permitted in the R8 district.

In order to achieve the overall development object for this project, the applicant seeks approval of a modification to the previously approved Ennis Francis LSRD to waive height factor, FAR and other bulk regulations presumed to be associated with the 1983 LSRD and allow the new buildings on Lot 57 to be designed according to the underlying height factor regulations of the underlying zoning districts of the LSRD, taking into account the building on Lot 29. Additionally, Lot 17 would be removed from the LSRD since it was determined that a Quality Housing building should not be developed within an LSRD. With the removal of Lot 17, the LSRD would be composed of Lot 57 and Lot 29 and have a combined area of 71,331 sf. The proposed modification would allow development within the modified LSRD at the allowable FAR of 6.02 for residential or 6.5 for community facility. This would allow a total of 419,956 zoning square feet of residential floor area within the modified LSRD, or 463,652 zoning square feet of community facility space. Lot 29 is occupied by a residential and commercial building at a FAR of 6.67, including 6.53 FAR of residential space. Therefore, under the LSRD's underlying zoning, up to 5.8 FAR of residential development, or 6.42 FAR of total residential and community facility development, would be available for utilization on the Development Site, Lot 57. The Applicant's proposal calls for the development of 5.80 FAR of residential floor area (276,048 ZSF) and total FAR of 6.42 FAR.

Dwelling Unit Density
The Proposed Development will have approximately 322 dwelling units, of which 173 would be permanently affordable for tenants who earn less than 80 percent AMI ("Low Income Restricted Housing Units"). The Applicant has coordinated with HPD on the Site Plan and is seeking HPD's Extremely Low and Low-Income Affordability (ELLA) Program funds. The Applicant has coordinated with HPD on the range of incomes and unit sizing (studio-three bedrooms) to be provided. The Dwelling Units would range in size from studios to three-bedrooms. Including the existing dwellings units on lot 29, the total number of dwelling units in the LSRD would be 482.

Bulk
Building A is proposed to be 17-stories tall (169' or 172'6" to the top of the parapet) with 125 feet of street frontage. To accommodate flexibility, the maximum possible height would be 20 stories (210 feet). Regardless of the maximum height, Building A is proposed to have a 15-foot open area along the front lot line to allow the use of alternate front setbacks of Section 23-642 of the Zoning Resolution. The residential floors above would have a depth of approximately 56 feet, which is sufficient for a double-loaded corridor plan for residential buildings. Building B is proposed to be 18-stories tall (190') with approximately 175 feet of street frontage. To accommodate flexibility, the maximum possible height would be 20 stories (210 feet). Regardless of the maximum height, Building B is proposed to have a 15-foot open area along the front lot line to allow the use of alternate front setbacks of Section 23-642 of the Zoning Resolution.

Proposed Uses and Entrances
Each Proposed Building's residential lobby will be accessed from West 124th Street. A portion of the ground floor of Building A will contain community facility space with direct access from West 124th Street.

Open Space
The development site will have a minimum of 38,911 square feet of open space, representing 9.5% open space, which is sufficient for residential buildings with a height factor of 13. The open space will have a mix of landscaping and active and passive open space areas in the rear yard of the buildings. Some of the required open space will be provided on the roof above community facility space in Building A. The open space will be private, for the use of building residents.

Parking
In an R8 district, parking is required for at least 40 percent of the total number of dwelling units. However, the proposed development is within a transit zone, which eliminates required parking for income-restricted housing units in the proposed buildings. 54 percent of the dwelling units in the proposed development, or approximately 173 units, qualify as income-restricted housing units for purposes of parking waiver and no parking is required for these units. Therefore, parking spaces will be required for 40% of the 149-market rate / workforce units, or 60 spaces. Parking spaces will be in an enclosed, below-grade parking facility in Building A containing the 60 parking spaces. The parking facility is accessed from a single entrance and exit in Building A from a curb cut on west 124th street. No parking is required for affordable dwelling units, or community facility uses in use group 4 in R8 districts.

Build Year

2021 assuming 6 months for ULURP and 18-24 months for construction.

Figure 1.5-1: Site Plan of Proposed Development

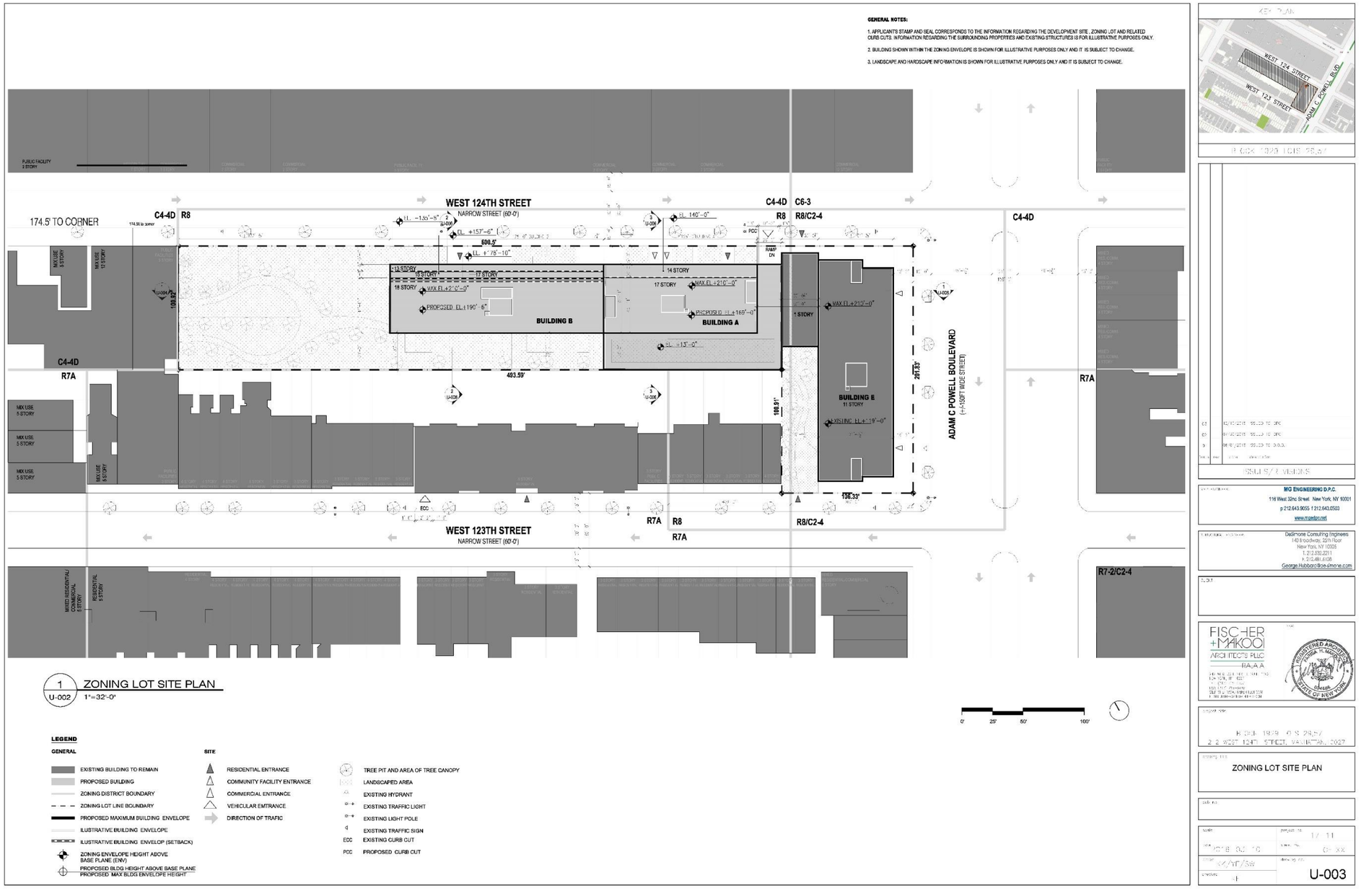


Figure 1.5-2: Massing of Proposed Development (Illustrative)

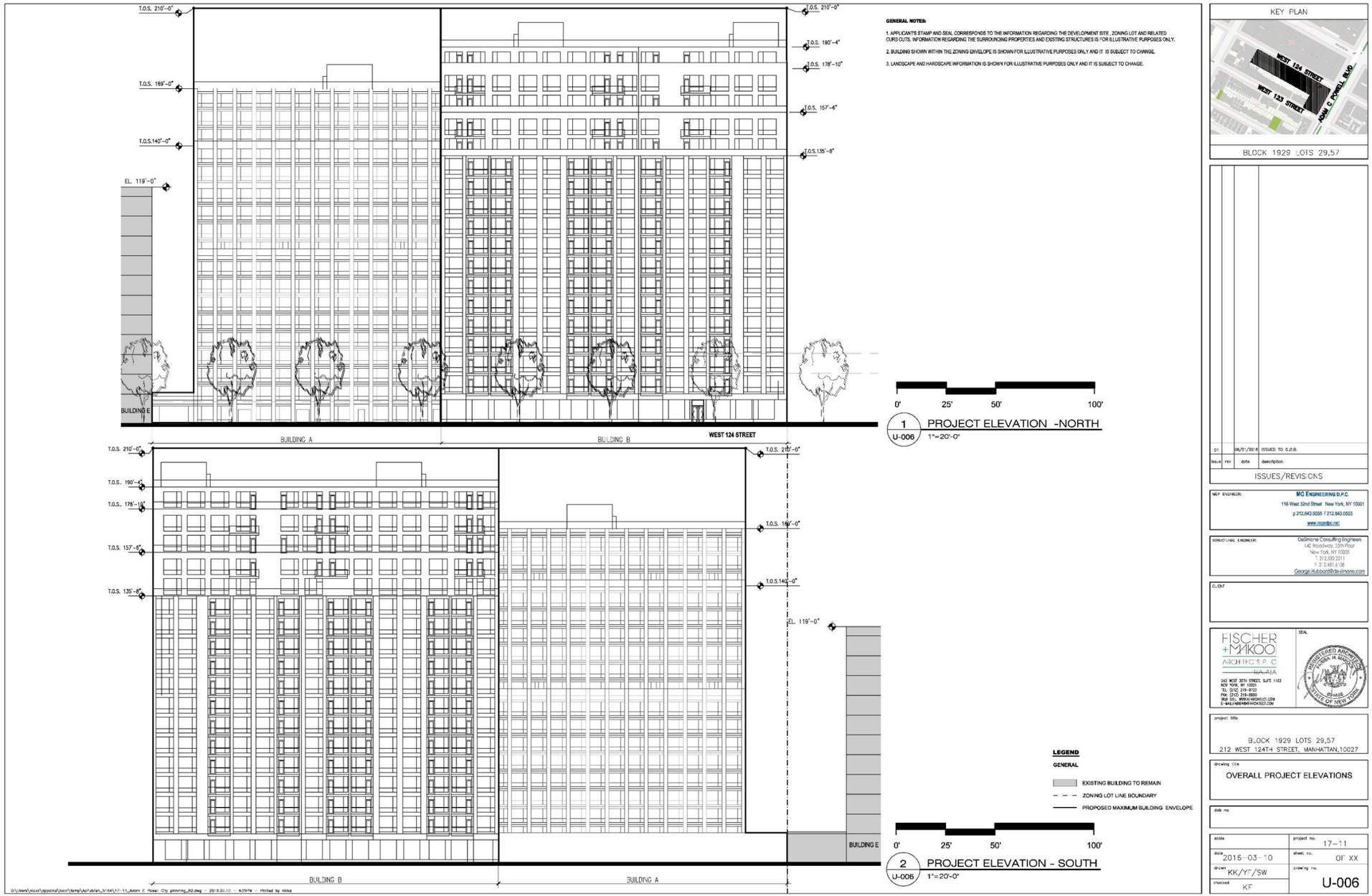


Figure 1.5-3: Rendering of Proposed Development (Illustrative)

1.6 Action(s) Necessary to Facilitate the Project

The application seeks to modify the current LSRD to remove Lot 17 from the LSRD and allow the Proposed Development to be constructed according to the requirements of the underlying zoning district (underlying zoning is split as described above). Changes to the LSRD plans will allow development in accordance with the adjusted zoning districts underlying the LSRD area. FAR would still be transferrable throughout the modified LSRD area per the original special permit based on blended FAR that is factored from the represented zoning districts underlying the lots that make up the LSRD area. However, land use, height, setback, and other bulk characteristics would be subject to the zoning controls underlying each individual lot present within the LSRD.

The minor modification will have the effect of:

(i) Modifying the amount of residential floor area available for construction on Lot 57 by considering the available adjusted FAR from the underlying zoning for the entire LSRD area;
(ii) Modifying the number of dwelling units as a byproduct of the increased residential FAR available from the factored FAR of the underlying zoning districts of the LSRD;
(iii) Adding ground floor community facility uses which are allowed by the underlying zoning;
(iv) Increasing the amount of accessory parking which is required from the R8 zone that is under the Applicant Site (Lot 57) in the LSRD; and
(v) Removing from the LSRD the contextual building that was built on Lot 17; contextual development is not permitted within an LSRD.

1.7 Purpose and Need

The general intent of Section 78-01 is to provide better site planning and community planning through the modified application of the district regulations in the LSRD. The proposed minor modification will facilitate the timely construction of the Proposed Buildings. The demolition of the existing 3-story building and redevelopment of the site will provide the neighborhood with an attractive mixed-use building with vital community support in an area that is well served by transit, community facilities, and local commercial uses. The development of new affordable housing units is aligned with the City's mandate for increased amount of affordable housing units and quality of construction and will help revitalize the site in Harlem.

1.8 Analysis Framework

This EAS studies the potential for individual and cumulative environmental impacts related to the Proposed Action occurring in a study area of approximately 400 feet around the LSRD or (Affected Area). As shown in Figure 1-1: Site Location Map, this area is composed of Block 1929, Lots 17, 29, and 57. The Affected Area is generally bound by West 123rd Street, Adam Clayton Powell Jr. Blvd., West 124th Street, and Frederick Douglass Blvd.

This environmental assessment considers the potential effects of the Proposed Action compared to future conditions without the approvals sought by the project sponsor. The analysis framework is described below:

Reasonable Worst-Case Development Scenario

In order to assess the possible effects of the proposed action, a reasonable worst-case development scenario was developed for both the current zoning (Future No-Action) and proposed zoning (Future With-Action) conditions for a three-year build period (build year 2021).

The incremental difference between the Future No-Action and Future With-Action Scenarios will serve as the basis for the impact analyses of the Environmental Assessment Statement.

Existing Conditions

The Affected Area is located on Block 1929 (Lots 17, 29, and 57) in Harlem within Manhattan Community Board 10. The combined lot area of the existing Affected Area/LSRD is 89,832 sf and has a total of 321,926 GSF (285,592 ZSF) of development (including vacant residential building on Lot 57) and a combined FAR of 3.18. 318,726 GSF (282,392 ZSF) of the total floor area within the Affected Area is residential with 292 affordable dwelling units (including 72 vacant dwelling units within the vacant residential building on Lot 57) and 3,200 ZSF/GSF of the total floor area is commercial. The Affected Area contains a total of 37 enclosed parking spaces (12,000 SF). The underlying zoning in the Affected Area is split between R7A, R8, and R8/C2-4.

Lot 17 (Residential Building)
The proposed LSRD Modification would remove Lot 17 from the LSRD. The Lot is located entirely in an R7A zoning district. The lot area is 18,501 square feet. Lot 17 is improved with an 8-story, 98,995 GSF (73,792 ZSF) residential building with 60 affordable dwelling units. There are 37 enclosed parking spaces (12,000 sf of parking) provided on Lot 17 accessory to Lot 29, according to the latest certificate of occupancy. Lot 17 has a total FAR of 3.99.

Lot 29 (Mixed-Use Building)
Lot 29 is constructed with an 11-story, 146,780 GSF (143,908 ZSF) mixed-use building with 3,200 GSF/ZSF of ground floor commercial retail space fronting Adam Clayton Powell Jr. Blvd. and 143,580 GSF/140,708 ZSF of upper floor residential floor area containing 160 affordable dwelling units total. The lot area is approximately 21,562 square feet. Lot 29 has a total FAR of 6.67, including 6.53 FAR for residential floor area and 0.15 FAR for commercial floor area.

Lot 57 (Vacant Residential Building; the Proposed Development Site)
The development site consists of lot 57. It has a total lot area of 39,769 square feet with 493'-2" of frontage along west 124th street, a narrow street as defined under the zoning resolution. The development site currently includes a vacant 3-story, 76,191 GSF (67,892 ZSF) residential building with 72 untenanted dwelling units and an FAR of 1.36. No parking is currently provided on the development site, which is located in a transit zone. The building is in poor condition and has been vacant since 2015. Therefore, it would be demolished prior to the construction of the proposed development.

*The Affected Area is identified in **Figure 1-2: Tax Map** and **Figure 1-1: Site Location Map** above. The use of these lots is presented in **Table 1.8-1** below:*

Table 1.8-1: Affected Area- Existing Conditions

Block	Lot	Address	Owner	Lot Size (ft2)	# of building	# of Floors	Height	Existing Use	DU	Floor Area (GSF)	Existing FAR	Maximum FAR Under Proposed Action	Built FAR
1929	57	206-254 West 124th Street	The Abyssinian Development Corporation	49,769	1	3	29'-6"	Vacant	72	76,191	1.36	6.50	100%
1929	29	2070 Adam Clayton Powell Jr. Blvd		21,562	1	11	124'	Mixed-Use Res/Commercial	160	146,780	6.67	6.67	100%
1929	17	225 West 123rd Street		18,501	1	8	85'	Residential	60	98,955	3.99	3.99	100%

Future No-Action Scenario

No changes to existing conditions would occur to the LSRD for Lot 29 or Lot 17. It is assumed that reoccupation of the vacant building currently occupying Lot 57 would occur. The previous use was solely for affordable residential housing. The building has been vacant for approximately 5 years. Although the current building is in poor condition, rehabilitation of the existing building is feasible and would be more cost effective and practical than demolishing and rebuilding a similarly sized building allowed under the current LSRD restrictions. It is assumed that the current LSRD regulations restrict development to the existing development on Lots 17, 29, and 57. Further, the Regulatory Agreement described previously indicates that Lot 29 and Lot 57 are restricted to 220 units total. Therefore, no changes to existing conditions, other than reoccupation of the building on Lot 57, are likely to occur without a modification of the LSRD.

Future With-Action Scenario

The With-Action Scenario assumes development that maximizes allowable residential and overall (residential and community facility) development of the Development Site given the height factor FAR for residential uses and a 6.50 for community facilities in an R8 zoning district, and the presence within the modified LSRD of the mixed commercial and residential building occupying Lot 29. Development of a mixed residential and community facility building of up to 20 stories (210 feet) could occur. The new building on Lot 57 would contain approximately 30,990 gross/zoning square feet of community facility space, assumed to be occupied by community facility use. There would be a total of 339 new dwelling units, consisting of 203 units of affordable housing as required by the Regulatory Agreement on Lot 57 which includes 30 'workforce' units affordable to households at an average of 130% of AMI, and 136 market rate units. The residential component would occupy 311,004 gross square feet of floor area or 288,462 zoning square feet. Accessory parking for 40% of the non-Income Restricted Housing Units would be provided in a below-grade parking facility to be accessed from 124th Street. 66 spaces would be provided for the development's 166 combined market rate and workforce housing units.

Lot 29 is expected to remain as it currently exists under the With-Action Scenario with 160 affordable units. Lot 17, a 98,995 GSF or 73,792 ZSF building containing 60 units at 3.9 FAR built in 2012 would now be severed from the LSRD and governed by the underlying R7A zone. R7A allows a FAR of 4.0; as such Lot 17 is 99% developed and is subject to the previously discussed regulatory agreement and would remain as it exists in the With-Action Scenario.

Although Lot 17 would be removed from the LSRD under the proposed action, there would be no change to development or occupancy of the site. Additionally, there would be no change in development or occupancy of Lot 29. Incremental development under the proposed action would consist of the demolition and redevelopment of the existing 3-story, 72 unit building containing 76,191 GSF or 67,892 ZSF of residential floor area with a 20-story, 339-unit building containing 311,004 GSF (288,462 ZSF) of residential floor area and 30,990 gross/zoning square feet of community facility space, as well as below-grade parking for sixty-six vehicles.

The With-Action Scenario would produce a net increment of development of 234,813 GSF or 220,570 ZSF of residential floor space and 30,990 GSF/ZSF of community facility space. A net increment of 267 units would be produced, including 136 market rate units, 30 units of 'workforce' housing, and an increase of 131 affordable units, with 203 new affordable units replacing the no-action 72 units.

The With-Action Scenario exhausts all available residential and overall (residential, commercial, and community facility) floor area within the modified LSRD boundaries, consisting of Lots 29 and

57. The scenario's building height of 210 feet (20 stories) is the maximum height that could be built in a reasonable building configuration using double-loaded corridors with height factor requirements. The total number of units to be analyzed under the With-Action Scenario is based on a rationalization of the required combination of affordable housing units at 60% and market rate at 40% per the Regulatory Agreement controlling Lot 57 described above - which assumes smaller unit sizes for affordable housing units to create an average unit size of 1 unit per 850 ZSF considering the combination of affordable and market units. Given the available residential maximum FAR of 6.02 for the R8 combined with the lot size of the LSRD, a total of 429,170 residential ZSF could be built. Minus the existing 140,708 ZSF present on lot 29, the maximum residential floor area that could be developed on Lot 57 is 288,462 ZSF. Dividing the available zoning floor area of 288,462 by 850 gives 339 total units of which 203 would be affordable and 136 market rate. The available R8 Community Facility FAR on Lot 57 is 6.5, subtracting the maximum residential zoning floor area of 288,462 from the maximum of 319,452 ZSF available on site, an additional 30,990 ZSF of community facility space could be built on the development site to maximize all available development potential.

Table 1.8-2: Comparative Existing, No-Action, Build Worksheet

	EXISTING CONDITION	NO-ACTION CONDITION	WITH-ACTION CONDITION	INCREMENT
Land Use				
Residential	☑ Yes ☐ No	☑ Yes ☐ No	☑ Yes ☐ No	
If "yes," specify the following:				
Describe type of residential structures	hi and mid rise multi-family elevator buildings	hi and mid rise multi-family elevator buildings	hi rise multi-family elevator buildings	
No. of dwelling units	292	292	559	267
No. of low- to moderate-income units	292	292	423	131
Gross floor area (sq. ft.)	318,726	318,726	454,584	135,858
Commercial	☑ Yes ☐ No	☑ Yes ☐ No	☑ Yes ☑ No	
If "yes," specify the following:				
Describe type (retail, office, other)	retail	retail	retail	
Gross floor area (sq. ft.)	3200	3200	3200	0
Manufacturing/Industrial			N/A	
If "yes," specify the following:				
Type of Use			N/A	
Gross floor area (sq. ft.)			N/A	
Open storage area (sq. ft.)			N/A	
If any enclosed activities, specify:			N/A	
Community Facility	☐ Yes ☑ No	☐ Yes ☑ No	☑ Yes ☐ No	
If "yes," specify the following:				
Type of Use	N/A	N/A	medical office	
Gross floor area (sq. ft.)	N/A	N/A	30,990	30,990
Vacant Land	☐ Yes ☑ No	☐ Yes ☑ No	☐ Yes ☑ No	
If "yes", describe:	N/A	N/A	N/A	
Publicly Accessible Open Space	☐ Yes ☑ No	☐ Yes ☑ No	☐ Yes ☑ No	
If "yes," specify type (mapped City, State, or Federal Parkland, wetland-mapped or otherwise known, other):	N/A	N/A	N/A	
Other Land Uses	☐ Yes ☑ No	☐ Yes ☐ No	☐ Yes ☑ No	
If "yes," describe:	N/A		N/A	
Parking				
Garages	☑ Yes ☐ No	☑ Yes ☐ No	☑ Yes ☐ No	
If "yes," specify the following:				
No. of public spaces				
No. of accessory spaces	37	37	103	66
Operating hours	24/7	24/7	24/7	
Attended or non-attended	na	na	attended	
Lots	☐ Yes ☑ No	☐ Yes ☑ No	☐ Yes ☑ No	
If "yes," specify the following:				
No. of public spaces	N/A	N/A	N/A	
No. of accessory spaces	N/A	N/A	N/A	
Operating hours	N/A	N/A	N/A	
Other (includes street parking)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	

If "yes," describe:				
Population				
Residents	☑ Yes ☐ No	☑ Yes ☐ No	☑ Yes ☐ No	
If "yes," specify number:	683	683	1308	625
Briefly explain how the number of residents was calculated:	using 2014 ACS profile 2.34 persons per houshold in census tract 222 (location of affected area) and multiplying by the number of units			
Businesses	☑ Yes ☐ No	☑ Yes ☐ No	☑ Yes ☐ No	
If "yes," specify the following:				
No. and type	1 restaurant, 1 retail store	1 restaurant, 1 retail store	1 restaurant, 1 retail store, 20 medical offices, 5 general office	16
No. and type of workers by business	3 retail, 6 restuarant	3 retail, 6 restuarant	3 retail, 6 restaurant/50 medical office, 10 general	60
No. and type of non-residents who are not workers	retail and restaurant patrons, 150 daily	retail and restaurant patrons, 150 daily	medical office, general office =1,628, retail and restaurant patron 150 = total of 1778 patrons daily	1628
Briefly explain how the number of businesses was calculated:	assume average medical office and gereral office size of 1,700 square feet			
Other (students, visitors, concert-goers, *etc* .)	☐ Yes ☑ No	☐ Yes ☑ No	☑ Yes ☐ No	
If any, specify type and number:	N/A	N/A	patrons & general office	
Briefly explain how the number was calculated:	70 patrons per 1000 sf per day averaged for medical office, and 20 for general office per 1000 sf			
Zoning				
Zoning classification	LSRD - R7A and R8 w C2-4 (LSRD restrictions override underlying zone)	LSRD - R7A and R8 w C2-4 (LSRD restrictions override underlying zone)	R8 and R8/C2-4 (the area zoned R7A would be removed from the LSRD, and the LSRD would be modified to allow development pursuant to its underlying R8 and R8/C2-4 zoning	

	EXISTING CONDITION	NO-ACTION CONDITION	WITH-ACTION CONDITION	INCREMENT
Maximum amount of floor area that can be developed	4.15 FAR under LSRD (89,832.67 SF * 4.15) = 372,805.6	4.15 FAR under LSRD (89,832.67 SF * 4.15) = 372,805.6	6.02 HF FAR Residential FAR, 6.5 Community Facility FAR, 2.0 Commercial FAR within C2-4 Maximum amount of floor area the can be developed within reduced LSRD area of 71,331 sf is 463,360	90,554
Predominant land use and zoning classifications within land use study area(s) or a 400 ft. radius of proposed project	Residential/commercial/ R8/R8-A/R7/C4-4A/C4-4D/C6-3/R6A/C4-4/C4-7/R7-2/C2-4/C1-4	Residential/commercial/ R8/R8-A/R7/C4-4A/C4-4D/C6-3/R6A/C4-4/C4-7/R7-2/C2-4/C1-4	Residential/commercial/ R8/R8-A/R7/C4-4A/C4-4D/C6-3/R6A/C4-4/C4-7/R7-2/C2-4/C1-4	
Attach any additional information that may be needed to describe the project. If your project involves changes that affect one or more sites not associated with a specific development, it is generally appropriate to include total development projections in the above table and attach separate tables outlining the reasonable development scenarios for each site.				

Table 1.8-2: Existing, No-Action and With Action Programs for the Affected Area

Part III - RWCDS Analysis Framework Spreadsheet (Site Specific Only)

Existing

	Address	Block	Lot	Lot Size SF	Projected Site Lot Size SF	Existing Zoning		TOTAL FAR		Residential FAR		Commercial FAR		Community Facility FAR		Manufacturing FAR		# of Stories		Height		TOTAL SF		Residential SF		Commercial SF		Community Facility SF		Manufacturing SF		Parking SF	Total DU (Market + Affordable)	Affordable DU		Market-rate DU	Parking		
								Exist.	Max.	Exist.	Max.	Exist.	Max.	Exist.	Max.	Exist.	Max.	Exist.	Max.	Exist.	Max.	GSF	ZSF	GSF	ZSF	GSF	ZSF	GSF	ZSF	GSF	ZSF						Residential	Commercial	Community
Site	Ennis Francis Houses 225 West 123rd St, 200 Adam Clayton Powell Jr Blvd and 206-254 West 124th Street	1929	17	18,501.00	89,832.00	LSRD\(underlying zoning is split Lot 17 is zoned R7A, Lot 57 R8, Lot 29 R8/ C2-4		3.99	(4.15 assumed for LSRD)	3.99	4.15 (assumed under LSRD)							8	Height Factor Building	85'-0"	Height Factor Building	98,955	73,792	98,955	73,792							12,000	60	60		0	37	na	na
			29	21,562.00				6.67		6.53		0.15						11		124'		146,780	143,908	143,580	140,708	3,200	3,200					na	160	160		0	na	na	na
			57	49,769.00				1.36		1.36								3		29'-6"		76,191	67,892	76,191	67,892							na	72	72		0	na	na	na
TOTAL				89,832.00	89,832			3.18		3.14		0.15										321,926	285,592	318,726	282,392	3,200	3,200	0	0	0	0	12,000	292	292		0	37	0	0

No-Action Scenario

	Address	Block	Lot	Lot Size SF	Projected Site Lot Size SF	Existing Zoning		TOTAL FAR		Residential FAR		Commercial FAR		Community Facility FAR		Manufacturing FAR		# of Stories		Height		TOTAL SF		Residential SF		Commercial SF		Community Facility SF		Manufacturing SF		Parking SF	Total DU (Market + Affordable)	Affordable DU		Market-rate DU	Parking		
								Prop.	Max.	Prop.	Max.	Prop.	Max.	Prop.	Max.	Prop.	Max.	Prop.	Max.	Prop.	Max.	GSF	ZSF	GSF	ZSF	GSF	ZSF	GSF	ZSF	GSF	ZSF						Residential	Commercial	Community
Site	Ennis Francis Houses 225 West 123rd St, 200 Adam Clayton Powell Jr Blvd and 206-254 West 124th Street	1929	17	18,501.00	89,832.00	LSRD\(underlying zoning is split Lot 17 is zoned R7A, Lot 57 R8, Lot 29 R8/ C2-4		3.99	(4.15 assumed for LSRD)	3.99	4.15 (assumed under LSRD)							8	Height Factor Building	85'-0"	Height Factor Building	98,955	73,792	98,955	73,792							na	60	60		0	37		
			29	21,562.00				6.67		6.53		0.15						11		124'		146,780	143,908	143,580	140,708	3,200	3,200					na	160	160		0	na	na	na
			57	49,769.00				1.36		1.36								3		29'-6"		76,191	67,892	76,191	67,892							na	72	72		0	0	na	na
TOTAL				89,832.00	89,832			3.18		3.14		0.04										321,926	285,592	318,726	282,392	3,200	3,200	0	0	0	0	0	292	292		0	37	0	0

With-Action Scenario

	Address	Block	Lot	Lot Size SF	Projected Site Lot Size SF	Existing Zoning	Proposed Zoning	TOTAL FAR		Residential FAR		Commercial FAR		Community Facility FAR		Manufacturing FAR		# of Stories		Height		TOTAL SF		Residential SF		Commercial SF		Community Facility SF		Manufacturing SF		Parking SF	Total DU (Market + Affordable)	Affordable DU	Affordable DU (@ 80% AMI)	Market-rate DU	Parking		
								Prop.	Max.	Prop.	Max.	Prop.	Max.	Prop.	Max.	Prop.	Max.	Prop.	Max.	Prop.	Max.	GSF	ZSF	GSF	ZSF	GSF	ZSF	GSF	ZSF	GSF	ZSF						Residential	Commercial	Community
Site	Ennis Francis Houses 225 West 123rd St, 200 Adam Clayton Powell Jr Blvd and 206-254 West 124th Street	1929	29	21,562.00	71,331.00	LSRD underlying zoning is split Lot 57 R8, Lot 29 R8/ C2-4	R8, R8/C2-4	6.67	6.50	6.53	6.02	0.15	2.0 (C2-4)	0.00	6.5 (R8)			11	Height Factor Building	124'	Height Factor Building	146,780	143,908	143,580	140,708	3,200	3,200					na	160	160					
			57	49,769.00				6.42		5.80				0.43				20		210'		341,994	319,452	311,004	288,462			30,990	30,990			10,000	339	203		136	66		
TOTAL				71,331.00	71,331.00			6.50		6.02		0.04		0.43								488,774	463,360	454,584	429,170	3,200	3,200	30,990	30,990	0	0	10,000	499	363	0	136	66		0
INCREMENT				-18,501	-18,501			3.32		2.87		0.01		0.43								166,848	177,768	135,858	146,778	0	0	30,990	30,990	0	0	10,000	207	71	0	136	29	0	0

Other Sites Not Expected To Be Affected By The Proposed Actions

	Address	Block	Lot	Lot Size SF	Projected Site Lot Size SF	Existing Zoning		TOTAL FAR		Residential FAR		Commercial FAR		Community Facility FAR		Manufacturing FAR		# of Stories		Height		TOTAL SF		Residential SF		Commercial SF		Community Facility SF		Manufacturing SF		Rationale for Exclusion
								Prop.	Max.	Prop.	Max.	Prop.	Max.	Prop.	Max.	Prop.	Max.	Prop.	Max.	Prop.	Max.	GSF	ZSF	GSF	ZSF	GSF	ZSF	GSF	ZSF	GSF	ZSF	
Other Site 1	Ennis Francis Houses 225 West 123rd St	1,929	17	18,501.00	18,501.00	R7A		3.99	4.00	3.99	4.00							8.00	8.00	85	80	98,955	73,792	98,955	73,792							It is assumed that Lot 17, which is proposed to be severed from the LSRD would remain as it currently exists but not be part of the LSRD. The site was developed in 2012 with discretionary financing and is currently improved with 60 affordable dwelling units at 3.9 FAR, which is 99% of the 4.0 FAR available with the underlying R7A zoning.
TOTAL				18,501	18,501																	98,955	73,792	98,955	73,792	0	0	0	0	0	0	

2.0 ENVIRONMENTAL REVIEW

2.1 Land Use, Zoning, and Public Policy

The *CEQR Technical Manual* recommends procedures for analysis of land use, zoning and public policy to ascertain the impacts of a project on the surrounding area. Land use, zoning and public policy are described in detail below. Land use refers to the activity that is occurring on land and within the structures that occupy it. Types of uses include residential, retail, commercial, industrial, vacant land, and parks.

Methodology

Existing land uses are determined by reference the New York City Zoning and Land Use (Zola) database and PLUTOTM 16v2 shapefiles. These uses were then confirmed through site visits. Identifying existing Zoning districts related to the 400-foot Study Area were performed with reference to New York City Zoning Maps and the Zoning Resolution of the City of New York and served as the basis for the zoning evaluation of the Future No Action and Future With-Action Conditions. Public Policy research was performed through an evaluation of New York City Department of City Planning (NYCDCP) and other city agencies programs and documentation.

2.1.1 Land Use

The *CEQR Technical Manual* suggests that a land use, zoning and public policy study area should extend 400 feet from the site of the proposed action. Existing land use patterns of city blocks within approximately 400 feet of the Project Site are presented above in **Figure 1-1**.

Existing Conditions – Affected Area

The Affected Area is located on Block 1929 (Lots 17, 29, and 57) in Harlem within Manhattan Community Board 10. The combined lot area of the Affected Area is 89,832 square feet and contains a total of 321,926 GSF or 285,592 ZSF of existing development. 318,726 GSF (282,392 ZSF) of the total floor area within the Affected Area is residential with 292 affordable dwelling units (including 72 vacant dwelling units within the vacant residential building on Lot 57) and 3,200 GSF of the total floor area is commercial. The Affected Area contains a total of 37 enclosed parking spaces (12,000 SF) and a combined FAR of 3.18.

The Affected Area consists of three residential buildings: the original two buildings on Adam Clayton Powell Jr. Boulevard and West 124th Street (on Lots 29 and 57) that were constructed in 1985 with a total of 232 dwelling units, and a subsequent building on West 123rd Street (Lot 17) that was constructed in 2012 with 60 dwelling units. The 3-story residential building on West 124th Street (Lot 57 “Development Site”) contains 72 dwelling units and is currently vacant. Under the Proposed Action, Lot 17 will be severed from the LSRD, leaving only Lots 29 and 57 as part of the LSRD.

The LSRD currently governs development within the Affected Area. The original Special Permit (C840090 ZSM) modified the minimum distance between the 11-story building on Tax Lot 29 and the 3-story building on Tax Lot 57, as well as the height and setback of the 11-story building on Tax Lot 29 of the LSRD.

Lot 57 (Vacant Residential Building “The Proposed Development Site”) and Lot 29: The Development Site consists of Lot 57. Lot 57 is located at 206-254 West 124th Street. It has 493’-2” of frontage along West 124th Street, a narrow street as defined under the Zoning Resolution.

The Development Site currently includes a vacant 3- story (29'-6"), 65,020 square foot residential building with 72 dwelling units on a 49,769 sf lot. The building is in poor condition and has been vacant since 2015.

Lot 29
Lot 29 is located at 2070 Adam Clayton Powell Jr. Boulevard and is constructed with an 11-story, 146,780 GSF (143,908 ZSF) mixed use building with 143,580 GSF (140,708 ZSF) of residential use (160 affordable units) and 3,200 GSF of ground floor commercial retail space. The Lot is approximately 21,562 sf.

Lot 17
Lot 17 is an 18,501 sf lot with an existing 8-story, 85-foot building on-site. The building is entirely residential, with 98,955 GSF (73,792 ZSF) and 60 affordable units. 12,000 sf of parking is provided, containing 37 parking spaces.

Existing Conditions-Surrounding Area

A variety of land uses are present in the vicinity of the Affected Area. Residential uses predominate with the exception of the commercial and mixed land uses existing along the 125th Street Corridor, the north side of West 124th Street, and on the east side of Adam Clayton Powell Boulevard. There are several community facility, and institutional land uses in the vicinity of the Project Site and several open space land uses.

Land Use/Built Form
The Surrounding Area consists of residential, institutional, retail or service establishment uses. North of 124th street is predominantly developed with two to eleven story residential and commercial buildings and South of 124th street consists primarily of 4- and 5-story tenement buildings and townhomes. Commercial overlays have facilitated mixed-use residential and commercial development along Frederick Douglass Boulevard and Adam Clayton Powell Jr. Blvd to the west and east of the Affected Area, respectively, and on 125th Street one block to the north. There are also several institutional buildings and houses of worship within the Surrounding Area. The Surrounding Area has two public community gardens: The Joseph Daniel Wilson Memorial Garden and Our Little Green Acre (Garden Eight) both front on 122nd Street.

Future No-Action Scenario

No changes to existing conditions would occur, other than the reoccupation of the vacant building currently occupying Lot 57, the Development Site. The previous use was solely for affordable residential housing. The building has been vacant for approximately 5 years. Although the current building is in poor condition, rehabilitation of the existing building is feasible and would be more cost effective and practical than demolishing and rebuilding a similarly sized building allowed under the current LSRD restrictions.

Future With-Action Scenario

Under the Future With-Action Scenario, Lot 17 would be severed from the LSRD. Lots 29 and 57 would remain within the modified LSRD boundaries. The With-Action scenario assumes development that maximizes allowable residential and overall (residential and community facility) development of the Development Site given height factor FAR for residential uses in an R8 and a FAR of 6.5 for community facility uses in an R8. For the purposes of the RWCDS, development of a mixed residential and community facility building of up to 20 stories (210 feet) could occur. The new building on Lot 57 would contain approximately 30,990 square feet of community facility

space, assumed to be occupied by medical or similar community facility use. There would be a total of 339 new dwelling units, consisting of 173 units of affordable housing to be built under HPD's ELLA Program, 30 'workforce' units affordable to households at an average of 130% of AMI, and 136 market rate units. The residential component would occupy 311,004 GSF of floor area on Lot 57. Accessory parking for 40% of the non-Income Restricted Housing Units would be provided in a 10,000 square foot, below-grade parking facility to be accessed from 124th Street. 66 spaces would be provided for the development's 166 market rate and workforce housing units. Under a With-Action Scenario, Lot 29 would remain as it currently exists, with 160 affordable housing units. Lot 57 would utilize the LSRD's remaining FAR available from the underlying zoning district and apply it to the new development on the Lot. This would prevent Lot 29 from adding additional development within the LSRD and on their own Lot. The development on lot 17, as a relatively new development, is not considered "soft", and is expected to remain as it exists after being severed from the Ennis Francis LSRD. Additionally as noted previously, both Lot 17 and Lot 29 are subjects of regulatory agreements limiting their use to the current affordable housing development on those sites.

Conclusion

The Proposed Action would eliminate a blighted and vacant building on Lot 57, thus facilitating a more efficient use of land and a more pedestrian-friendly site design. Active ground floor uses would animate the pedestrian realm, and provide natural surveillance, thus increasing public safety. The Proposed Action would facilitate a development that is consistent with the surrounding land use pattern of residential and community facility uses and would not create conflicts with existing land uses or alter the overall land use pattern in the area. The provision of affordable housing and a local serving community facility use strengthens the proposed development's relationship and contribution to the Surrounding Area. The Proposed Action would increase density on 124th Street, in between two high-density corridors on Adam Clayton Powell Boulevard and Frederick Douglas Boulevard. The provision of higher density affordable housing at or near a mass transit hub further contributes to the mission and purpose of integrated housing with transportation and employment opportunities, thus encouraging live-work communities and transit-oriented development. No other changes to land use on the Proposed Development Site or the Affected Area or within the 400-foot Study Area are foreseen as a result of the actions or resulting from other known actions in the area.

2.1.2 Zoning

The *New York City Zoning Resolution* dictates the use, density and bulk of developments within New York City. The City has three basic zoning district classifications – residential (R), commercial (C), and manufacturing (M). These classifications are further divided into low, medium, and high-density districts. Per the CEQR Technical Manual, the zoning study area should extend 400 feet from the site of the Proposed Action. Existing zoning districts within approximately 400 feet of the Affected Area are presented in **Figure 1-3.**

Existing Conditions

The LSRD:

The Affected Area is located within the 1983 Ennis Francis LSRD, which consists of Block 1929, Lots 29, 57, and 17. The original two buildings on Adam Clayton Powell Jr. Boulevard and West 124th Street (on Lots 29 and 57) were constructed in 1985 with a total of 231 dwelling units, and a subsequent building on West 123rd Street (Lot 17) was constructed in 2012 with 60 dwelling units. The building on Lot 57, which contains 72 dwelling units, is currently vacant.

The LSRD is known as Site 106 under the former Harlem East Harlem Urban Renewal Plan ("URP"). In 2000, Site 106 was designated for inclusion in the Harlem Gateway Urban Renewal Area with restrictions from the Harlem-East Harlem URP expiring in 2008. The LSRD currently governs development within the Affected Area. The original Special Permit (C840090 ZSM) modified the minimum distance between the 11-story building on Tax Lot 29 and the 3-story building on Tax Lot 57, as well as the height and setback of the 11-story building on Tax Lot 29 of the LSRD.

Lot 17
A previous EAS (**10DCP028M)** for Lot 17, Tax Block 1929 – 225 West 123 Street was given a final conditional negative declaration for approval of A Minor Modification to the Ennis Francis Houses Large Scale Residential Plan on September 17, 2010, to effectuate the construction of the 60-unit, 8-story, 37 parking space development that currently sits on the site. As amended in 2010, the LSRD permitted a quality housing building to be constructed on Lot 17 that complied with the underlying R7A bulk regulations. Pursuant to the Proposed Action, Lot 17 would be severed from the LSRD.

Lots 57 and 29:
As originally approved under the 1983 LSRD, the two buildings on Lots 29 and 57 have an FAR of 4.15 based on the application of height factor regulations, and were granted additional allowances for height, setback, and space between buildings. The 4.15 FAR that was approved appears descriptive of the original proposed residential floor area divided by its lot coverage, not a cap imposed by the LSRD. The actual floor area for the two buildings that were constructed in 1985 is 211,800 square feet (3.69 FAR).

The Underlying Zoning Districts:
The underlying zoning in the Affected Area is split between R7A, R8 and R8/C2-4. Lot 57 and 29 are located entirely on an R8. A 102-foot portion of Lot 29 facing Adam Clayton Powell has a C2-4 overlay. Lot 17 is located entirely on a R7A.

The RWCDS pursuant to the Proposed Action assumes a blended FAR for the combination of land area within the LSRD that lies within specific zoning boundaries. The controlling FAR is derived from the composition of the lots within the Affected Area and the percentage of the total of each within their respective zone.

- *Lot 17 (to be removed from the LSRD) has 18,501 SF within R7A or 21% of the total Affected Area;*
- *Lot 29 has 21,562 SF within R8/C2-4 or 24% of the total Affected Area; and*
- *Lot 57 has 49,769 SF within R8 or 55% of the total Affected Area.*

Study Area

Much of the land to the north of the Affected Area along 124th Street is zoned R8, while 125th Street one block to the north is zoned C4-7. The Special 125th Street District extends to the northern side of 124th Street. The surrounding area to the west of the Affected Area, along Frederick Douglass Blvd., is mapped R8A/C2-4 and C4-4D districts, which were the result of the Frederick Douglass Blvd. Rezoning adopted in 2003 to encourage contextual building. The area to the east of the Affected Area along Adam Clayton Powell III Boulevard is zoned C4-4 and R7-2. There is an Inclusionary Housing Designated Area mapped to the north of the Proposed Development Site above West 124th Street.

C4-4, C4-4D, and C4-7

C4 districts are mapped in regional commercial centers, such as Flushing in Queens and the Hub in the Bronx, that are located outside of the central business districts. In these areas, specialty and department stores, theaters and other commercial and office uses serve a larger region and generate more traffic than neighborhood shopping areas. Use Groups 5, 6, 8, 9, 10 and 12, which include most retail establishments, are permitted in C4 districts. Uses that would interrupt the desired continuous retail frontage, such as home maintenance and repair service stores listed in Use Group 7, are not allowed.

C4-4 districts are considered non-contextual, have an FAR of 3.4, and require one parking space per 1,000 SF.

C4-4D districts are contextual districts in which the commercial and residential bulk and density regulations can differ from corresponding non-contextual districts. The residential district equivalent is R8A. An FAR of 3.4 is allowed, with accessory parking required at a rate of 1 space per 1,000 SF. Floor area may be increased with a public plaza or Inclusionary Housing Program bonus.

C4-7 districts are considered non-contextual, have an FAR of 10.0, and have no parking requirements.

C6-3

C6 districts permit a wide range of high-bulk commercial uses requiring a central location. Corporate headquarters, large hotels, department stores and entertainment facilities in high-rise mixed buildings are permitted in C6 districts

C6-3 districts, typically mapped in areas outside central business cores, have a commercial FAR of 6.0. Floor area may be increased by a bonus for a public plaza or Inclusionary Housing. C6 districts are well served by mass transit, and off-street parking is not required.

R7A

R7 districts are medium-density apartment house districts. R7A districts are governed by mandatory contextual Quality Housing regulations, which produce high lot coverage and seven- to eight-story apartment buildings. R7A permit an FAR of 4.0 (4.6 for developers that provide affordable housing pursuant to the IH program requirements) and a base height of 40-65 feet. The building must set back to a depth of 10 feet on a wide street or 15 feet on a narrow street before rising to a maximum height of 80 feet. In order to preserve the traditional streetscape, the street wall of the 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 14 feet. Buildings must have interior amenities

for the residents pursuant to the Quality Housing Program. Off-street parking is not allowed in front of a building. Parking is required for 50% of all residential dwelling units (30% for lots less than 10,000 SF, and waived if fewer than 15 spaces are required), but is not required for affordable housing units within specified Transit Zones.

R7-2

R7 districts are medium-density apartment house districts. Height factor regulations for R7 districts encourage lower apartment buildings on smaller zoning lots, and, on larger lots, taller buildings with less lot coverage.

> **Height Factor Option:** The FAR for height factor development in R7 districts ranges from .87 to 3.44; the open space ratio ranges from 15.5 to 25.5. A taller building may be obtained by providing more open space. The building must be set within a sky exposure plane at a height of 60 feet above the street line and then slopes inward over the zoning lot.
>
> **Quality Housing Option:** The optional Quality Housing regulations in R7 districts utilize height limits to produce lower, high lot coverage buildings set at or near the street line. The maximum FAR is 4.0 and the base height before setback is 40 to 75 feet with a maximum building height of 80 feet, or 85 feet if providing a qualifying ground floor. The maximum FAR on narrow streets and within the Manhattan Core is 3.44, and the base height before setback is 40 to 65 feet with a maximum building height of 75 feet.

Regulations for R7-2 districts are essentially the same as R7 districts, except that R7-2 districts, which are mapped primarily in upper Manhattan, have lower parking requirements; parking must be provided for 50% of dwelling units.

R8

Apartment buildings in R8 districts can range from mid-rise, eight- to ten-story buildings to much taller buildings set back from the street on large zoning lots. This high-density residential district is mapped along the Grand Concourse in the Bronx and on the edge of Brooklyn Heights. New buildings in R8 districts may be developed under either ***height factor*** regulations or the optional ***Quality Housing*** regulations that often reflect the older, pre-1961 neighborhood streetscape.

> ***Height Factor Option:*** The floor area ratio (FAR) for height factor development in R8 districts ranges from 0.94 to 6.02; the open space ratio (OSR) ranges from 5.9 to 11.9. A taller building may be obtained by providing more open space. Thus, the maximum FAR is achievable only where the zoning lot is large enough to accommodate a practical building footprint as well as the required amount of open space. There are no absolute height limits; the building must be set within a sky exposure plane which, in R8 districts, begins at a height of 85 feet above the street line and then slopes inward over the zoning lot. Off-street parking requirements are the are required for 40% of the dwelling units or 20% if the zoning lot is between 10,001 and 15,000 square feet; waived if zoning lot is less than 10,000 square feet, or has 15 of fewer spaces required.
>
> ***Quality Housing Option:*** The optional Quality Housing regulations in R8 districts utilize height limits to produce lower, high lot coverage buildings set at or near the street line. With floor area ratio (FAR) equal to or greater than can be achieved using R8 height factor

regulations, the optional Quality Housing regulations produce new buildings in keeping with many of the city's established neighborhoods. The maximum FAR is 6.02, and the base height before setback is 60 to 80 feet with a maximum building height of 105 feet. On wide streets outside the Manhattan Core, the FAR rises to 7.2, and the base height before setback is 60 to 85 feet. The street wall of the building must extend along the width of the zoning lot and at least 70% of the street wall must be within eight feet of the street line. The area between a building's street wall and the street line must be planted and the building must have interior amenities for residents pursuant to the Quality Housing Program. Off-street parking requirements are the same as for height factor buildings.

R8A

R8A districts are high-density residential districts. R8A districts are regulated by mandatory Quality Housing bulk regulations which typically result in high lot coverage apartment buildings of roughly 12 to 14 stories set at or near the street line. The FAR in R8A districts is 6.02 for basic, and 7.20 for MIH. Above a base height of 60 to 85 feet, the building must set back to a depth of 10 feet on a wide street and 15 feet on a narrow street before rising to its maximum height of 120 feet. If providing a qualifying ground floor, the maximum base height is 95 feet, and the maximum height is 125 feet. On a wide street, the street wall must extend along the entire width of the zoning lot and at least 70% of the street wall must be within eight feet of the street line. Higher maximum heights are available for buildings participating in the MIH program or that provide certain senior facilities.

R8A/C1-4 Commercial Overlays

C1-4 districts are commercial overlays mapped within residence districts. Mapped along streets that serve local retail needs, they are found extensively throughout the city's lower- and medium-density areas and occasionally in higher-density districts. Typical retail uses include neighborhood grocery stores, restaurants and beauty parlors. In mixed buildings, commercial uses are limited to one or two floors and must always be located below the residential use. When mapped in an R8A district the maximum commercial FAR is 2.0.

R7-2, R8, R8A/C2-4 Commercial Overlays

C2 districts permit a wide range of local retail and service establishments and are intended to serve a larger neighborhood footprint. C2-4 are overlay districts that have lower parking requirements in areas with easily accessible mass transit. Use Groups 1-6 are allowed under C2-4. A C2-4 commercial overlay mapped within R7-2, R8, and R8A districts permits commercial development at a Floor Area Ratio of 2.0. Community Facility development is permitted at a Floor Area Ratio of 6.5.

Table 2.1-1 Summary of Existing Zoning Regulations

Zoning District	Type and Use Group (UG)	Floor Area Ratio (FAR)	Parking (Required Spaces)
C4-4	Commercial UGs 1-5, 6, 8. 9, 10 and 12	3.4 Commercial .87-3.44 Residential 6.5 Community Facility	1 per 1,000 SF
C4-4D	Commercial UGs 1-5, 6, 8. 9, 10 and 12	3.4 Commercial 6.02 Residential 6.5 Community Facility	1 per 1,000 SF
C4-7	Commercial UGs 1-5, 6, 8. 9, 10 and 12	10.0 all uses	None
C6-3	Commercial UGs 1-12	6.0 Commercial .99-7.52 Residential 10.0 Community Facility	None

R7-2	Residential UGs 1-4	3.44-4.0 Residential 6.5 Community Facility	Basic—50% of DU Inclusionary—15% of IRHU
R7-2/C2-4 Overlay	Commercial Overlay UGs 1-9 & 14	2.0 Commercial	Generally not required
R7A	Contextual Residential UGs 1-4	4.0 all uses	Basic—50% of DU Inclusionary—15% of IRHU
R8	Residential UGs 1-4	6.02-7.20 Residential	Basic—40% of DU Inclusionary—12% of IRHU
R8/C2-4 Overlay	Commercial Overlay UGs 1-9 & 14	2.0 Commercial	Generally not required
R8A	Contextual Residential UGs 1-4	6.02 Residential 6.5 Community Facility	Basic—40% of DU Inclusionary—12% of IRHU
R8A/C1-4 Overlay	Commercial Overlay UGs 1-6	2.0 Commercial	Generally not required
R8A/C2-4 Overlay	Commercial Overlay UGs 1-9 & 14	2.0 Commercial	Generally not required

Source: Zoning Handbook, New York City Department of City Planning, January 2006

Analysis

Future No-Action Scenario

Under a No-Action scenario, where the land development controls of the existing LSRD would govern the available bulk for possible redevelopment of any of the sites, it is highly unlikely that any of the three lots within the LSRD would develop. Reoccupancy of the vacant building on Lot 57, the Development Site, is anticipated.

Currently, the entire LSRD has a built FAR of 3.18 - with a presumed maximum development of 4.15. Lot 17 was constructed in 2012 and is unlikely to be altered or augmented given that the site currently is nearly built out on its own lot. Lot 29 was developed in 1985 and currently has an FAR of 6.67 on its own lot and demolition and replacement would be highly improbable without allowing for greater development potential. Lot 57, which is currently vacant, could potentially be renovated and re-tenanted with the existing unit count (72) in place.

Future With-Action Scenario

Under the Proposed Action, the LSRD, as altered by the minor modification to remove Lot 17, would allow the underlying zoning district regulations applicable to the specific lots within the LSRD to control bulk and use development of those lots while allowing FAR factored and adjusted from the underlying zoning districts present in the LSRD to be transferred within the LSRD. The Land Development Assumptions under this section assume a blended FAR from the combination of land area within the modified LSRD that lies within specific zoning boundaries. The controlling FAR is derived as follows:

Lot 29 has 21,562.0 SF within R8/C2-4 or 30.228% of the total Project Area
Lot 57 has 49,769.0 SF within R8 or 69.772% of the total Project Area.

Pursuant to the Proposed Action, the Adjusted FAR from blended zoning is shown below:

Adjusted Residential FAR from Blended Zoning
R8 zoning = 6.02 FAR or 429,413 SF of Floor Area

Adjusted Community Facility FAR from Blended Zoning
.30228 x 6.5 FAR (R8) = 1.96482
.69772 x 6.02 FAR (R8/C2-4) = 4.20027
Total Adjusted FAR = 6.16509 or 439,762 SF of Floor Area

The proposed modification would increase allowable FAR within the modified LSRD from 4.15 (assumed for the existing LSRD inclusive of Lot 17) to 6.50. The Proposed Action would allow a 20-story, 210-foot mixed-use commercial, community facility, and residential building comprising 341,994 GSF to be built on Lot 57 as part of the RWCDS. Accessory parking would be provided in a 10,000 SF lot, containing 66 parking spaces. There would be 339 total dwelling units, 203 of which would be affordable. The bulk regulations of the underlying R8 zoning district, as discussed above, would apply. A deed restriction placed on Lot 57 requires the greater of 72 dwelling units or 60% of all units constructed to be low-income units.

Lot 29 is expected to remain as it currently exists under the Proposed Action—a 160-unit affordable housing building. Lot 57's projected development would use all available FAR under this RWCDS. Additionally, as noted previously, regulatory agreements effectively limit development of both Lot 17 and Lot 29 to the current configuration and use.

In the future with the Proposed Action, Lot 17 would be severed from the LSRD. In this scenario, a building on Lot 17 is no longer required to be consistent with the descriptive height factor FAR and calculations of the 1983 LSRD. Lot 17 is within an R7A zoning district which has a maximum FAR of 4.00; currently, Lot 17 is built out at 3.99 FAR. Additionally, a deed restriction placed on Lot 17 requires that 96% of the building's units (212 units) are set aside for households in which incomes are at or below 60% of AMI. Therefore, for the purposes of the RWCDS Lot 17 is not considered 'soft,' and is therefore expected to remain as it currently exists.

Conclusion
The proposed scale and placement of the Projected Development would relate harmoniously with the surrounding area, which is characterized by medium-density apartment buildings and community facilities, with local-serving commercial activity on the avenues, and a regional commercial area on 125th Street. Removal of Lot 17 from the LSRD is appropriate because contextual development, such as currently exists on Lot 17, is not permitted within an LSRD. The Proposed Action would not create a conflict with established zoning patterns or the intent of the Zoning Resolution, and would not adversely affect surrounding uses. The Proposed Action would not result in any new zoning districts or classifications on the Development Site or within the Affected Area, and would allow development to be guided by the underlying zoning of the LSRD. Additionally, the Proposed Action would not change any text within the NYZR. The Projected Development would be consistent with the surrounding built form. Therefore, a significant adverse zoning impact would not occur as a result of the Proposed Action.

2.1.3 Public Policy
For public policy, the 2014 CEQR Technical Manual stipulates that a preliminary assessment 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 alter or conflict with identified policies. If so, a detailed assessment should be conducted. Otherwise, no further assessment is needed.

The Project Site is located in a Food Retail Expansion to Support Health Program (FRESH) area. The FRESH Program offers zoning incentives and financial benefits in these underserved communities. Its goal is to encourage the development and retention of convenient, accessible

stores that provide fresh meat, fruit and vegetables, and other perishable goods in addition to a full range of grocery products. The program offers a set of zoning incentives that provide additional floor area in mixed buildings, reduce the amount of required parking for food stores and permit larger grocery stores as-of-right in light manufacturing districts.

The Affected Area is also located within a Transit Zone. The Transit Zone is an area where special lower accessory parking requirements apply for various types of affordable housing including income-restricted housing units. These are generally areas of the city beyond the Manhattan Core within one-half mile of a subway station where auto ownership rates are among the lowest in the city. Because the Affected Area is within a Transit Zone, parking for Low Income Restricted Housing Units is not required for the Proposed Building.

Public policies applicable to the Proposed Project include the New York City Department of Housing Preservation and Development ("HPD") initiatives to develop affordable, high-quality housing on underutilized public land as described in 'Housing New York.' The Proposed Action would meet many of the City's stated policy goals by providing affordable housing, supportive transit-oriented housing, and job creation.

Also applicable to the Project Site is the Harlem East Harlem Urban Renewal Plan. The Harlem East Harlem Urban Renewal Plan that governed the redevelopment of this area was established in 1968 and expired in 2008. Elements of the plan which are applicable to the Proposed Project: redevelop the area in a comprehensive manner, removing blight and maximizing appropriate land use; remove or rehabilitate substandard and unsanitary structures; remove impediments to land assemblage and orderly development; strengthen the tax base of the City by encouraging development and employment opportunities in the area; provide new housing of high quality; provide appropriate community facilities, parks, and recreational uses, retail shopping, public parking, and private parking; and provide a stable environment within the area that will not be a blighting influence on surrounding neighborhoods. The Proposed Action is consistent with the intent of the Harlem East Harlem Urban Renewal Plan.

The Affected Area is within an LSRD, which allows modification of the underlying zoning district rules to allow greater flexibility in locating bulk and open space on a site. LSRDs must be situated on a tract of vacant land comprising at least three acres (130,680 SF) and contain a minimum of 500 dwelling units, or at least 1.5 acres with a minimum of three principal residential buildings. The Quality Housing Program is inapplicable to LSRDs. Because Lot 17 is being severed from the LSRD as part of the Proposed Action, Lots 29 and 57 would be required to meet the LSRD minimums described above. As part of the Proposed Development, Lot 29 and 57 would meet the 1.5-acre minimum, and development of Lot 57 is planned to build 2 new residential buildings, which, when combined with the existing building on Lot 29, would meet the 3 principal residential building threshold placed on a LSRD.

Conclusion

Development under the Proposed Action would be consistent with HPD policies to provide new affordable housing opportunities in areas where residents would have access to economic opportunity, social services, and local commercial services, and where the new development would be integrated into established communities. The severing of Lot 17 from the LSRD and development of Lot 57 would maintain the minimum requirements of an LSRD by providing 3 principal residential buildings on at least 1.5 acres of land. Overall the proposed action would meet many of the City's stated policy goals for affordable housing, supportive transit-oriented housing, and provision of first-floor commercial development that serves the needs of the local community.

2.2 Socioeconomic Conditions

According to the *2014 CEQR Technical Manual,* a socioeconomic assessment should be conducted if a project may be reasonably expected to create socioeconomic changes within the area affected by the project that would not be expected to occur without the project. The following circumstances would typically require a socioeconomic assessment:

- The project would directly displace residential population to the extent that the socioeconomic character of the neighborhood would be substantially altered. Displacement of less than 500 residents would not typically be expected to alter the socioeconomic character of a neighborhood. For projects exceeding this threshold, assessments of the direct residential displacement, indirect residential displacement, and indirect business displacement are appropriate.
- The project would directly displace more than 100 employees. For projects exceeding this threshold, assessments of direct business displacement and indirect business displacement are appropriate.
- The project would directly displace a business that is unusually important because its products or services are uniquely dependent on its location; that, based on its type or location, is the subject of other regulations or publicly adopted plans aimed at its preservation; or that serves a population uniquely dependent on its services in its present location. Information provided in Chapter 4, "Land Use, Zoning, and Public Policy," may be useful in determining whether an assessment is appropriate. If any of these conditions is considered likely, assessments of direct business displacement and indirect business displacement are appropriate.
- The project would result in substantial new development that is markedly different from existing uses, development, and activities within the neighborhood. Such a project may lead to indirect displacement. Typically, projects that are small to moderate in size would not have significant socioeconomic effects unless they are likely to generate socioeconomic conditions that are very different from existing conditions in the area. Residential development of 200 units or less or commercial development of 200,000 square feet or less would typically not result in significant socioeconomic impacts. For projects exceeding these thresholds, assessments of indirect residential displacement and indirect business displacement are appropriate.
- The project would add to, or create, a retail concentration that may draw a substantial amount of sales from existing businesses within the study area to the extent that certain categories of business close and vacancies in the area increase, thus resulting in a potential for disinvestment on local retail streets. Projects resulting in less than 200,000 square feet of retail on a single development site would not typically result in socioeconomic impacts. If the proposed development is located on multiple sites located across a Affected Area, a preliminary analysis is likely only warranted for retail developments in excess of 200,000 sq. ft. that are considered regional-serving (not the type of retail that primarily serves the local population). For projects exceeding these thresholds, an assessment of the indirect business displacement due to market saturation is appropriate.
- If the project is expected to affect conditions within a specific industry, an assessment is appropriate. For example, a citywide regulatory change that would adversely affect the economic and operational conditions of certain types of businesses or processes may affect socioeconomic conditions in a neighborhood: (1) if a substantial number of residents or workers depend on the goods or services provided by the affected businesses; or (2) if

it would result in the loss or substantial diminishment of a particularly important product or service within the city. Since the range of possible types of projects that may require an analysis of specific industries varies, the lead agency, in consultation with the Mayor's Office of Environmental Coordination (MOEC), should provide guidance as to whether an analysis is warranted.

Methodology

Typically, the socioeconomic study area boundaries are similar to those of the land use study area, as described in Chapter 4, "Land Use, Zoning, and Public Policy." The study area encompasses the project site and adjacent area within 400 feet, 0.25 mile, or 0.5 mile, depending on project size and area characteristics. The socioeconomic assessment seeks to examine the potential to change socioeconomic character relative to the study area population. For projects that result in an increase in residential population, the scale of the relative change is typically represented as a percent increase in population.

Analysis

Existing Conditions

The Affected Area is located on Block 1929 (Lots 17, 29, and 57) in Harlem within Manhattan Community Board 10. The combined lot area of the Affected Area/LSRD is 89,832 and contains a total of 321,926 total gross square feet ("GSF") or 285,592 zoning square feet ("ZSF") of existing development. 318,726 GSF (282,392 ZSF) of the total floor area within the Affected Area is residential with 292 affordable dwelling units (*including 72 vacant dwelling units within the vacant residential building on Lot 57*) and 3,200 GSF/ZSF of the total floor area is commercial. The Affected Area contains a total of 37 enclosed parking spaces (12,000 SF) and a combined FAR of 3.18. The underlying zoning in the Affected Area is split between R7A, R8, and R8/C2-4.

- ***Lot 17 (Residential Building):*** Lot 17 is located at 225 West 123rd Street and is improved with an 8-story (85'), 98.955 GSF (73,792 ZSF) building with 60 affordable dwelling units. The lot area is approximately 18,501 square feet. There are 37 enclosed accessory parking spaces provided on Lot 17, according to the latest certificate of occupancy. Lot 17 has a total FAR of 3.99 and is located within an underlying R7A zoning district.

- ***Lot 29 (Mixed-Use Building):*** Lot 29 is located at 2070 Adam Clayton Powell Jr. Blvd and is constructed with an 11-story (124') 149,780 GSF (143,908 ZSF) mixed-use building with 143,580 GSF (140,708 ZSF) of residential floor area with 160 affordable dwelling units and 3,200 GSF/ZSF of ground floor commercial retail space fronting Adam Clayton Powell Jr. Blvd. The lot area is approximately 21,562 square feet. Lot 29 has a total FAR of 6.67 (6.53 residential FAR and 0.15 commercial FAR) and is located within an underlying R8/C2-4 district.

- ***Lot 57 (Vacant Residential Building "The Proposed Development Site"):*** The Development Site consists of Lot 57. Lot 57 is located at 206-254 West 124th Street. It has 493'-2" of frontage along West 124th Street, a narrow street as defined under the Zoning Resolution. The Development Site currently includes a vacant 3- story (29'-6"), 76,191 GSF (67,892 ZSF) residential building with 72 currently untenanted dwelling units on a 49,769-square foot lot. The building is in poor condition and has been vacant since 2015. No parking is provided on the Development Site, which is

located in the Transit Zone. Lot 57 has an FAR of 1.36 and is located entirely within an underlying R8 zoning district.

Future No-Action Scenario

Under a No-Action scenario, where the land development controls of the existing LSRD would govern the available bulk for possible redevelopment of any of the sites, Lot 29 and Lot 17 are assumed to remain consistent with existing conditions. Per a Regulatory Agreement, recorded and filed on 2-02-2012 (CRFN 2012000048291), among NYS Housing Finance Agency, ADC/Ennis Francis Owner, L.P. and ADC/Ennis Francis II Housing Development Fund Company, INC. relating to Lots 17 and 29 requires that in exchange for Affordable Housing Revenue Bonds utilized to fund mortgage payments related to the development of improvements at Lots 17 and 29 – namely the construction of a new 60 unit residential development on Lot 17, 96% of the "Project's (Lot 17 and 29) Revenue units are set aside for households in which incomes are at or below 60% of the Area Median Income "AMI". The total units on these two lots is 220, and therefore 212 are required to be available at or below 60% of AMI…effectively restricted development on these two parcels to the current number of units 220.

Lot 57 which is currently vacant, could potentially be renovated and re-tenanted with existing unit count (72) in place. Although the current building is in poor condition, rehabilitation of the existing building is certainly feasible and would be more cost effective and practical than demolishing and rebuilding a similarly sized building, allowed under the current LSRD restrictions. Per a Regulatory Agreement, entered into on December 19, 2017, between NYC Department of Housing and Development "HPD" and the Applicant, Carthage 124th LP, a restriction on Lot 57 was created requiring that 60% of units constructed on the Lot be "Low Income Units", and that of these, at least 34 of the units be for tenants with incomes that do not exceed 50% of AMI, and that no more than 10% of the units be available to incomes that do not exceed 130% AMI, and that the balance of the low-income units be for tenants whose annual incomes do not exceed 80% of AMI.

Future With-Action Scenario

The With-Action scenario assumes development that maximizes allowable residential and overall (residential and community facility) development of the Development Site given the height factor FAR for residential uses in an R8 and a 6.5 for community facility in an R8. Development of a mixed residential and community facility building of up to 20 stories (210 feet) could occur. The new building on Lot 57 would contain approximately 30,990 square feet of community facility space, assumed to be occupied by community facility use. There would be a total of 339 new dwelling units, consisting of 203 units of "affordable housing" as required by the Regulatory Agreement on Lot 57, of these, 30 'workforce' units affordable to households at an average of 130% of AMI, and 136 market rate units. The residential component would occupy 311,004 gross square feet of floor area or 288,462 zoning square feet. Accessory parking for 40% of the non-Income Restricted Housing Units would be provided in a below-grade parking facility to be accessed from 124th Street. Sixty-six spaces would be provided for the development's 166 combined market rate and workforce housing units.

Lot 29 is expected to remain as it currently exists under the With-Action Scenario with 160 affordable units. Lot 17, a 73,792 ZSF building but in 2012 containing 60 units at 3.9 FAR, would be severed from the LSRD and governed by the underlying R7A zone. R7A allows a FAR of 4.0, as such, Lot 17 is 99% developed, is subject to the previously discussed regulatory agreement and would remain as it exists in the With-Action Scenario.

The With-Action Scenario would produce a net increment of development of 234,813 GSF or 220,570 ZSF of residential floor space and 30,990 GSF/ZSF of community facility space. A net increment of 267 units would be produced, including 136 market rate units, 30 units of 'workforce' housing, and an increase of 131 affordable units, with 203 new affordable units replacing the no-action 72 units.

2.2.1 Preliminary Socioeconomic Assessment

Direct Residential Displacement
As the Proposed Development Site currently contains 72 vacant residential units, which are assumed to be re-tenanted under No-Action Conditions or replaced by new development containing 339 residential dwelling units under With-Action Conditions, the Proposed Action would not directly displace any residents. Therefore, an assessment of direct residential displacement is not warranted.

Direct Business Displacement
The Proposed Development would not directly displace any businesses under the Proposed Action. Therefore, an assessment of direct business displacement is not warranted.

Indirect Residential Displacement

The proposed action would result in a net induced development of 207 dwelling units, 71 of which would be affordable. Inclusive of Lot 17, which would be severed from the LSRD under With-Action Conditions, the proposed action would result in a net induced development of 267 dwelling units, 131 of which would be affordable. Pursuant to the *2014 CEQR Technical Manual*, for projects exceeding 200 dwelling units, assessments of indirect residential displacement are appropriate. Therefore, further analysis of the potential for indirect displacement due to increased rents is warranted.

Indirect Business Displacement due to Retail Market Saturation
The Proposed Action is projected to result in the net incremental development of 30,990 gross square feet of community facility use. Induced development would be far below relevant thresholds, and therefore further analysis of indirect business displacement is not warranted.

Adverse Effects on Specific Industries
The Proposed Action would only induce redevelopment on Lot 57, which is currently occupied by a vacant residential structure. Therefore, no adverse impacts to any industries would occur as a result of the Proposed Action.

Because the Proposed Action would result in the induced development of over 200 residential units, further analysis of the potential for indirect impacts associated with increased rents was conducted, relying on the methodology of the *2014 CEQR Technical Manual*. *Pursuant to Chapter 5, Section 310 of the CEQR Technical Manual*, an initial study area of ¼ mile radius is identified as appropriate. To estimate existing population within the study area, reference was made to the 2010 United States Census. The Study Area was defined to include those census tracts that are more than 50% within a ¼ mile radius of the Affected Area (**Figure 2.2-1**). **Table 2.2-1: Study Area population** presents 2010 and 2000 population for these tracts. Based on 2000-2010 Census Data for the Study Area population, an applied population growth rate of 1.01 percent per annum was factored to the projected 2021 build year.

Table 2.2-1: Study Area Population

Manhattan Census Tract	2000 Population	2010 Population	Population Change 2000-2010	Percentage Change 2000-2010	2021 (Build Year) Per Annum Growth Rate of 1.01%
222	2,412	2,644	232	9.6%	N/A
220	5,068	5,370	302	6%	N/A
224	6,211	6,427	216	3.5	N/A
257	2,942	3,876	934	31.7%	N/A
TOTAL	**16,633**	**18,317**	**1,684**	**10.1%**	**20,436**

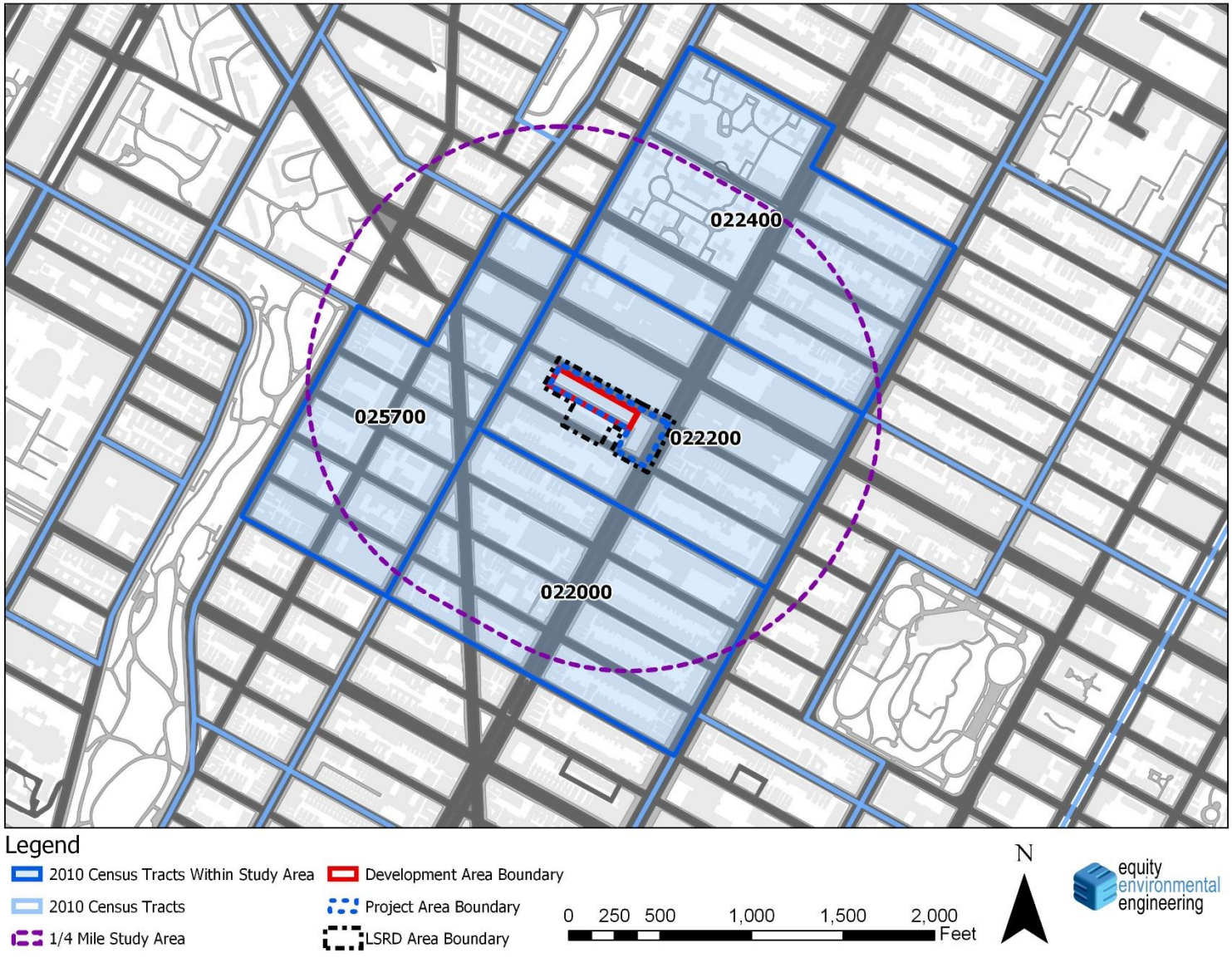
*Note the Affected Area falls entirely within Census Tract 222

Compared to No-Action Conditions, inclusive of the existing development on Lot 17, the Proposed Action would introduce 267 dwelling units, 131 of which would be affordable. Assuming an average household size of 2.34 persons, which is the average for Census Tract 222 pursuant to the 2012-2016 American Community Survey Data, there would be 625 incremental residents resulting from the Proposed Action.

In determining whether a detailed analysis of potential indirect residential displacement is warranted, CEQR Technical Manual Chapter 5, Section 322.1, Step 2, stated in part, '*if the population increase is less than 5% within the study area, or identified sub-area, further analysis is not necessary as this change would not be expected to affect real estate market conditions.*'

As shown above in Table 2.2-1, under No Action Conditions in the 2021 build year, the Study Area would contain a projected 20,436 residents (*based on a per annum growth rate of 1.01%).* Pursuant to the Proposed Action, inclusive of the 625 incremental project generated residents, the study area would contain approximately 21,061 residents. Therefore, the Proposed Action would result in a population increase of 3.04%, compared to No Action Conditions [625/20,436=3.04%]. This is below the 5% increment identified as warranting further assessment.

Figure 2.2-1: Socioeconomic Study Area



Conclusion

Induced development resulting from the Proposed Action would continue established trends of population growth in the area and would not significantly affect socioeconomic conditions. As indicated above, the Proposed Action is anticipated to result in a 3.04% increase to the overall Study Area population. Therefore, no further analysis is warranted.

2.3 Community Facilities And Services

A community facilities assessment may be necessary if an action could potentially affect the provision of services provided by public or publicly funded community facilities such as schools, hospitals, libraries, day care/Head Start facilities, and fire and police protection. Per the screening levels established in the *CEQR Technical Manual*, there are direct and indirect effects. An assessment of the project's effects on community facilities is generally warranted if:

- a project would add new population to an area that would increase the demand for services and cause potential indirect effects on service delivery. Depending on the size, income characteristics, and age distribution of the new population there may be effects on public or publicly funded schools, libraries, health care facilities, or day care/Head Start facilities.

- a project would physically alter a community facility, whether by displacement of the facility or other physical change. This direct effect triggers the need to assess the service delivery of the facility and the potential effect that the change may have on that service delivery.

2.3.1 Preliminary Screening

The incremental development effectuated by the Proposed Action under the Reasonable Worst-Case Development Scenario would include 207 total units, 71 of which would be affordable. However, in order to provide a conservative analysis for the purpose of this assessment, Lot 17 (*which would be severed from the LSRD under With-Action Conditions*) was included in the incremental development scenario for a net increment of 251,560 ZSF of development, of which 220,570 ZSF would be residential floor area and 30,990 ZSF/GSF would be community facility use. Inclusive of the existing dwelling units on Lot 17, a net increment of 267 total dwelling units would be produced, 131 of which would be affordable.

Based on a preliminary assessment of Manhattan CEQR thresholds for analysis, as shown in **Table 2.3-1 Community Facilities – Preliminary Assessment of CEQR Thresholds,** this project does trigger a detailed CEQR analysis for public schools but does not trigger a detailed C*EQR* analysis for libraries, health care facilities, publicly funded daycare/head start facilities or Police and Fire Protection services. The incremental development scenario results in 60 combined elementary and middle school students, 6 high school students, and 15 publicly funded daycare/head start students. As shown below in Table 2.3-1, this is above the applicable threshold of 50 combined elementary and middle school students, and below the threshold of 150 high school students and 20 publicly funded daycare/head start students.

Table 2.3-1 Community Facilities-Preliminary Assessment of *CEQR* Thresholds

Community Facility	Threshold	267 total DUs 131 low to extremely low-income DUs		Exceeds Criteria Threshold
Public Schools Elementary School and Middle School Students	>50 elementary and middle school children (combined)	0.16 0.06	43 17	Yes
High School Students	>150 high school students (see 2014	0.02	6	No

	CEQR Technical Manual, Table 6-1a)			
Libraries >5% Increase in ratio of residential units	>901 DUs in the Manhattan (*CEQR Technical Manual* Table 6-1)		NA	No
Health Care Facilities >600 low or low-to-moderate income units	NA		NA	No
Publicly Funded Day Care/Head Start Facilities <6 years old	> 20 children based on # of low to moderate income units 170 residential DUs in the Manhattan generate a total of 20 children (see 2014 *CEQR Technical Manual,* Table 6-1b)	0.115	15	No
Fire Protection	Direct Effect			No
Police Protection	Direct Effect			No

Primary and Intermediate Schools—Detailed Assessment

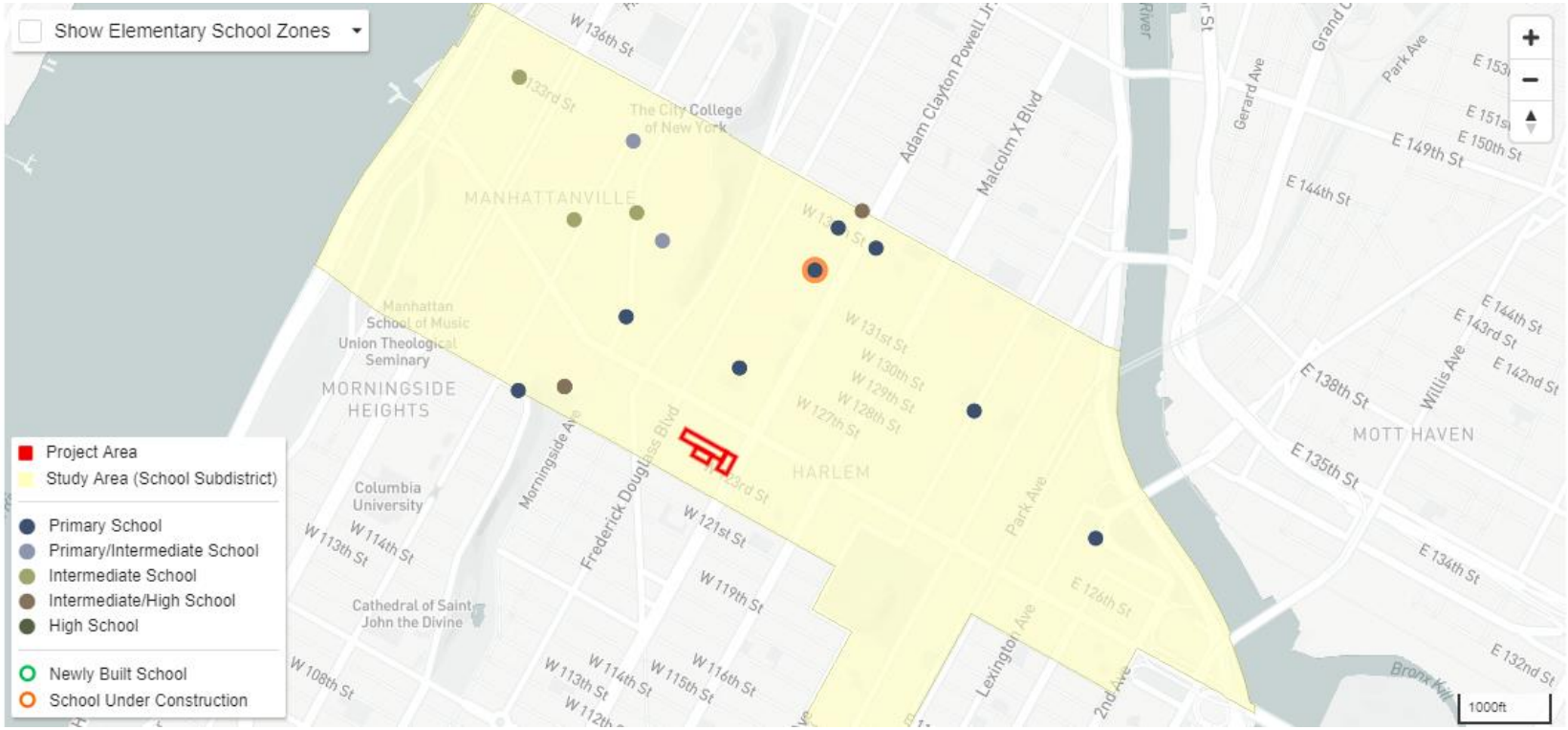
Based on the preliminary analysis, the Proposed Action is expected to result in a total of 58 additional public-school students (43 primary and 17 intermediate school students), which is above the threshold of 50 students for the applicable area as warranting further analysis.

Study Area

Per the 2014 CEQR Technical Manual, the study area for the analysis of elementary and intermediate schools is to be conducted in the school district's sub-district in which the project is located. The Affected Area is located entirely within Community School District 5 (CSD 17), Sub-District 1 (**Figure 2.3-1: School Study Area**). CSD 5 Sub-District 1 has 8 primary, 3 intermediate schools and 2 intermediate/primary schools for a total of 13 primary and intermediate schools combined.

Figure 2.3-1 shows primary and intermediate schools within CSD 5 Sub-District 1. **Tables 2.3-2** and **2.3-3** provide their location, enrollment capacity, and utilization rate.

Figure 2.3-1: School Study Area



Existing Conditions

Primary Schools CSD 5 Sub-District 1: As shown in Table 2.3-2, excluding charter schools and special education schools, CSD 5 Sub-District 1 has a capacity of 3,980 seats (*excluding transportable classroom units and mini-schools*) at the primary level, with an enrollment of 3,113 students (*including transportable classroom units and mini-schools*), and a utilization rate of 78 percent. There are currently 867 seats available.

Intermediate Schools CSD 5 Sub-District 1: As shown in Table 2.3-3, excluding charter schools and special education schools, CSD 5 Sub-District 1 has a capacity of 2,123 seats at the intermediate level, with an enrollment of 1,673 students, and a utilization rate of 79 percent. There are currently 450 seats available.

Table 2.3-2: Primary Schools

Org. ID	Bldg. ID	School Name	Address	Org Level	Enrollment	Target Capacity	Available Seats	Utilization (%)
M030	M030	P.S. 30 - M	144-176 EAST 128 STREET	PS	269	537	268	50%
M036	M036	P.S. 36 - M	123 MORNINGSIDE DRIVE	PS	427	766	339	56%
M092	M092	P.S. 92 - M	222 WEST 134 STREET	PS	277	280	3	99%
M125	M125	P.S. 125 - M	425 WEST 123 STREET	PS	262	154	-108	170%
M129	M129	P.S. 129 - M	425 WEST 130 STREET	PSIS	285	429	144	66%
M133	M133	P.S. 133 - M	2121 5TH AVENUE	PS	219	363	144	60%
M154	M154	P.S. 154 - M	250 WEST 127 STREET	PS	317	380	63	83%
M161	M161	P.S. 161 - M	499 WEST 133 STREET	PSIS	473	484	11	98%
M175	M175	P.S. 175 HENRY H GARNET - M *P.S. 175 - M*	175 WEST 134 STREET	PS	311	427	116	73%
M517	M916	TEACHER'S COLLEGE COMMUNITY SCHOOL-M *TEACHERS COLLEGE COMMUNITY SCHOOL - M*	168 MORNINGSIDE AVENUE	PS	273	160	-113	171%
Totals (District 5 - Subdistrict 1)					**3113**	**3980**	**867**	**78%**

Source: SCA Enrollment, Capacity, and Utilization (Blue Book) [2016-17]

Table 2.3-3: Intermediate Schools

Org. ID	Bldg. ID	School Name	Address	Org Level	Enrollment	Target Capacity	Available Seats	Utilization (%)
M129	M129	P.S. 129 - M	425 WEST 130 STREET	PSIS	166	250	84	66%
M161	M161	P.S. 161 - M	499 WEST 133 STREET	PSIS	358	367	9	98%
M223	M223	I.S. 223 - M *I.S. 223 (MOTT HALL) - M*	71-111 CONVENT AVENUE	IS	286	265	-21	108%
M286	M043	I.S. 286 - M *I.S. 172 (OLD 43) - M*	509 WEST 129 STREET	IS	231	409	178	56%
M362	M125	I.S. 362 - M *P.S. 125 - M*	425 WEST 123 STREET	ISHS	297	288	-9	103%
M514	M195	NEW DESIGN MIDDLE SCHOOL - M *TERENCE D. TOLBERT EDUCATION COMPLEX - M*	625 WEST 133 STREET	IS	162	352	190	46%
M670	M970	THURGOOD MARSHALL ACADEMY - M *THURGOOD MARSHALL ACAD. - M*	200-214 WEST 135 STREET	ISHS	173	192	19	90%
Totals (District 5 - Subdistrict 1)					**1673**	**2123**	**450**	**79%**

Source: SCA Enrollment, Capacity, and Utilization (Blue Book) [2016-17]

Future No-Action Condition

Utilizing the latest projections and housing generated pipeline students made available by the School Construction Authority (SCA) for enrollment from 2016 to 2025 (**See Table 2.3-4)**, elementary enrollment in CSD 5, Subdistrict 1 is expected to increase from 3,113 students in the 2018-2019 school year to 3,828 students by the 2020-2021 school year. Intermediate enrollment in CSD 5, Subdistrict 1 is expected to decrease from 1,673 students in the 2018-2019 school year to 1,310 students in the 2020-2021 school year.

Table 2.3-4: 2021 Enrollment

Study Area	Projected 2021 Enrollment	Students Introduced by No Action Residential Development*	Total No Action Enrollment	Capacity	Available Seats	Utilization (%)
Primary Schools						
District 5 – Subdistrict 1	3518	310	3828	3980	152	96%
Intermediate Schools						
District 5 – Subdistrict 1	1243	67	1310	2123	813	62%

*Housing generated pipeline students

In the future without the Proposed Action Lots 17 and 29 would remain the same as existing conditions. The building on Lot 57 would be renovated and its 72 dwelling units would be re-tenanted. Therefore, an additional 11 primary school students (72 dwelling units X .16) and 4 intermediate school students (72 dwelling units X .06) would be introduced in the no-action scenario. The total no-action enrollment totals add the 11 primary and 4 intermediate school students from Lot 57 to the numbers from **Table 2.3-4** and are shown below in **Table 2.3-5.**

Table 2.3-5: No-Action Enrollment

Study Area	Projected 2021 Enrollment	Students Introduced by No Action Residential Development*	Total No Action Enrollment	Capacity	Available Seats	Utilization (%)
Primary Schools						
District 5 - Subdistrict 1	3518	321	3839	3980	141	96%
Intermediate Schools						
District 5 - Subdistrict 1	1243	71	1314	2123	809	62%

*Housing generated pipeline students plus no-action dwelling units

Future With-Action Scenario

Under the Proposed Action, an additional 267 dwelling units are expected to be developed within the Affected Area by 2021. This would generate 43 primary school students and 17 intermediate school students by the 2021 analysis year. The resulting enrollment, capacity, and utilization for public schools in CSD 5, Sub-District 1 in the future with the Proposed Action is identified below in **Table 2.3-6.** The Proposed Action would generate additional students in the With-Action Scenario, resulting in 97 percent utilization for Primary School and 62 percent utilization of Intermediate School seats in the 2020-2021 school year.

Table 2.3-6: Projected Public Primary and Intermediate School Enrollment

Study Area	Projected No-Action Enrollment	Project Generated Students	Total With-Action Enrollment	Capacity	Available Seats	Utilization
Primary School						
CSD 5, SD1	3,839	43	3,871	3,980	109	97%
Intermediate Schools						
CSD 5, SD1	1,314	17	1,327	2,123	796	62%

Conclusion

As stated in Section 6-410 of the 2014 CEQR Technical Manual, a significant impact may result warranting consideration of potential mitigation if a proposed project would result in both of the following conditions:

- A collective utilization rate of the elementary or intermediate schools that is equal to or greater than 100 percent in the With-Action Condition; and
- An increase of five percent or more in the collective utilization rate between the No-Action and With-Action conditions.

This analysis indicates that in the future With-Action Condition the utilization rate at both of primary and intermediate schools would be below 100%. Further, the Proposed Action would result in only a 1% increase in utilization from the No-Action Condition for Primary Schools and a 0% increase in utilization from the No-Action Condition for Intermediate Schools. Therefore, pursuant to CEQR Technical Manual methodology, the Proposed Action would not result in significant adverse impacts related to primary or intermediate school utilization.

2.4 Open Space

The *CEQR Technical Manual* defines the need for an open space assessment if the proposed action would have a direct or indirect effect on open space resources. Direct effects would occur if the proposed action would result in the physical loss of a public open space; change of use of an open space so that it no longer serves the same user population; limit public access to an open space; or cause increased noise or air pollutant emissions, odors, or shadows on public open space that would affect its usefulness, whether temporary or permanent. Indirect effects would occur if the proposed action would result in an increase of population would be sufficiently large to noticeably diminish the ability of an area's open space to serve future population.

Methodology

If the project exceeds the thresholds outlined in Section 200, above, a preliminary assessment is warranted, and, depending on the results of that assessment, a more detailed analysis may also be required. A full, detailed open space analysis is necessary if the project would displace a highly utilized open space (direct effect) or introduce a large population in an area underserved by open space (indirect effect). In some cases, however, the need for a detailed analysis may be less clear, and a preliminary assessment may be useful in determining the need for a more detailed analysis of open space. The first step in any open space analysis is to define and map a study area. Once the study area is defined, the next step is to determine which analysis is required by calculating the percentage change in the open space ratio between the No-Action condition and the future With-Action condition.

The Proposed Development on Lot 57 would not directly affect any public open space. This area is not considered an underserved open space area by the NYC Mayor's Office of Sustainability.[1] The Proposed Action would potentially add a net increase of approximately 625 residents in 267 incremental new units (based on an average of 2.34 persons per unit[2]) and 60 additional employees. For most new projects in New York City located in areas that are neither "underserved" or "well-served" area for open space, an open space assessment is generally conducted if the proposed project would generate more than 200 residents or 500 employees. As the number of new residents anticipated resulting from the proposed action is above the CEQR preliminary screening threshold level of 200 residents, a preliminary analysis of open space impacts due to new residents is warranted.

2.4.1 Preliminary Open Space Assessment

Per the guidelines of the City's *CEQR Technical Manual* for analysis of residential development, census tracts with at least half of their geographic area within a one-half mile radius of the Affected Area should comprise the open space study area. Using current population figures, an open space ratio is calculated for both the future no-action and future action scenarios, expressed as the amount of open space acreage per 1,000 user population. Typically, a comparison is made to the median open space ratio (OSR) of the City, which is 1.50 acres per 1,000 residents. A reduction in the open space ratio increment of more than 5 percent over future no-action conditions generally warrants a more detailed analysis, unless the open space ratio is below the citywide average, in which case even a small reduction could be considered significant.

In addition to field surveys, information from the NYC Department of City Planning's Community District Needs Statements, NYC Parks Department website, and US Census data were utilized in preparing the open space analysis.

[1] http://www1.nyc.gov/site/oec/environmental-quality-review/open-space-maps-manhattan.page
[2] Census FactFinder, *2010-2014 ACS Profile Census Tract 222*

Study Area Definition

In accordance with the guidelines established in the City's 2014 *CEQR Technical Manual*, the open space study area is defined to analyze both the nearby open spaces and the population using those open space resources. It is generally defined by a reasonable walking distance that users would travel to reach local open spaces and recreational areas. The study area is typically a one-half-mile radius from residential users. Since the proposed action would not introduce a significant daytime user population compared to the No-Action (i.e., 500 or more workers), the 1/2-mile study area is used for a residential population.

The open space study area ("The Study Area") includes all U.S. Census Tracts that have 50 percent or more of the tract within a half-mile radius of the Affected Area, as shown in **Figure 2.4-1** below, consisting of the following Census Tracts shown in **Table 2.4-1** below.

Existing Conditions

The Affected Area is located within Manhattan Census Tract 222. An assessment of open space utilization was conducted pursuant to *CEQR Technical Manual* methodology, which requires delineating a half-mile radius study area, and identifying all census tracts with at least 50% of their area within the half-mile radius, as well as all open spaces within the study area. Using these criteria, the Study Area contains the following sixteen (16) Manhattan Census Tracts: 190, 197.01, 198, 200, 207.01, 208, 209.01, 210.02, 213.03, 215, 218, 220, 222, 224, 226, and 257.

As of the 2010 U.S. Census, there were a total of 61,049 residents in the Study Area, as shown in **Table 2.4-1** below. Assuming a background growth rate commensurate with the rate of growth between 2000 and 2010 in these census tracts, a rate of 14 percent over 10 years or a rate of 1.4% percent per year, the 2021 population (build year) is anticipated to be 71,137. The Study Area contains a total of approximately 55.99 acres of publicly accessible open space (both active and passive), with the size of existing open space resources within this Study Area identified in **Table 2.4-2** and shown in **Figure 2.4-2**. The Study Area contains open spaces not included in the OSR quantitative analysis. While community gardens are abundant in the Study Area and provide visual relief from the built environment, much in the same way as a passive park, they are not counted as open space resources.

In accordance with CEQR methodology, the assessment of open space resources in the study area focuses on the calculated open space ratio (OSR), or the ratio of the acres of open space per 1,000 persons. The study area has 55.89 acres of open space and an existing residential population of 68,231 persons, based on 2010 census Study Area population and an applied growth rate of 1.4 percent per annum to the 2018 year. Therefore, the existing OSR in the study area is approximately 0.82 acres per 1,000 residents, which is below the target OSR of 1.50 acres per 1,000 residents.

Table 2.4-1 Census Tracts and Population in the Study Area through 2021[3]

Census Tract Number	Population by Year			
	2000	**2010**	**2018** *(1.4% per annum growth rate from 2010)*	**2021** *(1.4% growth rate from 2010)*
190	1,818	3,083		
197.01	23	614		
198	1,517	1,914		
200	2,413	2,581		
207.01	2,548	3,329		
208	4,071	4,591		
209.01	3,448	3,673		
210.02	3,594	3,865		
213.03	5,941	5,619		
215	2,925	3,068		
218	5,018	6,617		
220	5,068	5,370		
222*	2,412	2,644		
224	6,211	6,427		
226	3,601	3,778		
257	2,942	3,876		
	Total: 53,550	**Total: 61,049**	**Total: 68,231**	**Total: 71,137**

*Affected Area is entirely within Manhattan Census Tract 222

[3] Source: NYC Census Fact Finder
Note: Shaded Row indicates Census Tract of the Proposed Development Site

Figure 2.4-1 Open Spaces Study Area Map

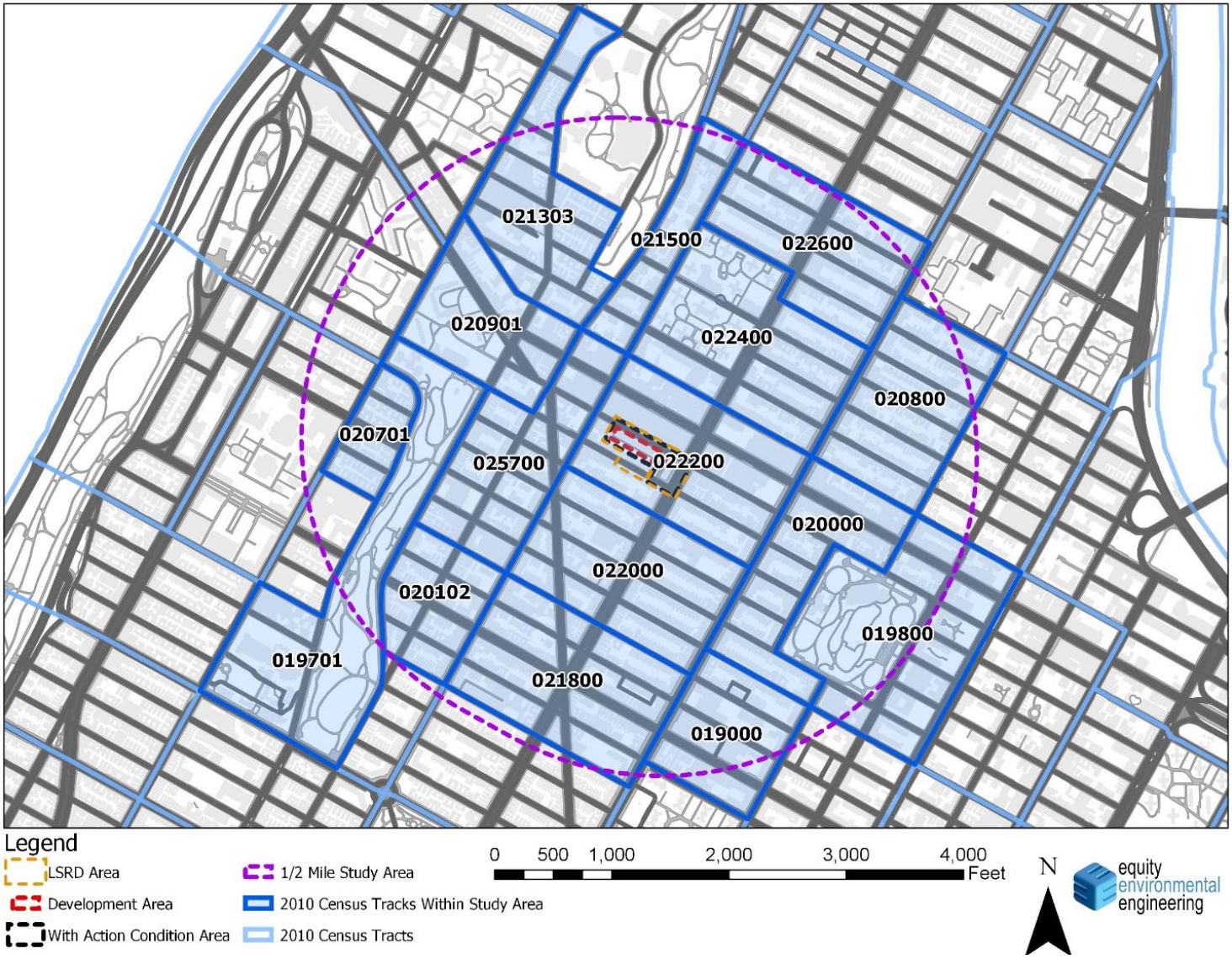


Figure 2.4-2 Open Spaces Resources within the Study Area

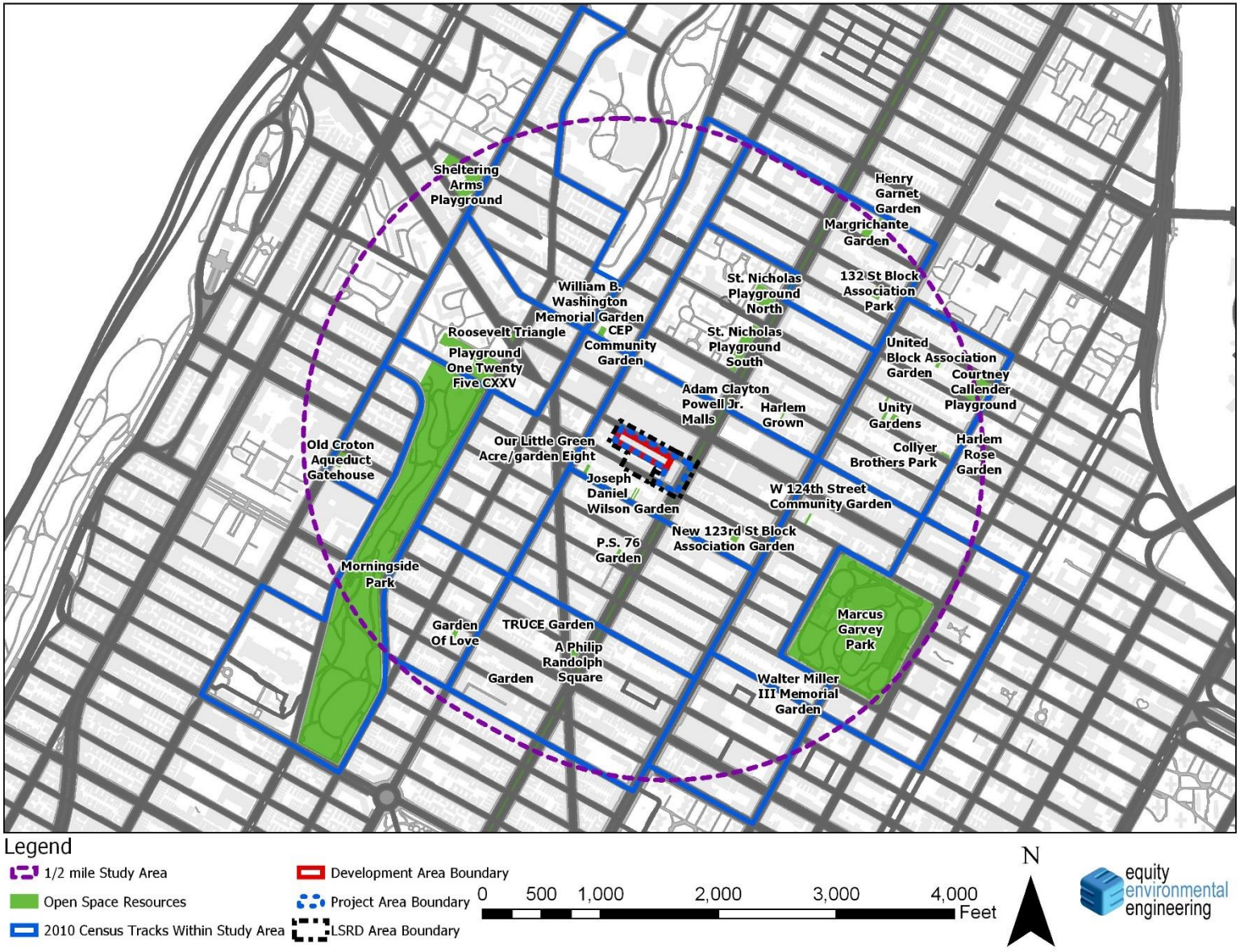


Table 2.4-2 Open Space Resources in the Study Area

NYC Park Number	Park Name	Type	Features	Acres
M056	Morningside Park	Community Park	BQ, BF, BC, HB, SS, PG, RC, RT, BR, DA	29.89
M211A	St. Nicholas Playground South	Playground	PG, SS	0.67
M155	Courtney Callender Playground	Playground	BC, PG, HB, SS	0.65
M205	Playground One Twenty Five CXXV	Jointly Operated Playground	BC, HB, PG	1.69
M243	Eugene McCabe Field	Jointly Operated Playground	HB, PG	0.79
M021	A Philip Randolph Square	Triangle/Plaza	Be	0.07
M058	Marcus Garvey Park	Community Park	BC, Fe, RC, SS, PG, BR, DA, P	20.16
M189	Roosevelt Triangle	Triangle/Plaza	Be	0.07
M211B	St. Nicholas Playground North	Playground	Pg, SS	0.66
M003	Annunciation Park	Neighborhood Park	BR, PG	1.24
				55.89

Features:

BC=Basketball Courts
BR=Bathrooms
RT=Running track
Be=Benches
CG=Community Garden
TC=Tennis Courts
DA=Dog Friendly Area
P=Pool

HB=Handball Courts
BF=Baseball fields
VC=Volleyball courts
Wa=Walkways
RC- Recreation Center
NC=Nature Center
FI=Fishing

PG=Playground
FE=Fitness Equip
SF=Soccer Fields
SS= Spray Showers
SP=Swimming Pool
BQ=Barbeque Areas
C/K=canoe/kayak

Future No-Action Scenario

In the future without the proposed action, it is expected that population growth in the area would continue following recent trends. Between 2000 and 2010, population in the study area increased by 14% from 55,550 to 61,049. The per annum growth rate for the study area is 1.4%, as shown in **Table 2.4-1** above. The per annum growth rate was used as a basis for forecasting the expected population growth rate by the Proposed Action's expected build year of 2021. By 2021 the population is anticipated to be 71,137. Under the No-Action Scenario, it is assumed that the vacant building on Lot 57 would be renovated and its existing 72 dwelling units re-tenanted, resulting in an increase of 168 residents or a total of 71,305 residents in the Study Area. Therefore, the open space ratio would be 0.7838 acres per thousand people. This is below the citywide average of 1.50 acres per thousand people.

Future With-Action Scenario

The proposed development on Lot 57 would result in the incremental development of 267 new dwelling units as compared to the No-Action Scenario. The Proposed Action would add a net increase of approximately 625 residents (based on an average of 2.34 persons per unit[4]). This would increase the projected 2021 study area population of 71,137 to 71,762. With this addition to area population, the open space ratio would decrease to 0.7788 acres per 1,000 residents.

Conclusion

The Proposed Action would result in a decrease of .005 acres per thousand people (.06%) in the OSR compared to the No-Action Condition. Additionally, while St. Nicholas Park (22.74 acres) is located within a half-mile of the Affected Area, it is not located within the Open Spaces Study Area. Although less than 50% of the Census Tract that contains this park falls within the half-mile buffer area, the park's access point is located within the buffer area (approximately 1,200 feet from the Affected Area). Therefore, this park is easily accessible to the population within the study area. With the addition of St. Nicholas Park, the Study Area would contain 78.73 acres. The OSR would be 1.10 under the future No-Action Scenario and 1.10 under the future With-Action scenario. As shown in **Figure 2.4-2**, the Study Area contains open spaces that are not included in the OSR quantitative analysis. While community gardens are abundant in the Study Area and provide visual relief from the built environment, much in the same way as a passive park, they are not counted as open space resources. Further, the Proposed Development on Lot 57 will provide a minimum of 8.3% (43,583 SF) of open space, sufficient for residential buildings with a height factor of 9. The open space will have a mix of landscaping and active and passive open space areas in the rear yard of the buildings. Therefore, no impacts to open space resources would occur as a result of the Proposed Action and no further analysis is warranted.

[4] Census FactFinder, *2010-2014 ACS Profile Census Tract 222*

2.5 Shadows

The *CEQR Technical Manual* defines a shadow as the condition that results when a building or other built structure blocks the sunlight that would otherwise directly reach a certain area, space or feature. An incremental shadow is the additional or new shadow that a building or other built structure resulting from a proposed project would cast on a sunlight-sensitive resource during the year. The sunlight-sensitive resources of concern are those resources that depend on sunlight or for which direct sunlight is necessary to maintain the resource's usability or architectural integrity, including public open space, architectural resources and natural resources. Shadows can have impacts on publicly accessible open spaces or natural features by adversely affecting their use and important landscaping and vegetation. In general, increases in shadow coverage make parks feel darker and colder, affecting the experience of park patrons. Shadows can also have impacts on historic resources whose features are sunlight-sensitive, such as stained-glass windows, by obscuring the features or details, which make the resources significant.

The duration and dimensions of Shadows are determined by the geographic location of the area from which the shadow is cast and the time of day and season. Shadows cast during the morning and evening, when the sun is low in the sky, are longer, while midday shadows are shorter in length. Shadows in winter, when the sun arcs low across the southern sky, are also longer throughout the day than at corresponding times in spring and fall seasons. In summer, the high arc of the sun casts shorter shadows than at any other time of year, and early and late shadows during the summer are cast towards the south than shadows cast in early and late winter months.

The *CEQR Technical Manual* states that a shadow assessment considers projects that result in new shadows long enough to reach a sunlight-sensitive resource. Therefore, a shadow assessment is warranted only if the project would either result in: (a) new structures (or additions to existing structures including the addition of rooftop mechanical equipment) of 50 feet or more; or, (b) be located adjacent to, or across the street from, a sunlight-sensitive resource. However, a project located adjacent to or across the street from a sunlight-sensitive open space resource (which is not a designated New York City Landmark or listed on the State/National Registers of Historic Places, or eligible for these programs) may not require a detailed shadow assessment if the project's height increase is ten feet or less.

The sunlight-sensitive resources of concern are those resources that depend on sunlight or for which direct sunlight is necessary to maintain the resource's usability or architectural integrity, including public open space, architectural resources and natural resources. In general, shadows on city streets and sidewalks or on other buildings are not considered significant. Some open spaces also contain facilities that are not sensitive to sunlight. These are usually paved such as handball or basketball courts, contain no seating areas and no vegetation, no unusual or historic plantings, or contain only unusual or historic plantings that are shade tolerant. These types of facilities do not need to be analyzed for shadow impacts. Additionally, it is generally not necessary to assess resources located to the south of projected development sites, as shadows cast by the action-generated development would not be cast in the direction of these resources. Furthermore, shadows occurring within one and one-half hour of sunrise or sunset generally are not considered significant in accordance with the *CEQR Technical Manual*.

Methodology

This preliminary analysis of shadows follows the guidelines set forth in the *2014 CEQR Technical Manual* for a preliminary assessment (**Section 310**). According to the *2014 CEQR Technical Manual*, a preliminary shadow assessment includes the development of a base map showing the site location in relation to any sunlight-sensitive resources as per guidelines provided in the *2014*

CEQR Technical Manual. Following these guidelines, the longest shadow study area is determined and a Tier 1 screening assessment is conducted to determine if any sunlight-sensitive resources fall within the study area. If no resources are identified, no further analysis would be required. If sunlight-sensitive resources lay within the longest shadow study area, the next tier of screening assessment should be conducted. This preliminary assessment includes a basic description of the proposed project that would be facilitated by the proposed action in order to determine whether a more detailed assessment would be appropriate.

2.5.1 Preliminary Shadow Screening Assessment

The RWCDS will analyze the development of a new building on Lot 57. As the development will occur in a height factor district there is no set height. Therefore, for the purposes of this analysis, a 210-foot building with 100% lot coverage on Lot 57 can be assumed to be the RWCDS. Accordingly, a preliminary assessment of shadows is warranted.

The shadow assessment begins with a preliminary screening assessment to ascertain whether a project's shadow may reach any sunlight-sensitive resources at any time of the year. If the screening assessment does not eliminate this possibility, a detailed shadow analysis may be warranted to determine the extent and duration of the net incremental shadow resulting from the project. The effects of shadows on a sunlight-sensitive resource are site-specific; therefore, as directed in the *CEQR Technical Manual*, the screening assessment was performed for the relevant project site and projected development sites to determine whether they fall within the range of maximum possible shadow cast on potential sunlight sensitive resources as described above. To determine this, a Tier 1 Screening Assessment was performed in accordance with the *CEQR Technical Manual*. A base map is developed that illustrates the proposed site location in relation to any sunlight-sensitive resources. The longest shadow study area is then determined, which encompasses the site of the proposed project(s) and a perimeter around the site's boundary with a radius equal to the longest shadow that could be cast by the proposed structure, which is 4.3 times the height of the structure that occurs on December 21st, the winter solstice. A map as shown in **Figure 2.5-1** was prepared placing NYC Department of Parks Resources, as well as Selected Facilities and Program Sites, provided on NYC.gov Department of City Planning GIS portal, a list of park and public spaces provided from NYC.gov DOITT- GIS and Mapping Portal, and a screen of SHPO and NYC Landmark Listed Properties. After this, a buffer map was prepared to display the maximum possible shadow of 735.3 feet, which could be cast from the Proposed Development. This shadow cast was derived by multiplying 213' (the total height of the proposed building, inclusive of ground elevation and bulkheads) by 4.3 (the CEQR Technical Manual multiplier representing the maximum shadow cast from any object as being 4.3 times its height). The potentially impacted area of shadow from each projected site was then compared to those resources identified below to see if any fell within the shadow cast area.

As indicated in **Table 2.5-1** below: The following potentially effected sunlight sensitive resources were identified within the Shadow Study Area (Radius of 915.9 feet)

Table 2.5-1: Study Area Sunlight Sensitive Resources

ID Number	Name	Type
1	Adam Clayton Powell Jr. Blvd. Malls	Mall
2	Joseph Daniel Wilson Garden	Community Garden
3	Harriet Tubman Memorial	Monument
4	Hancock Park	Triangle/Plaza
5	CEP Community Garden	Community Garden
6	Our Little Green Acre/Garden 8	Community Garden
7	P.S. 76 Garden	Garden
8	Private Entry Garden	Garden
9	Morningside Park	Park
10	William B. Washington Garden	Garden

*Note: ID Number in column one of **Table 2.5-1** above corresponds with the below sunlight sensitive resources identified in **Figure 2.5-1**.*

Figure 2.5-1: Tier 1 Screening Assessment

Urban Cartographics

2.5.2 Tier 2 Shadow Screening Assessment

The *CEQR Technical Manual* states that if any portion of a sunlight-sensitive resource lies within the longest shadow study area, a Tier 2 screening assessment should be performed. Because of the path the sun travels across the sky in the northern hemisphere, no shadow can be cast in a triangular area south of any given project site. In New York City, this area lies between -108 and +108 degrees from true north. For a Tier 2 screening assessment, sunlight-sensitive resources within the triangular area cannot be shaded by new development sites, and are screened out. The complementing portion to the north within the longest shadow study area is the area that can be shaded by the proposed project.

As shown in **Figure 2.5-2** below, the Tier 2 screening assessment shows that resource ID number 1, 6 and 7, 8, and 9 screen out of the longest shadow study area. However, resource ID number 2, 3, 4, 5, and 10 can still be reached by a potential shadow from the Proposed Development outside the triangular area where no shadow can be cast. Therefore, further analysis is required for these resources to determine the extent of the impact of shadows.

2.5.3 Tier 3 Shadow Screening Assessment

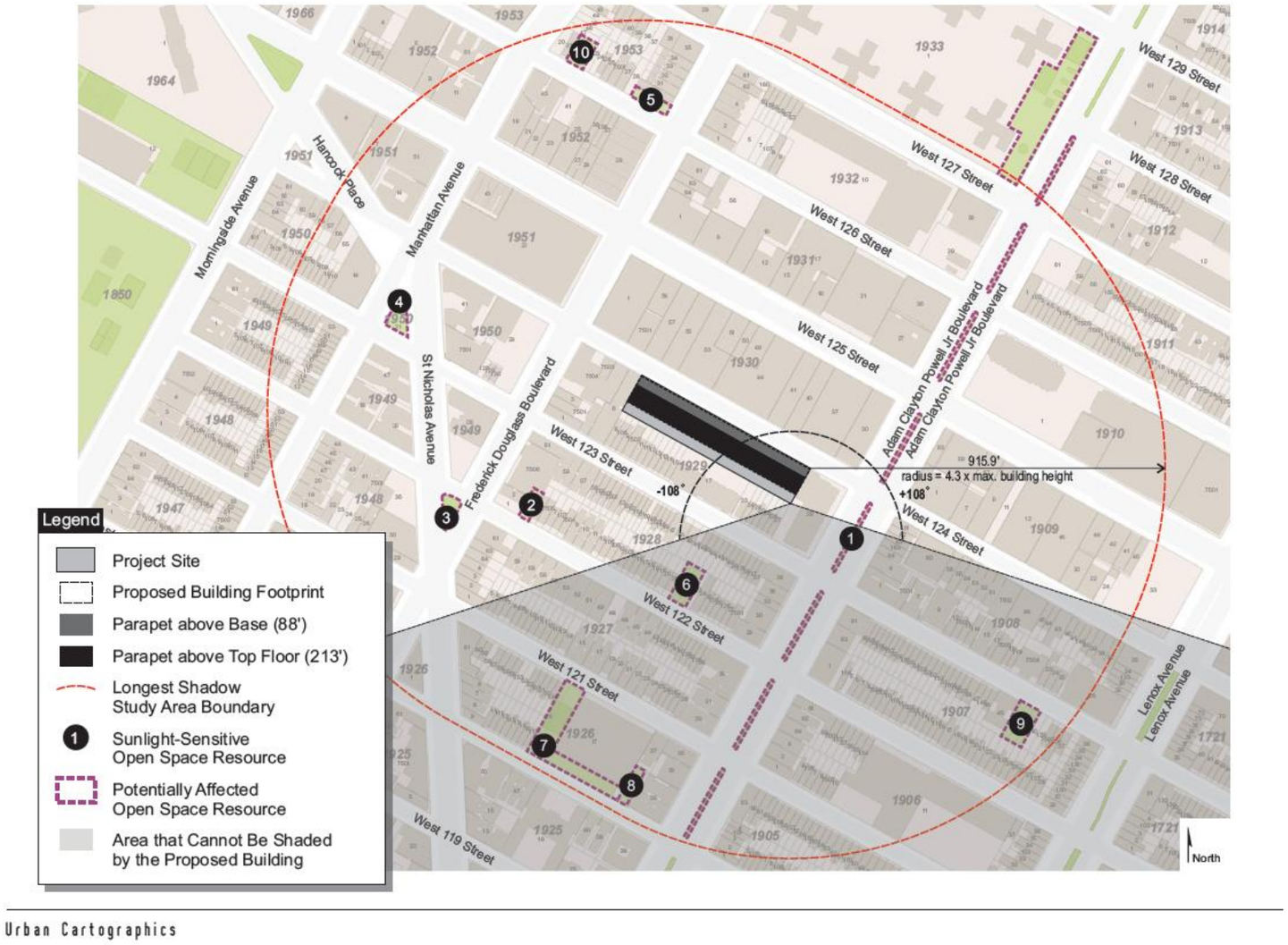
Based on the results of the Tier 2 Screening assessment, a Tier 3 screening assessment should be performed if any portion of a sunlight-sensitive resource is within the area that could be shaded by the proposed project. Because The sun rises in the east and travels across the southern part of the sky to set in the west, a project's earliest shadows would be cast almost directly westward. Throughout the day, shadows shift clockwise (moving northwest, then north, then northeast) until sunset, when they would fall east. Therefore, a projects earliest shadow on a sunlight-sensitive resource would occur in a similar pattern, depending on the location of the resource in relation to the Project Site.

The CEQR Technical Manual states that for the New York City area, the months of interest for an open space resource encompass the growing season (March through October) and one month between November and February (Usually December) representing a cold-weather month. Assessment of the shadows cast during four representative dates were prepared in accordance with the CEQR Technical Manual to encompass a cold-weather month and months during the growing season. The four representative dates of the Tier 3 screening assessment are:

- December 21st
- March 21st
- May 6th
- June 21st

As shown in **Figure 2.5-3** through **Figure 2.5-6**, the Tier 3 screening assessment showed that project-generated shadows have the potential to reach resource 1 on December 21st, resources 1 and 4 on March 21st, resources 1 and 2 on May 6, and resources 1, 2, and 3 on June 21st

Figure 2.5-2: Tier 2 Shadow Screening Assessment



Urban Cartographics

Figure 2.5-3: Tier 3 – December 21st Shadow Simulation

Urban Cartographics

Figure 2.5-4: Tier 3 – March 21st Shadow Simulation

Figure 2.5-5: Tier 3 – May 6th Shadow Simulation

Urban Cartographics

Figure 2.5-6: Tier 3 – June 21st Shadow Simulation

Urban Cartographics

2.5.4 Detailed Shadow Analysis

The *CEQR Technical Manual* states that a detailed shadow analysis is warranted when the screening analyses does not rule out the possibility that project-generated shadows would reach any sunlight-sensitive resources. The purpose of the detailed analysis is to determine the extent and duration of shadows that fall on a sunlight-sensitive resource as a result of the proposed project. The results of the detailed shadow analyses on the identified resources of concern are summarized in **Table 2.5-2 and 2.5-3** and visualized in **Figures 2.5-7** through **2.5-10** below. The shadows of intervening buildings were included in the detailed shadow analysis in order to identify the incremental shadows cast by the Proposed Buildings.

Based on the Findings of the Detailed Shadow Analysis, the Proposed Building under the RWCDS would cast shadows on Sunlight Sensitive Resource 1: Adam Clayton Powell Jr. Boulevard Malls and Sunlight Sensitive Resource 2: Harriet Tubman Memorial.

Table 2.5-2 Detailed Shadow Analysis Summary
Sunlight Sensitive Resource 1: Adam Clayton Powell Jr. Boulevard Malls

Analysis Date	December 21	March 21	May 6	June 21
Analysis Period	8:51 a.m. – 2:53 p.m.	7:36 a.m. – 4:29 p.m.	6:27 a.m. – 5:18 p.m.	5:57 a.m. – 6:01 p.m.
Shadows Enter/Exit Time	none	4:16 p.m. – 4:29 p.m.	3:10 p.m. – 5:18 p.m	3:19 p.m. – 6:01 p.m.
Shadow Duration	N/A	13 minutes	2 hrs and 8 minutes	2 hrs and 42 minutes

Table 2.5-3 Detailed Shadow Analysis Summary
Sunlight Sensitive Resource 3: Harriet Tubman Memorial

Analysis Date	December 21	March 21	May 6	June 21
Analysis Period	8:51 a.m. – 2:53 p.m.	7:36 a.m. – 4:29 p.m.	6:27 a.m. – 5:18 p.m.	5:57 a.m. – 6:01 p.m.

Shadows Enter/Exit Time	None	None	None	5:57 a.m. – 6:12 a.m.
Shadow Duration	N/A	N/A	N/A	15 minutes

Note: Daylight Saving Time not used/applied (Per CEQR)

As indicated in the below Figures, incremental shadows cast from the Proposed Building would fall on a small section of the Adam Clayton Powell Jr. Blvd. Malls on March 21st from 4:16 pm to 4:29 pm (13 minutes), May 6th from 3:10 pm to 5:18 pm (2 hours and 8 minutes), and June 21st from 3:19 pm to 6:01 pm (2 hours and 42 minutes). Incremental shadows would also be cast from the Proposed Building to the southern tip of Harriet Tubman Monument on June 21st from 5:57 am to 6:12 am (15 minutes).

Adam Clayton Powell Jr. Boulevard Malls

Adam Clayton Powell Jr. Boulevard Malls is an approximately 1.68-acre strip of open space owned by the Department of Parks and Recreation. The Malls contain vegetation and tree plantings and run between Adam Clayton Powell Jr. Boulevard. The Malls act as traffic medians. There are no benches, bike paths, or walkways provided, and the malls are not used for active or passive recreation.

Harriet Tubman Memorial

The Harriet Tubman Memorial, also known as Swing Low, is a 13' by 14' bronze and Chinese granite sculpture located at the triangle of West 122nd Street, St. Nicholas Avenue, and Frederick Douglass Boulevard. The memorial is located in the middle of the triangle and would not be impacted by shadows cast from the Proposed Building—the cast shadows would cover the southern tip of the triangle, which is used as a pedestrian median. There are no benches or bike paths provided on the triangle, and it is not used for active or passive recreation.

Photo 2.5-1 Adam Clayton Powell Jr. Blvd. Malls

Photo 2.5-2 Harriet Tubman Memorial

Figure 2.5-7: Tier 3 – Incremental Impact for the December 21st Analysis Day

Figure 2.5-8: Tier 3 – Incremental Impact for the March 21st Analysis Day

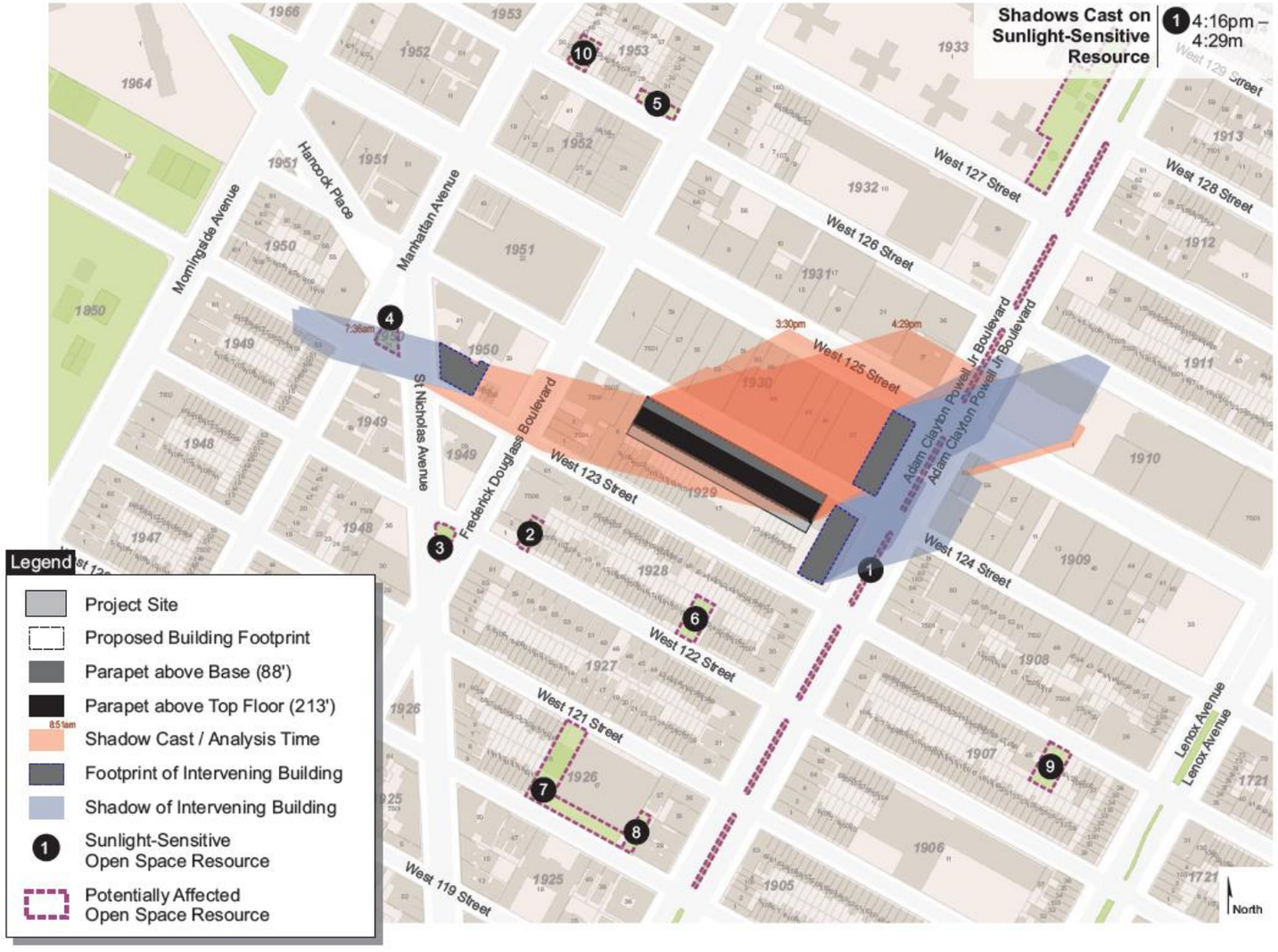


Figure 2.5-9: Tier 3 – Incremental Impact for the May 6th Analysis Day

Figure 2.5-10: Tier 3 – Incremental Impact for the June 21st Analysis Day

Urban Cartographics

Determination of Shadow Impact Significance

The *CEQR Technical Manual* states that the determination of significance of shadow on a sunlight-sensitive resource is based on: (1) the information resulting from the detailed shadow analysis describing the extent and duration of incremental shadows; and (2) an analysis of the resource's sensitivity to reduced sunlight. The goal of the assessment is to determine whether the effects of incremental shadows on a sunlight-sensitive resource are significant under CEQR. A shadow impact occurs when the incremental shadow from a proposed project falls on a sunlight-sensitive resource or feature and reduces its direct sunlight exposure. Determining whether this impact is significant or not, under CEQR, depends on the extent and duration of the incremental shadow and the specific context in which the impact occurs.

For open space and natural resources, the uses and features of a resource is an indicator of its sensitivity to shadows. Shadows occurring during the cold-weather months generally do not affect the growing season of outdoor vegetation; however, their effects on other uses and activities should be assessed. This sensitivity is assessed for warm-weather-dependent features (such as wading pools and sand boxes) or vegetation that could be affected by a loss of sunlight during the growing season, and for features (such as benches) that could be affected by a loss of winter sunlight. Vegetation requiring direct sunlight includes the tree canopy, flowering plants and plots in community gardens. Generally, four to six hours a day of sunlight, particularly in the growing season, is often a minimum requirement. Where the incremental shadows from the project fall on sunlight-sensitive features or uses, the analysis assesses the loss of sunlight relative to sunlight that would be available without the project.

As stated in the *CEQR Technical Manual*, to determine impact significance, an incremental shadow is generally not considered significant when its duration is no longer than 10 minutes at any time of year and the resource continues to receive substantial direct sunlight. A significant shadow impact generally occurs when an incremental shadow of 10 minutes or longer falls on a sunlight-sensitive resource and results in one of the following:

- *Vegetation* - A substantial reduction in sunlight available to a sunlight-sensitive feature of the resource to less than the minimum time necessary for its survival (when there was sufficient sunlight in the future without the project). Or, a reduction in direct sunlight exposure where the sunlight-sensitive feature of the resource is already subject to substandard sunlight (i.e., less than minimum time necessary for its survival).
- *Open Space Utilization* - A substantial reduction in the usability of open space as a result of increased shadow.
- *For Any Sunlight-Sensitive Feature of a Resource* - Complete elimination of all direct sunlight on the sunlight-sensitive feature of the resource, when the complete elimination results in substantial effects on the survival, enjoyment, or, in the case of open space or natural resources, the use of the resource.

Conclusion

As mentioned above, the Adam Clayton Powell Jr. Boulevard Malls and Harriet Tubman Memorial do not contain any active or passive resources, and therefore, any incremental shadows would not impact the Open Space Utilization of this resource, nor would the shadows cast by the Proposed Building result in the complete elimination of all direct sunlight on the sunlight-sensitive feature or resource. The shadows cast on Harriet Tubman Memorial would not reach vegetation. The Adam Clayton Powell Jr. Boulevard Malls area that is covered in shadow by the Proposed

Building is a median directly across from an 11- and 12-story building. The intervening shadow cast by the Proposed Building affects a small portion of the southern tip of the median. Further, the shadows cast on Adam Clayton Powell Jr. Boulevard Malls on March 21st, May 6th and June 21st occur in the evening hours for 13 minutes on March 21st, 2 hours and 8 minutes on May 6th and 2 hours and 42 minutes on June 21st—lengths of time that would not reduce direct sunlight exposure to less than the minimum time necessary for the survival of the street trees that are affected. Therefore, the incremental shadows would not result in a substantial reduction in sunlight available to the vegetation that exists in the malls. As shown above, incremental shadows from the Proposed Development would be very minimal and would not affect the usability of the space and would not impact the growing season of outdoor vegetation. As such, the Proposed Action would not affect the vitality or usage of the sunlight sensitive resources identified in the study area, and significant adverse impacts from shadows would not result from the proposed action. Please see **Appendix B** for the New York City Landmarks Preservation Commission sign-off letter finding no impacts from project-generated shadows on historic resources in the area.

2.6 Historic and Cultural Resources

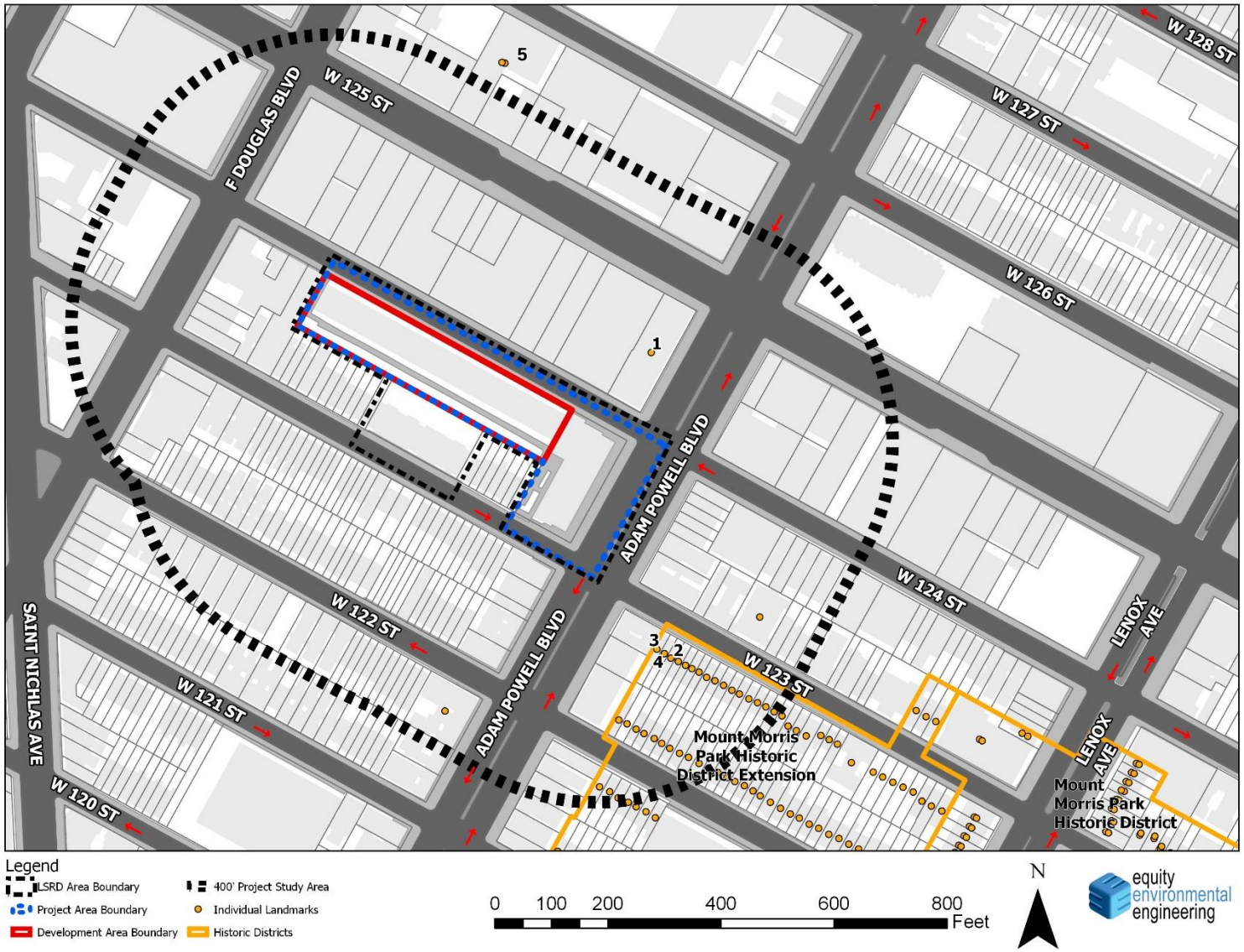
An assessment of historic and cultural resources is usually necessary for projects that are located in close proximity to historic or landmark structures or districts, or for projects that require in-ground disturbance, unless such disturbance occurs in an area that has been formerly excavated, according to the *CEQR Technical Manual*.

