

WATERSHED ANALYSIS OF THE MYSTIC RIVER AND NEPONSET RIVER WATERSHEDS

TASK 4C TECHNICAL REPORT NEPONSET RIVER WATERSHED PROPERTY PARCEL ANALYSES

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1 INTRODUCTION

The Neponset River Watershed is highly residential, drains into Boston Harbor, and faces multiple water quality impairments including pathogens and nutrients (phosphorus and nitrogen) from human activity and urban development. These impairments are evidenced by high fecal bacteria levels. Twenty-four waterbody segments have TMDLs for fecal bacteria, with illicit sewer connections, failing septic systems, and stormwater carrying fecal matter from domestic and wild animals identified as the primary sources (MassDEP, 2012, 2002) with an additional eighteen segments listed as requiring a TMDL (MassDEP, 2023). Stormwater runoff also carries excess nutrients into waterbodies which can cause algal blooms and macrophyte growth that contribute to anoxic bottom waters that do not support aquatic life, reduce water clarity, degrade waterbodies' aesthetic quality, and impair designated uses such as fishing, swimming, and boating, as evidenced in the nearby Charles River and Mystic River Watersheds where stormwater is the primary source of these pollutants (U.S. EPA, 2022a; USEPA, 2020). Within the Neponset River Watershed, there are twenty-three segments on the 303(d) list with evidence of nutrient pollution and eutrophication based on impairments for either nutrients, dissolved oxygen, turbidity, aquatic plants (macrophytes), or algae (MassDEP, 2023). On August 24, 2020, the U.S. Environmental Protection Agency (EPA) received a residual designation petition from the Conservation Law Foundation for the Neponset River Watershed. The petition requests that EPA permit stormwater from commercial, industrial, institutional, and multi-family residential (CIIM) properties of one acre or greater under the National Pollutant Discharge Elimination System (NPDES) program to meet water quality standards (WQS) in the Neponset River.

This report presents a methodology to develop, and analyses of, parcel-level stormwater TP and total nitrogen (TN) loading within the Neponset River Watershed that may be used by EPA Region 1 to support decision making regarding the residual designation petition. Long-term stormwater runoff and pollutant loading developed for the Neponset River Watershed (Paradigm Environmental, 2023a) forms the basis against which parcel-level stormwater management strategies can be evaluated. Key information presented in this report includes an analysis of CIIM parcels, their characteristics such as the amount of impervious cover (IC), and their estimated stormwater nutrient loads. IC is the largest source of stormwater runoff within the watershed and findings from an analysis of the relationship between the number of CIIM parcels, IC area, and TP load are presented to demonstrate potential strategies regulating the fewest number of parcels while achieving the largest possible pollutant reduction benefits. The results of this report can be further refined using other considerations, such as where and how communities facing environmental justice (EJ) concerns may be impacted, and apportioned into each municipality within the watershed where, ultimately, progress can be made towards improving water quality.

2 METHODOLOGY

The general methodology presented here follows the process used in the Charles River Watershed (CRW) Total Phosphorous analysis (U.S. EPA, 2022a Appendix 4, 2022b). Key steps, refinements, and quality assurance checks are detailed in the following subsections.

2.1 Data Inventory

Readily available data necessary for parcel analysis were collected, reviewed, and assessed. Data were obtained from online repositories as well as from EPA staff. Table 2-1 provides an inventory of the GIS data collected and indicates the use of that dataset.

Table 2-1. Data used in the parcel analysis

Name	Use	Source	Source Link	Source Date
2016 Land use and land cover	IC calculation	MassGIS	https://www.mass.gov/info-details/massgis-data-2016-land-coverland-use	May 2019
Hydrologic Response Units (HRUs)	Loading rate and load calculations	Task 4A and 4B (Paradigm Environmental, 2023a)		
Parcel boundaries	For summary results	MassGIS	https://www.mass.gov/info-details/massgis-data-property-tax-parcels	Feb 2023
L3 Tax Assessor Table	Parcel details	MassGIS		Feb 2023
Municipal boundaries	For summary results	MassGIS	https://www.mass.gov/info-details/massgis-data-municipalities	April 2022
Neponset River Watershed	For summary results	MassGIS	https://www.mass.gov/info-details/massgis-data-major-watersheds	June 2000
Subwatershed boundaries	For summary results	MassGIS	https://www.mass.gov/info-details/massgis-data-drainage-sub-basins	December 2007
Municipal separate storm sewer system (MS4) boundaries	For summary results	EPA	Admin Record	

2.2 Parcel Analysis

Parcel analysis includes two main components: 1) GIS-based spatial analysis and 2) summary analysis using a python-based tool. These steps are described below and were formulated to be as accurate, transparent, and reproducible as feasible. The parcel analysis workflow, required inputs, and outputs is shown in Figure 2-1. Results of the parcel analysis are summary attributes for each parcel, as shown in Table 2-2, and additional summaries aggregating the parcel data with other conditions and spatial scales as detailed in Section 3.

Table 2-2. Parcel-level summary attributes calculated

Attribute	Description
Loc_ID	Unique parcel ID
Parcel Type	Tax classification (e.g., TAX, FEE, ROW, WATER)
Municipality Name	City or Town name
Owner	Property owner's name
Owner Address	Property owner's address
Owner City	Property owner's city
Owner Country	Property owner's country
Owner State	Property owner's state
Owner Zip Code	Property owner's zip code
Lot Size (ac)	Deed area (converted to acres in this analysis)
Site Address	Site address
Site Zip Code	Site address zip code
Units	Number of units on the property
Year Built	Year building was built
Public/Private	Owner type (public or private) based on filtering described in Section 2.3.1
FY	Year of data
MS4 (boolean, 1 = within MS4)	Inside or outside of the MS4 area
CSA (boolean, 1 = within CSA)	Inside or outside of the Combined Sewer Area (CSA)
Subbasin	Subbasin name(s) and percentages if multiple
Area in Major Basin (%)	Percentage of parcel area with the watershed
Use Code	Use code from Tax Assessor
L3 Use Description	Use description from Tax Assessor
Dept. Revenue Description	Use description from MA Dept. of Revenue (from Use Code)
Parcel Use Group	Land use classification in the current analysis (from Use Code)
MassGIS Land Use	Land use from MassGIS 2016 LULC
Total Area (ac)	Parcel area calculated in the current analysis
IC Area (ac)	The impervious cover area from the 2016 data
IC Percent	Percent impervious cover calculated from MassGIS 2016 LULC
Wetland Area (ac)	Wetland area on the parcel
Wetland Percent	Wetland percent on the parcel
Water Area (ac)	Water area on the parcel
Water Percent	Water percent on the parcel
Forest Area (ac)	Forest area on the parcel
Forest Percent	Forest percentage on the parcel
Pervious Area (ac)	Pervious area
Pervious Percent	Percent pervious

Attribute	Description
Total Pervious Load (lb/yr)	TP and TN load from the parcel's pervious cover
IC Load (lb/yr)	TP and TN load from the parcel's impervious cover
Total parcel load (lb/yr)	Total TP and TN load from parcel

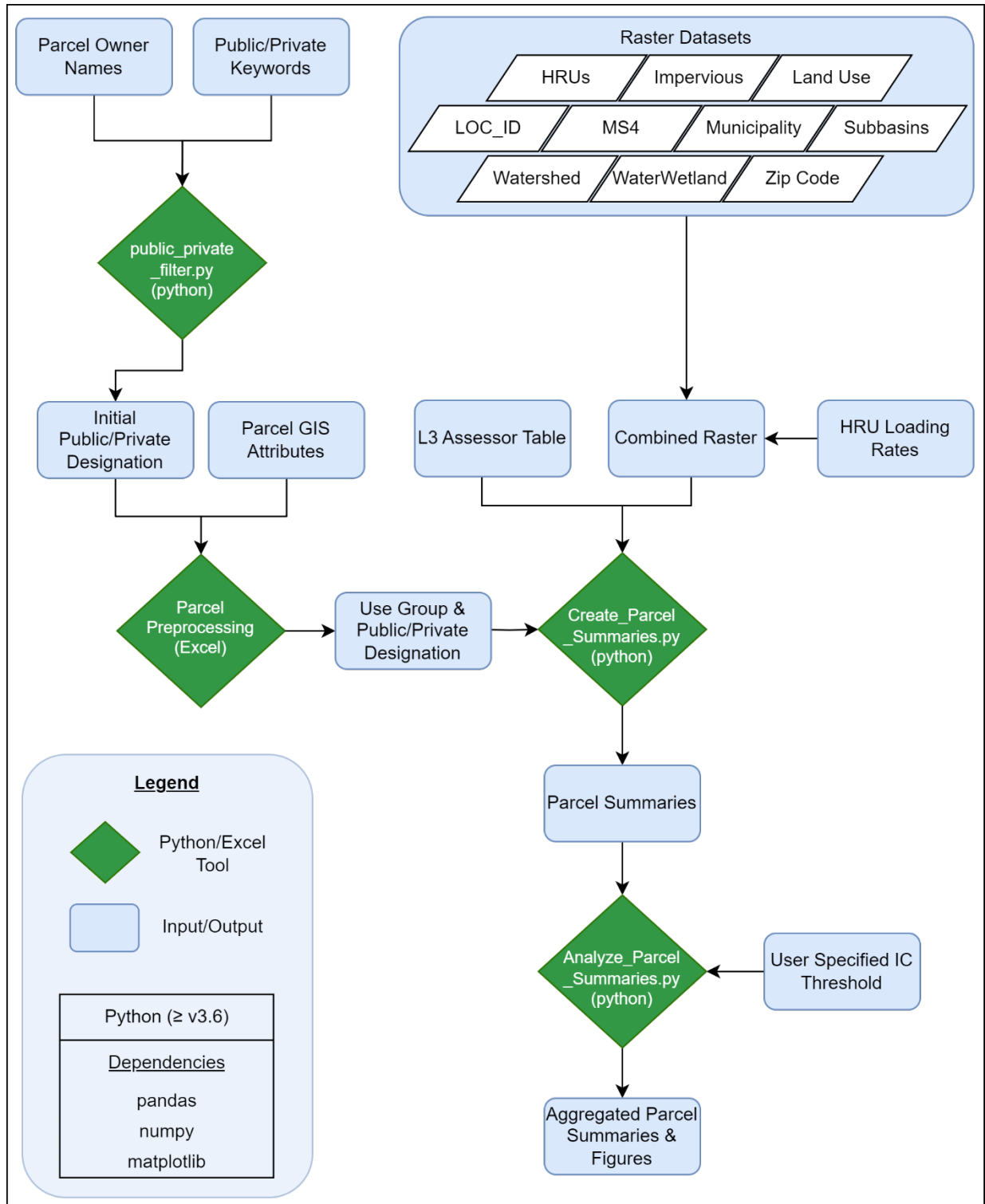


Figure 2-1. Parcel analysis workflow, including relevant requirements, inputs, and outputs.

2.2.1 GIS-based Spatial Analysis

The GIS-based processing is raster-based and assembles the required data for parcel-level analysis and summaries at other spatial scales. The output of this step is a combined raster layer and attribute table listing the unique combinations of all input rasters. The major GIS processing steps are:

1. Ensure all layers use the same projection (EPSG: 26986, Massachusetts State Plane Coordinate System, Mainland Zone).
2. Clip all layers to the area of interest (Neponset River Watershed boundary).
3. Convert all polygon layers to rasters with 1-square meter cells (e.g., parcel layer). The raster cell values will be a unique identifier (e.g., *LOC_ID* for parcels) to allow the joining of attributes in later steps.
4. Overlay all rasters using the ESRI Combine tool. The output is a combined raster and an attribute table with a unique identifier for each unique combination of input raster values.

The combined raster attribute table is converted into an Excel spreadsheet and the pollutant load calculated based on the HRU by multiplying the area of each unique combination by the appropriate loading rate. The development of loading rates is described in the Task 4A-B memo (Paradigm Environmental, 2023a).

Parcel Preprocessing

One additional processing step was performed on the tax parcel polygon layer to create a second input to the python-based processing described below. Namely, once all the parcels were clipped to the watershed, all the unique “Use_Codes” were mapped to a single use group similar to those used in the CRW TP analysis (Table 2-3). This allows users to easily update parcel classifications as additional parcel details or corrections become available, without having to modify the python code. The Use Codes are generally, but not always, standardized codes set by the MA Department of Revenue and provide a greater number of categories than the 2016 LULC dataset (MA Dept. of Revenue Division of Local Services, 2016). For example, the CRW TP analysis grouped several Code 9 Use Code values into institutional groups; these categories do not exist in the MassGIS 2016 LULC dataset but are important for evaluating loading from CIIM parcels. As well as using the CRW Use Code groups, a right-of-way group and water group were added as the current analysis considers all parcels within the Neponset River Watershed. A public or private designation was assigned to each parcel during this preprocessing step (detailed in Section 2.3.1).

Table 2-3. Use Groups assigned in the CRW and Neponset analyses

CRW Use Group	Neponset Use Groups	Public/Private
Agriculture	Agriculture	Private
Commercial	Commercial	Public or Private
Industrial	Industrial	Public or Private
Open Land	Open Land	Public or Private
Local Institutional	Local Institutional	Public
Private Institutional	Private Institutional	Private
State Institutional	State Institutional	Public
MultiFamily Residential	MultiFamily Residential	Public or Private
Single Family Residential	Single Family Residential	Public or Private
Federal Institutional	Federal Institutional	Public
Two Family Residential	MultiFamily Residential	Public or Private
Three Family Residential	MultiFamily Residential	Public or Private
MultiFamily Residential (4-8)	MultiFamily Residential	Public or Private

CRW Use Group	Neponset Use Groups	Public/Private
MultiFamily Residential (>8)	MultiFamily Residential	Public or Private
	Right-of-Way	Public or Private
	Water	Public or Private

The main steps in parcel Use Group classification are listed below. In general, each step reclassifies unknowns from the preceding steps.

1. Assign from Use Code based on existing CRW classification
2. Assign institutional categories from Use Code 9 parcels unique to the Neponset River Watershed
3. Assign “Unknown” if no Use Code and no Owner
4. Assign Multi-Use (Table 2-4)
5. Assign from major Use Code category (first digit, Table 2-5)
6. Assign from PolyType (only Right-of-Way and Water)
7. Remaining Unknowns classified from the dominant MassGIS 2016 LULC category.
8. Manually reclassify select parcels (these are predominately open land that was originally classified as public institutional, see Appendix A).

Appendix B lists all the unique Use Codes, Use Groups, and Public/Private categories within the watershed; all preprocessing steps are detailed in the accompanying excel file (AppendixB_TaxParcel_PreprocessingWorkbook.xlsx).

Table 2-4. Reclassification table for Multi-Use parcels

2 Digit Use Code	Use Group
01	MultiFamily Residential
03	Commercial
04	Industrial
06	Open Land
07	Open Land
08	Open Land
09	Private Institutional

Table 2-5. Reclassification table for major Use Code category

1 Digit Use Code	Use Group
1	MultiFamily Residential
2	Open Land
3	Commercial
4	Industrial
5	Unknown
6	Open Land
7	Open Land
8	Open Land
9	Private Institutional

Results of the parcel preprocessing, in terms of total distribution within the Neponset River Watershed, are shown in Figure 2-2 and mapped in Figure 2-3. This analysis shows that a third (33%) of the watershed area is made up of single-family residences; combined multi-family residences make up 6%. Public institutional groups (local, state, and federal) make up 6.4% of the watershed area with private institutional totaling 3.6%. In total, commercial, industrial, and private institutional constitute 13.5% of the watershed area. The distribution of public/private parcels, grouped by Use Code group, is shown in Table 2-6. In total, the current classification has 33.9% public parcels (largely open land) and 66.1% private by area. By parcel count, however, the watershed is dominated by private parcels (95.8%).

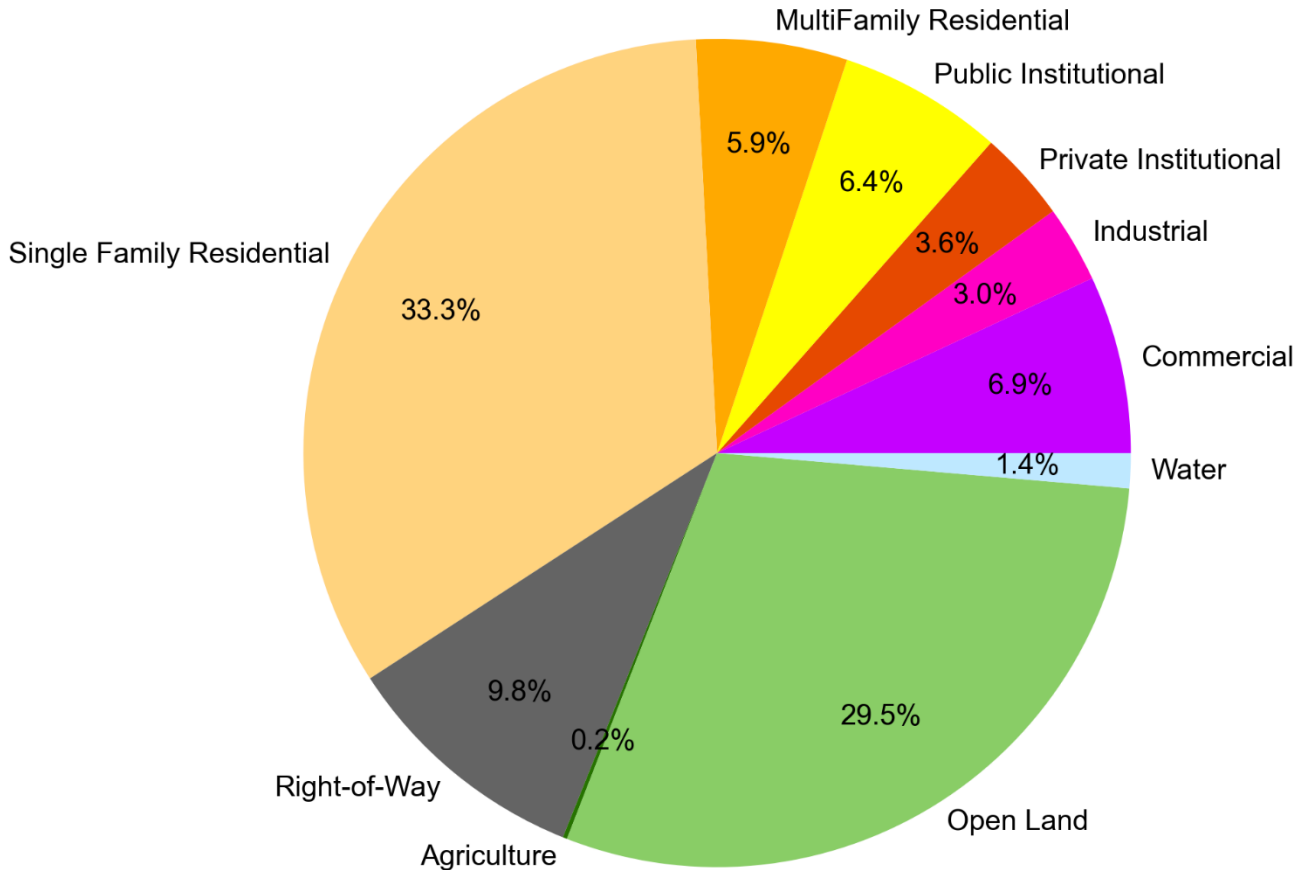


Figure 2-2. Distribution of parcel area by Use Group within the Neponset River Watershed.

