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Senior Honors Thesis
Interdisciplinary Studies in Urban Planning
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April 21, 2017

Reinventing the Gelly: Proposal for adaptive reuse of the Atlantic Gelatin Plant in Woburn, Mass.

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Overview:

This thesis proposes several ways for the small city of Woburn, MA to adaptively reuse a large manufacturing center in East Woburn that closed in January 2016. The manufacturing center, commonly referred to as the Atlantic Gelatin plant or "the Gelly," is currently owned by the Kraft Heinz Company and had produced gelatin and flavoring products for 97 years. The main site spans 57 acres, with 23 additional acres owned by Kraft Heinz as well. Over half of the property is currently undeveloped, forested land, with the rest dotted with various manufacturing and industrial buildings.

I begin with an explanation of what drew me to this specific site in this specific community, highlighting the ways in which Woburn is similar to and different from the other suburban communities with which I'm familiar. I then go into a discussion of Woburn's history, specifically its environmental and industrial history beginning around the time of the Industrial Revolution. I note the ways in which Woburn has embraced its history as part of its own distinctive culture, sometimes selectively emphasizing only certain aspects of its history. I pay particular attention to the water contamination crisis that affected Woburn in the 1970s and 1980s,[i] and how the city seems reluctant to acknowledge this aspect of its history considering its scant mention in an otherwise comprehensive book about the city's history and its omission from an exhibit about Woburn's tanning industry at the Woburn Historical Society.

Subsequently, I go into details about the Atlantic Gelatin plant, explaining its long history in Woburn as well as its economic, social, and environmental significance for the city. This part of the paper draws extensively from a film produced by the Historical Society about the Gelly and from interviews with former plant workers. I try to trace the ways in which the work

environment at the plant changed over time, for better and for worse, especially as management shifted hands, and show how these changes relate to national and international economic trends.

Based on the history of the plant and of Woburn, I then propose how the plant could be adaptively reused, arguing that adaptive reuse of the plant into a locally-based business and community center with ample green space is the most environmentally, socially, and economically sustainable option. Specifically, I envision the Gelly being transformed into an indoor urban agriculture center featuring multiple food-producing businesses as a way to bring back Woburn's historic agricultural base and to employ people in the area. I also call for the establishment of community gardens outdoors and an educational center in other parts of the existing structure that teaches visitors about the history of the site and its new use for indoor agriculture. A farmer's market could also be established outdoors, including other local businesses in the area. Phytoremediation techniques could be employed to clean up some of the soil on the site and turn parts of the undeveloped land into a public forested area maintained by the city's conservation and/or recreation commission, perhaps with help from volunteers as well.

Aside from my ideas for reuse, my proposal includes some housing (approximately 50 multi-family units) in a separate part of the site, with 30% of that housing designated as affordable. These homes would not necessarily be constructed from the adaptive reuse of the buildings, as they would be located closer to some of the other homes nearby. In sum, I argue that this vision best fits the needs of Woburn, which is currently undergoing demographic changes (becoming much more racially diverse), deindustrialization, and gentrification. It also provides a local solution to some of the issues associated with current planning practices in the United States, which are often environmentally unsustainable, segregate people of different socioeconomic and racial backgrounds, and mandate the use of cars.

Methods:

My arguments for adaptive reuse are based on several concepts: environmental sustainability; enhancing Woburn residents' sense of place, history, and community; and strengthening the local economy through the creation of stable, well-paying jobs for people from different socioeconomic and educational backgrounds, much like the ones previously available at the Gelly. To this end, I make several assumptions: 1) that environmental sustainability is an important concept that planners must incorporate into developmental decisions at the local level; 2) that the needs of economically struggling members of society must be considered in planning decisions, especially given the decline in job opportunities and social and government programs for working class and working poor people at the local, regional, and national scales, and; 3) that an understanding of a community's history allows planners to make more informed decisions for that community that strengthen the community's local pride and social capital. Throughout this paper, I strive to convince readers that these assumptions are logical and appropriate.

Adaptive reuse refers to the reclamation of sites and buildings—usually industrial or manufacturing sites, but not exclusively so—that were originally built for a specific purpose, but are no longer in use. The concept aims to preserve the structure and integrity of the original site for a new purpose that suits the evolving needs and desires of the surrounding community.[ii] A famous example of adaptive reuse is the Tate Modern Art Museum in London, which was formerly an electricity generating station. Often, abandoned sites are either demolished entirely to make way for a new development or sit derelict for years. Adaptive reuse offers a more environmentally sustainable approach to these sites and serves as a way to recognize and preserve the historic structure and/or use of the site.

Figure 1: The Tate Modern Art Museum was constructed in a former electricity generating station in London. Image courtesy of tate.org.

One of the biggest contributors to pollution and landfill waste is the building industry. Tearing down a building necessitates energy and landfill space for disposing of the old building materials. Constructing a new building from scratch uses tons of materials and fossil fuels required to produce and transport those materials.[iii] Adaptive reuse can therefore be seen as a way to "reduce, reuse, and recycle" buildings and land. Additionally, the concept aims to solve the environmental problems associated with unused property and land. When large buildings and sites are left untouched for years, they can create environmental hazards, especially when the buildings were used to produce chemicals, energy, food, or other products that required or released potentially hazardous materials.[iv]

A manufacturing and food-processing site such as the Gelly contains toxic pollutants that already have and will continue to contaminate the soil, air, and waterways of the surrounding

area. At this point, city officials and a former potential developer of the site know that the site contains asbestos, PCBs, and fuel oil.[v] The longer the site sits unused, the more these contaminants will harm the surrounding environment, and the more difficult it will be to eventually clean up the site. These kinds of unused sites, often referred to as brownfields, can also have harmful economic impacts, lowering the property values of nearby homes and representing a lost economic opportunity for the community.[vi]

My specific proposal for adaptive reuse is inspired by the successes and failures of adaptive reuse projects of former manufacturing sites elsewhere, some of which I describe in my literature review. In addition, I've interviewed a number of different people from Woburn who have a stake in this topic, including: four former Gelly employees; two representatives from the Historical Society and one from the Historical Commission; two representatives from the city government—a city engineer and the director of the redevelopment authority and planning commission; a couple active community members; and a representative from the former developer of the Gelly. The discussions with former plant workers in particular have revealed what made the Gelly an attractive place to work and how the new use of the site could offer similarly beneficial employment opportunities without compromising the surrounding natural environment. I've also been following city meetings and local news in Woburn, and I attended a recent community forum on race relations and affordability in the city.

However, I faced some limitations in my ability to gather information from city officials. Despite calling and emailing several times, I was not able to reach the alderwoman who represents Woburn's Ward 5, in which the Gelly is located. Nor could I reach the former supervisor of the plant, or even a spokesperson from Kraft Heinz. Additionally, I found that it was not always in my interest to reveal that I was planning to come up with a proposal for reuse

of the site depending on with whom I was speaking. For example, in order to get an interview with someone from Boston-based real estate developer Leggat McCall, which had expressed interest in redeveloping the site, I decided not to reveal that I was planning to come up with an alternative proposal for redevelopment.

Given that my methods are both traditionally academic and involved interviews and informal discussions with community members, I make one more important assumption: that the best planning decisions do not come from a top-down approach, but rather incorporate the experiences and opinions of people who actually live, work, and play at and near the site in question. Planning at the local level offers a unique opportunity to receive more representative input from people who will be affected by planning decisions. I therefore assume that getting input from the public is an essential part of the planning process, especially when it comes to local development projects.

Lastly, though I hope to provide a fair and accurate picture of what is taking place in Woburn, I do not pretend to offer complete neutrality. During my interviews, I certainly listened to any and all ideas regarding Woburn, the Gelly, and the site's future. But in the writing of this piece, I came to my own conclusions based on all of my interviews *and* based on outside research I've conducted, which I strive to support in this paper.

Literature Review:

This is an interdisciplinary project, incorporating multiple fields including environmental science, urban studies, economics, American studies and history—many of which are interdisciplinary themselves. There exist a range of case studies and books discussing adaptive reuse, brownfield redevelopment, and sustainable planning, often drawing primarily from one

field or expertise. Because my paper focuses on a specific site that has not been studied extensively as far as I am aware, I hope to add to the discussion on these topics given the details and circumstances surrounding this site. Most of the literature I've encountered on adaptive reuse looks at the concept as a way to redevelop sites in economically depressed, often rural areas, whereas this site is in a desirable area for development by virtue of its proximity to Boston and to I-93. This paper therefore aims to make a case for adaptive reuse not only as an economic stimulator for economically depressed communities, but as a way to create more equitable and sustainable communities everywhere.

Several case studies have inspired both my methods and my conclusions in this paper. One is Ninian Stein's manuscript of her upcoming book, *Not Your Average Run-of-the-Mill: Combining Archeology and Environmental History to Shape the Future of Factory Sites*. Stein combines the fields of industrial archeology and environmental history to determine the implications and future uses of industrial sites through the case study of the Lebanon Mill Company in Pawtucket, Rhode Island. Though Stein meticulously traces the specific history of the Lebanon Mill Company, she also offers insight for researchers seeking to study similar sites elsewhere. A major component of her approach is to challenge the notion that industrial sites are devoid from the natural environment, noting the pollutants and enduring environmental impacts of the Lebanon Mill that makes it intimately connected to the surrounding ecosystem.[vii]

Stein's vision of these industrial sites as part of the landscape and fabric of a community has been an important framework for my thesis. I obtained as many historical artifacts about the site as I could, including archival newspaper material available at the Woburn Public Library and Sanborn Fire Insurance Maps from the Massachusetts Statehouse that illustrate how the buildings at the Gelly have evolved overtime. Throughout the paper, I note the broader history of Woburn

as a community of immigrants and working class people in the hopes that the city will continue to consider tolerance, diversity, and affordability as the site is redeveloped. These approaches were inspired by Stein's incorporation of environmental, industrial, social, and local history into adaptive reuse; whereas much of the literature on adaptive reuse sticks to strictly technical issues such as what new uses are most economically viable and what contaminants to expect, I follow Stein's footsteps by also studying the broader history and current state of Woburn in order to make a proposal that serves the needs of community members, both old and new.

In addition to Stein's appreciation for the local histories of industrial buildings and their surrounding environments, my methods also draw from Maynard Seider's analysis of another New England industrial site as a way to understand flawed national and international policies. Seider, a professor of sociology at the Massachusetts College of Liberal Arts, studied a large mill in rural North Adams, Mass. *after* it had been repurposed. His feature film, *Farewell to Factory Towns* (2012), examines the differences between the former role of the mill as an employer of nearly 25% of North Adams residents for decades and the current economic role of the modern art museum, known as MASS MoCa, into which the mill was transformed in 1999. The film questions whether "creative" uses of former industrial sites can revitalize struggling communities, concluding that individual redevelopment projects cannot make up for national policies that fail to help working class and working poor people.

Just as manufacturing jobs began leaving the United States in high numbers in the late 1970s,[viii] Seider argues, federal government programs that were intended to help low-income, unemployed, or displaced workers were cut. President Reagan ended the decades-long war on the poverty in the 1980s, President Clinton established new restrictions on welfare and turned against labor unions in the 1990s, and the passing of the North Atlantic Free Trade Agreement in

1994 led to the loss of many factory, working class and unionized jobs in the United States.[ix] Today's presidential administration is intent on cutting more welfare and aid programs as well.[x] Perhaps partly in response to these continuing trends, Seider points out that many New England communities have shifted from manufacturing to tourist-based economies through projects like MASS MoCa. However, he argues that these projects have not been able to solve persistent poverty or growing inequality in these communities. Anthropologist Cathy Stanton draws a similar conclusion in her book *The Lowell Experiment*, which argues that Lowell's adaptive reuse of mills as part of the city's efforts to reinvent itself starting in the 1970s has not directly benefited those in the city who are struggling the most.[xi]

This economic and political context has been helpful for me in determining a new use for the Gelly that serves the needs of the people who are already in Woburn, rather than one that explicitly tries to attract tourists or millennials. Though my proposal is unconventional and does not seek to "bring back" manufacturing jobs, it certainly does not aim to "reinvent" Woburn in a drastic way, as local policymakers in North Adams and Lowell aimed to do. Seider's analysis of the shortcomings of MASS MoCa, which created less than half the number of purported new jobs and failed to have the "trickle-down" economic impact on other businesses in town that policymakers promised, reveal the limitations of individual redevelopment projects and the importance of creating something at the Gelly that will directly benefit many people in Woburn of all backgrounds.