Methodology

The term “historic resources” defines districts, buildings, structures, sites, and objects of historical, aesthetic, cultural, architectural and archaeological importance. In assessing both historic and cultural resources, the findings of the appropriate city, state, and federal agencies are consulted. Historic resources include: the New York City Landmarks Preservation Commission (LPC) designated landmarks, interior landmarks, scenic landmarks, and historic districts; locations being considered for landmark status by the LPC; properties/districts listed on, or formally determined eligible for, inclusion on the State and/or National Register (S/NR) of Historic Places; locations recommended by the New York State Board for Listings on the State and/or National Register of Historic Places and National Historic Landmarks.

According to *CEQR Technical Manual* guidelines, impacts on historic resources are considered on those sites affected by the Proposed Action, and in the area surrounding identified development sites. The historic architectural resources study area identified the sites that are projected or have the potential to be redeveloped, plus an approximately 400-foot radius (the “Historic Study Area”) around these projected and potential redevelopment sites, see **Figure 2.6-1** (Map identifying surround historic resources with a buffer around Affected Area). These are the areas in which it is expected that new development could affect physical, visual, and historic relationships of historic architectural resources. Archaeological resources are considered only in those areas where excavation is likely, and would result in new in-ground disturbance. These are limited to sites that may be developed in the rezoning area, including projected and potential development sites.

Figure 2.6-1 Historic Resources



Analysis

Existing Conditions-Surrounding Area

The Affected Area is on the block bounded by West 123rd Street, Adam Clayton Powell Jr. Blvd., West 124th Street, and Frederick Douglass Blvd. The area surrounding the Affected Area ("The Surrounding Area") consists of residential, institutional, retail or service establishment uses. North of 124th street is predominantly developed with two to eleven story residential and commercial buildings and South of 124th street consists primarily of 4- and 5-story tenement buildings and townhomes. Commercial overlays have facilitated mixed-use residential and commercial development along Frederick Douglass Boulevard and Adam Clayton Powell Jr. Blvd. There are also several institutional buildings and houses of worship within the Surrounding Area. The Surrounding Area has two public community gardens: The Joseph Daniel Wilson Memorial Garden and Our Little Green Acre (Garden Eight) are both front 122nd Street. The Mount Morris Park Historic District Extension is located east of the Affected Area beyond 7th Avenue (Adam Clayton Powell Jr. Boulevard) with its 123rd Street Boundary falling within the Study Area (400 feet).

Existing Condition-Affected Area

The Affected Area is located on Block 1929 (Lots 17, 29, and 57) in Harlem within Manhattan Community Board 10. The combined lot area of the Affected Area is 89,832 and contains a total of 321,926 GSF or 285,592 ZSF of existing development. 318,726 GSF (282,392 ZSF) of the total floor area within the Affected Area is residential with 292 affordable dwelling units (including 72 vacant dwelling units within the vacant residential building on Lot 57) and 3,200 GSF of the total floor area is commercial. The Affected Area contains a total of 37 enclosed parking spaces (12,000 SF) and a combined FAR of 3.18.

The current Affected Area consists of three residential buildings: the original two buildings on Adam Clayton Powell Jr. Boulevard and West 124th Street (on Lots 29 and 57) that were constructed in 1985 with a total of 232 dwelling units, and a subsequent building on West 123rd Street (Lot 17) that was constructed in 2012 with 60 dwelling units. The 3-story residential building on West 124th Street (Lot 57 "Proposed Development Site") containing 72 dwelling units is currently vacant. Under the Proposed Action, Lot 17 will be severed from the LSRD, leaving only Lots 29 and 57 as part of the LSRD.

Analysis

Future No-Action Scenario

No changes to existing conditions would occur, other than the reoccupation of the vacant building currently occupying Lot 57. The previous use was solely for affordable residential housing. The building has been vacant for approximately 5 years. Although the current building is in poor condition, rehabilitation of the existing building is feasible and would be more cost effective and practical than demolishing and rebuilding a similarly sized building allowed under the current LSRD restrictions.

Future With-Action Scenario

The With-Action scenario assumes development that maximizes allowable residential and overall (residential and community facility) development of the Development Site given height factor FAR for residential uses in an R8 and a FAR of 6.5 for community facility uses in an R8. For the purposes of the RWCDS, development of a mixed residential and community facility building of up to 20 stories (210 feet) could occur. The new building on Lot 57 would contain approximately 30,990 square feet of community facility space, assumed to be occupied by medical or similar

community facility use. The residential component would occupy 311,004 GSF of floor area on Lot 57. Accessory parking for 40% of the non-Income Restricted Housing Units would be provided in a 10,000 square foot, below-grade parking facility to be accessed from 124th Street. Under a With-Action Scenario, Lot 29 would remain as it currently exists, with 160 affordable housing units. Lot 57 would utilize the remaining FAR available from the underlying zoning district and apply it to the new development on the Lot. This would prevent Lot 29 from adding additional development within the LSRD and on their own Lot. The development on lot 17, as a relatively new development, is not considered "soft", and is expected to remain as it exists after being severed from the Ennis Francis LSRD. Additionally, as noted previously, regulatory agreements limit development on both Lot 17 and Lot 29 to the existing bulk and uses.

The With-Action Scenario would produce a net increment of development of 234,813 GSF or 220,570 ZSF of residential floor space and 30,990 GSF/ZSF of community facility space. A net increment of 267 units would be produced, including 136 market rate units, 30 units of 'workforce' housing, and an increase of 131 affordable units, with 203 new affordable units replacing the no-action 72 units.

Historic Review

Per *CEQR Technical Manual* guidelines, impacts on historic resources are considered on those sites affected by the Proposed Action and in the area surrounding identified development sites. The historic resources Study Area is defined as the Proposed Development Site, plus an approximately 400-foot radius around the Proposed Action area. To determine whether the Proposed Development has the potential to affect nearby off-site historic or architectural resources, the Study Area was screened for historic and architectural resources.

2.6.1 Architectural Resources

Per consultation with the Landmarks Preservation Commission (LPC), several architectural resources were found within the Study Area that would be considered historic or significant. The LPC was contacted for their initial review of the project's potential to impact nearby historic and cultural resources, and a response was received on November 17, 2017 (***See Appendix B***). Supplemental analysis was submitted to LPC in August 2018, and a response from LPC on the supplemental analysis was received on September 5, 2018 (***See Appendix B***).

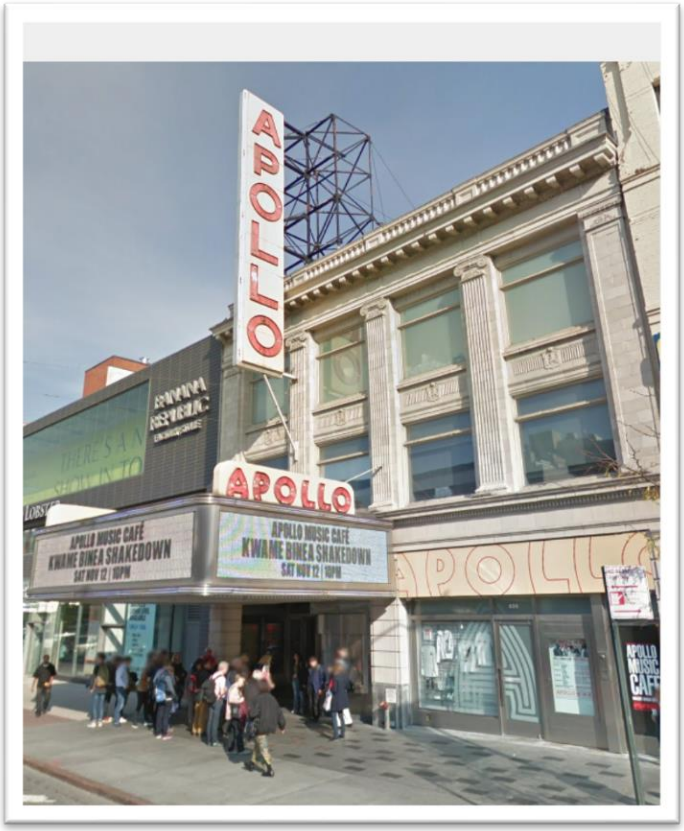
Affected Area
The LPC review indicated that the Affected Area (the LSRD) does not contain any known architectural significance.

Surrounding Area
The LPC review indicated the presence of one Historic District Extension that is LPC and National Register Listed ("NR/L"), Two individual LPC and National Register Listed buildings and one National Register Eligible ("NR/E)" property with architectural significance within the historic Study area (400' buffer surrounding the Affected Area). The Architectural Resources within the Historic Study Area are listed below in Table 2.5-1.

Table 2.6-1: Historic Resources Within the Study Area

Map #	Lot	Block	Historic Resource	Address
5	10	1931	Apollo Theater (originally Hurtig & Seamon's New (Burlesque) Theater)	253 WEST 125 STREET
N/A	34	1930	Blumstein's Department Store	230 West 125th Street
1	30	1930	Hotel Theresa	2082 ADAM C POWELL BLVD
2	*59*	*1907*	*Mount Morris Park Historic District Extension*	*164 WEST 123 STREET*
3	*60*	*1907*	*Mount Morris Park Historic District Extension*	*168 WEST 123 STREET*
4	*159*	*1907*	*Mount Morris Park Historic District Extension*	*166 WEST 123 STREET*

Apollo Theater

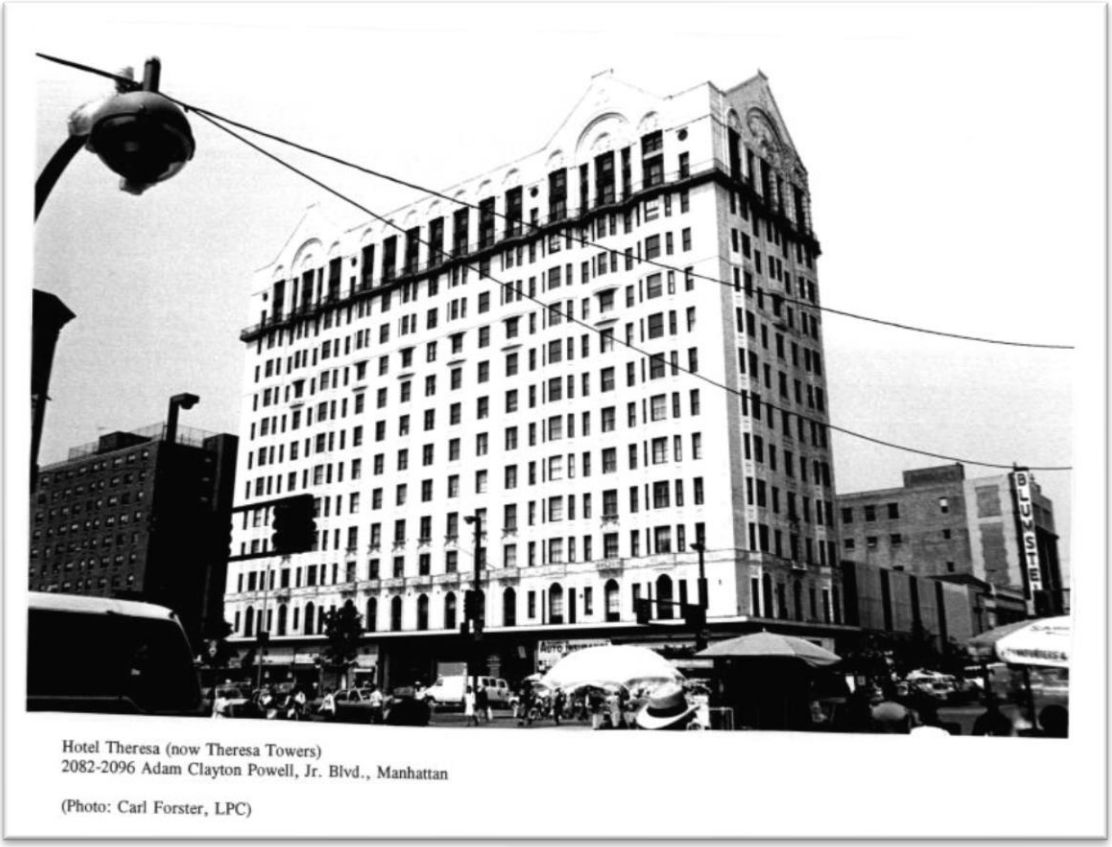


Apollo Theater (originally Hurtig & Seamon's New Burlesque Theater) is located on 253 West 125th Street between Adam Clayton Powell Jr. Boulevard and Frederick Douglass Boulevard in the Harlem neighborhood of Manhattan, New York City. The Theater was built in 1913 and has played a role in the emergence of jazz, swing, bebop, R&B, gospel, blues and soul. The design by architect George Keister displays elements of the neo-classical style. The Apollo Theater, designated in 1983 by the NYC LPC as an Individual Landmark, now holds landmark status from the U.S. government, the State of New York and New York City. Today, the Apollo under the Apollo Theater Foundation Inc. operates as a non-for-profit, which presents concerts, performing arts, education and community outreach programs. The theatre draws an estimated 1.3 million visitors and is featured in Showtime at the Apollo, a variety show promoting new talent.

Blumstein Department Store

The Blumstein Department Store was built in 1923 by the architects Robert D. Kohn and Charles Butler in a mixed Art Nouveau and Art Deco style. The building features a limestone façade and three copper bays. According to property records, the Blumstein family sold the building in 1976, and it is now owned by Parkseen Realty Associates. The ground floor has now been partitioned into different storefronts, and it is unclear what the top floor uses are currently. Blumstein's Department Store is National Register Eligible.

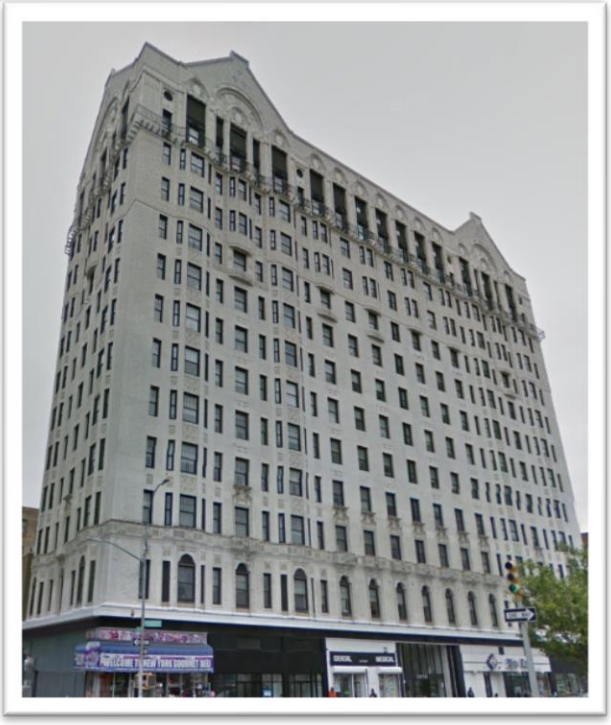
Hotel Theresa



Hotel Theresa (now Theresa Towers)
2082-2096 Adam Clayton Powell, Jr. Blvd., Manhattan

(Photo: Carl Forster, LPC)

Hotel Theresa, located at 2082-2096 Adam Clayton Powell Jr. Blvd encompasses the entire western blockfront of Adam Clayton Powell, Jr. Boulevard (originally Seventh Avenue), between West 124th and West 125th streets. Theresa is visually striking with its projecting bays, arched surrounds, and prominent gables. Theresa was built in 1912-1913 by architect George & Edward Blum. Hotel Theresa was designated as an individual landmark building in 1991. Hotel Theresa was one of the major social centers of Harlem, serving transient guests and providing a two-story dining room used for banquets, weddings, meetings and other functions. Theresa was home to important Harlem institutions including the March Community Bookstore and Malcolm X's Organization of Afro-American-Unity. Hotel Theresa was designated as an individual landmark in 1993.



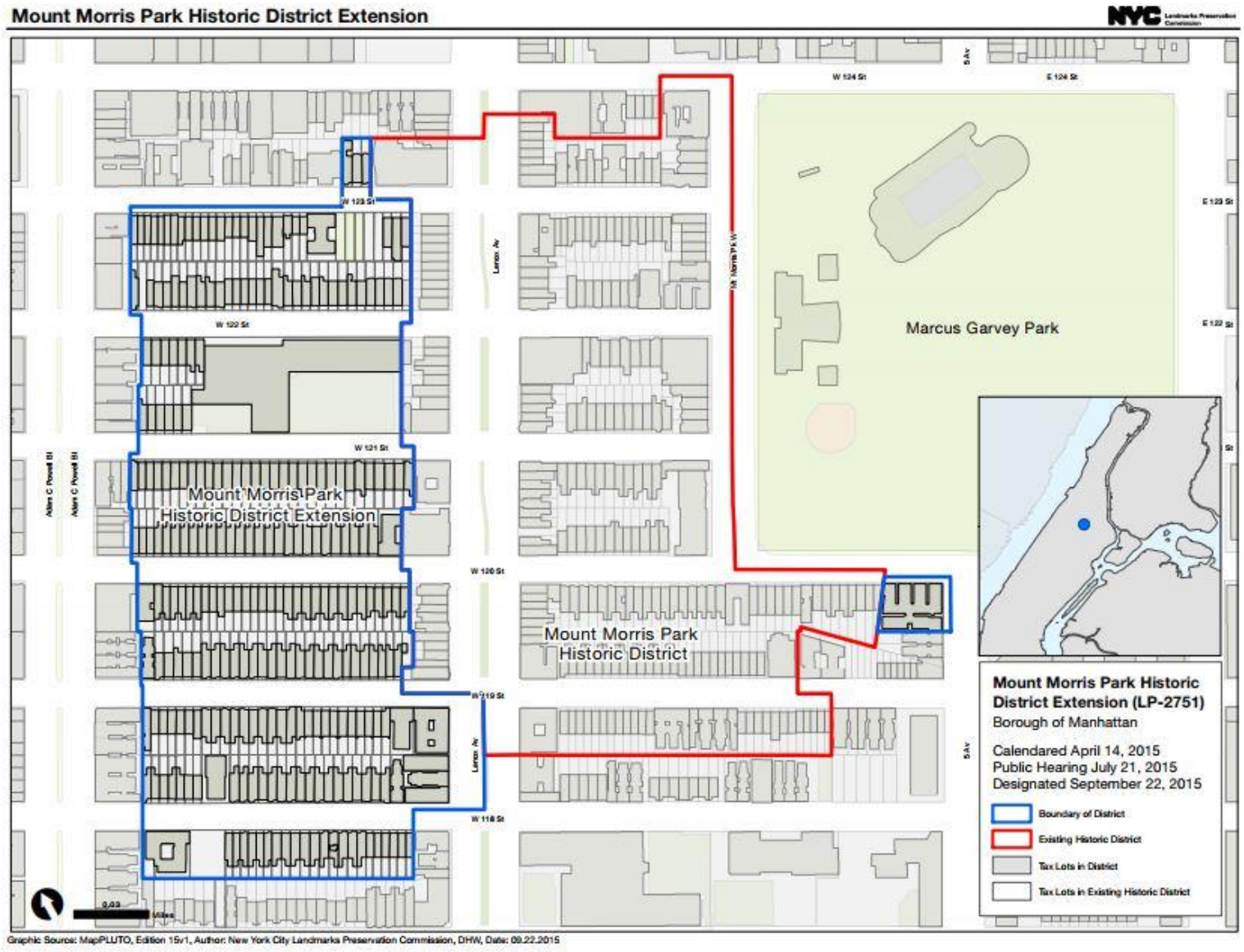
Mount Morris Park Historic District

The Mount Morris Park Historic District Extension, designated in 2015, consists of approximately 276 properties primarily located on six blocks immediately west of the existing Mount Morris Park Historic District, which was designated by the Landmarks Preservation Commission in 1971. The proposed historic district extension, which encompasses more than 250 row houses and approximately 12 apartment buildings on the blocks between West 118th to 123rd Street, Lenox Avenue/Malcolm X Boulevard, Fifth Avenue, and Adam Clayton Powell, Jr. Boulevard, shares a development history with the existing Mount Morris Park Historic District. Many of the architects and developers responsible for structures within the existing historic district were also responsible for the buildings within the proposed extension. Like the Mount Morris Park Historic District, the streets of the historic district extension are lined with masonry row houses of exceptional quality that reflected Harlem's development as an affluent residential community following the extension of rapid transit into the area around 1880. Similar to the previously-designated historic district, the buildings within the Mount Morris Park Historic District Extension display a variety of architectural styles popular in the late 19th and early 20th centuries.

The Mount Morris Park Historic District Extension contains 3 buildings within the Study Area, concentrated along the south side of 123rd Street. As shown below in **Photo 2.6-1**, these buildings are characterized by three and four-story contiguous brownstone row houses.

Photo 2.6-1: Morris Park Historic District Extension
South Side of 123rd Street

Figure 2.6-2 Mount Morris Park Historic District Extension



Conclusion

According to the *CEQR Technical Manual*, significant adverse impacts to historic and cultural resources could potentially result if a proposed action affects those characteristics that make a resource eligible for LPC designation or S/NR listing. The Future With-Action Scenario's potential for significant adverse impacts on historic resources were assessed in accordance with **Table 2.6-2** to determine (a) whether there would be a physical change to any designated resource or its setting, and (b) if so, is the change likely to diminish the qualities of the resource that make it important (including non-physical changes such as context or visual prominence). The assessment of the potential for impacts on significant resources are described below.

Table 2.6-2 Possible Impacts to Historic and Cultural Resources

• Construction resulting in ground disturbance, including construction of temporary roads and access facilities, grading, and landscaping.
• Below-ground construction, such as excavation or installation of utilities.
• Physical destruction, demolition, damage, alteration or neglect of all or part of an historic property
• Changes to the architectural resource that cause it to become a different visual entity, such as a new location, design, materials, or architectural features.
• Isolation of the property from, or alteration of, its setting or visual relationship with the streetscape. This includes changes to the resource's visual prominence so that it no longer conforms to the streetscape in terms of height, footprint, or setback; is no longer part of an open setting; or can no longer be seen as part of a significant view corridor.
• Introduction of incompatible visual, audible, or atmospheric elements to a resource's setting.
• Replication of aspects of the resource so as to create a false historical appearance.
• Elimination or screening of publicly accessible views of the resource.
• Construction-related impacts such as falling objects, vibration, dewatering, flooding, subsidence, or collapse.
• Introduction of significant new shadows, or significant lengthening of the duration of existing shadows, over an historic landscape or an historic structure to the extent that the architectural details that distinguish that resource as significant are obscured.

Source: Table 8-1 CEQR Technical Manual

The Proposed Action would not result in any types of visual and contextual impacts to the known historic resources within the Study Area. As all of the new buildings that could be developed under the Proposed Action would be residential, commercial, or community facility structures of heights and bulk consistent with those urban design features of the area. The Proposed Action would not introduce any incompatible visual, audible, or atmospheric elements to the settings of historic resources. As discussed in the Urban Design section below (See Section 2.7, *Urban Design and Visual Resources*), the proposed building has been designed to be visually compatible and consistent with existing developments. Additionally, the significant views of each

of the historic architectural resources identified above in **Table 2.6-1** will not be adversely affected by the Proposed Action.

The historic resources in the project area include a range of buildings of various types, sizes, and styles and the Proposed Action aims to encourage the design of new development that is in character with the area. Publicly accessible views of resources would not be blocked, because all new development would occur on existing blocks and lots, and maximum building heights would be limited and capped according to the zoning district regulations. In addition, as more fully described in the Shadows section (See Section 2.4, *Shadows*) there would be no significant adverse impacts to historic resources with sunlight dependent features. Most resources would not be affected by incremental shadow and where resources would be subject to varying amounts of incremental shadow as a result of the Proposed Action, the increments would not be significant due to their limited extent and other site-specific factors.

Because the Projected Development Site does not contain, nor is adjacent to, or is within 90 feet of the identified historic architectural resources, no direct or construction-related effects via ground-borne construction activities will occur as a result of the Proposed Action.

2.6.2 Archaeological Resources

Unlike the architectural evaluation of a Study Area that extends beyond the footprint of a project's block and lot lines, the analysis of potential and/or projected impacts to archaeological resources is controlled by the actual footprint of the limits of soil disturbance. Archaeological resources are physical remains, usually subsurface, of the prehistoric and historic periods such as burials, foundations, artifacts, wells and privies. The *CEQR Technical Manual* requires a detailed evaluation of a project's potential effect on the archaeological resources if it would potentially result in an in-ground disturbance to an area not previously excavated. The project would result in an in-ground disturbance under the Proposed Action. As noted, the LPC was contacted for their initial review of the project's potential to onsite archaeological resources, and a response was received on November 17, 2017 (***See Appendix B***). The supplemental analysis was submitted to LPC in August 2018, and LPC's response to the additional analysis was received on September 5, 2018 (***See Appendix B***).

The LPC review identified the following information:

ADDRESS: 2070 ADAM C POWELL BLVD, BBL: 1019290057
The LPC is in receipt of the "Ennis Francis Houses 2070 Adam Clayton Powell, Jr Blvd, Manhattan, Phase 1A Documentary Report," prepared by Joan Geismar and dated October 2010. We concur that B 1929 L 17 is unlikely to contain any significant archaeological resources and that B 1929 L 57 has the potential to contain human remains. If any excavation work is proposed on B 1929 L 57 as a result of this action archaeological testing should occur after developing an appropriate consultation plan with relevant descendent communities.

Archaeological Resources Conclusion
In a letter dated November 14, 2017, the NYC Landmarks Preservation Commission determined that there is a reasonable likelihood, based on the sites' location and characteristics, that it contains significant archaeological resources. As part of the Proposed Project, the Applicant will enter into a Restrictive Declaration agreeing to conduct archaeological identification, investigation, and mitigation in accordance with the CEQR Technical Manual and NYC Landmarks Preservation Commission guidelines for archaeological work in New York City.

The Restrictive Declaration is binding on the Applicant, and the property's successors and assigns and serves as a mechanism to assure the archaeological testing be conducted and that any necessary mitigation measures be undertaken prior to any site disturbance (i.e., site grading, excavation, demolition, or building construction). The Restrictive Declaration will be prepared in a form acceptable to LPC and recorded with the City's Department of Finance at a future date. Consequently, no significant adverse impact to archaeological resources are expected to result from the proposed action.

2.7 Urban Design and Visual Resources

According to the *CEQR Technical Manual*, urban design is the totality of components that may affect a pedestrian's experience of public space. Elements that play an important role in the pedestrian's experience include streets, buildings, visual resources, open space, and natural features, as well as wind as it relates to channelization and downwash pressure from tall buildings. Pursuant to the 2014 *CEQR Technical Manual*, an assessment of Urban Design may be warranted when a Proposed Action may affect one or more of the elements that contribute to the pedestrian experience of an area, specifically the arrangement, appearance, and functionality of the built environment.

Methodology

As stated in the *CEQR Technical Manual*, the Study Area for urban design is the area where the project may influence land use patterns and the built environment, and is generally consistent with the Study Area used for the land use analysis (i.e., 400 feet around the project sites). For visual resources, existing publicly accessible view corridors within the Study Area should be identified. The purpose of the preliminary assessment is to determine whether any physical changes proposed by a project may raise the potential to significantly and adversely affect elements of urban design, which would warrant the need for a detailed urban design and visual resources assessment.

Analysis

Existing Conditions-Affected Area

The Affected Area is located on Block 1929 (Lots 17, 29, and 57) in Harlem within Manhattan Community Board 10. The combined lot area of the Affected Area/LSRD is 89,832 and contains a total of 321,926 total GSF, 285,592 ZSF of existing development-3,200 GSF of which is commercial and 318,726 GSF of which is residential. The Affected Area contains a total of 292 dwelling units (including 72 unoccupied units within the vacant residential building on Lot 57), and a combined FAR of 3.18. The Affected Area contains a total of 37 enclosed parking spaces (12,000 SF).

Lot 17 (Residential Building): Lot 17 is located at 225 West 123rd Street and is improved with an 8-story, 98,955 GSF Quality Housing building, with 60 affordable dwelling units. The lot area is approximately 18,501 square feet. There are 37 enclosed accessory parking spaces provided on Lot 17, according to the latest certificate of occupancy. Lot 17 is entirely within an underlying R7A zoning district.

Lot 29 (Mixed-Use Building): Lot 29 is located at 2070 Adam Clayton Powell Jr. Blvd and is constructed with an 11-story, 146,780 GSF mixed-use height factor building, 143,580 GSF of residential use, with 3,200 GSF of ground floor commercial retail space fronting Adam Clayton Powell Blvd and 160 affordable dwelling units above. The lot area is approximately 21,562 sf. Lot 29 is entirely within an underlying R8/C2-4 district.

Lot 57 (Vacant Residential Building "The Proposed Development Site"):
The Development Site consists of Lot 57. Lot 57 is located at 206-254 West 124th Street. It has 493'-2" of frontage along West 124th Street, a narrow street as defined under the Zoning Resolution. The Development Site currently includes a vacant 3-story, 65,020 ZSF residential building with 72 dwelling units on a 49,769-sf lot. The building is in poor condition and has been vacant since 2015. No parking is provided on the Development

Site, which is located in the Transit Zone. Lot 57 is entirely within an underlying R8 zoning district.

Existing Conditions-Surrounding Area

The Affected Area is on the block bounded by West 123rd Street, Adam Clayton Powell Jr. Blvd., West 124th Street, and Frederick Douglass Blvd.

Land Use/Built Form
The area surrounding the Affected Area ("The Surrounding Area") consists of residential, institutional, retail or service establishment uses. North of 124th street is predominantly developed with two to eleven story residential and commercial buildings and South of 124th street consists primarily of 4- and 5-story tenement buildings and townhomes. Commercial overlays have facilitated mixed-use residential and commercial development along Frederick Douglass Boulevard and Adam Clayton Powell Jr. Blvd. There are also several institutional buildings and houses of worship within the Surrounding Area. The Surrounding Area has two public community gardens: The Joseph Daniel Wilson Memorial Garden and Our Little Green Acre (Garden Eight) are both front 122nd Street.

Transportation
The Surrounding Area, and the Affected Area are located within a Transit Zone. The area is "transit-rich" with multiple subway and bus lines. The B/D line runs along St. Nicholas Avenue with entrances at 125th Street. Multiple bus lines run through the Surrounding Area with routes on Frederick Douglass Blvd., Adam Clayton Powell Jr. Blvd., and 125th Street. The M10 and M2 buses run north/south on Frederick Douglass Blvd. and Adam Clayton Powell Jr. Blvd. respectively. The M60, M100, M101 and BX15 run east/west along 125th Street with service within Manhattan and to the Bronx and Queens.

The street grid is regular, with streets that are narrower east to west which feed into wider north to south collector roads. West 124th Street is a single lane, one-way, west to east road with parking on both sides of the street. West 123rd Street is a single lane, one-way, east to west road with parking on both sides of the street. The main collector in the Study Area, Adam Clayton Powell Jr. Boulevard, also known as 7th Avenue, is a two-way, 4-lane, north to south collector road located directly east of the Affected area with available curbside parking.

Zoning Districts; Special Districts
The Affected Area is mapped within zoning districts R7A, R8, and R8/C2-4. The surrounding area to the west of the Affected Area, along Frederick Douglass Blvd., is mapped R8A/C2-4 and C4-4D districts, which were the result of the Frederick Douglass Blvd. Rezoning adopted in 2003 to encourage contextual building. The blocks to the north of West 124th Street form a portion of the Special 125th Street District and are mapped for C6-3 and C4-7 commercial uses. There is an Inclusionary Housing Designated Area mapped to the north of the Proposed Development Site above West 124th Street.

No-Action Condition

Currently, the entire LSRD has a built FAR of 3.18 with a presumed maximum development of 4.15. Under a No- Action scenario, where the land development controls of the existing LSRD would govern the available bulk for possible redevelopment of any of the sites, it is highly unlikely that any of the three lots within the LSRD would develop under this scenario.

Lot 17 was constructed in 2012 and is unlikely to be altered our augmented given that the site currently is nearly built out on its own lot and is the subject of a Regulatory Agreement which effectively limits its bulk and use to its existing development.

Lot 29 was developed in 1985 and currently has an FAR of 6.67 on its own lot and is the subject of a Regulatory Agreement which effectively limits its bulk and use to its existing development.

Lot 57 which is currently vacant, could potentially be renovated with the existing unit count (72) in place.

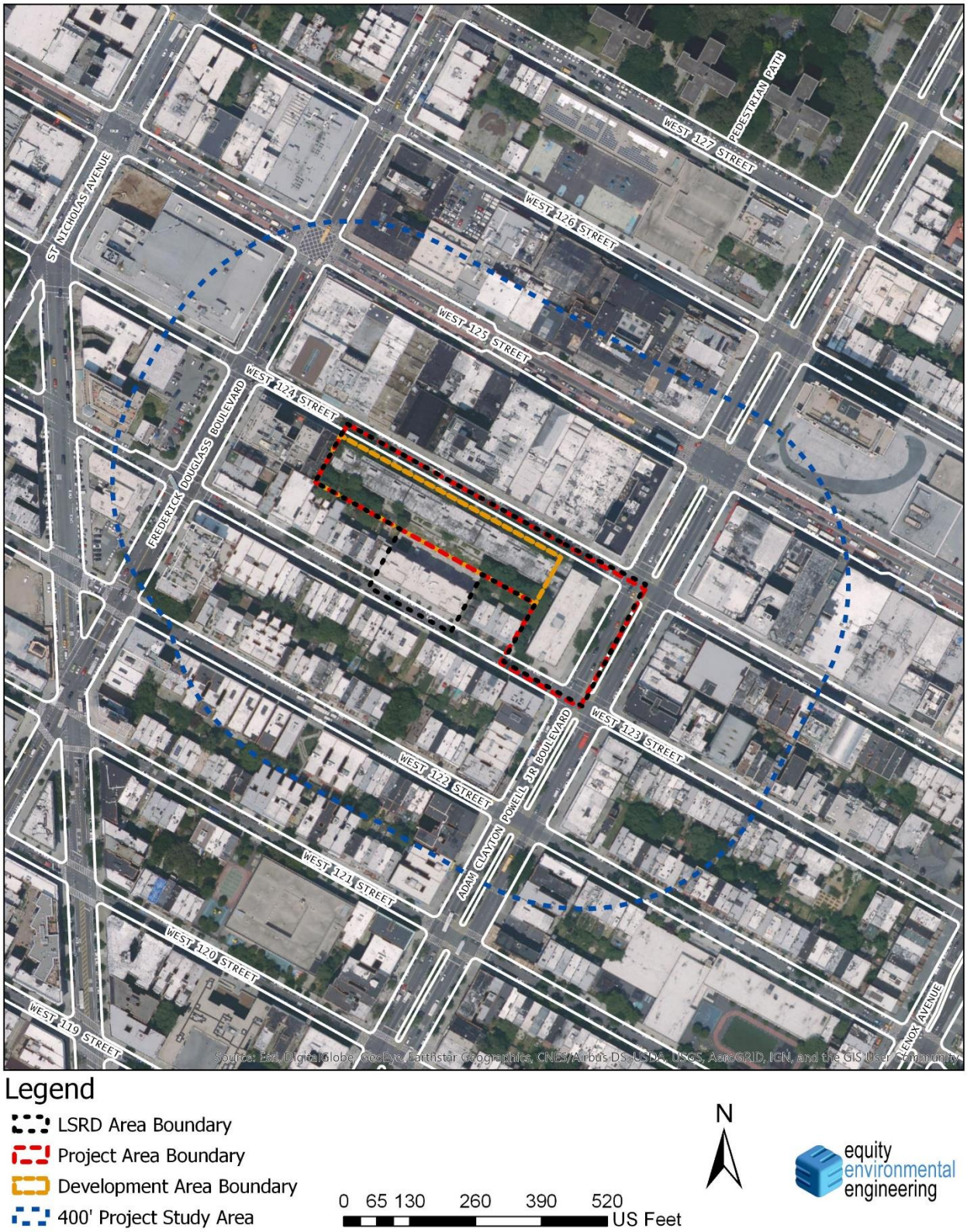
With-Action Condition

Under the Future With-Action Scenario, Lot 17 is severed from the LSRD. Lots 29 and 57 would remain under the existing LSRD. The With-Action scenario assumes development that maximizes allowable residential and overall (residential and community facility) development of the Development Site given height factor FAR for residential uses in an R8 and a FAR of 6.5 for community facility uses in an R8. For the purposes of the RWCDS, development of a mixed residential and community facility building of up to 20 stories (210 feet) could occur. The new building on Lot 57 would contain approximately 30,990 square feet of community facility space, assumed to be occupied by medical or similar community facility use. The residential component would occupy 311,004 GSF of floor area on Lot 57. Accessory parking for 40% of the non-Income Restricted Housing Units would be provided in a 10,000 square foot, below-grade parking facility to be accessed from 124th Street. Under a With-Action Scenario, Lot 29 would remain as it currently exists, with 160 affordable housing units. Lot 57 would utilize the remaining FAR available from the underlying zoning district and apply it to the new development on the Lot. This would prevent Lot 29 from adding additional development within the LSRD and on their own Lot. The development on lot 17, as a relatively new development, is not considered “soft”, and is expected to remain as it exists after being severed from the Ennis Francis LSRD. Additionally, as noted previously, regulatory agreements limit development on both Lot 17 and Lot 29 to the existing bulk and uses.

The With-Action Scenario would produce a net increment of development of 234,813 GSF or 220,570 ZSF of residential floor space and 30,990 GSF/ZSF of community facility space. A net increment of 267 units would be produced, including 136 market rate units, 30 units of ‘workforce’ housing, and an increase of 131 affordable units, with 203 new affordable units replacing the no-action 72 units.

The Applicant’s Proposed Buildings would consist of two buildings: Building A, a 17-story, 169-foot tall building containing 164,856 GSF, 30,990 GSF for community facility space and 10,000 GSF for accessory parking spaces at cellar level. Building B would be an 18-story, 190-foot tall building containing 184,480 GSF of residential space. The Proposed Buildings will have a ground floor that extends the entire depth of the Development Site with residential floors above of approximately 62 to 68 feet in depth, which is ideal for a double-loaded corridor plan for residential buildings. The Development Site will have a minimum of 8.3% open space, sufficient for residential buildings with a height factor of 9. The open space will have a mix of landscaping and active and passive open space areas in the rear yard of the buildings. Some of the required open space will be provided on the roofs above community facility uses in the Proposed Buildings.

Figure 2.7-1: Aerial Map



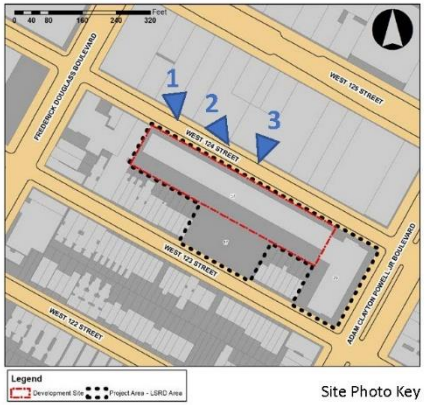
Existing Conditions

Photos Taken on 5/28/17

1. Looking SE on W 124th Street – View of Development Site

2. Looking SE on W 124th Street – View of Development Site

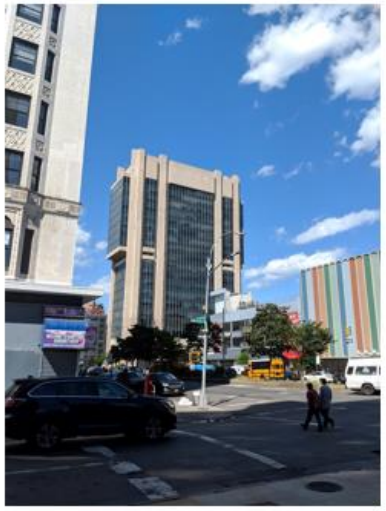
3. Looking SE on W 124th Street – Full Frontage Shot of Development Site – Enis Francis Houses



Site Photo Key

Ennis Francis Houses – Minor Modification
Site Area Photos

4. Looking east from corner of W 124th Street and Adam Clayton Powell Jr. Blvd.



5. Looking north on corner of Adam Clayton Powell Jr. Blvd. and 124th Street

6. View south down Adam Clayton Powell Jr. Blvd.

Photo Key

2070 Adam Clayton Powell Jr. Blvd.
6/14/2018

The following figures show the reasonable-worst case development (as described in Section 1.9) building elevations in context to the surrounding area:

Figure 2.7-3 No-Action Scenario
Looking west down West 124th Street

Figure 2.7-4 No-Action Scenario
Looking east down West 124th Street

Figure 2.7-5 No-Action Scenario
Looking south at Development Site

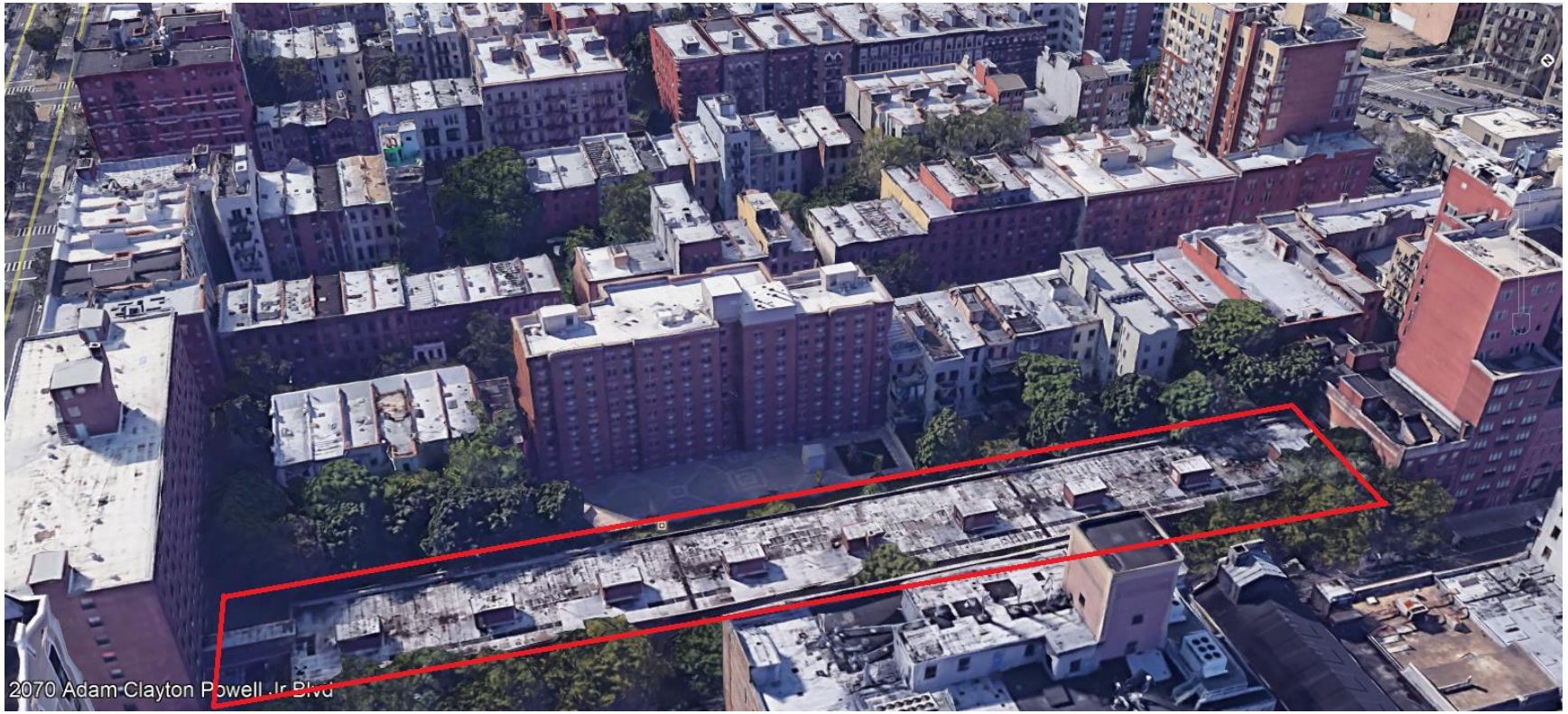


Figure 2.7-6 Proposed Development Elevation

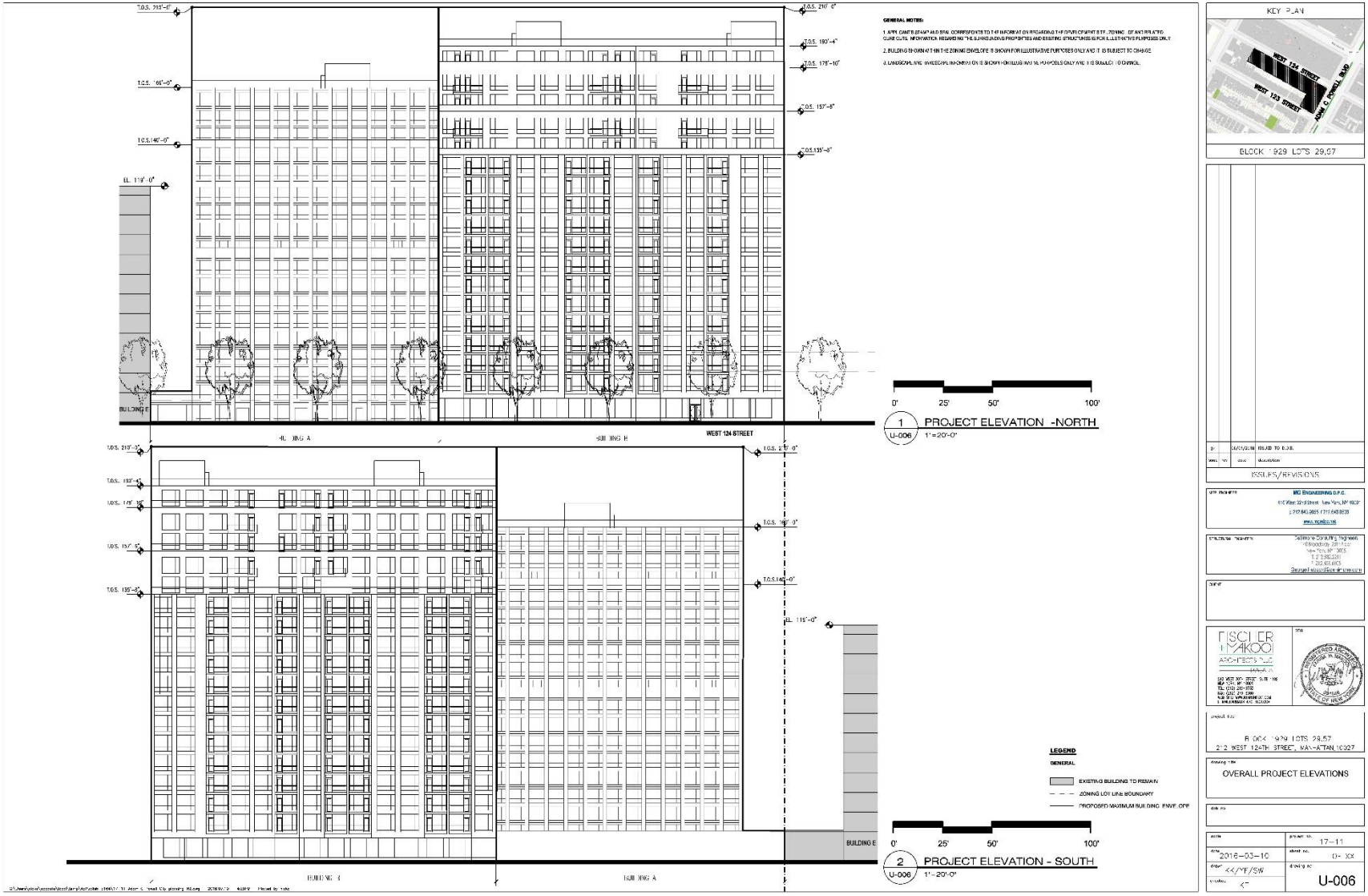


Figure 2.7-7 Photomontage – Existing and With-Action Looking West Down 124th Street

Figure 2.7-8 Photomontage – Existing and With-Action Looking East Down 124th Street

Conclusion

There are no existing publicly accessible view corridors within the study area and there would be no significant adverse effects to visual resources as a result of the Proposed Action. The redevelopment of the Proposed Development Site would remove a blighted and vacant building, with no active ground floor and effectuate the redevelopment of the site with an attractive mixed-use building with vital community support at a density and scale similar to surrounding built-form. The Proposed Buildings will improve the pedestrian experience by enlivening the ground floor and increasing the level of interest and complexity along West 124th Street as well as increasing public safety. The Proposed Buildings would be tapered with setbacks, thus reducing the apparent mass of the buildings and ensuring that they maintain a more desirable and human-scale pedestrian experience. Additionally, the proposed open space would provide landscaping and greenery. The Affected Area would contain open space that would provide linkages to the other buildings within the area.

2.8 Hazardous Materials

According to the CEQR Technical Manual, the potential for significant impacts from hazardous materials can occur when: (a) hazardous material exists on a site, and (b) an action would increase pathways to their exposure, or (c) an action would introduce new activities or processes using hazardous materials.

Methodology

The hazardous materials assessment generally begins with a Phase 1 Environmental Site Assessment (ESA), which is a qualitative evaluation of the environmental conditions present at a site, based on a review of available information site observations, and interviews. Pursuant to the *2014 CEQR Technical Manual*, the Phase 1 ESA is conducted in accordance with the standards established by the current ASTM Phase 1 ESA Standard and includes research and field observations to determine whether the site may contain contamination from either past or present activities on the site or as a result of activities on adjacent or nearby properties. If a potential REC is identified during this assessment, then building any subsurface investigations are usually conducted as part of a Phase II Environmental Site Investigation (ESI) to confirm the presence and extent of the contamination.

Analysis

Existing Conditions-Affected Area

The Affected Area is located on Block 1929 (Lots 17, 29, and 57) in Harlem within Manhattan Community Board 10. The combined lot area of the Affected Area/LSRD is 89,732 and contains a total of 285,592 total gross square feet ("GSF") or 274,479 zoning square feet ("ZSF") of existing development. 282,392 GSF (271,279 ZSF) of the total floor area within the Affected Area is residential with 292 affordable dwelling units (including 72 vacant dwelling units within the vacant residential building on Lot 57) and 3,200 GSF of the total floor area is commercial. The Affected Area contains a total of 37 enclosed parking spaces (12,000 SF) and a combined FAR of 3.06.

Lot 57 (Vacant Residential Building "The Proposed Development Site"): The Development Site consists of Lot 57. Lot 57 is located at 206-254 West 124th Street. It has 493'-2" of frontage along West 124th Street, a narrow street as defined under the Zoning Resolution. The Development Site currently includes a vacant 3- story (29'-6"), 65,020 square foot residential building with 72 dwelling units on a 49,771-square foot lot. The building is in poor condition and has been vacant since 2015. The existing building will be demolished prior to the construction of the Proposed Development.

The LSRD is known as Site 106 under the former Harlem East Harlem Urban Renewal Plan ("URP"). In 2000, Site 106 was designated for inclusion in the Harlem Gateway Urban Renewal Area with restrictions from the Harlem-East Harlem URP expiring in 2008. As originally approved under the 1983 LSRD, the two buildings on Lots 29 and 57 have an FAR of 4.15 based on the application of height factor regulations, and were granted additional allowances for height, setback, and space between buildings. The 4.15 FAR that was approved appears descriptive of the original proposed residential floor area divided by its lot coverage, not a cap imposed by the LSRD. The actual floor area for the two buildings that were constructed in 1985 is 211,800 square feet (3.69 FAR).

Lot 17

A previous EAS (**10DCP028M)** for Lot 17, Tax Block 1929 – 225 West 123 Street was given a final conditional negative declaration for approval of A Minor Modification to the Ennis Francis Houses Large Scale Residential Plan on 9-17-10 to effectuate the construction of the 60-unit, 8-story – 37 parking space development that currently sits on the site. As amended in 2010, the LSRD permitted a quality housing building to be constructed on Lot 17 that complied with the underlying R7A bulk regulations. Pursuant to the Proposed Action, Lot 17 would be severed from the LSRD.

Existing Conditions-Surrounding Area

The area surrounding the Affected Area ("The Surrounding Area") consists of residential, institutional, retail or service establishment uses. North of 124th street is predominantly developed with two to eleven story residential and commercial buildings and South of 124th street consists primarily of 4- and 5-story tenement buildings and townhomes. Commercial overlays have facilitated mixed-use residential and commercial development along Frederick Douglass Boulevard and Adam Clayton Powell Jr. Blvd. There are also several institutional buildings and houses of worship within the Surrounding Area. The Surrounding Area has two public community gardens: The Joseph Daniel Wilson Memorial Garden and Our Little Green Acre (Garden Eight) are both front 122nd Street.

Future No-Action Scenario

No changes to existing conditions would occur, other than the reoccupation of the vacant building currently occupying Lot 57. The previous use was solely for affordable residential housing. The building has been vacant for approximately 5 years. Although the current building is in poor condition, rehabilitation of the existing building is certainly feasible and would be more cost effective and practical than demolishing and rebuilding a similarly sized building, allowed under the current LSRD restrictions.

Future With-Action Scenario

The With-Action scenario assumes development that maximizes allowable residential and overall (residential and community facility) development of the Development Site given height factor FAR for residential uses in an R8 and a FAR of 6.5 for community facility uses in an R8. For the purposes of the RWCDS, development of a mixed residential and community facility building of up to 20 stories (210 feet) could occur. The new building on Lot 57 would contain approximately 30,990 square feet of community facility space, assumed to be occupied by medical or similar community facility use. There would be a total of 339 new dwelling units, consisting of 173 units of affordable housing to be built under HPD's ELLA Program, 30 'workforce' units affordable to households at an average of 130% of AMI, and 135 market rate units. The residential component would occupy 341,994 gross square feet of floor area on Lot 57. Accessory parking for 40% of the non-Income Restricted Housing Units would be provided in a 10,000 square foot, below-grade parking facility to be accessed from 124th Street. Sixty-six spaces would be provided for the development's 165 market rate and workforce housing units. Under a With-Action Scenario, Lot 29 would remain as it currently exists, with 160 affordable housing units. Lot 57 would utilize the remaining FAR available from the underlying zoning district and apply it to the new development on the Lot. This would prevent Lot 29 from adding additional development within the LSRD and on their own Lot. The development on lot 17, as a relatively new development, is not considered "soft", and is expected to remain as it exists after being severed from the Ennis Francis LSRD.

2.8.1 Phase 1 Environmental Site Assessment Summary

The Proposed Action would effectuate development that would be limited to Lot 57 ("The Proposed Development Site") within the LSRD. Conditions at the Proposed Development Site resulting from previous and existing uses and those in surrounding areas were determined from a review of a Phase 1 Environmental Site Assessment (ESA) prepared by Equity Environmental Engineering, LLC (Equity) on November 29, 2017 (***See Appendix C***). The ESA was performed pursuant ASTM Standard E-1527-05. The purpose of the Phase I ESA was to evaluate the current and historical conditions of the project site in an effort to identify recognized environmental conditions (RECs) in connection with the Proposed Development Site referred to as the "Subject Property" in the Phase I ESA prepared by Equity.

Findings

Recognized Environmental Conditions (RECs) are defined as the presence or likely presence of any hazardous substances or petroleum products under conditions that indicate an existing release, past release or a material threat of a release into structures on the properties or into the ground, groundwater, or surface waters of the properties. Historic Recognized Environmental Conditions (HRECs) are RECs previously remediated to government standards. De minimis RECs are those that do not present a threat to health or the environment, and would not be the subject of an enforcement action by a government agency. Controlled Recognized Environmental Conditions (CRECs) are RECs that are under some form of institutional and/or engineering control. A Vapor Encroachment Condition (VEC) is the presence or likely presence of chemical of concern vapors in the subsurface of the target property caused by the release of vapors from contaminated soil and/or groundwater either on or near the target property. All RECs and VECs are discussed below.

Equity performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527-13 at the Subject Property. The Phase I ESA has revealed the following information in connection with the Subject Property:

- **RECs** – Equity observed mold and asbestos inside the building. In addition, the Sanborn Fire Insurance Maps revealed the presence of a Chemical Products facility onside from 1951 to 1980.

    - ***Asbestos-Containing Materials***
      Asbestos is the name for a group of naturally occurring silicate minerals that can be separated into fibers. The fibers are strong, durable, and resistant to heat and fire. They are also long, thin and flexible, so they can even be woven into cloth. Because of these qualities, asbestos has been used in thousands of consumer, industrial, maritime, automotive, scientific and building products. During the 20th century, some 30 million tons of asbestos have been used in industrial sites, homes, schools, shipyards and commercial buildings in the United States. Common ACMs include pipe-covering, insulating cement, insulating block, refactory and boiler insulation materials, transite board, fireproofing spray, joint compound, vinyl floor tile, ceiling tile, mastics, roofing products, and duct insulation for HVAC applications. Inhalation of asbestos fibers can result in deleterious health effects.

      Asbestos Containing Material (ACM) was observed wrapped around piping in the basement of the Subject Building.

- ***Microbial Contamination (Mold)***

  In accordance with the scope of work, the site reconnaissance is to include a visual inspection for indications of water intrusions or the presence of active mold growth on readily accessible interior and exterior surfaces. Confirmation sampling is not included in the scope of work for the Phase I ESA. Readily accessible areas of the building were observed for visual or olfactory indications of mold, and for areas of water damage.

  A heavy build-up of mold was observed on the door of one unit inside the Subject Building. Given the number of missing windows and the opportunity for stormwater to enter the building, it is likely that there is more mold onsite.

- **HRECs** - Equity found no HRECs associated with the property.
- **CRECs** - Equity found no CRECs associated with the property.
- **VECs** - Based on the evidence provided in the database report, specifically the presence of a historic onsite Chemical Products Facility, it is Equity's conclusion that a Vapor Encroachment Condition (VEC) cannot be ruled out.

Upon review of the Phase I ESA, DEP issued a letter dated October 2nd, 2018 concurring with the findings of the Phase I ESA and the (E) Designation language below. (***See Appendix B***). As indicated below, further hazardous materials assessments will be conducted through the Mayor's Office of Environmental Remediation (OER).

2.8.2 E-Designations

Based on Prior on-site and/or surrounding area land uses which could result in environmental contamination, an (E) designation will be placed on the zoning map pursuant to ZR Section 11-15 for the development site (Block 1929, Lot 57). The (E) designation E-521 will ensure that testing and mitigation will be provided, as necessary, before any future development and/or soil disturbance.

The text for (E) designation E-521 related to hazardous materials is as follows.

Block 1929, Lot 57

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

Based on the evidence presented in the Phase I ESA further investigation and, if necessary, remediation would be required to ensure that no impacts due to the presence of hazardous materials are anticipated. Because the proposed action would allow new development for residential and commercial use, no new activities or processes using hazardous materials would be introduced to the site or increase pathways to a hazardous materials exposure. Should any remediation be warranted, the applicant commits to perform the necessary mitigation in order to ensure that construction and occupancy of action-induced development does not result in significant adverse impacts related to hazardous materials. With the above measures in place, the Proposed Action would not have the potential for impacts related to hazardous materials.

2.9 Transportation

Pursuant to *CEQR Technical Manual* methodology, a transportation assessment may be necessary when a proposed action would alter the transportation network by closing, opening, or realigning an element of the transportation system such as a roadway, pedestrian way, or transit route, or if it would generate new trips on the transportation network. The objective of the transportation analyses is to determine whether a proposed project may have a potential significant impact on traffic operations and mobility, public transportation facilities and services, pedestrian elements and flow, safety of all roadway users (pedestrians, bicyclists and vehicles), on- and off-street parking, or goods movement.

Methodology

The *CEQR Technical Manual* states that if an analysis is warranted, a preliminary trip generation assessment should be prepared to determine whether a quantified analysis of any technical areas of the transportation system is necessary. Except in unusual circumstances, a further quantified analysis would typically not be needed for a technical area if the proposed development would result in fewer than the following increments:

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

The *CEQR Technical Manual* also states that if the threshold for traffic is surpassed, a parking assessment may also be warranted. This chapter assesses the potential for project-generated vehicle, transit, and pedestrian trips to affect the local transportation network, as well as an assessment of transportation safety in the study area.

Analysis

Description of the Affected Area

The Affected Area is located on Block 1929 (Lots 17, 29, and 57) in Harlem within Manhattan Community District 10. The combined lot area of the Affected Area/LSRD is 89,832 square feet and contains a total of 321,926 total gross square feet ("GSF") or 285,592 zoning square feet ("ZSF") of existing development. 318,726 GSF (282,392 ZSF) of the total floor area within the Affected Area is residential with 292 affordable dwelling units (*including 72 vacant dwelling units within the vacant residential building on Lot 57*) and 3,200 GSF of the total floor area is commercial. The Affected Area contains a total of 37 enclosed parking spaces (12,000 SF) and a combined FAR of 3.18. The underlying zoning in the Affected Area is split between R7A, R8, and R8/C2-4.

- ***Lot 17 (Residential Building):*** Lot 17 is located at 225 West 123rd Street and is improved with an 8-story (85'), 98,995 GSF (73,792 ZSF) building with 60 affordable dwelling units. The lot area is approximately 18,501 square feet. There are 37 enclosed accessory parking spaces provided on Lot 17, according to the latest certificate of occupancy. Lot 17 has a total FAR of 3.99 and is located within an underlying R7A zoning district.
- ***Lot 29 (Mixed-Use Building):*** Lot 29 is located at 2070 Adam Clayton Powell Jr. Blvd and is constructed with an 11-story (124') 146,780 GSF (143,908 ZSF) mixed-use building with 143,580 GSF (143,708 ZSF) of residential use (160 affordable dwelling units) and

3,200 GSF of ground floor commercial retail space fronting Adam Clayton Powell Jr. Blvd. The lot area is approximately 21,562 square feet. Lot 29 has a total FAR of 6.67 (6.52 residential FAR and 0.15 commercial FAR) and is located within an underlying R8/C2-4 district.

- ***Lot 57 (Vacant Residential Building "The Proposed Development Site"):*** The Development Site consists of Lot 57. Lot 57 is located at 206-254 West 124th Street. It has 493'-2" of frontage along West 124th Street, a narrow street as defined under the Zoning Resolution. The Development Site currently includes a vacant 3- story (29'-6"), 76,191 GSF (67,892 ZSF) residential building with 72 dwelling units on a 49,769-square foot lot. No parking is provided on the Development Site, which is located in the Transit Zone. Lot 57 has an FAR of 1.36 and is located entirely within an underlying R8 zoning district.

The Surrounding Area, and the Affected Area are located within a Transit Zone. The area is "transit-rich" with multiple subway and bus lines. The B/D line runs along St. Nicholas Avenue with entrances at 125th Street. Multiple bus lines run through the Surrounding Area with routes on Frederick Douglass Blvd., Adam Clayton Powell Jr. Blvd., and 125th Street. The M10 and M2 buses run north/south on Frederick Douglass Blvd. and Adam Clayton Powell Jr. Blvd. respectively. The M60, M100, M101 and BX15 run east/west along 125th Street with service within Manhattan and to the Bronx and Queens.

Future No-Action Scenario

Under a No-Action scenario, where the land development controls of the existing LSRD would govern the available bulk for possible redevelopment of any of the sites, Lot 29 and Lot 17 are assumed to remain consistent with existing conditions. The vacant building on Lot 57 could potentially be renovated and re-tenanted with existing unit count (72) in place. Although the current building is in poor condition, rehabilitation of the existing building is certainly feasible and would be more cost effective and practical than demolishing and rebuilding a similarly sized building allowed under the current LSRD restrictions.

Future With-Action Scenario

The With-Action scenario assumes development that maximizes allowable residential and overall (residential and community facility) development of the Development Site. Development of a 341,994 GSF mixed residential and community facility building of up to 20 stories (210 feet) could occur. The new building on Lot 57 would contain approximately 30,990 square feet of community facility space, assumed to be occupied by medical office use for the purposes of the transportation assessment. There would be a total of 339 new dwelling units, consisting of 203 units of affordable housing and 136 market rate units. Accessory parking for 40% of the non-Income Restricted Housing Units would be provided in a below-grade parking facility to be accessed from 124th Street. Sixty-six (66) spaces would be provided for the development's 166 combined market rate and workforce housing units. Lot 29 is expected to remain as it currently exists under the With-Action Scenario with 160 affordable units. Lot 17, a 73,792 ZSF building but in 2012 containing 60 units at 3.9 FAR, would be severed from the LSRD and governed by the underlying R7A zone. R7A allows a FAR of 4.0, as such, Lot 17 is 99% developed, is subject to the previously discussed regulatory agreement and would remain as it exists in the With-Action Scenario.

The Transportation Assessment below will consider the potential effects of the Proposed Action under a reasonable Worst-Case Development Scenario, compared to future conditions without the approvals sought by the project sponsor, as described above.

2.9.1 Preliminary Assessment

The Affected Area is located in CEQR traffic zone two (2). Pursuant to Table 16-1 of the *2014 CEQR Technical Manual*, a development that exceeds either 200 dwelling units or 25,000 square feet of additional local retail space would exceed the threshold for warranting further analysis of potential transportation impacts.

The Incremental Development, as assessed under the RWCDS, that could be effectuated by the Proposed Action is as follows:

Community Facility: +30,990 GSF
Residential Dwelling Units: +267 incremental new dwelling units

*Refer to **Table 2.9-1** below for the Incremental Development Scenario*

Table 2.9-1 Incremental Development Scenario[5]

	With-Action	No-Action	Increment
Residential	311,004 GSF	76,191 GSF	+234,813 GSF
Dwelling Units	339	72	+267
Community Facility	30,990 GSF	0	+30,990 GSF

2.9.2 Tier 1 Trip Generation Screening Assessment

The following Transportation Study assesses the incremental difference between the With-Action and the No-Action Scenarios, in order to determine the potential effects of the Proposed Action on traffic conditions. The analysis assesses conditions such as traffic flow, parking, pedestrian conditions, ingress, egress, and circulation. Data sources include field observations, information provided by the project sponsor, data gathered from the Institute of Transportation Engineers (ITE) manual, the 2014 CEQR Technical Manual, U.S. Census data, factors developed for recent environmental reviews, and other references as described below. These factors form the basis for the travel demand forecast (*Tier 1: Trip Generation Screening Assessment*) which analyzes peak hours and projected mode of travel, as well as person, pedestrian and vehicular trip-ends.

The trip generation analysis provides the estimated number of person trip-ends expected to be generated by the proposed project over the course of the entire day, as well as during the peak analysis hours. The classification of a proposed project's daily trip-ends by hour of the day is also referred to as its temporal distribution. Modal split refers to the travel modes likely to be used by persons going to and from the proposed project, including autos, taxis and delivery services, subways, buses, ferries, commuter rail, bicycles, and walking. These modes are considered in terms of percentages—i.e., what percent of the total number of people traveling to and from the site would travel by that particular mode. The modal split percentages are then applied to the hourly trip generation estimates to determine the number of persons traveling to and from the site by each mode for each of the analysis peak hours.

[5] Lot 17 would be removed from the LSRD under the Proposed Action, however this incremental analysis focuses strictly on development that would occur on the Proposed Development Site under With-Action and No-Action Conditions. Induced development within the Affected Area is limited to The Proposed Development Site.

All Trip Generation Planning Factors are described below and shown in Table 2.9-2. Tables 2.9-3, 2.9-4, and 2.9-5 show the estimated person-trips, pedestrian trips and vehicle-trips, respectively, during the weekday AM, Weekday midday, Weekday PM, and Saturday Midday Peak Hours.

Transportation Planning Factors:

Residential Assumptions

To assess the trip generation characteristics of the residential use that would occur under both with-action and no-action conditions, Chapter 16 of the 2014 *CEQR Technical Manual* was consulted. Per Table 16-2 of the CEQR Manual, trips for a Residential Land Use (3 or more floors) would be generated at an average rate of 8.075-person trips per dwelling unit on Weekdays, with 10% of trips occurring in the AM peak hour, 5% occurring during the Midday peak hour, and 11% of trips occurring in the PM peak hour. Per Table 16-2, an average of 9.6-person trips per dwelling unit could be anticipated on Saturdays, with 8% occurring during the Saturday peak hour. Because the *2014 CEQR Technical Manual* did not provide directional distribution, the *Institute of Transportation Engineers ("ITE") Trip Generation Manual, 9th Edition Volume 3 (p. 1730-1748). Per the ITE Trip Generation Manual,* directional distribution for a residential land use is as follows: 17% entering and 83% exiting during the AM peak hour, 40% entering and 60% exiting during the midday peak hour, 67% entering and 33% exiting during the PM peak hour, and 50% entering and existing, respectively during the Saturday Peak Hour. Per Table 16-2 of the CEQR Technical Manual, truck trips would be generated at an average of 0.06 per dwelling unit on weekdays and 0.02 per dwelling unit on Saturdays, with 12% occurring in the AM peak hour, 9% occurring during the midday peak hour, 2% occurring during the PM peak hour, 9% occurring during the Saturday peak hour, and a 50/50 directional distribution. The residential modal split was obtained from the U.S. Census Bureau 2012-2016 American Community Survey 5-year estimates Journey to Work Transportation Package Part 1 data for the subject Census Tract (222) and bounding census tracts (200, 220, 224, 257) in order to provide an adequate sample size (*see Figure 2.9-1 below*).

Community Facility (Medical Office) Assumptions

To assess the trip generation characteristics of the 30,990-gross square foot ground floor community facility space, as the space does not have a specified tenant, medical office assumptions were used. A trip generation rate of 103.4 daily person trips per 1,000 sf for weekdays and 62.1 daily person trips per 1,000 sf for Saturdays was obtained from New York City Department of Transportation (NYCDOT) data for medical office use, based 24-hour video survey data at 14 sites within five boroughs. This data also provided temporal distributions, vehicle occupancy, and modal split percentages for a medical office use in a Manhattan Transit Zone. Based on this data, 10% of trips occur during the AM peak hour, 13% occur during the Midday peak hour, 9% occur during the PM peak hour, and 16% occur during the Saturday peak hour. Directional distributions, truck trip generation factors, and taxi occupancy were obtained from the *East New York Rezoning Proposal FEIS (*CEQR Ref No. 15DCP102K). For medical office delivery tips, a trip generation rate of 0.29 daily trucks per 1,000 sf for weekdays and Saturdays and temporal distributions of 3 percent, 11 percent, 1 percent and 0 percent for the weekday AM, midday, PM and Saturday peak hours, respectively, were obtained from the *East New York Rezoning Proposal*.

Figure 2.9-1: Census Tract Study Area for Residential Modal Split Factors

Table 2.9-2: Transportation Planning Factors

Land Use:	Residential (No-Action)		Residential (With Action)		Community Facility-Medical Office (With Action)	
	Dwelling Units		Dwelling Units		Gross Square Feet	
Size:	72		339		30,990	
Trip Generation:	**(1)**		**(1)**		**(2)**	
Weekday	8.075		8.075		103.4	
Saturday	9.6		9.6		62.1	
	per dwelling unit		per dwelling unit		per 1,000 GSF	
Temporal Distribution:	**(1)**		**(1)**		**(2)**	
AM Peak Hour	10%		10%		10%	
MD Peak Hour	5%		5%		13%	
PM Peak Hour	11%		11%		9%	
Saturday Peak Hour	8%		8%		16%	
Modal Split:	**(3)**		**(3)**		**(2)**	
Auto	12%		12%		1%	
Taxi	1%		1%		5%	
Subway	66%		66%		60%	
Bus	6%		6%		5%	
Walk/Other	15%		15%		29%	
Total	100%		100%		100%	
Vehicle Occupancy:						
Auto	1.16	**(3)**	1.16	**(3)**	1.53	(**2**)
Taxi	1.2	**(4)**	1.2	**(4)**	1.20	**(4)**
Linked Trip Credit Taxi					25% inbound trips	
	(5)		**(5)**		**(4)**	
Directional Distribution	**In**	**Out**	**In**	**Out**	**In**	**Out**
(8-9) AM	0.17	0.83	0.17	0.83	0.89	0.11
(12N-1PM) Midday	0.40	0.60	0.40	0.60	0.51	0.49
(5-6) PM	0.67	0.33	0.67	0.33	0.48	0.52
Saturday Peak Hour	0.50	0.50	0.50	0.50	0.41	0.59
Truck Trips	**(1)**		**(1)**		**(4)**	
Daily Trip Generation	Weekday	0.06	Weekday	0.06	Weekday	0.29
	Saturday	0.02	Saturday	0.02	Saturday	0.29
	per DU		per DU		per 1,000 s.f.	
Temporal Distribution (Truck)						
AM Peak Hour	12.00%		12.00%		3%	
MD Peak Hour	9.00%		9.00%		11%	
PM Peak Hour	2.00%		2.00%		1%	
Sat Peak Hour	9.00%		9.00%		0%	
Directional Distribution (Truck)						
AM/MD/PM/Sat	50%	50%	50%	50%	50%	50%

Sources:
(1) 2014 CEQR Technical Manual, Table 16-2
(2) Per DOT survey data for medical office use (mode split from survey data for medical office in Manhattan Transit Zone)
(3) U.S. Census Bureau, American Community Survey 2012-2016- Census Transportation Planning Package (CTPP) Journey to Work for subject census tract and all bounding census tracts
(4) East New York Rezoning Proposal FEIS (CEQR Ref. No. 15DCP102K)
(5) Directional Distribution Assumptions for Residential from the Institute of Traffic Engineers (ITE) Trip Generation Manual 9th Edition Volume 3 (P. 1730-1748)

Table 2.9-3: Estimated Person Trips

Land Use:	Residential (No-Action)		Residential (With Action)		Community Facility-Medical Office (With Action)		Project Increment		
	Dwelling Units		Dwelling Units		Gross Square Feet				
Size:	72		339		30,990				
Weekday Daily Person Trips	581		2,737		3,204		5,360		Net Weekday Daily Trips
Saturday Daily Person Trips	691		3,254		1,924		4,488		Net Saturday Daily Trips
Net Peak Hour Trips									
AM Peak Hour	58		274		320		536		
Midday Peak Hour	29		137		417		524		
PM Peak Hour	64		301		288		526		
Saturday Peak Hour	55		260		308		513		
Person Trips:									
AM Peak Hour	***Inbound***	***Outbound***	***Inbound***	***Outbound***	***Inbound***	***Outbound***	***Increment Inbound***	***Increment Outbound***	***Total AM Peak Hour Incremental Person Trips***
Auto	1	6	6	27	3	0	7	22	29
Taxi	0	0	0	2	14	2	15	4	18
Subway	7	32	31	150	171	21	195	139	335
Bus	1	3	3	14	14	2	16	12	29
Walk	1	7	7	34	83	10	88	37	125
Total	10	48	47	227	285	35	322	214	536
Midday Peak Hour	***Inbound***	***Outbound***	***Inbound***	***Outbound***	***Inbound***	***Outbound***	***Increment Inbound***	***Increment Outbound***	***Total Midday Peak Hour Increment***
Auto	1	2	7	10	2	2	7	10	17
Taxi	0	0	1	1	11	10	11	11	22
Subway	8	12	36	54	127	122	156	165	321
Bus	1	1	3	5	11	10	13	14	27
Walk	2	3	8	11	62	59	68	69	137
Total	12	17	55	82	212	204	256	269	524
PM Peak Hour	***Inbound***	***Outbound***	***Inbound***	***Outbound***	***Inbound***	***Outbound***	***Inbound***	***Outbound***	***Total PM Peak Hour Increment***
Auto	5	2	24	12	1	1	20	11	31
Taxi	0	0	2	1	7	7	9	8	17
Subway	28	14	133	66	83	90	188	142	330
Bus	3	1	12	6	7	7	16	12	29
Walk	2	3	30	15	40	43	64	55	119
Total	43	21	202	99	138	150	297	228	526
Saturday Peak Hour	***Inbound***	***Outbound***	***Inbound***	***Outbound***	***Inbound***	***Outbound***	***Increment Inbound***	***Increment Outbound***	***Total Saturday Peak Hour Increment***
Auto	3	3	16	16	1	2	14	14	28
Taxi	0	0	1	1	6	9	7	10	17
Subway	18	18	86	86	76	109	143	177	320
Bus	2	2	8	8	6	9	12	15	28
Walk	4	4	20	20	37	53	52	68	120
Total	28	28	130	130	126	182	229	284	513

Sources: Table 2.9-2

Table 2.9-4: Estimated Pedestrian Trips

Land Use:	Residential (No-Action)		Residential (With Action)		Community Facility-Medical Office (With Action)		Project Increment		
	Dwelling Units		Dwelling Units		Gross Square Feet				
Size:	72		339		30,990				
Pedestrian Trips:									
AM Peak Hour	***Inbound***	***Outbound***	***Inbound***	***Outbound***	***Inbound***	***Outbound***	***Increment Inbound***	***Increment Outbound***	***Total AM Peak Hour Incremental Person Trips***
Subway	7	32	31	150	171	21	195	139	335
Bus	1	3	3	14	14	2	16	12	29
Walk	1	7	7	34	83	10	88	37	125
Total	9	42	41	198	268	33	299	188	**489**
Midday Peak Hour	***Inbound***	***Outbound***	***Inbound***	***Outbound***	***Inbound***	***Outbound***	***Increment Inbound***	***Increment Outbound***	***Total Midday Peak Hour Increment***
Subway	8	12	36	54	127	122	156	165	321
Bus	1	1	3	5	11	10	13	14	27
Walk	2	3	8	12	62	59	68	69	137
Total	10	15	48	71	200	192	237	248	485
PM Peak Hour	***Inbound***	***Outbound***	***Inbound***	***Outbound***	***Inbound***	***Outbound***	***Inbound***	***Outbound***	***Total PM Peak Hour Increment***
Subway	28	14	133	66	83	90	188	142	330
Bus	3	1	12	6	7	7	16	12	29
Walk	6	3	30	15	40	43	64	55	119
Total	37	18	176	86	130	141	268	209	477
Saturday Peak Hour	***Inbound***	***Outbound***	***Inbound***	***Outbound***	***Inbound***	***Outbound***	***Increment Inbound***	***Increment Outbound***	***Total Saturday Peak Hour Increment***
Subway	18	18	86	86	76	109	143	177	320
Bus	2	2	8	8	6	9	12	15	28
Walk	4	4	20	20	37	53	52	68	120
Total	24	24	113	113	119	171	208	260	468

Sources: Table 2.9-2 & Table 2.9-3
***Note numbers rounded to the nearest whole number**

Table 2.9-5: Estimated Vehicular Trips

-	*No-Action*		*With Action*				*Project Increment*		
Vehicular Trips	*Residential*		*Residential*		*Medical Office*				
AM Peak Hour	*Inbound*	*Outbound*	Inbound	Outbound	Inbound	Outbound	Inbound Increment	Outbound Increment	Total
Auto (Total)	1	5	5	24	2	0	6	19	**25**
Taxi	0	0	0	2	10	1	10	3	**13**
Taxi Balanced	0	0	2	2	10	10	12	12	**24**
Truck	0	0	1	1	0	0	1	1	**2**
Total	**1**	**6**	**8**	**27**	**12**	**10**	**19**	**32**	**51**
Midday Peak Hour	*Inbound*	*Outbound*	Inbound	Outbound	Inbound	Outbound	Inbound Increment	Outbound Increment	Total
Auto (Total)	1	0	6	8	1	1	6	9	**15**
Taxi	0	0	1	1	7	7	8	7	**15**
Taxi Balanced	0	0	2	2	12	12	14	14	**28**
Truck	0	0	1	1	0	0	1	1	**2**
Total	**1**	**0**	**9**	**11**	**13**	**13**	**21**	**25**	**46**
PM Peak Hour	*Inbound*	*Outbound*	*Inbound*	*Outbound*	*Inbound*	*Outbound*	*Inbound Increment*	*Outbound Increment*	Total
Auto (Total)	4	2	21	10	1	1	18	9	**28**
Taxi	0	0	2	1	5	5	6	6	**12**
Taxi Balanced	0	0	3	3	9	9	12	12	**24**
Truck	0	0	0	0	0	0	0	0	**0**
Total	**4**	**2**	**24**	**13**	**10**	**10**	**31**	**21**	**52**
Saturday Peak Hour	*Inbound*	*Outbound*	*Inbound*	*Outbound*	*Inbound*	*Outbound*	*Inbound Increment*	*Outbound Increment*	Total
Auto (Total)	3	3	13	13	1	1	11	11	**22**
Taxi	0	0	1	1	4	6	5	7	**11**
Taxi Balanced	0	0	2	2	9	9	11	11	**22**
Truck	0	0	0	0	0	0	0	0	**0**
Total	**3**	**3**	**16**	**16**	**10**	**10**	**22**	**22**	**44**

Source: Table 2.9-2 and 2.9-3
Note:
***A linked trip credit of 25% applied to inbound taxi trips for medical office**
***Numbers rounded to the nearest whole number**

Tier 1: Trip Generation Assessment Conclusion

As further discussed below, the following Peak Hours (*Identified in grey in Table 2.9-6*) exceed the applicable thresholds for a Tier 1: Trip Generation Assessment and warrant further analysis (*Tier 2: Project Generated Trip Assignment*):

Table 2.9-6: Tier 1: Trip Generation Findings

Peak Hour	*AM Peak Hour*	*Midday Peak Hour*	*PM Peak Hour*	*Saturday Peak Hour*
Total Walk Only Trip-Ends	125	137	119	120
Total Subway Trip-Ends	335	321	330	320
Subway Threshold	**200**	**200**	**200**	**200**
Total MTA Bus Trip-Ends	29	27	29	28
MTA Bus Threshold	**200**	**200**	**200**	**200**
Total Pedestrian Trip-Ends	**489**	**485**	**477**	**468**
Pedestrian Threshold	**200**	**200**	**200**	**200**
Vehicular Trip-Ends	51	46	52	44
Vehicular Threshold	**50**	**50**	**50**	**50**

Tier 1: Vehicular Trip Generation Threshold

The preliminary screening thresholds in the March 2014 CEQR Technical Manual suggest that any project which generates 50 or more peak hour incremental vehicle trip-ends is likely to warrant a Tier 2: Vehicular Assignment to the Local Network. Conversely, projects that are anticipated to generate fewer than 50 peak hour incremental vehicle trip-ends do not warrant detailed traffic assessments, and potential traffic impacts are not expected.

As indicated in *Table 2.9-6* above, the Proposed Action would result in greater 50 peak hour incremental project-generated vehicular trip-ends during the AM and PM peak hours. Therefore, a *Tier 2: Vehicular Trip Assignment* is warranted for the peak hours in which exceedances are projected (*See Section 2.9.3 below*).

Tier 1: Pedestrian Trip Generation Threshold

The March 2014 CEQR Technical Manual indicates that a Tier 2: Pedestrian Trip Assignment to the Local Network Assessment be performed for projects that are likely to generate 200 or more incremental pedestrian trips during any peak hour. Additionally, the March 2014 CEQR Technical Manual suggests that a detailed pedestrian analysis be performed for projects that are likely to generate 200 or more incremental pedestrian trips during any peak hour on any one pedestrian element (i.e., a crosswalk, street corner, or sidewalk) based on the results of the Tier 2: Pedestrian Trip Assignment.

As shown in *Table 2.9-4 above*, the proposed project is projected to generate greater than 200 combined (*i.e., the combined total of subway, bus, and walk trips*) incremental project-generated pedestrian trips-ends during the Weekday AM (*489 total pedestrian trip-ends*),

Weekday Midday (*485 pedestrian trip-ends*), Weekday PM (*477 pedestrian trip-ends*), and Saturday Midday (*468 pedestrian trip-ends*) peak hour, respectively. Therefore, the Tier *2: Pedestrian Trip Assignment Assessment* is warranted

Tier 1: Transit Trip Generation Threshold

Pursuant to Section 313.2 of the 2014 CEQR Technical Manual, according to general thresholds used by MTA agencies, if the proposed project is projected to result in fewer than 200 peak hour subway/rail or bus transit riders, further transit analyses are not typically required as the proposed project is considered unlikely to create a significant transit impact.

Based on The *Tier 1: Trip Generation Screening Assessment*, the Proposed Action exceeds the applicable 200 transit trip-ends during all identified peak hours for Subway trips. A total of 335, 321, 330 and 320 subway trip-ends are anticipated during the AM, Midday, PM, and Saturday Peak Hours, respectively. Therefore, the Tier *2: Pedestrian Trip Assignment* will include an assessment of project-generated transit trips to determine whether the Proposed Action has the potential to impact the capacity of any specific Subway Lines, Stations, Platforms or entry points.

2.9.3 Tier 2 Vehicular Assignment to the Local Network

The Proposed Action is projected to result in 51 incremental vehicular trip-ends (*19 inbound and 32 outbound trips*) during the AM peak hour and 52 incremental vehicular trip-ends (*31 inbound and 21 outbound)* during the PM peak hour.

The preliminary screening thresholds in the March 2014 CEQR Technical Manual suggest that any project which generates 50 or more peak hour incremental vehicle trip-ends through a single intersection in any given peak hour is likely to warrant a detailed traffic operations analysis. Conversely, projects that are anticipated to generate fewer than 50 peak hour incremental vehicle trip-ends through a single intersection generally do not warrant detailed traffic assessments, and potential traffic impacts are not expected

As shown below in Figures 2.9-2 and 2.9-3, based on the Tier 2 Vehicular Assignment, no one intersection is anticipated to result in greater than 50 vehicular trips. Therefore, no further analysis of vehicular impacts is warranted.

Figure 2.9-2 Tier 2 AM Vehicular Trip Assignment

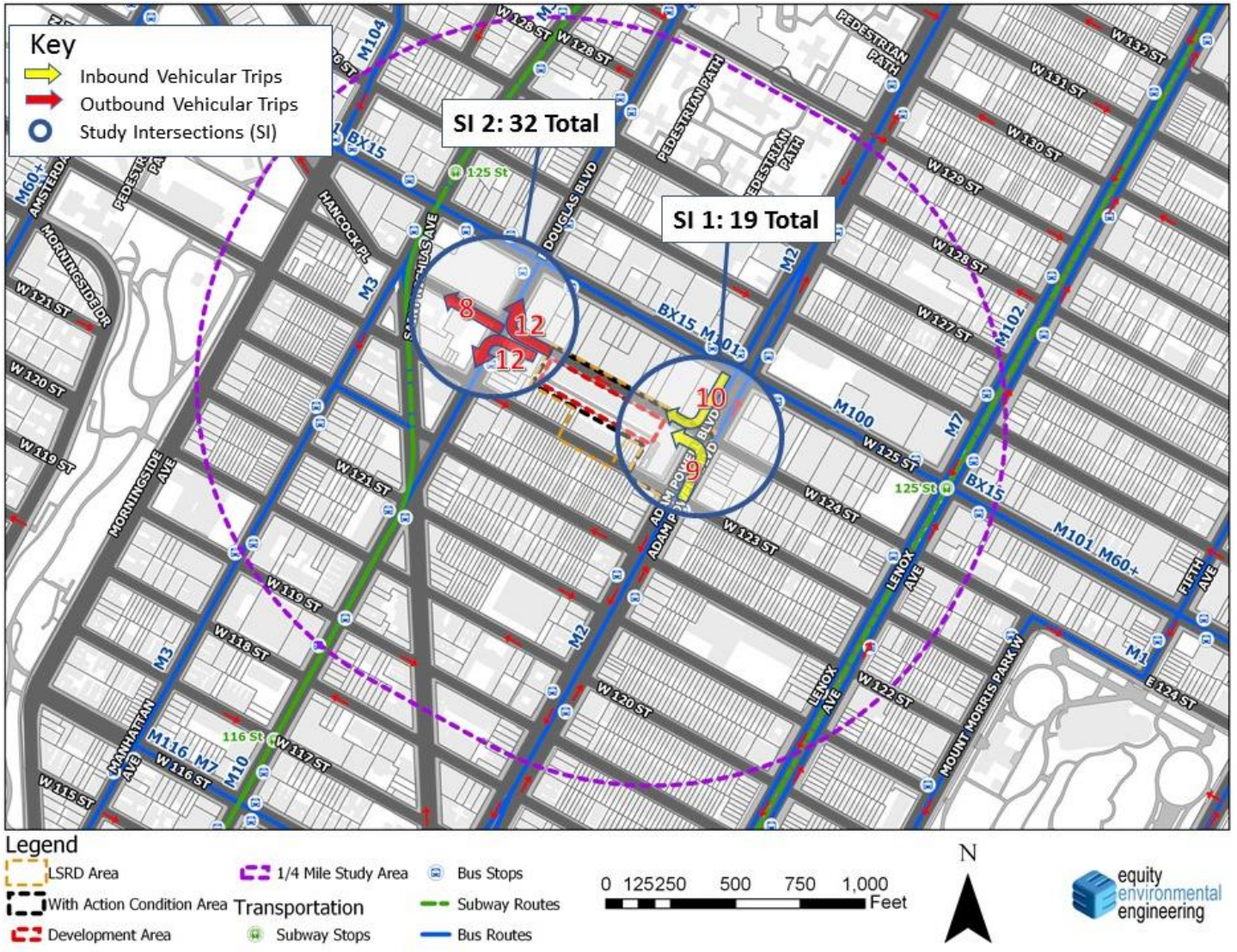
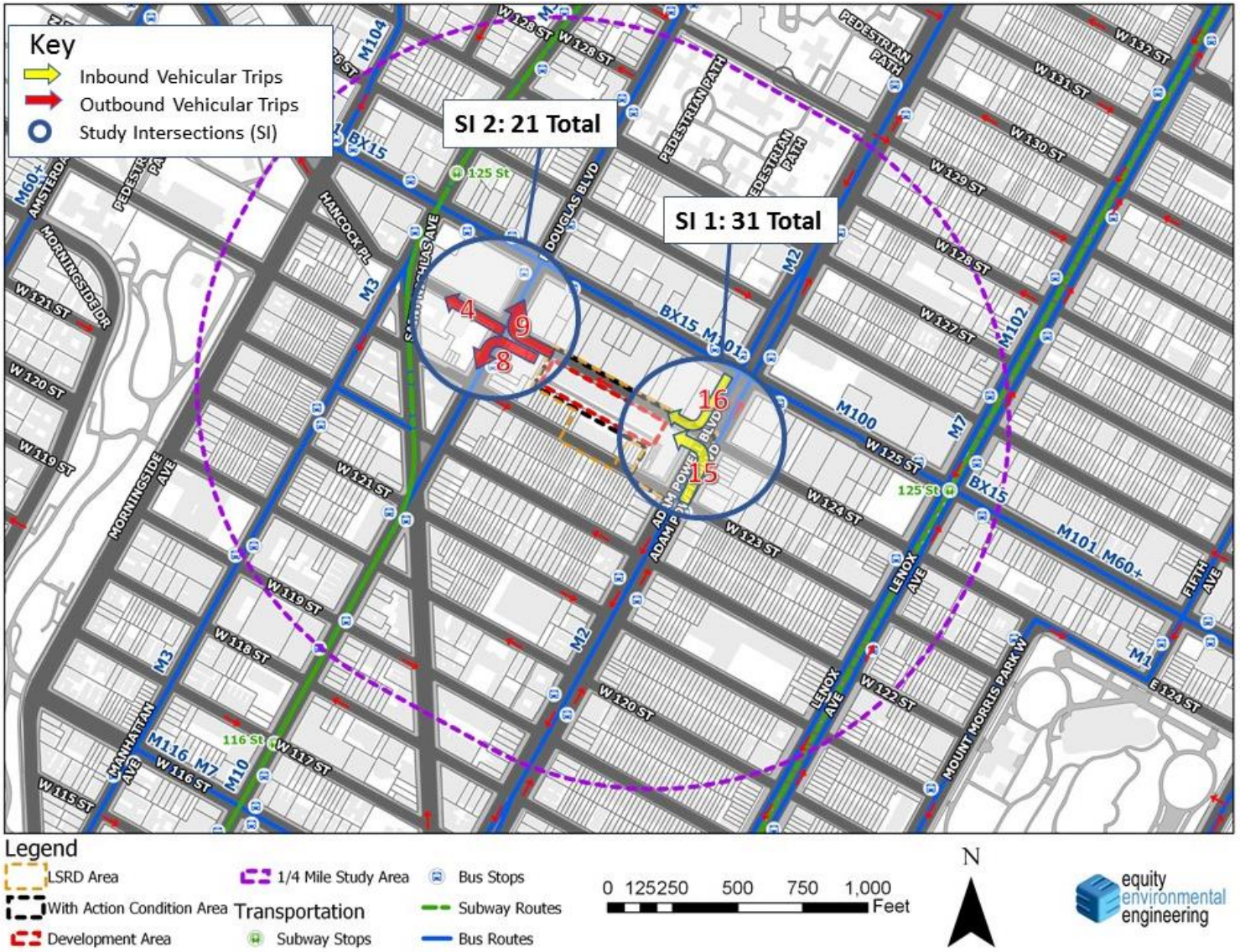


Figure 2.9-3 Tier 2 PM Vehicular Trip Assignment



2.9.4 Tier 2 Pedestrian Assignment to the Local Network

Pursuant to Section 320 of the CEQR Technical Manual, when a proposed project exceeds 50 peak hour vehicle trip-ends, or 200 peak hour pedestrian or transit trips as determined by the Tier 1 Trip Generation Screening Assessment, a Tier 2 Project Generated Trip Assignment should be prepared where exceedances are projected to determine whether a detailed assessment of any technical areas is warranted.

Because the Proposed Action is projected to generate a higher number of trips during the weekday peak hours than during the Saturday midday peak hour, the weekday is assumed to represent a reasonable worst-case scenario for project-generated pedestrian trip-ends. Therefore, further detailed analysis focusses on operations during the weekday AM, Midday, and PM peak hours under existing conditions, Future No-Action conditions, and Future With-Action conditions. The following assumptions were made for the trip distribution patterns for pedestrians traveling within the identified Study Area to and from the proposed development site:

Tier 2 Pedestrian Trip Distribution and Trip Assignment Assumptions

Study Area
A quarter-mile study area, which represents a five-minute walk from the point of origin to the point of destination or secondary transfer point (i.e., bus stop or subway station) is identified in *Figure 2.9-4* below.

Residential Tier 2 Assumptions
In order to identify destination points for the proposed residential pedestrian trips, U.S. Census Bureau American Community Survey 2006-2010 Census Transportation Planning Package Part 3 Journey to Work (JTW) data was reviewed for Census Tract 222 (the subject census tract). The JTW data indicated the following commuting flows for the subject census tract:

- Queens - 5%
- Brooklyn - 6%
- The Bronx - 8%
- Manhattan - 81%

Of the 81% of residents who commute to Manhattan from Census Tract 222, 62% commute to the south, 7% commute to the north, 2% commute to the east, 16% commute to the west, and 13% commute within the subject census tract.

Medical Office Tier 2 Assumptions
For the Medical Office Component, pedestrian trips were assumed to be evenly dispersed between the bounding intersections of the Affected Area (East 124th Street and Adam Clayton Powell Jr. Blvd & East 124th Street and Frederick Douglass Boulevard). Transit Trips from the medical office component were assigned to the subway stations and bus stops identified below, based on the Tier 1 Screening Assessment findings. Walk Only trips were not assigned beyond the boundaries of the identified ¼ mile study area and were anticipated to be concentrated within areas where residential development is the predominant land use.

Subway Lines/Stations
The Transportation Study Area is located within a Transit Zone that is well served by transit resources. Based on the Tier 1 Trip Generation Assessment, the majority of pedestrian trip-ends

are composed of secondary walking trips to and from Subway access points, as identified below. *As shown below in Figures 2.9-4 and 2.9-5, there are two subway stations within the Study Area:*

> **125 St Subway Station (Saint Nicholas Avenue):** 125th Street is an express station on the IND Eighth Avenue Line located at the intersection of 125th Street and St. Nicholas Avenue to the west of the Affected Area. It is served by the A and D trains at all times, by the C train at all times except late nights, and by the B train on weekdays. This ADA-accessible station contains elevators near the middle of the platforms. The station has a mezzanine above the tracks at the Southern end and platforms that connect both fare control areas at either ends. There are five staircases to each platform.
>
> **125 St. Subway Station (IRT Lenox Avenue Line):** 125th Street is a station on the IRT Lenox Avenue Line and located at the intersection of 125th Street and Lenox Avenue, to the east of the Affected Area. It is served by the 2 and 3 trains at all times. This underground station has two side platforms and two tracks. The is no crossover or cross under between platforms. The northbound platform serves the 2 train toward Wakefield-241st Street and the 3 train toward Harlem-148th Street. The Southbound platform serves the 2 train toward Flatbush Avenue-Brooklyn College and the 3 train toward New Lots Avenue (Time square late nights). The west side of the intersection has two access points, which provide downtown (southbound platform) access. The east side of this intersection has two access points which provide uptown (northbound) access.

Both subway stations within the study area offer service to downtown, midtown and Brooklyn (the destination points that are most traveled based on census data journey flows). Therefore, 50% of subway derived pedestrian trips-ends are assumed to arrive from and depart to the 125th Street IRT Lenox Avenue Station. Similarly, 50% are assumed to arrive from and depart to the 125th Street Station. Because the 125th Street Saint Nicholas Station has five access points with mezzanine crossover, trips would be concentrated to the east side of the intersection.

The 125th Street IRT Lenox Avenue Station provides downtown (southbound access) on the west side of the intersection, where the majority (approximately 90%) of AM subway trips for the residential component would occur based on the census data commuting flows. During the PM peak hour, subway trips from this station for the residential component would be derived from the east side of the intersection. The residential trips projected during the Midday and Saturday, and the Medical Office Trips projected at this station are assumed to be evenly dispersed between the eastern and western side of the intersection.

Bus Lines/Bus Stops

The Surrounding Area, and the Affected Area are located within a Transit Zone. The area is “transit-rich” and is served by multiple bus lines. Multiple bus lines run through the Surrounding Area with routes on Frederick Douglass Blvd., Adam Clayton Powell Jr. Blvd., and 125th Street. The B/D line runs along St. Nicholas Avenue with entrances at 125th Street. The M10 and M2 buses run north/south on Frederick Douglass Blvd. and Adam Clayton Powell Jr. Blvd. respectively. The M60, M100, M101, and BX15 run east/west along 125th Street with service within Manhattan and to the Bronx and Queens.

For the purposes of this Assessment, MTA bus trips were assumed to be evenly dispersed to the between the bounding bus stops for the bus lines discussed above and shown in *Figure 2.9-4* below.

Figure 2.9-4 Transportation Study Area

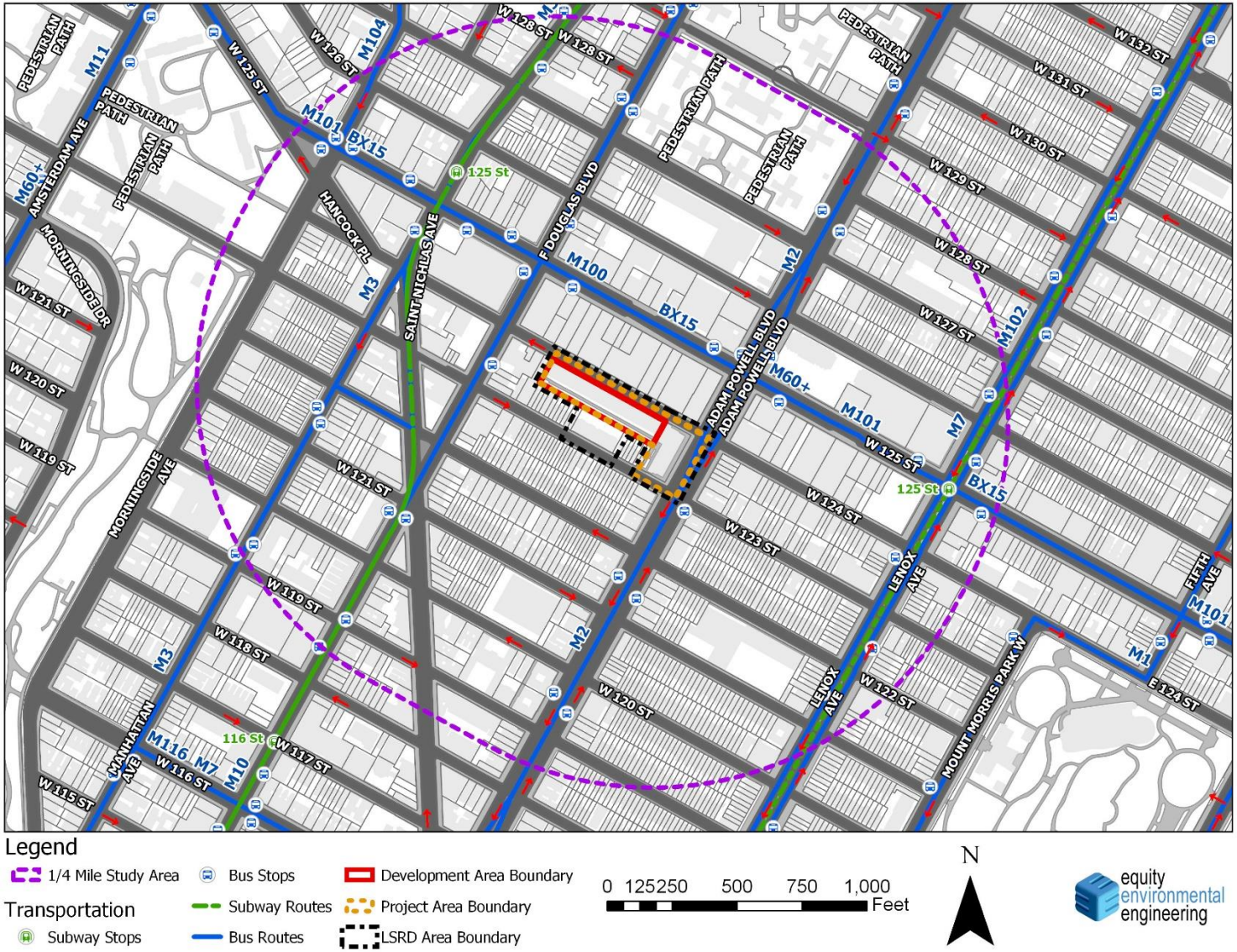


Figure 2.9-5 NYC Subway Map

Figure 2.9-6: Tier 2 AM Pedestrian Trip Assignment

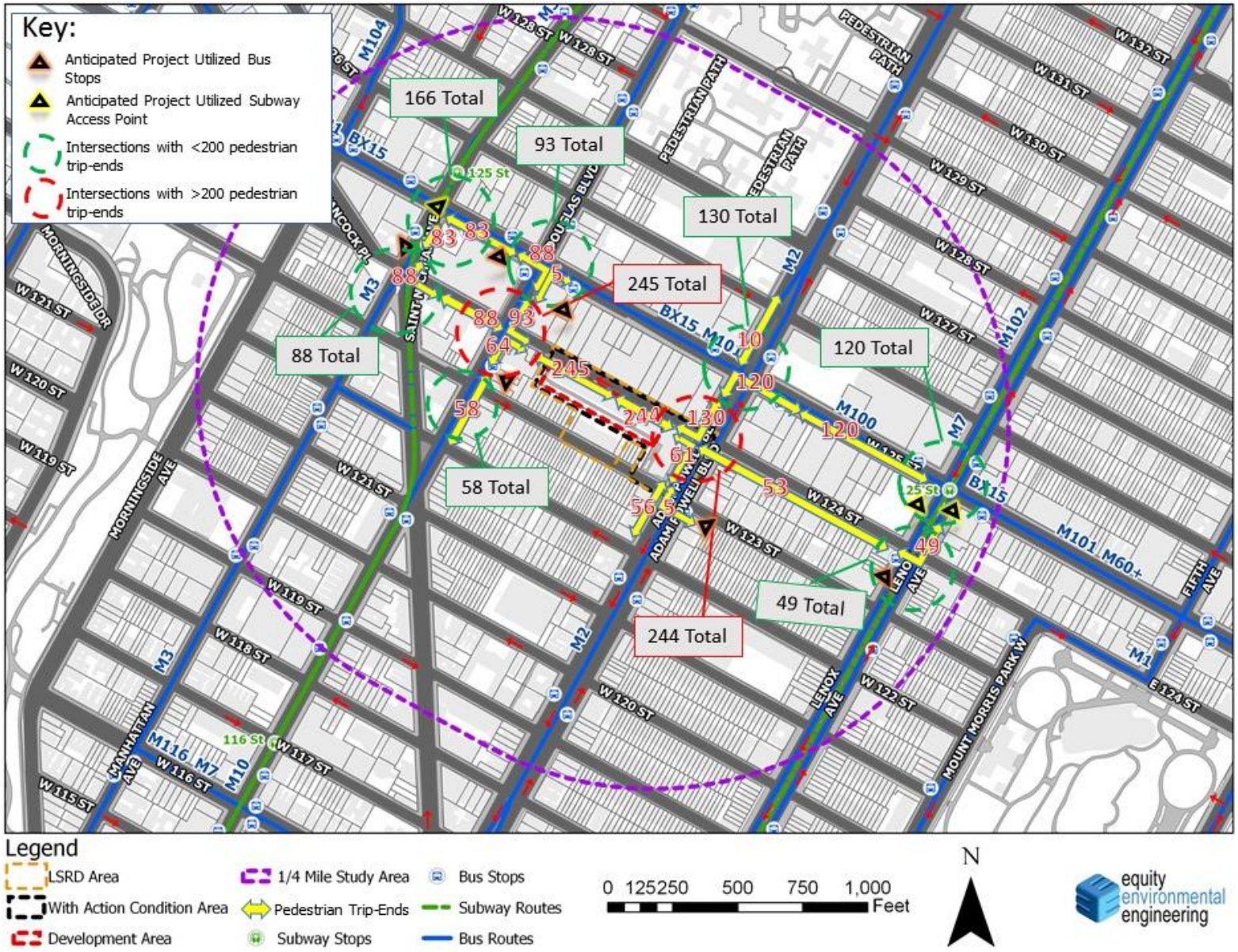


Figure 2.9-7: Tier 2 Midday Pedestrian Trip Assignment

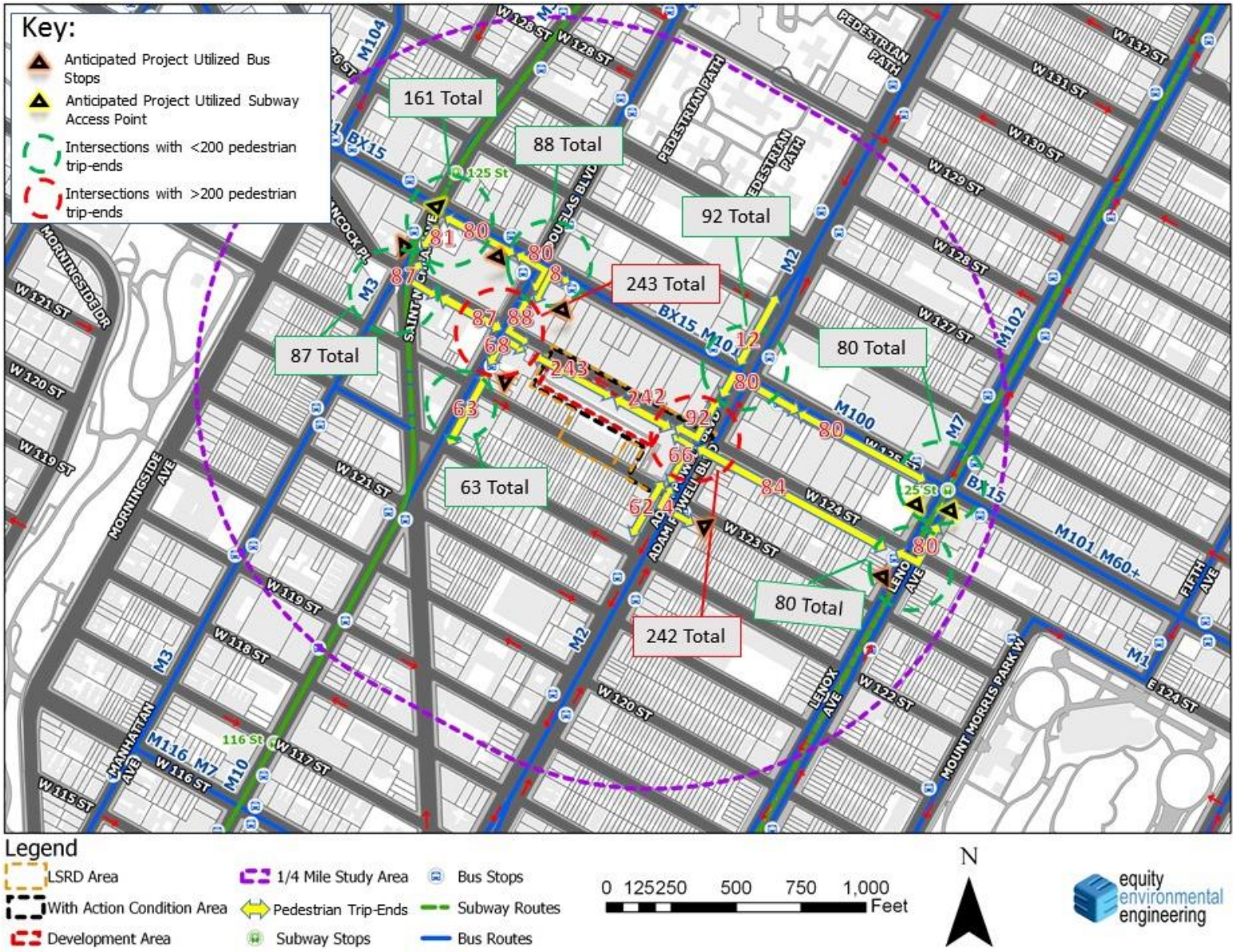


Figure 2.9-8: Tier 2 PM Pedestrian Trip Assignment

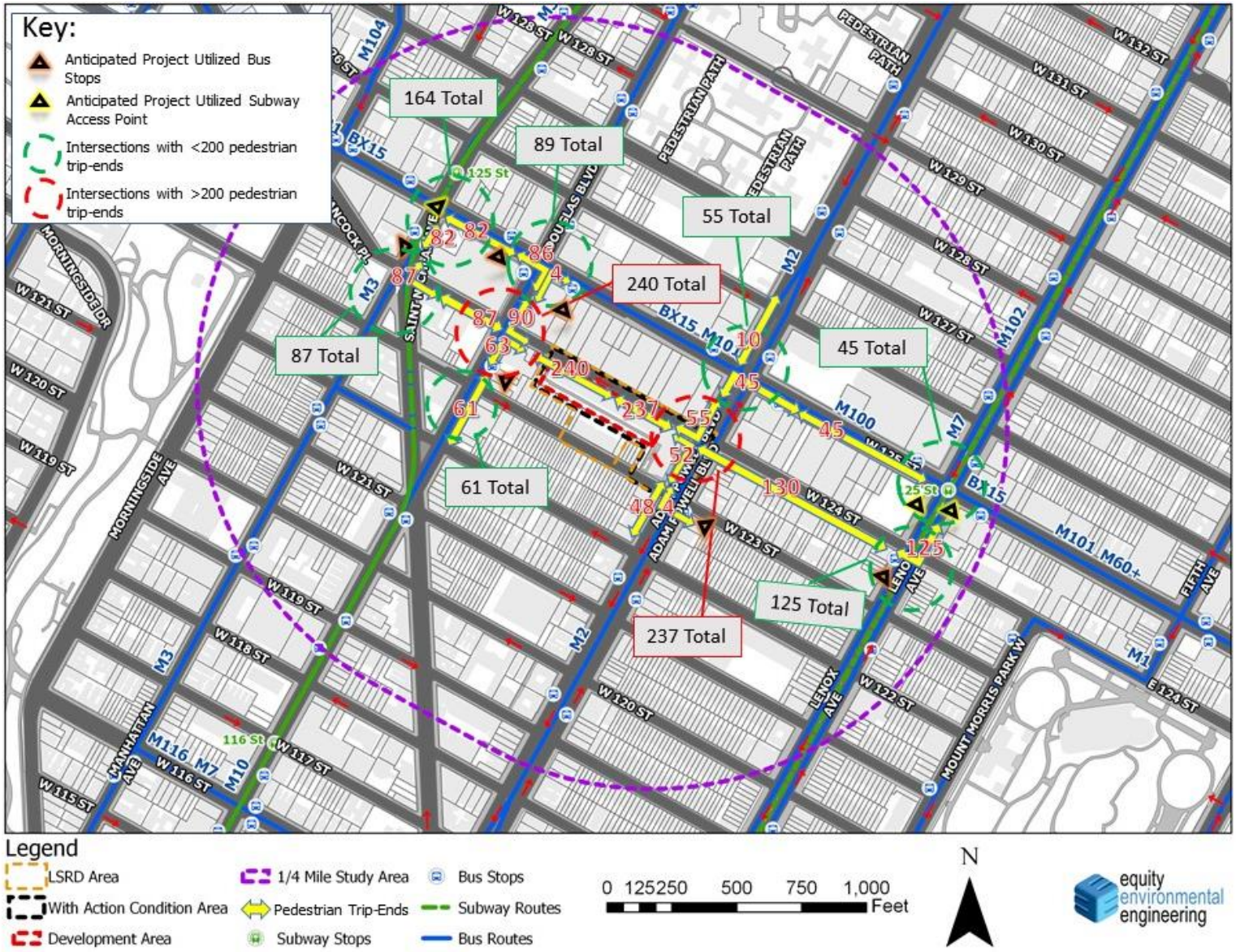
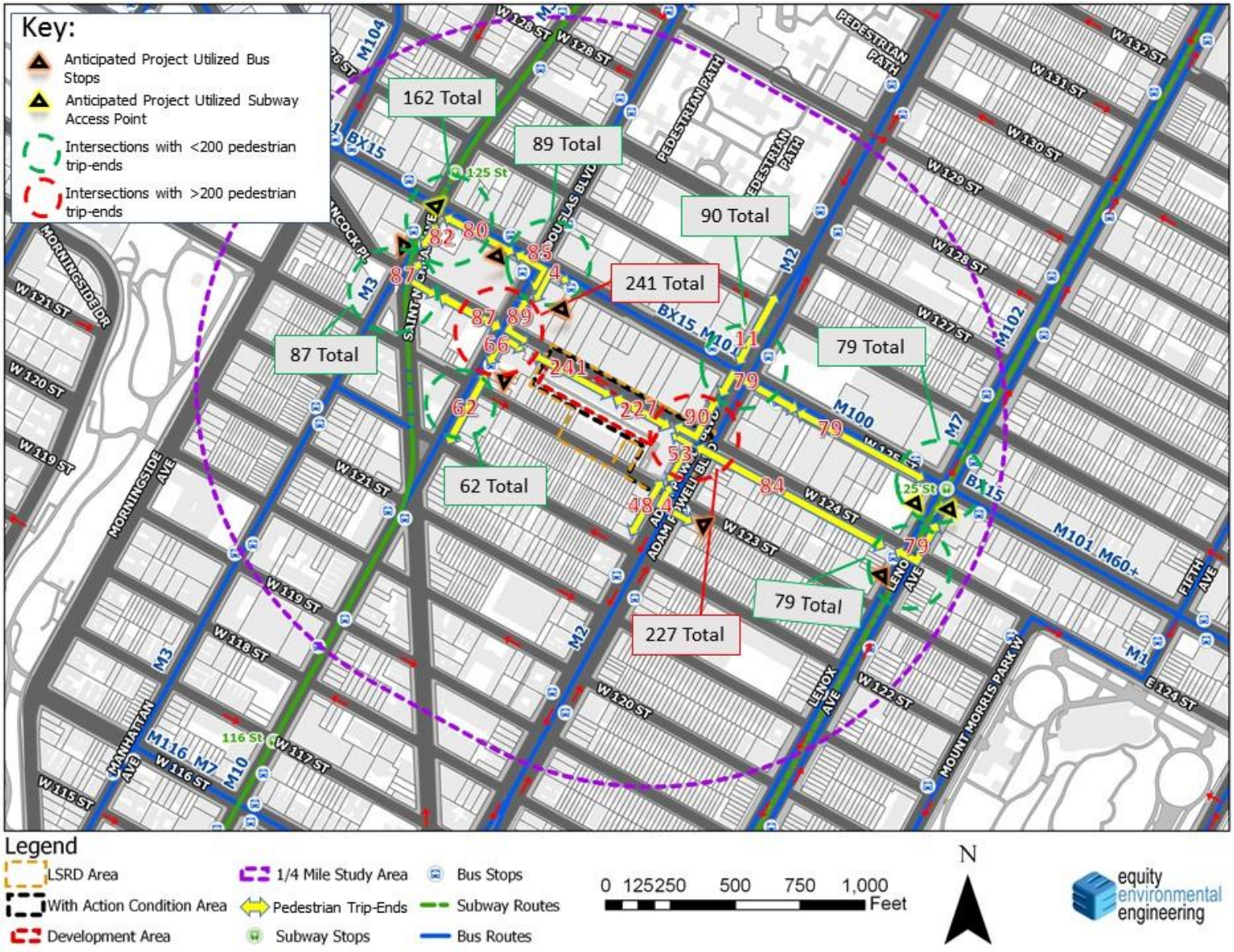


Figure 2.9-9: Tier 2 Saturday Pedestrian Trip Assignment



Tier 2: Pedestrian Assignment Findings

As indicated above in *Figures 2.9-6 – 2.9-9*, the following two study intersections are likely to experience greater than 200 peak hour pedestrian trip-ends pursuant to the Proposed Action:

Study Intersection 1: West 124th Street and Adam Clayton Powell Jr. Blvd.
Located to the east of the Affected Area, this intersection is a four-way fully signalized intersection with enhanced pedestrian crosswalks and pedestrian crossing signals controlling all four legs. West 124th Street is a one-way, single-lane, eastbound road. Adam Clayton Powell Jr. Blvd. is a two-way north and southbound road. Three (3) southbound and three (3) north-bound lanes are provided for vehicles on the northern portion of this street segment. Two (2) south-bound and two (2) northbound lanes are provided for vehicles on the southern portion of this street segment. A vegetated median separates the northbound and southbound portions of Adam Clayton Powell Jr. Boulevard and islands for pedestrian crossings are provisioned on the northern and southern legs of the intersection.

A total of 244, 242, 237, and 227 pedestrian trip-ends are projected at this intersection during the AM, Midday, PM, and Saturday Peak Hour, respectively. As greater than 200 pedestrian trip-ends are projected at this study intersection for all identified peak hours, a Tier 3 Pedestrian Level of Service was conducted during the worst-case Weekday AM, Midday, and PM peak hours, as further described below.

Study Intersection 2: West 124th Street and Frederick Douglass Blvd.
Located to the west of the Affected Area, this intersection is a four-way signalized intersection with enhanced pedestrian pavement markings and pedestrian crossing signals controlling all four legs. Fredrick Douglass Boulevard is a two-way northbound and southbound road divided by a vegetated traffic median. Two lanes are provided on this street segment for the north and southbound vehicles, respectively. A pedestrian island is provisioned for the pedestrian crossings on the northern and southern legs of this intersection.

A total of 245, 243, 240, and 241 pedestrian trip-ends are projected at this intersection during the AM, Midday, PM, and Saturday Peak Hour, respectively. Pursuant to the 2014 CEQR Technical Manual, this is above the 200 pedestrian-trip end threshold for all identified peak study hours. Accordingly, a Tier 3 Pedestrian Level of Service was conducted during the worst-case Weekday AM, Midday, and PM peak hours, as further described below.

Based on the *Tier 2 Pedestrian Assignment*, the Proposed Action would not result in greater than 200 pedestrian trip-ends to any one specific Subway Line, Station, Platform or entry point. Therefore, no impact to subway capacity is anticipated as a result of the Proposed Action. *The Tier 3 Pedestrian Level of Service Assessment* focuses solely on the existing and With-Action capacity of the individual and constituent pedestrian elements of the two study intersections listed above.

2.9.5 Tier 3 Pedestrian Level of Service Assessment

Field counts of pedestrian volumes on all sidewalks, crosswalks, and corners at the two study intersections listed above were conducted on June 14, 2018 during the Weekday AM (7:30 am to 8:30 am), Midday (12:00 pm -1:00 pm) and PM (4:30 pm – 5:30 pm) peak periods. Based on the peak period pedestrian counts, the weekday AM, Midday, and PM peak hours for pedestrian activity at each intersection was determined. Counts of vehicles making conflicting turning

movements through each of the crosswalks during each of the three analysis peak periods were also recorded and included in the analysis. The physical characteristics of all pedestrian elements at each study intersection were inventoried in the field. The inventory included:

- Crosswalk locations, types (standard crosswalks or high-visibility "enhanced" crosswalks), widths, and lengths;
- Sidewalk locations and widths,
- Curb return radii;
- Locations and dimensions of street appurtenances along the sidewalks and on corners (which constitute obstacles to the unimpeded flow of pedestrians); and
- Traffic and Pedestrian Crossing signal timing.

Pedestrian LOS Analysis Methodology

The analysis of pedestrian flow involves quantifying the comfort level for pedestrians walking along the sidewalks, waiting to cross the street at intersection corners, and traversing through intersection crosswalks. The LOS for these elements is calculated using the physical and operational parameters at the intersection including the pedestrian flow rates, the lengths and widths (i.e., area) of the crosswalks, the effective widths of the sidewalks, the area of each street corner, conflicting vehicular traffic volumes making turning movements through the crosswalks, and the signal timing at the intersection. Crosswalk, street corner, and sidewalk operations were analyzed using the methodologies described in the CEQR Technical Manual and were conducted using NYCDOT's pedestrian analysis Excel Spreadsheet (*Provided for Existing, No-Action and With-Action Conditions in* ***Appendix D***).

The crosswalk and street corner LOS methodologies are based on pedestrian density, as expressed in units of "square feet of space per pedestrian" (feet^2/ped), during the peak 15-minute period of the peak hour. A pedestrian walking speed of 3.5 feet/second was used in the analysis. The LOS ranges for crosswalks and street corners are as shown below in **Table 2.9-7**.

Table 2.9-7: LOS Criteria for Crosswalks and Street Corners

LOS	Square Feet of Space per Pedestrian (feet^2/ped)
A	> 60
B	> 40 to 60
C	> 24 to 40
D	> 15 to 24
E	> 8 to 15
F	≤ 8

Source: Adapted from March 2014 *CEQR Technical Manual*, Table 16-10, page 16-48.

The LOS methodology for sidewalks is also based on pedestrian density, as expressed in units of "square feet of space per pedestrian" (feet^2/ped), during the peak 15-minute period of the peak hour. The LOS ranges for sidewalks under platoon flow conditions are as shown below in **Table 2.9-8.**

Table 2.9-8: LOS Criteria for Sidewalks under Platoon Flow Conditions

LOS	Square Feet of Space per Pedestrian (feet^2/ped)
A	> 530
B	> 90 to 530
C	> 40 to 90
D	> 23 to 40
E	> 11 to 23
F	≤ 11

Source: Adapted from March 2014 *CEQR Technical Manual*, Table 16-9, page 16-47.

The Pedestrian Levels of Service for Study Intersection 1 (West 124th Street and Frederick Douglass Boulevard) and Study Intersection 2 (West 124th Street and Adam Clayton Powell Jr. Boulevard) under Existing**,** No-Action and With-Action Conditions are summarized below**.**

Existing Level of Service

The Pedestrian LOS analysis for existing conditions are based on peak 15-minute pedestrian flows observed during the weekday AM, midday, and PM peak hours. The pedestrian LOS for Study Intersection One (1) (*Adam Clayton Powell Blvd. Jr. and West 124th Street*) and Study Intersection Two (2) (*Frederick Douglass Blvd. and West 124th Street*) crosswalks, street corners, and sidewalks, respectively are summarized below.

Study intersection 1

AM/MD

As indicated below In Figure 2.9-10 (1 of 3) and Figure 2.9-10 (2 of 3) all crosswalks, street corners and sidewalks currently operate at LOS/Platoon LOS "A" during the AM and Midday peak hours under existing conditions.

Evening ("PM")

As indicated below In Figure 2.9-10 (3 of 3) all crosswalks and street corners currently operate a LOS "A" during the PM Peak Hour. The E-W sidewalk connecting to the southwest corner operates at a Platoon Level of Service "B". Similarly, the E-W sidewalk connecting to the NW corner operates at a Platoon Level of Service "B". All other sidewalks operate at a LOS/Platoon LOS "A".

Study intersection 2

AM

As indicated below In Figure 2.9-11 (1 of 3), all crosswalks, street corners and sidewalks currently operate at LOS/Platoon LOS "A" during the AM peak hour under existing conditions.

MD

As indicated below In Figure 2.9-11 (2 of 3), all crosswalks and street corners currently operate at LOS "A" during the AM peak hour under existing conditions. The E-W sidewalk connecting to the northeast corner operates at a Platoon Level of Service "B". Similarly, the E-W sidewalk connecting to the southeast corner operates at a Platoon Level of Service "B". All other sidewalks operate at a LOS/Platoon LOS "A".

PM

As indicated below In Figure 2.9-11 (3 of 3), all crosswalks and street corners currently operate at LOS “A” during the AM peak hour under existing conditions. The E-W sidewalk connecting to the northeast corner operates at a Platoon Level of Service “B”. Similarly, the E-W sidewalk connecting to the southwest corner operates at a Platoon Level of Service “B”. All other sidewalks operate at a LOS/Platoon LOS “A”.

These conditions reflect the relatively low pedestrian volumes that currently exist at these two intersections and the relative freedom of movement that pedestrians experience when walking through these intersections.

Figure 2.9-10 (1 of 3) Existing AM LOS Summary – Study Intersection 1
Adam Clayton Powell Blvd. and West 124th St.

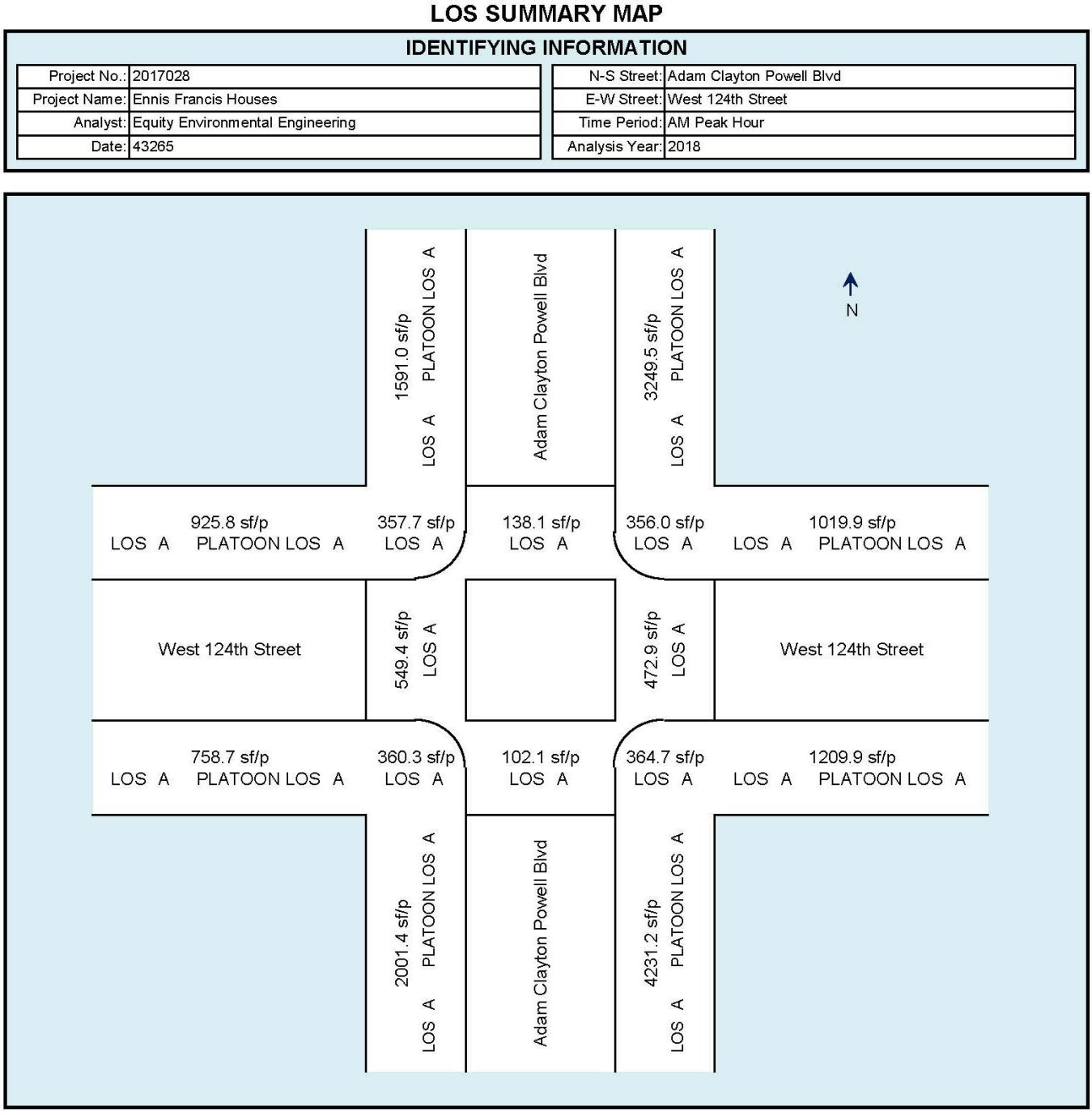


Figure 2.9-10 (2 of 3) Existing MD LOS Summary – Study Intersection 1
Adam Clayton Powell Blvd. and West 124th St.

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Mid Day Peak Hour
Date:	43265	Analysis Year:	2018

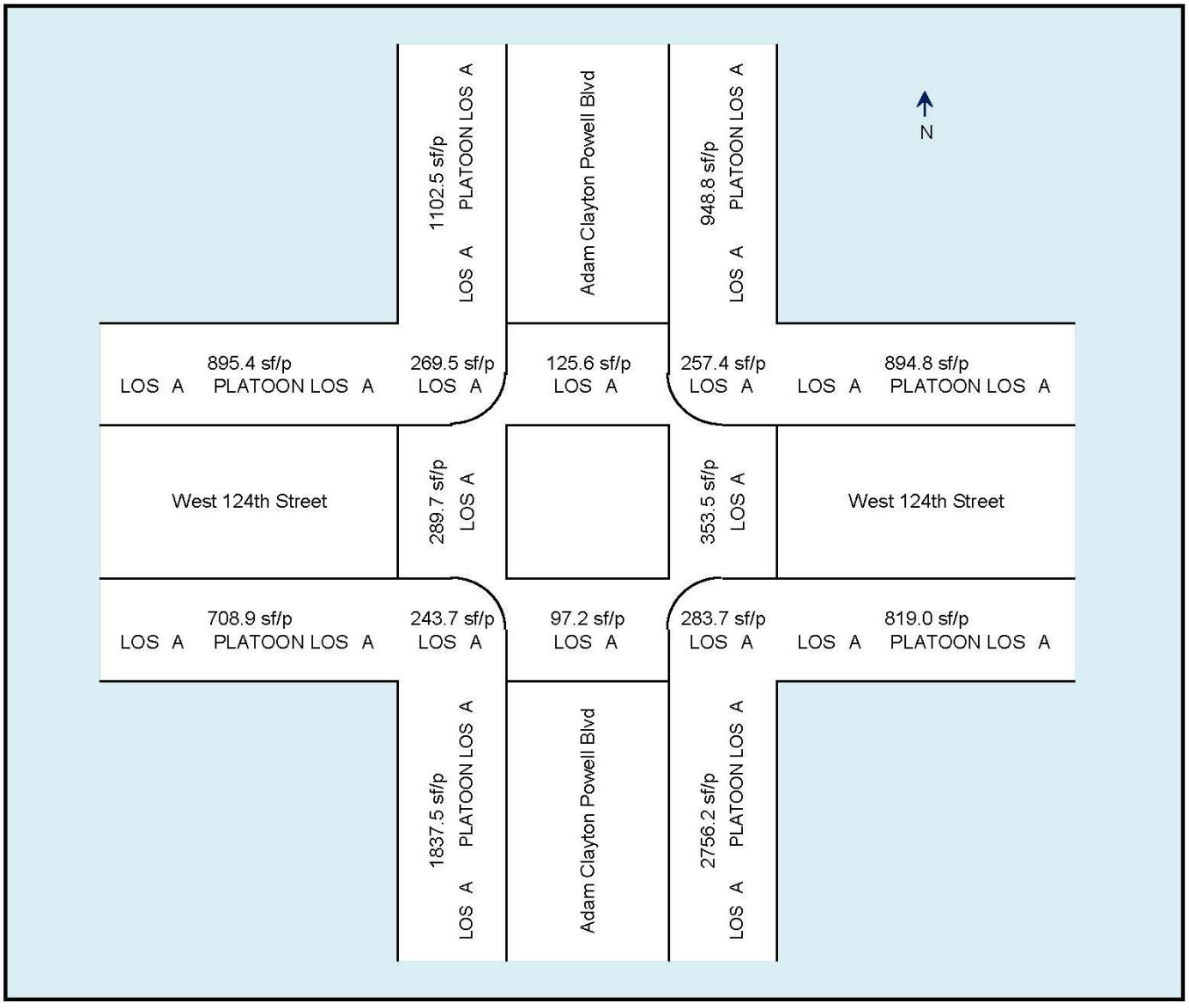


Figure 2.9-10 (3 of 3) Existing PM LOS Summary – Study Intersection 1
Adam Clayton Powell Blvd. and West 124th St.

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak Hour
Date:	43265	Analysis Year:	2018

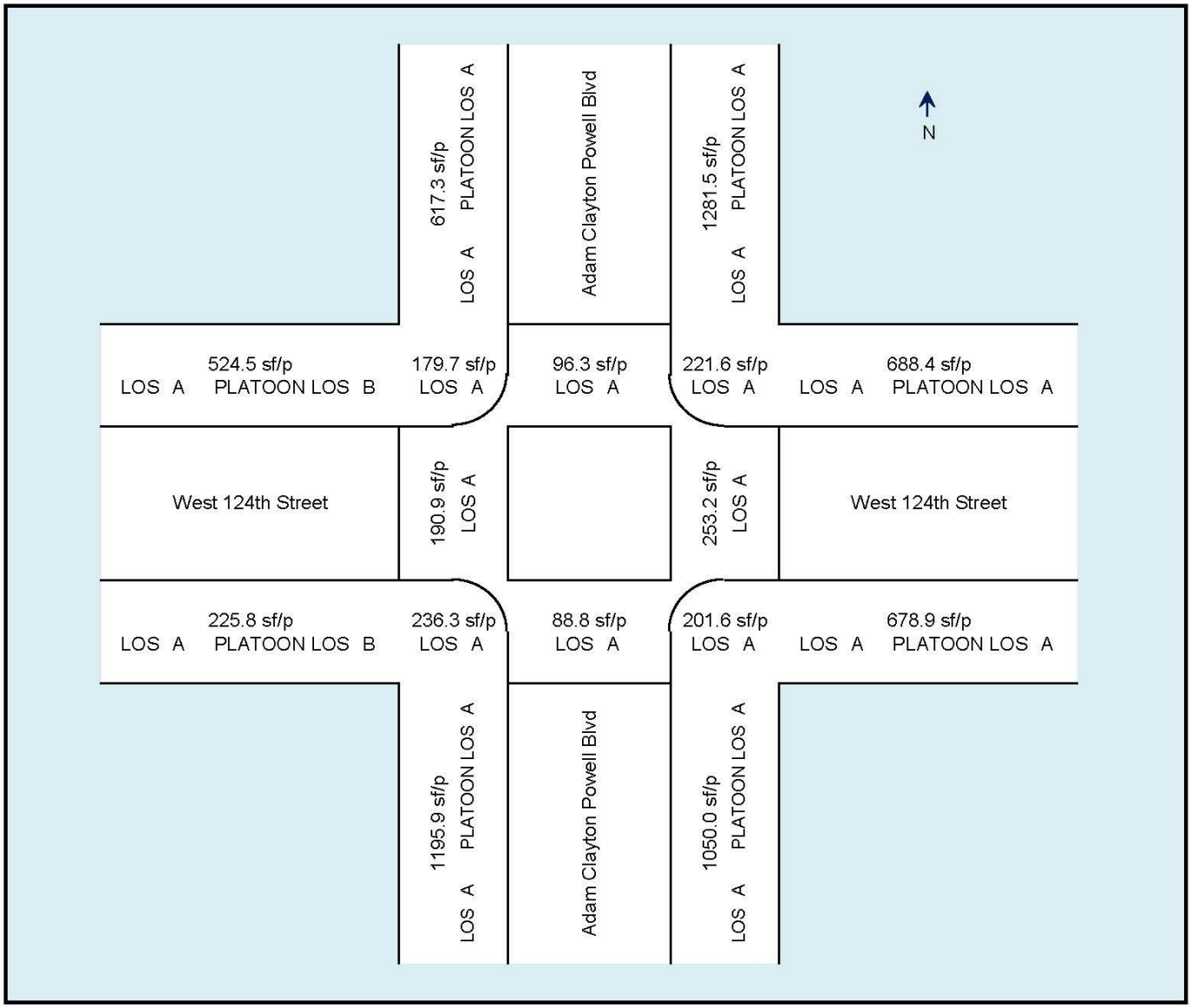


Figure 2.9-11 (1 of 3) Existing AM LOS Summary – Study Intersection 2
Frederick Douglass Boulevard and West 124th St.