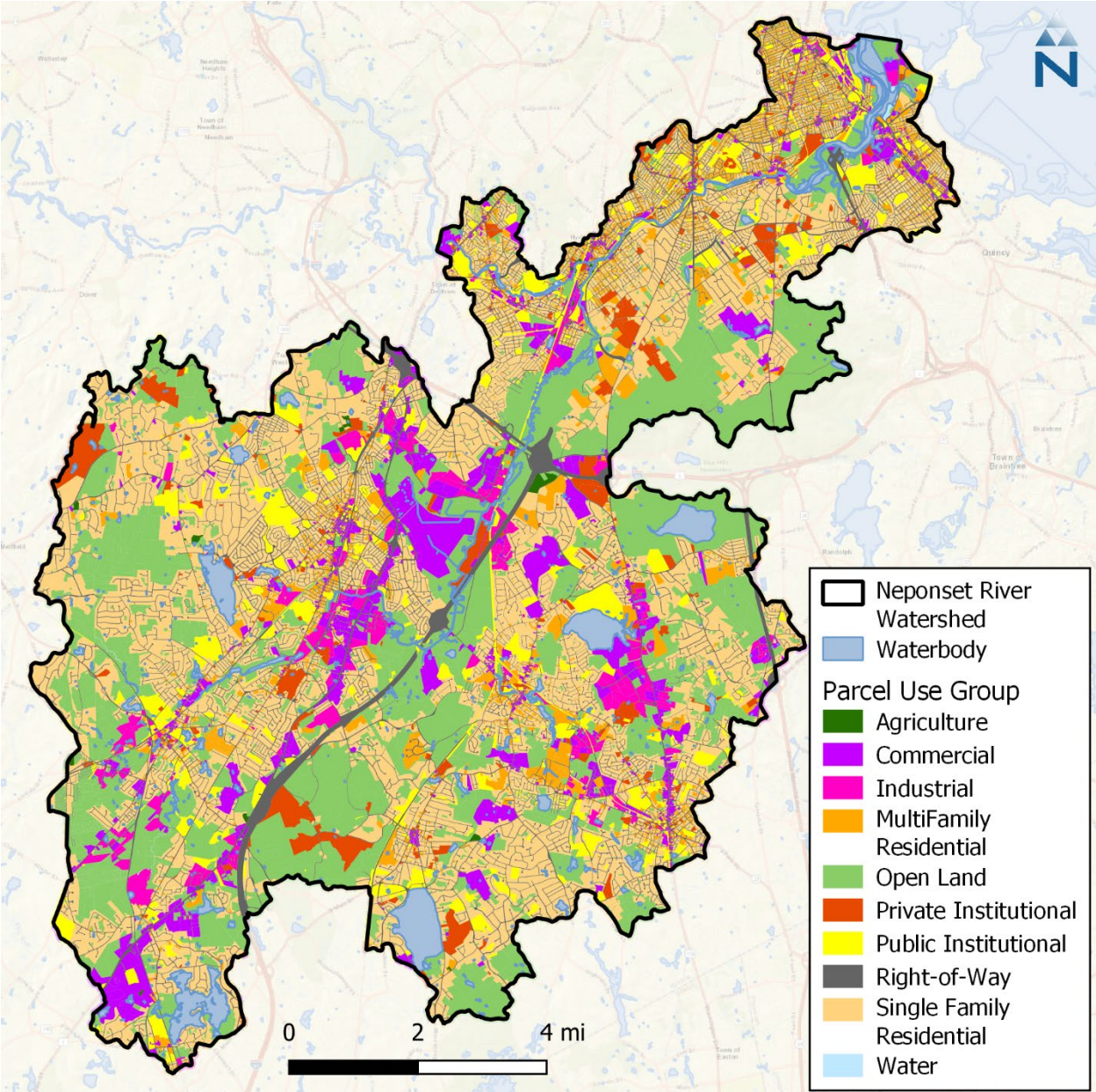


Figure 2-3. Map of parcel Use Groups within the Neponset River Watershed. Note that the resolution of this map is parcel-scale; waterbodies exist within non-Water class parcels and have been added to aid visualization.

Table 2-6. Distribution of public and private parcel areas by Use Group

Public/ Private	Use Group	Count	Count (%)	Total Area (ac)	Total Area (%)
Private	Agriculture	65	0.08	126.74	0.17
	Commercial	2,564	3.22	5,186.25	6.92
	Industrial	507	0.64	2,241.27	2.99
	MultiFamily Residential	13,233	16.64	4,425.76	5.91
	Open Land	4,967	6.25	9,841.80	13.13
	Private Institutional	813	1.02	2,667.03	3.56
	Right-of-Way	113	0.14	54.43	0.07
	Single Family Residential	53,929	67.81	24,987.16	33.34
	Water	0	0.00	0.00	0.00
	Subtotal	76,191	95.8	49,530.46	66.1
Public	Agriculture	0	0.00	0.00	0.00
	Commercial	4	0.01	10.46	0.01
	Industrial	0	0.00	0.00	0.00
	MultiFamily Residential	0	0.00	0.00	0.00
	Open Land	810	1.02	12,303.27	16.42
	Public Institutional	2,288	2.88	4,820.08	6.43
	Right-of-Way	191	0.24	7,258.29	9.68
	Single Family Residential	0	0.00	0.00	0.00
	Water	43	0.05	1,021.78	1.36
	Subtotal	3,336	4.2	25,413.88	33.9
Total	79,527	100	74,944.34	100	

2.2.2 Python-Based Summary Analysis

The raster attribute table output from GIS processing was further processed using a tool developed in python (Figure 2-1). Python is a commonly used programming language for data management and analysis due to its ease of use and readability; all python software and packages used in this analysis are freely available and open source. The output of this processing is an Excel compatible spreadsheet file including every parcel and additional summaries based on aggregating the data with different conditions and spatial scales. The major python processing steps include:

1. Read the combined raster attribute table into a data frame using the pandas python package.
 - This is a powerful data structure that allows for a wide variety of data manipulation and evaluation.
 - Efficient for large-size datasets.
2. Join relevant attribute tables.
 - The parcel *LOC_ID* is used to join parcels with the preprocessed parcel data and the L3 Assessors Table, which provides parcel details such as site address, owner information, and year built.
 - Performing this step outside of a GIS environment should reduce processing time and potential data overlap errors.
3. Calculate parcel-level information.
 - The information shown in Table 2-2 is calculated for each parcel.
4. Generate parcel-level summary tables.
 - A summary spreadsheet file is generated and saved. The file includes all necessary information as shown in Table 2-2 for each property parcel.
 - The code can also optionally generate a summary table for multiple attributes (e.g., the unique intersection of parcel, municipality, and subbasin). This is useful for additional QA of area and loads.
5. Generate additional summaries.
 - Additional summaries of the calculated parcel data are created by aggregating with other conditions and spatial scales.
 - For example, TP loading from IC areas can be summarized for parcels of varying IC areas and Use Groups.

Outputs of the python-based processing are presented and evaluated in the Results and Discussion section. All input data, processing codes, and outputs will be made available to EPA; outputs can be visualized by joining with the *LOC_ID* in the parcel polygon layer.

2.3 Refinements from CRW Analysis

Parcel analysis for the Neponset River Watershed is based on the general methodology used in the Charles River Watershed. Several refinements were made to improve transparency and consistency including:

1. High-resolution (i.e., 1 squared meter cell size) raster-based GIS data processing
2. A consistent source of land use classification (MassGIS 2016 LULC)
3. Binary public or private designation at parcel-scale
4. The long-term annual average loading rates from the Opti-Tool HRU time series (for a period of 2007-2016)
5. The pollutant loading from the pervious areas is based on the HSG classification, providing additional resolution for load calculation.

The GIS processing performed in the CRW TP analysis was based primarily on polygon datasets, which can lead to errors or require additional processing with polygons being duplicated and/or overlapped. For the Neponset River analysis, the raster-based approach (Section 2.2.1) spatially aligns all datasets to eliminate errors such as polygon slivers or overlap of multi-part polygons.

The impervious cover is based on a rasterized version of the MassGIS 2016 LULC dataset, which contains the most recent and detailed IC data currently available. The land cover information in this layer is consistent with the Coastal Change Analysis Program (C-CAP)'s high-resolution land cover classification scheme and the entire LULC layer has been thoroughly vetted and documented by MassGIS (MassGIS, 2016). The CRW analysis used both a MassGIS 2005 IC raster and the 2016 LULC polygon dataset and stated that the 2005 IC raster was overly simplified. However, the 2016 land cover classifications are based on 1-meter aerial imagery and can be converted back to a 1-meter raster with essentially no loss in accuracy. This was evaluated for the Mystic River Watershed and shown in the Task 3C memo (Paradigm Environmental, 2023b). Additionally, loading rates were calculated from the Opti-Tool Hydrologic Response Units (HRUs) that are primarily based on the MassGIS 2016 LULC dataset and average annual SW HRU pollutant load export rates that were developed in subtasks 4A and 4B (Paradigm Environmental, 2023a).

2.3.1 *Public/Private Classification*

For the Neponset River Watershed, a binary public/private classification based on similar Use Codes as those used in the CRW analysis was developed. The public/private designation uses keyword filters on the "OWNER1" attribute as an initial designation which is then further refined by looking at the assigned Use Group (Table 2-3). For example, any local, state, or federal institutional groups that were not classified as public in the keyword filtering were changed to public. These keywords are listed in Table 2-7 and were selected by visual inspection of unique code 9 owner names remaining after filtering out CRW use codes for local, state, and federal institutional groups. Binary classification is important to help distinguish between parcels already subject to regulation.

The main steps in creating the public/private designation are:

1. Owner keyword filtering (performed in python script)
2. Update RoW based on parcel PolyType
3. Classify parcels with a "Water" Use Group as public
 - a. These parcels are predominately water and account for only 0.1% of the total TP and TN loads (Table 3-2)
4. Classify unknowns based on Use Group
5. Update Residential
 - a. If residential and not Use code 9XX: private
6. Manual reclassification of selected parcels

Table 2-7. OWNER1 keywords for initial public/private parcel filtering

Public Keywords		
CITY OF	MASS BAY TRANS AUTHORITY	MASSACHUSETTS COMM OF METRO DIST COMM
COMM OF MASS	MASS BAY TRANS, AUTHORITY	MASSACHUSETTS COMMON OF
COMMNLTH OF MASS	MASS BAY TRANS. AUTH	MASSACHUSETTS COMMONWEALTH
COMMONWEALTH OF	MASS BAY TRANS. AUTHORITY	MASSACHUSETTS COMMONWEALTH OF
COMMWLTH OF MASS	MASS BAY TRANSP AUTH	MASSACHUSETTS DEPARTMENT
COMWLTH OF MASS	MASS BAY TRANSPORT AUTH	MASSACHUSETTS GOVT LAND BANK
COUNTY OF	MASS BAY TRANSPORTATION	MASSACHUSETTS PORT AUTH
DCR	MASS BAY TRANSPORTATION AUTH	MASSACHUSETTS PORT AUTHORITY
DEPARTMENT OF	MASS BAY TRANSPTN AUTHOR	MASSACHUSETTS TURNPIKE AUTHORITY
DEPT OF	MASS DOT	MBTA
DEPT. OF	MASS ELECTRIC CO	POST OFFICE
FIRE + POLICE BUILDING	MASS PORT AUTHORITY	REDEVELOPMENT ASSOC
FIRE DEPARTMENT	MASS TURNPIKE AUTHORITY	REDEVELOPMENT AUTH
HOUSING AUTH	MASS WATER RESOURCE AUTH	TOWN OF
LIBRARY	MASSACHUSETT PORT AUTHORITY	TOWN OFFICE BUILDING
M B T A	MASSACHUSETTS BAY TRANS AUTH	U S POST OFFICE
MASS BAY AUTHORITY	MASSACHUSETTS BAY TRANSIT AUTHORITY	UNITED STATES OF AMERICA
MASS BAY TRAN AUTHORITY	MASSACHUSETTS BAY TRANSIT AUTHORITY	UNITED STATES POSTAL SERVICE
MASS BAY TRANS AUTH	MASSACHUSETTS COMM OF	UNITED STATES PROPERTY
Private Keywords		
COMPANY	CONDO	LLC
TRUST	TRS	CREDIT UNION
REALTY	RLTY	INC
INCORPORATED		

2.4 Quality Assurance / Quality Control (QA/QC)

Several QA/QC steps have been performed to ensure the highest level of accuracy feasible. The greatest source of uncertainty in this analysis is the parcel attributes from the L3 Tax Assessor table. As seen in Table 2-7, owner names and other details are not standardized and may have typos or other inconsistencies that make automated processing difficult. To address this, parcels that remain unclassified as public/private after the processing described in Section 2.3.1 were manually examined and updated.

Additional checks include:

- Ensuring parcels have a single MassGIS 2016 land use category by intersecting parcel boundaries and reclassified land use categories.
- Evaluating the fraction of public and private ownership for feasibility
- Checking the sum of all parcel areas within a municipality equals the sum of municipality area and similar checks for other boundaries such as sub-watersheds.

2.5 Limitations

One limitation of this analysis is that parcels crossing the boundary of the Neponset River Watershed will only be evaluated for the portion of their area within the watershed. This is not expected to impact the calculation of load within the watershed but will impact the calculation of area for different land uses at the parcel scale. For example, a parcel may have IC outside of the watershed boundary, but only the IC area and load within the watershed will be accounted for. The percentage of IC area will be calculated as the IC area within the watershed divided by the total parcel area within the watershed. The impact of splitting parcels on the watershed boundary should be negligible given that this is a small portion of the total number of parcels.

3 RESULTS AND DISCUSSION

This section describes the calculated TP and TN loads from private and public properties based on the parcel Use Group. Analyses include the proportional impact of different private property classes, the proportional impact of different property sizes based on the amount of impervious cover on each property, and a range of the optimal IC size thresholds to reduce the greatest amount of TN and TP while potentially regulating the fewest number of properties. The analyses presented here do not distinguish between parcels inside or outside of MS4 areas. Only 5% of the area within the Neponset River Watershed is outside MS4 boundaries and this area is predominately undeveloped and pervious (see Figure 2-9 and Table 2-9 in Paradigm Environmental [2023a]).

Total baseline nutrient loads used in this parcel analysis are from the 1992-2022 time period and represent unattenuated stormwater TP and TN loads of 34,367 lb/yr and 253,686 lb/yr, respectively (Table 3-1). Note that there is 1,254 ac of parcel area outside of any municipality (denoted as “No Data” in Table 3-1). TP load from these areas is 0.05% of the watershed total but was not assigned to any municipality; this corresponds to the approach for calculating municipality loading used in the loading analysis (Paradigm Environmental, 2023a).

Table 3-1. Stormwater annual average TP and TN loads (1992-2022) for municipalities within the Neponset River Watershed

Municipality	Unattenuated Annual Average (1992-2022) Load (lb/yr)			
	Public (%)	Private (%)	TP	TN
BOSTON	30%	70%	5,190.56	37,058.56
CANTON	29%	71%	4,660.38	35,662.07
DEDHAM	34%	66%	1,240.24	9,340.38
DOVER	18%	82%	415.84	2,815.36
FOXBOROUGH	21%	79%	1,112.64	8,562.31
MEDFIELD	27%	73%	447.38	3,088.03
MILTON	34%	66%	3,289.64	23,747.69
NORWOOD	26%	74%	4,439.66	34,070.60
QUINCY	31%	69%	1,813.70	13,204.50
RANDOLPH	49%	51%	320.40	2,315.00
SHARON	36%	64%	2,649.47	18,981.10
STOUGHTON	30%	70%	2,253.34	16,534.24
WALPOLE	31%	69%	4,350.17	31,983.97
WESTWOOD	29%	71%	2,165.69	16,148.12
No Data ¹	61%	39%	18.19	173.57
Total			34,367.30	253,685.50

¹Note that there are 274 ac of parcel area within the Neponset River Watershed that are not covered by a municipal boundary. These areas represent 0.05% and 0.07% of the total TP and TN loads, respectively.

3.1 All Parcels

A total of 79,527 parcels were analyzed within the Neponset River Watershed. More than two thirds of the parcels are single family residential (68%) and multi-family residential parcels make up another 17%. By land area these two categories make up 42%. Open land makes up 30% of the parcel area and is approximately evenly split between public and private.

Figure 3-1 illustrates the distribution of summary attributes by Public/Private designation for all parcels in the Neponset River Watershed. Private parcels account for 96% of parcels and 66% of total parcel area. Twenty-one percent of total parcel area is impervious cover, with private parcels having 1.8 times as much total IC area as public parcels (64% of total IC area). In terms of nutrient loading, private parcels contribute 70% of the total TP and 69% of the total TN. Loading from IC within private parcels amounts to 81% of the total TP and 82% of the total TN load from private parcels. Private IC load represents 57% of total TP and total TN from all parcels. These results indicate that private parcels contribute nearly three quarters of the nutrient load and may require further stormwater controls for the watershed to meet its water quality goals. Table 3-2 and Table 3-3 provide additional details summarizing the IC area and load for parcels by Use Group and Private/Public designation for TP and TN, respectively.

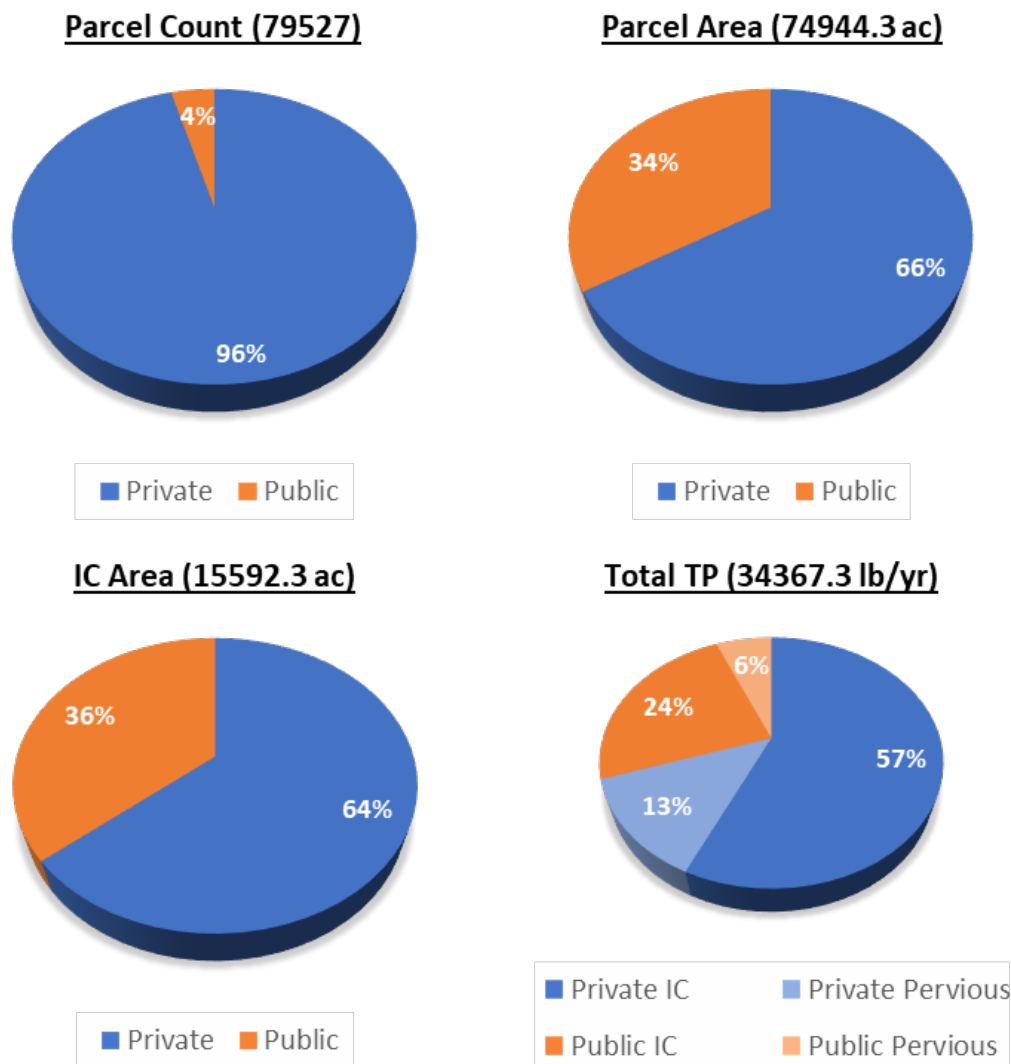


Figure 3-1. Private/Public summaries for all parcels within the Neponset River Watershed.

