



# ENVIRONMENTAL JUSTICE THROUGH TOXICS USE REDUCTION **OPPORTUNITIES IN MASSACHUSETTS**



A Report by the Toxics Use Reduction Institute of Massachusetts  
FEBRUARY 2025

## Acknowledgments

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## Disclaimer

The analysis contained here is meant to provide an overview of the environmental justice landscape in Massachusetts. It is not a robust statistical analysis. The report is neither meant to be used to concretely link health outcomes to chemical releases nor as a comprehensive risk assessment. Most data used in the analysis comes from reports provided by facilities under the Massachusetts Toxics Use Reduction Act, which may be incomplete or erroneous.

This report is not meant to cast companies located near environmental justice communities in a negative light. TURI recognizes the benefits businesses can provide for their communities. Rather, this report is meant to help the TURA Program and others provide targeted support to companies and communities that could benefit the most from Toxics Use Reduction.

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## Contact

TURI encourages interested readers of this report to engage and share their views. Please contact us at <https://www.turi.org/contact-us>.

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*The following corrections were issued to this report in February 2025 - Figure 2 was updated; citations 2 and 6 were updated; the captions and sources for Figures 7,10,13 and 14 were updated to reflect the terminology used in the EEA Massachusetts Environmental Justice Strategy.*

## About TURI

The Toxics Use Reduction Institute (TURI) of Massachusetts is an independent government agency with a statutory mandate to help protect workers, communities and the environment from toxic chemicals and pollution. TURI is hosted by the University of Massachusetts Lowell. TURI was established in 1989 under by the Massachusetts Toxics Use Reduction Act (TURA) of 1989. The legislation was passed following the emergence of childhood cancer clusters near mismanaged hazardous waste sites in the state.

Since the adoption of TURA, Massachusetts has seen significant reductions in the use of and environmental releases of hazardous chemicals while maintaining competitiveness of Massachusetts businesses. Working in close collaboration with businesses of all sizes, as well as government agencies, local communities and international organizations, TURI helps identify actions companies and communities can take to reduce the use of Toxics<sup>1</sup> upstream. Thus, the mandate given to TURI contributes to and closely aligns with the environmental justice agenda.

Implemented by TURI and its sister agencies, the Massachusetts Office of Technical Assistance (OTA) and MA Department of Environmental Protection (MassDEP), the TURA Program is an internationally recognized model for reducing the use of toxic chemicals. TURI is committed to advancing environmental justice by helping communities and their businesses apply Toxics Use Reduction to prevent harm and protect human health and the environment



1 “Toxics” are substances in a gaseous, liquid, solid or other form as identified on the toxic or hazardous substance list established pursuant to section 9 of TURA.



## Introduction

In Massachusetts, “environmental justice is based on the principle that all people have a right to be protected from environmental hazards and to live in and enjoy a clean and healthful environment regardless of race, color, national origin, income, or English language proficiency.”<sup>2</sup> While progress has been made over several decades to reduce the use of various toxic pollutants, vulnerable and marginalized communities continue to endure the adverse impacts of unequal protection from these and other environmental hazards.

Toxics Use Reduction is a best practice for advancing the pursuit of environmental justice for all. This approach involves upstream interventions and helps users of chemicals find safer alternatives to hazardous chemicals, which can minimize or even eliminate potential harms to communities and the environment. Prioritizing the adoption of safer alternatives upstream is the preferred means of protecting those most vulnerable or at risk—children, income-disadvantaged people, workers, persons with disabilities, older persons, indigenous peoples, migrants, and people of color—while taking into account gender-specific risks.

A wealth of data is generated by the Massachusetts Toxics Use Reduction Act (TURA) on the use and release of Toxics<sup>3</sup> in the Commonwealth. This report draws upon TURA Data,<sup>4</sup> aiming to help government agencies, businesses and communities identify opportunities to advance environmental justice by reducing the use of Toxics in Massachusetts.

This report analyzes the use and release of Toxics in Massachusetts through an environmental justice lens. The base analysis is on a municipality-by-municipality basis, distinguished by the percentage of the population living in Environmental Justice Neighborhoods (EJ Neighborhoods).<sup>5</sup> It considers municipalities in Massachusetts with high levels of the population living in EJ Neighborhoods,

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Mass. Executive Office of Energy  
and Environmental Affairs

- 2 Massachusetts General Law, Chapter 30, Section 62. Retrieved from <https://malegislature.gov/Laws/GeneralLaws/PartI/TitleIII/Chapter30/Section62> See also Commonwealth of Massachusetts Executive Office of Energy and Environmental Affairs. (2022). *EEA environmental justice strategy* (English). Retrieved from <https://www.mass.gov/doc/eea-environmental-justice-strategy-english/download>
- 3 “Toxics” are substances in a gaseous, liquid, solid or other form as identified on the toxic or hazardous substance list established pursuant to section 9 of TURA.
- 4 Available at: [www.TURADData.org](http://www.TURADData.org)
- 5 A definition of EJ Neighborhood is provided in Box 1 (p 5).

## DEFINING ENVIRONMENTAL JUSTICE POPULATIONS AND NEIGHBORHOODS

In the Commonwealth of Massachusetts, an Environmental Justice Population is defined as a census block where one or more of the following criteria are true:<sup>6</sup>

1. The annual median household income is 65 percent or less of the statewide annual median household income;
2. Minorities make up 40 percent or more of the population;
3. 25 percent or more of households identify as speaking English less than “very well”; and/or
4. Minorities make up 25 percent or more of the population and the annual median household income of the municipality in which the neighborhood is located does not exceed 150 percent of the statewide annual median household income.

As this analysis uses the neighborhood census block, it will refer to those census blocks which fulfill one or more of the above criteria as Environmental Justice Neighborhoods (EJ Neighborhoods).

Four distinctions are used to divide 351 municipalities in Massachusetts, as defined by data from the Massachusetts Department of Public Health.<sup>7</sup>

1. Greater than or equal to 75% of the population living in an EJ Neighborhood (26 Municipalities—31.7% of MA population, Total Land Area—420 Square Miles)
2. Between 50% and 75% of the population living in an EJ Neighborhood (29 Municipalities—14.6% of MA population, Total Land Area—519 Square Miles)
3. Between 25% and 50% of the population living in an EJ Neighborhood (68 Municipalities—19.2% of MA population, Total Land Area—1,407 Square Miles)
4. Less than or equal to 25% of the population living in an EJ Neighborhood (228 Municipalities—34.5% of MA population, Total Land Area—5,078 Square Miles)

Toxics data are averaged for each of the four groups by finding the release and use totals and dividing by the number of municipalities in each group. This analysis method draws upon a similar environmental justice study carried out at Northeastern University in 2002 which also used TURA data.<sup>8</sup> Figure 1 (p. 6) helps illustrate the four categories of municipalities and their populations.

