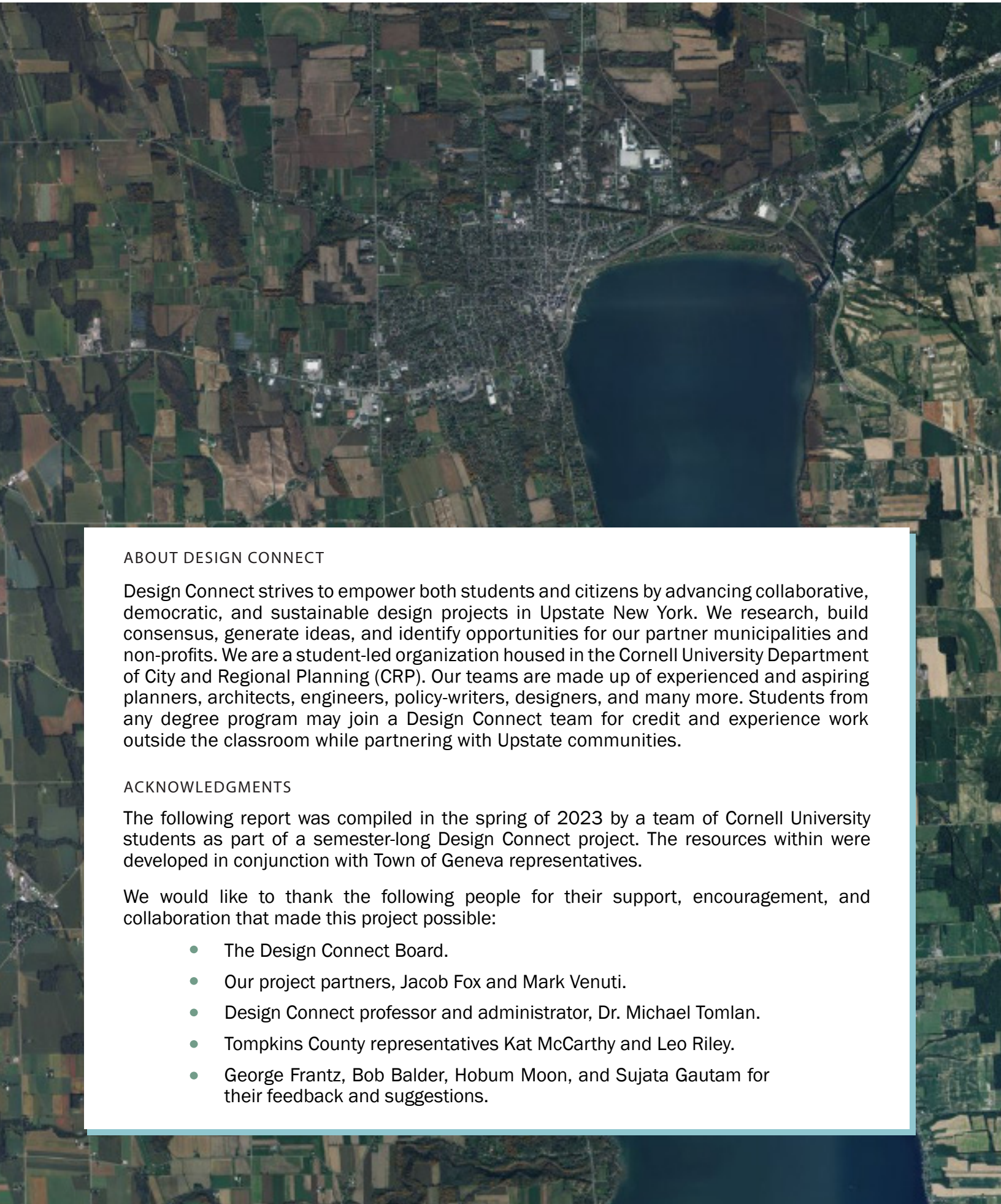
UPGRADING THE TOWN OF GENEVA TRANSFER STATION

SPRING 2023

DESIGN CONNECT
FINAL REPORT

Cornell AAP
Architecture Art Planning

DESIGN CONNECT



ABOUT DESIGN CONNECT

Design Connect strives to empower both students and citizens by advancing collaborative, democratic, and sustainable design projects in Upstate New York. We research, build consensus, generate ideas, and identify opportunities for our partner municipalities and non-profits. We are a student-led organization housed in the Cornell University Department of City and Regional Planning (CRP). Our teams are made up of experienced and aspiring planners, architects, engineers, policy-writers, designers, and many more. Students from any degree program may join a Design Connect team for credit and experience work outside the classroom while partnering with Upstate communities.

ACKNOWLEDGMENTS

The following report was compiled in the spring of 2023 by a team of Cornell University students as part of a semester-long Design Connect project. The resources within were developed in conjunction with Town of Geneva representatives.

We would like to thank the following people for their support, encouragement, and collaboration that made this project possible:

- The Design Connect Board.
- Our project partners, Jacob Fox and Mark Venuti.
- Design Connect professor and administrator, Dr. Michael Tomlan.
- Tompkins County representatives Kat McCarthy and Leo Riley.
- George Frantz, Bob Balder, Hobum Moon, and Sujata Gautam for their feedback and suggestions.

IN THE REPORT

THANK YOU

Thank you for taking the time to review this report.

For information about this specific project - Town of Geneva Supervisor Mark Venuti: supervisor@townofgeneva.com

For information about Design Connect: designconnect@cornell.edu

EXECUTIVE SUMMARY

ORIGINS OF THE PROJECT

During the fall of 2022, representatives from the Town of Geneva, New York submitted an application to Cornell Design Connect for the Spring 2023 project cycle. The Town of Geneva is located in Ontario County on the northwest corner of Seneca Lake, about a one hour drive from Cornell University's main campus in Ithaca, New York. In their application, Town Supervisor Mark Venuti and Sustainability Coordinator Jacob Fox requested assistance with a design for an upgraded transfer station that maximizes resource recovery and minimizes landfilling. The proposed design will be included in grant applications intended to secure funding for the project. Additionally, the project partners expressed interest in developing designs for a reuse center and decentralized mobile pick up system. Currently, the Town sends a large majority of its municipal solid waste and recycling to the Ontario County Landfill, which will reach its capacity and the end of its lease in 2028, making the county landfill free by 2029. This closure will lead to higher material hauling costs for residents, increased greenhouse gas emissions due to longer transport distances, and loss of valuable resources for the community. In an attempt to mitigate these impacts, the Town of Geneva has proposed expanding and relocating the current transfer station to increase local material recovery.

The current Town transfer station, located at 32 White Springs Road, is used widely and offers a more affordable option for local waste management. However, the current transfer station is spatially constrained and is impacting the operations of the Town Highway and Water Departments that share the same parcel. As a result, there is no room for the transfer station to grow at its present location. An upgraded transfer station could allow for the co-location of reuse initiatives, recycling and food scrap collection, and waste consolidation in a central facility. Reuse of materials would be prioritized in this system, followed by recycling or composting, with wasting as a last resort. Upgrading the transfer station could help minimize the amount of waste that residents have to pay to dispose of, recover valuable materials, keep economic benefits within the community, and reduce greenhouse gas emissions by increasing material diversion and decreasing landfilling.

Location and municipal boundary of the Town of Geneva, NY.

Current Town of Geneva Transfer Station.

PROJECT SITE OPTIONS

From the outset of the project, Town representatives proposed the Town of Geneva Town Hall site as a primary location for the proposed upgraded transfer station. The site is bound to the east by Ontario County Route (CR) 6, also known as Pre-Emption Road, and to the west by NY-14A/245. The site can be accessed via paved road from CR 6 and via gravel access road on NY-14A/245. The plot is currently owned by the Town of Geneva and hosts a small bike park, box turf field, an active agricultural field, and a utility tower. The site is thought to be a good candidate for the proposed upgraded transfer station because it is already owned by the Town, is relatively centrally located, has good access via NY-14A, has ample undeveloped land, and would be co-located with other Town services. Potential challenges of the site include: slope conditions, proximity to residential housing east of CR 6, and potential reluctance to host a materials management facility near Town Hall. While the Town Hall site is the primary proposed location for the upgraded transfer station, Design Connect also identified an underutilized shopping plaza located at the corner of Route 5 & 20 and NY-14A that could serve as another option for the location of an upgraded transfer station. There are many unknown factors related to this site, but it offers the potential for an innovative adaptive reuse project and would be conveniently located along a major commercial corridor.

Site at the Town of Geneva Town Hall.

Plaza site located in a commercial area.

PROCESS AND EXPECTATIONS

To develop this project, Design Connect assembled an 11 person team, with members ranging from various backgrounds and areas of expertise including architecture, art, design, landscape architecture, and planning during the 2023 spring semester. Final deliverables agreed upon by the team and project partners included a site plan for the proposed upgraded transfer station and reuse center, renderings for the transfer station and reuse center, maps for mobile material collection sites, renderings of mobile material collection sites, and a community engagement summary. These deliverables are presented in the following report, in a final presentation, and a poster that can be made available upon request. Looking forward, this report and its associated deliverables can be used to apply for grants to fund the upgrading of the current Town of Geneva Recycling and Disposal Station and to support local movements toward sustainable material management in the Finger Lakes region.

PROJECT GOALS

- Reduce the cost that Town of Geneva residents pay on their material management.
- Reduce the amount of material sent to landfill and increase local resource recovery.
- Reduce the number of road miles driven by large garbage trucks on local roads, especially on narrow, unpaved, or otherwise vulnerable roads.

PROJECT RECOMMENDATIONS

The following recommendations have been made on behalf of the Design Connect team based on our research, community engagement, and design processes that took place over the course of the spring 2023 semester:

- Conduct an in depth comparison of the Geneva Town Hall and shopping plaza sites.
    - This report provides an initial comparison outlined as pros and cons of each site, but deeper analysis should be undertaken to understand differences in project costs, timelines, construction considerations, available funding sources, and specific environmental impacts associated with the potential development of an upgraded transfer station at both sites.
- For the proposed decentralized mobile pick-up system, the Town of Geneva should consider purchasing Pro-Tainer Pro-Gravity recycling trailers.
- Prioritize the North Side Fire Company, Inc. and West Lake Road Fire Department Association, Inc. as decentralized mobile pick-up system locations.
- Give precedence to the construction of the drop off and reuse centers for the proposed upgraded transfer station.
- Consider collaborating with Finger Lakes ReUse and other regional resource recovery organizations to learn more about retail best practices, material storage, internal operations, workforce considerations, business models, and associated programming that could help shape a reuse center in the Town of Geneva.
- Identify and build relationships with local partners for recycling materials, especially hard to recycle materials or niche items.
- Continue community engagement efforts and offer additional opportunities for input and feedback.
- Utilize resources provided by Design Connect to facilitate discussions about these initiatives with municipal and county leaders in the City of Geneva and Ontario County at large.

Rendering of concept transfer station drop-off area.

Rendering of concept reuse center.

PROJECT TEAM

SARAH STANZI

MASTER OF REGIONAL PLANNING

PROJECT MANAGERS

WYETH AUGUSTINE-MARCEIL

MASTER OF REGIONAL PLANNING

VANESSA CHAN

URBAN AND REGIONAL STUDIES

ATHENA DENG

URBAN AND REGIONAL STUDIES

ASHLEY HERRERA

DESIGN + ENVIRONMENTAL ANALYSIS

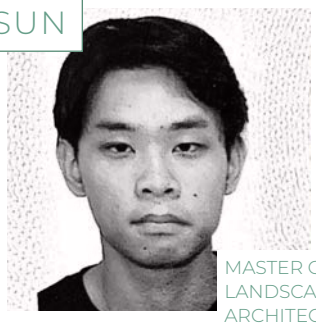
MIMI LI

BACHELOR OF FINE ARTS

LAUREL MARGERUM

MASTER OF REGIONAL PLANNING

JIACHENG SUN



MASTER OF LANDSCAPE ARCHITECTURE

AARON TANG

MASTER OF REGIONAL PLANNING

QINGFENG TIAN

MASTER OF ADVANCED ARCH. DESIGN

MINNUE UHM

BACHELOR OF LANDSCAPE ARCHITECTURE

COMMUNITY EVALUATION

PROJECT CONTEXT

HISTORY OF THE TOWN OF GENEVA

The Town of Geneva and the City of Geneva were initially joined as one town, but split in 1806. In 1872, the Town of Geneva became its own municipality. Prior to settlement by Europeans, the Town of Geneva was part of the territory of the Seneca Nation. Before the American Revolution, the Seneca Nation of Indians held significant control over the land in the Finger Lakes region. However, they were dispossessed of their land following the conflict. Most of western New York was sold to private investors in 1788 who began stripping the Seneca Nation of their title to the land. Settlement of the area by Americans increased after this. Development of the Town of Geneva increased through the twentieth century, much of it tied to the development of the City of Geneva and increasing popularity of lakefront homes.

COMMUNITY SNAPSHOT

Today, the Town of Geneva is primarily rural in character but also contains suburban neighborhoods around the City of Geneva and waterfront development. In the southern half of the Town, housing is concentrated along the Seneca lakefront. Lakefront single-family housing is frequently clustered into private points and informal homeowners' associations like Kashong Point, Whites Point, and Clarks Point. Inland from these lakeside neighborhoods are agricultural fields dotted with rural single-family housing. Around the City of Geneva, there are a few neighborhoods that transition from city to town with little change; these are primarily low-density single-family homes. Other Town roads farther from the city have single family homes on relatively large lots. Higher density multi-family developments in the Town of Geneva include Northwood Townhomes, The Woodlands at Northside Apartments, Townside at Pre-Emption, and Sheridan Park Apartments. In the northwestern corner of the Town there is one mobile home park containing approximately forty homes. Immediately to the west and north of the city there are two areas of commercial development. To the west, the Town includes a continuation of the commercial area along Route 5 & 20 that has a Walmart Supercenter, chain eateries, and car dealerships. To the north, off NY-14A, there is a small concentration of manufacturing and other businesses. The Town now hosts three breweries and three wineries and, along with the city, has become a tourist destination in the summer and fall.

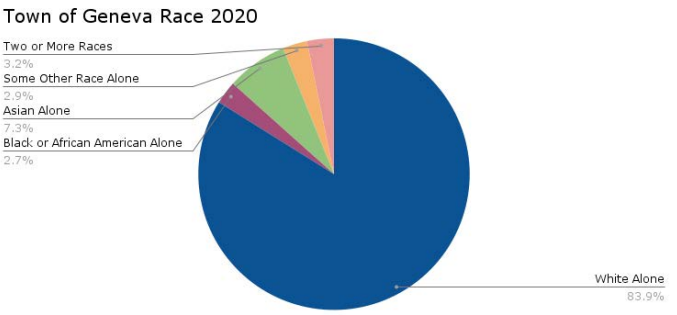
Map of the Town of Geneva.

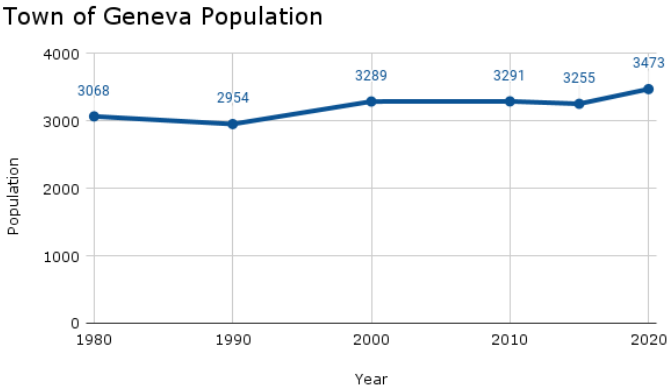
Photo: Hobart and William Smith Colleges

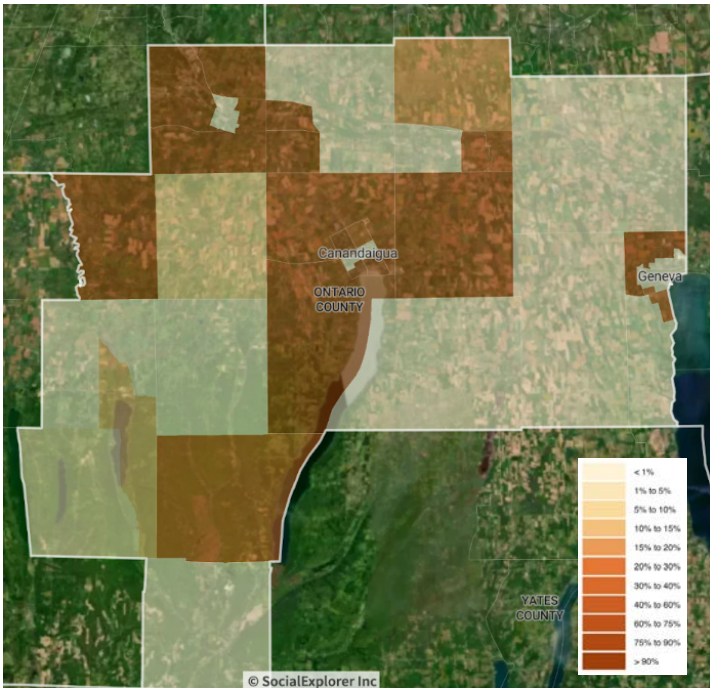
DEMOGRAPHICS

A GROWING TOWN AND COUNTY

The 2020 Census counted 3,473 persons in the Town of Geneva. The population is mostly white (84%) with smaller percentages of Asian (7%), African American or Black (3%), other races (not including Native American or Native Pacific Islander) (6%), and mixed race populations. The population density is 181 persons per square mile, indicating the Town's rural character as compared to City of Geneva's 3,040 person per square mile density. The Town of Geneva's population has increased 13% over the past 40 years, and the population has grown by almost 200 people over the past ten years. This growth has been concentrated in the northernmost Census Block Group in the Town of Geneva; the two more southerly Block Groups experienced decline over the same period. Over the period from 1980 to 2020, the population of the City of Geneva declined from 15,142 to 12,812, a substantial decline of 16%; however, the population of Ontario County increased from 88,909 to 112,458.