Table 3-2. Summary of parcel attributes by Use Group and Public/Private designation with TP*

Public/ Private	Use Group	Count	Count (%)	Total Area (ac)	Total Area (%)	IC Area			TP Load (lb/yr)				
						Acre	% IC of Total Area	Parcel Avg. (ac)	IC	Pervious	Total	Total (%)	Parcel Total Avg.
Private	Agriculture	65	0.08	126.74	0.17	20.56	16.22	0.32	36.09	23.32	59.41	0.17	0.91
	Commercial	2,564	3.22	5,186.25	6.92	2,266.98	43.71	0.88	4,083.84	302.19	4,386.03	12.76	1.71
	Industrial	507	0.64	2,241.27	2.99	1,020.67	45.54	2.01	1,835.81	91.33	1,927.14	5.61	3.80
	MultiFamily Res.	13,233	16.64	4,425.76	5.91	1,695.04	38.30	0.13	3,977.59	311.37	4,288.96	12.48	0.32
	Open Land	4,967	6.25	9,841.80	13.13	413.04	4.20	0.08	750.19	1,086.79	1,836.99	5.35	0.37
	Private Inst.	813	1.02	2,667.03	3.56	410.64	15.40	0.51	742.43	296.06	1,038.49	3.02	1.28
	Right-of-Way	113	0.14	54.43	0.07	26.13	48.01	0.23	36.64	2.81	39.45	0.11	0.35
	Single Family Res.	53,929	67.81	24,987.16	33.34	4,105.84	16.43	0.08	8,082.22	2,345.06	10,427.28	30.34	0.19
	Water	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	76,191	95.8	49,530.46	66.1	9,958.90	20.1	--	19,544.82	4,458.92	24,003.73	69.8	--
Public	Agriculture	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Commercial	4	0.01	10.46	0.01	7.85	75.02	1.96	14.14	0.36	14.50	0.04	3.62
	Industrial	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MultiFamily Res.	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Open Land	810	1.02	12,303.27	16.42	93.06	0.76	0.11	161.73	1,476.44	1,638.17	4.77	2.02
	Public Inst.	2,288	2.88	4,820.08	6.43	840.61	17.44	0.37	1,461.28	429.17	1,890.44	5.50	0.83
	Right-of-Way	191	0.24	7,258.29	9.68	4,689.99	64.62	24.55	6,557.05	255.43	6,812.48	19.82	35.67
	Single Family Res.	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Water	43	0.05	1,021.78	1.36	1.87	0.18	0.04	3.00	4.97	7.97	0.02	0.19
Subtotal	3,336	4.2	25,413.88	33.9	5,633.38	22.2	--	8,197.20	2,166.37	10,363.57	30.2	--	
Total	79,527	100	74,944.34	100	15,592.28	20.8	--	27,742.02	6,625.28	34,367.30	100	--	

* A darker color gradient represents increasing value within a column.

Table 3-3. Summary of parcel attributes by Use Group and Public/Private designation with TN*

Public/ Private	Use Group	Count	Count (%)	Total Area (ac)	Total Area (%)	IC Area			TN Load (lb/yr)				
						Acre	% IC of Total Area	Parcel Avg. (ac)	IC	Pervious	Total	Total (%)	Parcel Total Avg.
Private	Agriculture	65	0.08	126.74	0.17	20.56	16.22	0.32	301.04	164.12	465.16	0.18	7.16
	Commercial	2,564	3.22	5,186.25	6.92	2,266.98	43.71	0.88	34,061.46	2,468.02	36,529.48	14.40	14.25
	Industrial	507	0.64	2,241.27	2.99	1,020.67	45.54	2.01	15,528.90	725.58	16,254.48	6.41	32.06
	MultiFamily Res.	13,233	16.64	4,425.76	5.91	1,695.04	38.30	0.13	24,118.65	2,214.67	26,333.32	10.38	1.99
	Open Land	4,967	6.25	9,841.80	13.13	413.04	4.20	0.08	5,370.44	7,398.24	12,768.68	5.03	2.57
	Private Inst.	813	1.02	2,667.03	3.56	410.64	15.40	0.51	6,214.73	2,024.01	8,238.74	3.25	10.13
	Right-of-Way	113	0.14	54.43	0.07	26.13	48.01	0.23	270.13	20.30	290.43	0.11	2.57
	Single Family Res.	53,929	67.81	24,987.16	33.34	4,105.84	16.43	0.08	58,446.03	16,377.44	74,823.47	29.49	1.39
	Water	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	76,191	95.8	49,530.46	66.1	9,958.90	20.1	--	144,311.37	31,392.38	175,703.75	69.3	--
Public	Agriculture	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Commercial	4	0.01	10.46	0.01	7.85	75.02	1.96	119.68	3.23	122.91	0.05	30.73
	Industrial	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	MultiFamily Res.	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Open Land	810	1.02	12,303.27	16.42	93.06	0.76	0.11	1,343.55	10,888.38	12,231.94	4.82	15.10
	Public Inst.	2,288	2.88	4,820.08	6.43	840.61	17.44	0.37	12,138.61	3,221.03	15,359.64	6.05	6.71
	Right-of-Way	191	0.24	7,258.29	9.68	4,689.99	64.62	24.55	48,290.44	1,906.40	50,196.84	19.79	262.81
	Single Family Res.	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Water	43	0.05	1,021.78	1.36	1.87	0.18	0.04	23.95	46.47	70.42	0.03	1.64
	Subtotal	3,336	4.2	25,413.88	33.9	5,633.38	22.2	--	61,916.23	16,065.52	77,981.75	30.7	--
Total	79,527	100	74,944.34	100	15,592.28	20.8	--	206,227.60	47,457.90	253,685.50	100	--	

* A darker color gradient represents increasing value within a column.

3.2 Commercial, Industrial, Institutional, and Multi-Family Parcels

Commercial, Industrial, Institutional, and Multi-Family parcels make up 22% parcels by count and 19% of area in the Neponset River Watershed (Table 3-4). The greatest number of CIIM parcels are Multifamily Residential. On average, however, these parcels have the lowest IC area and TP and TN loads. Industrial parcels have the highest average IC and load values, followed by Commercial and Institutional. CIIM parcels make up 35% of total IC area and 38% and 39% of total TP and TN load from all IC, respectively. These parcels could be candidates for additional stormwater controls while excluding the regulation of the nearly 54,000 private single family residential parcels.

Table 3-4. Summary of private commercial, industrial, institutional, and multifamily parcel attributes in the Neponset River Watershed

Use Group	Count	Total Area (ac)	IC Area			TP Load (lb/yr)			TN Load (lb/yr)		
			Acre	% IC of Total Area	Parcel Avg. (ac)	IC	Pervious	Parcel Total Avg.	IC	Pervious	Parcel Total Avg.
Commercial	2,564	5,186.25	2,266.98	43.71	0.88	4,083.84	302.19	1.71	34,061.46	2,468.02	14.25
Industrial	507	2,241.27	1,020.67	45.54	2.01	1,835.81	91.33	3.80	15,528.90	725.58	32.06
MultiFamily Residential	13,233	4,425.76	1,695.04	38.30	0.13	3,977.59	311.37	0.32	24,118.65	2,214.67	1.99
Private Institutional	813	2,667.03	410.64	15.40	0.51	742.43	296.06	1.28	6,214.73	2,024.01	10.13
Subtotal	17,117	14,520.32	5,393.33	37.14	--	10,639.67	1,000.94	--	79,923.73	7,432.29	--
Watershed Total (%)	21.5	19.4	34.6	--	--	38.4	15.1	--	38.8	15.7	--

3.2.1 Analysis of CIIM Parcels by IC Area

Because regulating all CIIM parcels may be impractical due to the high number of multifamily residential parcels, it may be possible to regulate fewer CIIM properties based on the amount of IC area while still targeting the majority of the nutrient load. The relationship between the number of parcels, the amount of IC area within a parcel, and the total load was evaluated for private CIIM parcels by varying thresholds of IC area as shown Figure 3-2 and Figure 3-3 (Appendix C presents similar plots by individual parcel use group). These plots show that while the IC threshold is relatively large (e.g., ≥ 2 ac), the number of parcels regulated is relatively small, but accounts for approximately half of the private CIIM total load. As the IC threshold decreases below 1 ac, the number of parcels regulated sharply increases, but with lower increases in the total load. IC thresholds below ≥ 0.25 ac exhibit a large increase in the number of parcels regulated because more multifamily residential parcels are included (these parcels have an average IC area of 0.1 ac, as shown in Table 3-4).

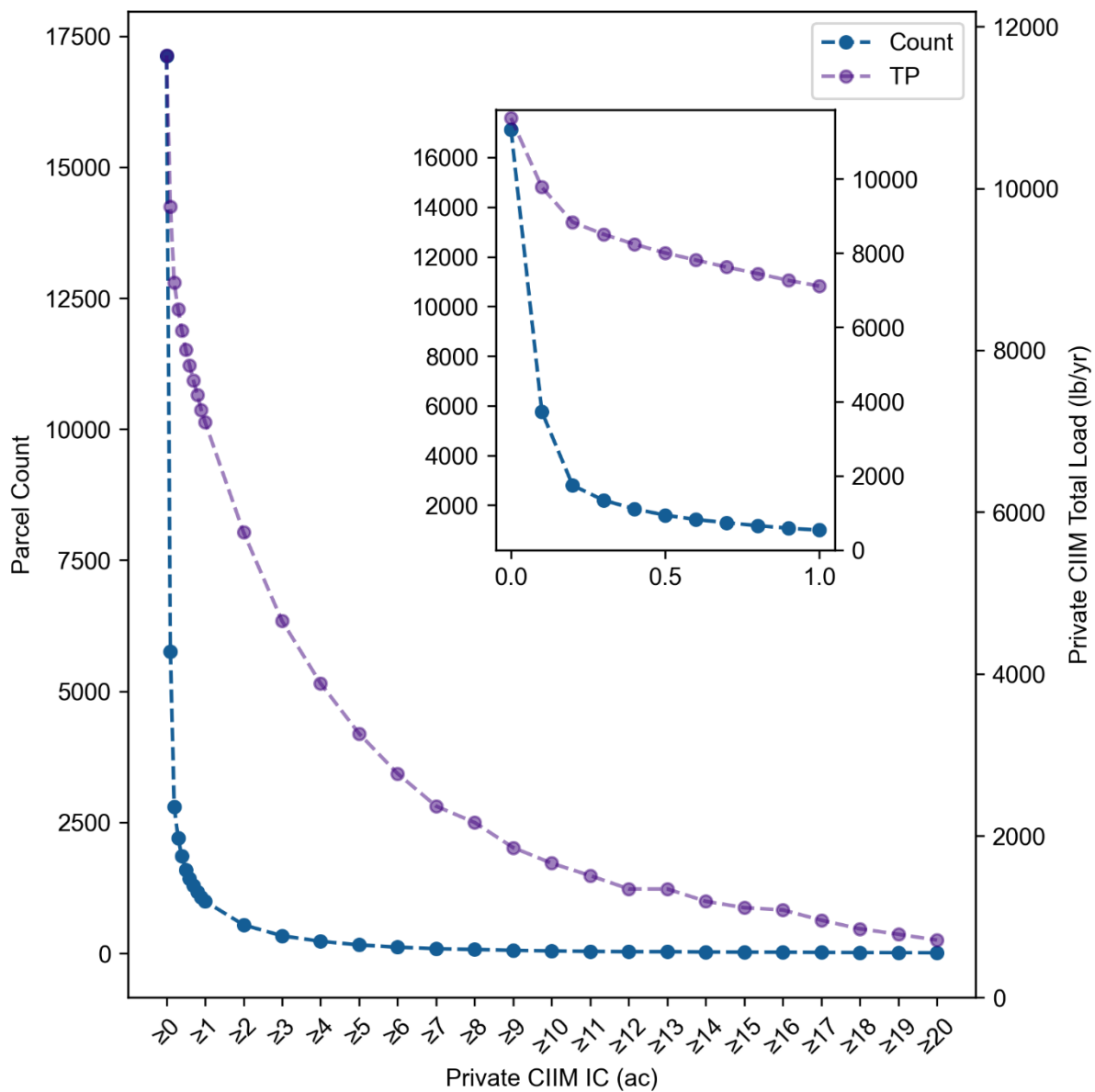


Figure 3-2. Private CIIM parcel count and total TP load by parcel IC area. Note that a threshold of ≥ 0 ac IC includes all private CIIM parcels.

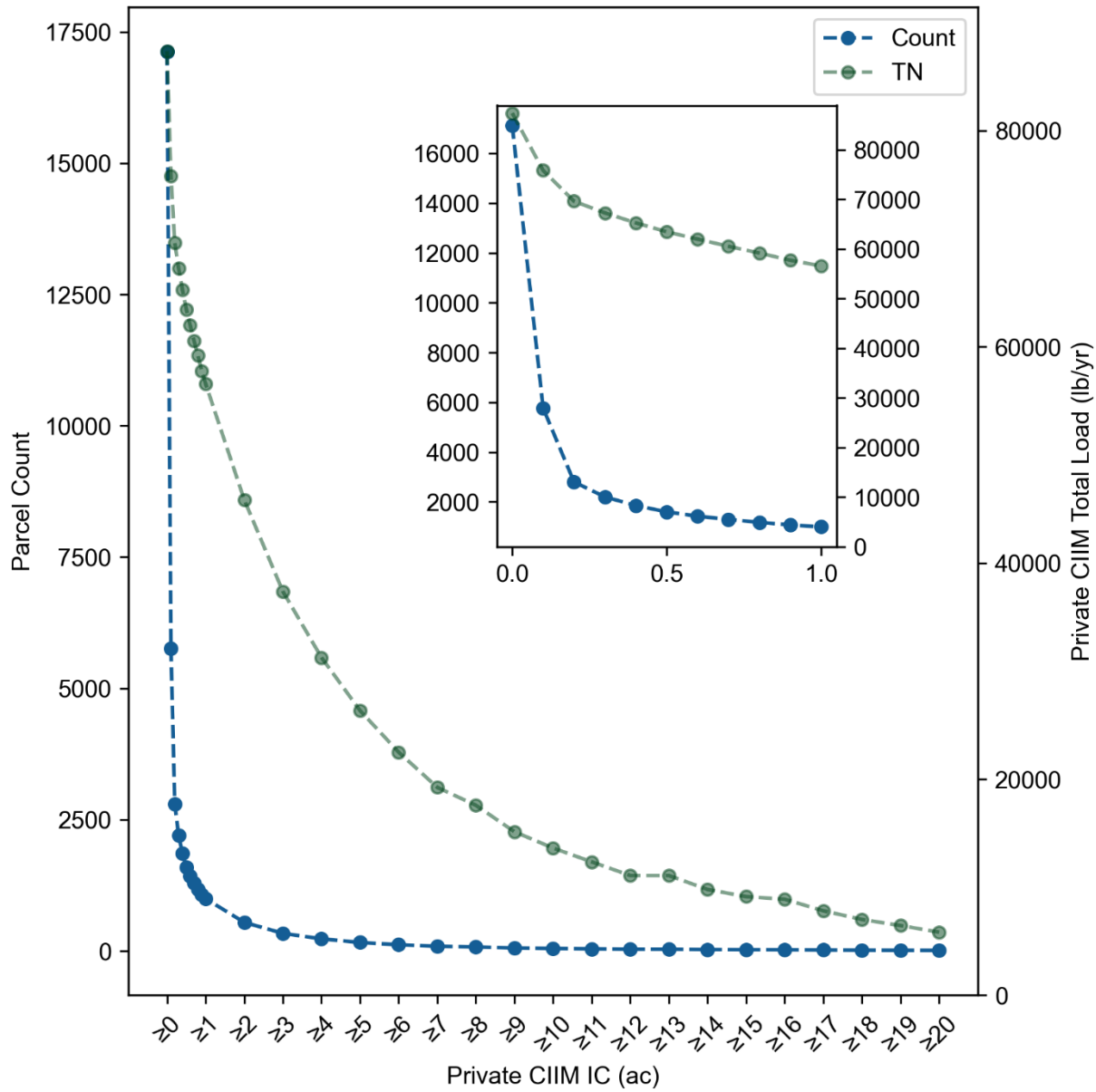


Figure 3-3. Private CIIM parcel count and total TN load by parcel IC area. Note that a threshold of ≥ 0 ac IC includes all private CIIM parcels.

The parcel count, load, IC relationship was further analyzed for IC thresholds of 0.25 ac, 0.5 ac, 0.75 ac, 1 ac, 2 ac, and 5 ac as shown in Table 3-5 to Table 3-10. These tables show that, for a small percentage of the total number of parcels, a larger proportion of the IC nutrient load can be controlled. For example, private CIIM parcels with ≥ 0.25 ac of IC represent 3% (2,430) of the total number of parcels but account for 29% of the IC TP load and 30% of the IC TN load from all parcels. Larger IC thresholds require regulating fewer parcels, but with the potential to treat less of the nutrient load.