6 Massachusetts General Law, Chapter 30, Section 62. See also MA EEA, *Environmental Justice Policy of the Executive Office of Energy and Environmental Affairs*, updated June 24, 2021, (hereinafter EEA EJ Policy). Retrieved from <https://malegislature.gov/Laws/GeneralLaws/PartI/TitleIII/Chapter30/Section62>

7 Massachusetts Department of Public Health Environmental Justice Tool. EJ Data and Report. Retrieved from <https://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html>

8 Daniel R Faber, and Eric J Krieg, 2002. Unequal exposure to ecological hazards: environmental injustices in the Commonwealth of Massachusetts. *Environmental Health Perspectives*: <https://doi.org/10.1289/ehp.02110s2277>

FIGURE 1

### Percentage of Population Living in an EJ Neighborhood

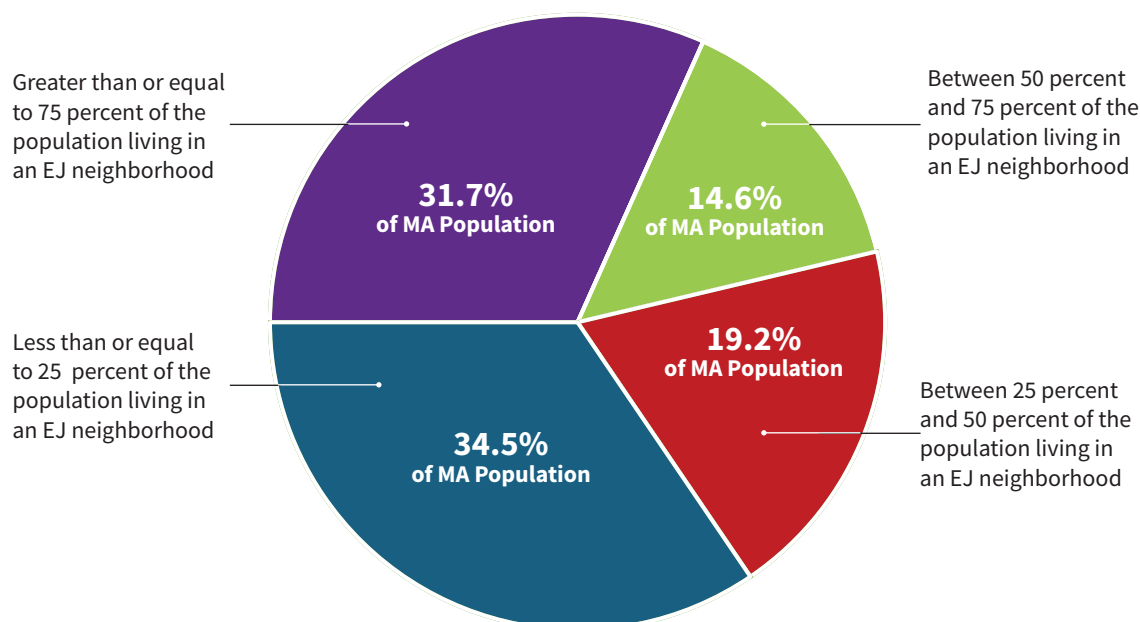


Chart illustrating the populations living in each of the municipality groups as defined by the percentage of the population living in an EJ neighborhood.

SOURCE: MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH ENVIRONMENTAL JUSTICE TOOL. EJ DATA AND REPORT. RETRIEVED FROM [HTTPS://MATRACKING.EHS.STATE.MA.US/ENVIRONMENTAL-DATA/EJ-VULNERABLE-HEALTH/ENVIRONMENTAL-JUSTICE.HTML](https://MATRACKING.EHS.STATE.MA.US/ENVIRONMENTAL-DATA/EJ-VULNERABLE-HEALTH/ENVIRONMENTAL-JUSTICE.HTML)

as well as the specific populations and groups that make up those communities. This report is based on a detailed analysis of socioeconomic factors and Toxics used in Massachusetts, the results of which will continue to inform TURI work and may be made available to the public in the future.

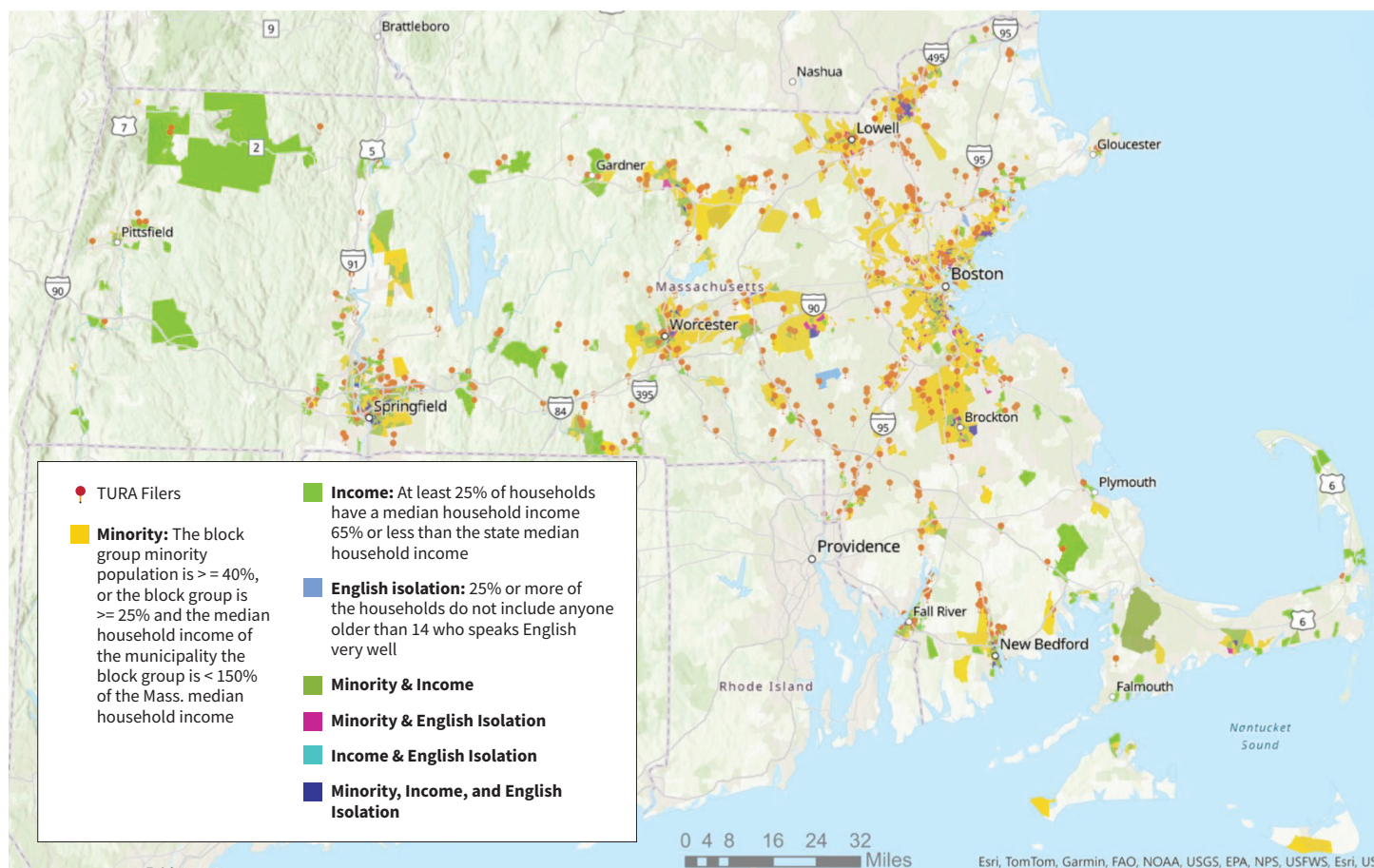
**Toxics Use Reduction is a best practice for advancing the pursuit of environmental justice for all.**

According to data from the Massachusetts Department of Public Health, 21 percent of Massachusetts lives in an EJ Neighborhood when averaged across all municipalities in the state. Figure 2 (p. 7) shows facilities filing reports under TURA in 2021 overlaid on EJ Neighborhoods. Similar maps which provide additional context for the present environmental justice situation in MA and beyond with respect to Toxics can be found using the EPA EJScreen Tool.<sup>9</sup>

9 Environmental Protection Agency (n.d.). *EJScreen Tool*. Retrieved August 8, 2024 from <https://www.epa.gov/ejscreen>.

FIGURE 2

## Massachusetts Environmental Justice Block Groups



Map which overlays TURA filers on neighborhoods which fulfil at least one of the environmental justice criteria as defined by MA EEA (see footnote 6).

