A. INTRODUCTION

This chapter considers the Proposed Actions' effects on solid waste and sanitation services. Based on the *City Environmental Quality Review (CEQR) Technical Manual* (January 2012 Edition), a solid waste assessment determines whether a project has the potential to cause a substantial increase in solid waste production that may overburden available waste management capacity, or otherwise be inconsistent with the City's Solid Waste Management Plan or with state policy related to the City's integrated solid waste management system. The following analysis estimates the amount of existing solid waste generated by uses within the Proposed Development Area and Commercial Overlay Area,[1] describes the anticipated methods of solid waste storage and disposal for the proposed project, and assesses the potential impacts of the proposed project on solid waste and sanitation services.

B. PRINCIPAL CONCLUSIONS

The solid waste assessment finds that the Proposed Actions would not result in significant adverse impacts to the City's solid waste and sanitation services. In accordance with the City's Solid Waste Management Plan (SWMP), the proposed project would comply with, and exceed the standards of, the City's recycling program. By 2021, development resulting from the Proposed Actions in the Proposed Development Area[2] and in the Commercial Overlay Area[3] would result in an increase of up to 31.9 tons of solid waste generation per week. By 2031, the incremental amount of solid waste attributable to the Proposed Actions would increase to 41.0 tons. The incremental waste generated by the proposed project by 2021 and by 2031 would be less than 50 tons per week, which is the threshold in the *CEQR Technical Manual* for a potential significant adverse impact.

The New York City Department of Sanitation (DSNY) would continue to collect waste for residential uses (both non-NYU and NYU residential, including dormitories), as well as for the public school in the proposed Bleecker Building.[4] Private carters would collect waste generated by

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[1] The Mercer Plaza Area within the project site is not considered in this analysis, because the solid waste generated by Mercer Plaza (a publicly accessible open space) is minimal, and would be the same in the future with and without the Proposed Actions.

[2] The Proposed Development Area includes: Block 524, Lots 1, 9, and 66; Block 533, Lots 1 and 10; and the portions of Mercer Street and LaGuardia Place that are currently not improved as streets and that are proposed to be demapped, either entirely or below a defined limiting plane. The unimproved portions of Mercer Street and LaGuardia Place owned by the City are under the jurisdiction of the New York City Department of Transportation (NYCDOT). The City-owned portion of Bleecker Street adjacent to the South Block (none of which is proposed to be demapped) is under the jurisdiction of the New York City Department of Parks and Recreation (NYCDPR).

[3] The Commercial Overlay Area includes: Block 546, Lots 1, 5, 8, 10, 11, 15, 20, 21, 26, 30; Block 547, Lots 1, 4, 5, 8, 14, 15, 18, 19, 20, and 25; and Block 548, Lots 1, 4, 21, 24, 40, and 45.

[4] If by 2025 the New York City School Construction Authority (SCA) does not exercise its option to build the public school, NYU would build and utilize the 100,000-square-foot space for its own academic purposes.

academic, dormitory, retail, hotel, and other commercial uses. Given that a truck can haul about 10 tons of solid waste, the solid waste generated by the operations of the proposed project would require up to five additional truck trips per week by 2031. Compared with the 13,000 tons per day that private carters currently handle, it is expected that private carters would have sufficient capacity to accommodate the additional waste generated by the proposed project. The proposed project could generate up to 7,484 pounds (3.7 tons) of waste per week that would be handled by DSNY. Compared to the 12,000 tons of waste that DSNY collects daily, this increase would be minimal.

Overall the proposed project would be supportive of the City's SWMP, as it would include measures to exceed the City's recycling standards and include a pilot composting program.