Another scholar who elucidates the connections between deindustrialization, globalization, and neoliberalism in New England is photographer and writer Steve Dunwell. His 1978 book *The Run of the Mill* traces the success, decline, and continuing legacy of the New England textile industry through historical analysis and interviews. While Dunwell does not

focus on a specific community in New England, he shows how the industry was able to support much of the region, and then overwork and exploit its workers and ultimately abandon them entirely for other parts of the country with fewer corporate regulations. A similar phenomenon occurred at the Gelly, albeit on a smaller scale. This is why I argue that the reuse of the plant should involve one or multiple businesses that are locally owned so as to foster a positive, neighborly relationship between bosses and workers while producing products that will still be in demand in the region for the foreseeable future (such as food).

A counterargument to this point, of course, is that such businesses are not economically viable, nor are sustainable policies such as conservation of natural resources, the reuse of buildings, or even sustainable approaches to decontamination. But several studies have found that sustainable development practices can have economic benefits for developers and cities, such as increasing property values. For example, Mark E. Hostetler's *The Green Leap: A Primer for Conserving Biodiversity in Subdivision Development* (2012) discusses alternative approaches that developers should embrace for both environmental and economic reasons. Hostetler points out that healthy natural areas facilitate tourism and recreation and that preserved natural areas can help developers sell homes.[xii]

Similarly, Ioan Voicu and Vicki Been's 2008 article "The Effect of Community Gardens on Neighborhood Property Values" finds that community gardens, especially in lower-income neighborhoods, have significant positive effects on property values, especially within 1,000 feet of gardens. Using data from New York City community gardens, the article found that this positive impact increases over time. The article also draws from other studies, such as B. Bolitzer and N.R. Netusil's "The Impact of Open Spaces on Property Values in Portland, Oregon" (2000), which found that proximity to open space increased the cost of homes in Portland. Been and

Voicu's article also notes another study, "Metamorphosis: Documenting Change" (2006), which found that median rent and housing costs went up in the immediate vicinity of community gardens in St. Louis, based on data from 54 community gardens in the city.[xiii]

Because part of my proposal for reuse argues for inclusionary zoning (IZ) as a way to devote some of the housing built on the site to affordable housing, I've also studied the impacts of such zoning policies, which are increasingly common in Massachusetts and other parts of the country. The overall impact on the housing market of IZ, which typically allow developers to bypass certain zoning restrictions if they sell a percentage of the housing units they construct at a below-market rate, points to a few differing conclusions. For example, Jenny Schuetz, Rachel Meltzer, and Vicki Been's 2010 article "Silver Bullet or Trojan Horse? The Effects of Inclusionary Zoning on Local Housing Markets in the United States" argues that inclusionary zoning in the Boston area has modestly contributed to higher home prices and gentrification, especially when developers are *not* given incentives to offset the reduced number of market rate homes they can sell, but are instead forced to include affordable homes. Their results suggest that IZ "has increased prices and lowered production during periods of regional housing price appreciation," but only by a small amount. They also found that when the regional housing market is soft, IZ has little to no effect on it.[xiv]

Other reports, such as the Lincoln Institute of Land Policy's 2015 report, "Inclusionary Housing: Creating and Maintaining Equitable Communities," found that the impacts of IZ depend entirely on the incentives put in place for developers, how long such policies have been in place in a community or region, and how effectively inclusionary housing projects are overseen by third parties.[xv] LILP's report ultimately illustrated that the exact impacts on the housing market of IZ are difficult to predict. Partially because of the sometimes conflicting and

incomplete literature on this topic, I therefore heavily considered the political context of Woburn in choosing to propose an IZ policy for the housing constructed at the Gelly. Given that Woburn's Ward 5 alderwoman recently vocally opposed an all-affordable housing project in this area of the city, I decided that an IZ policy, rather than an entirely affordable project, is a better solution to Woburn's affordable housing deficit, regardless of potential impacts on the housing market.[xvi]

Introduction:

Woburn, MA is a city, but it doesn't quite feel like one. It's also a suburb of a larger city—Boston—but somehow, it doesn't feel like a suburb, either. It's a community of about 40,000 people, spans 12.9 square miles, and is situated about 11 miles northwest of Boston. When I tell people that I'm writing my senior thesis on this seemingly inconspicuous place, many people ask why. The answer is partly personal, stemming from my childhood, my understanding of the relationship between suburbs and cities, and the types of urban and suburban communities I'd like to see in the future and maybe even live in after I graduate.

Woburn seems to illustrate the great variety between suburbs, the many disparate purposes of different suburbs, and even the changing roles of suburbs in the United States, especially in the Boston area. The differences between it and where I grew up, for example, are much more significant than I would have thought before beginning this research. I spent most of my childhood in the village of Hastings-on-Hudson, NY, a bedroom community of New York City in southern Westchester County. Hastings is a suburb of a major city, like Woburn, and it is about the same distance from the Bronx as Woburn is from Boston. Growing up, I believed that

Hastings was not all that different from other suburbs, and that most suburbs were not too different from it.

But Hastings is a village of 8,000 people, and therefore too small to have a significant local job base like Woburn. This can be illustrated by the fact that it takes approximately 20% of Hastings residents 40-59 minutes to get to work every morning, many of whom commute to New York City. 17% of Hastings residents spend 60-89 minutes getting to work, and more than half of all working residents in Hastings make their commute alone by car, which inevitably has a huge environmental toll in terms of greenhouse gas emissions.[xvii]

In addition to the fact that most people in Hastings work outside of the village, mostly in the major urban center of New York City, those who live there tend to associate themselves with the history and culture of New York City, rather than with a distinct history or culture of the village. I grew up attending Hastings' high-ranking public schools, from Kindergarten to 12th grade. The only local history I remember learning about was the Hudson River's history of pollution and its gradual transition from a highly toxic river flooded with PCBs to one into which we could at least safely dip our feet. The vast majority of the "local" history we learned (which was relatively minimal) was about the history of New York City or of the greater region. My high school American history class, for example, visited the tenement museum in the Lower East Side to learn about European immigration to New York in the 19th century. But Hastings' own economic, industrial, social, and ethnic history? We hardly got any of that in school, as we were raised to have more of a regional identity than a local one.

Perhaps we didn't learn about Hastings' history because many people in the village have families who came from other parts of the country, state, or world. My mom is from the Bronx; my dad is from Virginia. They each moved to New York City in their twenties after graduating

from college. When they decided to have kids, they moved to Hastings, the city's nearest "rivertown." It seemed to them like the ideal place to raise a family, and by the time they were in their late 30s, they could afford to buy a house there. Indeed, the high cost of living in Hastings is arguably one of its most defining features: 24% of households in the village earned over $200,000 in 2014. Again, growing up, my privileged and sheltered self thought this was typical for suburbs.

In addition to its wealth, Hastings is 90% white, making it one of the whitest villages in Westchester County (which itself is 74% white).[xviii] Despite the village's racial homogeneity, the citizens consider themselves left-leaning and artistic. There is a farmers' market most weekends, a yoga studio, a gluten-free bakery, a locally-sourced restaurant, a health foods store, and zero chain stores, restaurants, or fast-food joints. According to Hastings Mayor Peter Swiderski, despite being as wealthy or wealthier than most other Westchester County towns, Hastings has more affordable housing options than all other towns and villages in the county as a percentage of its overall housing stock;[xix] this is less impressive, however, when remembering that Hastings is home to just 8,000 people.

Hastings residents certainly have pride; *The New York Times* has described us as a suburban "hipster" hub,[xx] and many residents embrace this characterization of the village. Residents are also proud of the village's excellent public schools and its commitment to sustainability; Hastings was the first municipality in New York to ban both single-use plastic bags and foam food containers from its stores.[xxi]

But there is something Hastings lacks that I have not been able to confirm using census data. I only know it from having lived there, and I never would have thought much of it had I not started studying Woburn. Hastings lacks continuity, self-sufficiency and an identity based on

shared history. Perhaps it had these qualities at one time, when the village was centered on quarrying, mills, refineries, and a chemical plant, but this industrial history is too far removed from the village consciousness for many residents to know about it.[xxii] By and large, Hastings residents are united by their relatively high social status, their high educational levels and their progressive values, even if those values don't always play out in practice. In fact, Hastings residents have some unprogressive attitudes. As is the case in many wealthy communities, residents often oppose the construction of affordable housing units in their neighborhoods.[xxiii] As a result, most of the village's affordable housing has been built in neighborhoods that are already considered less desirable and less expensive, creating a degree of socioeconomic and racial segregation.[xxiv]

This may be why I don't think about moving back to Hastings later in life. Hastings isn't affordable, it isn't a job hub, and it's hardly an ideal place for anyone but white, upper-middle class families. Someone close to me who grew up in Hastings told me that the village was once much more affordable and had a distinct culture, filled primarily with working class families and artists. Indeed, the village's Hudson River waterfront used to be lined with factories until the last one closed in 1975.[xxv] But today, the village is almost exclusively high-end residential. For these reasons, despite its attractiveness to well-off families, Hastings doesn't strike me as a long-term community for many people, including my family—my mom plans to move out when my brother graduates from college—and myself.

The story of Woburn, on the other hand, reveals a different type of suburb. The late sociology professor Leo F. Schnore, who specialized in urbanization, human ecology, and demography, seems to perfectly sum up its history and place in the Boston area when talking about suburbanization in the United States. Writing in 1963, Schnore noted: "Some suburbs are

literally manufacturing centers, devoted to light or heavy industry … as such, they represent significant centers of employment, drawing workers from other subcenters and even from the central city itself."[xxvi] While Woburn has lost some of its historic manufacturing industries, unlike Hastings, it is still an employment hub, and its residents view the community as more of an independent entity rather than simply a suburb of a larger city. It can be described as an edge city: a newly urbanized community with more jobs than bedrooms, perceived by locals and neighbors as a distinct place as opposed to a bedroom community.[xxvii]

However, Woburn's status as an affordable city and employment hub seems to be in jeopardy since the rising cost of living in the Boston area is starting to catch up to this relatively far out suburb and more of the community is being devoted to the construction of new housing, as opposed to new sites of employment, cultural centers, public services, or recreational facilities. Woburn also just experienced the loss of one of its largest and most significant manufacturing employment centers—the Atlantic Gelatin plant in East Woburn, which operated from 1919 to 2016. While the closing of this plant represents the decline of Woburn's working class history, the future of this 80-acre site presents an opportunity for Woburn to use its history to inform its future, to remain affordable and practical while also becoming more of a livable community.

Though some suburbs, like Hastings, have certain inherent characteristics that make them less practical for middle and lower-income people and less livable overall, Woburn has the opportunity to be a viable, desirable alternative to the center city of Boston for people of diverse incomes. Additionally, given that the city has become significantly more racially diverse over the last 20 years, it is crucial that Woburn provide spaces in which newcomers who are largely of color can meet and interact with the more established Irish and Italian residents to create a

stronger, more cohesive community. These goals, however, can only be accomplished by understanding Woburn's past, celebrating what has attracted and kept many families in Woburn for so long, and reflecting on what could make Woburn a more just, sustainable and livable community in its future.