Table 3-5. Summary of private commercial, industrial, institutional, and multifamily parcels with IC ≥ 0.25 ac in the Neponset River Watershed

Use Group	Count	Total Area (ac)	IC Area		TP Load (lb/yr)			TN Load (lb/yr)		
			Acre	% IC of Total Area	IC	Pervious	Total	IC	Pervious	Total
Commercial	1,222	4,782.05	2,107.26	44.07	3,786.92	270.06	4,056.99	31,680.82	2,231.12	33,911.94
Industrial	410	2,124.38	1,011.09	47.59	1,818.89	83.05	1,901.94	15,387.13	659.17	16,046.30
MultiFamily Residential	536	2,100.06	699.39	33.30	1,625.85	179.31	1,805.16	9,964.84	1,279.05	11,243.89
Private Institutional	262	1,905.30	369.82	19.41	668.43	216.99	885.42	5,599.86	1,478.61	7,078.47
Subtotal	2,430	10,911.79	4,187.56	38.38	7,900.09	749.41	8,649.50	62,632.65	5,647.96	68,280.61
Watershed Total (%)	3.1	14.6	26.9	--	28.5	11.3	25.2	30.4	11.9	26.9

Table 3-6. Summary of private commercial, industrial, institutional, and multifamily parcels with IC ≥ 0.5 ac in the Neponset River Watershed

Use Group	Count	Total Area (ac)	IC Area		TP Load (lb/yr)			TN Load (lb/yr)		
			Acre	% IC of Total Area	IC	Pervious	Total	IC	Pervious	Total
Commercial	780	4,525.19	1,949.60	43.08	3,499.58	258.49	3,758.06	29,304.48	2,147.02	31,451.50
Industrial	344	2,076.84	986.25	47.49	1,774.50	81.22	1,855.72	15,012.95	644.72	15,657.67
MultiFamily Residential	303	1,777.46	617.43	34.74	1,432.75	143.86	1,576.61	8,795.68	1,053.26	9,848.94
Private Institutional	170	1,741.69	336.81	19.34	608.84	206.18	815.02	5,102.45	1,398.00	6,500.45
Subtotal	1,597	10,121.18	3,890.09	38.44	7,315.68	689.74	8,005.42	58,215.56	5,243.01	63,458.57
Watershed Total (%)	2.0	13.5	24.9	--	26.4	10.4	23.3	28.2	11.0	25.0

Table 3-7. Summary of private commercial, industrial, institutional, and multifamily parcels with IC ≥ 0.75 ac in the Neponset River Watershed

Use Group	Count	Total Area (ac)	IC Area		TP Load (lb/yr)			TN Load (lb/yr)		
			Acre	% IC of Total Area	IC	Pervious	Total	IC	Pervious	Total
Commercial	593	4,335.04	1,835.92	42.35	3,293.69	250.42	3,544.11	27,585.64	2,089.35	29,674.99
Industrial	297	2,017.31	957.00	47.44	1,721.85	79.18	1,801.03	14,567.31	630.08	15,197.39
MultiFamily Residential	219	1,561.76	565.98	36.24	1,314.16	119.45	1,433.61	8,062.45	889.96	8,952.41
Private Institutional	126	1,656.41	309.78	18.70	560.20	199.73	759.93	4,694.06	1,352.78	6,046.84
Subtotal	1,235	9,570.53	3,668.68	38.33	6,889.90	648.78	7,538.68	54,909.46	4,962.17	59,871.63
Watershed Total (%)	1.6	12.8	23.5	--	24.8	9.8	21.9	26.6	10.5	23.6

Table 3-8. Summary of private commercial, industrial, institutional, and multifamily parcels with IC ≥ 1 ac in the Neponset River Watershed

Use Group	Count	Total Area (ac)	IC Area		TP Load (lb/yr)			TN Load (lb/yr)		
			Acre	% IC of Total Area	IC	Pervious	Total	IC	Pervious	Total
Commercial	470	4,084.48	1,730.21	42.36	3,103.32	240.13	3,343.45	26,005.81	2,014.43	28,020.24
Industrial	253	1,934.04	919.61	47.55	1,654.78	76.02	1,730.80	14,000.96	606.60	14,607.56
MultiFamily Residential	168	1,439.22	521.76	36.25	1,211.01	109.78	1,320.79	7,433.62	812.20	8,245.81
Private Institutional	104	1,579.26	290.18	18.37	525.18	193.24	718.43	4,399.13	1,302.36	5,701.49
Subtotal	995	9,036.98	3,461.76	38.31	6,494.29	619.17	7,113.46	51,839.52	4,735.59	56,575.11
Watershed Total (%)	1.3	12.1	22.2	--	23.4	9.3	20.7	25.1	10.0	22.3

Table 3-9. Summary of private commercial, industrial, institutional, and multifamily parcels with IC ≥ 2 ac in the Neponset River Watershed

Use Group	Count	Total Area (ac)	IC Area		TP Load (lb/yr)			TN Load (lb/yr)		
			Acre	% IC of Total Area	IC	Pervious	Total	IC	Pervious	Total
Commercial	240	3,367.79	1,400.94	41.60	2,508.59	203.15	2,711.74	21,033.47	1,702.59	22,736.06
Industrial	161	1,630.82	782.38	47.97	1,408.65	68.11	1,476.76	11,921.90	546.33	12,468.23
MultiFamily Residential	98	1,096.16	423.35	38.62	981.10	81.18	1,062.28	6,032.13	610.73	6,642.86
Private Institutional	45	1,143.93	210.54	18.40	381.14	117.52	498.66	3,201.30	794.80	3,996.10
Subtotal	544	7,238.71	2,817.21	38.92	5,279.48	469.97	5,749.45	42,188.81	3,654.45	45,843.25
Watershed Total (%)	0.7	9.7	18.1	--	19.0	7.1	16.7	20.5	7.7	18.1

Table 3-10. Summary of private commercial, industrial, institutional, and multifamily parcels with IC ≥ 5 ac in the Neponset River Watershed

Use Group	Count	Total Area (ac)	IC Area		TP Load (lb/yr)			TN Load (lb/yr)		
			Acre	% IC of Total Area	IC	Pervious	Total	IC	Pervious	Total
Commercial	77	1,977.31	896.16	45.32	1,597.94	118.95	1,716.90	13,364.99	1,030.01	14,395.01
Industrial	47	855.94	424.09	49.55	764.04	38.31	802.36	6,468.40	298.91	6,767.32
MultiFamily Residential	25	586.64	195.99	33.41	455.01	50.99	506.00	2,777.10	394.07	3,171.17
Private Institutional	12	472.02	115.67	24.51	207.93	28.73	236.66	1,758.59	248.51	2,007.10
Subtotal	161	3,891.91	1,631.91	41.93	3,024.93	236.98	3,261.91	24,369.09	1,971.51	26,340.60
Watershed Total (%)	0.2	5.2	10.5	--	10.9	3.6	9.5	11.8	4.2	10.4

Figure 3-4 further illustrates the tradeoff between pollutant reduction and the number of private CIIM parcels with IC area ranging from ≥ 20 ac to ≥ 0 ac (i.e., all private CIIM parcels) that would have to install SCMs. This figure assumes that runoff from IC within a parcel would be treated by SCMs sized to achieve a 60% reduction¹. The “knee” of the curve, where the slope begins to flatten, indicates the IC threshold where the fewest number of parcels can provide the greatest benefit in terms of TP reduction. For the Neponset River Watershed, this appears to lie between parcels with ≥ 0.25 ac and ≥ 0.75 ac of IC.

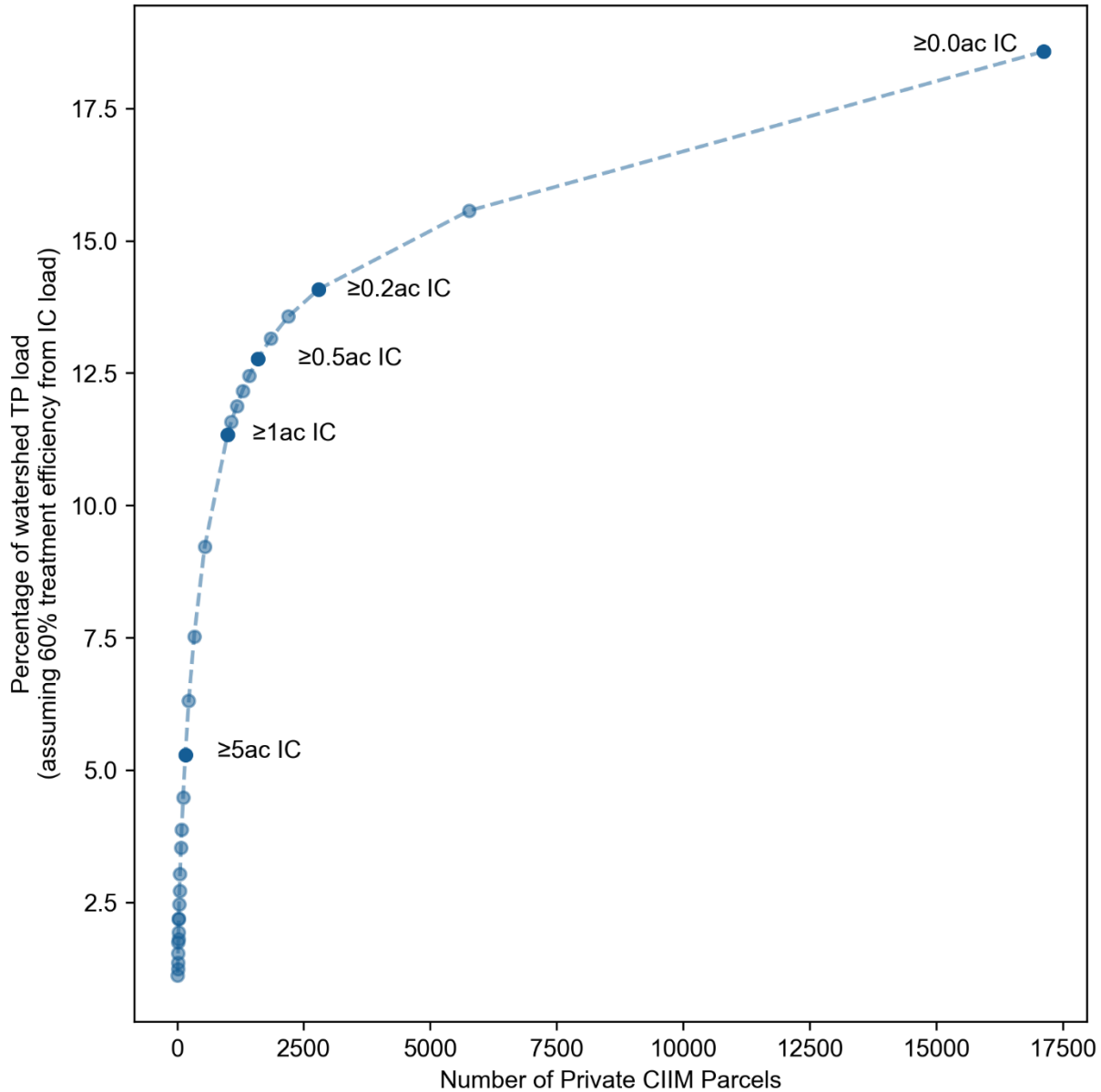


Figure 3-4. Percentage of watershed TP load that can be captured from IC runoff, assuming a 60% treatment efficiency, and the corresponding number of private CIIM parcels based on IC threshold. Labels for IC thresholds correspond to the dark blue dots.

¹ In the absence of a specific TP reduction requirement, 60% was used as a starting point in this analysis to align with MA MS4 permitting.

4 CONCLUSIONS

This report presented a methodology for summarizing and evaluating stormwater pollutant load from parcels within the Neponset River Watershed that may be used by EPA Region 1 to support decisions regarding the control of stormwater runoff from certain private properties to improve water quality. Findings from this analysis include:

1. Private properties contribute nearly three quarters (70%) of the watershed’s total TP load.
2. The majority of TP from private properties is generated from impervious cover (81% of load from private properties and 57% of the watershed total load).
3. Private commercial, industrial, institutional, and multi-family residential (CIIM) properties make up 22% of all parcels, but have relatively high percentages of IC and therefore contribute a large proportion of the watershed TP load (34%)
4. Selecting private CIIM parcels based on their IC area (which is a dominate factor in the nutrient load generated) can minimize the number of parcels installing stormwater controls, while providing the greatest nutrient reduction benefit (Table 4-1).

The findings in this report indicate that unattenuated stormwater runoff from private parcels within the Neponset River Watershed contributes the majority of the nutrient load. Without additional controls on stormwater runoff and pollutant loads from these parcels, making meaningful improvements to water quality could be difficult. Designating stormwater discharges from certain classes of private properties for NPDES permits based on the amount of IC area will help reduce the burden on MS4s by targeting properties generating the largest amount of nutrients in stormwater on a per-property scale. In any scenario, municipalities will still need to engage the private property owners with smaller property size or IC size to eventually meet water quality goals. However, requiring action on private properties with larger amounts of IC now through NPDES permitting provides greater flexibility to the communities in deciding which private properties to target to meet their own MS4 permit obligations.

Table 4-1. Summary of private CIIM parcels installing SCMs based on parcel IC area and the reduction achieved in watershed total TP load

IC Threshold (ac)	Parcel Count	Total TP Load (lb/yr)	IC TP Load (lb/yr)	Total TP Treated (%)*
≥0 (All)	17,117	11,640.62	10,639.67	19%
≥0.25	2,430	8,649.50	7,900.09	14%
≥0.5	1,597	8,005.42	7,315.68	13%
≥0.75	1,235	7,538.68	6,889.90	12%
≥1	995	7,113.46	6,494.29	11%
≥2	544	5,749.45	5,279.48	9%
≥5	161	3,261.91	3,024.93	5%

* Percentage calculated as IC load times a 60% treatment efficiency divided by the watershed total TP load of 34,367 lb/yr.

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- U.S. EPA, 2022a. ATTACHMENT 6 Clean Water Act Residual Designation Determination for Certain Stormwater Discharges in the Charles, Mystic, and Neponset River Watersheds, in Massachusetts: Charles River Watershed Stormwater Total Phosphorus Analysis.
- U.S. EPA, 2022b. Mystic River and Neponset River Watershed Analysis RFQ.
- U.S. EPA, 2022c. ATTACHMENT 6 Clean Water Act Residual Designation Determination for Certain Stormwater Discharges in the Charles, Mystic, and Neponset River Watersheds, in Massachusetts: Charles River Watershed Stormwater Total Phosphorus Analysis.
- USEPA, 2020. Mystic River Watershed Alternative TMDL Development for Phosphorus Management-Final Report. Boston, MA.

APPENDIX A

Table A-1. Parcels with manually classified Use Group and Public/Private designation

LOC_ID	Description	Use Group	Public/Private
F_780359_2922318	Sliver	Single Family Residential	Private
F_781055_2921668	Sliver	Single Family Residential	Private
F_758299_2886766	Reservoir Pond	Water	Public
F_781452_2931054	Neponset River	Water	Public
F_755037_2915112	Mill Pond Reservation	Water	Public
F_754234_2914530	Mill Pond Reservation	Water	Public
F_753208_2914230	Mill Pond Reservation	Water	Public
F_750502_2915060	Water	Water	Public
F_750155_2915815	Water	Water	Public
F_749136_2916382	Water	Water	Public
F_729067_2901046	Buckmaster Pond	Water	Public
F_728369_2901198	Buckmaster Pond	Water	Public
F_781543_2929285	Neponset River	Water	Public
F_748919_2860153	Roads	Right-of-Way	Public
F_770438_2920433	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_783942_2931605	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_783713_2930719	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_783369_2931678	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_776359_2921917	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_777053_2923249	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_781937_2933694	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_781492_2935465	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_778609_2925770	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_779427_2925176	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_780997_2930955	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_781249_2930379	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_779834_2928134	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public

LOC_ID	Description	Use Group	Public/Private
F_775508_2924285	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_779004_2926463	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_774577_2926250	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_779778_2926965	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_737150_2911650	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_746627_2919355	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_751436_2921737	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_751806_2921331	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_752560_2922693	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_754110_2919212	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_757433_2911989	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_760967_2908972	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_763779_2904223	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_755105_2871949	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_755372_2871726	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_755183_2871825	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_755194_2872010	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_754382_2871968	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_755129_2872057	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_755224_2872080	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_753875_2873307	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_756412_2870089	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_755978_2871989	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public

LOC_ID	Description	Use Group	Public/Private
F_754850_2871858	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_757651_2870589	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_768308_2911432	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_768992_2910667	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_753795_2873643	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_754043_2871734	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_755040_2867300	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_750577_2897939	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_751495_2899628	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_754716_2871895	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_754620_2871922	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_750920_2898917	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_749356_2901829	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_753800_2871442	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_757085_2907003	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_754846_2901507	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_756571_2902089	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_755004_2903207	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_754946_2871830	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_756646_2871070	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_755842_2904527	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_755910_2905855	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_751122_2903228	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public

LOC_ID	Description	Use Group	Public/Private
F_756229_2867274	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_754904_2868148	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_775713_2913360	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_775349_2913131	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_776785_2904919	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_752466_2904929	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_758313_2908007	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_757475_2908701	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_759309_2909871	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_759426_2909758	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_757422_2907303	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_772000_2897220	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_768200_2896600	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_757894_2910737	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_756908_2909751	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_758151_2910955	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_718977_2866425	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_718878_2865311	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_718708_2865540	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_719435_2882189	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_720414_2891228	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_719502_2891302	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_735961_2908556	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public

LOC_ID	Description	Use Group	Public/Private
F_737296_2910569	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_739023_2910203	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_736598_2907604	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_714753_2880611	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_715652_2880947	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_716720_2881595	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_716820_2880841	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_748742_2851548	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_750554_2854615	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_751018_2855175	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_718536_2865168	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_718921_2865810	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_719271_2865922	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_738386_2910887	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_736949_2910519	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_717965_2866236	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_717525_2866118	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_717499_2866334	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_719506_2866679	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_719273_2866791	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_717697_2866037	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_716452_2870658	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_725605_2869047	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public

LOC_ID	Description	Use Group	Public/Private
F_750289_2855284	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_747046_2853938	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_736149_2909463	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_751096_2856135	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_763944_2877198	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_737861_2909254	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_737254_2910226	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_717631_2877270	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_737166_2910030	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_718373_2866926	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_716909_2867111	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_717743_2866937	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_720540_2867062	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_717694_2868497	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_717169_2868704	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_738732_2908268	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_734751_2909323	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_723630_2871040	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_734624_2909022	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_718052_2869854	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_718010_2869610	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_714203_2881926	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_714492_2881602	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public

LOC_ID	Description	Use Group	Public/Private
F_722501_2869883	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_764009_2878035	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_716461_2870358	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_722894_2870053	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_716452_2870534	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_732829_2905585	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_747215_2855926	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_764064_2877575	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_761374_2877195	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_716047_2871545	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_749767_2857498	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_749218_2856169	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_731790_2906322	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_715827_2872659	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_723176_2872493	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_732480_2906343	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_749466_2857960	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_736247_2902523	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_724282_2872642	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_724967_2872633	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
M_228106_883095	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
M_227710_883132	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
M_227806_883151	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public

LOC_ID	Description	Use Group	Public/Private
M_227587_883098	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
M_228039_882907	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_747790_2857686	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_716174_2874455	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_765030_2877078	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_762491_2876921	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_763333_2877083	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_715254_2883614	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
M_226331_883730	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_736436_2903362	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
M_226115_883735	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_744820_2859540	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_718120_2878575	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_752470_2857869	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_715302_2887388	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_715853_2887170	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_715796_2887705	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_715751_2888058	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_715802_2888323	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_716663_2886401	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_713738_2888271	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_716456_2886728	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_716656_2886099	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public

LOC_ID	Description	Use Group	Public/Private
F_714845_2885818	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_715155_2886542	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_754889_2889540	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_719701_2882209	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_720213_2882633	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_725046_2885436	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_723800_2887307	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_719973_2883185	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_719399_2883333	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
M_221539_871443	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_721040_2883311	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
M_221283_870781	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
M_221297_870818	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_718695_2883850	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_719901_2884335	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_719348_2884381	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_718097_2884587	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_718309_2885176	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_717323_2885617	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_724122_2885811	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_724762_2885896	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
M_219930_870254	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
M_221189_870390	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public

LOC_ID	Description	Use Group	Public/Private
M_221266_870266	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
M_221380_870383	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_717870_2885308	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
M_222034_870244	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
M_221990_870340	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_714889_2889774	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_715075_2889736	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_716374_2891236	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
M_219583_870079	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_717190_2886308	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_716065_2892101	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_723775_2886463	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_724349_2886662	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_725624_2886649	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_717246_2886645	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_726118_2886695	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_721283_2886915	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
M_220447_870027	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_724905_2886900	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_725977_2887270	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
M_221852_869896	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
M_221925_870152	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_716303_2859334	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public

LOC_ID	Description	Use Group	Public/Private
F_739601_2907615	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_717488_2890658	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_719609_2891665	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_718530_2891720	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_718870_2892691	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_720435_2891527	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_721354_2891617	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_720162_2892045	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_719891_2892599	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_718402_2891378	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_722320_2892348	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_719394_2893626	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
M_227330_881047	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_715348_2881796	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_717076_2882041	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_716694_2882435	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_716095_2883099	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_721728_2896515	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_737416_2865984	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
M_218464_871338	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_739433_2867371	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_735994_2907796	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_740358_2868870	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public

LOC_ID	Description	Use Group	Public/Private
F_726869_2869017	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_716997_2886546	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_716708_2888676	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_716734_2887274	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_716635_2890258	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_716631_2890609	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_716568_2890938	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_747089_2877054	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
M_226130_884029	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
M_227336_880728	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
F_716023_2864405	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
M_221637_869761	Blue Hills Res., Neponset River Res., Border Lands S.P., etc	Open Land	Public
M_217849_885481	Roads	Right-of-Way	Public
F_784326_2932518	Roads	Right-of-Way	Public

APPENDIX B

See the accompanying Excel workbook for full preprocessing steps.