C. EXISTING CONDITIONS

DESCRIPTION OF CURRENT SOLID WASTE SANITATION SERVICES

DSNY is the City agency responsible for the collection and disposal of municipal solid waste, refuse, and designated recyclable materials generated by residences, public schools, some nonprofit institutions, tax exempt non-residential facilities, and many City and State agencies. DSNY also collects waste from City litter baskets, street-sweeping operations, and lot cleaning activities. It is estimated DSNY collects over 12,000 tons of residential and institutional refuse and recyclables per day.[1] DSNY delivers most of the refuse it collects to certain public or private solid waste management facilities known as transfer stations, in the City or in adjoining communities, for processing and transportation to out-of-city disposal facilities. Solid wastes that are not recycled, reused, or converted to a useful product locally must be exported from the City for disposal since New York City does not have public or private local disposal facilities such as sanitary landfills, construction and demolition debris landfills, traditional incinerators, or waste-to-energy resource recovery facilities.

DSNY collects designated recyclables, including metal, glass, and plastic, and designated paper recyclables and delivers them to materials recovery facilities. In addition, DSNY collects residential yard waste on certain fall weekends and delivers it to the City's yard waste and composting facilities. DSNY developed a Solid Waste Management Plan (SWMP) to address management of expected future demands for the city's solid waste. The SWMP was approved by the New York City Council in July 2006 and by the New York State Department of Environmental Conservation (NYSDEC) in October 2006, and covers the period through 2025.

The City's solid waste management services are undertaken in accordance with the SWMP, through DSNY. The SWMP establishes a hierarchy of preferred solid waste management methods to reduce and process solid waste generated within the City. The objectives of the SWMP are, in order of importance: waste reduction, recycling, composting, resource conservation and energy production, and lastly, landfill disposal. The SWMP mandates that solid waste be transferred to solid waste management facilities located in each borough, including special (hazardous materials) waste collection sites, composting facilities, and bulk residential waste sites. Local Law 19 of 1989 requires that DSNY and private carters collect recyclable materials and deliver them to material recovery facilities. New York City residents are required to separate aluminum foil, glass, plastic and metal containers, and newspapers and other paper wastes from household waste for separate collection. The SWMP also mandates that commercial establishments are subject to recycling requirements. Businesses must separate certain types of

[1] DSNY website: http://www.nyc.gov/html/dsny/html/about/about.shtml

paper wastes, cardboard, metal items, and construction wastes. Food and beverage establishments must recycle metal, glass, and plastic containers, and aluminum foil, in addition to meeting the commercial recycling requirements.

The Electronic Equipment Recycling and Reuse Act, enacted in May 2010, establishes a state-wide reuse and recycling program for certain waste electronic equipment. The law prohibits disposal of such e-waste within the state by those other than individuals and households as of January 1, 2012, and by individuals and households as of January 1, 2015. Local Law 97 of 2005 also bans the disposal of rechargeable batteries as solid waste and requires them to be taken instead to local retailers that sell such batteries so that they may be recycled pursuant to a program arranged by the battery manufacturer.

Private carters also consolidate commercial solid waste for commercial establishments (restaurants, retail facilities, offices, industries, etc.) for collection and for processing and/or disposal of various kinds of solid waste, construction and demolition debris, non-hazardous industrial wastes, and recyclables.

Currently, waste collection at the University Village and Washington Square Village residential buildings is handled by DSNY. Private carters are contracted to collect waste for retail uses in both the Proposed Development Area and in the Commercial Overlay Area.

SOLID WASTE GENERATION

The Proposed Development Area and the Commercial Overlay Area contain a number of active uses that currently generate solid waste. Based on *CEQR Technical Manual* solid waste generation rates, waste generation rates from other published environmental studies, and discussions with NYU, the existing uses on the project site generate a total of approximately 205,698 pounds of solid waste per week (about 102.8 tons per week).