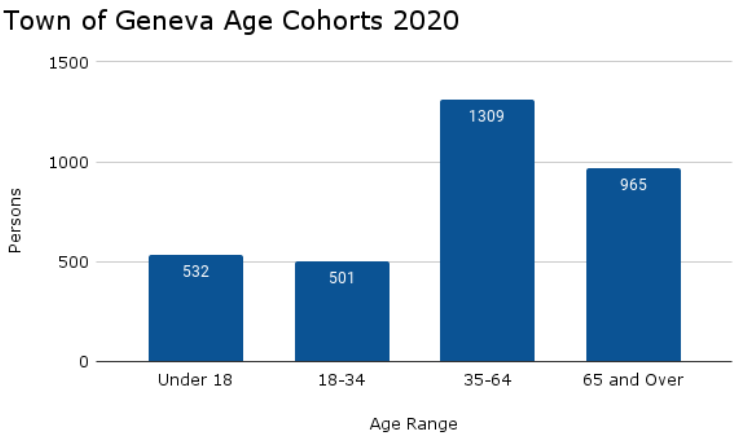




Ontario County population growth 2010-2020.

Recent population growth in western New York has been concentrated in the region's urban areas, with rural counties experiencing population declines. Ontario and Tompkins counties are the only counties without a major urban center (Rochester, Buffalo or Syracuse) to increase in population in western New York since 2010. Population growth in Ontario County since 2010 has been concentrated in the corridor between Rochester and Canandaigua, but includes the population growth in the northern portion of the Town of Geneva. Projected county population growth from the Cornell Program on Applied Demographics suggests that Ontario County's population will continue to grow until 2038, when it will begin to slowly decline. The projected growth will stem from net in migration until the death rate of the aging population outweighs the birthrate and in migration.

The Town of Geneva's recent increase in population is an indicator that the Town is enjoying a degree of local popularity and investment in new construction; however, its small and aging population indicate that this growth may be fleeting. The Town of Geneva's median age is 53.6 years. This is much older than the City's median age of 31.1 years and older than Ontario County's median age of 43.8 years and the national median of 38.8 years. Approximately 29% of the Town's population is over the age of 65.



Increases in population in the northern section of the Town since 2010 may be due to the development of a low-income housing development, the Woodlands at Northside Apartments. Some of this recent growth may also be out-migration from the City of Geneva to newer housing options in the Town of Geneva. It should be also noted that there has been a 7% increase in the population over the age of 65 since 2010, yet all other age cohorts have declined in population, highlighting again the trend of an aging population. Cornell's Program on Applied Demographics projects an increasing population over the age of 65 in Ontario County and a declining population of younger people. Of note, 13% of the population is over 75 years (445 persons) and 4% of the population is over 85 years (126 persons).

EDUCATION

For 5% of the Town's population over the age of 25, less than a high school diploma is the highest form of education. Among residents, 57% have attained a high school diploma as their highest level of education, while 39% hold a bachelor's degree or higher. This varies somewhat from the State of New York's overall educational attainment: 13% of the State population over 25 has less than a high school diploma, 50% has only a high school diploma, and 47% have a bachelor's degree or more. Of those with a bachelor's degree, 9% (220) have a doctorate degree, this is far higher than the average doctorate degree attainment for the State of New York, which is 2%. This higher concentration of doctorate degrees is likely due to the proximity of Hobart and William Smith Colleges.

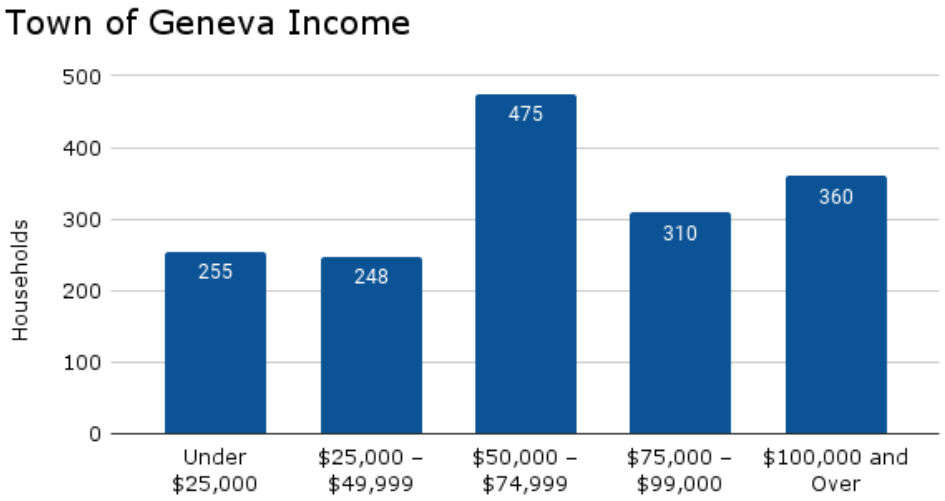
HOUSEHOLDS

There are 1,663 households in the Town of Geneva. The average household size is 2.1 persons per household. This is lower than the national average of 2.6 persons per household, but to be expected considering the Town of Geneva's older population. Of these households, 737 or 44% are married couple households. Around 200 households are single-householder family households with either a male (77) or a female (123) householder. Additionally, 726 households are single persons. Of these, 355 are single male households and 371 are single female households. Only 335 or 20% of households have one or more children under the age of 18 present in the household.


Photo: City of Geneva

ECONOMIC INDICATORS

The Town of Geneva's median household income in 2020 was $62,421. This is higher than the City of Geneva's median household income of $42,472 but on par with Ontario County's median income of $64,795 and the national median of $67,521. Geneva's median household income declined from 2010 to 2020 from $63,571 to $62,421, and there has been an increase in the Town's low income population. The number of residents earning less than $30,000 has increased in the Town of Geneva from 2010 to 2020. In 2010 there were 209 households earning less than $30,000, making up 15% of total households. In 2020 this increased to 304 households earning less than $30,000, constituting 18% of total households.



EMPLOYMENT

Of the total population, 56% (1,619) of residents are employed, while 42% (1,207) are not in the labor force. Only 1.7% (5) of residents are unemployed. Among workers, 25% are employed in management, business, and financial operations. Approximately 22% (347) of residents are engaged in professional occupations for their employment. Another 11% (176) are employed in sales. Around 11% (185) are employed in transportation and material moving services. The remaining 31% of employed residents work in various different sectors.

TRANSPORTATION

The majority of workers in the Town of Geneva used a personal vehicle to reach work in 2020. Nearly 83% (1,332) of workers drove a personal vehicle while 6% (97) of workers carpooled, 1% (6) used a bicycle, 5% (84) walked, and 5% (80) worked from home.

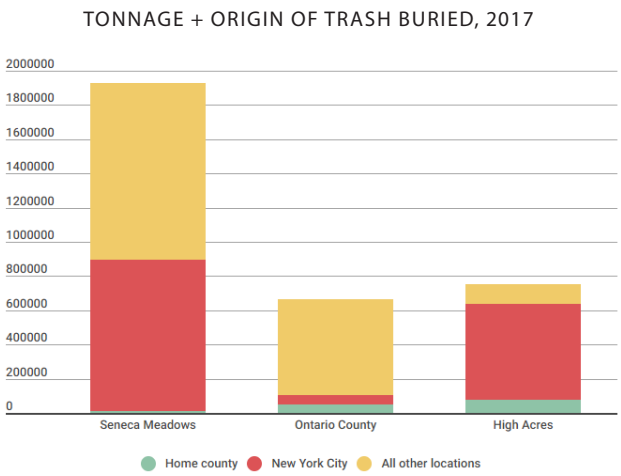
HOUSING

There are 1,261 (77%) housing units in the Town of Geneva that are owner-occupied while 387 (23%) housing units are renter-occupied. With a 4% vacancy rate, the occupied housing units in the area amount to 1,648, while only 69 units remain vacant. This vacancy rate is much lower than that of Ontario County, which stands at 11% and the City of Geneva which is 10%. This low vacancy rate is a good indicator of the current popularity of the Town of Geneva. Of these housing units, 81% are single family homes; the remaining 19% are multifamily buildings, typically small buildings with no more than 20 units. The median year built of a house in the Town of Geneva is 1971. This indicates that the housing stock in the Town of Geneva is on average newer than that across the State of New York, which has a median year built of 1957, but on par with Ontario County (1973).

WASTE IN GENEVA

The population of New York State has witnessed a steady increase since the twentieth century, which has coincided with the growth and development of the Town of Geneva. More specifically, this growth has been concentrated in New York City, where the population has almost tripled since 1910. This intense growth has presented challenging waste management issues that the city and state have been grappling with for decades. Unfortunately, Upstate New York has essentially become a "dumping ground" for downstate waste (Orr, 2018). Today, nearly 30% of waste generated in New York City is ending up in landfills in the Finger Lakes region, where some of the state's largest landfills are located (Orr, 2018).

These landfills have significant social and environmental impacts on the communities near them, with negative effects on air quality, water resources, local ecosystems, and public health. At the same time, these landfills are contributing to climate change through emissions of carbon dioxide and methane, and are exacerbating environmental justice issues as landfills and hazardous waste sites are disproportionately located in BIPOC and low-income communities. However, these landfills are profitable and have been presented in the past as tools for economic development in smaller cities and towns. In 2018, it was estimated that the Finger Lakes region generates $1.7 billion annually from its landfills (Orr, 2018).



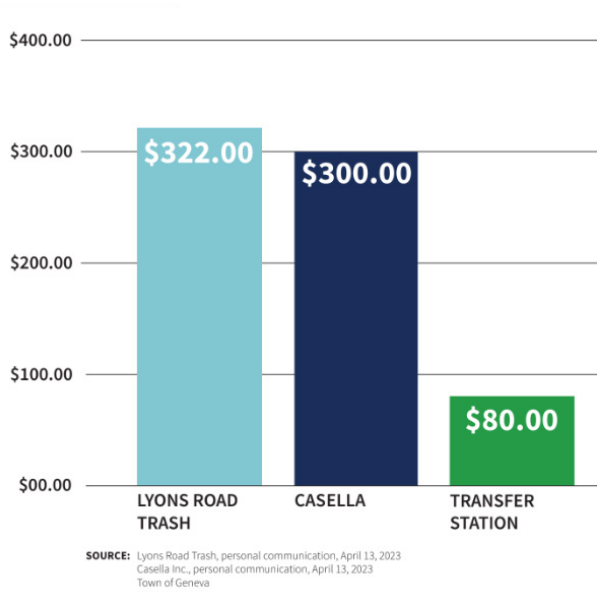
Source: Orr, 2018 and NYS DEC annual landfills reports

The Town of Geneva is located within 25 miles of New York State's three largest landfills by tons of waste annually received: Seneca Meadows, High Acres, and the Ontario County Landfill (Orr, 2018). Seneca Meadows is located 12.5 miles away in Waterloo, High Acres is in the Town of Macedon 24 miles away, and the Ontario County Landfill in Flint, a mere 3.5 miles away. Although being in close proximity to landfills offers the advantage of cost-effective waste disposal, it is crucial to acknowledge the prevailing social and environmental drawbacks associated with these facilities.

Orr, S. (2018). Investigation: NYC dumping more garbage than ever in Finger Lakes area. Democrat and Chronicle. https://www.democratandchronicle.com/story/news/2018/07/06/finger-lakes-landfills-booming-monroe-ontario-and-seneca-counties-residents-angry/754940002/

LOCAL WASTE MANAGEMENT

Currently, Town of Geneva residents can use the services of a local trash hauler, primarily Casella, a larger conglomerate, or Lyons Road Trash, a local alternative, for roadside pick-up or they can bring their waste to the Town of Geneva Transfer Station at 32 White Springs Road for dropoff on Wednesdays and Saturdays. The Town Transfer station is significantly less expensive than either of the two private haulers. Use of the transfer station requires a $65 annual permit that allows for the dropoff of two 32-gallon bags of trash per week. Recycling is $15 per year. The transfer station accepts municipal solid waste and recycling in separate compactors in addition to more specialized waste including scrap metal, food waste, and yard waste. The transfer station is an exempt facility under New York law, meaning that it only accepts a limited amount of waste. The Town of Geneva is preparing for changes in its waste disposal systems and increasing cost as the Ontario County Landfill prepares to close in the coming years.



DEMOGRAPHIC FORCES ON WASTE MANAGEMENT

The Town's population growth over the past decade suggests a sustained, and possibly expanding, market for waste management. However, future declines in population should be anticipated in the long run. The demographic makeup of the Town of Geneva, characterized by an aging population, highlights the importance of developing a waste management system that adequately caters to the needs of older individuals and those with limited mobility, both presently and in the years to come. While retired households may have more time to bring their waste to a central transfer station, older individuals and those with limited mobility may also benefit from more convenient mobile pick-up stations or pick-up service. Aging households may also benefit from bulk item pick-up for household organization or downsizing projects that often come later in life.

While the Town of Geneva's population is aging, there are still many households with children under the age of 18 years. These households may also seek more convenient waste drop-off or pick-up systems as they balance jobs and childcare. Single-parent households may face additional challenges finding time to drop their waste at a centralized transfer station and benefit from continued pick-up service.

The economic profile for the Town of Geneva suggests that affordability will be an important factor in a future waste management system. The northern section of the Town in particular has a high concentration of very low-income households. The cost of waste disposal services will be of great importance to these families; however, it will be important to understand how housing developments' group waste systems may work with a future transfer station.

The high percentage of residents in the Town of Geneva that use a personal vehicle to reach work suggests that vehicle ownership in the Town is high. This bodes well for a transfer station that functions primarily as a drop-off center.

PREVIOUS LOCAL STUDIES

ONTARIO COUNTY RECYCLES SURVEY

The survey findings indicate that the new transfer station in the Town of Geneva will fill a gap in waste management by providing convenient drop-off for a wider range of recyclables. It should accommodate hazardous and nonstandard recyclables, with education and outreach needed to enhance recycling practices. The survey highlights the need for improved food scraps disposal, which can be addressed through a convenient system at the transfer station and educational materials. Affordability of new services will be important based on residents' willingness to pay for electronics recycling.

- Barriers to recycling: Limited curbside bin space and lack of knowledge about recycling electronics and hazardous waste hinder recycling efforts.
- Need for additional collection events and education: Residents would benefit from events and educational programs focused on recycling hazardous or nonstandard items.
- Food waste disposal: The majority (62%) of respondents dispose of food waste in the trash, while only 46% compost, primarily through backyard composting (42%).
- Willingness to pay for electronics recycling: 60% of respondents are willing to pay for electronics recycling, with most willing to pay less than $10.

ONTARIO COUNTY SOLID WASTE MANAGEMENT PLAN

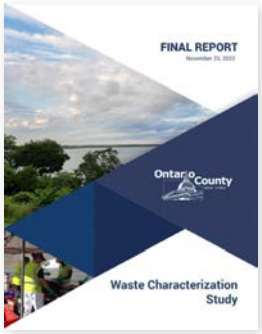
The Ontario County Solid Waste Management Plan is a 10-year plan that was completed in 2014 and provides a comprehensive look at current waste systems in the county and plans for future management of waste. The policy emphasizes four key priorities:

- Minimizing waste generation
- Promoting the reuse and recycling of all feasible materials
- Responsibly harnessing energy from solid waste
- Safely disposing of any remaining waste through appropriate land burial.

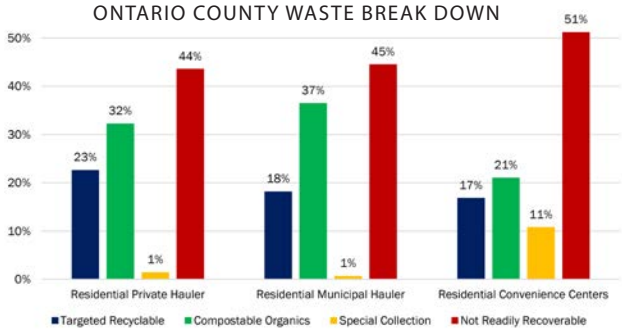
The primary objective of the plan is to minimize waste generation while maximizing opportunities for reuse, recycling, and composting. According to the plan, the majority of municipal solid waste in the county is transported to the Ontario County Landfill. Interestingly, Geneva's transfer station stands out as one of the few in Ontario County that does not accept bulk items. Additionally, approximately one-third of transfer stations accept construction and demolition debris, while a few also accommodate tires and sludge disposal.