SOURCE: MassGIS Data: 2020 Environmental Justice Populations (<https://www.mass.gov/info-details/massgis-data-2020-environmental-justice-populations>), MassGIS Data: MassDEP Major Facilities (<https://www.mass.gov/info-details/massgis-data-massdep-major-facilities>)

## KEY TAKEAWAYS

The following are some of the key findings from the analysis of TURA Data:

- From 2007 to 2020, the average use of Toxics per municipality was greatest in those with 75% or more of their population living in EJ Neighborhoods.
- Toxics Use Reduction efforts have had a significant impact on reducing the releases of Toxics in Massachusetts, including in those municipalities with 75% or more of the population living in EJ neighborhoods. However, the average release of Toxics per municipality was still highest in this group, especially from 2007 to 2017.
- In 2020, the average use and release of Toxics, number of TURA facilities and the quantity of chemicals shipped were all highest for the group of municipalities with 75% or more of the population living in EJ Neighborhoods. This suggests that those living in EJ Neighborhoods may continue to face comparatively greater risk of negative health outcomes due to Toxics use and release.
- The average use and release of TURA Higher Hazard Substances (e.g. carcinogens) per municipality, both historically since 2007 and in 2020, is greater in the municipality groups with more of the population living in an EJ Neighborhood. Several facilities that release significant amounts of these Toxics are in EJ Neighborhoods. Individuals in these communities may be at greater risk of developing associated chronic and acute health effects that can result from exposure to these Toxics.
- A preliminary analysis found that communities with high densities of EJ neighborhoods were above state averages for several environmental burden indicators (e.g., lead paint risk and exposure to air pollution).<sup>10</sup> This, combined with barriers that impede at-risk groups from organizing for increased protection from the use and release of Toxics,<sup>11</sup> suggests that these communities are more susceptible to negative health outcomes due to Toxics exposure.
- Asthma rates are comparatively higher in many municipalities with significant environmental justice populations, and among lower-income and African American populations statewide.<sup>12</sup> Also, among municipalities with the highest percentage of the population living in an EJ Neighborhood, there is presently and historically a higher per municipality average use and release of Toxics linked to asthma.
- PFAS testing data at the time of this report's release do not show greater PFAS concentrations in the drinking water of municipalities with higher proportions of their population living in EJ Neighborhoods.<sup>13</sup> However, two facilities that reported PFAS releases under TURA are located within or close to EJ Neighborhoods.

10 U.S. Environmental Protection Agency. (n.d.). *EJSCREEN: Environmental justice screening and mapping tool*. Environmental Protection Agency. Retrieved June 5, 2023, from <https://www.epa.gov/ejscreen>

11 Shapiro, M.D. (2005). Equity and information: Information regulation, environmental justice, and risks from toxic chemicals. *J. Pol. Anal. Manage.*, 24: 373-398. <https://doi.org/10.1002/pam.20094>

12 Massachusetts Department of Public Health. (2017). *Prevalence of asthma among adults and children in Massachusetts*. Retrieved from <https://www.mass.gov/doc/prevalence-of-asthma-among-adults-and-children-in-massachusetts/download>

13 More information on efforts to test for PFAS in Massachusetts drinking water can be found here <https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas-in-drinking-water>

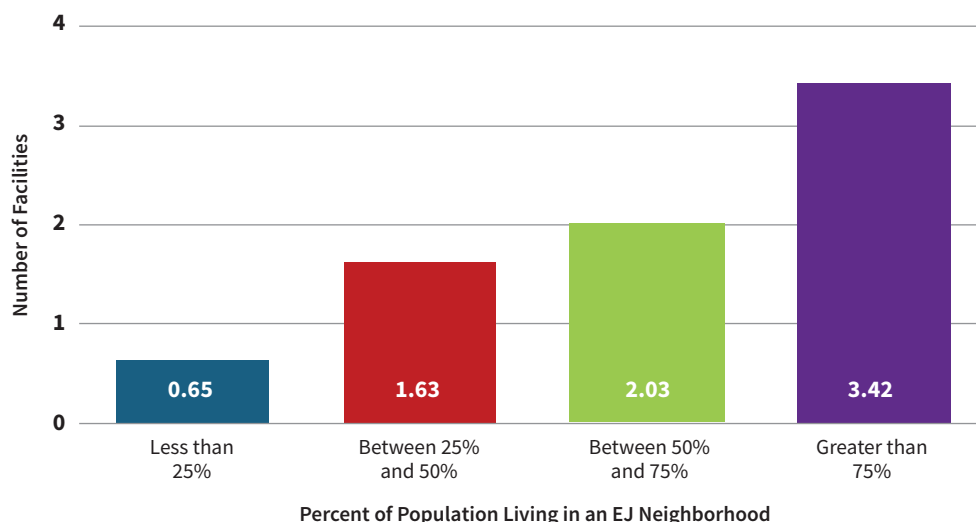
# The Unequal Burden of Toxics in Massachusetts

This analysis of the data reported annually by hundreds of chemical users in Massachusetts (TURA Data, p. 11) helps illustrate opportunities to advance environmental justice. The data suggests that residents living in EJ Neighborhoods may have faced higher cumulative risk of negative health outcomes due to the use and release of Toxics for many years.

As is often the case, the toxic chemicals are disproportionately used and released in lower income, minority and/or linguistically marginalized communities. For example, the average number of TURA reporting facilities (i.e. substantial users of Toxics) is over five times greater in municipalities where over 75% of the population lives in an EJ Neighborhood (Figure 3). What is encouraging is that Toxics Use Reduction efforts have had a significant impact on reducing the releases of Toxics in Massachusetts, including in those municipalities with 75% or more of the population living in EJ neighborhoods. The following discussion takes a closer look at the communities where Toxics are used, released and transported in Massachusetts.

**Prioritizing the adoption of safer alternatives upstream is the preferred means of protecting those most vulnerable or at risk.**

FIGURE 3  
**Average Number of TURA Facilities per Municipality, 2020**



The average number of TURA facilities per municipality for each of the four groups as defined by the percentage of the population which lives in an EJ neighborhood.

SOURCE: [WWW.TURADATA.ORG](http://WWW.TURADATA.ORG), MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH ENVIRONMENTAL JUSTICE TOOL ([matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html](http://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html))