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak
Date:	43265	Analysis Year:	2018

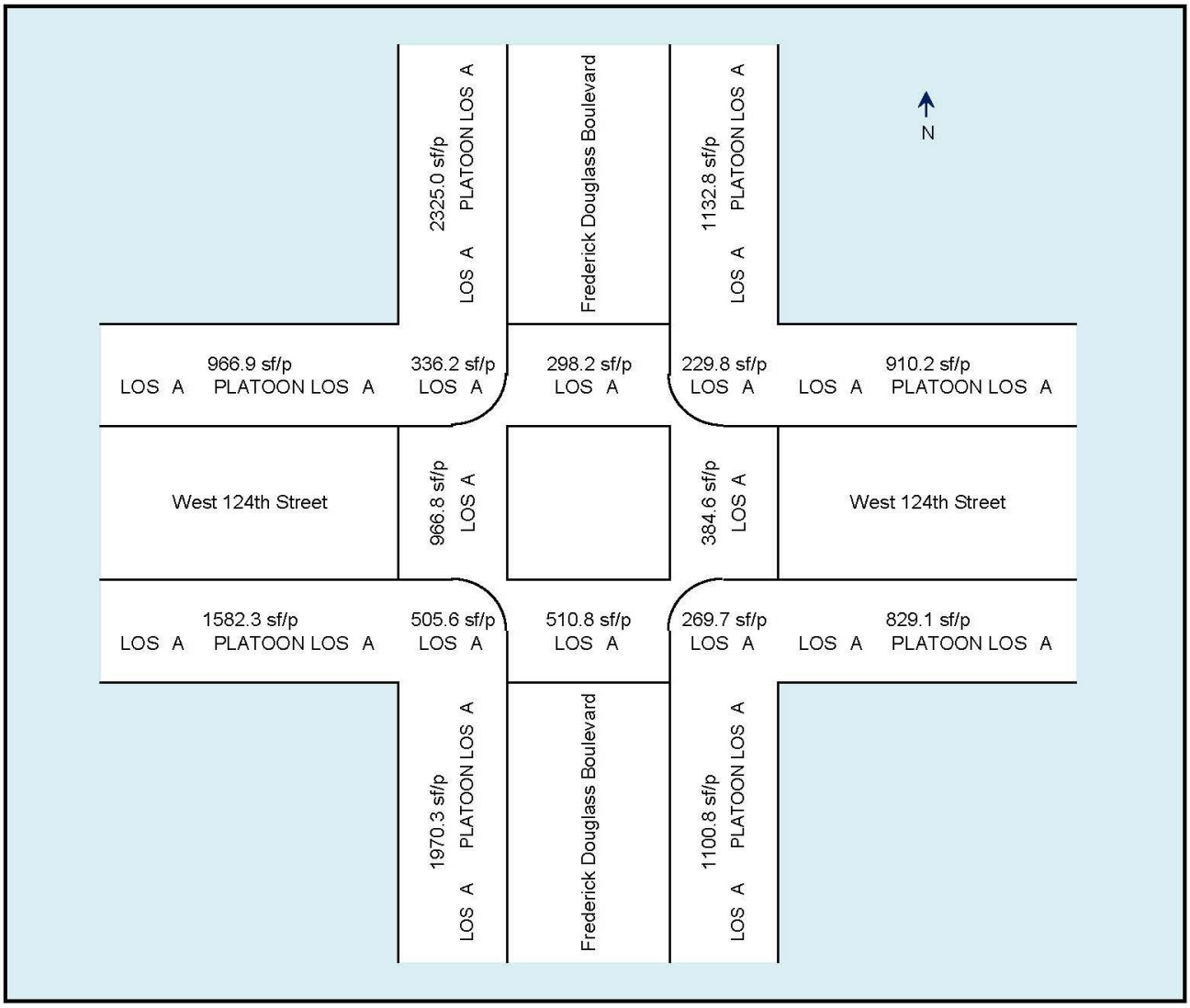


Figure 2.9-11 (2 of 3) Existing MD LOS Summary – Study Intersection 2
Frederick Douglass Boulevard and West 124th St.

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Midday Peak
Date:	43265	Analysis Year:	2018

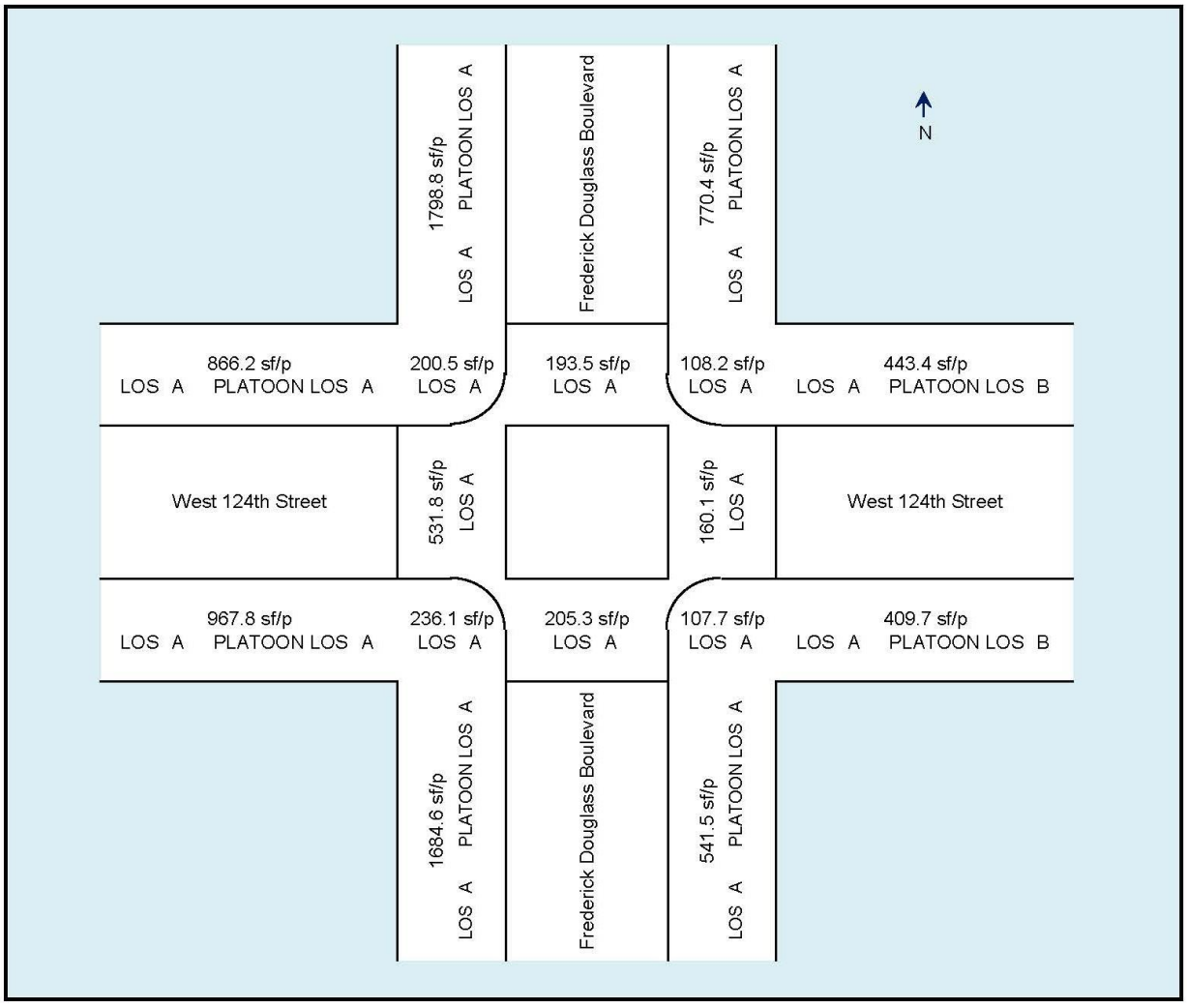
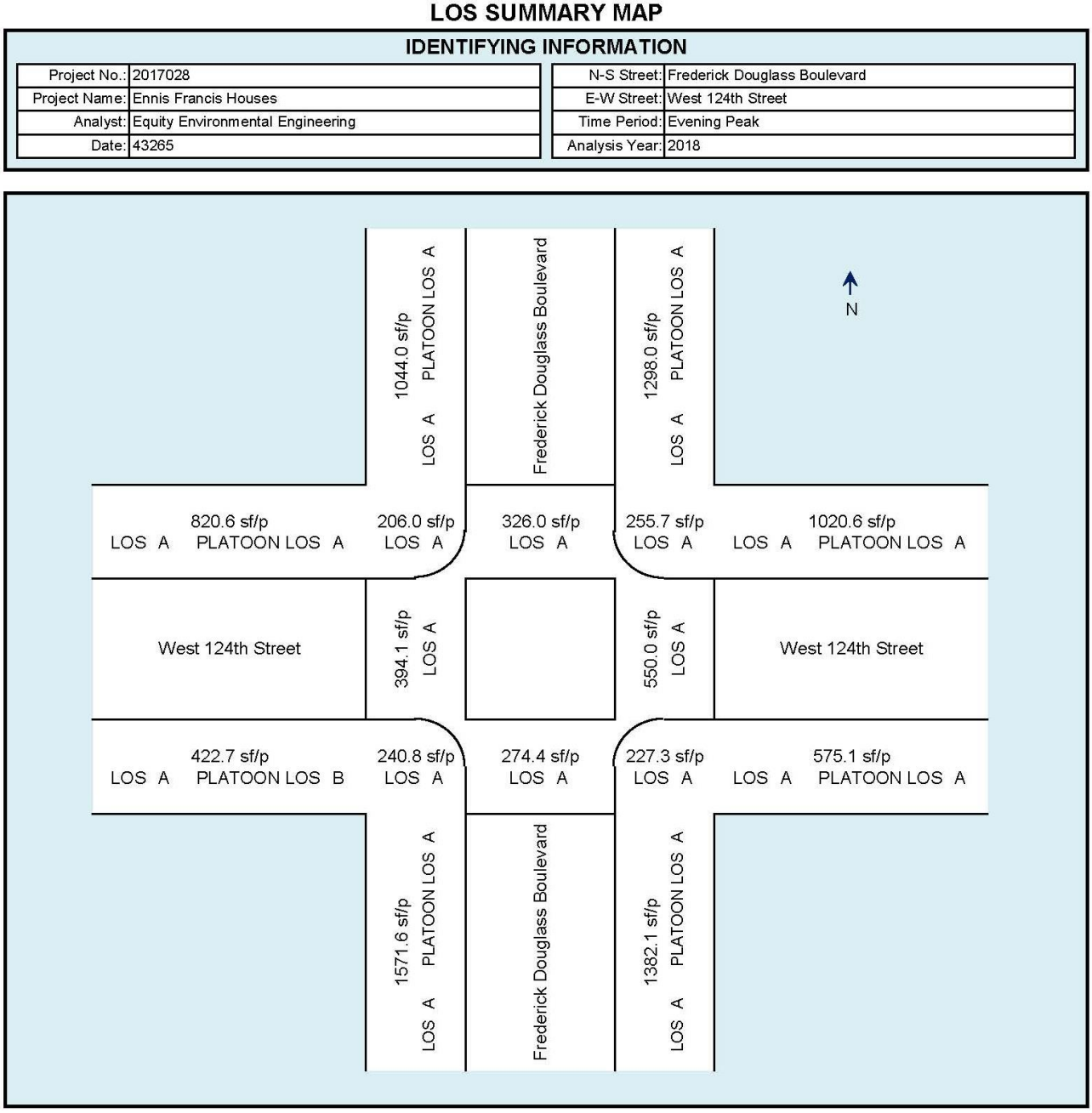


Figure 2.9-11 (3 of 3) Existing PM LOS Summary – Study Intersection 2
Fredrick Douglass Boulevard and West 124th St.



Future No-Action Pedestrian Conditions

Pedestrian activity in the study area was projected to the 2021 build year to reflect the background population growth under the Future No-Action Condition using existing pedestrian volumes as the baseline. The projected Future No-Action pedestrian volumes include background growth in pedestrian activity that is expected to occur through the study area between 2018 and 2021 (*i.e., a compounded growth rate of 1.01% per annum for population increase based on census data projections for the ¼ study area.).* Additionally, the conflicting traffic volumes through the crosswalks were also increased by 1.01 percent to reflect background pedestrian traffic growth between 2018 and 2021.

The Study Area was defined to include those census tracts that are more than 50% within a ¼ mile radius of the Affected Area. To estimate the projected growth rate within the study area, reference was made to the 2000 and 2010 United States Decennial Census *(see Table 2.9-9 below)*. Based on 2000-2010 Census Data for the Study Area population, an applied population growth rate of 1.01 percent per annum was factored for pedestrian volumes to the projected 2021 build year.

Table 2.9-9: Study Area Population Per Annum Growth Factor

Manhattan Census Tract	2000 Population	2010 Population	Population Change 2000-2010	Percentage Change 2000-2010
222	2,412	2,644	232	9.6%
220	5,068	5,370	302	6%
224	6,211	6,427	216	3.5
257	2,942	3,876	934	31.7%
TOTAL	**16,633**	**18,317**	**1,684**	**10.1%**

*Note the Affected Area falls entirely within Census Tract 222

There are no known development projects of significant size and proximity to the study intersections that warrant an increase in background pedestrian volumes beyond that associated with the aforementioned growth.

As shown below in *Figures 2.9-12 and 2.9-13*, no changes to the Levels of Service for any of the pedestrian elements at either intersection are projected based on the above growth projections.

Figure 2.9-12 (1 of 3) No-Action AM LOS Summary – Study Intersection 1
Adam Clayton Powell Blvd. and West 124th St.

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak Hour
Date:	43265	Analysis Year:	2021 No-Action

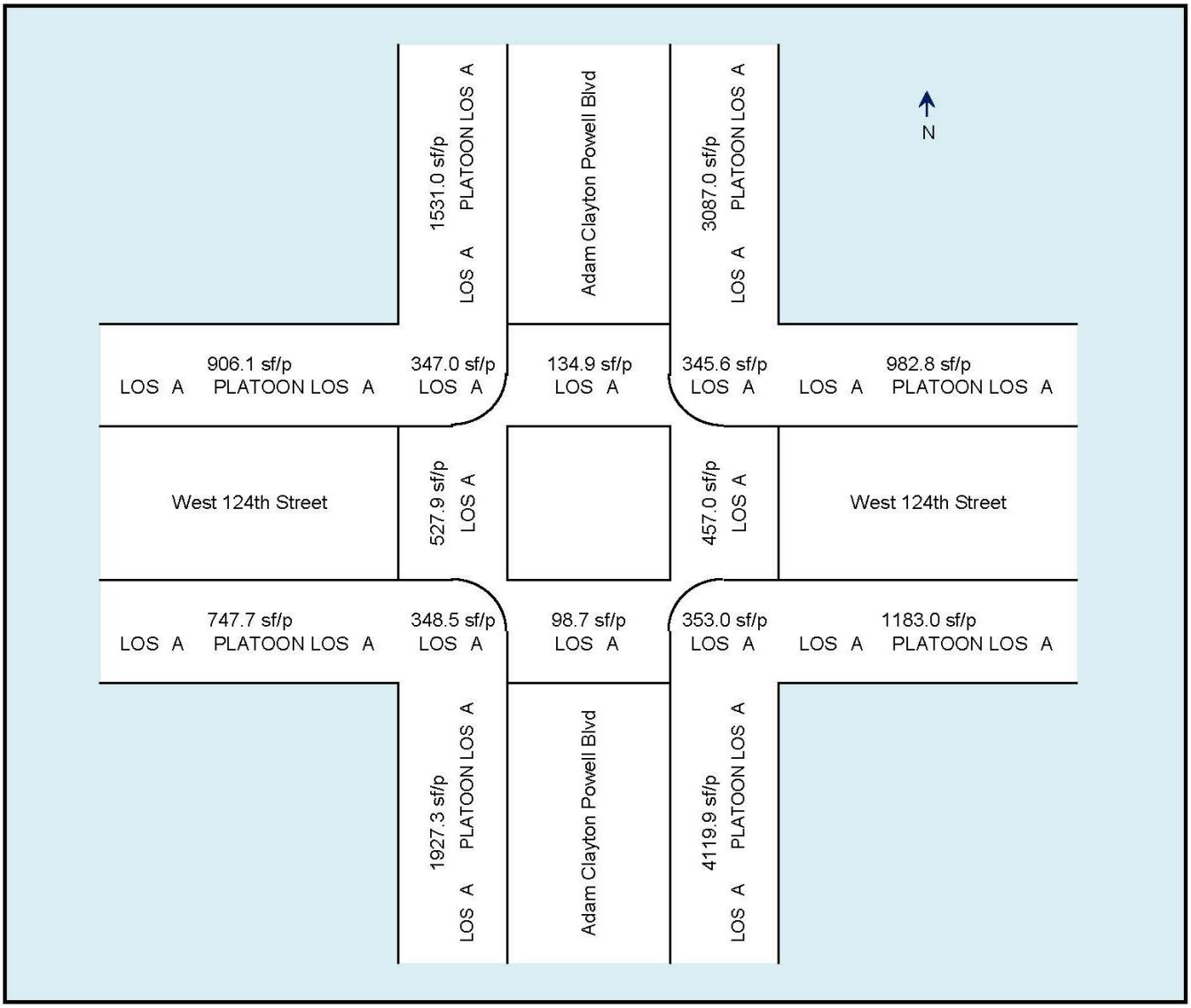


Figure 2.9-12 (2 of 3) No-Action MD LOS Summary – Study Intersection 1
Adam Clayton Powell Blvd. and West 124th St.

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Mid Day Peak Hour
Date:	43265	Analysis Year:	2021 No-Action

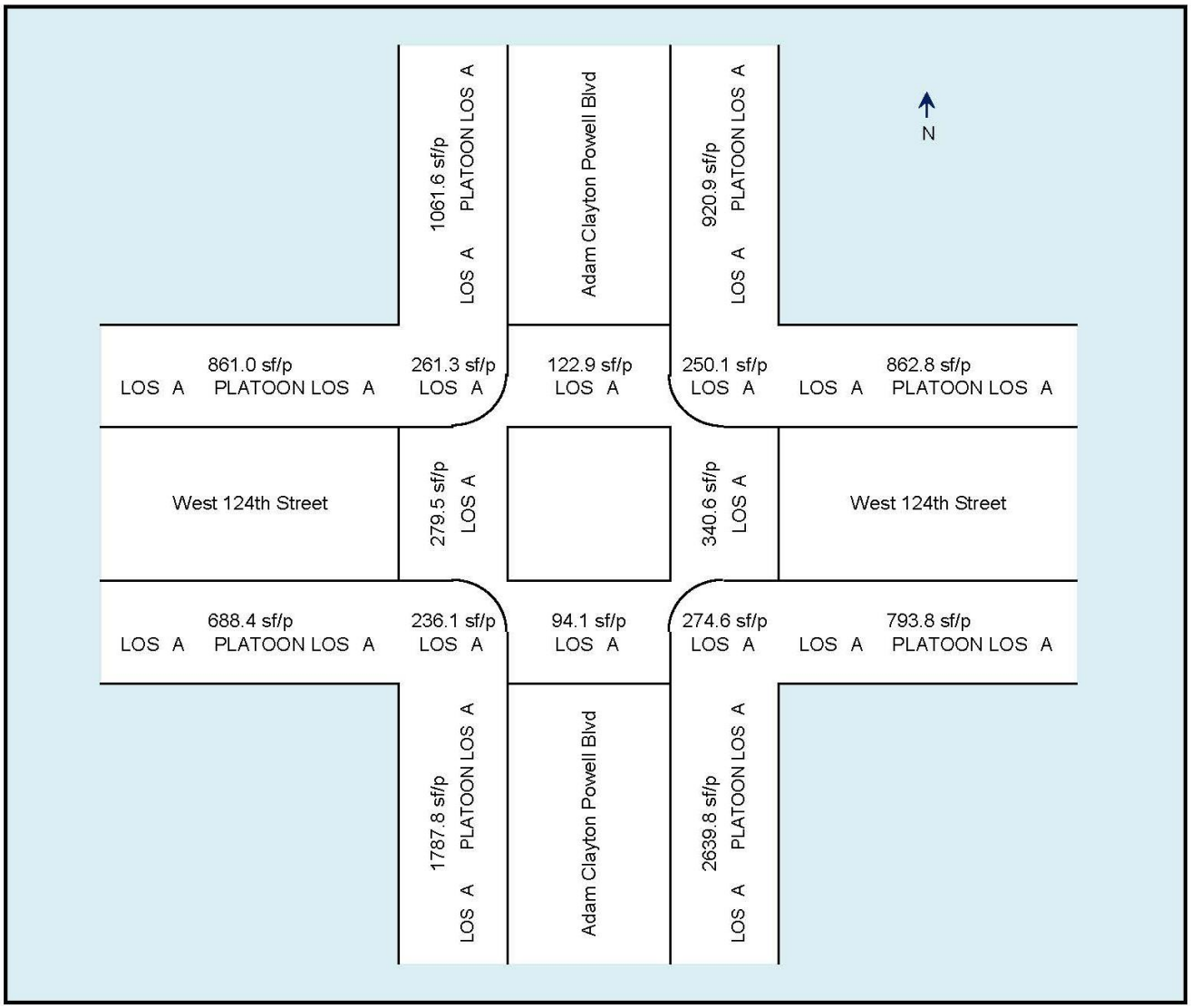


Figure 2.9-12 (3 of 3) No-Action PM LOS Summary – Study Intersection 1
Adam Clayton Powell Blvd. and West 124th St.

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak Hour
Date:	43265	Analysis Year:	2021 No-Action

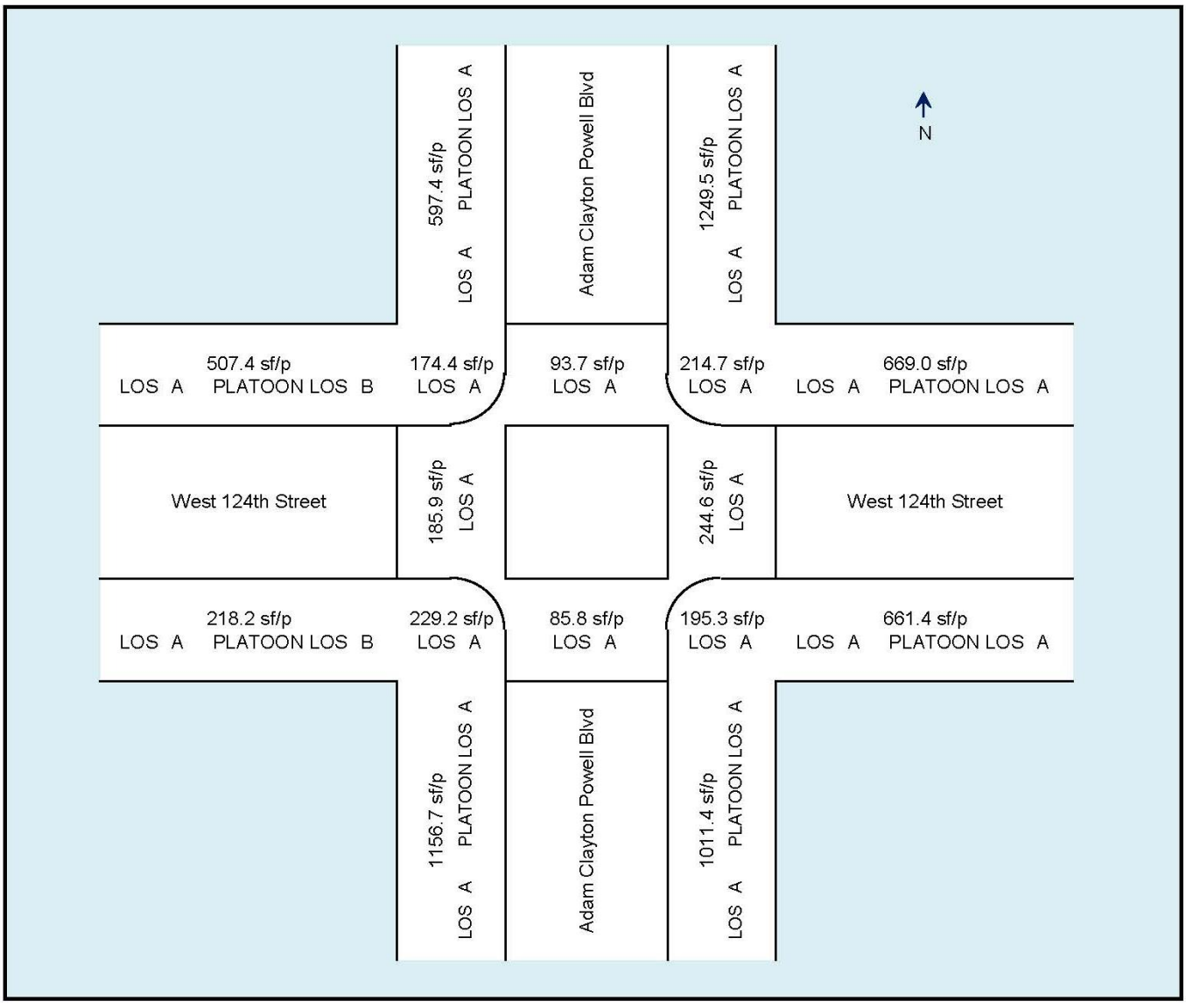


Figure 2.9-13 (1 of 3) No-Action AM LOS Summary – Study Intersection 2
Frederick Douglass Boulevard and West 124th St.

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak
Date:	43265	Analysis Year:	2021 No-Action

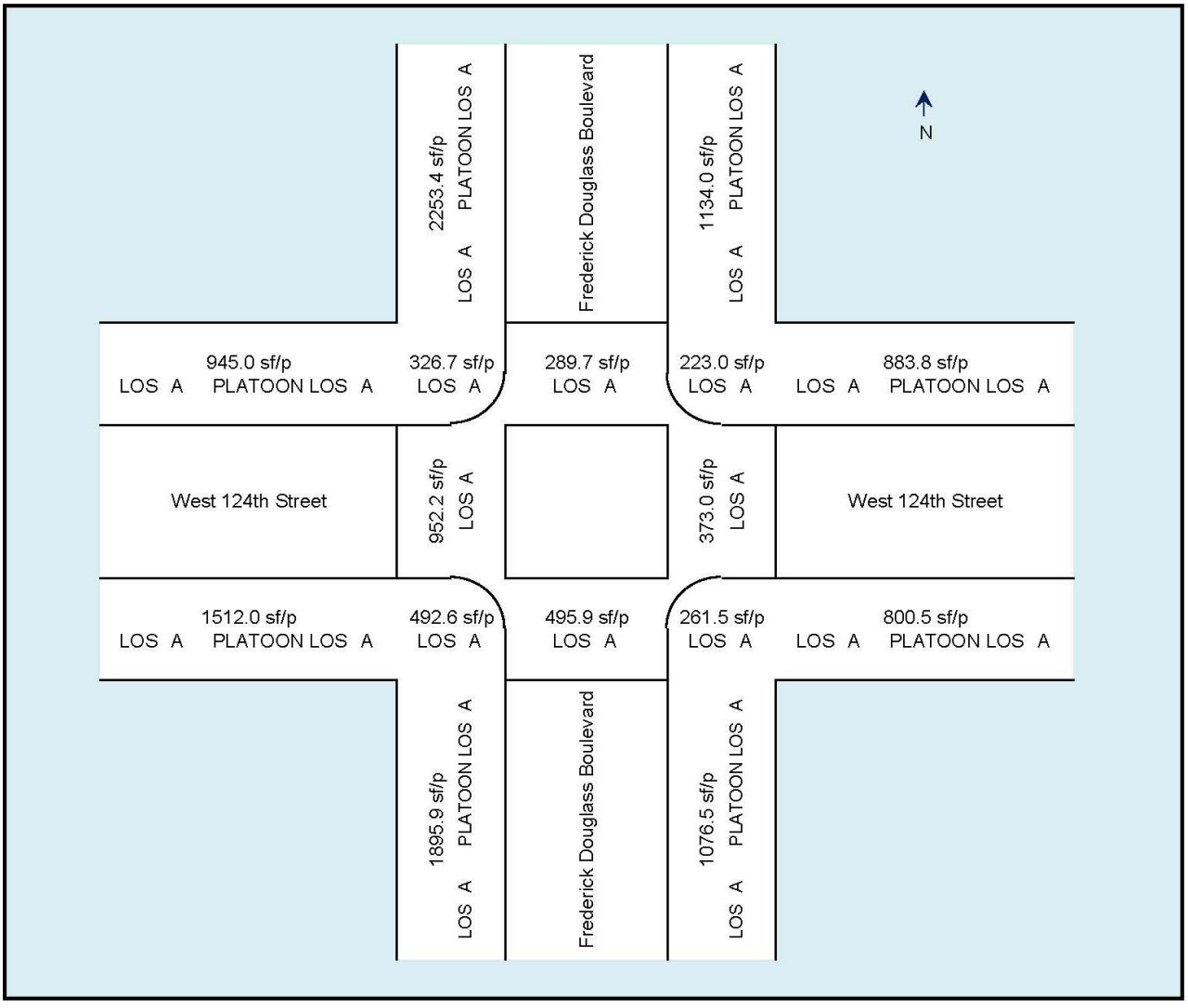


Figure 2.9-13 (2 of 3) No-Action MD LOS Summary – Study Intersection 2
Frederick Douglass Boulevard and West 124th St.

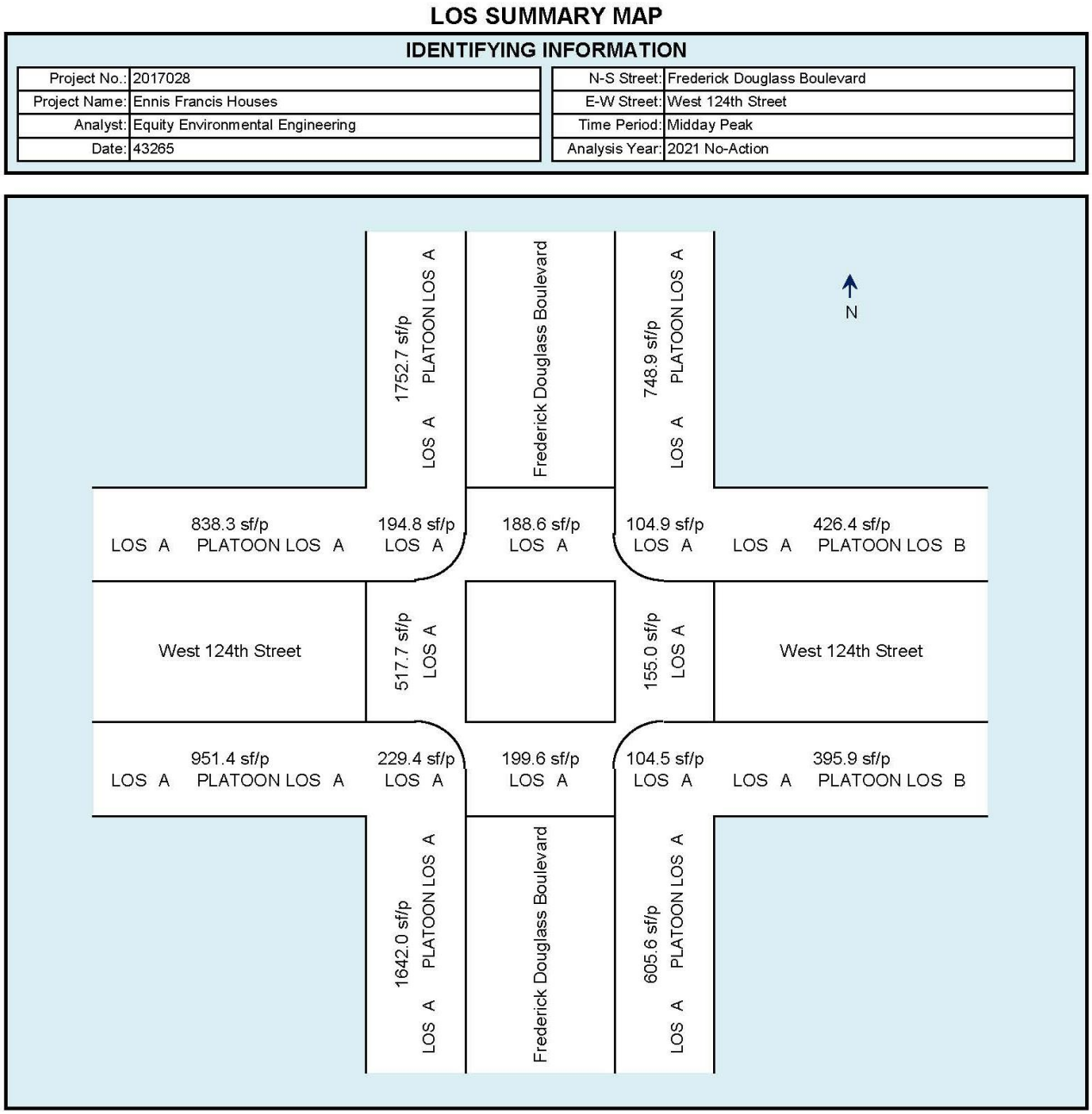
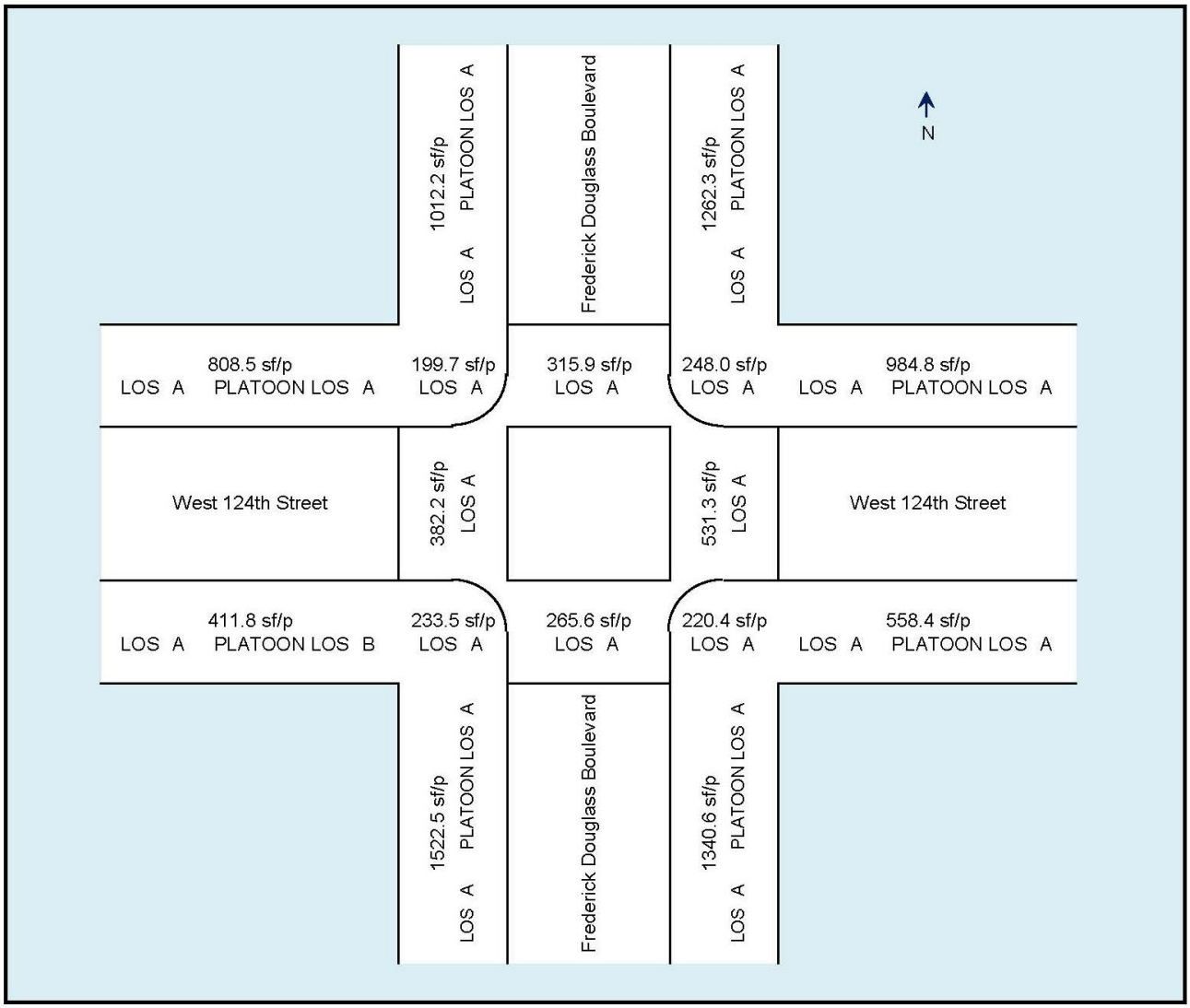


Figure 2.9-13 (3 of 3) No-Action PM LOS Summary – Study Intersection 2
Fredrick Douglass Boulevard and West 124th St.

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak
Date:	43265	Analysis Year:	2021 No-Action



Future With-Action Pedestrian Conditions

The projected Future-With Action pedestrian levels-of-service analysis utilizes the baseline No-Action pedestrian level of service projections in order to reflect the anticipated background population growth and the associated increase in pedestrian movements by the proposed build year.

To determine the pedestrian levels-of-service associated with the Proposed Action, the crosswalk, corner, and sidewalk LOS analyses added the projected pedestrian movements (determined by the *Tier 2 Pedestrian Assignments* at the study intersections) to the baseline No-Action pedestrian level of service. The With-Action Pedestrian Conditions reflect the anticipated pedestrian distribution patterns described previously under Section 2.9.4 and displayed in *Figures 2.9-6 - 2.9.9* above.

Assessment of Projected Pedestrian Impacts

The assessment of projected pedestrian impacts is based in part on whether the pedestrian element being analyzed is part of a Central Business District (CBD) and, for sidewalks, whether the pedestrian flow is platooned or not. The study intersections are not assumed to be considered CBD location; however, due to the adjacency of multiple transit stops and stations, which could be expected to generate platooned pedestrian flows, and the adjacency to 125th Street, which effectively functions as a CBD of Harlem, platoon flow conditions were assumed.

For crosswalks and street corners in non-CBD locations: According to the guidelines established in the *CEQR Technical Manual*, average pedestrian space under the Future With-Action condition deteriorating to LOS "C" or better should generally not be considered a significant impact. If the pedestrian space under the Future With-Action condition deteriorates to LOS "D" or worse (i.e., less than 24.0 square feet/ped), then the determination of whether the impact is considered significant is based on a sliding scale that varies with the Future No-Action pedestrian space.

For sidewalks with platoon flow in non-CBD locations: According to the guidelines established in the *CEQR Technical Manual*, average pedestrian space under the Future With-Action condition deteriorating to LOS "C" or better should generally not be considered a significant impact. If the pedestrian space under the Future With-Action condition deteriorates to LOS "D" or worse (i.e., less than 40.0 square feet/ped), then the determination of whether the impact is considered significant is based on a sliding scale that varies with the Future No-Action pedestrian space.

Based on the site-generated pedestrian volume assignments, the Future With-Action Pedestrian LOS are described and shown in *Figures 2.9-14 and 2.9-15* below.

Figure 2.9-14 (1 of 3) With-Action AM LOS Summary – Study Intersection 1
Adam Clayton Powell Blvd. and West 124th St.

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak Hour
Date:	43265	Analysis Year:	2021 With-Action

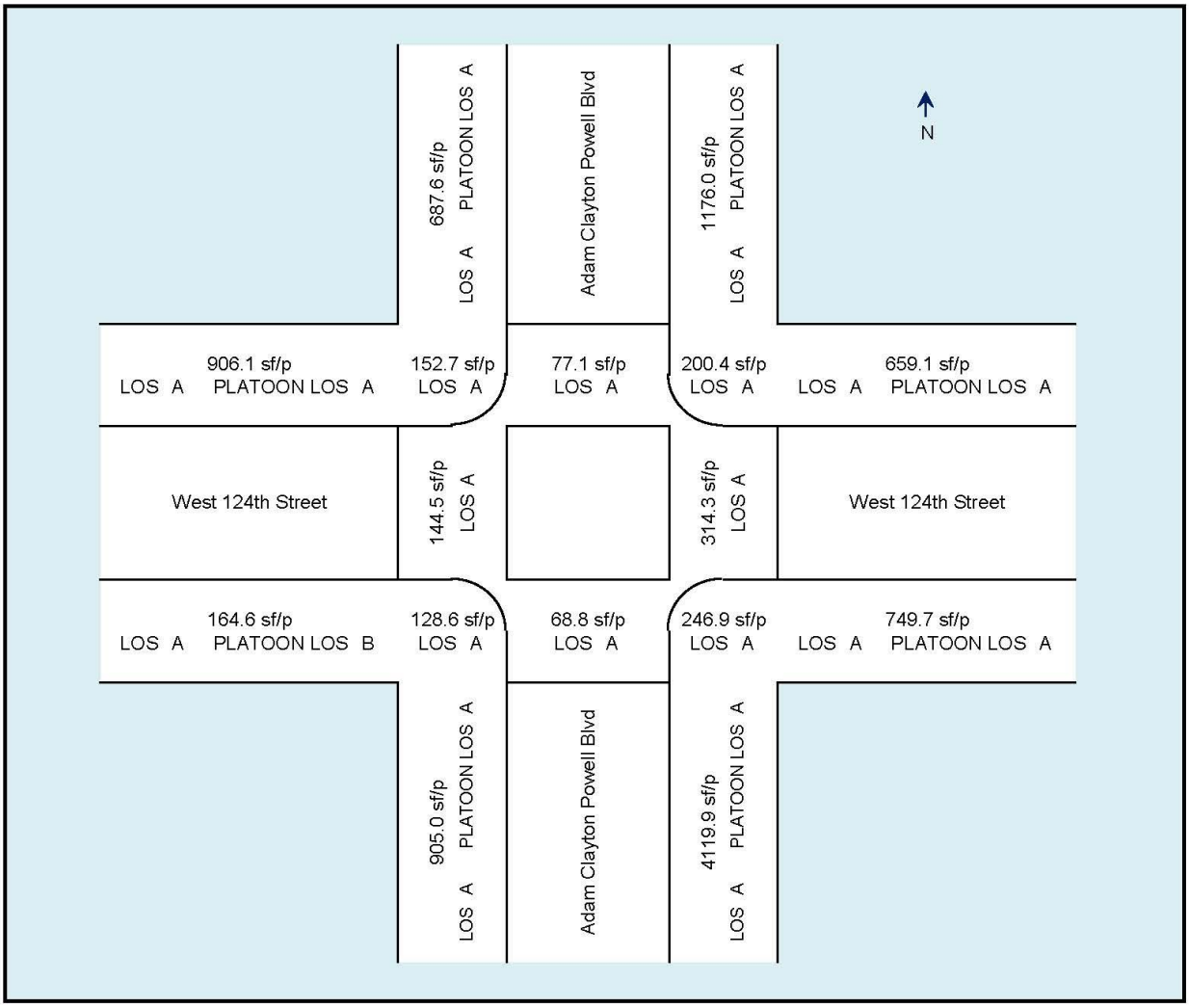


Figure 2.9-14 (2 of 3) With-Action MD LOS Summary – Study Intersection 1
Adam Clayton Powell Blvd. and West 124th St.

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Mid Day Peak Hour
Date:	43265	Analysis Year:	2021 With-Action

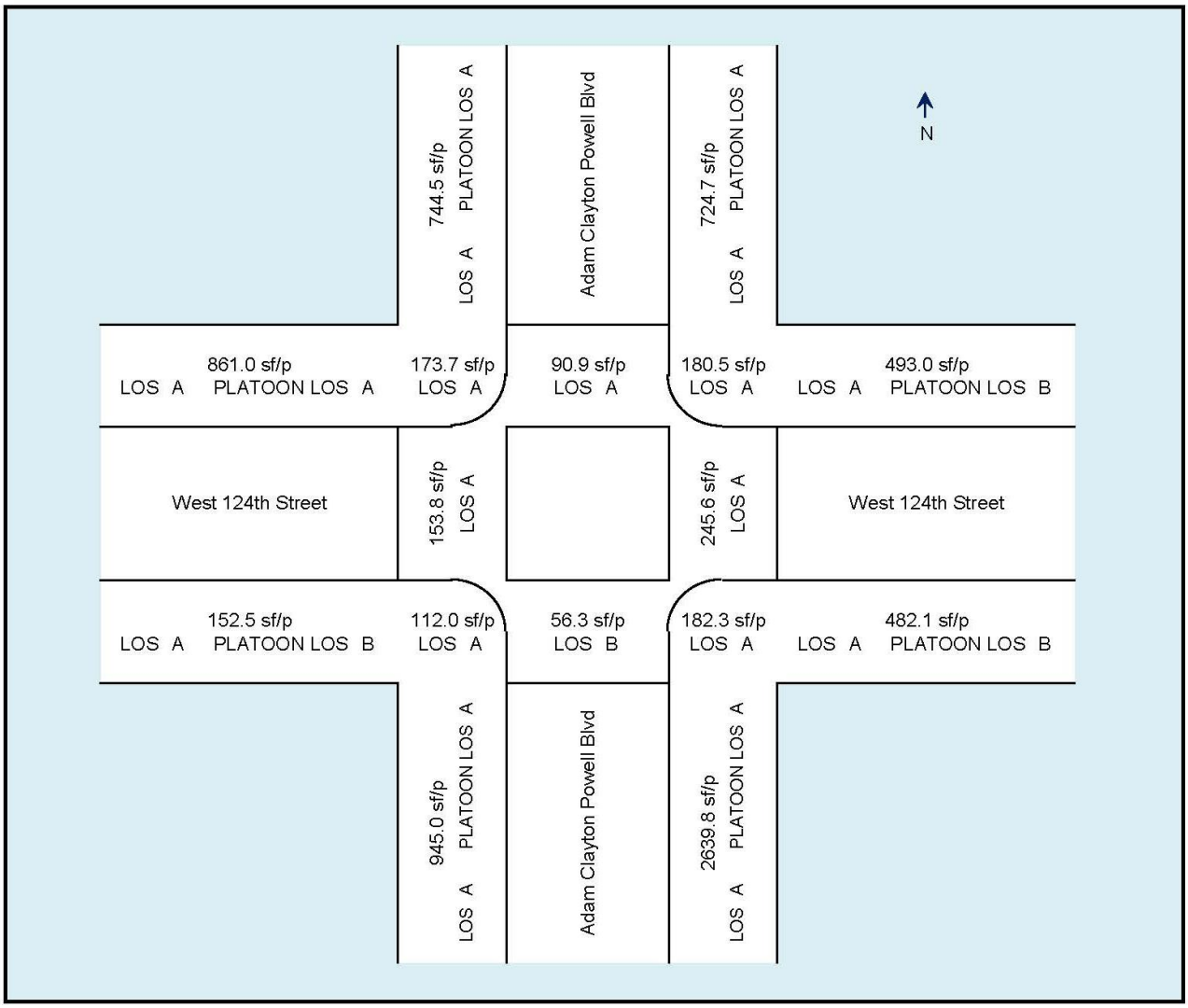


Figure 2.9-14 (3 of 3) With-Action PM LOS Summary – Study Intersection 1
Adam Clayton Powell Blvd. and West 124th St.

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak Hour
Date:	43265	Analysis Year:	2021 With-Action

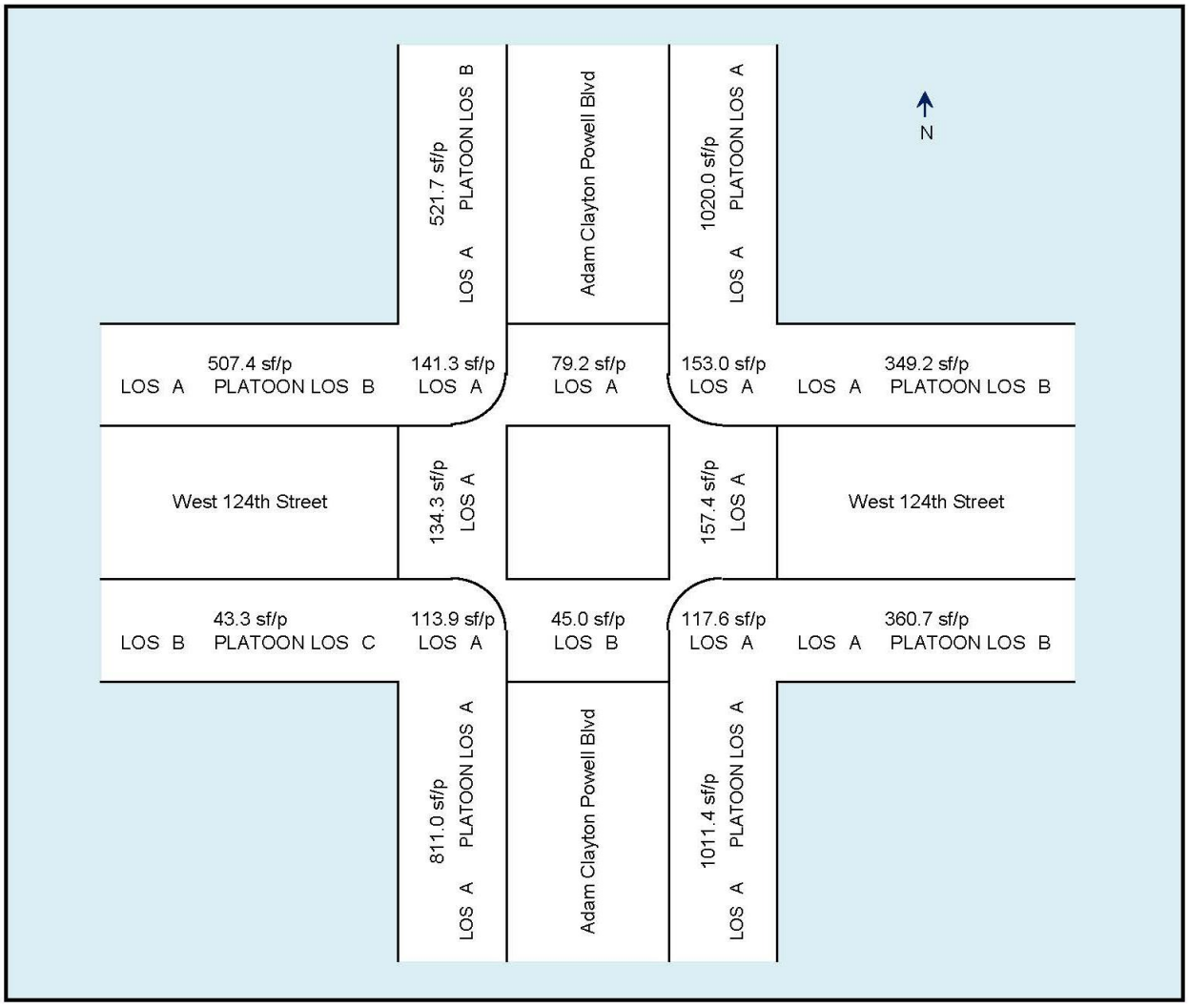


Figure 2.9-15 (1 of 3) With-Action AM LOS Summary – Study Intersection 2
Frederick Douglass Boulevard and West 124th St.

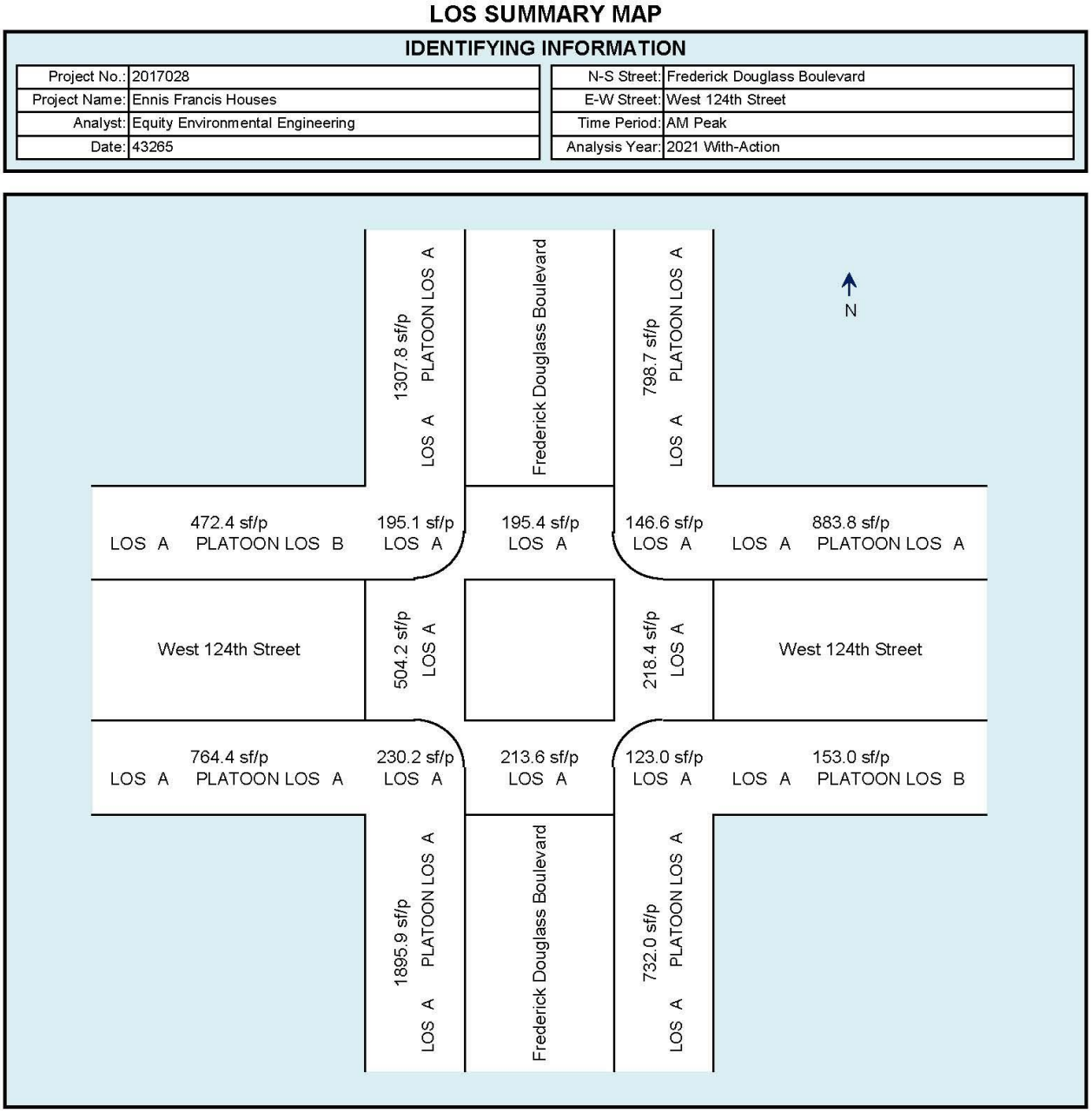


Figure 2.9-15 (2 of 3) With-Action MD LOS Summary – Study Intersection 2
Frederick Douglass Boulevard and West 124th St.

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Midday Peak
Date:	43265	Analysis Year:	2021 With-Action

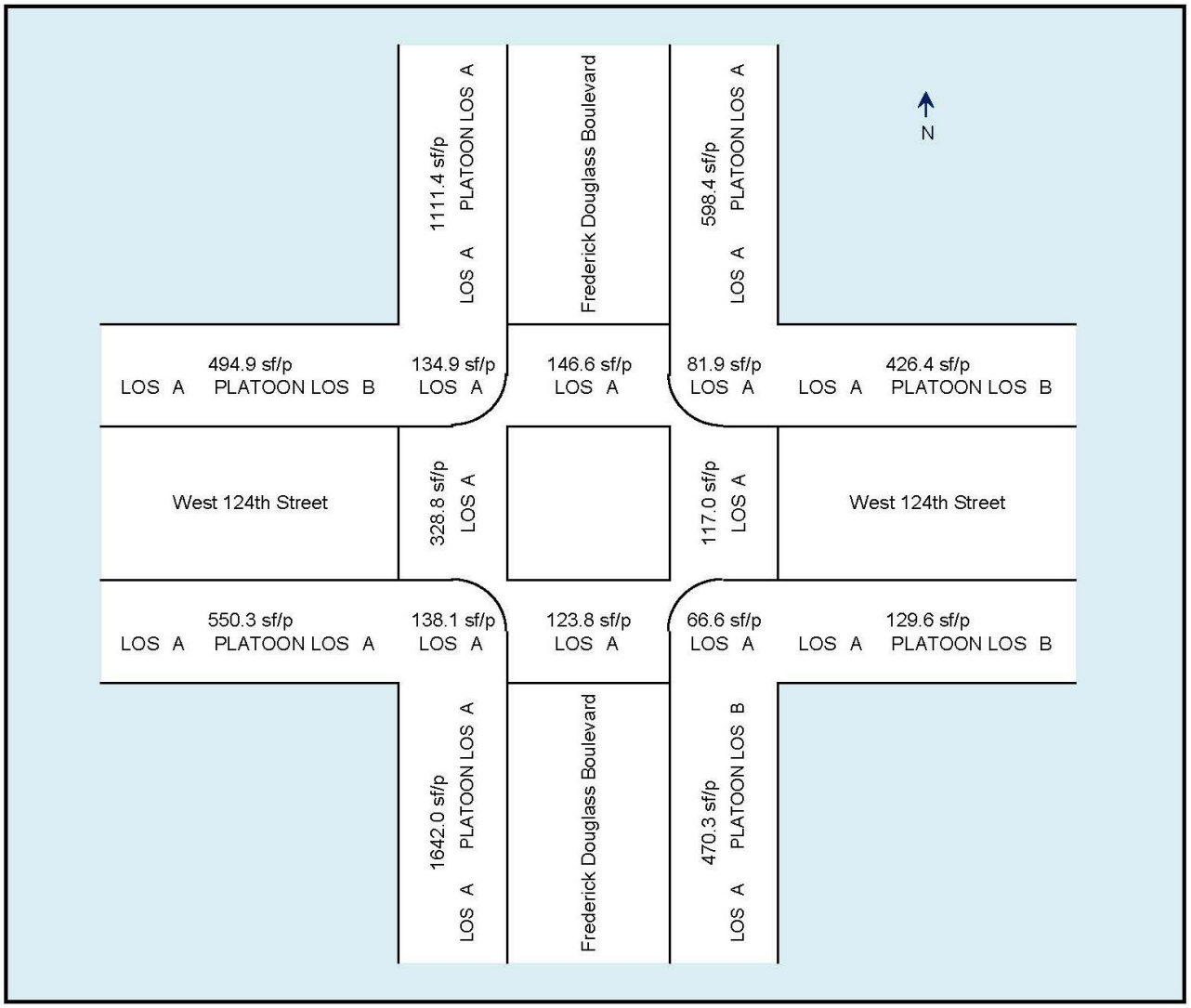
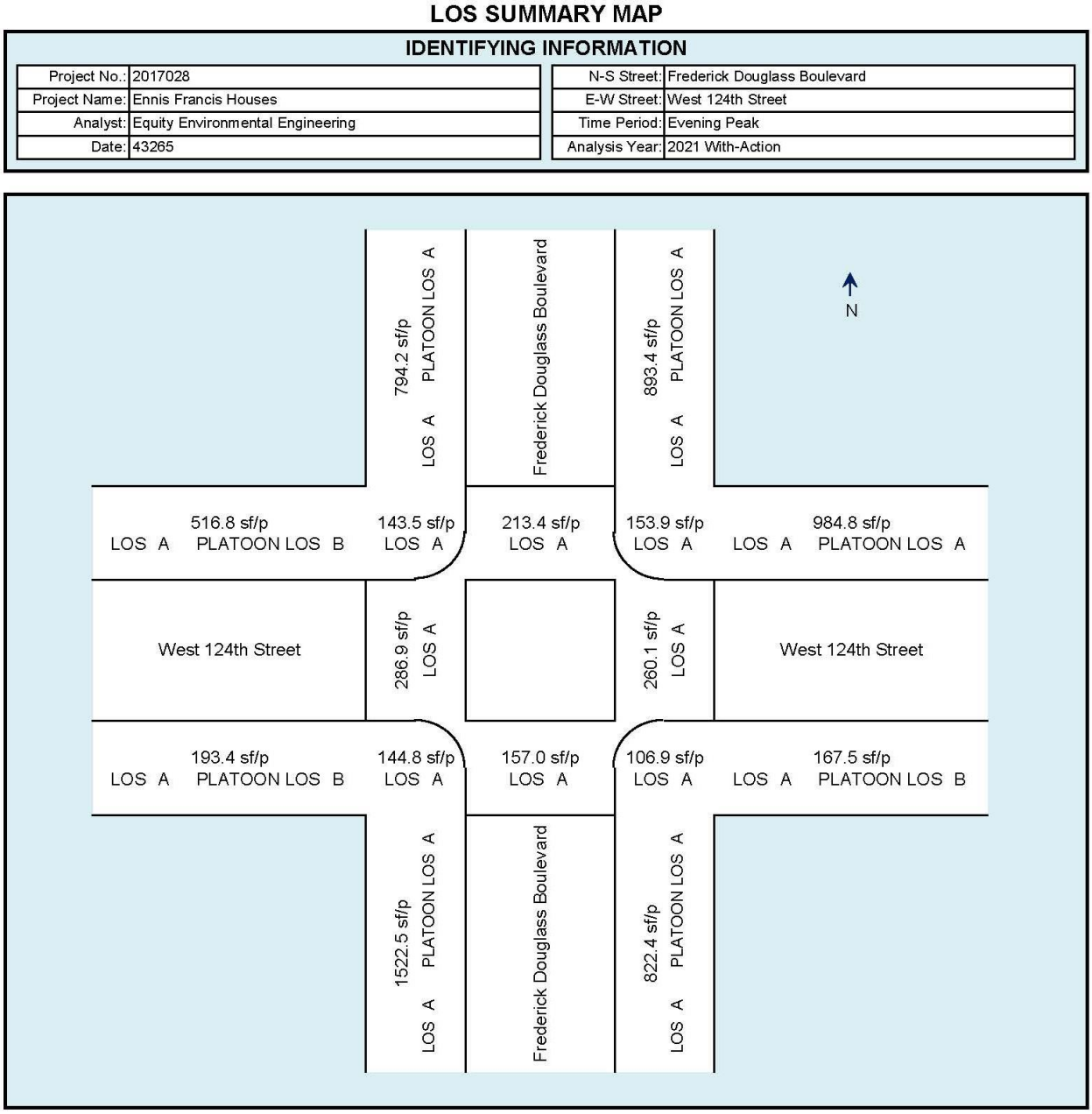


Figure 2.9-15 (3 of 3) With-Action LOS Summary – Study Intersection 2
Fredrick Douglass Boulevard and West 124th St.



Study Intersection One (1) Findings: Adam Clayton Powell Jr. Blvd. and West 124th Street:

The following changes to Study Intersection One (1) crosswalks, corners, and sidewalks compared to No-Action/Existing Conditions are projected based on the With-Action Pedestrian Volumes:

- *AM Peak Hour: The southwest sidewalk (E-W)* would operate at a Platoon LOS "B" (*Platoon LOS "A" under No-Action Conditions).*
- *Midday Peak Hour: The southeast (E-W), southwest (E-W), and northeast (E-W) sidewalks would operate at a Platoon LOS "B" (Platoon LOS "A" under No-Action Conditions). The southern crosswalk would operate at a LOS "B" (LOS "A" under No-Action Conditions)*
- *PM Peak Hour: The southern crosswalk would operate at a LOS "B" (LOS "A" under No-Action Conditions). The southwest (E-W) sidewalk would operate at a LOS B/Platoon LOS C (LOS A/Platoon LOS B under No-Action Conditions), and the northeast (E-W) and southeast (E-W), and northwest (N-S) sidewalks would operate at a Platoon LOS B (Platoon LOS A under No-Action Conditions).*

Study Intersection Two (2) Findings: Frederick Douglass Blvd. and West 124th Street:

The following changes to Study Intersection Two (2) crosswalks, corners and sidewalks compared to No-Action/Existing Conditions are projected based on the With-Action Pedestrian Volumes:

- *AM Peak Hour:* The southeast (E-W) and northwest (E-W) sidewalks would operate at a level of Platoon LOS "B" *(Platoon LOS "A" under No-Action Conditions*);
- *Midday Peak Hour:* The northwest (E-W) and southeast (N-S) sidewalks would operate at a level of Platoon LOS "B" (*Platoon LOS "A" under No-Action Conditions*");
- *PM Peak Hour:* The southeast and northwest sidewalks (E-W) would operate at a level of Platoon LOS "B" (*Platoon LOS "A" under No-Action Conditions)*;

Therefore, based on CEQR Methodology, there are not projected to be any significant pedestrian impacts associated with the Proposed Action.

2.9.6 Safety Assessment

The two identified study intersections were assessed to determine if either intersection is considered a "high crash" location, where safety concerns related to increasing pedestrian concentrations would result pursuant to the Proposed Action. Pursuant to Chapter 16 Section 341 of the *2014 CEQR Technical Manual*, a high crash area is one where there are 48 or more total crashes (reportable and non-reportable), or five or more pedestrian/bicycle injury crashes in any consecutive 12 months of the most recent 3-year period for which data is available. If any high crash locations are identified, practicable measures to enhance pedestrian/bicycle safety at these locations will be described.

New York Police Department (NYPD) crash data involving vehicles, pedestrians and/or cyclists at study area intersections was obtained from NYPD Motor Vehicle Crashes for the most recent three-year period available (*See Table 2.9-10 below*). The results of the Crash Data Review are shown below. *The NYPD Crash Data is provided in Appendix D.* As indicated, Study Intersection One (1) and Study Intersection Two (2) are not considered high-crash locations. Additionally, both intersections are fully controlled from a pedestrian standpoint. Therefore, based on the

assessment of existing traffic and pedestrian controls and previous crash-related incidents, no pedestrian safety impacts related to increased project generated pedestrian activity is anticipated pursuant to the Proposed Action.

Table 2.9-10: NYPD Crash Data Review					
Study Intersection 1: Adam Clayton Powell Jr. Blvd ("7th Avenue") and West 124th Street					
Year	**Number of Crashes**	**Number of Motorists Injured**	**Number of Motorists Killed**	**Number of Pedestrians/Cyclists Injured**	**Number of Pedestrians/Cyclists Killed**
2018	3	0	0	0	0
2017	2	1	0	0	0
2016	7	0	0	3	0
Study Intersection 2: Frederick Douglass Boulevard ("8th Avenue") and West 124th Street					
Year	**Number of Crashes**	**Number of Motorists Injured**	**Number of Motorists Killed**	**Number of Pedestrians/Cyclists Injured**	**Number of Pedestrians/Cyclists Killed**
2018	2	0	0	0	0
2017	4	2	0	0	0
2016	7	1	0	0	0

Source: NYPD Motor Vehicle Collisions NYC Open Data

Conclusion

This chapter presented an analysis of the effects of additional peak hour trips projected to be generated by the Proposed Action on the transportation system, transit resources, road networks, and pedestrian elements within the vicinity of the Affected Area. The following conclusions are drawn from this analysis:

- The Proposed Action would not result in an increase of 50 or more vehicular-trip ends either cumulatively, or individually, to any one intersection within the study area. Therefore, the Proposed Action would not result in significant adverse impacts related to traffic, parking or circulation.
- The Proposed Action would not lead to an increase of 200 or more subway or bus trips to any one transit line, stop, station, or platform. Therefore, the Proposed Action would not lead to any significant adverse subway or bus impacts related to circulation or capacity.
- The results of the pedestrian LOS analyses indicate that no significant adverse pedestrian impacts are projected to occur at any of the crosswalks, street corners, or sidewalks at Study Intersection One (1) or Study Intersection Two (2) as a result of the Proposed Action.
- Neither of the two study intersections are classified as "high crash locations" based on *CEQR Technical Manual* methodology.

2.10 Air Quality

Ambient air quality describes pollutant levels in the surrounding environment to which the public has access. To assess potential health hazards due to ambient air quality, the impact of air pollutants emitted by motor vehicles (mobile source) and by fixed facilities (stationary source) are analyzed, where the effects of both the proposed project on ambient air quality and the ambient air quality effect on the proposed project are considered. The analysis frame work, as mandated by the State Environmental Review Act, follows the *New York City Environmental Quality Review 2014 Technical Manual*. The potential air quality impacts of the following emissions are estimated following the procedures and methodologies prescribed in the *CEQR Technical Manual*:

- Vehicular emission resulting from increased vehicular traffic and/or changes to traffic pattern.
- Vehicular emission associated with off-street parking facilities.
- Vehicular emission generated at an atypical (*e.g.*, not at-grade) roadway.
- Emission from the burning of fossil fuels in the heating, ventilation and air conditioning (HVAC) equipment of the proposed developments.
- Air toxics emission released from industrial or manufacturing facilities.
- Stationary source emission of facilities that require Prevention of Significant Deterioration permits (Title V), and facilities which require a state facility permit.
- Facilities' malodorous emissions to unreasonably interfere with the proposed project's occupant's comfortable enjoyment of life or their property.

Existing Conditions

The Affected Area consists of three lots (29, 57, and 17) on Block 1929 in the Harlem neighborhood of Manhattan Community District 10. The Proposed Development Site is Lot 57. The project build year is 2021.

Lot 17 is improved with an 8-story, 98,955 square foot residential building with 60 affordable dwelling units. There are 37 enclosed parking spaces provided on Lot 17 accessory to Lot 29, according to the latest certificate of occupancy.

Lot 29 is constructed with an 11-story, 146,780 square foot mixed-use building with ground floor commercial retail space and 160 affordable dwelling units above. The commercial space occupies approximately 3,200 square feet of space.

The Development Site consists of Lot 57. The Development Site currently includes a vacant 3-story, 67,892 square foot residential building with 72 dwelling units, which will be demolished prior to the construction of the Proposed Development. The building is in poor condition and has been vacant since 2015. No parking is currently provided on the Development Site.

Future No-Action Scenario

Per the *CEQR Technical Manual*, a project's effects on air quality are determined by comparing predictions made for the future no-action and the future with-action conditions. The existing condition does not serve as a baseline for determining if a proposed project would have a significant impact but is typically included in the analysis for informational purposes.

Absent the proposed action, the mixed-use buildings on Lots 17 and 29 would remain in their current condition, and the building on Lot 57 would be rehabilitated and reoccupied.

With-Action Scenario

In the future with the Proposed Actions, the mixed-use buildings on Lots 17 and 29 would remain in their current condition; the building on Lot 57 will be demolished and the Development Site will be developed with a mixed residential and community facility building. For the purpose of the air quality analysis, the development RWCDS and the actual building dimension provided by the building architect are considered.

> Actual Proposed Development: The actual Proposed Development will include two buildings: Building A, a 17-story, 172'-6" feet tall building (169 feet high building and 3'-6" parapet wall) containing 164,856 gsf of floor area, of which 30,990 gsf are community facility space and 10,000 gsf are for 66 accessory parking spaces in the cellar level. Building A would also include a 189 feet high bulkhead. Building B, an 18-story, 190 feet tall building (206 feet tall bulkhead), containing 184,480 gsf of floor area.

The predicted difference between the future with-action and the future no-action conditions are the development of an additional 234,813 gsf of residential floor area, 30,990 gsf of community facility space, and 66 new accessory parking spaces.

As the existing buildings on Lots 17 and 29 would remain in the future with the Proposed Action, they will not be included in this EAS section for analysis purposes.

Air Pollutants and Applicable Standards and Guidelines

National Air Quality Standards

The U.S. Environmental Protection Agency (EPA) has identified six pollutants, known as criteria pollutants which are being of concern nationwide, and established threshold concentrations based upon adverse effect on human health.

As required by the Clean Air Act, National Ambient Air Quality Standards (NAAQS) have been established for the criteria pollutants by EPA, and New York State has adopted the NAAQS as the State ambient air quality standards. The pollutant for which a detailed analysis was conducted, together with their health-related averaging periods, are presented in **Table 2.10-1**.

Table 2.10-1: National and New York States Ambient Air Quality

Pollutant	Averaging Period	National and State Standards
$PM_{2.5}$	24-Hour Concentration	35 µg/m^3
	Average of 3 Consecutive Annual Means	12 µg/m^3
NO_2	1-Hour Average of 8^{TH} Highest Concentration	188 µg/m^3
	Annual Arithmetic Average	100 µg/m^3

NO_2 NAAQS

Nitrogen oxide (NO_x) emissions from gas combustion consist predominantly of nitric oxide (NO) at the source. The NO_x in these emissions are then gradually converted to NO_2, which is the pollutant of concern, in the atmosphere (in the presence of ozone and sunlight as these emissions travel downwind of a source).

The 1-hour NO_2 NAAQS standard of 0.100 ppm (188 ug/m^3) is the 3-year average of the 98^{th} percentile (8^{th} Highest) of daily maximum 1-hour average concentrations in a year. For determining compliance with this standard, the EPA has developed a modeling approach for

estimating 1-hour NO_2 concentrations that is comprised of 3 tiers: Tier 1, the most conservative approach, assumes a full (100%) conversion of NO_x to NO_2; Tier 2 applies a conservative ambient NOx/NO_2 ratio of 80% to the NO_x estimated concentrations; and Tier 3, which is the most precise approach, employs AERMOD's PVMRM module. The PVMRM accounts for the chemical transformation of NO emitted from the stack to NO_2 within the source plume using hourly ozone background concentrations. When Tier 3 is utilized, AERMOD generates 8th highest daily maximum 1-hour NO_2 concentrations or total 1-hour NO_2 concentrations if hourly NO_2 background concentrations are added within the model.

Per the *CEQR TM*, a Tier 1 approach is initially applied, followed by a Tier 2 application of NOx/NO_2 ratio of 80% to the NOx modeled concentration to determine whether violation of the NAAQS is likely to occur. A less conservative Tier 3 approach is then applied if exceedances of the 1-hour NO_2 NAAQS were estimated.

NYC Interim Guidelines

In addition to the NAAQS, the *CEQR Technical Manual* requires that projects subject to CEQR apply a $PM_{2.5}$ and CO 8-hour averaging time significant impact criteria (based on concentration increments). These criteria are called *de minimis* and they are more stringent than the NAAQS and the state standards, as the criteria set a maximum increase of pollutant concentration that is below the national standard. If the estimated impacts of a proposed project are less than the *de minimis* criteria, the impacts are not considered to be significant. $PM_{2.5}$ significant impact concentration was evaluated as follows:

- Predicted 24-hour maximum $PM_{2.5}$ concentration increase of more than half the difference between the 24-hour background concentration and the 24-hour standard; or
- Predicted annual average PM2.5 concentration increments greater than 0.3 µg/m3 at any receptor location for stationary sources.

Background Concentrations

Determination of significant impact criteria is evaluated by adding the background concentrations at the nearest New York State Department of Environmental Conservation (NYSDEC) monitoring station to the concentrations of criteria pollutants in the ambient air of the existing and planned land uses.

Background concentrations of NO_2 and $PM_{2.5}$—the criteria pollutants for which a detailed analysis was conducted—were obtained from the NYSDEC's annual report for 2017 at the nearest monitoring stations. **Table 2.10-2** shows the background concentrations.

Table 2.10-2: Background Concentration at the Nearest NYSDEC Monitoring Station

Pollutant	Averaging Period	Background Concentration	Monitoring Station
NO_2	1-Hour Concentration	117.3 µg/m^3	IS 52
	Annual Arithmetic Average	32.5 µg/m^3	
$PM_{2.5}$	24-Hour Concentration	19.7 µg/m^3	
	Average of 3 Consecutive Annual Means	8.0 µg/m^3	

The *de minimis* criteria for CO and $PM_{2.5}$ were evaluated as described in the NYC Interim Guidelines. The concentrations increments are presented below:

- 24-hour $PM_{2.5}$ 7.70 µg/m^3
- Annual $PM_{2.5}$ 0.3 µg/m^3 (for stationary source)

Mobile Source Analysis

Introduction

Projects may result in significant mobile source impacts when they create mobile sources of pollutants, change traffic pattern, or add new uses near mobile sources of pollutants. Per CEQR guidelines, a detailed analysis is conducted to predict whether the proposed actions could potentially have a significant adverse air quality impact if certain threshold criteria are met or exceeded, while proposed projects that do not meet or exceed the threshold criteria (screen out) are not expected to have a mobile source impact. Projects that require a detailed analysis, model the ambient air CO and $PM_{2.5}$ concentrations—the mobile source pollutants of concern—and compare the modeled concentrations with the applicable air quality standard.

Mobile Source Screen

Project-Generated Traffic

Per the *CEQR Technical Manual*, localized increases in CO and $PM_{2.5}$ levels may result from increased vehicular traffic volumes and changed traffic patterns in the study area as a consequence of the proposed project. Screening analyses for CO and $PM_{2.5}$ were therefore carried out to determine whether the project-generated traffic have the potential to cause significant impact. For purposes of the screening assessment, “project-generated traffic” refers to the number of additional vehicular trips in any given hour under future with-action conditions, compared with the number under future no-action conditions.

As outlined in the Transportation Chapter, the Proposed Actions would generate a maximum of 35 (29 autos and 6 trucks) net vehicle trip ends (at any or at least one of the peak hours).

For this area of the City, the threshold volume for a detailed analysis of CO concentration, using MOVES2014 and CAL3QHC or AERMOD, is an increment of 170 vehicles. $PM_{2.5}$ threshold criterion is an increment of applies heavy-duty diesel vehicles (HDDVs) screen.
As outlined in the Transportation section and shown above, the maximum trip generation increment between the Future With No-Action and the Future With Action does not exceed the threshold of 170 vehicular trip generation.

According to *CEQR Technical Manual*, $PM_{2.5}$ detailed analysis is required if a threshold criterion, determined by project-generate peak hour HDDVs traffic or its equivalent in vehicular emission, is exceeded. The threshold criteria depend on the type of road and the incremental vehicular traffic as follows:

- 12 or more HDDV for paved roads with 5,000 vehicles;
- 19 or more HDDV for collector roads;
- 23 or more HDDV for principal and minor arterials; or
- 23 or more HDDV for expressways and limited access roads.

Fredrick Douglass Boulevard is categorized as a principal arterial road; Adam Clayton Powel Junior Boulevard is categorized as a minor arterial; the other roads around the Project Area are

categorized as a paved road with less than 5000 vehicles. Therefore, the analysis assumed that the peak hour traffic would travel on a paved road, which is the most stringent road type.

As the $PM_{2.5}$ screen does not apply to passenger cars, the NYSDEC vehicle population by source type database (part of MOVES2014a database for the county of New York) was consulted. The database shows that there are 144,036 and 125,694 passenger cars and passenger trucks in New York. This translates to 53.4% and 46.6% LDGV and LDGT1 distribution, and at most 12 net equivalent trucks trip ends (14 LDGT1 and 6 HDDVs) during the worst-case peak hour period. As such, the peak hour vehicle trip ends pass the $PM_{2.5}$ screening analysis.

Therefore, no intersection detailed air quality analysis was required, and no significant mobile source air quality impacts are expected at intersections affected by the proposed project.

Parking Garage

Based on CEQR guidelines, the maximum capacity of a parking garage is evaluated against a threshold criterion to predict whether the potential impacts associated with mobile source emissions are significant. The threshold criteria level, per CEQR guidelines, is 85 off-street parking spaces. If the threshold is met or exceeded, a detailed analysis is warranted.

The proposed project future with-action scenario includes an increment of 66 off-street parking spaces, less than the 85 parking spaces threshold criterion. Therefore, no detailed air quality analysis is required, and no significant mobile source air quality impacts are expected from vehicular emission generated at the proposed project's off-street parking space.

Existing Mobile Source of Pollutant

According to *CEQR Technical Manual*, projects that would result in new sensitive uses within 200 feet of atypical roadways or near an existing parking facility may result in significant mobile source air quality impacts. These impacts are estimated at sensitive receptors located at air intakes, operable windows, and terraces of the receptor building. There is no atypical roadway within 200 feet of the proposed project, and there are no large parking facilities located near the proposed project. Therefore, no analysis was required, and no mobile source significant adverse air quality impacts are expected to the proposed project from vehicular emission generated at an existing nearby mobile source of pollutant.

Project HVAC Systems Analysis

Introduction

Per the *CEQR Technical Manual*, the HVAC analysis considers the potential for emissions from the HVAC system of the proposed project to significantly impact existing land uses (project-on-existing), and the potential of the proposed project to significantly impact each other (project-on-project).

As outlined in the *CEQR Technical Manual*, the analysis of buildings' HVAC systems follows stationary sources methodology, and based on CEQR guidelines, a preliminary screening analysis is to be conducted as a first step to predict whether the potential impacts of the heat and hot water system boiler emissions can be significant. This CEQR screening procedure is applicable to buildings that are not less than 30 feet from the nearest building of similar or greater height. Otherwise, a detailed dispersion analysis is required.

Screening Analysis

A screening analysis was performed, using the methodology described in the *CEQR Technical Manual*, to determine if the heat and hot water system of the proposed buildings would result in potential air quality impacts to another building in the area. This methodology determines the threshold of development size below which the action would not have a significant impact.

As outlined in the *CEQR Technical Manual,* the potential for stationary source emissions from heat and hot water systems to have a significant adverse impact on nearby receptors depends on the type of fuel that would be used, the building's residential or non-residential use, the square footage of the development that would be served by the system, the height of the building served by the HVAC system and the distance to the nearest building whose height is at least as great as the building served by the HVAC system. The *CEQR Technical Manual* provides a screening analysis based on these factors, which was utilized to determine the potential for significant impacts from the projected buildings' HVAC systems.

If the actual distance between a stack and the affected building is greater than the threshold distance for a building size, then that building passes the screening analysis (and no adverse significant impact is predicted). However, if the actual distance is less than the threshold distance for a building, then there is a potential for an adverse significant impact and a detailed analysis would be required.

As previously mentioned, two scenarios, the project RWCDS and actual proposed buildings, were considered in the analysis. These scenarios are as follows:

1. RWCDS: The RWCDS is a single 20-story mixed residential and community facility building, 210 feet high, and containing 341,994 GSF of floor area.
2. Actual Proposed Development: The actual Proposed Development will include two buildings:

   Building A: A 17-story, 172'-6" feet tall building, containing 164,856 gsf of floor area, of which 30,990 gsf are community facility space and 10,000 gsf are for 66 accessory parking spaces in the cellar level. The building's stack would be located on top of the 189 feet above grade bulkhead. The building's HVAC system would operate on natural gas.

   Building B: An 18-story, 190 feet tall building, containing 184,480 gsf of floor area. The building's stack would be located on top of the 206 feet above grade bulkhead. The building's HVAC system would operate on natural gas.

The following screening analysis were conducted:

1. The Proposed Development RWCDS (210 feet high) impact on the 292 feet tall building located at 163 West 125 Street (project-on-existing) - Figure 17-1.
2. The actual proposed buildings: Building A (172'-6" feet high) impact on the 292 feet tall building located at 163 West 125 Street (project-on-existing) - Figure 17-2.
3. The actual proposed buildings: Building B (190 feet high) impact on the 292 feet tall building located at 163 West 125 Street (project-on-existing) - Figure 17-3.
4. The actual proposed buildings: Building A impact on Building B (project-on-project).

Per the *CEQR Technical Manual*, the CEQR nomographs depicted on Figure 17-5 or 17-7 of the *CEQR Technical Manual Appendix* for a 165-foot stack height were applied (as the 165 feet curve height is closest to but not higher than the proposed stack height of any of the proposed buildings.) The Stationary Source Screen in Figure 17-5 is a generic screen that considers the type of fuel oil used. According to 15 RCNY 2-15, no new boiler or burner installations may use No. 6 or No. 4 fuel oils. Therefore, the highest-emitting fuel that could be used in the RWCDS building is No.

2 fuel oil. The Stationary Source Screen Figure 17-7 referenced in the *Appendices* of the *CEQR Technical manual* is a generic screen assuming the HVAC system is fueled by natural gas. These nomographs depict the size of the development versus distance below which the potential impact can occur and provides a conservative estimate of the threshold distance. In addition, and per *CEQR Technical Manual*, the distance to nearest building of similar or greater height was assumed to be 400 feet if the actual distance is greater. **Figures 2.10-1 through 2.10-3** show the screening analyses nomographs.

Figure 2.10-1: The Proposed Development RWCDS - HVAC Screen Oil #2 Nomograph

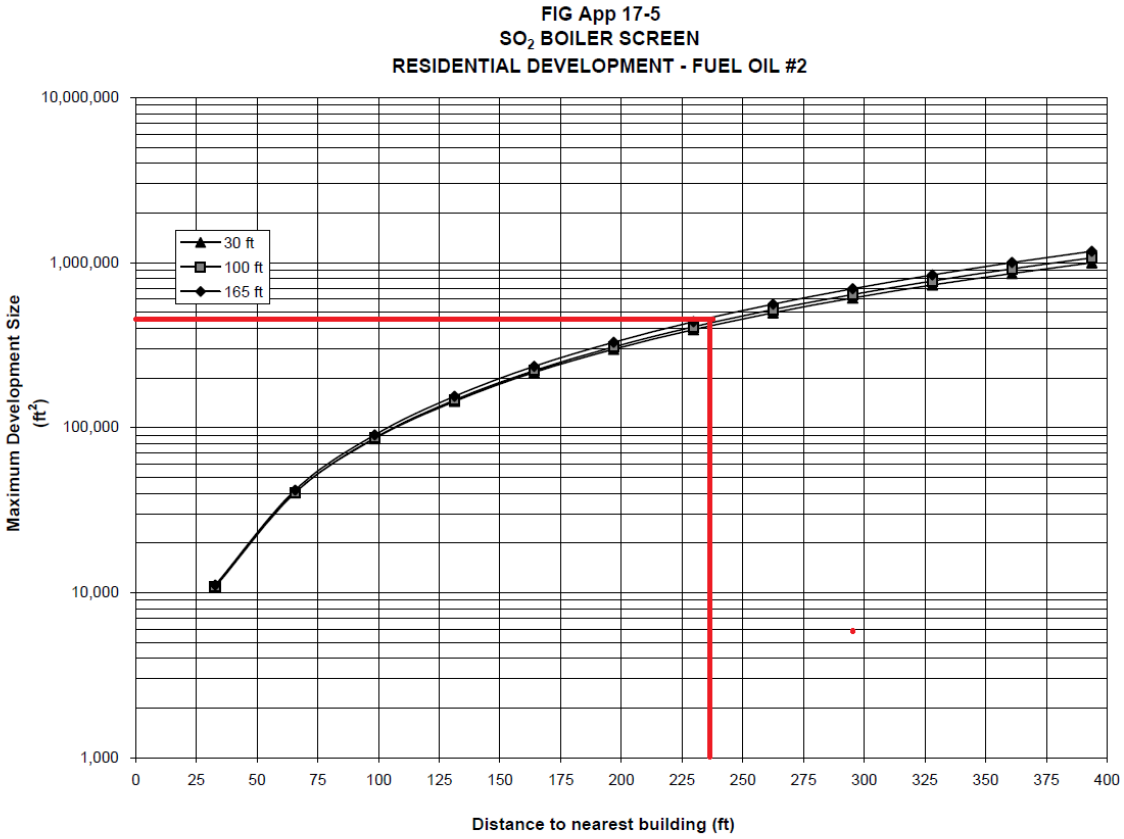


Figure 2.10-2: Building A - HVAC Screen Natural Gas Nomograph

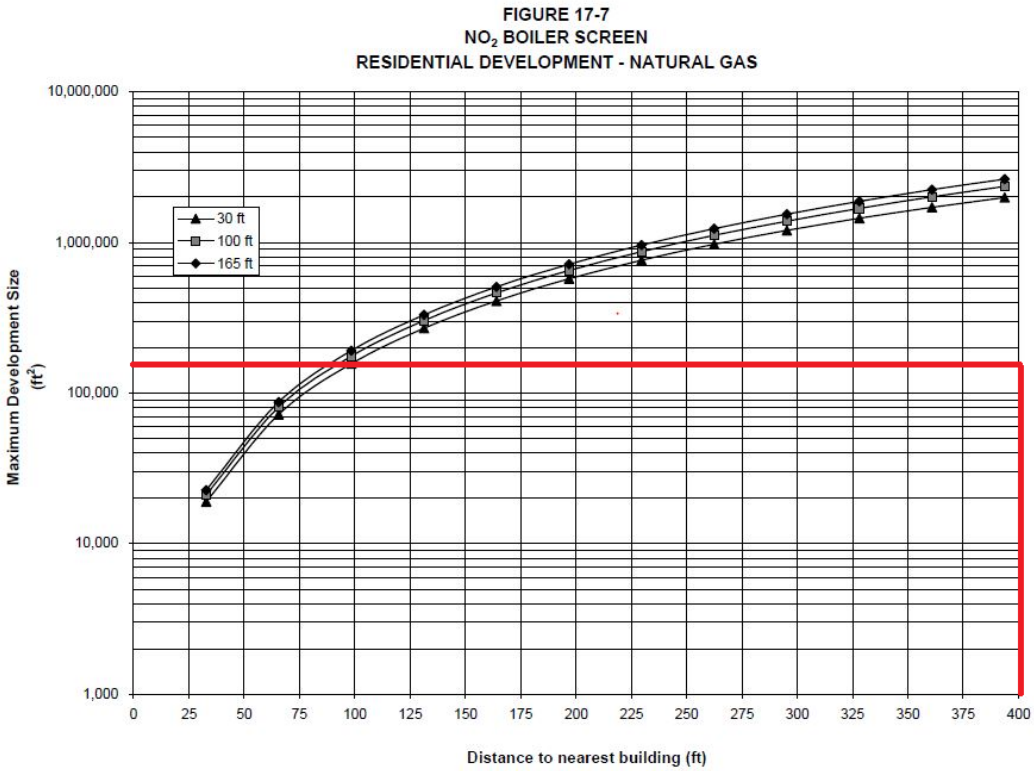
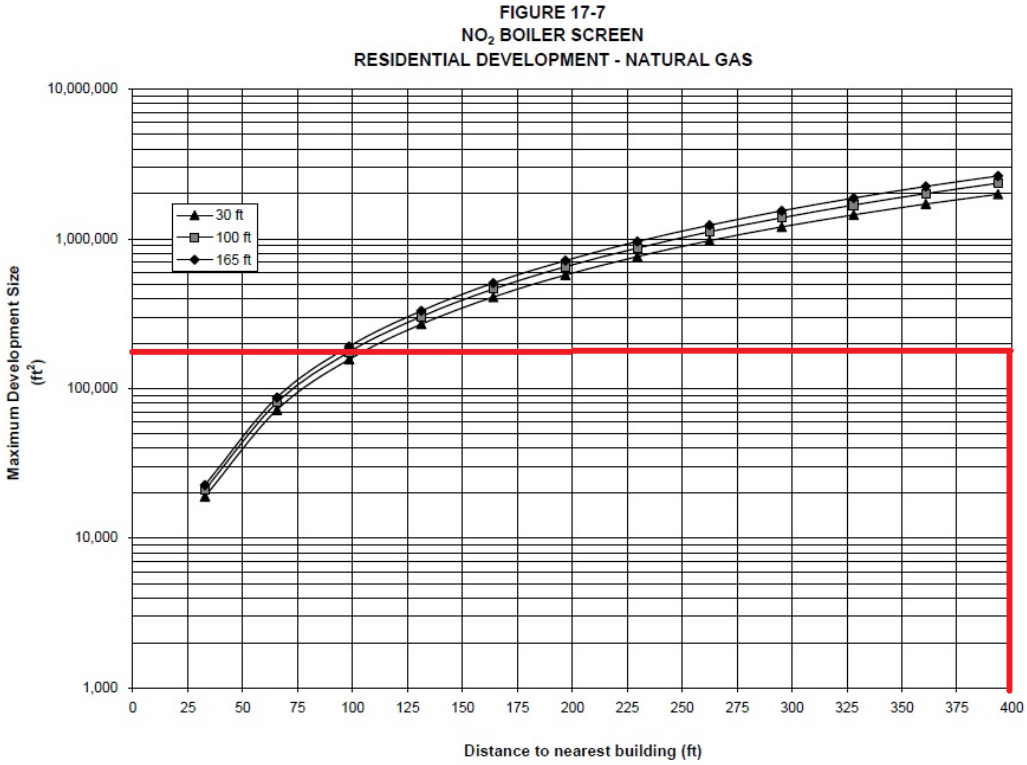


Figure 2.10-3: Building B - HVAC Screen Natural Gas Nomograph



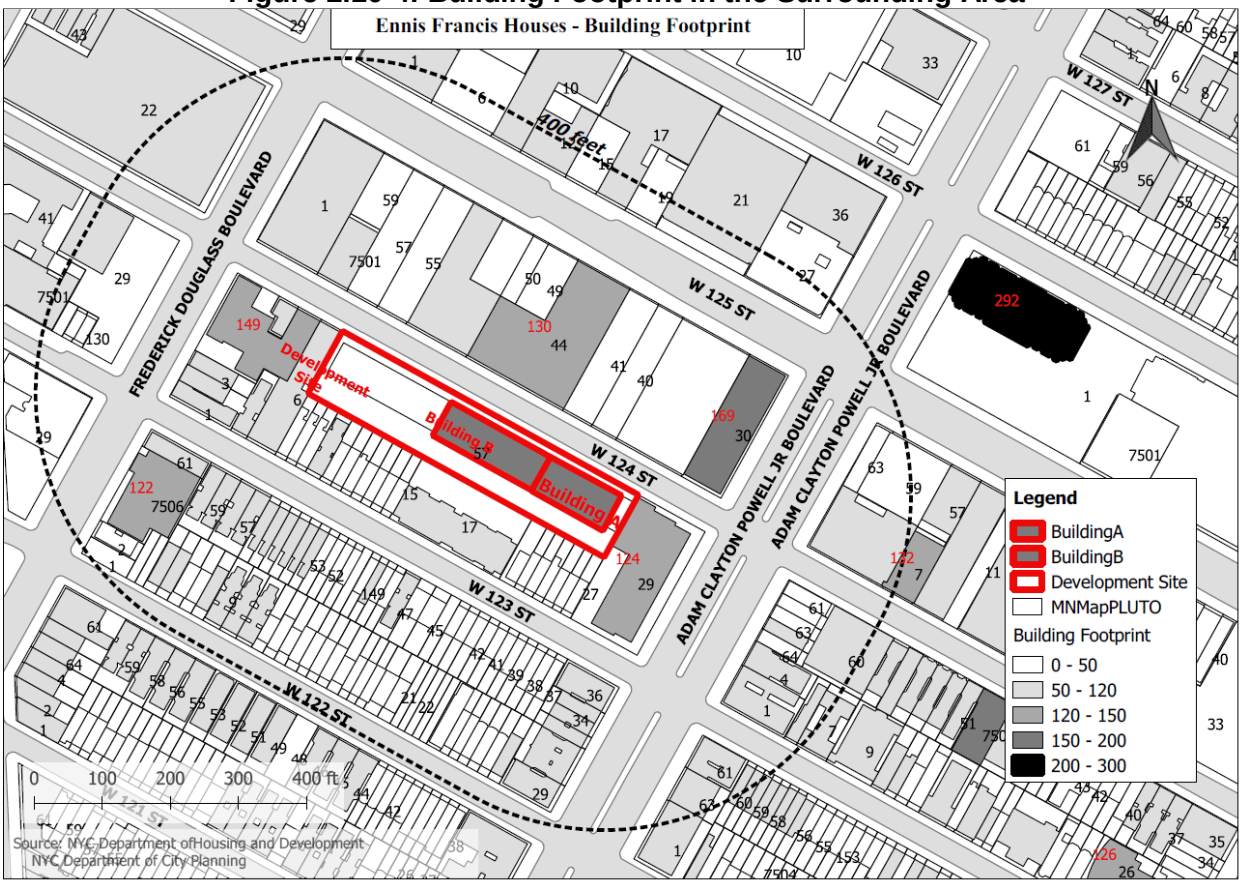
As previously mentioned, the screening analyses were applied to distances of 400 feet as the nearest building of similar or greater height for each screening analysis scenario is the 19-story, 292 feet high building, located at 163 West 25th Street (Block 1910, Lot 1).

As Building A abuts Building B, the screening analysis was not applicable (screening procedure is applicable to buildings that are not less than 30 feet from the nearest building of similar or greater height). Therefore, a detailed analysis was performed.

Figure 2.10-4 shows the proposed buildings and the Development Site plotted on the NYC Building Footprint map. The building footprint geo metadata was obtained from the NYC Open Data Building Footprints shapefile.[6]

[6] https://data.cityofnewyork.us/Housing-Development/Building-Footprints/nqwf-w8eh/data.

Figure 2.10-4: Building Footprint in the Surrounding Area



As seen in Figure 2.10-4, the proposed buildings (Building A and Building B) and the Development Site (Lot 57) were plotted on the NYC Building Footprint map, and a 400 feet radius plotted around the Development Site (Lot 57). As seen in Figure 2.10-4, there is no building similar or greater in height than the lowest proposed building (Building A) within 400 feet of the Development Site.

Table 2.10-3 depicts the screening analyses results, where “Fail” indicate that a detailed analysis using AERMOD dispersion analysis was required.

Table 2.10-3: Screening Analysis Results

Proposed Buildings	Building Height (ft.)	Heated Area (sq. ft.)	Receptor Building (Site ID or Block/Lot)	Receiving Building Distance (ft.)	Pass/ Fail
Project-on-Existing					
RWCDS	210	463,360	1910/ 1	> 400	Pass
Building A	172’-6”	164,856	1910/ 1	> 400	Pass
Building B	190	184,480	1910/ 1	> 400	Pass
Project-on-Project					
Building A	172’-6”	164,856	Building B	0	Fail

Detailed AERMOD Analysis

Methodology

AERMOD dispersion analyses were run to determine whether exhaust from the anticipated development's Building A HVAC system might have a significant adverse impact on Building B. In accordance with CEQR guidance, this analysis was conducted assuming stack tip downwash, urban dispersion surface roughness length of 1.0-meter, elimination of calms, and population of 2,000,000. Building Profile Input Program (BPIP) was run with the downwash effect enabled.

The development, Building A, HVAC equipment would be fueled by natural gas. Per the *CEQR Technical Manual*, the pollutants of concern for natural gas-fueled boilers are NO_2 and $PM_{2.5.}$ The boiler heat capacity was calculated from the annual fuel usage, the building's gross floor area, and the assumption that the building's fuel use would resemble that of a residential building. Pertinent values were obtained from the *CEQR Technical Manual Appendix* for residential buildings, and the assumption that all fuel would be consumed during the 100-day (or 2,400 hour) heating season.

Emission factors were obtained from the EPA AP-42 manual. Table 2.10-4 shows the short-term and annual emission rates.

Table 2.10-4: Building A HVAC Equipment Parameters

Fuel Annual Consumption (10^6 ft^3/year)	Control Equipment	Stack Height (ft)	Pollutant	Emission factor (lb/10^6_ft^3_Gas)	Short-term Emission Rate (lb/hr)	Annual Emission Rate (lb/yr)
9.7	None	192	NO_2	100	0.406	974
			$PM_{2.5}$	7.6	0.031	74

The diameter of the stack and the exhaust's exit velocity was estimated based on values obtained from the New York City Department of Environmental Protection (DEP) "CA Permit" database for the corresponding boiler size (i.e., rated heat input or million Btu per hour). The stack exit temperature was assumed to be 300ºF (423ºK), which is appropriate for boilers. The stack was located 3 feet above the 189 feet above grade bulkhead.

Receptors on Building B were placed all around the building envelope in 10-foot increments, and 6 feet above each floor level.

Building A and Building B were input into the AERMOD model per the Site Plans provided by the building's architect for this project. As previously mentioned, Building A would rise to a height of 172'-6", and would include 189 feet high (above grade) bulkhead. The bulkhead would be located approximately 45 feet from Building B. Per guidance from the Department of City Planning, the building's stack was located above the bulkhead. The bulkhead's location and height were specified per the plans provided by the building's architect for this project.

All analyses were conducted using the latest five consecutive years of meteorological data (2013-2017). Surface data was obtained from La Guardia Airport and upper air data was obtained from Brookhaven station, New York. These meteorological data provide hour-by-hour wind speeds and directions, stability states, and temperature inversion elevations over the 5-year period. Meteorological data were combined to develop a 5-year set of meteorological conditions, which was used for the AERMOD modeling runs and Anemometer height of 9.4 meters was specified per Lakes Environmental Software Inc.

Meteorological data were combined to develop a 5-year set of meteorological conditions, which was used for the AERMOD modeling runs and Anemometer height of 9.4 meters was specified per Lakes Environmental Software Inc.

Per Lakes Environmental Inc., $PM_{2.5}$ special procedure which is incorporated into AERMOD calculates concentrations at each receptor for each year modeled, averages those concentrations across the number of years of data, and then selects the highest values across all receptors of the 5-year averaged highest values.

The NO_2 1-hour with downwash effect on plum dispersion utilized a Tier 3 with NO_2 and ozone background concentrations. 2013-2017 Ozone hourly background concentrations were obtained from the NYSDEC[7] Botanical Garden monitoring station. The maximum ozone hourly concentration was filled for missing values. 2015-2017 NO_2 hourly background concentrations were obtained from the NYSDEC for IS52 monitoring station, except 5 hours during Feb. 29th, 2016 which were obtained from the Botanical Garden monitoring station. The 3-year of data was compiled, and a 5-year of hourly background concentrations file created following the EPA March 2011 Memorandum (Page 17)[8].

AERMOD calculates concentrations according to the dispersion option, pollutant and averaging time, and output specified in the model, where the model is capable of handling multiple sources in a single run. As such, each pollutant was modeled separately and two stacks, one for the short-term and the other for annual averaging times, were created, except the NO_2 1-hour Tier 3 analysis. Each stack was placed in a different source group and AERMOD outputs concentration for each group is read from the output file.

Results of Dispersion Analyses

As stated in the AERMOD Setting section, each pollutant averaging time was modeled twice—with building wake effect enabled/disabled. The predicted concentration is the highest concentration of these. The Tier 1 NO_2 1-hour and annual averaging times modeled concentrations were added to the background concentrations. The Tier 3 NO_2 1-hour concentration includes the background concentration. The $PM_{2.5}$ 24-hour and annual averaging times modeled concentrations were compared with the NYC Guidelines threshold criterions. The results of the HVAC dispersion NO_2 and $PM_{2.5}$ analyses are shown in Table 2.10-5.

Table 2.10-5: Detailed HVAC Analyses Results

	24-hr $PM_{2.5}$ Modeled Conc.	Annual $PM_{2.5}$ Modeled Conc.	1-hr NO_2			Annual NO_2	
			Modeled Conc.	With Background Conc.	Tier No.	Modeled Conc.	With Background Conc.
	µg/m³	**µg/m³**	**µg/m³**		**Tier No.**	**µg/m³**	**µg/m³**
Concentration	1.85	0.04	177		3	0.5	35.6
de minimis I	**7.70**	**0.3**		**188**		**100**	

The results are compared with the 24-hour/annual $PM_{2.5}$ significant impact criteria, and the 1-hour/annual NO_2 NAAQS. The $PM_{2.5}$ impacts are less than the significant impact criteria for $PM_{2.5}$

[7] http://www.nyaqinow.net/
[8] https://www.epa.gov/sites/production/files/2015-07/documents/appwno2_2.pdf

of 7.70 µg/m^3 and 0.3 µg/m^3, respectively, and both the 1-hour and annual NO_2 concentrations estimated are less than the 1-hour and annual NO_2 NAAQS of 188 µg/$m^3$and 100 µg/m^3, respectively.

Therefore, with (E) Designations in place, the emissions of the Building A's HVAC system would not significantly impact sensitive receptors on Building B.

(E) Designation

The (E) Designation language for the development Reasonable Worst-Case Development Scenario (RWCDS) is as follows:

Scenario 1, The Reasonable Worst Case Development:

> **(Block 1929, Lot 57): Any new residential or commercial development on the above-referenced property must exclusively use natural gas as the type of fuel for heating, ventilating, air conditioning (HVAC) systems and hot water systems, ensure that the stack(s) is located at the highest tier and at least 213 feet above grade to avoid any potential significant air quality impacts.**

The (E) Designation language for the development proposed buildings is as follows:

Scenario 2, Proposed Development:

> **Building A (Block 1929, Lot 57): Any new residential or commercial development on the above-referenced property must exclusively use natural gas as the type of fuel for heating, ventilating, air conditioning (HVAC) systems and hot water systems, ensure that the stack(s) is located at the highest tier and at least 192 feet above grade, and at least 393 feet from the lot line facing Fredrick Douglass Boulevard to avoid any potential significant air quality impacts.**
>
> **Building B (Block 1929, Lot 57): Any new residential or commercial development on the above-referenced property must exclusively use natural gas as the type of fuel for heating, ventilating, air conditioning (HVAC) systems and hot water systems, ensure that the stack(s) is located at the highest tier and at least 209 feet above grade to avoid any potential significant air quality impacts.**

Industrial and Major Sources

Introduction

As outlined in the *CEQR Technical Manual*, projects that would introduce new uses near industrial sources, major sources, large sources, and odor producing facilities may result in potentially significant adverse air quality impacts. The analysis considers industrial sources within 400 feet of the Project Area and major sources, large sources, and odor producing facilities within 1,000 feet of the Project Area. These sources are categorized as follows:

> Industrial sources are identified as commercial, industrial, or processing facilities that are likely to have DEP processing permits.
>
> Major emission sources are identified as those sources located at Title V facilities that require Prevention of Significant Deterioration permits.
>
> Large emission sources are identified as sources located at facilities which require a State facility permit, such as solid waste or medical waste incinerators, asphalt and concrete plants, or large printing facilities.

Odor producing facilities are operations that have the potential to cause discomfort, such as: solid waste management facilities, water pollution control plants (i.e., sewage treatment plants), and incinerators.

Study Result – Major and Large Sources and Odor Producing Facilities

A review of the NYSDEC Issued Permits databases[9] identified no Title V facility, nor a facility with an Air State Facility permit in the study area. As such, no existing large combustion sources, such as power plants, cogeneration facilities, etc., are in the 1,000-foot study area. In addition, no odor producing facility was identified in the 1,000-foot study area. Therefore, no analysis was warranted.

Study Result – Industrial Sources Toxic Air Emission

The search of the DEP CATs online database identified one expired as of 2011 certificate for an engine/generator (PB010502), located at the building on Block 1931, Lot 21. The distance between the 6-story building located at 215 West 125 Street (Block 1931, Lot 21) and Building A (the closest proposed building) is 390 feet. The emission point associated with PB010502 is either an emergency generator, which are exempt, or a cogeneration generator. For cogeneration generators, the New York City Building Code (Building Code) requires that a rooftop stack should be at least 10 feet away from the edge of the roof and at least 3 feet higher than the roofline. As such, the stack is located at least 400 feet from the closest proposed building. In addition, no industrial sources, such as auto body repair shops or woodworking facilities, were identified in the 400-foot study area. Therefore, the Proposed Buildings are not affected by industrial source emissions and no further analysis for air toxics is warranted.

Conclusion

Air quality analyses addressed mobile sources, stationary HVAC systems, and air toxics. The results of the analyses are summarized below.

- Emissions from project-related vehicle trips would not cause significant air quality impacts to receptors at the local or neighborhood scale;
- Emissions from project-related heating, ventilation, and air conditioning systems (HVACs) would not cause significant air quality impacts to receptors at the local scale with (E) - Designations in place.
- No significant air quality impacts to the proposed project are anticipated from air toxics; and
- As no existing large or major sources are located within 1,000 feet of the Development Site, emissions from existing stationary sources would not cause a significant air quality impact to the Proposed Buildings.

[9] https://data.ny.gov/Energy-Environment/Issued-Title-V-Facility-Permits/4n3a-en4b
https://data.ny.gov/Energy-Environment/Issued-State-Facility-Air-Permits/2wgt-bc53

2.11 Noise

According to the *2014 CEQR Technical Manual,* a Noise Analysis may be required if the project would (1) generate any mobile or stationary sources of noise; and/or (2) be located in an area with existing high ambient noise levels. If the proposed project is located in areas with high ambient noise levels, which typically include those near highly-trafficked thoroughfares, airports, rail, or other loud activities, further noise analysis may be warranted to determine the attenuation measures that are appropriate for the proposed project.

Introduction

Noise Monitoring was conducted by Equity Environmental Engineering, LLC (equity) personnel to support the proposal for a new mixed-use residential and community facilities development at 206-254 West 124th Street (The Development Site). The Development Site has 493'-2" of frontage along West 124th Street, a narrow street as defined under the Zoning Resolution. The Site currently includes a vacant 3- story (29'-6"), 65,020 square foot residential building with 72 dwelling units on a 49,771-square foot lot. The building is in poor condition and has been vacant since 2015. No parking is provided on the Development Site, which is located in the Transit Zone. Lot 57 has an FAR of 1.21 and is located entirely within an underlying R8 zoning district.

Vehicular traffic is the predominant source of noise in this area. Therefore, the proposed development warrants an assessment of the potential for adverse effects on the proposed residential and community facility's occupants from ambient noise. The proposed development would not create a significant stationary noise generator. Additionally, project-generated traffic would not double vehicular traffic on nearby roadways, and therefore would not result in a perceptible increase in vehicular noise. This noise assessment is limited to an assessment of ambient noise that could adversely affect occupants of the development.

Methodology

Noise is defined as any unwanted sound, and sound is defined as any air pressure variation that the human ear can detect. Human beings can detect a large range of sound pressures ranging from 20 to 20 million micropascals, but only those air-pressure variations occurring within a set of frequencies are experienced as sound. Air-pressure changes that occur between 20 and 20,000 times a second, stated as units of Hertz (Hz), are registered as sound.

In terms of hearing, humans are less sensitive to low frequencies (<250 Hz) than mid-frequencies (500-1,000 Hz). Humans are most sensitive to frequencies in the 1,000 to 5,000 Hz range. Since ambient noise contains many different frequencies all mixed together, measures of human response to noise assign more weight to frequencies in this range. This is known as the A-weighted sound level.

Noise is measured in sound pressure level (SPL), which is converted to a decibel scale. The decibel is a relative measure of the sound level pressure with respect to a standardized reference quantity. Decibels on the A-weighted scale are termed "dB(A)." The A-weighted scale is used for evaluating the effects of noise in the environment because it most closely approximates the response of the human ear. On this scale, the threshold of discomfort is 120 dB(A), and the threshold of pain is about 140 dB(A). **Table 2.11-1** shows the range of noise levels for a variety of indoor and outdoor noise levels.

Because the scale is logarithmic, a relative increase of 10 decibels represents a sound pressure level that is 10 times higher. However, humans do not perceive a 10 dB(A) increase as 10 times louder; they perceive it as twice as loud. The following are typical human perceptions of dB(A) relative to changes in noise level:

- 3 dB(A) change is the threshold of change detectable by the human ear;
- 5 dB(A) change is readily noticeable; and
- 10 dB(A) increase is perceived as a doubling of the noise level.

The *CEQR Technical Manual* recommends an analysis of two principal types of noise sources: mobile sources; and stationary sources. Both types of noise sources are examined in the following sections.

Table 2.11-1 Sound Pressure Level & Loudness of Typical Noises in Indoor & Outdoor Environments

Noise Level dB(A)	Subjective Impression	Typical Sources		Relative Loudness (Human Response)
		Outdoor	Indoor	
120-130	Uncomfortably Loud	Air raid siren at 50 feet (threshold of pain)	Oxygen torch	32 times as loud
110-120	Uncomfortably Loud	Turbo-fan aircraft at take-off power at 200 feet	Riveting machine Rock band	16 times as loud
100-110	Uncomfortably Loud	Jackhammer at 3 feet		8 times as loud
90-100	Very Loud	Gas lawn mower at 3 feet Subway train at 30 feet Train whistle at crossing Wood chipper shredding trees Chain saw cutting trees at 10 feet	Newspaper press	4 times as loud
80-90	Very Loud	Passing freight train at 30 feet Steamroller at 30 feet Leaf blower at 5 feet Power lawn mower at 5 feet	Food blender Milling machine Garbage disposal Crowd noise at sports event	2 times as loud
70-80	Moderately Loud	NJ Turnpike at 50 feet Truck idling at 30 feet Traffic in downtown urban area	Loud stereo Vacuum cleaner Food blender	Reference loudness (70 dB(A))
60-70	Moderately Loud	Residential air conditioner at 100 feet Gas lawn mower at 100 feet Waves breaking on beach at 65 feet	Cash register Dishwasher Theater lobby Normal speech at 3 feet	2 times as loud
50-60	Quiet	Large transformers at 100 feet Traffic in suburban area	Living room with TV on Classroom Business office Dehumidifier Normal speech at 10 feet	1/4 as loud

40-50	Quiet	Bird calls Trees rustling Crickets Water flowing in brook	Folding clothes Using computer	1/8 as loud
30-40	Very quiet		Walking on carpet Clock ticking in adjacent room	1/16 as loud
20-30	Very quiet		Bedroom at night	1/32 as loud
10-20	Extremely quiet		Broadcast and recording studio	
0-10	Threshold of Hearing			

Sources: Noise Assessment Guidelines Technical Background, by Theodore J. Schultz, Bolt Beranek and Newman, Inc., prepared for the US Department of Housing and Urban Development, Office of Research and Technology, Washington, D.C., undated; Sandstone Environmental Associates, Inc.; Highway Noise Fundamentals, prepared by the Federal Highway Administration, US Department of Transportation, September 1980; Handbook of Environmental Acoustics, by James P. Cowan, Van Nostrand Reinhold, 1994.

Analysis

Mobile Sources

Mobile noise sources are those which move in relation to receptors. The mobile source screening analysis addresses potential noise impacts associated with vehicular traffic generated by the Proposed Action.

Per the CEQR Technical Manual, if existing passenger car equivalent (PCE) values are increased by 100 percent or more due to a Proposed Action, a detailed analysis is generally performed. No significant adverse mobile source noise impacts due to vehicular traffic are anticipated because of the Proposed Action as It does not increase existing passenger equivalent values by more than 100 percent.

As discussed in the CEQR Technical Manual, if the proposed project is located in areas with high ambient noise levels, which typically include those near heavily-traveled thoroughfares, airports, exposed rail, or other loud activities. Accordingly, ambient noise levels were measured at the proposed development site to provide an assessment of the potential for ambient noise to have a significant adverse effect on future residents of the proposed development.

The CEQR Technical Manual provides noise exposure guidelines in terms of Leq and L10 for the maximum amount of allowable noise under existing regulations. Leq is the continuous equivalent sound level. The sound energy from the fluctuating sound pressure levels is averaged over time to create a single number to describe the mean energy or intensity level. High noise levels during a measurement period will have greater effect on the Leq than low noise levels. The Leq has an advantage over other descriptors because Leq values from different noise sources can be added and subtracted to determine cumulative noise levels. In comparison, L10 is the SPL exceeded 10 percent of the time. Similar descriptors include the L50, L01, and L90 values.

Stationary Sources

The *CEQR Technical Manual* states that based upon previous studies, unless existing ambient noise levels are very low and/or stationary source levels are very high (and there are no structures that provide shielding), it is unusual for stationary sources to have significant impacts at distances beyond 1,500 feet. A detailed analysis may be appropriate if the proposed project would: cause

a substantial stationary source (i.e., unenclosed mechanical equipment for manufacturing or building ventilation purposes, playground, etc.) 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. Machinery, mechanical equipment, heating, ventilating and air-conditioning units, loudspeakers, new loading docks, and other noise associated with building structures may also be considered in a stationary source noise analysis. Impacts may occur when a stationary noise source is near a sensitive receptor, and is unenclosed. No unenclosed specific stationary noise sources of concern were observed during field inspection. As the project site is not subject to high ambient noise levels from any nearby stationary source, no stationary source noise impacts from surrounding uses are anticipated. Additionally, as the proposed project would not introduce a new stationary noise source, no significant adverse stationary source impacts are anticipated because of the Proposed Action, and no further analysis is warranted.

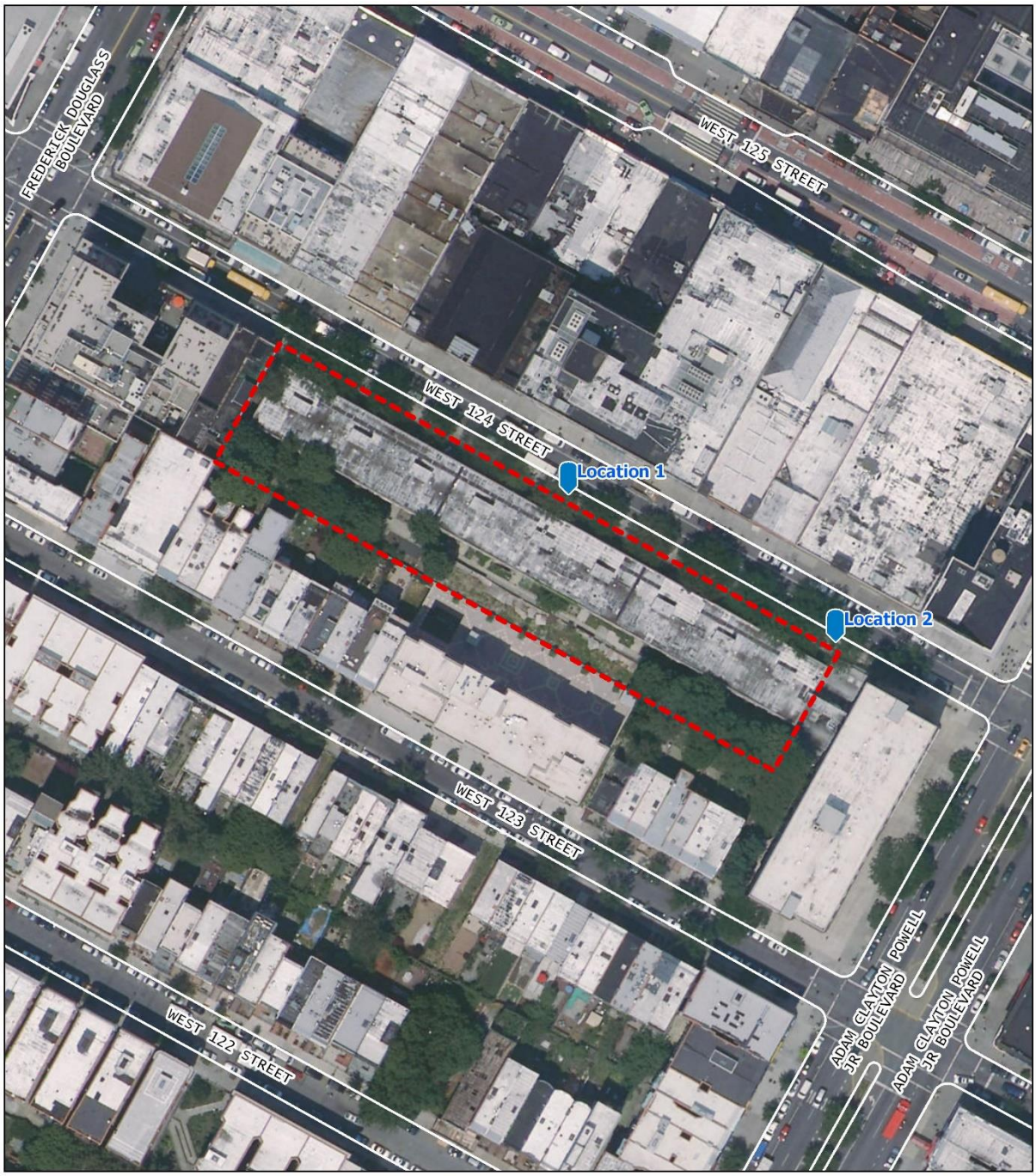
Measurement Location and Equipment

Because the predominant noise source in the area of the proposed project is vehicular traffic, noise monitoring was conducted during peak vehicular travel periods, 07:30 am-09:00 am, 12:00 pm-1:30 pm, and 4:30 pm-6:00 pm. Pursuant to CEQR Technical Manual methodology, readings in front of the Project Site (Location 1) and at the eastern edge of the Project Site (Location 2) were conducted for 20-minute periods during each peak vehicular traffic period. Figure 1 below displays the Noise Monitoring Locations of the Project Site on West 124th Street. Noise monitoring was conducted using a Larson Davis SoundTrack LxT2 sound meter and Casella CEL 63-X, with wind screen. The monitor was placed on a tripod at a height of approximately three feet above the ground, away from any other surfaces. The monitor was calibrated prior to each monitoring session.

Location 1
Project Site (Outside Building 206-254 on West 124th Street)

Location 2
Project Site (Outside Corner of building 206-254 on West 124th Street)

Figure 2.11-1: Noise Monitoring Locations



Measurement Conditions

Monitoring was conducted during typical midweek conditions, on Thursday, November 2, 2017 for location 1 and Thursday, November 1, 2018 for location 2. At location 1, the weather was dry and wind speeds were low throughout the day; and a movie production crew stored trucks, trailers, and generators on West 124th Street prior to the monitoring session. At location 2, the weather was dry and wind speeds were low throughout the day. Traffic volumes and vehicle classifications were documented during the noise monitoring. The sound meter was calibrated before and after each monitoring session.

Existing Condition

Based on the noise measurements taken at the Project Site, the predominant source of noise at the site is commercial vehicular traffic, specifically buses and cars. The volume of traffic, and its corresponding level of noise, is moderate at Locations 1 and 2.

Table 2.11-2 *below contains the results for the measurements taken at the Project Area:* Note: **Bold** denotes L_{10} noise level exceedances, according to Table 19-2 of the CEQR Technical Manual

Table 2.11-2: Noise Levels Location 1 (dB)

	Thursday, November 2, 2017		
	7:30 am – 7:50 am	12:00 pm – 12:20 pm	4:30 pm – 4:50 pm
L_{max}	84.4	89.1	86.3
L_{10}	68.4	67.5	67.8
L_{eq}	65.4	65.3	65.6
L_{50}	61.7	60.8	62.0
L_{90}	58.8	59.0	60.6
L_{min}	47.0	57.1	57.9

Table 2.11-3: Noise Levels Location 2 (dB)

	Thursday, November 1, 2018		
	8:27 am – 8:47 am	12:02 pm – 12:22 pm	4:30 pm – 4:50 pm
L_{max}	81.9	89.7	92.7
L_{10}	68.0	68.0	68.5
L_{eq}	65.3	66.2	68.7

L_{50}	63.5	63.0	64.5
L_{90}	60.5	59.5	61.5
L_{min}	56.6	56.3	58.3

Table 2.11-4 and Table 2.11-5 *below contain the traffic volumes (vehicle counts) and vehicle classifications for the AM, Mid-Day, and PM sessions at Location 1 and 2:*

Table 2.11-4: Peak Hour Traffic Counts and Vehicle Classifications

Location 1	**AM**	**MD**	**PM**
Car/ Taxi	41	43	51
Van/ Light Truck/SUV	29	38	29
Heavy Truck	0	2	2
Bus	3	0	2
Mini-Bus	10	0	4
Motorcycle	0	2	1

Table 2.11-5: Peak Hour Traffic Counts and Vehicle Classifications

Location 2	AM	MD	PM
Car/ Taxi	36	39	56
Van/ Light Truck/SUV	36	31	64
Heavy Truck	5	6	5
Bus	6	1	7
Mini-Bus	0	0	0
Motorcycle	0	0	0

Conclusion

The 2014 *CEQR Technical Manual* Table 19-2 contains noise exposure guidelines. For a residential use such as would occur under the proposed action, an L_{10} of between 65 and 70 dB(A) is identified as marginally acceptable general external exposure, and noise levels between 70 and 80 dB are identified as marginally unacceptable. The highest recorded L_{10} at ***Location 1*** was 68.4 dB(A) during the morning period, and at **Location 2** the highest recorded L_{10} was 68.5 dB(A) during the evening period.

Based on these results, ambient noise levels observed at the Development Site were below the relevant threshold, and no window-wall attenuation is required. Therefore, residential occupants of the Proposed Buildings would not be impacted by high ambient noise levels, and there would be no potential for adverse impacts associated with noise.

2.12 Public Health

According to the 2014 *CEQR Technical Manual*, Public health is the organized effort of society to protect and improve the health and well-being of the population through monitoring; assessment and surveillance; health promotion; prevention of disease, injury, disorder, disability and premature death; and reducing inequalities in health status. The goal of CEQR with respect to public health is to determine whether adverse impacts on public health may occur as a result of a proposed project, and if so, to identify measures to mitigate such effects.

Methodology

Pursuant to 2014 CEQR Technical Manual methodology, for most proposed 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, no public health analysis is warranted. If, however, an unmitigated significant adverse impact is identified in other CEQR analysis areas, such as air quality, water quality, hazardous materials, or noise, the lead agency may determine that a public health assessment is warranted for that specific technical area.

Analysis

Hazardous Materials

As discussed above in Section 2.8, The Development Site was the subject of a Phase I Environmental Site Assessment (ESA) prepared by Equity Environmental Engineering LLC in November 2017. The Phase I ESA revealed the historic presence of a Chemical Products Facility onsite. Equity also performed cursory evaluations for ASTM “Non-Scope” items, such as asbestos-containing materials (ACM), lead-based paint, radon, mold and wetlands. Equity observed mold and asbestos inside the building.

Based on the evidence presented in the Phase I ESA (described above in Section 2.7) further investigation and, if necessary, remediation would be required to ensure that no impacts due to the presence of hazardous materials are anticipated. Because the proposed action would allow new development for residential and commercial use, no new activities or processes using hazardous materials would be introduced to the site or increase pathways to a hazardous materials exposure. With the above measures in place, the Proposed Action would not have the potential for impacts related to hazardous materials.

Noise

The 2014 *CEQR Technical Manual* Table 19-2 contains noise exposure guidelines. For a residential use such as would occur under the proposed action, an L_{10} of between 65 and 70 dB(A) is identified as marginally acceptable general external exposure, and noise levels between 70 and 80 dB are identified as marginally unacceptable. As discussed above in Section 2.10, the highest recorded L_{10} at the Development Site was 68.4 dB(A) during the morning period.

Based on these results, ambient noise levels observed at the Development Site were below the relevant threshold, and no window-wall attenuation is required. Therefore, residential occupants of the Proposed Buildings would not be impacted by high ambient noise levels, and there would be no potential for adverse impacts associated with noise.

Conclusion

As discussed above, no adverse impacts associated with noise are anticipated as a result of the Proposed Action. The project will include measures to address the potential impacts related to

Air Quality and Hazardous Materials. The applicant commits to perform the necessary mitigation measures in order to ensure that the construction and occupancy of action-induced development do not result in significant adverse impacts. Based on the analyses presented in this report, the proposed action does not have the potential for significant unmitigated impacts to any of the constituent elements of public health. Therefore, no further analysis of public health is warranted.

2.13 Neighborhood Character

Methodology

Neighborhood character is an amalgam of various elements that give neighborhoods their distinct "personality." These elements may include a neighborhood's land use, urban design, visual resources, historic resources, socioeconomics, traffic, and/or noise. These technical areas are often considered in a CEQR assessment and are defined and described individually in other chapters of the Technical Manual. A neighborhood character assessment is required under *CEQR* if a proposed action would affect any of the following attributes within the vicinity of a project site: land use, urban design and visual resources, historic resources, socioeconomic conditions, transportation, or noise; or when a proposed action could result in moderate effects to several of the aforementioned elements which might cumulatively impact the neighborhood's "personality". Each of these potential impact areas has been discussed in other sections of this attachment and no significant adverse impacts have been identified, as summarized below.

- **Land Use** – The development associated with the Proposed Action will be compatible with existing land uses in the area and will not result in the loss of a particular use;
- **Urban Design** – The Proposed Action would not alter existing street patterns, and the design would be consistent with the uses, heights, and bulk of other buildings in the vicinity of the Project Site. The proposed development would not obstruct views to significant visual resources or view corridors;
- **Historic Resources –** A letter was submitted to LPC requesting a review of the Proposed Action for a determination as to whether the Project Site contains any historical, archaeological, or architectural significance. In correspondence dated November 17, 2017 (included in Appendix B), LPC indicated that the Project Site is not architecturally significant but does contain the potential for archaeological resources from a 19th Century cemetery. Architecturally significant properties in the 400-foot Study Area were analyzed, and no adverse impacts are expected as a result of the Proposed Action. An LPC-approved Restrictive Declaration will be executed for LPC's archaeological significance determination, which will prevent significant adverse archaeological resource impacts by mandating archaeological testing be conducted prior to any site disturbance or construction work at the Project Site and prior to the issuance of DOB permits;
- **Socioeconomics** - The Proposed Action would not result in the direct displacement of residential population, business, or employees and as such, no direct socioeconomic impacts will result from the proposed action. The proposed action would result in the addition of less than a 5% increase in study area (1/2-mile radius) population compared to future no-action conditions, the CEQR threshold for potential indirect socioeconomic impacts. Based on this information, no significant adverse socioeconomic impacts will result from the Proposed Action.
- **Transportation** - The Proposed Action would not result in an increase of 50 or more vehicular-trip ends either cumulatively, or individually, to any one intersection within the study area and it would not lead to an increase of 200 or more subway or bus trips to any one transit line, stop, station, or platform. The results of the pedestrian LOS analyses indicate that no significant adverse pedestrian impacts are projected to occur at any of the crosswalks, street corners, or sidewalks at Study Intersection One (1) or Study Intersection Two (2) as a result of the Proposed Action. Neither of the two study intersections are classified as "high crash locations" based on CEQR Technical Manual methodology.
- **Noise** - Ambient noise levels observed at the Affected Area were below the relevant threshold, and no window-wall attenuation is required. Therefore, residential occupants of

the Proposed Buildings would not be impacted by high ambient noise levels, and there would be no potential for adverse impacts associated with noise.

Combination of Moderate Effects: Based on the above findings, there will be minimal effects as a result of the Proposed Action. There would be no combination of moderate effects to several elements that cumulatively may affect neighborhood character.

2.14 Construction

According to the *2014 CEQR Technical Manual,* Construction impacts may be analyzed for any project that involves construction or could induce construction. For construction activities not related to in-ground disturbance, short-term construction generally does not warrant a detailed construction analysis. For example, the use of a property for construction staging activities is likely only to warrant analysis if this activity continues for a period of several years. Consideration of several factors, including the location and setting of the project in relation to other uses and intensity of construction activities are used to determine if a project's construction activities warrant analysis in one or more of the following technical areas:

- Transportation
- Air Quality or Noise
- Historic and Cultural Resources
- Hazardous Materials
- Natural Resources
- Open Space
- Socioeconomic Conditions
- Community Facilities
- Land Use and Public Policy
- Neighborhood Character
- Infrastructure

A preliminary assessment is generally not needed for these technical areas unless

- Construction activities are considered long-term (Last longer than two years); or
- Short term construction activities would directly affect a technical area, such as impeding the operation of a community facility.
- Result in the closing, narrowing, impeding of traffic, transit, or obstruction of pedestrian or vehicular routes in proximity to critical land uses.
- Construction of multiple buildings where there is a potential for on-site receptors on buildings completed before the final build-out.
- The operation of several pieces of diesel equipment in a single location at peak construction.
- Closure of a community facility or disruption in its services.
- Disturbance of a site containing or adjacent to a site containing natural resources.
- 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.

ANALYSIS

Future No-Action Scenario

No changes to existing conditions would occur to the LSRD for Lot 29 or Lot 17. It is assumed that reoccupation of the vacant building currently occupying Lot 57 would occur. Although the current building is in poor condition, rehabilitation of the existing building is feasible and would be more cost effective and practical than demolishing and rebuilding a similarly sized building allowed under the current LSRD restrictions. Based on the soft site criteria of the 2014 CEQR Technical Manual, the development potential of sites within the Affected Area under existing

zoning was assessed. Based on this assessment, it is expected that existing uses within the Affected Area would remain in the future without the Proposed Action. Therefore, no construction impacts would result under the No-Action scenario.

Future With-Action Scenario

The With-Action Scenario assumes development of a mixed residential and community facility building of up to 20 stories (210 feet) could occur on Lot 57.

Lot 29 is expected to remain as it currently exists under the With-Action Scenario and would not contribute to potential construction impacts.

Although Lot 17 would be removed from the LSRD under the Proposed Action, there would be no change to development or occupancy of the site, and no impacts to construction would occur.

The With-Action Scenario exhausts all available residential and overall (residential, commercial, and community facility) floor area within the modified LSRD boundaries, consisting of Lots 29 and 57. The scenario's building height of 210 feet (20 stories) is the maximum height that could be built in a reasonable building configuration using double-loaded corridors with height factor requirements. The total number of units to be analyzed under the With-Action Scenario is based on a rationalization of the required combination of affordable housing units at 60% and market rate at 40% per the Regulatory Agreement controlling Lot 57 described above - which assumes smaller unit sizes for affordable housing units to create an average unit size of 1 unit per 850 ZSF considering the combination of affordable and market units. Given the available residential maximum FAR of 6.02 for the R8 combined with the lot size of the LSRD, a total of 429,170 residential zoning square feet could be built. Minus the existing 140,708 ZSF present on lot 29, the maximum residential floor area that could be developed on Lot 57 is 288,462 ZSF. Dividing the available zoning floor area of 288,462 by 850 gives 339 total units of which 203 would be affordable and 136 market rate. The available R8 Community Facility FAR on Lot 57 is 6.5, subtracting the maximum residential floor area of 288,462 from the maximum of 319,452 ZSF available on site an additional 30,990 ZSF of community facility space could be built on site to maximize all available development potential.

Historic and Cultural Resources

As discussed elsewhere in this document, the Landmarks Preservation Commission has determined that the Affected Area does not possess architectural or archaeological resources. However, the Affected Area is within the 400-foot radius of the Hotel Theresa, Mount Morris Park Historic District Extension, Blumsteins Department Store, and the Apollo Theater, therefore construction measures appropriate to this context should be identified. The Projected Development Site was also found to have archaeological significance.

The City has two procedures for avoidance of damage to historic structures from adjacent construction. All buildings are provided some protection from accidental damage through New York City Department of Buildings (DOB) controls that govern the protection of any adjacent properties from construction activities, under Building Code Section 27-166 (C26-112.4). For all construction work, Building Code section 27-166 (C26-112.4) serves to protect buildings by requiring that all lots, buildings, and service facilities adjacent to foundation and earthwork areas be protected and supported in accordance with the code requirements.

The second protective measure applies only to designated NYCL and S/NR listed historic buildings that are located within 90 linear feet of a proposed construction site. For these structures, the DOB's Technical Policy and Procedure Notice (TPPN) #10/88 is applicable. The DOB's TPPN 10/88 supplements the standard building protections afforded by the Building Code C26-112.4 by requiring, among other things, a monitoring program to reduce the likelihood of construction damage to adjacent LPC-designated or S/NR-listed resources (within 90 feet), and to detect at an early stage the beginnings of damage so that construction procedures can be changed. The 90-foot distance is recognized as being close enough to potentially experience adverse construction-related impacts from ground-borne construction-period vibrations, falling debris, and/or collapse.

The historic sites listed above would, therefore, be protected under the measures of TPPN 10/88. Provided these measures are followed, the proposed actions would not result in significant adverse construction-related impacts at these resources.

By following the protection measures under DOB Code Section 27-166 (C26-112.4) and DOB's TPPN #10/88 for those applicable resources, demolition and/or construction work on the projected development site would not cause any significant adverse construction-related impacts to nearby historic and cultural resources.

A restrictive declaration will be placed on the property which will serve as a mechanism to assure that archaeological testing be conducted and that any necessary mitigation measures be undertaken prior to any ground disturbance.

Build Year:
Factoring the ULURP process, closing for financing sources, and an 18-24 month construction schedule, the projected build year will be 2021.

Conclusion
Construction activities would be completed within approximately 18 to 24 months from the start date. The existing building on Lot 57 would be demolished in place and capped in deference to the archaeological sensitivity of the site. Further, by following the above-mentioned historic and cultural resources protective measures, and application of a restrictive declaration on ground disturbance, there would be no impacts to historic and cultural resources. Construction would also be performed subject to relevant DOT and DOB regulations to ensure minimal construction impacts. Therefore, no significant adverse impacts associated with construction activities would occur.