Chapter One

On the surface, Woburn isn't all that different from Hastings. The city is relatively racially homogenous—81.5% of residents in 2015 were white. But this makes Woburn much more diverse than some of its neighbors, such as Winchester and Stoneham, and certainly more diverse than it was throughout its history as an incorporated town.[xxviii] It is also a suburb of a major city, in this case Boston. But unlike Hastings, Woburn is not a bedroom community; in fact, it is a job hub, and not just for white-collar professionals. As the city's most recent Master Plan from 2005 notes, "Woburn is a regional jobs center with far more jobs in the City than there are residents in the workforce."[xxix] This shows that many Woburn residents have historically worked in Woburn, and many people from neighboring towns have come to Woburn to work as well. Today, about 30% of residents have a commute time between 10 and 20 minutes,[xxx] and city officials pride themselves on the ability of some workers to walk to their jobs.[xxxi]

This makes Woburn relatively unique compared to its immediate neighbors, such as Winchester, Stoneham, Lexington, Burlington, and Reading. In its 2008 MetroFuture report, the Boston Metropolitan Area Planning Council classified Woburn as a "regional urban center," while all of these immediate neighbors were considered "maturing suburbs." The differences between these two categories are significant. The "maturing suburbs" tend to have "a sense of community, safety, high-quality schools, and access to open space," as well as a limited supply

of moderately-priced or affordable housing, according to the report. They also usually require residents to get in their car to go to work in other communities.[xxxii]

Regional urban centers like Woburn, on the other hand, contain "lower-density single family homes … significant populations of immigrants and people of color … higher incidences of crime, underperforming schools, limited access to green space, and other factors that contribute to poorer health outcomes for their residents. Many also have the additional burden of struggling economies, as mills and factories close and residents struggle to fill the economic gap left in their wake."[xxxiii] Woburn displays all of these characteristics in some form or another, and it is undergoing rapid population growth—the number of households is expected to increase by 16% by 2030—and increasing unaffordability.[xxxiv]

In addition, the city stands out from its neighbors for explicitly demographic reasons. Though it is not a low-income community relative to the rest of the country and the rest of Massachusetts, Woburn's median household income in 2015 was $80,266, lower than all of its immediate neighbors except Stoneham. Its residents tend to describe the town as solidly working class. About 59.5% of residents owned their homes in 2015, less than all of its immediate neighbors. 5.6% of residents lived below the poverty line, a rate slightly higher than all of its immediate neighbors. And only 61.7% of residents had attended some college or more, a rate lower than any of its immediate neighbors and than other nearby suburbs such as Medford and Waltham.[xxxv]

Though I cannot find data about how many families have lived in Woburn over multiple generations or how long most people stay in the community, I can say that most of the people I've spoken to from the city—primarily former plant workers or active citizens in either the city government or the historical society, notably all of whom are white—have lived in Woburn

nearly all their lives. Sue Ellen Holland of the Historical Commission, a Tufts graduate, noted that something that makes Woburn so unique—something I noticed early on in my research process because of its absence in Hastings—is the city's retention of families across generations.

"Someone from Tufts asked me once, 'Why is it that people from Woburn tend not to leave?'" Holland said. "And I said, 'I have no idea.' My great-great grandparents on [both] sides lived here. One [pair] came with the Irish, and the other was from England." City residents even have a nickname for those who weren't born and raised in the city: carpetbaggers. To me, that evokes a different picture than Hastings, to which most residents move only when they decide to raise a family.

Woburn was settled in 1640 as part of Charlestown, the first town in Massachusetts, and was initially populated by Protestants and Puritans from Great Britain.[xxxvi] Samuel Sewall's 1868 account of Woburn's history describes the territory that would become Woburn as a "wild, unsettled state of the country" and an "unbroken, dreary forest, or a wide, uncultivated waste." Sewall writes about the decades-long conflicts between the English settlers and the "savage" Native Americans, using similar language to describe the Native population and the landscape itself, as is often the case with colonial literature. [xxxvii] Most of the Native Americans who inhabited the area were referred to as "Aberginians," a collective name used to refer to the Massachusett, Wippanap, and Taratine tribes.[xxxviii xxxix]

After a minor population decline of the British settlers in the early 19th century, the town (Woburn was not yet a city at this time) saw an influx of Irish immigrants beginning in the 1840s. Between 1864 and 1865, 110 out of the 181 people born in Woburn had fathers who had been born in Ireland.[xl] The Irish were blamed for many of the town's ills, including the sale of liquor, heavy drinking, and crimes such as vandalism, assaults, and batteries.[xli]

The Irish also faced underrepresentation in city government. Despite making up a significant portion of the population in Woburn beginning in the 1850s, no one of Irish Catholic descent held a single position as an elected official until the 1880s. According to Woburn historian John D. McElhiney, "The only place one would find Irish surnames in the Town's annual reports before this period was either in the listing of those who had received welfare from the overseers of the poor, or on a list of laborers paid by the highway department."[xlii] Even after some Irishmen were elected to the city government, they continued to face exclusion by better established populations in Woburn, specifically, "wealthy businessmen, virtually all of whom were Protestant in their religion, and Republican in their politics."[xliii]

But as Woburn entered the 20th century, many of these ethnic tensions became less pronounced in the city, especially as Woburn's Irish population continued to increase, and other ethnic minorities such as Italian and Greek populations grew in size and prominence in the city.[xliv] All of these groups were still marginalized by mainstream, White American society and considered "nonwhite" at this time, according to racial "classifications" designed by social scientists.[xlv] Given this historical context, it seems that Woburn was a community that learned at least to tolerate some marginalized groups, at least as valued workers in the city's industries. By the 1880s, Woburn had "the largest population of any of its neighbors; it had a much larger industrial and commercial base than any of its neighbors; its factories were a major employer for the region …"[xlvi]

Immigrants from Ireland and eventually Italy and Southern and Eastern Europe also helped develop the city's leathermaking industry, which had been present in Woburn from the community's founding but did not take off until about the same time that the Irish population increased. The first tannery opened in 1668. By 1866, 200 years later, 138 of the town's

workingmen were in the leather-making business (either as tanners, cordwainers or shoe and leather manufacturers), while the remaining 103 workingmen were employed in other sectors.[xlvii] The tanneries flourished for another 100 years or so, and with them came other businesses related to leather making, such as chemical manufacturing and gelatin production.

Though the tanning industry gradually left Woburn over the course of the 20th century, leather-making is still an important part of the city's heritage. The Woburn Historical Society had an exhibit on display in spring and summer 2016 about the leather and tanning industries in the city. Elementary school students visited the exhibit to learn about the process of leather making, the health risks associated with working in a tannery, and the industry's history.

Figure 2: This map was on display at the Woburn Historical Society's exhibit on the tanning industry in spring and summer 2016. The red dots indicate the location of tanneries in the city around the turn of the 20th century.

One sign from the exhibit explained how the workers in the city's tanneries removed hair and dirt from the animal hides. Workers would place the hides in three-foot-deep soaking pits filled with water and lime. After two to three days, the workers would pull out the soaked hides, which weighed about 100 pounds each. This task "was the cause for many men to have hernias and strains," according to the exhibit. The workers were also exposed to chemicals emitted during the process, including volatile organic compounds (VOCs), particulate emissions, and

sulfides.[xlviii] Fire was a constant risk in the tanneries due to the plethora of chemicals; many of the tanneries were ultimately destroyed entirely from chemical fires that broke out either while the tanneries still operated or after they had closed.

The decline of tannery jobs in Woburn began as early as World War I. The economic boom and bust cycles that had been taking place since the beginning of the Industrial Revolution affected business in Woburn's dozens of tanneries, and one out of every two men employed in local tanneries in 1919 had lost their jobs by 1921.[xlix] Amazingly, in 1922, employment in the tanneries doubled back to the 1919 rate.[l] But despite the sudden spurts of increased employment, the tanneries were facing a steady decline, and most of them could not recover from the economic devastation of the Great Depression.

According to Maureen Willis, an active member of the Woburn Historical Society who has lived in Woburn her whole life, some of the leather making companies moved north to states such as Maine and Vermont, where labor costs (i.e. wages) were cheaper. The leatherworkers' union in Woburn also had a long history of strikes and labor conflicts between workers and supervisors, and unions were weaker in northern states, she explained. Additionally, changing consumer preferences hurt the industry. Lastly, the process of leather making literally could not sustain itself in the city, as it required toxic chemicals that were not properly disposed of. Most of the time, the companies would dig large pits into the soil near their operations, pour the chemicals into the pits and then cover them up with more soil, according to Willis.

"Especially after World War II, there wasn't as much demand for leather," Willis said. "People started wearing sneakers and more casual shoes … also, some of the land became so saturated with chemicals that they couldn't use it anymore. So they essentially used up the land and then sort of moved on." The situation mirrored national trends, with the number of tanneries

in the United States decreasing steadily throughout the second half of 20th century due to the development of synthetic substitutes for leather, stricter environmental regulations and the availability of inexpensive leather imports.[li]

But at least in Woburn, tanneries were not the only important industry to decline rapidly during the second half of the 20th century. Agriculture was also a historically important industry in the city, according to Willis and the vice president of the Historical Society, Kathy Lucero. By the 1920s, Woburn had also become a regional horticultural and floricultural center. In 1929, there were 20 different plant-growing enterprises and over 150 greenhouses in the city, in addition to at least half a dozen farms.[lii]

Willis explained that the loss of the agricultural and horticultural industries happened very recently, almost entirely within her lifetime. Many of the city's farms grew flowers and produce, and there were also several dairy farms, which supplied cowhides to the tanneries. For example, the Cummings family, well-known philanthropists from Woburn, owned a tannery and a farm in the late 19th and early 20th centuries, both of which contributed to the city's leather production. "[The Cummings family] raised the cattle that were used in the leather factories, produced milk … and [the cows] went into the food chain in Woburn," Willis said. "Also, the vegetables grown [at Woburn farms] supported the local supermarkets, and the flowers were primarily sold in the Boston flower market."

One reason why the city was considered a desirable place to farm was its proximity to numerous waterways, both small and large, according to Greg Rheaume, an engineer for the city. These waterways continued to be an asset for the city as it industrialized, further illustrating the interconnections between Woburn's agricultural and industrial bases. "Once the industrial revolution came along, waterpower was very important for obvious reasons," Rheaume said.

"You used water mills to turn gristmills. All of the waste just ran off your property into the water. Nobody swam, so what a good way to get rid of your waste."

The reasons for the decline of Woburn's farms were similar to those that led to the loss of small farms throughout the country during the 20th century. After World War II, the federal government's farm policies shifted to prioritize larger farms that were more productive and specialized than smaller, family-owned farms. This policy change was meant to respond to changing consumer preferences and shifts in the U.S. and the global economy. New machinery also reduced the amount of labor needed on farms, further cutting down the number of small-scale farms that produced a variety of products, and catering to farms that only produced one or two products in mass quantities.[liii][liv]

The loss of Woburn's agricultural base, however, was also a result of increased pressure for housing in the area that began in the 1950s. In 1944, the federal government passed the G.I. Bill, which made it easier for returning World War II veterans—though only white veterans—to obtain home loans and is cited as a cause of suburbanization throughout the country.[lv] As McElhiney puts it, by the 1950s, owners of small farms and of open land in Woburn "could not resist the pressures of development that were brought to bear, and scores of new subdivisions began springing up, virtually overnight." By 1952, 92 homes were under construction on new streets that had been recently converted from farmland.[lvi] Two major farms in East Woburn—a large portion of Russell Farm (which still operates today) and Schneider Farm—were subdivided in the 1950s, too.[lvii]

Willis grew up near another important farm, Shannon Farm, whose last remaining plots were recently slated for development into townhouses and single-family homes. Despite being one of the city's last and oldest farms, its closing, she said, did not come as a huge surprise:

"Overtime, the farming industry is difficult. As the farms downsized and closed, they usually became residential areas." She said that another farm, Spence Farm, was recently purchased by the city as well. Primarily selling flowers and corn, Spence Farm's closing also led to the closing of the Woburn Farmer's Market a few years ago, which had been held on one of Spence Farm's parcels. According to Rheaume, there are simply no more farms that are large enough to sell any produce at all.