## Use of Toxics in EJ Neighborhoods of Massachusetts

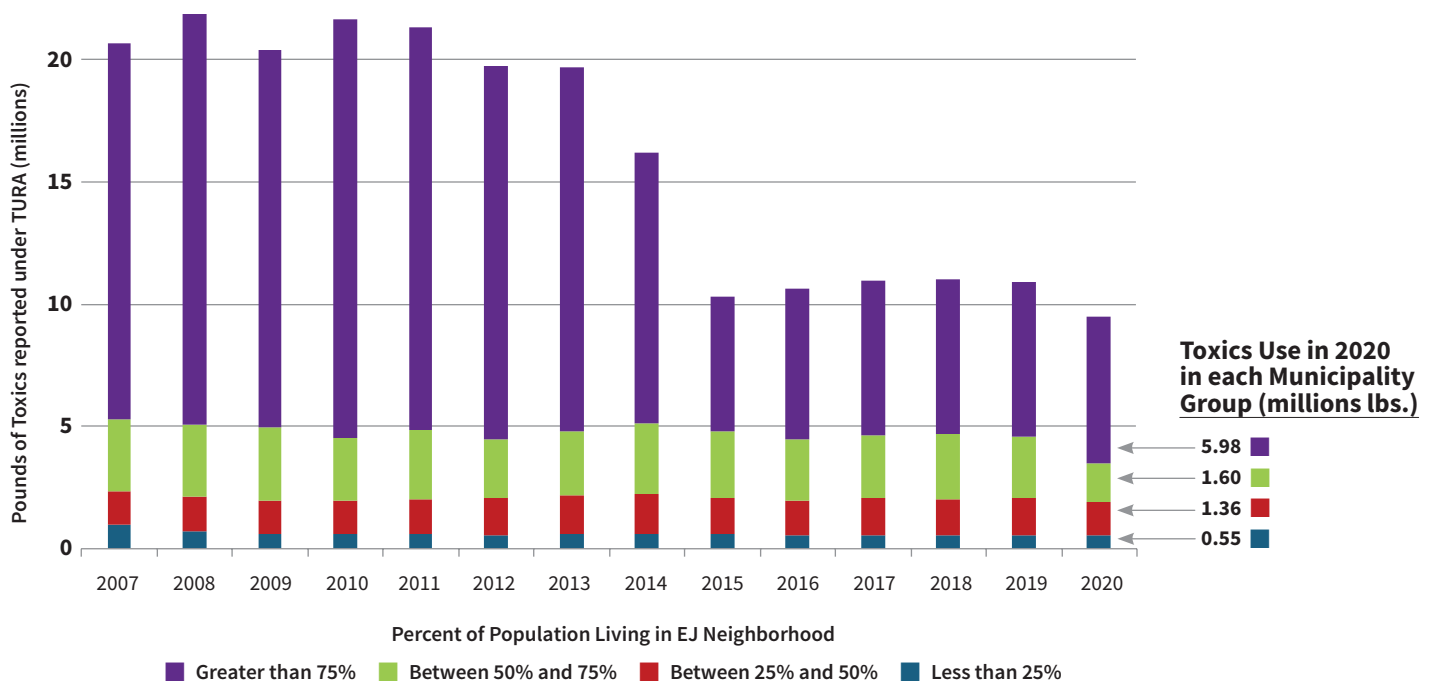
TURA Data shows that the average per municipality use and release of Toxics is greater in those municipalities where 75% or more of the population lives in an EJ Neighborhood. The disparity is most stark in the average Toxics use per municipality, in which municipalities with over 75% of the population living in an EJ neighborhood average over 10 times the Toxics use when compared to the average in municipalities with less than 25% of the population living in an EJ Neighborhood. Figure 4 aims to illustrate the present and historic differences in Toxics use among the four municipality groups using data from 2007 to 2020.

Considering the cumulative health and environmental effects which Toxics use and release has on communities, a historical perspective is also crucial to this analysis. While chemical use and release has decreased throughout the country and the state, certain municipalities may have benefitted from these reductions more than others. Since 2007, Toxics use has been greater in those municipalities with over 75% of the population living in an EJ neighborhood.

**Since 2007, Toxics use has been greater in those municipalities with over 75% of the population living in an EJ neighborhood.**

FIGURE 4

### Average Use of Toxics per Municipality, 2007–2020



The per municipality average Toxics use from 2007 to 2020 for each of the four groups as defined by the percentage of the population which lives in an EJ neighborhood.

SOURCE: WWW.TURADATA.ORG, MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH ENVIRONMENTAL JUSTICE TOOL ([matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html](https://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html))

## TURA DATA: A UNIQUE TOOL FOR ENVIRONMENTAL JUSTICE

Access to information on the use of toxic chemicals empowers businesses, researchers and community organizations to enable the adoption of alternatives that are less hazardous to human health and the environment. The adoption of safer alternatives advances environmental justice for communities that are at elevated risk of pollution, contamination and hazardous exposures in the workplace.

Communities in Massachusetts have unrivaled access to information about the use of toxic chemicals. Under the Massachusetts Toxics Use Reduction Act (TURA), manufacturing facilities in the state must report their use of hundreds of different toxic chemicals if they have greater than ten employees and use more than a certain amount per year. Information is collected yearly about what chemicals are being used and their quantities, in which locations, for which industries and by which companies.

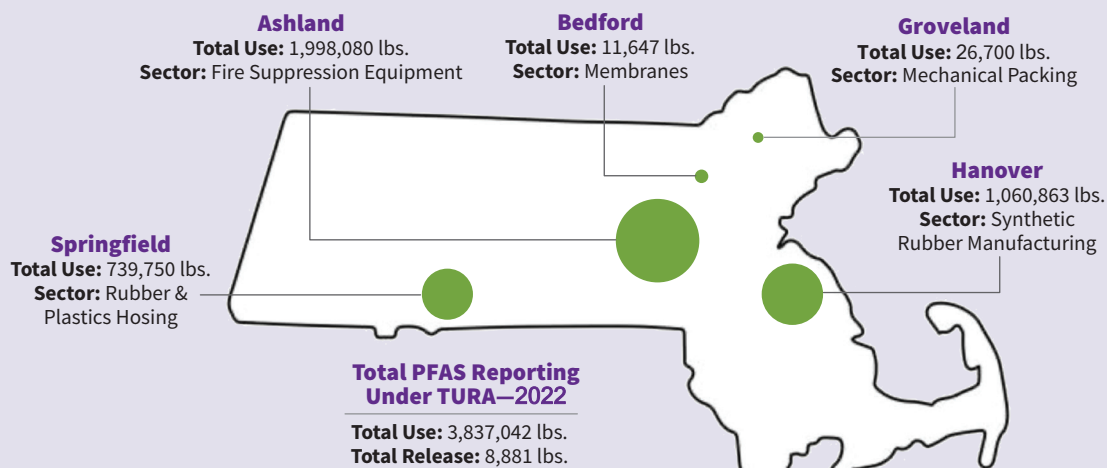
As part of their “right to know,” communities in Massachusetts can find information about the use of toxics in their vicinity, as well as their byproduct and releases. This information can be found on “TURA Data,” a user-friendly website ([www.TURAdata.org](http://www.TURAdata.org)) maintained by TURI.

The findings of this report utilize the information generated by TURA and available in TURA Data. For example, the addition of a category of PFAS substances to the TURA list of chemicals in 2021 enabled the generation and disclosure of information about the use of these Toxics in Massachusetts (see Figure 14, p. 19). Innovators are now better able to identify needs and develop solutions to help prevent pollution and protect workers by reducing the use of these Toxics at the source.

Unfortunately, a dataset like TURA Data on the use of toxic chemicals is rare. Massachusetts is the only state in the United States with a comprehensive mechanism to collect such information on chemical use, and one of the few in the world.

FIGURE 5

### Use of Certain PFAS Reported Under TURA in 2022 (lbs.)



The TURA Data website contains a wealth of information about the use, release and byproducts of chemicals that can help drive innovation toward safer alternatives. The map above shows 2022 (the first reported year) PFAS filers. Facility name and information can be found at [www.turadata.org](http://www.turadata.org).