Appendix A: Architecture

ZONING CHART

Block/Lots:	1929 / 29, 57
Address:	2070 Adam C Powell Boulevard, Manhattan, NY 10027
Total Zoning Lot Area	71,331 sq.ft. (LOT 29=21,562 sq.ft., LOT 57 = 49,769 sq.ft.
Zoning Map:	6a
Zoning District(s):	R8 & R8 with C2-4 Overlay
Community District:	Manhattan 10

ZR	Item/ Description	Required/Permitted	Proposed			Compliance
			Existing to Remain	Proposed New	Total	
USE						
22-10 / 32-10	USE GROUPS AS OF RIGHT					
		1-4 (R8)		2 , 4	N/A	Complies
		1-9 & 14 (R8/C2-4)	2 , 6		N/A	Complies
BULK						
23-151/24-11/ 33-121	FAR					
	RESIDENTIAL Residential FAR by Height Factor is Total Floor Area / Max, Lot Coverage excluding roof area that qualifies as open space	FAR =5.81 BASED ON HF CALCULATION (SEE BELOW)				
		114.522 (BLDG A)+161,526.5 (BLDG B) + 143,908 (EXIST. BLDG.E) / 6,989+9,785+15,160 = 419,956 / 31,934 =13 HF FAR FOR HF13=5.81	1.975	3.77	5.7500	Complies
	Community Facility	6.5		0.1004	0.1004	Complies
	Commercial	2.0	0.04492		0.0449	Complies
	Total	6.5			5.9000	Complies
23-151/23-153/ 24-11/33-121	FLOOR AREA					
	Residential	414433.0 SF	140,708 SF	268,884.5 SF	409,592.5 SF	Complies
	Community Facility	463,651 SF		7,164.0 SF	7,164.0 SF	Complies
	Commercial	142,662 SF	3,200.0 SF		3,200.0 SF	Complies
	Total All Uses	463,651 SF	143,908 SF	276048.5 SF	419,956.5 SF	Complies
23-151	OPEN SPACE / HEIGHT FACTOR R6-R9					
	Height Factor For Open space Ratio= Total Residential Floor Area(HF buildings)/Residential Lot Coverage	Open Space=9.5% BASED ON HF CALCULATION BELOW				
		107,358(BLDG.A)+161,526.5(BLDG.B)+140,708(EXIST.BLDG.E)/ 6,989 +9,785 + 15,160= 409,592.5/31,934=12.8/ 13 HF =0,095 OSR				
	Open Space	0.095x 409,592.5 SF= 38,911.0 SF	EXSISTING OPEN SPACE AS PER 1983	40,292.0 SF	40,292.0 SF	Complies
			31,497 SF			
23-462/24-35/ 23-47	YARDS					
	Front Yards	None Required	NONE REQUIRED	15' FRONT SET BACK IS PROVIDEDE	15'	Complies
	Side Yards	None or 8'	NONE OR 8'		0'-0" and 172'-9"	Complies
	Rear Yards	Residential 30'	RESIDENTIAL 30'	30' REAR YARD IS PROVIDED	30'-0"	Complies
24-33 b)	Permitted Obstruction in Required Yards	C.F. with max Height of 23'-0"			C.F. Height=13'-0"	Complies
23-642/24-53	HEIGHT AND SETBACK					
	Alternate Req'd front setback on Narrow Street	15'	15'	15' PROVIDED	15'	Complies
	Height above Street line	85'	85'	85'	85'	Complies
	Alternate Sky Exposure Plane	3.7 to 1	3.7 TO 1	3.7 TO 1	3.7 to 1	Complies
25-231/74-533	PARKING					
	Residential	R8_40% required of Proposed 149 Market Rate Units =60 parking R8_None Required for Proposed 173 Affordable Units (Transit Zone)		60	60	Complies
	Community Facility	None Required		None Provided		Complies
25-811	BICYCLE PARKING					
	Residential	1 PER 2 DU (0.5x322)		161	161	Complies
	Community Facility	1 PER 5000 SF =6 (waiver for 6 and less)		None Provided	None Provided	Complies
23-03/26-41	STREET TREES					
	1 per 25'	West 124th St 601'-8"/25= 24 trees	10	14	24	Complies
		Adam C Powell Blvd. 201'-10"/25= 8 trees	4	4	8	Complies
		TOTAL	14	18	30	Complies

ZONING FLOOR AREA SCHEDULE (ALL BUILDINGS)

	RESIDENTIAL	COMMERCIAL	COMMUNITY FACILITY	TOTAL
BUILDING A	107,358.0		7,164.0	114,522.0
BUILDING B	161,526.5			161,526.5
BUILDING E	140,708.4	3,200.0		143,908.4
Total	409,592.9	3,200.0	7,164.0	419,956.9

KEY PLAN

BLOCK 1929 LOTS 29,57

issue	rev	date	description
01		06/01/2018	ISSUED TO D.O.B.

ISSUES/REVISIONS

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SEAL

REGISTERED ARCHITECT FARIBA H. MAKOOI 034686 STATE OF NEW YORK

project title

BLOCK 1929 LOTS 29,57
212 WEST 124TH STREET, MANHATTAN,10027

drawing title

ZONING ANALYSIS

dob no

scale	project no. 17–11
date 2016–03–10	sheet no. OF XX
drawn KK/YF/SW	drawing no. U-003
checked KF	

ZONING ANALYSIS

Address: 225 W. 123rd Street, New York, New York 10027
2070 Adam Clayton Powell Jr. Blvd, New York,N.Y.10027
218-250 W. 124th Street, New York,New York 10027

Zone: R7A,R8,R8/C2-4
Map: 6a
Block:1929
Tax Lots: 57(Tentative Lots 57,17 &29)

LOT AREA

R7A	Tentative Lot 17	18,501.00 sf
R8	Tentative Lot 29	21,562.00 sf
R8/C2-4	Tentative Lot 57	49,769.00 sf
Total		89,832.00 sf

		R8 lot 57	R8/C2-4 lot 29	COMPLIANCE	R7A lot 17	COMPLIANCE	TOTAL FOR LSRD	EFHLSRDP COMPLIANCE	EFHLSRDP MODIFICATION
SECTION	REGULATION								
	USE GROUPS								
	Permitted								
ZR 22-12	Residential	Use Groups 1,2- Residential	Use Groups 1,2- Residential		Use Group 2- Residential		Use Group 2- Residential		
ZR 24-11	Community Facility	Use Groups 3,4	Use Groups 3,4						
ZR32-15	Commercial		Use Groups 5-9 & 14						
	Proposed/Existing								
	Residential	Use Group 2- Residential (Existing)	Use Group 2- Residential (Existing)	Complies	Use Group 2- Residential	Complies	Use Group 2- Residential (Existing and Proposed)	Complies	
	Commercial		Use Group 6 - Retail/Personal Service (Existing)	Complies			Use Group 6- Retail/Personal Service(Proposed)		Minor Modification
ZR 23-153	**MAX.LOT COVERAGE**								
	Permitted	N/A			0.65X18,501= 12,026.00 sf		N/A	N/A	
	Proposed/Existing	Existing = 39,834 sf (Existing Lot Coverage as per 1983 LSRP)			Proposed = 10,324.42 sf	Complies	Total =39,834 sf(Existing Lot Coverage as per 1983 LSRP)+10,324 sf(Proposed)=50,158.42 sf		Minor Modification
	MAX.FLOOR AREA RATIO								
	Permitted								
ZR 23-15	Residential	211,800 sf (Existing as per 1983 LSRP)-3,200 sf (Existing retail)=208,600 (F.A.)/39,834(L.C.)=5HF=3.69 F.A.R.			N/A		4.15		
ZR 23-151	Residential	N/A			4.0		N/A		
ZR 24-11	Community Facility	6.5			N/A		N/A		
ZR 33-121	Commercial		2.0		N/A		N/A		
	Proposed/Existing								
ZR 23-15	Residential	208600/71,331.27=2.92		Complies			208,600 sf (Existing Residential) + 73,792 sf (Proposed Residential)/89,832 sf(L.A.)=3.14	Complies	
ZR 23-151	Residential	N/A			73,792 sf(F.A.)/18,501 sf(L.C.)=3.99	Complies			
ZR 24-11	Community Facility	0		Complies	0				
ZR 33-121	Commercial		3200 sf/20,183 sf=0.16 FAR	Complies			3,200 sf/20,183 sf=0.16 FAR		Minor Modification
	MAX.FLOOR AREA								
	Permitted								
ZR 23-15	Residential	3.69*71,331 sf=263,211 sf			N/A		89,832.67 sf*4.15=372,805.6 sf		
ZR 23-151	Residential	N/A			18,501sf* 4.0= 74,005 sf		N/A		
ZR 24-11	Community Facility	6.5*71,331 sf=463,652 sf			18,501sf* 6.5= 120,259 sf		N/A		
ZR 33-121	Commercial		2.0*21,562 sf=43,124 sf		N/A		N/A		
	Total Floor Area	3.69*71,331 sf=263,211 sf			18,501sf* 4.0= 74,005 sf		89,832.67 sf*4.15=372,805.6 sf		
	Proposed/Existing								
ZR 23-15	Residential	211,800 sf(Existing as per 1983 LSRP)-3200 sf(Existing Retail)=208,600 sf		Complies			208,600 sf (Existing)+73,792 sf(Proposed)=282,392 sf		Minor Modification
ZR 23-151	Residential				73,792.0 sf	Complies			
ZR 24-11	Community Facility	0		Complies	0	Complies			
ZR 33-121	Commercial		3200 sf	Complies			3,200 sf		
	Total Floor Area	211,800 sf(Existing as per 1983 LSRP)		Complies	73,792.0 sf	Complies	208,600 sf (Existing)+3,200 sf)Proposed)+73,792 sf(Proposed)=285,392 sf	Complies	Minor Modification
ZR 23-151	**OPEN SPACE**								
		208,600 / 39,834 (LC) = 5.3 HF for Open space in R8 therefore open space ratio is 7.1							
	Required	7.1/100=0.71*208,600=14,811 sf			N/A		7.40		
	Proposed/Existing	71,331sf-39,834 sf(Existing Lot Coverage as per 1983 LSRP)=31,497 sf		Complies			((31,497.27+8,176.98)/(208,600+73,792))*100=14.0	Complies	
ZR 23-22	**MAX. DWELLING UNITS**								
	Permitted	71,331*6.02/740= 580			18,501sf* 4.0/680 = 109		1.633 Zoning Rooms		
	Proposed/Existing	159(Existing) +72 (Existing) +1(Existing)=232		Complies	60	Complies	159(Existing)+72(Existing)+61(Proposed)=292 D.U.	Complies	Minor Modification
ZR 23-45	**FRONT YARD**								
	Required	None			None		None		
	Proposed/Existing	None		Complies	None	Complies	None	Complies	
ZR 23-462c	**SIDE YARD**								
	Required	None/8'-0" If provided			None		None		
	Proposed/Existing	8'-0" at Low Rise Building (Existing)		Complies	None	Complies	None	Complies	
ZR 23-47	**REAR YARD**								
	Required	30'-0" at Interior Lot/ None Required at Corner Lot			30'-0"		30'-0" at Interior Lot/ None Required at Corner Lot		
	Proposed/Existing	38'-7" at Interior Lot/None at Corner Lot (Existing)		Complies	44'-1"	Complies	38'-7" at Interior Lot/None at Corner Lot (Existing)	Complies	
	HEIGHT & SETBACK								
	Permitted								
ZR 23-641	Narrow Street	85' Above Streetline Setback 20' on a Narrow St. Slope 2.7(v)to 1(h)					85' Above Streetline Setback 20' on a Narrow St. Slope 2.7(v)to 1(h)		
	Wide Street	85' Above Streetline Setback 10' on a Wide St. Slope 5.6(v)to 1(h)					85' Above Streetline Setback 10' on a Narrow St. Slope 3.7(v)to 1(h)		
	Proposed/Existing								
ZR 23-641	Narrow Street	124th St. Low Rise Max. Building Height=33'-0"		Complies			124th St. Low Rise Max. Building Height=33'-0"	Complies	
		124th St. High Rise Max. Building Height=98'-8"		C 840090 ZSM			124th St. High Rise Max. Building Height=98'-8" C 840090 ZSM	Complies	
		123rd St. High Rise Max. Building Height=98'-8"		C 840090 ZSM			123rd St. High Rise Max. Building Height=98'-8" C 840090 ZSM	Complies	
ZR 23-64	Wide Street	High Rise Maximum Building Height =98'-8"		Complies			High Rise Maximum Building Height =98'-8"	Complies	
ZR 23-662	**Quality Housing**	N/A							
	Permitted								
					15'-0" Req.Setback on Narrow St.		N/A/ DEVELOPMENT SITE		
					40'-0" Minimum Base Height		N/A/ DEVELOPMENT SITE		
					65'-0" Maximum Base Height		N/A/ DEVELOPMENT SITE		
					80'-0" Maximum Building Height		N/A/ DEVELOPMENT SITE		
	Proposed								
					15'-0" Req.Setback on Narrow St.	Complies	15'-0" Setback		
					40'-0" Minimum Base Height	Complies	40'-0" Minimum Base Height		
					65'-0" Maximum Base Height	Complies	65'-0" Maximum Base Height		
					80'-0" Maximum Building Height	Complies	80'-0" Maximum Building Height		
ZR 25-23	**Parking**								
	Required	12%= 232*0.12=28 Spaces			15%=60*0.15=9 spaces		49 Spaces		
	Proposed/Existing	28 Spaces		Complies	9 spaces	Complies	37 Spaces		Minor Modifications
ZR 26-41	**Street Tree Planting**								
	Required	1 Tree per 25 ' of Street Frontage=36 Trees Required			1 Tree per 25 ' of Street Frontage=7		N/A		
	Proposed/Existing	16 Existing +2- Proposed =36 Total		Complies	7 Trees	Complies			

1 U-008 **EXISTING LSRD ZONING CALCULATION**
1"=80'-0"

ZONING ANALYSIS

Address:
2070 Adam Clayton Powell Jr. Blvd, New York,N.Y.10027
218-250 W. 124th Street, New York,New York 10027

Zone: R8,R8/C2-4
Map: 6a
Block:1929
Tax Lots: 57 & 29 (Tentative Lot 57)

LOT AREA

R8 Tentative Lot 29	21,562.00 sf
R8/C2-4 Tentative Lot 57	49,769.00 sf
Total	71,331.00 sf

		R8	R8/C2-4	COMPLIANCE
SECTION	REGULATION			
	USE GROUPS			
	Permitted			
ZR 22-12	Residential	Use Groups 1, 2	Use Groups 1, 2	
ZR 24-11	Community Facility	Use Groups 3,4	Use Groups 3,4	
ZR32-15	Commercial		Use Groups 5-9 & 14	
	Proposed/Existing			
ZR 22-12	Residential	Use Group 2- Residential (Proposed)	Use Group 2- Residential (Existing)	Complies
ZR 24-11	Community Facility	Use Group 4- Community Facility (Proposed)		Complies
ZR32-15	Commercial		Use Group 6 - Retail/Personal Service (Existing)	Complies
ZR 23-145	**MAX.LOT COVERAGE**			
	Permitted	N/A		
	Proposed/Existing	(6,989 sf+9,785 sf)= 16,774 sf (Proposed)	15,160 sf (Existing)	
	MAX.FLOOR AREA RATIO			
	Permitted FAR			
ZR 23-151	Residential FAR by Height Factor is Total Floor Area/Max.Lot Coverage	For HF=13 FAR= 5.81(Based on HF Calculation, see below) 114,522 sf (Proposed Bldg.A)+161,526.5(Proposed Bldg.B)+143,908 (Existing Bldg.E)/ 16,774 sf (Proposed)+15,160 sf(Existing) = 13 HF		
ZR 24-11	Community Facility	6.5		
ZR 33-121	Commercial		2.0	
	Total FAR all uses		6.5	
	Proposed/Existing FAR			
ZR 23-151	Residential FAR	268,884.5/ 71,331sf=3.77 (Proposed)	140,708 sf/71,331 sf=1.972 (Existing)	Complies
	Total residential FAR	3.77+1.972=5.74		Complies
ZR 24-11	Community Facility FAR	7,164/71,331 sf= 0.1004(Proposed)		Complies
ZR 33-121	Commercial FAR		0.04492(Existing)	Complies
	Total FAR all uses	3.77 (Proposed Residential)+ 1.972 (Existing Residential)+0.1006(Proposed C.F.)+0.04492(Commercial)=5.89		Complies
	MAX.FLOOR AREA			
	Permitted			
ZR 23-151	Residential	5.89*71,331 sf=420,139 sf		
ZR 24-11	Community Facility	6.5*71,331 sf=463,651.5 sf		
ZR 33-121	Commercial		2.0*21,562 sf= 43,124 sf	
	Total Floor Area all uses	5.89*71,331 sf=420,139 sf		
	Proposed/Existing			
ZR 23-151	Residential	268,884.5sf(Proposed)	140,708 sf (Existing)	Complies
	Total Residential Floor Area	409,592.5 sf		Complies
ZR 24-11	Community Facility	7,164.0 sf(Proposed)		Complies
ZR 33-121	Commercial		3200 sf (Existing)	Complies
	Total Floor Area	268,884.5 sf(Proposed Residential)+140,708 sf(Existing Res.)+7,164.0 sf(Proposed C.F.)+3,200 sf(Existing Comm.)=419,956 sf		Complies
	OPEN SPACE/ H.F.			
ZR 23-151	Height Factor for Open Space Ratio=Total Residential Floor Area /Residential Lot Coverage	For HF=13 Open Space=9.5% (based on HF calculation below) 268,884sf(Proposed Bldg A+B)+140,708sf(Existing Bldg E)/6,989sf+9,785sf+15,160 sf=409,592.5/31,934 sf=12.8 (13 HF)		
	Open Space Required	0.095x409,592.5 sf= 38,911.0		
	Proposed/Existing	40,292 sf		Complies
	MAX. DWELLING UNITS			
ZR 23-22	Permitted	71,331*5.81/680= 609		
	Proposed/Existing	160(Existing) +322(Proposed)=482		Complies
	FRONT YARD			
ZR 23-45	Required	None		
	Proposed/Existing	None		Complies
	SIDE YARD			
ZR 23-462	Required	None or 8'		
	Proposed/Existing	None and 172'-8"		Complies
	REAR YARD			
ZR 23-47	Required	30'-0"		
	Proposed/Existing	30'-0"		Complies
ZR 23-642	**HEIGHT & SETBACK**			
	Required			
	Alternate front setback			
	Narrow Street	15'		
	Wide Street		10'	
	Proposed/Existing			
	Alternate front setback			
	Narrow Street	15' on 124th Street		Complies
	Wide Street		10' on Adam C Powell	C 840090 ZSM
	Required Height above Street Line			
	Narrow Street	85'		
	Wide Street		85'	
	Proposed/Existing			
	Height above Street Line			
	Narrow Street	85' on 124th Street		Complies
	Wide Street		85' on Adam C Powell	C 840090 ZSM
	Required Alternate Sky Exposure Plane			
	Narrow Street	3.7(v)to 1(h)		
	Wide Street		7.6 (v)to 1(h)	
	Proposed/Existing			
	Alternate Sky Exposure Plane			
	Narrow Street	3.7(v)to 1(h) on 124th Street		Complies
	Wide Street		7.6 (v)to 1(h) on Adam C Powell	C 840090 ZSM
	Parking			
ZR25-23	Required	40% of proposed 149 Market Rate Units=60 parking		
ZR74-533		None Required for 173 proposed Affordable units (Transit Zone)		
	Proposed	60 parking		Complies
	Bicycle			
ZR25-811	Required	50% of proposed 322 Units=161		
	Proposed	161		Complies
ZR 26-41	**Street Tree Planting**			
	Required	1 Tree per 25 ' of Street Frontage=30 Trees Required		
	Proposed/Existing	14 Existing +16 Proposed =30 Total		Complies

2 U-008 **PROPOSED SUB-DIVIDED LSRD ZONING CALCULATION**
1"=80'-0"

KEY PLAN

BLOCK 1929 LOTS 29,57

issue	rev	date	description
01		06/01/2018	ISSUED TO D.O.B.

ISSUES/REVISIONS

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SEAL

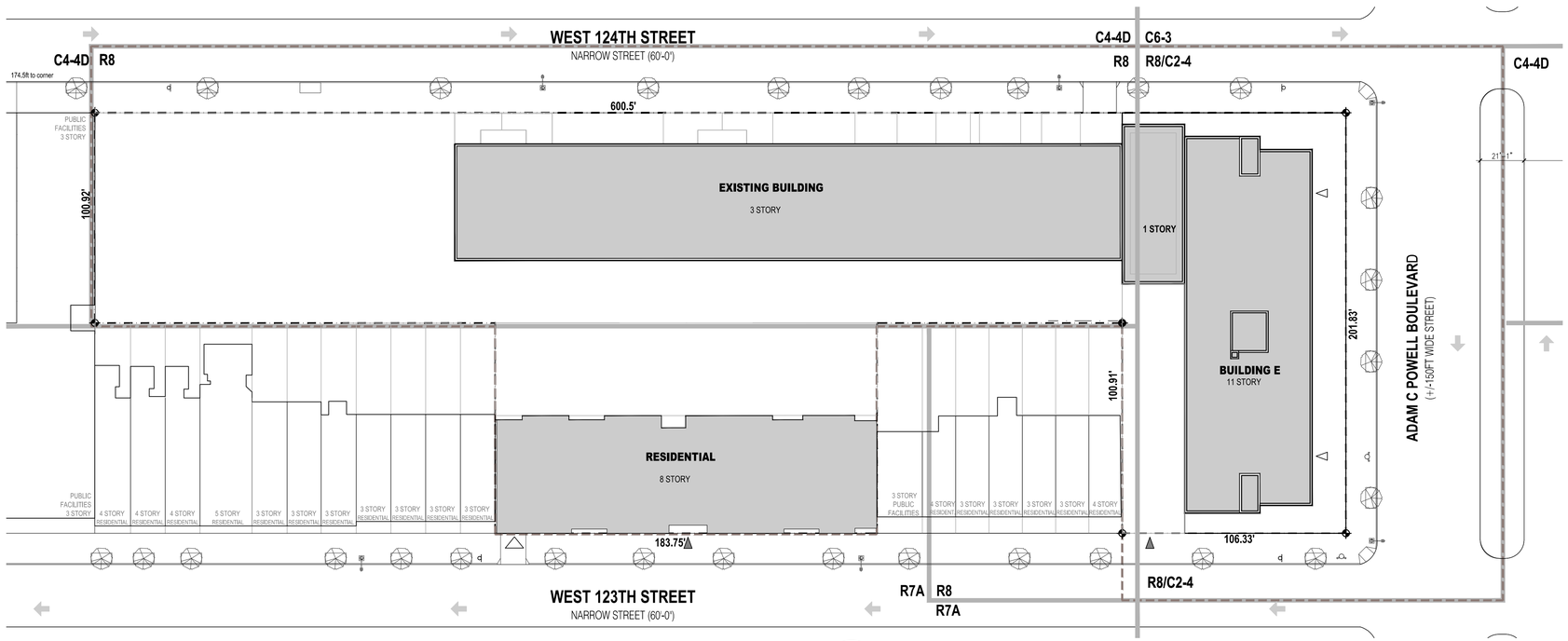
REGISTERED ARCHITECT FARIBA H. MAKOOI 034686 STATE OF NEW YORK

project title
BLOCK 1929 LOTS 29,57
212 WEST 124TH STREET, MANHATTAN,10027

drawing title
EXISTING LSRD AND PROPOSED LSRD ZONING CALCULATION

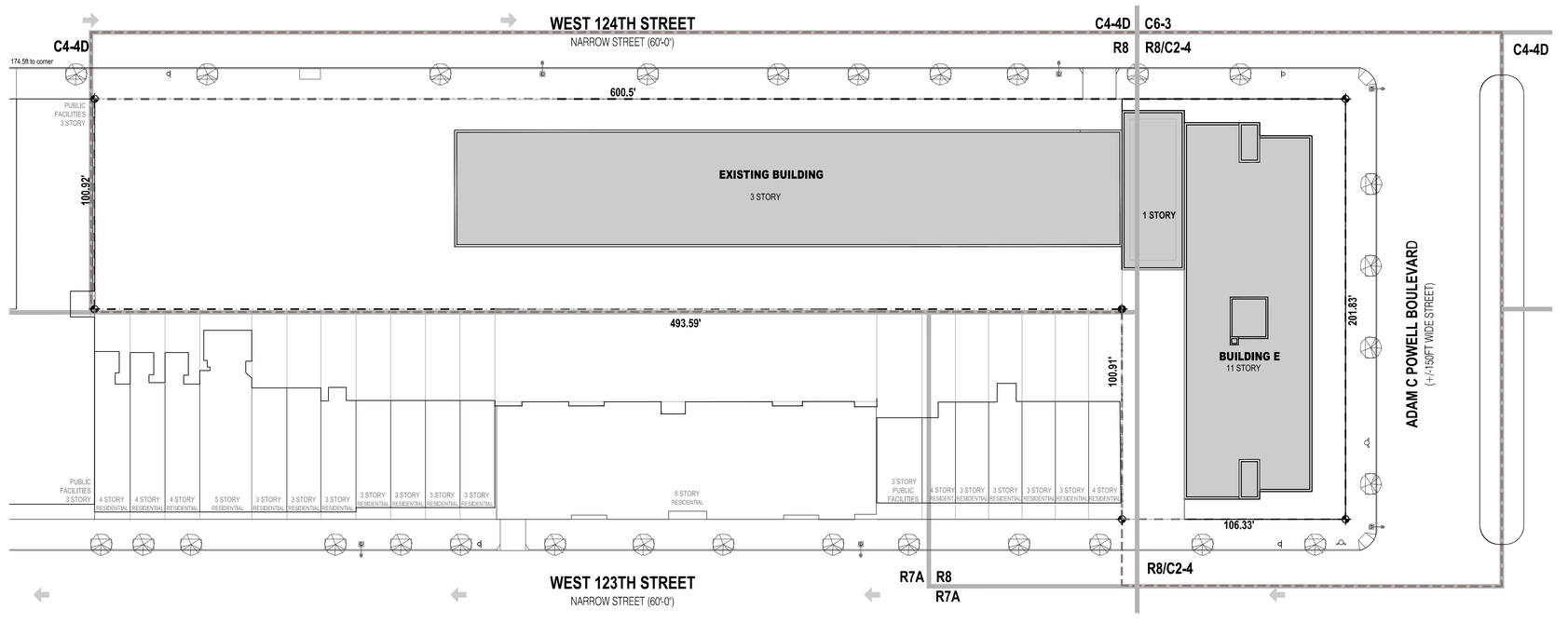
dob no

scale	project no. 17-11
date 2016-03-10	sheet no. OF XX
drawn KK/YF/SW	drawing no. U-008
checked KF	



1 U-001 EXISTING LARGE-SCALE RESIDENTIAL DEVELOPMENT SITE PLAN

1/32"=1'-0"



2 U-001 PROPOSED SUB-DIVIDED LARGE-SCALE RESIDENTIAL DEVELOPMENT SITE PLAN

1/32"=1'-0"

LEGEND

GENERAL

- EXISTING BUILDING TO REMAIN
- ZONING DISTRICT BOUNDARY
- LSRD BOUNDARY
- ZONING LOT LINE BOUNDARY

KEY PLAN

BLOCK 1929 LOTS 29,57

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REGISTERED ARCHITECT FARIBA H. MAKOOI 034686 STATE OF NEW YORK

project title

BLOCK 1929 LOTS 29,57
212 WEST 124TH STREET, MANHATTAN,10027

drawing title

EXISTING LARGE SCALE RESIDENTIAL DE□ELOPMENT

dob no

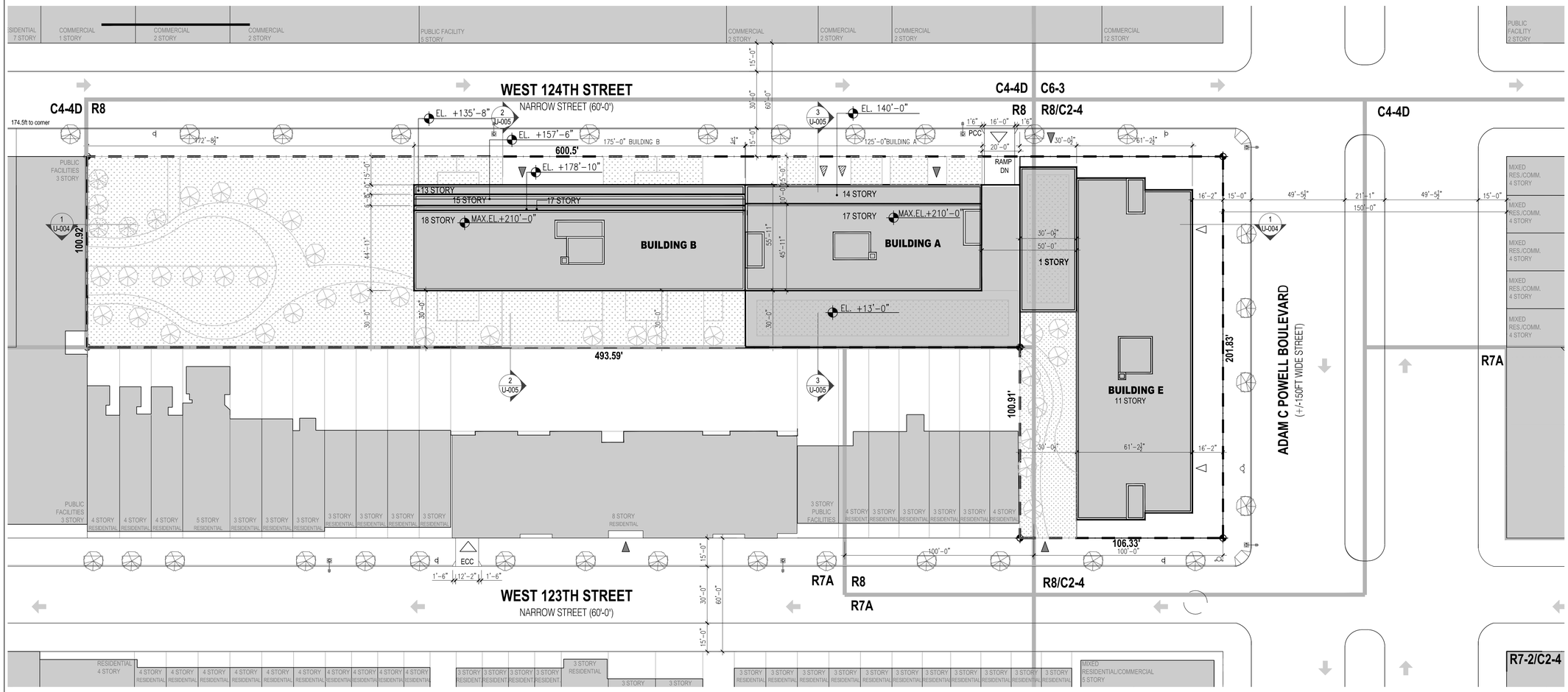
scale	project no. 17-11
date 2016-03-10	sheet no. OF XX
drawn KK/YF/SW	drawing no. U-001
checked KF	

GENERAL NOTES:

1. APPLICANT'S STAMP AND SEAL CORRESPONDS TO THE INFORMATION REGARDING THE DEVELOPMENT SITE , ZONING LOT AND RELATED CURB CUTS. INFORMATION REGARDING THE SURROUNDING PROPERTIES AND EXISTING STRUCTURES IS FOR ILLUSTRATIVE PURPOSES ONLY.

2. BUILDING SHOWN WITHIN THE ZONING ENVELOPE IS SHOWN FOR ILLUSTRATIVE PURPOSES ONLY AND IT IS SUBJECT TO CHANGE.

3. LANDSCAPE AND HARDSCAPE INFORMATION IS SHOWN FOR ILLUSTRATIVE PURPOSES ONLY AND IT IS SUBJECT TO CHANGE.



1 U-002 ZONING LOT SITE PLAN

0' 25' 50' 100'

LEGEND

GENERAL

- EXISTING BUILDING TO REMAIN
- PROPOSED BUILDING
- ZONING DISTRICT BOUNDARY
- ZONING LOT LINE BOUNDARY
- PROPOSED MAXIMUM BUILDING ENVELOPE
- ILUSTRATIVE BUILDING ENVELOPE
- ZONING ENVELOPE HEIGHT ABOVE BASE PLANE (ENV)
- PROPOSED BLDG HEIGHT ABOVE BASE PLANE
- PROPOSED MAX BLDG ENVELOPE HEIGHT ABOVE BASE PLANE

SITE

- RESIDENTIAL ENTRANCE
- COMMUNITY FACILITY ENTRANCE
- COMMERCIAL ENTRANCE
- VEHICULAR EMTRANCE
- DIRECTION OF TRAFIC
- TREE PIT AND AREA OF TREE CANOPY
- LANDSCAPED AREA
- EXISTING HYDRANT
- EXISTING TRAFFIC LIGHT
- EXISTING LIGHT POLE
- EXISTING TRAFFIC SIGN
- ECC EXISTING CURB CUT
- PCC PROPOSED CURB CUT

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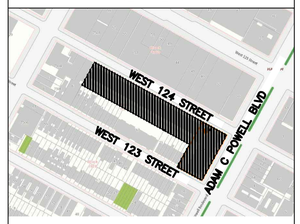
KEY PLAN



BLOCK 1929 LOTS 29,57

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SEAL: REGISTERED ARCHITECT FARIBA H. MAKOOI 034686 STATE OF NEW YORK

project title

BLOCK 1929 LOTS 29,57
212 WEST 124TH STREET, MANHATTAN,10027

drawing title

ZONING LOT SITE PLAN

dob no

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checked KF	

ZONING CHART

Block/Lots:	1929 / 29, 57
Address:	2070 Adam C Powell Boulevard, Manhattan, NY 10027
Total Zoning Lot Area	71,231 sq.ft. (LOT 29=21,460 sq.ft., LOT 57 49,771 sq.ft.
Zoning Map:	6a
Zoning District(s):	R8 & R8 with C2-4 Overlay
Community District:	Manhattan 10

ZR	Item/ Description	Required/Permitted	Proposed			Compliance
			Existing to Remain	Proposed New	Total	
USE						
22-10 / 32-10	**USE GROUPS AS OF RIGHT**					
		1-4 (R8)		2 , 4	N/A	Complies
		1-9 (R8/C2-4)	2 , 6		N/A	Complies
BULK						
23-151/24-11/ 33-121	**FAR**					
	RESIDENTIAL Residential FAR by Height Factor is Total Floor Area / Max, Lot Coverage excluding roof area that qualifies as open space	FAR =5.81 BASED ON HF CALCULATION (SEE BELOW)				
		114.522 (BLDG A)+161,526.5 (BLDG B) + 143,908 (EXIST. BLDG.E) / 6,989+9,785+15,160 = 419,956 / 31,934 =13 HF FAR FOR HF13=5.81	1.975	3.775	5.7500	Complies
	Community Facility	6.5		0.1006	0.1006	Complies
	Commercial	2.0	0.04492		0.0449	Complies
	Total	6.5			5.9956	Complies
23-151/23-153/ 24-11/33-121	**FLOOR AREA**					
	Residential	413,852.0 SF	140,708 SF	268,884.5 SF	409,592.5 SF	Complies
	Community Facility	463,001 SF		7,164.0 SF	7,164.0 SF	Complies
	Commercial	42,920SF	3,200.0 SF		3,200.0 SF	Complies
	Total All Uses	463,001.5 SF	143,908 SF	276048.5 SF	419,956.5 SF	Complies
23-151	**OPEN SPACE / HEIGHT FACTOR R6-R9**					
	Height Factor For Open space Ratio= Total Residential Floor Area(HF buildings)/Residential Lot Coverage	Open Space=9.5% BASED ON HF CALCULATION BELOW				
		107,358(BLDG.A)+161,526.5(BLDG.B)+140,708(EXIST.BLDG.E)/ 6,989 +9,785 + 15,160= 409,592.5/31,934=12.8/ 13 HF =0,095 OSR				
	Open Space	0.095x 409,592.5 SF= 38,911.0 SF		40,292.0 SF	40,292.0 SF	Complies
23-462/24-35/ 23-47	**YARDS**					
	Front Yards	None Required			None Provided	Complies
	Side Yards	None or 8'			0'-0" and 172'-9"	Complies
	Rear Yards	Residential 30'			30'-0"	Complies
24-33 b)	Permitted Obstruction in Required Yards	C.F. with max Height of 23'-0"			C.F. Height=13'-0"	Complies
23-642/24-53	**HEIGHT AND SETBACK**					
	Alternate Req'd front setback on Narrow Street	15'			15'	Complies
	Height above Street line	85'			85'	Complies
	Alternate Sky Exposure Plane	3.7 to 1			3.7 to 1	Complies
25-231/74-533	**PARKING**					
	Residential	R8_40% required of Proposed 149 Market Rate Units =60 parking R8_None Required for Proposed 173 Affordable Units (Transit Zone)		60	60	Complies
	Community Facility	None Required		None Provided		Complies
25-811	**BICYCLE PARKING**					
	Residential	1 PER 2 DU (0.5x322)		161	161	Complies
	Community Facility	1 PER 5000 SF =6 (waiver for 6 and less)		None Provided	None Provided	Complies
23-03/26-41	**STREET TREES**					
	1 per 25'	West 124th St 601'-8"/25= 24 trees	10	14	24	Complies
		Adam C Powell Blvd. 201'-10"/25= 8 trees	4	4	8	Complies
		TOTAL	14	18	30	Complies

ZONING FLOOR AREA SCHEDULE (ALL BUILDINGS)

	RESIDENTIAL	COMMERCIAL	COMMUNITY FACILITY	TOTAL
	ZFA	ZFA	ZFA	ZFA
BUILDING A	107358.0		7164.0	114522.0
BUILDING B	161526.5			161526.5
BUILDING E	140708.0	3200.0		143908.0
TOTAL	**409592.5**	**3200.0**	**7164.0**	**419956.5**

KEY PLAN

BLOCK 1929 LOTS 29,57

issue	rev	date	description
01		06/01/2018	ISSUED TO D.O.B.

ISSUES/REVISIONS

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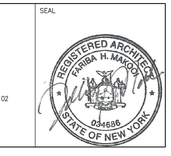

project title

BLOCK 1929 LOTS 29,57
212 WEST 124TH STREET, MANHATTAN,10027

drawing title

ZONING ANALYSIS

dob no

scale	project no. 17-11
date 2016-03-10	sheet no. OF XX
drawn KK/YF/SW	drawing no. U-003
checked KF	

GENERAL NOTES:

1. APPLICANT'S STAMP AND SEAL CORRESPONDS TO THE INFORMATION REGARDING THE DEVELOPMENT SITE , ZONING LOT AND RELATED CURB CUTS. INFORMATION REGARDING THE SURROUNDING PROPERTIES AND EXISTING STRUCTURES IS FOR ILLUSTRATIVE PURPOSES ONLY.

2. BUILDING SHOWN WITHIN THE ZONING ENVELOPE IS SHOWN FOR ILLUSTRATIVE PURPOSES ONLY AND IT IS SUBJECT TO CHANGE.

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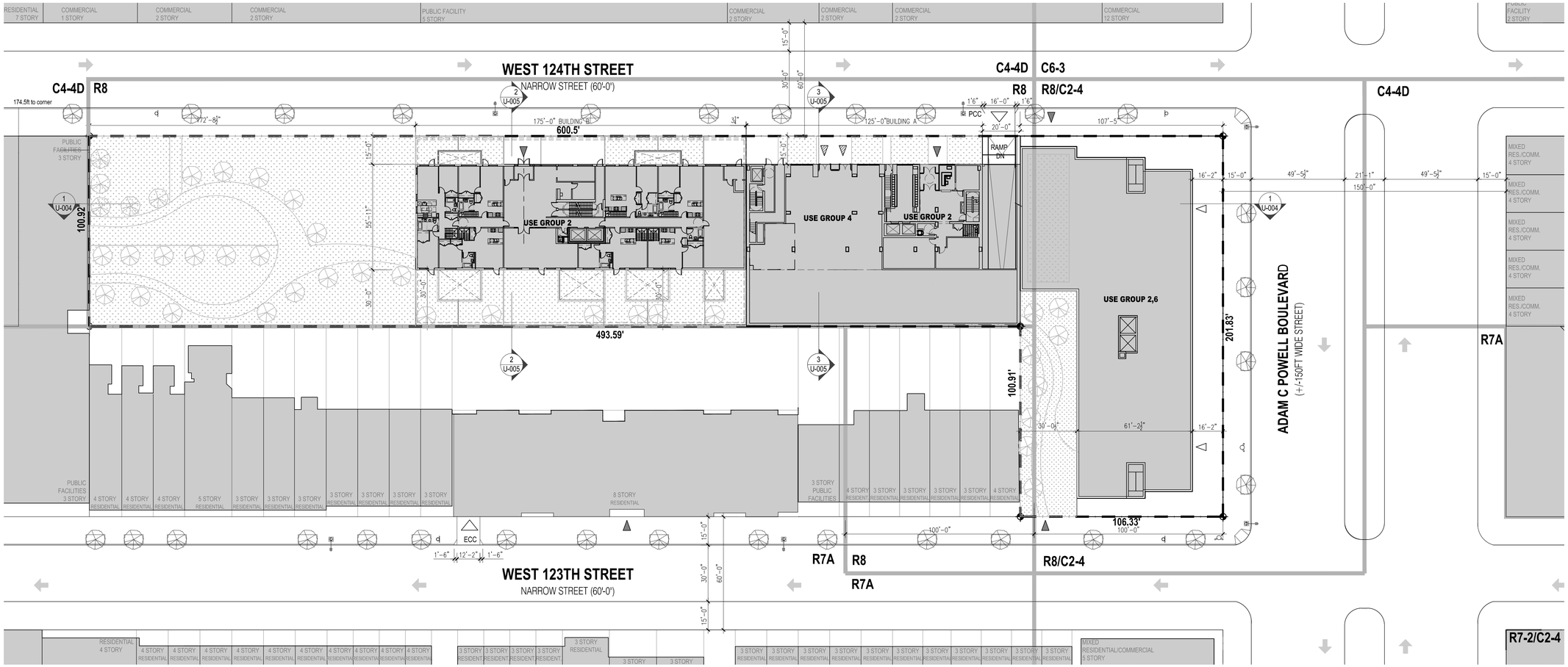

1 U-004 FIRST FLOOR PLAN

LEGEND

GENERAL

- EXISTING BUILDING TO REMAIN
- PROPOSED BUILDING
- ZONING DISTRICT BOUNDARY
- ZONING LOT LINE BOUNDARY
- PROPOSED MAXIMUM BUILDING ENVELOPE
- ILUSTRATIVE BUILDING ENVELOPE
- ZONING ENVELOPE HEIGHT ABOVE BASE PLANE (ENV)
- PROPOSED BLDG HEIGHT ABOVE BASE PLANE
  PROPOSED MAX BLDG ENVELOPE HEIGHT ABOVE BASE PLANE

SITE

- RESIDENTIAL ENTRANCE
- COMMUNITY FACILITY ENTRANCE
- COMMERCIAL ENTRANCE
- VEHICULAR EMTRANCE
- DIRECTION OF TRAFIC
- TREE PIT AND AREA OF TREE CANOPY
- LANDSCAPED AREA
- EXISTING HYDRANT
- EXISTING TRAFFIC LIGHT
- EXISTING LIGHT POLE
- EXISTING TRAFFIC SIGN
- ECC EXISTING CURB CUT
- PCC PROPOSED CURB CUT

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KEY PLAN

BLOCK 1929 LOTS 29,57

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SEAL

REGISTERED ARCHITECT FARIBA H. MAKOOI 034606 STATE OF NEW YORK

project title

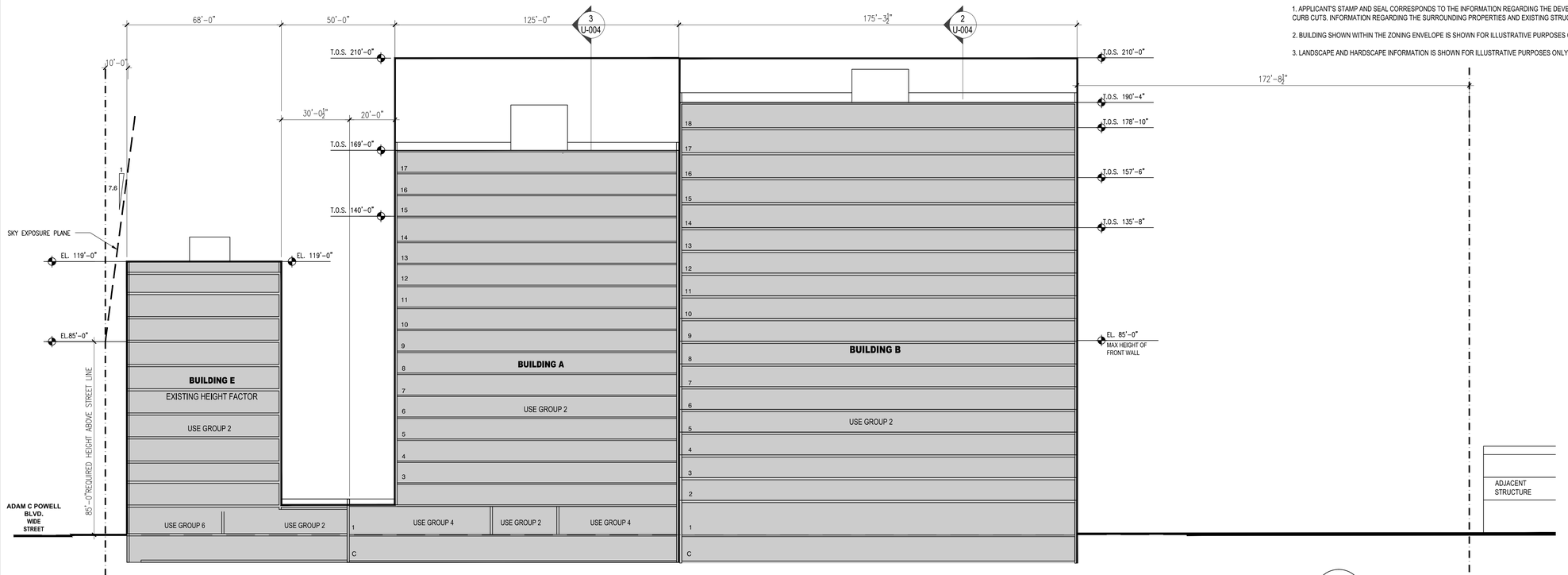
BLOCK 1929 LOTS 29,57
212 WEST 124TH STREET, MANHATTAN,10027

drawing title

□LOOR PLANS-1ST □LOOR

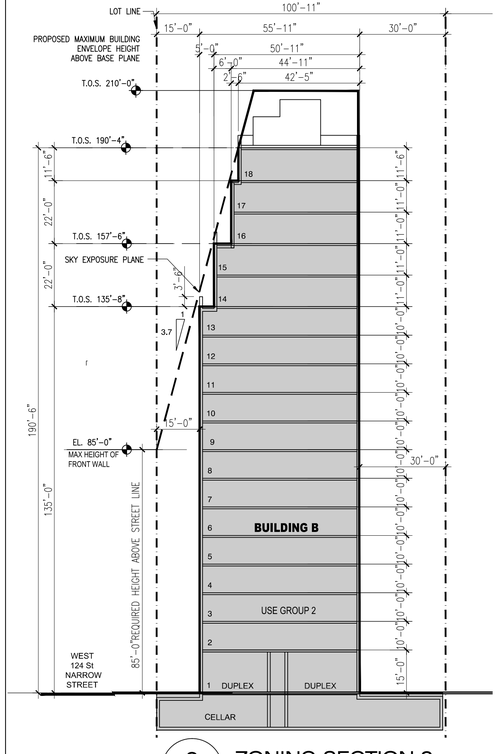
dob no

scale	project no. 17-11
date 2016-03-10	sheet no. OF XX
drawn KK/YF/SW	drawing no. U-004
checked KF	



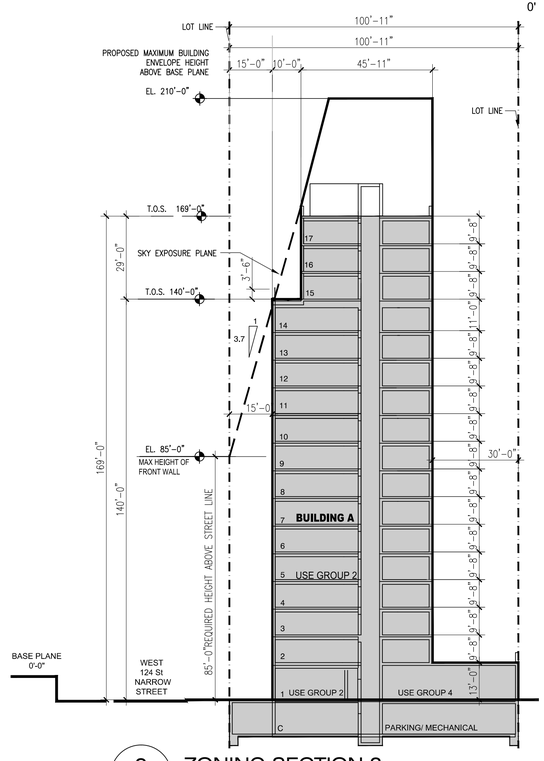
1 U-005 ZONING SECTION 1
1"=25'-0"

0' 25' 50' 100'



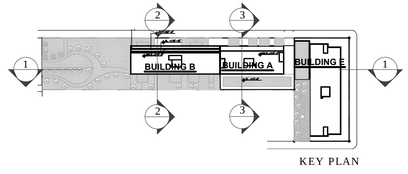
2 U-005 ZONING SECTION 2
1"=25'-0"

0' 25' 50' 100'



3 U-005 ZONING SECTION 3
1"=25'-0"

BASE PLANE (0'-0")= 28.375' GEO.



KEY PLAN

LEGEND

GENERAL

- EXISTING BUILDING TO REMAIN
- PROPOSED BUILDING
- ZONING LOT LINE BOUNDARY
- PROPOSED MAXIMUM BUILDING ENVELOPE

GENERAL NOTES:

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SEAL

REGISTERED ARCHITECT FARIBA H. MAKOOI 034606 STATE OF NEW YORK

project title

BLOCK 1929 LOTS 29,57
212 WEST 124TH STREET, MANHATTAN,10027

drawing title

ZONING SECTIONS

dob no

scale	project no. 17-11
date 2016-03-10	sheet no. OF XX
drawn KK/YF/SW	drawing no. U-005
checked KF	

1 U-006 PROJECT ELEVATION -NORTH
1"=20'-0"

0' 25' 50' 100'

2 U-006 PROJECT ELEVATION - SOUTH
1"=20'-0"

0' 25' 50' 100'

LEGEND

GENERAL

- EXISTING BUILDING TO REMAIN
- ZONING LOT LINE BOUNDARY
- PROPOSED MAXIMUM BUILDING ENVELOPE

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BLOCK 1929 LOTS 29,57

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SEAL

project title

BLOCK 1929 LOTS 29,57
212 WEST 124TH STREET, MANHATTAN,10027

drawing title

OVERALL PROJECT ELEVATIONS

dob no

scale		project no.	17-11
date	2016-03-10	sheet no.	OF XX
drawn	KK/YF/SW	drawing no.	U-006
checked	KF		

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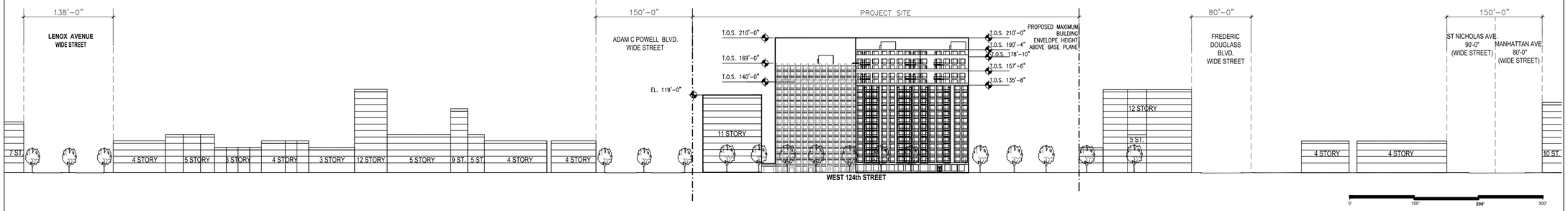
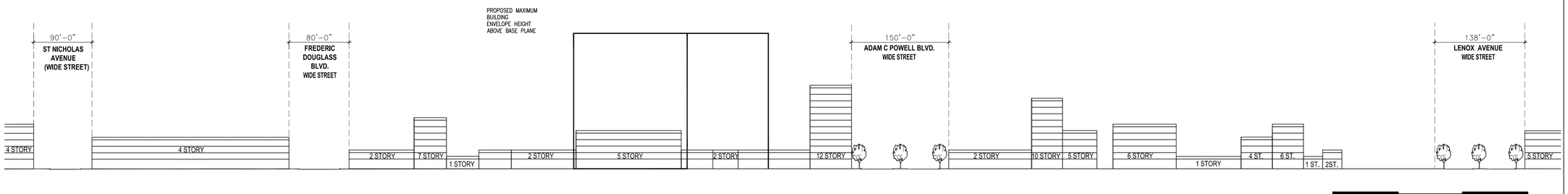


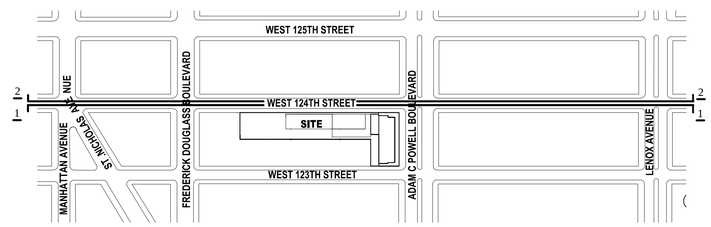
1 U-007 NEIGHBOURHOOD CHARACTER DIAGRAM : 124TH STREET FROM LENOX AVENUE TO ST NICHOLAS AVENUE

1"=80'-0"



2 U-007 NEIGHBOURHOOD CHARACTER DIAGRAM : 124TH STREET FROM ST NICHOLAS AVENUE TO LENOX AVENUE

1"=80'-0"



KEY PLAN LEGEND N.T.S.

LEGEND

GENERAL

- - - ZONING LOT LINE BOUNDARY

——— PROPOSED MAXIMUM BUILDING ENVELOPE

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KEY PLAN

BLOCK 1929 LOTS 29,57

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SEAL

REGISTERED ARCHITECT FARIBA H. MAKOOI 034686 STATE OF NEW YORK

project title

BLOCK 1929 LOTS 29,57
212 WEST 124TH STREET, MANHATTAN,10027

drawing title

NEIG□□OUR□OOD C□ARACTER DIAGRAM

dob no

scale	project no. 17-11
date 2016-03-10	sheet no. OF XX
drawn KK/YF/SW	drawing no. U-00□
checked KF	

ZONING ANALYSIS

Address: 225 W. 123rd Street, New York, New York 10027 — Zone: R7A,R8,R8/C2-4
2070 Adam Clayton Powell Jr. Blvd, New York,N.Y.10027 — Map: 6a
218-250 W. 124th Street, New York,New York 10027 — Block:1929
Tax Lots: 57(Tentative Lots 57,17 &29)

LOT AREA

R7A	Tentative Lot 17	18,501.40 sf
R8	Tentative Lot 29	20,183.00 sf
R8/C2-4	Tentative Lot 57	51,148.27 sf
Total		89,832.67 sf

SECTION	REGULATION	R8	R8/C2-4	COMPLIANCE
	USE GROUPS			
	Permitted			
ZR 22-12	Residential	Use Groups 1,2- Residential	Use Groups 1,2- Residential	
ZR 24-11	Community Facility	Use Groups 3,4	Use Groups 3,4	
ZR32-15	Commercial		Use Groups 5-9	
	Proposed/Existing			
	Residential	Use Group 2- Residential (Existing)	Use Group 2- Residential (Existing)	Complies
	Commercial		Use Group 6 - Retail/Personal Service (Existing)	Complies
ZR 23-145	**MAX.LOT COVERAGE**			
	Permitted	N/A		
	Proposed/Existing	Existing = 39,834 sf (Existing Lot Coverage as per 1983 LSRP)		
	MAX.FLOOR AREA RATIO			
	Permitted			
ZR 23-143	Residential	211,800 sf (Existing as per 1983 LSRP)-3,200 sf (Existing retail)=208,600 (F.A.)/39,834(L.C.)=5HF=3.69 F.A.R.		
ZR 23-145	Residential	N/A		
ZR 24-11	Community Facility	6.5		
ZR 33-121	Commercial		2.0	
	Proposed/Existing			
ZR 23-143	Residential	208600/71,331.27=2.92		Complies
ZR 23-145	Residential	N/A		
ZR 24-11	Community Facility	0		Complies
ZR 33-121	Commercial		3200 sf/20,183 sf=0.16 FAR	Complies
	MAX.FLOOR AREA			
	Permitted			
ZR 23-143	Residential	3.69*71,331.27 sf=263,313 sf		
ZR 23-145	Residential	N/A		
ZR 24-11	Community Facility	6.5*71,331.27 sf=463,653 sf		
ZR 33-121	Commercial		2.0*20,183 sf=40,366 sf	
	Total Floor Area	3.69*71,331.27 sf=263,313 sf		
	Proposed/Existing			
ZR 23-143	Residential	211,800 sf(Existing as per 1983 LSRP)-3200 sf(Existing Retail)=208,600 sf		Complies
ZR 23-145	Residential			
ZR 24-11	Community Facility	0		Complies
ZR 33-121	Commercial		3200 sf	Complies
	Total Floor Area	211,800 sf(Existing as per 1983 LSRP)		Complies
ZR 23-143	**OPEN SPACE**			
	Required	7.1/100=0.71*208,600=14,810 sf		
	Proposed/Existing	71,331.27sf-39,834 sf(Existing Lot Coverage as per 1983 LSRP)=31,497.27 sf		Complies
ZR 23-22	**MAX. DWELLING UNITS**			
	Permitted	71,331.27*6.02/740= 580		
	Proposed/Existing	159(Existing) +72 (Existing) +1(Existing)=232		Complies
ZR 23-45	**FRONT YARD**			
	Required	None		
	Proposed/Existing	None		Complies
ZR 23-462c	**SIDE YARD**			
	Required	None/8'-0" If provided		
	Proposed/Existing	8'-0" at Low Rise Building (Existing)		Complies
ZR 23-533	**REAR YARD**			
	Required	30'-0" at Interior Lot/ None Required at Corner Lot		
	Proposed/Existing	38'-7" at Interior Lot/None at Corner Lot (Existing)		Complies
	HEIGHT & SETBACK			
	Permitted			
ZR 23-632a	Narrow Street	85' Above Streetline Setback 20' on a Narrow St. Slope 2.7(v)to 1(h)		
ZR 23-64	Wide Street	85' Above Streetline Setback 10' on a Narrow St. Slope 3.7(v)to 1(h)		
	Proposed/Existing			
ZR 23-632a	Narrow Street	124th St. Low Rise Max. Building Height=33'-0"		Complies
		124th St. High Rise Max. Building Height=98'-8"		C 840090 ZSM
		123rd St. High Rise Max. Building Height=98'-8"		C 840090 ZSM
ZR 23-64	Wide Street	High Rise Maximum Building Height =98'-8"		Complies
ZR 23-633b,c	**Quality Housing**	N/A		
	Permitted			
	Proposed			
ZR 25-25C	**Parking**			
	Required	12%= 232*0.12=28 Spaces		
	Proposed/Existing	28 Spaces		Complies
ZR 26-41	**Street Tree Planting**			
	Required	1 Tree per 25 ' of Street Frontage=36 Trees Required		
	Proposed/Existing	16 Existing + 2- Proposed =36 Total		Complies

SECTION	REGULATION	R7A	COMPLIANCE
	USE GROUPS		
	Permitted		
		Use Group 2- Residential	
	Proposed/Existing		
		Use Group 2- Residential	Complies
	MAX.LOT COVERAGE		
	Permitted	0.65X18,501.40= 12,026.00 sf	
	Proposed/Existing	Proposed = 10,324.42 sf	Complies
	MAX.FLOOR AREA RATIO		
	Permitted		
		N/A	
		4.0	
		6.5	
		N/A	
	Proposed/Existing		
		18,501sf * 4.0= 74,005 sf	
		73,792 sf(F.A.)/18,501 sf(L.C.)=3.99	Complies
		0	Complies
		73,792.0 sf	Complies
		0	Complies
		73,792.0 sf	Complies
	MAX.FLOOR AREA		
	Permitted		
		N/A	
		18,501sf * 4.0= 74,005 sf	
		18,501sf * 6.5= 120,259 sf	
		N/A	
		18,501sf * 4.0= 74,005 sf	
	Proposed/Existing		
		73,792.0 sf	Complies
		0	Complies
		73,792.0 sf	Complies
	OPEN SPACE		
	Required	N/A	
	Proposed/Existing	(31,497.27+8,176.98)/(208,600+73,792)*100=14.0	Complies
	MAX. DWELLING UNITS		
	Permitted	18,501sf * 4.0/680 = 109	
	Proposed/Existing	60	Complies
	FRONT YARD		
	Required	None	
	Proposed/Existing	None	Complies
	SIDE YARD		
	Required	None	
	Proposed/Existing	None	Complies
	REAR YARD		
	Required	30'-0"	
	Proposed/Existing	44'-1"	Complies
	HEIGHT & SETBACK		
	Permitted		
		15'-0" Req.Setback on Narrow St.	
		40'-0" Minimum Base Height	
		65'-0" Maximum Base Height	
		80'-0" Maximum Building Height	
	Proposed		
		15'-0" Req.Setback on Narrow St.	Complies
		65'-0" Minimum Base Height	Complies
		65'-0" Maximum Base Height	Complies
		80'-0" Maximum Building Height	Complies
	Parking		
	Required	15%=60*0.15=9 spaces	
	Proposed/Existing	9 spaces	Complies
	Street Tree Planting		
	Required	1 Tree per 25 ' of Street Frontage=7	
	Proposed/Existing	7 Trees	Complies

SECTION	REGULATION	TOTAL FOR LSRD		EFHLSRDP COMPLIANCE	EFHLSRDP MODIFICATION
	USE GROUPS				
	Permitted				
		Use Group 2- Residential			
	Proposed/Existing				
		Use Group 2- Residential (Existing and Proposed)		Complies	
		Use Group 6- Retail/Personal Service(Proposed)			Minor Modification
	MAX.LOT COVERAGE				
	Permitted	N/A		N/A	
	Proposed/Existing	Total =39,834 sf(Existing Lot Coverage as per 1983 LSRP)+10,324 sf(Proposed)=50,158.42 sf			Minor Modification
	MAX.FLOOR AREA RATIO				
	Permitted				
		4.15			
		4.0			
		N/A			
		N/A			
	Proposed/Existing				
		208,600 sf (Existing Residential) + 73,792 sf (Proposed Residential)/89,832 sf(L.A.)=3.14		Complies	
		3,200 sf /20,183 sf=0.16 FAR			Minor Modification
	MAX.FLOOR AREA				
	Permitted				
		89,832.67 sf *4.15=372,805.6 sf			
		N/A			
		N/A			
		N/A			
		89,832.67 sf *4.15=372,805.6 sf			
	Proposed/Existing				
		208,600 sf (Existing)+73,792 sf(Proposed)=282,392 sf			Minor Modification
		3,200 sf			
		208,600 sf (Existing)+3,200 sf)Proposed)+73,792 sf(Proposed)=285,392 sf		Complies	Minor Modification
	OPEN SPACE				
		7.40			
		((31,497.27+8,176.98)/(208,600+73,792))*100=14.0		Complies	
	MAX. DWELLING UNITS				
		1.633 Zoning Rooms			
		159(Existing)+72(Existing)+61(Proposed)=292 D.U.		Complies	Minor Modification
	FRONT YARD				
		None			
		None		Complies	
	SIDE YARD				
		None			
		None		Complies	
	REAR YARD				
		30'-0" at Interior Lot/ None Required at Corner Lot			
		38'-7" at Interior Lot/None at Corner Lot (Existing)		Complies	
	HEIGHT & SETBACK				
	Permitted				
		85' Above Streetline Setback 20' on a Narrow St. Slope 2.7(v)to 1(h)			
		85' Above Streetline Setback 10' on a Narrow St. Slope 3.7(v)to 1(h)			
	Proposed/Existing				
		124th St. Low Rise Max. Building Height=33'-0"		Complies	
		124th St. High Rise Max. Building Height=98'-8"	C 840090 ZSM	Complies	
		123rd St. High Rise Max. Building Height=98'-8"	C 840090 ZSM	Complies	
		High Rise Maximum Building Height =98'-8"		Complies	
		N/A/ DEVELOPMENT SITE			
		N/A/ DEVELOPMENT SITE			
		N/A/ DEVELOPMENT SITE			
		N/A/ DEVELOPMENT SITE			
	Proposed				
		15'-0" Setback			
		65'-0" Minimum Base Height			
		65'-0" Maximum Base Height			
		80'-0" Maximum Building Height			
	Parking				
		49 Spaces			
		37 Spaces			Minor Modifications
	Street Tree Planting				
		N/A			

ZONING ANALYSIS

Address: 225 W. 123rd Street, New York, New York 10027 — Zone: R8,R8/C2-4
2070 Adam Clayton Powell Jr. Blvd, New York,N.Y.10027 — Map: 6a
218-250 W. 124th Street, New York,New York 10027 — Block:1929
Tax Lots: 57(Tentative Lots 57&29)

LOT AREA

R8 Tentative Lot 29		21,460.00 sf
R8/C2-4 Tentative Lot 57		49,771.00 sf
Total		71,231.00 sf

SECTION	REGULATION	R8	R8/C2-4	COMPLIANCE
	USE GROUPS			
	Permitted			
ZR 22-12	Residential	Use Groups 1, 2	Use Groups 1, 2	
ZR 24-11	Community Facility	Use Groups 3,4	Use Groups 3,4	
ZR32-15	Commercial		Use Groups 5-9	
	Proposed/Existing			
ZR 22-12	Residential	Use Group 2- Residential (Proposed)	Use Group 2- Residential (Existing)	Complies
ZR 24-11	Community Facility	Use Group 4- Community Facility (Proposed)		Complies
ZR32-15	Commercial		Use Group 6 - Retail/Personal Service (Existing)	Complies
ZR 23-145	**MAX.LOT COVERAGE**			
	Permitted	N/A		
	Proposed/Existing	(6,989 sf+9,785 sf)= 16,774 sf (Proposed)	15,160 sf (Existing)	
	MAX.FLOOR AREA RATIO			
	Permitted FAR			
ZR 23-151	Residential FAR by Height Factor is Total Floor Area/Max.Lot Coverage	For HF=13 FAR= 5.81(Based on HF Calculation, see below) 114,522 sf (Proposed Bldg.A)+161,526.5(Proposed Bldg.B)+143,908 (Existing Bldg.E)/ 16,774 sf (Proposed)+15,160 sf(Existing) = 13 HF		
ZR 24-11	Community Facility	6.5		
ZR 33-121	Commercial		2.0	
	Total FAR all uses		6.5	
	Proposed/Existing FAR			
ZR 23-151	Residential FAR	268,884.5/ 71,231sf=3.775(Proposed)	140,708 sf/71,231 sf=1.975(Existing)	Complies
	Total residential FAR	3.775+1.975=5.75		Complies
ZR 24-11	Community Facility FAR	7,164.0/71,231 sf=0.1006(Proposed)		Complies
ZR 33-121	Commercial FAR		0.04492(Existing)	Complies
	Total FAR all uses	3.775 (Proposed Residential)+ 1.975 (Existing Residential)+0.1006(Proposed C.F.)+0.04492(Commercial)=5.9956		Complies
	MAX.FLOOR AREA			
	Permitted			
ZR 23-151	Residential	5.81*71,231 sf=413,852.0 sf		
ZR 24-11	Community Facility	6.5*71,231 sf=463,001.5 sf		
ZR 33-121	Commercial		2.0*21,460 sf=42,920 sf	
	Total Floor Area all uses	6.5*71,231 sf=463,001.5 sf		
	Proposed/Existing			
ZR 23-151	Residential	268,884.5sf(Proposed)	140,708 sf (Existing)	Complies
	Total Residential Floor Area	409,592.5 sf		
ZR 24-11	Community Facility	7,164.0 sf(Proposed)		Complies
ZR 33-121	Commercial		3200 sf (Existing)	Complies
	Total Floor Area	268,884.5 sf(Proposed Residential)+140,708 sf(Existing Res.)+7,164.0sf(Proposed C.F.)+3,200 sf(Existing Comm.)=419,956 sf		Complies
	OPEN SPACE/ H.F.			
ZR 23-151	Height Factor for Open Space Ratio=Total Residential Floor Area /Residential Lot Coverage	For HF=13 Open Space=9.5% (based on HF calculation below) 268,884sf(Proposed Bldg A+B)+140, 708sf(Existing Bldg E)/6,989sf+9,785sf+15,160 sf=409,592.5/31,934 sf=12.8 (13 HF)		
	Open Space Required	0.095x409,592.5 sf=38,911.0		
	Proposed/Existing	40,292 sf		Complies
	MAX. DWELLING UNITS			
ZR 23-22	Permitted	71,231*5.81/680= 608.6		
	Proposed/Existing	160(Existing) +322(Proposed)=482		Complies
	FRONT YARD			
ZR 23-45	Required	None		
	Proposed/Existing	None		Complies
	SIDE YARD			
ZR 23-462	Required	None or 8'		
	Proposed/Existing	None and 172'-8"		Complies
	REAR YARD			
ZR 23-533	Required	30'-0"		
	Proposed/Existing	30'-0"		Complies
ZR 23-642	**HEIGHT & SETBACK**			
	Required Alternate front setback			
	Narrow Street	15'		
	Wide Street		10'	
	Proposed/Existing Alternate front setback			
	Narrow Street	15' on 124th Street		Complies
	Wide Street		10' on Adam C Powell	C 840090 ZSM
	Required Height above Street Line	85'		
	Narrow Street	85'		
	Wide Street		85'	
	Proposed/Existing Height above Street Line			
	Narrow Street	85' on 124th Street		Complies
	Wide Street		85' on Adam C Powell	C 840090 ZSM
	Required Alternate Sky Exposure Plane			
	Narrow Street	3.7(v)to 1(h)		
	Wide Street		7.6 (v)to 1(h)	
	Proposed/Existing Alternate Sky Exposure Plane			
	Narrow Street	3.7(v)to 1(h) on 124th Street		Complies
	Wide Street		7.6 (v)to 1(h) on Adam C Powell	C 840090 ZSM
	Parking			
ZR25- 231	Required	40% of proposed 149 Market Rate Units=60 parking		
ZR74-533		None Required for 173 proposed Affordable units (Transit Zone)		
	Proposed	60 parking		Complies
	Bicycle			
ZR25-811	Required	50% of proposed 322 Units=161		
	Proposed	161		Complies
ZR 26-41	**Street Tree Planting**			
	Required	1 Tree per 25 ' of Street Frontage=30 Trees Required		
	Proposed/Existing	14 Existing +16 Proposed =30 Total		Complies

1 U-008 — EXISTING LSRD ZONING CALCULATION
1"=80'-0"

2 U-008 — PROPOSED SUB-DIVIDED LSRD ZONING CALCULATION
1"=80'-0"

KEY PLAN

BLOCK 1929 LOTS 29,57

issue	rev	date	description
01		06/01/2018	ISSUED TO D.O.B.

ISSUES/REVISIONS

MEP ENGINEER: MG ENGINEERING D.P.C.
116 West 32nd Street New York, NY 10001
p 212.643.9055 f 212.643.0503
www.mgedpc.net

STRUCTURAL ENGINEER: DeSimone Consulting Engineers
140 Broadway, 25th Floor
New York, NY 10005
T. 212.532.2211
F. 212.481.6108
George.Hubbard@de-simone.com

CLIENT

FISCHER +MAKOOI ARCHITECTS PLLC
RA-AIA
242 WEST 30TH STREET, SUITE 1102
NEW YORK, NY 10001
TEL: (212) 219-9733
FAX: (212) 219-8980
WEB SITE: WWW.KFARCHITECT.COM
E-MAIL:FARIBAMK@KFARCHITECT.COM

SEAL — REGISTERED ARCHITECT FARIBA H. MAKOOI 034686 STATE OF NEW YORK

project title
BLOCK 1929 LOTS 29,57
212 WEST 124TH STREET, MANHATTAN,10027

drawing title
EXISTING LSRD AND PROPOSED LSRD ZONING CALCULATION

dob no

scale	project no. 17-11
date 2016-03-10	sheet no. OF XX
drawn KK/YF/SW	drawing no. U-008
checked KF	

Appendix B: Agency Correspondence

CITY PLANNING COMMISSION
CITY OF NEW YORK

OFFICE OF THE CHAIR

September 27, 2010

CONDITIONAL NEGATIVE DECLARATION

Project Identification
CEQR No. 10DCP028M
ULURP No. M840090AZSM
Manhattan, Community District 10
SEQR Classification: Unlisted

Lead Agency
City Planning Commission
22 Reade Street
New York, NY 10007
Contact: Robert Dobruskin
(212) 720-3423

Name, Description and Location of Proposal

Ennis Francis Houses
The applicant, Abyssinian Development Corporation, is proposing a minor modification of the previously approved Ennis Francis Large Scale Residential Development (LSRD) plan (C 840090 ZSM) located on the eastern block-front of Adam Clayton Powell Jr. Boulevard between West 123rd Street and 124th (p/o Block 1929, Lot 57) in Manhattan, Community District 10. The proposed action would modify the Ennis Francis LSRD plan in the following areas:

- Building Count: a change to the building count in the LSRD from three to four buildings;
- Unit Count: an increase in the unit count in the LSRD from 231 to 292 units;
- Use of Available Residential Floor Area: an increase in the use of available residential floor area within the LSRD area from 211,800 sq. ft. to 285,592 sq. ft.;
- Use of Available Commercial Floor Area: use of available commercial floor area of 3,200 sq. ft. on the ground floor of the existing 11-story building (i.e., residential tower) on Adam Clayton Powell Blvd.; and
- Parking: a decrease in the number of parking spaces from 49 to 37 spaces.

The proposed action would facilitate a proposal by the applicant to construct an 8-story, 60-unit, approximately 74,000 square foot residential building and reduce the number of parking spaces from 49 (on two separate parking lots) to 37 (within a single garage) on the subject site. Further, the action would facilitate two use conversions within an existing 11-story building on the site: 570 square feet of accessory space (a "community room," or meeting room for the building residents) would be converted to residential use on the fourth floor, and 3,200 square feet of accessory space (a larger "community room") would be converted to commercial retail use on the ground floor.

Robert Dobruskin, AICP, *Director*
Celeste Evans, *Deputy Director*
22 Reade Street, New York, N.Y. 10007-1216 Room 4E (212) 720-3420
FAX (212) 720-3495
R_DOBRUS@planning.nyc.gov

The subject site, owned by the applicant, is currently developed with two 3-story residential buildings fronting West 124th Street (containing 32 and 40 residential units), an 11-story, 159-unit residential building fronting Adam Clayton Powell Jr. Boulevard, a 5,381 square foot playground and two accessory parking lots with a combined 49 spaces of at-grade parking. The site is currently zoned R7A (along West 123rd Street, at a 100' depth), R8 (along West 124th Street, at 100' depth), and R8/C2-4 (along Adam Clayton Powell Jr. Boulevard, at a 200'depth and a 100' depth, respectively). R7A, a mandatory Quality Housing District, permits a maximum residential and community facility FAR of 4.0. R8 zoning districts allow medium-density residential development up to 6.02 FAR and community facility uses up to 6.50 FAR. The C2-4 commercial overlay allows Use Group 6 uses at up to 2.0 FAR; however, in mixed use residential and commercial buildings, commercial use is allowed up to 1.0 FAR and is limited to the ground floor.

The applicant intends on seeking Tax Exempt Bonds from New York State Housing Finance Authority, and 4% low income housing tax credits. In order to qualify for the tax credits, the project will be 100 % affordable to families earning at or below 60% of the area median income.

Absent the proposed action, the applicant has stated that the subject site would remain as in existing conditions.

The build year for the proposed action is 2013.

Statement of No Significant Effect:

The Environmental Assessment and Review Division of the Department of City Planning, on behalf of the City Planning Commission, has completed its technical review of the Environmental Assessment Statement, dated July 26, 2010, prepared in connection with the ULURP Application (No. M840090(A)ZSM). The City Planning Commission has determined that the proposed action will have no significant effect on the quality of the environment, once it is modified as follows:

1. The applicant shall agree via a restrictive declaration to conduct a Phase II Environmental Site Assessment (Phase II) in accordance with the sampling protocol approved by New York City Department of Environmental Protection (DEP).

   The applicant shall further agree to perform any necessary remediation of the subject property if hazardous materials are found as the result of the Phase II. The applicant would prepare a Remedial Action Plan, including a sampling protocol and a health and safety plan, for DEP for approval. Remediation measures would be undertaken pursuant to the approved remediation plan.

   The restrictive declaration shall also restrict the applicant from submitting any permit applications to the New York City Department of Buildings (DOB) that would allow for soil disturbance on the subject property until such time that DEP provides the necessary written notice to DOB.

2. The applicant shall agree via a restrictive declaration to conduct archaeological identification, investigation and mitigation in accordance with the *CEQR Technical*

Manual and New York City Landmarks Preservation Commission (LPC) guidelines for Archaeological Work in New York City.

The restrictive declaration shall also restrict the applicant from submitting any permit applications to the DOB that would allow for soil disturbance on the subject property until such time that LPC provides the necessary written notice to DOB.

Supporting Statement:

The above determination is based on an environmental assessment which finds that:

1. A Phase I Environmental Site Assessment (ESA) was prepared for the project site. The Phase I ESA was reviewed by DEP's Office of Environmental Planning and Assessment, and pursuant to a letter dated July 21, 2010 a Phase II Environmental Assessment Statement (ESA), hazardous materials sampling protocol and health and safety plan were recommended due to the potential presence of hazardous materials on the site as a result of past on-site and/or surrounding area land uses. As such, the applicant shall enter into a restrictive declaration to ensure that a detailed Phase II testing would occur, and hazardous materials sampling protocol including a health and safety plan would be prepared, and is binding upon the property's successors and assigns. The declaration shall serve as a mechanism to assure the potential for hazardous material contamination that may exist in the subsurface soils and groundwater on the project site would be characterized prior to any site disturbance (i.e., site grading, excavation, demolition, or building construction). Consequently, no significant adverse impacts related to hazardous materials will occur.

   Based on the DEP's recommendations, a restrictive declaration, reviewed and approved by the DEP, will be executed and recorded. The restrictive declaration will be binding upon the property-owner and its successors and assigns. The declaration will serve as a mechanism to ensure that a detailed Phase II testing would occur, and hazardous materials sampling protocol including a health and safety plan would be prepared, prior to any construction work or site disturbance at the Project Site. The restrictive declaration will assure that the potential for any significant adverse hazardous materials impacts as a result of the proposed action would be avoided. The applicant understands that if the restrictive declaration is not recorded, with proof of recording approved by the DEP, prior to any City Planning Commission approval of the proposed action, then any such approval will make recordation of the declaration a condition to the Department of Building's issuance, and the applicant's acceptance, of any permit involving ground disturbance of the Project Site.

2. A previous application for the proposed development site requested a determination from LPC as to whether the subject site contains any historical, architectural, or archaeological significance. By letter dated July 14, 2010, LPC determined that the subject site may be archaeologically significant and that further testing would be required in order to determine if the site contains remains from 19th century burials. As such, the applicant shall enter into a restrictive declaration which requires that prescribed archaeological work be conducted in accordance with the CEQR Technical Manual and LPC Guidelines for Archaeological Work in New York City.

The restrictive declaration shall be binding upon the property's successors and assigns. The declaration shall serve as a mechanism to assure that archaeological testing be conducted and that any necessary mitigation measures be undertaken prior to any site disturbance (i.e., site grading, excavation, demolition, or building construction). Consequently, no significant adverse impacts related to historic and cultural resources will occur.

Based on the LPC's recommendations, a restrictive declaration, reviewed and approved by LPC, will be executed and recorded. The restrictive declaration will be binding upon the property-owner and its successors and assigns. The declaration will serve as a mechanism to ensure that archaeological testing be conducted and that any necessary mitigation measures be undertaken prior to any site disturbance (i.e., site grading, excavation, demolition, or building construction) prior to any construction work or site disturbance at the Project Site. The restrictive declaration will assure that the potential for any significant adverse historic and cultural resources impacts as a result of the proposed action would be avoided. The applicant understands that if the restrictive declaration is not recorded, with proof of recording approved by LPC, prior to any City Planning Commission approval of the proposed action, then any such approval will make recordation of the declaration a condition to the Department of Building's issuance, and the applicant's acceptance, of any permit involving ground disturbance of the Project Site.

3. No other significant adverse effects on the environment which would require an Environmental Impact Statement are foreseeable.

It is fully agreed and understood that if the foregoing conditions, modification and alterations are not fully incorporated into the proposed actions, this Conditional Negative Declaration shall become null and void. In such event, the applicant shall be required to prepare a Draft Environmental Impact Statement before proceeding further with said proposal.

This Conditional Negative Declaration has been prepared in accordance with Article 8 of the Environmental Conservation Law 6NYCRR part 617.

I, the Undersigned, as the applicant or authorized representative for this proposal, hereby affix my signature in acceptance of the above conditions to the proposed actions.

Signature of Applicant or Authorized Representative

Date: 7/26/10

James Howard, Vice President of Real Estate

Name of Applicant or Authorized Representative

Robert Dobruskin

Robert Dobruskin, AICP, Director
Environmental Assessment & Review Division
Department of City Planning

Date: 7/26/10

Amanda M. Burden, FAICP, Chair
City Planning Commission

Date: 9/27/10

Environmental Protection

Vincent Sapienza, P.E.
Commissioner

Angela Licata
Deputy Commissioner of Sustainability

59-17 Junction Blvd.
Flushing, NY 11373

Tel. (718) 595-4398
Fax (718) 595-4422
alicata@dep.nyc.gov

October 2, 2018

Rachel Antelmi
Project Manager
Environmental Assessment and Review Division
New York City Department of City Planning
120 Broadway, 31st Floor
New York, NY 10271

Re: Ennis Francis Houses
Block 1929, Lots 17, 29, and 57
CEQR # 19DCP041M

Dear Ms. Antelmi:

The New York City Department of Environmental Protection, Bureau of Sustainability (DEP) has reviewed the August 2018 Environmental Assessment Statement (EAS) and the November 2017 Phase I Environmental Site Assessment (Phase I) prepared by Equity Environmental Engineering, on behalf of Carthage Real Estate Advisors LLC (applicant) for the above referenced project. It is our understanding that the applicant is seeking a minor modification to Special Permit C840090 ZSM from the New York City Department of City Planning (DCP) pursuant to Sections 78-312 and 78-313 of the Zoning Resolution of the City of New York. The proposed action would alter the bulk provisions of the Ennis Francis Houses Large Scale Residential Development plan, to facilitate the development of two new contiguous buildings on Block 1929, Lot 57 (development site). The development site currently includes a vacant 3-story residential building. The proposed development will include a 17-story building (Building "A") and an 18-story building (Building "B"). The proposed buildings would contain a total of 290,395 gross square feet (gsf) of residential floor area and 7,451 gsf of ground floor community facility space. The project area is bounded by West 123rd Street, Adam Clayton Powell Jr. Blvd., West 124th Street, and Fredrick Douglass Boulevard in the Central Harlem neighborhood of Manhattan Community District 10. It should be noted that there would be no change in development or occupancy of Lots 17 and 29.

Block 1929, Lot 57

The November 2017 Phase I report revealed that historical on-site and surrounding area land uses consisted of a variety of residential and commercial uses including mixed use residential dwellings with store fronts, commercial/office buildings, apartment buildings, a substation, a music hall, an opera house, a railway line, a garage, an auto school, a parking garage, a hotel, restaurants, a department store, a bank, a warehouse, a police station, an auto sales yard, a furniture store, a public market, a community center, dry cleaners,

a gasoline station, a church, etc. Based on the age of the subject building, asbestos containing materials could be present in the on-site structure. Regulatory databases identified 16 spills within 1/8 mile; 5 underground storage tank sites and 45 aboveground storage tank sites within 1/4 mile; 62 leaking storage tank sites and 1 brownfield site within 1/2 mile; 1 National Priority List site and 2 manufactured gas plant sites within 1 mile of the project site.

Based upon our review of the submitted documentation, we have the following comments and recommendations to DCP:

Block 1929, Lot 57

- Based on prior on-site and/or surrounding area land uses which could result in environmental contamination, DEP concurs with the EAS recommendation that an (E) designation for hazardous materials should be placed on the zoning map pursuant to Section 11-15 of the New York City Zoning Resolution for the subject property. The (E) designation will ensure that testing and mitigation will be provided as necessary before any future development and/or soil disturbance. Further hazardous materials assessments should be coordinated through the Mayor's Office of Environmental Remediation.

Future correspondence and submittals related to this project should include the following CEQR # **19DCP041M**. If you have any questions, you may contact Mohammad Khaja-Moinuddin (718) 595-4445.

Sincerely,

Wei Yu
Deputy Director, Hazardous Materials

c: R. Weissbard
M. Khaja-Moinuddin
T. Estesen
M. Wimbish
R. Dobruskin – DCP
O. Abinader – DCP
M. Bertini – OER

NYC 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

Final Sign-Off (Multiple Sites)

Project number: DEPARTMENT OF CITY PLANNING / LA-CEQR-M
Project: ENNIS FRANCIS HOUSES
Date received: 11/14/2017

Comments: as indicated below. Properties that are individually LPC designated or in LPC historic districts require permits from the LPC Preservation department. Properties that are S/NR listed or S/NR eligible require consultation with SHPO if there are State or Federal permits or funding required as part of the action.

Properties with no Archaeological significance:

1) ADDRESS: 225 WEST 123 STREET, BBL: 1019290017

Properties with Architectural significance:

Properties with Archaeological significance:

2) ADDRESS: 2070 ADAM C POWELL BLVD, BBL: 1019290057

The LPC is in receipt of the, "Ennis Francis Houses 2070 Adam Clayton Powell, Jr Blvd, Manhattan, Phase 1A Documentary Report," prepared by Joan Geismar and dated October 2010. We concur that B 1929 L 17 is unlikely to contain any significant archaeological resources and that B 1929 L 57 has the potential to contain human remains. If any excavation work is proposed on B 1929 L 57 as a result of this action archaeological testing should occur after developing an appropriate consultation plan with relevant descendent communities.

Properties with Architectural significance:

In the 400' radius, Hotel Theresa (LPC and National Register listed); Mount Morris Park Historic District Extension (LPC and National Register listed); Blumsteins Department Store (National Register eligible); Apollo Theater (LPC and National Register Listed).

Gina Santucci 11/17/2017

SIGNATURE DATE
Gina Santucci, Environmental Review Coordinator

File Name: 32927_FSO_DNP_11162017.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 / 19DCP041M
Project: ENNIS FRANCIS HOUSES
Date received: 9/5/2018

Properties with Archaeological significance:
1) ADDRESS: 2070 ADAM C POWELL BLVD, BBL: 1019290057, TIME PERIOD: 19th c (unspecified)

Comments:

The LPC is receipt of the Supplemental Studies to the EAS dated August 2018. The LPC notes that this document states that an archaeological restrictive declaration will be prepared for Lot 57 and that it has the potential to contain human remains. The document further notes that L 17 is no longer part of this action. The language pertaining to archaeological resources is acceptable.

There are no sun-sensitive historic resources in the study area. The architectural portion of the EAS is acceptable.

Gina Santucci 9/21/2018

SIGNATURE DATE
Gina Santucci, Environmental Review Coordinator

File Name: 32927_FSO_ALS_09112018.doc

Appendix C: Phase I Environmental Site Assessment

Equity Environmental Engineering

November 30, 2017

Ed Poteat
Carthage Real Estate Advisors, LLC
200 Malcolm X Blvd.
2nd Floor, New York, NY 10027

Re: Environmental Site Assessment, Phase I
Ennis Francis Houses
206-254 W124th Street
New York, NY

Please find enclosed the Phase I Environmental Site Assessment we have completed for the above referenced site. We appreciate this opportunity to serve you. Please contact me if you have any questions about the report.

Robert L. Jackson
Managing Director

Phase I Environmental Site Assessment Report

Ennis Francis Houses
206-254 W124th Street
New York, NY 10027

Prepared for

Carthage Real Estate Advisors, LLC
200 Malcolm X Blvd.
2nd Floor, New York, NY 10027

Prepared by

Equity Environmental Engineering
500 International Drive
Mount Olive, NJ 07828
Phone: 973-527-7451

Job Number: 2017028
11/22/2017

TABLE OF CONTENTS

1.0 GENERAL INFORMATION

Project Information:
Ennis Francis Houses
Project Number:
2017028

Consultant Information:
Equity Environmental Engineering
500 International Drive
Mount Olive, NJ 07828
Phone: 973-527-7451
Fax: 973-858-0280
E-mail Address:
Inspection Date: 11/02/2017
Report Date: 11/22/2017

Site Information:
Ennis Francis Houses
206-254 W124th Street
New York, NY 10027
Latitude, Longitude: 40.808688, -73.950326
Site Access Contact: Dr. Gail Badger

Client Information:
Carthage Real Estate Advisors, LLC
Ed Poteat
200 Malcolm X Blvd.
2nd Floor, New York, NY 10027

Site Assessor

Jonathan Walker
Junior Engineer

Senior Reviewer

Robert L. Jackson
Managing Director

Certification:

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in 40 CFR Part 312. I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Jonathan Walker -

Robert L. Jackson - Managing Director

2.0 EXECUTIVE SUMMARY

2.1 Subject Property Description

The Subject Property is located at 218-250 West 124th Street in Manhattan on Block 1929, bounded by West 123rd Street, Adam Clayton Powell Jr. Blvd., West 124th Street, and Frederick Douglass Blvd. The Subject Property consists entirely of Lot 57, which is developed with a 3-story 76,200 square-foot residential building. The lot area is approximately 49,771 square feet. The building is currently vacant.

2.2 Data Gaps

There were no data gaps for this Phase I assessment.

2.3 Environmental Report Summary

Report Section		No Further Action	REC	HREC	CREC	Issue/Further Investigation	Comments
4.4	**Current Use of Property**		X			X	Mold and asbesots observed in the building.
4.6	**Adjoining Property Information**	X					
6.1	**Standard Environmental Records Sources**	X					
6.4.1	**Historical Summary**	X					
6.4.7	**Other Environmental Reports**	X					
7.3.1	**Hazardous Substances**	X					
7.3.2	**Petroleum Products**	X					
7.3.3	**USTs**	X					
7.3.4	**ASTs**	X					
7.3.5	**Other Suspect Containers**	X					
7.3.6	**Equipment Likely to Contain PCBs**	X					
7.3.7	**Interior Staining/Corrosion**	X					
7.3.8	**Discharge Features**	X					
7.3.9	**Pits, Ponds, And Lagoons**	X					
7.3.10	**Solid Waste Dumping/Landfills**	X					
7.3.11	**Stained Soil/Stressed Vegetation**	X					
7.3.12	**Wells**	X					
	Asbestos-Containing Materials		X			X	Asbestos wrapped piping was observed in the basement.
	Lead-Based Paint	X					Given the age of the building it is unlikely that there is lead-based paint present.
	Microbial Contamination (Mold)		X			X	Mold was observed in the building.

2.4 Recommendations

Recognized Environmental Conditions (RECs) are defined as the presence or likely presence of any hazardous substances or petroleum products under conditions that indicate an existing release, past release, or a material threat of a release into structures on the property or into the ground, groundwater or surface waters of the property. Historic RECs (HRECs) are RECs previously remediated to government standards. Controlled RECs (CRECs) are RECs in which engineering control has been implemented to contain the REC. De minimis RECs are those that do not present a threat to health or the environment, and would not be the subject of an enforcement action by a government agency. All RECs, excluding de minimus RECs are discussed.

2.4 Recommendations (continued)

We have performed a Phase I Environmental Site Assessment for the Properties in conformance with the scope and limitations of ASTM Practice E 1527-13. Any exceptions to, or deviations from, this practice are described in Section VIII of this report. This assessment has revealed the following:

RECs - Equity observed mold and asbestos inside the building. In addition, the Sanborn Fire Insurance Maps revealed the presence of a Chemical Products facility onside from 1951 to 1980. Due to the presence of asbestos and mold and the historic presence of a Chemical Products facility onsite, further investigation, and if necessary, remediation is warranted.

HRECs - Equity found no HRECs associated with the property.

CRECs - Equity found no CRECs associated with the property.

VECs - Based on the evidence provided in the database report, specifically the historic presence of a Chemical Products facility onsite, it is Equity's conclusion that a Vapor Encroachment Condition (VEC) can not be ruled out.

3.0 INTRODUCTION

3.1 Purpose

The purpose of the Phase I Environmental Site Assessment (ESA) was to evaluate the current and historical conditions of the Subject Property in an effort to identify recognized environmental conditions in connection with the Subject Property.

A recognized environmental condition is defined by ASTM as: The presence or likely presence of any hazardous substances or petroleum products in, on, or at a property due to release to the environment; under conditions indicative of a release to the environment; or conditions that pose a material threat of a future release to the environment. De minimis conditions are not recognized environmental conditions.

The identification of recognized environmental conditions in connection with the subject property may impose an environmental liability on owners or operators of the site, reduce the value of the site, or restrict the use or marketability of the site, and therefore, further investigation may be warranted to evaluate the scope and extent of potential environmental liabilities.

3.2 Scope of Work

The Phase I ESA conducted at the Subject Property was in general accordance with ASTM Standard E 1527-13 and included the following:

- Review of previous environmental site assessments;
- Records review;
- Interviews with regulatory officials and personnel associated with the subject and adjoining properties;
- A site visit; and
- Evaluation of information and preparation of the report provided herein.

Typically, a Phase I ESA does not include sampling or testing of air, soil, groundwater, surface water, or building materials. These activities would be carried out in a Phase II ESA, if required. For this Phase I ESA, no additions to the ASTM E 1527-13 standard were made.

3.3 Significant Assumptions

No significant assumptions were made during this assessment.

3.4 Limitations and Exceptions

Along with all of the limitations set forth in various sections of the ASTM E 1527-13 protocol, the accuracy and completeness of this report may be limited by the following: access Limitations, physical obstructions to observations, outstanding information requests, historical data source failure, and/or other issues.

It should be noted that this assessment did not include a review or audit of operational environmental compliance issues, or of any environmental management systems (EMS) that may exist on the property. Where required, the documents listed in Appendices A and E were used as reference material for the completion of the Phase I ESA. Some of the information presented in this report was provided through existing documents and interviews. Although attempts were made, whenever possible, to obtain a minimum of two confirmatory sources of information, Equity Environmental Engineering LLC (Equity) in certain instances has been required to assume that the information provided is accurate.

The information and conclusions contained in this report are based upon work undertaken by trained professional and technical staff in accordance with generally accepted engineering and scientific practices current at the time the work was performed. The conclusions and recommendations presented represent the best judgment of Equity based on the data obtained from the work. Due to the nature of investigation and the limited data available, Equity cannot warrant against undiscovered environmental liabilities. Conclusions and recommendations presented in this report should not be construed as legal advice.

Should additional information become available which differs significantly from our understanding of conditions presented in this report, we request that this information be brought to our attention so that we may reassess the conclusions provided herein.

3.5 Deviations

There were no deviations during this assessment.

3.6 Special Terms and Conditions

Authorization to perform this assessment was given by the client on November 2 and 15, 2017. Instructions as to the location of the property, access, and an explanation of the property and facilities to be assessed were provided by Carthage Real Estate Advisors, LLC.

3.7 Reliance

This report has been prepared for the sole benefit of the client. The report may not be relied upon by any other person or entity without the express written consent of Carthage Real Estate Advisors, LLC.

4.0 SITE DESCRIPTION

4.1 Location and Legal Description

The Subject Property is known as Ennis Francis Houses and is located at 206-254 W124th Street, New York, NY. The Subject Property consists of Block 1929, Lot 57.

4.2 Activity/Use Limitations

Equity has performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527-13 of the property located at 206-254 W124th Street, New York, NY 10027. Any exceptions to or deletions from this practice are described in Section 2.5 of this report. There are no known activity/use limitations.

4.3 Site and Vicinity Description

The Subject Property consists of approximately 49,800 square feet and is developed with a 3-story, approximately 76,200 square-foot, residential building. The ground surface at the site is relatively flat. Ground cover consists primarily of the building, concrete sidewalks and some limited green space behind the building. The Subject Property is in a mixed residential commercial neighborhood. The subject property can be accessed from W124th Street on the east and W123rd Street from the west. There is a bridge from the building at 2070 Adam Clayton Powell Blvd. to the roof of the Subject Property.

The site is zoned R8 which permits high density residential developments. The area surrounding the site is primarily fully developed with little or no open land and mixed use buildings from 2 to over 10 stories in height.

4.4 Current Use of Property

The Subject Property is vacant and has been for several years. The building is approximately 34 years old. According to the City of New York Building Inspection Department, the Property is zoned R8. The building contains seventy two (72) residential dwelling units. The occupancy at the time of the site reconnaissance was reported to be 0% percent.

4.5 Description of Structures and Other Improvements

The building on the Subject Property is of Brick and presumably steel frame construction and has approximately 76,200 interior square footage. The exterior of the building is in very good condition minus the vandalism that has taken place with broken windows, stolen air conditioners, and some boarded up windows and doors. The flat roof is constructed of typical roofing materials. There is a roof top bridge from the adjacent building on Lot 29 (2070 Adam Clayton Powell Blvd). There is a basement which houses the telephone system, electrical and water services, hot water tanks and the building boilers or furnaces all of which are gas-fired systems. There is a crawl space that extends to the north end of the building where the basement ends.

The interior of the building is in poor to fair condition. Because its been vacant, there are numerous broken windows, boarded up doors, debris all over the living space, mold and water damage to floors and ceiling tiles, etc.

The City of New York supplies drinking water to the Subject Property from the municipal distribution system. Sanitary discharges on the subject site are discharged into the municipal sanitary sewer system. The subject site area is serviced by the City of New York. Electricity is provided to the Subject Property by Consolidated Edison of New York (Con Ed).

4.6 Adjoining Property Information

During the vicinity reconnaissance, Equity observed the following land use on properties in the immediate vicinity of the Subject Property:

North: multi-family residential building and small, store front commercial use
South: multi-family residential building and small, store front commercial use
East: commercial/office buildings
West: multi-family residential buildings

5.0 USER PROVIDED INFORMATION

5.1 Specialized Knowledge

Equity has no specialized knowledge of the Subject Property outside of the research which was conducted and reported as part of this report. The Subject Property ownership as well as all individuals who were interviewed as part of this investigation, have not reported any specialized knowledge of this Subject Property outside of what is contained in this report.

5.2 Valuation Reduction for Environmental Issues

Equity has not been provided with an appraisal for the Subject Property. This property is to be sold, however a selling price was not available. No environmental issues were identified by the user/client that could result in property value reduction.

5.3 Owner, Property Manager, and Occupant Information

No written or verbal communication with the property owner, manager and tenants revealed any information which suggested that there are currently or historically any recognized environmental conditions associated with the Subject Property.

5.4 Reason For Performing Phase I ESA

The purpose of this Phase I Environmental Site Assessment (ESA) was to identify existing or potential Recognized Environmental Conditions (as defined by ASTM Standard E 1527-13) in connection with the Subject Property. Equity understands that the Phase I ESA is being conducted as part of environmental due diligence prior to purchase of the property.

6.0 RECORDS REVIEW

6.1 Standard Environmental Records Sources

Equity contracted Environmental Data Resources, Inc. (EDR) to conduct a search of Federal and State databases containing known and suspected sites of environmental contamination. The number of listed sites identified within the approximate minimum search distance (AMSD) from the Federal and State environmental records database listings specified in ASTM Standard E 1527-13 are summarized in the following table. Detailed information for sites identified within the AMSDs is provided below, along with an opinion about the significance of the listing to the analysis of recognized environmental conditions in connection with the subject property. The Subject Property is not listed on any of the databases. Copies of the EDR research data and a description of the databases are included in Appendix D of this report.

Map Findings Summary

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
NPL		1	0	0	0	1	NR	1
CORRACTS		1	0	0	0	1	NR	1
RCRA-LQG		0.25	3	8	NR	NR	NR	11
RCRA-SQG		0.25	0	1	NR	NR	NR	1
RCRA-CESQG		0.25	1	8	NR	NR	NR	9
CONSENT		1	0	0	0	1	NR	1
EDR Hist Auto		0.125	1	NR	NR	NR	NR	1
ROD		1	0	0	0	1	NR	1
RCRA NonGen / NLR		0.25	48	121	NR	NR	NR	169
EDR Hist Cleaner		0.125	1	NR	NR	NR	NR	1
NY MANIFEST		0.25	58	148	NR	NR	NR	206
NY DRYCLEANERS		0.25	0	3	NR	NR	NR	3
NY LTANKS		0.5	4	12	46	NR	NR	62
NY SPILLS		0.125	16	NR	NR	NR	NR	16
NY VAPOR REOPENED		1	0	0	0	1	NR	1
NY RES DECL		0.125	1	NR	NR	NR	NR	1
NY VCP		0.5	0	5	11	NR	NR	16
NJ MANIFEST		0.25	11	33	NR	NR	NR	44
NY E DESIGNATION		0.125	21	NR	NR	NR	NR	21
NY AST		0.25	9	36	NR	NR	NR	45
NY UST		0.25	2	3	NR	NR	NR	5
NY SHWS		1	0	0	0	1	NR	1
NY BROWNFIELDS		0.5	0	1	0	NR	NR	1
PA MANIFEST		0.25	0	4	NR	NR	NR	4
EDR MGP		1	0	0	0	2	NR	2

6.2 Additional Environmental Record Sources

Equity reviewed a previous Phase I Environmental Site Assessment prepared by ACE Development Group, Inc. for building owner Abyssinian Development Corporation and Developers Carthage Real Estate Advisors, LLC. The Phase I ESA was conducted in January and September of 2016, for the Subject Property Located at 218-250 West 124th Street, New York, NY 10027 (Block 1929, Lot 57).

The previous Phase I identified the following Findings and Recommendations:

1. Physical site walk through revealed the following (or a potential for) environmental concerns:

a) ASBESTOS: There is no record of asbestos violation found on the property. However, is assumed that ceiling (popcorn) plaster, VCT/linoleum flooring, and roofing materials (including roof membrane, damp proofing and flashing materials) contain asbestos. In addition, we strongly recommend a full asbestos investigation of the entire building (to determine presence or absence, including quantity and location of asbestos-containing materials - ACM).
**During Equity's Phase I investigation, Asbestos wrapped piping was observed in the basement.*

6.2 Additional Environmental Record Sources (continued)

b) MOLD: Mold growth was observed on the first floor of the buildings.

According to the previous Phase I ESA, based on the available public records, the buildings are not included on any Federal of State active hazardous site database or list. A copy of the Previous Phase I ESA prepared by Ace Development Group is provided in Appendix H.

6.3 General Site Setting

The Subject Property is located in a densely populated area in Harlem with numerous multi-family, multi-story residential and commercial buildings. The general area of the Subject Property is flat with little topographic relief.

6.3.1 Topography

Topographical location of the Subject Property is approximately Latitude of N40 80.18 and Longitude of W73 95.42' at elevation of approximately 50 feet. Based on a review of the 2013 USGS topographic map for the site area, groundwater is inferred to flow to the east towards the Spuyten Duyvil which connects the East and Hudson Rivers. It is located approximately 4,000 feet to the east of the Subject Property.

6.3.2 Surface Water Bodies

The nearest surface water in the vicinity of the Property is the Spuyten Duyvil which connects the East and Hudson Rivers. It is located approximately 4,000 feet to the east of the Subject Property. No surface water is located on the Property.

6.3.3 Geology and Hydrology

Based on Soil Conservation Service STATSGO data, the following additional subordinant soil types may appear within the general area of the Subject Property.

Soil Surface Textures: silt loam
loamy sand
sandy loam
fine sandy loam

Surficial Soil Types: silt loam
loamy sand
sandy loam
fine sandy loam

Deeper Soil Types: unweathered bedrock
very gravelly - loamy sand
stratified
sandy loam

Water generally flows toward the east from the Property. No on-site water wells or springs were observed during the Property reconnaissance. The nearest surface water in the vicinity of the Property is Spuyten Duyvil approximately 4,000 feet to the east. No settling ponds, lagoons, surface impoundments, wetlands or natural catch basins were observed at the Property during this investigation.

6.4 Historical Use

6.4.1 Historical Summary

The historical information reviewed by Equity reveals one REC on the Subject Property. The Sanborn Fire Insurance maps from 1951-1980 identify a Chemical Products Facility occupying the eastern portion of the Subject Property.

The historical sources are identified in the Table Below.

Source Reviewed	Date(s)	Source Details
USEPA Enforcement Compliance History Online	June 2007	http://www.epa.gov/echo/
USEPA Envirofacts Data Warehouse Multi-System Report	June 2007	http://www.epa.gov/enviro/html/multisystem_query_java.html
County Appraiser Website	June 2007	
Sanborn Fire Insurance Maps	1902-2005	Appendix C
City Directories	1920-2006	Appendix C
Historical Topographic Maps	1897-2013	Appendix C
Aerial Photographs	1924-2011	Appendix C

6.4.2 Title Records

No title records were provided for the Subject Property.

6.4.3 City Directories

The City Directories included the Subject Property from 1920-2006. It is all listed multiple times as residential. Adjacent properties are almost exclusively residential as well with the exception of some garages, parking lots, and grocery stores, etc. The City Directory is provided in Appendix C.

6.4.4 Aerial Photos

A total of fifteen (15) aerial photographs were provided from 1924-2011. No discernible information was obtained from these photographs. The aerial photographs can be found in Appendix C.

6.4.5 Sanborn/Historical Maps

Twenty one (21) Sanborn Fire Insurance maps were provided from 1902-2005. The details of the Sanborn Maps are provided in the following table. The maps are provided in Appendix C.

The Sanborn Fire Insurance maps from 1951-1980 identify a Chemical Product Facility occupying the eastern portion of the Subject Property.

6.4.5 Sanborn/Historical Maps (continued)

Summary

Date(s)	Property Comments	Surrounding Area Comments
1902	The Subject Property consists of multiple lots developed with contiguous residential dwellings, storefronts, and a telephone exchange building.	The Subject Block is and surrounding area is primarily developed with storefronts and residential buildings. The Edison electric house is located directly west of the Subject Property. North of West 125th Street is developed with a music hall and the Harlem opera house. The Manhattan Railway runs along what is now Frederick Douglass Boulevard, located directly west of the Subject Block.

6.4.5 Sanborn/Historical Maps (continued)

Date(s)	Property Comments	Surrounding Area Comments
1912	The eastern end of the Subject Property is developed with a garage and an auto school. The middle portion of the Subject Property is developed with mixed-use residential dwellings with storefronts, and the western portion of the Subject Property is developed with a parking garage and residential development.	The southern portion of the Surrounding Area is predominantly characterized by residential development. North of the Subject Block (Block 1930) from east to west is developed with Hotel Theresa, the west end cafï¿½, and restaurant, a department store, residential buildings, a warehouse, and mixed-use commercial/residential development. Further north of that (Block 1931) is characterized by offices, a bank, the Bishop building, and the Opera house. Seventh Avenue (Now Adam Clayton Powell Jr. Blvd) is lined with contiguous storefronts and dwellings.
1951	From east to west, the Subject Property consists of a chemical products facility, a Salvation Army facility, an auto repair facility, several lots of parking, an apartment building, a garage, and several single family dwellings.	South of the Subject Property on the Subject Block consists of a police station and several contiguous apartment buildings. Consolidated Edison is located directly west of the Subject Property, followed by an Auto Sales yard along what is now Frederick Douglass Boulevard. Tax block 1930 consist of a furniture store, department store, Hotel Theresa, and Market.
1976, 1978, 1980	Same as above.	The Subject Block remains the same, with the exception of the Auto Sales Yard, which is now developed with an unspecified building. A Community center has replaced Con Edison, and a dry cleaner is now located along Adam Clayton Powell Jr. Blvd. The Surrounding area remains the same with the exception of a gasoline station replacing a furniture store along Fredrick Douglass Boulevard northwest of the Subject Block.
1985, 1986, 1988, 1989, 1991, 1992, 1993, 1994, 1995, 1996, 2001, 2002, 2003, 2004, 2005.	The Subject Property now consists of a large lot and is developed with the current 72-unit residential dwelling.	West of the Subject Property, on what is now Tax Lot 17, consists of a large vacant area used for parking. The subject building is connected by a walkway to the adjacent Ennis Francis Houses building on what is now Tax Lot 29. The building on Lot 29 fronts Adam Clayton Powell Jr. Blvd and contains 176 residential dwellings. The Subject Block consist of a mix of low to high density residential developments, a hotel along Fredrick Douglass Blvd, and a Community Center (converted to a church in 2004). The Surrounding Area remains consistent with previously stated built conditions.

6.4.6 Historical Topographic Maps

A total of nine (9) Historical Topographic Maps were provided for review. The topographic maps included Central Park and Harlem USGS Quadrangle Maps. The maps provided were from 1897 - 2013. There was no discernible information interpreted from these maps, which are provided as Appendix C.

6.4.7 Other Environmental Reports

No other environmental reports were provided for this Subject Property.

6.4.8 Building Department Records

NYC Department of Buildings (DOB) records were reviewed. The Subject Property has a total of 351 actions including 6 complaints, 115 violations (15 open), and 7 jobs. Complaints reported to the DOB on the building included improper maintenance of the backyards and illegal dog breeding/selling.

According to Alternation Type 1-DOB Job No. 120426379, approved on August of 2010, Lot 57 was reapportioned into 3 separate tax lots (17, 29, and 57) all part of one zoning lot. This resulted in the separation of the adjacent high rise building from Lot 57, to its own tentative tax lot (29). No change in use, egress, or occupancy were proposed. DOB records are provided in Appendix E.

6.5 Environmental Liens and Activity/Use Limitations

There are no known liens or activity use limitations on the Subject Property.

7.0 SITE RECONNAISSANCE

7.1 Methodology and Limiting Conditions

The site reconnaissance was conducted on Thursday November 2 and Wednesday November 15, 2017, by Robert Jackson, Managing Director of Equity Environmental Engineering LLC, accompanied by Mr. Ed Poteat/Carthage Real Estate Advisors LLC, Dr. Gail Badger/Shinda Management Corporation, and Darren Norman, Building Superintendent. The visual reconnaissance consisted of observing the boundaries of the property and systematically traversing the site to provide an overlapping field of view, wherever possible. The periphery of the on-site structure was observed along with interior accessible common areas, manufacturing, storage and maintenance areas. Photographs of pertinent site features identified during the site reconnaissance are included in Appendix B.

7.2 General Site Setting

The property consists of approximately 49,800 square feet and is developed with a 3-story building with 76,200 square-foot of space. It is a residential use building. The ground surface at the site is relatively flat. Groundcover consists primarily of the building, landscaped green areas, asphalt, and heavily vegetated soil. The Subject Property is accessed from the west from 123rd Street and the east from 124thStreet. There is a bridge from 207 0Adam Clayton Powell Blvd. to the roof of the Subject Property.

7.3 Site Visit Findings

7.3.1 Hazardous Substances

No hazardous substance were observed during the assessment.

7.3.2 Petroleum Products

No petroleum products were observed during the assessment.

7.3.3 USTs

No USTs or appurtenances were observed during the assessment.

7.3.4 ASTs

No ASTs or appurtenances were observed during the assessment.

7.3.5 Other Suspect Containers

No suspect containers were observed during the assessment.

7.3.6 Equipment Likely to Contain PCBs

No equipment likely to contain PCBs was observed during the assessment.

7.3.7 Interior Staining/Corrosion

There was interior staining from water damage and mold.

7.3.8 Discharge Features

There were several catch basins observed on the west side of the building in the sidewalk and vegetated areas. There was also a floor drain in the boiler room of the basement.

7.3.9 Pits, Ponds, And Lagoons

No pits, ponds or lagoons were observed during the assessment.

7.3.10 Solid Waste Dumping/Landfills

There was some concrete rubble and general refuse or trash in the vegetated areas.

7.3.11 Stained Soil/Stressed Vegetation

There was no evidence of stained soil or stressed vegetation observed during the assessment.

7.3.12 Wells

There are no known wells on the Subject Property.

8.0 INTERVIEWS

Equity staff interviewed Mr. Ed Poteat/Carthage Real Estate Advisors LLC, Dr. Gail Badger/Shinda Management Corporation, and Mr. Darren Norman, building superintendent. They provided limited information on the building.

9.0 OTHER ENVIRONMENTAL CONSIDERATIONS

Asbestos-Containing Materials

Asbestos is the name for a group of naturally occurring silicate minerals that can be separated into fibers. The fibers are strong, durable, and resistant to heat and fire. They are also long, thin and flexible, so they can even be woven into cloth. Because of these qualities, asbestos has been used in thousands of consumer, industrial, maritime, automotive, scientific and building products. During the 20th century, some 30 million tons of asbestos have been used in industrial sites, homes, schools, shipyards and commercial buildings in the United States. Common ACMs include pipe-covering, insulating cement, insulating block, refactory and boiler insulation materials, transite board, fireproofing spray, joint compound, vinyl floor tile, ceiling tile, mastics, roofing products, and duct insulation for HVAC applications. Inhalation of asbestos fibers can result in deleterious health effects.

Asbestos containing material (ACM) was observed wrapped around piping in the basement of the building.

Lead-Based Paint

Given the age of the building, it is unlikely that there is lead-based paint in the building.

Microbial Contamination (Mold)

In accordance with the scope of work, the site reconnaissance is to include a visual inspection for indications of water intrusions or the presence of active mold growth on readily accessible interior and exterior surfaces. Confirmation sampling is not included in the scope of work for the Phase I ESA. Readily accessible areas of the building were observed for visual or olfactory indications of mold, and for areas of water damage.

A heavy build-up of mold was observed on the door of one unit inside the building. Given the number of missing windows and the opportunity for storm water to enter the building, it is likely that there is more mold onsite.

CONCLUSIONS

Recognized Environmental Conditions (RECs) are defined as the presence or likely presence of any hazardous substances or petroleum products under conditions that indicate an existing release, past release, or a material threat of a release into structures on the property or into the ground, groundwater or surface waters of the property. Historic RECs (HRECs) are RECs previously remediated to government standards. Controlled RECs (CRECs) are RECs in which engineering control has been implemented to contain the REC. De minimis RECs are those that do not present a threat to health or the environment, and would not be the subject of an enforcement action by a government agency. All RECs, excluding de minimus RECs are discussed.We have performed a Phase I Environmental Site Assessment for the Properties in conformance with the scope and limitations of ASTM Practice E 1527-13. Any exceptions to, or deviations from, this practice are described in Section VIII of this report. This assessment has revealed the following:

RECs - Equity observed mold and asbestos inside the building. In addition, the Sanborn Fire Insurance Maps revealed the presence of a Chemical Products facility onsite from 1951 to 1980. Due to the presence of asbestos and mold and the historic presence of a Chemical Products facility onsite, further investigation, and if necessary, remediation is warranted.

HRECs - Equity found no HRECs associated with the property.

CRECs - Equity found no CRECs associated with the property.

VECs - Based on the evidence provided in the database report, specifically the historic presence of an onsite Chemical Products facility, it is Equity's conclusion that a Vapor Encroachment Condition (VEC) can be ruled out.

REFERENCES

1. Previous Phase I ESA by Ace Development Group, Inc., Jan/Sep. 2016
2. EDR Radius Report
3. Sanborn Fire Insurance Maps
4. Aerial Photographs
5. Topographic Maps
6. City Directory
7. NYC DOB Records

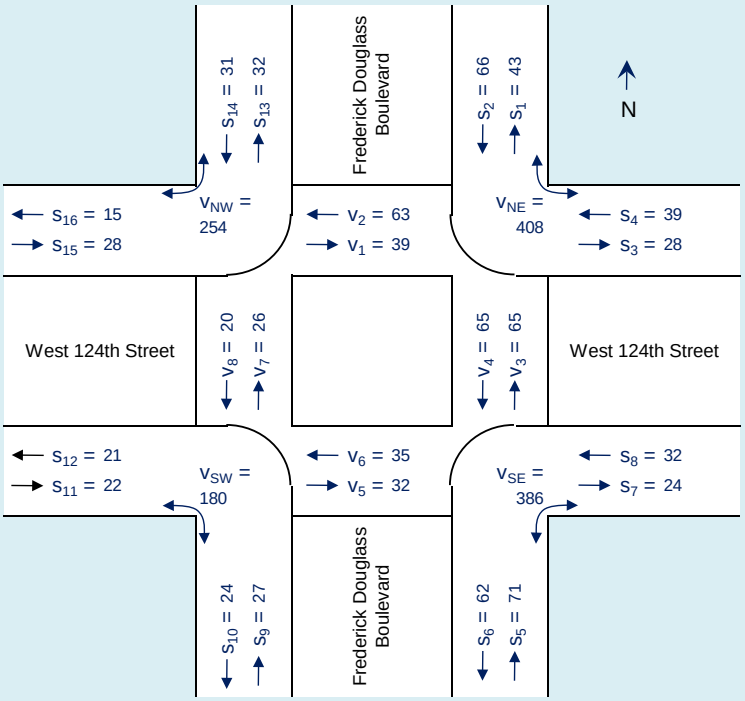
Appendix D: Transportation

PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak
Date:	14-Jun-18	Analysis Year:	2018

PEDESTRIAN PEAK HOUR VOLUMES

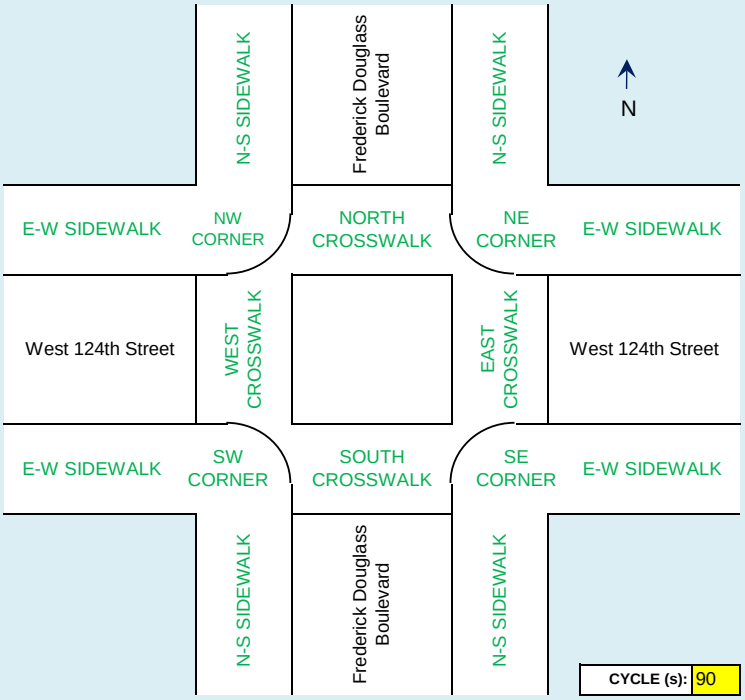


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	s_1	43	0.70
		s_2	66	
	E-W	s_3	28	0.88
		s_4	39	
SE	N-S	s_5	71	0.83
		s_6	62	
	E-W	s_7	24	0.67
		s_8	32	
SW	N-S	s_9	27	0.55
		s_{10}	24	
	E-W	s_{11}	22	0.72
		s_{12}	21	
NW	N-S	s_{13}	32	0.75
		s_{14}	31	
	E-W	s_{15}	28	0.60
		s_{16}	15	

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	v_1	39	0.65
	v_2	63	0.83
E	v_3	65	0.81
	v_4	65	0.86
S	v_5	32	0.80
	v_6	35	0.88
W	v_7	26	0.65
	v_8	20	0.83

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	v_{NE}	408	0.93
SE	v_{SE}	386	0.99
SW	v_{SW}	180	0.94
NW	v_{NW}	254	0.84

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	19.5	5.5	3.5
	E-W	10.0	4.5	3.5
SE	N-S	19.5	5.5	3.5
	E-W	10.0	4.5	3.5
SW	N-S	20.0	5.5	3.5
	E-W	12.0	4.5	3.5
NW	N-S	21.0	5.5	3.5
	E-W	10.0	4.5	3.5

* 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	60.0	12.0	3.5	25	15	5	45	0	0
E	30.0	18.0	3.5	30	6	5	41	10	15
S	60.0	12.0	3.5	25	15	5	45	0	0
W	30.0	18.0	3.5	30	6	5	41	0	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	18.0	10.0	4.00
	E-W	12.0		
SE	N-S	18.0	10.0	4.00
	E-W	12.0		
SW	N-S	18.0	10.0	4.00
	E-W	12.0		
NW	N-S	18.0	10.0	4.00
	E-W	12.0		

* Override if corner width is different than sidewalk width.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak
Date:	43265	Analysis Year:	2018

INPUTS

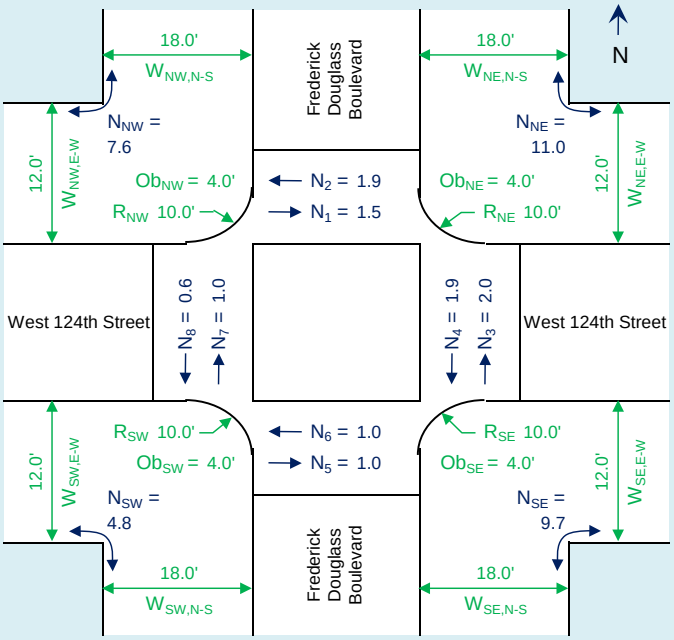
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 39	0.7	N_1 = 1.5
v_2 = 63	0.8	N_2 = 1.9
v_3 = 65	0.8	N_3 = 2.0
v_4 = 65	0.9	N_4 = 1.9
v_5 = 32	0.8	N_5 = 1.0
v_6 = 35	0.9	N_6 = 1.0
v_7 = 26	0.7	N_7 = 1.0
v_8 = 20	0.8	N_8 = 0.6
v_{NE} = 408	0.9	N_{NE} = 11.0
v_{SE} = 386	1	N_{SE} = 9.7
v_{SW} = 180	0.9	N_{SW} = 4.8
v_{NW} = 254	0.8	N_{NW} = 7.6

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	25	$g_{Walk,N}$ = 29
E	30	$g_{Walk,E}$ = 34
S	25	$g_{Walk,S}$ = 29
W	30	$g_{Walk,W}$ = 34

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ 17,145.0 ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 31.0 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} = 10.5 \text{ s}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ 16,937.5 ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = 336.2 sf/ped LOS A

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ 17,145.0 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 39.2 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 32.9 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ 16,784.3 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 229.8 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ 17,145.0 ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 20.7 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} = 17.4 \text{ s}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ 16,954.5 ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = 505.6 sf/ped LOS A

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 17,145.0 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 20.6 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 35.0 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 16,867.5 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 269.7 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak
Date:	43265	Analysis Year:	2018

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 39	0.65	N_1 = 1.5
v_2 = 63	0.83	N_2 = 1.9
v_3 = 65	0.81	N_3 = 2.0
v_4 = 65	0.86	N_4 = 1.9
v_5 = 32	0.8	N_5 = 1.0
v_6 = 35	0.88	N_6 = 1.0
v_7 = 26	0.65	N_7 = 1.0
v_8 = 20	0.83	N_8 = 0.6

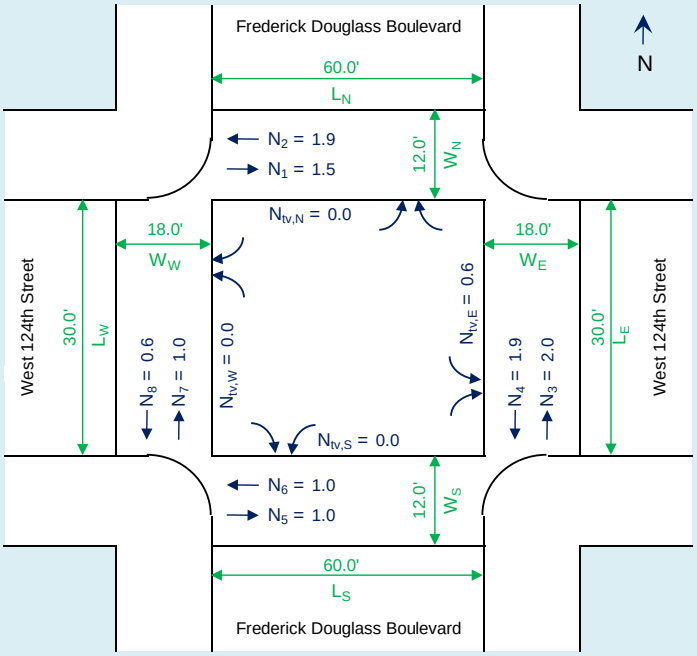
TURNING VOL PER CYCLE

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	
$v_{lt,perm,E}$ = 15	$N_{tv,E}$ = 0.6
$v_{rt,E}$ = 10	
$v_{lt,perm,S}$ = 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	25	$g_{Walk,N}$ = 29
E	3.5	30	$g_{Walk,E}$ = 34
S	3.5	25	$g_{Walk,S}$ = 29
W	3.5	30	$g_{Walk,W}$ = 34

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 20{,}880.0$ ft²-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 0.0$ ft²-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 20{,}880.0$ ft²-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 1.0$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 1.3$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 20.6$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 20.6$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 70.0$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 298.2 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 18{,}360.0$ ft²-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 450.0$ ft²-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 17{,}910.0$ ft²-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 1.2$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 1.2$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 12.0$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 11.9$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 46.6$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 384.6 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 20{,}880.0$ ft²-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 0.0$ ft²-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 20{,}880.0$ ft²-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$= 0.7$ p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$= 0.7$ p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$= 20.5$ s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$= 20.5$ s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$= 40.9$ s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = 510.8 sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 18{,}360.0$ ft²-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 0.0$ ft²-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 18{,}360.0$ ft²-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$= 0.6$ p

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$= 0.4$ p

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$= 11.9$ s

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$= 11.8$ s

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$= 19.0$ s

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

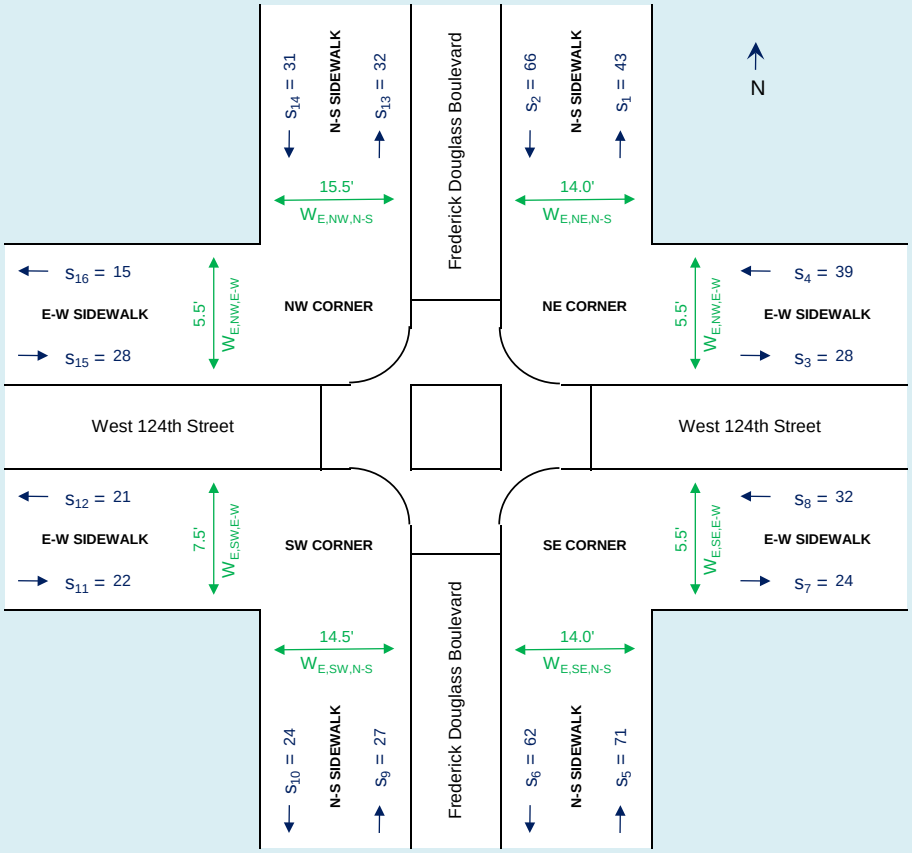
$M_{cw,W}$ = 966.8 sf/p LOS A

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak
Date:	43265	Analysis Year:	2018

INPUTS



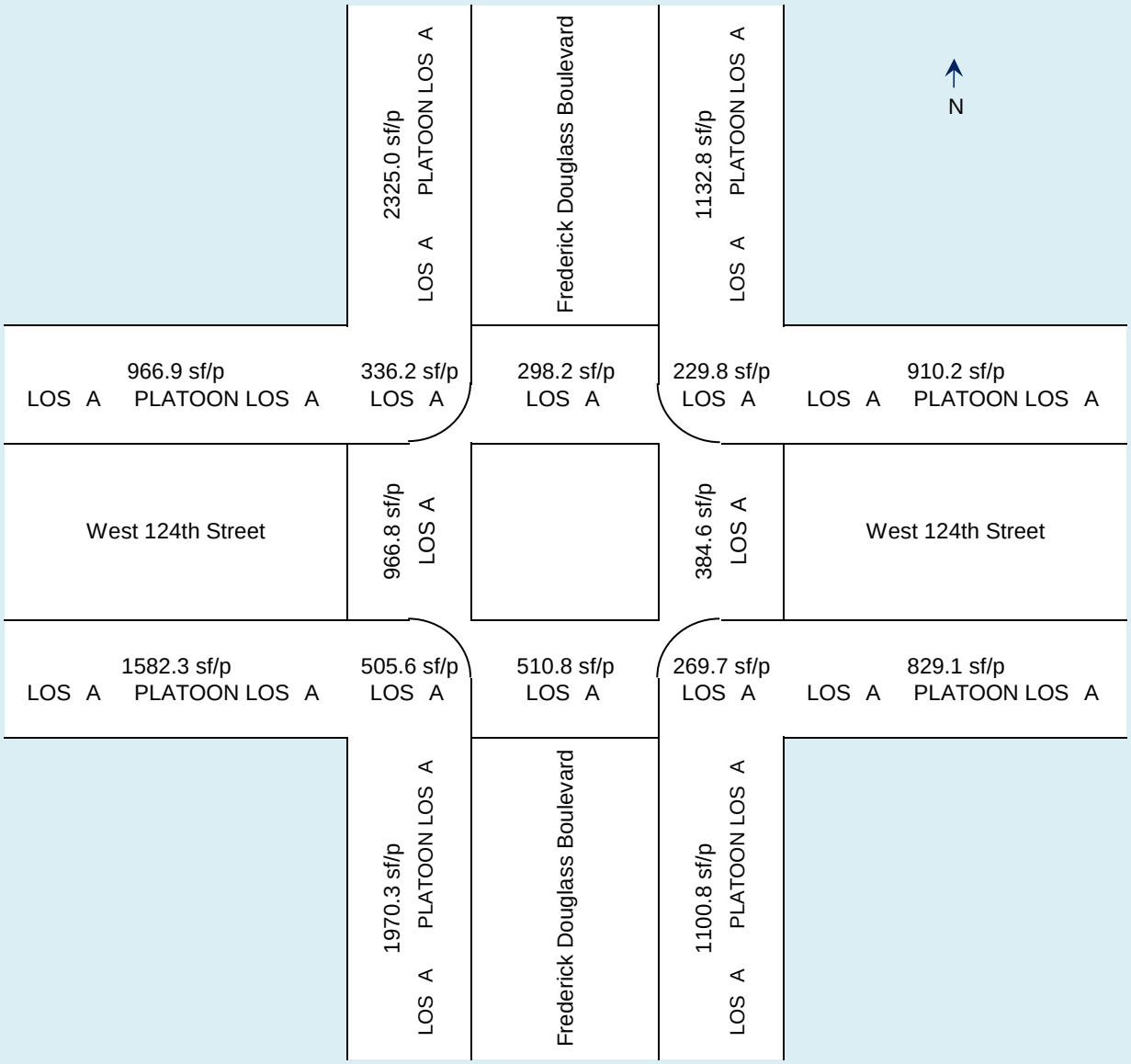
ANALYSIS

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	43	109	0.70	19.5	5.5	14.0	0.2	3.5	3.5	1132.8	A	A
		s_2	66											
	E-W	s_3	28	67	0.88	10.0	4.5	5.5	0.2	3.5	3.5	910.2	A	A
		s_4	39											
SE	N-S	s_5	71	133	0.83	19.5	5.5	14.0	0.2	3.5	3.5	1100.8	A	A
		s_6	62											
	E-W	s_7	24	56	0.67	10.0	4.5	5.5	0.3	3.5	3.5	829.1	A	A
		s_8	32											
SW	N-S	s_9	27	51	0.55	20.0	5.5	14.5	0.1	3.5	3.5	1970.3	A	A
		s_{10}	24											
	E-W	s_{11}	22	43	0.72	12.0	4.5	7.5	0.1	3.5	3.5	1582.3	A	A
		s_{12}	21											
NW	N-S	s_{13}	32	63	0.75	21.0	5.5	15.5	0.1	3.5	3.5	2325.0	A	A
		s_{14}	31											
	E-W	s_{15}	28	43	0.60	10.0	4.5	5.5	0.2	3.5	3.5	966.9	A	A
		s_{16}	15											

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak
Date:	43265	Analysis Year:	2018

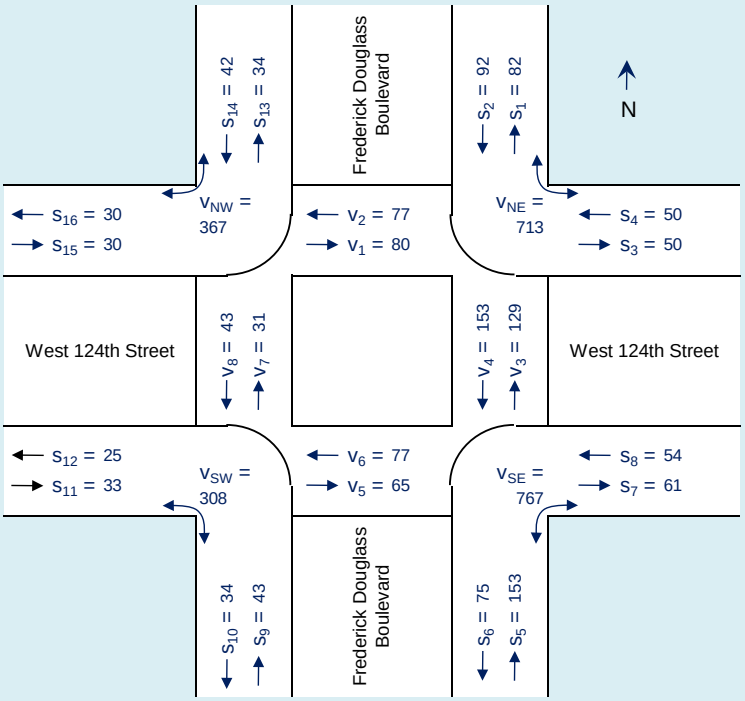


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Midday Peak
Date:	14-Jun-18	Analysis Year:	2018

PEDESTRIAN PEAK HOUR VOLUMES

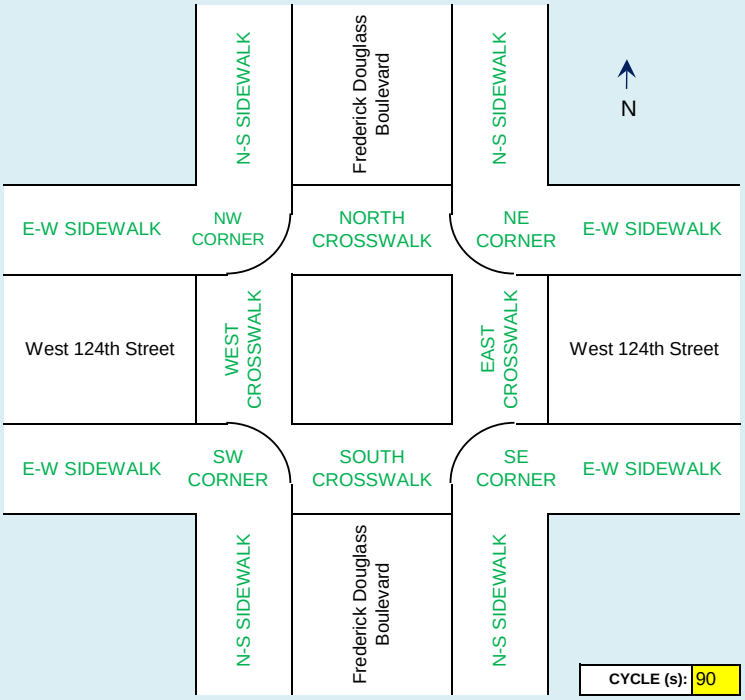


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	s_1	82	0.76
		s_2	92	
	E-W	s_3	50	0.64
		s_4	50	
SE	N-S	s_5	153	0.70
		s_6	75	
	E-W	s_7	61	0.68
		s_8	54	
SW	N-S	s_9	43	0.71
		s_{10}	34	
	E-W	s_{11}	33	0.81
		s_{12}	25	
NW	N-S	s_{13}	34	0.70
		s_{14}	42	
	E-W	s_{15}	30	0.75
		s_{16}	30	

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	v_1	80	0.74
	v_2	77	0.77
E	v_3	129	0.75
	v_4	153	0.80
S	v_5	65	0.74
	v_6	77	0.71
W	v_7	31	0.65
	v_8	43	0.63

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	v_{NE}	713	0.75
SE	v_{SE}	767	0.79
SW	v_{SW}	308	0.77
NW	v_{NW}	367	0.72

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



SIDEWALKS				
CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S	19.5	5.5	3.5
	E-W	10.0	4.5	3.5
SE	N-S	19.5	5.5	3.5
	E-W	10.0	4.5	3.5
SW	N-S	20.0	5.5	3.5
	E-W	10.0	4.5	3.5
NW	N-S	21.0	5.5	3.5
	E-W	10.0	4.5	3.5