Table 12-1
Solid Waste Existing Conditions in the Proposed Development Area and Commercial Overlay Area

Use	Units	Generation Rate (pounds per week)	Total (pounds per week)
Residential	2,675 dwelling units[1]	41 per household	109,675
Dormitory	389 beds	17 per individual	6,613
Academic	6,695 students[2]	1 per pupil	6,695
Office	418 employees[3]	13 per employee	5,434
General Retail	122 employees[4]	79 per employee	9,638
Restaurant	89 employees[4]	251 per employee	22,339
Fast Food	76 employees[4]	200 per employee	15,200
Food Store	106 employees[4]	284 per employee	30,104
		TOTAL:	**205,698**

Notes:
[1] Includes faculty housing and non-NYU housing in the project site
[2] Academic calculations assume 14.4 students per 1,000 sf of the 52 percent of total floor area that is assumed to be dedicated to student use
[3] Office calculations assume 2.04 employees per 1,000 sf
[4] Retail calculations assume 3.0 employees per 1,000 sf
Sources: NYU; solid waste generation rates are based on Table 14-1 of the *CEQR Technical Manual* (January 2012 Edition)

Of this total, approximately 96,023 pounds are handled by private carters and approximately 109,675 pounds are handled by DSNY. **Table 12-1** summarizes the existing solid waste generation.

D. FUTURE WITHOUT THE PROPOSED ACTIONS

This section projects the future demand for solid waste handling in the Proposed Development Area and Commercial Overlay Area by 2021 and 2031, the future analysis years, without the Proposed Actions. These conditions are projected by considering the development that will occur in project site independent of the Proposed Actions, as discussed in Chapter 2, "Land Use, Zoning, and Public Policy." The solid waste conditions described below form the "No Build" or "Future without the Proposed Actions" condition. This condition describes the baseline conditions in the study area against which the Proposed Actions' incremental changes are measured.

2021 PHASE 1

As noted in **Table 2-2**, there are two projects within the Commercial Overlay Area that would be complete by the 2021 analysis year (the only planned changes to the Proposed Development Area by 2021 are open space improvements that would not substantially affect waste generation). At 15 Washington Place, the existing residential building would be redeveloped into a 129,000-gsf academic building; and at 25 West 4th Street, an additional 20,000-gsf of NYU office space would be added to the existing, approximately 100,000-gsf NYU office building. As shown in **Table 12-2**, these projects would result in a net decrease in waste generation estimated at 1,608 pounds per week, due to the replacement of residential units with academic uses, which generate less waste.

Table 12-2
Solid Waste Generation: Planned Projects in Commercial Overlay Area by 2021

Location	Existing Units	Generation Rate (pounds per week)	Existing Solid Waste Total (pounds per week)	Future Units	Generation Rate (pounds per week)	Future Solid Waste Total (pounds per week)	Incremental Change (pounds per week)
15 Washington Place	78 dwelling units	41 pounds per unit	3,198	966 students	1 per pupil	966	-2,232
25 West 4th Street	240 workers	13 per employee	3,120	288 workers	13 per employee	3,744	624
						Total:	**-1,608**

Notes: [1] Academic calculations assume 14.4 students per 1,000 sf of the 52 percent of total floor area that is assumed to be dedicated to student use.
Sources: NYU; Table 14-1 of the *CEQR Technical Manual* (January 2012 Edition)

Overall, in the Future without the Proposed Actions, approximately 204,090 pounds per week of waste (about 102 tons) would be generated in the Proposed Development Area and in the Commercial Overlay Area by 2021 (see **Table 12-3**).

2031 PHASE 2

As noted in **Table 2-4**, there is one project within the Proposed Development Area that would be complete by the 2031 analysis year—NYU would redevelop the Morton Williams grocery store site with a 175,000-gsf academic building, which would include a replacement, approximately 29,000-gsf grocery store. As shown in **Table 12-4**, this project would result in an incremental increase in waste generation of 1,093 pounds per week. Overall, by 2031, the No Build projects in the Proposed Development Area and Commercial Overlay Area would result in a net decrease in waste generation of 515 pounds as compared to existing conditions.

As shown in **Table 12-5**, in the Future without the Proposed Actions by 2031 approximately 205,183 pounds per week of waste (about 102.6 tons) would be generated in the Proposed Development Area and in the Commercial Overlay Area.