Currently, 90% of waste produced in Ontario County is landfilled, with the remaining 10% being composted, recycled, or processed in another way. While the first implementation task of the plan is to continue utilizing landfills, specifically the Ontario County Landfill for municipal solid waste disposal, one objective calls for increased support for municipalities. The Ontario County Planning Department offers 30 hours of assistance to each municipality annually for assistance in planning tasks. This could be useful for future transfer station upgrading planning efforts in the Town of Geneva.

ONTARIO COUNTY WASTE CHARACTERIZATION STUDY



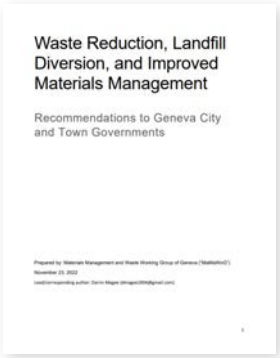
The Ontario County Waste Characterization Study, completed November 23, 2022, sorted the contents of 57 samples of waste into 50 materials categories to generate a comprehensive look at what is going into local landfills. The study also noted that the Ontario County Landfill is permitted to accept around 1 million tons of waste annually, of which only around 90,000 tons will be generated in the County. After sorting carefully selected sections of waste loads arriving to the landfill by hand, each collection of material type was weighed to generate waste composition data.



Residential waste streams were found to contain around 40% organic material, 20% of this being food waste, 25% paper, and 17% plastic. Significant amounts of divertable waste, either compostable or recyclable were found in residential waste streams, indicating that there is room to improve waste practices in Ontario County.

Results from the study suggest that residential municipal haulers outperform residential private haulers when it comes to organics, yet private haulers are more effective in recovering targeted recyclables. Furthermore, it appears that residential convenience centers are accumulating a higher quantity of items that may pose challenges in terms of their recoverability.

TOWN AND CITY GENEVA WORKING GROUP REPORT



The report “Waste Reduction, Landfill Diversion, and Improved Materials Management: Recommendations to Geneva City and Town Governments” was completed by the Materials Management and Waste Working Group of Geneva, a joint group representing both the City and Town of Geneva, in November, 2022. The report documents the current waste management system in Geneva and provides recommendations for future improvements. The 2028 closure of the Ontario County Landfill was the impetus for the report and it prioritizes reducing the financial impact of the closure of the landfill on locals. The primary goals for waste systems in the City and Town include:

- Dramatically reducing the amount of waste that is destined for landfill
- Increasing the separation and recycling of materials
- Identifying new waste streams for specific materials

The planning of an upgraded transfer station is closely aligned with these goals. Additionally, the report recommends two specific actions that are closely linked to the planning of a new transfer station in the Town of Geneva: expanding retail outlets for secondhand items and upgrading transfer stations. The report identifies a gap in retail outlets receiving and selling second hand construction materials in particular and suggests that the market for all secondhand items is much larger than currently served by existing stores. This project directly addresses the report’s recommendation of upgrading transfer stations, as the report aims “to transform the existing City and Town transfer stations into one or more state-of-the-art resource recovery transfer stations capable of handling organic waste, electronic waste, construction and demolition (C&D) waste, and other materials.” The report suggests that the municipalities will need to seek grant funding for transfer station construction, upgrades, and maintenance. This project aims to strategically position the Town of Geneva to apply for grants and continue the planning and community engagement process for an upgraded transfer station.

TEAM SITE VISITS

TOWN OF GENEVA SITE VISIT

Key Takeaways

- The current transfer station is a compact operation yet is mostly meeting the current waste management needs of residents, but faces spatial challenges due to coexisting operations of the Town highway and water departments, therefore, the transfer station needs a new location with more room to expand.
- Ensuring random dumping does not occur is important for the viability of the recycling at the transfer station.
- The Town Hall site offers ample greenfield land on which to develop a new transfer station.

TOMPKINS COUNTY RECYCLING & SOLID WASTE MANAGEMENT

Key Takeaways

- The site is divided into multiple sections and includes containers for recycling, solid waste, food scraps, yard waste, scrap metal, glass, tires, electronics, batteries, and rigid plastics.
- There is a focus on user experience through traffic flow management, clear signage, adequate staffing, accessible drop-off zones, and sanitary stations.
- The main drop-off zone is staggered with recyclable bins adjacent to landfill bins. This layout minimizes the need for unnecessary vehicle movement, Additionally, the parking spaces are elevated to so users can more easily lift and dump trash containers into bulk collection bins.

COMMUNITY ENGAGEMENT EVENT

Key Takeaways

- The community engagement event took place over four hours while the transfer station was open and residents were dropping off waste. The event was publicized on the Town website and in a Finger Lakes Times article.
- Town representatives shared more about appropriate scope for the new design and narrowed down to essential features, including drop-off bins, a storage building, and a reuse center.
- The team visited an underutilized shopping plaza in the Town that may be viable site option for a new transfer station. The 'plaza' site is flat, paved, and already developed, offering opportunities for adaptive reuse of the existing structures.

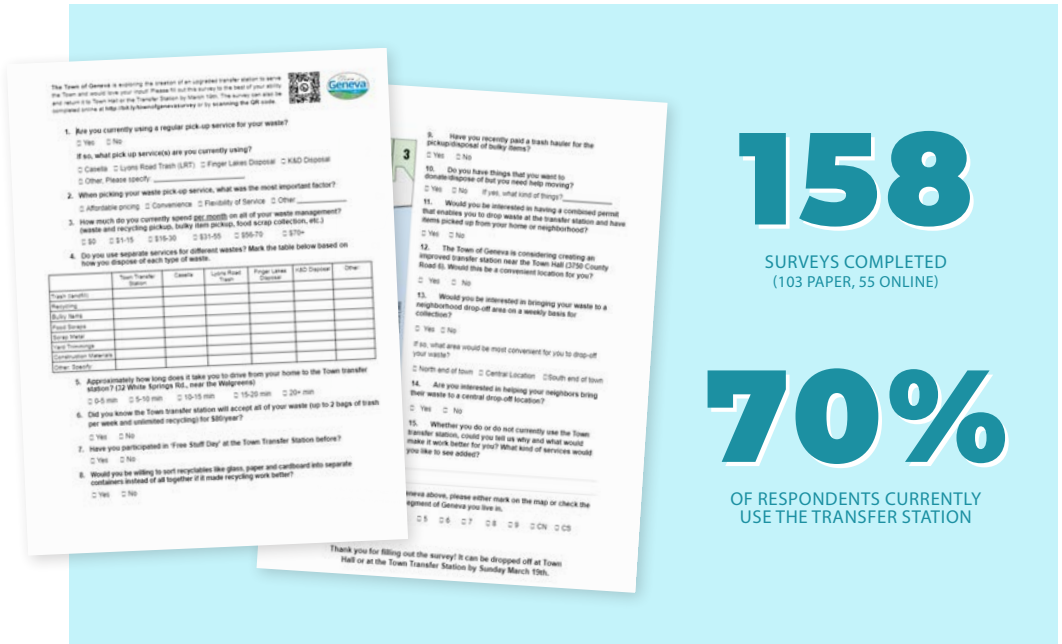
COMMUNITY SURVEY

CREATION AND FORMAT

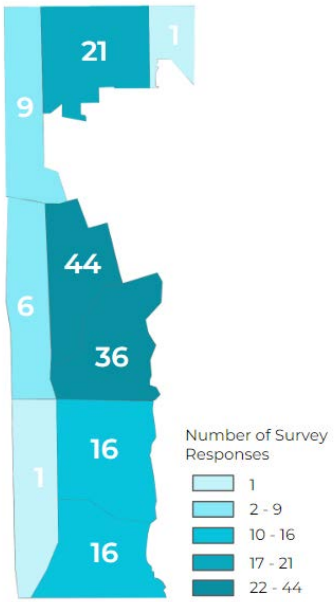
On March 13th, 2023 an article in the Finger Lakes Times titled “Geneva Town Officials Look at Bigger Recycling Station,” a Town website press release, and a social media post were published to promote the Town’s exploration of an upgraded transfer station and collaboration with Cornell Design Connect Team on the project. The article and the press release included a link to an online version of the survey for members of the Town to complete. Concurrently, a paper version of the survey was added to a town-wide mailer regarding a tax reassessment. This ensured that all 1,800 of the Town of Geneva’s households received a copy of the survey and were given a chance to provide feedback. The paper version of the survey also included a web address and QR code for the online version, so residents could submit their feedback virtually, if desired. Paper surveys were requested to be returned to the Town Hall or transfer station by March 20th. Many surveys were received after March 20th and were all included in the results.

GOALS FOR SURVEY

Working with Town staff, the Design Connect team identified goals for the survey and key questions to be answered by residents. Importantly, the team wanted to understand current waste management practices and identify preferences for future services. The resulting survey was split between questions that fell into these two categories. In terms of current waste practices, the team hoped to discover how much residents were paying for waste and what services they were utilizing. The survey aimed to understand why people might not be using the current transfer station and what preferences or lack of knowledge were associated with that decision. On the topic of future services, the survey aimed to determine residents’ willingness to sort materials and bring them to various drop-off locations. The survey also sought to discover what new services would be useful to residents and locations that would be most convenient for those services. With these various guiding goals, the team crafted a 16 question survey that aimed to succinctly gather a variety of information from residents and guide the planning of a new transfer station.



NUMBER OF RESPONSES BY AREA



SURVEY FINDINGS

The outcomes and insights derived from these results informed our approach to site planning and design, effectively delineating the preferences, requirements, and aspirations of residents. This local perspective provided valuable insight into the community's vision and guided our decision-making process. In total, 158 surveys were collected: 103 paper surveys and 55 online surveys. In terms of current waste practices, results from the survey indicate the following:

- Most respondents use and know about the Town's transfer station offerings.
- Users are happy with the current transfer station, but want it to accept more materials and be open more frequently.
- Non-users prefer convenience and affordability and use other pick-up services like Lyons Road Trash or Casella.
- Results concerning future services indicate that many respondents would have interest in a reuse center, as many reported having taken part in the Town's Free Stuff Day.
- Most respondents are willing to sort recyclables, but some find it burdensome.
- Some respondents had difficulty disposing of bulky items.
- There is support for future services that offer pick up and drop off options, and the Town Hall site is seen as a suitable location for a new transfer station.
- The number of respondents who commented on the inconvenient traffic flow at the current station shows that this is an area to be improved in a future design.
- Assistance for respondents with mobility impairment or more convenient dumping setups should be incorporated in a new transfer station.

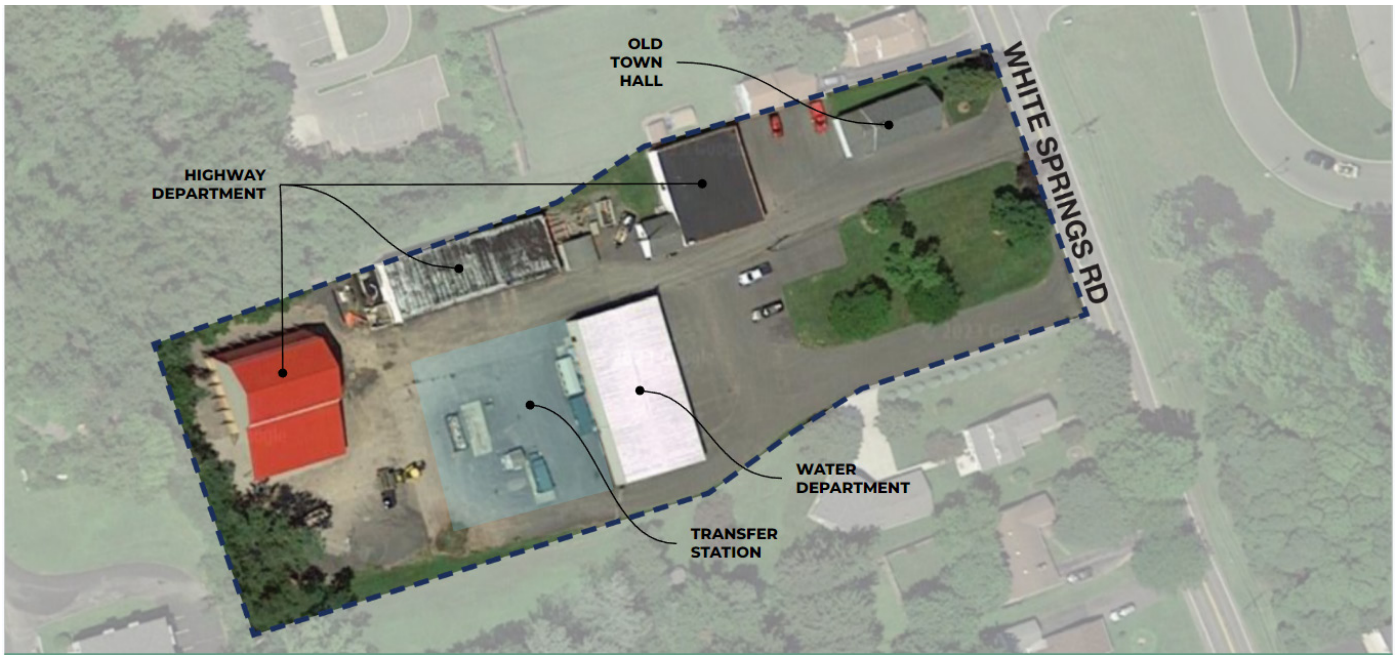
TRANSFER STATION DESIGN + PROCESS

SITE ANALYSIS

CURRENT TRANSFER STATION

The current Town of Geneva Recycling and Disposal Station is located at 32 White Plains Road, as shown in the Map below. Conveniently located near a main commercial district, the current transfer station is easily accessible to many residents. However, the transfer station is spatially constrained on the current parcel and is impacting the operations of the Town Highway and Water Departments. Through our survey, we also found that the transfer station is incompatible with surrounding residential land uses. One resident commented, “[The] hydraulic pumps are so loud in the neighborhood, can they be moved inside?” In light of these challenges, our project partners suggested the possibility of relocating the transfer station to the Geneva Town Hall site as a potential solution.

The current Town of Geneva transfer station (center, outlined blue) is surrounded by largely incompatible land uses.



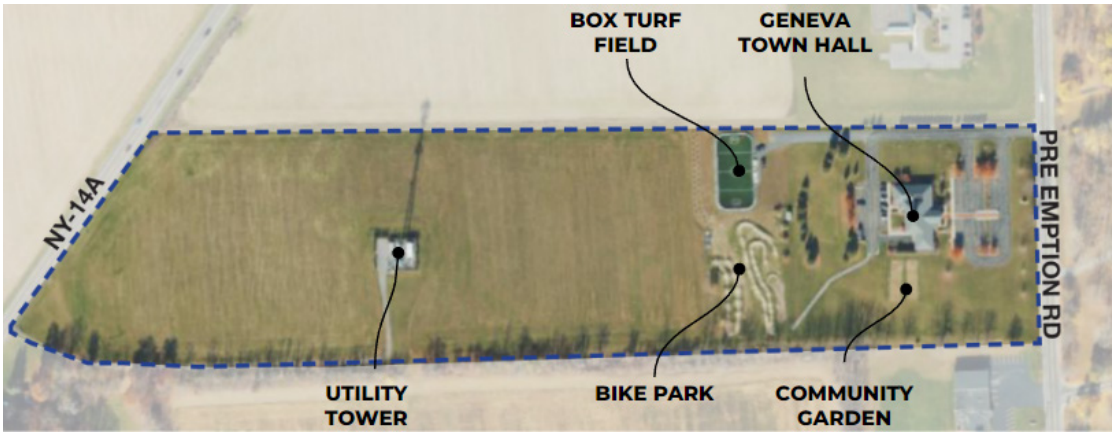
The current transfer station shares a plot with the highway and water departments, constricting traffic flow and inhibiting operation.

PROPOSED TOWN HALL SITE

The Town of Geneva Town Hall building is centrally located at 3750 CR 6. The Town owns the entirety of the 24 acre parcel of land encompassing the Town Hall building, extending from Pre-Emption Road to NY-14A. At the project's outset, our project partners from the Town of Geneva recommended this location as a viable option for the upgraded transfer station. As a major land holding for the Town, the site is becoming a community hub with a box turf field, bike park, community garden, and utility tower located on the parcel. The parcel is currently zoned for agriculture and approximately 12 acres of land on the current parcel have been rented to an individual farmer and cultivated in the past. The soil on site consists of the Honeoye Series which is very deep and well drained, forming a loamy till that is ideal for farming. However, yields on the parcel have not been substantial in recent years. Town of Geneva representatives see relocating and upgrading the transfer station to the western portion of the site as a more productive use of the land that would also help serve the community and region more broadly.