* 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	60.0	12.0	3.5	25	15	5	45	0	0
E	30.0	18.0	3.5	30	6	5	41	12	23
S	60.0	12.0	3.5	25	15	5	45	0	0
W	30.0	18.0	3.5	30	6	5	41	0	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	18.0	10.0	4.00
	E-W	12.0		
SE	N-S	18.0	10.0	4.00
	E-W	12.0		
SW	N-S	18.0	10.0	4.00
	E-W	12.0		
NW	N-S	18.0	10.0	4.00
	E-W	12.0		

* Override if corner width is different than sidewalk width.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Midday Peak
Date:	43265	Analysis Year:	2018

INPUTS

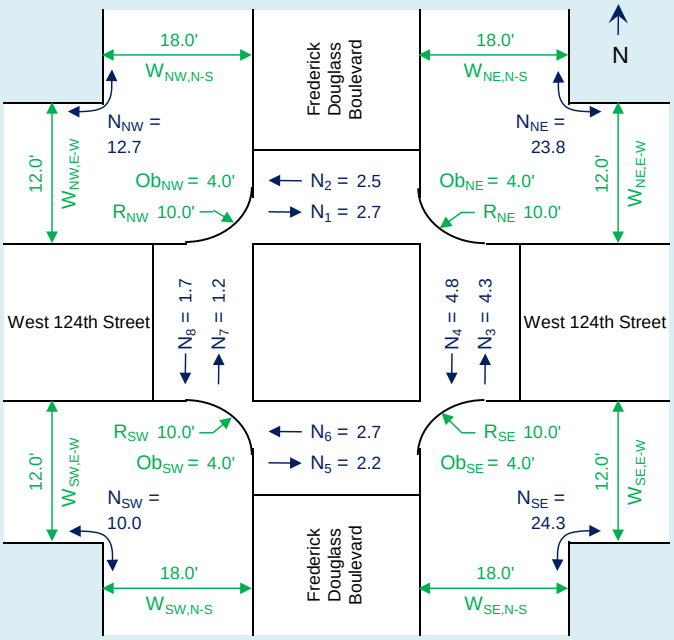
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 80	0.7	N_1 = 2.7
v_2 = 77	0.8	N_2 = 2.5
v_3 = 129	0.8	N_3 = 4.3
v_4 = 153	0.8	N_4 = 4.8
v_5 = 65	0.7	N_5 = 2.2
v_6 = 77	0.7	N_6 = 2.7
v_7 = 31	0.7	N_7 = 1.2
v_8 = 43	0.6	N_8 = 1.7
v_{NE} = 713	0.8	N_{NE} = 23.8
v_{SE} = 767	0.8	N_{SE} = 24.3
v_{SW} = 308	0.8	N_{SW} = 10.0
v_{NW} = 367	0.7	N_{NW} = 12.7

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	25	$g_{Walk,N}$ = 29
E	30	$g_{Walk,E}$ = 34
S	25	$g_{Walk,S}$ = 29
W	30	$g_{Walk,W}$ = 34

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ 17,145.0 ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 55.9 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} = 29.7 \text{ s}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ 16,717.0 ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = 200.5 sf/ped LOS A

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ 17,145.0 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 51.7 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 83.3 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ 16,470.1 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 108.2 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ 17,145.0 ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 45.4 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} = 20.8 \text{ s}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ 16,814.2 ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = 236.1 sf/ped LOS A

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 17,145.0 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 56.0 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 74.9 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 16,490.2 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 107.7 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Midday Peak
Date:	43265	Analysis Year:	2018

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 80	0.74	N_1 = 2.7
v_2 = 77	0.77	N_2 = 2.5
v_3 = 129	0.75	N_3 = 4.3
v_4 = 153	0.8	N_4 = 4.8
v_5 = 65	0.74	N_5 = 2.2
v_6 = 77	0.71	N_6 = 2.7
v_7 = 31	0.65	N_7 = 1.2
v_8 = 43	0.63	N_8 = 1.7

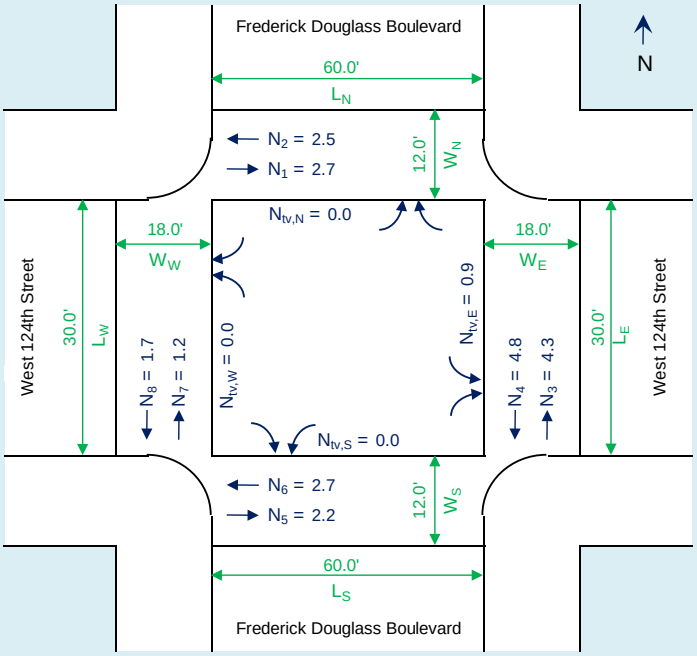
TURNING VOL PER CYCLE

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	
$v_{lt,perm,E}$ = 23	$N_{tv,E}$ = 0.9
$v_{rt,E}$ = 12	
$v_{lt,perm,S}$ = 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	25	$g_{Walk,N}$ = 29
E	3.5	30	$g_{Walk,E}$ = 34
S	3.5	25	$g_{Walk,S}$ = 29
W	3.5	30	$g_{Walk,W}$ = 34

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 20{,}880.0$ ft^2-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 0.0$ ft^2-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 20{,}880.0$ ft^2-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 1.8$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 1.7$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 20.8$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 20.7$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 107.9$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 193.5 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 18{,}360.0$ ft^2-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 630.0$ ft^2-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 17{,}730.0$ ft^2-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 2.7$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 3.0$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 12.2$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 12.2$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 110.8$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 160.1 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 20{,}880.0$ ft^2-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 0.0$ ft^2-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 20{,}880.0$ ft^2-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$= 1.5$ p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$= 1.8$ p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$= 20.7$ s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$= 20.8$ s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$= 101.7$ s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = 205.3 sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 18{,}360.0$ ft^2-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 0.0$ ft^2-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 18{,}360.0$ ft^2-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$= 0.7$ p

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$= 1.1$ p

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$= 11.9$ s

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$= 11.9$ s

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$= 34.5$ s

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

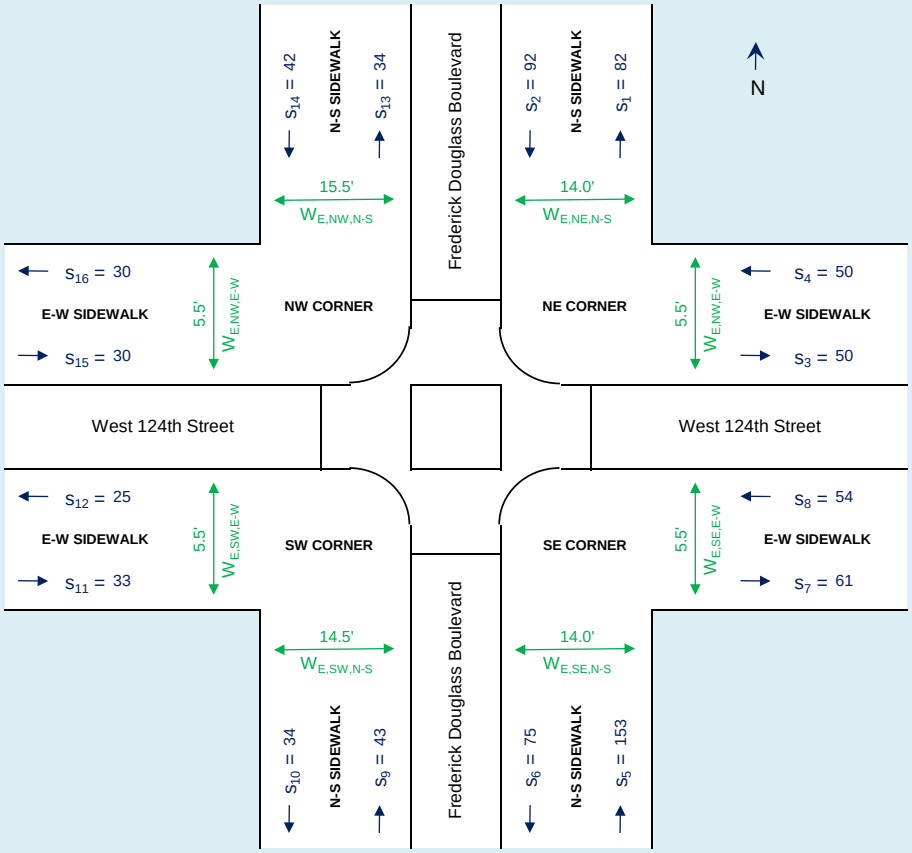
$M_{cw,W}$ = 531.8 sf/p LOS A

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Midday Peak
Date:	43265	Analysis Year:	2018

INPUTS



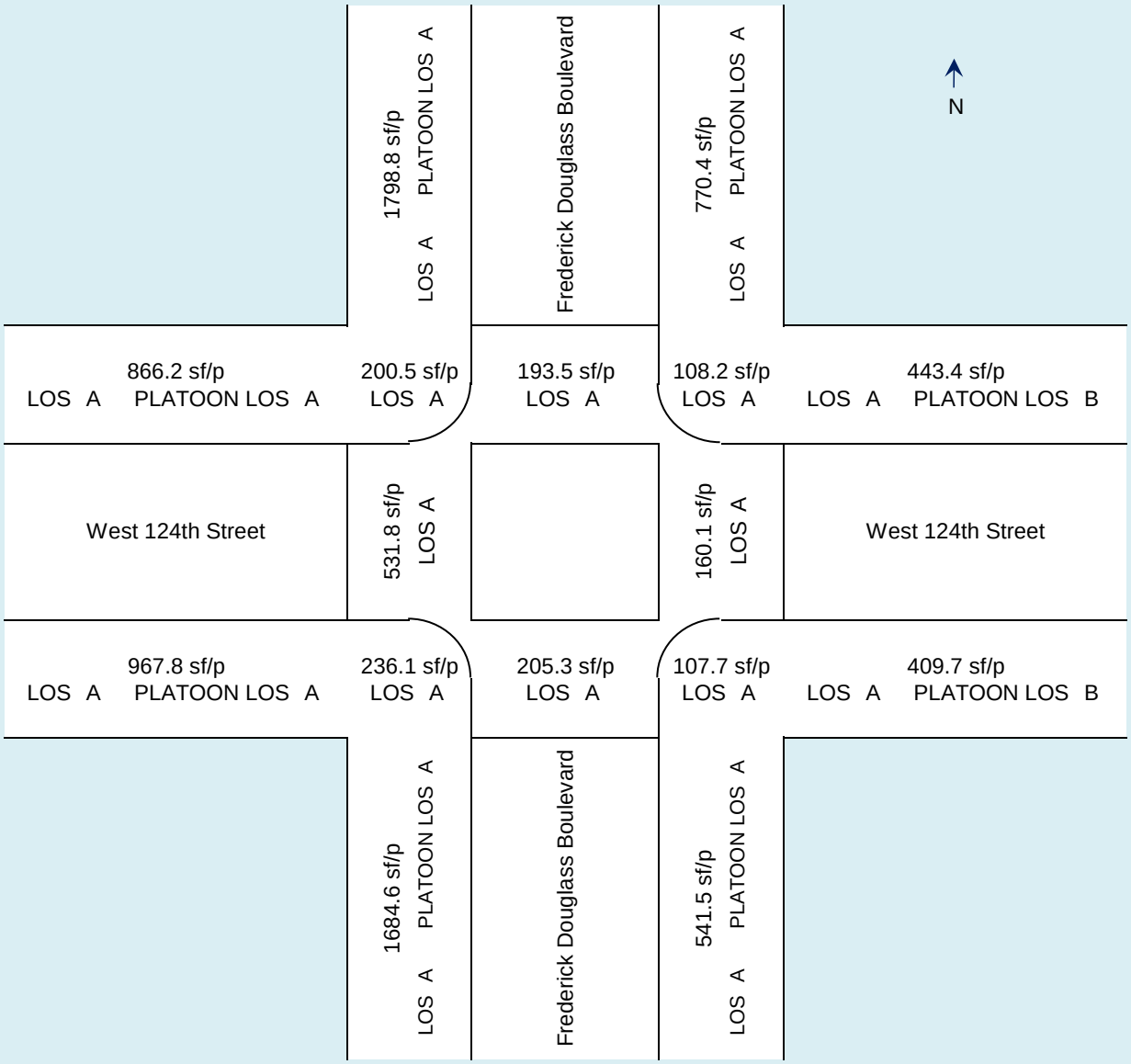
ANALYSIS

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	82	174	0.76	19.5	5.5	14.0	0.3	3.5	3.5	770.4	A	A
		s_2	92											
	E-W	s_3	50	100	0.64	10.0	4.5	5.5	0.5	3.5	3.5	443.4	A	B
		s_4	50											
SE	N-S	s_5	153	228	0.70	19.5	5.5	14.0	0.4	3.5	3.5	541.5	A	A
		s_6	75											
	E-W	s_7	61	115	0.68	10.0	4.5	5.5	0.5	3.5	3.5	409.7	A	B
		s_8	54											
SW	N-S	s_9	43	77	0.71	20.0	5.5	14.5	0.1	3.5	3.5	1684.6	A	A
		s_{10}	34											
	E-W	s_{11}	33	58	0.81	10.0	4.5	5.5	0.2	3.5	3.5	967.8	A	A
		s_{12}	25											
NW	N-S	s_{13}	34	76	0.70	21.0	5.5	15.5	0.1	3.5	3.5	1798.8	A	A
		s_{14}	42											
	E-W	s_{15}	30	60	0.75	10.0	4.5	5.5	0.2	3.5	3.5	866.2	A	A
		s_{16}	30											

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Midday Peak
Date:	43265	Analysis Year:	2018

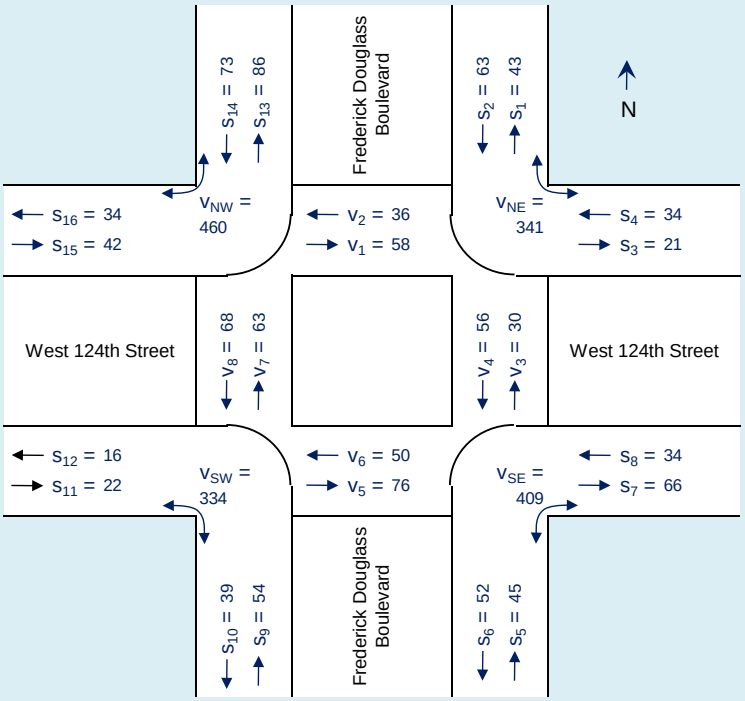


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak
Date:	14-Jun-18	Analysis Year:	2018

PEDESTRIAN PEAK HOUR VOLUMES

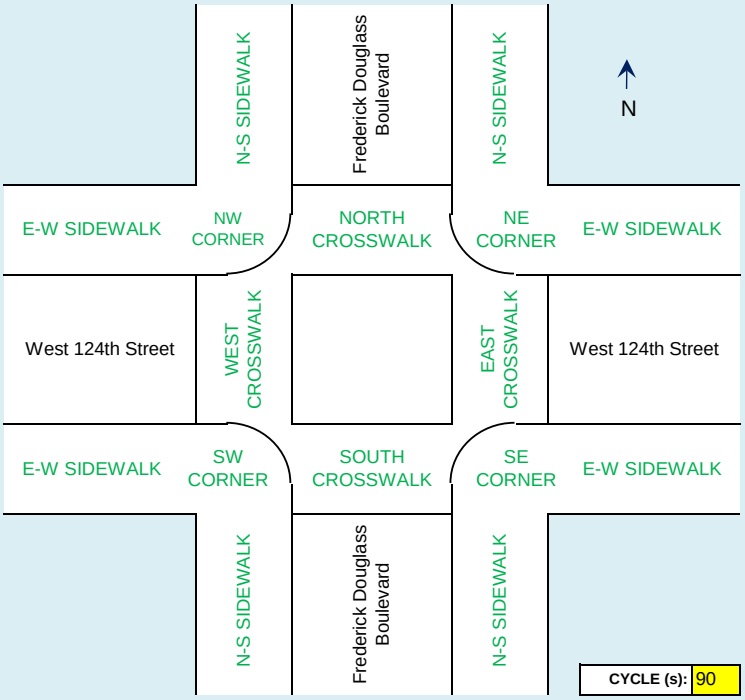


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	s_1	43	0.78
		s_2	63	
	E-W	s_3	21	0.81
		s_4	34	
SE	N-S	s_5	45	0.76
		s_6	52	
	E-W	s_7	66	0.83
		s_8	34	
SW	N-S	s_9	54	0.80
		s_{10}	39	
	E-W	s_{11}	22	0.17
		s_{12}	16	
NW	N-S	s_{13}	86	0.85
		s_{14}	73	
	E-W	s_{15}	42	0.90
		s_{16}	34	

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	v_1	58	0.85
	v_2	36	0.64
E	v_3	30	0.75
	v_4	56	0.82
S	v_5	76	0.95
	v_6	50	0.74
W	v_7	63	0.83
	v_8	68	0.85

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	v_{NE}	341	0.80
SE	v_{SE}	409	0.84
SW	v_{SW}	334	0.85
NW	v_{NW}	460	0.86

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



SIDEWALKS				
CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUCTIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S	19.5	5.5	3.5
	E-W	10.0	4.5	3.5
SE	N-S	19.5	5.5	3.5
	E-W	10.0	4.5	3.5
SW	N-S	20.0	5.5	3.5
	E-W	12.0	4.5	3.5
NW	N-S	21.0	5.5	3.5
	E-W	10.0	4.5	3.5

* 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	60.0	12.0	3.5	25	15	5	45	0	0
E	30.0	18.0	3.5	30	6	5	41	12	23
S	60.0	12.0	3.5	25	15	5	45	0	0
W	30.0	18.0	3.5	30	6	5	41	0	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	18.0	10.0	4.00
	E-W	12.0		
SE	N-S	18.0	10.0	4.00
	E-W	12.0		
SW	N-S	18.0	10.0	4.00
	E-W	12.0		
NW	N-S	18.0	10.0	4.00
	E-W	12.0		

* Override if corner width is different than sidewalk width.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak
Date:	43265	Analysis Year:	2018

INPUTS

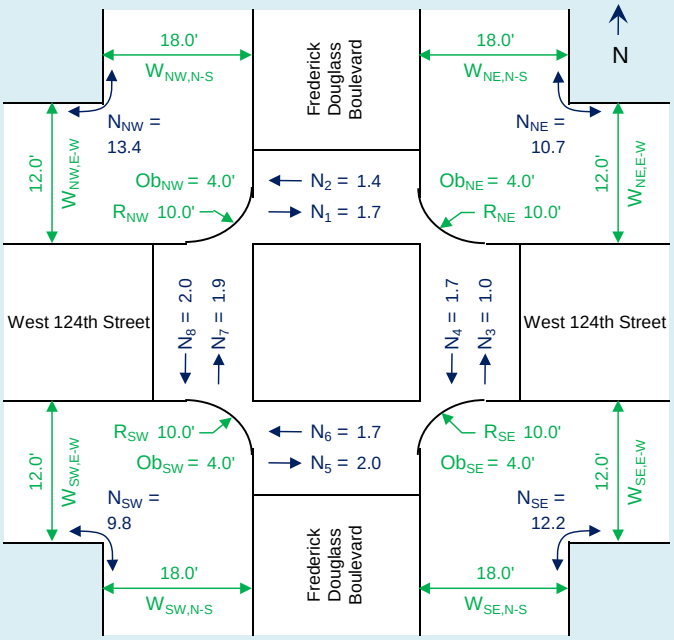
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 58	0.9	N_1 = 1.7
v_2 = 36	0.6	N_2 = 1.4
v_3 = 30	0.8	N_3 = 1.0
v_4 = 56	0.8	N_4 = 1.7
v_5 = 76	1	N_5 = 2.0
v_6 = 50	0.7	N_6 = 1.7
v_7 = 63	0.8	N_7 = 1.9
v_8 = 68	0.9	N_8 = 2.0
v_{NE} = 341	0.8	N_{NE} = 10.7
v_{SE} = 409	0.8	N_{SE} = 12.2
v_{SW} = 334	0.9	N_{SW} = 9.8
v_{NW} = 460	0.9	N_{NW} = 13.4

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	25	$g_{Walk,N}$ = 29
E	30	$g_{Walk,E}$ = 34
S	25	$g_{Walk,S}$ = 29
W	30	$g_{Walk,W}$ = 34

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ 17,145.0 ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 35.3 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} = 34.8 \text{ s}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ 16,794.5 ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = 206.0 sf/ped LOS A

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ 17,145.0 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 29.1 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 29.7 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ 16,850.9 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 255.7 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ 17,145.0 ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 41.3 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} = 33.1 \text{ s}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ 16,773.0 ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = 240.8 sf/ped LOS A

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 17,145.0 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 34.9 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 17.4 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 16,883.3 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 227.3 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak
Date:	43265	Analysis Year:	2018

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 58	0.85	N_1 = 1.7
v_2 = 36	0.64	N_2 = 1.4
v_3 = 30	0.75	N_3 = 1.0
v_4 = 56	0.82	N_4 = 1.7
v_5 = 76	0.95	N_5 = 2.0
v_6 = 50	0.74	N_6 = 1.7
v_7 = 63	0.83	N_7 = 1.9
v_8 = 68	0.85	N_8 = 2.0

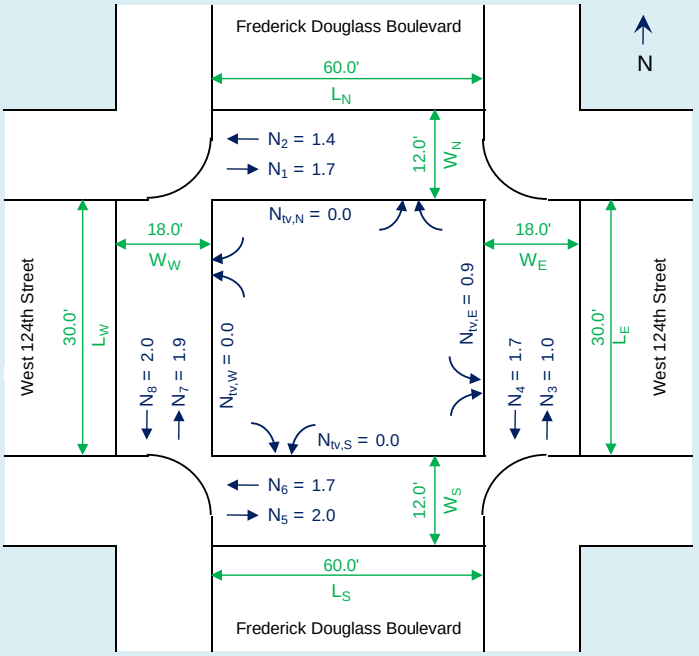
TURNING VOL PER CYCLE

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	
$v_{lt,perm,E}$ = 23	$N_{tv,E}$ = 0.9
$v_{rt,E}$ = 12	
$v_{lt,perm,S}$ = 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	25	$g_{Walk,N}$ = 29
E	3.5	30	$g_{Walk,E}$ = 34
S	3.5	25	$g_{Walk,S}$ = 29
W	3.5	30	$g_{Walk,W}$ = 34

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 20{,}880.0$ ft²-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 0.0$ ft²-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 20{,}880.0$ ft²-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 1.2$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 1.0$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 20.6$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 20.6$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 64.1$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 326.0 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 18{,}360.0$ ft²-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 630.0$ ft²-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 17{,}730.0$ ft²-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 0.6$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 1.1$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 11.9$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 11.9$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 32.2$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 550.0 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 20{,}880.0$ ft²-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 0.0$ ft²-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 20{,}880.0$ ft²-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$= 1.4$ p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$= 1.1$ p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$= 20.6$ s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$= 20.6$ s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$= 76.1$ s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = 274.4 sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 18{,}360.0$ ft²-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 0.0$ ft²-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 18{,}360.0$ ft²-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$= 1.2$ p

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$= 1.2$ p

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$= 11.9$ s

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$= 12.0$ s

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$= 46.6$ s

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

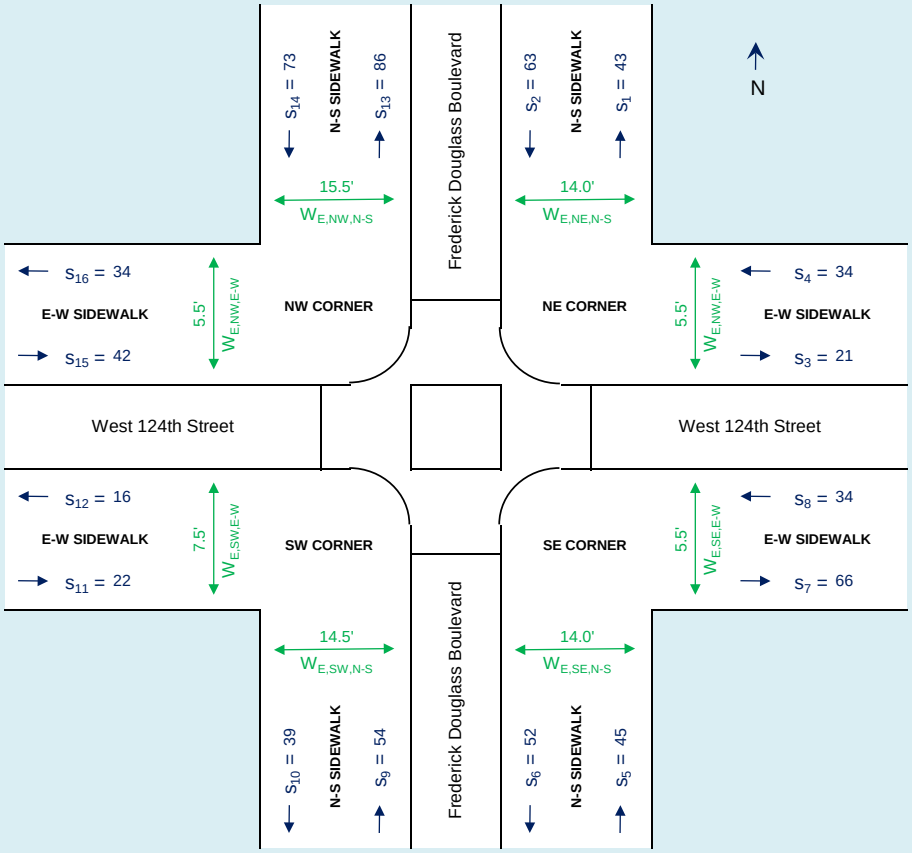
$M_{cw,W}$ = 394.1 sf/p LOS A

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak
Date:	43265	Analysis Year:	2018

INPUTS



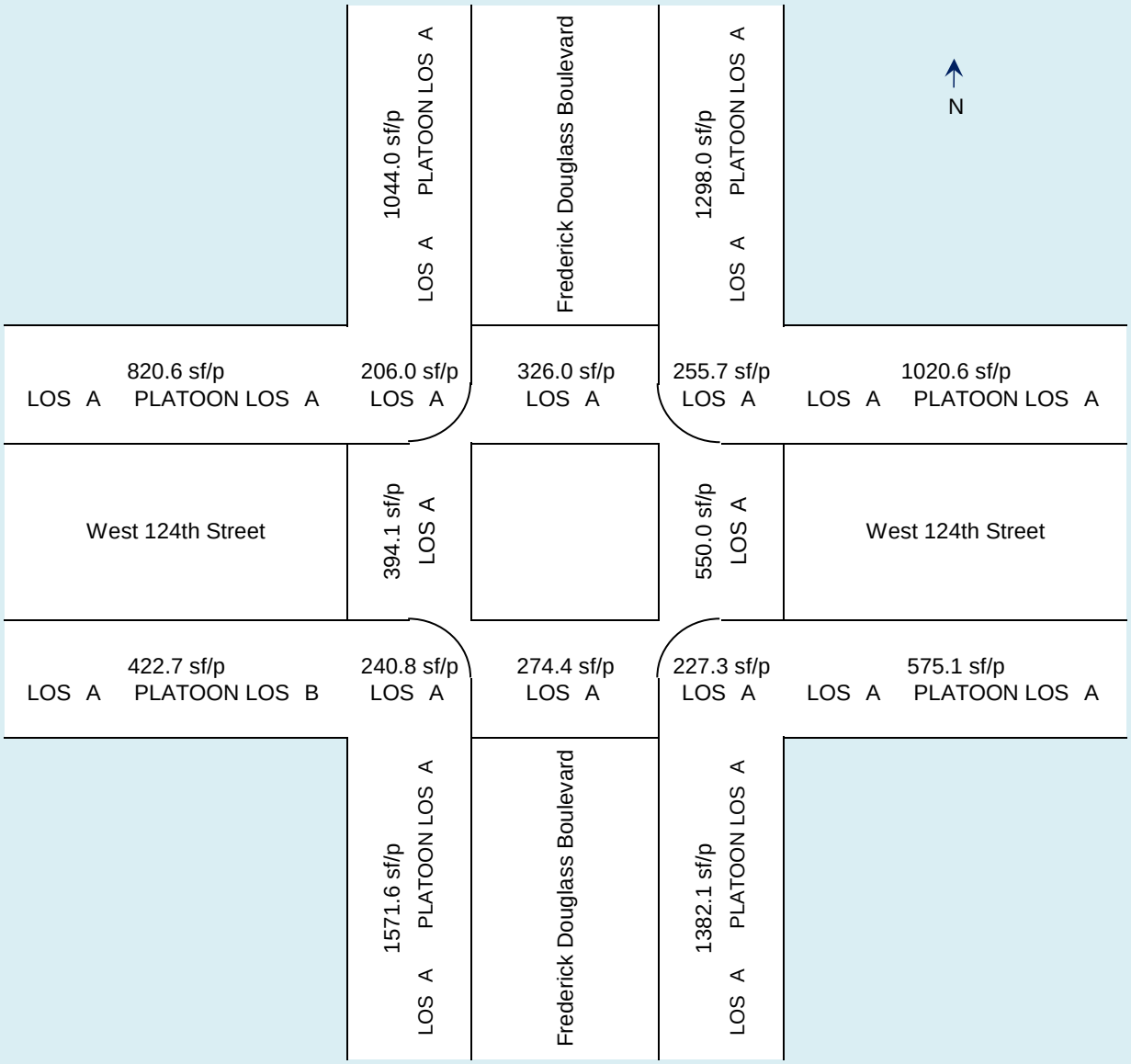
ANALYSIS

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	43	106	0.78	19.5	5.5	14.0	0.2	3.5	3.5	1298.0	A	A
		s_2	63											
	E-W	s_3	21	55	0.81	10.0	4.5	5.5	0.2	3.5	3.5	1020.6	A	A
		s_4	34											
SE	N-S	s_5	45	97	0.76	19.5	5.5	14.0	0.2	3.5	3.5	1382.1	A	A
		s_6	52											
	E-W	s_7	66	100	0.83	10.0	4.5	5.5	0.4	3.5	3.5	575.1	A	A
		s_8	34											
SW	N-S	s_9	54	93	0.80	20.0	5.5	14.5	0.1	3.5	3.5	1571.6	A	A
		s_{10}	39											
	E-W	s_{11}	22	38	0.17	12.0	4.5	7.5	0.5	3.5	3.5	422.7	A	B
		s_{12}	16											
NW	N-S	s_{13}	86	159	0.85	21.0	5.5	15.5	0.2	3.5	3.5	1044.0	A	A
		s_{14}	73											
	E-W	s_{15}	42	76	0.90	10.0	4.5	5.5	0.3	3.5	3.5	820.6	A	A
		s_{16}	34											

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak
Date:	43265	Analysis Year:	2018

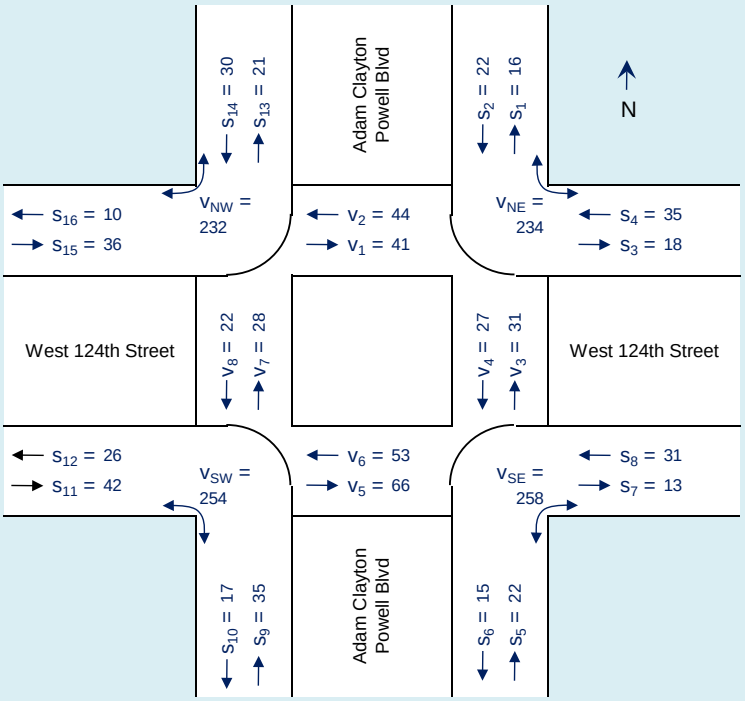


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak Hour
Date:	14-Jun-18	Analysis Year:	2018

PEDESTRIAN PEAK HOUR VOLUMES

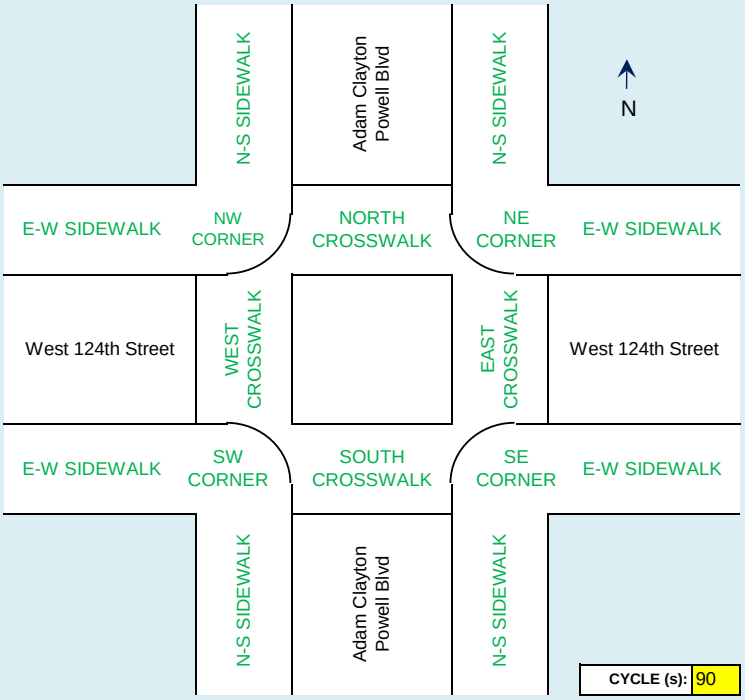


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	s_1	16	0.56
		s_2	22	
	E-W	s_3	18	0.66
		s_4	35	
SE	N-S	s_5	22	0.71
		s_6	15	
	E-W	s_7	13	0.65
		s_8	31	
SW	N-S	s_9	35	0.59
		s_{10}	17	
	E-W	s_{11}	42	0.63
		s_{12}	26	
NW	N-S	s_{13}	21	0.46
		s_{14}	30	
	E-W	s_{15}	36	0.52
		s_{16}	10	

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	v_1	41	0.60
	v_2	44	0.73
E	v_3	31	0.48
	v_4	27	0.52
S	v_5	66	0.72
	v_6	53	0.78
W	v_7	28	0.64
	v_8	22	0.55

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	v_{NE}	234	0.62
SE	v_{SE}	258	0.76
SW	v_{SW}	254	0.69
NW	v_{NW}	232	0.57

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	23.0	5.5	3.5
	E-W	10.0	3.5	3.5
SE	N-S	23.0	5.5	3.5
	E-W	10.0	3.5	3.5
SW	N-S	22.0	8.0	3.5
	E-W	10.0	3.5	3.5
NW	N-S	22.0	8.0	3.5
	E-W	10.0	3.5	3.5

* 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	100.0	13.0	3.5	7	28	30	65	3	4
E	30.0	20.0	3.5	25	7	30	62	19	31
S	100.0	12.0	3.5	7	28	30	65	3	5
W	30.0	16.0	3.5	25	7	30	62	9	6

* 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	23.0	10.0	4.00
	E-W	12.0		
SE	N-S	23.0	9.0	4.00
	E-W	12.0		
SW	N-S	23.0	10.0	4.00
	E-W	12.0		
NW	N-S	23.0	10.0	4.00
	E-W	12.0		

* Override if corner width is different than sidewalk width.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak Hour
Date:	43265	Analysis Year:	2018

INPUTS

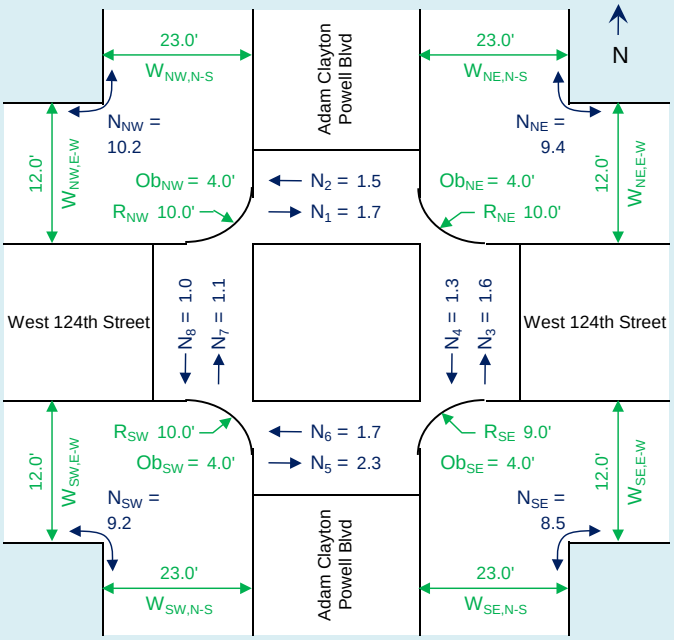
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 41	0.6	N_1 = 1.7
v_2 = 44	0.7	N_2 = 1.5
v_3 = 31	0.5	N_3 = 1.6
v_4 = 27	0.5	N_4 = 1.3
v_5 = 66	0.7	N_5 = 2.3
v_6 = 53	0.8	N_6 = 1.7
v_7 = 28	0.6	N_7 = 1.1
v_8 = 22	0.6	N_8 = 1.0
v_{NE} = 234	0.6	N_{NE} = 9.4
v_{SE} = 258	0.8	N_{SE} = 8.5
v_{SW} = 254	0.7	N_{SW} = 9.2
v_{NW} = 232	0.6	N_{NW} = 10.2

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	7	$g_{Walk,N}$ = 11
E	25	$g_{Walk,E}$ = 29
S	7	$g_{Walk,S}$ = 11
W	25	$g_{Walk,W}$ = 29

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ 22,545.0 ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 59.2 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} = 20.7 \text{ s}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ 22,145.5 ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = 357.7 sf/ped LOS A

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ 22,545.0 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 52.0 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 26.8 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ 22,150.7 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 356.0 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ 22,545.0 ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 79.5 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} = 22.6 \text{ s}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ 22,034.7 ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = 360.3 sf/ped LOS A

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 22,912.7 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 58.9 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 33.4 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 22,451.3 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 364.7 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak Hour
Date:	43265	Analysis Year:	2018

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 41	0.6	N_1 = 1.7
v_2 = 44	0.73	N_2 = 1.5
v_3 = 31	0.48	N_3 = 1.6
v_4 = 27	0.52	N_4 = 1.3
v_5 = 66	0.72	N_5 = 2.3
v_6 = 53	0.78	N_6 = 1.7
v_7 = 28	0.64	N_7 = 1.1
v_8 = 22	0.55	N_8 = 1.0

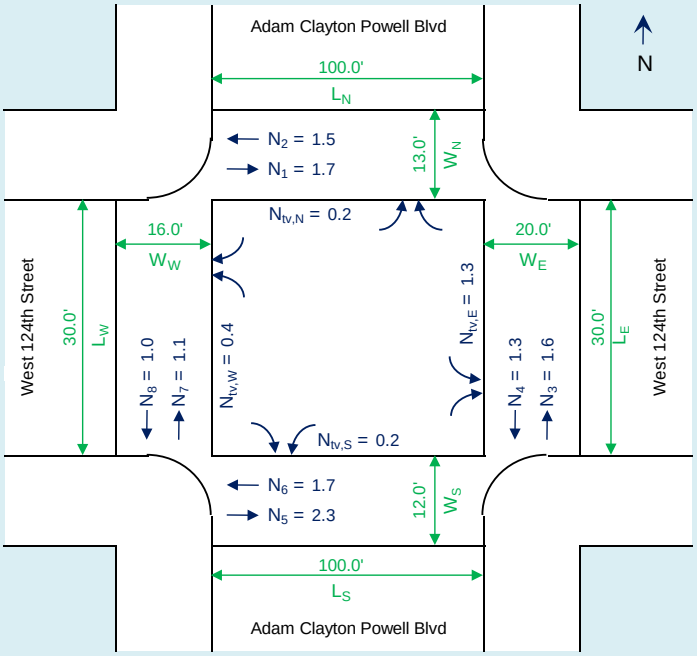
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ = 4	$N_{tv,N}$ = 0.2
$v_{rt,N}$ = 3	
$v_{lt,perm,E}$ = 31	$N_{tv,E}$ = 1.3
$v_{rt,E}$ = 19	
$v_{lt,perm,S}$ = 5	$N_{tv,S}$ = 0.2
$v_{rt,S}$ = 3	
$v_{lt,perm,W}$ = 6	$N_{tv,W}$ = 0.4
$v_{rt,W}$ = 9	

WALKING SPEED & CROSSING TIME

CROSS-WALK	S_p (ft/s)	WALK (s)	g_{Walk} = WALK + 4 (s)
N	3.5	7	$g_{Walk,N}$ = 11
E	3.5	25	$g_{Walk,E}$ = 29
S	3.5	7	$g_{Walk,S}$ = 11
W	3.5	25	$g_{Walk,W}$ = 29

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 14{,}300.0$ ft²-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 91.0$ ft²-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 14{,}209.0$ ft²-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 1.5$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 1.3$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 32.1$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 32.0$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 102.9$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 138.1 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 17{,}400.0$ ft²-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 1{,}000.0$ ft²-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 16{,}400.0$ ft²-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 1.1$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 0.9$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 11.9$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 11.9$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 34.7$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 472.9 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 13{,}200.0$ ft²-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 96.0$ ft²-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 13{,}104.0$ ft²-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$= 2.0$ p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$= 1.5$ p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$= 32.2$ s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$= 32.1$ s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$= 128.4$ s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = 102.1 sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 13{,}920.0$ ft²-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 240.0$ ft²-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 13{,}680.0$ ft²-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$= 0.7$ p

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$= 0.7$ p

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$= 11.9$ s

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$= 11.9$ s

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$= 24.9$ s

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

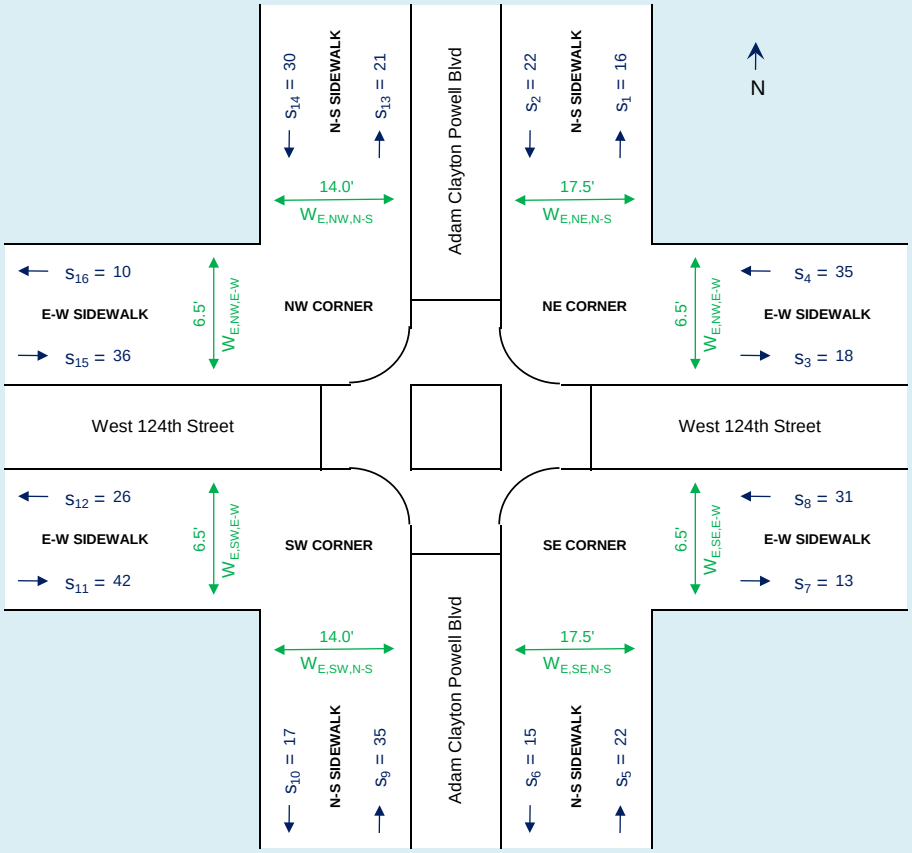
$M_{cw,W}$ = 549.4 sf/p LOS A

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak Hour
Date:	43265	Analysis Year:	2018

INPUTS



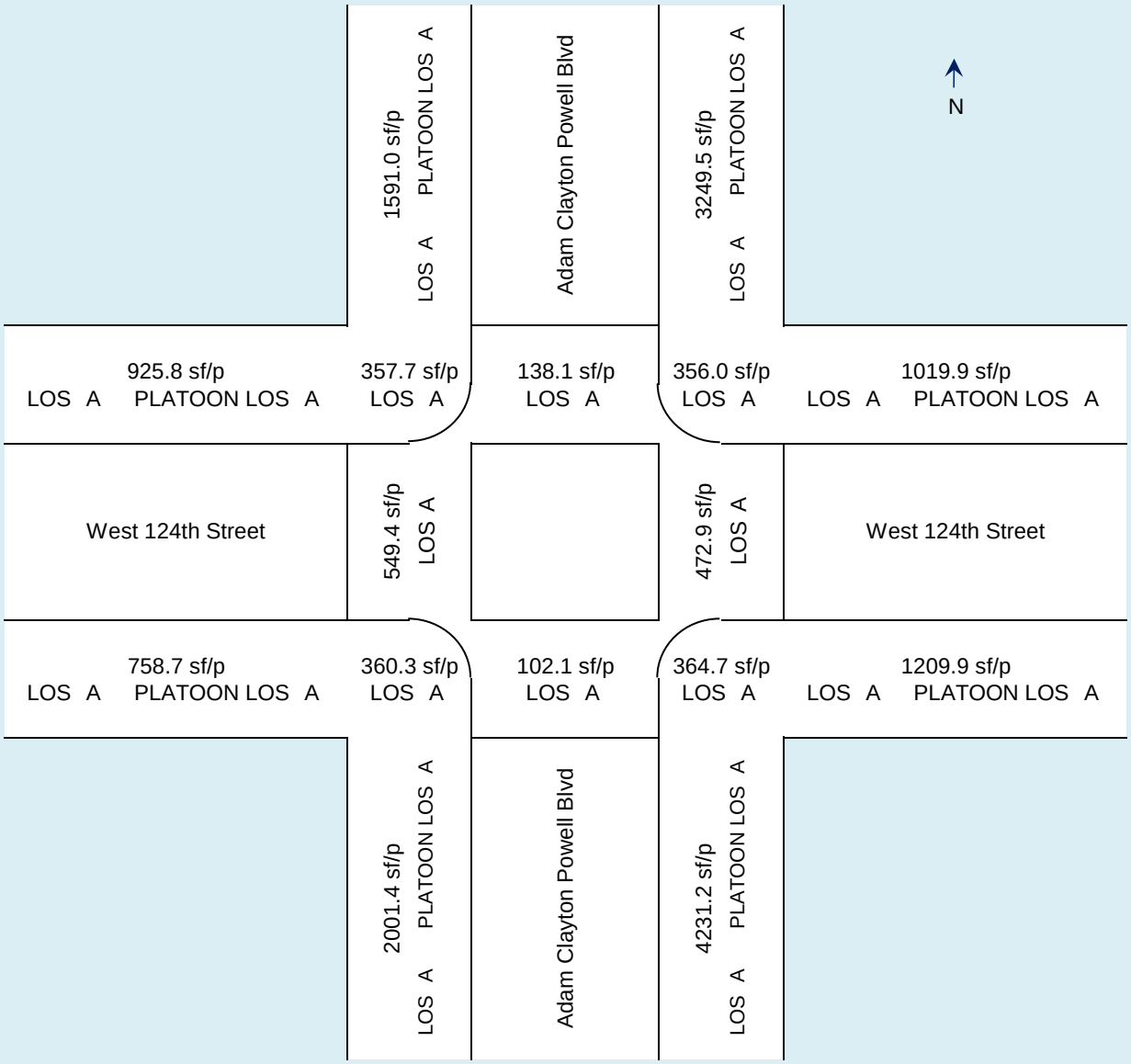
ANALYSIS

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	16	38	0.56	23.0	5.5	17.5	0.1	3.5	3.5	3249.5	A	A
		s_2	22											
	E-W	s_3	18	53	0.66	10.0	3.5	6.5	0.2	3.5	3.5	1019.9	A	A
		s_4	35											
SE	N-S	s_5	22	37	0.71	23.0	5.5	17.5	0.0	3.5	3.5	4231.2	A	A
		s_6	15											
	E-W	s_7	13	44	0.65	10.0	3.5	6.5	0.2	3.5	3.5	1209.9	A	A
		s_8	31											
SW	N-S	s_9	35	52	0.59	22.0	8.0	14.0	0.1	3.5	3.5	2001.4	A	A
		s_{10}	17											
	E-W	s_{11}	42	68	0.63	10.0	3.5	6.5	0.3	3.5	3.5	758.7	A	A
		s_{12}	26											
NW	N-S	s_{13}	21	51	0.46	22.0	8.0	14.0	0.1	3.5	3.5	1591.0	A	A
		s_{14}	30											
	E-W	s_{15}	36	46	0.52	10.0	3.5	6.5	0.2	3.5	3.5	925.8	A	A
		s_{16}	10											

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak Hour
Date:	43265	Analysis Year:	2018

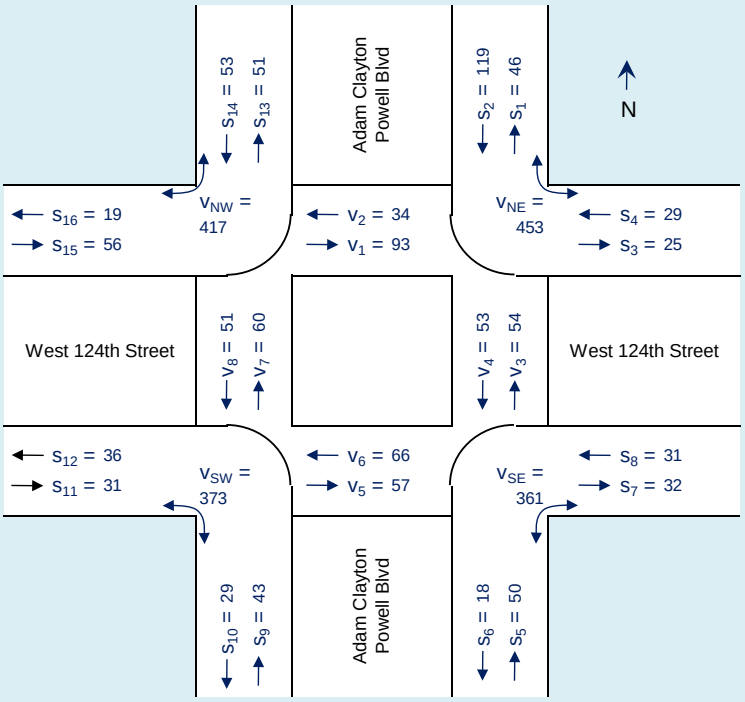


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Mid Day Peak Hour
Date:	14-Jun-18	Analysis Year:	2018

PEDESTRIAN PEAK HOUR VOLUMES

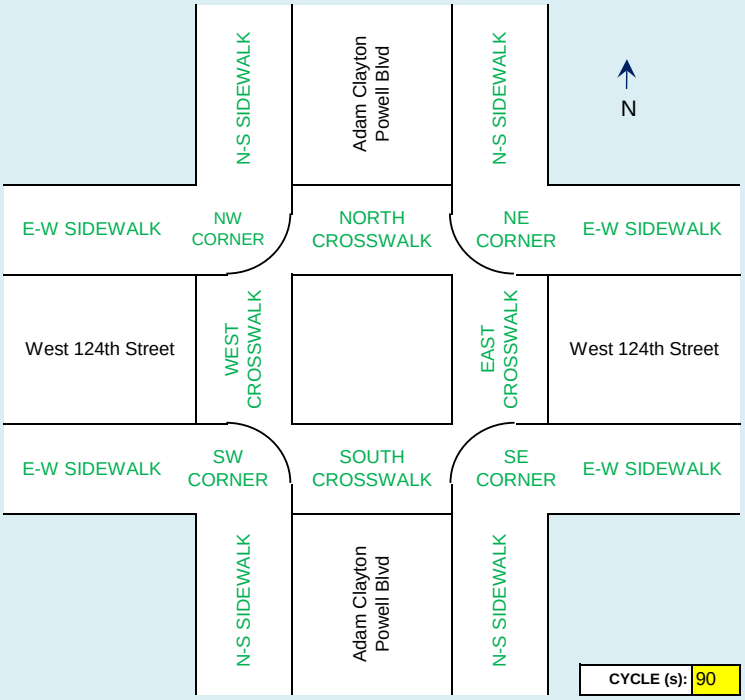


SIDEWALKS				
CORNER	MOVE-MENT		VOL (p/hr)	PHF
NE	N-S	S_1	46	0.71
		S_2	119	
	E-W	S_3	25	0.59
		S_4	29	
SE	N-S	S_5	50	0.85
		S_6	18	
	E-W	S_7	32	0.63
		S_8	31	
SW	N-S	S_9	43	0.75
		S_{10}	29	
	E-W	S_{11}	31	0.58
		S_{12}	36	
NW	N-S	S_{13}	51	0.65
		S_{14}	53	
	E-W	S_{15}	56	0.82
		S_{16}	19	

CROSSWALKS			
CROSS-WALK	MOVE-MENT	VOL (p/hr)	PHF
N	V_1	93	0.93
	V_2	34	0.85
E	V_3	54	0.68
	V_4	53	0.70
S	V_5	57	0.79
	V_6	66	0.69
W	V_7	60	0.60
	V_8	51	0.85

CORNERS			
CORNER	MOVE-MENT	VOL (p/hr)	PHF
NE	V_{NE}	453	0.80
SE	V_{SE}	361	0.78
SW	V_{SW}	373	0.65
NW	V_{NW}	417	0.81

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



CYCLE (s): 90

SIDEWALKS				
CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUC-TIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S	23.0	5.5	3.5
	E-W	10.0	3.5	3.5
SE	N-S	23.0	5.5	3.5
	E-W	10.0	3.5	3.5
SW	N-S	22.0	8.0	3.5
	E-W	10.0	3.5	3.5
NW	N-S	22.0	8.0	3.5
	E-W	10.0	3.5	3.5

* Sum of widths and shy distances from obstructions.

CORNERS				
CORNER	SIDEWALK	TOTAL WIDTH*, W (ft)	RADIUS, R (ft)	OBSTRUC-TIONS, Ob (ft^2)
NE	N-S	23.0	10.0	4.00
	E-W	12.0		
SE	N-S	23.0	9.0	4.00
	E-W	12.0		
SW	N-S	23.0	10.0	4.00
	E-W	12.0		
NW	N-S	23.0	10.0	4.00
	E-W	12.0		

* 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	100.0	13.0	3.5	7	28	30	65	11	2
E	30.0	20.0	3.5	25	7	30	62	16	35
S	100.0	12.0	3.5	7	28	30	65	5	1
W	30.0	16.0	3.5	25	7	30	62	0	0

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

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Mid Day Peak Hour
Date:	43265	Analysis Year:	2018

INPUTS

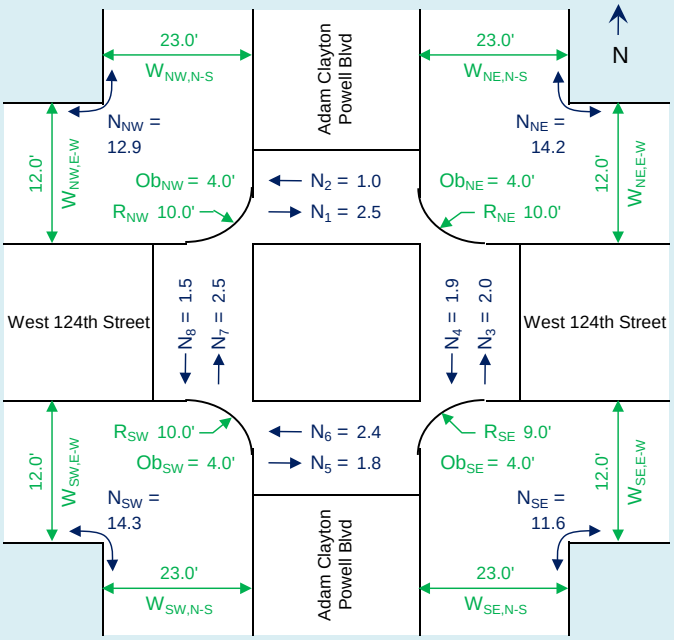
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 93	0.9	N_1 = 2.5
v_2 = 34	0.9	N_2 = 1.0
v_3 = 54	0.7	N_3 = 2.0
v_4 = 53	0.7	N_4 = 1.9
v_5 = 57	0.8	N_5 = 1.8
v_6 = 66	0.7	N_6 = 2.4
v_7 = 60	0.6	N_7 = 2.5
v_8 = 51	0.9	N_8 = 1.5
v_{NE} = 453	0.8	N_{NE} = 14.2
v_{SE} = 361	0.8	N_{SE} = 11.6
v_{SW} = 373	0.7	N_{SW} = 14.3
v_{NW} = 417	0.8	N_{NW} = 12.9

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	7	$g_{Walk,N}$ = 11
E	25	$g_{Walk,E}$ = 29
S	7	$g_{Walk,S}$ = 11
W	25	$g_{Walk,W}$ = 29

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ 22,545.0 ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 86.7 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} = 31.0 \text{ s}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ 21,956.6 ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = 269.5 sf/ped LOS A

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ 22,545.0 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 34.7 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 39.1 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ 22,176.0 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 257.4 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ 22,545.0 ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 62.5 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} = 51.7 \text{ s}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ 21,973.9 ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = 243.7 sf/ped LOS A

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 22,912.7 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 82.9 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 41.0 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 22,292.9 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 283.7 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Mid Day Peak Hour
Date:	43265	Analysis Year:	2018

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 93	0.93	N_1 = 2.5
v_2 = 34	0.85	N_2 = 1.0
v_3 = 54	0.68	N_3 = 2.0
v_4 = 53	0.7	N_4 = 1.9
v_5 = 57	0.79	N_5 = 1.8
v_6 = 66	0.69	N_6 = 2.4
v_7 = 60	0.6	N_7 = 2.5
v_8 = 51	0.85	N_8 = 1.5

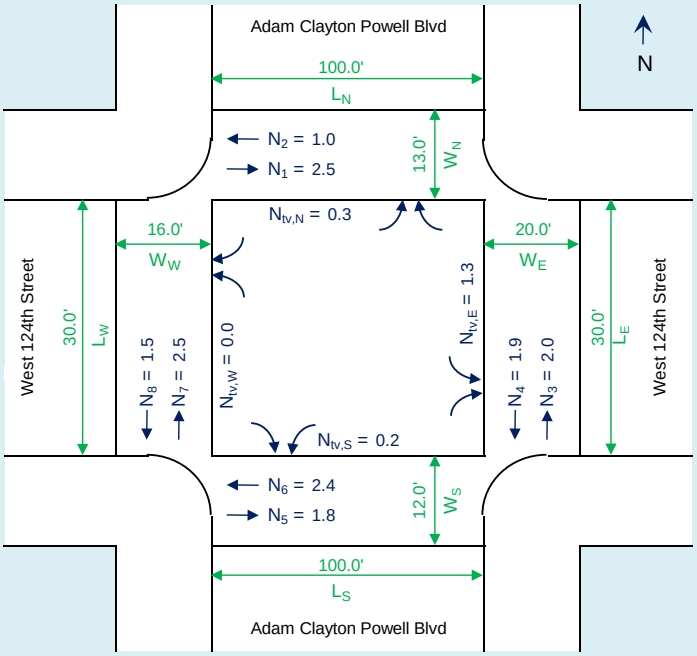
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ = 2	$N_{tv,N}$ = 0.3
$v_{rt,N}$ = 11	
$v_{lt,perm,E}$ = 35	$N_{tv,E}$ = 1.3
$v_{rt,E}$ = 16	
$v_{lt,perm,S}$ = 1	$N_{tv,S}$ = 0.2
$v_{rt,S}$ = 5	
$v_{lt,perm,W}$ = 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	7	$g_{Walk,N}$ = 11
E	3.5	25	$g_{Walk,E}$ = 29
S	3.5	7	$g_{Walk,S}$ = 11
W	3.5	25	$g_{Walk,W}$ = 29

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 14{,}300.0$ ft²-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 169.0$ ft²-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 14{,}131.0$ ft²-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 2.2$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 0.9$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 32.2$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 32.0$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 112.5$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 125.6 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 17{,}400.0$ ft²-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 1{,}020.0$ ft²-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 16{,}380.0$ ft²-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 1.3$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 1.3$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 12.0$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 11.9$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 46.3$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 353.5 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 13{,}200.0$ ft²-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 72.0$ ft²-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 13{,}128.0$ ft²-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$= 1.6$ p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$= 2.1$ p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$= 32.1$ s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$= 32.2$ s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$= 135.1$ s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = 97.2 sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 13{,}920.0$ ft²-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 0.0$ ft²-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 13{,}920.0$ ft²-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$= 1.7$ p

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$= 1.0$ p

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$= 12.1$ s

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$= 11.9$ s

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$= 48.1$ s

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

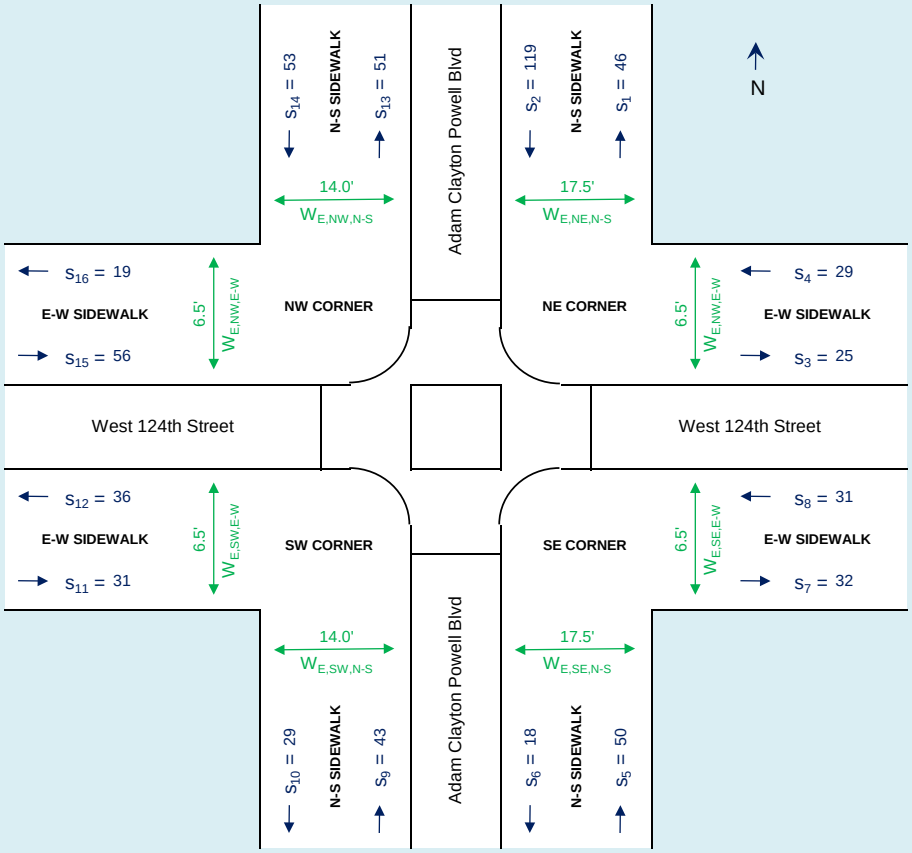
$M_{cw,W}$ = 289.7 sf/p LOS A

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Mid Day Peak Hour
Date:	43265	Analysis Year:	2018

INPUTS



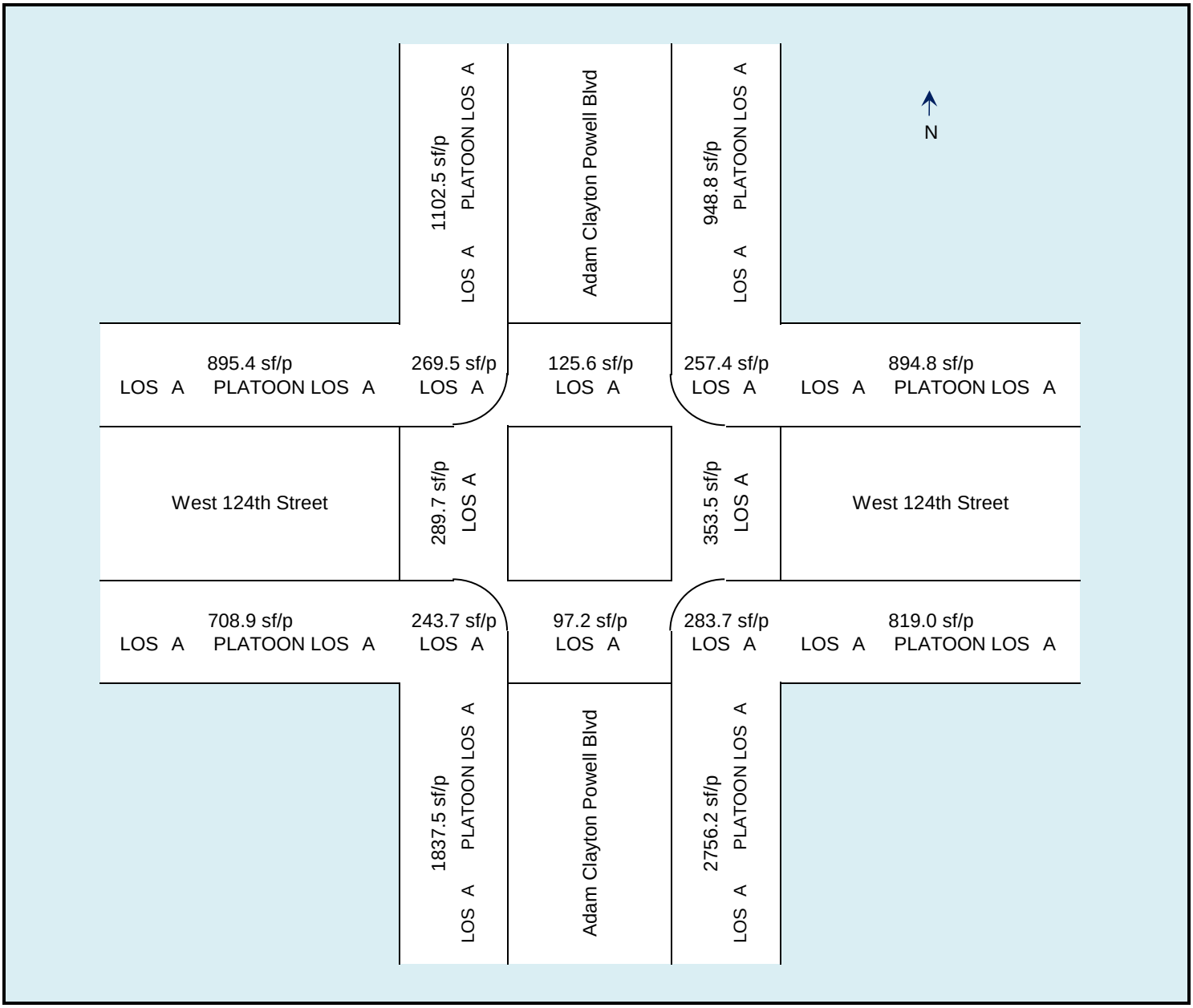
ANALYSIS

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	46	165	0.71	23.0	5.5	17.5	0.2	3.5	3.5	948.8	A	A
		S_2	119											
	E-W	S_3	25	54	0.59	10.0	3.5	6.5	0.2	3.5	3.5	894.8	A	A
		S_4	29											
SE	N-S	S_5	50	68	0.85	23.0	5.5	17.5	0.1	3.5	3.5	2756.2	A	A
		S_6	18											
	E-W	S_7	32	63	0.63	10.0	3.5	6.5	0.3	3.5	3.5	819.0	A	A
		S_8	31											
SW	N-S	S_9	43	72	0.75	22.0	8.0	14.0	0.1	3.5	3.5	1837.5	A	A
		S_{10}	29											
	E-W	S_{11}	31	67	0.58	10.0	3.5	6.5	0.3	3.5	3.5	708.9	A	A
		S_{12}	36											
NW	N-S	S_{13}	51	104	0.65	22.0	8.0	14.0	0.2	3.5	3.5	1102.5	A	A
		S_{14}	53											
	E-W	S_{15}	56	75	0.82	10.0	3.5	6.5	0.2	3.5	3.5	895.4	A	A
		S_{16}	19											

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Mid Day Peak Hour
Date:	43265	Analysis Year:	2018

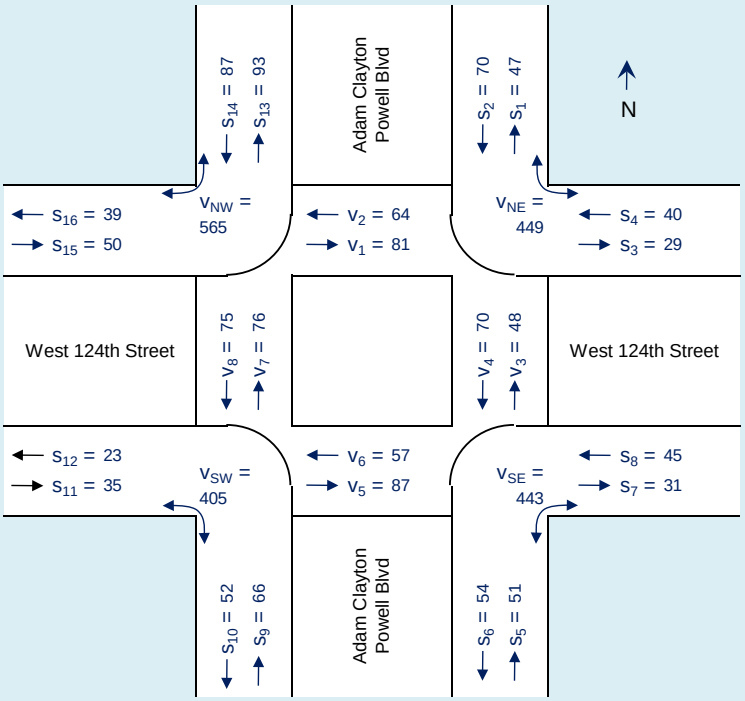


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak Hour
Date:	14-Jun-18	Analysis Year:	2018

PEDESTRIAN PEAK HOUR VOLUMES

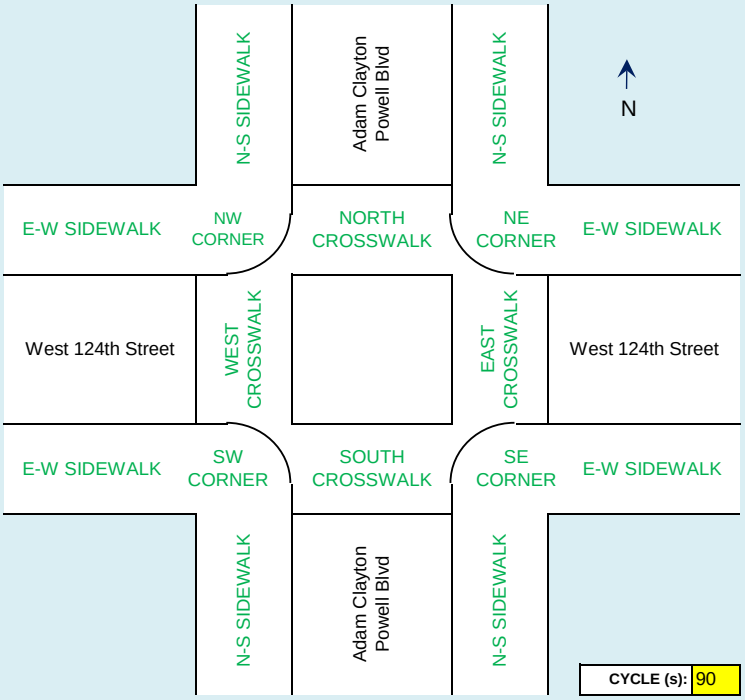


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	s_1	47	0.68
		s_2	70	
	E-W	s_3	29	0.58
		s_4	40	
SE	N-S	s_5	51	0.50
		s_6	54	
	E-W	s_7	31	0.63
		s_8	45	
SW	N-S	s_9	66	0.80
		s_{10}	52	
	E-W	s_{11}	35	0.16
		s_{12}	23	
NW	N-S	s_{13}	93	0.63
		s_{14}	87	
	E-W	s_{15}	50	0.57
		s_{16}	39	

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	v_1	81	0.78
	v_2	64	0.80
E	v_3	48	0.48
	v_4	70	0.58
S	v_5	87	0.81
	v_6	57	0.75
W	v_7	76	0.79
	v_8	75	0.52

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	v_{NE}	449	0.77
SE	v_{SE}	443	0.63
SW	v_{SW}	405	0.81
NW	v_{NW}	565	0.72

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	23.0	5.5	3.5
	E-W	10.0	3.5	3.5
SE	N-S	23.0	5.5	3.5
	E-W	10.0	3.5	3.5
SW	N-S	22.0	8.0	3.5
	E-W	10.0	3.5	3.5
NW	N-S	22.0	8.0	3.5
	E-W	10.0	3.5	3.5

* 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	23.0	10.0	4.00
	E-W	12.0		
SE	N-S	23.0	9.0	4.00
	E-W	12.0		
SW	N-S	23.0	10.0	4.00
	E-W	12.0		
NW	N-S	23.0	10.0	4.00
	E-W	12.0		

* 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	100.0	13.0	3.5	7	28	30	65	0	4
E	30.0	20.0	3.5	25	7	30	62	18	12
S	100.0	12.0	3.5	7	28	30	65	5	1
W	30.0	16.0	3.5	25	7	30	62	0	0

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

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak Hour
Date:	43265	Analysis Year:	2018

INPUTS

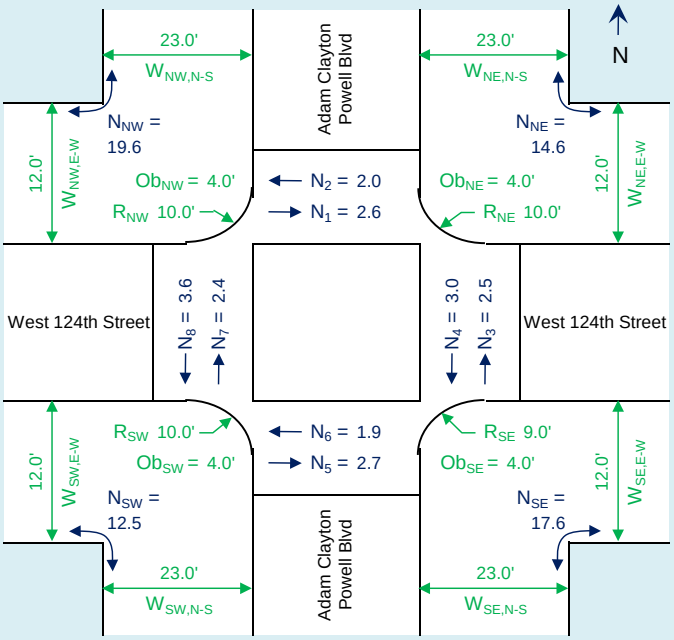
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 81	0.8	N_1 = 2.6
v_2 = 64	0.8	N_2 = 2.0
v_3 = 48	0.5	N_3 = 2.5
v_4 = 70	0.6	N_4 = 3.0
v_5 = 87	0.8	N_5 = 2.7
v_6 = 57	0.8	N_6 = 1.9
v_7 = 76	0.8	N_7 = 2.4
v_8 = 75	0.5	N_8 = 3.6
v_{NE} = 449	0.8	N_{NE} = 14.6
v_{SE} = 443	0.6	N_{SE} = 17.6
v_{SW} = 405	0.8	N_{SW} = 12.5
v_{NW} = 565	0.7	N_{NW} = 19.6

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	7	$g_{Walk,N}$ = 11
E	25	$g_{Walk,E}$ = 29
S	7	$g_{Walk,S}$ = 11
W	25	$g_{Walk,W}$ = 29

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ 22,545.0 ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 90.0 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} = 74.5 \text{ s}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ 21,722.2 ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = 179.7 sf/ped LOS A

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ 22,545.0 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 69.3 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 62.4 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ 21,886.4 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 221.6 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ 22,545.0 ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 93.1 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} = 49.7 \text{ s}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ 21,830.9 ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = 236.3 sf/ped LOS A

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 22,912.7 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 65.9 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 51.7 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 22,324.9 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 201.6 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak Hour
Date:	43265	Analysis Year:	2018

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 81	0.78	N_1 = 2.6
v_2 = 64	0.8	N_2 = 2.0
v_3 = 48	0.48	N_3 = 2.5
v_4 = 70	0.58	N_4 = 3.0
v_5 = 87	0.81	N_5 = 2.7
v_6 = 57	0.75	N_6 = 1.9
v_7 = 76	0.79	N_7 = 2.4
v_8 = 75	0.52	N_8 = 3.6

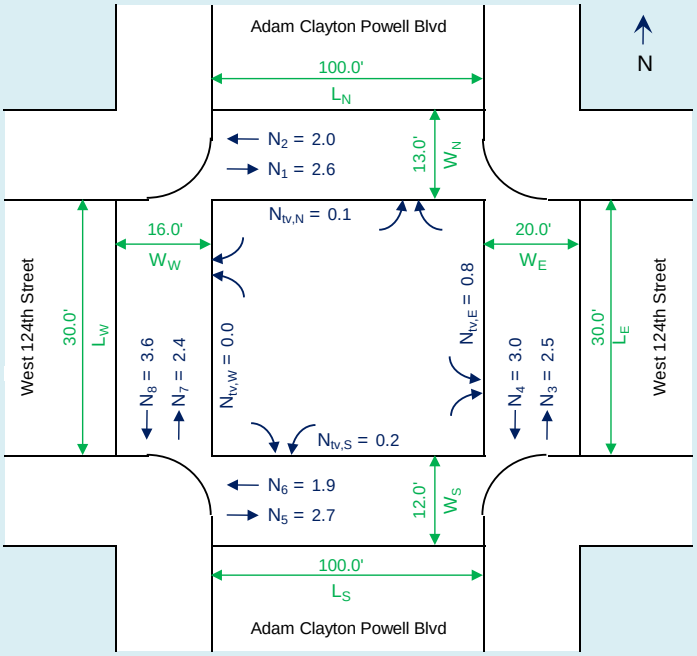
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ = 4	$N_{tv,N}$ = 0.1
$v_{rt,N}$ = 0	
$v_{lt,perm,E}$ = 12	$N_{tv,E}$ = 0.8
$v_{rt,E}$ = 18	
$v_{lt,perm,S}$ = 1	$N_{tv,S}$ = 0.2
$v_{rt,S}$ = 5	
$v_{lt,perm,W}$ = 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	7	$g_{Walk,N}$ = 11
E	3.5	25	$g_{Walk,E}$ = 29
S	3.5	7	$g_{Walk,S}$ = 11
W	3.5	25	$g_{Walk,W}$ = 29

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 14{,}300.0$ ft²-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 52.0$ ft²-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 14{,}248.0$ ft²-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 2.3$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 1.8$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 32.2$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 32.1$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 148.0$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 96.3 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 17{,}400.0$ ft²-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 600.0$ ft²-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 16{,}800.0$ ft²-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 1.7$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 2.0$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 12.0$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 12.0$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 66.4$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 253.2 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 13{,}200.0$ ft²-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 72.0$ ft²-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 13{,}128.0$ ft²-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$= 2.4$ p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$= 1.7$ p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$= 32.3$ s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$= 32.1$ s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$= 147.8$ s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = 88.8 sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 13{,}920.0$ ft²-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 0.0$ ft²-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 13{,}920.0$ ft²-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$= 1.6$ p

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$= 2.4$ p

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$= 12.0$ s

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$= 12.2$ s

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$= 72.9$ s

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

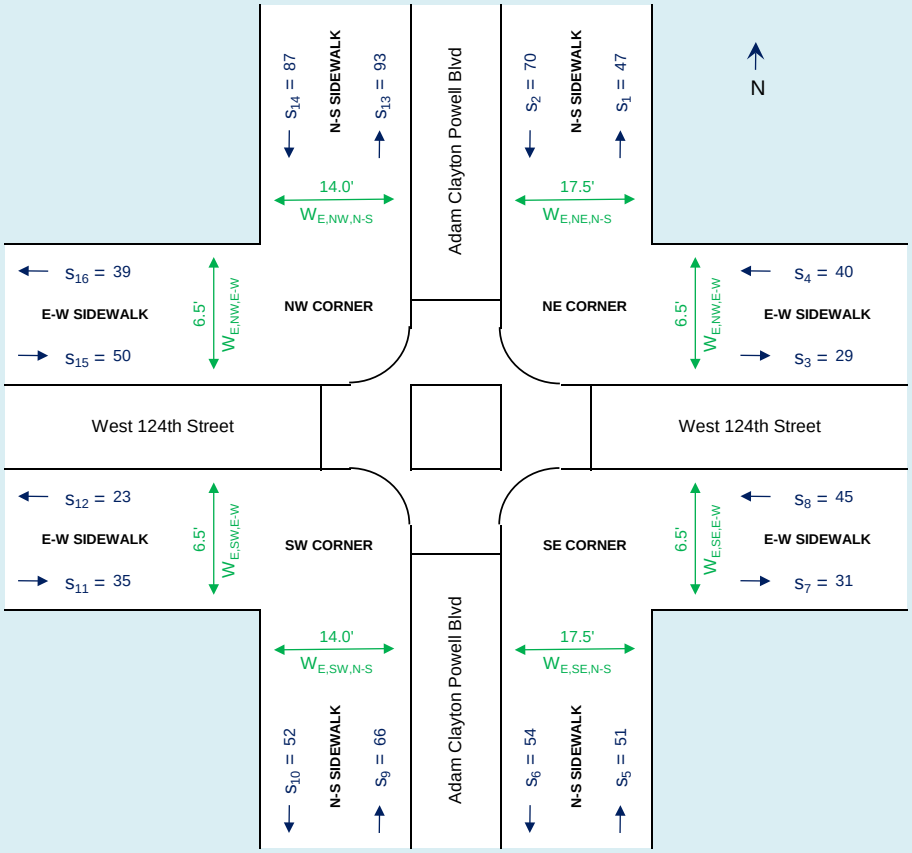
$M_{cw,W}$ = 190.9 sf/p LOS A

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak Hour
Date:	43265	Analysis Year:	2018

INPUTS



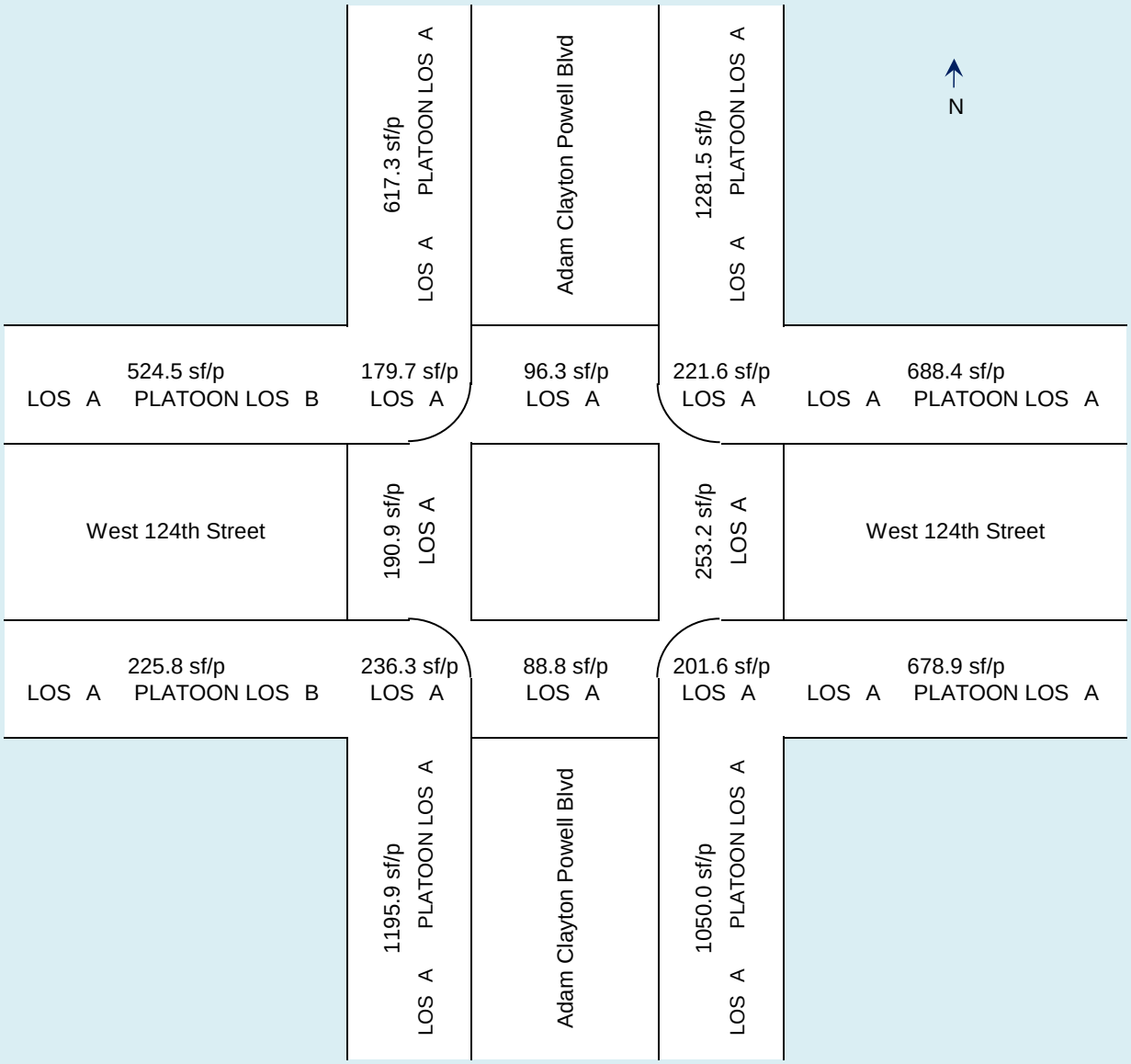
ANALYSIS

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	47	117	0.68	23.0	5.5	17.5	0.2	3.5	3.5	1281.5	A	A
		s_2	70											
	E-W	s_3	29	69	0.58	10.0	3.5	6.5	0.3	3.5	3.5	688.4	A	A
		s_4	40											
SE	N-S	s_5	51	105	0.50	23.0	5.5	17.5	0.2	3.5	3.5	1050.0	A	A
		s_6	54											
	E-W	s_7	31	76	0.63	10.0	3.5	6.5	0.3	3.5	3.5	678.9	A	A
		s_8	45											
SW	N-S	s_9	66	118	0.80	22.0	8.0	14.0	0.2	3.5	3.5	1195.9	A	A
		s_{10}	52											
	E-W	s_{11}	35	58	0.16	10.0	3.5	6.5	0.9	3.5	3.5	225.8	A	B
		s_{12}	23											
NW	N-S	s_{13}	93	180	0.63	22.0	8.0	14.0	0.3	3.5	3.5	617.3	A	A
		s_{14}	87											
	E-W	s_{15}	50	89	0.57	10.0	3.5	6.5	0.4	3.5	3.5	524.5	A	B
		s_{16}	39											

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak Hour
Date:	43265	Analysis Year:	2018

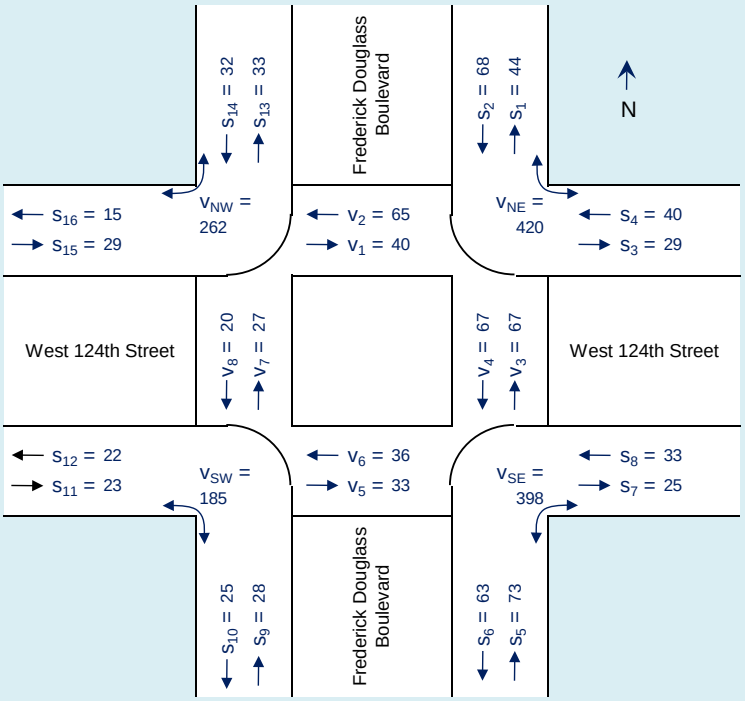


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak
Date:	14-Jun-18	Analysis Year:	2021 No-Action

PEDESTRIAN PEAK HOUR VOLUMES

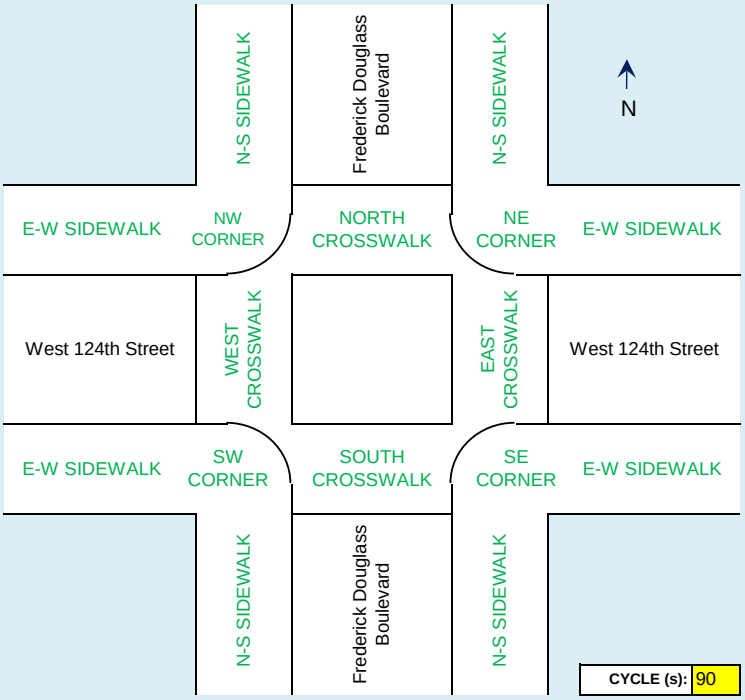


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	s_1	44	0.72
		s_2	68	
	E-W	s_3	29	0.88
		s_4	40	
SE	N-S	s_5	73	0.83
		s_6	63	
	E-W	s_7	25	0.67
		s_8	33	
SW	N-S	s_9	28	0.55
		s_{10}	25	
	E-W	s_{11}	23	0.72
		s_{12}	22	
NW	N-S	s_{13}	33	0.75
		s_{14}	32	
	E-W	s_{15}	29	0.60
		s_{16}	15	

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	v_1	40	0.65
	v_2	65	0.83
E	v_3	67	0.81
	v_4	67	0.86
S	v_5	33	0.80
	v_6	36	0.88
W	v_7	27	0.65
	v_8	20	0.85

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	v_{NE}	420	0.93
SE	v_{SE}	398	0.99
SW	v_{SW}	185	0.94
NW	v_{NW}	262	0.84

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	19.5	5.5	3.5
	E-W	10.0	4.5	3.5
SE	N-S	19.5	5.5	3.5
	E-W	10.0	4.5	3.5
SW	N-S	20.0	5.5	3.5
	E-W	12.0	4.5	3.5
NW	N-S	21.0	5.5	3.5
	E-W	10.0	4.5	3.5

* 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	18.0	10.0	4.00
	E-W	12.0		
SE	N-S	18.0	10.0	4.00
	E-W	12.0		
SW	N-S	18.0	10.0	4.00
	E-W	12.0		
NW	N-S	18.0	10.0	4.00
	E-W	12.0		

* 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	60.0	12.0	3.5	25	15	5	45	0	0
E	30.0	18.0	3.5	30	6	5	41	10	15
S	60.0	12.0	3.5	25	15	5	45	0	0
W	30.0	18.0	3.5	30	6	5	41	0	0

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

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak
Date:	43265	Analysis Year:	2021 No-Action

INPUTS

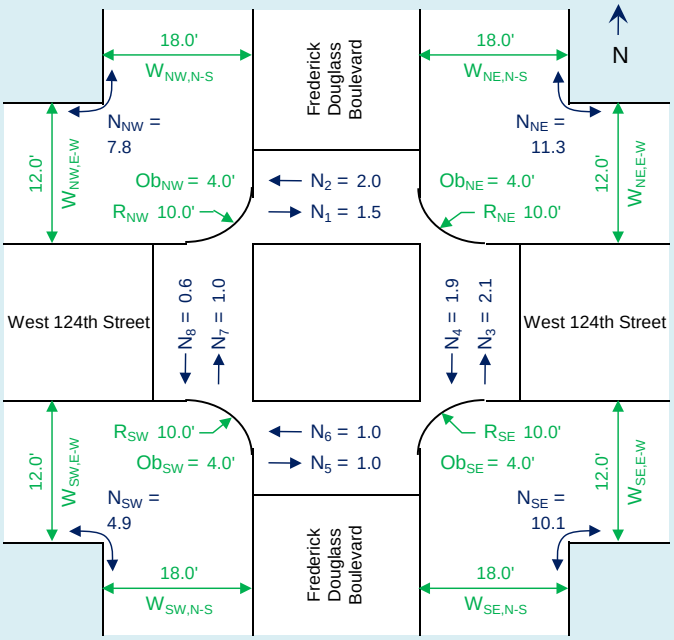
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 40	0.7	N_1 = 1.5
v_2 = 65	0.8	N_2 = 2.0
v_3 = 67	0.8	N_3 = 2.1
v_4 = 67	0.9	N_4 = 1.9
v_5 = 33	0.8	N_5 = 1.0
v_6 = 36	0.9	N_6 = 1.0
v_7 = 27	0.7	N_7 = 1.0
v_8 = 20	0.9	N_8 = 0.6
v_{NE} = 420	0.9	N_{NE} = 11.3
v_{SE} = 398	1	N_{SE} = 10.1
v_{SW} = 185	0.9	N_{SW} = 4.9
v_{NW} = 262	0.8	N_{NW} = 7.8

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	25	$g_{Walk,N}$ = 29
E	30	$g_{Walk,E}$ = 34
S	25	$g_{Walk,S}$ = 29
W	30	$g_{Walk,W}$ = 34

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ 17,145.0 ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 31.8 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} = 10.2 \text{ s}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ 16,934.7 ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = 326.7 sf/ped LOS A

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ 17,145.0 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 40.5 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 33.9 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ 16,773.0 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 223.0 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ 17,145.0 ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 21.3 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} = 18.1 \text{ s}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ 16,947.9 ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = 492.6 sf/ped LOS A

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 17,145.0 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 21.1 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 36.0 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 16,859.2 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 261.5 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak
Date:	43265	Analysis Year:	2021 No-Action

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 40	0.65	N_1 = 1.5
v_2 = 65	0.83	N_2 = 2.0
v_3 = 67	0.81	N_3 = 2.1
v_4 = 67	0.86	N_4 = 1.9
v_5 = 33	0.8	N_5 = 1.0
v_6 = 36	0.88	N_6 = 1.0
v_7 = 27	0.65	N_7 = 1.0
v_8 = 20	0.85	N_8 = 0.6

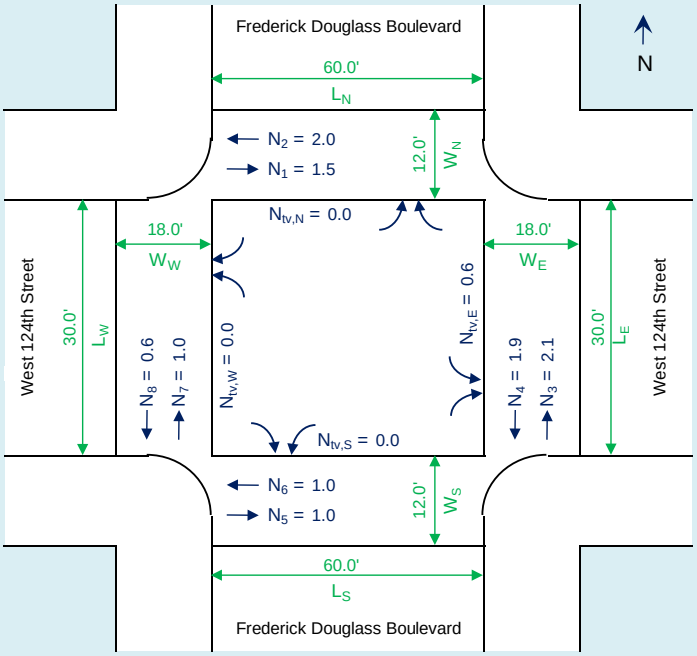
TURNING VOL PER CYCLE

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	
$v_{lt,perm,E}$ = 15	$N_{tv,E}$ = 0.6
$v_{rt,E}$ = 10	
$v_{lt,perm,S}$ = 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	25	$g_{Walk,N}$ = 29
E	3.5	30	$g_{Walk,E}$ = 34
S	3.5	25	$g_{Walk,S}$ = 29
W	3.5	30	$g_{Walk,W}$ = 34

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 20{,}880.0$ ft²-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 0.0$ ft²-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 20{,}880.0$ ft²-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 1.0$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 1.3$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 20.6$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 20.6$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 72.1$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 289.7 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 18{,}360.0$ ft²-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 450.0$ ft²-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 17{,}910.0$ ft²-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 1.3$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 1.2$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 12.0$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 12.0$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 48.0$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 373.0 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 20{,}880.0$ ft²-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 0.0$ ft²-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 20{,}880.0$ ft²-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$= 0.7$ p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$= 0.7$ p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$= 20.5$ s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$= 20.5$ s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$= 42.1$ s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = 495.9 sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 18{,}360.0$ ft²-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 0.0$ ft²-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 18{,}360.0$ ft²-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$= 0.6$ p

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$= 0.4$ p

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$= 11.9$ s

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$= 11.8$ s

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$= 19.3$ s

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

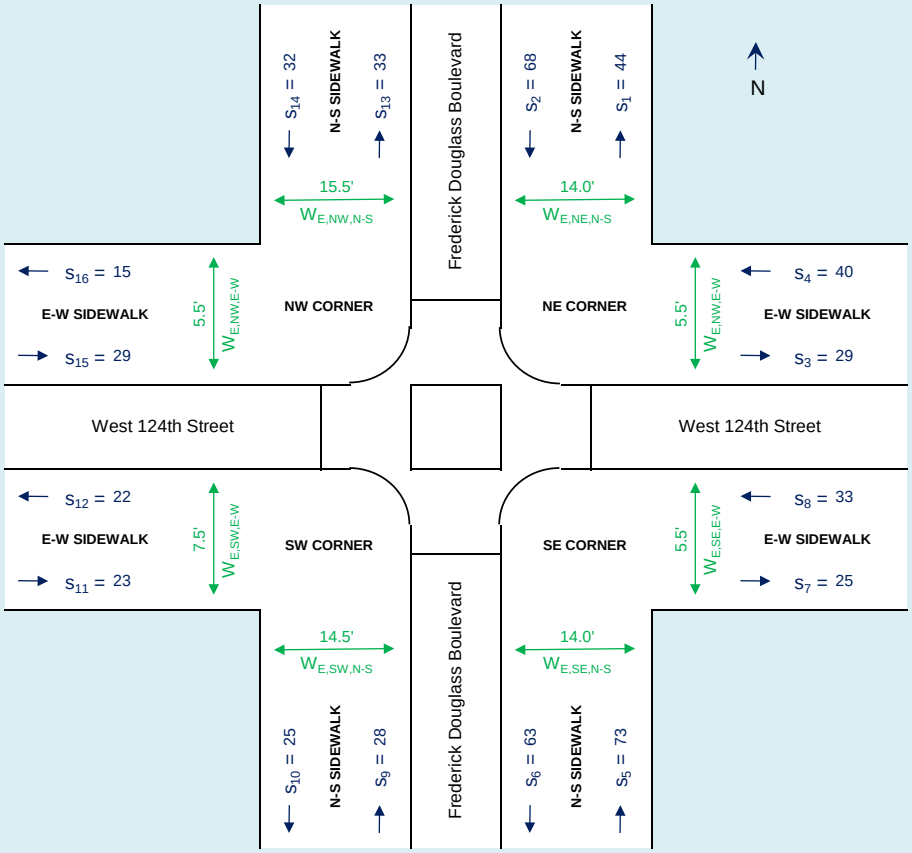
$M_{cw,W}$ = 952.2 sf/p LOS A

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak
Date:	43265	Analysis Year:	2021 No-Action

INPUTS



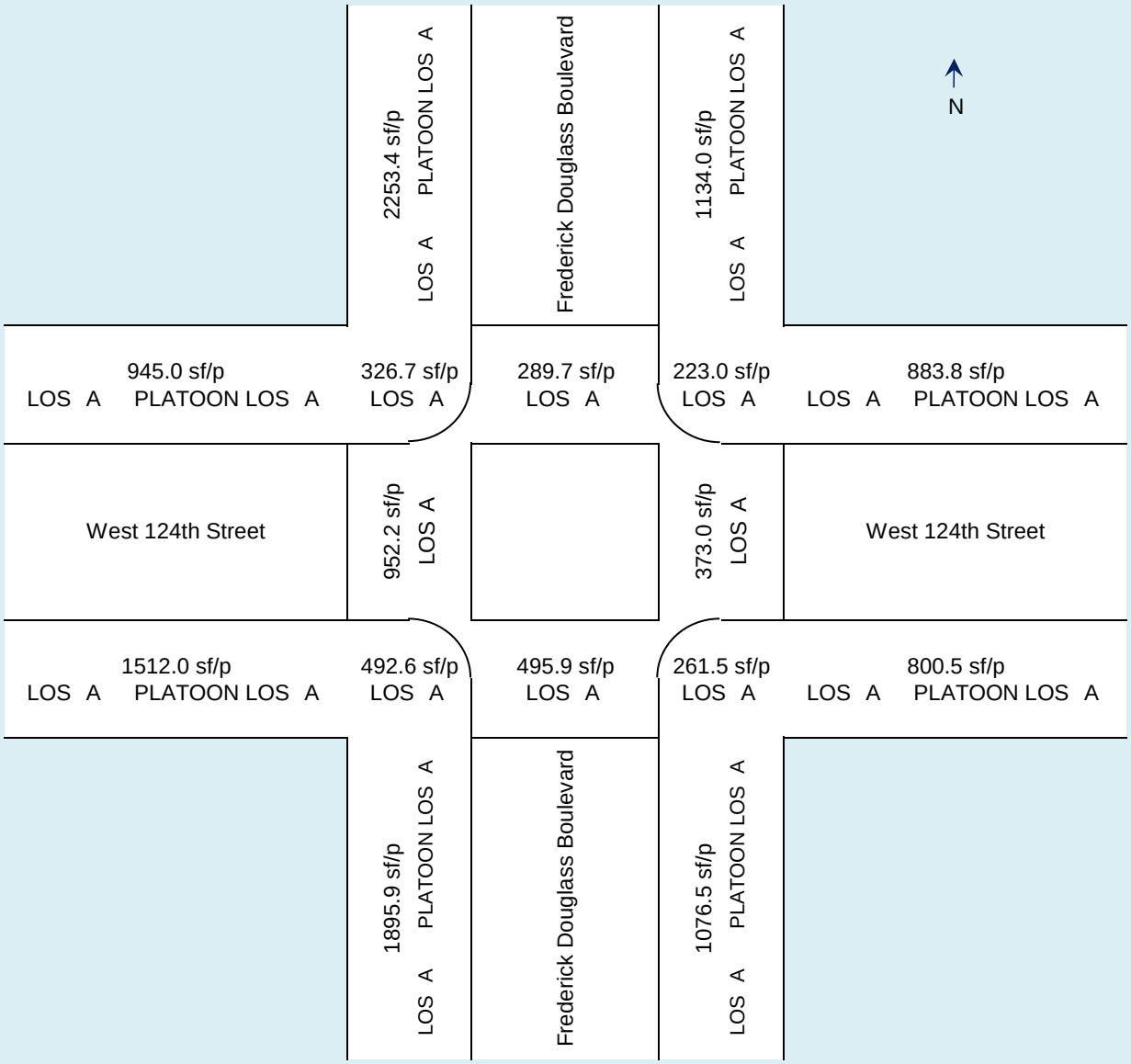
ANALYSIS

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	44	112	0.72	19.5	5.5	14.0	0.2	3.5	3.5	1134.0	A	A
		s_2	68											
	E-W	s_3	29	69	0.88	10.0	4.5	5.5	0.2	3.5	3.5	883.8	A	A
		s_4	40											
SE	N-S	s_5	73	136	0.83	19.5	5.5	14.0	0.2	3.5	3.5	1076.5	A	A
		s_6	63											
	E-W	s_7	25	58	0.67	10.0	4.5	5.5	0.3	3.5	3.5	800.5	A	A
		s_8	33											
SW	N-S	s_9	28	53	0.55	20.0	5.5	14.5	0.1	3.5	3.5	1895.9	A	A
		s_{10}	25											
	E-W	s_{11}	23	45	0.72	12.0	4.5	7.5	0.1	3.5	3.5	1512.0	A	A
		s_{12}	22											
NW	N-S	s_{13}	33	65	0.75	21.0	5.5	15.5	0.1	3.5	3.5	2253.4	A	A
		s_{14}	32											
	E-W	s_{15}	29	44	0.60	10.0	4.5	5.5	0.2	3.5	3.5	945.0	A	A
		s_{16}	15											

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak
Date:	43265	Analysis Year:	2021 No-Action

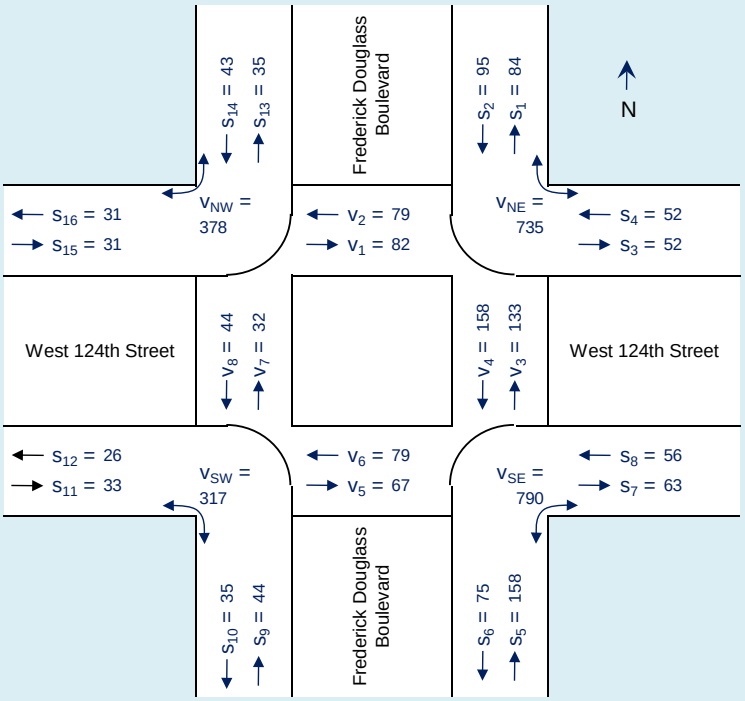


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Midday Peak
Date:	14-Jun-18	Analysis Year:	2021 No-Action

PEDESTRIAN PEAK HOUR VOLUMES

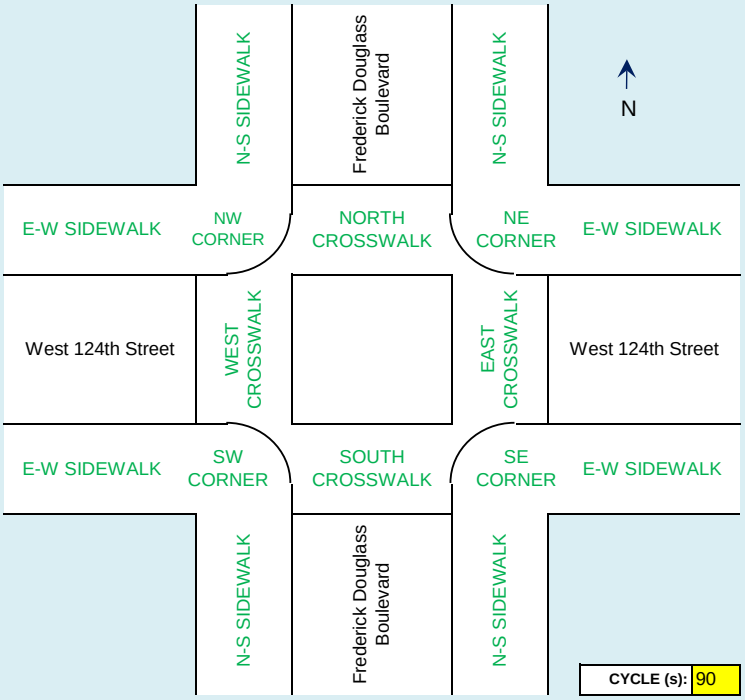


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	s_1	84	0.76
		s_2	95	
	E-W	s_3	52	0.64
		s_4	52	
SE	N-S	s_5	158	0.80
		s_6	75	
	E-W	s_7	63	0.68
		s_8	56	
SW	N-S	s_9	44	0.71
		s_{10}	35	
	E-W	s_{11}	33	0.81
		s_{12}	26	
NW	N-S	s_{13}	35	0.70
		s_{14}	43	
	E-W	s_{15}	31	0.75
		s_{16}	31	

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	v_1	82	0.74
	v_2	79	0.77
E	v_3	133	0.75
	v_4	158	0.80
S	v_5	67	0.74
	v_6	79	0.71
W	v_7	32	0.65
	v_8	44	0.63

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	v_{NE}	735	0.75
SE	v_{SE}	790	0.79
SW	v_{SW}	317	0.77
NW	v_{NW}	378	0.72

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	19.5	5.5	3.5
	E-W	10.0	4.5	3.5
SE	N-S	19.5	5.5	3.5
	E-W	10.0	4.5	3.5
SW	N-S	20.0	5.5	3.5
	E-W	10.0	4.5	3.5
NW	N-S	21.0	5.5	3.5
	E-W	10.0	4.5	3.5

* 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	60.0	12.0	3.5	25	15	5	45	0	0
E	30.0	18.0	3.5	30	6	5	41	12	23
S	60.0	12.0	3.5	25	15	5	45	0	0
W	30.0	18.0	3.5	30	6	5	41	0	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	18.0	10.0	4.00
	E-W	12.0		
SE	N-S	18.0	10.0	4.00
	E-W	12.0		
SW	N-S	18.0	10.0	4.00
	E-W	12.0		
NW	N-S	18.0	10.0	4.00
	E-W	12.0		

* Override if corner width is different than sidewalk width.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Midday Peak
Date:	43265	Analysis Year:	2021 No-Action

INPUTS

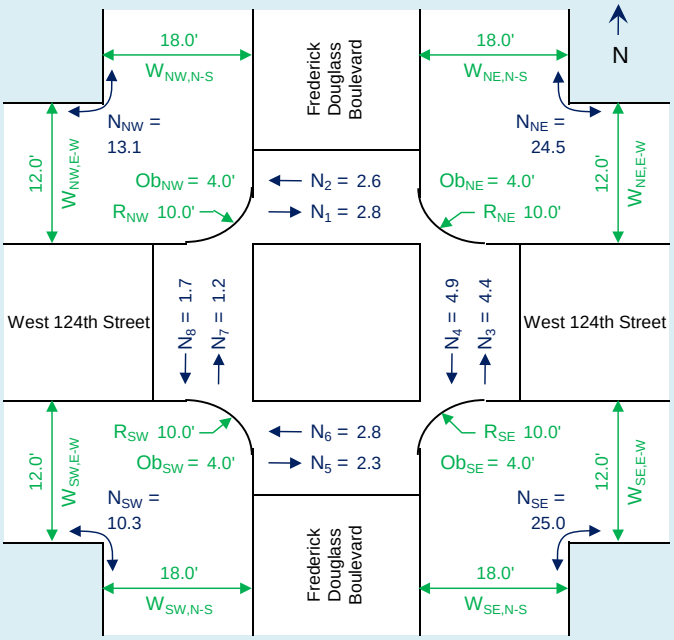
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 82	0.7	N_1 = 2.8
v_2 = 79	0.8	N_2 = 2.6
v_3 = 133	0.8	N_3 = 4.4
v_4 = 158	0.8	N_4 = 4.9
v_5 = 67	0.7	N_5 = 2.3
v_6 = 79	0.7	N_6 = 2.8
v_7 = 32	0.7	N_7 = 1.2
v_8 = 44	0.6	N_8 = 1.7
v_{NE} = 735	0.8	N_{NE} = 24.5
v_{SE} = 790	0.8	N_{SE} = 25.0
v_{SW} = 317	0.8	N_{SW} = 10.3
v_{NW} = 378	0.7	N_{NW} = 13.1

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	25	$g_{Walk,N}$ = 29
E	30	$g_{Walk,E}$ = 34
S	25	$g_{Walk,S}$ = 29
W	30	$g_{Walk,W}$ = 34

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ 17,145.0 ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 57.3 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} = 30.4 \text{ s}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ 16,706.6 ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = 194.8 sf/ped LOS A

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ 17,145.0 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 53.0 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 86.0 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ 16,449.8 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 104.9 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ 17,145.0 ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 46.8 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} = 21.4 \text{ s}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ 16,803.8 ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = 229.4 sf/ped LOS A

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 17,145.0 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 57.5 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 77.2 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 16,471.3 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 104.5 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Midday Peak
Date:	43265	Analysis Year:	2021 No-Action

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 82	0.74	N_1 = 2.8
v_2 = 79	0.77	N_2 = 2.6
v_3 = 133	0.75	N_3 = 4.4
v_4 = 158	0.8	N_4 = 4.9
v_5 = 67	0.74	N_5 = 2.3
v_6 = 79	0.71	N_6 = 2.8
v_7 = 32	0.65	N_7 = 1.2
v_8 = 44	0.63	N_8 = 1.7

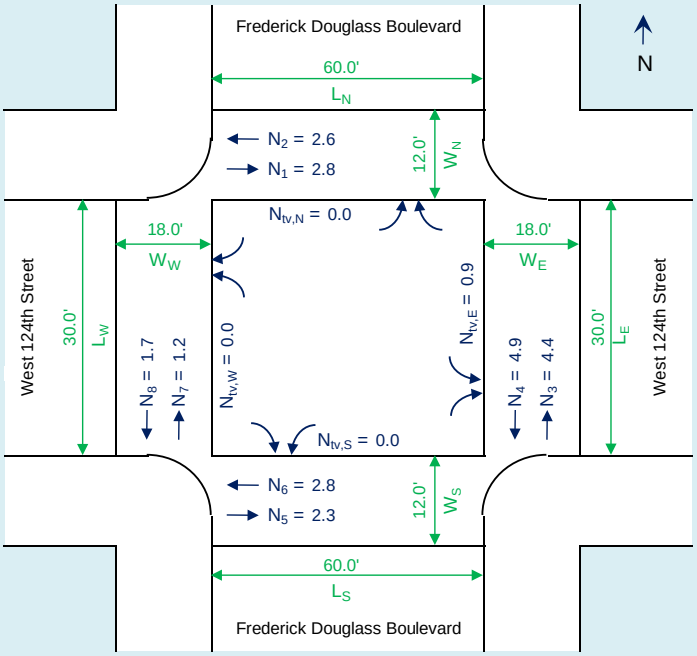
TURNING VOL PER CYCLE

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	
$v_{lt,perm,E}$ = 23	$N_{tv,E}$ = 0.9
$v_{rt,E}$ = 12	
$v_{lt,perm,S}$ = 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	25	$g_{Walk,N}$ = 29
E	3.5	30	$g_{Walk,E}$ = 34
S	3.5	25	$g_{Walk,S}$ = 29
W	3.5	30	$g_{Walk,W}$ = 34

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 20{,}880.0$ ft^2-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 0.0$ ft^2-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 20{,}880.0$ ft^2-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 1.9$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 1.7$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 20.8$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 20.7$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 110.7$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 188.6 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 18{,}360.0$ ft^2-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 630.0$ ft^2-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 17{,}730.0$ ft^2-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 2.8$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 3.1$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 12.2$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 12.2$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 114.4$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 155.0 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 20{,}880.0$ ft^2-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 0.0$ ft^2-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 20{,}880.0$ ft^2-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$= 1.5$ p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$= 1.9$ p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$= 20.7$ s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$= 20.8$ s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$= 104.6$ s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = 199.6 sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 18{,}360.0$ ft^2-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 0.0$ ft^2-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 18{,}360.0$ ft^2-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$= 0.8$ p

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$= 1.1$ p

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$= 11.9$ s

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$= 11.9$ s

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$= 35.5$ s

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

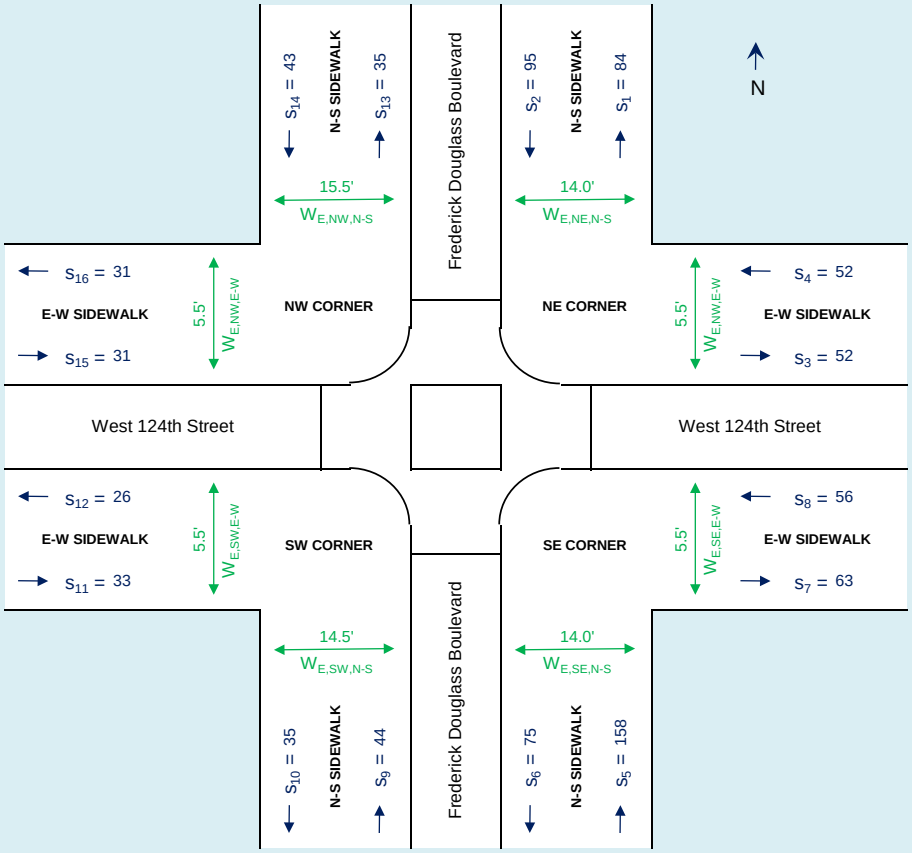
$M_{cw,W}$ = 517.7 sf/p LOS A

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Midday Peak
Date:	43265	Analysis Year:	2021 No-Action

INPUTS



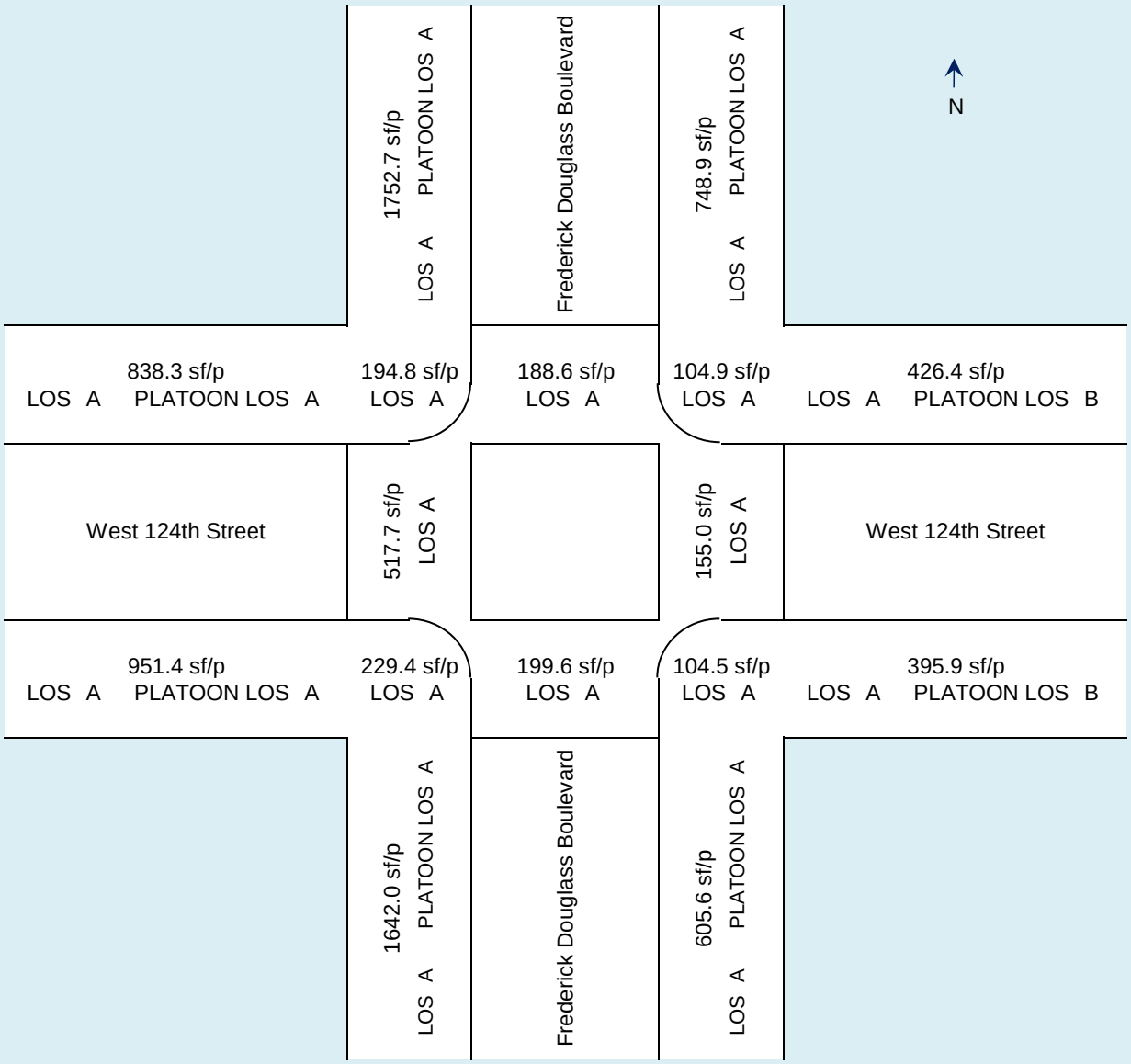
ANALYSIS

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	179	0.76	19.5	5.5	14.0	0.3	3.5	3.5	748.9	A	A
		s_2	95											
	E-W	s_3	52	104	0.64	10.0	4.5	5.5	0.5	3.5	3.5	426.4	A	B
		s_4	52											
SE	N-S	s_5	158	233	0.80	19.5	5.5	14.0	0.3	3.5	3.5	605.6	A	A
		s_6	75											
	E-W	s_7	63	119	0.68	10.0	4.5	5.5	0.5	3.5	3.5	395.9	A	B
		s_8	56											
SW	N-S	s_9	44	79	0.71	20.0	5.5	14.5	0.1	3.5	3.5	1642.0	A	A
		s_{10}	35											
	E-W	s_{11}	33	59	0.81	10.0	4.5	5.5	0.2	3.5	3.5	951.4	A	A
		s_{12}	26											
NW	N-S	s_{13}	35	78	0.70	21.0	5.5	15.5	0.1	3.5	3.5	1752.7	A	A
		s_{14}	43											
	E-W	s_{15}	31	62	0.75	10.0	4.5	5.5	0.3	3.5	3.5	838.3	A	A
		s_{16}	31											

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Midday Peak
Date:	43265	Analysis Year:	2021 No-Action

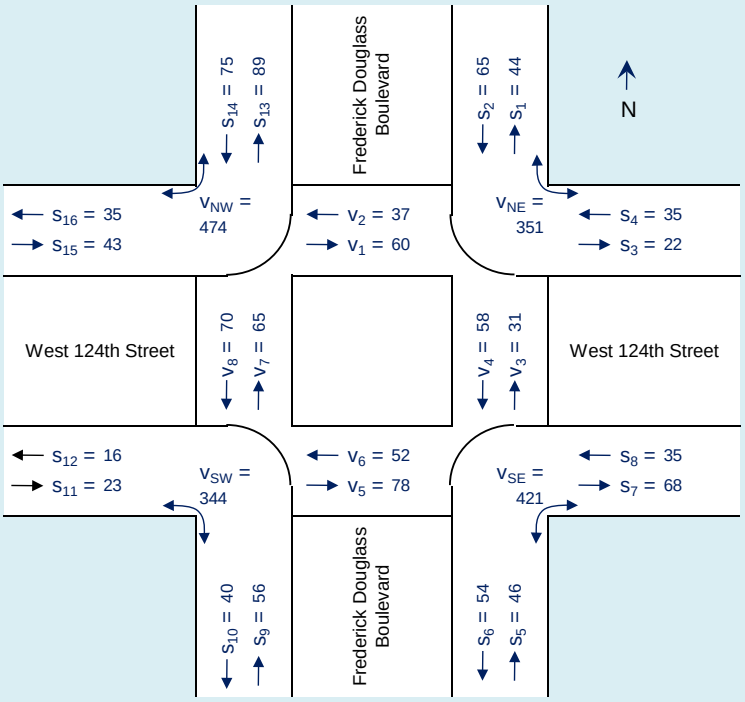


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak
Date:	14-Jun-18	Analysis Year:	2021 No-Action

PEDESTRIAN PEAK HOUR VOLUMES

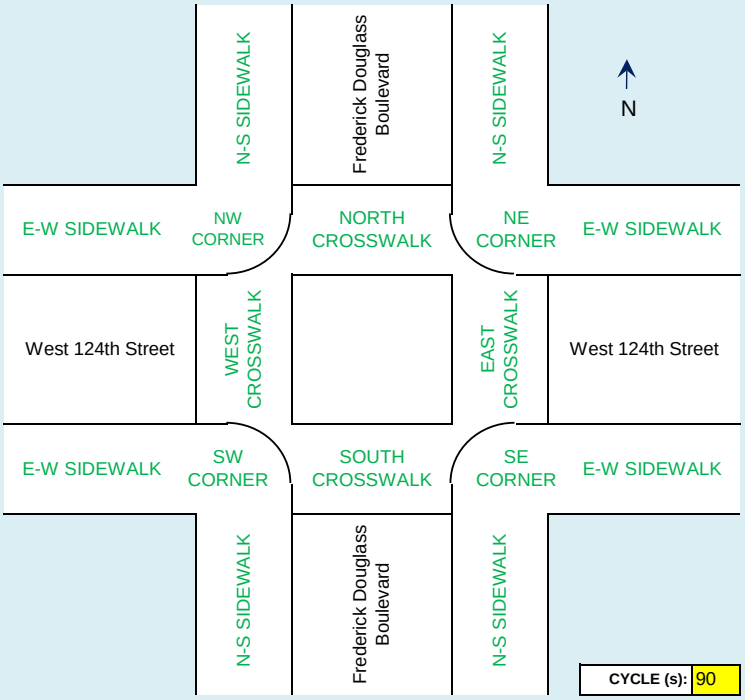


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	s_1	44	0.78
		s_2	65	
	E-W	s_3	22	0.81
		s_4	35	
SE	N-S	s_5	46	0.76
		s_6	54	
	E-W	s_7	68	0.83
		s_8	35	
SW	N-S	s_9	56	0.80
		s_{10}	40	
	E-W	s_{11}	23	0.17
		s_{12}	16	
NW	N-S	s_{13}	89	0.85
		s_{14}	75	
	E-W	s_{15}	43	0.91
		s_{16}	35	

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	v_1	60	0.85
	v_2	37	0.64
E	v_3	31	0.75
	v_4	58	0.82
S	v_5	78	0.95
	v_6	52	0.74
W	v_7	65	0.83
	v_8	70	0.85

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	v_{NE}	351	0.80
SE	v_{SE}	421	0.84
SW	v_{SW}	344	0.85
NW	v_{NW}	474	0.86

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	19.5	5.5	3.5
	E-W	10.0	4.5	3.5
SE	N-S	19.5	5.5	3.5
	E-W	10.0	4.5	3.5
SW	N-S	20.0	5.5	3.5
	E-W	12.0	4.5	3.5
NW	N-S	21.0	5.5	3.5
	E-W	10.0	4.5	3.5

* 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	60.0	12.0	3.5	25	15	5	45	0	0
E	30.0	18.0	3.5	30	6	5	41	12	23
S	60.0	12.0	3.5	25	15	5	45	0	0
W	30.0	18.0	3.5	30	6	5	41	0	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	18.0	10.0	4.00
	E-W	12.0		
SE	N-S	18.0	10.0	4.00
	E-W	12.0		
SW	N-S	18.0	10.0	4.00
	E-W	12.0		
NW	N-S	18.0	10.0	4.00
	E-W	12.0		

* Override if corner width is different than sidewalk width.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak
Date:	43265	Analysis Year:	2021 No-Action

INPUTS

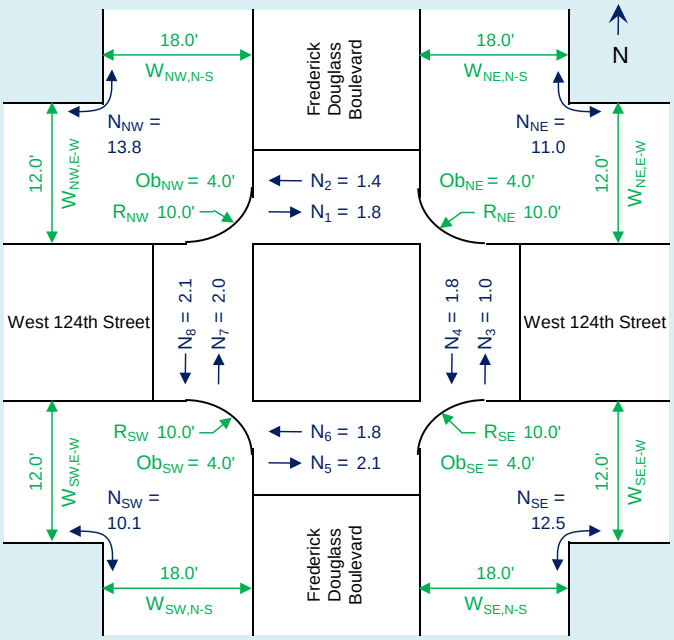
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 60	0.9	N_1 = 1.8
v_2 = 37	0.6	N_2 = 1.4
v_3 = 31	0.8	N_3 = 1.0
v_4 = 58	0.8	N_4 = 1.8
v_5 = 78	1	N_5 = 2.1
v_6 = 52	0.7	N_6 = 1.8
v_7 = 65	0.8	N_7 = 2.0
v_8 = 70	0.9	N_8 = 2.1
v_{NE} = 351	0.8	N_{NE} = 11.0
v_{SE} = 421	0.8	N_{SE} = 12.5
v_{SW} = 344	0.9	N_{SW} = 10.1
v_{NW} = 474	0.9	N_{NW} = 13.8

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	25	$g_{Walk,N}$ = 29
E	30	$g_{Walk,E}$ = 34
S	25	$g_{Walk,S}$ = 29
W	30	$g_{Walk,W}$ = 34

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ 17,145.0 ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 36.5 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} = 35.9 \text{ s}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ 16,783.3 ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = 199.7 sf/ped LOS A

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ 17,145.0 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 29.9 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 30.8 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ 16,841.6 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 248.0 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ 17,145.0 ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 42.4 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} = 34.1 \text{ s}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ 16,762.3 ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = 233.5 sf/ped LOS A

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 17,145.0 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 36.3 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 18.0 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 16,873.4 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 220.4 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak
Date:	43265	Analysis Year:	2021 No-Action

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 60	0.85	N_1 = 1.8
v_2 = 37	0.64	N_2 = 1.4
v_3 = 31	0.75	N_3 = 1.0
v_4 = 58	0.82	N_4 = 1.8
v_5 = 78	0.95	N_5 = 2.1
v_6 = 52	0.74	N_6 = 1.8
v_7 = 65	0.83	N_7 = 2.0
v_8 = 70	0.85	N_8 = 2.1

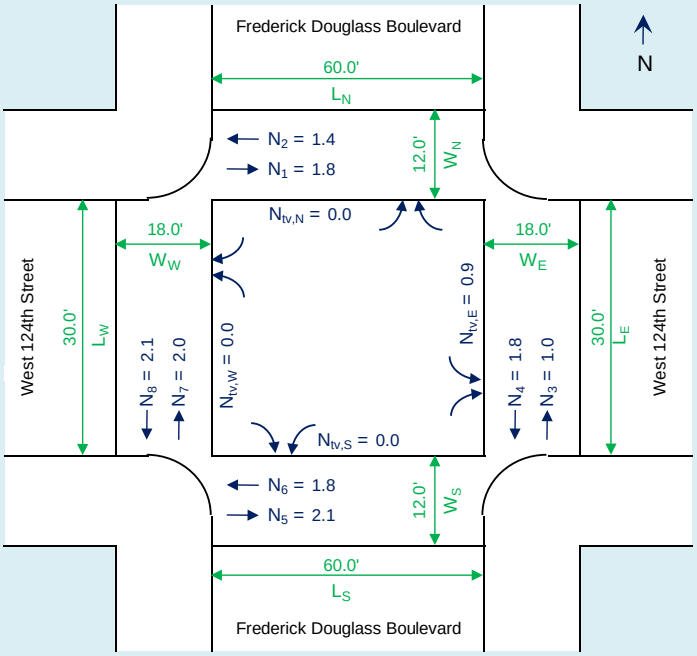
TURNING VOL PER CYCLE

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	
$v_{lt,perm,E}$ = 23	$N_{tv,E}$ = 0.9
$v_{rt,E}$ = 12	
$v_{lt,perm,S}$ = 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	25	$g_{Walk,N}$ = 29
E	3.5	30	$g_{Walk,E}$ = 34
S	3.5	25	$g_{Walk,S}$ = 29
W	3.5	30	$g_{Walk,W}$ = 34

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 20{,}880.0$ ft^2-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 0.0$ ft^2-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 20{,}880.0$ ft^2-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 1.2$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 1.0$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 20.6$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 20.6$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 66.1$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 315.9 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 18{,}360.0$ ft^2-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 630.0$ ft^2-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 17{,}730.0$ ft^2-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 0.6$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 1.1$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 11.9$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 11.9$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 33.4$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 531.3 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 20{,}880.0$ ft^2-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 0.0$ ft^2-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 20{,}880.0$ ft^2-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$= 1.4$ p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$= 1.2$ p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$= 20.7$ s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$= 20.6$ s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$= 78.6$ s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = 265.6 sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 18{,}360.0$ ft^2-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 0.0$ ft^2-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 18{,}360.0$ ft^2-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$= 1.2$ p

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$= 1.3$ p

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$= 12.0$ s

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$= 12.0$ s

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$= 48.0$ s

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

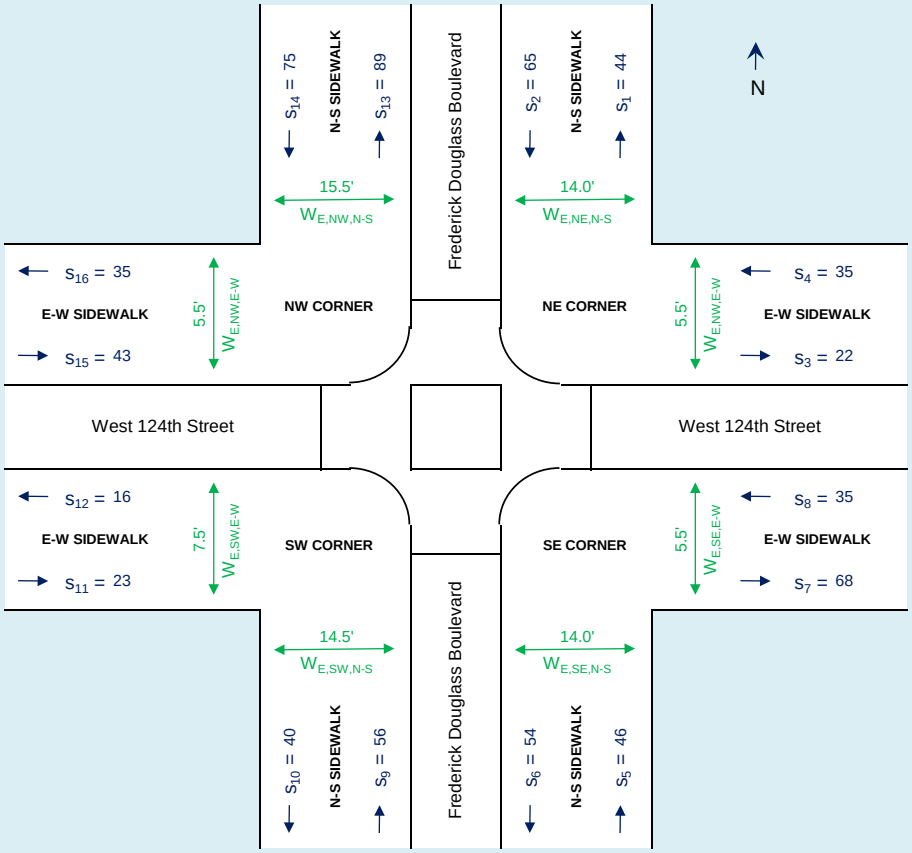
$M_{cw,W}$ = 382.2 sf/p LOS A

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak
Date:	43265	Analysis Year:	2021 No-Action

INPUTS



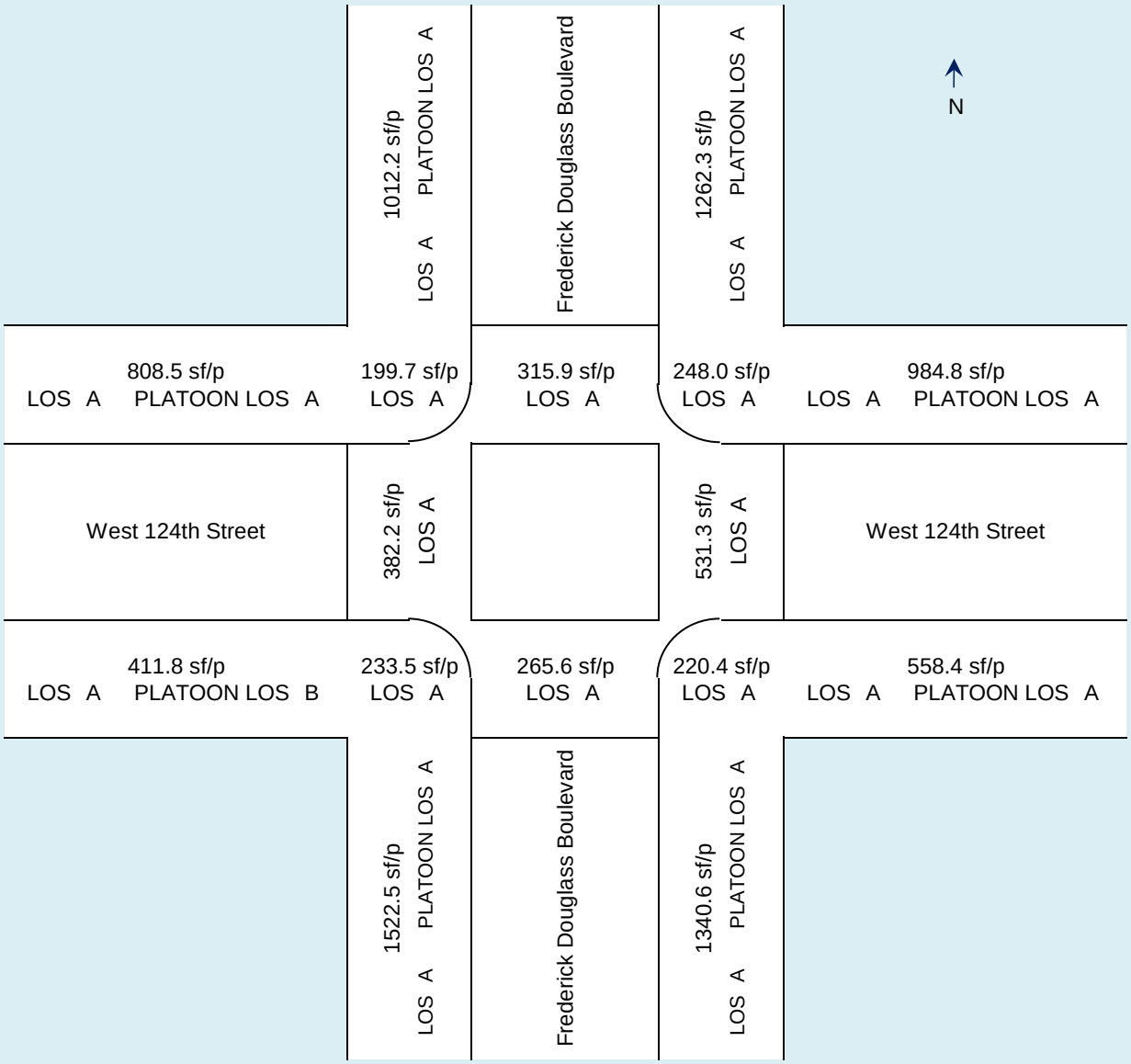
ANALYSIS

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	44	109	0.78	19.5	5.5	14.0	0.2	3.5	3.5	1262.3	A	A
		s_2	65											
	E-W	s_3	22	57	0.81	10.0	4.5	5.5	0.2	3.5	3.5	984.8	A	A
		s_4	35											
SE	N-S	s_5	46	100	0.76	19.5	5.5	14.0	0.2	3.5	3.5	1340.6	A	A
		s_6	54											
	E-W	s_7	68	103	0.83	10.0	4.5	5.5	0.4	3.5	3.5	558.4	A	A
		s_8	35											
SW	N-S	s_9	56	96	0.80	20.0	5.5	14.5	0.1	3.5	3.5	1522.5	A	A
		s_{10}	40											
	E-W	s_{11}	23	39	0.17	12.0	4.5	7.5	0.5	3.5	3.5	411.8	A	B
		s_{12}	16											
NW	N-S	s_{13}	89	164	0.85	21.0	5.5	15.5	0.2	3.5	3.5	1012.2	A	A
		s_{14}	75											
	E-W	s_{15}	43	78	0.91	10.0	4.5	5.5	0.3	3.5	3.5	808.5	A	A
		s_{16}	35											

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak
Date:	43265	Analysis Year:	2021 No-Action

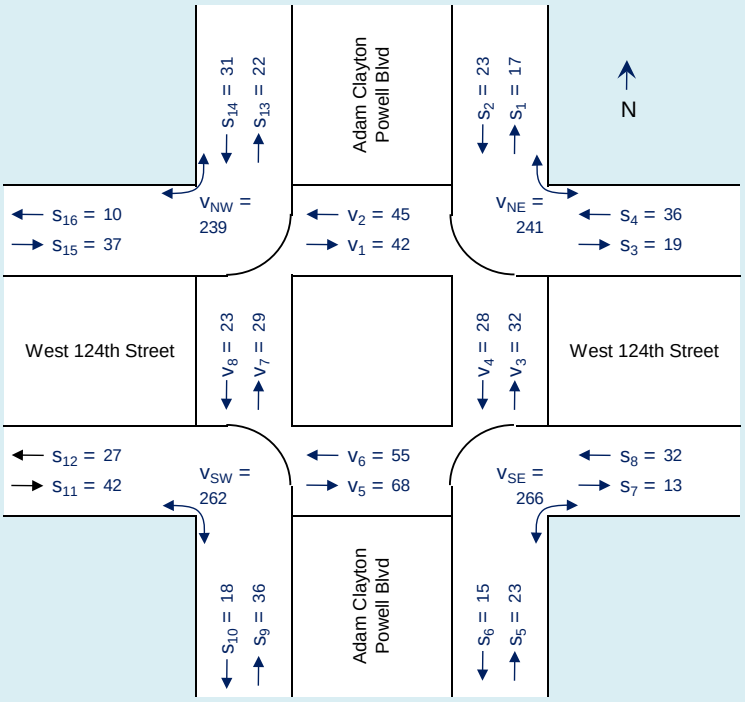


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak Hour
Date:	14-Jun-18	Analysis Year:	2021 No-Action

PEDESTRIAN PEAK HOUR VOLUMES

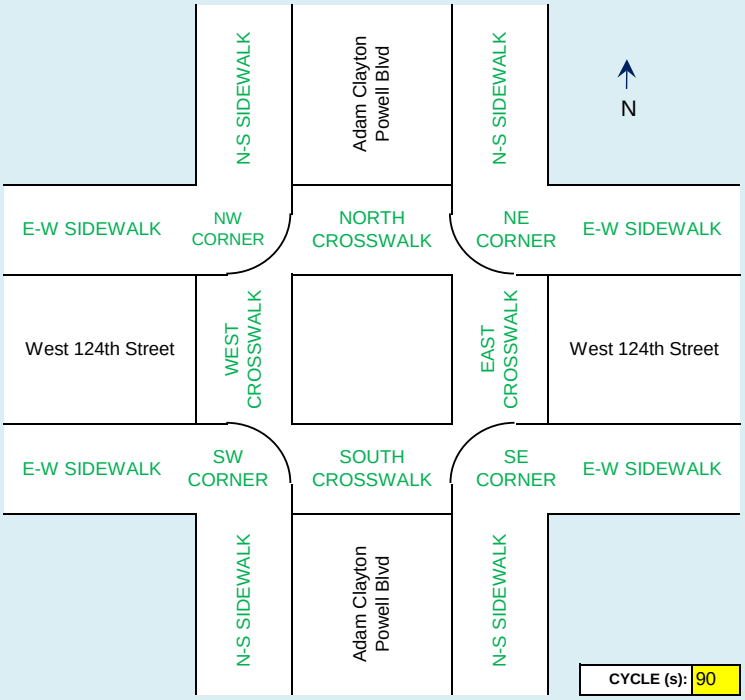


SIDEWALKS				
CORNER	MOVE-MENT		VOL (p/hr)	PHF
NE	N-S	S_1	17	0.56
		S_2	23	
	E-W	S_3	19	0.66
		S_4	36	
SE	N-S	S_5	23	0.71
		S_6	15	
	E-W	S_7	13	0.65
		S_8	32	
SW	N-S	S_9	36	0.59
		S_{10}	18	
	E-W	S_{11}	42	0.63
		S_{12}	27	
NW	N-S	S_{13}	22	0.46
		S_{14}	31	
	E-W	S_{15}	37	0.52
		S_{16}	10	

CROSSWALKS			
CROSS-WALK	MOVE-MENT	VOL (p/hr)	PHF
N	V_1	42	0.60
	V_2	45	0.73
E	V_3	32	0.48
	V_4	28	0.52
S	V_5	68	0.72
	V_6	55	0.78
W	V_7	29	0.64
	V_8	23	0.55

CORNERS			
CORNER	MOVE-MENT	VOL (p/hr)	PHF
NE	V_{NE}	241	0.62
SE	V_{SE}	266	0.76
SW	V_{SW}	262	0.69
NW	V_{NW}	239	0.57

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



CYCLE (s): 90

SIDEWALKS				
CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUC-TIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S	23.0	5.5	3.5
	E-W	10.0	3.5	3.5
SE	N-S	23.0	5.5	3.5
	E-W	10.0	3.5	3.5
SW	N-S	22.0	8.0	3.5
	E-W	10.0	3.5	3.5
NW	N-S	22.0	8.0	3.5
	E-W	10.0	3.5	3.5

* Sum of widths and shy distances from obstructions.