Table B-1. List of all unique combinations of Use Code, Use Group, Public/Private designation, and example owner

Use Code	Use Code Group	Public/Private	Owner1 (first value returned if multiple)
013	Commercial	Private	1141 WASHINGTON STREET REALTY TRUST
016	MultiFamily Residential	Private	SOCIETY FOR THE PRESERVATION N E ANTIQUITIES
017	MultiFamily Residential	Private	LOVELL GEORGE A
018	MultiFamily Residential	Private	THORNHILL KAREN M
031	Commercial	Private	1503 RIVER STREET LLC
037	Commercial	Private	THOMAS REALTY TRUST
038	Commercial	Private	WOLLASTON GOLF CLUB
041	Industrial	Private	CREAN EDWIN A
071	Open Land	Private	LOVELL GEORGE A
083	Open Land	Public	TOWN OF MILTON
091	Private Institutional	Private	COPELAND FAMILY FOUNDATION INC
093	Private Institutional	Private	NORTHEASTERN CONFERENCE CORP
094	Private Institutional	Private	HALE RESERVATION INC
101	Single Family Residential	Private	1 WELLESLEY ROAD LLC
0101	Single Family Residential	Private	37 MCDONALD STREET LLC
102	MultiFamily Residential	Private	112 KING STREET CONDOMINIUM TRUST
104	MultiFamily Residential	Private	10 MASON STREET REALTY TRUST
0104	MultiFamily Residential	Private	166 MILTON STREET LLC
105	MultiFamily Residential	Private	10 CENTRE AVENUE HOLDING LLC
0105	MultiFamily Residential	Private	185-189 WASHINGTON LLC
106	Single Family Residential	Private	15 FENTON STREET LLC
108	MultiFamily Residential	Private	MCENTEE LAUREN A
109	MultiFamily Residential	Private	345 353 NEPONSET AVENUE LLC
0109	MultiFamily Residential	Private	40 FRONT STREET REALTY TRUST
111	MultiFamily Residential	Private	1 ASPINWALL ROAD REALTY TRUST
0111	MultiFamily Residential	Private	13 DEAN STREET,LLC
112	MultiFamily Residential	Private	215 PEARL LLC
0112	MultiFamily Residential	Private	ANJOM LLC
113	MultiFamily Residential	Private	ADAMS ST VILLAGE LLC MASS LLC
114	MultiFamily Residential	Private	BISMARCK STREET OWNER LLC
116	MultiFamily Residential	Private	CARMELLA L MARBLE
117	MultiFamily Residential	Private	JG MCCARTHY PROPERTIES LLC
118	MultiFamily Residential	Private	CHERITON HEIGHTS LP
119	MultiFamily Residential	Private	CHARTWELL CHOCOLATE FACTORY LLC

Use Code	Use Code Group	Public/Private	Owner1 (first value returned if multiple)
121	MultiFamily Residential	Private	BAY COVE HUMAN SERVICES
125	MultiFamily Residential	Private	ADAMS COURT LLC MASS LLC
126	MultiFamily Residential	Private	DORCHESTER HOUSING ASSOC LPS
127	MultiFamily Residential	Private	RILEY HOUSE NON-PROFIT
0130	Commercial	Private	210 SHERMAN ST NOMNE TR
130	Open Land	Private	17 VAN WINKLE LLC
0131	Commercial	Private	FAHY JOHN
131	Open Land	Private	121 WRENTHAM STREET LLC
0132	Commercial	Private	WELCH, EDWARD A
132	Open Land	Private	14 BOWDOIN LLC
132	Open Land	Public	CITY OF BOSTON
132	Right-of-Way	Public	BISSON STEPHEN W
0134	Commercial	Private	WONS MARY
0137	MultiFamily Residential	Private	THOMAS REALTY TRUST
140	Commercial	Private	CHARCY STOUGHTON LLC
0170	MultiFamily Residential	Private	HARMONY HILL TRUST
0180	MultiFamily Residential	Private	CUMMINGS CARL R AND TROY
300	Commercial	Private	PVG FIVE LLC
0301	Commercial	Private	KVD LLC
301	Commercial	Private	STRAZZULA MATTHEW J TRSTS
304	Commercial	Private	BASLER WILLARD L TS
305	Commercial	Private	HCH-150 YORK STREET LLC
307	Commercial	Private	B J GROUP LLC
309	Commercial	Private	S-1419 BLUE HILL AVENUE REALTY TRUST
0310	Commercial	Private	121 FAYETTE STREET LLC
310	Commercial	Private	J & D HORAN SERIES LLC
311	Commercial	Private	1826 LLC
312	Commercial	Private	ESS STORAGE ACQUISITION
313	Commercial	Private	COHENNO INCORPORATED
316	Commercial	Private	166 TOSCA DRIVE LLC
0316	Commercial	Private	DOLPHIN REALTY TRUST
317	Agriculture	Private	181 BOWDOIN STREET LLC
0317	Commercial	Private	LOVELL GEORGE A
318	Commercial	Private	PGC PROPERTIES LLC
319	Commercial	Private	1735 DORCHESTER AVENUE REALTY TRUST
320	Commercial	Private	130 BOWDOIN STREET DEVELOPERS CORP
321	Commercial	Private	FIELDS STATION LLC
0322	Commercial	Private	1363 MAIN STREET LLC

Use Code	Use Code Group	Public/Private	Owner1 (first value returned if multiple)
322	Commercial	Private	NEW CREEK II LLC
323	Commercial	Private	CB STOUGHTON LLC
324	Commercial	Private	A F CUMMINS REALTY LLC
0325	Commercial	Private	1135 WASHINGTON STREET LLC
325	Commercial	Private	1153 WASHINGTON STREET REALTY TRUST
0326	Commercial	Private	17-19 WOODWORTH STREET LLC
326	Commercial	Private	516 WASHINGTON STREET RLTY LLC
327	Commercial	Private	ARROWSMITHDAVIS LLC
328	Commercial	Private	465 PLT LLC
329	Commercial	Private	1217 HP REALTY TRUST
330	Commercial	Private	433 FURNACE BROOK LLC
331	Commercial	Private	1217 HP REALTY TRUST
332	Commercial	Private	1217 HP REALTY TRUST
0332	Commercial	Private	KAMEN, IRWIN L TR
333	Commercial	Private	710 GALLIVAN REALTY TRUST
334	Commercial	Private	209 EAST MAIN STREET LLC
335	Commercial	Private	HADBRO 1997 REALTY TRUST
337	Commercial	Private	1217 HP REALTY TRUST
338	Commercial	Private	SAWYER JOHN F
340	Commercial	Private	1 ELIOT STREET LLC
0340	Commercial	Private	738 HIGH STREET REALTY TRUST
341	Commercial	Private	ARC CBMTNMA001, LLC
0342	Commercial	Private	62 SOUTH MAIN STREET LLC
342	Commercial	Private	BARRON PHILIP C TS
343	Commercial	Private	1135-1137 WASHINGTON STREET LLC
344	Commercial	Private	FOUR 13 NEPONSET AV RLTY LLC MASS LLC
350	Commercial	Private	BID HYDE PARK LLC
353	Commercial	Private	CLUB LUIZ DECAMOES INC
353	Commercial	Public	DEPARTMENT OF MASSACHUSETTS
354	Commercial	Private	1139 WASH LLC
355	Commercial	Private	358 PARK STREET LLC
0355	Commercial	Private	45 COMMON STREET LLC
357	Commercial	Private	PJM ADAMS STREET LLC
358	Commercial	Private	CAMPBELL DAVID C
364	Commercial	Private	STANTON MARY J TS
369	Commercial	Private	CONNELLY STEVEN A TRUSTEE
370	Commercial	Private	COVITZ RONALD N TRST
0374	Commercial	Private	DRAIN REAL ESTATE LLC

Use Code	Use Code Group	Public/Private	Owner1 (first value returned if multiple)
374	Commercial	Private	GREEN FLASH LLC
376	Commercial	Private	INDEPENDENT TRANSIT COMPANY
379	Commercial	Private	500 TALBOT LLC
0380	Commercial	Private	CONCERT BLUE HILL LLC
384	Commercial	Private	CPC ERICSSON STREET LLC
0385	Commercial	Private	MASSAPOAG SPORTSMENS CLUB
386	Commercial	Private	USA ACADEMY OF EDUCATION
387	Commercial	Private	THE VIETNAMESE AMERICAN
390	Open Land	Private	1217 HP REALTY TRUST
390	Open Land	Public	DEPARTMENT OF MASSACHUSETTS
0391	Commercial	Private	C AND C REALTY TRUST
391	Open Land	Private	433 FURNACE BROOK LLC
392	Open Land	Private	ANTONELLI MARCO & ANTONIO
393	Open Land	Private	OLDFIELD FAMILY LLC
400	Industrial	Private	1551 CENTRAL STREET REALTY LLC
0400	Industrial	Private	ASHNICK REALTY HOLDING LLC
401	Industrial	Private	153 MILL ST LLC
0401	Industrial	Private	TAS REALTY TRUST
402	Industrial	Private	95 MILL ST REALTY LLC
0402	Industrial	Private	AARON WILLIAMS LLC
403	Industrial	Private	1670 HYDE PARK AVE LLC
0404	Industrial	Private	ARGIROS, ALEXANDER A TRS
404	Industrial	Private	CLIFFORD PAUL D TS
406	Industrial	Private	N E TEL & TEL CO OF NY
407	Industrial	Private	3 NORWOOD STREET LLC
410	Industrial	Private	S M LORUSSO & SONS INC
412	Industrial	Private	1550 RIVER STREET LLC
414	Industrial	Private	MARIANO BROS INC
415	Industrial	Private	BOSTON WINERY REAL ESTATE LLC
423	Open Land	Private	BOSTON EDISON COMPANY
424	Industrial	Private	BOSTON EDISON CO
425	Industrial	Private	VERIZON NEW ENGLAND INC
427	Industrial	Private	NATIONAL GRID ENERGY SERVICE
428	Industrial	Private	BOSTON GAS COMPANY
430	Industrial	Private	NEW ENGLAND TEL + TEL CO
437	Industrial	Private	G GREENE PROPERTIES LLC
438	Industrial	Private	BENTLEY ST JOSEPH REAL ESTATE LLC
440	Open Land	Private	AGUIAR LANDSCAPE INC

Use Code	Use Code Group	Public/Private	Owner1 (first value returned if multiple)
441	Open Land	Private	85 ISLAND STREET LLC
442	Open Land	Private	85 ISLAND STREET LLC
444	Industrial	Private	CLBW, LLC
465	Industrial	Private	ALS REALTY TRUST
601	Open Land	Private	BANCROFT WILLIAM N
0610	Open Land	Private	RC FOUNDRY LLC
716	Agriculture	Private	MCNAMARA CHARLES H JR
719	Agriculture	Private	LOVELL GEORGE A
803	Open Land	Private	ROGERS DEBORAH C
805	Open Land	Private	WOLLASTON GOLF CLUB
900	Public Institutional	Public	U S POST OFFICE
901	Public Institutional	Public	CITY OF BOSTON BY FCL
901	Water	Public	COMWLTH OF MASS
902	Private Institutional	Private	BAY COVE HUMAN SERVICES INC
902	Public Institutional	Public	BOSTON HOUSING AUTHORITY
903	Private Institutional	Private	BOSTON REDEVELOPMENT AUTH
0903	Private Institutional	Private	INHABITANTS OF THE TOWN
903	Public Institutional	Public	CITY OF BOSTON
904	Private Institutional	Private	BOSTON BAPIST COLLEGE
905	Private Institutional	Private	BAY COVE HUMAN SERVICES INC
905	Public Institutional	Public	CITY OF BOSTON BY FCL
906	Private Institutional	Private	ADATH JESHURUN CEMETERY
906	Public Institutional	Public	CITY OF BOSTON
907	Private Institutional	Private	AT- DORCHESTER LIMITED
907	Public Institutional	Public	CITY OB BOSTON PUBLIC HEALTH
908	Public Institutional	Public	BOSTON HOUSING AUTH
920	Open Land	Public	DEPARTMENT OF CONSERVATION
920	Private Institutional	Private	LANE CHARLES H
920	Public Institutional	Public	DEPARTMENT OF CONSERVATION
924	Public Institutional	Public	DEPARTMENT OF CONSERVATION
925	Open Land	Public	COMM OF MASS MDC
929	Public Institutional	Public	MASS BAY TRANS AUTHORITY
930	Open Land	Public	DEPARTMENT OF CONSERVATION
930	Public Institutional	Public	TOWN OF DOVER
931	Open Land	Public	TOWN OF MEDFIELD
931	Private Institutional	Private	MILTON HISTORICAL SOCIETY
931	Public Institutional	Public	TOWN OF DOVER
932	Open Land	Public	TOWN OF DOVER (CONSERV COMM)

Use Code	Use Code Group	Public/Private	Owner1 (first value returned if multiple)
933	Private Institutional	Private	TRUSTEES OF MILTON ACADEMY
933	Public Institutional	Public	TOWN OF MILTON SCHOOL DEPT
934	Open Land	Public	TOWN OF MEDFIELD
934	Public Institutional	Public	TOWN OF MEDFIELD
935	Public Institutional	Public	TOWN OF MILTON FIRE DEPT
936	Open Land	Public	TOWN OF STOUGHTON
936	Public Institutional	Public	TOWN OF DOVER
937	Public Institutional	Public	TOWN OF STOUGHTON
939	Public Institutional	Public	COUNTY OF NORFOLK
940	Open Land	Public	TOWN OF STOUGHTON
940	Private Institutional	Private	DELPHI SCHOOLS INC
940	Public Institutional	Public	TOWN OF STOUGHTON
941	Private Institutional	Private	CONGREGATION OF THE SISTERS OF SAINT JOSEPH
941	Public Institutional	Public	TOWN OF STOUGHTON
942	Private Institutional	Private	BOSTON BAPTIST BIBLE COLLEGE
943	Private Institutional	Private	HOISTING & PORTABLE
944	Public Institutional	Public	TOWN OF STOUGHTON
945	Private Institutional	Private	BOYS AND GIRLS CLUBS OF BOSTON INC
945	Public Institutional	Public	CITY OF BOSTON
946	Private Institutional	Private	THACHER MONTESSORI SCHOOL INC
946	Public Institutional	Public	TOWN OF STOUGHTON
950	Open Land	Private	CUNNINGHAM FOUNDATION
950	Open Land	Public	TOWN OF MILTON
951	Private Institutional	Private	MARY MB WAKEFIELD CHARITABLE TRUST
952	Private Institutional	Private	PEOPLES CLUB OF NIGERIA
953	Open Land	Private	BAY COVE HUMAN SERVICES INC
953	Open Land	Public	TOWN OF STOUGHTON
954	Private Institutional	Private	AMERICAN LEGION POST #114
955	Private Institutional	Private	MILTON HOSPITAL INC
956	Private Institutional	Private	CAPT ROBERT BENNETT FORBES HOUSE INC
956	Public Institutional	Public	TOWN OF STOUGHTON
957	Private Institutional	Private	ANIMAL RESCUE LEAGUE OF BOSTON
958	Open Land	Private	BOSTON COUNCIL INC
959	MultiFamily Residential	Private	CUNNINGHAM FOUNDATION
960	Private Institutional	Private	AHAVATH TORAH SYNAGOGUE
961	Private Institutional	Private	CHURCH OF OUR SAVIOR
962	Private Institutional	Private	AHAVATH TORAH SYNAGOGUE
968	Public Institutional	Public	CITY OF BOSTON

Use Code	Use Code Group	Public/Private	Owner1 (first value returned if multiple)
970	Private Institutional	Private	ANOINTED BAPTIST CHURCH INC
971	Open Land	Public	TOWN OF STOUGHTON
971	Private Institutional	Private	TRUSTEES OF BETHANY FIRST
971	Public Institutional	Public	TOWN OF STOUGHTON
972	Public Institutional	Public	MASSACHUSETTS DEPT OF TRANSPOR
973	Private Institutional	Private	ABCD COMMUNITY PROPERTIES INC
973	Public Institutional	Public	COMMONWEALTH OF MASS
974	Public Institutional	Public	CITY OF BOSTON
975	Public Institutional	Public	CITY OF BOSTON
976	Private Institutional	Private	BOSTON RENAISSANCE CHARTER
976	Public Institutional	Public	CITY OF BOSTON
978	Public Institutional	Public	CITY OF BOSTON
979	Private Institutional	Private	BOWDOIN ST HEALTH CENTER INC
980	Open Land	Public	TOWN OF CANTON
980	Public Institutional	Public	MASS WATER RESOURCES AUTH
981	Public Institutional	Public	COMWLTH OF MASS DPW
982	Public Institutional	Public	COMMONWEALTH OF MASS
983	Private Institutional	Private	ADATH JESHURUN CEMETERY
983	Public Institutional	Public	CITY OF BOSTON
985	Open Land	Public	CITY OF BOSTON
985	Private Institutional	Private	ADATH JESHURUN CEMETERY
985	Public Institutional	Public	CITY OF BOSTON
985	Water	Public	COMM OF MASS MDC
986	Open Land	Public	COMM OF MASS
986	Private Institutional	Private	BAY COVE HAMILTON GROUP
986	Public Institutional	Public	CITY OF BOSTON
986	Water	Public	METROPOLITAN DISTRICT COMM
987	Private Institutional	Private	UNITED CEREBRAL PALSY ASSOC
990	Private Institutional	Private	FAITH BAPTIST CHURCH
991	Public Institutional	Public	COUNTY OF NORFOLK
992	Public Institutional	Public	THE COUNTY OF NORFOLK
995	Open Land	Private	.
997	Open Land	Private	DRY POND ASSOC
1010	Single Family Residential	Private	1 FOREST AVE NOMINEE REALTY TR
1011	Single Family Residential	Private	MAGOMEDOVA OLGA
1013	Single Family Residential	Private	ALEXANDER BRUCE E & SHELLEY A S TRS
1014	MultiFamily Residential	Private	KOSTA ABDELKADER
1015	Single Family Residential	Private	BULGER CHRISTOPHER