Town Hall parcel in blue

The westernmost portion of the parcel would be the best location for the upgraded transfer station since it is located away from residential uses along Pre-Emption Road and it is accessible by NY-14A. Through research, conversations with project partners, and site planning considerations, we propose the 5 acre portion of the site shown in the map below as the location for an upgraded Town of Geneva transfer station. This scaled down site is the basis of our proposed final designs.

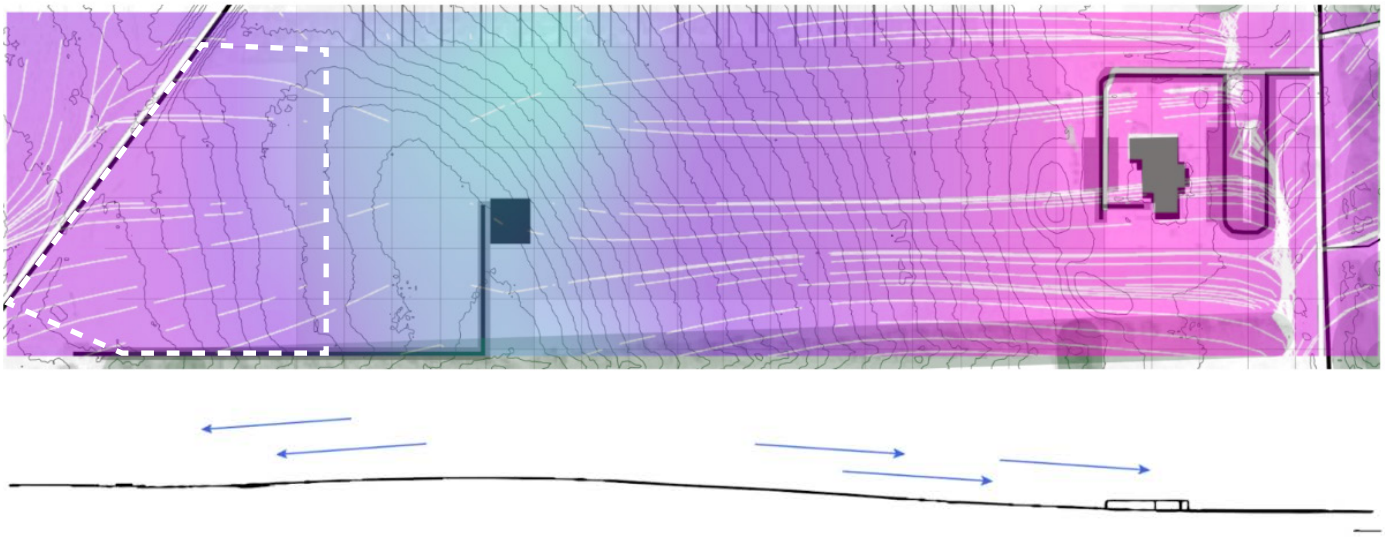


Full parcel owned by the Town of Geneva.

Scaled down area most suitable for development as a transfer station.

CONDITIONS OF PROPOSED TOWN HALL SITE

While the far western portion of the Town Hall site is mostly amenable, slope conditions in this area could pose challenges in the excavation and construction of a transfer station. The elevation peaks at the utility tower, which has a substantial slope to the west and east. There is an average slope of 2.3% and maximum slope of 11% on this part of the parcel. The diagrams below show the topography of the site and the storm water runoff respectively.



Considerable slope conditions at the Town Hall site.

PROS AND CONS OF PROPOSED TOWN HALL SITE

Pros	Cons
• Town-owned property • Expansive area providing ample flexibility • Strategically situated at the geographical center of the Town of Geneva • Isolated from residential zones, except for a single dwelling • The initially suggested site, thus more familiar to multiple stakeholders • Would expand community services already offered on the site	• Sloping terrain near NY 14-A • Traffic safety challenges due to accessibility and visibility • Greenfield development • Incompatible with surrounding land use (Town Hall, agriculture, residential areas) • Contradicts comprehensive plan for farmland preservation • Lack of on-site services • Proximity of power lines to HWY 14a • Zoning changes required for transfer station construction • Extended development timeline

CASE STUDIES (TRANSFER STATIONS)

COLLECTION CENTER FOR RECYCLABLE MATERIALS

SCHWEINERN, AUSTRIA

The building's design was based on efficient waste management logistics, with a focus on an open structure to facilitate traffic flow and container placement. A covered area was designated for weather protection during loading, and separate areas were allocated for disposal of different types of waste. The managing office was integrated into the middle for better oversight.

TOMPKINS COUNTY RECYCLING & SOLID WASTE CENTER

ITHACA, NEW YORK

The Tompkins County Recycling and Solid Waste Center incorporates a looped drive-through circuit for efficient traffic flow. This design allows for easy and safe access to all areas of the facility, including drop-off points and processing areas. The efficient layout helps to minimize wait times and increase the overall effectiveness of the recycling process. However, administrators commented on issues with cars parking at the drop-off areas during peak use times, suggesting that traffic should be able to flow more freely through the drop-off area. Additionally, managers mentioned issues with compost contamination that was addressed through more clear signage at food scrap bins.

SIMS RECYCLING CENTER

BROOKLYN, NEW YORK

The Sims Recycling Center in Brooklyn is dedicated to sustainability, incorporating features such as bioswales and renewable energy sources like solar panels. Their commitment to the environment extends to educating the public on recycling and waste reduction. They offer programs and events to promote awareness and understanding of sustainable practices, encouraging individuals and businesses to take action towards a greener future.

CASE STUDIES (REUSE CENTERS)

NEW PALTZ REUSE AND RECYCLING CENTER

NEW PALTZ, NEW YORK

The New Paltz Recycling Center is a vital resource for promoting sustainability in the local community. Their innovative use of a warehouse as a reuse center provides an affordable and practical option for a recycling facility. In addition to recycling services, the center also hosts educational workshops and events to raise awareness about sustainable living practices and waste reduction.

FINGER LAKES REUSE

ITHACA, NEW YORK

Finger Lakes ReUse is a community-based organization that promotes environmental sustainability by reducing waste through reuse and recycling. Finger Lakes ReUse operates two storefronts around Ithaca, NY and has diverted 9.7 million pounds of materials over the past five years. It offers a wide variety of secondhand items, including furniture, clothing, books, and electronics. The center's exterior features a unique custom mural that reflects its commitment to creativity and sustainability.

WALPOLE RECYCLING AND REUSE CENTER

WALPOLE, NEW HAMPSHIRE

This community-driven organization promotes sustainability by reducing waste through recycling and reuse. The center features custom-made shelving that allows for efficient sorting and organization of recyclable materials. The site is also adorned with colorful murals that have been designed and created by members of the local community, adding to its unique and creative atmosphere.

DESIGN CONSIDERATIONS

BUILDING TYPOLOGY

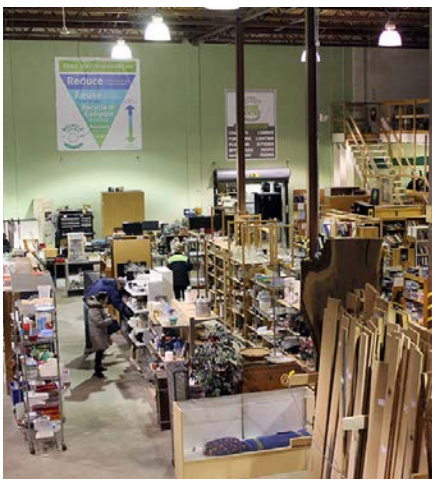
Based on case studies and best practices, we have developed a building plan that puts forth potential options and considerations for exteriors, interiors, and programming for a reuse center that could be co-located with the upgraded transfer station. For the purposes and scale of proposed operations at the upgraded Town of Geneva transfer station, we recommend a 40 foot by 50 foot prefabricated pole barn with at least one roll up door. Prefabricated pole barns have several benefits over new construction as they are more cost effective, can be a more eco-friendly option if materials are recycled, take a significantly less amount of time to build, and can be more flexible in their use. We recommend the Town consider exploring the purchase of used pole barns to further reduce the cost and environmental footprint of the building.

Interior and exterior example images of poles barns.

INTERIOR CONSIDERATIONS

When designing the interior of the reuse center, several factors should be considered. The layout should be carefully planned to ensure easy navigation and efficient flow of people and materials. Adequate shelving and storage solutions should be determined based on the types of items to be sold. Good lighting, both natural and artificial, should be incorporated to create a welcoming environment. Heating systems need to be modified to provide comfort during colder seasons. Clear signage should be used to guide customers and donors. Additionally, designated work areas should be organized and accessible for staff and volunteers, prioritizing safety and efficiency. This space could also be used to host community events such as:

- Recycling and waste education sessions
- Upcycling and repurposing workshops
- DIY sustainability projects
- Guest speakers and documentaries
- Community-Wide clean-up projects
- Fix-it clinics



Example images of reuse facilities.

DESIGN PROGRESSION

PROCESS

The design process involved discussion and collaboration among project partners, designers, and local residents. Discussions and feedback sessions were held to refine the design and address challenges, while regular communication with project partners ensured alignment with stakeholder objectives. Input from local residents was actively sought through various channels, resulting in a design that aims to achieve the project's goals and create a functional design that resonates with the community.

TOWN HALL SITE BLOCKING DIAGRAMS

At the beginning of our design process, we developed 'blocking' diagrams to organize and propose potential programs within the transfer station at the Geneva Town Hall site. Our first blocking diagram proposed a grand vision for the development of a public space that was centered around a large sculpture park and a recycling center. The idea behind the design was to create a multi-functional space that would not only serve as a transfer station but also offer a variety of activities and amenities to attract citizens. The centerpiece of the design was the sculpture park, which was envisioned as a sprawling green space with a variety of sculptures and art installations. The park was intended to be a place where people could come to relax, enjoy nature, and appreciate art. This initial blocking diagram was presented at the Design Connect Mid-Review on May 9th, 2023.

A final blocking diagram was developed that centered a more comprehensive recycling center with educational opportunities. It also included a distinct education center that could offer courses on sustainability and a market that could feature locally sourced and recycled products, aiming to create a cohesive public space that inspires environmental stewardship and serves as a model for sustainable urban development. The final diagram also presented a larger reuse center that could foster a community space that could hold upcycling workshops or other educational initiatives in addition to serving as a place where residents could donate and exchange reusable items.

TOWN HALL DRAFT SITE PLANS

Using the blocking diagrams as a design basis, Design Connect project managers provided feedback to the design team that was incorporated into two initial site plans. These site plans adopted the scaled down site parcel at the westernmost portion of the Town Hall site. These plans were developed for the community engagement event on Saturday, March 25, 2023 in order to receive feedback directly from community members and project partners.

The first site plan presents a transfer station layout with drop off bins centrally located and a three lane circular drop-off traffic flow. In this traffic configuration, the outer two lanes would be permitted to pull over to drop off materials while the center lane flows continuously. This would prevent cars from parking or backing up, which are traffic issues that were highlighted by administrators at the Tompkins County Recycling and Solid Waste Center. This plan also clearly separates areas designated for vehicles and pedestrians, an important safety consideration. Main points of feedback for this plan focused on the potential issues in servicing the collection bins and the movement of materials from drop-off locations to a recycling storage area. Road widths and arrangements for this plan were also identified as challenges with this plan, with particular attention given to the maneuverability of larger vehicles within the site.

The second site plan also carefully considers traffic flow by strategically separating the drop-off area from the reuse center, recycling storage area, and staff offices. There are designated areas for residents' vehicles and larger hauling vehicles, which promotes greater efficiency and safety. Stormwater management is also considered in this plan with a ditch located at the southeast corner of the transfer station, a feature that was ultimately incorporated into our final site plan. Similar feedback regarding this plan emphasized concerns regarding potential traffic congestion or maneuverability challenges with larger vehicles when transporting materials from the collection bins to storage areas. We concluded that while a separation of spaces and uses is necessary, we needed to better integrate the operations of the transfer station.

SITE PLAN FOLLOWING COMMUNITY ENGAGEMENT

Community engagement is a crucial component of the design process, as it helps to ensure that the design meets the needs and expectations of local residents. Based on feedback received during community engagement, the main design change was refining the locations of key areas within the transfer station to improve the flow of traffic for both residents, truck drivers, and staff.

A significant modification involved the optimization of the material drop-off area. This area was carefully placed to ensure that residents could easily drop off their waste and recycling materials without impeding the flow of traffic within the transfer station. It is situated in a convenient location for both residents and staff, making management and maintenance more effective. The reuse center was also carefully placed to ensure that residents could easily access and make use of this important resource. At the entrance, there is a staff office for transfer station operators to supervise and assist users. By streamlining the location of these areas, the design team was able to ensure that the transfer station was accessible, convenient, and orderly for all residents and other users of the space.

Another important aspect of this site plan is the recycling storage area building, which is where recyclable materials from the drop-off bins would be consolidated and stored for future sale or hauling. It is more closely located to the drop-off bins, making it easier for trucks to service bins and store valuable recyclable materials. However, some traffic flow and layout issues were still present in this plan, with street widths and traffic mixing among residents and trucks as main concerns.

Overall, the design changes made after community engagement were focused on optimizing traffic flow and improving the convenience and accessibility of the transfer station for both residents and staff. By carefully considering the placement of key areas such as the material drop-off area, reuse center, recycling storage area, and staff office the design team was able to create a design that was responsive to the needs of the community and improved for efficiency and convenience.

FINAL SITE PLAN

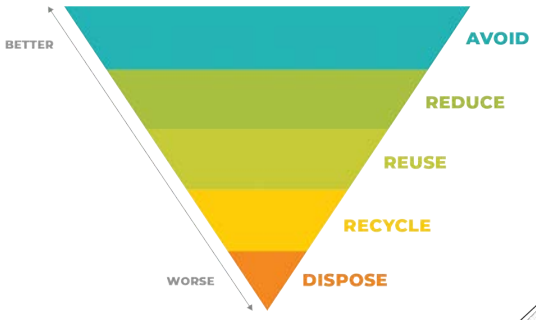
For the final iteration, the design team integrated feedback from the mid-review, community engagement meetings, project partners, project managers, and team members to develop the below site plan. This site plan strategically lays out the transfer station with a 'waste hierarchy' in mind. Upon entering the transfer station from NY-14A, residents are presented with the reuse center as the first option for material drop-off. Placing the reuse center at the entrance allows residents who solely wish to shop to conveniently access a separate exit roadway without navigating the entire station.

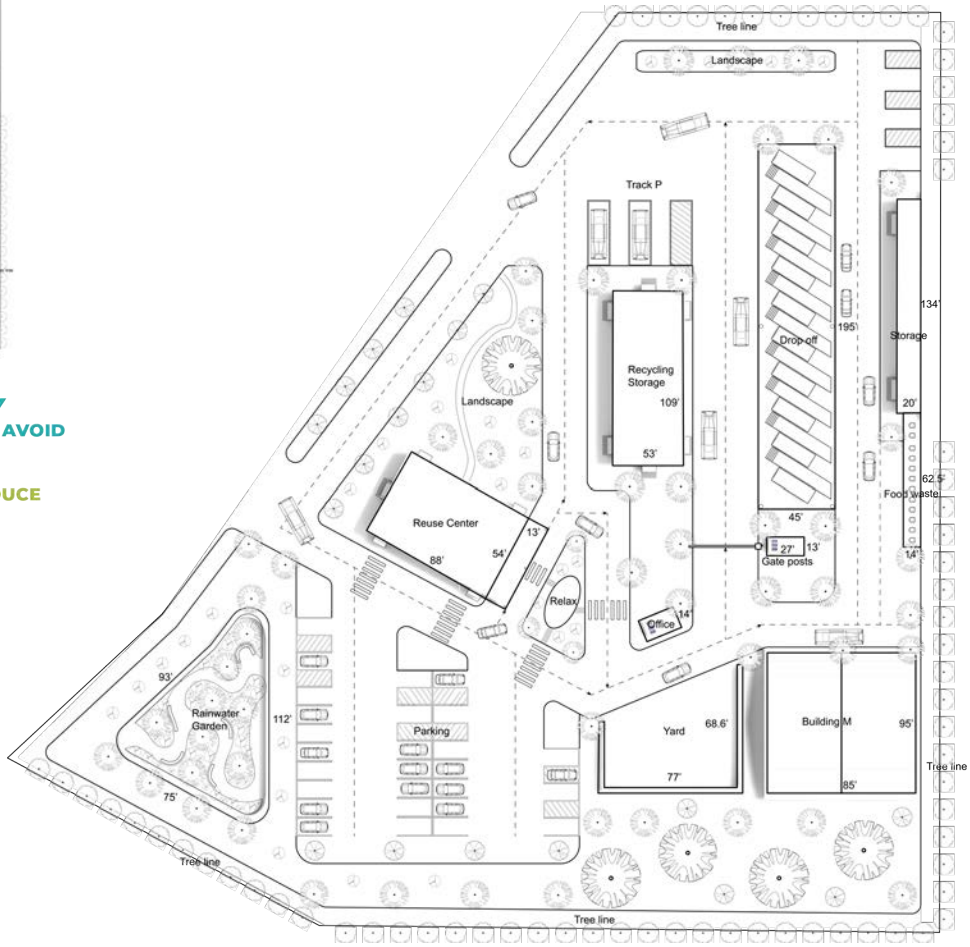
Proceeding further, users encounter an attendant's shed that provides guidance towards appropriate areas for specific materials. The initial collection areas consist of yard waste and building materials drop-off zones. Users are then directed to the food scrap drop-off area, featuring smaller toter bins for the collection of compostable materials. Continuing through the site, users reach covered recycling drop-off bins arranged in a staggered manner. This area is elevated so that users can easily drop recyclables into bins in the drop-off area. The hard to recycle/hazardous material drop-off building is equipped to collect items like batteries, electronics, appliances, medications, or a variety of other materials that could be collected regularly or during special collection events.