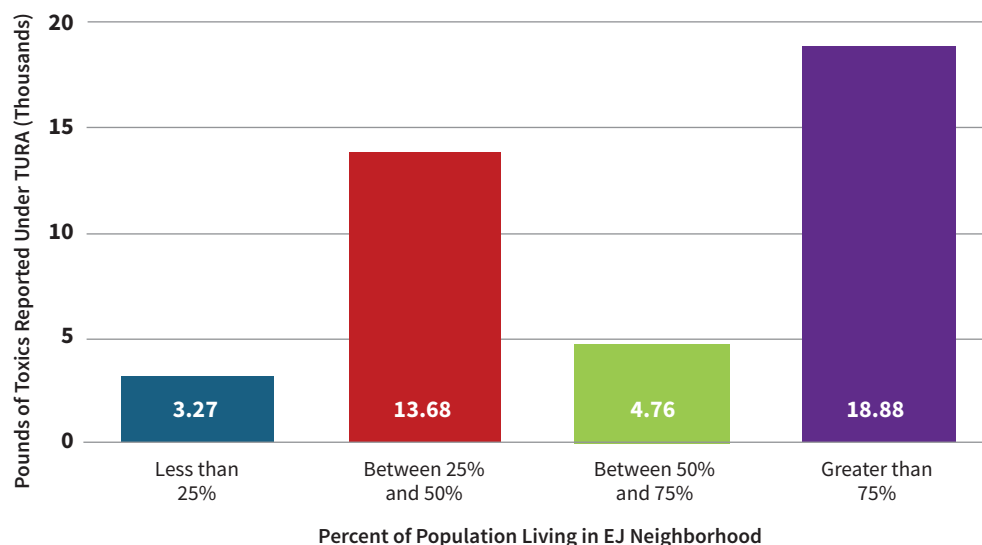
## Release of Toxics in EJ Neighborhoods of Massachusetts

As illustrated in Figure 7, the average per municipality release of Toxics, while higher in municipalities with greater than 75% of the population living in EJ Neighborhoods, is not disproportionate to their population as is Toxics use. Nonetheless, municipalities with greater than 75% of the population living in an EJ Neighborhood averaged five times more releases per municipality when compared to groups of municipalities with less than 25% of the population living within an EJ Neighborhood. The maps in Figure 7 (p.13) show the three facilities with the highest releases of Toxics in 2020 in relation to EJ Neighborhoods.

The average release of Toxics per municipality has generally decreased each year in those municipalities with at least 75% of the population living in an EJ Neighborhood (Figure 8, p. 13). The three facilities with the most Toxics released from 2007 to 2020 are power plants or Municipal Waste Combustors (MWCs). They are located either directly in EJ Neighborhoods, or in close proximity.

FIGURE 6

### Average Release of Toxics per Municipality, 2020



The per municipality average Toxics release in 2020 for each of the four groups as defined by the percentage of the population which lives in an EJ neighborhood.

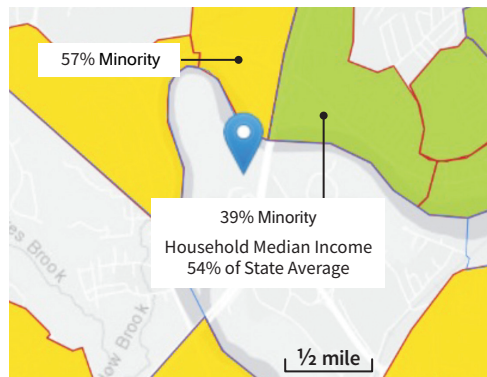
SOURCE: [WWW.TURADATA.ORG](http://WWW.TURADATA.ORG), MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH ENVIRONMENTAL JUSTICE TOOL ([matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html](http://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html))

FIGURE 7

## Top Three Facilities for Toxics Release, 2020

Haverhill, Mass.

#1 Highest Releasing Facility in 2020



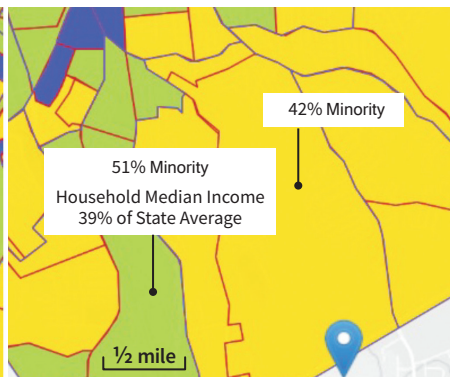
Lowell, Mass.

#2 Highest Releasing Facility in 2020



Millbury, Mass.

#3 Highest Releasing Facility in 2020



■ Minority ■ Minority & Income ■ Minority, Income, and English Isolation

Maps showing the three facilities with the highest releases of Toxics in 2020 in relation to EJ neighborhoods.

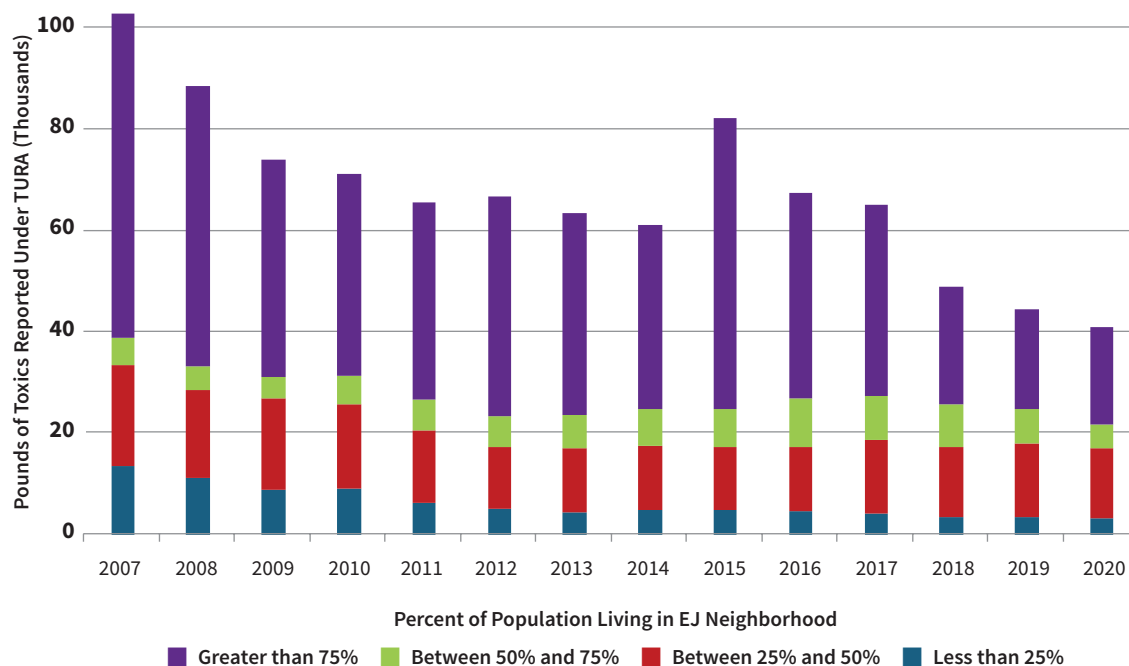
SOURCE: WWW.TURADATA.ORG, MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH ENVIRONMENTAL JUSTICE TOOL

(matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html)

See Figure 2 for definitions and criteria.

FIGURE 8

## Average Release of Toxics per Municipality, 2007–2020



The per municipality average Toxics release from 2007 to 2020 for each of the four groups as defined by the percentage of the population which lives in an EJ neighborhood.