The remaining acres of Russell Farm in North Woburn, however, may be the exception. Woburn resident Tony Angelucci has owned the farm since 1982, though he said it has operated "since the days of horse and buggy." The farm contains greenhouses that grow horticultural plants and vegetables, and its 3-¼ acre field grows tomatoes, bell peppers, green beans, whole beans, broccoli, squash, eggplant, herbs, parsley, Swiss chard, kale and other produce.

Angelucci, who has lived in Woburn for 35 years, said that the city does not provide many resources or financial incentives for people running farms. The farm has been subdivided many times over the years, making it now too small to qualify for Massachusetts' Chapter 61 tax breaks. This law gives tax breaks to agricultural land, but the parcels must span at least five acres to qualify, which is no longer the case for Russell Farm.[lviii] In addition, because it is a small business, Russell Farm is not zoned as residential land by the city of Woburn, but as commercial land. If it were zoned as residential land, Angelucci would pay a tax rate $9.94 for every $1,000 of property value per fiscal year. If it were zoned agricultural, the state's Farmland Valuation Advisory Commission would assess Angelucci's property each year based on the estimated market value of agricultural products his land could produce.[lix] Instead, Angelucci pays $24.97 per year for every $1,000 of property vales for his "commercial" property, as determined by Woburn's Board of Assessors.[lx]

For this reason, Angelucci feels that land that is used for commercial purposes should be taxed the same amount as residential land: "In other towns, like Reading, everybody pays the same amount, including businesses," he said. "So businesses feel more supported." Nonetheless, he said the economic hardships facing him as a farmer in Woburn are not very different from the difficulties facing other small farms throughout the country: "Farming, in general, is not really supported by people, in general. It's not the city of Woburn. They all like the idea of having farms, but they don't want to pay for them."

Angelucci is correct to point out that the decline of certain industries in Woburn—as well as the problems that these industries caused—is not a uniquely Woburn phenomenon. But putting these broader trends—deindustrialization, globalization, automation, the rise of industrial agriculture—into a local context can help us make sense of the impacts they've had on actual people's lives. Understanding the environmental history of the community, such as the numerous waterways that have existed in Woburn and what plants are native to the area, can help city planners make better decisions for the future that minimize the environmental impacts of development.[lxi] Homeowners have also expressed interest in learning about the local history associated with their neighborhoods, and communities with a strong understanding and pride for their history have shown to be more desirable for newcomers looking to buy a home.[lxii]

Knowing this history, in short, allows us to plan for a healthier, more sustainable, and more just future. In Woburn, one of most important history lessons took place only about 30 years ago, when a water contamination crisis hit East Woburn—the neighborhood in which the Gelly is located.

Chapter Two

Starting in 1969, the cancer and leukemia rates for Woburn residents—particularly East Woburn residents—began to increase to four times the normal rate for a city of Woburn's size. 20 Woburnites were diagnosed with leukemia between 1969-79, and only two survived. Nine other children were diagnosed with leukemia starting in 1983, and other illnesses, including adult leukemia and renal cancer, appeared at elevated rates in East Woburn during this same time period.[lxiii]

Though city officials and even doctors initially denied that the cancer rates were noteworthy, it became clear that chemicals emitted by tanneries and several other companies (including a chemical company called W.R. Grace, which came to Woburn in the 20th century as a much-desired new industrial employer to make up for tannery job losses) were directly responsible for the problem. The chemicals had seeped into two drinking wells, wells G and H, which the city had developed in 1964 and 1967 to supply water to East Woburn homes. The book *A Civil Action* (1995) and the subsequent 1998 Hollywood film of the same name dramatized the efforts of a lawyer to bring justice to the families affected by the contamination of the wells. The name Woburn became known throughout the world, and not for a reason Woburnites wanted.

According to Willis, the lawsuits brought on by several affected families in the 1980s effectively "chased out of town" John J. Riley Company, Woburn's last tannery, which closed in 1988. J.J. Riley and W.R. Grace were the two companies forced to compensate the families who brought on the lawsuit against them, but the EPA later found three other companies also responsible for the contamination of the wells.[lxiv] Willis was in middle school when some of her classmates started to get sick from drinking contaminated water. She noted that the leukemia and cancer rates were not evenly spread throughout the city, but concentrated among several families

living on a few blocks in East Woburn. It was only these families whose drinking water came from wells G and H. This may be why the issue was not widely known by other Woburn residents until the book *A Civil Action* and the film adaptation were released.

"It wasn't anything that was talked about at my kitchen table, it wasn't anything we'd read about in the paper," Willis said. "And I don't think it stopped anyone from moving to the city, because of our industrial base, and because the taxes are very low here. I think that by the time it became public knowledge, it was all very well in hand."

Though Willis remembers little about how the contamination crisis played out, other Woburn residents did know about the issue when it was happening. A few residents actively opposed their neighbors' efforts to find out what was causing the sicknesses in their families, for reasons ranging from fear of declining property values, to denial that Woburn's beloved industries and government could be complicit in water contamination, to a refusal to accept that their families could be at risk, too. One East Woburn resident whose family members got sick from drinking contaminated water recalled experiencing hostility from neighbors because she demanded answers from the city and the companies involved:

"We had fights with my own neighbor, of all people," the anonymous activist said. "I couldn't believe it ... I think people are afraid to believe that their backyard could be contaminated, that they could be killed by these chemicals. I think people are afraid."[lxv]

Some people who fell sick also experienced stigmatization when they told neighbors about it. The wife of a leukemia victim involved in the lawsuits against J.J. Riley and W.R. Grace reported being "verbally attacked" in public because of her supposed anti-Woburn agenda.[lxvi] Some people accused the families carrying out the lawsuits of being selfish and/or

only wanting money, which could not have been farther than the truth for the eight families who were eventually compensated. According to one compensated family member:

"When we did get the money and it was in our hands, and our bank accounts, it was very, very hard to even think about using it … I still feel like it is a payoff. As long as I feel like that, I can't stand the thought of using it."[lxvii]

Evidently, the environmental and health consequences of the leather making industry in Woburn were fatal. Today, wells G and H are classified by the EPA as active superfund sites and are still in the process of being cleaned up. Not far from the wells is another active superfund site, Industri-Plex, a former chemical and glue manufacturing facility that is undergoing cleanup and is expected to be redeveloped in the near future. In total, Woburn contains *ten* geographically distinct superfund sites that are connected to these two primary sites. The city has the most superfund sites in Middlesex County, and almost all of them are former industrial sites related to leather making or the production of chemicals used in leather making.[lxviii] Additionally, the EPA classifies some of East Woburn, specifically the portion right near the Gelly on the Stoneham line, as an environmental justice community because the percentage of minorities in this part of the city is greater than or equal to 25% of the total population.[lxix]

While the Woburn Historical Society's exhibit on the tanneries displayed the dangers of working in the tanneries and the strikes and labor issues associated with the industry, the exhibit made no mention of the water contamination issues related to the tanneries—not even of the J.J. Riley tannery's involvement. It included a photograph of this tannery with the caption: "John J. Riley Company / Salem Street / LAST TANNERY IN WOBURN / CLOSED 1988," but said nothing about the company's shameful reason for leaving town.

Woburn has long thought of itself as pro-business, and the exhibit ultimately emphasized this, providing information about how the industry offered stable jobs to hundreds of workers from Woburn and surrounding towns. Indeed, the city's ability to keep jobs close to home despite the eventual loss of the tanneries is impressive; its unemployment rate has long been consistently below that of Massachusetts, even in the postwar decades when other New England manufacturing towns were facing job losses and population decline.[lxx] When the tanning industry started to disappear completely, several self-proclaimed "pro-business" mayors worked to sell former tannery sites to developers and companies.[lxxi] The moving in of newer manufacturing industries like W.R. Grace, Monsanto, and a Marshalls Distribution Center over the course of the 20th century helped put former leather workers back to work.

The question is, how can cities like Woburn be pro-business, pro-environment and pro-public health? There are obvious limitations to a "pro-business" attitude if it does not include thoughtful consideration for environmental and public health needs. Not only can a pro-business attitude harm the environment, but it can also harm citizens themselves, especially those who are less wealthy. Many Woburn residents involved in the lawsuit in the 1980s grew to distrust their local government, as they, rather than city officials, were the ones who discovered and insisted on fixing the water contamination problem despite little experience with activism or environmental health. The city government at the time seemed more concerned with protecting industries in Woburn, seeing as families reported having told city authorities about the poor water quality, only to be ignored or deemed paranoid by their own government.[lxxii]

Had it not been for the families' persistent demands for answers, the public might not have learned about and solved the problem at all.[lxxiii] How much city officials knew—or could have known, had they paid attention to the complaints sooner—remains unclear. However, the

case highlights the need for city officials everywhere to consider that a pro-business approach to city planning is not automatically pro-citizen.

Today, one of the largest remaining industrial job sources in the city has just closed after having stuck around for nearly 100 years against many Woburnites' expectations: the Gelly in East Woburn, near many of the homes that were serviced by the contaminated water wells. The plant has served as an economic staple with cultural and historical significance for the city since it opened in 1919. How this roughly 100-acre site will be redeveloped could influence the future of the city's economy, demographics, and natural environment.

The city initially proposed a "business-friendly" idea for the site: the development of a mixed-use complex, including some housing, some retail space, and space for high-tech firms, advanced manufacturing firms, general office space and biotechnology firms. The city was also interested in establishing day care centers, a gym, and other "essential public services."[lxxiv] However, the developer that initially expressed interest in making some version of this vision a reality was more interested in developing new housing units, including single family homes and condos, as well as substantial retail units. That developer dropped its pending purchase and sale agreement with Kraft Heinz, the current owners of the site, at the end of last year, leaving the future of the plant once again up in the air.

There are many questions that communities should address when considering redeveloping a site of this size, ranging from the environmental impact of redevelopment, to the effects of dozens of new children entering school systems if the project includes housing, to possibly unintended consequences such as gentrification. It is also important to ask what kinds of jobs will be brought through the redevelopment project and for whom, rather than to assume that all new jobs are good jobs. As stated previously, learning about the local history of Woburn and

the particular history of East Woburn can help ensure that the redevelopment project pursued will truly serve the needs of the Woburn community as a whole, especially those who were laid off when the plant closed.

My approach to history does not stop at learning about what took place in Woburn and at the Gelly and when. I believe that it is valuable to learn not only about what was produced at the plant and the different architectural and environmental assets on site, but also what it was like for the workers who worked there when considering future uses of the site. Considering that the closing of the plant in 2016 led to the loss of over 300 jobs beginning in 2014 (and the loss of a few hundred additional jobs over the course of the decades prior), in coming up with a proposal for reuse of the site, I felt obligated to speak to as many former workers at the plant as I could in conducting this project. Their perspectives on the significance of the plant and the reasons why it was a great place to work have helped me determine what kind of employment opportunities the city should try to attract to the new site.