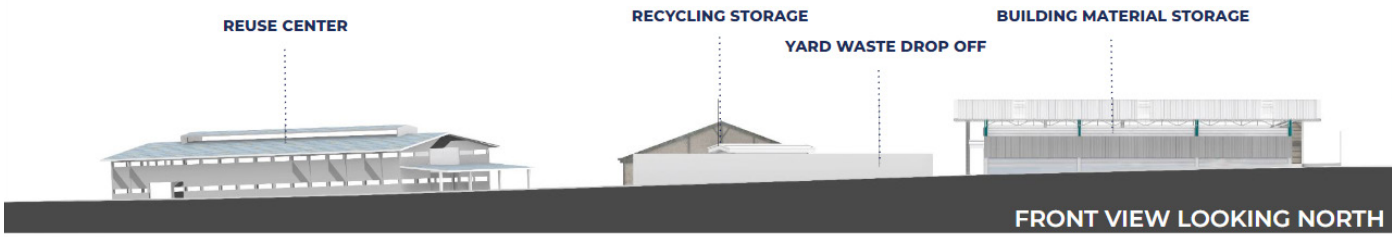
Lastly, users arrive at the waste drop-off bins to dispose of any remaining items that are not reusable, compostable, or recyclable. Subsequently, users can exit onto NY-14A to conclude their visit to the transfer station. Other special considerations of this site include a perimeter ditch and fence, a stormwater rain garden to capture and control precipitation and surface runoff, and native species plantings to provide biodiversity, phytoremediation, and screening on the site.

1	Rainwater Garden	4	Recycling Storage	7	Building Material	10	Storage
2	Reuse Center	5	Office	8	Gate Posts	11	Drop off Area
3	Parking	6	Yard Waste	9	Food Waste	12	Truck Parking

FINAL SITE PLAN DETAILS





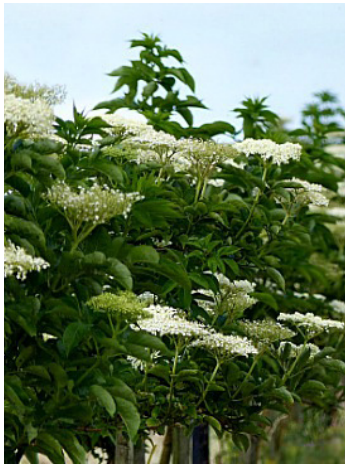


PLANTING PLAN

Four native tree species were chosen as planting options for the site. These species include Sugar Maple (Acer saccharum), Silver Maple (Acer saccharinum), White Oak (Quercus alba), and American Beech (Fagus grandifolia). These trees were chosen because they are all native to the area, are generally low maintenance, provide adequate screening, and support surrounding ecosystems. Additionally, two native shrub species were chosen to enhance soil stability, water runoff processing, air quality, and to support biodiversity. These species, Canadian Serviceberry (Amelanchier canadensis) and Common Elderberry (Sambucus canadensis) will also bring aesthetic qualities to the transfer station, specifically in the spring and summer.

Sugar Maple (Acer saccharum)

Canadian Serviceberry (Amelanchier canadensis)



Common Elderberry (Sambucus canadensis)

White Oak (Quercus alba)

SHRUBS

Diagram	Common Name	Scientific Name	Bloom Color	Bloom Time	Height	Spread
	Canadian serviceberry	Amelanchier canadensis	White	Spring	6 - 20’	3 - 10’
	Common Elderberry	Sambucus canadensis	White	Summer	4 - 13’	6 - 10’

TREES

Diagram	Common Name	Scientific Name	Bloom Color	Bloom Time	Height	Spread
	Sugar maple	Acer saccharum	Greenish-yel-low	Spring	40 - 80’	30 - 60’
	Silver maple	Acer sacchari-num	Yellow Red	Autumn	50 - 80’	35 - 70’
	White Oak	Quercus alba	White	Spring	80 - 100’	50 - 80’
	American Beech	Fagus grandifolia	Green-ish-yellow	Spring	50 - 70’	40 - 80’

APPLIED BRANDING

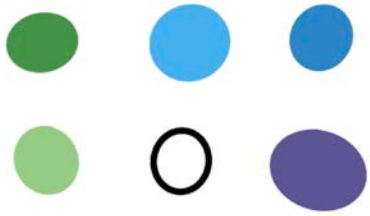
Branding is an important aspect for community resource recovery initiatives. A strategic branding approach can shift pre-existing views around waste management and communicate local attitudes. In this case, we wanted to ensure that our branding approach centered community character and sustainable material management. Using the Town of Geneva logo as a starting point, the design team developed a color palette that matched current Town branding. This color palette has also been used to develop our final deliverables.

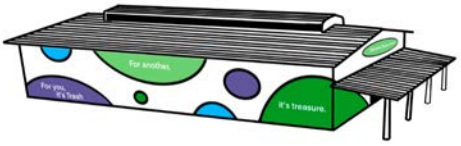
Our next step was developing a mural design for the proposed reuse center. Other reuse centers in the region have adopted this technique as branding and local art opportunities. The design for the proposed reuse center represents a unique blend of creativity and local identity encapsulating the community's commitment to sustainability while also serving as a visual representation of the Town's unique characteristics.

The design also draws inspiration from successful global initiatives like the Oko-Mural in Venezuela. This innovative project, spearheaded by NGO Okospiri and artist Oscar Olivares, created the country's first mural made from more than 200,000 plastic bottle caps. The reuse center's mural could incorporate recycled bottle caps sorted according to the Town of Geneva logo color palette. This not only aligns with the mission of the reuse center but also adds a unique textural quality to the mural, making it a striking visual feature against the white backdrop.

Furthermore, this approach could serve as a hands-on educational project and community-building opportunity for residents. By actively engaging the community in the creation of the mural, we're reinforcing the interconnectedness of art, sustainability, and civic participation. Incorporated into the mural is the well-known idiom, "For you, it's trash. For another, it's treasure." This phrase captures the essence of the reuse center, encouraging visitors to view their waste not as useless trash, but as potential treasure for someone else. The inclusion of this message in the mural serves as a powerful reminder of the importance of reuse and recycling.

Additionally, the design team created a design for a Pro-Tainer Pro-Gravity recycling trailer that features the distinct elements of the Town of Geneva logo, as well as the logo itself. The water and sailboats adored on the trailer pay homage to the Town's unique geographical features and recreational activities, creating a visual connection to the Town's branding and reinforcing the Town's pride in its sustainability efforts.





Potential mural partners:

- Local muralist Victor Pultinus
- Local painter Bernadette Bos
- The City of Geneva Public Art Committee
- HWS Colleges Art and Architecture Department
- The Soil Factory

Looking Northwest at the resident material drop off area.

Looking West at the reuse center and reuse drop off.

PRELIMINARY COST ESTIMATIONS

Plant Type	Common Name	Scientific Name	Size	Cost	Quantity	Total Cost
Tree	American Beech	Fagus grandifolia	2 gal	$50.00	65	$3,250.00
Tree	Sugar Maple	Acer saccharum	5 gal	$120.00	5	$600.00
Tree	Silver Maple	Acer saccharinum	5 gal	$40.00	70	$2,800.00
Tree	White Oak	Quercus alba	2 gal	$50.00	20	$1,000.00
Shrub	Canadian Serviceberry	Amelanchier canadensis	5 gal	$70.00	40	$2,800.00
Shrub	Common Elderberry	Sambucus canadensis	5 gal	$75.00	20	$1,500.00
					Total:	**$11,950.00**

Transfer Station Amenities	Quantity	Cost (per item)	Total Cost
Drop off Bins	6	$4,795.00	$28,770.00
		Total:	**$28,770.00**

Buildings and Construction	Sq Ft	Cost/Sq Ft	Total Cost
Reuse Center Warehouse	4,752	$20.00	$95,040.00
Reuse Center Awning	702	$30.00	$21,060.00
Recycling Center Structure	5,777	$25.00	$144,425.00
Attendants Sheds	60	$130.00	$7,800.00
Bin Recycling Structure	8,730	$30.00	$261,900.00
Building Materials Structure	8,075	$20.00	$161,500.00
Parking Lot	20,000	$10.00	$200,000.00
Sidewalks	200	$9.00	$1,800.00
Rain Garden	3,460	$10.00	$34,600.00
		Total:	**$928,125.00**

TOTAL ESTIMATED COST: $968,845

Please note that these estimates are very initial attempts to quantify the cost of developing a transfer station at the Town Hall site and require much further validation.

ALTERNATE SITE

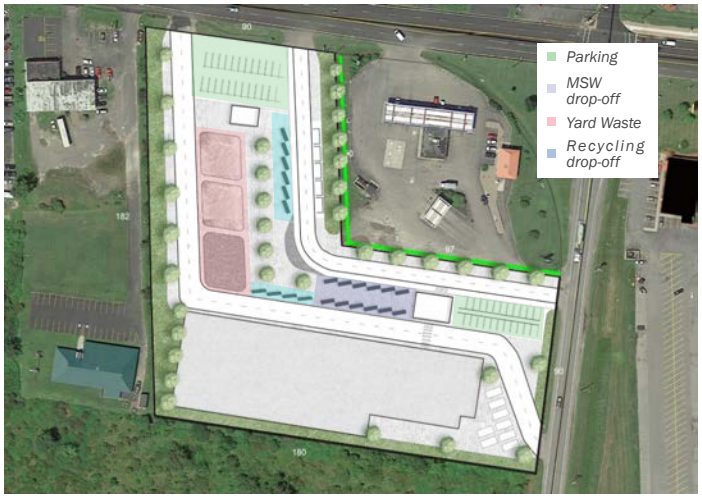
The Design Connect team identified the shopping plaza site located at 833 Canandaigua Ave which consists of 6.36 acres. The parcel is currently owned by the GRHS foundation and is located at a major intersection along a main commercial corridor. On the property, there is also a 52,940 square foot structure that was previously a shopping plaza. At present, the site comprises an abandoned structure and a sizable vacant parking lot, both of which are in a state of disrepair and are being underutilized. This property could offer an innovative option for the location of an upgraded transfer station. Adaptively reusing the building to host a recycling storage, drop-off, or reuse center could save the Town time and money while mitigating carbon that would be emmitted in the construction of a brand new transfer station and preserve the Town Hall site as a greenfield. The parking lot also provides ample space for a drop-off system which could become effective almost immediately. There is plenty of room for parking, residential traffic flow, and maneuvering for larger trucks.

Condition of the existing building is critical to the viability of the site. Further investigation is needed.

Large building and paved area with potential for development.

Pros	Cons
• Favorable for sustainable adaptive reuse • Revitalization opportunity for the corner • Optimal physical conditions with flat, graded, and paved terrain featuring a gentle slope of 0-3% • Potential for expedited development • Versatile structure on-site suitable for various purposes • Improved location for accommodating traffic to reuse retail stores • Alignment with the Town's comprehensive plan • Around more like-uses (commercial corridor)	• Privately owned rather than belonging to the Town • Reconfiguration may be required • Designated for commercial use • Structural enhancements required such as water system upgrades, insulation, and pavement repairs • Concerns regarding the risk of mold may necessitate demolition • Considerations regarding traffic flow and road access • Reduced flexibility compared to other options • Importance of implementing effective stormwater management strategies

Transfer station could potentially be entirely housed within the current structure, similar to the Monroe County EcoPark.



A more immediate option could be to relocate the current transfer station infrastructure to the paved parking area of this parcel.

PICK-UP SYSTEM + PROCESS

PICK-UP SYSTEM RESEARCH

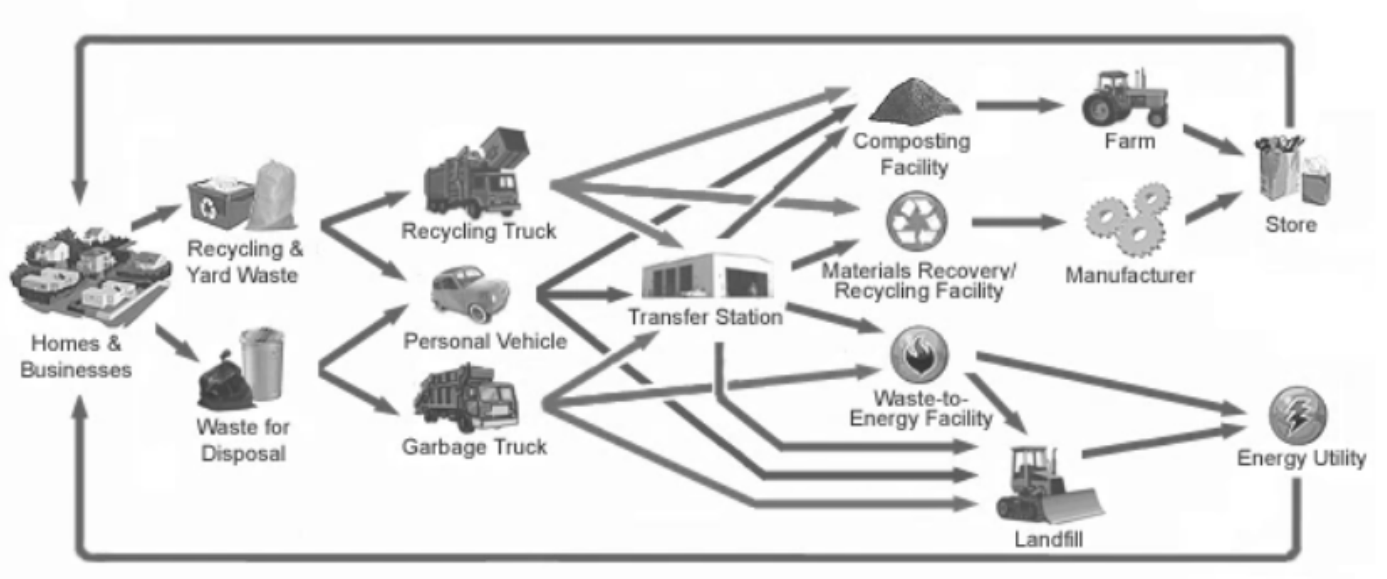
Geographically, the Town of Geneva is oblong in shape stretching nearly 10 miles along the North-South axis. In order to accommodate the furthest corners of the Town of Geneva's area, our team sought to create a mobile pick-up service given a transfer station located in the central area of the Town. This extension service responds to the needs of the Town, and is thus designed to have easily scaled operations.

Mobile waste management falls into two categories: hauled services and stationery services. Hauled services use secondary storage containers to collect and transport waste to processing stations or disposal sites, like curbside pick-up. Stationary services keep waste containers at the point of generation, except for collection, such as commercial dumpsters. Hauled services typically use smaller containers, while stationary services use larger ones.

Hauled services provide convenience, especially for the elderly population, and maintain sanitary conditions by preventing trash accumulation. However, they are costlier due to operating expenses and labor. Large dump trucks used in hauled services pose environmental concerns on narrow roads that are common in the Town of Geneva.

On the other hand, stationary services are advantageous when considering larger and unwieldy items. Due to its size, there is a higher flexibility regarding the waste material in the container. As such, the stationary services are generally more applicable to both residential and commercial waste requirements. The disadvantages, however, emerge from the stationary service's labor requirements. Without a dedicated collection service, residents and commercial users bear the burden of depositing their own trash to the storage container. However, this in turn results in a highly affordable waste management alternative which could be viewed as an advantage.

Using trailers in waste management offers flexibility as they can be mobilized or detached to remain stationary. An attachment apparatus enhances compatibility with a wider range of vehicles, making it an innovative alternative to hauled and stationary services.