CORNERS				
CORNER	SIDEWALK	TOTAL WIDTH*, W (ft)	RADIUS, R (ft)	OBSTRUC-TIONS, Ob (ft^2)
NE	N-S	23.0	10.0	4.00
	E-W	12.0		
SE	N-S	23.0	9.0	4.00
	E-W	12.0		
SW	N-S	23.0	10.0	4.00
	E-W	12.0		
NW	N-S	23.0	10.0	4.00
	E-W	12.0		

* 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	100.0	13.0	3.5	7	28	30	65	3	4
E	30.0	20.0	3.5	25	7	30	62	19	31
S	100.0	12.0	3.5	7	28	30	65	3	5
W	30.0	16.0	3.5	25	7	30	62	9	6

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

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak Hour
Date:	43265	Analysis Year:	2021 No-Action

INPUTS

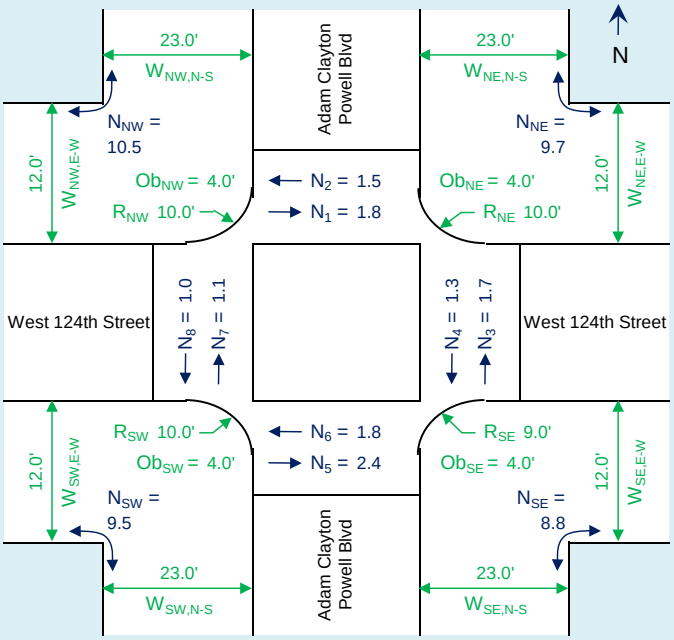
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 42	0.6	N_1 = 1.8
v_2 = 45	0.7	N_2 = 1.5
v_3 = 32	0.5	N_3 = 1.7
v_4 = 28	0.5	N_4 = 1.3
v_5 = 68	0.7	N_5 = 2.4
v_6 = 55	0.8	N_6 = 1.8
v_7 = 29	0.6	N_7 = 1.1
v_8 = 23	0.6	N_8 = 1.0
v_{NE} = 241	0.6	N_{NE} = 9.7
v_{SE} = 266	0.8	N_{SE} = 8.8
v_{SW} = 262	0.7	N_{SW} = 9.5
v_{NW} = 239	0.6	N_{NW} = 10.5

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	7	$g_{Walk,N}$ = 11
E	25	$g_{Walk,E}$ = 29
S	7	$g_{Walk,S}$ = 11
W	25	$g_{Walk,W}$ = 29

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ 22,545.0 ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 60.7 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} = 21.6 \text{ s}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ 22,133.6 ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = 347.0 sf/ped LOS A

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ 22,545.0 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 53.2 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 27.8 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ 22,139.8 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 345.6 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ 22,545.0 ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 81.9 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} = 23.4 \text{ s}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ 22,018.6 ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = 348.5 sf/ped LOS A

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 22,912.7 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 61.1 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 34.5 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 22,434.8 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 353.0 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak Hour
Date:	43265	Analysis Year:	2021 No-Action

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 42	0.6	N_1 = 1.8
v_2 = 45	0.73	N_2 = 1.5
v_3 = 32	0.48	N_3 = 1.7
v_4 = 28	0.52	N_4 = 1.3
v_5 = 68	0.72	N_5 = 2.4
v_6 = 55	0.78	N_6 = 1.8
v_7 = 29	0.64	N_7 = 1.1
v_8 = 23	0.55	N_8 = 1.0

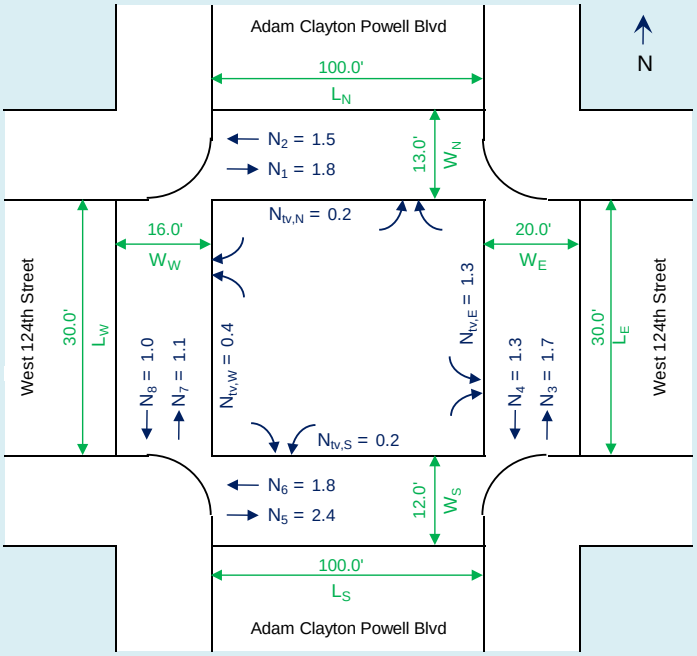
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ = 4	$N_{tv,N}$ = 0.2
$v_{rt,N}$ = 3	
$v_{lt,perm,E}$ = 31	$N_{tv,E}$ = 1.3
$v_{rt,E}$ = 19	
$v_{lt,perm,S}$ = 5	$N_{tv,S}$ = 0.2
$v_{rt,S}$ = 3	
$v_{lt,perm,W}$ = 6	$N_{tv,W}$ = 0.4
$v_{rt,W}$ = 9	

WALKING SPEED & CROSSING TIME

CROSS-WALK	S_p (ft/s)	WALK (s)	g_{Walk} = WALK + 4 (s)
N	3.5	7	$g_{Walk,N}$ = 11
E	3.5	25	$g_{Walk,E}$ = 29
S	3.5	7	$g_{Walk,S}$ = 11
W	3.5	25	$g_{Walk,W}$ = 29

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 14{,}300.0$ ft²-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 91.0$ ft²-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 14{,}209.0$ ft²-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 1.5$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 1.3$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 32.1$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 32.1$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 105.4$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 134.9 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 17{,}400.0$ ft²-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 1{,}000.0$ ft²-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 16{,}400.0$ ft²-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 1.1$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 0.9$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 11.9$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 11.9$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 35.9$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 457.0 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 13{,}200.0$ ft²-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 96.0$ ft²-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 13{,}104.0$ ft²-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$= 2.1$ p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$= 1.5$ p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$= 32.2$ s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$= 32.1$ s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$= 132.7$ s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = 98.7 sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 13{,}920.0$ ft²-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 240.0$ ft²-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 13{,}680.0$ ft²-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$= 0.8$ p

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$= 0.7$ p

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$= 11.9$ s

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$= 11.9$ s

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$= 25.9$ s

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

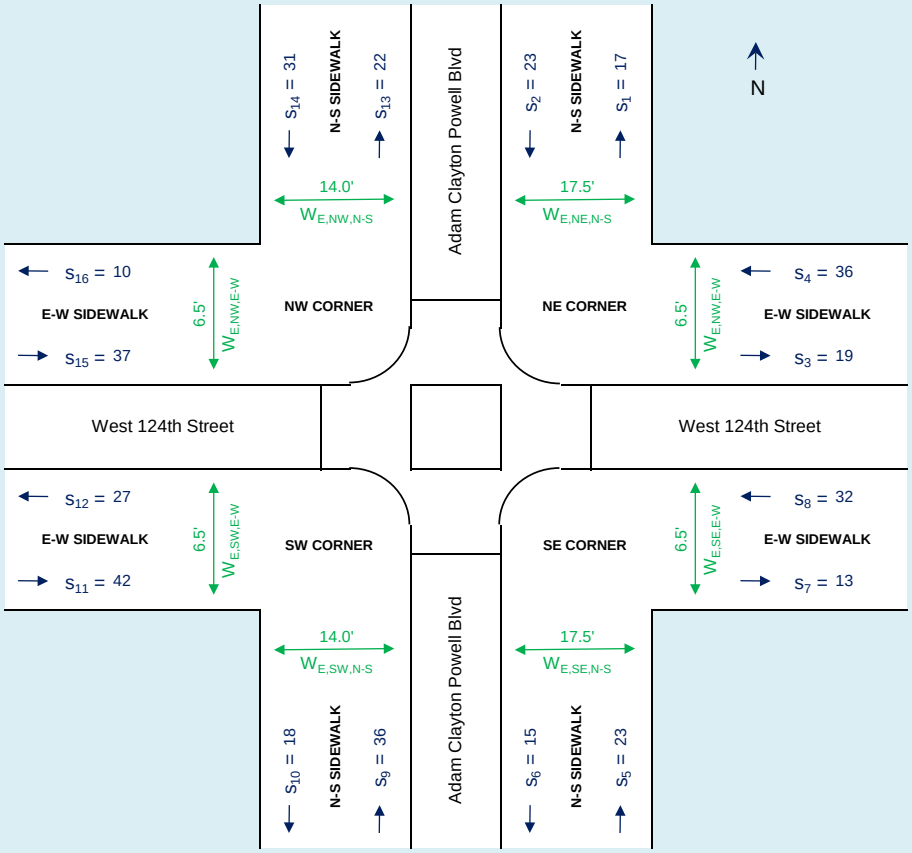
$M_{cw,W}$ = 527.9 sf/p LOS A

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak Hour
Date:	43265	Analysis Year:	2021 No-Action

INPUTS



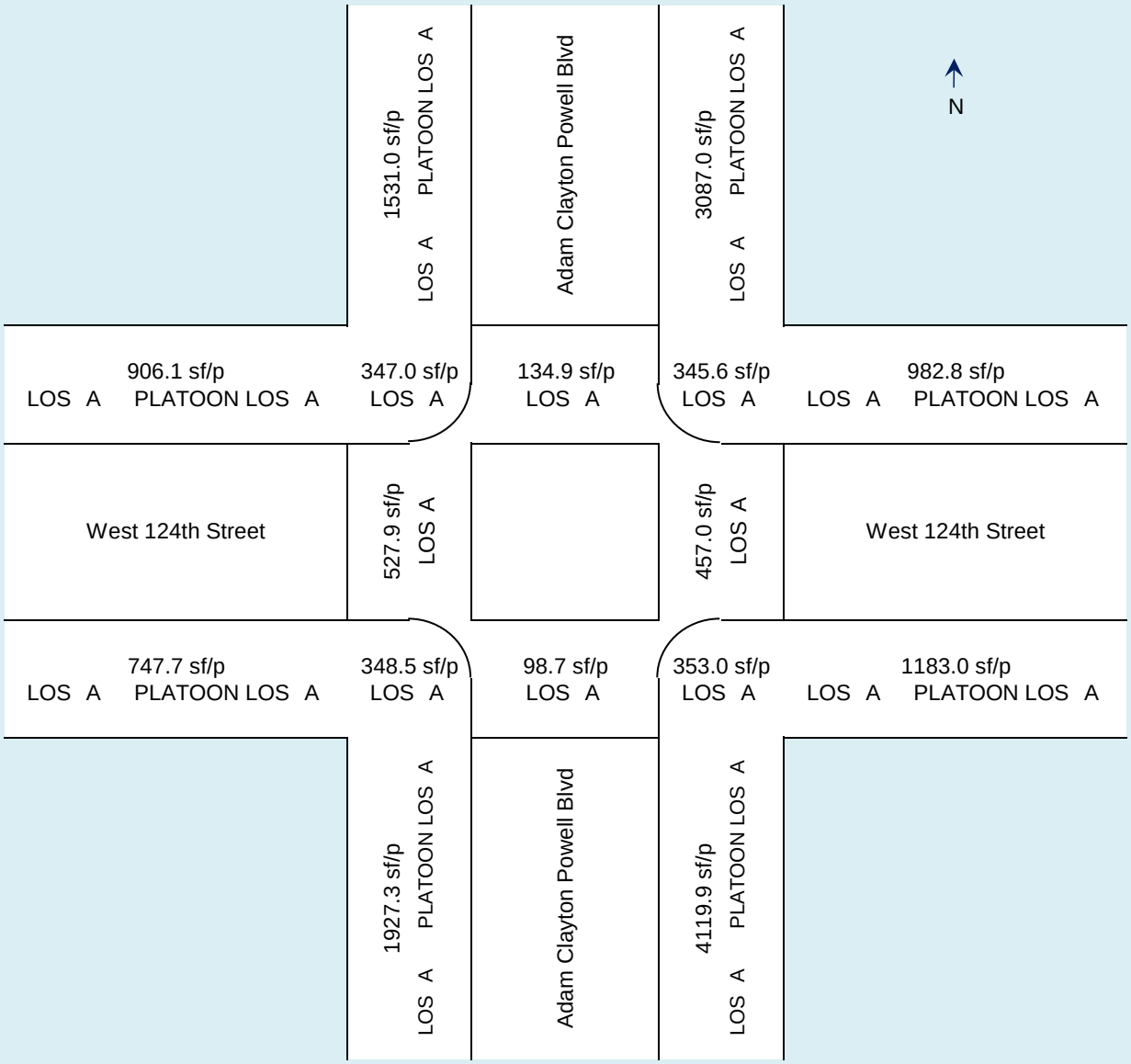
ANALYSIS

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	17	40	0.56	23.0	5.5	17.5	0.1	3.5	3.5	3087.0	A	A
		s_2	23											
	E-W	s_3	19	55	0.66	10.0	3.5	6.5	0.2	3.5	3.5	982.8	A	A
		s_4	36											
SE	N-S	s_5	23	38	0.71	23.0	5.5	17.5	0.1	3.5	3.5	4119.9	A	A
		s_6	15											
	E-W	s_7	13	45	0.65	10.0	3.5	6.5	0.2	3.5	3.5	1183.0	A	A
		s_8	32											
SW	N-S	s_9	36	54	0.59	22.0	8.0	14.0	0.1	3.5	3.5	1927.3	A	A
		s_{10}	18											
	E-W	s_{11}	42	69	0.63	10.0	3.5	6.5	0.3	3.5	3.5	747.7	A	A
		s_{12}	27											
NW	N-S	s_{13}	22	53	0.46	22.0	8.0	14.0	0.1	3.5	3.5	1531.0	A	A
		s_{14}	31											
	E-W	s_{15}	37	47	0.52	10.0	3.5	6.5	0.2	3.5	3.5	906.1	A	A
		s_{16}	10											

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak Hour
Date:	43265	Analysis Year:	2021 No-Action

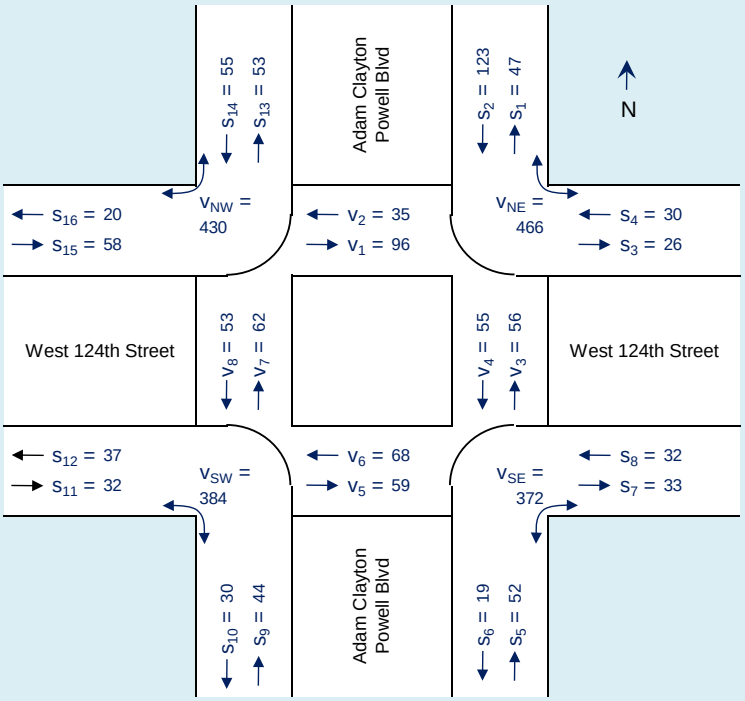


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Mid Day Peak Hour
Date:	14-Jun-18	Analysis Year:	2021 No-Action

PEDESTRIAN PEAK HOUR VOLUMES

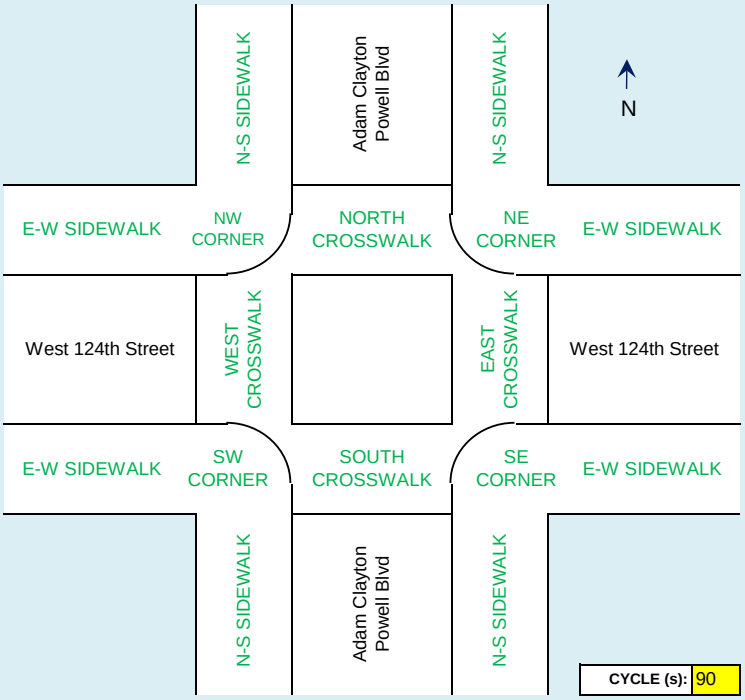


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	S_1	47	0.71
		S_2	123	
	E-W	S_3	26	0.59
		S_4	30	
SE	N-S	S_5	52	0.85
		S_6	19	
	E-W	S_7	33	0.63
		S_8	32	
SW	N-S	S_9	44	0.75
		S_{10}	30	
	E-W	S_{11}	32	0.58
		S_{12}	37	
NW	N-S	S_{13}	53	0.65
		S_{14}	55	
	E-W	S_{15}	58	0.82
		S_{16}	20	

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	V_1	96	0.93
	V_2	35	0.88
E	V_3	56	0.68
	V_4	55	0.70
S	V_5	59	0.79
	V_6	68	0.69
W	V_7	62	0.60
	V_8	53	0.85

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	V_{NE}	466	0.80
SE	V_{SE}	372	0.78
SW	V_{SW}	384	0.65
NW	V_{NW}	430	0.81

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	23.0	5.5	3.5
	E-W	10.0	3.5	3.5
SE	N-S	23.0	5.5	3.5
	E-W	10.0	3.5	3.5
SW	N-S	22.0	8.0	3.5
	E-W	10.0	3.5	3.5
NW	N-S	22.0	8.0	3.5
	E-W	10.0	3.5	3.5

* 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	100.0	13.0	3.5	7	28	30	65	11	2
E	30.0	20.0	3.5	25	7	30	62	16	35
S	100.0	12.0	3.5	7	28	30	65	5	1
W	30.0	16.0	3.5	25	7	30	62	0	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	23.0	10.0	4.00
	E-W	12.0		
SE	N-S	23.0	9.0	4.00
	E-W	12.0		
SW	N-S	23.0	10.0	4.00
	E-W	12.0		
NW	N-S	23.0	10.0	4.00
	E-W	12.0		

* Override if corner width is different than sidewalk width.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Mid Day Peak Hour
Date:	43265	Analysis Year:	2021 No-Action

INPUTS

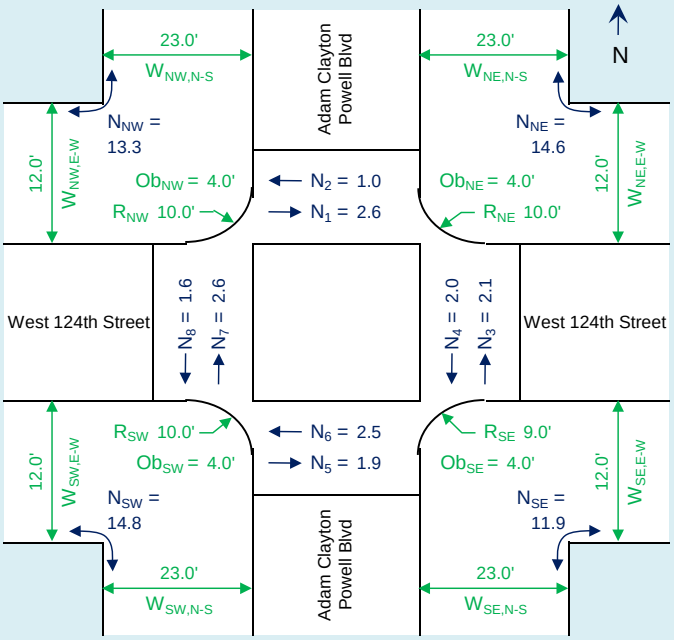
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 96	0.9	N_1 = 2.6
v_2 = 35	0.9	N_2 = 1.0
v_3 = 56	0.7	N_3 = 2.1
v_4 = 55	0.7	N_4 = 2.0
v_5 = 59	0.8	N_5 = 1.9
v_6 = 68	0.7	N_6 = 2.5
v_7 = 62	0.6	N_7 = 2.6
v_8 = 53	0.9	N_8 = 1.6
v_{NE} = 466	0.8	N_{NE} = 14.6
v_{SE} = 372	0.8	N_{SE} = 11.9
v_{SW} = 384	0.7	N_{SW} = 14.8
v_{NW} = 430	0.8	N_{NW} = 13.3

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	7	$g_{Walk,N}$ = 11
E	25	$g_{Walk,E}$ = 29
S	7	$g_{Walk,S}$ = 11
W	25	$g_{Walk,W}$ = 29

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ 22,545.0 ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 89.5 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} = 32.2 \text{ s}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ 21,936.5 ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = 261.3 sf/ped LOS A

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ 22,545.0 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 34.5 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 40.6 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ 22,169.6 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 250.1 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ 22,545.0 ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 64.7 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} = 53.4 \text{ s}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ 21,954.3 ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = 236.1 sf/ped LOS A

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 22,912.7 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 85.4 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 42.6 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 22,272.7 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 274.6 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Mid Day Peak Hour
Date:	43265	Analysis Year:	2021 No-Action

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 96	0.93	N_1 = 2.6
v_2 = 35	0.88	N_2 = 1.0
v_3 = 56	0.68	N_3 = 2.1
v_4 = 55	0.7	N_4 = 2.0
v_5 = 59	0.79	N_5 = 1.9
v_6 = 68	0.69	N_6 = 2.5
v_7 = 62	0.6	N_7 = 2.6
v_8 = 53	0.85	N_8 = 1.6

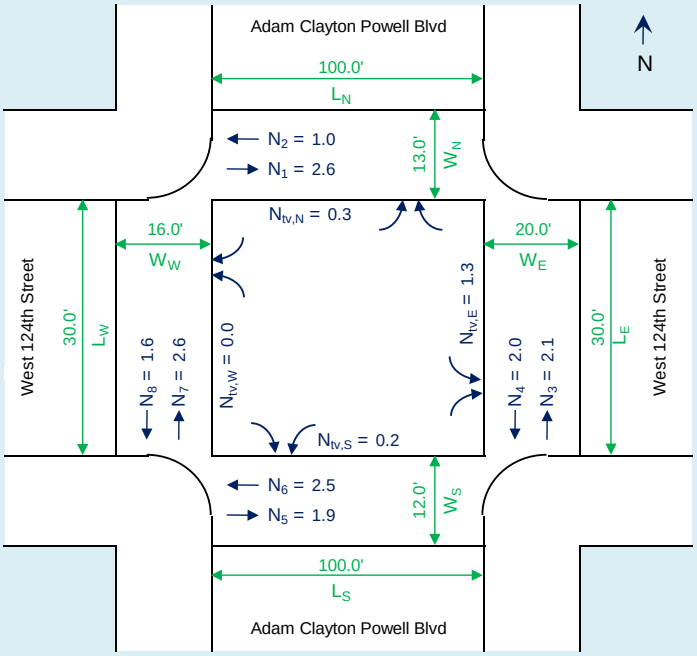
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ = 2	$N_{tv,N}$ = 0.3
$v_{rt,N}$ = 11	
$v_{lt,perm,E}$ = 35	$N_{tv,E}$ = 1.3
$v_{rt,E}$ = 16	
$v_{lt,perm,S}$ = 1	$N_{tv,S}$ = 0.2
$v_{rt,S}$ = 5	
$v_{lt,perm,W}$ = 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	7	$g_{Walk,N}$ = 11
E	3.5	25	$g_{Walk,E}$ = 29
S	3.5	7	$g_{Walk,S}$ = 11
W	3.5	25	$g_{Walk,W}$ = 29

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 14{,}300.0$ ft^2-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 169.0$ ft^2-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 14{,}131.0$ ft^2-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 2.3$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 0.9$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 32.2$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 32.0$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 115.0$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 122.9 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 17{,}400.0$ ft^2-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 1{,}020.0$ ft^2-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 16{,}380.0$ ft^2-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 1.4$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 1.3$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 12.0$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 12.0$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 48.1$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 340.6 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 13{,}200.0$ ft^2-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 72.0$ ft^2-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 13{,}128.0$ ft^2-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$= 1.6$ p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$= 2.2$ p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$= 32.1$ s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$= 32.3$ s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$= 139.5$ s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = 94.1 sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 13{,}920.0$ ft^2-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 0.0$ ft^2-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 13{,}920.0$ ft^2-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$= 1.8$ p

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$= 1.1$ p

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$= 12.1$ s

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$= 11.9$ s

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$= 49.8$ s

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

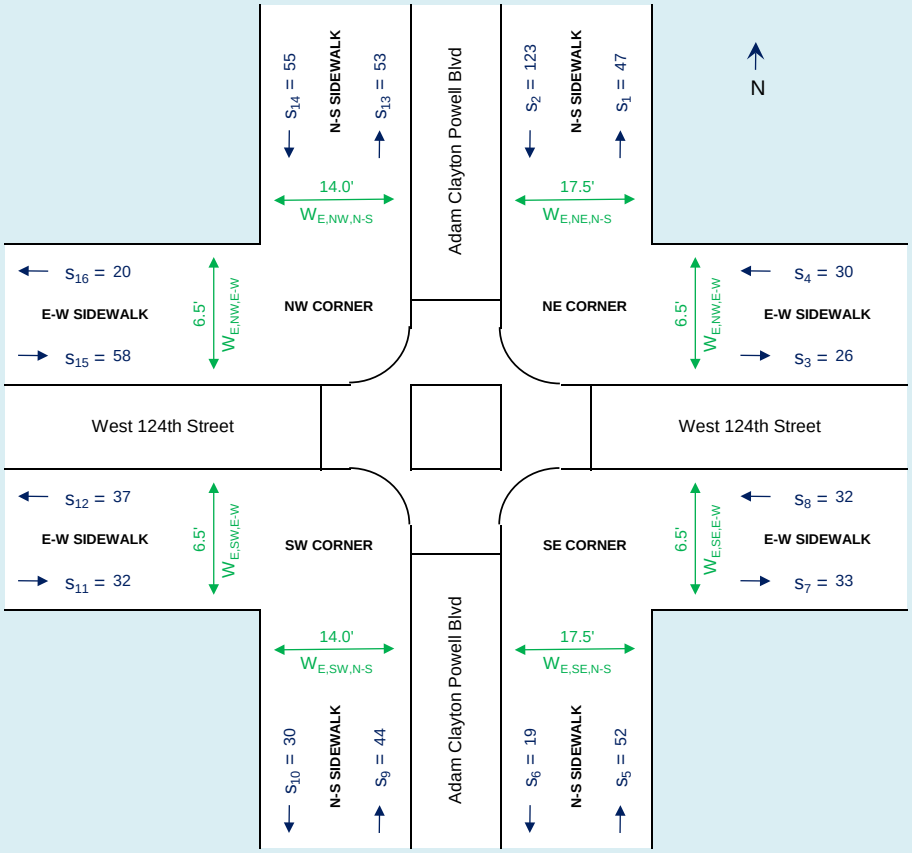
$M_{cw,W}$ = 279.5 sf/p LOS A

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Mid Day Peak Hour
Date:	43265	Analysis Year:	2021 No-Action

INPUTS



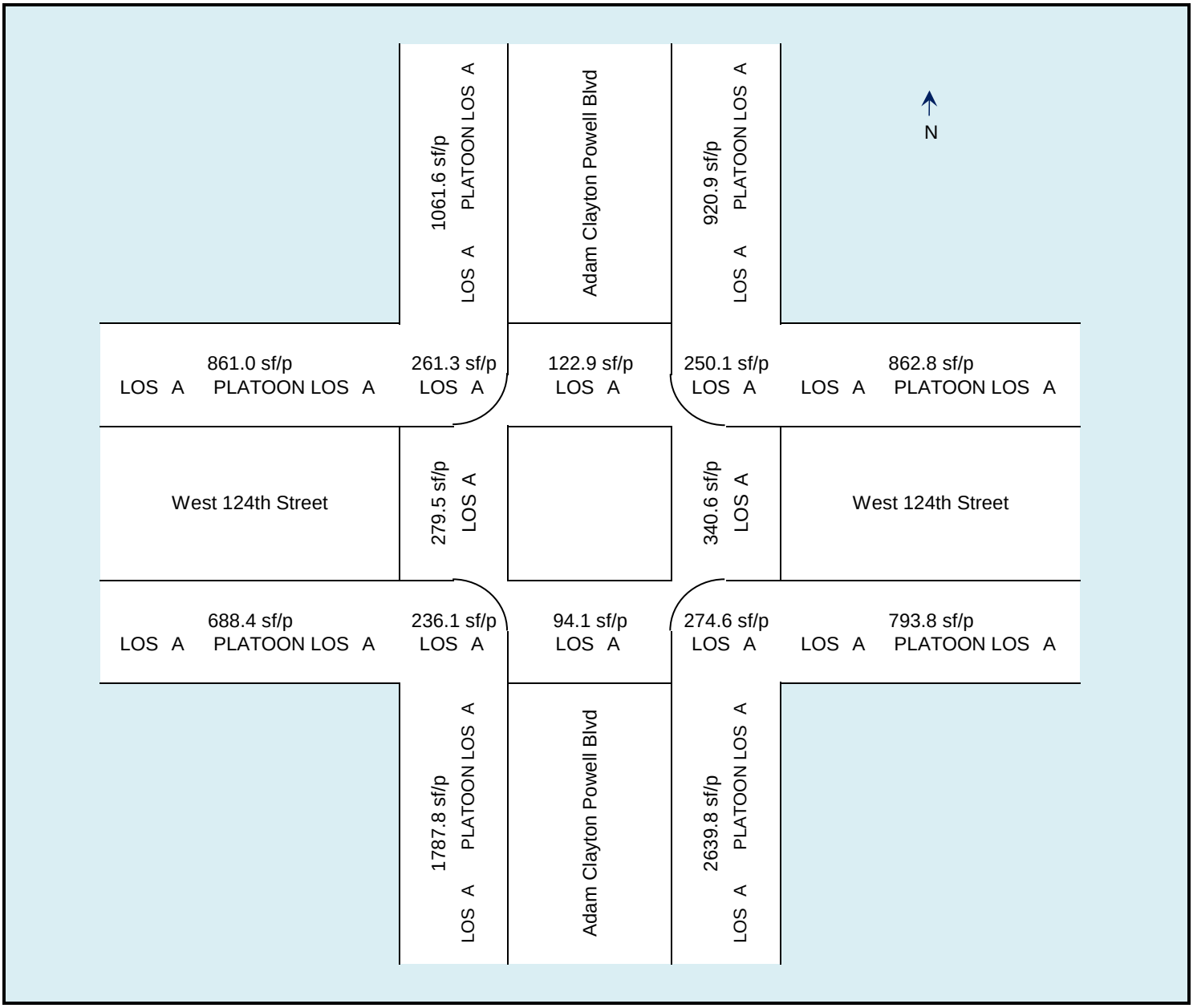
ANALYSIS

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	47	170	0.71	23.0	5.5	17.5	0.2	3.5	3.5	920.9	A	A
		s_2	123											
	E-W	s_3	26	56	0.59	10.0	3.5	6.5	0.2	3.5	3.5	862.8	A	A
		s_4	30											
SE	N-S	s_5	52	71	0.85	23.0	5.5	17.5	0.1	3.5	3.5	2639.8	A	A
		s_6	19											
	E-W	s_7	33	65	0.63	10.0	3.5	6.5	0.3	3.5	3.5	793.8	A	A
		s_8	32											
SW	N-S	s_9	44	74	0.75	22.0	8.0	14.0	0.1	3.5	3.5	1787.8	A	A
		s_{10}	30											
	E-W	s_{11}	32	69	0.58	10.0	3.5	6.5	0.3	3.5	3.5	688.4	A	A
		s_{12}	37											
NW	N-S	s_{13}	53	108	0.65	22.0	8.0	14.0	0.2	3.5	3.5	1061.6	A	A
		s_{14}	55											
	E-W	s_{15}	58	78	0.82	10.0	3.5	6.5	0.2	3.5	3.5	861.0	A	A
		s_{16}	20											

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Mid Day Peak Hour
Date:	43265	Analysis Year:	2021 No-Action

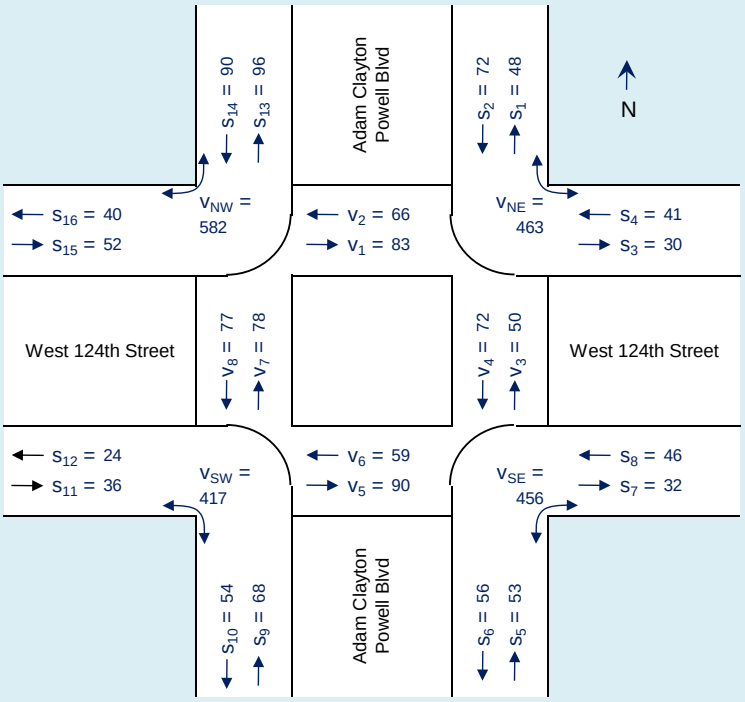


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak Hour
Date:	14-Jun-18	Analysis Year:	2021 No-Action

PEDESTRIAN PEAK HOUR VOLUMES

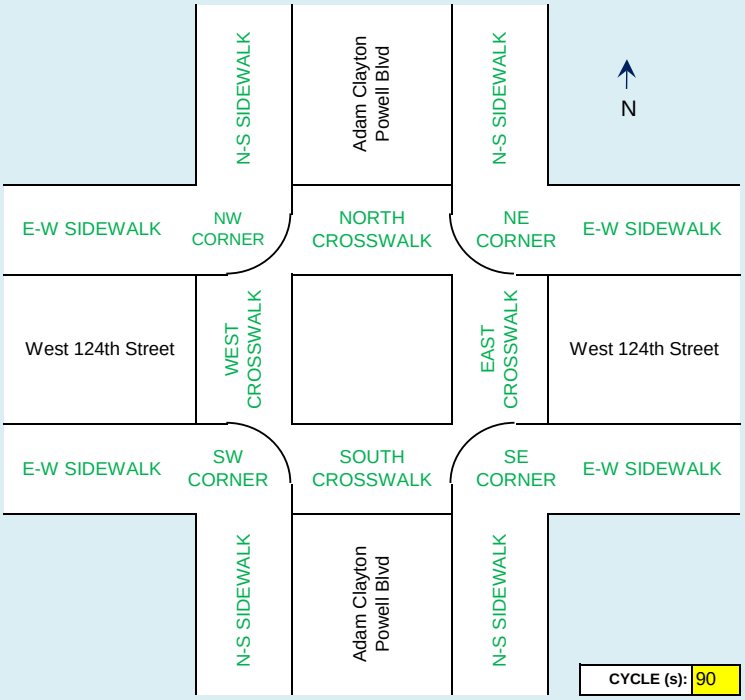


SIDEWALKS				
CORNER	MOVE-MENT		VOL (p/hr)	PHF
NE	N-S	S_1	48	0.68
		S_2	72	
	E-W	S_3	30	0.58
		S_4	41	
SE	N-S	S_5	53	0.50
		S_6	56	
	E-W	S_7	32	0.63
		S_8	46	
SW	N-S	S_9	68	0.80
		S_{10}	54	
	E-W	S_{11}	36	0.16
		S_{12}	24	
NW	N-S	S_{13}	96	0.63
		S_{14}	90	
	E-W	S_{15}	52	0.57
		S_{16}	40	

CROSSWALKS			
CROSS-WALK	MOVE-MENT	VOL (p/hr)	PHF
N	V_1	83	0.78
	V_2	66	0.80
E	V_3	50	0.48
	V_4	72	0.58
S	V_5	90	0.81
	V_6	59	0.75
W	V_7	78	0.79
	V_8	77	0.52

CORNERS			
CORNER	MOVE-MENT	VOL (p/hr)	PHF
NE	V_{NE}	463	0.77
SE	V_{SE}	456	0.63
SW	V_{SW}	417	0.81
NW	V_{NW}	582	0.72

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



CYCLE (s): 90

SIDEWALKS				
CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUC-TIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S	23.0	5.5	3.5
	E-W	10.0	3.5	3.5
SE	N-S	23.0	5.5	3.5
	E-W	10.0	3.5	3.5
SW	N-S	22.0	8.0	3.5
	E-W	10.0	3.5	3.5
NW	N-S	22.0	8.0	3.5
	E-W	10.0	3.5	3.5

* 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	100.0	13.0	3.5	7	28	30	65	0	4
E	30.0	20.0	3.5	25	7	30	62	18	12
S	100.0	12.0	3.5	7	28	30	65	5	1
W	30.0	16.0	3.5	25	7	30	62	0	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)	OBSTRUC-TIONS, Ob (ft^2)
NE	N-S	23.0	10.0	4.00
	E-W	12.0		
SE	N-S	23.0	9.0	4.00
	E-W	12.0		
SW	N-S	23.0	10.0	4.00
	E-W	12.0		
NW	N-S	23.0	10.0	4.00
	E-W	12.0		

* Override if corner width is different than sidewalk width.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak Hour
Date:	43265	Analysis Year:	2021 No-Action

INPUTS

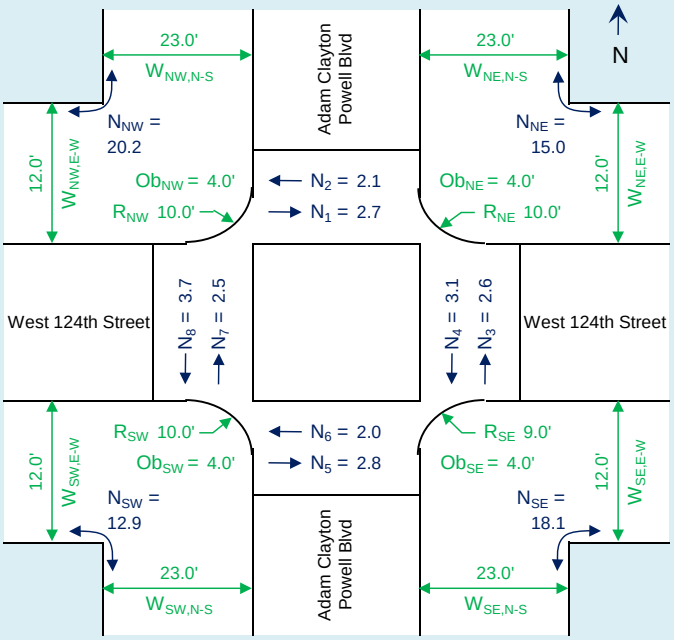
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 83	0.8	N_1 = 2.7
v_2 = 66	0.8	N_2 = 2.1
v_3 = 50	0.5	N_3 = 2.6
v_4 = 72	0.6	N_4 = 3.1
v_5 = 90	0.8	N_5 = 2.8
v_6 = 59	0.8	N_6 = 2.0
v_7 = 78	0.8	N_7 = 2.5
v_8 = 77	0.5	N_8 = 3.7
v_{NE} = 463	0.8	N_{NE} = 15.0
v_{SE} = 456	0.6	N_{SE} = 18.1
v_{SW} = 417	0.8	N_{SW} = 12.9
v_{NW} = 582	0.7	N_{NW} = 20.2

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	7	$g_{Walk,N}$ = 11
E	25	$g_{Walk,E}$ = 29
S	7	$g_{Walk,S}$ = 11
W	25	$g_{Walk,W}$ = 29

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ 22,545.0 ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 92.2 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} = 76.5 \text{ s}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ 21,701.2 ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = 174.4 sf/ped LOS A

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ 22,545.0 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 71.5 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 64.2 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ 21,866.7 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 214.7 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ 22,545.0 ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 96.3 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} = 51.0 \text{ s}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ 21,808.3 ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = 229.2 sf/ped LOS A

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 22,912.7 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 68.2 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 53.8 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 22,302.5 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 195.3 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak Hour
Date:	43265	Analysis Year:	2021 No-Action

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 83	0.78	N_1 = 2.7
v_2 = 66	0.8	N_2 = 2.1
v_3 = 50	0.48	N_3 = 2.6
v_4 = 72	0.58	N_4 = 3.1
v_5 = 90	0.81	N_5 = 2.8
v_6 = 59	0.75	N_6 = 2.0
v_7 = 78	0.79	N_7 = 2.5
v_8 = 77	0.52	N_8 = 3.7

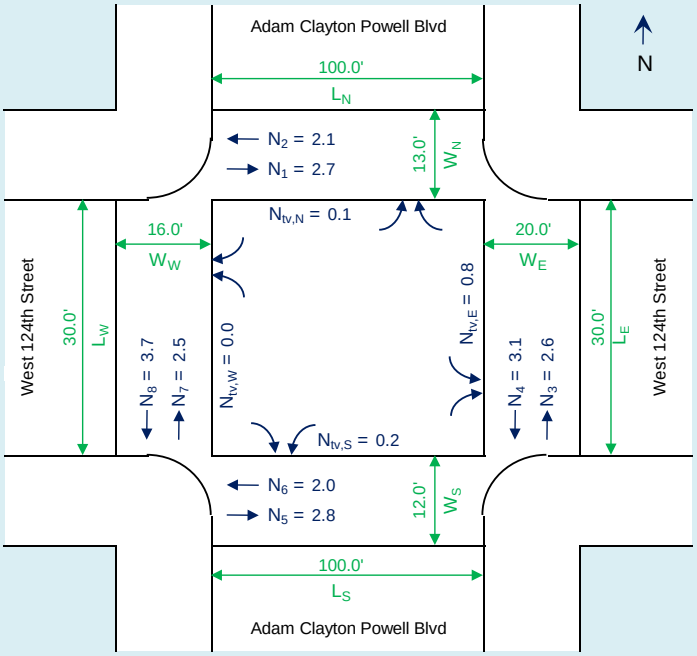
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ = 4	$N_{tv,N}$ = 0.1
$v_{rt,N}$ = 0	
$v_{lt,perm,E}$ = 12	$N_{tv,E}$ = 0.8
$v_{rt,E}$ = 18	
$v_{lt,perm,S}$ = 1	$N_{tv,S}$ = 0.2
$v_{rt,S}$ = 5	
$v_{lt,perm,W}$ = 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	7	$g_{Walk,N}$ = 11
E	3.5	25	$g_{Walk,E}$ = 29
S	3.5	7	$g_{Walk,S}$ = 11
W	3.5	25	$g_{Walk,W}$ = 29

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 14{,}300.0$ ft^2-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 52.0$ ft^2-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 14{,}248.0$ ft^2-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 2.3$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 1.8$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 32.3$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 32.1$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 152.1$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 93.7 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 17{,}400.0$ ft^2-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 600.0$ ft^2-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 16{,}800.0$ ft^2-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 1.8$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 2.1$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 12.0$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 12.1$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 68.7$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 244.6 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 13{,}200.0$ ft^2-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 72.0$ ft^2-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 13{,}128.0$ ft^2-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$= 2.4$ p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$= 1.7$ p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$= 32.3$ s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$= 32.2$ s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$= 153.0$ s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = 85.8 sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 13{,}920.0$ ft^2-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 0.0$ ft^2-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 13{,}920.0$ ft^2-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$= 1.7$ p

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$= 2.5$ p

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$= 12.1$ s

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$= 12.2$ s

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$= 74.9$ s

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

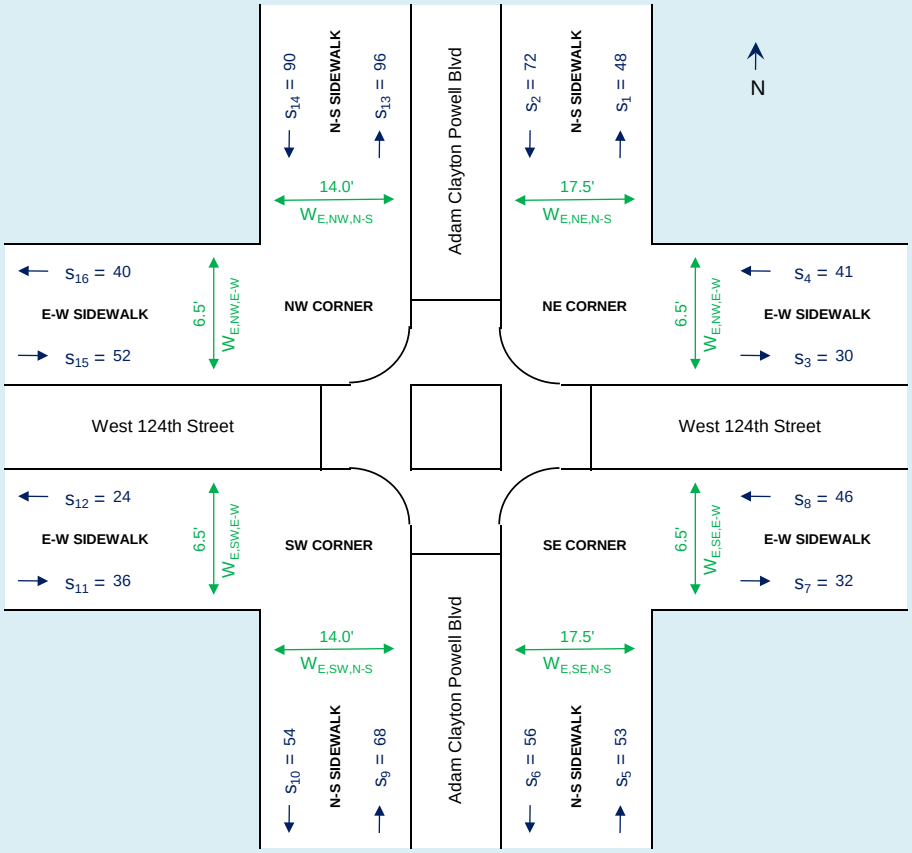
$M_{cw,W}$ = 185.9 sf/p LOS A

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak Hour
Date:	43265	Analysis Year:	2021 No-Action

INPUTS



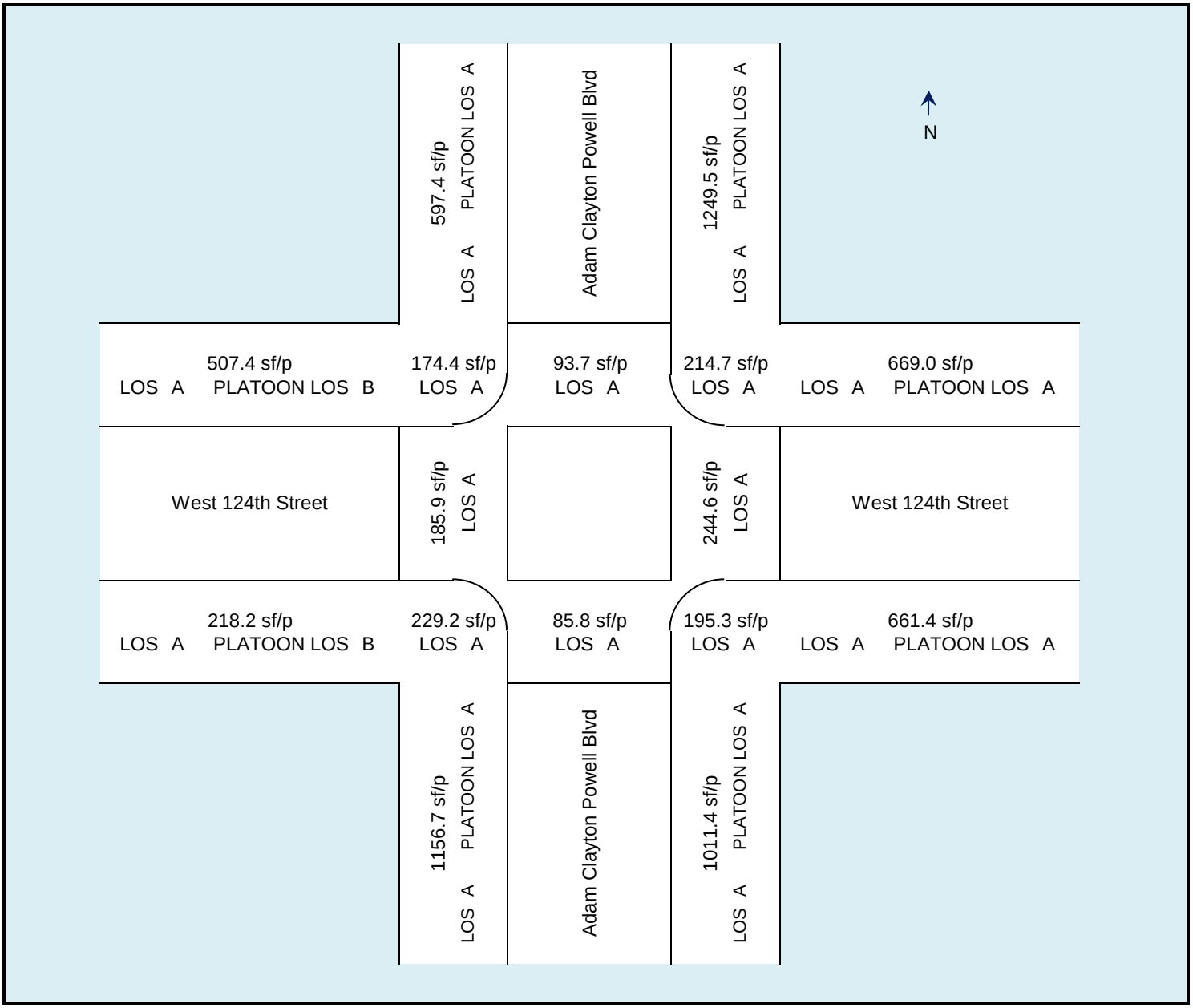
ANALYSIS

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	48	120	0.68	23.0	5.5	17.5	0.2	3.5	3.5	1249.5	A	A
		S_2	72											
	E-W	S_3	30	71	0.58	10.0	3.5	6.5	0.3	3.5	3.5	669.0	A	A
		S_4	41											
SE	N-S	S_5	53	109	0.50	23.0	5.5	17.5	0.2	3.5	3.5	1011.4	A	A
		S_6	56											
	E-W	S_7	32	78	0.63	10.0	3.5	6.5	0.3	3.5	3.5	661.4	A	A
		S_8	46											
SW	N-S	S_9	68	122	0.80	22.0	8.0	14.0	0.2	3.5	3.5	1156.7	A	A
		S_{10}	54											
	E-W	S_{11}	36	60	0.16	10.0	3.5	6.5	1.0	3.5	3.5	218.2	A	B
		S_{12}	24											
NW	N-S	S_{13}	96	186	0.63	22.0	8.0	14.0	0.4	3.5	3.5	597.4	A	A
		S_{14}	90											
	E-W	S_{15}	52	92	0.57	10.0	3.5	6.5	0.4	3.5	3.5	507.4	A	B
		S_{16}	40											

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak Hour
Date:	43265	Analysis Year:	2021 No-Action

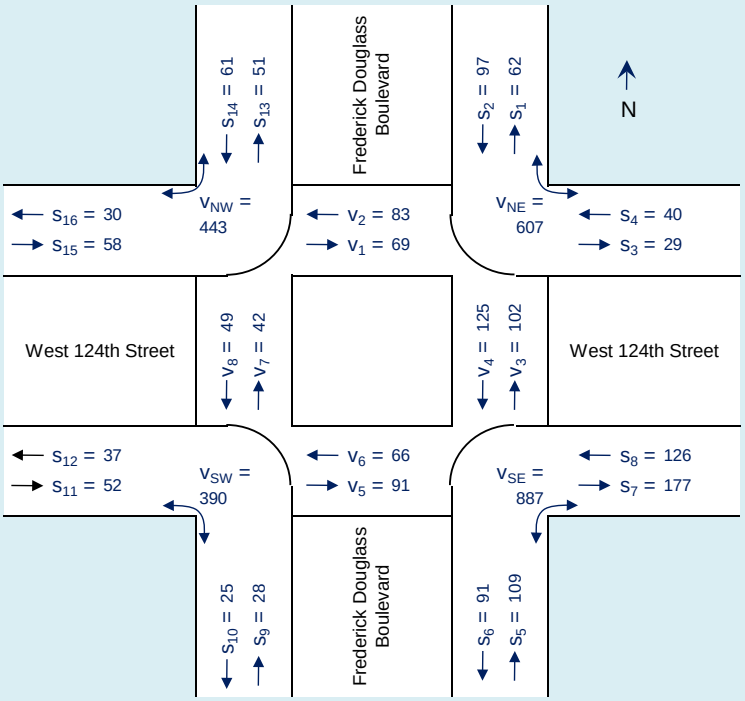


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak
Date:	14-Jun-18	Analysis Year:	2021 With-Action

PEDESTRIAN PEAK HOUR VOLUMES

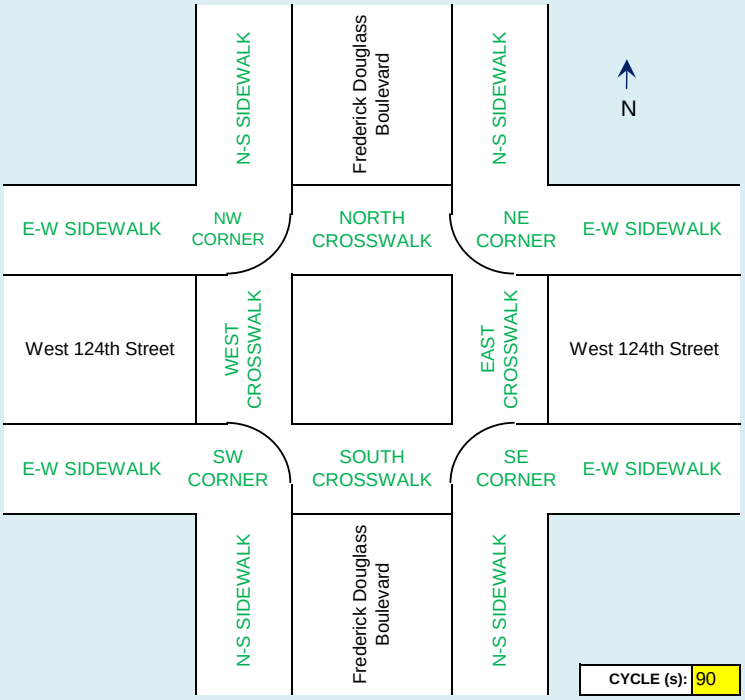


SIDEWALKS				
CORNER	MOVE-MENT		VOL (p/hr)	PHF
NE	N-S	S_1	62	0.72
		S_2	97	
	E-W	S_3	29	0.88
		S_4	40	
SE	N-S	S_5	109	0.83
		S_6	91	
	E-W	S_7	177	0.67
		S_8	126	
SW	N-S	S_9	28	0.55
		S_{10}	25	
	E-W	S_{11}	52	0.72
		S_{12}	37	
NW	N-S	S_{13}	51	0.75
		S_{14}	61	
	E-W	S_{15}	58	0.60
		S_{16}	30	

CROSSWALKS			
CROSS-WALK	MOVE-MENT	VOL (p/hr)	PHF
N	V_1	69	0.65
	V_2	83	0.83
E	V_3	102	0.81
	V_4	125	0.86
S	V_5	91	0.80
	V_6	66	0.88
W	V_7	42	0.65
	V_8	49	0.85

CORNERS			
CORNER	MOVE-MENT	VOL (p/hr)	PHF
NE	V_{NE}	607	0.93
SE	V_{SE}	887	0.99
SW	V_{SW}	390	0.94
NW	V_{NW}	443	0.84

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



CYCLE (s): 90

SIDEWALKS				
CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUC-TIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S	19.5	5.5	3.5
	E-W	10.0	4.5	3.5
SE	N-S	19.5	5.5	3.5
	E-W	10.0	4.5	3.5
SW	N-S	20.0	5.5	3.5
	E-W	12.0	4.5	3.5
NW	N-S	21.0	5.5	3.5
	E-W	10.0	4.5	3.5

* 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	60.0	12.0	3.5	25	15	5	45	0	0
E	30.0	18.0	3.5	30	6	5	41	10	15
S	60.0	12.0	3.5	25	15	5	45	0	0
W	30.0	18.0	3.5	30	6	5	41	0	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)	OBSTRUC-TIONS, Ob (ft^2)
NE	N-S	18.0	10.0	4.00
	E-W	12.0		
SE	N-S	18.0	10.0	4.00
	E-W	12.0		
SW	N-S	18.0	10.0	4.00
	E-W	12.0		
NW	N-S	18.0	10.0	4.00
	E-W	12.0		

* Override if corner width is different than sidewalk width.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak
Date:	43265	Analysis Year:	2021 With-Action

INPUTS

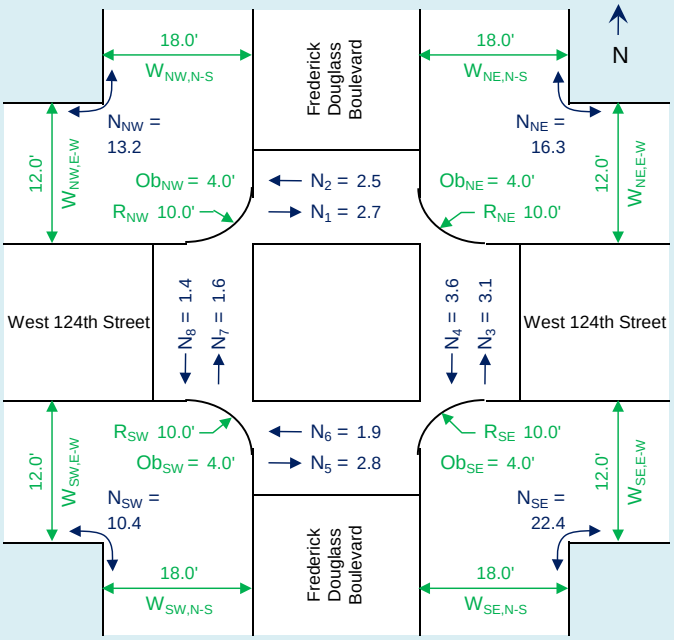
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 69	0.7	N_1 = 2.7
v_2 = 83	0.8	N_2 = 2.5
v_3 = 102	0.8	N_3 = 3.1
v_4 = 125	0.9	N_4 = 3.6
v_5 = 91	0.8	N_5 = 2.8
v_6 = 66	0.9	N_6 = 1.9
v_7 = 42	0.7	N_7 = 1.6
v_8 = 49	0.9	N_8 = 1.4
v_{NE} = 607	0.9	N_{NE} = 16.3
v_{SE} = 887	1	N_{SE} = 22.4
v_{SW} = 390	0.9	N_{SW} = 10.4
v_{NW} = 443	0.8	N_{NW} = 13.2

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	25	$g_{Walk,N}$ = 29
E	30	$g_{Walk,E}$ = 34
S	25	$g_{Walk,S}$ = 29
W	30	$g_{Walk,W}$ = 34

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ 17,145.0 ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 54.9 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} = 25.1 \text{ s}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ 16,745.2 ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = 195.1 sf/ped LOS A

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ 17,145.0 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 51.7 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 63.3 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ 16,570.1 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 146.6 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ 17,145.0 ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 58.8 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} = 28.1 \text{ s}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ 16,710.3 ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = 230.2 sf/ped LOS A

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 17,145.0 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 38.8 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 54.8 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 16,677.0 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 123.0 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak
Date:	43265	Analysis Year:	2021 With-Action

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 69	0.65	N_1 = 2.7
v_2 = 83	0.83	N_2 = 2.5
v_3 = 102	0.81	N_3 = 3.1
v_4 = 125	0.86	N_4 = 3.6
v_5 = 91	0.8	N_5 = 2.8
v_6 = 66	0.88	N_6 = 1.9
v_7 = 42	0.65	N_7 = 1.6
v_8 = 49	0.85	N_8 = 1.4

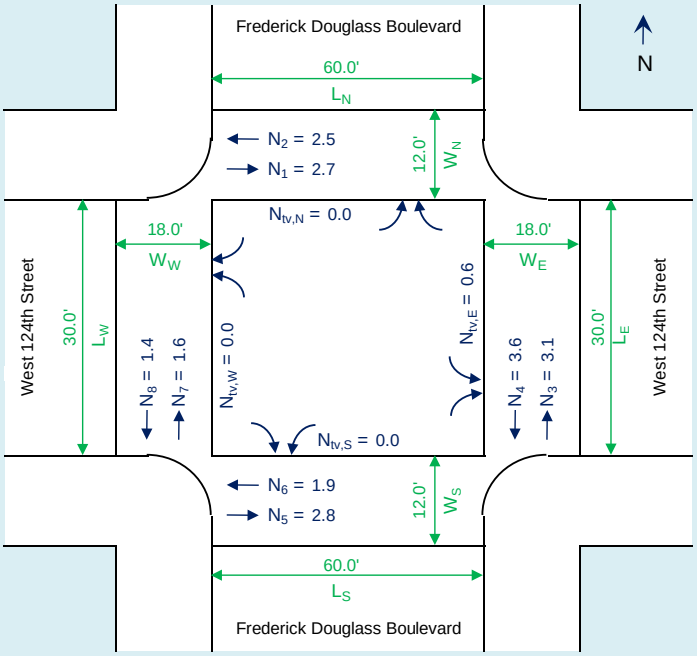
TURNING VOL PER CYCLE

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	
$v_{lt,perm,E}$ = 15	$N_{tv,E}$ = 0.6
$v_{rt,E}$ = 10	
$v_{lt,perm,S}$ = 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	25	$g_{Walk,N}$ = 29
E	3.5	30	$g_{Walk,E}$ = 34
S	3.5	25	$g_{Walk,S}$ = 29
W	3.5	30	$g_{Walk,W}$ = 34

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 20{,}880.0$ ft^2-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 0.0$ ft^2-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 20{,}880.0$ ft^2-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 1.8$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 1.7$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 20.7$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 20.7$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 106.9$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 195.4 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 18{,}360.0$ ft^2-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 450.0$ ft^2-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 17{,}910.0$ ft^2-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 2.0$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 2.3$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 12.1$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 12.1$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 82.0$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 218.4 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 20{,}880.0$ ft^2-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 0.0$ ft^2-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 20{,}880.0$ ft^2-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$= 1.9$ p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$= 1.3$ p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$= 20.8$ s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$= 20.6$ s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$= 97.8$ s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = 213.6 sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 18{,}360.0$ ft^2-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 0.0$ ft^2-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 18{,}360.0$ ft^2-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$= 1.0$ p

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$= 0.9$ p

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$= 11.9$ s

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$= 11.9$ s

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$= 36.4$ s

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

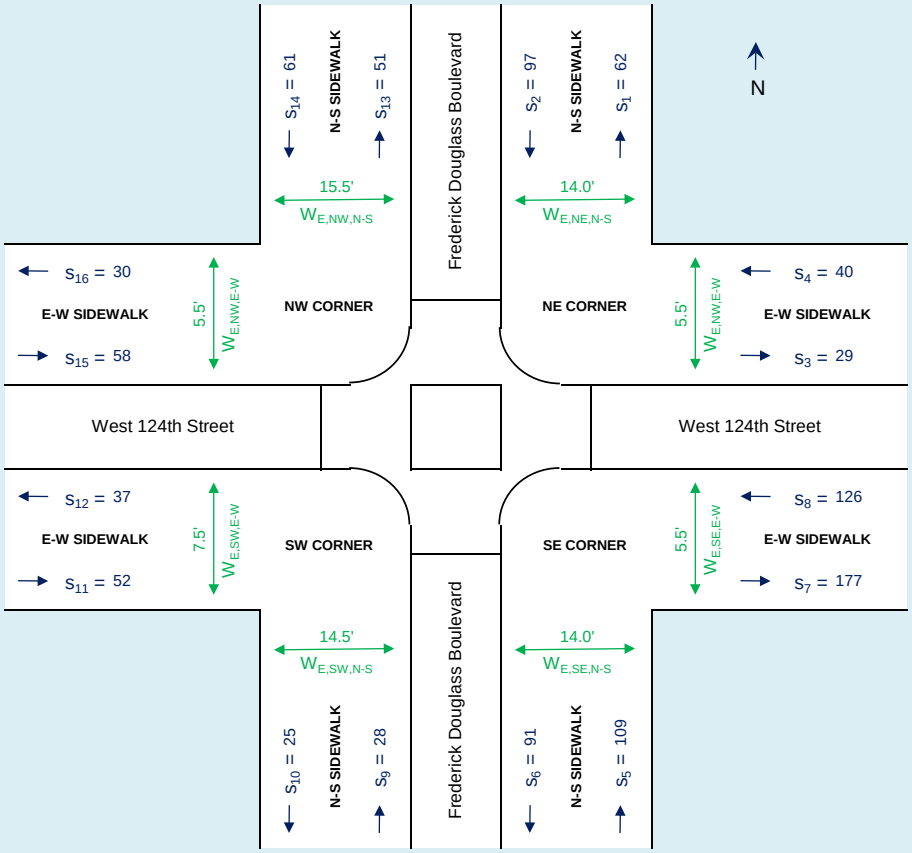
$M_{cw,W}$ = 504.2 sf/p LOS A

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak
Date:	43265	Analysis Year:	2021 With-Action

INPUTS



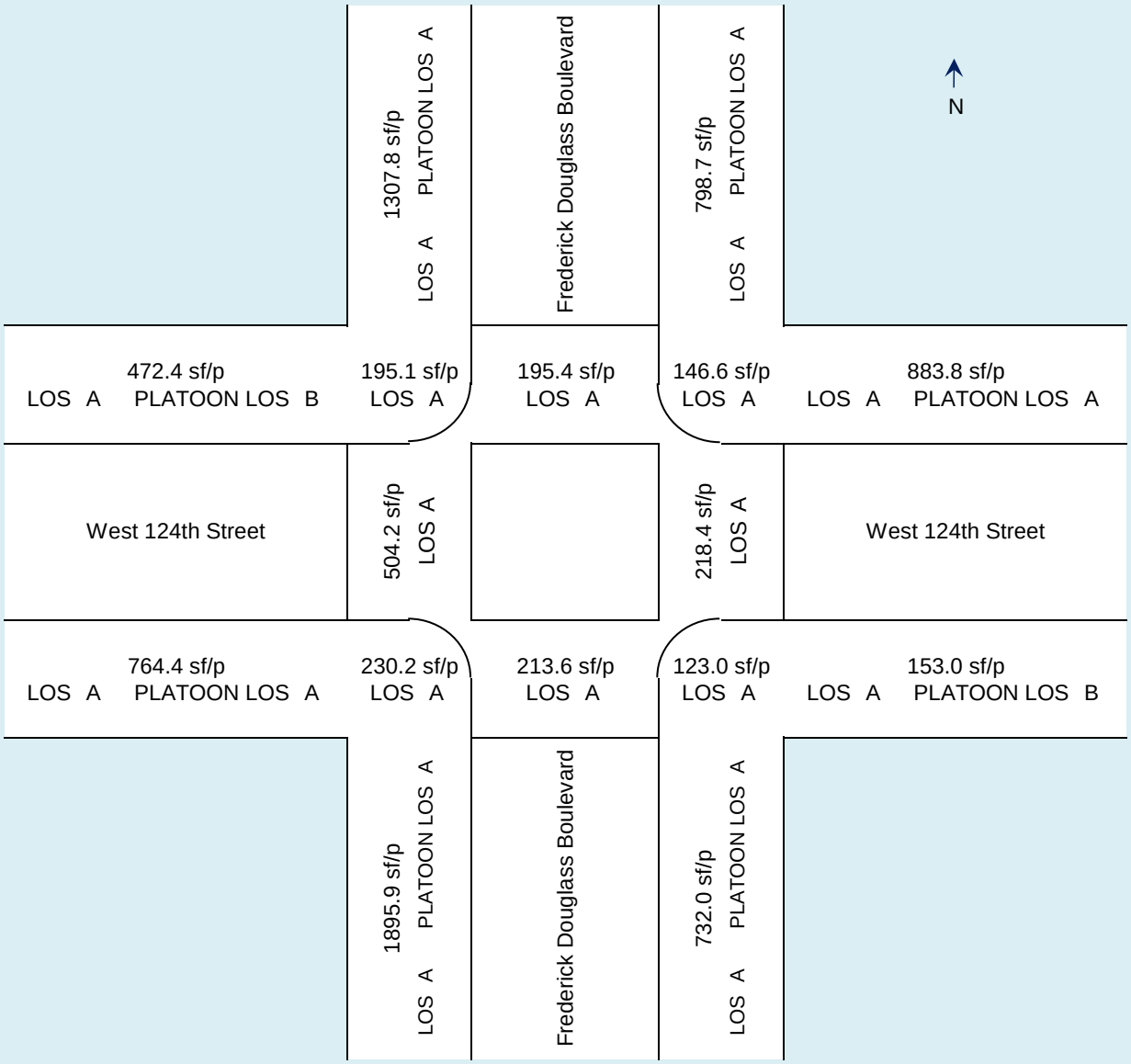
ANALYSIS

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	62	159	0.72	19.5	5.5	14.0	0.3	3.5	3.5	798.7	A	A
		s_2	97											
	E-W	s_3	29	69	0.88	10.0	4.5	5.5	0.2	3.5	3.5	883.8	A	A
		s_4	40											
SE	N-S	s_5	109	200	0.83	19.5	5.5	14.0	0.3	3.5	3.5	732.0	A	A
		s_6	91											
	E-W	s_7	177	303	0.67	10.0	4.5	5.5	1.4	3.5	3.5	153.0	A	B
		s_8	126											
SW	N-S	s_9	28	53	0.55	20.0	5.5	14.5	0.1	3.5	3.5	1895.9	A	A
		s_{10}	25											
	E-W	s_{11}	52	89	0.72	12.0	4.5	7.5	0.3	3.5	3.5	764.4	A	A
		s_{12}	37											
NW	N-S	s_{13}	51	112	0.75	21.0	5.5	15.5	0.2	3.5	3.5	1307.8	A	A
		s_{14}	61											
	E-W	s_{15}	58	88	0.60	10.0	4.5	5.5	0.4	3.5	3.5	472.4	A	B
		s_{16}	30											

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak
Date:	43265	Analysis Year:	2021 With-Action

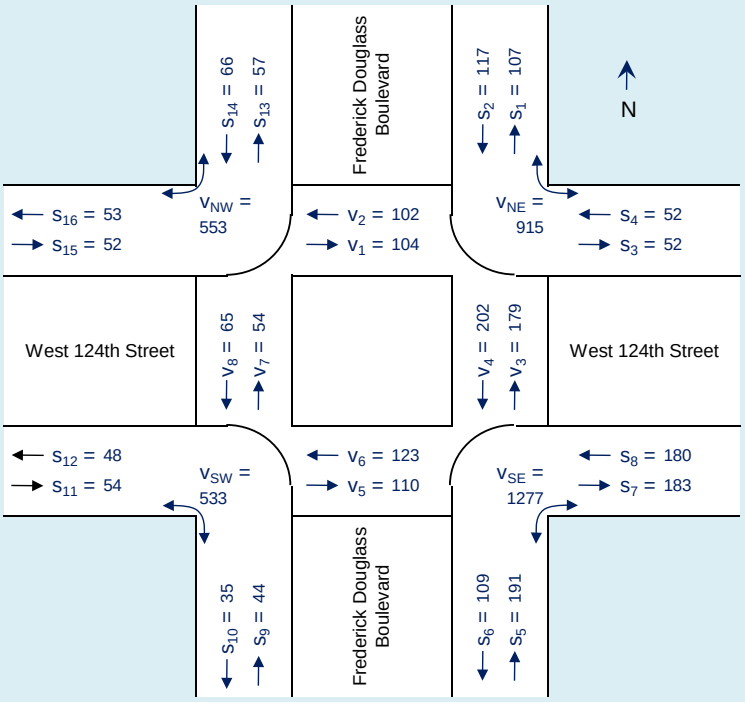


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Midday Peak
Date:	14-Jun-18	Analysis Year:	2021 With-Action

PEDESTRIAN PEAK HOUR VOLUMES

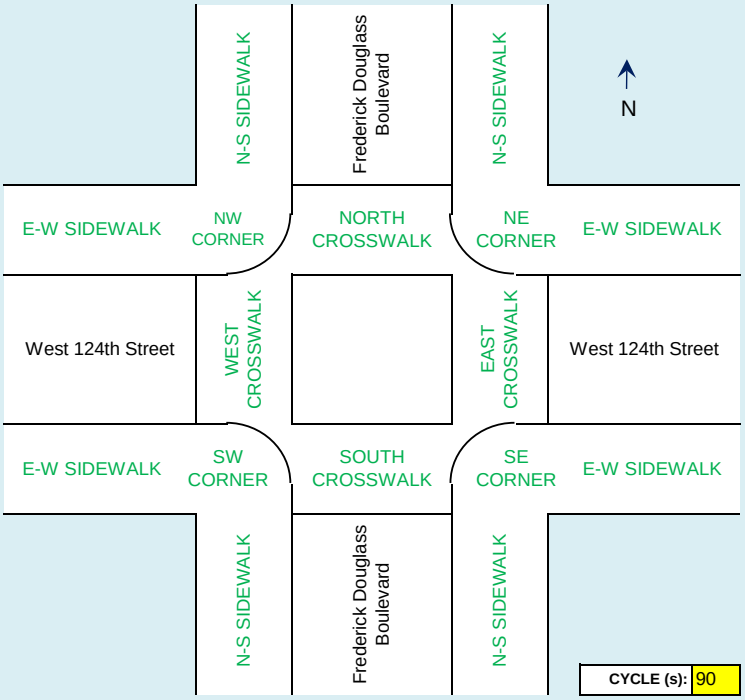


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	s_1	107	0.76
		s_2	117	
	E-W	s_3	52	0.64
		s_4	52	
SE	N-S	s_5	191	0.80
		s_6	109	
	E-W	s_7	183	0.68
		s_8	180	
SW	N-S	s_9	44	0.71
		s_{10}	35	
	E-W	s_{11}	54	0.81
		s_{12}	48	
NW	N-S	s_{13}	57	0.70
		s_{14}	66	
	E-W	s_{15}	52	0.75
		s_{16}	53	

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	v_1	104	0.74
	v_2	102	0.77
E	v_3	179	0.75
	v_4	202	0.80
S	v_5	110	0.74
	v_6	123	0.71
W	v_7	54	0.65
	v_8	65	0.63

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	v_{NE}	915	0.75
SE	v_{SE}	1277	0.79
SW	v_{SW}	533	0.77
NW	v_{NW}	553	0.72

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	19.5	5.5	3.5
	E-W	10.0	4.5	3.5
SE	N-S	19.5	5.5	3.5
	E-W	10.0	4.5	3.5
SW	N-S	20.0	5.5	3.5
	E-W	10.0	4.5	3.5
NW	N-S	21.0	5.5	3.5
	E-W	10.0	4.5	3.5

* 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	60.0	12.0	3.5	25	15	5	45	0	0
E	30.0	18.0	3.5	30	6	5	41	12	23
S	60.0	12.0	3.5	25	15	5	45	0	0
W	30.0	18.0	3.5	30	6	5	41	0	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	18.0	10.0	4.00
	E-W	12.0		
SE	N-S	18.0	10.0	4.00
	E-W	12.0		
SW	N-S	18.0	10.0	4.00
	E-W	12.0		
NW	N-S	18.0	10.0	4.00
	E-W	12.0		

* Override if corner width is different than sidewalk width.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Midday Peak
Date:	43265	Analysis Year:	2021 With-Action

INPUTS

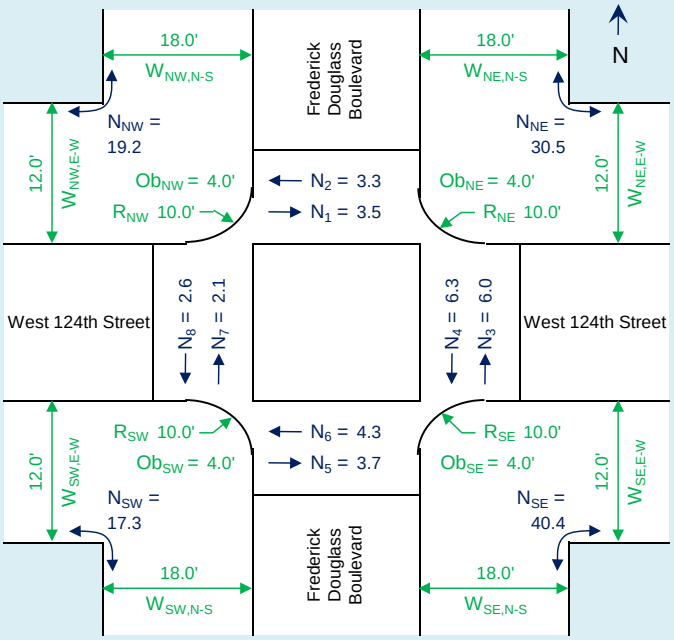
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 104	0.7	N_1 = 3.5
v_2 = 102	0.8	N_2 = 3.3
v_3 = 179	0.8	N_3 = 6.0
v_4 = 202	0.8	N_4 = 6.3
v_5 = 110	0.7	N_5 = 3.7
v_6 = 123	0.7	N_6 = 4.3
v_7 = 54	0.7	N_7 = 2.1
v_8 = 65	0.6	N_8 = 2.6
v_{NE} = 915	0.8	N_{NE} = 30.5
v_{SE} = 1277	0.8	N_{SE} = 40.4
v_{SW} = 533	0.8	N_{SW} = 17.3
v_{NW} = 553	0.7	N_{NW} = 19.2

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	25	$g_{Walk,N}$ = 29
E	30	$g_{Walk,E}$ = 34
S	25	$g_{Walk,S}$ = 29
W	30	$g_{Walk,W}$ = 34

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ 17,145.0 ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 72.6 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} = 44.9 \text{ s}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ 16,557.1 ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = 134.9 sf/ped LOS A

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ 17,145.0 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 68.5 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 110.0 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ 16,252.8 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 81.9 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ 17,145.0 ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 76.8 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} = 36.2 \text{ s}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ 16,580.0 ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = 138.1 sf/ped LOS A

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 17,145.0 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 89.5 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 104.0 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 16,177.6 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 66.6 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Midday Peak
Date:	43265	Analysis Year:	2021 With-Action

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 104	0.74	N_1 = 3.5
v_2 = 102	0.77	N_2 = 3.3
v_3 = 179	0.75	N_3 = 6.0
v_4 = 202	0.8	N_4 = 6.3
v_5 = 110	0.74	N_5 = 3.7
v_6 = 123	0.71	N_6 = 4.3
v_7 = 54	0.65	N_7 = 2.1
v_8 = 65	0.63	N_8 = 2.6

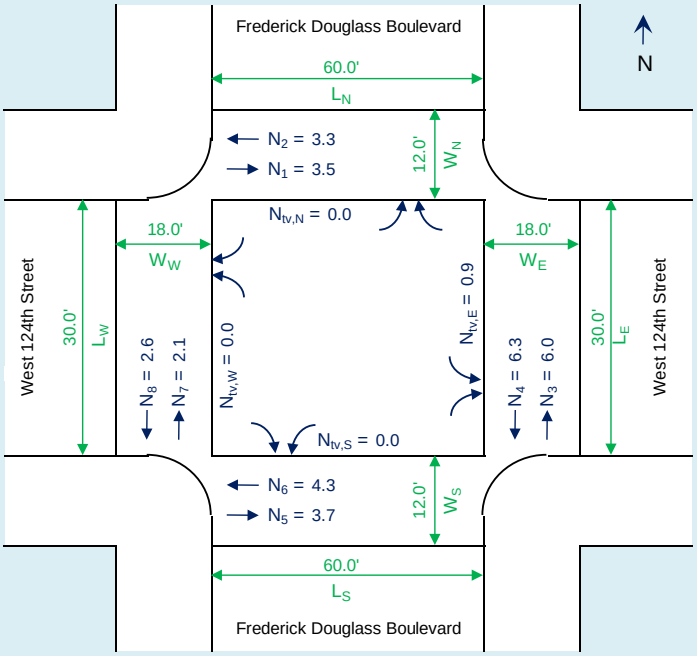
TURNING VOL PER CYCLE

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	
$v_{lt,perm,E}$ = 23	$N_{tv,E}$ = 0.9
$v_{rt,E}$ = 12	
$v_{lt,perm,S}$ = 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	25	$g_{Walk,N}$ = 29
E	3.5	30	$g_{Walk,E}$ = 34
S	3.5	25	$g_{Walk,S}$ = 29
W	3.5	30	$g_{Walk,W}$ = 34

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 20{,}880.0$ ft^2-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 0.0$ ft^2-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 20{,}880.0$ ft^2-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 2.4$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 2.2$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 20.9$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 20.8$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 142.4$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 146.6 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 18{,}360.0$ ft^2-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 630.0$ ft^2-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 17{,}730.0$ ft^2-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 3.7$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 3.9$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 12.3$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 12.4$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 151.6$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 117.0 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 20{,}880.0$ ft^2-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 0.0$ ft^2-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 20{,}880.0$ ft^2-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$= 2.5$ p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$= 2.9$ p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$= 20.9$ s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$= 21.0$ s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$= 168.7$ s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = 123.8 sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 18{,}360.0$ ft^2-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 0.0$ ft^2-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 18{,}360.0$ ft^2-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$= 1.3$ p

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$= 1.6$ p

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$= 12.0$ s

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$= 12.0$ s

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$= 55.8$ s

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

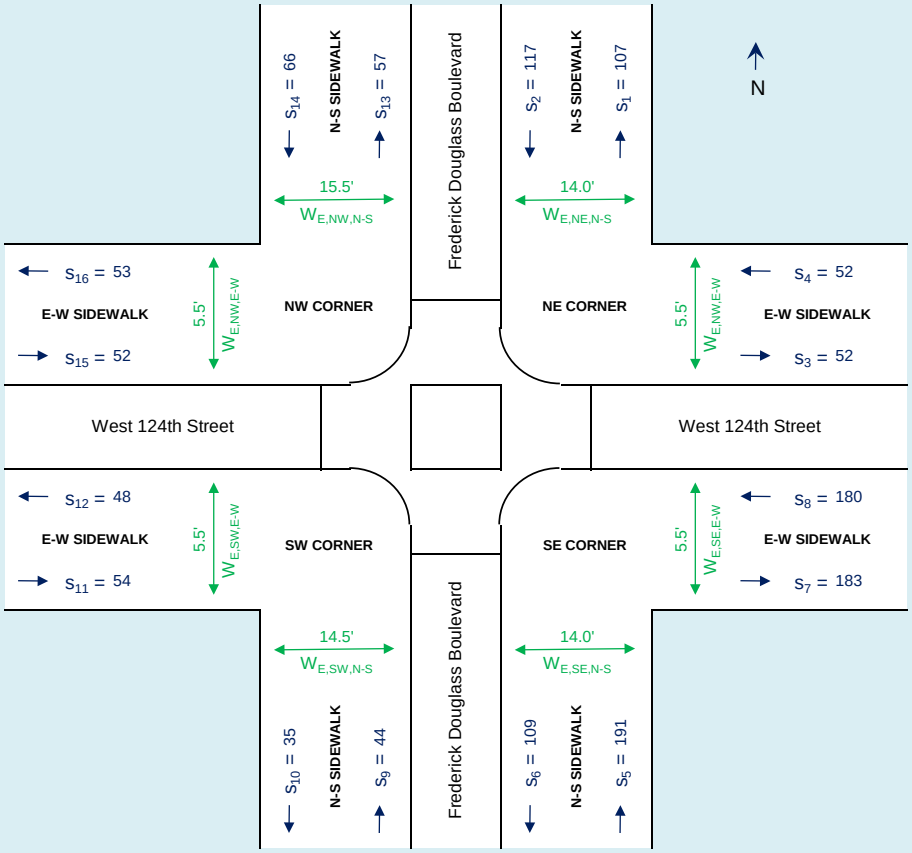
$M_{cw,W}$ = 328.8 sf/p LOS A

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Midday Peak
Date:	43265	Analysis Year:	2021 With-Action

INPUTS



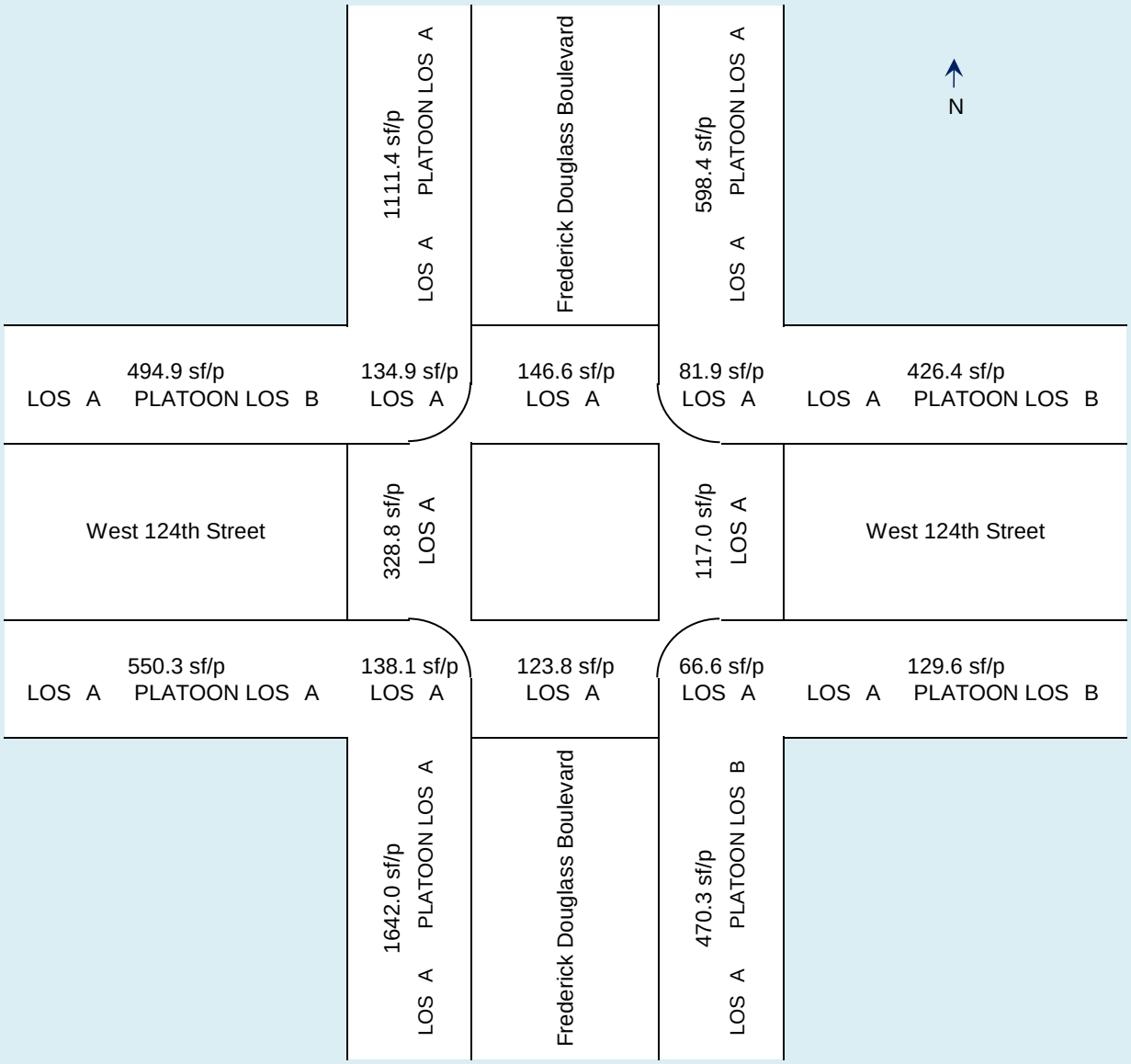
ANALYSIS

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	107	224	0.76	19.5	5.5	14.0	0.4	3.5	3.5	598.4	A	A
		S_2	117											
	E-W	S_3	52	104	0.64	10.0	4.5	5.5	0.5	3.5	3.5	426.4	A	B
		S_4	52											
SE	N-S	S_5	191	300	0.80	19.5	5.5	14.0	0.4	3.5	3.5	470.3	A	B
		S_6	109											
	E-W	S_7	183	363	0.68	10.0	4.5	5.5	1.6	3.5	3.5	129.6	A	B
		S_8	180											
SW	N-S	S_9	44	79	0.71	20.0	5.5	14.5	0.1	3.5	3.5	1642.0	A	A
		S_{10}	35											
	E-W	S_{11}	54	102	0.81	10.0	4.5	5.5	0.4	3.5	3.5	550.3	A	A
		S_{12}	48											
NW	N-S	S_{13}	57	123	0.70	21.0	5.5	15.5	0.2	3.5	3.5	1111.4	A	A
		S_{14}	66											
	E-W	S_{15}	52	105	0.75	10.0	4.5	5.5	0.4	3.5	3.5	494.9	A	B
		S_{16}	53											

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Midday Peak
Date:	43265	Analysis Year:	2021 With-Action

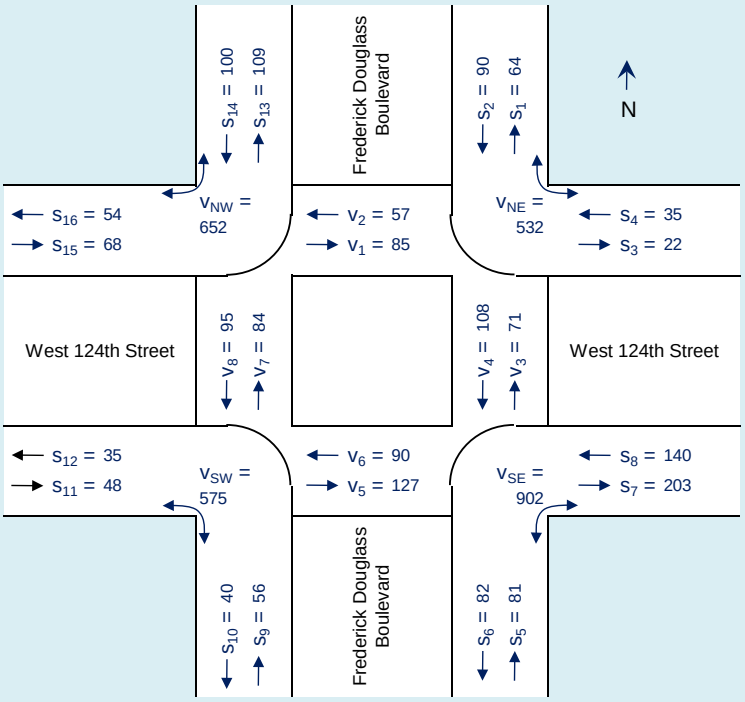


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak
Date:	14-Jun-18	Analysis Year:	2021 With-Action

PEDESTRIAN PEAK HOUR VOLUMES

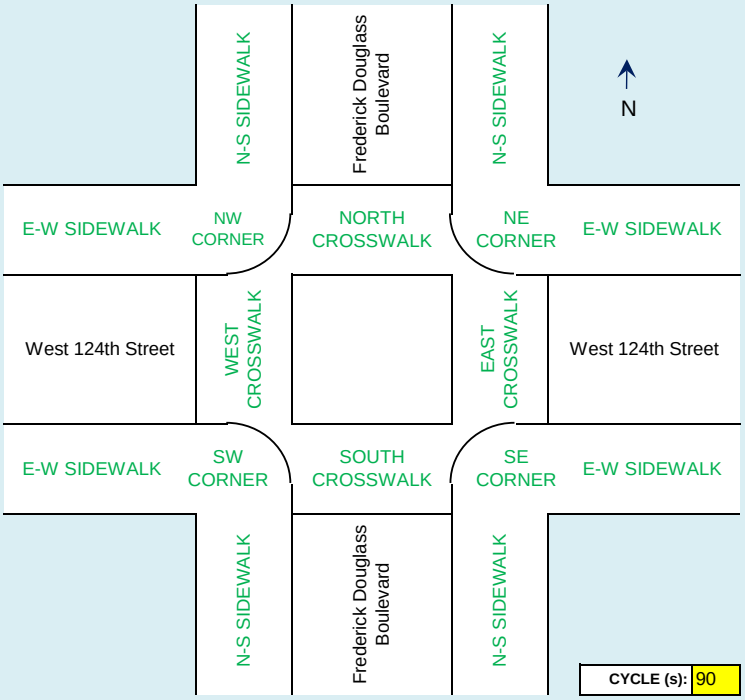


SIDEWALKS				
CORNER	MOVE-MENT		VOL (p/hr)	PHF
NE	N-S	S_1	64	0.78
		S_2	90	
	E-W	S_3	22	0.81
		S_4	35	
SE	N-S	S_5	81	0.76
		S_6	82	
	E-W	S_7	203	0.83
		S_8	140	
SW	N-S	S_9	56	0.80
		S_{10}	40	
	E-W	S_{11}	48	0.17
		S_{12}	35	
NW	N-S	S_{13}	109	0.85
		S_{14}	100	
	E-W	S_{15}	68	0.91
		S_{16}	54	

CROSSWALKS			
CROSS-WALK	MOVE-MENT	VOL (p/hr)	PHF
N	V_1	85	0.85
	V_2	57	0.64
E	V_3	71	0.75
	V_4	108	0.82
S	V_5	127	0.95
	V_6	90	0.74
W	V_7	84	0.83
	V_8	95	0.85

CORNERS			
CORNER	MOVE-MENT	VOL (p/hr)	PHF
NE	V_{NE}	532	0.80
SE	V_{SE}	902	0.84
SW	V_{SW}	575	0.85
NW	V_{NW}	652	0.86

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



SIDEWALKS				
CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUC-TIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S	19.5	5.5	3.5
	E-W	10.0	4.5	3.5
SE	N-S	19.5	5.5	3.5
	E-W	10.0	4.5	3.5
SW	N-S	20.0	5.5	3.5
	E-W	12.0	4.5	3.5
NW	N-S	21.0	5.5	3.5
	E-W	10.0	4.5	3.5

* Sum of widths and shy distances from obstructions.

CORNERS				
CORNER	SIDEWALK	TOTAL WIDTH*, W (ft)	RADIUS, R (ft)	OBSTRUC-TIONS, Ob (ft^2)
NE	N-S	18.0	10.0	4.00
	E-W	12.0		
SE	N-S	18.0	10.0	4.00
	E-W	12.0		
SW	N-S	18.0	10.0	4.00
	E-W	12.0		
NW	N-S	18.0	10.0	4.00
	E-W	12.0		

* 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	60.0	12.0	3.5	25	15	5	45	0	0
E	30.0	18.0	3.5	30	6	5	41	12	23
S	60.0	12.0	3.5	25	15	5	45	0	0
W	30.0	18.0	3.5	30	6	5	41	0	0

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

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak
Date:	43265	Analysis Year:	2021 With-Action

INPUTS

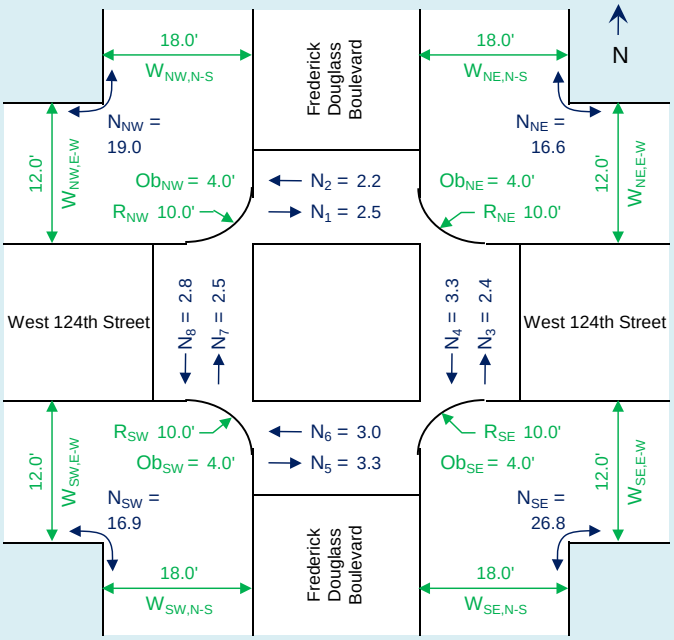
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 85	0.9	N_1 = 2.5
v_2 = 57	0.6	N_2 = 2.2
v_3 = 71	0.8	N_3 = 2.4
v_4 = 108	0.8	N_4 = 3.3
v_5 = 127	1	N_5 = 3.3
v_6 = 90	0.7	N_6 = 3.0
v_7 = 84	0.8	N_7 = 2.5
v_8 = 95	0.9	N_8 = 2.8
v_{NE} = 532	0.8	N_{NE} = 16.6
v_{SE} = 902	0.8	N_{SE} = 26.8
v_{SW} = 575	0.9	N_{SW} = 16.9
v_{NW} = 652	0.9	N_{NW} = 19.0

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	25	$g_{Walk,N}$ = 29
E	30	$g_{Walk,E}$ = 34
S	25	$g_{Walk,S}$ = 29
W	30	$g_{Walk,W}$ = 34

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ 17,145.0 ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 51.7 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} = 48.7 \text{ s}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ 16,643.2 ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = 143.5 sf/ped LOS A

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ 17,145.0 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 46.0 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 57.4 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ 16,628.0 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 153.9 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ 17,145.0 ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 69.1 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} = 44.1 \text{ s}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ 16,579.2 ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = 144.8 sf/ped LOS A

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 17,145.0 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 62.9 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 41.2 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 16,624.6 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 106.9 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak
Date:	43265	Analysis Year:	2021 With-Action

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 85	0.85	N_1 = 2.5
v_2 = 57	0.64	N_2 = 2.2
v_3 = 71	0.75	N_3 = 2.4
v_4 = 108	0.82	N_4 = 3.3
v_5 = 127	0.95	N_5 = 3.3
v_6 = 90	0.74	N_6 = 3.0
v_7 = 84	0.83	N_7 = 2.5
v_8 = 95	0.85	N_8 = 2.8

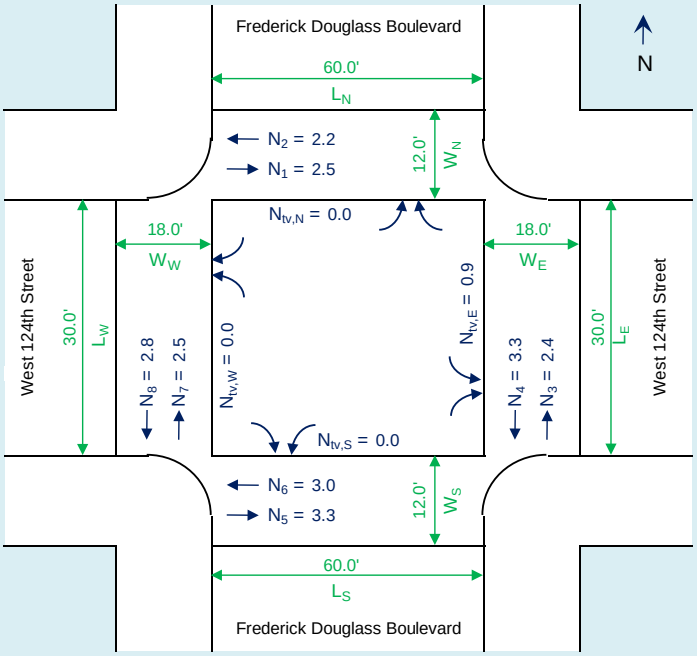
TURNING VOL PER CYCLE

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	
$v_{lt,perm,E}$ = 23	$N_{tv,E}$ = 0.9
$v_{rt,E}$ = 12	
$v_{lt,perm,S}$ = 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	25	$g_{Walk,N}$ = 29
E	3.5	30	$g_{Walk,E}$ = 34
S	3.5	25	$g_{Walk,S}$ = 29
W	3.5	30	$g_{Walk,W}$ = 34

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 20{,}880.0$ ft²-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 0.0$ ft²-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 20{,}880.0$ ft²-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 1.7$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 1.5$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 20.7$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 20.7$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 97.9$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 213.4 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 18{,}360.0$ ft²-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 630.0$ ft²-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 17{,}730.0$ ft²-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 1.5$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 2.0$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 12.0$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 12.1$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 68.2$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 260.1 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 20{,}880.0$ ft²-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 0.0$ ft²-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 20{,}880.0$ ft²-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$= 2.3$ p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$= 2.1$ p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$= 20.9$ s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$= 20.8$ s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$= 133.0$ s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = 157.0 sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 18{,}360.0$ ft²-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 0.0$ ft²-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 18{,}360.0$ ft²-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$= 1.6$ p

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$= 1.7$ p

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$= 12.0$ s

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$= 12.0$ s

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$= 64.0$ s

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

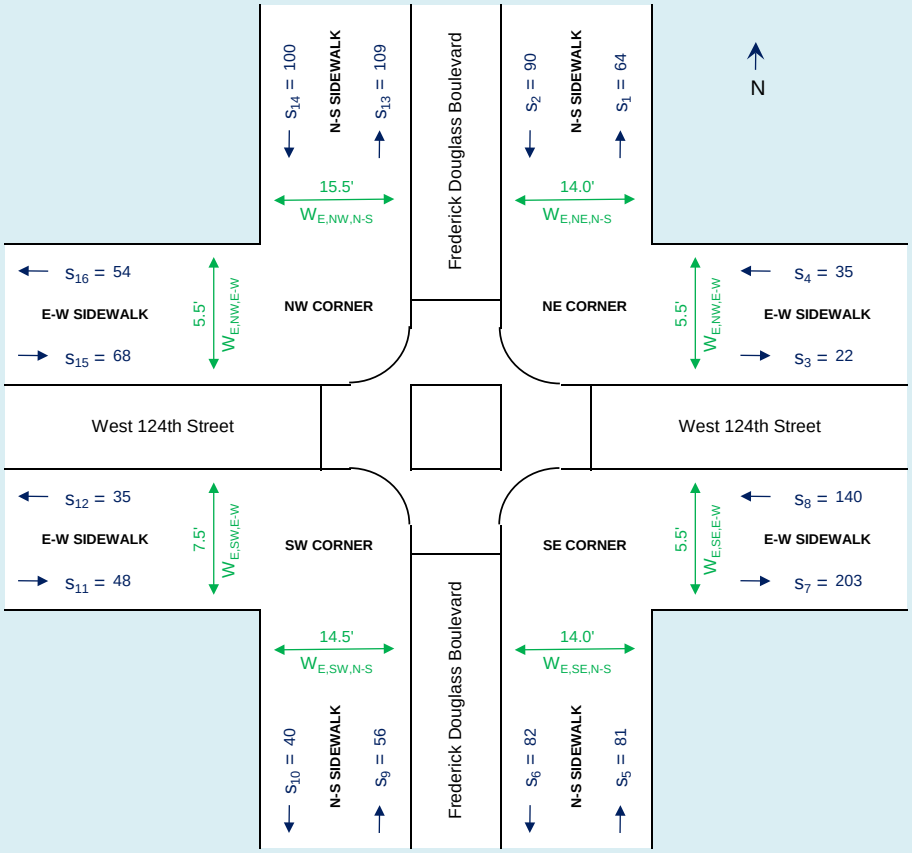
$M_{cw,W}$ = 286.9 sf/p LOS A

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak
Date:	43265	Analysis Year:	2021 With-Action

INPUTS



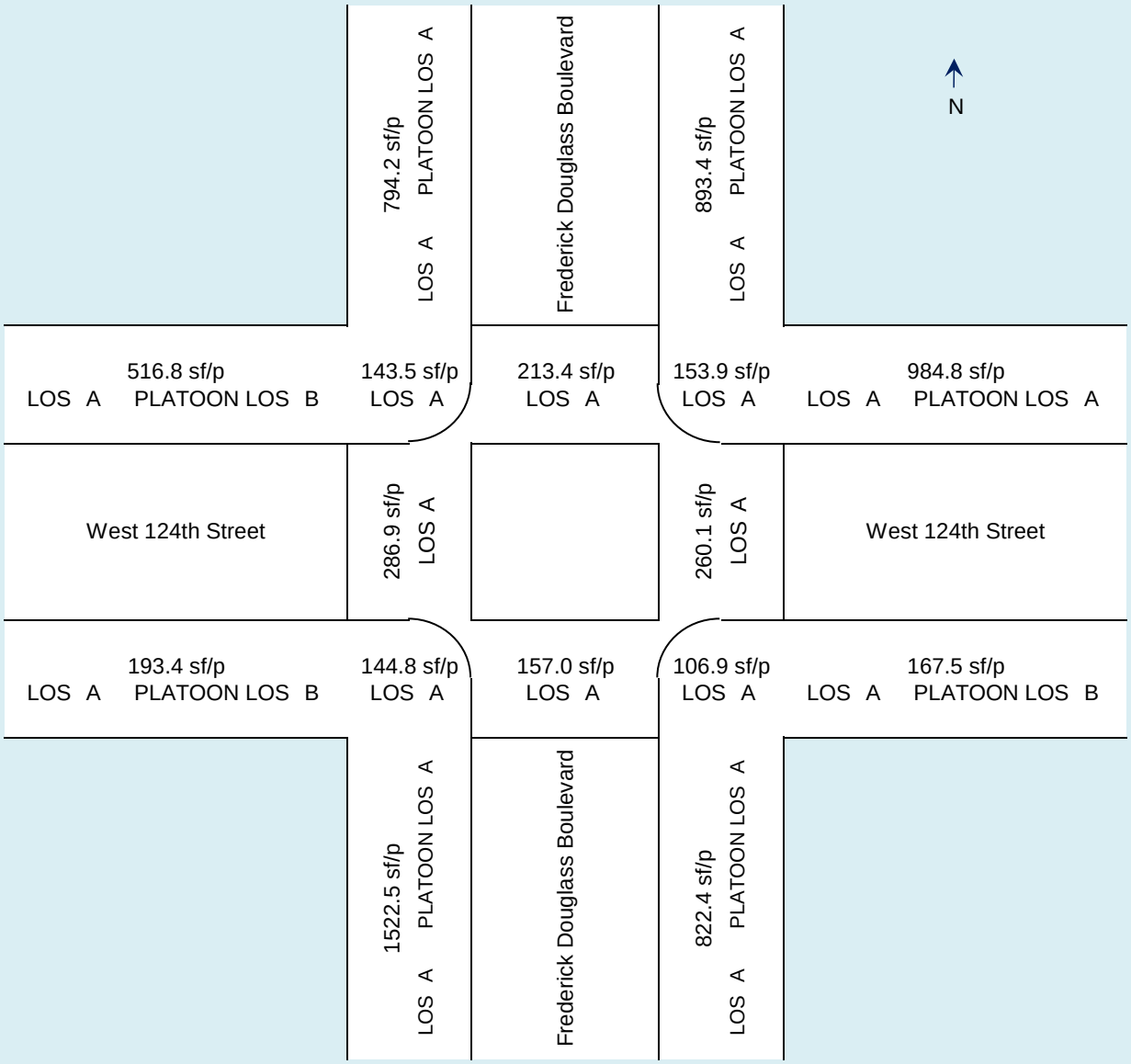
ANALYSIS

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	64	154	0.78	19.5	5.5	14.0	0.2	3.5	3.5	893.4	A	A
		s_2	90											
	E-W	s_3	22	57	0.81	10.0	4.5	5.5	0.2	3.5	3.5	984.8	A	A
		s_4	35											
SE	N-S	s_5	81	163	0.76	19.5	5.5	14.0	0.3	3.5	3.5	822.4	A	A
		s_6	82											
	E-W	s_7	203	343	0.83	10.0	4.5	5.5	1.3	3.5	3.5	167.5	A	B
		s_8	140											
SW	N-S	s_9	56	96	0.80	20.0	5.5	14.5	0.1	3.5	3.5	1522.5	A	A
		s_{10}	40											
	E-W	s_{11}	48	83	0.17	12.0	4.5	7.5	1.1	3.5	3.5	193.4	A	B
		s_{12}	35											
NW	N-S	s_{13}	109	209	0.85	21.0	5.5	15.5	0.3	3.5	3.5	794.2	A	A
		s_{14}	100											
	E-W	s_{15}	68	122	0.91	10.0	4.5	5.5	0.4	3.5	3.5	516.8	A	B
		s_{16}	54											

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Frederick Douglass Boulevard
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak
Date:	43265	Analysis Year:	2021 With-Action

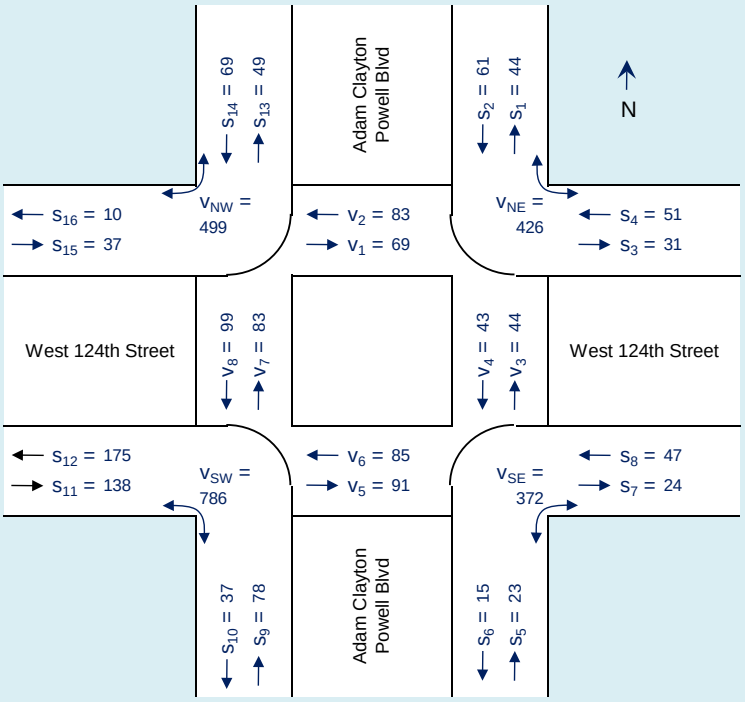


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak Hour
Date:	14-Jun-18	Analysis Year:	2021 With-Action

PEDESTRIAN PEAK HOUR VOLUMES

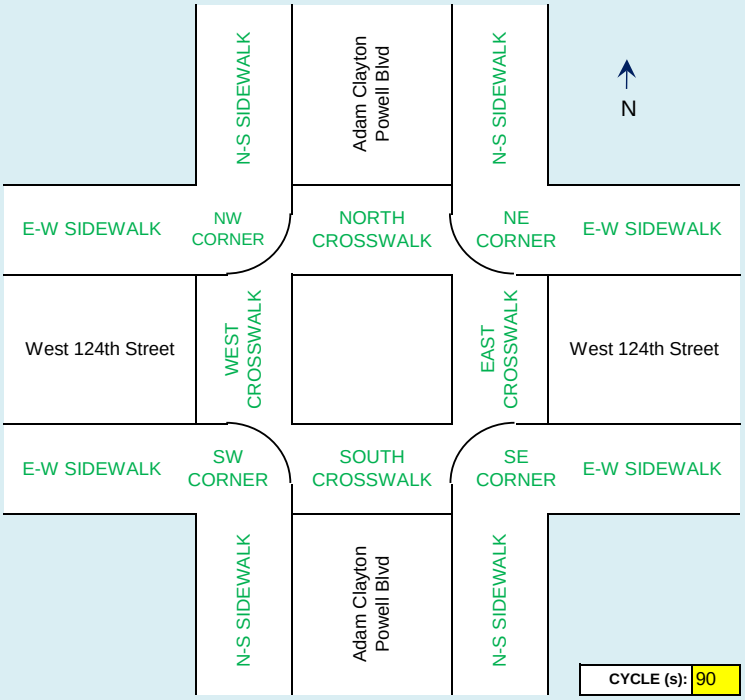


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	s_1	44	0.56
		s_2	61	
	E-W	s_3	31	0.66
		s_4	51	
SE	N-S	s_5	23	0.71
		s_6	15	
	E-W	s_7	24	0.65
		s_8	47	
SW	N-S	s_9	78	0.59
		s_{10}	37	
	E-W	s_{11}	138	0.63
		s_{12}	175	
NW	N-S	s_{13}	49	0.46
		s_{14}	69	
	E-W	s_{15}	37	0.52
		s_{16}	10	

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	v_1	69	0.60
	v_2	83	0.73
E	v_3	44	0.48
	v_4	43	0.52
S	v_5	91	0.72
	v_6	85	0.78
W	v_7	83	0.64
	v_8	99	0.55

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	v_{NE}	426	0.62
SE	v_{SE}	372	0.76
SW	v_{SW}	786	0.69
NW	v_{NW}	499	0.57

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	23.0	5.5	3.5
	E-W	10.0	3.5	3.5
SE	N-S	23.0	5.5	3.5
	E-W	10.0	3.5	3.5
SW	N-S	22.0	8.0	3.5
	E-W	10.0	3.5	3.5
NW	N-S	22.0	8.0	3.5
	E-W	10.0	3.5	3.5

* 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	100.0	13.0	3.5	7	28	30	65	3	4
E	30.0	20.0	3.5	25	7	30	62	19	31
S	100.0	12.0	3.5	7	28	30	65	3	5
W	30.0	16.0	3.5	25	7	30	62	9	6

* 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	23.0	10.0	4.00
	E-W	12.0		
SE	N-S	23.0	9.0	4.00
	E-W	12.0		
SW	N-S	23.0	10.0	4.00
	E-W	12.0		
NW	N-S	23.0	10.0	4.00
	E-W	12.0		

* Override if corner width is different than sidewalk width.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak Hour
Date:	43265	Analysis Year:	2021 With-Action

INPUTS

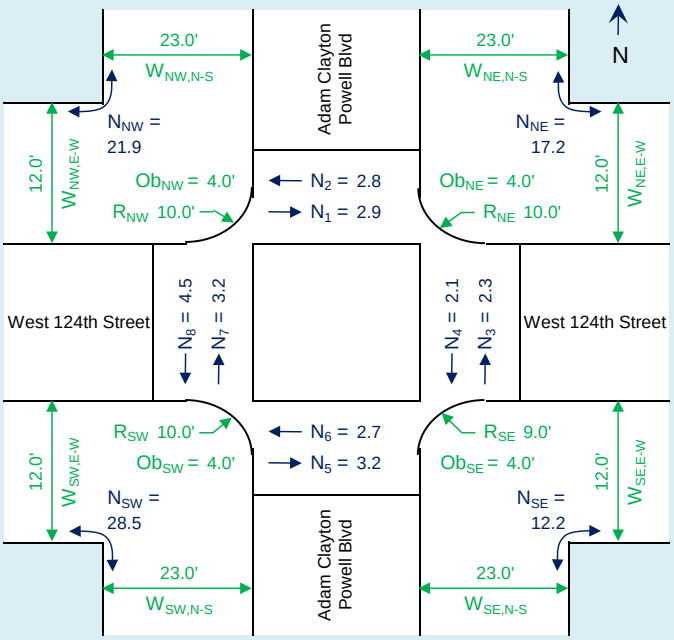
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 69	0.6	N_1 = 2.9
v_2 = 83	0.7	N_2 = 2.8
v_3 = 44	0.5	N_3 = 2.3
v_4 = 43	0.5	N_4 = 2.1
v_5 = 91	0.7	N_5 = 3.2
v_6 = 85	0.8	N_6 = 2.7
v_7 = 83	0.6	N_7 = 3.2
v_8 = 99	0.6	N_8 = 4.5
v_{NE} = 426	0.6	N_{NE} = 17.2
v_{SE} = 372	0.8	N_{SE} = 12.2
v_{SW} = 786	0.7	N_{SW} = 28.5
v_{NW} = 499	0.6	N_{NW} = 21.9

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	7	$g_{Walk,N}$ = 11
E	25	$g_{Walk,E}$ = 29
S	7	$g_{Walk,S}$ = 11
W	25	$g_{Walk,W}$ = 29

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ 22,545.0 ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 99.7 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} = 93.0 \text{ s}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ 21,581.5 ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = 152.7 sf/ped LOS A

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ 22,545.0 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 98.2 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 42.7 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ 21,840.6 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 200.4 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ 22,545.0 ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 109.6 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} = 67.0 \text{ s}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ 21,662.1 ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = 128.6 sf/ped LOS A

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 22,912.7 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 94.5 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 47.4 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 22,203.5 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 246.9 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak Hour
Date:	43265	Analysis Year:	2021 With-Action

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 69	0.6	N_1 = 2.9
v_2 = 83	0.73	N_2 = 2.8
v_3 = 44	0.48	N_3 = 2.3
v_4 = 43	0.52	N_4 = 2.1
v_5 = 91	0.72	N_5 = 3.2
v_6 = 85	0.78	N_6 = 2.7
v_7 = 83	0.64	N_7 = 3.2
v_8 = 99	0.55	N_8 = 4.5

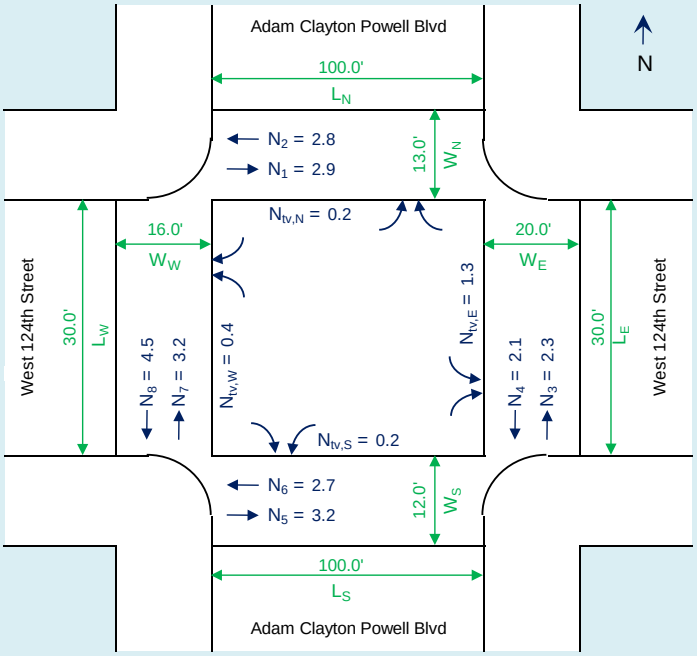
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ = 4	$N_{tv,N}$ = 0.2
$v_{rt,N}$ = 3	
$v_{lt,perm,E}$ = 31	$N_{tv,E}$ = 1.3
$v_{rt,E}$ = 19	
$v_{lt,perm,S}$ = 5	$N_{tv,S}$ = 0.2
$v_{rt,S}$ = 3	
$v_{lt,perm,W}$ = 6	$N_{tv,W}$ = 0.4
$v_{rt,W}$ = 9	

WALKING SPEED & CROSSING TIME

CROSS-WALK	S_p (ft/s)	WALK (s)	g_{Walk} = WALK + 4 (s)
N	3.5	7	$g_{Walk,N}$ = 11
E	3.5	25	$g_{Walk,E}$ = 29
S	3.5	7	$g_{Walk,S}$ = 11
W	3.5	25	$g_{Walk,W}$ = 29

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 14{,}300.0$ ft²-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 91.0$ ft²-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 14{,}209.0$ ft²-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 2.5$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 2.5$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 32.3$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 32.3$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 184.3$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 77.1 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 17{,}400.0$ ft²-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 1{,}000.0$ ft²-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 16{,}400.0$ ft²-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 1.6$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 1.4$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 12.0$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 12.0$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 52.2$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 314.3 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 13{,}200.0$ ft²-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 96.0$ ft²-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 13{,}104.0$ ft²-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$= 2.8$ p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$= 2.4$ p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$= 32.4$ s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$= 32.3$ s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$= 190.4$ s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = 68.8 sf/p LOS A

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 13{,}920.0$ ft²-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 240.0$ ft²-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 13{,}680.0$ ft²-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$= 2.2$ p

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$= 3.1$ p

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$= 12.1$ s

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$= 12.3$ s

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$= 94.7$ s

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

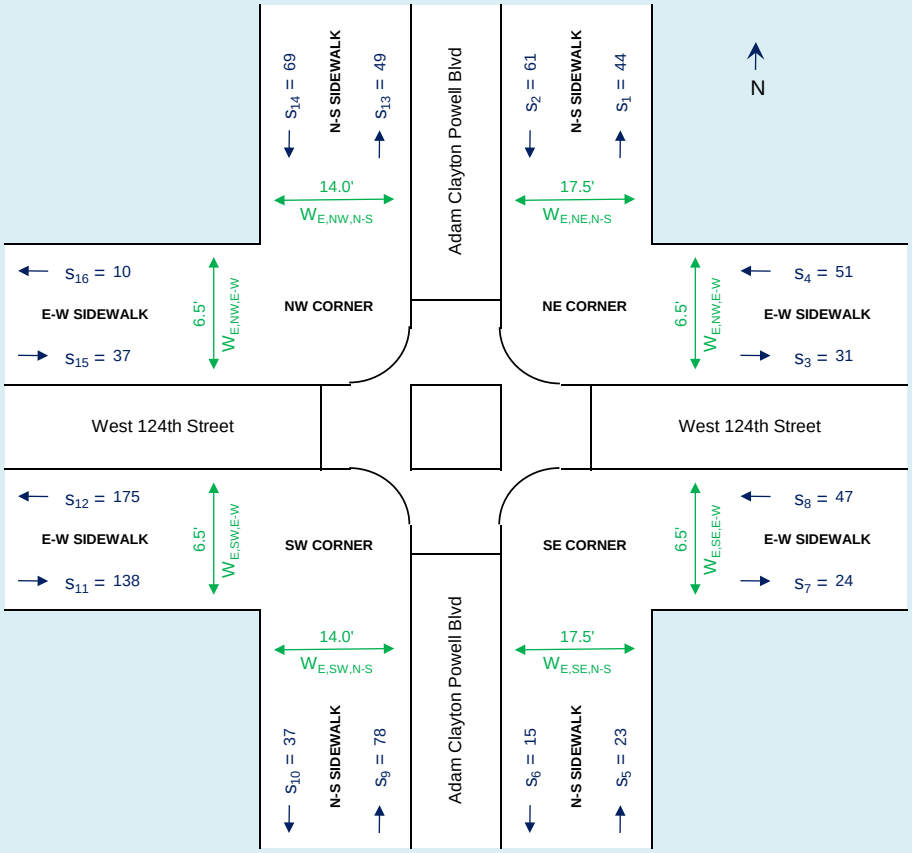
$M_{cw,W}$ = 144.5 sf/p LOS A

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak Hour
Date:	43265	Analysis Year:	2021 With-Action

INPUTS



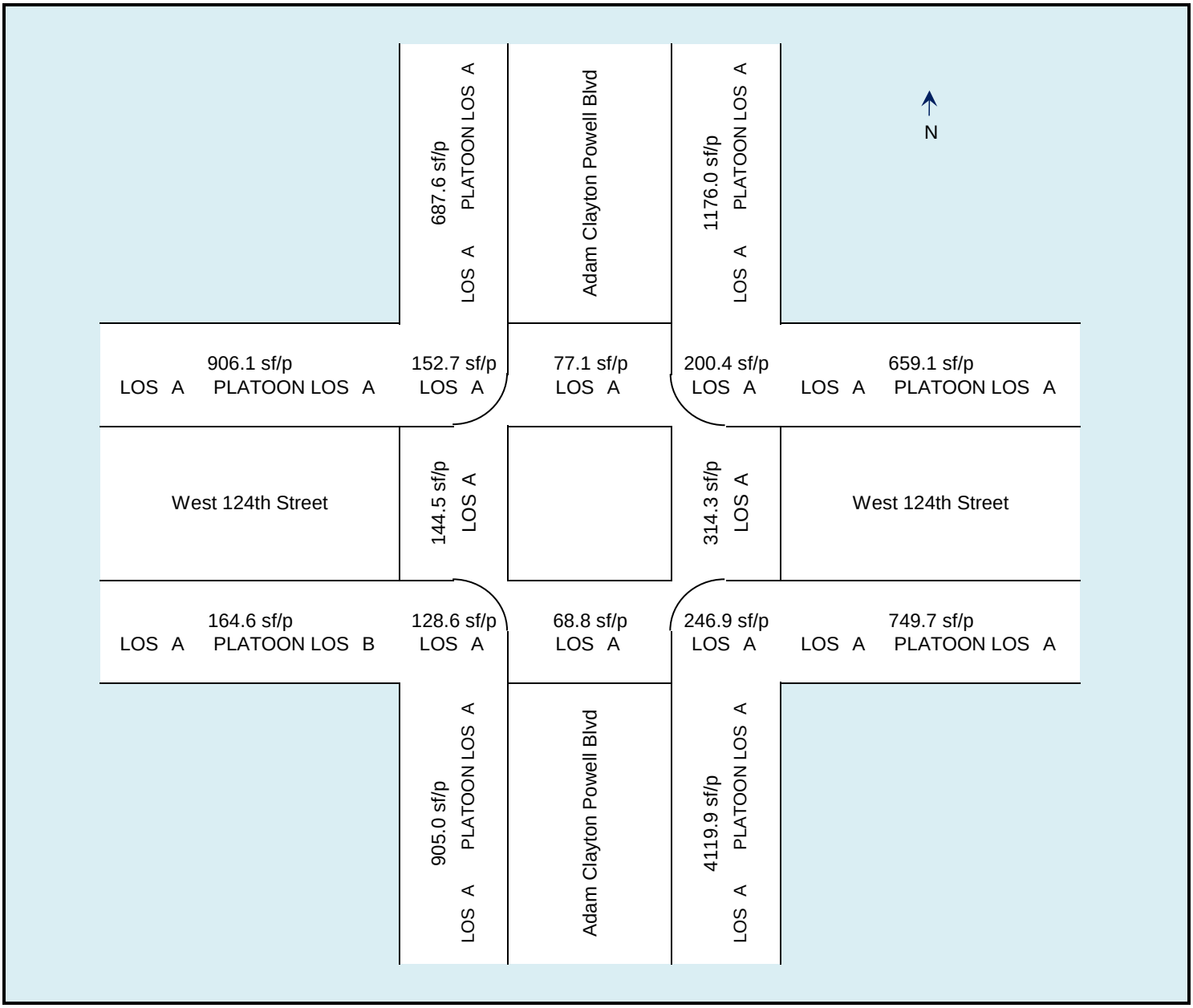
ANALYSIS

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	44	105	0.56	23.0	5.5	17.5	0.2	3.5	3.5	1176.0	A	A
		S_2	61											
	E-W	S_3	31	82	0.66	10.0	3.5	6.5	0.3	3.5	3.5	659.1	A	A
		S_4	51											
SE	N-S	S_5	23	38	0.71	23.0	5.5	17.5	0.1	3.5	3.5	4119.9	A	A
		S_6	15											
	E-W	S_7	24	71	0.65	10.0	3.5	6.5	0.3	3.5	3.5	749.7	A	A
		S_8	47											
SW	N-S	S_9	78	115	0.59	22.0	8.0	14.0	0.2	3.5	3.5	905.0	A	A
		S_{10}	37											
	E-W	S_{11}	138	313	0.63	10.0	3.5	6.5	1.3	3.5	3.5	164.6	A	B
		S_{12}	175											
NW	N-S	S_{13}	49	118	0.46	22.0	8.0	14.0	0.3	3.5	3.5	687.6	A	A
		S_{14}	69											
	E-W	S_{15}	37	47	0.52	10.0	3.5	6.5	0.2	3.5	3.5	906.1	A	A
		S_{16}	10											

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	AM Peak Hour
Date:	43265	Analysis Year:	2021 With-Action

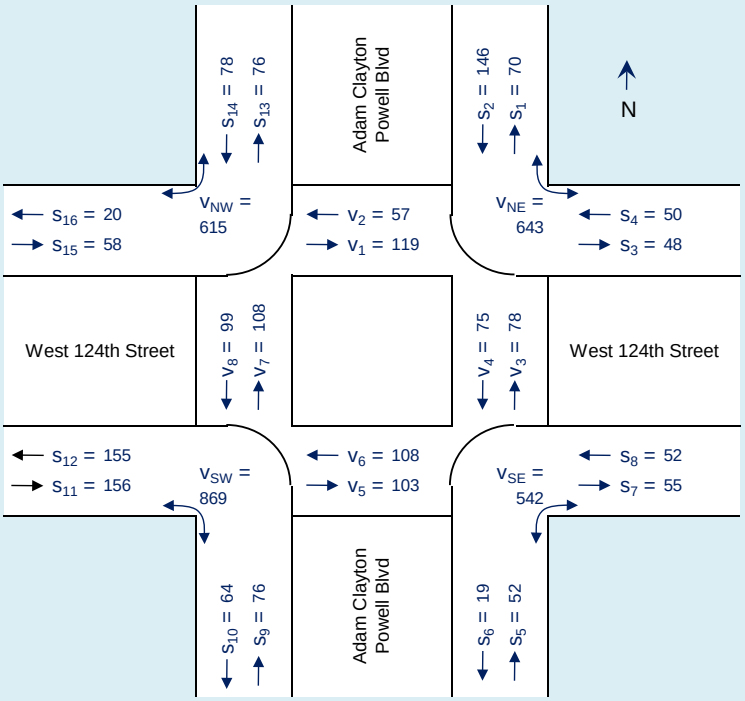


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Mid Day Peak Hour
Date:	14-Jun-18	Analysis Year:	2021 With-Action

PEDESTRIAN PEAK HOUR VOLUMES

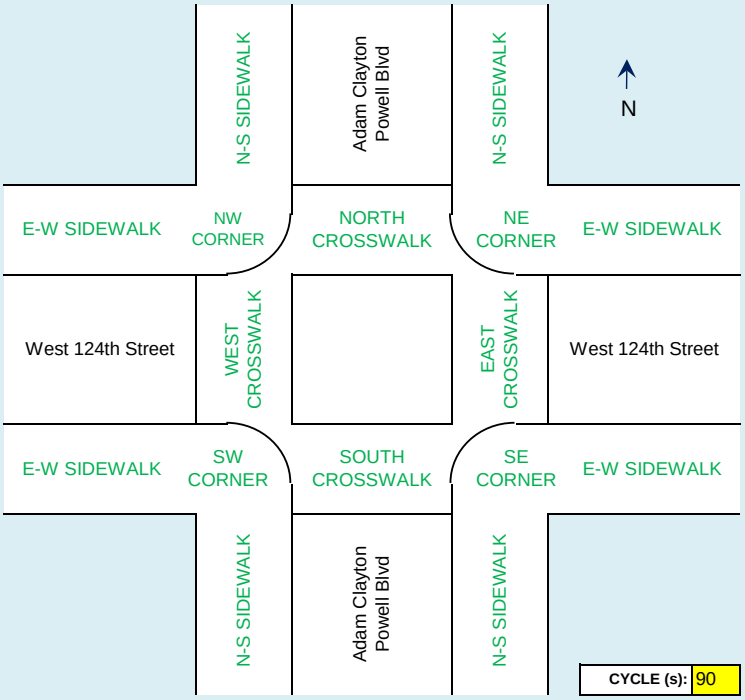


SIDEWALKS				
CORNER	MOVEMENT		VOL (p/hr)	PHF
NE	N-S	s_1	70	0.71
		s_2	146	
	E-W	s_3	48	0.59
		s_4	50	
SE	N-S	s_5	52	0.85
		s_6	19	
	E-W	s_7	55	0.63
		s_8	52	
SW	N-S	s_9	76	0.75
		s_{10}	64	
	E-W	s_{11}	156	0.58
		s_{12}	155	
NW	N-S	s_{13}	76	0.65
		s_{14}	78	
	E-W	s_{15}	58	0.82
		s_{16}	20	

CROSSWALKS			
CROSS-WALK	MOVEMENT	VOL (p/hr)	PHF
N	v_1	119	0.93
	v_2	57	0.88
E	v_3	78	0.68
	v_4	75	0.70
S	v_5	103	0.79
	v_6	108	0.69
W	v_7	108	0.60
	v_8	99	0.85

CORNERS			
CORNER	MOVEMENT	VOL (p/hr)	PHF
NE	v_{NE}	643	0.80
SE	v_{SE}	542	0.78
SW	v_{SW}	869	0.65
NW	v_{NW}	615	0.81

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	23.0	5.5	3.5
	E-W	10.0	3.5	3.5
SE	N-S	23.0	5.5	3.5
	E-W	10.0	3.5	3.5
SW	N-S	22.0	8.0	3.5
	E-W	10.0	3.5	3.5
NW	N-S	22.0	8.0	3.5
	E-W	10.0	3.5	3.5

* 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	100.0	13.0	3.5	7	28	30	65	11	2
E	30.0	20.0	3.5	25	7	30	62	16	35
S	100.0	12.0	3.5	7	28	30	65	5	1
W	30.0	16.0	3.5	25	7	30	62	0	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	23.0	10.0	4.00
	E-W	12.0		
SE	N-S	23.0	9.0	4.00
	E-W	12.0		
SW	N-S	23.0	10.0	4.00
	E-W	12.0		
NW	N-S	23.0	10.0	4.00
	E-W	12.0		

* Override if corner width is different than sidewalk width.