Chapter Three

Figure 3: This map, obtained from City Planner Tina Cassidy, shows the site of the Gelly in the southeastern corner of Woburn.

The site of the Gelly sits directly west of Interstate 93 and south of Montvale Avenue, spanning approximately 80 acres. About 57 of its acres are in Woburn, with the rest in Stoneham and Winchester. Joseph H. Cohen, a Lithuanian Jew whose family arrived in Boston when he was four years old, founded the Gelly in 1920. While studying at the Massachusetts Institute of Technology, Cohen took a leave of absence to work at the American Glue Company plant in Salem. There, he began to notice the similarities between the leather, glue and gelatin production processes and the raw materials these processes used. In 1919, he purchased the site from Baeder, Adamson & Co. Glue Company that had been in operation there since at least the 1880s, opening what Cohen named the Atlantic Gelatin Company.[lxxv] He continued to work at the Gelly, which primarily produced gelatin and flavoring products, until retiring in 1955.[lxxvi]

Many of the Gelly's first employees had previously worked in the city's tanneries. After General Foods purchased Atlantic Gelatin in 1930, the business began to expand, operating on a 24-hour basis until the start of World War II. During the war, the factory began to hire women, and by the time that men returned from the war, over 500 men and women worked there. It was common for entire families to work there, most of whom hailed from Woburn, and some from Stoneham and other nearby communities. By 1965, the Gelly was Woburn's second largest taxpayer, as well as the largest gelatin production plant in the world. [lxxvii]

According to the former employees I've spoken to, one of the best things about working at the plant was the positive relationship between management and workers throughout most of its history. All of the workers were part of the strong, well-established leatherworkers' union and, according to several former employees, received high salaries and good benefits. Cohen prioritized making the plant a safe and secure place for his workers. Before retiring, he started a tradition of service award ceremonies at which he would honor longstanding employees. In 1952, Cohen also created a plant-wide newspaper, AtGel Topics, which served as a way to keep employees in the loop about the state of General Foods. That same year, Cohen helped start a credit union, which Gelly families relied on for many years. [lxxviii]

Paul McLaughlin, Sr., an East Woburn resident, worked at the Gelly for 39 years. He is one of several former Gelly workers with whom I spoke to get a better sense of what the plant meant for the Woburn community and what kind of future uses it could have. I biked to McLaughlin's house from the Tufts campus, riding through Medford, Winchester and finally Woburn, to interview him at his home on Grape Street, about half a mile from the Gelly.

On the way there, I was struck by the same sign I saw on at least two lawns in Winchester: "Help protect Winchester / No Mega Stores / No Mega CVS." It reminded me of my

hometown and its strict no-chain store policy. Of course, plenty of people in Hastings shop at chain stores in neighboring communities; it's the consumerist equivalent of "not in my backyard," because many people resent the presence of chain stores outcompeting small businesses in their own downtowns, but are willing to shop at them elsewhere. I wonder if a similar phenomenon takes place in Winchester, seeing as neighboring Woburn is filled with chain stores, particularly fast-food joints.

Once I passed into southeastern Woburn, the sizes of the houses and their lots grew more modest. McLaughlin's house, like many of the homes in this neighborhood, was serviced by the infamous wells G and H until they were permanently shut off in 1979.[lxxix] He mostly told me about his time living in Woburn and working at the Gelly, though he also mentioned that he, his wife, and his five children drank the water from the contaminated wells for years, which he said "stank."

Though he fortunately did not lose children or other family members as some nearby households did during the contamination crisis, two of McLaughlin's daughters were afflicted with unusual illnesses similar to some of the health problems that occurred throughout the neighborhood. One of his daughters suffered from a tumor on her thyroid, and another daughter developed a tumor on her pituitary gland, both while they were still young. The first one went to the hospital as soon as McLaughlin's wife found out about it and underwent surgery that night. The second daughter passed out one day, fortunately right in front of a walk-in clinic in Woburn Center. Doctors there were able to provide her with immediate treatment.

Despite the unsettling illnesses in his family, McLaughlin made a point to say that he "didn't know" if the companies found guilty for contaminating the water were actually responsible for the high cancer and tumor rates in East Woburn. He was, however, willing to say

that he was overall quite satisfied with working at the Gelly for half his life. He started working at the gelatin-producing plant in 1953 at age 17. His sister had been working in the office there, so he went there, too, as a messenger boy. After graduating from high school, he took one summer off and then resumed working full-time for General Foods. Sometime after that, he started working in the payroll department while attending night school. After a year and a half, he got engaged, prompting him to switch from the payroll office to the plant in order to earn more money.

"The money to be made was [inside] the plant," he said. "So I transferred to the plant and worked a lot of nights." In 1961, he was promoted to supervisor for the night shift. After that, he moved around to different levels of supervision throughout the plant. In 1985, he was promoted to gelatin production manager, where he worked for seven years until he was asked—or perhaps forced—into retirement. "The benefits included the pay, being so close to work, small things," he said. "The roads can be pretty busy in this area. It was easier for me to walk there, because I could walk down the railroad tracks. I won't say that I did it that much. If I was trying to lose weight, I did."

Part of what initially made the site attractive for industry was its proximity to these railroad tracks, which were owned by the Boston and Lowell Railway. This part of the tracks was known as the Woburn Loop, and it was built in 1844. At the time of its construction, the city didn't want the railroad to run through the center of town, so it had the Woburn stop stationed in East Woburn. Paul recalls that the line transported freight and materials to the plant and finished products out of the plant. Service on the tracks ended in 1960, the same year that the Woburn section of Interstate 93 opened.[lxxxlxxxi]

Throughout his career at the Gelly, Paul frequently volunteered for new positions, some of which were very physically demanding. He did this because he was concerned about his job security with the influx of new, college-educated workers in the 1960s. But he didn't always enjoy the tasks demanded of him, such as training the new workers or overseeing the nightshift. Some years, the majority of the workers during the nightshift were alcoholics, making it difficult to manage them. Additionally, Paul worried that he would not be able to compete with the new workers, having only attended night school for three years and never gone to college. One day, he decided to confront the gelatin supervisor about these concerns.

"I said, 'I'm sick of training people that are going to get promoted and maybe end up being my boss,"' Paul said. He then made a proposal to the gelatin producer: he would attend a community college during the week, work on Saturdays and Sundays, and receive a full salary until he finished college. But the company told him not to worry: they would take care of him, college degree or no college degree. "At that time, it was around 1970, so I already had 17 years at the company," he said. "I wasn't going anywhere. I survived." After all, Paul added, those who came to the Gelly, stayed at the Gelly.

Some of the workers there, however, might have been better off not staying. Though Paul had few complaints about his job's impact on his health, some of his colleagues experienced back pain and other health issues. "At the Gelly, there was a lot of acid, sulfuric acid, and a lot of moving machinery," Paul said. "There were a lot of vats where the material was treated, so you had to be careful. People got hurt."

When Paul first started there, workers would have to physically move 50-100 pounds of pigskins used to make gelatin multiple times a day. It was not until his last years at the Gelly that the company brought in cranes to move shipments and raw materials—a technological switch

that certainly reduced physical strain for workers, but also may have reduced the number of workers employed overall. “I worked with an awful lot of guys with bad backs, and there’s no fixing a bad back,” Paul said. “Operations are never successful.”

Nonetheless, he described the Gelly as a source of “a lot of good jobs,” and he is sad to see the plant now closed. Today, the city collects over $400,000 a year in real estate taxes from the site, and Kraft Foods was one of the largest employers and highest taxpayers in Woburn at the time of its closing.[lxxxii] Paul remembers Kraft employing over 500 people at given points in time, including his sister, his brother-in-law, his son, and his son-in-law.[lxxxiii]

But beginning around 1990, the company began to downsize at its Woburn plant, as more efficient ways to produce gelatin were developed. By 1983, there were six other gelatin producers in the United States, which competed with each other and with imports from abroad that entered the country duty-free. Additionally, by the 1990s, many more people lived in the area surrounding the plant, and they began to complain about odors, waste disposal processes, and air pollution coming from the plant. Given that Woburn was just recovering from its recent water contamination crisis, the managers of the plant and the city took these complaints seriously. All of these emerging trends and concerns took place in conjunction with an overall decline in traditional manufacturing jobs throughout the country, and especially in Massachusetts.[lxxxiv] Nevertheless, the Gelly continued to employ hundreds of people until its closing in January 2016.

According to McLaughlin, workers at the plant anticipated that it would close for decades before it actually did, for reasons ranging from the old age of the plant to the opening of new gelatin producing plants in other parts of the country. “There was always talk that Atlantic Gelatin was going to close, even when I started there,” he said. “In the 1960s, we thought they

were going to close because they started a plant down in Dover, Massachusetts, where they put all of these companies into one big facility … They were trying, from my understanding, to get us there, too. But we used so much water, which was available in this area, unlike down there. And probably because the tanneries were up here, too, they made the decision not to move us." Indeed, in addition to the site's proximity to railroad tracks, it was also considered a lucrative location because it was close to a major water source, the Aberjona River.[lxxxv]

Ultimately, the plant closed because it was no longer economically viable to produce gelatin there, as production of gelatin overseas had become much more cost-efficient. Representatives from Kraft Foods stressed that its closing was not a reflection on workers in Woburn, but simply based on what made sense economically in an increasingly globalized world. But McLaughlin noted another factor that may have led to its closing: "labor problems," or conflicts between unionized workers and plant managers during the last few decades of the plant's operation.

Chapter Four

Another former Gelly worker, Joda Day, continued to work at the plant after McLaughlin left in 1992 and experienced the worst of these so-called labor problems. Day joined the Gelly in 1985, the same year that the Phillip Morris Companies acquired the operation from General Foods—the second of the plant's three major transfers of ownership. The former Woburn resident initially began working at the Gelly because it offered a relatively high salary and benefits and was available to those without college degrees. Having never finished college, that opportunity was uncommon. "College and I didn't fit, so I just ended up working there," Day said. "You could make a hell of a living there if you put your time into it."

First working part-time, Day started out making gelatin in the "vat room" for a few years before moving to the flavor tower. The gelatin-producing vat room was where the animal hides were treated with acid and other chemicals. The flavor tower was where, unsurprisingly, different flavors for jelly, chesses, and other products were engineered. "There was a lot of nasty stuff up in [the flavor tower]," he said. "Sometimes it was unpleasant, depending on what you were working with. When we made hazelnut flavoring, that was pretty tough … it depended on the day you were working, and when you were sweating, it would get into your pores. You'd take those days off if you could."

Even those who didn't work at the plant found the flavoring process to be unpleasant. Beginning in the 1980s, the operation faced frequent complaints from East Woburn and West Stoneham residents about a persistent smell coming from the plant.[lxxxvi] The issue was so bad in summer 2012 that alderman Darlene Mercer-Bruen of Ward 5 (East Woburn) said she received calls from several East Woburn residents who claimed that the smell was preventing them from spending time in their backyards on Memorial Day. [lxxxvii]

These issues were especially pronounced during the later years when Kraft Foods took over the plant, after Phillip Morris bought Kraft in 1988. In addition to the odors, Kraft was also found to be in violation of the Clean Air Act and was penalized by the EPA for an oil spill in the early 2000s: "Despite its status as a considerable taxpayer and employer in the city, Kraft Foods has a spotty environmental record in Woburn," read a 2009 article from *The Stoneham Independent*. "In 2006, the EPA reached an agreement with Kraft, which paid a $15,000 penalty and spent $300,000 to replace several of its ozone-depleting refrigeration units at the Woburn plant … Also, Kraft paid a $9,950 fine for an oil spill in 2005, when 500 gallons of fuel were discharged from a leaky pipe into the soil near a tributary to the Aberjona River."[lxxxviii]

Unlike Day, McLaughlin was hardly fazed by the environmental impacts of the plant. He said that Kraft Foods, Phillip Morris Companies and General Foods, the three major companies that owned the plant at separate times during the years McLaughlin worked there, worked tirelessly to fix these problems. "I know how bad [the smell] used to be, and I know of the improvements and the amount of money General Foods spent trying to correct any problems that were causing any odors," McLaughlin said. "Just before I left, they put a whole new process in. I forget what the cost was, but I know it had to have been well over $2 million, and that was in 1992."