Table 12-3
Solid Waste Conditions in the Future Without the Proposed Project by 2021
Proposed Development Area and Commercial Overlay Area

Use	Units	Generation Rate (pounds per week)	Total (pounds per week)
Residential	2,597 dwelling units[1]	41 per household	106,477
Dormitory	389 beds	17 per individual	6,613
Academic	7,661 students[2]	1 per pupil	7,661
Office	466 employees[3]	13 per employee	6,058
General Retail	122 employees[4]	79 per employee	9,638
Restaurant	89 employees[4]	251 per employee	22,339
Fast Food	76 employees[4]	200 per employee	15,200
Food Store	106 employees[4]	284 per employee	30,104
		TOTAL:	**204,090**

Notes:
[1] Includes faculty housing and non-NYU housing in the project site
[2] Academic calculations assume 14.4 students per 1,000 sf of the 52 percent of total floor area that is assumed to be dedicated to student use
[3] Office calculations assume 2.04 employees per 1,000 sf
[4] Retail calculations assume 3.0 employees per 1,000 sf
Sources: NYU; Table 14-1 of the *CEQR Technical Manual* (January 2012 Edition)

Table 12-4
Solid Waste Generation: Planned Projects in Proposed Development Area and Commercial Overlay Area by 2031

Location	Existing Units	Generation Rate (pounds per week)	Existing Solid Waste Total (pounds per week)	Future Units	Generation Rate (pounds per week)	Future Solid Waste Total (pounds per week)	Incremental Change (pounds per week)
15 Washington Place	78 dwelling units	41 pounds per unit	3,198	966 students	1 per pupil	966	-2,232
25 West 4th Street	240 workers	13 per employee	3,120	288 workers	13 per employee	3,744	624
Morton Williams site	87 workers	284 per employee	24,708	87 workers/ 1,093 students	284 per employee/ 1 per pupil	25,801	1,093
						Total:	**-515**

Notes: [1] Assumes grocery store will remain at 29,000-gsf and new academic space will occupy the balance of the 175,000-gsf building. Student population of academic space assumes 14.4 students per 1,000 sf of student space, which is assumed to be 52 percent of overall academic space.
Sources: NYU; Table 14-1 of the *CEQR Technical Manual* (January 2012 Edition)

Table 12-5
Solid Waste Conditions in the Future Without the Proposed Project by 2031
Proposed Development Area and Commercial Overlay Area

Use	Units	Generation Rate (pounds per week)	Total (pounds per week)
Residential	2,597 dwelling units[1]	41 per household	106,477
Dormitory	389 beds	17 per individual	6,613
Academic	8,754 students[2]	1 per pupil	8,754
Office	466 employees[3]	13 per employee	6,058
General Retail	122 employees[4]	79 per employee	9,638
Restaurant	89 employees[4]	251 per employee	22,339
Fast Food	76 employees[4]	200 per employee	15,200
Food Store	106 employees[4]	284 per employee	30,104
		TOTAL:	**205,183**

Notes:
[1] Includes faculty housing and non-NYU housing in the project site
[2] Academic calculations assume 14.4 students per 1,000 sf of the 52 percent of total floor area that is assumed to be dedicated to student use
[3] Office calculations assume 2.04 employees per 1,000 sf
[4] Retail calculations assume 3.0 employees per 1,000 sf
Sources: NYU; Table 14-1 of the *CEQR Technical Manual* (January 2012 Edition)

E. FUTURE WITH THE PROPOSED ACTIONS

This section estimates the demand for solid waste handling in the future with the Proposed Actions. For analysis purposes, a reasonable worst-case development scenario (RWCDS) was developed to determine the likely maximum amount of solid waste that could be generated from proposed new uses on the project site. In general, the reasonable worst-case development scenario maximizes the uses that generate the most solid waste, such as hotel and retail uses. RWCDS 3 (Max Hotel) in **Tables 1-7 and 1-9**, which maximizes hotel and retail uses, is utilized for the purposes of analysis in this chapter. In addition, it is assumed that one-half of the new retail uses would be restaurants, which generate the highest amount of solid waste.