SOURCE: WWW.TURADATA.ORG, MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH ENVIRONMENTAL JUSTICE TOOL

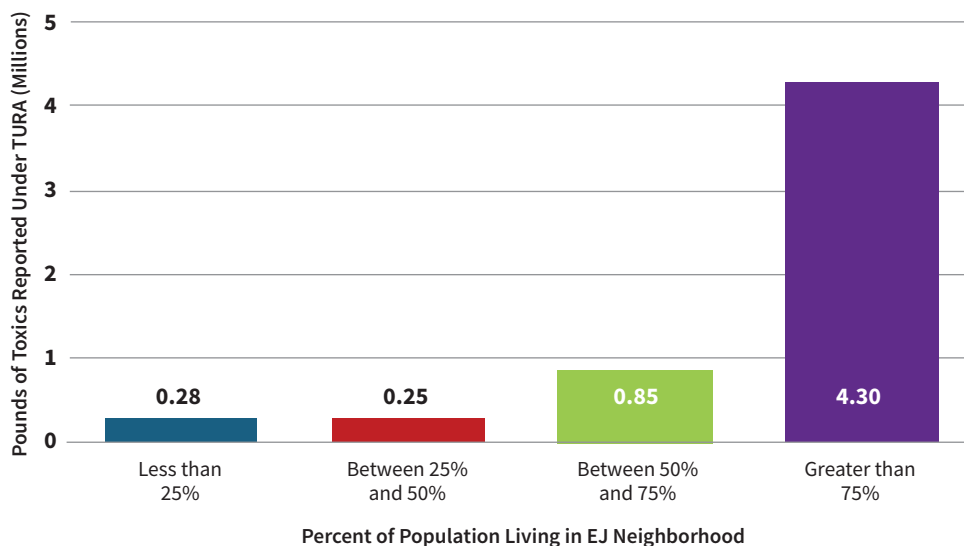
(matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html)

## Transport of Toxics in EJ Neighborhoods of Massachusetts

Analyzing the amount of Toxics shipped in products is important to consider. This is because the magnitude of Toxics shipping can be a useful proxy for the risk of chemical accidents. Those communities where chemicals are being moved at higher rates may face more risk of accidental, acute exposures.<sup>14</sup> This concern is underlined by nationwide focus on the possibility of hazardous spills, as in the case of the 2023 train derailment in East Palestine, Ohio. In 2020, municipalities with greater than 75% of the population living in an EJ Neighborhood averaged over five times more Toxics shipped per municipality than the next highest group (Figure 9). Figure 10 (p. 15) shows the location of the facility with the most Toxics shipped in 2020.

FIGURE 9

### Average Amount of Toxics Shipped per Municipality, 2020



The per municipality average amount of Toxics shipped in 2020 for each of the four groups as defined by the percentage of the population which lives in an EJ neighborhood.

SOURCE: WWW.TURADATA.ORG, MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH ENVIRONMENTAL JUSTICE TOOL (matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html)

14 Centers for Disease Control and Prevention. (2015). Geographic distribution of acute chemical incidents—Hazardous Substances Emergency Events Surveillance, nine states, 1999–2008. *Morbidity and Mortality Weekly Report: Surveillance Summaries*, 64(SS02), 32–38. Retrieved from <https://www.cdc.gov/mmwr/preview/mmwrhtml/ss6402a5.htm>

FIGURE 10

### Facility with Greatest Amount of Toxics Shipped, 2020



Map showing the facility with the largest amount of Toxics shipped in 2020 in relation to EJ neighborhoods.

SOURCE: WWW.TURADATA.ORG, MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH ENVIRONMENTAL JUSTICE TOOL ([matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html](https://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html))  
See Figure 2 for definitions and criteria.

## Specific Toxics of Concern: Chemicals linked to asthma and cancer, and “forever chemicals”

The use and release of certain types of Toxics are examined here in the context of environmental justice. The classes of Toxics chosen—those linked to asthma and cancer, and PFAS or “forever” chemicals—draw on the chemical groups covered in annual TURA information releases.

### Asthmagens

An asthmagen is a substance that can cause or trigger asthma in exposed people. They include various fumes and dusts, as well as various chemicals used in the manufacture of textiles, footwear, plastics, rubber, cleaners, among many other products. Of the over 350 chemicals identified by the Association of Occupational and Environmental Clinics as asthmagens, sixteen are reported under TURA. The release of asthmagens have steadily declined since 2007, including in those towns with 75% or more of the population in an EJ Neighborhood (Figure 11, p. 16).

Asthma is a significant issue of concern for many communities. There are traditionally high levels of asthma found among certain vulnerable groups (e.g. children) in EJ Neighborhoods. According to data from a 2017 report by the MA Department of Public Health, of the top twenty municipalities with the highest percentage of the population living in an EJ Neighborhood, fifteen have childhood asthma rates that are more than twice the state average.<sup>15</sup> Asthma is a particularly difficult problem in Springfield,

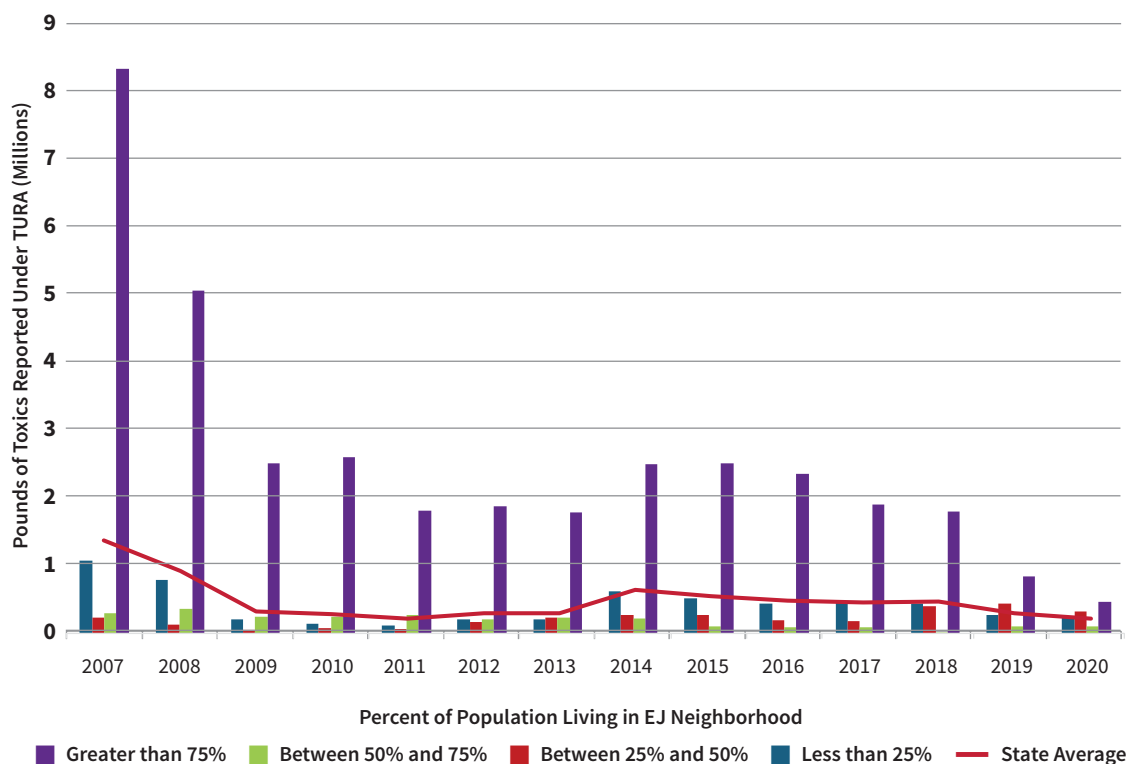
15 Massachusetts Department of Public Health. (2017). *Prevalence of asthma among adults and children in Massachusetts*. Retrieved from <https://www.mass.gov/doc/prevalence-of-asthma-among-adults-and-children-in-massachusetts/download>

which has asthma rates above the 95th percentile for the nation. Hospital visits for childhood asthma in Springfield were 220.5 per 10,000 residents in 2020, almost three times higher than the state average.<sup>16</sup> Between 2007 and 2014, a TURA reporting facility in Springfield reported cumulative releases of 3,351 pounds of methyl methacrylate and 63,372 pounds of styrene monomer, both of which are asthmagens. The facility recently closed.