CORNER WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Mid Day Peak Hour
Date:	43265	Analysis Year:	2021 With-Action

INPUTS

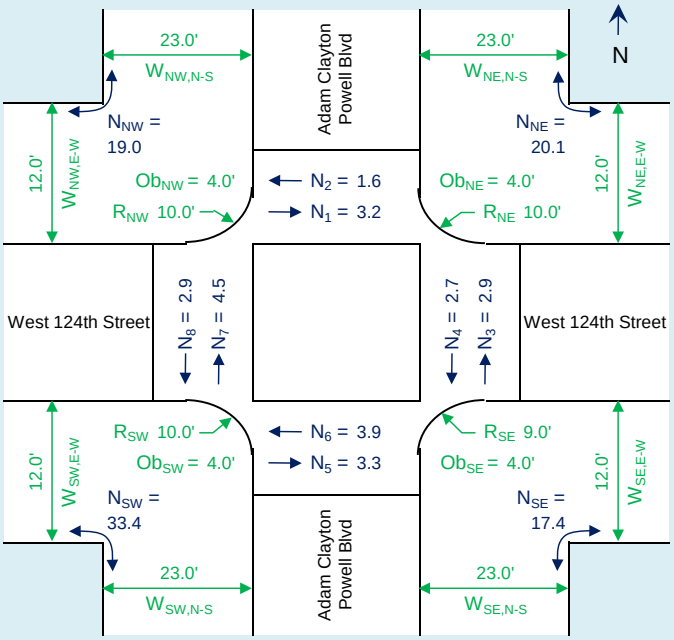
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 119	0.9	N_1 = 3.2
v_2 = 57	0.9	N_2 = 1.6
v_3 = 78	0.7	N_3 = 2.9
v_4 = 75	0.7	N_4 = 2.7
v_5 = 103	0.8	N_5 = 3.3
v_6 = 108	0.7	N_6 = 3.9
v_7 = 108	0.6	N_7 = 4.5
v_8 = 99	0.9	N_8 = 2.9
v_{NE} = 643	0.8	N_{NE} = 20.1
v_{SE} = 542	0.8	N_{SE} = 17.4
v_{SW} = 869	0.7	N_{SW} = 33.4
v_{NW} = 615	0.8	N_{NW} = 19.0

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	7	$g_{Walk,N}$ = 11
E	25	$g_{Walk,E}$ = 29
S	7	$g_{Walk,S}$ = 11
W	25	$g_{Walk,W}$ = 29

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ 22,545.0 ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 110.9 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} = 60.2 \text{ s}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ 21,689.5 ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = 173.7 sf/ped LOS A

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ 22,545.0 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 56.1 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 55.4 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ 21,987.4 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 180.5 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ 22,545.0 ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 113.0 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} = 93.0 \text{ s}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ 21,514.8 ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = 112.0 sf/ped LOS A

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 22,912.7 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 135.7 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 59.3 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 21,937.9 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 182.3 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Mid Day Peak Hour
Date:	43265	Analysis Year:	2021 With-Action

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 119	0.93	N_1 = 3.2
v_2 = 57	0.88	N_2 = 1.6
v_3 = 78	0.68	N_3 = 2.9
v_4 = 75	0.7	N_4 = 2.7
v_5 = 103	0.79	N_5 = 3.3
v_6 = 108	0.69	N_6 = 3.9
v_7 = 108	0.6	N_7 = 4.5
v_8 = 99	0.85	N_8 = 2.9

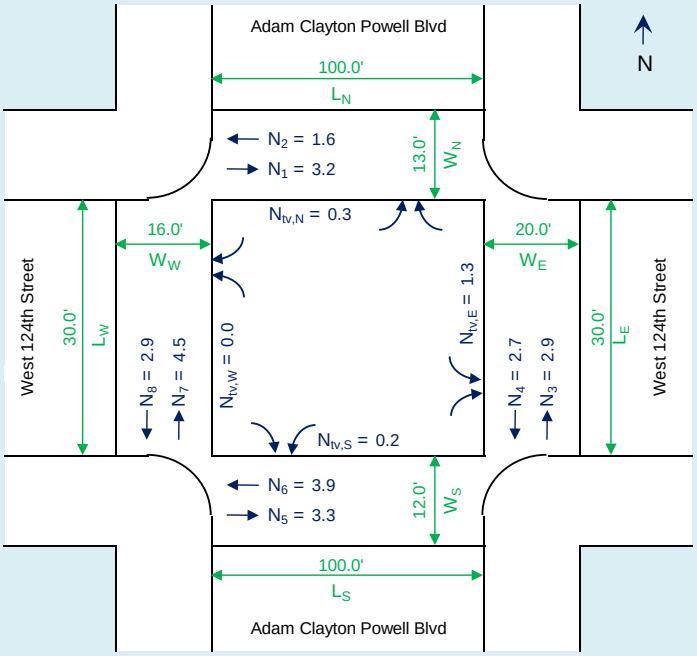
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ = 2	$N_{tv,N}$ = 0.3
$v_{rt,N}$ = 11	
$v_{lt,perm,E}$ = 35	$N_{tv,E}$ = 1.3
$v_{rt,E}$ = 16	
$v_{lt,perm,S}$ = 1	$N_{tv,S}$ = 0.2
$v_{rt,S}$ = 5	
$v_{lt,perm,W}$ = 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	7	$g_{Walk,N}$ = 11
E	3.5	25	$g_{Walk,E}$ = 29
S	3.5	7	$g_{Walk,S}$ = 11
W	3.5	25	$g_{Walk,W}$ = 29

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 14{,}300.0$ ft²-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 169.0$ ft²-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 14{,}131.0$ ft²-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 2.8$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 1.4$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 32.4$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 32.1$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 155.4$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 90.9 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 17{,}400.0$ ft²-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 1{,}020.0$ ft²-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 16{,}380.0$ ft²-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 1.9$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 1.8$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 12.0$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 12.0$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 66.7$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 245.6 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 13{,}200.0$ ft²-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 72.0$ ft²-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 13{,}128.0$ ft²-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$= 2.9$ p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$= 3.4$ p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$= 32.4$ s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$= 32.5$ s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$= 233.0$ s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = 56.3 sf/p LOS B

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 13{,}920.0$ ft²-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 0.0$ ft²-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 13{,}920.0$ ft²-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$= 3.1$ p

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$= 2.0$ p

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$= 12.3$ s

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$= 12.1$ s

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$= 90.5$ s

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

$M_{cw,W}$ = 153.8 sf/p LOS A

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
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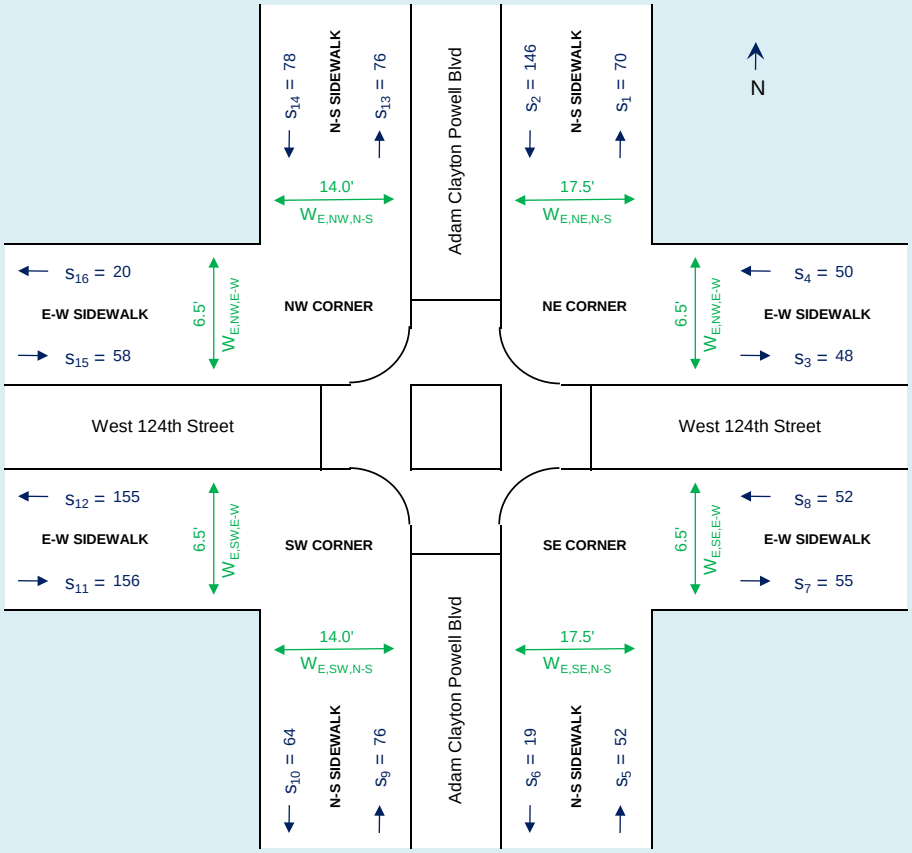
Analyst:	Equity Environmental Engineering	Time Period:	Mid Day Peak Hour
Date:	43265	Analysis Year:	2021 With-Action

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	70	216	0.71	23.0	5.5	17.5	0.3	3.5	3.5	724.7	A	A
		S_2	146											
	E-W	S_3	48	98	0.59	10.0	3.5	6.5	0.4	3.5	3.5	493.0	A	B
		S_4	50											
SE	N-S	S_5	52	71	0.85	23.0	5.5	17.5	0.1	3.5	3.5	2639.8	A	A
		S_6	19											
	E-W	S_7	55	107	0.63	10.0	3.5	6.5	0.4	3.5	3.5	482.1	A	B
		S_8	52											
SW	N-S	S_9	76	140	0.75	22.0	8.0	14.0	0.2	3.5	3.5	945.0	A	A
		S_{10}	64											
	E-W	S_{11}	156	311	0.58	10.0	3.5	6.5	1.4	3.5	3.5	152.5	A	B
		S_{12}	155											
NW	N-S	S_{13}	76	154	0.65	22.0	8.0	14.0	0.3	3.5	3.5	744.5	A	A
		S_{14}	78											
	E-W	S_{15}	58	78	0.82	10.0	3.5	6.5	0.2	3.5	3.5	861.0	A	A
		S_{16}	20											

LOS SUMMARY MAP

IDENTIFYING INFORMATION

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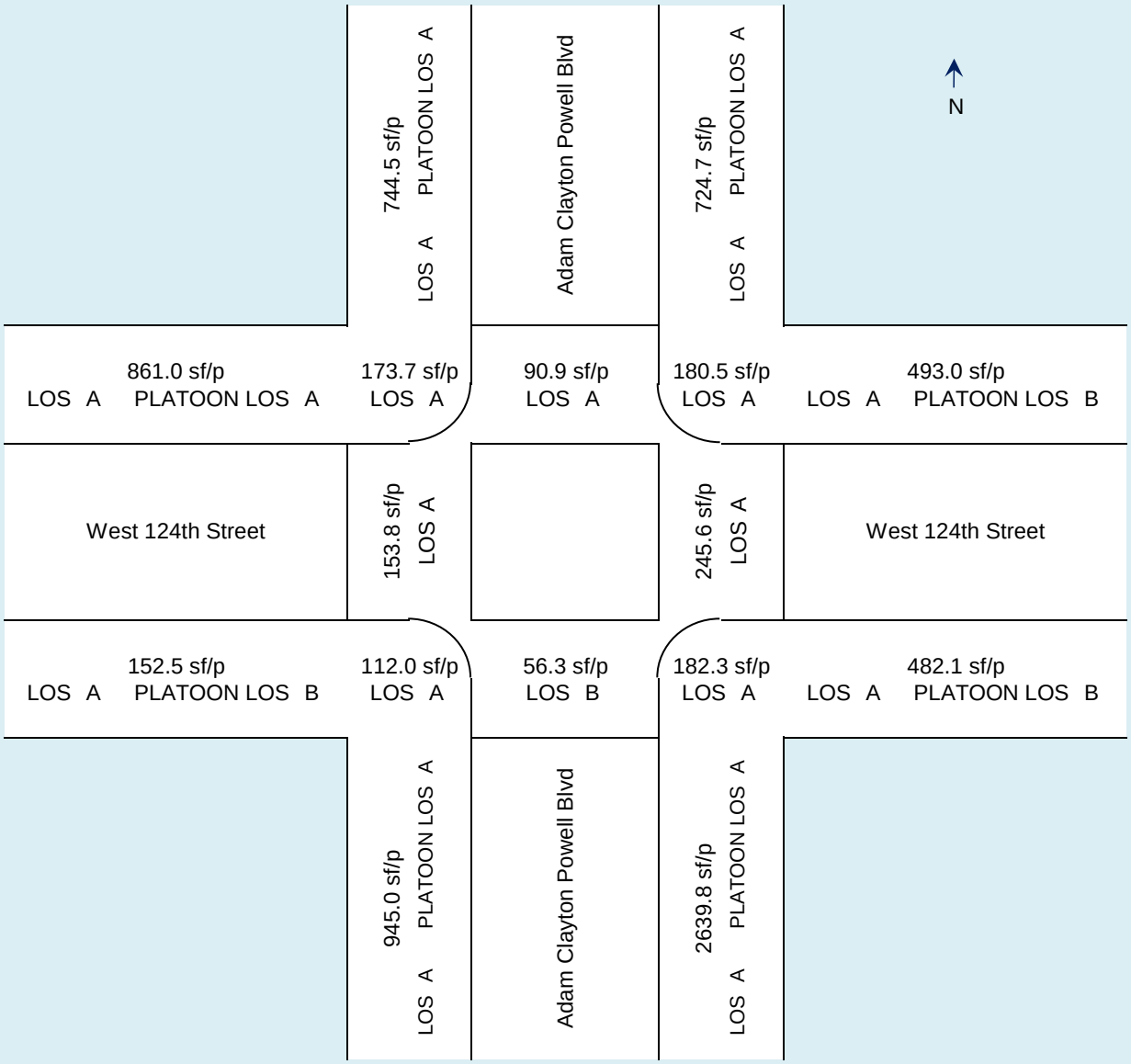
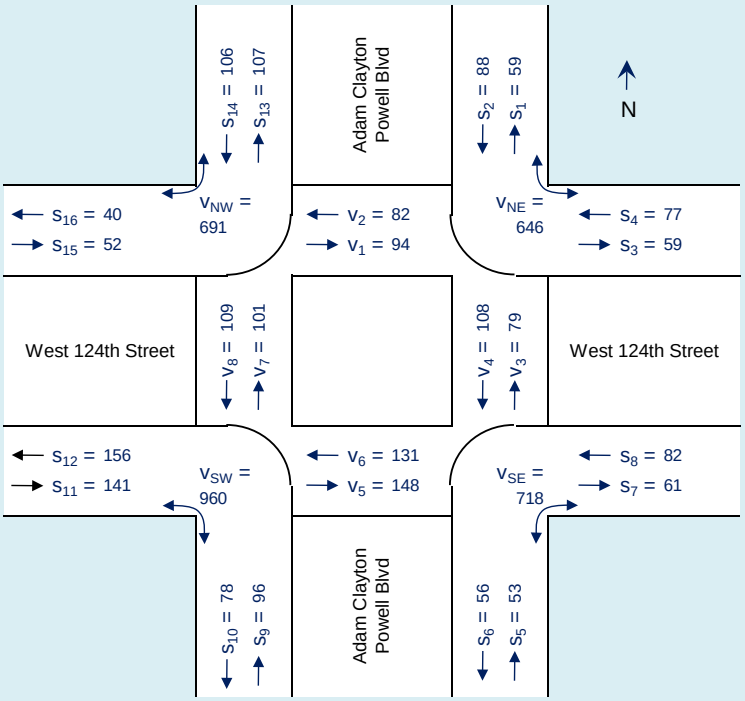


PEDESTRIAN LOS WORKSHEET - INPUT DATA

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak Hour
Date:	14-Jun-18	Analysis Year:	2021 With-Action

PEDESTRIAN PEAK HOUR VOLUMES

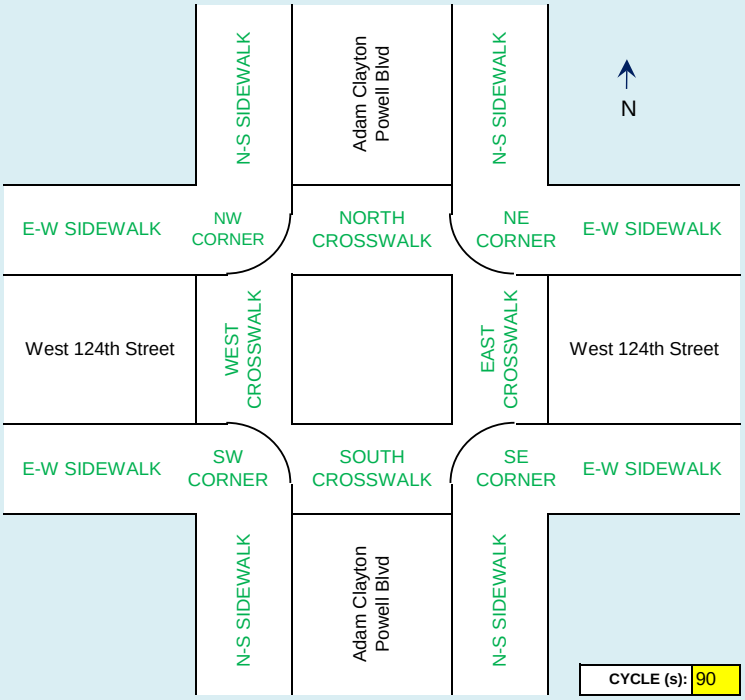


SIDEWALKS				
CORNER	MOVE-MENT		VOL (p/hr)	PHF
NE	N-S	S_1	59	0.68
		S_2	88	
	E-W	S_3	59	0.58
		S_4	77	
SE	N-S	S_5	53	0.50
		S_6	56	
	E-W	S_7	61	0.63
		S_8	82	
SW	N-S	S_9	96	0.80
		S_{10}	78	
	E-W	S_{11}	141	0.16
		S_{12}	156	
NW	N-S	S_{13}	107	0.63
		S_{14}	106	
	E-W	S_{15}	52	0.57
		S_{16}	40	

CROSSWALKS			
CROSS-WALK	MOVE-MENT	VOL (p/hr)	PHF
N	V_1	94	0.78
	V_2	82	0.80
E	V_3	79	0.48
	V_4	108	0.58
S	V_5	148	0.81
	V_6	131	0.75
W	V_7	101	0.79
	V_8	109	0.52

CORNERS			
CORNER	MOVE-MENT	VOL (p/hr)	PHF
NE	V_{NE}	646	0.77
SE	V_{SE}	718	0.63
SW	V_{SW}	960	0.81
NW	V_{NW}	691	0.72

GEOMETRY, SIGNAL TIMING, AND CONFLICTING VEHICLES



CYCLE (s): 90

SIDEWALKS				
CORNER	SIDEWALK	TOTAL WIDTH, W_T (ft)	OBSTRUC-TIONS*, W_O (ft)	FREE FLOW WALK SPEED, S_{pf} (ft/s)
NE	N-S	23.0	5.5	3.5
	E-W	10.0	3.5	3.5
SE	N-S	23.0	5.5	3.5
	E-W	10.0	3.5	3.5
SW	N-S	22.0	8.0	3.5
	E-W	10.0	3.5	3.5
NW	N-S	22.0	8.0	3.5
	E-W	10.0	3.5	3.5

* 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	100.0	13.0	3.5	7	28	30	65	0	4
E	30.0	20.0	3.5	25	7	30	62	18	12
S	100.0	12.0	3.5	7	28	30	65	5	1
W	30.0	16.0	3.5	25	7	30	62	0	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)	OBSTRUC-TIONS, Ob (ft^2)
NE	N-S	23.0	10.0	4.00
	E-W	12.0		
SE	N-S	23.0	9.0	4.00
	E-W	12.0		
SW	N-S	23.0	10.0	4.00
	E-W	12.0		
NW	N-S	23.0	10.0	4.00
	E-W	12.0		

* Override if corner width is different than sidewalk width.

CORNER WORKSHEET

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INPUTS

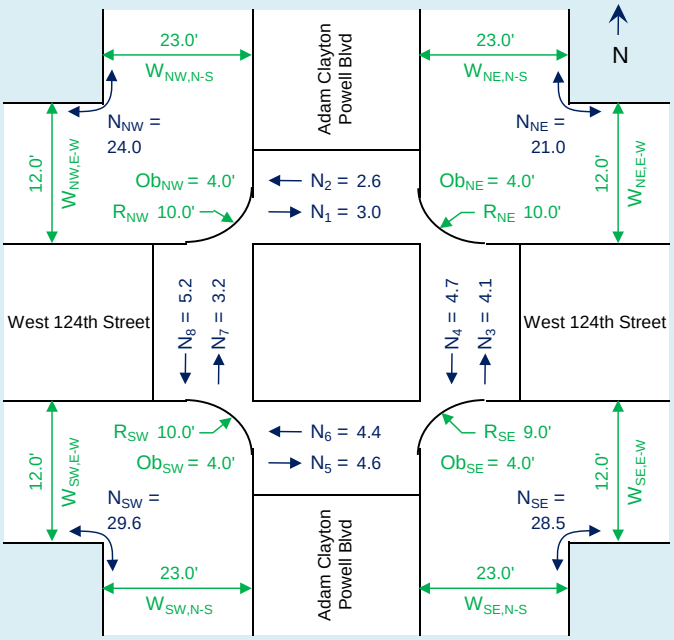
PED VOLUMES PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 94	0.8	N_1 = 3.0
v_2 = 82	0.8	N_2 = 2.6
v_3 = 79	0.5	N_3 = 4.1
v_4 = 108	0.6	N_4 = 4.7
v_5 = 148	0.8	N_5 = 4.6
v_6 = 131	0.8	N_6 = 4.4
v_7 = 101	0.8	N_7 = 3.2
v_8 = 109	0.5	N_8 = 5.2
v_{NE} = 646	0.8	N_{NE} = 21.0
v_{SE} = 718	0.6	N_{SE} = 28.5
v_{SW} = 960	0.8	N_{SW} = 29.6
v_{NW} = 691	0.7	N_{NW} = 24.0

CROSSING TIME

CROSS-WALK	WALK (s)	g_{Walk} = WALK + 4 (s)
N	7	$g_{Walk,N}$ = 11
E	25	$g_{Walk,E}$ = 29
S	7	$g_{Walk,S}$ = 11
W	25	$g_{Walk,W}$ = 29

C = 90



ANALYSIS

NORTHWEST CORNER

$TS_{corner,NW} = C(W_{NW,N-S}W_{NW,E-W} - 0.215R_{NW}^2 - Ob_{NW}) =$ 22,545.0 ft^2-s

$$Q_{t,NW,N} = \frac{N_1(C - g_{Walk,N})^2}{2C} = 104.5 \text{ s}$$

$$Q_{t,NW,W} = \frac{N_8(C - g_{Walk,W})^2}{2C} = 108.3 \text{ s}$$

$TS_{c,NW} = TS_{corner,NW} - 5.0(Q_{t,NW,N} + Q_{t,NW,W}) =$ 21,481.0 ft^2-s

$$M_{corner,NW} = \frac{TS_{c,NW}}{4.0(N_7 + N_8 + N_1 + N_2 + N_{NW})}$$

$M_{corner,NW}$ = 141.3 sf/ped LOS A

NORTHEAST CORNER

$TS_{corner,NW} = C(W_{NE,N-S}W_{NE,E-W} - 0.215R_{NE}^2 - Ob_{NE}) =$ 22,545.0 ft^2-s

$$Q_{t,NE,N} = \frac{N_2(C - g_{Walk,N})^2}{2C} = 88.8 \text{ s}$$

$$Q_{t,NE,E} = \frac{N_4(C - g_{Walk,E})^2}{2C} = 96.2 \text{ s}$$

$TS_{c,NE} = TS_{corner,NE} - 5.0(Q_{t,NE,N} + Q_{t,NE,E}) =$ 21,619.6 ft^2-s

$$M_{corner,NE} = \frac{TS_{c,NE}}{4.0(N_1 + N_2 + N_3 + N_4 + N_{NE})}$$

$M_{corner,NE}$ = 153.0 sf/ped LOS A

SOUTHWEST CORNER

$TS_{corner,SW} = C(W_{SW,N-S}W_{SW,E-W} - 0.215R_{SW}^2 - Ob_{SW}) =$ 22,545.0 ft^2-s

$$Q_{t,SW,S} = \frac{N_5(C - g_{Walk,S})^2}{2C} = 158.4 \text{ s}$$

$$Q_{t,SW,W} = \frac{N_7(C - g_{Walk,W})^2}{2C} = 66.1 \text{ s}$$

$TS_{c,SW} = TS_{corner,SW} - 5.0(Q_{t,SW,S} + Q_{t,SW,W}) =$ 21,422.7 ft^2-s

$$M_{corner,SW} = \frac{TS_{c,SW}}{4.0(N_5 + N_6 + N_7 + N_8 + N_{SW})}$$

$M_{corner,SW}$ = 113.9 sf/ped LOS A

SOUTHEAST CORNER

$TS_{corner,SE} = C(W_{SE,N-S}W_{SE,E-W} - 0.215R_{SE}^2 - Ob_{SE}) =$ 22,912.7 ft^2-s

$$Q_{t,SE,S} = \frac{N_6(C - g_{Walk,S})^2}{2C} = 151.4 \text{ s}$$

$$Q_{t,SE,E} = \frac{N_3(C - g_{Walk,E})^2}{2C} = 85.1 \text{ s}$$

$TS_{c,SE} = TS_{corner,SE} - 5.0(Q_{t,SE,S} + Q_{t,SE,E}) =$ 21,730.4 ft^2-s

$$M_{corner,SE} = \frac{TS_{c,SE}}{4.0(N_3 + N_4 + N_5 + N_6 + N_{SE})}$$

$M_{corner,SE}$ = 117.6 sf/ped LOS A

CROSSWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak Hour
Date:	43265	Analysis Year:	2021 With-Action

INPUTS

PED VOL PER CYCLE

v (p/hr)	PHF	$N = \frac{v\,C}{3600\,PHF}$ (p/cycle)
v_1 = 94	0.78	N_1 = 3.0
v_2 = 82	0.8	N_2 = 2.6
v_3 = 79	0.48	N_3 = 4.1
v_4 = 108	0.58	N_4 = 4.7
v_5 = 148	0.81	N_5 = 4.6
v_6 = 131	0.75	N_6 = 4.4
v_7 = 101	0.79	N_7 = 3.2
v_8 = 109	0.52	N_8 = 5.2

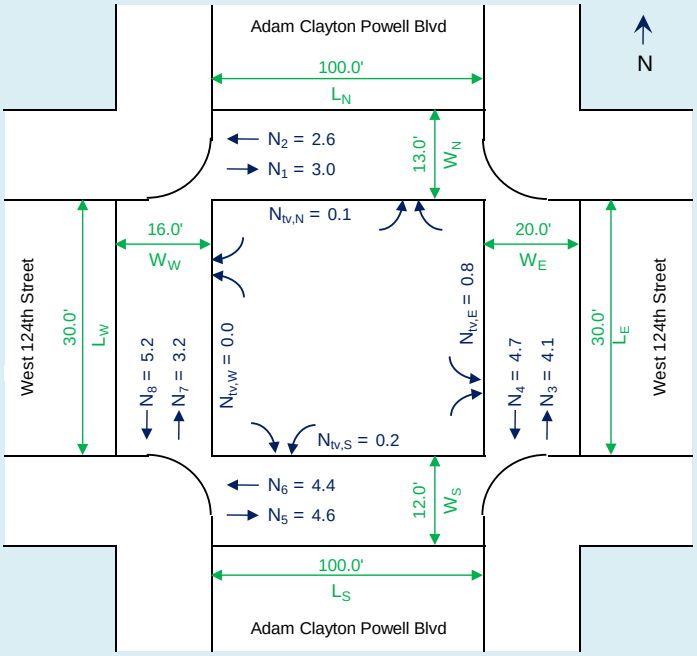
TURNING VOL PER CYCLE

v (veh/hr)	$N_{tv} = \frac{v_{lt,perm} + v_{rt}}{3600} C$ (veh/cycle)
$v_{lt,perm,N}$ = 4	$N_{tv,N}$ = 0.1
$v_{rt,N}$ = 0	
$v_{lt,perm,E}$ = 12	$N_{tv,E}$ = 0.8
$v_{rt,E}$ = 18	
$v_{lt,perm,S}$ = 1	$N_{tv,S}$ = 0.2
$v_{rt,S}$ = 5	
$v_{lt,perm,W}$ = 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	7	$g_{Walk,N}$ = 11
E	3.5	25	$g_{Walk,E}$ = 29
S	3.5	7	$g_{Walk,S}$ = 11
W	3.5	25	$g_{Walk,W}$ = 29

C = 90



ANALYSIS

NORTH CROSSWALK

$TS_{cw,N} = L_N W_N g_{Walk,N}$
$= 14{,}300.0$ ft^2-s

$TS_{tv,N} = 40 N_{tv,N} W_N$
$= 52.0$ ft^2-s

$TS^*_{cw,N} = TS_{cw,N} - TS_{tv,N}$
$= 14{,}248.0$ ft^2-s

$N_{ped,1} = N_1 \frac{C - g_{Walk,N}}{C}$
$= 2.6$ p

$N_{ped,2} = N_2 \frac{C - g_{Walk,N}}{C}$
$= 2.2$ p

$t_{ps,1} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,1}}{Max(W_N,10)}$
$= 32.3$ s

$t_{ps,2} = 3.2 + \frac{L_N}{S_{p,N}} + 2.7 \frac{N_{ped,2}}{Max(W_N,10)}$
$= 32.2$ s

$T_{occ,N} = t_{ps,1} N_1 + t_{ps,2} N_2$
$= 180.0$ s

$M_{cw,N} = \frac{TS^*_{cw,N}}{T_{occ,N}}$

$M_{cw,N}$ = 79.2 sf/p LOS A

EAST CROSSWALK

$TS_{cw,E} = L_E W_E g_{Walk,E}$
$= 17{,}400.0$ ft^2-s

$TS_{tv,E} = 40 N_{tv,E} W_E$
$= 600.0$ ft^2-s

$TS^*_{cw,E} = TS_{cw,E} - TS_{tv,E}$
$= 16{,}800.0$ ft^2-s

$N_{ped,3} = N_3 \frac{C - g_{Walk,E}}{C}$
$= 2.8$ p

$N_{ped,4} = N_4 \frac{C - g_{Walk,E}}{C}$
$= 3.2$ p

$t_{ps,3} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,3}}{Max(W_E,10)}$
$= 12.1$ s

$t_{ps,4} = 3.2 + \frac{L_E}{S_{p,E}} + 2.7 \frac{N_{ped,4}}{Max(W_E,10)}$
$= 12.2$ s

$T_{occ,E} = t_{ps,3} N_3 + t_{ps,4} N_4$
$= 106.8$ s

$M_{cw,E} = \frac{TS^*_{cw,E}}{T_{occ,E}}$

$M_{cw,E}$ = 157.4 sf/p LOS A

SOUTH CROSSWALK

$TS_{cw,S} = L_S W_S g_{Walk,S}$
$= 13{,}200.0$ ft^2-s

$TS_{tv,S} = 40 N_{tv,S} W_S$
$= 72.0$ ft^2-s

$TS^*_{cw,S} = TS_{cw,S} - TS_{tv,S}$
$= 13{,}128.0$ ft^2-s

$N_{ped,5} = N_5 \frac{C - g_{Walk,S}}{C}$
$= 4.0$ p

$N_{ped,6} = N_6 \frac{C - g_{Walk,S}}{C}$
$= 3.8$ p

$t_{ps,5} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,5}}{Max(W_S,10)}$
$= 32.7$ s

$t_{ps,6} = 3.2 + \frac{L_S}{S_{p,S}} + 2.7 \frac{N_{ped,6}}{Max(W_S,10)}$
$= 32.6$ s

$T_{occ,S} = t_{ps,5} N_5 + t_{ps,6} N_6$
$= 291.8$ s

$M_{cw,S} = \frac{TS^*_{cw,S}}{T_{occ,S}}$

$M_{cw,S}$ = 45.0 sf/p LOS B

WEST CROSSWALK

$TS_{cw,W} = L_W W_W g_{Walk,W}$
$= 13{,}920.0$ ft^2-s

$TS_{tv,W} = 40 N_{tv,W} W_W$
$= 0.0$ ft^2-s

$TS^*_{cw,W} = TS_{cw,W} - TS_{tv,W}$
$= 13{,}920.0$ ft^2-s

$N_{ped,7} = N_7 \frac{C - g_{Walk,W}}{C}$
$= 2.2$ p

$N_{ped,8} = N_8 \frac{C - g_{Walk,W}}{C}$
$= 3.6$ p

$t_{ps,7} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,7}}{Max(W_W,10)}$
$= 12.1$ s

$t_{ps,8} = 3.2 + \frac{L_W}{S_{p,W}} + 2.7 \frac{N_{ped,8}}{Max(W_W,10)}$
$= 12.4$ s

$T_{occ,W} = t_{ps,7} N_7 + t_{ps,8} N_8$
$= 103.6$ s

$M_{cw,W} = \frac{TS^*_{cw,W}}{T_{occ,W}}$

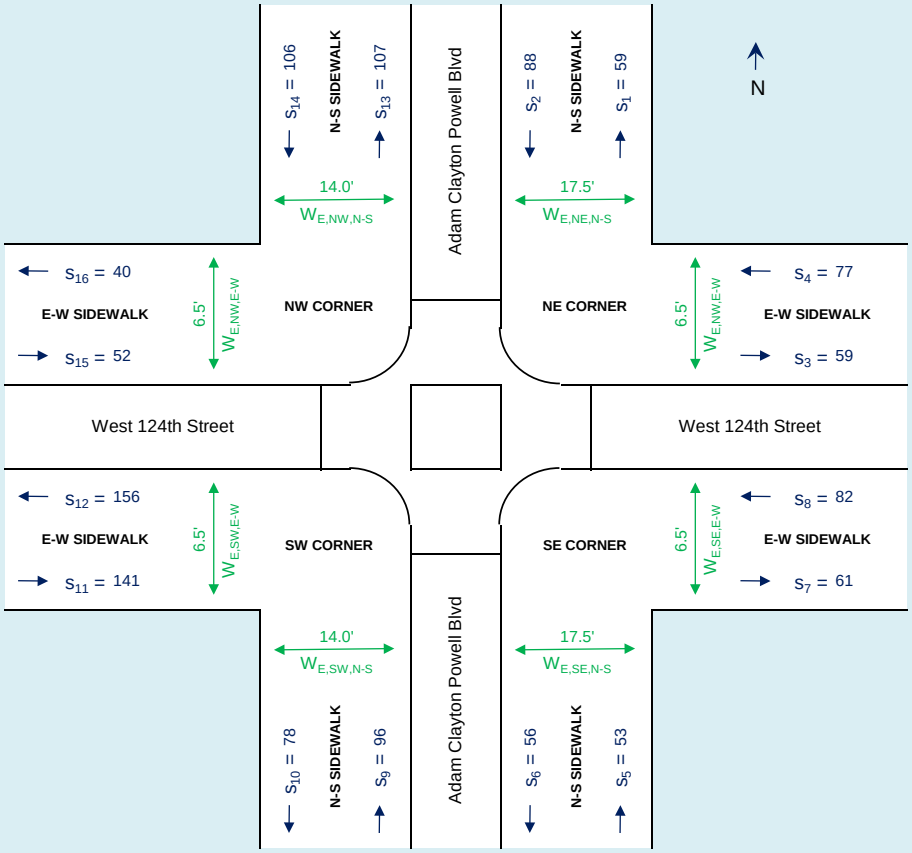
$M_{cw,W}$ = 134.3 sf/p LOS A

SIDEWALK WORKSHEET

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak Hour
Date:	43265	Analysis Year:	2021 With-Action

INPUTS



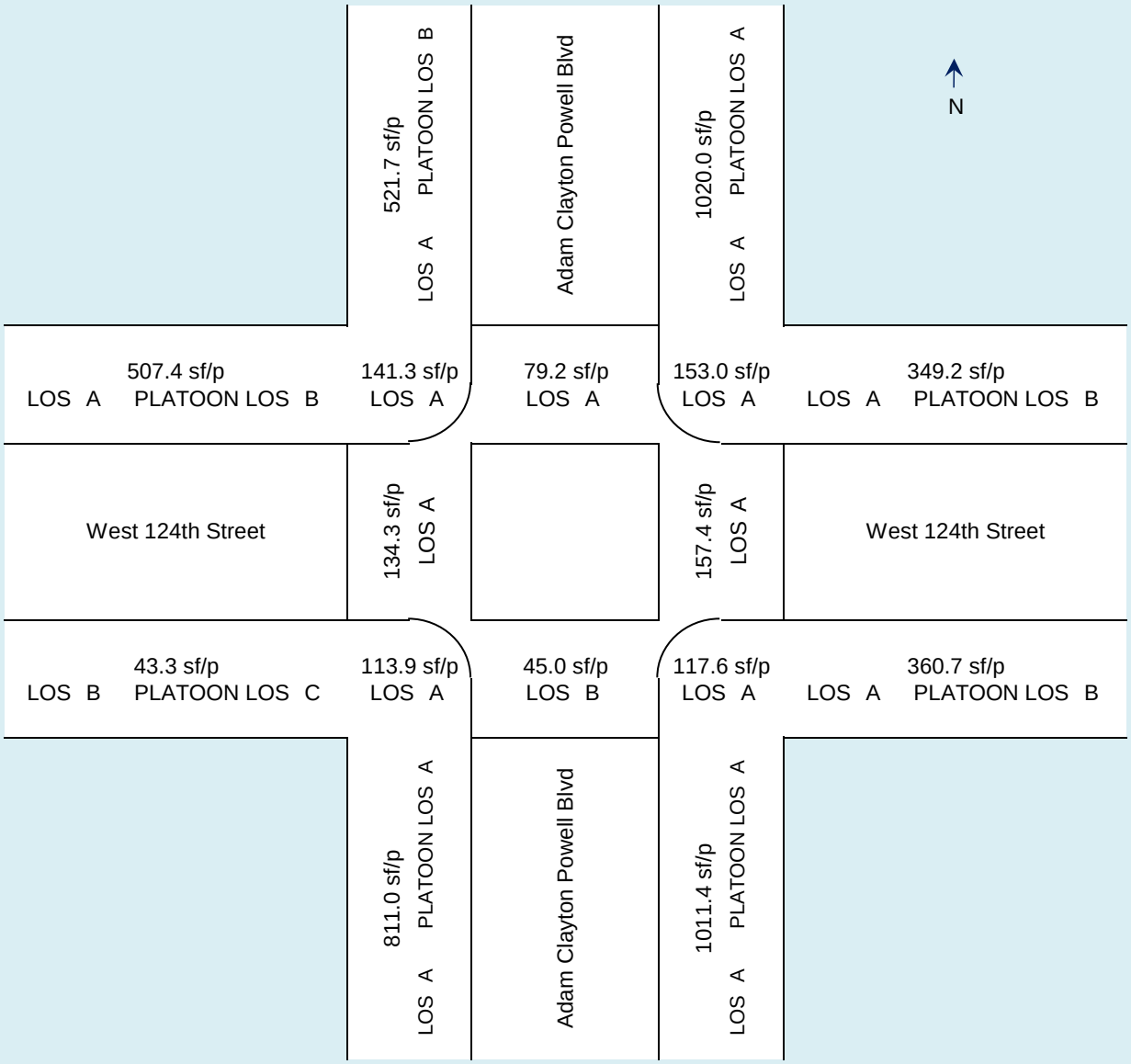
ANALYSIS

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	59	147	0.68	23.0	5.5	17.5	0.2	3.5	3.5	1020.0	A	A
		S_2	88											
	E-W	S_3	59	136	0.58	10.0	3.5	6.5	0.6	3.5	3.5	349.2	A	B
		S_4	77											
SE	N-S	S_5	53	109	0.50	23.0	5.5	17.5	0.2	3.5	3.5	1011.4	A	A
		S_6	56											
	E-W	S_7	61	143	0.63	10.0	3.5	6.5	0.6	3.5	3.5	360.7	A	B
		S_8	82											
SW	N-S	S_9	96	174	0.80	22.0	8.0	14.0	0.3	3.5	3.5	811.0	A	A
		S_{10}	78											
	E-W	S_{11}	141	297	0.16	10.0	3.5	6.5	4.8	3.5	3.4	43.3	B	C
		S_{12}	156											
NW	N-S	S_{13}	107	213	0.63	22.0	8.0	14.0	0.4	3.5	3.5	521.7	A	B
		S_{14}	106											
	E-W	S_{15}	52	92	0.57	10.0	3.5	6.5	0.4	3.5	3.5	507.4	A	B
		S_{16}	40											

LOS SUMMARY MAP

IDENTIFYING INFORMATION

Project No.:	2017028	N-S Street:	Adam Clayton Powell Blvd
Project Name:	Ennis Francis Houses	E-W Street:	West 124th Street
Analyst:	Equity Environmental Engineering	Time Period:	Evening Peak Hour
Date:	43265	Analysis Year:	2021 With-Action



DATE	TIME	BOROUGH	ZIP CODE	LATITUDE	LONGITUDE	LOCATION	ON STREET NAME	CROSS STREET NAME	NUMBER OF PERSONS INJURED	NUMBER OF PERSONS KILLED	NUMBER OF PEDESTRIANS INJURED	NUMBER OF PEDESTRIANS KILLED	NUMBER OF CYCLIST INJURED	NUMBER OF CYCLIST KILLED	NUMBER OF MOTORIST INJURED	NUMBER OF MOTORIST KILLED	CONTRIBUTING FACTOR VEHICLE 1	CONTRIBUTING FACTOR VEHICLE 2	CONTRIBUTING FACTOR VEHICLE 3	UNIQUE KEY	VEHICLE TYPE CODE 1	VEHICLE TYPE CODE 2	VEHICLE TYPE CODE 3
10/27/2018	17:30	MANHATTAN	10027	40.808292	-73.94883	(40.808292, -73.94883)	WEST 124 STREET	7 AVENUE	0	0	0	0	0	0	0	0	Driver Inattention/Distraction	Unspecified		4009341	Station Wagon/Sport Utility Vehicle	Station Wagon/Sport Utility Vehicle	
9/29/2018	12:20	MANHATTAN	10027	40.80949	-73.95167	(40.80949, -73.95167)	WEST 124 STREET	8 AVENUE	0	0	0	0	0	0	0	0	Driver Inattention/Distraction	Unspecified	Unspecified	3995789	Sedan	Sedan	Station Wagon/Sport Utility Vehicle
3/10/2018	7:39	MANHATTAN	10027	40.80949	-73.95167	(40.80949, -73.95167)	WEST 124 STREET	8 AVENUE	0	0	0	0	0	0	0	0	Driver Inattention/Distraction	Other Vehicular		3862814	SPORT UTILITY / STATION WAGON	PASSENGER VEHICLE	
2/3/2018	11:13	MANHATTAN	10027	40.808292	-73.94883	(40.808292, -73.94883)	7 AVENUE	WEST 124 STREET	0	0	0	0	0	0	0	0	Passenger Distraction	Pedestrian/Bicyclist/Other Pedestrian Error/Confusion		3840913	SPORT UTILITY / STATION WAGON	SPORT UTILITY / STATION WAGON	
1/17/2018	15:00	MANHATTAN	10027	40.808292	-73.94883	(40.808292, -73.94883)	WEST 124 STREET	7 AVENUE	0	0	0	0	0	0	0	0	Driver Inattention/Distraction	Unspecified		3834286	PASSENGER VEHICLE	PASSENGER VEHICLE	
12/16/2017	16:15	MANHATTAN	10027	40.80949	-73.95167	(40.80949, -73.95167)	WEST 124 STREET	8 AVENUE	0	0	0	0	0	0	0	0	Driver Inattention/Distraction	Unspecified		3812408	PASSENGER VEHICLE	SPORT UTILITY / STATION WAGON	
12/13/2017	20:15	MANHATTAN	10027	40.80949	-73.95167	(40.80949, -73.95167)	WEST 124 STREET	DOUGLASS BOULEVARD	0	0	0	0	0	0	0	0	Driver Inattention/Distraction	Unspecified		3810108	PASSENGER VEHICLE	PASSENGER VEHICLE	
10/15/2017	11:40	MANHATTAN	10027	40.808292	-73.94883	(40.808292, -73.94883)	7 AVENUE	WEST 124 STREET	1	0	0	0	0	0	1	0	Unspecified	Unspecified		3772342	SPORT UTILITY / STATION WAGON	SPORT UTILITY / STATION WAGON	
10/11/2017	12:50	MANHATTAN	10027	40.80949	-73.95167	(40.80949, -73.95167)	WEST 124 STREET	8 AVENUE	0	0	0	0	0	0	0	0	Driver Inattention/Distraction	Unspecified	Unspecified	3767942	SPORT UTILITY / STATION WAGON	PASSENGER VEHICLE	SPORT UTILITY / STATION WAGON
6/27/2017	21:30	MANHATTAN	10027	40.808292	-73.94883	(40.808292, -73.94883)	7 AVENUE	WEST 124 STREET	0	0	0	0	0	0	0	0	Driver Inattention/Distraction	Driver Inattention/Distraction		3700802	PASSENGER VEHICLE	PASSENGER VEHICLE	
4/21/2017	22:45	MANHATTAN	10027	40.80949	-73.95167	(40.80949, -73.95167)	WEST 124 STREET	8 AVENUE	2	0	0	0	0	0	2	0	Driver Inattention/Distraction	Unspecified		3656417	TAXI	TAXI	
12/3/2016	17:12	MANHATTAN	10027	40.8082954	-73.9488206	(40.8082954, -73.9488206)	WEST 124 STREET	7 AVENUE	1	0	1	0	0	0	0	0	Failure to Yield Right-of-Way			3573145	SPORT UTILITY / STATION WAGON		
9/15/2016	11:09	MANHATTAN	10027				WEST 124 STREET	7 AVENUE	0	0	0	0	0	0	0	0	Following Too Closely	Unspecified		3522051	PASSENGER VEHICLE	SPORT UTILITY / STATION WAGON	
6/19/2016	15:40	MANHATTAN	10027	40.8094906	-73.9516627	(40.8094906, -73.9516627)	WEST 124 STREET	8 AVENUE	0	0	0	0	0	0	0	0	Unspecified	Unspecified		3464106	PASSENGER VEHICLE	PASSENGER VEHICLE	
6/16/2016	18:27	MANHATTAN	10027	40.8094906	-73.9516627	(40.8094906, -73.9516627)	WEST 124 STREET	8 AVENUE	0	0	0	0	0	0	0	0	Unspecified	Unspecified		3466564	BICYCLE	PASSENGER VEHICLE	
6/12/2016	15:06	MANHATTAN	10027				7 AVENUE	WEST 124 STREET	1	0	1	0	0	0	0	0	Unspecified			3493947	PASSENGER VEHICLE	PASSENGER VEHICLE	
4/15/2016	16:00	MANHATTAN	10027	40.8094906	-73.9516627	(40.8094906, -73.9516627)	WEST 124 STREET	8 AVENUE	0	0	0	0	0	0	0	0	Driver Inattention/Distraction	Driver Inattention/Distraction		3410182	PASSENGER VEHICLE	PASSENGER VEHICLE	
4/3/2016	6:51	MANHATTAN	10027	40.8082954	-73.9488206	(40.8082954, -73.9488206)	WEST 124 STREET	7 AVENUE	0	0	0	0	0	0	0	0	Driver Inattention/Distraction	Driver Inattention/Distraction		3410155	PASSENGER VEHICLE	PASSENGER VEHICLE	
3/10/2016	8:39	MANHATTAN	10027	40.8082954	-73.9488206	(40.8082954, -73.9488206)	WEST 124 STREET	7 AVENUE	0	0	0	0	0	0	0	0	Unspecified	Unspecified		3402841	PASSENGER VEHICLE	PASSENGER VEHICLE	
3/5/2016	18:51	MANHATTAN	10027	40.8094906	-73.9516627	(40.8094906, -73.9516627)	WEST 124 STREET	8 AVENUE	0	0	0	0	0	0	0	0	Backing Unsafely	Turning Improperly		3400453	PASSENGER VEHICLE	PASSENGER VEHICLE	
2/25/2016	23:45	MANHATTAN	10027	40.8082954	-73.9488206	(40.8082954, -73.9488206)	WEST 124 STREET	7 AVENUE	1	0	1	0	0	0	0	0	Failure to Yield Right-of-Way			3395308	TAXI		
2/18/2016	2:41	MANHATTAN	10027	40.8094906	-73.9516627	(40.8094906, -73.9516627)	WEST 124 STREET	8 AVENUE	1	0	0	0	0	0	1	0	Fatigued/Drowsy	Unspecified		3391169	TAXI	UNKNOWN	
2/2/2016	16:50	MANHATTAN	10027	40.8094906	-73.9516627	(40.8094906, -73.9516627)	8 AVENUE	WEST 124 STREET	0	0	0	0	0	0	0	0	Lost Consciousness	Lost Consciousness		3381948	TAXI	SMALL COM VEH(4 TIRES)	
1/25/2016	17:17	MANHATTAN	10027	40.8094906	-73.9516627	(40.8094906, -73.9516627)	WEST 124 STREET	8 AVENUE	0	0	0	0	0	0	0	0	Unspecified	Unspecified		3377354	BUS	SPORT UTILITY / STATION WAGON	
1/10/2016	0:45	MANHATTAN	10027	40.8082954	-73.9488206	(40.8082954, -73.9488206)	7 AVENUE	WEST 124 STREET	0	0	0	0	0	0	0	0	Other Vehicular	Unspecified		3368568	PASSENGER VEHICLE	SPORT UTILITY / STATION WAGON	

Appendix E: Deed Restrictions

NYC DEPARTMENT OF FINANCE
OFFICE OF THE CITY REGISTER

This page is part of the instrument. The City Register will rely on the information provided by you on this page for purposes of indexing this instrument. The information on this page will control for indexing purposes in the event of any conflict with the rest of the document.

2012012000858011002E40CA

RECORDING AND ENDORSEMENT COVER PAGE **PAGE 1 OF 54**

Document ID: 2012012000858011 Document Date: 01-12-2012 Preparation Date: 01-24-2012
Document Type: SUNDRY AGREEMENT
Document Page Count: 53

PRESENTER:
ENVISION TITLE SERVICES, LLC (EN110374NY)
PICKUP BY BRIDGE SERVICE CORP.
333 EARLE OVINGTON BLVD. SUITE 608
UNIONDALE, NY 11553
516-513-0815
afriedmann@envisiontitle.com

RETURN TO:
NY STATE HOUSING FINANCE AGENCY
641 LEXINGTON AVENUE
NEW YORK, NY 10022

PROPERTY DATA

Borough	Block	Lot		Unit	Address
MANHATTAN	1929	17	Entire Lot		N/A ADAM C POWELL BLVD
Property Type:	NON-RESIDENTIAL VACANT LAND				
Borough	**Block**	**Lot**		**Unit**	**Address**
MANHATTAN	1929	29	Entire Lot		2070 ADAM C POWELL BLVD
Property Type:	APARTMENT BUILDING				

CROSS REFERENCE DATA

CRFN_____ *or* Document ID_____ *or* _____ Year____ Reel ___ Page ____ *or* File Number_____

PARTIES

PARTY 1:
NEW YORK STATE HOUSING FINANCE AGENCY
641 LEXINGTON AVENUE
NEW YORK, NY 10022

FEES AND TAXES

Mortgage			Filing Fee:	
Mortgage Amount:	$	0.00	$	0.00
Taxable Mortgage Amount:	$	0.00	NYC Real Property Transfer Tax:	
Exemption:			$	0.00
TAXES: County (Basic):	$	0.00	NYS Real Estate Transfer Tax:	
City (Additional):	$	0.00	$	0.00
Spec (Additional):	$	0.00		
TASF:	$	0.00		
MTA:	$	0.00		
NYCTA:	$	0.00		
Additional MRT:	$	0.00		
TOTAL:	$	0.00		
Recording Fee:	$	EXEMPT		
Affidavit Fee:	$	0.00		

RECORDED OR FILED IN THE OFFICE OF THE CITY REGISTER OF THE CITY OF NEW YORK
Recorded/Filed 02-02-2012 16:25
City Register File No.(CRFN):
2012000048291

City Register Official Signature

Execution Copy

REGULATORY AGREEMENT

by and among

NEW YORK STATE HOUSING FINANCE AGENCY

and

ADC/ENNIS FRANCIS OWNER, L.P.

and

ADC/ENNIS FRANCIS II HOUSING DEVELOPMENT FUND COMPANY, INC.

for the

ENNIS FRANCIS HOUSES PROJECT

Regulatory Agreement for HFA Multi Family Housing
Affordable Housing Revenue Bond Program
(Federal New Issuance Bond Program)
Freddie Mac Credit Facility
and
Low Income Housing Tax Credits

Record and Return to:
Barbara D. Roslyn, Esq.
New York State Housing Finance Agency
641 Lexington Avenue
New York, New York 10022

Premises: 2070 Seventh Avenue
225 West 123rd Street

County: New York
Section: 7
Block: 1929
Lots: 17 and 29

778-462

TABLE OF CONTENTS

APPENDICES AND EXHIBITS

This **Regulatory Agreement** ("Agreement"), entered into as of the 12th day of January 2012, by and among **ADC/ENNIS FRANCIS OWNER, L.P.** ("Beneficial Owner"), a New York limited partnership, having an office located at c/o Abyssinian Development Corporation, 4 West 125th Street, New York, New York 10027, **ADC/ENNIS FRANCIS II HOUSING DEVELOPMENT FUND COMPANY, INC.** ("HDFC" and together with the Beneficial Owner, the "Owners") a New York not-for-profit corporation organized under Article XI of the New York State Private Housing Finance Law ("PHFL"), having an office c/o Abyssinian Development Corporation, 4 West 125th Street, new York, New York 10027, and the **NEW YORK STATE HOUSING FINANCE AGENCY** ("Agency"), a corporate governmental agency established pursuant to Article III of the New York State Private Housing Finance Law ("PHFL"), constituting a public benefit corporation, having its principal place of business at 641 Lexington Avenue, New York, New York 10022.

W I T N E S S E T H:

WHEREAS, the HDFC is the holder of fee interest in certain real property ("Premises"), more fully described in Schedule A attached hereto, which interest is held solely as nominee on behalf of the Beneficial Owner, upon which an existing 160 unit building is to be rehabilitated and a new 60 unit building is to be constructed at 2070 7th Avenue, New York, New York (the "Project");

WHEREAS, pursuant to that certain nominee agreement between HDFC and the Beneficial Owner dated as of the date hereof, the Beneficial Owner is the operator and holder of all beneficial interest in the Premises and the Project; and

WHEREAS, not less than ninety-six (96%) of the Project's revenue units, or 212 units, are set aside for households in which incomes are at or below 60% of the Area Median Income ("AMI") for New York County, adjusted for family size; and

WHEREAS, pursuant to its Affordable Housing Revenue Bonds (Federal New Issue Bond Program), NIBP Series 1 Resolution adopted by the Agency on December 3, 2009, as amended and its Affordable Housing Revenue Bonds, 2009 Series 1, Subseries F Resolution, the Agency has issued its $276,130,000 Affordable Housing Revenue Bonds (Federal New Issue Bond Program), 2009 Series 1 Bonds ("2009 Series 1 Program Bonds"), $24,000,000 of which have been remarketed and converted to fixed rate bonds (the "Converted Bonds"); and

WHEREAS, pursuant its Affordable Housing Revenue Bonds (Federal New Issue Bond Program), Additional Series 1 Parity Bonds Resolution, 2011 Series 4 ("Series 4 Parity Bonds Resolution"), the Agency has also issued its $14,565,000 Affordable Housing Revenue Bonds Federal New Issue Bond Program), Additional Series 1Parity Bonds ("2011 Series 1 Parity Bonds"); and

WHEREAS, a portion of the Converted Bonds and a portion of the 2011 Series 1 Parity Bonds (collectively, the "Bonds") will be used to fund a mortgage loan ("Mortgage Loan") in an amount not exceeding $38,565,000 to pay for a portion of the costs of constructing the Project; and

WHEREAS, the Note will be secured by a First Multifamily Mortgage, Assignment of Rents and Security Agreement dated as of January 1, 2012 (the "Mortgage"), granted by the Owners to the Agency covering the Premises, which Mortgage will be recorded in office of New York County Clerk's Office, New York (the Note, the Mortgage and each and every document executed with, by or in favor of the Agency in connection with the Mortgage Loan are hereinafter collectively referred to as the "Loan Documents"); and

WHEREAS, The Bank of New York Mellon shall act as trustee under the Resolution (the "Trustee"); and

WHEREAS, the Mortgage will be assigned to Freddie Mac (as defined below) and the Trustee, as their interests may appear, pursuant to an Assignment and Intercreditor Agreement by and among the Agency, Freddie Mac, and the Trustee and acknowledged, accepted and agreed to by the Owners, dated as of January 1, 2012 (the "Assignment"); and

WHEREAS, the Mortgage Loan will be credit enhanced pursuant to the terms of a Credit Enhancement Agreement dated as January 1, 2012 (the "Credit Enhancement Agreement") between Freddie Mac (as hereinafter defined) and the Trustee, which Credit Enhancement Agreement will provide for credit enhancement for payments required to be made under the Note; and

WHEREAS, the Beneficial Owner and the Agency have entered into a Financing Agreement dated as January 12, 2012 (the "Financing Agreement") whereby, among other things, the Beneficial Owner agrees to undertake certain obligations to the Agency, including the payment of certain fees and expenses; and

WHEREAS, one hundred and sixty revenue generating units on Lot 29 of the Project are subject to a project-based Housing Assistance Payment Contract ("Lot 29 HAP Contract") from the New York City Housing Authority ("NYCHA") as contract administrator for HUD (as hereinafter defined), which expires in 2016; and

WHEREAS, sixty(60) revenue generating units to be constructed on Lot 17 of the Project are subject to a project based Agreement to Enter into Housing Assistance Payments Contract ("Lot 17 AHAP) from NYCHA, as contract administrator for HUD (as hereinafter defined); and

WHEREAS, NYCHA has issued a letter of intent dated December 9, 2011 (the "Letter of

Intent") pursuant to which NYCHA has confirmed that upon the completion of "Phase II" (as defined in the Letter of Intent) NYCHA intends to , among other things, enter into (i) a fifteen year renewal HAP Contract with respect to the units on Lot 29, (ii) a new fifteen year HAP Contract, with a 15 year renewal option, with respect to the units on Lot 17, and (iii) merge the foregoing HAP Contracts such that the units on Lot 29 and Lot 17 are subject to a single HAP Contract with a fifteen year term and a fifteen year renewal opinion (collectively, the "HAP Contract"); and

WHEREAS, during the period of construction of the Project, Freddie Mac will be secured by a credit facility letter credit issued by PNC Bank, National Association which is expected to be released pursuant to the terms of a Construction Phase Financing Agreement at which time it is anticipated that the principal amount of the Mortgage Loan will be reduced to $24,000,000; and

WHEREAS, the Beneficial Owner will obtain simultaneously herewith, the following additional financing for the Project: (i) an estimated amount of $1,000,000 from the New York City Capital Allocation Loan ("City Loan"); (ii) Seller's Note estimated at $8,327,396 ("Seller Loan"); and (iii) an existing New York City Department of Housing Preservation and Development ("HPD") Article 8A Subordinate Loan of $6,439,661 ("HPD Loan", collectively with the City Loan and the Seller Loan the "Subordinate Loans"); and

WHEREAS, each of the Subordinate Loans shall be secured by a mortgage, the lien of which shall be subordinate to the Mortgage Loan; and

WHEREAS, in connection with the HPD Loan, the Owners have entered into a Regulatory Agreement, dated the date hereof, with the City of New York, which impose certain income and occupancy restrictions, and other regulatory requirements, on certain of the units in the Project; and

WHEREAS, the Agency has found and determined that the Project is to be occupied by persons or families of low or moderate income pursuant to the restrictions set forth in this Agreement; and

WHEREAS, the Agency is a credit administering agency under §42 of the Code, and the Agency has approved the allocation to the Beneficial Owner of low-income housing tax credits ("LIHTC") pursuant to §42(h)(4) of the Code; and

WHEREAS, the Agency requires, as a condition of the issuance of the Bonds, financing of the Mortgage Loan, and the allocation to the Project of LIHTC, that the Owners agree to the restrictions running with the land and binding on all of Owners' successors, assigns, heirs, grantees or lessees for the term of this Agreement as set forth herein, and the Mortgage, and that the Owners consent to be regulated by the Agency to: (i) preserve the tax-exempt status of the Bonds under the Code; (ii) meet the requirements of §44.29-a of the PHFL; (iii) meet the requirements of §42 of the Code with regard to LIHTC; and (iv) to ensure that other public benefit requirements are met;

NOW THEREFORE, the parties do hereby agree as follows:

1.0 **DEFINITIONS** - Except as otherwise defined herein, all capitalized words and phrases herein shall have the meanings assigned to such terms in the Mortgage and the Code. For general rules of interpretation, see Section 7.1. In addition, the following words and phrases as used in this Agreement shall have the following meanings:

"Agency" shall mean the New York State Housing Finance Agency.

"Agreement" shall mean this Regulatory Agreement.

"Area Median Income" or **"AMI"** shall mean shall mean the area median gross income for the area as determined from time to time by the Secretary of the United States Department of Housing and Urban Development ("HUD") as applicable pursuant to the Code. References to 50% of AMI shall mean amounts established by HUD constituting the Very Low Income Limit for HUD's Section 8 programs. References to 40% of the AMI shall mean amounts established by HUD constituting 80% of the Very Low Income Limit for HUD's Section 8 programs.

"Assignment" shall have the meaning assigned in the recitals to this Agreement.

"Assumption Fee" shall have the meaning assigned in section 5.5 (d) of this Agreement.

"Beneficial Owner" shall mean ADC/ Ennis Francis Owner, L.P., its successors and assigns.

"Beneficial Owner's Tax Certification" shall have the meaning assigned in Section 5.8(c).

"Bonds" shall have the meaning assigned in the recitals to this Agreement.

"Code" shall mean the Internal Revenue Code of 1986, as amended, the Treasury Regulations and published administrative positions of the Internal Revenue Service set forth in Revenue Procedures, Revenue Rulings, and other Internal Revenue Service publications with binding authority applicable thereunder.

"Compliance Period" shall have the meaning assigned in Section 3.1.

"Credit Enhancement Agreement" shall have the meaning assigned in the recitals to this Agreement.

"Credit Enhancer" shall have the meaning assigned in section 5.3(a).

"Credit Period" shall have the meaning assigned in sections 3.1.

"Early Termination" shall have the meaning assigned in Section 3.2(b).

"Eligible Basis" shall have the meaning assigned in Section 6.2(a) (5).

"ELIHC" shall have the meaning assigned in Section 3.2(a).

"Event of Default" shall have the meaning assigned in Section 2.1.

"Extended Use Period" shall have the meaning assigned in Section 3.2(b).

"Federal Section 8" shall have the meaning assigned in Section 3.1.

"**Freddie Mac**" shall mean the Federal Home Loan Mortgage Corporation, a shareholder-owned government-sponsored enterprise organized and existing under the laws of the United States of America, and its successors and assigns.

"**Financing Agreement**" shall have the meaning assigned in the recitals to this Agreement

"General Partner" shall mean Ennis Francis Corporation.

"Governmental Entity" shall have the meaning assigned in Section 5.6(a).

"Gross Rent Floor" shall have the meaning assigned in the Code.

"Guidelines" shall mean the Agency's Fair Housing and Tenant Selection Guidelines, as the same may be amended from time to time.

"HAP Contract" shall have the meaning assigned in the recitals to this Agreement.

"**HDFC**" shall mean ADC/Ennis Francis II Housing Development Fund Company, Inc. its successors and assigns.

"**HUD**" shall refer to the United States Department of Housing and Urban Development and/or the Secretary of the United States Department of Housing and Urban Development.

"Individuals of Low Income" shall mean individuals and families: (i) whose income is 60% or less of Area Median Income of [New York County, New York area for purposes of §§142(d) (2) (B) and 142(d) (3) of the Code and §1.103-8 (b) (8) (v) of the Tax Regulations (except that "60 percent" shall be substituted for "80 percent" therein), (ii) who are

individuals of low income within the meaning of the New York State Housing Finance Agency Act, Article III of the PHFL.

"LIHTC" shall have the meaning assigned in the recitals to this Agreement.

"Limited Partner" shall mean PNC MultiFamily Capital Institutional fund XL Limited Partnership, its successor and assigns.

"**Loan Agreement**" shall have the meaning assigned in the recitals to this Agreement.

"**Limited Partnership Agreement**" shall mean the Amended and Restated Limited Partnership Agreement of the Beneficial Owner dated as of the date hereof.

"Long Term Holding Period" shall have the meaning assigned in section 5.5 (d)

"Low Income Units" shall have the meaning assigned in Section 4.2a.

"Mortgage" and **"Mortgage Loan"** shall have the meanings assigned in the recitals to this Agreement.

"Note" shall have the meaning assigned in the recitals to this Agreement.

"Organized Crime Figure" shall have the meaning assigned in Section 5.6(b).

"Partnership Agreement" shall mean the Amended and Restated Agreement of Limited Partnership of the Beneficial Owner dated as of January 1, 2012, as the same may be amended from time to time.

"PHFL" shall have the meaning assigned in the recitals to this Agreement.

"Premises" shall have the meaning assigned in the recitals to this Agreement.

"Principal(s)" shall mean Abyssinian Development Corporation, a New York not-for-profit corporation.

"Prohibited Person" shall have the meaning assigned in Section 5.6(a).

"Project" shall have the meaning assigned in the recitals to this Agreement.

"Qualified Basis" shall have the meaning assigned in Section 6.2(a)(7).

"Qualified Project Period" shall have the meaning assigned in Section 3.1.

"Replacements" shall have the meaning assigned in Section 5.3(b) and "Replacement

"Reserve Account" shall have the meaning assigned in Section 5.3(a).

"Resolution" shall have the meaning assigned in the recitals to this Agreement.

"Special Limited Partner" shall mean Columbia Housing SLP Corporation.

Transfer Fee" shall have the meaning assigned in Section 5.5(d).

"Wrongful Dishonor" shall mean an uncured failure by Freddie Mac to make an advance to the Trustee upon proper presentation of documents which conform to the terms and conditions of the Credit Enhancement Agreement.

2.0 **ENFORCEMENT**

2.1 Incorporation in Mortgage and Termination of Agreement - (a) Agreement This Agreement and the restrictions hereunder are hereby incorporated by reference into the Mortgage, so that noncompliance hereunder, after expiration of application notice and cure periods, shall constitute an "Event of Default" under the Mortgage. For purposes of this Agreement, an Event of Default shall be deemed to have occurred if the Owner shall fail to observe any requirement or perform any obligations imposed on the Owner, and the Owner and/or the Special Limited Partner shall fail to cure such default within thirty (30) days after the Owner, Special Limited Partner and Freddie Mac receive written notice of such default from the Agency, unless such default shall not be a willful default and can be cured but cannot by its nature be cured within such thirty (30) day period, in which case an Event of Default shall not be deemed to have occurred so long as the Owner and/or the Special Limited Partner commence such cure as soon as reasonably possible and proceeds with due diligence to cure such default; provided, however, that in any case an Event of Default shall be deemed to have occurred (i) when and if interest on the Bonds shall be includable in gross income for federal income tax purposes or (ii) thirty (30) days before the Agency shall be required to commence foreclosure of the Mortgage in order to prevent interest on the Bonds from becoming includable in gross income for such purposes.

In addition, if the Agency assigns the Mortgage, the Agency may retain the right to declare an Event of Default under and prosecute foreclosure thereof, based upon any such Event of Default; provided that the agreement with any successor mortgagee wherein such rights are retained shall contain provisions substantially similar to those set forth in Exhibit "A" attached hereto. The immediately preceding sentence shall not apply to the extent the Credit Enhancement Agreement is in effect, provided that no Wrongful Dishonor exists.

Except as limited in section 3.2 hereof in regard to LIHTC, in the event of foreclosure or deed-in-lieu of foreclosure, this Agreement and the restrictions hereunder shall automatically terminate with respect to the Mortgage Loan, provided the Bonds are redeemed at the first available call date. However, if the obligor on the Mortgage Loan or a related person (within meaning of §144(a) (3) of the Code) thereafter obtains, during the term of this Agreement (as determined by section 3.1), an ownership interest in the Project for tax purposes, this Agreement shall be revived in full force and effect to the extent of the restrictions hereunder which affect the exclusion from federal income taxation of interest on the Bonds. In addition, this Agreement and the restrictions hereunder shall, in the Agency's sole discretion in consultation with Freddie Mac, cease to apply partially or entirely in the event of involuntary noncompliance caused by unforeseen events such as fire, seizure, requisition, condemnation, change in federal law, or action of a federal agency after the date of issue, which prevents the Agency from enforcing any restriction hereunder, provided the Bonds are redeemed at the first available call date following such unforeseen event.

2.2 Recording and Lien Provisions - The benefits and burdens of this Agreement shall run with the land and bind the interest of the Beneficial Owner and the HDFC in the Project, and the land upon which the Project is constructed. The Beneficial Owner, at its cost and expense, shall cause this Agreement to be duly recorded, filed, re-recorded, and refiled in such places as to the Premises, and shall pay or cause to be paid all recording, filing, or other taxes, fees and charges, and shall comply with all such statutes and regulations as may be required by law in order to establish, preserve and protect the ability of the Agency to enforce this Agreement. At the request of the Beneficial Owner, Freddie Mac or the HDFC, the Agency shall provide the Beneficial Owner with an instrument executed in recordable form at such time as the term of this Agreement has expired and the obligations of the Beneficial Owner and the HDFC have been satisfied, releasing the Beneficial Owner, the HDFC and the land from this Agreement.

2.3 Remedies - The injury to the Agency arising from noncompliance with any of the terms of this Agreement would be great, and the effect of misrepresentations of fact and any violations by Beneficial Owner or the HDFC of warranties and covenants under this Agreement would be irreparable, and the amount of consequential damage would be difficult to ascertain and may not be compensable by money alone. Therefore, upon the occurrence of an Event of Default, the misrepresentation of material fact, or violation of any warranty or covenant under this Agreement by Beneficial Owner or the HDFC, after expiration of applicable notice and cure periods, if any, the Agency, at its option, may apply to any state or federal court, for: (a) specific performance of this Agreement; (b) for an injunction against any noncompliance causing such event of Default or misrepresentation under this Agreement; or (c) with the prior written consent of Freddie Mac for such other relief as may be appropriate in addition to its right to foreclose or require foreclosure of the Mortgage, entirely or partially, pursuant to the terms of the Assignment. Noncompliance with

any of the terms of this agreement may jeopardize the tax-exempt status of the Bonds. The Agency is obligated to notify the Internal Revenue Service of non-compliance with this Agreement that results in noncompliance under the Code with respect to the LIHTC.

For purposes of this Agreement, the date of such Event of Default or misrepresentation or violation shall be the date the noncompliance causing such Event of Default, misrepresentation or violation was first discovered by the Beneficial Owner, the HDFC or the Agency, or would have been first discovered by the Beneficial Owner, the HDFC or the Agency by the exercise of reasonable diligence.

2.4 Indemnification - (a) (a) The Beneficial Owner shall indemnify and hold the Agency harmless from and against any and all claims, demands, liability, loss, cost or expense (including but not limited to reasonable attorney fees and other costs of litigation) which may be incurred by the Agency arising out of or in any way related to the Beneficial Owner's breach of any of its obligations or performance under this Agreement or any action taken by the Agency to enforce or exercise its rights under this Agreement as a result of such breach, provided, however, with the sole and exclusive exception, that if the Beneficial Owner is the prevailing party in its defense or pursuit of a suit, complaint, claim or arbitration initiated as the result of the Beneficial Owner's breach of this Agreement, after all appeals to the highest court or judicial authority having jurisdiction of this matter have been exhausted, the Beneficial Owner shall not be liable to the Agency for such damages, reasonable attorneys' fees, expenses and costs arising from such suit, claim, complaint or arbitration. The obligations under this section shall survive the termination or expiration of this Agreement as necessary to effectuate its provisions. This indemnity is not a guarantee of any portion of the Mortgage Loan. The Beneficial Owner shall not be required to indemnify the Agency for any claim, demand, liability, loss, cost or expense arising out of or related to the fraud, intentional misconduct or gross negligence of the Agency. Any monetary obligations arising under this Agreement and all claims or judgments for monetary damages against the Beneficial Owner occasioned by breach or alleged breach by the Beneficial Owner of its obligations hereunder shall be subordinated in priority and right to payment and in all other respects to the obligations, liens, rights (including without limitation the right to payment) and interests arising or created under the Loan Documents.

(b) Any subsequent owner of the Project shall be liable or obligated for the breach or default of any obligation of any prior owner (including the Beneficial Owner) under this Agreement, including but not limited to any payment of any indemnification obligation. Notwithstanding the prior sentence, during any period that Freddie Mac or its designee owns the Project or if any subsequent owner acquires the Project from Freddie Mac or its designee, neither Freddie Mac, such designee nor such subsequent owner shall be liable or obligated for the breach or default of any

obligation of any prior owner (including the Beneficial Owner) under this Agreement, including but not limited to any payment or indemnification obligation, in which case the owner of the Project at the time the default or breach occurred shall remain liable for any and all damages occasioned thereby even after such entity ceases to be the owner (and, in such event, any party seeking to collect such damages shall have no recourse and shall have no right to levy against or otherwise collect on any judgment from the Project).

3.0 **TERM**

3.1 Term of Agreement - The term of this Agreement shall commence on the execution and delivery hereof, and, subject to the provisions of section 2.1 above, shall extend through a period ("Qualified Project Period") which shall commence immediately and shall end on the latest of the following:

(i) the date which is fifteen (15) years after the date on which 50% of the residential units in the Project are first occupied;

(ii) the first date on which no Bonds (and any other private activity bonds relating to such Project) are outstanding;

(iii) if applicable, the date on which any assistance provided with respect to the Project under Section 8 of the United States Housing Act of 1937 ("Federal Section 8") terminates;

(iv) the date on which the Mortgage Loan is no longer outstanding or has been assigned to a third party without retention of any interest therein by the Agency;

(v) the end of a period (the "Compliance Period") consisting of fifteen (15) taxable years of the Owner commencing with the first taxable year of the credit period ("Credit Period") as defined in §42(f)(1) of the Code with respect to such Project;

(vi) the expiration or earlier termination of the Extended Use Period, as defined in section 3.2(b) hereinbelow; or

(vii) forty years (40) from the date of the Mortgage Loan closing.

3.2 Special Rules for Tax Credits - (a) This Agreement constitutes an extended low income housing commitment (the "ELIHC") pursuant to §42(h)(6) of the Code, arising from an election by the Beneficial Owner to accept the benefits of LIHTC and the Agency financing. Failure to comply with the provisions of the ELIHC shall be an Event of Default under the Mortgage and the Agency or its successors may exercise any of the remedies available thereunder. Furthermore, the

Agency may seek specific performance of the ELIHC by the Beneficial Owner or any successor in interest thereto, without declaring an Event of Default pursuant to the Mortgage and without waiving any remedies under the Mortgage, by filing an action in any court of competent jurisdiction in the State of New York. Any existing, past or prospective tenants of the Project who qualify, qualified or would qualify as low income occupants pursuant to §42(g) of the Code are hereby expressly agreed to be beneficiaries of this ELIHC and may apply to any court of competent jurisdiction in the State of New York for specific performance of any provisions of the ELIHC, notwithstanding any action which may or may not be taken by the Agency.

(b) The ELIHC shall begin on the first day of the Compliance Period and remain in effect until 15 years after the end of the Compliance Period ("Extended Use Period") except that the Extended Use Period will terminate earlier ("Early Termination") on the date of foreclosure of the Mortgage or deed-in-lieu of foreclosure (unless such events are part of an arrangement with the Beneficial Owner to cause an early termination as determined by the Internal Revenue Service). The Extended Use Period will not be subject to Early Termination pursuant to §42(h)(6)(E)(i)(II) of the Code.

(c) Notwithstanding anything herein to the contrary, the terms of this Agreement necessary to effectuate the terms and conditions of this Section 3.2 shall continue through the expiration of this Agreement or Early Termination.

(d) During the Extended Use Period:

(1) except as provided in section 4.2 of this Agreement, the Low Income Units, constituting in no event not less than 96% of the revenue-generating units (i.e., 212 units) in the Project (or such other percentage determined by the Agency upon issuance of the Internal Revenue Service form 8609 in relation to the Project) shall be occupied or available for occupancy by qualified families or individuals earning not more than 60% of the AMI, as adjusted for family size;

(2) the rents for the Low Income Units, as adjusted by utility allowances and any rental subsidies approved by the Agency in accordance with the Code, shall not be more than 30% of 60% of AMI adjusted for family size as follows: (i) for studio or efficiency apartments having no separate bedrooms, the designated family size shall be a 1-person family; and (ii) for apartments containing at least one bedroom, the designated family size shall be equal to 1.5 times the number of bedrooms;

(3) no portion of any building in the Project shall be disposed of to any person unless all of such building is disposed of to such person;

(4) the Beneficial Owner shall not refuse to lease to a holder of a voucher or certificate of eligibility under the Federal Section 8 program because of the status of the prospective tenant as such a holder;

(5) during the Extended Use Period and for the three (3) year period following an Early Termination:

(A) no existing tenant (i.e., the tenant occupying the respective Low Income Unit during the Extended Use Period, or upon the occurrence of an Early Termination of the Extended Use Period) may be removed whether by eviction, expiration of lease, or for any reason other than good cause; and

(B) no rents for any Low Income Unit occupied by such existing tenant may be increased, except as permitted under §42 of the Code; and

(6) the "applicable fraction" (as defined in §42(c)(1) of the Code) for the Project shall be 100% or such other amount as determined by the Agency upon the issuance of the Internal Revenue Service Form 8609 (the Low Income Housing Tax Credit Allocation Certification), however, in no event shall the applicable fraction be below 100%.

4.0 TENANTS AND LEASES

4.1 Rental Restrictions - Once available for occupancy each unit (other than any unit approved by the Agency for occupancy by a superintendent) must be rented or available for rental on a continuous basis to members of the "general public" (as defined in § 42(g) (9) of the Code) and occupied by individuals or families as their residence. No portion of the Project and none of the units in the Project will, at any time during the term of this Agreement, be used on a transient basis, for example, as a trailer park or trailer court or a hotel, motel, dormitory, fraternity house, sorority house, rooming house, hospital, nursing home, sanitarium or rest home. Use on a transient basis shall mean the rental of units for an initial lease term of less than 12 months.

4.2 Low Income Occupancy Requirements - (a) Continuously during the term of this Agreement, not less than 215 revenue producing residential units shall be occupied or, once having been so occupied, held available for occupancy by Individuals of Low Income, and upon vacancy of the remaining five (5) units whose gross household income, at the time of the date of this Agreement, exceed 60% of AMI, such units shall also be held available for occupancy by Individuals of Low Income (the "Low Income Units"). On or before the date of which the Agency issues IRS

Form 8609, the parties hereto shall amend this Agreement, if necessary, to reflect the final determination of the number of Low Income Units.

In accordance with Treasury Regulation §1.103-8(b) (8) and for LIHTC purposes, in accordance with Treasury Regulation §1.42-5 (b) (1) (vii) and Internal Revenue Notice 88-80, families of low income shall be determined in a manner consistent with determinations of "lower income families" under Federal Section 8 (or if such program is terminated, under such program as was in effect immediately before such termination). Determinations under the preceding sentence shall include adjustments for family size. Current adjustments for smaller and larger families are set forth in Exhibit C. In accordance with procedures established by the Agency, the Beneficial Owner shall take reasonable steps to verify the low income status of all families or individuals who occupy Low Income Units.

(b) A Low Income Unit shall continue to be treated as such, notwithstanding any increase in the income of the occupant of such Low Income Unit except as provided in the next sentence. Any Low Income Unit in which the aggregate income of the occupants as of the most recent annual recertification (as described in the Code) exceeds 140% of the applicable income limit (i.e. 140% of 60% of the AMI as adjusted for family size) shall not be treated as a Low Income Unit if after such determination but before the next determination, any Low Income Unit of comparable or smaller size in the same building is occupied by a new resident whose income exceeds the applicable income limit. Occupancy of a unit shall refer to the date that the tenant has possession of the unit and the right to occupy such unit pursuant to a fully executed lease.

4.3 Low Income Unit Rents, Fees and Charges – (a) The annual rents for the Low Income Units shall not exceed 30% of 60% of AMI adjusted for the number of individuals occupying the unit, as follows: (i) for studio or efficiency apartments having no separate bedrooms, the designated family size shall be a 1-person family; and (ii) for apartments containing at least one bedroom, the designated family size shall be equal to 1.5 times the number of bedrooms. "Rent" for purposes of this section and Section 3.2(d)(2), does not include any payment under Federal Section 8 or any comparable rental assistance program, but does include: (i) any utility allowance determined by the Secretary of Housing and Urban Development as may be adjusted by the Agency, or (ii) the cost of any utilities that would be covered by such utility allowance, as determined by the Agency, if the units were receiving Federal Section 8 assistance.

(b) Pursuant to the Code, the rents for Low Income Units shall be based on the AMI and may be trended upward for inflation annually pursuant to the calculations of AMI made by HUD in accordance with the Code, but in no case shall the rents for Low Income Units be adjusted downward. For example, if the AMI calculations in effect on the date hereof were to form the basis for setting maximum permitted rents, then such maximum rents would be set as follows:

MAXIMUM PERMITTED MONTHLY RENTS

Studio	One Bedroom	Two Bedroom	Three Bedroom	Four Bedroom
$859	$921	$1,105	$1,276	$1,423

Further, the maximum rents will be reduced by a utility allowance, if applicable, which may be revised annually. The Beneficial Owner shall review the utility allowance annually pursuant to the provisions of Treasury Regulation Section 1.42-10(c)(2). Accordingly, each January the Beneficial Owner shall submit to the Agency documentation satisfactory to the Agency of any utility estimates, usage, cost projections and proposed utility allowance with respect to units in the building for the upcoming year. Based thereon, in accordance with the Code, the Agency shall approve the proposed utility allowance or determine the appropriate utility allowance applicable to the units in the building for such period. The Beneficial Owner's failure to provide such information on a timely, annual basis, to the satisfaction of the Agency, may result in the Agency delaying or denying a change in Low Income Unit rents, and may constitute noncomplance with applicable requirements of the Code.

(c) The Beneficial Owner shall not impose fees and charges upon the tenants of Low Income Units without the prior written consent of the Agency, except for the following: (1) a late payment charge not to exceed $25.00 after the tenth day that the rent of such tenant is due; and (2) a bounced check fee not to exceed $25.00.

4.4 Lease Provisions for Low Income Units - Tenant leases for Low Income Units shall be for terms of at least one year and shall be expressly subordinate to the Mortgage. In a separate rider acceptable to the Agency the lease shall state that: (i) the lease shall be terminated and the tenant may be evicted for failure to qualify pursuant to the income standards for that unit if a tenant has falsely certified family income or family composition; (ii) false certification constitutes material noncompliance under the lease; (iii) tenants shall be obligated to provide income certification, and any additional recertifications of income as the Agency and/or the Beneficial Owner shall require; (iv) in the event the unit is not receiving a Federal Section 8 subsidy, the Beneficial Owner's right to increase rent for an existing tenant over the amounts provided in section 4.3(b) hereof upon the conclusion of the Qualified Project Period shall be conditioned upon the Beneficial Owner meeting the requirements of §42 of the Code as referenced in section 3.2 hereof and the Beneficial Owner furnishing such tenant with a notice at least six months prior to such increase in a form acceptable to the Agency, and that if such notice is not given, such tenant shall be entitled to lease renewals at the rents provided for in section 4.3(b) until such notice has been given and six months has elapsed; (v) subletting and the tenant's assignment of the lease shall be

prohibited; and (vi) the Agency and its representatives or agents shall have the right to inspect such unit for the purpose of fulfilling the Agency's responsibilities under the Code. The form of lease to be utilized by the Beneficial Owner in renting the Low Income Units in the Project shall be subject to the Agency's prior written approval. Failure to utilize an approved form of lease for such units shall subject the Beneficial Owner to a penalty equal to one month's rent for each affected unit.

4.5 Fair Market Housing Guidelines - The Beneficial Owner has submitted to the Agency for its records a marketing and tenant selection plan that is in compliance with the Agency's affirmative fair housing marketing guidelines. Such marketing plan specifically describes the method of marketing to and selection of tenants for the Low Income Units. Additionally, a certification as to compliance with the Guidelines and Applicable Rules, as defined in the Guidelines, must be submitted to the Agency at mortgage closing and on an annual basis for the term of this Agreement.

5.0 OPERATING RULES

5.1 Project Restrictions - The Project shall constitute a qualified multi-family residential rental project within the meaning of §142(d) of the Code and will be used for such purposes during the term of this Agreement. The Beneficial Owner warrants that the Project will be completed with due diligence substantially in accordance with building plans and specifications approved by the Agency for the Project and change orders approved by the Agency, to the extent approval of such change orders is required. The Project consists of a building or structure or several proximate buildings or structures which are located on a single tract of land or contiguous tracts of land with or without facilities directly related and essential thereto. The term "tract" means any parcels of land which are contiguous except for the interposition of a road, street, stream or similar property. Parcels are contiguous if their boundaries meet at one or more points. Pursuant to the plans and specifications and any change orders, all of the units in the Project will be similarly constructed. The Beneficial Owner (or a party related to the Beneficial Owner) shall not occupy a unit in a building or structure unless such building or structure contains more than four units. All of the units in the Project will contain within the unit complete living, sleeping, eating, cooking and sanitation facilities, all of which are separate and distinct from other units. In addition, the Project shall contain such other services and amenities as described in Exhibit D, attached hereto. All facilities used in connection with the Project are: (i) located on the premises of the Project, (ii) solely for the benefit of tenants of the Project, and (iii) of a character and size commensurate with the needs of such tenants. Beneficial Owner shall use its best efforts to ensure that handicapped or disabled individuals in the Project are afforded equal access to such facilities.

5.2 Low Income Unit Requirements - The Low Income Units shall constitute all units in the Project except for two non-revenue superintendent's unit. These requirements shall continue throughout the Qualified Project Period. To ensure that Low Income Units are occupied by

households of an appropriate number of individuals, the Beneficial Owner shall comply with the following standard for occupancy upon initial rental or re-rental of such units, or such smaller number if so required by local zoning or building department authorities:

Number of Bedrooms	Number of Persons	% Low Income Units
Studio	1	100%
One Bedroom	1-2	99.1%
Two Bedroom	2-4	92.86%
Three Bedroom	3-6	100%
Four Bedroom	4-8	100%

5.3 Replacement Reserve Account –(a) Owner shall enter into a Replacement Reserve Agreement with Freddie Mac, dated as of January 1, 2012, (the 'Replacement Reserve Agreement"), which shall require that a Replacement Reserve Account be established, the terms of which are incorporated herein by reference. The Agency shall also require the Borrower to fund such Replacement Reserve Account at Loan Closing in the amount of $80,000. In the event there is a Wrongful Dishonor by Freddie Mac of its obligations under the Credit Enhancement Agreement, or Freddie Mac is replaced by another entity as issuer or provider of the Credit Enhancement Agreement subject to the approval of the Agency ("Credit Enhancer"), and only in such events, the Replacement Reserve Agreement and all funds in accounts maintained thereunder shall revert to the Agency and the provisions in subparagraphs (b) through (e) of this section 5.3 shall be applicable in lieu thereof. The parties agree that (i) absent a Wrongful Dishonor by Freddie Mac, or (ii) prior to the replacement of Freddie Mac as the Credit Enhancer, the provisions set forth in subsections (b) through (e) of this section 5.3 shall not be applicable; and (iii in the event of a Wrongful Dishonor by Freddie Mac, the provisions of the Partnership Agreement with respect to the amount to be deposited into the replacement Reserve Account shall control to the extent that the amounts to be deposited thereunder are greater than the provisions of subsections (b) through (e).

(b) The Owner shall establish the following reserve account that shall be controlled by the Agency, to be known as the "Replacement Reserve Account", and shall deposit into such account an annual amount equal to $300 per unit per year, payable in equal monthly installments (subject to adjustment as hereinafter provided) commencing on the first business day of the first month after a Wrongful Dishonor by Freddie Mac or the replacement of Freddie Mac as Credit Enhancer. All interest earned on funds in the Replacement Reserve Account shall be added to and become part of said account, and will not be used to offset any required payments by the Owner into the Replacement Reserve Account. The Agency shall not be responsible for any losses resulting from

the investment of the Replacement Reserve Account or obtaining any specific level or percentage of earnings on such investment.

(c) The amount of monthly payments to the Replacement Reserve Account shall remain constant, until and unless revised in the reasonable discretion of the Agency based on (i) the results of the physical needs assessment report as described in subsection (d) hereinbelow, (ii) the replacement value of the Project, (iii) the Project's history of repairs, (iv) the existing physical condition of the Project, or (v) other factors deemed relevant by the Agency. Upon Owner's written request, the Agency shall disburse to the Owner, in a manner reasonably determined by the Agency, such amounts from the Replacement Reserve Account as may be necessary to reimburse the Owner for the actual approved cost of repairing and/or replacing building systems, equipment and other items of a capital nature, including without limitation the repair or refurbishing of common areas, required for the proper operation and marketing of the Project, or to remedy a situation deemed to be of an emergency nature ("Replacements"). No such disbursements shall be made, however, for costs incurred prior to the first (1st) anniversary of the date that deposits into the Replacement Reserve Account actually commence. In no event shall the Owner undertake work or purchase materials intended to be funded from the Replacement Reserve Account without the prior, written consent of the Agency, which shall not be unreasonably conditioned, withheld or delayed. In no event shall the Agency approve or make any payment of funds from the Replacement Reserve Account unless such work and or materials have been performed or installed, as applicable, and same has been approved by the Agency, which approval shall not be unreasonably withheld or delayed. Said amounts may be reduced (not below zero) by the amounts required to be deposited by the Owner into any replacement reserve account required to be maintained by any agreement with any entity providing credit enhancement for the Mortgage Loan. If at any time the funds deposited with the Agency are or will be insufficient to maintain the Replacement Reserve Account at a satisfactory level, as reasonably determined by the Agency, the Owner, upon notification, shall at such times as may be designated by the Agency, deposit into the Replacement Reserve Account an amount determined by the Agency to be reasonably necessary to restore the account to a sufficient level.

In no event shall the Agency be obligated to approve the disbursement of funds from the Replacement Reserve Account if an Event of Default has occurred and is continuing, or if an act, event or condition shall have occurred and then be existing as of that date, which solely with notice or lapse of time, would constitute an Event of Default. Notwithstanding the above, if an Event of Default has occurred, any entity providing credit enhancement to the Bonds may request the Agency in writing to release funds from the Replacement Reserve Account and thereupon such funds shall be disbursed.

(d) No earlier than the first day of the first month following the tenth anniversary of the date

of the Mortgage and on each tenth anniversary thereafter during the term of the Mortgage Loan, the Owner shall engage a licensed independent engineer or architect, reasonably acceptable to the Agency, to perform a physical needs assessment of the Project. The physical needs assessment shall be performed at the expense of the Owner, which expense shall be reimbursable from the Replacement Reserve Account. At the discretion of the Agency, after review of the physical needs assessment report, the Owner's required monthly payment to the Replacement Reserve Account may be adjusted within 90 days following the Agency's receipt of the physical needs assessment report so that the amount in the Replacement Reserve Account will, in the Agency's determination, be sufficient to pay for required Replacements as identified in said assessment. The Agency agrees that it shall exercise reasonable judgment as a prudent lender in determining such increases for required Replacements.

(e) After payment in full of all sums secured by the Mortgage and the expiration of the Qualified Project Period, the Agency shall disburse to the Owner all amounts remaining in the Replacement Reserve Account.

5.4 Project Management - - (a) The Beneficial Owner shall not employ or otherwise use or retain a management entity for the Project other than ADC TPT Management LLC without the Agency's and Freddie Mac's prior written approval of such management entity and the terms of its retention including compensation, which approval shall not be unreasonably withheld. Any renewal (other than an automatic contract renewal whose terms have already been approved by the Agency) or termination of the management entity's employment shall be subject to the Agency's approval, which approval shall not be unreasonably withheld. If the Beneficial Owner shall also retain a leasing/rental agent, other than the managing agent, such leasing/rental agent shall be subject to the Agency's approval, and may not be replaced without the Agency's prior approval, which approval shall not be unreasonably withheld. If the Beneficial Owner retains a managing agent without having first received approval of the Agency and Freddie Mac, the Owner will be subject to a monetary penalty equal to the lesser of (i) the amount of the monthly management fee paid to the unapproved agent, or (ii) $20,000, which amount shall be assessed initially and for each month such agent is in place without Agency and Freddie Mac approval.

(b) The Agency reserves the right to review the performance of the management agent. However, in no event will the Agency be allowed to terminate the managing agent's employment as described in this subparagraph without the prior written approval of Freddie Mac. In the event that, pursuant to section 5.4(c) hereinbelow or as otherwise provided herein, the Agency or an Agency appointed agent (with Freddie Mac's consent) serves as managing agent of the Project, the Beneficial Owner shall be responsible for payment of reasonable fees and expenses for such services rendered. The Beneficial Owner may also retain a leasing/rental agent, subject to Agency's and Freddie Mac's

prior written approval, which may be the managing agent and/or an affiliate of the Beneficial Owner, and may not be replaced without the Agency's and Freddie Mac's prior written approval.

(c) If the Agency notifies the Beneficial Owner of reasons for which it is not satisfied with the management of the Project, including but not limited to the failure to maintain the property or books and records of the Project, the Beneficial Owner shall cure such condition, or cause the managing agent to cure such condition, in a period of time not to exceed 30 days, provided that said time period may be extended for a reasonable period of time if Beneficial Owner is diligently and expeditiously seeking to cure such condition so long as such condition is curable in the Agency's reasonable judgment, or if such condition is not curable, Beneficial Owner shall engage a managing agent subject to approval by the Agency and Freddie Mac. The Beneficial Owner shall not thereafter employ or otherwise use or retain any managing agent for the property or any part thereof, without having first obtained the Agency's and Freddie Mac's written approval of such managing agent and the agreement setting forth all the terms of such employment or retainer including compensation. The management agreement shall contain a provision that it is subject to termination upon written request by the Agency or Freddie Mac in accordance with the provisions hereof. The Beneficial Owner shall submit to the Agency and to Freddie Mac such information as the Agency and Freddie Mac reasonably require concerning the background and qualifications of the new management entity, including proof of a valid New York State real estate broker's license, and corporate/individual/principal financial statements in a form acceptable to the Agency and Freddie Mac. If the Beneficial Owner has not submitted a managing agent acceptable to the Agency and Freddie Mac within 30 days or if there has been noncompliance hereunder which remains uncured for more than 30 days after notice provided by the Agency, or Freddie Mac, to the Beneficial Owner, Freddie Mac or the Agency with Freddie Mac's prior written request may act as the managing agent or appoint a managing agent. In this case, the Beneficial Owner shall be obligated to pay a management fee to the Freddie Mac or Agency or the Agency-appointed entity, respectively, in the amount equal to the fee paid including accrued incentive payments, if any, to the preceding managing agent.

(d) In the event there is a Wrongful Dishonor by Freddie Mac or Freddie Mac is replaced as Credit Enhancer, (i) the provisions of subparagraphs (a), (b) and (c) of this section 5.4 shall continue to apply, except that the "Agency" shall be substituted for any reference to "Freddie Mac", and any matter requiring the approval of the Agency and Freddie Mac shall only require the approval of the Agency; (ii) any approval of the Agency required pursuant to subparagraph (a) shall not be unreasonably withheld; and (iii) the Agency reserves the right to act as managing agent in the event the Beneficial Owner has failed to submit to the Agency a managing agent acceptable to it within 30 days of such request or if there has been noncompliance hereunder which remains uncured for more

30 days after notice thereof. In the case of (iii) above, the Beneficial Owner shall pay a management fee to the Agency or to the Agency appointed entity, respectively, in the amount equal to the fee paid, including accrued incentive payments, if any, to the preceding managing agent.

(e) Notwithstanding the provisions of sections 5.4(b) and 5.4(c) hereinabove, in the event there is a need to replace the management agent due to premature termination or otherwise, which requires immediate temporary replacement of the management agent before approval can be obtained from the Agency, Beneficial Owner may employ a replacement management agent, provided the agreement for such employment is terminable upon receipt by Beneficial Owner of written notice that said management agent is not acceptable to the Agency.

(f) The Agency reserves the right to review the performance of the leasing agent. In no event may the Agency require the removal of the leasing agent without the prior written approval of Freddie Mac. The provisions of subsection (a) hereinabove, relating to the employment of a managing agent, and the provisions of subsections (b), (c), (d) and (e) regarding the removal and replacement of the managing agent shall equally apply to, respectively, the employment, reasons and procedures for removal and replacement, of the leasing agent, except that the Agency shall not act in the capacity of leasing agent.

5.5 Change of Principals and Transfer Restrictions - (a) As used in this Section 5.5, the term "transfer" shall include any sale, transfer, assignment or other conveyance, provided, however, that the meaning of the term "transfer" shall not include a mortgaging of the Property.

(b) In addition to the restrictions on conveyance of the Project and the Premises as set forth in the Mortgage, neither the Beneficial Owner nor the HDFC shall transfer the Premises, the Project, or any part of either, without the prior written consent of the Agency which consent shall not be unreasonably withheld or delayed.

(c) No consent of the Agency shall be required for the transfer of any direct or indirect ownership interest in the Beneficial Owner, provided that after giving effect to such transfer: (i) there shall not be a change of more than 10%, in the aggregate, of the ownership interests in the Beneficial Owner or of the General Partner, and (ii) the Principal shall retain the day to day management and control of the Beneficial Owner and the Project. The consent of the Agency shall be required for the removal of the General Partner in accordance with the provisions of the Limited Partnership Agreement, however, no consent shall be required if in connection with such removal the General Partner's interest is transferred to an entity controlled by the Limited Partner and provided further that any subsequent replacement of the General Partner shall be subject to the Agency's consent and any applicable fees hereunder.

Notwithstanding any of the foregoing provisions, the following direct or indirect transfers of

interests in the Beneficial Owner or the General Partner shall be permitted without the prior written consent of the Agency, provided that the Principal, directly or indirectly, maintains all operational, managerial and financial control of the Beneficial Owner, the HDFC and the Project, and, in each case, the Beneficial Owner shall give the Agency prompt written notice thereof:

(1) any transfer to an entity wholly owned by the Principal;

(2) a transfer by the Limited Partner to (A) a nationally recognized entity regularly engaged in the purchase and syndication of LIHTC, if (i) such transfer is in connection with the purchase of Project's LIHTC; and (ii) such entity is not a Prohibited Person as such term is defined in Section 5.6 below, and (iii) such entity does not have the immediate or conditional right to exercise operational, managerial and financial control of the Owner and the Project; or (B) to an affiliate of the Limited Partner which is an entity regularly engaged in the purchase and syndication of LIHTC;

(3) transfers by operation of law or, in the case of any partner who is a natural person, transfers resulting from the death or incapacity of such partner.

(d) The Beneficial Owner represents and warrants that as of the date of this Agreement (i) it intends to own the Project for a long-term holding period of eight years commencing from the date when at least 50% percent of the units have received a temporary certificate of occupancy and at least one unit is actually occupied ("Long Term Holding Period") and (ii) the Beneficial Owner has no present intent to transfer direct or indirect ownership or control of the Project. In connection with its consent to any transfer, as required by this Section 5.5, the Agency will charge the Beneficial Owner a fee of one-half of one percent (0.5%) of the then outstanding principal amount of the Mortgage ("Transfer Fee"); provided, however, that if the proposed transfer occurs during the Long Term Holding Period, then in lieu of a Transfer Fee the Agency will charge an assumption fee ("Assumption Fee") based on the then outstanding principal amount of the Mortgage as follows:

Year 1. - 5.0%

Year 2. - 4.0%

Year 3. - 3.0%

Year 4. - 2.0%

Year 5. - 2.0%

Year 6. - 2.0%

Year 7 and Year 8. -1.0%

(e) In the event a transfer which requires Agency consent has occurred without the prior consent of the Agency, then in addition to the applicable Assumption Fee or Transfer Fee, the Beneficial Owner will be subject to a penalty of the greater of (i) an additional one half of one percent (0.5%) of the then outstanding principal balance of the Mortgage Loan, or (ii) $5,000. The Agency agrees that it will not charge the Beneficial Owner the Transfer Fee or Assumption Fee in connection with any transfers that do not require the Agency's consent under Section 5.5(c) above, however, the Agency reserves the right to charge Beneficial Owner for any reasonable related out-of-pocket expenses and such other fees as the Agency, in its reasonable discretion, may deem appropriate for such transfers.

(f) The Beneficial Owner shall, within five days after request of the Agency, furnish to the Agency the names of the officers, directors, members, partners and shareholders of Beneficial Owner, together with such information as the Agency shall request with respect to such persons.

(g) Notwithstanding any of the foregoing provisions, in no event shall any conveyance of the Project or the addition or substitution of any constituent of the Beneficial Owner, or of any other person or entity directly or indirectly holding an ownership interest in the Beneficial Owner, be permitted if such conveyance or addition or substitution shall cause the Beneficial Owner to become a Prohibited Person.

(h) Notwithstanding any other provision of this Agreement, at any time when the Mortgage shall no longer encumber any interest in the Project, or when none of the Bonds shall be outstanding, the Agency's consent shall not be required (and no assumption fee shall be charged by the Agency) with respect to any conveyance of any interest in the Project, or for any change in the ownership or control of any entity holding any interest in the Premises or the Project; provided that such conveyance or change does not cause the Premises or the Project to be owned by a Prohibited Person.

(i) The terms and conditions of this Agreement shall remain outstanding and enforceable against any new owner of the Project.

(j) The Beneficial Owner shall notify the Agency in writing, within 30 days after the occurrence thereof, of: (A) any transfer of any direct ownership interest in Beneficial Owner or the General Partner; or (B) any change in the Limited Partnership Agreement of the Beneficial Owner.

(k) No consent of the Agency to any transfer of the Project or change in the Principals of the Beneficial Owner or General Partner shall be effective without the prior written consent of Freddie Mac to such transfer if such consent is required under the Mortgage. Any written consent to the sale, transfer or other disposition of the Project given by the Agency shall constitute conclusive evidence that such sale, transfer or other disposition is not a violation of the disposition provisions of this Agreement.

5.6 Prohibited Persons - A "Prohibited Person" shall mean:

(a) any individual who has ever been convicted of a felony or any other crime involving moral turpitude, or is an Organized Crime Figure, as defined in Section 5.6(e) hereof, or is reputed to have substantial business or other affiliations with an Organized Crime Figure;

(b) any individual or entity against whom any action or proceeding is pending to enforce rights of any municipal, city, state or federal government, or any agency, department, public authority, public benefit corporation or local development corporation thereof ("Governmental Entity") arising out of a contractual obligation to any such Governmental Entity;

(c) any individual or entity with respect to whom any notice of monetary default which remains uncured has been given by any Governmental Entity;

(d) any individual who is an officer, director, or otherwise exercises managerial discretion or has an ownership interest in excess of 25% in:

(i) the owner of any one or more dwelling(s) subject to New York State Multiple Residence Law, which dwelling, while under the ownership of the owner in which the individual is an officer, director, or otherwise exercises managerial discretion, has been declared a nuisance by the responsible department, and such nuisance has not been removed by the owner in the time specified in the notice or order declaring the dwelling a nuisance (as such terms are defined and used in New York State Multiple Residence Law);

(ii) the owner of any one or more dwelling(s) subject to New York State Multiple Residence Law, with respect to which dwelling or combination of dwellings, on three distinct occasions, a tenant or tenants have withheld rent pursuant to a rent impairing violation having been noted in the official records of the responsible department, which violation the owner in which the individual is or was an officer, director, or otherwise exercises managerial discretion has failed to remove prior to that amount of time after which such failure permits a resident of such dwelling to legally withhold rent from the owner, and either no action to recover rent or possession has been brought by the owner, or the resident has prevailed in such action (as such terms are defined and used in New York State Multiple Residence Law);

(iii) the owner of any one or more dwelling(s) subject to New York State Multiple Dwelling Law, which dwelling, while under the ownership of the owner in which the individual is an officer, director, or otherwise exercises managerial discretion, has been declared a nuisance by the responsible department, and such nuisance has not been removed by the owner in the time specified in the notice or order declaring the dwelling a nuisance or fines and/or penalties have not been paid with respect thereto (as such terms are defined and used in New York State Multiple Dwelling Law); or

(iv) the owner of any one or more dwelling(s) subject to New York State Multiple Dwelling Law, with respect to which dwelling or combination of dwellings, on three distinct occasions, a tenant or tenants have withheld rent pursuant to a rent impairing violation having been noted in the official records of the responsible department, which violation the owner in which the individual is or was an officer, director, or otherwise exercises managerial discretion has failed to remove prior to that amount of time after which such failure permits a resident of such dwelling to legally withhold rent from the owner, and either no action to recover rent or possession has been brought by the owner, or the resident has prevailed in such action (as such terms are defined and used in New York State Multiple Dwelling Law).

(v) any entity which has ever been, or whose principals have ever been, suspended, debarred, disqualified, found non-responsible, had its and/or their prequalification revoked or otherwise has been declared ineligible to do business with any Governmental Entity or which could be deemed non-responsible under New York law.

(e) An individual shall be deemed to be an "Organized Crime Figure" if he or she is alleged as such in writing by a private investigation agency and such allegation has been confirmed by any state or federal prosecutorial, investigative or regulatory agency or authority.

5.7 Changes to Structure of Beneficial Owner Entity - The Beneficial Owner may not materially modify, amend or otherwise materially change the terms of its Limited Partnership Agreement without the prior written approval of the Agency, which approval shall not be unreasonably withheld, except that the approval of the Agency shall not be required if such modification or amendment is for the purpose of substituting or admitting a limited partner of the Beneficial Owner in accordance with Sections 5.5 and 5.9 hereof. In any event, the Beneficial Owner shall provide the Agency with such documents with revisions indicated, within 30 days of the execution thereof.

5.8 General Tax Covenants; Use of Mortgage Proceeds; Other Restrictions - The Beneficial Owner and the HDFC each covenant that they will not take any action, or fail to take any action, or make any use of the Project or the proceeds of the Bonds (including investment earnings), in a way which would adversely affect the exclusion of interest on the Bonds from federal income taxation under the Code. The Beneficial Owner further covenants and agrees that:

(a) The Beneficial Owner will submit a certification in the form attached hereto as Exhibit "B" with each requisition or request for disbursement of the Mortgage Loan except that such certificate shall not be required at the time of the first advance if waived by the Agency.

(b) No portion of the Mortgage Loan shall be used to provide any facilities other than the

multi-family housing units and the portion of the Project which is functionally related and subordinate to such units.

(c) All certifications, representations and warranties made in the tax certification executed by the Beneficial Owner ("Beneficial Owner's Tax Certification"), in connection herewith, as the same may have been amended and approved by the Agency, together with all supplements thereto and all Disbursement Certifications, except as so amended and approved by the Agency, are and will be true and correct. All such certifications, representations and warranties are hereby incorporated and repeated herein with full force and effect. Specifically and not by way of limitation, the Beneficial Owner warrants the accuracy of the schedules of costs included therein. The Beneficial Owner and the HDFC agree to execute and deliver such amendments and supplements to this Agreement as are necessary to preserve the tax exempt status of interest on the Bonds.

(d) The Beneficial Owner and the HDFC each covenant that it will comply with any use or occupancy requirement of any governmental entity providing any subsidy, tax abatement or regulatory approval for the Project, to the extent such requirements do not irreconcilably conflict with the requirements of this Agreement, the Mortgage or any rule, regulation or policy of any state or federal entity.

(e) In no event shall the Beneficial Owner, the HDFC or any Principal become the registered or beneficial owner of any of the Bonds.

5.9 Intentionally Omitted

6.0 REPORTING

6.1 Information and Project Reports - (a) The Beneficial Owner shall submit to the Secretary of the Treasury, at such time and in such manner as the Secretary shall prescribe, annual certifications as to whether the Project continues to meet the requirements of §142(d) of the Code. The Beneficial Owner is on notice that the Code provides that failure to comply will subject the Beneficial Owner to penalty as provided in §6652(j) of the Code.

(b) The Beneficial Owner covenants and agrees to submit to the Agency annually, or more frequently if required in writing by the Agency, reports detailing such facts as the Agency determines are sufficient to establish compliance with the restrictions contained hereunder. In addition, the Beneficial Owner shall provide to the Agency monthly occupancy reports and an annual certification, in a form acceptable to the Agency, regarding tenant income qualification. The Beneficial Owner covenants and agrees to secure and maintain on file for inspection and copying by the Agency, for at least six (6) years after the later of (i) the due date (including any extensions) for

any filings required to be made by the Beneficial Owner with the Internal Revenue Service or its successor agency for that year or (ii) the end of the Qualified Project Period, such information, reports and certifications as the Agency may from time to time require in writing. The Beneficial Owner further covenants and agrees to notify the Agency promptly if the Beneficial Owner discovers noncompliance with any restriction or covenant hereunder. The Agency agrees to notify the Beneficial Owner if the Agency discovers noncompliance with any restriction or covenant hereunder, but the Agency's failure to do so shall not affect the Beneficial Owner's obligations hereunder.

(c) The Beneficial Owner shall promptly furnish a copy of each lease and Low Income Rider entered into for each Low Income Unit with a copy of each annual tenant income certification.

(d) Prior to issuance of the Internal Revenue Service Form 8609 with respect any building in the Project, the Beneficial Owner shall file with the Agency a certificate of actual cost, which shall be accompanied by a certification of an independent certified public accountant reasonably acceptable to the Agency. The independent certified public accountant shall certify, in a format reasonably satisfactory to the Agency, that the amounts claimed as costs are necessary and reasonable, and ordinarily within the scope of the Project. The Agency reserves the right to reject the certificate of actual cost if it is inconsistent with the required format or is otherwise unsatisfactory to the Agency. Additionally, upon completion of the Project, the Beneficial Owner shall also certify to the Agency, based upon a review of its books and records by such certified public accountant, that the Mortgage Loan proceeds have been spent in accordance with the Beneficial Owner's Tax Certification, as modified and approved by the Agency.

(e) The Owner shall notify the Agency of the date of the following within ten days of the date thereof: (i) the issuance of any certificate of occupancy including any temporary certificate of occupancy; (ii) the rental of 50% of the units in the Project; and (iii) the rental of 80% of the units in the Project.

(f) The Beneficial Owner shall submit to the Agency within 90 days of the end of any other fiscal year, three copies of the Project's annual audited financial statements. Prior to the 90 days, the Beneficial Owner may request an extension of no more than 30 days, which request will not be unreasonably withheld or delayed. The financial statements must (i) include a balance sheet, a statement of operations, income, and expenses, a statement of cash flows, and all related notes; (ii) be prepared in accordance with generally accepted accounting principles ("GAAP"); (iii) be presented in a two-year comparative format; and (iv) be accompanied by an opinion of an independent certified public accountant acceptable to the Agency stating that the financial statements were audited in accordance with GAAP. The Agency may require that the financial statements be prepared in a specific format which, where practical, will be provided to the Beneficial Owner in advance, and may require that certain subjects be included in the notes to the financial statements. The Agency may require interim period financial statements, certified by an officer of the Beneficial

Owner, which shall be submitted within 60 days of the date of request, unless prior to the expiration of the applicable period, Beneficial Owner has requested an additional thirty (30) day extension, which request shall not be unreasonably denied by the Agency.

(g) The Beneficial Owner shall submit to the Agency, on or before the 20th day of each month, a cash flow statement and a schedule of accounts payable for the preceding month certified by an authorized representative of the Beneficial Owner. Such cash flow statement must also be prepared on a monthly basis as well as a cumulative basis (for all months which preceded it in the current fiscal year) for both budgeted and actual results and presented in a format reasonably acceptable to the Agency.

(h) In the event that a Wrongful Dishonor by Freddie Mac has occurred or Freddie Mac is replaced as Credit Enhancer, and thereafter during the term of this Agreement, the following shall apply: the Beneficial Owner shall submit to the Agency, on or before the twentieth day of each month, a cash flow statement and a schedule of accounts payable for the preceding month certified by an authorized representative of the Beneficial Owner. The cash flow statement must be prepared on a monthly basis as well as a cumulative basis (for all months which preceded it in the current fiscal year) for both budgeted and actual results and presented in a format reasonably acceptable to the Agency.

6.2 Monitoring and Record Keeping Requirements - (a) The Beneficial Owner shall keep records for each building in the Project showing for each year in the Qualified Project Period (except where otherwise indicated):

(1) The total number of residential rental units in the building (including the number of bedrooms and the size in square feet of each residential rental unit);

(2) The percentage of residential rental units in the building that are Low Income Units;

(3) The rent charged for each residential rental unit in the building (including any utility allowance);

(4) The Low Income Unit vacancies in the building and information that shows when and to whom the next available originally designated Low Income Units were rented;

(5) The annual income certification of each tenant unless and until the Agency in its sole discretion waives the requirement to collect and preserve income certifications on an annual basis;

(6) Documentation to support the income certification made by each tenant of a Low Income Unit (for example, a copy of the tenant's federal income tax return, Form W-2, or verifications of income from third parties such as employers or state agencies paying unemployment compensation), in accordance with Treasury Regulation §1.42-5(b)(1)(vii);

(7) The eligible basis as defined in §42(d) of the Code ("Eligible Basis") and the qualified basis as defined in §42(c) of the Code of the building at the end of the first year of the Credit Period;

(8) The character and use of the nonresidential portion of the building included in the building's Eligible Basis (e.g., tenant facilities that are available on a comparable basis to all tenants and for which no separate fee is charged for use of the facilities, or facilities reasonably required by the Project); and

(9) Such other information as the Agency may reasonably request from time to time.

(b) The Beneficial Owner shall retain the foregoing records for each building in the Project for at least six years after the due date (with extensions) for filing the Beneficial Owner's tax return for that year, except that the records for the first year of the Credit Period shall be retained for at least six years beyond the due date (with extensions) for filing the federal income tax return for the last year of the Compliance Period.

(c) The Beneficial Owner shall certify in a sworn statement to the Agency, on the last business day of December of each year through and including the end of the Qualified Project Period, that, for the preceding 12 month period:

(1) The Project met the requirements of the 20-50 test under §42(g)(1)(A) of the Code, or the 40-60 test (25-60 in New York City) under §42(g)(1)(B) of the Code;

(2) There was no change in the "applicable fraction" as defined in §42(c)(1)(B) of the Code of any building in the Project, or that there was a change, and a description of the change;

(3) The Beneficial Owner has received an annual income certification from each tenant of the Low Income Units (unless the Agency in its sole discretion waives the requirement to collect and preserve income certifications on an annual basis) and documentation to support that certification, or a substitute permitted under Treasury Regulation §1.42-5(c)(1)(iii);

(4) Each Low Income Unit in the Project was rent-restricted under §42(g)(2) of the Code;

(5) All units in the Project were for use by the general public and, except for the superintendents' units, and were used on a non-transient basis;

(6) Each building in the Project was suitable for occupancy, taking into account local health, safety, and building codes applicable to the Project; or, if there have been any violations of such health, safety or building code, a copy of any notice or summons related thereto has been forwarded to the Agency with a description of the violation and a remedial action plan of the Beneficial Owner. The Beneficial Owner shall further indicate whether the violation has been corrected as of the time of certification or Beneficial Owner's estimate of the time frame necessary for correction;

(7) There was no change in the Eligible Basis of any building in the Project or, if there was a change, the nature of the change;

(8) All tenant facilities included in the Eligible Basis of any building in the Project, were provided on a comparable basis without charge to all tenants in the building;

(9) If a Low Income Unit in the Project became vacant during the year, reasonable attempts were or are being made to rent that unit to tenants having a qualifying income before any units in the Project were or will be rented to tenants not having a qualifying income;

(10) An extended low-income housing commitment as defined in §42(h) (6) (B) of the Code was in effect with respect to the Project, which included the requirement under Code §42(h) (6) (B) (iv) that the Beneficial Owner cannot refuse to lease a unit in the Project to an applicant because the applicant holds a voucher or certificate of eligibility under Section 8 of the United States Housing Act of 1937, 42 U.S.C. 1437s;

(11) Each building in the Project complies with the requirements of the Code applicable to the Bonds;

(12) The Project has been and is in compliance with the Agency's Guidelines; the Beneficial Owner's marketing and tenant selection plan applicable to the Project, as filed with the Agency for its records, complies with the applicable rules as defined in the Agency's Guidelines; and there has been no finding of discrimination under any of such applicable rules, nor any complaint, investigation, administrative inquiry, or other action under such applicable rules, or, if there has been any such finding, complaint, investigation, administrative inquiry, or other action, a listing and an explanation thereof;

(13) The Beneficial Owner has complied with all requirements of the LIHTC program, as the same may be amended or supplemented, and with any additional reporting requirements which the Agency may have imposed in order to monitor compliance therewith;

(14) Such other matters as the Agency may reasonably request from time to time.

(d) Each year, during the term of this Agreement, the Beneficial Owner shall retain and make available for inspection and review by the Agency a copy of the annual income certification (unless the Agency in its sole discretion waives the requirement to collect and preserve income certifications on an annual basis) from each tenant and a copy of the documentation the Beneficial Owner has received to support that certification and such other information as the Agency deems necessary to comply with the monitoring requirements of §42 of the Code.

(e) The Agency shall have the right to perform audits of the Project through the end of the Compliance Period. For this purpose, an audit includes an inspection of any building in the Project, an inspection of any unit in the Project and a review of the records described in paragraph (a) of this section. The costs and expenses of any audit or inspection performed by Agency personnel shall be borne by the Agency. The Beneficial Owner shall be solely responsible for any costs incurred by Beneficial Owner or Beneficial Owner's consultants in connection with any such audit or inspection. However, in the event the Agency determines in its sole discretion that it is necessary to engage a third party to conduct such audit or inspection as a result of Beneficial Owner's failure to perform its obligations hereunder, then such expenses shall be borne by Beneficial Owner.

The Beneficial Owner shall use reasonable efforts to assist the Agency with obtaining access to any unit in the Project, shall accompany Agency representatives with such inspections, and shall include a provision in the lease rider to the effect that the tenant shall give the Agency, its

representatives or its agents the right to enter and physically inspect such unit. If the Agency cannot obtain access to a sufficient number of Low Income Units required to fulfill its obligations under the Code, notwithstanding the good faith efforts of the Beneficial Owner to assist the Agency in obtaining such access, the Agency will be obligated to report such lack of access to the Internal Revenue Service as an incident of non-compliance with LIHTC regulations.

(f) The Agency shall provide prompt written notice to the Beneficial Owner if the Agency does not receive the certification described in paragraph (c) of this section 6.2 or discovers on audit, inspection or review (or in some other manner) that the Project is not in compliance with the provisions of §42 of the Code. Additionally, the Agency shall file Form 8823, Low-Income Housing Credit Agencies Report of Noncompliance, with the Internal Revenue Service no later than 45 days after the end of the correction period (which period shall commence on the date that the Agency notifies the Beneficial Owner of noncompliance pursuant to the preceding sentence and shall extend for 60 days thereafter, unless the Agency determines that there is good cause for granting a extension of the correction period, in which case the period may be extended by the Agency for up to six months).

(g) The Agency shall retain records of noncompliance or failure to certify for six years after the Agency's filing of the respective Form 8823. The Agency shall retain the certifications described in subsection 6.1(c) for three years from the end of the calendar year the Agency receives such certifications.

(h) It is expressly understood by the Beneficial Owner that the Agency's monitoring of the Beneficial Owner's compliance with the requirements of §42 of the Code does not and will not make the Agency liable in any manner whatsoever for any noncompliance with such requirements.

6.3 Late Filing Penalties - Unless otherwise specified herein, all reports, certifications or information required under this Article 6 shall be submitted to the Agency by the 20th day of the month following the month to which they relate, and shall be in a format reasonably acceptable to the Agency. The Agency shall notify the Beneficial Owner in the event it has not received any report required hereunder within fifteen (15) days of the date due (as such due date may be extended upon approval of the Agency). If Beneficial Owner fails to submit such delinquent report within five (5) business days after the date of such notice, the Beneficial Owner will be subject to a late filing fee equal to the lesser of (i) five percent (5%) of the then current monthly mortgage debt service obligation, or (ii) $5,000, which amount will be assessed initially and for each succeeding month until such report is submitted. Notwithstanding the above, and with respect only to annual audited financial statements required pursuant to section 6.1(f) above which have been granted a 30 day filing extension, failure to file such reports upon the expiration of such 30 day period (as such period

may be further extended at the sole discretion of the Agency) will immediately, and without any notice required from the Agency, subject the Beneficial Owner to a late filing penalty equal to the lesser of (i) five percent (5%) of the then current monthly mortgage debt service obligation, or (ii) $20,000, which amount will be assessed initially and for each succeeding month until such report is submitted.

7.0 GENERAL PROVISIONS

7.1 Interpretation and Section Headings - In this Agreement: (a) The terms "hereby," "hereof," "hereto," "herein," "hereunder" and any similar terms as used in this Agreement refer to this Agreement, and the term "hereafter" means after, and the term "heretofore" means before the date of this Agreement.

(b) Unless the context otherwise requires, words of the masculine gender mean and include correlative words of the feminine and neuter genders, and words defined in the singular have the same meaning when used in the plural and vice versa.

(c) Words importing persons include firms, associations, partnerships, trusts, corporations, limited liability companies and other legal entities including public bodies, as well as natural persons.

(d) Any headings preceding the texts of any section, paragraph or subparagraph of this Agreement and table of contents appended to the copies hereof shall be solely for convenience of reference and shall not constitute a part of this Agreement, nor shall they affect its meaning, construction or effect.

(e) All certifications, documents and instructions, including those regarding approvals, consents and acceptances, required to be given or made by any person or party hereunder shall be made in writing.

7.2 Parties Bound - This Agreement shall be binding upon the Beneficial Owner, the HDFC and the Agency and any of their respective successors and assigns. Prior to any sale, transfer or other disposition of the Project, the Beneficial Owner and the HDFC shall require the subsequent purchaser or transferee to assume in writing the Beneficial Owner's and HDFC's obligations and duties under this Agreement and shall provide the Agency with a copy of such assumption. Such obligations and duties shall extend to the provisions that all partners or principals of the new owner shall also be bound hereby. Any sale, transfer or other disposition of the Project without such written assumption is null and void and not effective to result in the sale, transfer or other disposition of the Project or to relieve the Beneficial Owner or the HDFC of obligations under this Agreement.

The Beneficial Owner and the HDFC acknowledge that to the extent controlled by the Beneficial Owner or the HDFC or any of the purchasers, transferees, partners or principals of the new owner, it is intended that each person who is "related" to any party bound by this Agreement shall also be bound by this Agreement.

7.3 Compliance with Equal Opportunity Laws and Regulations - The Beneficial Owner and the HDFC shall comply with all applicable state and federal laws and regulations regarding affirmative action, equal opportunity in employment and fair housing laws.

7.4 Governing Law - This Agreement has been executed and delivered in, and shall be construed and enforced in accordance with and governed by the laws of the State of New York. In the event of conflict between the provisions of this Agreement and federal laws, regulations and requirements, the latter shall prevail.

7.5 Notices - All notices to be given pursuant to this Agreement shall be in writing and shall be deemed given when mailed by certified or registered mail, return receipt requested, to the parties hereto at the following addresses, or to such other place as the Agency or the Beneficial Owner from time to time designate in writing:

If to Freddie Mac:
Federal Home Loan Mortgage Corporation
8100 Jones Branch Drive
Mail Stop B4F
McLean, Virginia 22102
Attention: Director of Multifamily Loan Servicing
Facsimile: (703) 714-3003
Telephone: (703) 903-2000

with a copy to:
Federal Home Loan Mortgage Corporation
8200 Jones Branch Drive
McLean, Virginia 22102
Attention: Associate General Counsel - Multifamily
Legal Department
Facsimile: (703) 903-2885
Telephone: (703) 903-2000

with a copy to:
Federal Home Loan Mortgage Corporation
8100 Jones Branch Drive
Mail Stop B4Q
McLean, Virginia 22102
Attention: Director of Multifamily Loan Accounting
Facsimile: (703) 714-3273
Telephone: (703) 903-2000

If to the Servicer:

PNC Bank National Association
26901 Agoura Road, Suite 200
Calabasas Hills, CA 91301
Attention: Loan Administration Manager
Facsimile: 818-676-3209
Telephone: 818-676-3264

If to the Construction Lender:

PNC Bank, National Association
500 West Jefferson
Mail Code K1 KHDQ 23 4
Louisville, KY 40202
Attention: Tami Y. Spangler
Facsimile: (502) 581 3831
Telephone: (502) 581 3878

If to the Borrower:

Abyssinian Development Corporation
4 West 125th Street
New York, New York 10027
Attn: James T. Howard
(646) 442-6570

with a copy to:

Windels Marx Lane & Mittendorf, LLP
156 West 56th Street
New York, New York 10019
Attn: Charles E. Simpson
Telephone: (212)237-1010
Facsimile (212) 262-1215

with a copy to: Limited Partner and Special Limited Partner

PNC MultiFamily Capital Institutional Fund XL Limited Partnership
Columbia Housing SLP Corporation
121 SW Morrison Street, Suite 1300
Portland, OR 97204

with a copy to:

Richard S. Goldstein, Esq
Nixon Peabody LLP
401 9th Street NW, Suite 900
Washington, DC 20004-2128
Telephone: (202) 585-8730
Facsimile: (866) 947-3779

If to the Agency or Mortgagee:

New York State Housing Finance Agency
641 Lexington Avenue

New York, New York 10022
Attention: General Counsel
Attention: President, Finance and Development

7.6 Waiver - No omission by the Agency or act of the Agency other than a writing signed by it waiving a breach by the Beneficial Owner shall constitute a waiver thereof. No such waiver of any breach shall be deemed a waiver of any other or subsequent breach or affect or alter this Agreement, which shall continue in full force and effect with respect to any other then existing or subsequent breach.

7.7 Severability - All rights, powers and remedies provided herein may be exercised only to the extent that exercise thereof does not violate any applicable law, and are intended to be limited to the extent necessary so that they will not render this Agreement invalid, unenforceable or not entitled to be recorded, registered, or filed under applicable law. If any provision shall be held to be invalid, illegal or unenforceable, only such provision or part thereof shall be affected by such holding and the validity of other provisions of this Agreement and of the balance of any provision held to be invalid, illegal or unenforceable in part only, shall in no way be affected thereby, and this Agreement shall be construed as if such invalid, illegal, or unenforceable provision or part thereof had not been contained therein.

7.8 Counterparts - This Agreement may be executed in any number of counterparts, and each such counterpart shall be deemed to be a duplicate original. All such counterparts shall constitute but one and the same instrument.

7.9 HFA Sign - Subject to compliance with local laws and codes, during construction of the Project and for a period of up to six months thereafter, Beneficial Owner shall at its own expense provide, erect, maintain, and insure a sign in a design format and of a size, materials and appearance required by the Agency, in a location at the Project site acceptable to the Agency, and stating that the Project has been financed by the Agency. If the Beneficial Owner uses a sign provided by the Agency, Beneficial Owner shall reimburse the Agency for the cost of the sign, including the cost of transporting the sign to the site of the Project.