In 2021 and 2031, it is anticipated that DSNY would collect waste for faculty housing and non-NYU residential uses. A private carter would be used to collect solid waste for academic uses, dormitory uses, retail uses, hotel uses, and other commercial uses. The proposed project would also comply with the City's recycling program. NYU uses a one bin (or "single stream") collection system for common recyclables such as metals, glass, plastics, paper, and cardboard. In addition to the one bin collection system, NYU recycles all plastic products, exceeding the City's recycling program, which only recycles certain types of plastics. NYU considers the one bin recycling system to be more effective than separation (or multiple bin) systems, as it simplifies the recycling process and makes it easier to place bins in the space-constrained NYU campus. Additionally, NYU has initiated a pilot composting system that is anticipated to further cut down on the University's solid waste production.

On-site storage of recycling and solid waste would be managed by NYU, and would be adequate and accessible within the basement level(s) of the proposed buildings. Furthermore, as discussed in Chapter 1, "Project Description," sustainability principles would influence the design of the proposed project by focusing on recycling, minimizing waste, and sustainability strategies for the specification, construction, operations, and maintenance of the University buildings and public open spaces. The proposed project would be built to LEED Silver certification specifications, which contain provisions regarding recyclables and construction waste management. Overall, the proposed project is not expected to have a significant adverse impact on solid waste handling and disposal methods or recycling in the City.

2021 PHASE 1

By 2021 the proposed development on the South Block would be complete, including the new hotel, retail, public school, student dormitory uses, and faculty housing.[1] There would also be up to 23,236 gsf of new retail uses in the Commercial Overlay Area. As shown in **Table 12-6**, after the completion of Phase 1 in 2021, the Proposed Development Area and Commercial Overlay Area would collectively generate an estimated 267,925 pounds of solid waste per week (about 134.0 tons per week). This would be an additional 63,835 pounds (31.9 tons) of solid waste as compared to the future without the Proposed Actions in 2021 (see **Table 12-3**).

[1] The RWCDS used for this analysis does not include faculty housing; if faculty housing were part of the development program, the total amount of waste would be less than estimated for this RWCDS, but the solid waste generated by faculty housing would be handled by DSNY rather than private carters. Therefore, the analysis also considers the potential demand on DSNY services by addressing the possibility of faculty housing.

Table 12-6
Solid Waste Conditions in the Future With the Proposed Actions by 2021

Use	Units	Generation Rate (pounds per week)	Total (pounds per week)
Residential	2,597 dwelling units[1]	41 per household	106,477
Dormitory	1,706 beds	17 per individual	29,002
Academic	8,668 students[2]	1 per pupil	8,668
Office	639 employees[3]	13 per employee	8,307
General Retail	205 employees[4]	79 per employee	16,195
Restaurant	172 employees[4]	251 per employee	43,172
Fast Food	76 employees[4]	200 per employee	15,200
Food Store	106 employees[4]	284 per employee	30,104
Hotel	112 employees[5]	75 per employee	8,400
Elementary School	800 students[6]	3 per pupil	2,400
		TOTAL:	**267,925**

Notes:
[1] Includes faculty housing and non-NYU housing in the project site
[2] Academic calculations assume 14.4 students per 1,000 sf of the 52 percent of total floor area that is assumed to be dedicated to student use
[3] Office calculations assume 2.04 employees per 1,000 sf
[4] Retail calculations assume 3.0 employees per 1,000 sf
[5] Hotel calculations assume 1 room per 600 sf and 1 employee per 2.67 rooms
[6] Elementary school calculations assume 1 student per 125 sf
Sources: NYU; Table 14-1 of the *CEQR Technical Manual* (January 2012 Edition)

The vast majority of the additional waste would be handled by private carters; the only solid waste that would be handled by DSNY would be from the public school or faculty housing. Given that a truck can haul about 10 tons of solid waste, the development resulting from the Proposed Actions would require up to four additional truck trips per week by 2021. Solid waste and recyclables generated by the users of the proposed Zipper Building would be collected from within the loading dock area located off of Mercer Street. Solid waste and recyclables generated by the users of the proposed Bleecker Street Building would be collected curbside from Bleecker Street, subject to SCA preference.