Despite the alarming statistics on asthma in environmental justice communities around Massachusetts, releases of asthmagens have steadily declined since 2007, including in those towns with 75% or more of the population in an EJ neighborhood (Figure 11). A deeper dive into this decline may be helpful in crafting Toxics Use Reduction strategies which focus on environmental justice.

FIGURE 11

### Average Release per Municipality, Asthmagens, 2007–2020



The per municipality average release of asthmagens from 2007 to 2020 for each of the four groups as defined by the percentage of the population which lives in an EJ neighborhood.

SOURCE: [WWW.TURADATA.ORG](http://WWW.TURADATA.ORG), MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH ENVIRONMENTAL JUSTICE TOOL ([matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html](http://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html))

### Carcinogens and Other Higher Hazard Substances

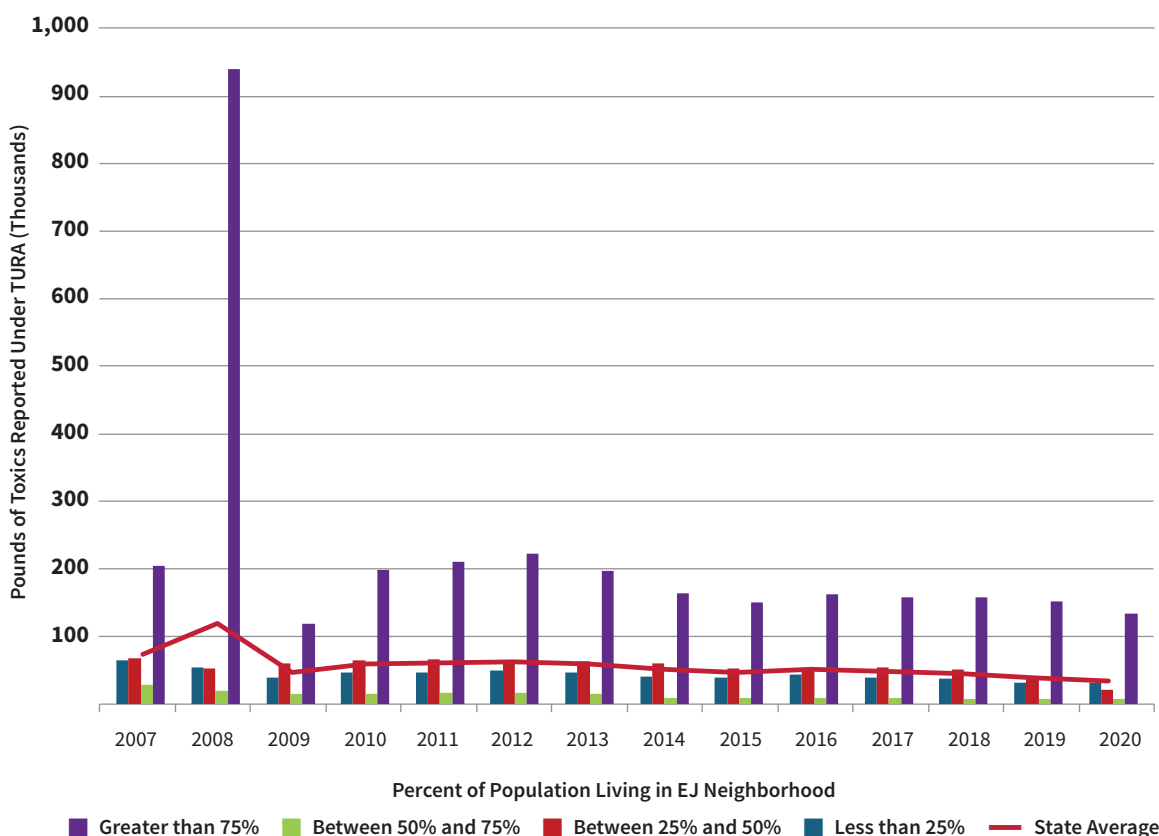
Under TURA, certain substances can be designated as higher hazard substances (HHS). The HHS list includes many halogenated solvents, toxic metals and other substances with associated chronic and acute health effects, including carcinogenicity. As illustrated in Figure 12 (p. 17), average use and release per municipality of HHS have been consistently higher in those municipalities with 75% or more of the population living in EJ Neighborhoods. In these municipalities, average use per municipality of HHS has decreased around 25% since 2007.

<sup>16</sup> *Id.*



TURI's lab staff have a proven track record of helping companies replace their use of Higher Hazard Substances with safer alternatives that protect EJ neighborhoods and workers.

FIGURE 12  
Average Use per Municipality, HHS, 2007–2020



The per municipality average use of HHS from 2007 to 2020 for each of the four groups as defined by the percentage of the population which lives in an EJ neighborhood.

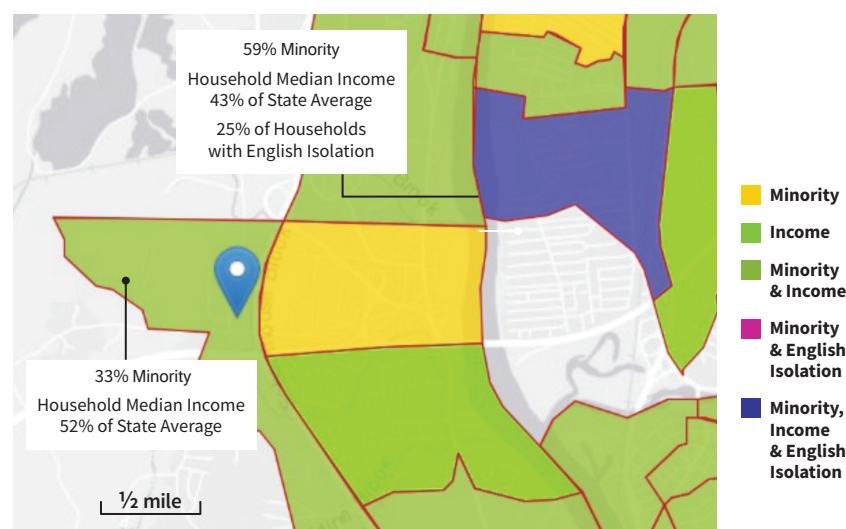
SOURCE: WWW.TURADATA.ORG, MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH ENVIRONMENTAL JUSTICE TOOL  
([matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html](https://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html))

The facility shown in Figure 13 has released the highest cumulative amount of the carcinogen trichloroethylene since 2007. It has also reported releases of other HHS such as hexavalent chromium and tetrachloroethylene.

FIGURE 13

### Facility with Highest Cumulative Releases of Trichloroethylene, 2007–2020

West Springfield, Mass.



Map showing facility with the highest cumulative release of the HHS trichloroethylene between 2007 and 2020 in relation to EJ neighborhoods.

SOURCE: WWW.TURADATA.ORG, MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH ENVIRONMENTAL JUSTICE TOOL ([matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html](https://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html))  
See Figure 2 for definitions and criteria.

## PFAS

Per- and poly-fluoroalkyl substances (PFAS) represent a category of thousands of chemicals that are widely used in manufacturing and consumer products. This class of chemicals is often described as “forever chemicals” because they never fully break down in the environment. PFAS have been detected in drinking water, and are linked to numerous adverse health impacts, including cancer and interference with endocrine and metabolic systems.