Use Code	Use Code Group	Public/Private	Owner1 (first value returned if multiple)
1016	Single Family Residential	Private	TIERNEY RONALD J
1020	MultiFamily Residential	Private	26 ANDREA DRIVE TRUST
1021	MultiFamily Residential	Private	215-217 HIGHLAND AVE CONDO
1024	MultiFamily Residential	Private	ANTONINO CARLA
1040	MultiFamily Residential	Private	112-114 RUSSELL STREET
1043	MultiFamily Residential	Private	AIELLO JOSEPH
1050	MultiFamily Residential	Private	1135 WASHINGTON STREET LLC
1060	Single Family Residential	Private	456 HIGH STREET REALTY TRUST
1063	Single Family Residential	Private	MEF FAMILY TRUST
1090	Single Family Residential	Private	105 ROCKLAND ST RLTY TR
1110	MultiFamily Residential	Private	12 NEWBURY AVE LLC
1111	MultiFamily Residential	Private	D.C. ASHCROFT LLC
1120	MultiFamily Residential	Private	104 REVERE STREET LLC
1210	MultiFamily Residential	Private	12 VERNON STREET, LLC
1250	MultiFamily Residential	Private	2 MIKAYLAS WAY LLC
1251	MultiFamily Residential	Private	NPV OWNER LLC
1252	MultiFamily Residential	Private	UNIVERSITY STATION SENIOR HOUSING LLC
1300	Open Land	Private	128 & 130 WALPOLE ST REALTY TR
1303	Open Land	Private	FAIRWEATHER, EMMA E EST OF
1310	Open Land	Private	405 NAHATAN STREET LLC
1311	Open Land	Private	MACINTOSH FARM COMM ASSOC
1320	Open Land	Private	1331 REALTY TRUST
1400	Commercial	Private	738 TURNPIKE STREET LLC
3000	Commercial	Private	ALDK NORWOOD, LLC
3010	Commercial	Private	ALIVA LLC
3030	Commercial	Private	AFFILIATED FAM FUNERAL SERVICE
3040	Commercial	Private	137 NICHOLS, LLC
3041	Commercial	Private	160 MAIN STREET WALPOLE LLC
3050	Commercial	Private	111 DEDHAM STREET, INC
3100	Commercial	Private	J & J DEVANEY TRUST THE
3130	Commercial	Private	3 P PROPERTIES, LLC
3140	Commercial	Private	JENSTAR OF WALPOLE II
3160	Commercial	Private	100 HUDSON ROAD LLC
3180	Commercial	Private	PEBBLES & BOULDERS LLC
3210	Commercial	Private	GILMORE STEVEN C TRUSTEE
3220	Commercial	Private	1200 PROVIDENCE HIGHWAY LLC
3221	Commercial	Private	CHAN FAI YIN & YU KWON
3222	Commercial	Private	HAWES BROOK REALTY, LLC

Use Code	Use Code Group	Public/Private	Owner1 (first value returned if multiple)
3230	Commercial	Private	CANTON LANES LTD PTR
3240	Commercial	Private	BNW REALTY LLC
3250	Commercial	Private	10-16 BROOK STREET LLC
3260	Commercial	Private	120 JACKSON ST REALTY TRUST
3260	Commercial	Public	NORWOOD, TOWN OF
3270	Commercial	Private	SPIEGEL, DAVID ET AL TRS
3300	Commercial	Private	141 PROVIDENCE HIGHWAY ASSOC LLC
3310	Commercial	Private	DAW REALTY CORP
3320	Commercial	Private	14 WESTWOOD LLC
3330	Commercial	Private	BANDONI, PAULINE TRS
3331	Commercial	Private	MAZZOCCA RICHARD P
3340	Commercial	Private	1237 HIGH ST LLC
3350	Commercial	Private	2180 BOSTON PROVIDENCE TPKE ASSOC LLC
3370	Commercial	Private	101 STATION DRIVE PROPERTY LLC
3380	Commercial	Private	ABDON JAMES J
3390	Commercial	Private	DOWLER, WILLIAM B
3400	Commercial	Private	10 COTTAGE STREET, LLC
3401	Commercial	Private	2140 PROVIDENCE HIGH WAY LLC
3410	Commercial	Private	931 MAIN STREET REALTY TRUST
3420	Commercial	Private	103 PROVIDENCE HIGHWAY LLC
3421	Commercial	Private	RED BUD RLTY LLC
3430	Commercial	Private	30 NORTH STREET REALTY TRUST
3440	Commercial	Private	ACCESS ROAD RLTY LLC
3450	Commercial	Private	1144 PROPERTIES LLC
3450	Commercial	Public	SIEMENS MEDICAL SOLUTIONS DIAGNOSTICS
3500	Commercial	Private	MASS POSTAL HOLDINGS LLC
3510	Commercial	Private	141 WASHINGTON STREET LLC
3520	Commercial	Private	5 LAKE AVE, LLC
3530	Commercial	Private	ELKS BUILDING CORPORATION
3540	Commercial	Public	NORWOOD TOWN OF AIRPORT
3541	Commercial	Private	FLIGHT LEVEL NORWOOD LLC
3550	Commercial	Private	456 HIGH STREET REALTY TRUST
3560	Commercial	Private	LOCAL 369 BUILDING FUND INC
3620	Commercial	Private	NAI ENTERTAINMENT HOLDINGS LLC
3640	Commercial	Private	STORYBOARD LLC
3660	Commercial	Private	FOXBORO REALTY ASSOCIATES LLC
3700	Commercial	Private	NORWOOD SPORTS CENTER
3740	Commercial	Private	DEDHAM TENNIS ASSOC RLTY TRUST

Use Code	Use Code Group	Public/Private	Owner1 (first value returned if multiple)
3750	Commercial	Private	DEDHAM TENNIS ASSOC REALTY TR
3760	Commercial	Private	AGNL EXERCISE LLC
3770	Commercial	Private	CANTON ICE HOUSE LLC
3800	Open Land	Private	NORFOLK GOLF CLUB
3840	Commercial	Private	SHM MARINA BAY LLC
3850	Commercial	Private	CANTON FISH & GAMES ASSN
3870	Commercial	Private	EVERWOOD CAMP PARTNERS LLC
3880	Commercial	Private	UDR WINDSOR GARDENS LLC
3900	Open Land	Private	1000 WASHINGTON ST REALTY LLC
3910	Open Land	Private	2160 WASHINGTON LLC
3920	Open Land	Private	1000 WASHINGTON STREET LLC
3920	Right-of-Way	Public	MB ACCESS CORPORATION
4000	Industrial	Private	105 CHAPMAN LLC
4010	Industrial	Private	100 MEADOW ROAD LLC
4020	Industrial	Private	5 SHAWMUT AVENUE LLC
4021	Industrial	Private	A & J REALTY TRUST
4030	Industrial	Private	CHERUBINI FAMILY TRUST II THE
4040	Industrial	Private	21 SOUTHWEST PROPERTIES LLC
4050	Industrial	Private	HERMAN, MATTHEW
4100	Industrial	Private	BRISTOL JAMES E JR & MARY B TRS
4220	Industrial	Private	NSTAR ELECTRIC & GAS COMPANY
4230	Open Land	Private	BOSTON EDISON CO
4240	Industrial	Private	BOSTON EDISON CO
4250	Industrial	Private	BOSTON GAS COMPANY
4280	Industrial	Private	ALGONQUIN GAS TRANSMISSION CO
4300	Industrial	Private	NEW ENGLAND TEL & TEL CO
4310	Industrial	Private	NEW ENGLAND TEL CO
4330	Industrial	Private	DIRICO FRANK
4400	Open Land	Private	346 UNIVERSITY LLC
4410	Open Land	Private	55 BH LLC
4420	Open Land	Private	1000 PROVIDENCE HWY, LLC
4520	Industrial	Private	HUGHES BAKER PROCESS SYSTEMS INC
6010	Open Land	Private	MORSE, ROBERT G JR TRUSTEE
7130	Agriculture	Private	CHARLES S BEAN II & ELENA A TRS.
7160	Agriculture	Private	ARGUIMBAU, DANIEL H & MARGARET D TTEES
7170	Agriculture	Private	LEE, JOHN
7180	Agriculture	Private	FIRTH TRACY K
8000	Open Land	Private	DEFRANCISCO STANLEY & PATRICIA

Use Code	Use Code Group	Public/Private	Owner1 (first value returned if multiple)
8050	Open Land	Private	25 TIOT HOLDINGS, LLC
8070	Open Land	Private	MASSAPOAG SPORTSMENS CLUB
8140	Open Land	Private	WESTWOOD GUN CLUB
9000	Public Institutional	Public	COMMONWEALTH OF MASSACHUSETTS
9010	Public Institutional	Public	MASS DOT
9030	Open Land	Public	TOWN OF SHARON
9030	Public Institutional	Public	CANTON TOWN OF
9030	Water	Public	CANTON TOWN OF
9031	Open Land	Public	WALPOLE TOWN OF CC
9032	Public Institutional	Public	TOWN OF WESTWOOD
9035	Public Institutional	Public	TOWN OF NORWOOD
9036	Public Institutional	Public	NORWOOD HOUSING AUTHORITY
9040	Private Institutional	Private	THE MAY INSTITUTE, INC
9050	Private Institutional	Private	AMEGO INC.
9051	Private Institutional	Private	HALE RESERVATION INC
9051	Public Institutional	Public	TOWN OF WESTWOOD
9060	Private Institutional	Private	AHMADIYYA MOVEMENT IN ISLAM, INC
9090	Private Institutional	Private	THE SKATING CLUB OF BOSTON
9100	Open Land	Public	DEPT OF CONSERVATION & REC
9120	Public Institutional	Public	COMMONWEALTH OF MASS
9130	Public Institutional	Public	MASSACHUSETTS COMMONWEALTH OF
9190	Private Institutional	Private	41 PLYMOUTH ST LLC
9200	Open Land	Public	TOWN OF WESTWOOD
9200	Private Institutional	Private	LOCHLAND HALL INC
9200	Public Institutional	Public	COMMONWEALTH OF MASS
9240	Public Institutional	Public	MASSACHUSETTS DEPT OF TRANSPOR
9250	Open Land	Public	DEPT OF CONSERVATION & REC
9290	Public Institutional	Public	MASS BAY TRANS AUTH
9300	Open Land	Private	OWNER UNKNOWN
9300	Open Land	Public	DEDHAM TOWN OF
9300	Private Institutional	Private	DUNN, MELISSA
9300	Public Institutional	Public	CANTON TOWN OF
9300	Right-of-Way	Public	TOWN OF SHARON
9300	Water	Public	DEDHAM TOWN OF
9306	Public Institutional	Public	NORWOOD, TOWN OF
9307	Public Institutional	Public	NORWOOD, TOWN OF
9308	Open Land	Public	NORWOOD, TOWN OF
9308	Public Institutional	Public	NORWOOD, TOWN OF

Use Code	Use Code Group	Public/Private	Owner1 (first value returned if multiple)
9310	Private Institutional	Private	GALLAGHER MICHAEL J
9310	Public Institutional	Public	CANTON TOWN OF
9320	Open Land	Private	THE TRUSTEES OF RESERVATIONS
9320	Open Land	Public	CANTON TOWN OF
9330	Public Institutional	Public	DEDHAM TOWN OF
9340	Private Institutional	Private	SHARON COTTAGE STREET SCHOOL
9340	Public Institutional	Public	BLUE HILLS REGIONAL SCHOOL
9350	Open Land	Public	CANTON TOWN OF
9350	Public Institutional	Public	CANTON TOWN OF
9360	Open Land	Public	NORWOOD, TOWN OF
9360	Public Institutional	Public	CANTON TOWN OF
9380	Open Land	Public	COUNTY COMM OF NORFOLK
9380	Private Institutional	Private	CEMETERY
9380	Public Institutional	Public	COUNTY COMM OF NORFOLK
9400	Private Institutional	Private	COMMUNITY HEALTH SYSTEMS, INC.
9401	Private Institutional	Private	NORWOOD HISTORICAL SOCIETY
9402	Private Institutional	Private	NEPONSET RIVER LAND HOLDING ASSN
9410	Private Institutional	Private	CHABAD LUBAVITCH TORAH CTR.
9420	Private Institutional	Private	MASSASOIT COMMUNITY COLLEGE
9430	Private Institutional	Private	HOISTING & PORTABLE ENG
9450	Private Institutional	Private	THE JUDGE ROTENBERG EDUCNL
9460	Private Institutional	Private	THE BOSTON ARCHITECTURAL
9460	Public Institutional	Public	CANTON TOWN OF
9470	Private Institutional	Private	JUDGE ROTENBERG ED CENTER INC
9500	Open Land	Private	CANTON HISTORICAL SOCIETY
9500	Open Land	Public	CANTON TOWN OF
9510	Private Institutional	Private	CHARLES RIVER ASSOcn FOR RETARDED CTZNS
9520	Public Institutional	Public	CANTON TOWN OF
9530	Open Land	Private	ANSHEY DOWIG ASSOCIATION
9530	Open Land	Public	CANTON TOWN OF
9540	Private Institutional	Private	C T C REALTY TRUST
9560	Public Institutional	Public	CANTON TOWN OF
9570	Private Institutional	Private	C RIVER ASSOC FOR RETARDED CITIZENS INC
9580	Open Land	Private	CANTON PLAYGROUND & BLDG
9580	Open Land	Public	CANTON TOWN OF
9590	MultiFamily Residential	Private	AMEGO INC
9591	MultiFamily Residential	Private	AMEGO, INC
9600	Private Institutional	Private	AMES STREET REALTY LLC

Use Code	Use Code Group	Public/Private	Owner1 (first value returned if multiple)
9603	Private Institutional	Private	CHRISTIAN CHURCH OF NORWOOD
9610	Private Institutional	Private	CHAI CENTER OF CANTON INC
9620	Private Institutional	Private	EVANGELICAL BAPTIST CHURCH
9700	Public Institutional	Public	CANTON HOUSING AUTHORITY
9701	Public Institutional	Public	NORWOOD HOUSING AUTHORITY
9702	Public Institutional	Public	NORWOOD AFFORD HOUSING CORP
9710	Open Land	Public	MASS BAY TRANS AUTHORITY
9710	Public Institutional	Public	WALPOLE TOWN OF
9720	Open Land	Public	COMMONWEALTH OF MASSACHUSETTS
9720	Public Institutional	Public	MASS BAY TRAN AUTHORITY
9721	Public Institutional	Public	MASS BAY TRANSPORTATION AUTH
9730	Public Institutional	Public	DEDHAM HOUSING AUTHORITY
9730	Water	Public	DEDHAM HOUSING AUTHORITY
9740	Public Institutional	Public	CANTON TOWN OF
9750	Private Institutional	Private	PENN CENTRAL CO
9750	Public Institutional	Public	MASS BAY TRANS AUTH
9800	Private Institutional	Private	WILDLANDS TRUST INC
9820	Public Institutional	Public	TOWN OF SHARON
9850	Public Institutional	Public	CANTON TOWN OF
9950	Open Land	Private	CANTON TERRACE LLC
010C	MultiFamily Residential	Private	1776 WASHINGTON PARTNERS LLC
010J	MultiFamily Residential	Private	208 WASHINGTON STREET LLC
011C	MultiFamily Residential	Private	27 PHOENIX GROUP LLC
011J	MultiFamily Residential	Private	LORUSSO ANTONIO J TRUSTEE
011Z	MultiFamily Residential	Private	AHEARN, PAUL D & TIMOTHY S TRS
013C	Commercial	Private	12 BASS LLC
031C	Commercial	Private	DRSOUNDSHORE, LLC
031I	Commercial	Private	KINGSWOOD TENNIS CLUB INC
031R	Commercial	Private	BLISS PROPERTIES, LLC
032I	Commercial	Private	TYNAN RICHARD TRUSTEE FTF REAL
032R	Commercial	Private	233 WASHINGTON STREET LLC
034R	Commercial	Private	12 BILLINGS STREET, LLC,
101H	Single Family Residential	Private	COOK ELAINE M
102C	MultiFamily Residential	Private	MACINTOSH FARM COMMUNITY ASSOC
102I	MultiFamily Residential	Private	MACINTOSH FARM COMMUNITY ASSOC
106V	Single Family Residential	Private	LAMB BRIAN
111C	MultiFamily Residential	Private	15-21 PLEASANT STREET TRUST
112C	MultiFamily Residential	Private	1034 EAST STREET LLC

Use Code	Use Code Group	Public/Private	Owner1 (first value returned if multiple)
112R	MultiFamily Residential	Private	WASHINGTON STREET PROPERTIES LLC
130V	Open Land	Private	111 BURGESS AVENUE REALTY TRUST
131V	Open Land	Private	KHATTAR, MITHUN
132V	Open Land	Private	BC HIGHLAND GLEN LLC
140C	Commercial	Private	GOSIA LLC
140R	Commercial	Private	1054 HIGH STREET WESTWOOD LLC
316I	Commercial	Private	BROWN, PETER D & ALAN J TRS
316S	Commercial	Private	YADISERNIA EDWARD & JANICE
322I	Commercial	Private	ASHNICK REALTY HOLDING LLC
322V	Commercial	Private	MICHIENZI, NOREEN
323I	Commercial	Private	WALPOLE MALL ASSOCIATES LLC
325C	Commercial	Private	68 POND STREET REALTY, LLC
332I	Commercial	Private	REDDISH PROPERTIES LLC
333V	Commercial	Private	TOWNE LYNNE CO
334C	Commercial	Private	SUNOCO LLC
334I	Commercial	Private	JOVANNA LLC
334V	Commercial	Private	SALINSKY, JUNE TRUSTEE
337V	Commercial	Private	FEELING FOXY LLC
338I	Commercial	Private	CHRIS SERVICE CENTER INC
340R	Commercial	Private	BROTHER REALTY PROPERTIES LLC
371C	Commercial	Private	SRJ MANAGEMENT LLC
387R	Commercial	Private	EVERWOOD CAMP PARTNERS LLC
388I	Commercial	Private	GRADAM LLC
400C	Industrial	Private	BIRD-JOHNSON COMPANY
410C	Industrial	Private	LORUSSO S M & SONS INC
410V	Industrial	Private	LORUSSO S M & SONS INC
424V	Industrial	Private	MASSACHUSETTS ELECTRIC CO
430V	Industrial	Private	NEW ENGLAND TEL & TEL CO
440V	Open Land	Private	GRADAM LLC
900C	Public Institutional	Public	UNITED STATES OF AMERICA
900V	Public Institutional	Public	UNITED STATES OF AMERICA
901V	Public Institutional	Public	COMMONWEALTH OF MASS
903C	Public Institutional	Public	SHARON PUBLIC LIBRARY
903R	Private Institutional	Private	WESTWOOD AFFORDABLE HOUSING ASSOCS INC
905C	Private Institutional	Private	BOYLSTON SCHUL-VEREIN INC
905C	Public Institutional	Public	TOWN OF SHARON
906C	Private Institutional	Private	EVANGELICAL BAPTIST CHURCH
906I	Private Institutional	Private	BOCHASANWASI SHREE AKSHAR