If NYU developed the project site as per the illustrative program (see **Table 1-9**), rather than RWCDS 3 (Max Hotel), than the proposed project would result in new faculty housing that would increase demand for DSNY services. Although total overall waste generation would be lower under the Illustrative Program, there would be approximately 124 new faculty residential units, assuming 850-sf per unit. These units would be expected to generate an estimated 5,084 pounds (2.5 tons) per week of solid waste that would be handled by DSNY. As noted in **Table 12-6**, the proposed elementary school would generate an approximately 2,400 pounds (1.2 tons) of waste per week; therefore, the proposed project could result in an increase in waste that would be handled by DSNY of up to 7,484 pounds (3.7 tons). This increase would not result in any significant adverse impacts to City solid waste services.

2031 PHASE 2

By 2031 all of the proposed development would be complete, including (in addition to the development built by 2021) approximately 874,000 gsf of new academic space, and up to 34,000 gsf of retail space. After the completion of Phase 2 in 2031, the development in the Proposed Development Area and Commercial Overlay Area (including both existing and proposed buildings) would generate approximately 287,270 pounds of solid waste per week (about 143.6 tons per week) (see **Table 12-7**). This would be an increase of 19,345 pounds (about 9.7 tons) as compared to the 2021 analysis year. Collectively, by 2031, the proposed project would result in

a total incremental increase of up to 82,087 pounds (41.0 tons) of solid waste compared to future conditions in 2031 without the Proposed Actions (see **Table 12-5**). Given that a truck can haul about 10 tons of solid waste, the development of the Proposed Project would require up to five additional truck trips per week by 2031. Solid waste and recyclables generated by the users of the proposed Mercer and LaGuardia Buildings, including users of the below-grade space between the buildings, would be collected from within the proposed loading dock area on the ground floor of Washington Square Village 2 located off of West 3rd Street.

Table 12-7
Solid Waste Conditions in the Future With the Proposed Actions by 2031

Use	Units	Generation Rate (pounds per week)	Total (pounds per week)
Residential	2,597 dwelling units[1]	41 per household	106,477
Dormitory	1,706 beds	17 per individual	29,002
Academic	15,212 students[2]	1 per pupil	15,212
Office	639 employees[3]	13 per employee	8,307
General Retail	205 employees[4]	79 per employee	16,195
Restaurant	223 employees[4]	251 per employee	55,973
Fast Food	76 employees[4]	200 per employee	15,200
Food Store	106 employees[4]	284 per employee	30,104
Hotel	112 employees[5]	75 per employee	8,400
Elementary School	800 students[6]	3 per pupil	2,400
		TOTAL:	**287,270**

Notes:
[1] Includes faculty housing and non-NYU housing in the project site
[2] Academic calculations assume 14.4 students per 1,000 sf of the 52 percent of total floor area that is assumed to be dedicated to student use
[3] Office calculations assume 2.04 employees per 1,000 sf
[4] Retail calculations assume 3.0 employees per 1,000 sf
[5] Hotel calculations assume 1 room per 600 sf and 1 employee per 2.67 rooms
[6] Elementary school calculations assume 1 student per 125 sf
Sources: NYU; Table 14-1 of the *CEQR Technical Manual* (January 2012 Edition)

As noted above, the Proposed Actions would result in the incremental generation of 82,087 pounds (41.0 tons) of solid waste by 2031, compared to the future without the Proposed Actions. Approximately 2,400 pounds of this total (the amount for the proposed elementary school) would be handled by DSNY, which could increase to up to 7,484 pounds if faculty housing is constructed. Compared to the 12,000 tons of waste that DSNY collects daily, this increase would be negligible. The remainder would be handled by private carters; compared with the 13,000 tons per day that private carters handle in the City,[1] the amount of waste generated by the proposed project is minimal. Given that a truck can haul about 10 tons of solid waste, the full development of the proposed project by 2031 would require up to five additional trucks per week. Therefore, the proposed project would not result in significant adverse impacts on solid waste and sanitation services. ✷

[1] http://www.nyc.gov/html/dsny/html/about/about.shtml [Accessed June 6, 2011].