7.10 Modification and Waiver - This Agreement may not be amended, supplemented, or modified except by written agreement of the parties hereto, and, so long as the Credit Enhancement Agreement shall continue to provide credit enhancement for this transaction and no Wrongful Dishonor by Freddie Mac shall have occurred with respect thereto, with the written consent of Freddie Mac.

This Agreement and the provisions herein may not be waived, amended, modified or rescinded unless such waiver, amendment, modification or rescission is in writing, and signed by the Beneficial Owner and the Agency.

7.11 Servicing Fee - (a) The Beneficial Owner shall pay to the Agency an annual servicing fee in the amount of twenty-five hundredths of one percent (0.25%) per annum of the outstanding principal amount of the Mortgage Loan payable in equal monthly installments commencing on the date of closing thereof and ending on the first day on which the Mortgage is no longer outstanding ("Servicing Fee").

(b) Commencing on the first date on which both the Bonds and Mortgage are no longer outstanding until the termination of this Regulatory Agreement, the Beneficial Owner shall pay to the Agency an annual monitoring fee in the amount of the greater of: (i) 1% of the total rent revenue due from the Low Income Units (whether or not collected); or (ii) $10,000 per annum, which fee shall be payable in equal monthly installments ("Monitoring Fee"), provided, however, that such Monitoring Fee shall not be applicable so long as a Servicing Fee remains payable to the Agency.

7.12 Approval of Commercial Leases Affecting the Mortgaged Property - The Beneficial Owner shall submit to the Agency for its prior written approval, which shall not be unreasonably withheld, the identity of any prospective retail or other commercial tenant and the proposed usage of the space. If there is no response by the Agency within ten (10) business days after receipt of the Owner's request for the Agency's approval of the identity of any prospective retail or other commercial tenant and the proposed usage of the space, such request shall be deemed approved.

7.13 Green Building Guidelines - The Project shall comply with the Agency's Green Building Guidelines.

7.14 Cure by Limited Partner. The Agency agrees to provide copies of all notices related to the Regulatory Agreement to the Limited Partner. The Limited Partner shall have the same right to cure any default under this Regulatory Agreement as the Beneficial Owner or the HDFC and any cure so made by the Limited Partner pursuant to this paragraph will be recognized by the Agency on the same basis as if made or tendered by the Beneficial Owner or the HDFC.

7.15 Freddie Mac a Third Party Beneficiary - For so long as the Credit Enhancement Agreement shall provide credit enhancement for this transaction, and provided that there shall not have been a Wrongful Dishonor by Freddie Mac under such Credit Enhancement Agreement, Freddie Mac is intended to be and shall be the sole third-party beneficiary of this Agreement. Freddie Mac shall have the right (but not the obligation) to enforce the terms of this Agreement, insofar as this Agreement sets forth the obligations of the Beneficial Owner hereunder. In the event

that Freddie Mac is no longer providing the Credit Enhancement Agreement or a Wrongful Dishonor has occurred and is continuing, all rights to enforce the Beneficial Owner's obligations under this Agreement shall be exercised solely by the Agency.

SIGNATURE PAGE FOLLOWS

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed and delivered by their respective duly authorized representatives, as of the day and year first written above.

Approved by Counsel to the Agency

By: _____
Stuart Zalka
Associate Counsel

AGENCY:

NEW YORK STATE HOUSING FINANCE AGENCY

By: _____
Gail T. Bressler
Vice-President

BENEFICIAL OWNER:

ADC/ENNIS FRANCIS OWNER, L.P.
a New York limited partnership

By: Ennis Francis Corporation
its general partner

By:_____
James T. Howard
Vice President

HDFC:

ADC/ENNIS FRANCIS II HOUSING DEVELOPMENT FUND COMPANY, INC

By:_____
James T. Howard
Vice President

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed and delivered by their respective duly authorized representatives, as of the day and year first written above.

Approved by Counsel to the Agency

By: _____
Barbara Roslyn
Associate Counsel

AGENCY:

NEW YORK STATE HOUSING FINANCE AGENCY

By: _____
Gail T. Bressler
Vice-President

BENEFICIAL OWNER:

ADC/ENNIS FRANCIS OWNER, L.P.
a New York limited partnership

By: ADC/Ennis Francis GP Corporation,
its General Partner

By: _____
James T. Howard
Vice-President

HDFC:
ADC/ENNIS FRANCIS II HOUSING DEVELOPMENT FUND COMPANY, INC

By: _____
James T. Howard
Vice President

STATE OF NEW YORK)
) ss.:
COUNTY OF NEW YORK)

On the 10 day of January in the year 2012, before me, the undersigned, a notary public in and for said state, personally appeared Gail T. Bressler personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose names is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity, and that by his signature on the instrument, the individual, or the person on behalf of which the individual acted, executed the instrument.

SEAL

Notary Public
Commission expires:

BERNADETTE JOY BRIDGES
Notary Public - State of New York
NO. 01BR4820523
Qualified in Kings County
My Commission Expires 5/3/2014

STATE OF NEW YORK)
) ss.:
COUNTY OF NEW YORK)

On the ____ day of January in the year 2012, before me, the undersigned, a notary public in and for said state, personally appeared James T. Howard personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose names is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity, and that by his signature on the instrument, the individual, or the person on behalf of which the individual acted, executed the instrument.

Notary Public
Commission expires:

STATE OF NEW YORK)
) ss.:
COUNTY OF NEW YORK)

On the 10TH day of JAN in the year 2012, before me, the undersigned, a notary public in and for said state, personally appeared JAMES T. HOWARD personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose names is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity, and that by his signature on the instrument, the individual, or the person on behalf of which the individual acted, executed the instrument.

Notary Public
Commission expires:

SEAL

CARLOS JORDAN
Notary Public, State of New York
No. 01JO4890568
Qualified in Queens County
Commission Expires April 27, 2015

STATE OF NEW YORK)
) ss.:
COUNTY OF NEW YORK)

On the 10TH day of JAN in the year 2012, before me, the undersigned, a notary public in and for said state, personally appeared JAMES T. HOWARD personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose names is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity, and that by his signature on the instrument, the individual, or the person on behalf of which the individual acted, executed the instrument.

Notary Public
Commission expires:

SEAL

CARLOS JORDAN
Notary Public, State of New York
No. 01JO4890568
Qualified in Queens County
Commission Expires April 27, 2015

SCHEDULE A
DESCRIPTION OF PREMISES

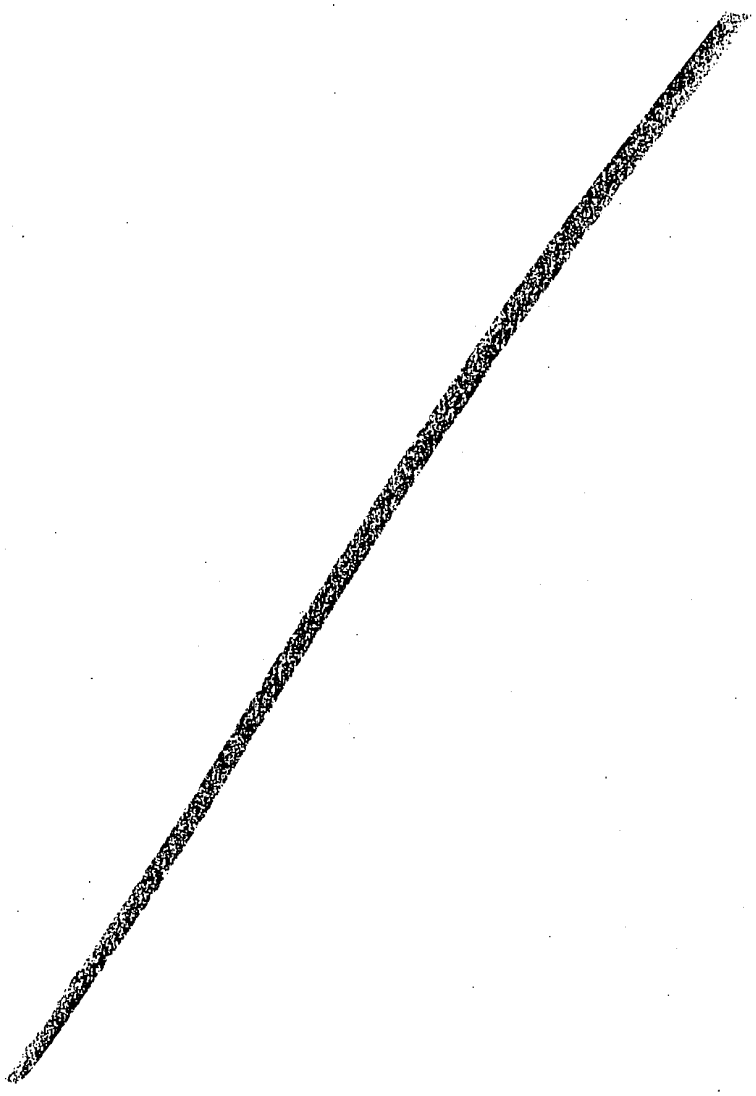


EXHIBIT A

LEGAL DESCRIPTION

Parcel I (Block 1929 Lot 17):
ALL that certain plot, piece or parcel of land, situate, lying and being in the Borough of Manhattan, County, City and State of New York, bounded and described as follows:

BEGINNING at a point on the northerly side of West 123rd Street distant 225 feet westerly from the corner formed by the intersection of the northerly side of West 123rd Street and the westerly side of Adam Clayton Powell Jr. Boulevard;

RUNNING THENCE westerly along the northerly side of West 123rd Street 183 feet 4 inches;

THENCE northerly along a line parallel with Adam Clayton Powell Jr. Boulevard 100 feet 11 inches to the centerline of block between West 123rd Street and West 124th Street;

THENCE easterly along said centerline of the block 183 feet 4 inches;

THENCE southerly along a line parallel with Adam Clayton Powell Jr. Boulevard 100 feet 11 inches to a northerly side of West 123rd Street at the point or place of BEGINNING.

Parcel II (Block 1929 Lot 29):
ALL that certain plot, piece or parcel of land, situate, lying and being in the Borough of Manhattan, County, City and State of New York, bounded and described as follows:

BEGINNING at the corner formed by the intersection of the southerly side of West 124th Street and the westerly side of Adam Clayton Powell Jr. Boulevard;

RUNNING THENCE southerly along the westerly side of Adam Clayton Powell Jr. Boulevard 201 feet 10 inches to the corner formed by the intersection of the westerly side of Adam Clayton Powell Jr. Boulevard and the northerly side of West 123rd Street;

THENCE westerly along the northerly side of West 123rd Street 106 feet 4 inches to a point;

THENCE northerly along a line parallel with Adam Clayton Powell Jr. Boulevard 100 feet 11 inches to the centerline of the block between West 123rd Street and West 124th Street;

THENCE westerly along the centerline of the block 1 foot to a point;

THENCE northerly along a line parallel with Adam Clayton Powell Jr. Boulevard 100 feet 11 inches to a southerly side of West 124th Street;

THENCE easterly along the southerly side of West 124th Street 107 feet 4 inches to the corner formed by the intersection of the southerly side of West 124th Street and the westerly side of Adam Clayton Powell Jr. Boulevard, the point or place of BEGINNING.

TOGETHER With the benefits of a certain Party Wall Agreement made by ADC/Ennis Francis Housing Development Fund Company, Inc. to ADC/Ennis Francis Housing Development Fund Company, Inc. dated April 19, 2011 and recorded May 13, 2011 in CRFN: 2011000174309 as supplemented by Consent And Joinder by Beneficial Owner by and between ADC/Ennis Francis Housing Development Fund Company, Inc. and ADC/Ennis Francis LLC dated as of January 12, 2012 and to be recorded in the Office of the New York City Register for New York County.

EXHIBIT A

AGREEMENT BETWEEN AGENCY AND SUCCESSOR MORTGAGEE
IN THE EVENT OF ASSIGNMENT OF THE MORTGAGE

After the Mortgage has been assigned to [insert name of successor mortgagee], the Agency's right to enforce the Mortgage, in its own right, shall be on the condition that the Agency may only cause an acceleration of the amounts due under the Mortgage Note and/or commencement of foreclosure of the Mortgage if the Agency has received the written consent of [insert name of successor mortgagee] or an opinion of a nationally recognized bond counsel acceptable to the Agency to the effect that such noncompliance under the Regulatory Agreement, the failure to accelerate the amount due under the Mortgage Note and/or commence foreclosure of the Mortgage, would adversely affect the exclusion from gross income for purposes of federal income taxation of interest on the Agency's bonds issued with respect to such Mortgage Loan. The Agency hereby agrees that it will only exercise its rights under the Loan Agreement, Mortgage and Regulatory Agreement to declare the outstanding balance of the Mortgage Loan to be due and payable and/or to foreclosure on the Mortgage as herein provided. This provision shall affect only the rights of [insert name of successor] and the Agency and it is not intended that the Beneficial Owner shall be a third party beneficiary hereof.

EXHIBIT B

PURSUANT TO NYSHFA REGULATORY AGREEMENT

Pursuant to that certain Regulatory Agreement dated as of the _____ day of _____, 201_ ("Regulatory Agreement"), by and between the **NEW YORK STATE HOUSING FINANCE AGENCY** ("Agency"), the Beneficial Owner hereby certifies to the Agency as set forth below. All capitalized terms used but not defined herein shall have the meaning given to them in the Regulatory Agreement.

1. The Beneficial Owner has requested a disbursement of a portion of the Mortgage Loan in the amount and for the purposes described on the attachment hereto. Such disbursement is referred to herein as the "Disbursement". The Certifications herein are made with respect to the Disbursement. This Disbursement will only be used for costs of the Project described in the Regulatory Agreement.

2. All certifications, representations and warranties made by the Beneficial Owner in the Regulatory Agreement and Beneficial Owner's Tax Certification executed simultaneously with the Regulatory Agreement, as either may have been amended and approved by the Agency, together with all supplements thereto and all prior Disbursement Certifications, except as so amended and approved, remain true and correct on the date of this Disbursement Certification and are hereby incorporated and repeated herein with full force and effect. Specifically and not by way of limitation the Beneficial Owner warrants the accuracy of the schedules of costs, actual or estimated as the case may be, included in the Beneficial Owner's Tax Certification. Beneficial Owner further warrants (x) that the Disbursement does not cause a change in the amount of any line item in the Beneficial Owner's Tax Certification, or in the alternative (y) that if it does cause such a change, attached hereto is a completed and executed Beneficial Owner's Tax Certification, revised to reflect any such change, together with the written approval thereof from the Agency.

3. After taking into account the Disbursement, no Mortgage Loan disbursements previously disbursed for payment of Expenditures with respect to the Project, as shown on Part 2 of the "Expected Uses of Loan Proceeds Schedule" included as part of the Beneficial Owner's Tax Certification, will have been applied to pay or reimburse the Beneficial Owner for the payment of "Unqualified Costs" (as classified in the Beneficial Owner's Tax Certification) of the Project in excess of the amounts shown on Schedule A of the Beneficial Owner's Tax Certification.

4. After taking into account the Disbursement and all prior and expected Disbursements, the aggregate amount of all Mortgage Loan disbursements which have been or will be applied to pay

or reimburse the Beneficial Owner for the payment of the cost of land or any interest therein (including capitalized lease payments) is or will be less than twenty five percent (25%) of the aggregate amount of Mortgage Loan.

5. After taking into account the Disbursement and all prior and anticipated Disbursements, the "average maturity" of the Bonds will not exceed (120%) of the "average reasonably expected economic life" (within the meanings ascribed to such quoted terms in Section 147(b) of the Code) of the Project financed or to be financed with the Mortgage Loan.

6. The Disbursement is requested to pay, or reimburse the Beneficial Owner for the payment of costs of the Project theretofore paid or incurred. After giving effect to the payment of costs for which this Disbursement request is made, Beneficial Owner expects that, at the time the costs are certified for LIHTC purposes in connection with preparation of Form 8609 for any building in the Project, the proceeds of the Bonds will be allocable to costs in the sequence and manner provided in Section _____ of the Loan Agreement.

7. The Beneficial Owner is in compliance with all of the terms and conditions of the Regulatory Agreement on the part of the Beneficial Owner to be observed or performed and is not aware of any impending failure in such compliance in any material respect.

IN WITNESS WHEREOF, the Beneficial Owner has caused this Certification to be duly executed and delivered as of the date hereof.

BENEFICIAL OWNER:

ADC/ENNIS FRANCIS OWNER, L.P.,
a New York limited partnership
By: Ennis Francis Corporation
its general partner

By: _____
Name: James T. Howard
Title: James T. Howard

EXHIBIT C

ADJUSTMENTS FOR SMALLER AND LARGER FAMILIES
TO THE AREA MEDIAN INCOME FIGURE

Number of Persons in Family

50% LOW INCOME UNITS

1	2	3	4	5	6
35%	40%	45%	50%	54%	58%

60% LOW INCOME UNITS

1	2	3	4	5	6
42.0%	48.0%	54.0%	60.0%	64.8%	69.6%

THE PERCENTAGES SET FORTH ABOVE ARE PERCENTAGES TO BE APPLIED TO AREA MEDIAN INCOME TO DETERMINE APPROPRIATE INCOME LEVELS

HOWEVER, THE ACTUAL APPLICABLE INCOME LIMITS ADJUSTED FOR FAMILY SIZE ARE THOSE PUBLISHED BY HUD FROM TIME TO TIME

EXHIBIT "D"
PROJECT SERVICES AND AMENITIES

Project: **ENNIS FRANCIS HOUSES Project**

1. The project includes commercial space, either financed by the Agency or included in the total development cost of the project: ☐ Yes ☐ No

2. There will be _____ units reserved for resident managers, superintendents and/or employees:

Unit # (If Known)	Unit Type	Residential or Commercial Use	Revenue- or Non-Revenue-Generating

3. The following services and amenities are offered by the project for a fee which is NOT included in the monthly base rent for all tenants (both affordable and market rate):

☐ Parking spaces:
- ☐ All spaces
- ☐ Indoor parking or garages only
- ☐ Additional space(s) after one
- ☐ Other: _____

Storage space

☐ Recreational facilities

☐ Individual utilities

☐ Electric

☐ Heat

☐ Gas

☐ A/C

☐ Water

☐ Cable service

- ☐ Laundry facilities:
  - ☐ Washer/Dryer hook-up
  - ☐ Washer/Dryer in unit
  - ☐ Laundry room
- ☐ Structural or architectural features:
- ☐ Bay windows
- ☐ Den in apartment
- ☐ Balconies
- ☐ Vaulted ceilings
- ☐ Fireplaces
- ☐ Other: _____
- ☐ Other services and/or amenities for which a fee will be charged:

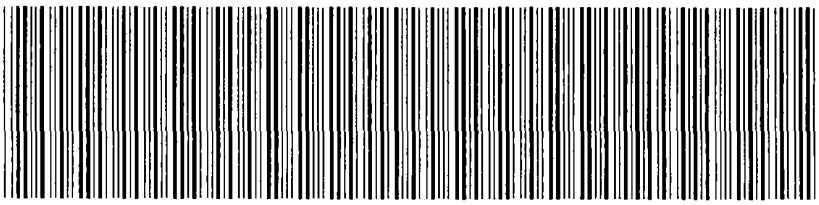
_____

_____

4. If applicable, the service package for senior/congregate/assisted projects includes:

_____

NYC DEPARTMENT OF FINANCE
OFFICE OF THE CITY REGISTER



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SUPPORTING DOCUMENT COVER PAGE **PAGE 1 OF 1**

Document ID: 2012012000858011 Document Date: 01-12-2012 Preparation Date: 01-24-2012
Document Type: SUNDRY AGREEMENT

SUPPORTING DOCUMENTS SUBMITTED:

	Page Count
RECORDING FEE EXEMPTION DOCUMENTATION	3

In the Matter of the Mortgage and Related Documents Executed by **ADC/ENNIS FRANCIS OWNER, L.P.** and **ADC/FRANCIS II HOUSING DEVELOPMENT FUND COMPANY, INC.** to **NEW YORK STATE HOUSING FINANCE AGENCY**	**AFFIDAVIT IN SUPPORT OF EXEMPTION FROM MORTGAGE RECORDING TAX AND CLERK'S FEES**

STATE OF NEW YORK)
) ss.:
COUNTY OF NEW YORK)

BARBARA D. ROSLYN, being duly sworn, deposes and says that:

1. I am an Associate Counsel of the New York State Housing Finance Agency (the "Agency"), and am duly authorized to make this affidavit on behalf of said Agency.

2. The Agency is a corporate governmental agency constituting a public benefit corporation of the State of New York (the "State"), created by Article III of the Private Housing Finance Law ("PHFL"), constituting Chapter 44-B of the Consolidated Laws of the State of New York, as amended (the "Act").

3. The Agency is empowered by the Act to make mortgage loans to the owners of certain projects with respect to which the Agency finds that portions are to be occupied by persons or families of low income.

4. The Agency made a mortgage loan (the "Loan") to the Borrower in the amount of $38,565,000, which is secured by a First Multifamily Mortgage, Assignment of Rents and Security Agreement dated as of January 1, 2012 ("Mortgage"), covering certain property located in New York County, State of New York ("Premises") and more fully described in said Mortgage which is intended to be recorded in the Office of the County Clerk for New York County ("County Clerk's Office").

5. In connection with the making of the Loan, the Agency and Borrower entered into a Regulatory Agreement for the Ennis Francis Apartments ("Project"), dated as of January __, 2012 ("Regulatory Agreement"), which contains restrictions that run with the land concerning the use of the Project to be constructed on the Premises, which Regulatory Agreement is intended to be recorded in the County Clerk's Office.

6. In connection with the making of the Loan, the Agency entered into a Building Loan and Project Loan Agreement ("Loan Agreement"), dated as of January 1, 2012, with the Borrower, pursuant to which the Agency makes the Loan and the Borrower agrees to complete the Project, which Loan Agreement is intended to be filed in the County Clerk's office.

7. In connection with the making of the Loan, the Agency entered into an Assignment and Intercreditor Agreement ("Intercreditor Agreement") with, among others, Freddie Mac and Bank of New York Mellon ("Trustee"), as their interests may appear, dated as of January 1, 2012, pursuant to which the Agency assigns the Mortgage and certain other security documents to Freddie Mac and the Trustee, as their interests may appear, and, which Intercreditor Agreement is intended to be filed in the County Clerk's Office.

8. Pursuant to Section 53 of the PHFL, property of the Agency, its income and operations, shall at all times be free from taxation.

9. The Mortgage, Regulatory Agreement, the Loan Agreement and Intercreditor Agreement (collectively, the "Documents") which are to be recorded or filed as an operation of the Agency and such recordation and/or filing are not subject to the mortgage recording tax imposed by Article XI of the Tax Law of the State of New York because it is being recorded by the Agency, or its designated agent, as a public benefit corporation specifically exempted therefrom pursuant to Section 53 of the PHFL.

10. Pursuant to Section 8017(a) of the New York Civil Practice Law and Rules, the Documents are also exempt from any clerk's fees for filing, recording or indexing any paper or document or for furnishing a transcript, certification or copy of any paper or document.

11. UCC Financing Statements ("UCCs") relating to the Mortgage are to be duly filed and/or recorded in the New York Department of State, Uniform Commercial Code Unit, are not subject to Article XI of the Tax Law and are exempt from fees for filing pursuant to Section 8017(a)of the New York Civil Practice Law and Rules.

SIGNATURE PAGE TO FOLLOW.

WHEREFORE, it is respectfully requested that the New York County Clerk's Office record and/or file the Mortgage, Regulatory Agreement, the Loan Agreement, the Intercreditor Agreement and UCCs, without demand for payment of fees or payment of the mortgage recording tax, and that the New York Department of State, Uniform Commercial Code Unit and the New York County Clerk's Office accept the UCCs for filing without demand for payment of filing fees.

Barbara D Roslyn

Barbara D. Roslyn

Sworn to before me this 10 th day
of January, 2012.

Maryann Vitacco

Notary Public

MARYANN VITACCO
Notary Public, State of New York
No. 01VI6129481
Qualified in Richmond County
Commission Expires June 27, 2013

SEAL

Ly/Ennis Francis\Tax Affid.2

NYC DEPARTMENT OF FINANCE
OFFICE OF THE CITY REGISTER

This page is part of the instrument. The City Register will rely on the information provided by you on this page for purposes of indexing this instrument.The information on this page will control for indexing purposes in the event of any conflict with the rest of the document.

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RECORDING AND ENDORSEMENT COVER PAGE **PAGE 1 OF 23**

Document ID: 2018010200172008 Document Date: 12-19-2017 Preparation Date: 01-05-2018
Document Type: SUNDRY AGREEMENT
Document Page Count: 22

PRESENTER:

ALL NEW YORK TITLE AGENCY, INC.
222 BLOOMINGDALE ROAD^ANY2016-1829C
SUITE 306
WHITE PLAINS, NY 10605
914-686-5600
JKAMNA@ALLNYT.COM

RETURN TO:

BRYAN R. KAPLAN, ESQ.
NYC DEPT OF HOUSING PRESERVATIONA AND DEVELOPMENT
100 GOLD STREET - ROOM 5-W10
NEW YORK, NY 10038

PROPERTY DATA

Borough	Block	Lot	Unit	Address
MANHATTAN	1929	57	Entire Lot	2070 ADAM C POWELL BLVD

Property Type: COMMERCIAL REAL ESTATE

CROSS REFERENCE DATA

CRFN_____ *or* DocumentID_____ *or* _____ Year_____ Reel____ Page_____ *or* File Number_____

PARTIES

PARTY 1:
CARTHAGE 124TH LP
200 MALCOLM X BLVD, 2ND FLOOR
NEW YORK, NY 10027

PARTY 2:
THE CITY OF NEW YORK, ACTING BY AND THROUGH ITS DE
100 GOLD STREET
NEW YORK, NY 10038

FEES AND TAXES

Mortgage :

Mortgage Amount:	$	0.00
Taxable Mortgage Amount:	$	0.00
Exemption:		
TAXES: County (Basic):	$	0.00
City (Additional):	$	0.00
Spec (Additional):	$	0.00
TASF:	$	0.00
MTA:	$	0.00
NYCTA:	$	0.00
Additional MRT:	$	0.00
TOTAL:	$	0.00
Recording Fee:	$	147.00
Affidavit Fee:	$	0.00

Filing Fee: $ 0.00

NYC Real Property Transfer Tax: $ 0.00

NYS Real Estate Transfer Tax: $ 0.00

RECORDED OR FILED IN THE OFFICE OF THE CITY REGISTER OF THE CITY OF NEW YORK
Recorded/Filed 01-08-2018 09:37
City Register File No.(CRFN): **2018000006697**

City Register Official Signature

REGULATORY AGREEMENT

THIS REGULATORY AGREEMENT ("Agreement' or "Regulatory Agreement") is entered into as of the 19 day of December, 2017, by and between **CARTHAGE 124TH LP**, a New York limited partnership ("Owner"), having an office at 200 Malcolm X Boulevard, 2nd Floor, New York, New York 10027, and the **CITY OF NEW YORK** ("City"), a municipal corporation of the State of New York ("State"), acting by and through its **DEPARTMENT OF HOUSING PRESERVATION AND DEVELOPMENT** ("HPD"), having an office at 100 Gold Street, New York, New York 10038.

WHEREAS, on the date hereof, Owner has acquired certain real property known as 200-254 West 124th Street, New York, New York and identified as Block 1929, Lot 57 on the Tax Map of the City of New York, and more particularly defined on Schedule A attached hereto and made a part hereof (the "Premises"), from ADC/Ennis Francis Housing Development Fund Corporation, Inc. ("ADC HDFC") and ADC/Ennis Francis LLC ("ADC LLC"); and

WHEREAS, it is anticipated that Owner will construct one or more new buildings on the Premises, which shall include rental housing for low income families (the "New Construction"); and

WHEREAS, the Premises are subject to that certain Regulatory Agreement, by and among ADC LLC, ADC HDFC and the City, dated as of September 22, 2006 and recorded on December 13, 2006 in the Office of the Register of The City of New York, in the County of New York ("Register's Office") in CRFN 2006000684213, as amended by that certain HPD Regulatory Agreement Amendment, by and among ADC LLC, ADC HDFC and the City, dated as of May 26, 2011 and recorded on June 10, 2011 in the Register's Office in CRFN 2011000206039 (as amended, the "Existing Regulatory Agreement"); and

WHEREAS, the Premises are being released from the Existing Regulatory Agreement on the date hereof in connection with the acquisition of the Premises by Owner; and

WHEREAS, as a condition to the acquisition of the Premises, Owner is entering into this Regulatory Agreement to provide rental housing for low income families; and

WHEREAS, the parties hereto have agreed that any construction, building, or development on the Premises, including the New Construction, shall be subject to the written approval of HPD.

NOW THEREFORE, the parties hereto do hereby agree as follows:

1. **Certain Definitions.**

"50% of AMI" shall mean 100% of the income levels as modified by household size for the New York metropolitan statistical area for fifty percent (50%) of median income families (a.k.a. as "very low income families") as determined from time to time by HUD under Section 3(b)(2) of the United States Housing Act of 1937 (or, if such program is terminated, under such program as was in effect immediately before such termination).

"80% of AMI" shall mean 160% of the income levels as modified by household size for the New York metropolitan statistical area for fifty percent (50%) of median income families (a.k.a. as "very low income families") as determined from time to time by HUD under

Section 3(b)(2) of the United States Housing Act of 1937 (or, if such program is terminated, under such program as was in effect immediately before such termination).

"130% of AMI" shall mean 260% of the income levels as modified by household size for the New York metropolitan statistical area for fifty percent (50%) of median income families (a.k.a. as "very low income families") as determined from time to time by HUD under Section 3(b)(2) of the United States Housing Act of 1937 (or, if such program is terminated, under such program as was in effect immediately before such termination).

"AMI" shall mean the area median income for the primary metropolitan statistical area as determined by HUD from time to time for a family of four, as adjusted for family size.

"Annual Income" is the anticipated total income from all sources to be received by the household head and spouse and by each additional member of the household, including all net income derived from assets, for the twelve (12) month period following the date of initial determination of income. The definitions and descriptions of income set forth in the HUD regulations contained in 24 CFR 5.609 or any successor regulations shall apply for the purposes of this Agreement and shall be incorporated herein.

"Eligible Tenant" shall mean tenants who meet the income restrictions and other requirements set forth in this Agreement.

"HUD" shall mean the United States Department of Housing and Urban Development or its successors.

"Legal Rent" shall have the meaning ascribed thereto in Paragraph 4(A) herein.

"Low Income Units" shall have the meaning ascribed thereto in Paragraph 3(A) herein.

"Marketing Handbook" shall mean the "*Marketing Handbook: Policies and Procedures for Resident Selection and Occupancy*" adopted by HPD and New York City Housing Development Corporation and published on the HPD website, as amended.

"Occupancy Date" shall mean the date on which a temporary certificate of occupancy has been obtained for the New Construction.

"Rent Stabilization Code" or "Rent Stabilization" shall mean Title 26, Chapter 4 of the New York City Administrative Code (and any successor statute) and the regulations promulgated in connection therewith.

"Section 8" shall mean housing assistance payments under Section 8 of the United States Housing Act of 1937 or any comparable rental assistance program approved by HPD with respect to a Unit or occupants thereof.

"Section 8 Rent" shall mean the maximum rent permitted under Section 8.

"Section 8 Units" shall mean Units occupied by tenants receiving a voucher or certificate under Section 8.

"Units" shall mean dwelling units in the Premises.

2. **Term of Restrictions.** The "Restriction Period" shall be the period commencing on the date hereof and terminating on the date that is thirty (30) years after the Occupancy Date.

3. **Eligibility of Tenants.**

A. Eligibility. The greater of (i) 72 Units or (ii) 60% of the Units constructed on the Premises shall be "Low Income Units" at all times during the Restriction Period. Throughout the Restriction Period, Owner shall lease:

(i) At least thirty-four (34) of the Units only to tenants whose Annual Incomes upon initial occupancy do not exceed 50% of AMI ("50% Units");

(ii) No more than 10% of the Units only to tenants whose Annual Incomes upon initial occupancy do not exceed 130% of AMI ("130% Units"); and

(iii) The balance of the Low Income Units only to tenants whose Annual Incomes upon initial occupancy do not exceed 80% of AMI ("80% Units").

In calculating the number of Units in each category above, no Unit may be counted in more than one category.

The Low Income Units shall be evenly distributed (other than rounding) as to unit type in accordance with HPD guidelines. The balance of the Units constructed on the Premises may be market rate units that, subject to Paragraph 24 herein, may be rental or homeownership Units and may be located in one or more buildings separate from the Low Income Units.

B. Changes in Income. Any Eligible Tenant shall be entitled to remain in occupancy and to obtain a renewal lease in accordance with the Rent Stabilization Code, notwithstanding that such tenant's Annual Income, after initial occupancy, may exceed the maximum for initial eligibility. Further, no Eligible Tenant may be evicted nor its tenancy terminated except for good cause.

C. Income Determinations. In order to determine whether a prospective tenant of a Low Income Unit is an Eligible Tenant, Owner shall ascertain the Annual Income of such tenant's household. Owner may consult with HPD to obtain advice and guidance with respect to income determinations. Owner must retain all records and documents relating to Owner's determination for a minimum of (3) three years after the date the tenant commences occupancy. Owner shall provide in each lease for the termination of the lease and eviction of the tenant if the tenant falsely or fraudulently certifies income to Owner.

D. Proof of Compliance. Owner shall submit to HPD not later than thirty (30) days after the Occupancy Date and upon each anniversary of such date until the end of the Restriction Period: (i) a certified rent roll for the Low Income Units and, at HPD's request, copies of leases for Low Income Units; and (ii) a written certification setting forth the Annual Incomes of all tenants of Low Income Units who began occupancy during the prior year and, at HPD's request, all supporting documentation for such income determination.

E. Section 8. Owner shall not refuse to lease a Low Income Unit to a holder of a voucher or certificate under the federal Section 8 Voucher Program or Section 8 Certificate Program or successor programs by reason of the status of the prospective tenant as such a holder.

4. **Rent Requirements.**

A. Registration in Accordance With Rent Stabilization Code.

On or before the Occupancy Date, Owner shall register the rents for each Low Income Unit as follows in accordance with the Rent Stabilization Code:

(i) 50% Units: 30% of 50% of AMI in effect as of the date of this Agreement;

(ii) 80% Units: 30% of 80% of AMI in effect as of the date of this Agreement and

(iii) 130% Units: 30% of 130% of AMI in effect as of the date of this Agreement and

The rents so registered shall be deemed the initial legal regulated Rent Stabilization Code rents. Owner shall follow all procedures and guidelines of the New York State Division of Housing and Community Renewal (or its successor agency with jurisdiction over enforcing the Rent Stabilization Code) and all relevant requirements of Rent Stabilization. As hereinafter referred to in this Agreement, the "Legal Rent" shall refer to the initial legal regulated rent as adjusted pursuant to the Rent Stabilization Code.

B. Rents Charged.

Throughout the Restriction Period, the rents for Low Income Units shall not exceed the following:

(i) 50% Units: the lesser of (1) the Legal Rent or (2) 30% of 50% of AMI; except that for Section 8 Units, where the initial legal regulated rent is set at or above the Section 8 Rent, the rents shall not exceed the lesser of (1) the Legal Rent, or (2) the Section 8 Rent, provided that the share of the rent payable by the tenant shall not exceed the amount required by Section 8 and allowed by Section 42.

(ii) 80% Units: the lesser of (1) the Legal Rent or (2) 30% of 80% of AMI except that for Section 8 Units where the initial legal regulated rent is set at or above the Section 8 Rent, the rents shall not exceed the lesser of (1) the Legal Rent or (2) the Section 8 Rent, provided that the share of the rent payable by the tenant shall not exceed the amount required by Section 8 and allowed by Section 42.

(iii) 130% Units: the lesser of (1) the Legal Rent or (2) 30% of 130% of AMI except that for Section 8 Units where the initial legal regulated rent is set at or above the Section 8 Rent, the rents shall not exceed the lesser of (1) the Legal Rent or (2) the Section 8 Rent, provided that the share of the rent

payable by the tenant shall not exceed the amount required by Section 8 and allowed by Section 42.

Following the expiration of the Restriction Period, (A) rents for Units occupied by tenants who began occupancy before the expiration of the Restriction Period shall not exceed the most recent rent charged to and paid by such tenant, which may thereafter be adjusted pursuant to Rent Stabilization or any successor statute, and (B) rents for Units becoming vacant shall not exceed the Legal Rent.

C. No Rent Stabilization Exemptions.

Owner shall not utilize any exemption or exclusion from any requirement of the Rent Stabilization Code to which Owner might otherwise be or become entitled with respect to one or more Low Income Units, including, but not limited to, any exemption or exclusion from the rent limits, renewal lease requirements, registration requirements, or other provisions of the Rent Stabilization Code due to (i) the vacancy of a Low Income Unit where the rent exceeds a prescribed maximum amount, (ii) the fact that tenant income and/or rent exceed prescribed maximum amounts, (iii) the nature of the tenant, or (iv) any other factor.

5. **Minimum Household Size.**

The minimum number of occupants for each Low Income Unit shall be as follows:

Unit Size	Minimum Number of Persons
0BR	1
1BR	1
2BR	2
3BR	4
4BR	6

6. **HPD Marketing Guidelines.** Owner shall submit to HPD a plan for the marketing of the Low Income Units in accordance and consistent with the Marketing Handbook (the "Marketing Plan") and, upon approval thereof, shall market the Low Income Units in accordance with the Marketing Plan and Marketing Handbook.

7. **Low Income Units Subject To Several Restrictions.**

If a Low Income Unit is subject to income or rent restrictions imposed by a lender or other governmental entity, or by HPD under another regulatory or similar agreement, the most restrictive provision shall control.

8. **Prohibition Against Condominium or Cooperative Conversions.**

Owner shall not convert the Premises to cooperative or condominium ownership during the Restriction Period without the prior written consent of HPD. Any conversion after the Restriction Period must conform to State and City laws and must be on the basis of a non-eviction plan.

9. **Management.**

A. General.

(i) Owner shall manage and operate the Premises in accordance with generally acceptable management practices in New York City.

(ii) On or before the Occupancy Date, Owner shall enter into a management contract with a third party management entity, which contract and management entity shall both be subject to HPD approval. Such contract shall have a term of not less than three (3) years. The management fee shall not exceed 6% of net rent collection, including rent from rental subsidies and rent from commercial units. Any new or replacement management entity shall be subject to HPD approval.

(iii) Owner shall be in default of this Paragraph 9(A) if HPD provides written notice to Owner of a violation and Owner has failed to cure such violation within ninety (90) days of such notice.

B. Maintenance of Premises. Owner shall maintain and operate the Premises in a proper, safe, sanitary and healthful condition in compliance with all applicable legal requirements, and make all necessary repairs and replacements, including curing all housing and building code violations in the time period prescribed by law.

C. Municipal Charges. Owner shall pay all municipal charges in a timely manner, including taxes, assessments (and installments of any assessments that are payable in installments), water rates, sewer rents, and other charges, including, without limitation, vault charges and fees for the use of vaults, chutes, and similar areas adjoining the Premises, now or hereafter levied or assessed against the Premises prior to the date upon which any fine, penalty, interest or cost may be added thereto or imposed by law for the nonpayment thereof. Upon HPD request, Owner shall provide HPD with evidence of payment of any such charges.

D. Insurance.

(i) Owner shall keep the buildings, improvements and all other property on the Premises insured by procuring general liability and building policies providing sufficient coverage issued by an insurance company licensed in the State of New York against fire, vandalism, malicious mischief, collapse, flood (if in a federally designated flood area), earthquakes and other risks customarily insured against under extended coverage policies in the City. Owner shall provide HPD on an annual basis with copies of insurance certificates in form satisfactory to HPD evidencing compliance with such requirements.

(ii) Owner shall maintain Commercial General Liability insurance in the amount of at least One Million Dollars ($1,000,000) per occurrence. In the event such insurance contains an aggregate limit, the aggregate shall apply on a per-location basis applicable to the Premises and such per-location aggregate shall be at least Two Million Dollars ($2,000,000). This insurance shall protect the insureds from claims for property damage and/or bodily injury, including death, that may arise from any of the operations under this Agreement. Coverage shall be at least as broad as that provided by the most recently issued Insurance

Services Office ("ISO") Form CG 0001, shall contain no exclusions other than as required by law or as approved by the HPD Commissioner, and shall be "occurrence" based rather than "claims-made." Policies providing such insurance may not include any endorsements excluding coverage relating to the emission of asbestos, lead, mold, or pollutants. Such Commercial General Liability insurance shall name the City of New York, together with its officials and employees, as an Additional Insured with coverage at least as broad as the most recent edition of ISO Form CG 2026.

E. Building Reserve. Owner shall establish a building reserve fund ("Reserve Account") into which Owner shall deposit, commencing on the Occupancy Date, an amount equal to $250 per Unit on the Premises per year, which payment shall be made on an annual basis thereafter throughout the Restriction Period and which shall increase by 3%, compounding annually, on the first anniversary of the Occupancy Date and on each anniversary thereafter. Monies in the Reserve Account shall be kept segregated from other monies of the Owner and may be drawn on and used to pay for the cost of capital improvements and/or for extraordinary increases in building maintenance and operating expenses beyond the control of the Owner. HPD must approve any withdrawal from the Reserve Account.

Upon the later of (i) Owner's sale, transfer, conveyance or other disposition of the Low Income Units, or (ii) the expiration of the Restriction Period, the entire outstanding balance in the Reserve Account shall be utilized by Owner in the following priority:

First, to pay any outstanding taxes, charges or other amounts owed to the City with the exception of loans made by HPD;

Second, to pay into a new replacement reserve account or any other reserve as required by HPD; and

Third, at Owner's request, with HPD's approval, to repay approved HPD loans or to satisfy the operating reserve targets for any affordable housing project owned by Owner or its affiliated entities.

F. Service and Maintenance Contracts. Owner shall only enter into service and maintenance contracts with qualified venders at commercially reasonable and customary fees.

G. Renting Vacant Units. Owner shall use all commercially reasonable efforts to re-rent vacated Units as soon as possible, and shall notify the HPD Assistant Commissioner of the Division of Asset Management or its successor if any Units remain vacant for six (6) months.

H. Building Registration. Owner shall register the Premises with HPD pursuant to Article 2 of Subchapter 4 of the New York City Housing Maintenance Code.

10. **Books, Records and Certifications.**

A. Maintenance of Books and Records. Owner shall keep and maintain full and accurate books and records regarding maintenance, operation and management of the Premises and comply with customary financial and other reporting requirements, and

shall permit HPD to review, examine and audit such books and records at all reasonable hours. Owner shall submit to HPD such reports and information as HPD may require. Said books and records shall be retained by Owner for six (6) years after the expiration of the Restriction Period. Upon ten (10) days' written notice from HPD, Owner, including any of its members, officers, directors, employees or agents, shall submit under oath to an oral examination by authorized representative(s) of HPD concerning any or all matters relating to the Premises, and shall produce for examination, review and/or audit by HPD all or such books and records, including, without limitation, journals, ledgers, accounts, check books, canceled vouchers, contracts, correspondence, stock books and minute books, as such notice may specify. Such notice shall specify the time and place of examination.

B. Audited Financial Reports. Owner shall submit to HPD annually, no later than 90 days after the end of the project's fiscal year, in such forms as shall be approved by HPD, (i) a copy of the audited annual financial report which shall include a statement of the income and expenses of the Premises, a balance sheet, a statement of cash flows, and accompanying notes and schedules; (ii) a certified rent roll; and (iii) proof of insurance.

C. Budget. Owner shall submit to HPD annually, commencing on the first anniversary date of this Agreement and on each anniversary date thereafter, a budget for the following year showing anticipated income and expenses for the Premises.

D. Additional Submissions. Owner shall submit to HPD in a timely manner such additional reports and information requested by HPD, including, but not limited to, bank statements, tenant income records for all existing tenants and all tenants who vacated within the previous three (3) years, rent collection reports, vacancy information, management expense reports, receipts evidencing proof of payments, portfolio information, and organizational charts.

11. **Right To Inspect.** HPD and its officers, employees, agents or inspectors shall have the right to enter and inspect the Premises at all reasonable times without prior notice.

12. **Prohibition Against Conveyances, Leasing and Loans.**

(a) Owner shall not, without the prior written approval of HPD, (i) further encumber the Premises with any lien imposed in connection with any other financing, or (ii) permit the Premises or any part thereof or any direct or indirect interest therein to be sold, transferred or conveyed to any other person or entity, or (iii) sell, transfer or convey the Premises or any part thereof or any direct or indirect interest therein, which shall include, but not be limited to, (x) where Owner is a business corporation (I) the sale or transfer of more than forty-nine percent (49%) of the outstanding shares of the corporation, or (II) the dilution of present stockholding or corporate control by issuance of new or treasury stock or by conversion of any non-voting stock or other securities to voting stock, or (y) where Owner is a partnership, the withdrawal (except by death), resignation or retirement of any general partner, or the appointment of any new, or other, or substitute general partner(s) (provided that the foregoing shall not apply to limited partners), or (z) where Owner is a limited liability company, the withdrawal (except by death), resignation or retirement of any member other than a passive investor member, or the appointment of any new, or other, or substitute member or members other than passive investor members.

(b) Owner shall not, without the prior written consent of HPD:

(i) lease or license all or substantially all of the Premises to any party; or

(ii) lease any commercial unit in the Premises to any affiliate, subsidiary or principal of Owner, or lease any commercial unit in the Premises for less than the prevailing market rent for the neighborhood where the Premises are located.

(c) Owner shall not, without the prior written consent of HPD, use any of the operating income or reserves for the Premises to make loans for any purpose (whether secured or unsecured or whether repayable or forgivable) to any affiliate, subsidiary or principal of Owner or to any third party.

13. **Amendments.**

Except as otherwise set forth herein, this Agreement may only be amended by HPD and Owner by an instrument executed by both parties in recordable form.

14. **Enforcement.**

(a) In the event of a breach of any of the covenants and agreements contained herein, the City shall have the right to one or more of the following:

(i) Institute and prosecute any proceeding for an injunction or for specific performance of Owner's obligations hereunder.

(ii) Extend the term of this Agreement by the period of such noncompliance upon the recording an appropriate document, executed solely by the City, against the Property. The period of noncompliance shall be presumed to be the period running from the date of this Agreement to the date that HPD notifies the Owner of such noncompliance, which presumption may be rebutted by Owner.

(iii) Upon a violation of Paragraph 9(E) or any reserve requirement established by any other agreement or document between HPD and Owner with respect to the Premises, HPD may require Owner to establish the Reserve Account in a bank account governed by a deposit agreement with a bank acceptable to HPD, which restricts withdrawals therefrom without an authorized signatory of HPD approving such withdrawal.

(b) In the event of a threatened breach of any of the covenants and agreements contained herein, the City shall have the right to the remedy described in Paragraph 14(a)(i) above.

HPD, in its sole and absolute discretion, may, in writing, (i) give Owner a period of up to thirty (30) days to cure any violation, provided the violation can be cured without affecting the rights of any bona fide tenants who have executed leases with Owner, or (ii) waive any of the provisions of this paragraph. No such waiver shall be effective unless it is in writing. Further, no delay or waiver in enforcing the provisions hereof as to any violation shall impair, damage or waive the right of the City to enforce this

Agreement in the event of a continuation or repetition of such breach or violation or any similar breach or violation hereof at any later time.

15. **Investigations.**

Owner is bound by the provisions of the Investigation Clause addendum attached hereto as Schedule B and made a part hereof.

16. **Binding Nature of Restrictions.**

This Agreement shall be recorded against the Premises in the Office of the City Register for the county in which the Premises are located. The restrictions set forth in this Agreement shall run with the land and bind Owner, Owner's successors, assigns, heirs, grantees and lessees. All references to "Owner" in this Agreement shall include Owner's successors, assigns, heirs, grantees and lessees.

17. **Notices.**

All notices shall be delivered by certified or registered mail, return receipt requested, to the respective parties hereto, at the addresses at first above written, unless such addresses are otherwise modified in writing by the addressee.

18. **Expiration.**

Except as otherwise provided herein, upon the expiration of the Restriction Period, this Agreement shall be of no further force and effect; provided, however, that HPD shall retain all of its rights and remedies to enforce this Agreement with respect to any default or violation that occurred prior to the expiration of the Restriction Period. HPD shall, if requested by Owner, execute and deliver to Owner a document in recordable form to reflect the expiration of this Agreement.

19. **Devotion of Premises to Residential Use.**

The Premises shall be devoted solely to residential and community facility use unless otherwise agreed to in writing by HPD

20. **Compliance with HireNYC.**

Owner shall, and shall cause the general contractor and all applicable subcontractors to, comply with the requirements of HireNYC as more particularly set forth in the HireNYC Rider attached hereto as Schedule C and made part hereof, as may be modified by the City from time to time.

21. **Building Benchmarking.**

Prior to the closing of any construction loan for the Premises, Owner shall contract, at Owner's expense, with a qualified benchmarking software provider (the "Qualified Software Provider") from the Housing Development Corporation (HDC) Qualified Benchmarking Software Provider list (the "Approved Provider List") to collect monthly and annual data on the heating, electric and water usage (the "Utility Performance Information") on the Premises in accordance with Section 2: Basic Framework of the HPD Benchmarking Protocol, a copy of which has been provided to Owner. Not later than May 1 of each year of the Restriction Period, the Qualified Software Provider retained by Owner shall input the Utility Performance Information for the immediately preceding year into the United States Environmental Protection Agency ENERGY STAR Portfolio Manager ("Portfolio Manager"), or such other system as may be designated by HPD.

Owner agrees and acknowledges that (i) the Utility Performance Information will be made available to HPD through the "NYC Affordable Housing" account located on Portfolio Manager and (ii) HPD may receive the Utility Performance Information directly from the Qualified Software Provider. HPD reserves the right to replace the Qualified Software Provider in the event that such provider ceases to be included on the Approved Provider List. Throughout the Restriction Period, Owner shall at all times abide by the terms and conditions set forth in this Paragraph 21 and in the HPD Benchmarking Protocol, as may be amended from time to time.

22. **Primary Residence.**

Low Income Units may only be occupied as a primary residence, as defined in Rent Stabilization, by natural persons or families pursuant to a one or two year lease who have met the applicable income requirements for Eligible Tenants at the time of such tenant's initial occupancy of such Low Income Unit. Owner shall only offer a vacant Low Income Unit for occupancy by persons or families intending to occupy such Low Income Unit as their primary residence pursuant to a one or two year lease and shall not cause or permit the sublease or assignment of any Low Income Unit for transient occupancy, for occupancy by any household that is not income eligible, or to any corporation or other entity.

23. **Contractual Rent Regulation.**

A. Definitions.

"Destabilization" shall mean any set of facts that causes Rent Stabilization to no longer apply to the Units subject to this Agreement, whether by expiration, legislative repeal, judicial invalidation, or any other reason.

"Contractual Rent Regulation" shall mean the following after Destabilization:

(a) Owner shall be required to offer renewal leases on the same terms and conditions as had been required by Rent Stabilization at the time of Destabilization (subject however to the provisions in subparagraphs (b) and (c) below), as if the Unit was still subject to and not excluded or exempted from any provision of Rent Stabilization, including, but not limited to, any exemption or

exclusion regarding rent limits, renewal lease requirements, or any other provision due to (i) the vacancy of a Unit where the rent exceeds a prescribed maximum amount, (ii) the fact that tenant income and/or Unit rent exceed prescribed maximum amounts, (iii) the nature of the tenant, or (iv) any other factor.

(b) The "Legal Rent," as such term is used in this Agreement, shall be limited by percentage increases calculated based on a method or index established by HPD for determining the maximum increase to Legal Rent upon lease renewal or vacancy. Such method or index shall be based on inflation or on factors substantially equivalent to the factors considered in calculating such increases under Rent Stabilization at the time of Destabilization, and shall incorporate a method for determining and implementing increases to Legal Rent by reason of major capital improvements performed by Owner, to the extent that such increases, if any, are not prohibited hereunder. HPD will publish such methodology in the city record and will provide a copy of the methodology to Owner upon request.

(c) Wherever this Agreement limits increases in rent by increases as permitted by Rent Stabilization (or language of similar import), such increases shall be limited by the percentage increases established by HPD as described in subparagraph (b) above.

B. If Destabilization occurs during the Restriction Period, then for the remainder of the Restriction Period, all Units that have undergone Destabilization shall be subject to Contractual Rent Regulation. If some Units remain subject to Rent Stabilization while other Units have undergone Destabilization, Contractual Rent Regulation will only apply to the Units that have undergone Destabilization.

24. **Approval of Development on Premises.**

Any construction, building, or development on the Premises by Owner, including the New Construction, shall require the prior written consent of HPD.

[remainder of page left blank by intention]

IN WITNESS WHEREOF, HPD and Owner have duly executed this Regulatory Agreement as of the day and year first-above written

THE CITY OF NEW YORK
By: Department of Housing Preservation and Development

By: _____
Name: Nathans Simms
Title: Assistant Commissioner

CARTHAGE 124TH LP, a New York limited liability company

By: Carthage Real Estate Advisors LLC, a New York limited liability company, its general partner

By: _____
Name: Edward Poteat
Title: Sole Member

APPROVED AS TO FORM
BY STANDARD TYPE OF CLASS
UNTIL NOVEMBER 30, 2017

By: /s/ Howard Friedman
(Acting) Corporation Counsel

ACKNOWLEDGEMENT

STATE OF NEW YORK)
) ss:
COUNTY OF NEW YORK)

On the 15th day of December, in the year 2017, before me, the undersigned, personally appeared **Nathan Simms**, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity, and that by his signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

Joanna Hamlin Kandel

JOANNA HAMLIN KANDEL
NOTARY PUBLIC
NOTARY PUBLIC-STATE OF NEW YORK
No. 01KA6224410
Qualified in New York County
My Commission Expires November 18, 2018

STATE OF NEW YORK)
) ss:
COUNTY OF NEW YORK)

On the __ day of December, in the year 2017, before me, the undersigned, personally appeared **Edward Poteat**, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity, and that by his signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

NOTARY PUBLIC

CHRISTOPHER DEVOE
Notary Public, State of New York
No. 01DE6165951
Qualified in Nassau County
Commission Expires May 14, 2019

SCHEDULE A
PROPERTY DESCRIPTION

All those certain plots, pieces and parcels of land, with the buildings and improvements thereon erected, situate, lying and being in the City and State of New York, designated on the Tax Map of the City of New York:

Borough: Manhattan

County: New York

Block: 1929

Lot: 57

Address: 200-254 West 124th Street

as more particularly described as follows:

BEGINNING at a point on the southerly side of West 124th Street, distant 107 feet 4 inches westerly from the comer formed by the intersection of the southerly side of West 124th Street and the westerly side of Adam Clayton Powell Jr. Boulevard;

RUNNING thence southerly along a line parallel with Adam Clayton Powell Jr. Boulevard, I00 feet II inches to a point in the center line of the block between West 123rd Street and West !24th Street;

THENCE westerly along the center line of the block, 493 feet 2 inches to a point;

THENCE northerly along a line parallel with Adam Clayton Powell Jr. Boulevard, 100 feet II inches to a point in the southerly side of West 124th Street;

THENCE easterly along the southerly side of West 124th Street, 493 feet 2 inches to the point or place of BEGINNING.

TOGETHER with the benefits and SUBJECT TO the burdens contained in that certain Egress Easement Agreement dated 4/19/2011 between ADC/Ennis Francis Housing Development Fund Company, Inc. and ADC/Ennis Francis Housing Development Fund Company, Inc. recorded on 5/13/2011 in CRFN 2011000174366, as supplemented by Consent and Joinder by Beneficial Owner (Egress Easement) dated as of I/12/2012, by and between ADC/Ennis Francis Housing Development Fund Company, Inc. and ADC/Ennis Francis LLC recorded on 2/2/2012 in CRFN 2012000048287.

SCHEDULE B
INVESTIGATION CLAUSE

(a) The parties to this Agreement agree to cooperate fully and faithfully with any investigation, audit or inquiry conducted by a State of New York (State) or City of New York (City) governmental agency or authority that is empowered directly or by designation to compel the attendance of witnesses and to examine witnesses under oath, or conducted by the Inspector General of a governmental agency that is a party in interest to the transaction, submitted bid, submitted proposal, contracts, lease, permit, or license that is the subject of the investigation, audit or inquiry.

(b) If any person who has been advised that his or her statement, and any information from such statement, will not be used against him or her in any subsequent criminal proceeding refuses to testify before a grand jury or other governmental agency or authority empowered directly or by designation to compel the attendance of witnesses and to examine witnesses under oath concerning the award of or performance under any transaction, agreement, lease, permit, contract, or license entered into with the City, the State or any political subdivision or public authority thereof, or the Port Authority of New York and New Jersey, or any local development corporation within the City, or any public benefit corporation organized under the laws of the State of New York; or

(c) If any person refuses to testify for a reason other than the assertion of his or her privilege against self-incrimination in an investigation, audit or inquiry conducted by a City or State governmental agency or authority empowered directly or by designation to compel the attendance of witnesses and to take testimony under oath, or by the Inspector General of the governmental agency that is a party in interest in, and is seeking testimony concerning the award of, or performance under, any transaction, agreement, lease, permit, contract, or license entered into with the City, the State, or any political subdivision thereof or any local development corporation within the City; then

(d) The commissioner or agency head whose agency is a party in interest to the transaction, submitted bid, submitted proposal, contract, lease, permit, or license shall convene a hearing upon not less than five (5) days written notice to the parties involved to determine if any penalties should attach for the failure of a person to testify.

(e) If any non-governmental party to the hearing requests an adjournment, the commissioner or agency head who convened the hearing may, upon granting the adjournment, suspend any contract, lease, permit, or license pending the final determination pursuant to paragraph (g) below without the City incurring any penalty or damages for delay or otherwise.

(f) The penalties which may attach after a final determination by the commissioner or agency head may include but shall not exceed:

(1) The disqualification for a period not to exceed five (5) years from the date of an adverse determination for any person, or any entity of which such person was a member at the time the testimony was sought, from submitting bids for, or transacting business with, or entering into or obtaining any contract, lease, permit or license with or from the City; and /or

(2) The cancellation or termination of any and all such existing City contracts, leases, permit, or licenses that the refusal to testify concerns and that have not been assigned as permitted under this agreement, nor the proceeds of which pledged, to an unaffiliated and unrelated institutional lender for fair value prior to the issuance of the notice scheduling the hearing, without the City incurring any penalty or damages on account of such cancellation or termination; moneys lawfully due for goods delivered, work done, rentals, or fees accrued prior to the cancellation or termination shall be paid by the City.

(g) The commissioner or agency head shall consider and address in reaching his or her determination and in assessing an appropriate penalty the factors in paragraphs (g)(1) and (g)(2) below. He or she may also consider, if relevant and appropriate, the criteria established in paragraphs (g)(3) and (g)(4) below in addition to any other information which may be relevant and appropriate:

(1) The party's good faith endeavors or lack thereof to cooperate fully and faithfully with any governmental investigation or audit, including but not limited to the discipline, discharge, or disassociation of any person failing to testify, the production of accurate and complete books and records, and the forthcoming testimony of all other members, agents, assignees or fiduciaries whose testimony is sought.

(2) The relationship of the person who refuses to testify to any entity that is a party to the hearing, including, but not limited to, whether the person whose testimony is sought has an ownership interest in the entity and/or the degree of authority and responsibility the person has within the entity.

(3) The nexus of the testimony sought to the subject entity and its contracts, leases, permits or licenses with the City.

(4) The effect a penalty may have on an unaffiliated and unrelated party or entity that has a significant interest in an entity subject to penalties under paragraph (f) above, provided that the party or entity has given actual notice to the commissioner or agency head upon the acquisition of the interest, or at the hearing called for in paragraph (d) above gives notice and proves that such interest was previously acquired. Under either circumstance the party or entity must present evidence at the hearing demonstrating the potential adverse impact a penalty will have on such person or entity.

(h)

(1) The term "license" or "permit" as used herein shall be defined as a license, permit, franchise or concession not granted as a matter of right.

(2) The term "person" as used herein shall be defined as any natural person doing business alone or associated with another person or entity as a partner, director, officer, principal or employee.

(3) The term "entity" as used herein shall be defined as any firm, partnership, corporation, association, or person that receives moneys, benefits, licenses, leases, or permits from or through the city or otherwise transacts business with the City.

(4) The term "member" as used herein shall be defined as any person in association with another person or entity as a partner, officer, principal or employee.

(i) In addition to and notwithstanding any other provisions of this Agreement, the Commissioner or agency head may in his or her sole discretion terminate this Agreement upon not less than three (3) days written notice in the event the contractor fails to promptly report in writing to the Commissioner of Investigation of the City of New York any solicitation of money, goods, requests for future employment or other benefit or thing of value, by or on behalf of any employee of the City or other person, firm, corporation or entity for any purpose which may be related to the procurement or obtaining of this Agreement by the contractor, or affecting the performance of this Agreement.

SCHEDULE C
HireNYC

The following HireNYC Rider applies to the Owner, the general contractor, and all subcontractors for the project with contracts of $500,000 or more and shall be included in the construction contract with the general contractor and all such subcontracts. All references to "Covered Party(ies)" shall be deemed to apply to the Owner, the general contractor, and all such subcontractors responsible for job posting during the project, as described below.

HIRING AND EMPLOYMENT RIDER

Introduction

This Rider addresses the HireNYC process, including reporting obligations under the HireNYC process, and certain other reporting requirements imposed by law. In general, the HireNYC process under this Rider requires Covered Parties to enroll with the HireNYC portal for the City of New York (the "City") found within the Department of Small Business Services' ("SBS") website, to disclose all new entry to mid-level job opportunities (as defined below) that are created by the project and located in New York City, ("Covered Jobs") and to evaluate or interview qualified candidates from HireNYC for Covered Jobs. Entry to mid-level jobs shall mean jobs requiring no more than an associate degree, as provided by the New York State Department of Labor (see Column F of https://labor.ny.gov/stats/2012-2022-NYS-Employment-Prospects.xls).

A. Enrollment

Each Covered Party must be enrolled with the HireNYC system, found at nyc.gov/hirenyc. The Owner and general contractor shall each enroll within thirty (30) days after the date of construction closing. Subcontractors must be enrolled by the earlier of (i) fifteen (15) days after the full execution of its subcontract or (ii) the start of work under such subcontract

The Owner or general contractor shall engage with SBS to create a project work plan that details the planned subcontracting engagements and any expected hiring needs. The work plan should include information such as projected start dates for subcontractors, the anticipated schedule of initiating the hiring process for any positions they might hire for, and contact information for all Covered Parties.

The Owner and general contractor may designate a project coordinator to act as the main contact for the Covered Parties with regard to the matters contained in this Rider. The role of the project coordinator will be to manage the administrative enrollment requirements of subcontractors and to facilitate communication between the Covered Parties and SBS.

B. Recruitment Requirements

Once enrolled in HireNYC, the Covered Parties shall update the HireNYC portal with a list of

all Covered Jobs as they become known. The Covered Parties or project coordinator must request candidates through the HireNYC portal to fill any Covered Jobs no less than three weeks prior to the intended first day of employment for each new position, or as otherwise negotiated with SBS, whose consent will not be unreasonably withheld, and must also update the HireNYC portal as set forth below. If an employee is needed in an unexpected situation to keep a project on schedule, the Covered Party must notify SBS of this need and if SBS is not able to refer a candidate within three (3) business days, the Covered Party may proceed without further consideration.

After enrollment and submission of relevant information through the HireNYC portal by Covered Parties or the project coordinator, SBS will work directly with the hiring manager for each Covered Party to develop a recruitment strategy for Covered Jobs. HireNYC will screen applicants based on employer requirements and refer qualified applicants to the appropriate Covered Party for evaluation or interviews. The Covered Parties must evaluate or interview referred applicants whom it believes are qualified. These requirements do not limit the Covered Party's ability to work with community partners who may also refer candidates for job opportunities, to assess the qualifications of prospective workers, or to make final hiring and retention decisions. No provision of this Rider shall be interpreted so as to require a Covered Party to employ any particular worker or to limit consideration to the prospective employees referred by HireNYC.

In addition, this Rider shall not apply to positions that a Covered Party intends to fill with employees employed pursuant to the job retention provision of Section 22-505 of the Administrative Code of the City of New York or to positions covered by Collective Bargaining Agreements or Project Labor Agreements. Covered Parties shall not be required to report such openings with HireNYC. However, Covered Parties shall enroll with the HireNYC system pursuant to Section A, above, and, if such positions subsequently become open, then the remaining provisions of this Rider will apply.

C. Reporting Requirements

After completing an evaluation or interview of a candidate referred by HireNYC, the Covered Party or project coordinator must provide feedback via the portal to indicate which candidates were evaluated or interviewed and hired, if any. For any individual hired through HireNYC, the Covered Party or project coordinator shall provide the expected start date, wage, and hours expected to work. The Covered Party or project coordinator shall provide such information on a monthly basis through the HireNYC portal for any candidates referred by HireNYC that are evaluated, interviewed and/or hired in a particular month.

In the event a Covered Party does not have any Covered Jobs in any given year, the Covered Party or project coordinator shall be required to provide an annual update to HireNYC to that effect. For this purpose, the reporting year shall run from the date of the registration of the contract and each anniversary date.

Covered Parties or the project coordinator shall report to the City all information reasonably requested by the City that is necessary for the City to comply with any reporting requirements imposed by law or rule. In addition, Covered Parties shall comply with all reporting requirements imposed by law or rule, or as otherwise requested by the City.

D. Audit Compliance

Covered Parties shall permit the New York City Department of Housing Preservation and Development ("HPD") to inspect any and all records concerning or relating to job openings or the hiring of individuals for Covered Jobs. Covered Parties shall retain all such records for one (1) year from the date of contract completion and shall permit an inspection by HPD within seven (7) business days of the request.

E. Other Hiring Requirements

Covered Parties shall comply with all federal, state, and/or local hiring requirements as may be set forth elsewhere in this Agreement or other project documents.

REGULATORY AGREEMENT

BETWEEN

THE CITY OF NEW YORK

and

CARTHAGE 124TH LP

Borough:	Manhattan
County:	New York
Block:	1929
Lot:	57
Address:	200-254 West 124th Street

RECORD AND RETURN TO:

Bryan R. Kaplan, Esq.
Department of Housing Preservation
and Development
100 Gold Street, Rm 5-W10
New York, NY 10038

Appendix F: Noise Backup

Calibration Certificate

Certificate Number 2017008544

Customer:

Equity Environmental Eng
500 International Drive
Mount Olive, NJ 07828, United States

Model Number	LxT2	***Procedure Number***	D0001.8378	
Serial Number	0002230	***Technician***	Ron Harris	
Test Results	**Pass**	***Calibration Date***	8 Aug 2017	
Initial Condition	AS RECEIVED same as shipped	***Calibration Due***	8 Aug 2018	
Description	SoundTrack LxT Class 2 Class 2 Sound Level Meter Firmware Revision: 2.301	***Temperature***	23.38 °C	± 0.25 °C
		Humidity	50.8 %RH	± 2.0 %RH
		Static Pressure	86.6 kPa	± 0.13 kPa

Evaluation Method Tested electrically using Larson Davis PRMLxT2 S/N 013562 and an 18.0 pF capacitor to simulate microphone capacitance. Data reported in dB re 20 µPa assuming a microphone sensitivity of 23.6 mV/Pa.

Compliance Standards Compliant to Manufacturer Specifications and the following standards when combined with Calibration Certificate from procedure D0001.8384:

IEC 60651:2001 Type 2	ANSI S1.4-2014 Class 2
IEC 60804:2000 Type 2	ANSI S1.4 (R2006) Type 2
IEC 61252:2002	ANSI S1.11 (R2009) Class 2
IEC 61260:2001 Class 2	ANSI S1.25 (R2007)
IEC 61672:2013 Class 2	ANSI S1.43 (R2007) Type 2

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the International System of Units (SI) through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2005. **Test points marked with a ‡ in the uncertainties column do not fall within this laboratory's scope of accreditation.**

The quality system is registered to ISO 9001:2008.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

Correction data from Larson Davis LxT Manual for SoundTrack LxT & SoundExpert Lxt, I770.01 Rev J Supporting Firmware Version 2.301, 2015-04-30

Calibration Check Frequency: 1000 Hz; Reference Sound Pressure Level: 114 dB re 20 µPa

Periodic tests were performed in accordance with precedures from IEC 61672-3:2013 / ANSI/ASA S1.4-2014/Part3.

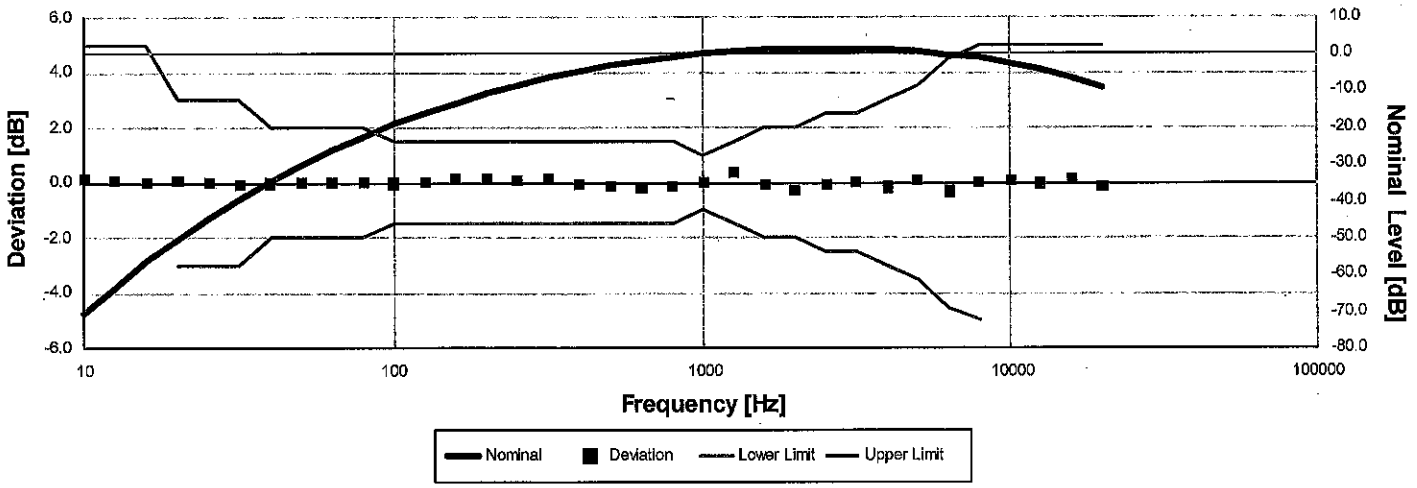
No Pattern approval for IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1 available.

The sound level meter submitted for testing successfully completed the periodic tests of IEC 61672-3:2013 / ANSI/ASA S1.4-2014/Part 3, for the environmental conditions under which the tests were performed. However, no general statement or conclusion can be made about conformance of the sound level meter to the full specifications of IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1 because (a) evidence was not publicly available, from an independent testing organization responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the class 2 specifications in IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1 or correction data for acoustical test of frequency weighting were not provided in the Instruction Manual and (b) because the periodic tests of IEC 61672-3:2013 / ANSI/ASA S1.4-2014/Part 3 cover only a limited subset of the specifications in IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1.

Standards Used

Description	Cal Date	Cal Due	Cal Standard
Hart Scientific 2626-S Humidity/Temperature Sensor	2017-06-11	2018-06-11	006943
SRS DS360 Ultra Low Distortion Generator	2017-06-29	2018-06-29	007118

A-weight Filter Response



Electrical signal test of frequency weighting performed according to IEC 61672-3:2013 13 and ANSI S1.4-2014 Part 3: 13 for compliance to IEC 61672-1:2013 5.5; IEC 60651:2001 6.1 and 9.2.2; IEC 60804:2000 5; ANSI S1.4:1983 (R2006) 5.1 and 8.2.1; ANSI S1.4-2014 Part 1: 5.5

Frequency [Hz]	Test Result [dB]	Deviation [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
10.00	-70.26	0.14	-inf	5.00	0.22	Pass
12.59	-63.34	0.06	-inf	5.00	0.22	Pass
15.85	-56.69	0.01	-inf	5.00	0.22	Pass
19.95	-50.43	0.07	-3.00	3.00	0.22	Pass
25.12	-44.70	0.00	-3.00	3.00	0.22	Pass
31.62	-39.44	-0.04	-3.00	3.00	0.22	Pass
39.81	-34.63	-0.03	-2.00	2.00	0.22	Pass
50.12	-30.18	0.02	-2.00	2.00	0.22	Pass
63.10	-26.18	0.02	-2.00	2.00	0.22	Pass
79.43	-22.47	0.03	-2.00	2.00	0.22	Pass
100.00	-19.13	-0.03	-1.50	1.50	0.22	Pass
125.89	-16.08	0.02	-1.50	1.50	0.22	Pass
158.49	-13.28	0.12	-1.50	1.50	0.22	Pass
199.53	-10.77	0.13	-1.50	1.50	0.22	Pass
251.19	-8.50	0.10	-1.50	1.50	0.22	Pass
316.23	-6.44	0.16	-1.50	1.50	0.22	Pass
398.11	-4.89	-0.09	-1.50	1.50	0.22	Pass
501.19	-3.32	-0.12	-1.50	1.50	0.22	Pass
630.96	-2.09	-0.19	-1.50	1.50	0.22	Pass
794.33	-0.97	-0.17	-1.50	1.50	0.22	Pass
1,000.00	0.00	0.00	-1.00	1.00	0.22	Pass
1,258.93	0.95	0.35	-1.50	1.50	0.22	Pass
1,584.89	0.93	-0.07	-2.00	2.00	0.22	Pass
1,995.26	0.91	-0.29	-2.00	2.00	0.22	Pass
2,511.89	1.25	-0.05	-2.50	2.50	0.22	Pass
3,162.28	1.22	0.02	-2.50	2.50	0.22	Pass
3,981.07	0.83	-0.17	-3.00	3.00	0.22	Pass
5,011.87	0.59	0.09	-3.50	3.50	0.22	Pass
6,309.57	-0.42	-0.32	-4.50	4.50	0.22	Pass
7,943.28	-1.06	0.04	-5.00	5.00	0.22	Pass
10,000.00	-2.43	0.07	-inf	5.00	0.22	Pass
12,589.25	-4.33	-0.03	-inf	5.00	0.22	Pass
15,848.93	-6.42	0.18	-inf	5.00	0.22	Pass
19,952.62	-9.45	-0.15	-inf	5.00	0.22	Pass

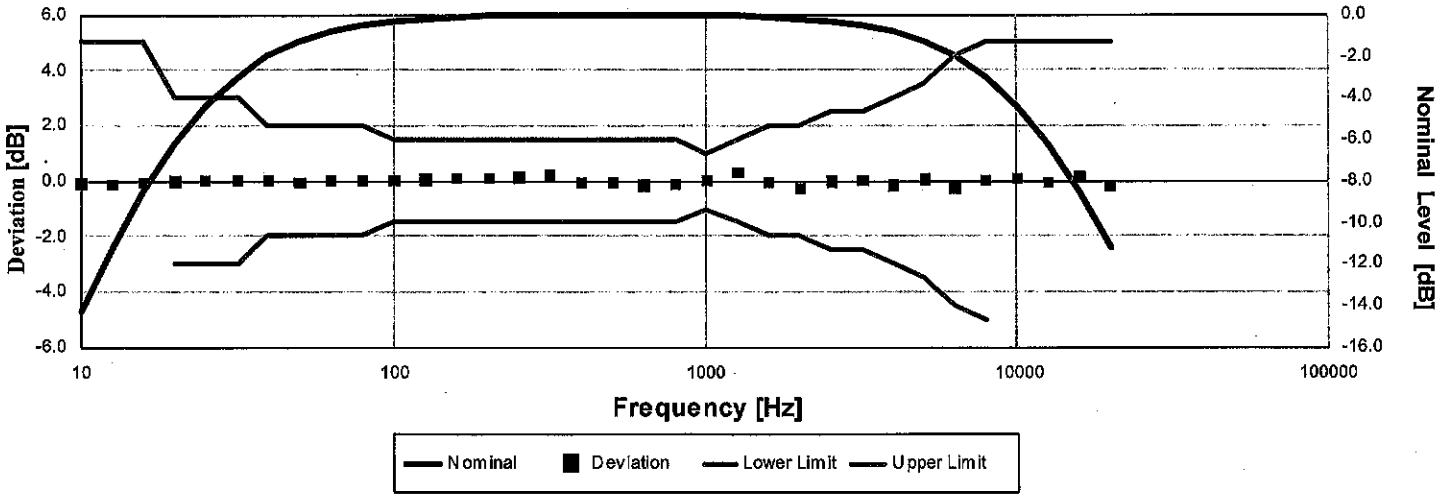
-- End of measurement results--

Larson Davis, a division of PCB Piezotronics, Inc
1681 West 820 North
Provo, UT 84601, United States
716-684-0001

ACCREDITED Cert. #3622.01

LARSON DAVIS
A PCB PIEZOTRONICS DIV.

C-weight Filter Response



Electrical signal test of frequency weighting performed according to IEC 61672-3:2013 13 and ANSI S1.4-2014 Part 3: 13 for compliance to IEC 61672-1:2013 5.5; IEC 60651:2001 6.1 and 9.2.2; IEC 60804:2000 5; ANSI S1.4:1983 (R2006) 5.1 and 8.2.1; ANSI S1.4-2014 Part 1: 5.5

Frequency [Hz]	Test Result [dB]	Deviation [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
10.00	-14.39	-0.09	-inf	5.00	0.22	Pass
12.59	-11.31	-0.11	-inf	5.00	0.22	Pass
15.85	-8.53	-0.03	-inf	5.00	0.22	Pass
19.95	-6.22	-0.02	-3.00	3.00	0.22	Pass
25.12	-4.41	-0.01	-3.00	3.00	0.22	Pass
31.62	-3.01	-0.01	-3.00	3.00	0.22	Pass
39.81	-2.00	0.00	-2.00	2.00	0.22	Pass
50.12	-1.34	-0.04	-2.00	2.00	0.22	Pass
63.10	-0.80	0.00	-2.00	2.00	0.22	Pass
79.43	-0.47	0.03	-2.00	2.00	0.22	Pass
100.00	-0.29	0.01	-1.50	1.50	0.22	Pass
125.89	-0.16	0.04	-1.50	1.50	0.22	Pass
158.49	-0.01	0.09	-1.50	1.50	0.22	Pass
199.53	0.07	0.07	-1.50	1.50	0.22	Pass
251.19	0.12	0.12	-1.50	1.50	0.22	Pass
316.23	0.19	0.19	-1.50	1.50	0.22	Pass
398.11	-0.05	-0.05	-1.50	1.50	0.22	Pass
501.19	-0.05	-0.05	-1.50	1.50	0.22	Pass
630.96	-0.16	-0.16	-1.50	1.50	0.22	Pass
794.33	-0.12	-0.12	-1.50	1.50	0.22	Pass
1,000.00	0.00	0.00	-1.00	1.00	0.22	Pass
1,258.93	0.32	0.32	-1.50	1.50	0.22	Pass
1,584.89	-0.13	-0.03	-2.00	2.00	0.22	Pass
1,995.26	-0.46	-0.26	-2.00	2.00	0.22	Pass
2,511.89	-0.32	-0.02	-2.50	2.50	0.22	Pass
3,162.28	-0.48	0.02	-2.50	2.50	0.22	Pass
3,981.07	-0.96	-0.16	-3.00	3.00	0.22	Pass
5,011.87	-1.26	0.04	-3.50	3.50	0.22	Pass
6,309.57	-2.29	-0.29	-4.50	4.50	0.22	Pass
7,943.28	-2.96	0.04	-5.00	5.00	0.22	Pass
10,000.00	-4.34	0.06	-inf	5.00	0.22	Pass
12,589.25	-6.25	-0.05	-inf	5.00	0.22	Pass
15,848.93	-8.35	0.15	-inf	5.00	0.22	Pass
19,952.62	-11.38	-0.18	-inf	5.00	0.22	Pass

-- End of measurement results--

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LARSON DAVIS
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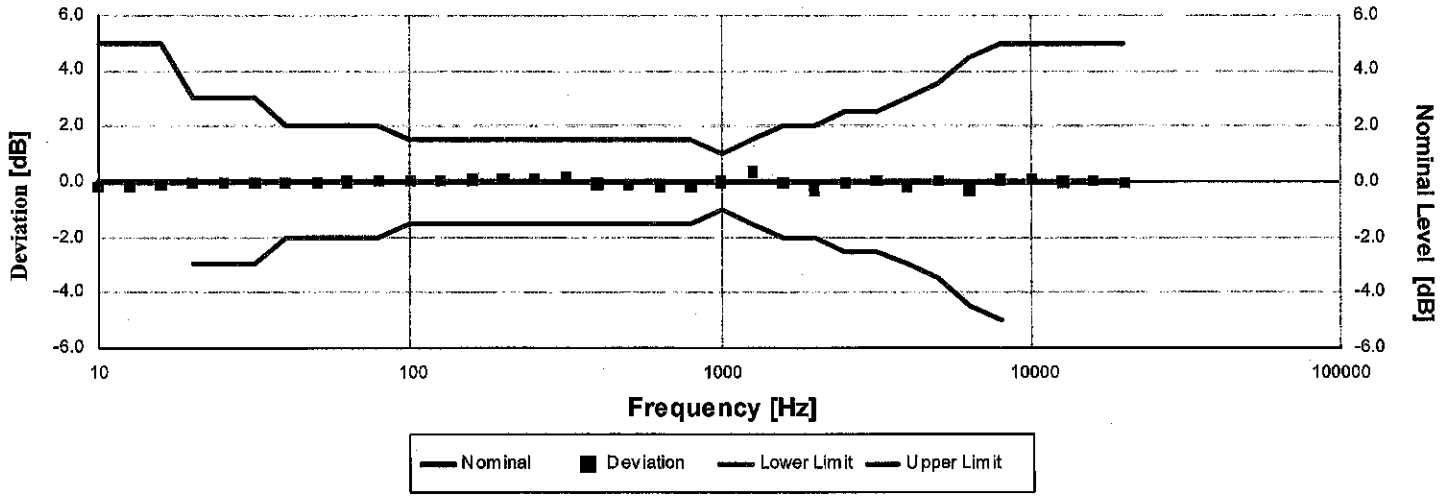
Z-weight Filter Response



Electrical signal test of frequency weighting performed according to IEC 61672-3:2013 13 and ANSI S1.4-2014 Part 3: 13 for compliance to IEC 61672-1:2013 5.5; IEC 60651:2001 6.1 and 9.2.2; IEC 60804:2000 5; ANSI S1.4:1983 (R2006) 5.1 and 8.2.1; ANSI S1.4-2014 Part 1: 5.5

Frequency [Hz]	Test Result [dB]	Deviation [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
10.00	-0.18	-0.18	-inf	5.00	0.22	Pass
12.59	-0.16	-0.16	-inf	5.00	0.22	Pass
15.85	-0.10	-0.10	-inf	5.00	0.22	Pass
19.95	-0.06	-0.06	-3.00	3.00	0.22	Pass
25.12	-0.06	-0.06	-3.00	3.00	0.22	Pass
31.62	-0.04	-0.04	-3.00	3.00	0.22	Pass
39.81	-0.03	-0.03	-2.00	2.00	0.22	Pass
50.12	-0.03	-0.03	-2.00	2.00	0.22	Pass
63.10	0.00	0.00	-2.00	2.00	0.22	Pass
79.43	0.02	0.02	-2.00	2.00	0.22	Pass
100.00	0.03	0.03	-1.50	1.50	0.22	Pass
125.89	0.01	0.01	-1.50	1.50	0.22	Pass
158.49	0.07	0.07	-1.50	1.50	0.22	Pass
199.53	0.11	0.11	-1.50	1.50	0.22	Pass
251.19	0.12	0.12	-1.50	1.50	0.22	Pass
316.23	0.17	0.17	-1.50	1.50	0.22	Pass
398.11	-0.08	-0.08	-1.50	1.50	0.22	Pass
501.19	-0.09	-0.09	-1.50	1.50	0.22	Pass
630.96	-0.19	-0.19	-1.50	1.50	0.22	Pass
794.33	-0.14	-0.14	-1.50	1.50	0.22	Pass
1,000.00	0.00	0.00	-1.00	1.00	0.22	Pass
1,258.93	0.35	0.35	-1.50	1.50	0.22	Pass
1,584.89	-0.05	-0.05	-2.00	2.00	0.22	Pass
1,995.26	-0.30	-0.30	-2.00	2.00	0.22	Pass
2,511.89	-0.03	-0.03	-2.50	2.50	0.22	Pass
3,162.28	0.01	0.01	-2.50	2.50	0.22	Pass
3,981.07	-0.16	-0.16	-3.00	3.00	0.22	Pass
5,011.87	0.02	0.02	-3.50	3.50	0.22	Pass
6,309.57	-0.30	-0.30	-4.50	4.50	0.22	Pass
7,943.28	0.08	0.08	-5.00	5.00	0.22	Pass
10,000.00	0.12	0.12	-inf	5.00	0.22	Pass
12,589.25	-0.01	-0.01	-inf	5.00	0.22	Pass
15,848.93	0.04	0.04	-inf	5.00	0.22	Pass
19,952.62	-0.04	-0.04	-inf	5.00	0.22	Pass

-- End of measurement results--

High Level Stability

Electrical signal test of high level stability performed according to IEC 61672-3:2013 21 and ANSI S1.4-2014 Part 3: 21 for compliance to IEC 61672-1:2013 5.15 and ANSI S1.4-2014 Part 1: 5.15

Measurement	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
High Level Stability	0.00	-0.30	0.30	0.01	Pass

-- End of measurement results--

Long-Term Stability

Electrical signal test of long term stability performed according to IEC 61672-3:2013 15 and ANSI S1.4-2014 Part 3: 15 for compliance to ISC 61672-1:2013 5.14 and ANSI S1.4-2014 Part 1: 5.14

Test Duration [min]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
33	0.00	-0.30	0.30	0.07	Pass

-- End of measurement results--

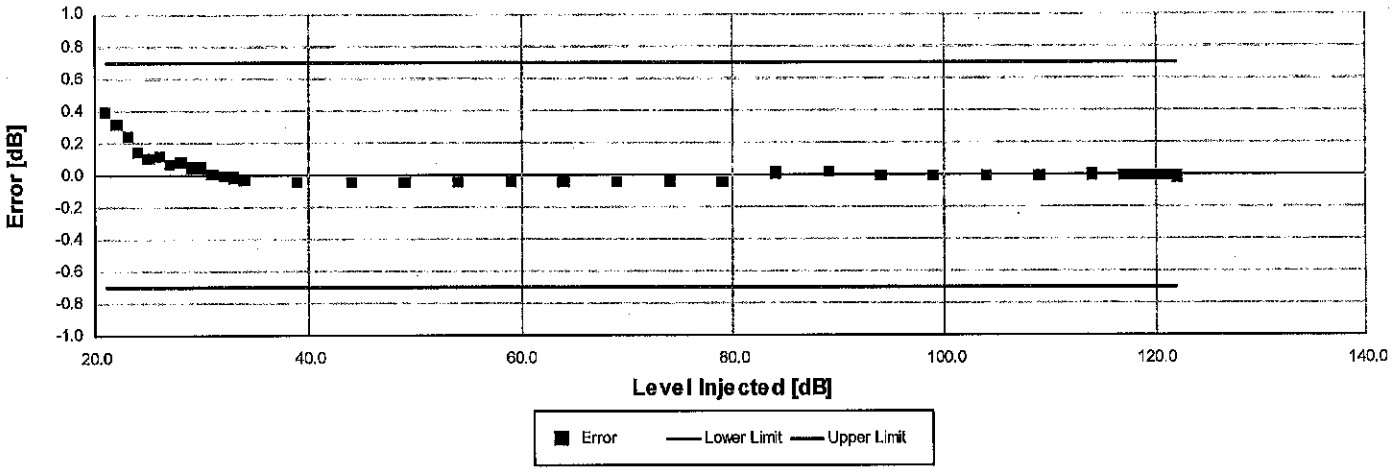
1 kHz Reference Levels

Frequency weightings and time weightings at 1 kHz (reference is A weighted Fast) performed according to IEC 61672-3:2013 14 and ANSI S1.4-2014 Part 3: 14 for compliance to IEC 61672-1:2013 5.5.9 and 5.8.3 and ANSI S1.4-2014 Part 1: 5.5.9 and 5.8.3

Measurement	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
C weight	105.80	105.60	106.00	0.09	Pass
Z weight	105.79	105.60	106.00	0.09	Pass
Slow	105.80	105.70	105.90	0.09	Pass
Impulse	105.80	105.70	105.90	0.09	Pass

-- End of measurement results--

A-weighted Broadband Log Linearity: 8,000.00 Hz

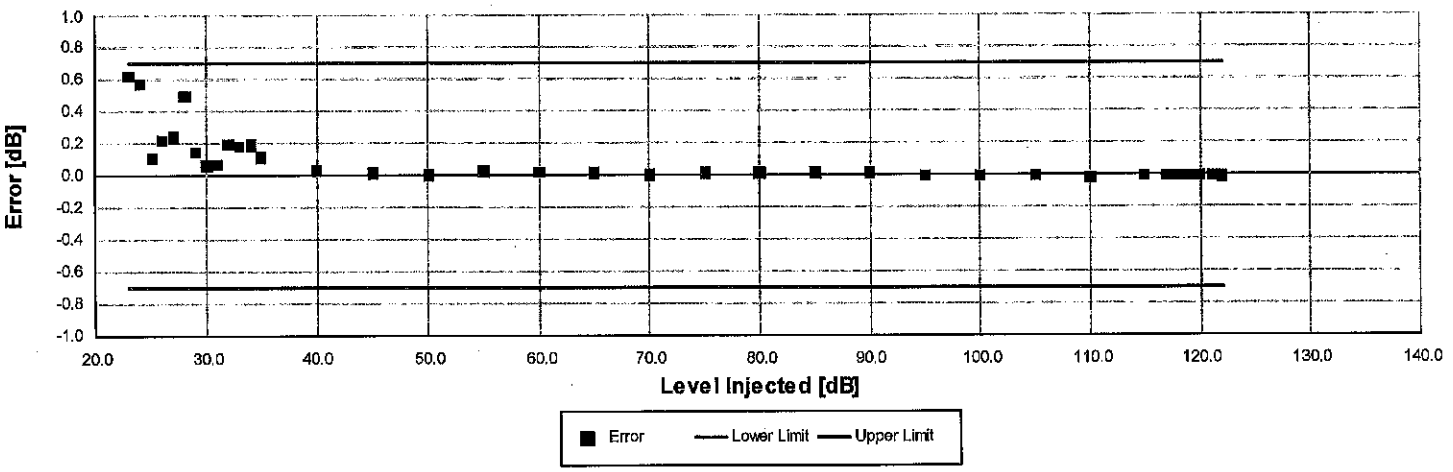


Broadband level linearity performed according to IEC 61672-3:2013 16 and ANSI S1.4-2014 Part 3: 16 for compliance to IEC 61672-1:2013 5.6, IEC 60804:2000 6.2, IEC 61252:2002 8, ANSI S1.4 (R2006) 6.9, ANSI S1.4-2014 Part 1: 5.6, ANSI S1.43 (R2007) 6.2

Level [dB]	Error [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
21.00	0.39	-0.70	0.70	0.09	Pass
22.00	0.32	-0.70	0.70	0.09	Pass
23.00	0.25	-0.70	0.70	0.09	Pass
24.00	0.15	-0.70	0.70	0.09	Pass
25.00	0.11	-0.70	0.70	0.09	Pass
26.00	0.12	-0.70	0.70	0.09	Pass
27.00	0.06	-0.70	0.70	0.09	Pass
28.00	0.08	-0.70	0.70	0.09	Pass
29.00	0.05	-0.70	0.70	0.09	Pass
30.00	0.05	-0.70	0.70	0.09	Pass
31.00	0.01	-0.70	0.70	0.09	Pass
32.00	-0.01	-0.70	0.70	0.09	Pass
33.00	-0.02	-0.70	0.70	0.09	Pass
34.00	-0.03	-0.70	0.70	0.09	Pass
39.00	-0.04	-0.70	0.70	0.09	Pass
44.00	-0.04	-0.70	0.70	0.09	Pass
49.00	-0.04	-0.70	0.70	0.09	Pass
54.00	-0.04	-0.70	0.70	0.09	Pass
59.00	-0.05	-0.70	0.70	0.09	Pass
64.00	-0.05	-0.70	0.70	0.09	Pass
69.00	-0.05	-0.70	0.70	0.09	Pass
74.00	-0.04	-0.70	0.70	0.09	Pass
79.00	-0.05	-0.70	0.70	0.09	Pass
84.00	0.01	-0.70	0.70	0.09	Pass
89.00	0.02	-0.70	0.70	0.09	Pass
94.00	0.00	-0.70	0.70	0.09	Pass
99.00	-0.01	-0.70	0.70	0.09	Pass
104.00	-0.01	-0.70	0.70	0.09	Pass
109.00	-0.01	-0.70	0.70	0.09	Pass
114.00	0.00	-0.70	0.70	0.09	Pass
117.00	-0.01	-0.70	0.70	0.09	Pass
118.00	-0.01	-0.70	0.70	0.09	Pass
119.00	-0.01	-0.70	0.70	0.09	Pass
120.00	-0.01	-0.70	0.70	0.09	Pass
121.00	-0.01	-0.70	0.70	0.09	Pass
122.00	-0.01	-0.70	0.70	0.09	Pass

-- End of measurement results--

1/1 Octave Log Linearity: 1,000.00 Hz



1/1 octave level linearity at normal range performed according to IEC 61260:2001 4.6, ANSI S.11 (R2009) 4.6

Level [dB]	Error [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
23.00	0.62	-0.70	0.70	0.09	Pass
24.00	0.57	-0.70	0.70	0.09	Pass
25.00	0.11	-0.70	0.70	0.09	Pass
26.00	0.22	-0.70	0.70	0.09	Pass
27.00	0.24	-0.70	0.70	0.09	Pass
28.00	0.50	-0.70	0.70	0.09	Pass
29.00	0.14	-0.70	0.70	0.10	Pass
30.00	0.06	-0.70	0.70	0.10	Pass
31.00	0.07	-0.70	0.70	0.09	Pass
32.00	0.19	-0.70	0.70	0.10	Pass
33.00	0.18	-0.70	0.70	0.09	Pass
34.00	0.19	-0.70	0.70	0.09	Pass
35.00	0.11	-0.70	0.70	0.09	Pass
40.00	0.03	-0.70	0.70	0.09	Pass
45.00	0.01	-0.70	0.70	0.09	Pass
50.00	0.00	-0.70	0.70	0.09	Pass
55.00	0.03	-0.70	0.70	0.09	Pass
60.00	0.02	-0.70	0.70	0.09	Pass
65.00	0.01	-0.70	0.70	0.09	Pass
70.00	0.00	-0.70	0.70	0.09	Pass
75.00	0.01	-0.70	0.70	0.09	Pass
80.00	0.01	-0.70	0.70	0.09	Pass
85.00	0.01	-0.70	0.70	0.09	Pass
90.00	0.01	-0.70	0.70	0.09	Pass
95.00	-0.01	-0.70	0.70	0.09	Pass
100.00	-0.01	-0.70	0.70	0.09	Pass
105.00	-0.01	-0.70	0.70	0.09	Pass
110.00	-0.02	-0.70	0.70	0.09	Pass
115.00	-0.01	-0.70	0.70	0.09	Pass
117.00	-0.01	-0.70	0.70	0.09	Pass
118.00	-0.01	-0.70	0.70	0.09	Pass
119.00	-0.01	-0.70	0.70	0.09	Pass
120.00	-0.01	-0.70	0.70	0.09	Pass
121.00	-0.01	-0.70	0.70	0.09	Pass
122.00	-0.01	-0.70	0.70	0.09	Pass

-- End of measurement results--

Slow Detector

Toneburst response performed according to IEC 61672-3:2013 18 and ANSI S1.4-2014 Part 3: 18 for compliance to IEC 61672-1:2013 5.9, IEC 60651:2001 9.4.2, ANSI S1.4:1983 (R2006) 8.4.2 and ANSI S1.4-2014 Part 1: 5.9

Amplitude [dB]	Duration [ms]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
136.00	200	-7.55	-8.42	-6.42	0.09	Pass
	2	-27.16	-31.99	-25.99	0.09	Pass

-- End of measurement results--

Fast Detector

Toneburst response performed according to IEC 61672-3:2013 18 and ANSI S1.4-2014 Part 3: 18 for compliance to IEC 61672-1:2013 5.9, IEC 60651:2001 9.4.2, ANSI S1.4:1983 (R2006) 8.4.2 and ANSI S1.4-2014 Part 1: 5.9

Amplitude [dB]	Duration [ms]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
136.00	200.00	-1.09	-1.98	0.02	0.23	Pass
	2.00	-18.24	-20.49	-16.99	0.09	Pass
	0.25	-27.25	-31.99	-25.49	0.09	Pass

-- End of measurement results--

Sound Exposure Level

Toneburst response performed according to IEC 61672-3:2013 18 and ANSI S1.4-2014 Part 3: 18 for compliance to IEC 61672-1:2013 5.9, IEC 60651:2001 9.4.2, ANSI S1.4:1983 (R2006) 8.4.2 and ANSI S1.4-2014 Part 1: 5.9

Amplitude [dB]	Duration [ms]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
136.00	200.00	-7.01	-7.99	-5.99	0.09	Pass
	2.00	-27.04	-29.49	-25.99	0.09	Pass
	0.25	-36.15	-41.02	-34.52	0.09	Pass

-- End of measurement results--

Peak C-weight

C-weighted peak sound level performed according to IEC 61672-3:2013 19 and ANSI S1.4-2014 Part 3: 19 for compliance to IEC 61672-1:2013 5.13 and ANSI S1.4-2014 Part 1: 5.13

Level [dB]	Frequency [Hz]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
134.00	31.50	137.17	133.50	139.50	0.09	Pass
134.00	500.00	137.56	135.50	139.50	0.09	Pass
134.00	8,000.00	136.55	134.40	140.40	0.10	Pass
134.00, Negative	500.00	136.18	134.40	138.40	0.09	Pass
134.00, Positive	500.00	136.18	134.40	138.40	0.09	Pass

-- End of measurement results--

Peak Z-weight

Z-weighted peak sound level performed according to IEC 60651:2001 9.4.4 and ANSI S1.4:1983 (R2006) 8.4.4

Amplitude [dB]	Duration[µs]		Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
135.20	100	Negative Pulse	127.33	125.00	129.00	0.09	Pass
	100	Positive Pulse	127.34	125.00	129.00	0.09	Pass
125.20	100	Negative Pulse	117.34	115.00	119.00	0.09	Pass
	100	Positive Pulse	117.34	115.01	119.01	0.09	Pass
115.20	100	Negative Pulse	107.33	104.99	108.99	0.09	Pass
	100	Positive Pulse	107.32	105.00	109.00	0.09	Pass
105.20	100	Negative Pulse	97.38	95.02	99.02	0.09	Pass
	100	Positive Pulse	97.35	95.06	99.06	0.09	Pass

-- End of measurement results--

Overload Detector

Overload indication performed according to IEC 61672-3:2013 20 and ANSI S1.4-2014 Part 3: 20 for compliance to IEC 61672-1:2013 5.11, IEC 60804:2000 9.3.5, IEC 61252:2002 11, ANSI S1.4 (R2006) 5.8, and ANSI S1.4-2014 Part 1: 5.11, ANSI S1.25 (R2007) 7.6, ANSI S1.43 (R2007) 7

Measurement	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
Positive	131.50	130.80	132.80	0.09	Pass
Negative	131.50	130.80	132.80	0.09	Pass
Difference	0.00	-1.50	1.50	0.09	Pass

-- End of measurement results--

Peak Rise Time

Peak rise time performed according to IEC 60651:2001 9.4.4 and ANSI S1.4:1983 (R2006) 8.4.4

Amplitude [dB]	Duration [µs]		Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
137.20	40	Negative Pulse	128.45	126.99	128.99	0.09	Pass
		Positive Pulse	128.45	126.99	128.99	0.09	Pass
	30	Negative Pulse	127.53	126.99	128.99	0.09	Pass
		Positive Pulse	127.54	126.99	128.99	0.09	Pass

-- End of measurement results--

Positive Pulse Crest Factor

200 µs pulse tests at 2.0, 12.0, 22.0, 32.0 dB below Overload Limit

Crest Factor measured according to IEC 60651:2001 9.4.2 and ANSI S1.4:1983 (R2006) 8.4.2

Amplitude [dB]	Crest Factor	Test Result [dB]	Limits [dB]	Expanded Uncertainty [dB]	Result
137.20	3	OVLD	± 1.00	0.09	Pass
	5	OVLD	± 1.00	0.09	Pass
127.20	3	-0.12	± 1.00	0.09	Pass
	5	-0.11	± 1.00	0.11	Pass
117.20	3	-0.13	± 1.00	0.09	Pass
	5	-0.11	± 1.00	0.09	Pass
107.20	3	-0.13	± 1.00	0.09	Pass
	5	-0.11	± 1.00	0.09	Pass

-- End of measurement results--

Negative Pulse Crest Factor

200 µs pulse tests at 2.0, 12.0, 22.0, 32.0 dB below Overload Limit

Crest Factor measured according to IEC 60651:2001 9.4.2 and ANSI S1.4:1983 (R2006) 8.4.2

Amplitude [dB]	Crest Factor	Test Result [dB]	Limits [dB]	Expanded Uncertainty [dB]	Result
137.20	3	OVLD	± 1.00	0.09	Pass
	5	OVLD	± 1.00	0.09	Pass
127.20	3	-0.11	± 1.00	0.09	Pass
	5	-0.12	± 1.00	0.09	Pass
117.20	3	-0.14	± 1.00	0.09	Pass
	5	-0.11	± 1.00	0.09	Pass
107.20	3	-0.14	± 1.00	0.09	Pass
	5	-0.13	± 1.00	0.09	Pass

-- End of measurement results--

Tone Burst

2kHz tone burst tests at 2.0, 12.0, 22.0, 32.0 dB below Overload Limit

Tone burst response measured according to IEC 60651:2001 9.4.2 and ANSI S1.4:1983 (R2006) 8.4.2

Amplitude [dB]	Crest Factor	Test Result [dB]	Limits [dB]	Expanded Uncertainty [dB]	Result
137.20	3	OVLD	± 1.00	0.09	Pass
	5	OVLD	± 1.00	0.09	Pass
127.20	3	-0.06	± 1.00	0.09	Pass
	5	0.02	± 1.00	0.09	Pass
117.20	3	-0.06	± 1.00	0.09	Pass
	5	-0.07	± 1.00	0.09	Pass
107.20	3	-0.06	± 1.00	0.09	Pass
	5	-0.04	± 1.00	0.09	Pass

-- End of measurement results--

Impulse Detector - Repeat

Impulse Detector measured according to IEC 60651:2001 9.4.3 and ANSI S1.4:1983 (R2006) 8.4.3

Amplitude [dB]	Repitition Rate [Hz]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
139	100.00	-2.84	-4.71	-0.71	0.09	Pass
	20.00	-7.81	-9.57	-5.57	0.16	Pass
	2.00	-8.96	-11.76	-5.76	0.09	Pass
Step	2.00	4.96	4.00	6.00	0.09	Pass

-- End of measurement results--

Impulse Detector - Single

Impulse Detector measured according to IEC 60651:2001 9.4.3 and ANSI S1.4:1983 (R2006) 8.4.3

Amplitude [dB]	Duration [ms]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
139	20.00	-3.70	-5.61	-1.61	0.09	Pass
	5.00	-8.75	-11.76	-5.76	0.10	Pass
Step	5.00	4.98	4.00	6.00	0.10	Pass

-- End of measurement results--

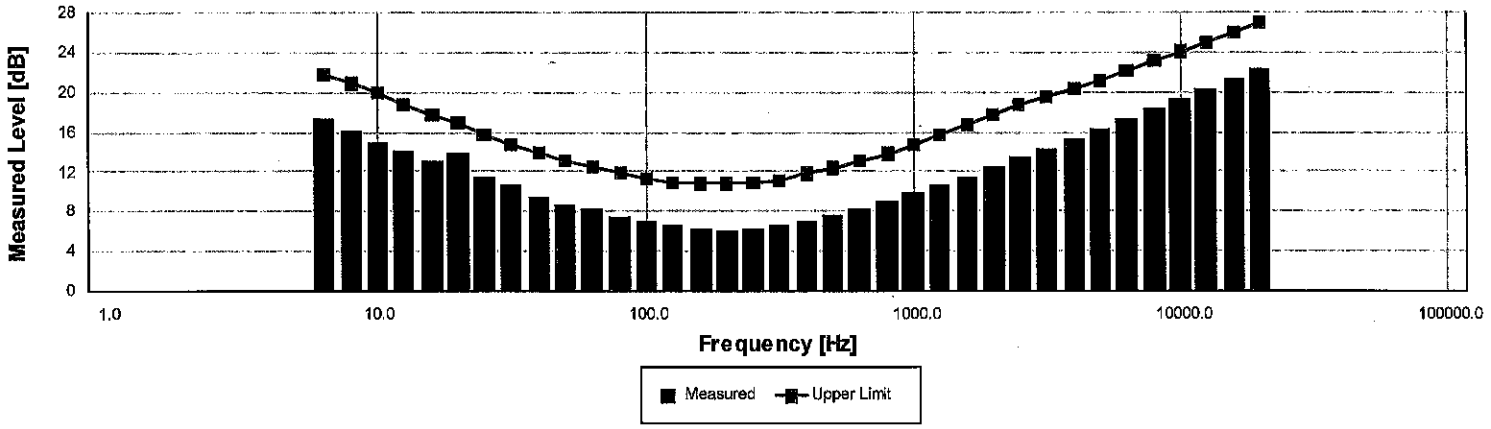
Gain

Gain measured according to IEC 61672-3:2013 17.3 and 17.4 and ANSI S1.4-2014 Part 3: 17.3 and 17.4

Measurement	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
0 dB Gain	104.02	103.90	104.10	0.09	Pass
0 dB Gain, Linearity	40.98	40.30	41.70	0.09	Pass
OBA Low Range	104.00	103.90	104.10	0.09	Pass
OBA Normal Range	104.00	103.20	104.80	0.09	Pass

-- End of measurement results--

1/3-Octave Self-Generated Noise



The SLM is set to low range.

Frequency [Hz]	Test Result [dB]	Upper limit [dB]	Result
6.30	17.35	21.80	Pass
8.00	16.20	20.90	Pass
10.00	15.02	20.00	Pass
12.50	14.12	18.80	Pass
16.00	13.18	17.80	Pass
20.00	13.96	16.90	Pass
25.00	11.58	15.70	Pass
31.50	10.66	14.80	Pass
40.00	9.48	13.90	Pass
50.00	8.61	13.10	Pass
63.00	8.18	12.50	Pass
80.00	7.48	11.90	Pass
100.00	7.07	11.30	Pass
125.00	6.67	10.90	Pass
160.00	6.15	10.80	Pass
200.00	6.00	10.80	Pass
250.00	6.27	10.90	Pass
315.00	6.59	11.10	Pass
400.00	7.09	11.80	Pass
500.00	7.60	12.40	Pass
630.00	8.21	13.10	Pass
800.00	9.06	13.80	Pass
1,000.00	9.83	14.80	Pass
1,250.00	10.76	15.70	Pass
1,600.00	11.57	16.70	Pass
2,000.00	12.52	17.70	Pass
2,500.00	13.47	18.70	Pass
3,150.00	14.37	19.50	Pass
4,000.00	15.36	20.30	Pass
5,000.00	16.38	21.20	Pass
6,300.00	17.41	22.20	Pass
8,000.00	18.31	23.20	Pass
10,000.00	19.36	24.10	Pass
12,500.00	20.32	25.10	Pass
16,000.00	21.33	26.10	Pass
20,000.00	22.32	27.10	Pass

-- End of measurement results--

Broadband Noise Floor

Self-generated noise measured according to IEC 61672-3:2013 11.2 and ANSI S1.4-2014 Part 3: 11.2

Measurement	Test Result [dB]	Upper limit [dB]	Result
A-weight Noise Floor	26.85	36.00	Pass
C-weight Noise Floor	26.07	35.00	Pass
Z-weight Noise Floor	31.37	39.00	Pass

-- End of measurement results--

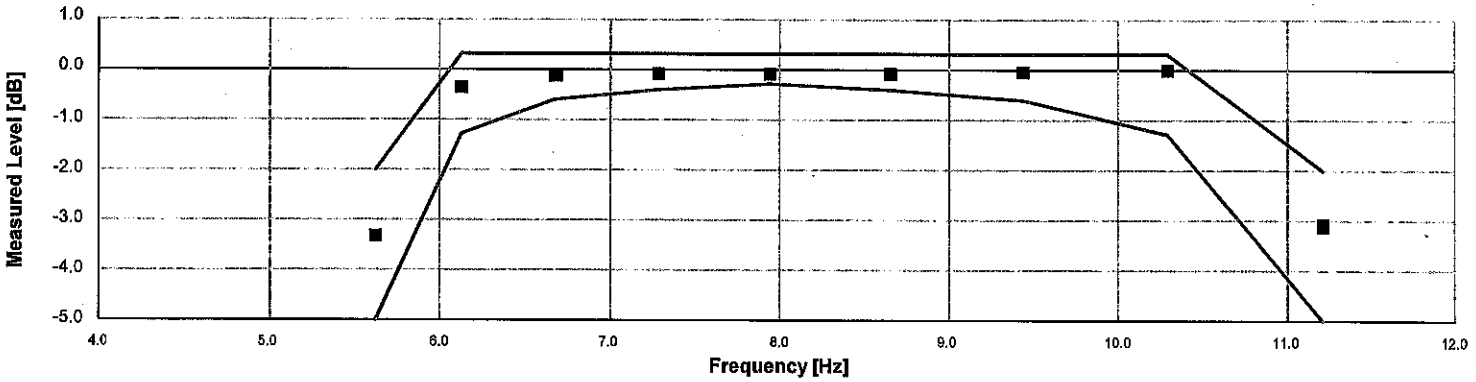
Total Harmonic Distortion

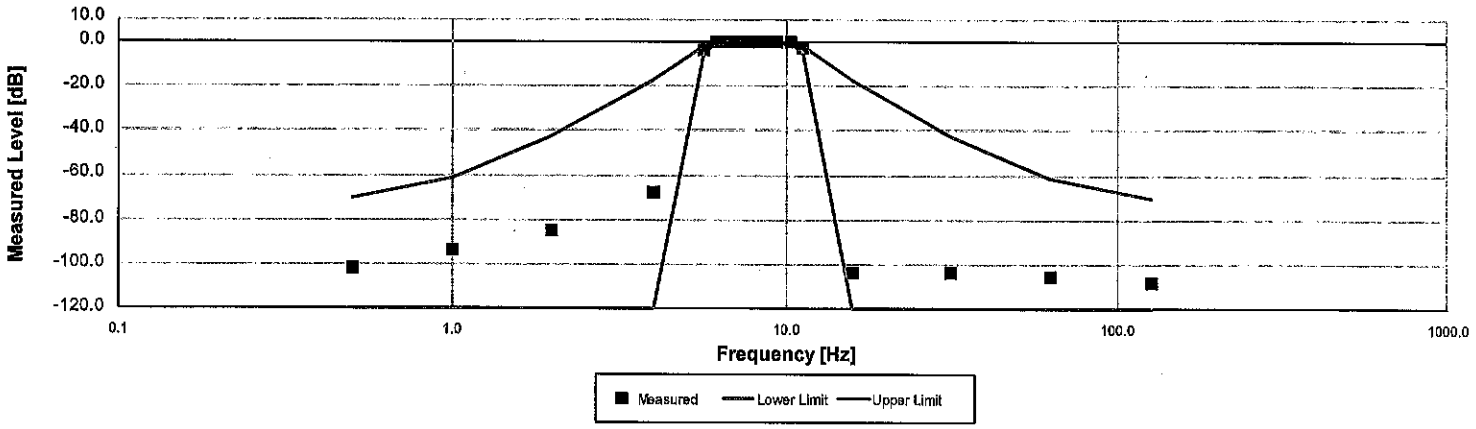
Measured using 1/3-Octave filters

Measurement	Test Result [dB]	Lower Limit [dB]	Upper Limit [dB]	Expanded Uncertainty [dB]	Result
10 Hz Signal	137.22	136.40	138.00	0.09	Pass
THD	-68.43		-58.00	0.01	Pass
THD+N	-63.90		-58.00	0.01	Pass

-- End of measurement results--

1/1 Octave Filter: 8.0 Hz



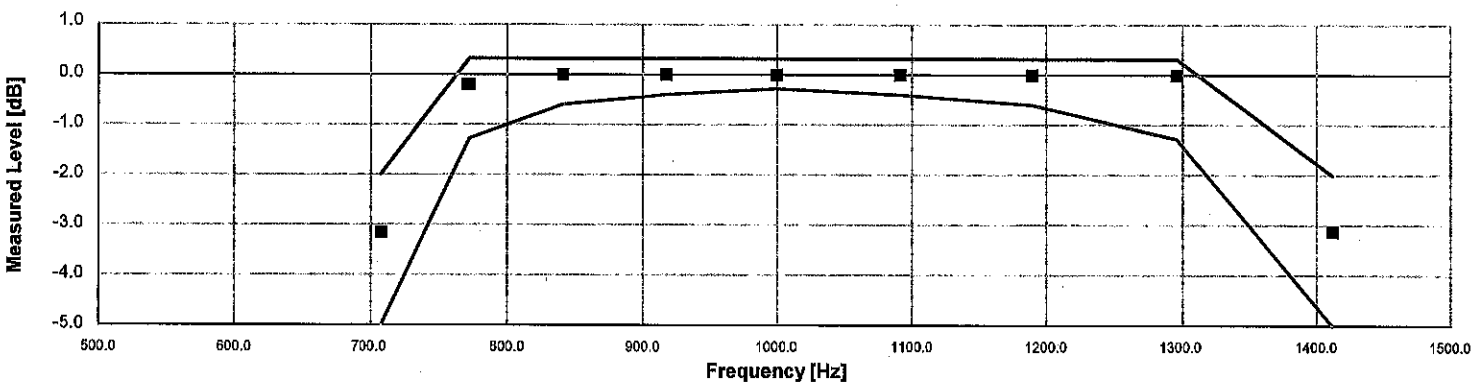


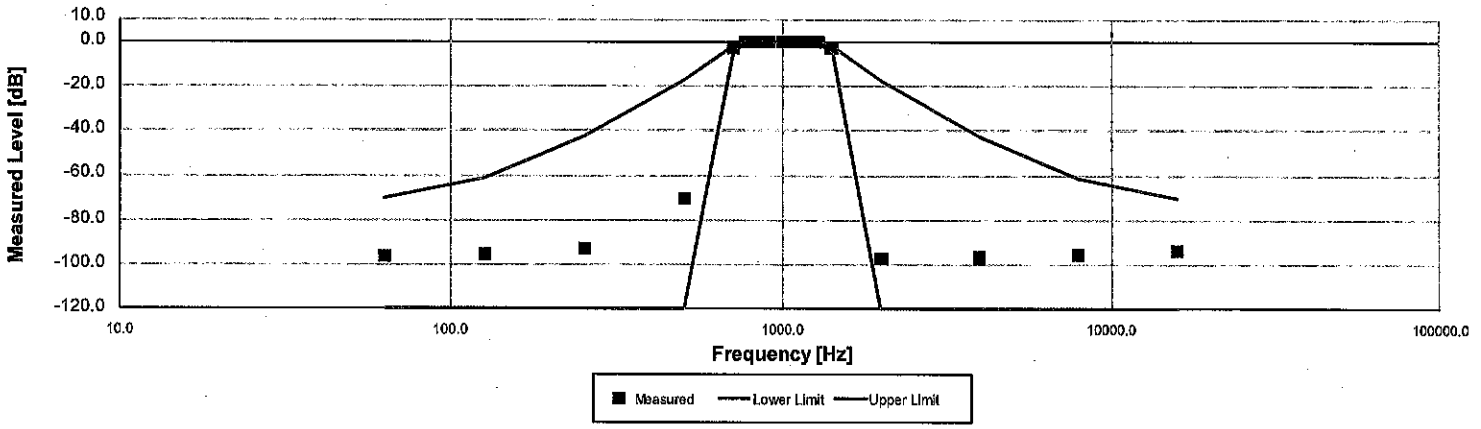
The SLM is set to normal range. Filter shape measured according to IEC 61260:2001 and ANSI S1.11:2004

Frequency [Hz]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
0.50	-101.30	-inf	-70.00	2.70	Pass
1.00	-93.90	-inf	-61.00	2.00	Pass
2.00	-84.76	-inf	-42.00	0.26	Pass
3.98	-67.85	-inf	-17.50	0.31	Pass
5.62	-3.32	-5.00	-2.00	0.09	Pass
6.13	-0.36	-1.30	0.30	0.09	Pass
6.68	-0.13	-0.60	0.30	0.09	Pass
7.29	-0.11	-0.40	0.30	0.09	Pass
7.94	-0.10	-0.30	0.30	0.09	Pass
8.66	-0.08	-0.40	0.30	0.09	Pass
9.44	-0.04	-0.60	0.30	0.09	Pass
10.29	-0.01	-1.30	0.30	0.09	Pass
11.22	-3.10	-5.00	-2.00	0.09	Pass
15.85	-103.81	-inf	-17.50	1.30	Pass
31.62	-103.61	-inf	-42.00	1.70	Pass
63.10	-105.01	-inf	-61.00	1.50	Pass
125.89	-107.95	-inf	-70.00	1.60	Pass

-- End of measurement results--

1/1 Octave Filter: 1 kHz



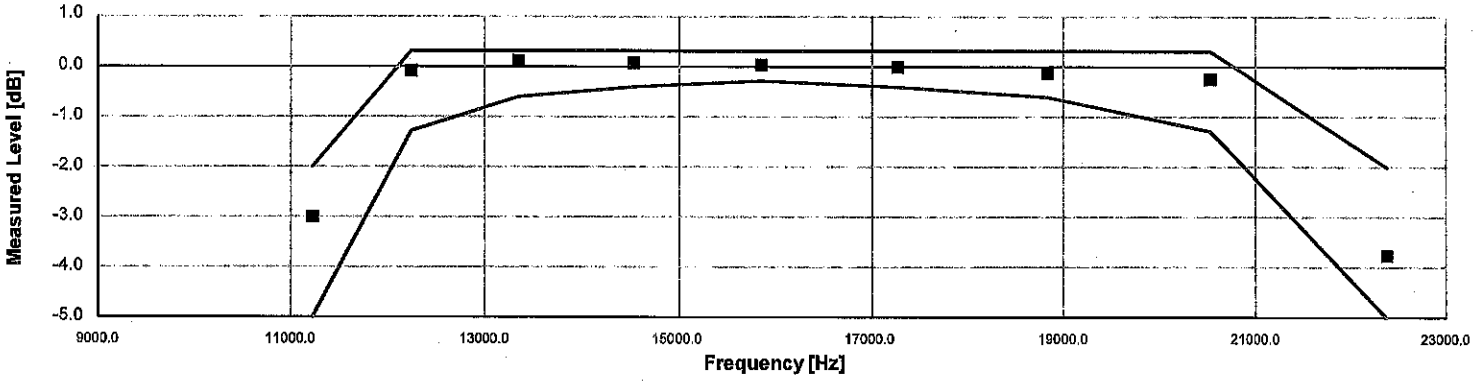


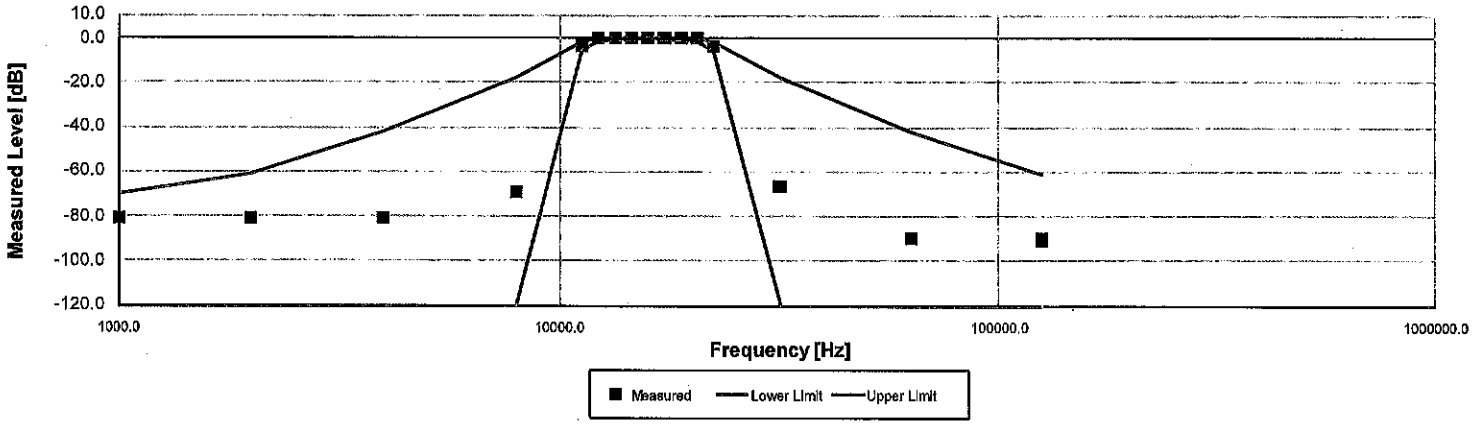
The SLM is set to normal range. Filter shape measured according to IEC 61260:2001 and ANSI S1.11:2004

Frequency [Hz]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
63.10	-96.60	-inf	-70.00	0.24	Pass
125.89	-95.00	-inf	-61.00	0.25	Pass
251.19	-92.64	-inf	-42.00	0.13	Pass
501.19	-69.89	-inf	-17.50	0.09	Pass
707.95	-3.15	-5.00	-2.00	0.09	Pass
771.79	-0.23	-1.30	0.30	0.09	Pass
841.40	-0.02	-0.60	0.30	0.09	Pass
917.28	-0.01	-0.40	0.30	0.09	Pass
1,000.00	0.00	-0.30	0.30	0.09	Pass
1,090.18	-0.02	-0.40	0.30	0.09	Pass
1,188.50	-0.02	-0.60	0.30	0.09	Pass
1,295.69	0.00	-1.30	0.30	0.09	Pass
1,412.54	-3.14	-5.00	-2.00	0.09	Pass
1,995.26	-96.81	-inf	-17.50	0.25	Pass
3,981.07	-96.77	-inf	-42.00	0.29	Pass
7,943.28	-95.45	-inf	-61.00	0.23	Pass
15,848.93	-93.47	-inf	-70.00	0.23	Pass

-- End of measurement results--

1/1 Octave Filter: 16 kHz





The SLM is set to normal range. Filter shape measured according to IEC 61260:2001 and ANSI S1.11:2004

Frequency [Hz]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
1,000.00	-80.96	-inf	-70.00	0.10	Pass
1,995.26	-80.62	-inf	-61.00	0.11	Pass
3,981.07	-80.68	-inf	-42.00	0.09	Pass
7,943.28	-69.52	-inf	-17.50	0.12	Pass
11,220.18	-3.00	-5.00	-2.00	0.09	Pass
12,232.07	-0.09	-1.30	0.30	0.09	Pass
13,335.21	0.12	-0.60	0.30	0.09	Pass
14,537.84	0.08	-0.40	0.30	0.09	Pass
15,848.93	0.04	-0.30	0.30	0.09	Pass
17,278.26	-0.02	-0.40	0.30	0.09	Pass
18,836.49	-0.13	-0.60	0.30	0.09	Pass
20,535.25	-0.26	-1.30	0.30	0.09	Pass
22,387.21	-3.76	-5.00	-2.00	0.09	Pass
31,622.78	-66.75	-inf	-17.50	0.09	Pass
63,095.73	-89.71	-inf	-42.00	0.10	Pass
125,892.54	-90.33	-inf	-61.00	0.10	Pass

-- End of measurement results--

-- End of Report--

Signatory: *Ron Harris*

Larson Davis, a division of PCB Piezotronics, Inc
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Provo, UT 84601, United States
716-684-0001

ilac-MRA ACCREDITED Cert. #3622.01

LARSON DAVIS
A PCB PIEZOTRONICS DIV.

MD Session

Summary		
Filename	LxT_Data.170	
Serial Number	2230	
Model	SoundTrack LxT®	
Firmware Version	2.301	
Measurement Description		
Start	2017/11/02 12:10:54	
Stop	2017/11/02 12:30:58	
Duration	0:20:03.7	
Run Time	0:20:03.7	
Pause	0:00:00.0	
Pre Calibration	2017/11/02 12:05:23	
Results		
LAeq	65.3	dB
LApeak (max)	97.4	dB
LAFmax	89.1	dB
LAFmin	57.1	dB
Statistics		
LAF5.00	70.1	dB
LAF10.00	67.5	dB
LAF33.30	62.1	dB
LAF50.00	60.8	dB
LAF66.60	60.1	dB
LAF90.00	59.0	dB

PM Session

Summary			
Filename	LxT_Data.171		
Serial Number	2230		
Model	SoundTrack LxT®		
Firmware Version	2.301		
Measurement Description			
Start	##################		
Stop	##################		
Duration	0:20:02.7		
Run Time	0:20:02.7		
Pre Calibration	##################		
Post Calibration	None		
Calibration Deviation	---		
Results			
LAeq	65.6	dB	
LApeak (max)	103.5	dB	
LAFmax	86.3	dB	
LAFmin	57.9	dB	
LAF > 85.0 dB (Exceedence Counts / Duration)	1	0.3	s
Statistics			
LAF5.00	69.8	dB	
LAF10.00	67.8	dB	
LAF33.30	63.5	dB	
LAF50.00	62.0	dB	
LAF66.60	61.3	dB	
LAF90.00	60.6	dB	

AM Session

Summary		
Filename	LxT_Data.169	
Serial Number	2230	
Model	SoundTrack LxT®	
Firmware Version	2.301	
Start	2017/11/02 7:30:05	
Stop	2017/11/02 7:50:10	
Duration	0:20:05.0	
Run Time	0:20:25.0	
Pre Calibration	2017/11/01 11:19:26	
Results		
LAeq	65.4	dB
LApeak (max)	107.9	dB
LAFmax	84.4	dB
LAFmin	47.0	dB
Statistics		
LAF5.00	70.9	dB
LAF10.00	68.4	dB
LAF33.30	63.4	dB
LAF50.00	61.7	dB
LAF66.60	60.5	dB
LAF90.00	58.8	dB

Certificate of Conformity and Calibration

Instrument Type:-	**CEL-633C**
Serial Number	4278006
Firmware revision	V006-01
Microphone Type:-	CEL-251
Serial Number	02470
Preamplifier Type:-	CEL-495
Serial Number	003570
Instrument Class/Type:-	1

Applicable standards:-

IEC 61672: 2002 / EN 60651 (Electroacoustics - Sound Level Meters)
IEC 60651 1979 (Sound Level Meters), ANSI S1.4: 1983 (Specifications For Sound Level Meters)

Note:- *The test sequences performed in this report are in accordance with the current Sound level meter Standard - IEC61672. The combination of tests performed are considered to confirm the products electro-acoustic performance to all applicable standards including superceeded Sound Level Meter Standards - IEC60651 and IEC60804.*

Test Conditions:-	26 °C	**Test Engineer:-**	Stephen Potten
	42 %RH	**Date of Issue:-**	January 22, 2018
	1011 mBar		

Declaration of conformity:-

This test certificate confirms that the instrument specified above has been successfully tested to comply with the manufacturer's published specifications. Tests are performed using equipment traceable to national standards in accordance with Casella's ISO 9001:2008 quality procedures. This product is certified as being compliant to the requirements of the CE Directive.

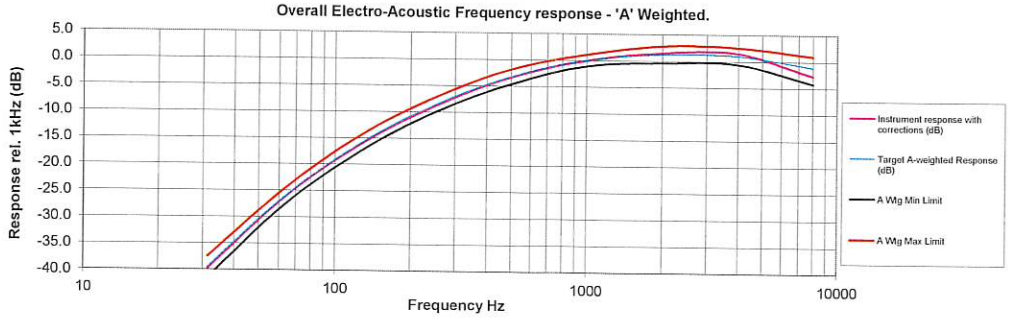
Test Summary:-

Self Generated Noise Test	**All Tests Pass**
Electrical Signal Test Of Frequency Weightings	**All Tests Pass**
Frequency & Time Weightings At 1 kHz	**All Tests Pass**
Level Linearity On The Reference Level Range	**All Tests Pass**
Toneburst Response Test	**All Tests Pass**
C-peak Sound Levels	**All Tests Pass**
Overload Indication	**All Tests Pass**
Acoustic Tests	**All Tests Pass**

Combined Electro-Acoustic Frequency Response - *A Weighted*

Combined Electro-Acoustic Frequency Response - A Weighted (IEC 61672-3:2006)

The following A-Weighted frequency response graph shows this instruments overall frequency response based upon the application of multi-frequency pressure field calibrations. The microphones Pressure to Free field correction coefficients are applied to pressure response. Reference level taken at 1kHz.



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Tested to CEL-63X test sheet TP444 revision 01-00

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CASELLA CEL - SERVICE RETURN SHEET

CUSTOMER INFORMATION

DATE RECEIVED: July 25, 2018

OUR SERVICE JOB #: 13282

COMPANY NAME: Equity Environmental Engineering
500 International Drive, Suite 150
Mount Olive, NJ 07828

CONTACT NAME: Amber Kartalyan
amber.kartalyan@equityenvironmental.com

LIST OF INSTRUMENTS RETURNED

MODEL:	S/N
120/2	4667874
633C	1274486

ENVIRONMENTAL CONDITIONS

TEMPERATURE :	24	°C
HUMIDITY :	79.9	%RH
AIR PRESSURE :	1020.3	mbar
OFFSET CORRECTION :	0.06	dB

SERVICE REQ.: Calibration

DESC. OF FAULT: Calibration

ACTION TAKEN: CEL-120/2 S/N: 4667874: & CEL-633.C1 S/N: 1274486: Both pass calibration.

SERVICE ENGINEER : Ken Umbeer

DATE FINISHED: July 30, 2018

Certificate of Conformity and Calibration

CASELLA CEL

Instrument Model: CEL-120/2 Acoustic Calibrator **Certificate #:** 68667

Serial Number: 4667874

Calibration References:

Casella CEL hereby certifies that the above listed sound measuring instrument has been tested according to the manufacturer's specifications and meets the requirements of the relevant American National Standards Institute (ANSI) Standard for Sound Calibrators S1.40 - 1983 (R1997). This instrument was calibrated against standards which are either traceable to the National Institute of Standards and Technology (NIST) or they have been derived by approved ratio techniques.

Test Conditions:

23.5	°C	**Date of Issue:-**	July 30, 2018
79.9	%RH	**Due Date:-**	July 30, 2019
1020.3	mBar	**Service Engineer:-**	Ken Umbeer

Declaration of conformity:-

This test certificate confirms that the instrument specified above has been successfully tested to comply with the manufacturer's published specifications. Tests are performed using equipment traceable to national standards. This product is certified as being compliant to the requirements of the CE Directive. Test accuracy ratio (TAR) ≥1.

Summary:

The data represents the response of the sound level meter calibrator to the reference source corrected for atmospheric conditions at the time of calibration.

	Nominal Value	Tolerance	As Received	As Adjusted
Frequency (Hz)	1000.0	±5.0	1000.0	1000.0
Level (dB)	114.0	±0.3	114.1	114.0

Standards Used in Calibration:		Serial Number	Calibration Due Date	Certificate Number
Sound Level Meter:	CEL-620.A1	5130002	1/30/2019	28473-2
Multimeter:	Fluke 45	4995184	1/16/2019	1626798

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Buffalo, NY 14221
U.S.A.

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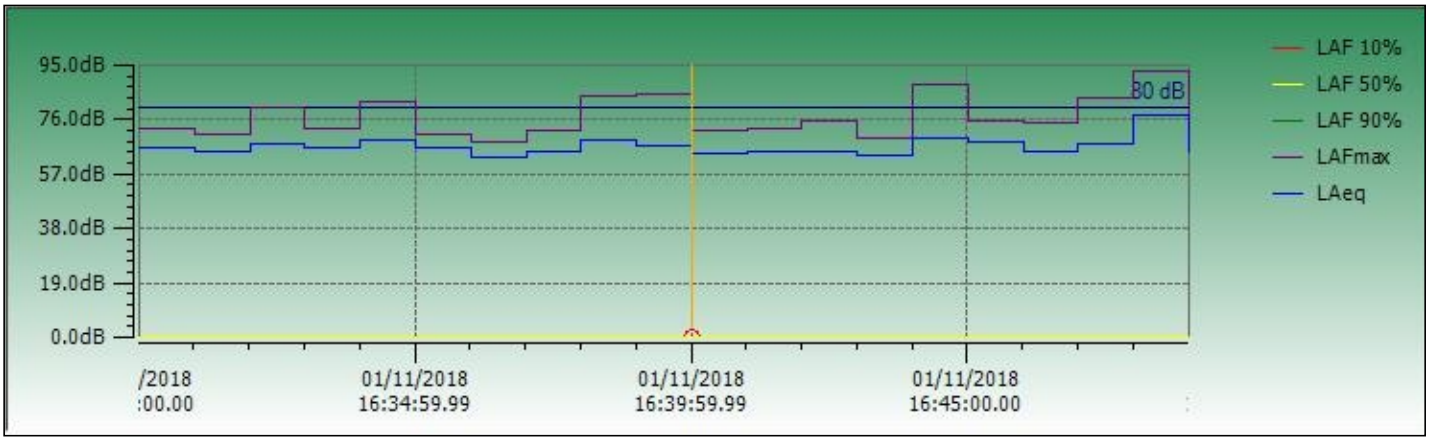
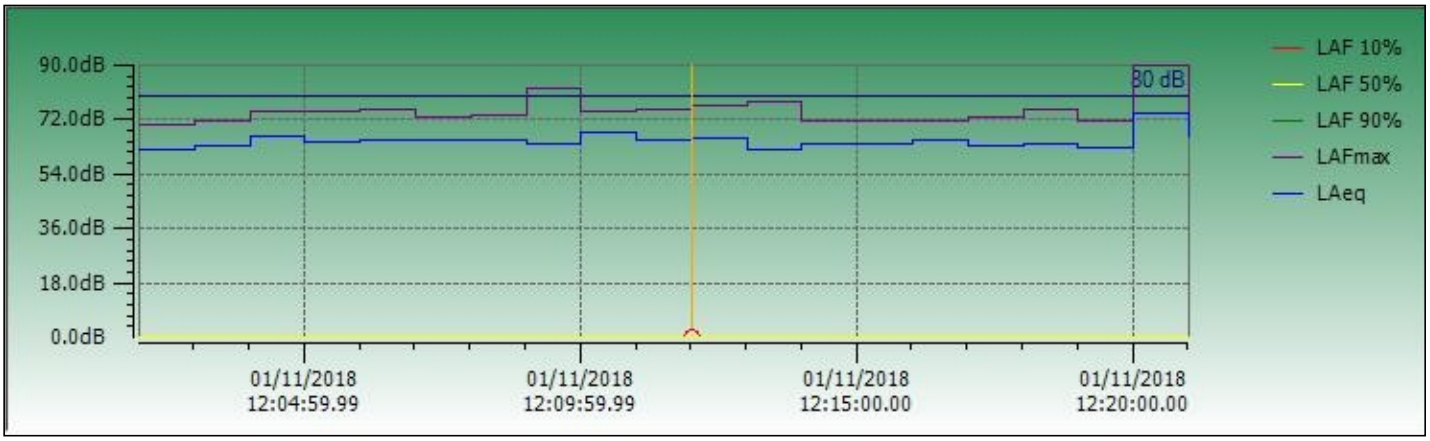
电话: 0086 10 85183141
传真: 0086 10 85183143
电子邮件:
info@casellameasurement.cn
网址: www.casellachina.cn

Instrument Model	**CEL-633C**
Serial Number	4278006
Start Date & Time	11/1/2018 4:30:00 PM
LAF 10%	68.5 dB
LAF 50%	64.5 dB
LAF 90%	61.5 dB
LAeq	68.7 dB
LAFmax	92.7 dB
LAFmin	58.3 dB
End Date & Time	11/1/2018 4:50:00 PM
Duration	00:20:00 HH:MM:SS



Instrument Model	**CEL-633C**

Serial Number	4278006	LAeq	66.2 dB
Start Date & Time	11/1/2018 12:02:01 PM	LAFmax	89.7 dB
LAF 10%	68 dB	LAFmin	56.3 dB
LAF 50%	63 dB	End Date & Time	11/1/2018 12:22:01 PM
LAF 90%	59.5 dB	Duration	00:20:00 HH:MM:SS



Instrument Model	**CEL-633C**

Serial Number	4278006	LAeq	65.3 dB
Start Date & Time	11/1/2018 8:27:06 AM	LAFmax	81.9 dB
LAF 10%	68 dB	LAFmin	56.6 dB
LAF 50%	63.5 dB	End Date & Time	11/1/2018 8:47:06 AM
LAF 90%	60.5 dB	Duration	00:20:00 HH:MM:SS