Use Code	Use Code Group	Public/Private	Owner1 (first value returned if multiple)
910C	Open Land	Public	MASSACHUSETTS COMMONWEALTH OF
910M	Public Institutional	Public	PARISH OF SAINT CHRYSOSTOM
910R	Public Institutional	Public	THE JUDGE ROTENBERG EDUCATION CENTER INC
910V	Open Land	Public	COMMONWEALTH OF MASSACHUSETTS
910V	Public Institutional	Public	COMM OF MASS & DIVISION OF PUBLIC WORKS
912I	Public Institutional	Public	COMMONWEALTH OF MASSACHUSETTS
912V	Public Institutional	Public	MASS WATER RESOURCES AUTHORITY
919R	Open Land	Public	COMMONWEALTH OF MA
919V	Open Land	Public	COMMONWEALTH OF MA
919V	Public Institutional	Public	COMMONWEALTH OF MA
921V	Open Land	Public	COMMONWEALTH OF MASSACHUSETTS
921V	Public Institutional	Public	COMMONWEALTH OF MASSACHUSETTS
924I	Public Institutional	Public	COMMONWEALTH OF MASSACHUSETTS
924V	Public Institutional	Public	COMM OF MASS-HIGHWAY DEPT.
925V	Open Land	Public	MASSACHUSETTS COMMONWEALTH OF
925V	Public Institutional	Public	COMMONWEALTH OF MASS
925V	Water	Public	COMMONWEALTH OF MASS.
929V	Public Institutional	Public	MASS DEPT OF TRANSPORTATION
930V	Open Land	Public	CITY OF QUINCY
930V	Private Institutional	Private	WALPOLE LITTLE LEAGUE
930V	Public Institutional	Public	QUINCY CITY OF
930W	Public Institutional	Public	DEDHAM TOWN OF
931C	Open Land	Public	TOWN OF SHARON
931C	Public Institutional	Public	CITY OF QUINCY
931I	Open Land	Public	TOWN OF FOXBOROUGH WATER DEPT
931I	Public Institutional	Public	TOWN OF FOXBOROUGH
931R	Public Institutional	Public	DEDHAM TOWN OF
931V	Public Institutional	Public	QUINCY CITY OF
932V	Open Land	Public	CITY OF QUINCY
933V	Open Land	Public	WALPOLE TOWN OF
933V	Private Institutional	Private	THE SAGE CENTER FOR LEARNING INC
933V	Public Institutional	Public	WALPOLE TOWN OF
934C	Private Institutional	Private	THE SAGE SCHOOL FOR LEARNING INC
934C	Public Institutional	Public	QUINCY CITY OF
934I	Public Institutional	Public	WALPOLE TOWN OF
934V	Public Institutional	Public	TOWN OF RANDOLPH
935I	Public Institutional	Public	QUINCY CITY OF
936V	Public Institutional	Public	QUINCY CITY OF

Use Code	Use Code Group	Public/Private	Owner1 (first value returned if multiple)
939C	Public Institutional	Public	NORFOLK COUNTY OF
940C	Private Institutional	Private	ROMAN CATHOLIC ARCHBISHOP
943C	Private Institutional	Private	LEAGUE SCHOOL OF BOSTON INC
943I	Private Institutional	Private	LEAGUE SCHOOL OF BOSTON INC
943R	Private Institutional	Private	LEAGUE SCHOOL OF GREATER
946V	Private Institutional	Private	LEAGUE SCHOOL OF BOSTON INC
950V	Open Land	Private	N E FORESTRY FOUNDATION INC
951A	Private Institutional	Private	MASSACHUSETTS AUDUBON SOCIETY
951C	Private Institutional	Private	WALPOLE FOOTLIGHTERS PLAYHOUSE
951R	Private Institutional	Private	ADVOCATES INC
951V	Private Institutional	Private	THIRTEEN-NINETEEN BLDG ASSOC
953C	Open Land	Private	KNOLLWOOD CEMETERY CORP
953V	Open Land	Private	E WALPOLE CEMETERY ASSOC
954C	Private Institutional	Private	DISABLED VETERANS CHARLES J
954R	Private Institutional	Private	MASSACHUSETTS AUDUBON SOCIETY
954V	Private Institutional	Private	JEWISH COMMUNITY CENTER OF SHARON INC
956V	Public Institutional	Public	
957C	Private Institutional	Private	
957R	Private Institutional	Private	
957V	Private Institutional	Private	
959C	Private Institutional	Private	
959R	Private Institutional	Private	
960C	Private Institutional	Private	
960I	Private Institutional	Private	
960R	Private Institutional	Private	
960V	Private Institutional	Private	
961C	Private Institutional	Private	
961R	Private Institutional	Private	
962V	Private Institutional	Private	
970C	Public Institutional	Public	
970R	Public Institutional	Public	
971I	Open Land	Public	
971I	Public Institutional	Public	
971V	Public Institutional	Public	
972C	Public Institutional	Public	
972I	Public Institutional	Public	
972V	Public Institutional	Public	
973V	Public Institutional	Public	

Use Code	Use Code Group	Public/Private	Owner1 (first value returned if multiple)
974V	Open Land	Public	
974V	Public Institutional	Public	
975V	Public Institutional	Public	
980V	Open Land	Public	
991V	Open Land	Public	THE JUDGE ROTENBERG EDUCNL
991V	Public Institutional	Public	
992I	Public Institutional	Public	THE BOSTON ARCHITECTURAL
992R	Public Institutional	Public	CANTON TOWN OF
995I	Open Land	Public	JUDGE ROTENBERG ED CENTER INC
996V	Open Land	Private	
	Commercial	Private	CANTON HISTORICAL SOCIETY
	MultiFamily Residential	Private	CANTON TOWN OF
	Open Land	Private	CHARLES RIVER ASSOCN FOR RETARDED CTZNS
	Right-of-Way	Private	
	Right-of-Way	Public	
	Single Family Residential	Private	
	Water	Public	CANTON TOWN OF

APPENDIX C

See the accompanying Excel workbook for the data used to create these plots.

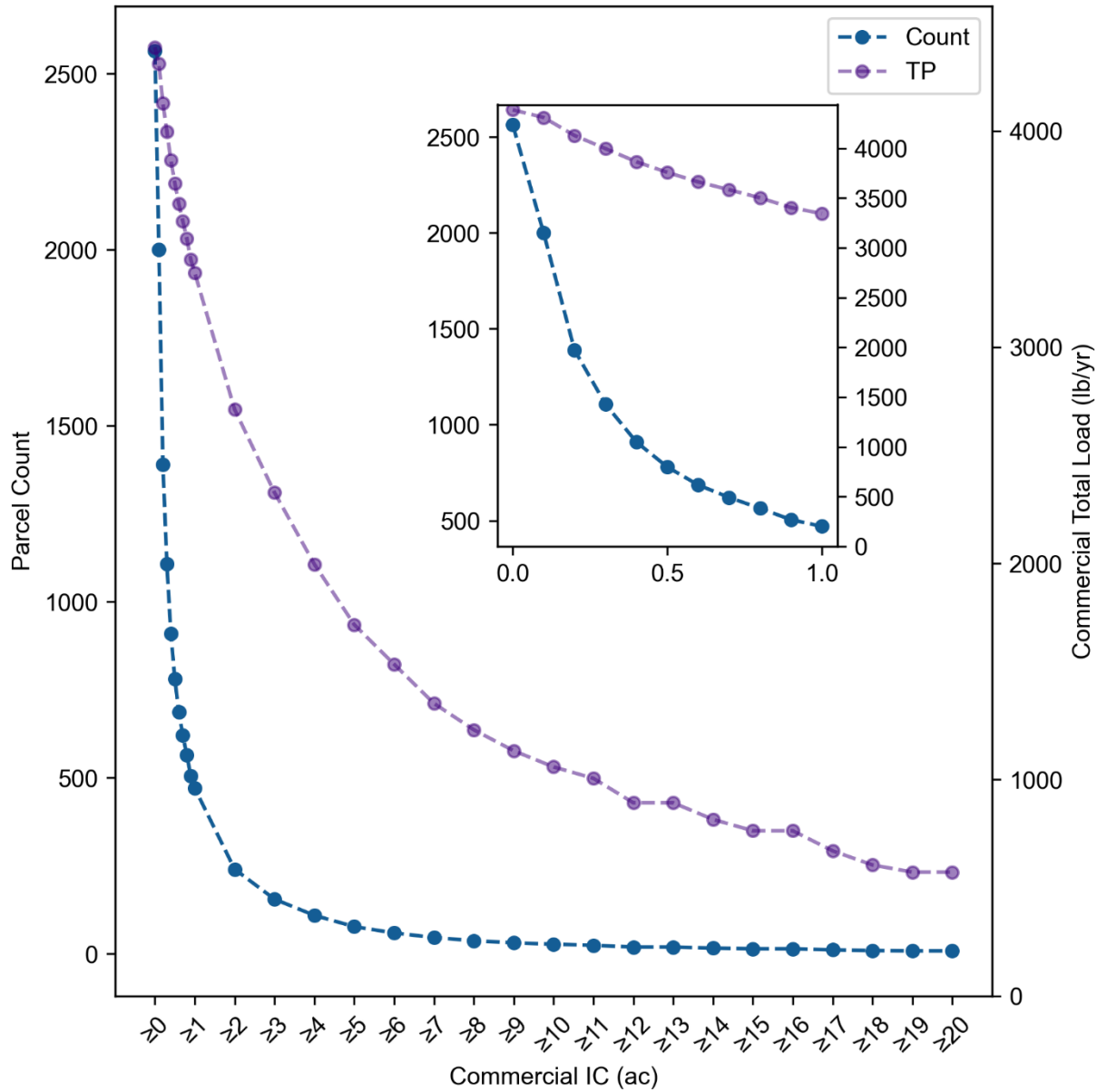


Figure C-1. Private commercial parcel count and total TP load by parcel IC area. Note that a threshold of ≥ 0 ac IC includes all private commercial parcels.

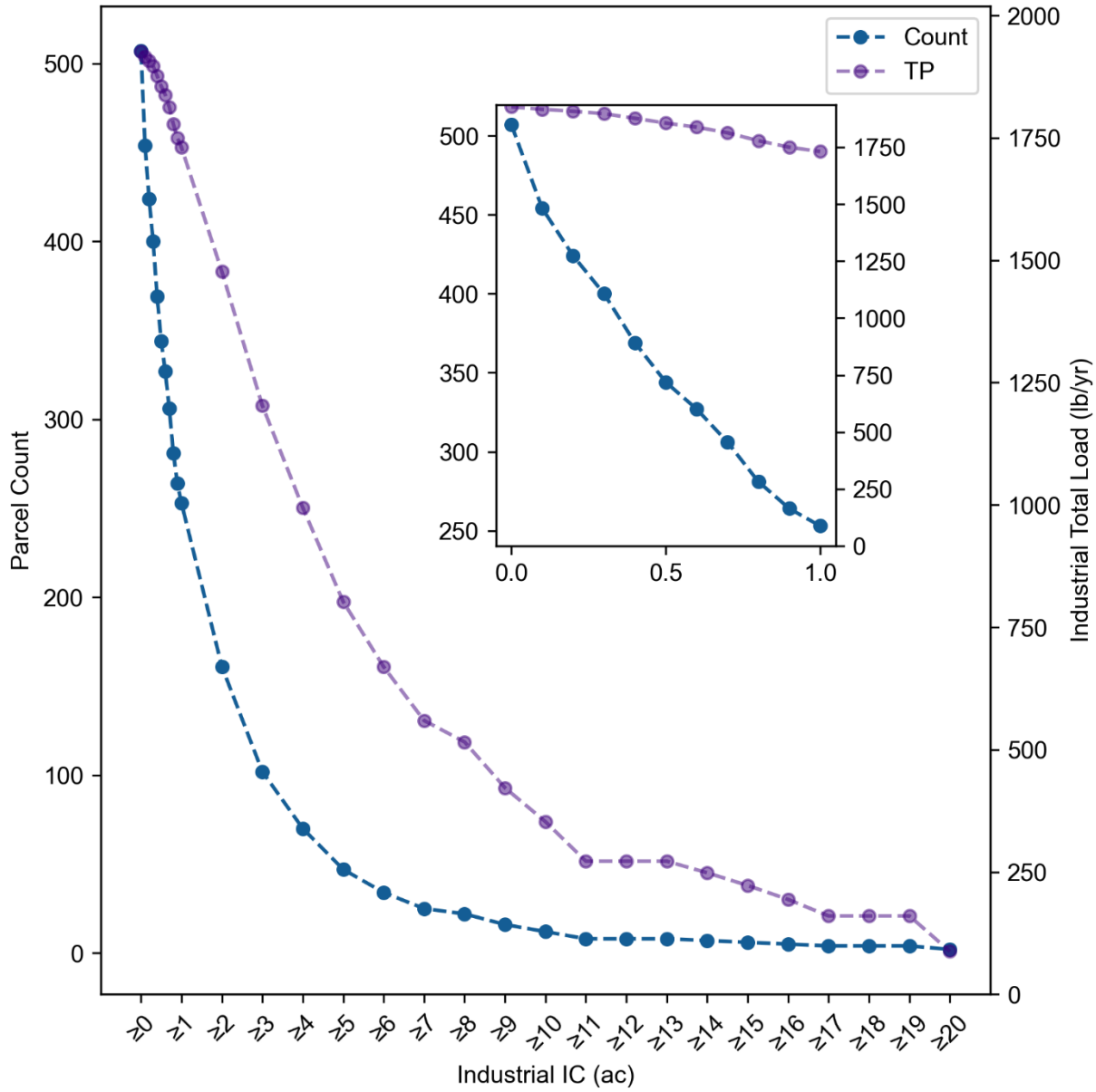


Figure C-2. Private industrial parcel count and total TP load by parcel IC area. Note that a threshold of ≥ 0 ac IC includes all private industrial parcels.

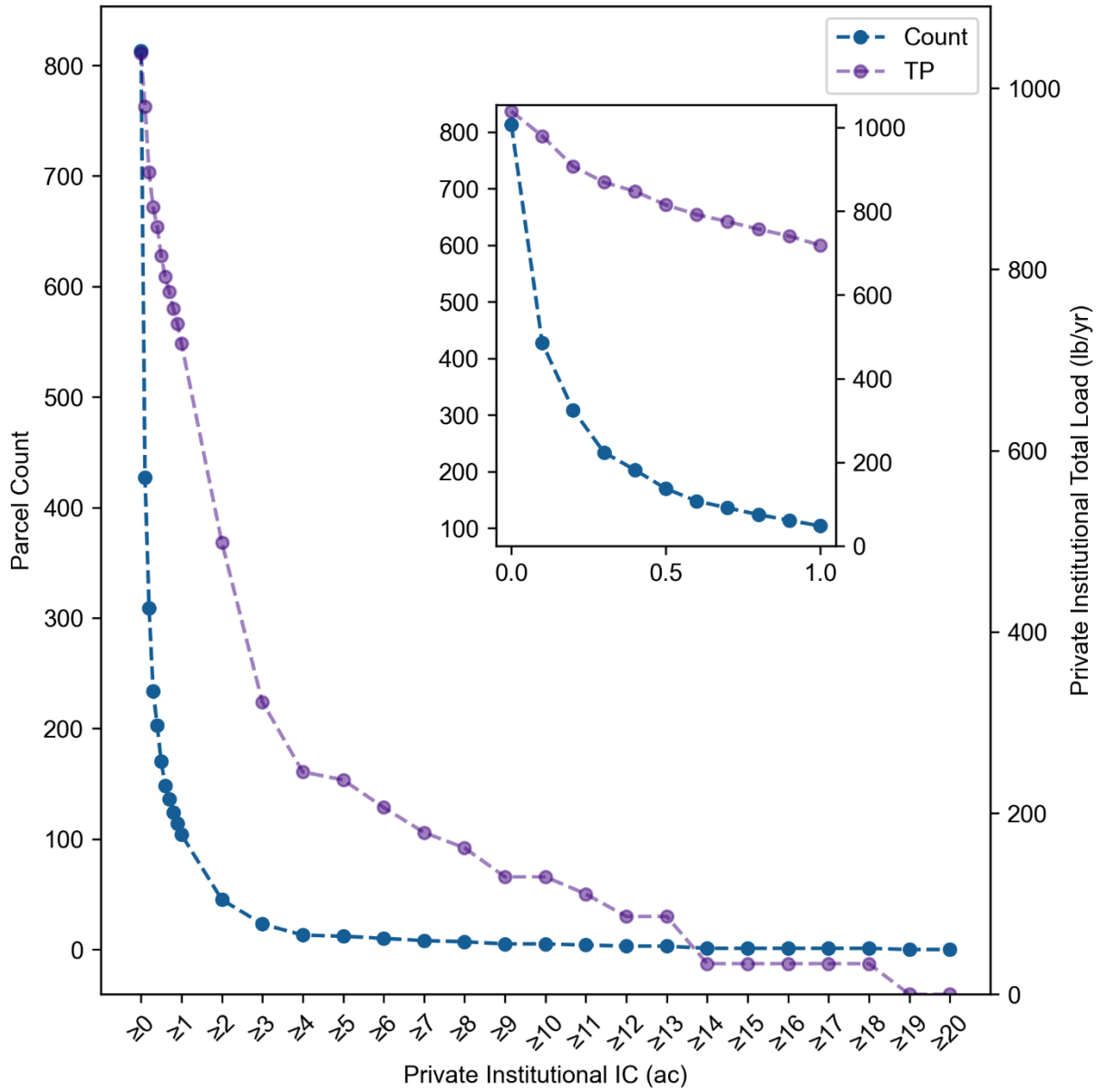


Figure C-3. Private institutional parcel count and total TP load by parcel IC area. Note that a threshold of ≥ 0 ac IC includes all private institutional parcels.