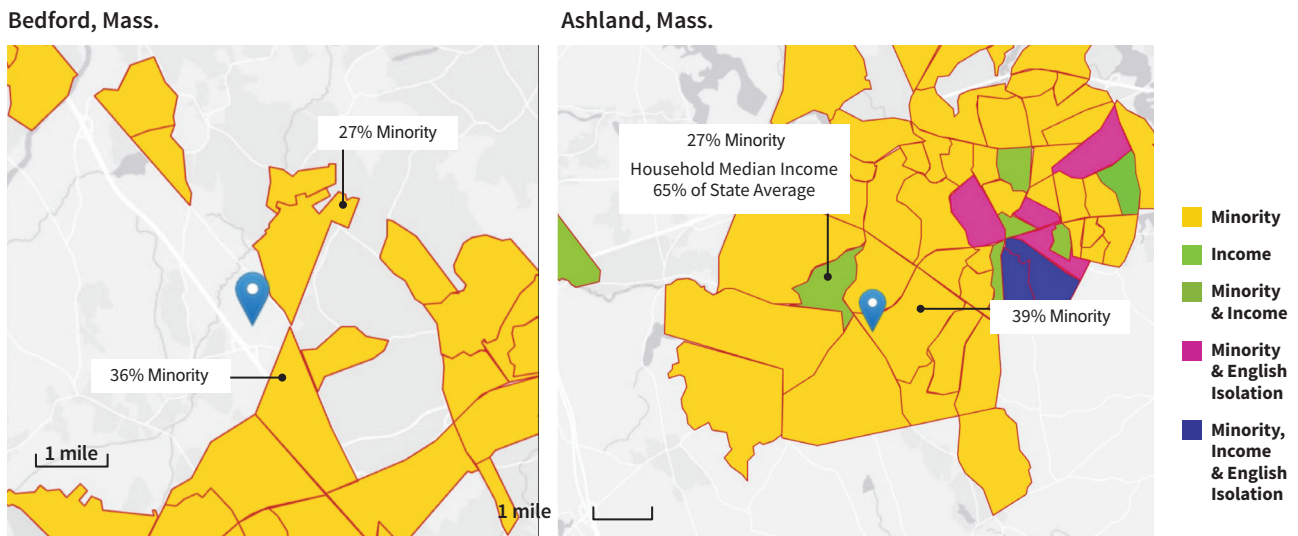
2022 was the first year in which reporting on the use of a new PFAS category<sup>17</sup> was required under TURA. Six facilities reported using PFAS covered in the TURA category. The two facilities which reported releases of these PFAS are shown in relation to EJ Neighborhoods in Figure 14 (p. 19). These were reported as point air and fugitive air emissions. Air emission and exposure of PFAS from manufacturing sources is not as well studied as PFAS in drinking water.<sup>18</sup>

17 For the 2022 Reporting Year, the Certain PFAS NOL category was added under TURA. The Certain PFAS NOL category is defined as those PFAS that contain: (i) a perfluoroalkyl moiety with three or more carbons (e.g.,  $-C_nF_{2n-}$ ,  $n \geq 3$ ; or  $CF_3-C_nF_{2n-}$ ,  $n \geq 2$ ) or; (ii) a perfluoroalkylether moiety with two or more carbons (e.g.,  $-C_nF_{2n}OC_mF_{2m-}$  or  $-C_nF_{2n}OC_mF_{m-}$ ,  $n$  and  $m \geq 1$ ), wherein for the example structures shown, the dash (–) is not a bond to a hydrogen and may represent a straight or branched structure, and that are not otherwise listed. Additional information on the TURA Certain PFAS NOL category can be found here—<https://www.turi.org/pfas-tracking-required-under-tura/>

18 Characterizing the Air Emissions, Transport, and Deposition of Per- and Polyfluoroalkyl Substances from a Fluoropolymer Manufacturing Facility. D’Ambro, Pye, Bash, et al. Science & Technology 2021 55 (2), 862-870 DOI: [10.1021/acs.est.0c06580](https://doi.org/10.1021/acs.est.0c06580)

FIGURE 14

## Facilities that Reported the Release of Certain PFAS, 2022



Maps showing facilities which reported the release of certain PFAS under TURA in 2022 in relation to EJ neighborhoods.

SOURCE: WWW.TURADATA.ORG, MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH ENVIRONMENTAL JUSTICE TOOL (matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html)

See Figure 2 for definitions and criteria.

The ability of Massachusetts to collect data on industrial PFAS use under TURA is unique as the EPA’s Toxics Release Inventory covers a far less extensive group of PFAS substances. Access to this information puts the Commonwealth in a strong position to address PFAS sources using

Toxics Use Reduction. As data collection on PFAS use in manufacturing and in products continues, TURI will seek opportunities to provide targeted assistance to the relevant companies, prioritizing those near EJ neighborhoods.

MassDEP recently adopted a drinking water standard limiting the sum of six specific PFAS to no more than 20 parts per trillion (ng/L).<sup>19</sup> A U.S. Government Accountability Office report issued on October 19, 2022 concluded that “In Massachusetts, communities with higher percentages of non-White or Hispanic/Latino residents and/ or families living in poverty were less likely than other communities to have PFAS in their drinking water.”<sup>20</sup>

Nonetheless, testing of drinking water in Massachusetts is ongoing, and the results should continue to be monitored with explicit consideration of the potential impacts on vulnerable groups and environmental justice populations.

**PFAS have emerged as a chemical class of major concern for fenceline communities.**

19 More information on efforts to test for PFAS in Massachusetts drinking water can be found at: <https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas>

20 U.S. Government Accountability Office. (2022). *Persistent Chemicals: EPA Should Use New Data to Analyze the Demographics of Communities with PFAS in Their Drinking Water*. Retrieved from <https://www.gao.gov/products/gao-22-105135>

# Opportunities for Intervention

Toxics Use Reduction is an internationally recognized best practice that can help ensure that all people and peoples are protected from environmental and occupational hazards. TURI and its partner agencies, OTA and MassDEP, are a resource for businesses and communities to better ensure everyone enjoys the benefits of a healthy environment.

The data generated from TURA (TURA Data) and presented in this report provides a foundation for targeted intervention to ensure more equitable distribution of environmental benefits and burdens. Given the considerable potential to improve health outcomes, state and local governments, as well as businesses, may wish to redouble efforts to reduce the use of Toxics in EJ Neighborhoods. Federal agencies may wish to use the analysis and conclusions found in this report to prioritize grant funding for EJ Populations and Neighborhoods described herein. State legislators and researchers may wish to prioritize the development of safer alternatives for those substances which pose the greatest risk of negative health outcomes for EJ Populations and Neighborhoods, including the Toxics covered by this report.

Deeper analysis of the intersection of environmental justice and occupational health in Massachusetts based on TURA Data is ongoing. Further research would be beneficial to help support this analysis. For example, research is needed to better understand factors that may influence disproportionate exposure levels and susceptibilities and data on health endpoints, as well as environmental and biological monitoring for pollutants.

TURI continues to collaborate with communities and businesses to better ensure equal protection from toxic exposures. We encourage anyone who is interested in advancing environmental justice through Toxics Use Reduction to contact us to discuss potential opportunities to reduce the use of Toxics.



The Toxics Use Reduction Institute (TURI) provides resources to help companies and communities make Massachusetts a safer place to live and work. Established by the state's Toxics Use Reduction Act of 1989, TURI's mission is to develop and facilitate the adoption of safer solutions to the use of toxic chemicals. For 35 years, TURI has provided research, training, technical support, laboratory services, and grant programs to reduce the use of toxic chemicals while enhancing the economic competitiveness of Massachusetts businesses.



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Learn more at <http://www.turi.org> • Contact us at [www.turi.org/contact-us](http://www.turi.org/contact-us)

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