Day's primary issue with the Gelly, however, was not its environmental record, but the way in which the historically positive relationship between management and unionized workers deteriorated after Kraft Foods began running the operation. He said he enjoyed working at the Gelly the most when McLaughlin served as gelatin production manager, before Kraft took over. "When I first worked there, you'd listen to management, they'd respect you, and you'd form [positive] relationships," Day said. "Once all the old-school people [like Paul] got out of there, it just went downhill from there. Those were the great guys to work for, very well-respected."

In 1988, the same year that Phillip Morris acquired Kraft Foods, J.J. Riley closed, leading to the disbandment of the leatherworkers' union in Woburn.[lxxxix] The Gelly workers were thus forced to join a new union, the local chapter of the Office and Professional Employees International Union, which Day said was significantly weaker. McLaughlin said it was the last union in Woburn, and it, too, disbanded when the Gelly closed in January 2016.

Day said the new management under Kraft Foods began to lay off workers arbitrarily, including McLaughlin, and caused strife among union workers by promoting a select few of them to management positions. McLaughlin did not express grief over retiring at age 56 since he

was offered a generous retirement package; however, his leaving, coupled with the departure of other longstanding employees from the plant, resulted in an increasingly hostile and tense work environment for the workers who remained.

"Before, it was always union vs. management, and you'd be fighting with [management] to get things in the contract," Day said. "Then it seemed that they just started handpicking people out as union stewards. It seemed to me that they were trying to catch people doing stuff, like smoking a joint or whatever, or taking a drink in the locker room, whatever would be against the policy."

Most of the people who were targeted were "old-school tough guys," Day said, and the Kraft managers showed little mercy. "They didn't care if you had an issue at home that made you late. You'd get written up," he said. "If you were a couple minutes late three times, you'd get a warning … it was just a mess. They were shuffling people around, pushing people's buttons. Maybe that was their plan all along, who knows?"

As the plant entered the new century, the power of the union continued to decline, largely due to the stressful, competitive work culture created by management, who treated workers "like babies," according to Day. Workers had little faith in the new union, especially because some members were given special privileges over others, and Kraft hired workers who "had no regard for union rules," Day said. Workers became desperate for money, and started to compete for limited overtime shifts. Christmas bonuses stopped coming. Management stopped offering workers time off.

"It turned into an overtime fest … people would be dying to get that overtime shift," Day said. "For Christmastime, you'd get a ham. They just treated the employees like shit at the end. It was pretty degrading the way they treated the workers."

Kraft fired Day in 2011, but he challenged them through the union and won, getting reinstated with back pay. However, in 2013, he was ultimately fired for "swearing at the union steward:" Describing his departure from the plant, he said, "I was just getting written up no matter what I did. I'm glad I got out of there, other than the fact that I was kind of forced out."

Day was not the only one who was "forced out." In the years leading up to the Gelly's closing, he said many workers were offered severance packages of various sizes if they left the plant, and those who were financially struggling accepted these packages: "I don't know what the hell Kraft was trying to do, but they did it. They broke the union and shut the place down. They must have had a long-term goal that I wasn't aware of."

Another former Gelly worker, Philip Boudreau, described a similarly tense work environment during the Gelly's later years. Boudreau, a lifelong Woburn resident, started working at the plant in 1970, which he said was "a very good job" that felt like "one big family" for residents of Woburn, Stoneham, Winchester, and other surrounding towns. He did not provide many details about what changed at the plant over time, though he said most of the changes had to do with the relationship between workers and management. "As far as management, all of the general managers were very interactive with the employees [when I started there]. They tried to have a lot of activities with the people. The last couple of years were just bad. The whole morale of the people just went down. It was as if they were trying to close the place down, which they did." Boudreau was laid off on December 5, 2015.

Day left Woburn shortly after he was fired from the Gelly. The pharmaceutical company where his wife works transferred her to Sparta, NJ, so he and his family moved there. Today, he stays at home to take care of his 8-year-old daughter: "I've just been working around the house,

doing whatever needs to be done, babysitting, watching the kids. It's a whole different lifestyle out here. It's beautiful."

McLaughlin remains in his same home in Woburn, where he still regularly catches up with close friends he once worked with at the Gelly. He is happy to be able to live in the same East Woburn home near most of his family members. He pointed to all of the homes in his neighborhood occupied by family members: "My daughter lives there, son lives over there, granddaughter owns the two houses across the street, my other daughter owns a two-family up the street, my other son lives in Woburn, my other daughter and granddaughter live in Lynnfield, Massachusetts, and I have a daughter who lives in Concord, NH."

As far as the economic and industrial changes that have occurred throughout his time living in Woburn, McLaughlin feels that the loss of heavy manufacturing and industrial jobs has mostly been a win for the city. "The piggeries were bad, the tanneries were bad," he said. "One of the tanneries was right by the high school, and if you got a hot summer day, then you got a sickly odor. All of the tanneries burned down. The piggeries just gradually, besides going out of business, [were bought up]. I suppose that was part of the reason the tanneries closed, too."

Today, much of the industry in Woburn comes from an industrial park in the northern part of the city, in which multiple land parcels were sold to different industries in the 1960s and 1970s. "That industrial park was on the property of a few tanneries and piggeries. It's where all the rubber used to get dumped in Woburn," McLaughlin said. "That's all in landfills now."

Chapter Five

Day's and McLaughlin's stories about the worsening work environment at the Gelly are anecdotal, but they are far from the only manufacturing workers in New England to have

witnessed a decline in good jobs for the working and middle class. In this part of the paper, I strive to take their accounts about the weakening of the Gelly's union and the downsizing and eventual closing of the plant, and put them into the context of the way that manufacturing jobs have historically operated in New England under our current economic system.

To understand New England manufacturing, one must understand the textile industry. Textile mills were the backbone of many smaller New England cities and towns during the 18th, 19th, and 20th centuries, and while the industry began to decline as early as the 1880s, it overall had a much longer run than the tanneries in Woburn. Unlike in Woburn, where tannery jobs were mostly replaced by the introduction of new industries in the 20th century, some New England "mill towns"—former hubs of the textile industry—did not recover as quickly from the loss of the industry, or have since lost their working-class, working poor, and immigrant bases entirely due to the emergence of new, primarily service and education based industries and gentrification.

The reasons for the fall of the industry are similar to the fall of the tanneries in Woburn: technological changes (the introduction of steam power meant that mills were not bound to areas near waterfalls and other natural resources) and comparatively lower operating and production costs in other parts of the country.[xc] The textile industry began to move to the South shortly after the Reconstruction era. The region had lower electric rates, was closer to Appalachian coal to power the mills and had an abundance of poor, white laborers who would work for lower wages than heavily unionized northerners. The South also had lower taxes and weaker labor laws, which was appealing to owners of textile mills who were facing frequent strikes and demands from workers for higher wages, shorter workweeks, and limits on child labor. Additionally, as historian Steve Dunwell points out, the South "*wanted* the textile industry, of which the North had grown tired."[xci]

Initially, northern mills responded to competition from the growing industry down south by demanding higher production per hour from their workers, resulting in overworking of workers. Mill owners also had to shorten the workweek to make ends meet, so workers saw their incomes decrease. These changes naturally increased tensions between workers and mill owners.[xcii]

Royal Little was the last of the mill town's tycoons. Beginning in the 1940s, Little built Textron, the first diversified conglomerate in the United States, by purchasing failing mills, installing modern machining, reorganizing each mill, and laying off workers who questioned his practices. Unions, workers, and some legislators tried to prevent or slow down the practices introduced by Little. Northern mill owners adopted the slogan, "Give us 45 hours and we'll fight the world," which argued for nationwide labor standards.[xciii] Senator Charles Tobey of New Hampshire even began an investigation into Little's mill reorganization strategies, but was unable to stop his actions, seeing as what he was doing was technically legal. Little was simply taking advantage of the current economic situation.[xciv] As a result of Little's actions and other similar practices, by the 1970s, only a handful of village mills in New England remained in the control of the companies or founders who had started them.[xcv]

It is certainly worth questioning whether or not the decline of the textile industry was really such a bad thing for New England. It is also worth asking the same question about the decline of manufacturing jobs in the United States in general, including jobs at the Gelly. If bosses won't meet the demands of unionized workers and are relocating to places where workers are paid half as much and have substantially fewer rights because "long-term investments" in that location no longer make "strategic sense," then shouldn't we say good riddance?[xcvi]

For Joda, the answer is yes. But for another former Gelly worker, Kathy Lucero, the answer is not so simple. Lucero grew up in Woburn and is the oldest of 11 children. Her father worked at the Gelly for 35 years, and she produced a documentary film about the plant's history and culture called *The Gelly: 97 Years of Atlantic Gelatin*. Though she described the business after the final manager took over as "not the same" as it was during its glory days, she also said that, "everybody is sad about the Gelly closing."

She even went so far as to say that the loss of manufacturing jobs in Woburn and throughout the United States has cost many families stable jobs and has forced them to rely on government programs: "We're hoping manufacturing comes back … that's what you need. You can't make a living working at Market Basket. I see it at the food pantry I work at [in Woburn]. Those people are all working, but you can't make it working at Market Basket."

Lucero gave additional insight into the positive work environment at the Gelly. Though Boudreau had implied that a job at the plant was somewhat difficult to acquire because people had to know someone who already worked there, Lucero described the Gelly as an open, "multicultural" place. Boudreau also mentioned an uptick in diversity throughout his time there, especially an increase in Asians, Latinos, and women, which seems to have been primarily a reflection on the changing demographics of Woburn and of neighboring towns. According to Lucero: "Woburn was mostly Irish, Italian, and Swedes, but it has changed in the last 10 or 15 years. Woburn is totally different now, with Dominicans, Brazilians, Eastern Europeans … But there have always been Black Woburnite Gellys, and [the Gelly always] had a lot Spanish-speaking people, too."

Lucero noted that the weakness of Gelly workers' second union and the lost sense of camaraderie during the later years of the Gelly were simply part of a larger trend throughout the

United States: "I would say right up until 1980, [the Gelly's union] was very strong, then I think like all unions, they kind of lost their zip. My husband is a policeman and unions are important for policemen and firemen, they protect your rights … I think the unions just aren't as strong as they were."