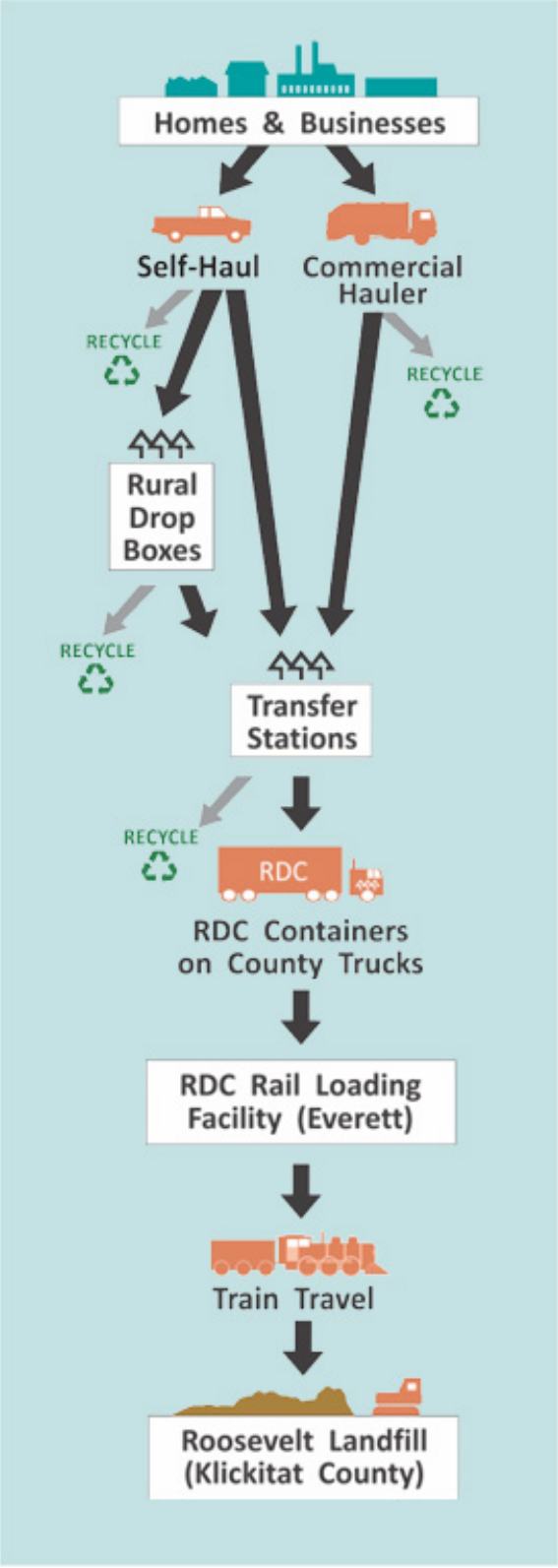
Flow diagram of an example waste management system.

CASE STUDY (PICK-UP SYSTEM)

The use of a mobile pick-up/collection service is associated with larger scale transfer stations that serve multiple municipalities. For example, the waste management system at Snohomish County in Washington State not only has multiple transfer stations, but also multiple mobile collection sites that support the existing transfer stations. The mobile collection sites in this case are referred to as drop boxes, and are specifically designed to support rural self-haulers.

In Snohomish County there are three drop boxes to support the transfer station operations. These are located at geographically rural locations, which makes sense considering their distance to surrounding transfer stations. On the days when the drop box sites are not in service, the county staff hauls the drop boxes to the main transfer station where trash is processed for waste diversion and landfills. Snohomish County uses commercial dump trucks to haul drop box waste back to the transfer station. This makes sense considering the scale of this operation and its need to support multiple municipalities.

Snohomish County's waste diversion infographic provides helpful insight into how rural drop boxes can be integrated into a systems-oriented design approach. Drop boxes help support self-hauling homes and businesses by providing a convenient alternative to transporting trash to the transfer stations. Snohomish County's waste management operation clarifies the ways in which we must consider the needs of all residents in a municipality, particularly those geographically excluded from central activity.



Flow diagram from Snohomish County example.

DESIGN PROGRESSION

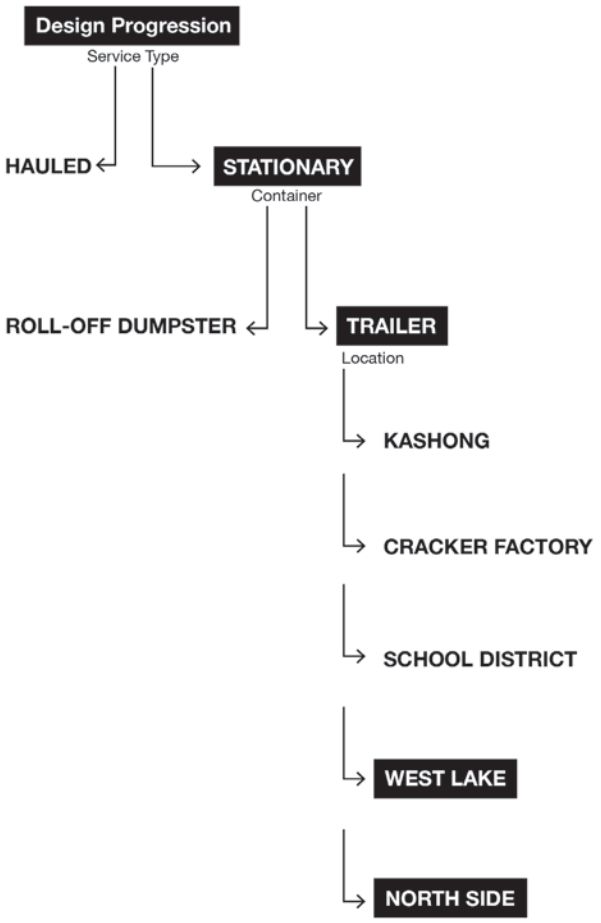
The design of our pick-up system relies on two main components: the method of collection and the pick-up location sites. Our team approached this design challenge through a systems-oriented mindset with an emphasis on integrating the pick-up service into the overall waste management system in the Town of Geneva. Moreover, community engagement and collaboration with the Town of Geneva project partners heavily influenced our design consideration, particularly relating to the pick-up location sites.

The first major design decision was regarding the service type. After considering advantages and disadvantages to the hauled and stationary services, we decided to use a stationary service due to its potential for flexibility, affordability, and ability to divert waste. The community survey which saw affordability being the most important factor in waste management, as well as the majority of the respondents' willingness to recycle waste supported this decision.

For the container used at stationary pick-up site locations, we opted for a Pro-Tainer Pro-Gravity recycling trailer based on its capacity to divert waste as well as its flexibility in regards to vehicle compatibility. We see this as an opportunity to reduce the environmental damage on small rural roads caused by large trash trucks. While a roll-off dumpster has the size to accommodate larger, unwieldy items, it cannot compartmentalize its container to sort and divert waste. Waste diversion is crucial to fulfill the sustainability goals of the Town of Geneva, therefore, we saw the roll-off dumpster's inability to divert waste as a critical drawback. Furthermore, roll-off dumpsters would likely require a rental from private companies. While short term this may be cheaper compared to the upfront cost of a trailer, roll-off dumpsters would ultimately be more expensive in the long run due to fixed rental costs.

Based on the community surveys, respondents expressed interest specifically in North-end and South-end pick-up locations. Furthermore, currently 55% of respondents are interested in a combined pick-up/drop-off service. These findings, in addition to recommendations by project partners, clarified five different potential locations. After conducting substantial mapping analyses to consider factors like parcel ownership, environmental conditions, residential concentration, and service area, we concluded that the North Side Fire Company, Inc. and West Lake Road Fire Department Association, Inc. lot were the most suitable choices for a trailer site.

Ultimately, our pick-up system design prioritizes flexibility and implementation into the existing transfer station system. By analyzing street width between the transfer station and the two pick-up sites as well as distance, we measured the optimal pick up route that a vehicle might take to deposit loaded trailers back to the transfer station. Furthermore, the number of trailers and the frequency with which they are returned to the transfer station can be easily scaled to reflect the needs of the Town.



MAPPING ANALYSIS

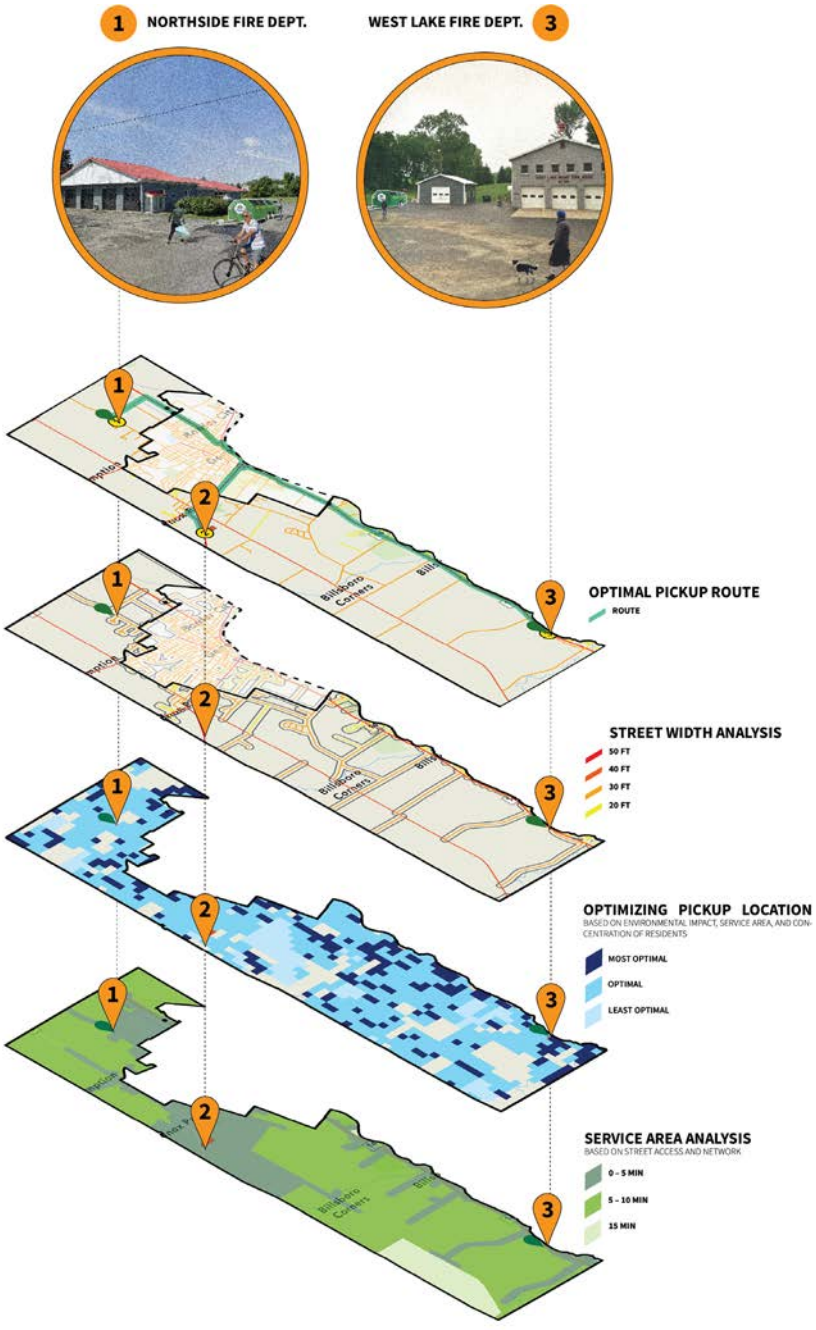
The placement of the pick-up system must be strategically justified. Compared with the main transfer station, the pick-up system is mobilized and flexible in operation and maintenance. The Town of Geneva strives to tackle the existing state of materials management while also nurturing the long-term advancement of the new system. Therefore, mapping analysis in GIS is the premise of our proposals and future development. Our mapping analysis included the development of 3 key analyses - network analysis, suitability analysis, and street width analysis - to optimize the pick-up system route, prioritize pick-up locations, and target areas with vulnerable roads.

FINAL SITE PLAN DETAILS

The majority of data, such as soil conditions, street centerlines, building footprint, tax parcels, and more, was accessed through the open-source portal of Ontario County Online Resources (ONCOR). In addition, we were supported by Sheri Norton, the county GIS Coordinator, in locating the modified zoning data for the Town of Geneva and the City of Geneva. Jacob Fox also provided valuable insights on potential locations for the pick-up system.

Using ArcGIS Pro, we visualized the reachable service area of our pick-up system by creating a network dataset based on street centerlines. Suitability analysis was then employed to qualify, compare, and rank candidate sites based on multiple layers. In this case, our team looked for reasonable pick-up locations that were environmentally-friendly and cost-efficient. Soil conditions, population density, and zoning layers were the main data sources used in this analysis. We used the zoning and population density layers to determine areas that may have less access to material management services, as well as high density neighborhoods that could be serviced more efficiently by this system. A weighted overlay function was then used to merge these multiple factors to generate the comprehensive suitability analysis.

Finally, the street width analysis was used to justify where the pick-up locations could be located to mitigate road damage. As larger trash pick-up trucks are not accessible on narrow streets, the pick-up locations can serve people who live along narrow roads, preventing future damage or safety issues.



**See appendix for detailed maps.*

PICK-UP SITE SELECTION

The mapping analysis allowed us to employ a data driven approach in determining the most ideal pick-up locations for the proposed decentralized material pick-up system. The network analysis allowed us to understand road access and drive times from the proposed transfer station at the Town Hall site, revealing far flung areas that may experience accessibility issues to material management services. The suitability analysis combined environmental sensitivity, population density, and the established service area to outline more desirable areas for this type of system. The street width analysis was used to target areas with narrow roads that should be prioritized in this system.

Based on these analyses, we determined the North Side Fire Company, Inc. and West Lake Road Fire Association sites as the most viable pick-up locations as they are located at the two far ends of the Town, are near both areas of low and medium population density, are not near any environmentally sensitive areas, and could service some of the most narrow roads in the Town. Using these sites, the team developed an optimal pick-up route for the proposed decentralized material pick-up system.

Pick-up trailer at Northside Fire Co.

Pick-up trailer at West Lake Road Fire Association

TRAILER DETAILS

After identifying the capacity and need for flexibility of a waste pick-up trailer, our team recommends the Pro-Tainer Pro-Gravity recycling trailers, which are medium size four-wheeled trailers that can be attached by normal vehicles such as pick-up trucks or vans. The desired capacity of each trailer would be 3,500 pounds maximum. Because the pick-up system requires frequent pick-up and drop-off at the proposed transfer station, the capacity should not exceed the daily needs of surrounding neighborhoods. Besides, frequent pick-up and drop-off services require flexible trailers that can access narrow streets in the Town. The measurement of the pick-up trailer should not exceed the pavement width of streets, which is 30 feet in the Town of Geneva.

Compared with roll-off dumpsters, the trailer functions as the material classifier, which can classify daily items into different sections. As residents approach the proposed pick-up site, they could dump their materials accordingly, and workers could save time loading the containers. This will also produce a more valuable end product when it comes to recyclables and compost.

Pick-up trailer with Town of Geneva inspired mural.

USAGE DAYS AND TIMES

One of the greatest advantages to using pick-up trailers is that they are highly flexible due to their maneuverability. This is particularly important because then the number of pick-up trailers as well as the scheduled uses can scale based on the needs of the residents. For example, if the pick-up trailer is lightly used then only one pick-up trailer could serve both the North and South ends of the Town of Geneva by dividing the week between the two locations. The trailer could remain stationary for the first half of the week on the North end, while the other half of the week the trailer remains stationary on the South end. This means that the trailers will only have to be returned to the transfer station twice a week. We recommend that the trailers are returned following the same Wednesday and Saturday schedule the current Town of Geneva transfer station operates on.

Such an operation can be easily scaled to include two trailers. If, for example, the number of residents depositing trash at the pick-up sites doubles, then the number of times the trailer has to deposit its load at the transfer site doubles. This could result in a system that has the trailer remain stationary at the North end for the first and third quarters of the week, and remain stationary at the South end for the second and fourth quarters of the week. Alternatively, the number of trailers could also be doubled to account for the higher quantity of materials, decreasing the amount of return trips the pick-up trailers would have to make.

As the transfer station plays a higher and more significant role in waste collection following the closing of the Ontario County Landfill, we speculate that pick-up locations will be used more frequently. However, these are only speculations. We recommend that the actual needs of residents should determine the pick-up system's operation. As such, the decentralized material pick-up system we propose is incredibly flexible and dynamic.

COST ESTIMATES

Fixed costs are expenses that remain constant regardless of the production level. In the context of the pick-up system, the trailer expense represents a fixed cost. The trailers could be purchased as assets, and the quote will be roughly $13,000 for each trailer. On the other hand, variable costs are expenses that fluctuate based on the level of pick-up service. As the frequency of the pick-up service increases, the variable costs also rise. For the first phase, which extends until 2028, the pick-up system will initially operate with one trailer, disposing of waste once a week. The estimated weekly total cost amounts to approximately $550. Specifically, the estimated cost of regular cleaning and maintenance would likely be $100 per week, the cost of fuel for the pick-up trailer might be $50 per week, and finally, the inspection cost and training cost could cost up to $400 per week.