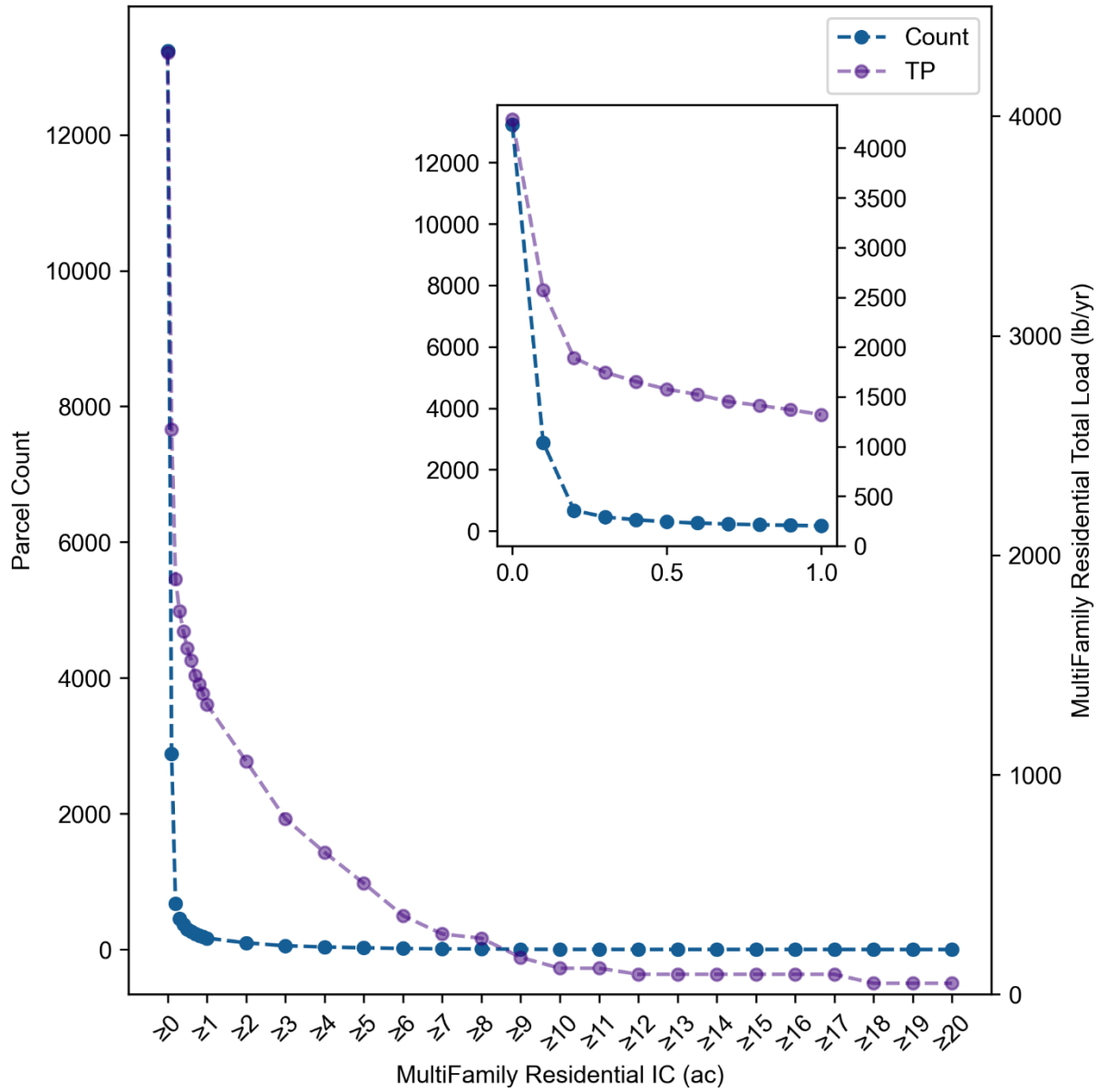


Figure C-4. Private multifamily residential parcel count and total TP load by parcel IC area. Note that a threshold of ≥ 0 ac IC includes all private multifamily residential parcels.

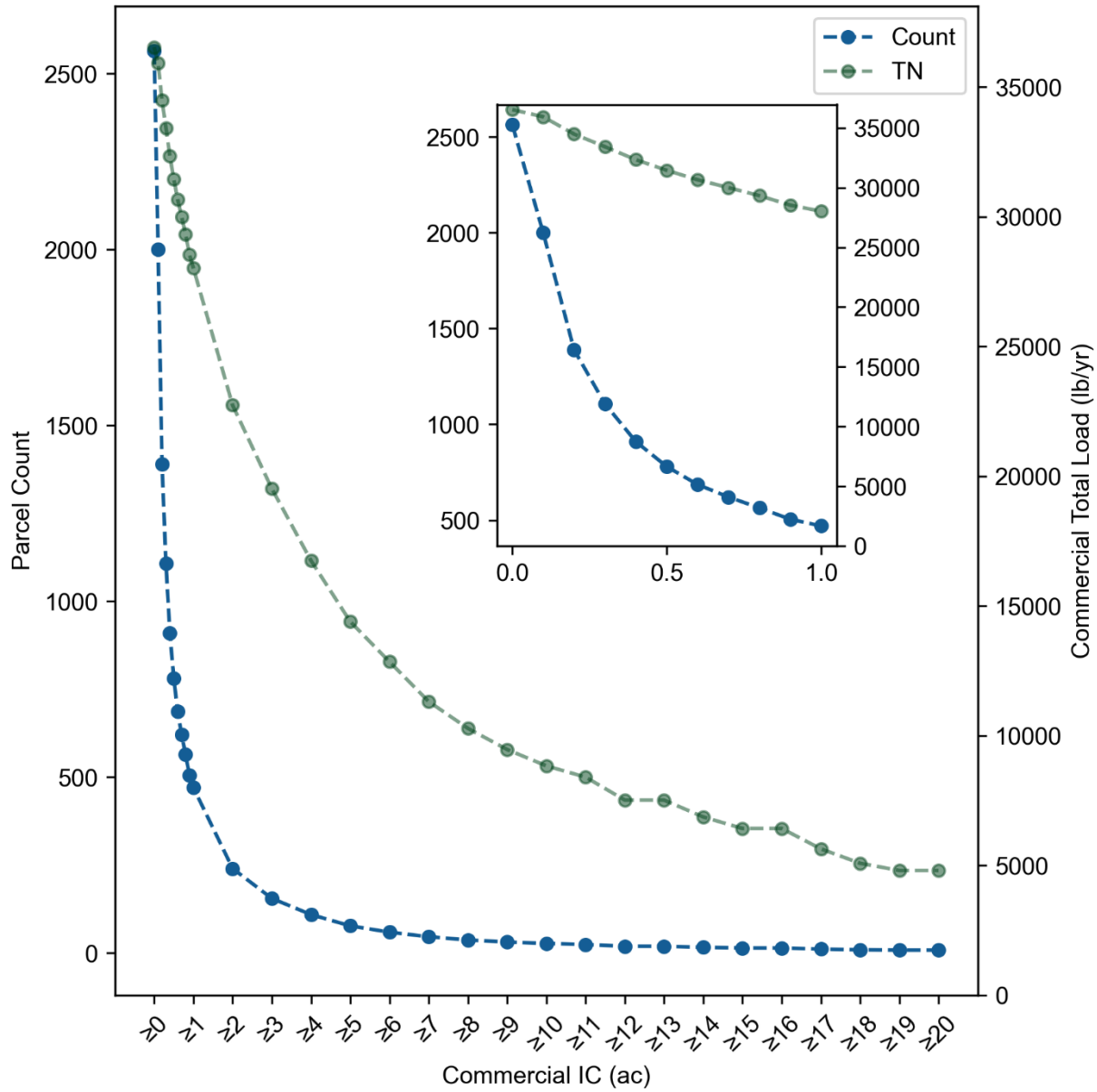


Figure C-5. Private commercial parcel count and total TN load by parcel IC area. Note that a threshold of ≥ 0 ac IC includes all private commercial parcels.

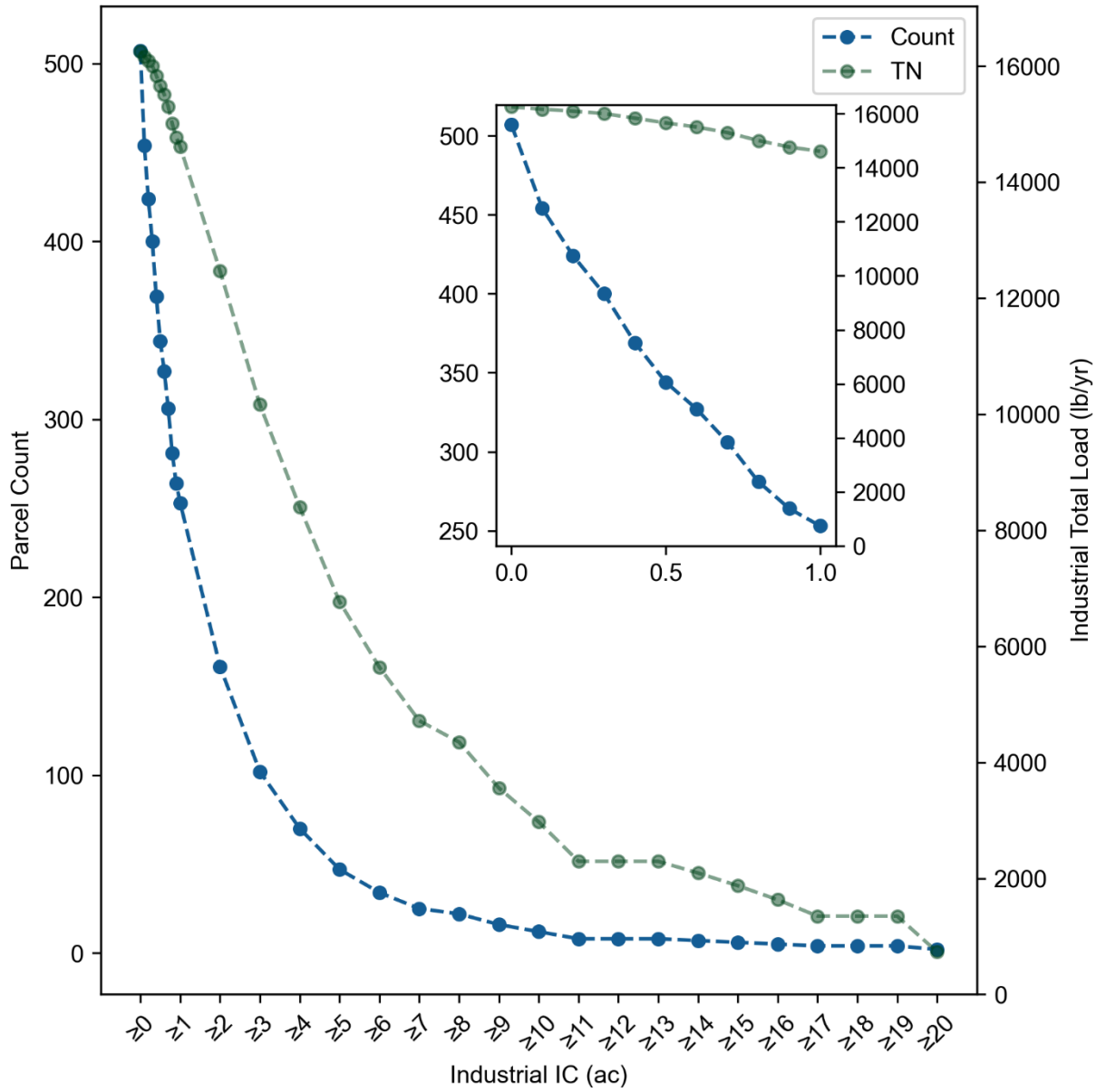


Figure C-6. Private industrial parcel count and total TN load by parcel IC area. Note that a threshold of ≥ 0 ac IC includes all private industrial parcels.

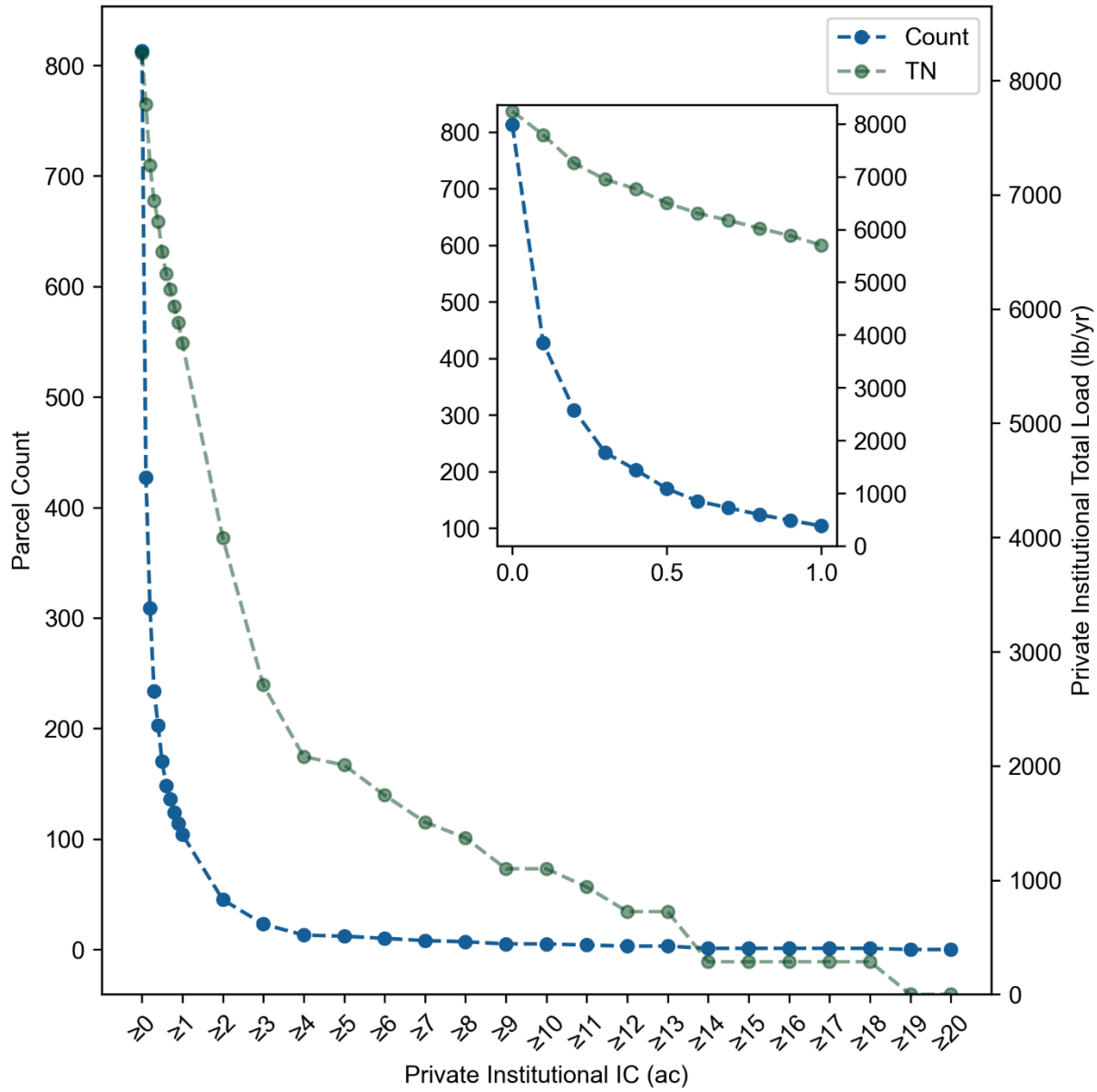


Figure C-7. Private institutional parcel count and total TN load by parcel IC area. Note that a threshold of ≥ 0 ac IC includes all private institutional parcels.

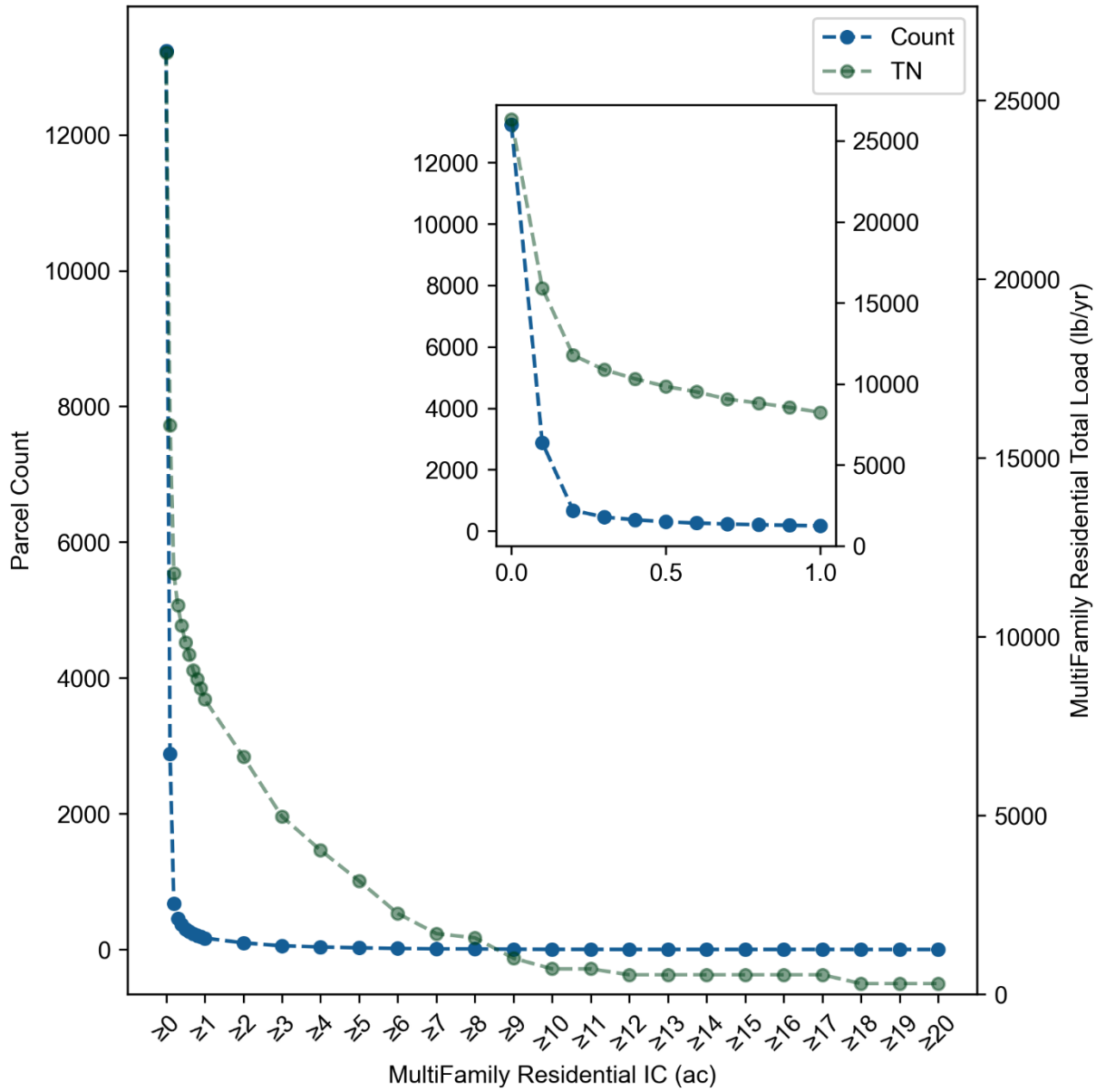


Figure C-8. Private multifamily residential parcel count and total TN load by parcel IC area. Note that a threshold of ≥ 0 ac IC includes all private multifamily residential parcels.