Indeed, the prevalence of unions in the United States has declined significantly over the last 50 years. In 1979, 34% of males working in the private sector were part of unions, whereas only 10% of male workers were in unions in 2013. For women, the change is less dramatic because fewer women have been in unions historically; in 1979, 16% of women were in unions, whereas by 2013, that number had fallen to 6%.[xcvii] In Massachusetts, 27.7% of workers in the state belonged to unions in 1964, whereas only 13.7% of Massachusetts' workers were in unions in 2014.[xcviii]

Much of the decline of unions in the United States can be attributed to federal policies that no longer support unionized workers, from the Labor Management Relations Act of 1947, which restricted the power of unions, to right-to-work laws that exist in 28 states outlawing union security agreements.[xcix] But another reason why unionized jobs have declined is because the primary economic sector with which they have historically been associated—manufacturing—has declined as well. Between 1947 and 2007, the number of manufacturing and agricultural workers in the United States went down from one in three Americans to one in eight—even though manufacturing output in the United States had sextupled.[c] This trend has continued up to the present; between 2000 and 2016, the United States lost 5 million manufacturing jobs.[ci] At the same time, jobs in the service sector, which historically are not unionized, have been on the rise.[cii] Retail trade employment is also on the rise, though not at the same pace as jobs in the service sector.[ciii] As Lucero implied when she referenced people who

work at Market Basket, workers in the "food-preparation and serving-related occupations" are also statistically the most likely to earn minimum wage.[civ]

Even the manufacturing jobs that remain in the United States are less stable than before, paying increasingly nonunionized workers lower wages than in the past. According to economics writer Ben Casselman: "Manufacturing no longer plays its former role in the economy, and not only because there are far fewer factory jobs than in the past. The jobs being created today often pay less than those of the past—sometimes far less." In addition, the new manufacturing and factory jobs are less likely to be permanent positions and more likely to be dangerous for workers. In fact, a big reason why manufacturing jobs still pay better than other jobs available to those without a college degree is because the few veteran workers who remain in the sector are paid substantially more than the new workers.[cv]

This is all to say that while the loss of the Gelly represents a loss of manufacturing jobs in Woburn, it also represents a decline in *unionized* jobs and a decline in the power of the unions that continue. Just as there was nothing inherently great about the textile industry in New England, there was also nothing inherently great about the Gelly in Woburn. Similarly, though Lucero emphasized the need to "bring manufacturing jobs back," there is nothing inherently superior about this sector, either. The Gelly, as well as the manufacturing industries in Woburn that came before it, demanded grueling, difficult, and sometimes dangerous work, and the plant itself created environmental and public health concerns.

Nonetheless, former Gelly workers seem to agree that anyone willing to put in the time and effort, regardless of their educational or socioeconomic background, could work at the Gelly, join the union, and work their way up in the ranks. Until the plant began to decline in the 1990s, workers had paid vacations and positive relationships with their bosses. Perhaps most

importantly, they felt valued and respected. Rather than lamenting the loss of manufacturing in the United States, economists, developers, politicians, and urban planners should seek to attract jobs that have these characteristics regardless of industry or sector.

My proposal for reuse of the Gelly therefore seeks to create a new use that offers some of the best aspects of the work environment at the Gelly, such as employment stability, a living wage, and either a workers' union or a cooperatively-owned business, while also being environmentally sustainable and producing something that the greater community could benefit from directly. While the city of Woburn had initially wanted to attract high-end firms that pay workers well, I propose that the businesses on site offer well-paying jobs available to those with a background in skilled trades and manufacturing as a way to make up for the jobs lost from the closing of the Gelly.

Recommendations

Housing: Add to Woburn's limited affordable housing stock

One component of my proposal for reuse of the site includes housing, with an emphasis on building a large percentage of affordable housing. I propose that a total of 50 housing units be constructed, with 30% of the housing (15 units) designated as affordable, and the rest sold at market rate. As is the case in many suburbs in the Boston area, affordability and gentrification are major concerns in Woburn. This problem has become more pronounced in Woburn over the last few years, but it seems to have been going on for at least a decade. According to the city's 2005 Master Plan, more than 6,610 households qualified for subsidized housing based on their household income at that time.[cvi] In 2016, more than one-third of all households were low-

income and eligible for housing assistance, with 18% of senior households subsisting on less than $20,000 a year.[cvii]

There are also a substantial number of people living in Woburn who face cost-burdens when it comes to housing, whether they live in subsidized housing or not. In 2016, 21.2% of Woburn homeowners were cost-burdened for housing—higher than the national average of 19.5% that year, but lower the statewide average of 21.9%. Out of the 40.5% of Woburnites renting their homes, 28.1% were cost-burdened that year, and 21.81% of renters were "extremely cost-burdened."[cviii] Finally, nearly 40% of all low-income households are cost-burdened.[cix]

Despite the need for affordable housing options for low-income residents in Woburn, in 2016, only 3.47% of households and 2.99% of the total population lived in any kind of subsidized housing.[cx] And as of September 2016, only 7% of all housing units in Woburn were considered affordable. Consequently, Woburn is approximately 500 units short of achieving the state's Chapter 40B threshold for affordable housing, which mandates that 10% of the city's housing stock be classified as affordable. For the purposes of the Massachusetts statute, affordable homes are defined as units that households making up to 80% of the median income in a community could afford to rent or buy.[cxi]

Before the previous developer of the Gelly backed out of his agreement with Kraft Heinz, the city and that developer had agreed to designate 15% of the housing units the developer was planning to build on the site to affordable housing. This decision was made primarily because Woburn needed to get closer to the 10% affordable housing benchmark. However, it is worth noting that devoting only 10% of all housing in a city to affordable housing is a fairly low standard, especially since over 20% of residents face high-cost housing burdens.

Building exclusively affordable housing on the site of the Gelly, on the other hand, might lead to a degree of socioeconomic segregation and even stigmatization between residents in new subsidized housing and in the existing households nearby. Public housing projects have historically proven to be politically unpopular among high and middle-income people, in Woburn and elsewhere.[cxii] In contrast, my proposal for a relatively aggressive inclusionary zoning policy, in which a certain percentage of housing within a given complex is designated affordable, is something that communities in Massachusetts are more used to, as they have been in place in the state since the 1970s.[cxiii] With that in mind, I call for the construction of housing that serves a range of incomes, with the affordable homes dispersed throughout the complex so as to avoid socioeconomic segregation between affordable and market rate homes; this occurred in a complex in Hastings in which all affordable units were designated to just one building, leading the Westchester County legislator to describe Hastings' affordable housing as "segregated."[cxiv]

As Mayor Scott Galvin noted at a public forum on race relations in the city on October 28, 2016, the demand for high-end housing in Woburn is increasing. "Over the next 18 months, we have about 1,400 units of housing ranging from million dollar houses, which we've never had, and on the other end of the spectrum, we'll be producing affordable housing units," the mayor said.[cxv] The city should continue working to meet this high-end demand, while aggressively pursuing affordable housing projects, because not constructing any new housing at market rates could exacerbate the problem of rising rents and homeownership costs in Woburn, as has been the case in much of the Boston area.[cxvi] Between 2010 and 2014, the Boston region gained 67,000 new households, but available housing increased by only 15,000 units.[cxvii] This issue has put renters in the region in a vulnerable position, because landlords can more easily

raise rents with housing demand so high, and it means that the cost of buying a home around Boston has gone up.[cxviii]

For this reason, the city should build *some* market-rate housing on the site. I propose that approximately 50 multi-story, multi-family units be constructed, which is below the city's original cap for the site at 150 new households. It seems logical to keep the number lower than the mayor's original cap, considering that there is now another mixed-use project underway in northeast Woburn that will add 298 new housing units to the city.[cxix] Thirty percent of the new households on the site of the Gelly should be affordable, subsidized housing. Thirty percent is on the high end for inclusionary zoning, but it is not unheard of in Massachusetts: some programs have required that half of all units satisfy income targets.[cxx]

It is important to note that inclusionary housing policies in the Boston area have been found to modestly increase the market price of homes and decrease the rate of housing production in the area.[cxxi] This is another reason why I propose that the housing proponent be kept small and that the percentage of affordable units be on the higher end, so as it minimize the negative impacts of inclusionary zoning. In addition, I propose that the developer of the homes be given some benefits or incentives to help offset the costs of producing affordable units, such as allowing for higher housing density. When developers are able to offset the money they lose through the construction of affordable units, this minimizes their opportunity costs, and thereby also minimizes some of the potential negative impacts of inclusionary housing on housing markets (such as increased cost of housing and decreased supply of housing).[cxxii]

There remains another important question for the city and for a potential developer: why limit the amount of housing to 50 units, when the site has room for four or five times that

amount? I will answer this question in the following sections, in which I discuss how the rest of the site can be reused and some of the undeveloped, forested land preserved.

Employment: Create sustainable agricultural and educational center

Last summer, Mayor Galvin proposed a detailed zoning plan for the site of the Gelly, called the Technology and Business Mixed Use Overlay District, to offer guidelines for how the site could be redeveloped. In this plan, Galvin wanted to attract to the site businesses that specialize in "biotechnology, medical, pharmaceutical, physical, biological and behavioral sciences and technology, environmental science, toxicology, genetic engineering, comparative medicine, bioengineering, cell biology, human and animal nutrition." The plan also called for "limited retail and residential development," and emphasized the importance of establishing jobs for Woburn residents on site that pay above minimum wage. It also allowed for a select few full-service restaurants, hotels, biomedical facilities, day care centers, financial institutions, gyms, "essential public services," and possibly fast-food joints, but only if they were "not visible from the exterior of a building."[cxxiii]

Though much of the TBOD made sense for the city and from an economic perspective, I agree with some counterpoints made by a representative from the former potential developer of the site, Boston-based real estate company Leggat McCall. Leggat McCall entered a pending purchase-and-sale agreement with Kraft Heinz last summer, though the agreement ultimately fell through toward the end of last year. Before Leggat McCall backed out of the agreement in November, citing problems with the overlay district ultimately agreed upon between the company the city,[cxxiv] Executive Vice President and Director of Acquisitions for Leggat McCall William Gause proposed some changes to the city's TBOD. Gause argued that the office space

component of the mayor's plan would not succeed without the inclusion of more residential and retail units.

"The issue is that in order to [build office space], you need to create more buzz, something that's going to bring people there," he said. "If someone has a choice to go to an interchange where there's lots of stuff going on, or go to another interchange where there's nothing going on, then they're not going to go here. Millennials, when they get out of [college], they want to go someplace where there's something fun going on. You might want to be downtown … So we want the city to give us the tools to make it a vibrant mix of uses, so that it's not just a little bit of retail, because a little bit of retail or housing won't survive. You really need buzz and critical mass that says it's a cool place to be."

This is why Leggat McCall asked Woburn to change its original TBOD. The fear of the city—and especially of the mayor—was that Leggat McCall would greatly reduce or nix the project's office space and biotechnology components at the expense of the retail and residential development, which the city would perceive as a lost opportunity to "do something bigger," according to Gause. Though the mayor and the city council liked the idea of including some residential space because it would allow people to walk from their homes to different amenities, the city government was a little disappointed with Leggat McCall's requested changes to the TBOD, according to Director of the Woburn Planning Board Tina Cassidy. However, the city council and the mayor ultimately agreed on the increased number of housing and retail units.

"The city council has decided to change the ordinance to match and mirror what the developer wants, rather than the vision of a biotech sort of office type complex," Cassidy told me last summer. "It will have offices, and they would love some biotech, but it will be much more of

a retail and residential center than the mayor was envisioning. So for us, it's a little disappointing. It will be a completely different kind of place than we were thinking."

Gause argued that his plan—which called for double the number of housing units allowed under the Mayor's plan, much more retail units and a minimal technology-based office component—was necessary in order for a developer like himself to make a profit off the site. "I think the reality is that if they don't pass an overlay [zoning district] that enables this live, work, play lifestyle and mixed-use development to occur, then it's going to stay as it is, just empty buildings," he said. "Because no one is going to go there without some reason."

While he made a convincing economic argument, bringing a substantial amount of retail to the site (especially assuming that this retail would primarily consist of national or multinational chain stores) would not have directly benefited Woburn residents who were looking for stable employment opportunities in their city or a greater sense of community. The mayor understood this, and residents do, too. As Kathy Lucero told me in the fall, Woburn residents are struggling to make a living while "working at Market Basket" and similar establishments. While more American manufacturing jobs like those at the Gelly continue to outsource, automate and cease operations entirely, jobs in retail trade employment are on the rise.[cxxv] Unfortunately, nearly 47% of American workers who earn minimum wage work in the food preparation and service sectors.[cxxvi]

Perhaps the mayor's vision to "do something bigger" and Gause's idea to make the site a vibrant and exciting place to live and work through retail development could be made compatible and incorporated into a single plan. This is what I propose: the bulk of the existing buildings on site should be adaptively reused into an indoor urban agricultural center. This would serve as a type of retail center, but it would also offer employment in more skilled trades such as growing

produce, and it would be locally based and locally owned. Unlike the mayor's initial proposal for high-end office space, it would also offer stable employment opportunities for those without specialized higher education degrees.