As an environmentally-friendly pick-up system, the maintenance of the pick-up system includes cleaning and waste management. Regular inspection of the pick-up trailer is required to check the possibility of leaks or internal damages. Additionally, proper loading and cleaning techniques are required to prevent the spread of disease and injuries. To reduce the total variable costs, the worker who operates and inspects the pick-up system could be the same person working in the proposed transfer station.

Pickup System Cost Estimate Table				
Type of Cost	Trailer Purchase	Regular Cleaning & Maintenance	Fuel	Worker Inspection & Training
Amount	$ 13000/Each	$ 100/Week	$ 50/Week	$400/Week
Total Cost	Fixed Cost $13,000 + Variable Cost $550 per week			

Pick-up trailers pulled by pick-up trucks are considerably lighter than large commercial garbage trucks.

CONCLUSION

FINAL RECOMMENDATIONS

Below are our final recommendations and suggested next steps based on our collaboration with project partners Mark Venuti and Jacob Fox, team research, community engagement processes, transfer station design iterations, and decentralized material pick-up system conceptualization:

- Conduct an in depth comparison of the Geneva Town Hall and shopping plaza sites.
    - This report provides an initial comparison outlined as pros and cons of each site, but deeper analysis should be undertaken to understand differences in project costs, timelines, construction considerations, available funding sources, and specific environmental impacts associated with the potential development of an upgraded transfer station at both sites.
- For the proposed decentralized mobile pick-up system, the Town of Geneva should consider purchasing Pro-Tainer Pro-Gravity recycling trailers.
- Prioritize the North Side Fire Company, Inc. and West Lake Road Fire Department Association, Inc. as decentralized mobile pick-up system locations.
- Give precedence to the construction of the drop off and reuse centers for the proposed upgraded transfer station.
- Consider collaborating with Finger Lakes ReUse and other regional resource recovery organizations to learn more about retail best practices, material storage, internal operations, workforce considerations, business models, and associated programming that could help shape a reuse center in the Town of Geneva.
- Identify and build relationships with local partners for recycling materials, especially hard to recycle materials or niche items.
- Continue community engagement efforts and offer additional opportunities for input and feedback.
- Utilize resources provided by Design Connect to facilitate discussions about these initiatives with municipal and county leaders in the City of Geneva and Ontario County at large.

NEXT STEPS

1 SOLICIT FEEDBACK FROM RELEVANT STAKEHOLDERS

2 FURTHER EVALUATE IMPLICATIONS AND COSTS OF EACH PROPOSED SITE

3 DEVELOP A PROJECT TIMELINE

4 APPLY FOR GRANT FUNDING

CURRENT

1 CURRENT TRANSFER STATION
Located on, 32 White Springs Rd, roughly 70% of town residents have used the transfer station in some capacity.

2 CURBSIDE COLLECTION SERVICE
However, roughly 30% of the town still relies on pickup services. Of this population, 50% used Lyons Rd Trash, while 40% reported using Casella.

3 ONTARIO COUNTY, NY LANDFILL
The majority of Geneva's waste is consolidated into Ontario landfill, a 389 acre development. Due to its high operation costs, this waste management option poses a threat to affordability, a factor which 54.1% of town residents saw as the most important in waste management.

2023 PHASE 1

4 CORNELL UNIVERSITY DESIGN CONNECT
In collaboration with the Town of Geneva, Design Connect seeks to expand the Transfer Station to provide an affordable, and environmentally friendly alternative to waste management.

5 TOWN HALL TRANSFER STATION
Our team proposes a new transfer station located at the Town Hall, a site which almost 90% of Geneva Residents found convenient.

6 WASTE DIVERSION
The current system relies on the Ontario Landfill to divert nonrecyclable waste, which accounts for roughly 60% of material at the Transfer Station.

PHASE 2 2028

7 ONTARIO LANDFILL CLOSES
In 2028, the Ontario Landfill will close. Residents using curbside services will experience exponentially higher costs as waste is transported to farther locations.

8 NEW LANDFILL
A new landfill is constructed, posing a threat to the environment as well as the cost of waste management to Geneva residents.

9 WASTE DIVERSION
The current Transfer Station recycles 40% of material, some of which is returned to the community. 48% of residents have reported participating in Free Stuff Day. Our proposed transfer station will increase this capacity.

10 HOUSEHOLD WASTE
Household waste will continue to be produced.

PHASE 3

11 MOBILE PICKUP SERVICE
An extension of the proposed Transfer Station, a pickup service using trailers is implemented to serve residents farthest from the Town Center.

12 PICKUP SERVICE EXPANSION
Currently, 55% of residents are interested in pick up/drop off service. As interest grows, our team proposes using more trailers based to expand this system and accomodate for more residents.

13 FOUNDATION FOR A CIRCULAR ECONOMY
With a new Transfer Station, our team ultimately hopes to provide a foundation for a sustainabile and environmentally conscious circular economy. While household waste is inevitably produced, we hope that it can be recycled back into the Town through either Free Stuff Day, new composting facilities, or a discounted shop containing restored items.

THANK YOU

UPGRADING THE TOWN OF GENEVA TRANSFER STATION

SPRING 2023

DESIGN CONNECT
FINAL REPORT

Cornell AAP
Architecture Art Planning

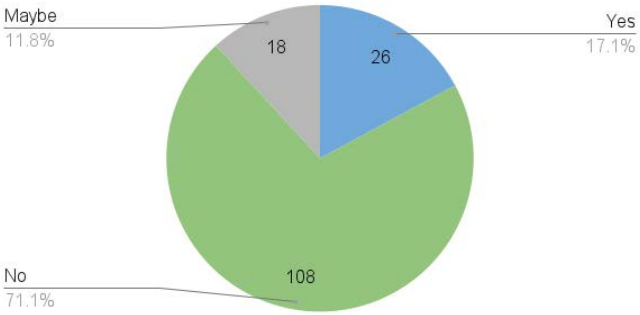
DESIGN CONNECT

For information about this specific project - Town of Geneva Supervisor Mark Venuti: supervisor@townofgeneva.com
For information about Design Connect: designconnect@cornell.edu

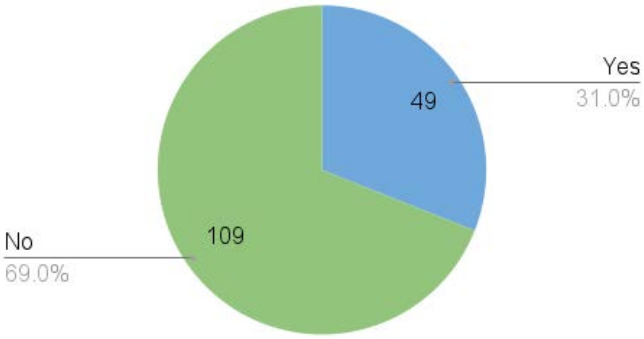
APPENDIX

FULL SURVEY RESULTS (1/2)

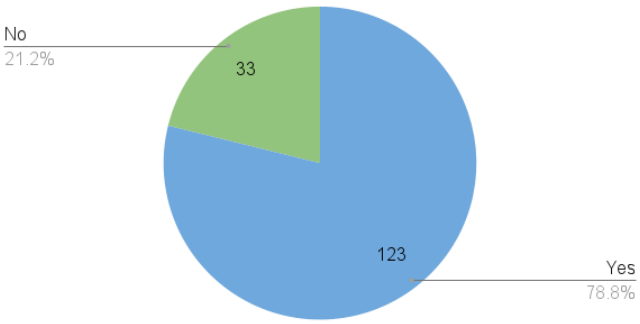
Are you interested in helping your neighbors bring their waste to a central drop-off location?



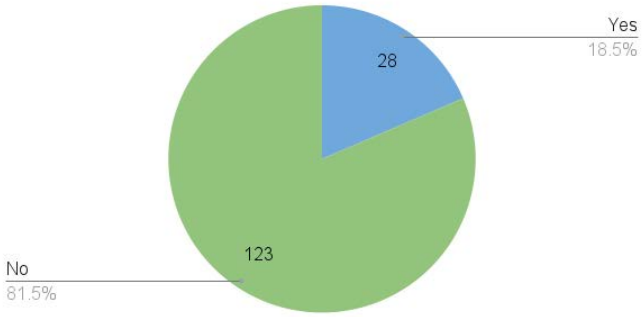
Are you using a pick-up service?



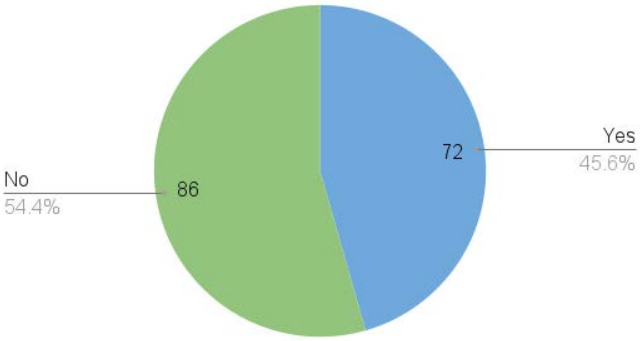
Did you know that the Town transfer station will accept all of your waste (up to 2 bags of trash per week and unlimited recycling) for



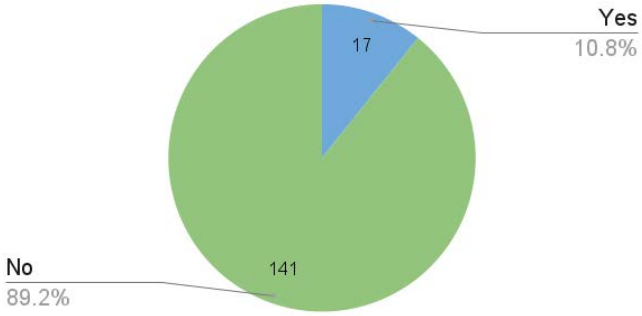
Do you have things that you want to donate/dispose of but need help moving?



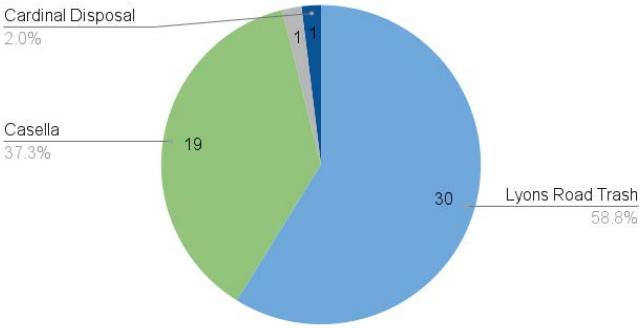
Have you participated in a Town free stuff day?



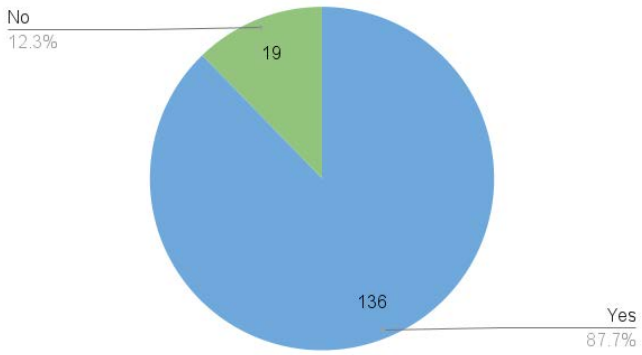
Have you recently paid a trash hauler for the pick-up or disposal of bulky items?



If you use pick-up, which company do you use?

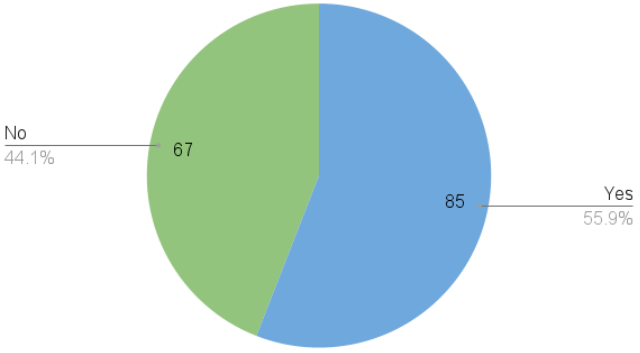


The Town of Geneva is considering creating an improved transfer station near the Town Hall (3750 County Road 6).

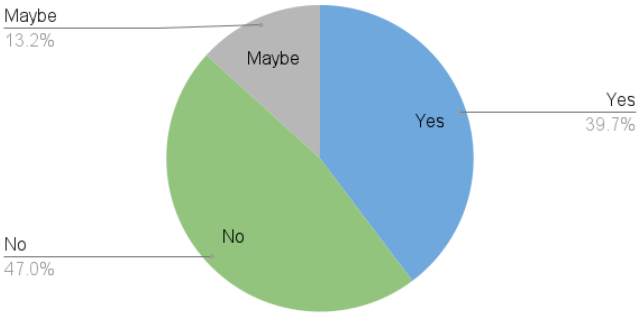


FULL SURVEY RESULTS (2/2)

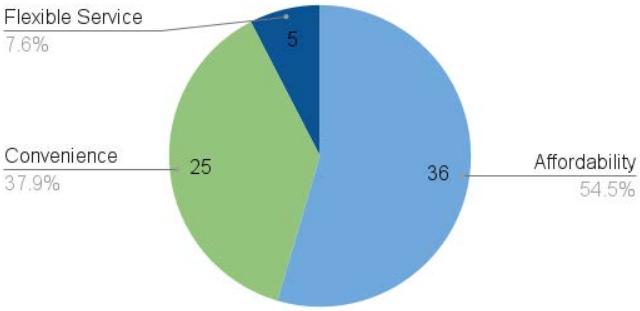
Would you be interested in having a combined permit that enables you to drop waste at the transfer station and have



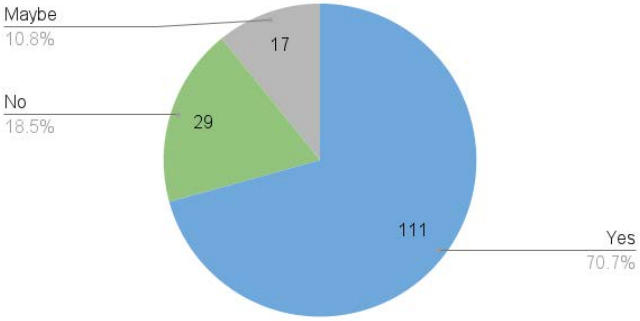
Would you be interested in bringing your waste to a neighborhood drop-off area on a weekly basis for collection?



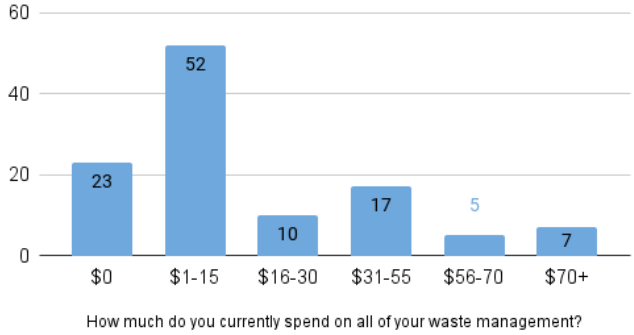
What was the most important factor when selecting a pick-up service?



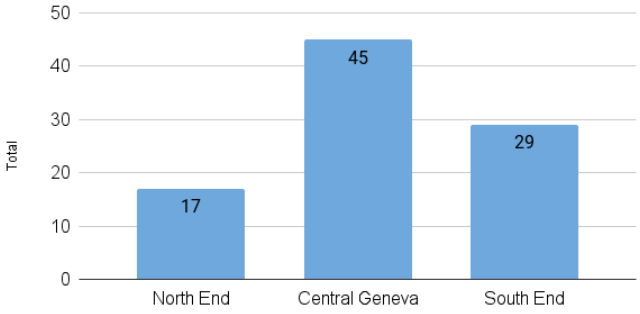
Would you be willing to sort recyclables like glass, paper and cardboard into separate containers instead of all together if it made



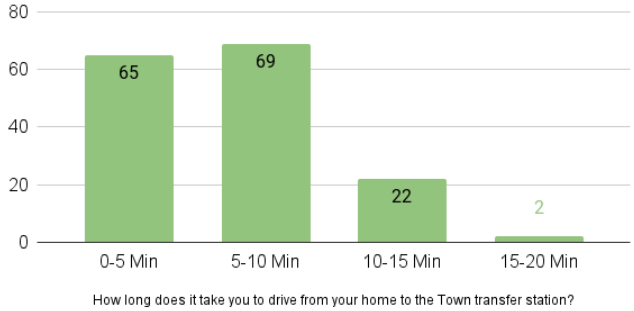
How much do you currently spend per month on all of



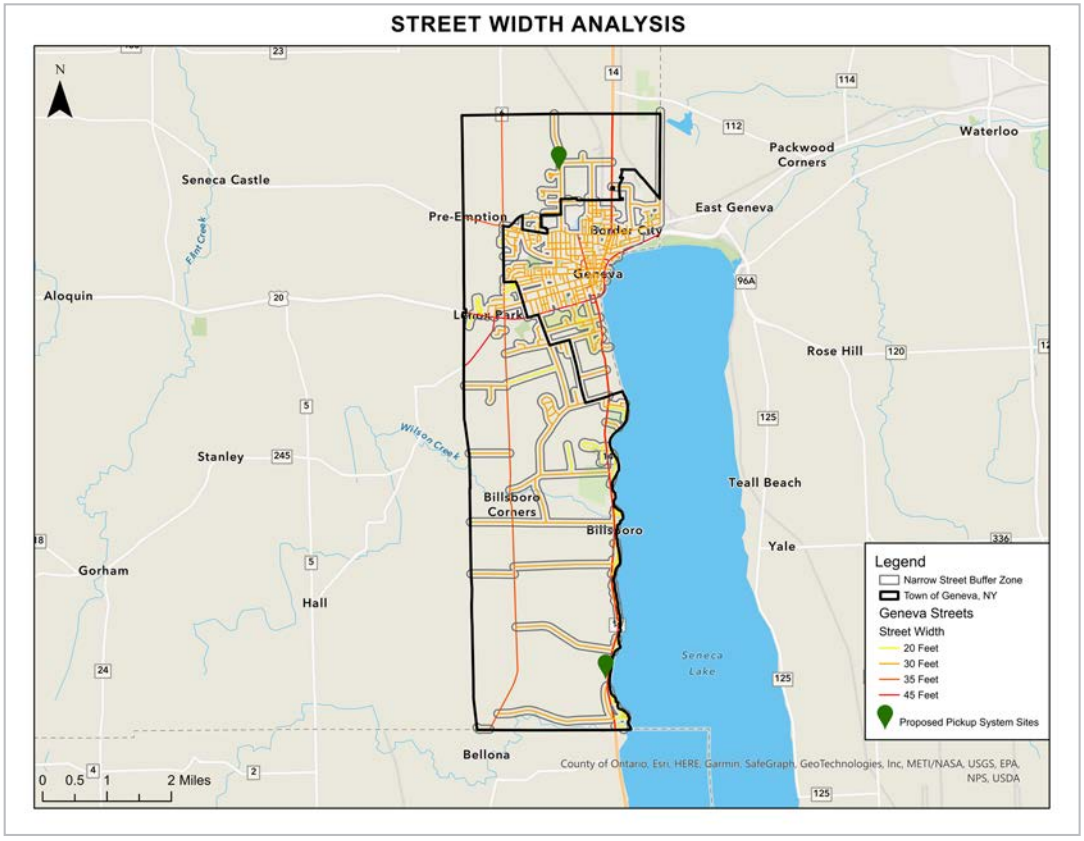
What area would be most convenient for you to drop-off your waste?

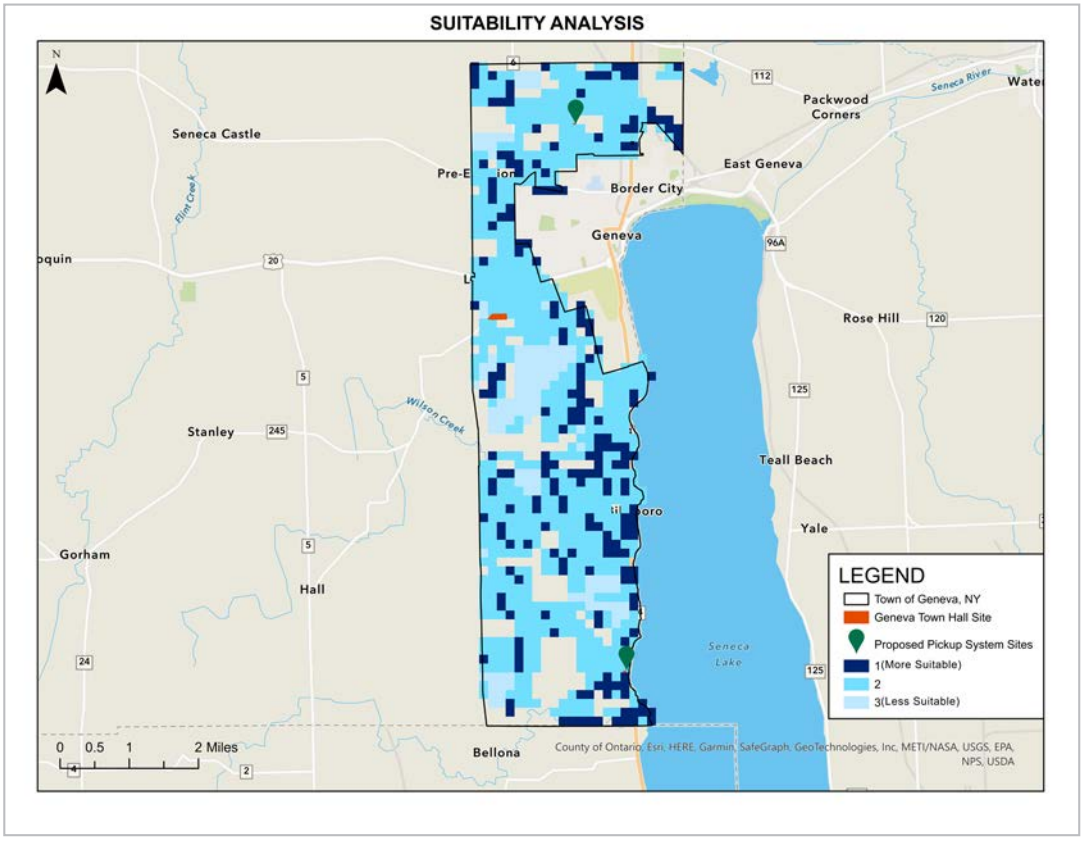


How long does it take you to drive from you home to the Town transfer station?

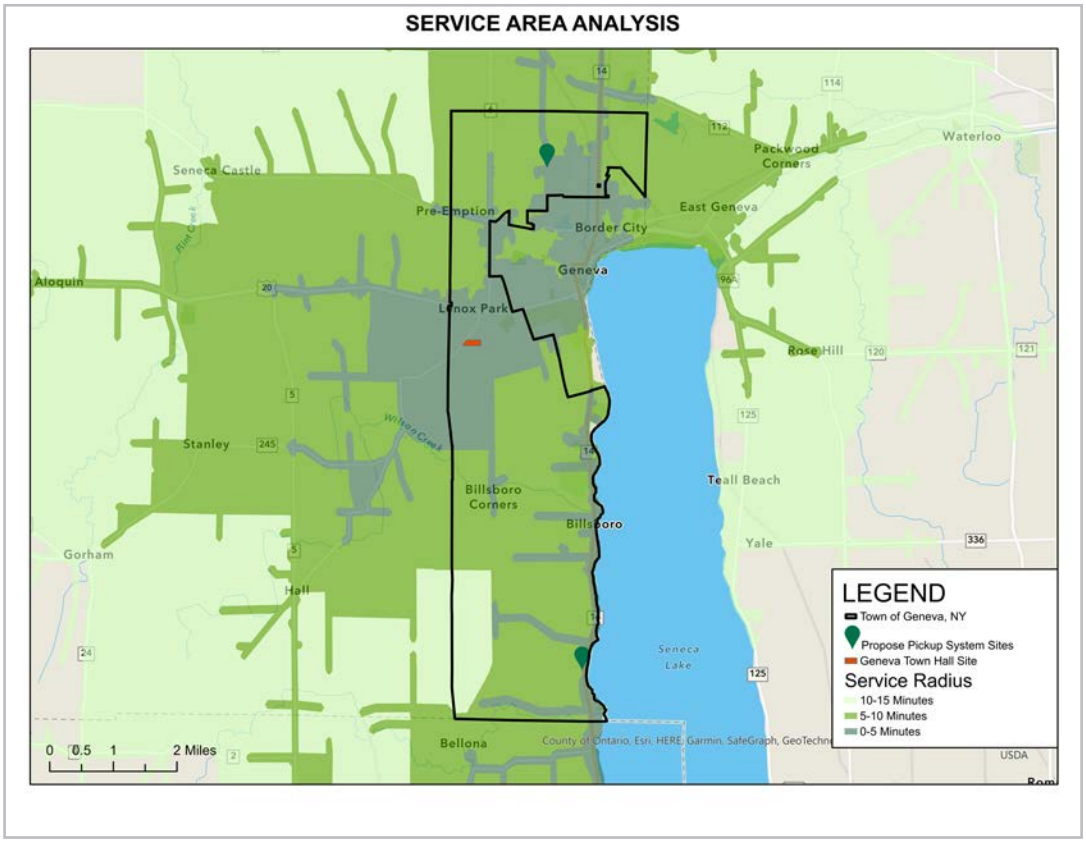


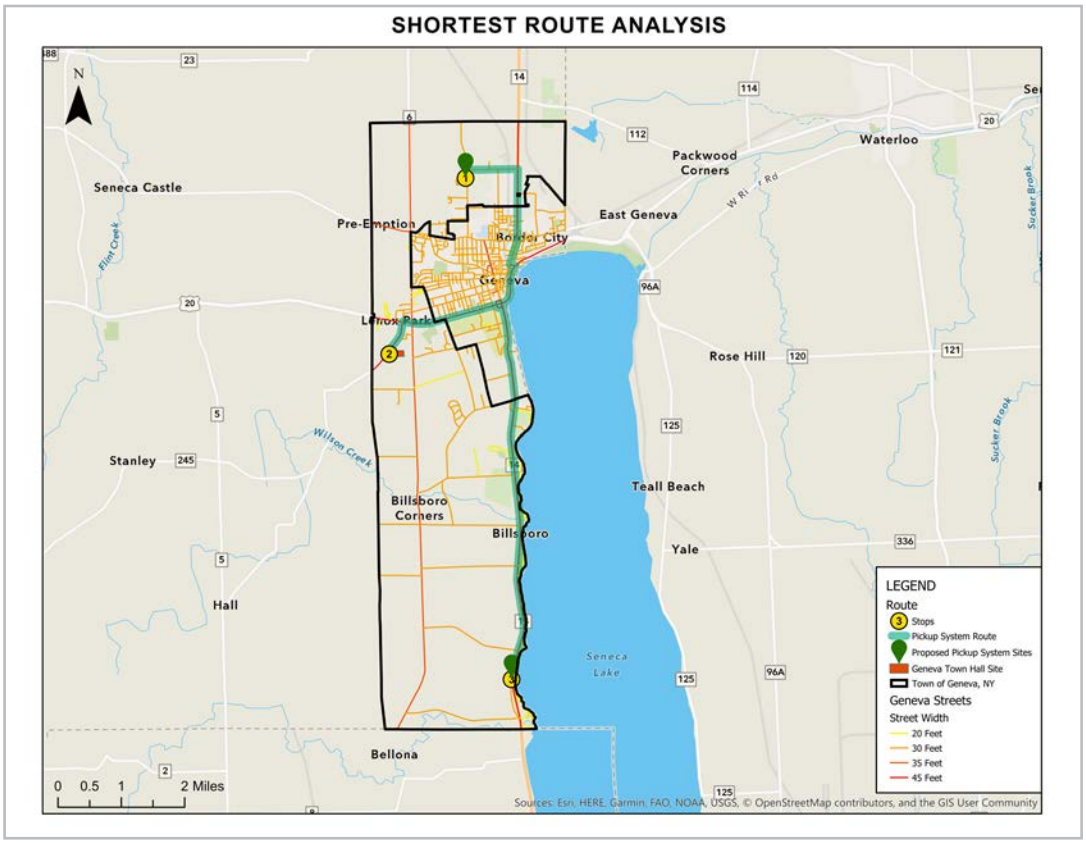
FINAL MAPS


STREET WIDTH ANALYSIS
N
Seneca Castle
Pre-Emption
Border City
Geneva
East Geneva
Packwood Corners
Waterloo
Aloquin
Lemon Park
Rose Hill
Stanley
Wilson Creek
Billsboro Corners
Billsboro
Teall Beach
Yale
Gorham
Hall
Seneca Lake
Bellona
Flint Creek
Legend
Narrow Street Buffer Zone
Town of Geneva, NY
Geneva Streets
Street Width
20 Feet
30 Feet
35 Feet
45 Feet
Proposed Pickup System Sites
0 0.5 1 2 Miles
County of Ontario, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA


SUITABILITY ANALYSIS
N
Seneca Castle
Packwood Corners
East Geneva
Border City
Geneva
Rose Hill
Stanley
Wilson Creek
Teall Beach
Yale
Gorham
Hall
Seneca Lake
Bellona
Flint Creek
Seneca River
LEGEND
Town of Geneva, NY
Geneva Town Hall Site
Proposed Pickup System Sites
1(More Suitable)
2
3(Less Suitable)
0 0.5 1 2 Miles
County of Ontario, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA

FINAL MAPS


SERVICE AREA ANALYSIS
Seneca Castle
Pre-Emption
Border City
East Geneva
Packwood Corners
Waterloo
Aloquin
Geneva
Lenox Park
Rose Hill
Stanley
Billsboro Corners
Billsboro
Teall Beach
Yale
Gorham
Hall
Bellona
Seneca Lake
LEGEND
Town of Geneva, NY
Propose Pickup System Sites
Geneva Town Hall Site
Service Radius
10-15 Minutes
5-10 Minutes
0-5 Minutes
0 0.5 1 2 Miles


SHORTEST ROUTE ANALYSIS
N
Seneca Castle
Pre-Emption
Border City
East Geneva
Packwood Corners
Waterloo
Geneva
Lenox Park
Rose Hill
Stanley
Billsboro Corners
Billsboro
Teall Beach
Yale
Hall
Bellona
Seneca Lake
LEGEND
Route
Stops
Pickup System Route
Proposed Pickup System Sites
Geneva Town Hall Site
Town of Geneva, NY
Geneva Streets
Street Width
20 Feet
30 Feet
35 Feet
45 Feet
0 0.5 1 2 Miles

COLLECTION BREAKDOWN

Material	Quantity and Collection Receptacle	Image	Notes
Bagged, unsorted municipal solid waste (garbage)	(2) Roll-off dumpster compactor (already owned by town)		
Corrugated Cardboard	(1) Roll-off dumpster compactor (already owned by town)		Valuable to bale and sell on market
Glass bottles(?)	(1) recycling roll off dumpster		Best way to ensure glass bottles are collected
Aluminum Cans / Glass Bottles / Plastic Bottles	(1) recycling roll off dumpster		Picked up regularly by the local little league to sort and return for the deposit
Paper products	(1) recycling roll off dumpster		
Scrap Metal	(1) Open top dumpster (under a roof)		

COLLECTION BREAKDOWN

Construction and Demolition waste	(1) Open top dumpster (under a roof)		
Reusable construction materials	(1) maybe part of the reuse center drop off? Maybe its own building?		https://www.gobroomecounty.com/solidwaste/eco-center-building-materials-reuse
Reusable items (clothes, housewares, furniture, working appliances, bikes, etc.)	(1) Reuse center drop off area		Should be connected to reuse center
Household hazardous materials (cleaners, paint, solvents, etc.)	(1) Area within the reuse center drop off - Two areas, one for useable and one for waste		https://landfill.countyofdane.com/services/clean-sweep/hazardous/exchange
Yard trimmings (branches, leaves, grass etc.)	(1) Concrete push area		

POSSIBLE GRANTS

Climate Smart Communities Grant Program

- *The Climate Smart Communities (CSC) Grant program was established in 2016 to provide 50/50 matching grants to cities, towns, villages, and counties of the State of New York for eligible climate change mitigation, adaptation, and planning and assessment projects including food scraps and recycling diversion as well as organics management plans municipal refrigerant management plans, construction and demolition waste policies.*

Grants for Waste Reduction and Prevention Projects

- *DEC is authorized to provide State assistance for projects that further the primary strategy of the NYS solid waste management hierarchy. A waste reduction/prevention project reduces the volume or toxicity of materials entering the MSW stream at the point of generation.*
- *These projects include:*
    - *Educational efforts that prevent the generation of waste*
    - *Materials reuse*
    - *Promotion or use of refillable or reusable packaging*
    - *Audits of procedures and practices, resulting in the elimination or reduction of materials disposed*
    - *Increasing awareness of non-toxic household product substitutes*
    - *Promotion of backyard or on-site composting*
    - *Promotion of product stewardship initiatives.*

Grants for Recycling Capital Projects

- *DEC is authorized to provide State assistance for projects that enhance municipal recycling infrastructure through*
    - *Construction materials recycling facilities*
    - *Construction of composting facilities*
    - *Purchasing of recyclables processing equipment*
    - *Purchasing of recycling containers, and*
    - *Purchasing of new recyclables collection vehicles*

Grants for Recycling Coordination and Education Projects

- *Eligible projects for state assistance under this program include planning, educational and promotional activities to increase public awareness of and participation in waste reduction and recycling. Municipalities may request funding toward costs for recycling coordination, publications, education and outreach for recycling and waste reduction.*

Grants for Household Hazardous Waste (HHW) Programs

- *DEC is authorized to provide grants for HHW collection programs in order to provide a safe alternative for recycling or disposal of household hazardous materials.*