One reason why the Gelly was considered a good place to work was because of the historically positive relationship between management and workers. Workers described the environment as familial; even though large corporations ran the business throughout most of its history, almost all of the workers, including those in managerial positions, hailed from Woburn or nearby towns. To now bring in a locally owned business that employs people in food production jobs—which are generally available to those without college degrees, similar to the jobs offered at the Gelly—would offer the benefits of retail development without some of the negative aspects traditionally associated with retail, such as low-wage, low-stability jobs.

I envision a business similar to the Chicago Plant, an adaptively reused, 93,500 square foot former pork processing and meatpacking facility in Chicago's South Side. Run by a non-profit organization that repurposed the once-derelict site, it contains several food producing businesses that are committed to the idea of a "circular economy," in which materials and waste from certain processes are then used as inputs for other processes, thereby producing little, if any, waste. It also serves as an educational center, hosting workshops and giving tours that educate visitors about the plant's model of zero-waste food production. The Chicago Plant also hosts indoor and outdoor farmers' markets depending on the season.[cxxvii]

Figure 4: The exterior of the Chicago Plant is pictured here. Image courtesy of Flickr.

The large site of the Gelly and its buildings of varying sizes would make it suitable for all of these uses. Like the Chicago Plant, it could incorporate several different food producing businesses, including bakeries, indoor produce facilities (many root vegetables and green vegetables can be grown indoors), and even breweries, which are often housed in repurposed former industrial sites.[cxxviii] Its warehouse-style buildings make it ideal for vertical indoor farming, which is an environmentally friendly approach to large-scale agricultural production that is increasingly popular in abandoned industrial sites in urban areas. It could also offer education tours that touch on the history of the Gelly, while also teaching visitors about indoor urban agriculture—an engaging combination of the old and new history of Woburn. There would also be space on the exterior of the plant for a farmers' market, which could incorporate produce from Woburn's Russell Farm.

Given Woburn's historic agricultural base and loss of local food production over the last 70 or so years, this use would help restore that industry. Additionally, because of the Gelly's history as a food production facility, the buildings are likely best suited for reuse that involves food production. At the Chicago Plant, one business involves aquaponics, which combines aquaculture with hydroponics. In this process, wastewater from a fish farm is used to feed edible plants, which then take in the nutrients from that water in order to grow. The plants, usually microgreens or other edible greens, then detoxify the water so that it can be circulated back to the fish farm.[cxxix] Aquaponics is labor-intensive and produces high-value products such as microgreens, which means that this kind of system could employ a significant number of people and be profitable, not to mention that it produces little to no waste or byproducts because of its closed-loop nature.

In addition to the businesses inside the Chicago Plant, the site contains community gardens on its exterior. This would be a beneficial option for the Gelly, providing a community gathering space centered on food production in an environmental justice community. As Paul McLaughlin noted, the site of the Gelly is within walking distance of many homes, but it is also relatively far from Woburn Center and most community spaces in Woburn, as well as most grocery stores. Community gardens would provide people living in this part of Woburn with a space to gather and grow fresh fruits and vegetables.

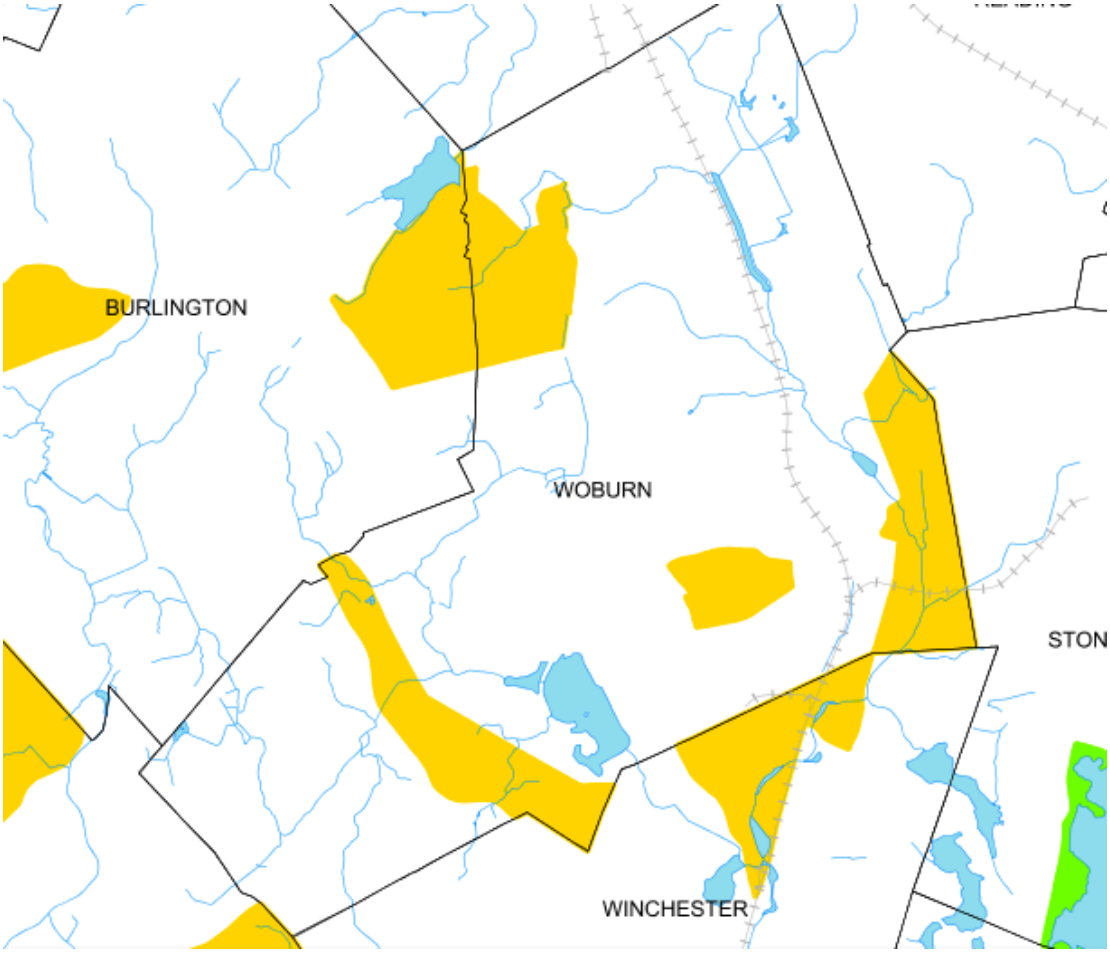

Figure 5: This map shows environmental justice communities in Woburn, based on data obtained from the Massachusetts Environmental Justice Tracker. Areas in yellow are environmental justice communities based on the percentage of racial minorities. The Gelly is located in the southeastern corner of the city.

This type of mixed-use environment would also help add to social capital in the neighborhood. Social capital refers to the networks and relationships within a society that have productive benefits, sometimes translating into literal capital—money or financial assets. As Peter Calthorpe and William Fulton note in their book on regional planning, neighborhoods that contain a variety of public spaces that promote social capital tend to thrive. "A neighborhood is more likely to be successful if it has a series of varied environments—in particular, community gathering places that provide people with a backdrop for engaging in the formal community life required to build social capital. These gathering places may be schools, parks, community centers, stores, cafes, or even bars."[cxxx] In addition to the obvious benefits of social capital such

as an increased sense of community, improving social capital can also have economic benefits; for example, because most people today find jobs through social networks, increasing social capital can also increase employment opportunities.[cxxxi][cxxxii]

Likewise, community gardens have been found to provide tangible economic benefits. A 2008 study published in Real Estate Economics found that community gardens increase the property values of a surrounding area by up to 9.4 percentage points within fives years of the garden's establishment. This study drew from a couple previous studies, which found similar impacts in neighborhoods with community gardens in St. Louis and New York City. This suggests that there could be a substantial economic incentive for greater investment in community gardens, especially in lower-income, primarily renter neighborhoods. "Such investments have a sizeable payoff for the surrounding community, and ultimately for the city itself, as it realizes additional property tax revenues from the neighborhood," the authors write.[cxxxiii] As the study found that renters tend to be more interested in community gardens than homeowners, community gardens would be especially beneficial for the 55.8% of people living in the Gelly's census tract who rent their homes.[cxxxiv]

For all of these reasons, Woburn, and especially this part of East Woburn, could greatly benefit from this type of mixed-use, retail/employment/community/educational site. This brings us to another important component of my proposal: the actual reuse of the buildings.

Architecture: Reuse most or all of the buildings on site

Perhaps the boldest part of my proposal involves the reuse of the Gelly's buildings. From speaking to public officials in the city as well as the former developer of the Gelly, it is clear that both parties did not feel that reuse was politically or economically feasible for the redevelopment

purposes they were considering. Last summer, Rheaume told me that retrofitting and reusing the Gelly would be very challenging for the city and the developer: "All of the existing buildings on the site are designed for heavy manufacturing and would not be easily converted to other uses. These building would not fit into any redesign of the property, could not meet current building codes efficiently or financially cost effective retrofits. In fact, these buildings may not even suit the needs of some other type of heavy manufacturer."

Certainly reusing the buildings would be a challenge. Perhaps some of the buildings would need to be substantially retrofitted for new food-producing uses, whereas some might be more easily converted. Nonetheless, the environmental and social capital benefits of reusing the site are significant enough for the city to consider the feasibility of this concept.

The redevelopment of brownfields like the Gelly is always a more environmentally conscious decision than the development of previously undeveloped sites, also known as greenfields. For one, redeveloping brownfields instead of greenfields reduces sprawl by taking advantage of spaces that are already in use. Additionally, the reuse of existing structures is almost always more energy efficient than the building of new structures, even if new structures are energy-saving or considered "green."[cxxxv] Reuse reduces both the amount of solid waste produced and the amount of greenhouse gas emissions generated from the production, transportation and assemblage of materials used in new buildings.[cxxxvi] In fact, the building sector is responsible for one-third of all material consumption and waste in the world.[cxxxvii] 80% of those emissions are released during the operational phase of the building, and 10% to 20% of them are released when materials are being manufactured, transported, constructed, maintained, renovated and demolished.[cxxxviii] Using buildings for as long as possible is one way to help reduce this environmental footprint.

Building waste also makes up a significant portion of all solid waste produced in the United States; compared to 134.3 million tons of municipal solid waste from American households that was discarded in landfills in 2013, 530 million tons of building construction and demolition waste was generated that same year. About 90% of that waste comes from demolition, rather than construction, processes. These materials can be recycled, but demolishing buildings requires a lot of energy, even if the materials are then reused.[cxxxix] Most likely, these materials will end up in landfills, where they generate methane gas, a potent greenhouse gas that contributes to climate change.

Though the environmental arguments for reuse of the building are compelling alone, the site also has some specific qualities that make it a viable candidate for adaptive reuse. Though the building is very old, dating to the 1880s, it was in use until January 2016. This means that it was likely up to Occupational Safety and Health Administration (OSHA) Codes for that year, which is not the case for buildings that have sat abandoned for years before they were adaptively reused, such as the Tate Modern Art Museum in London or Mass MoCa in North Adams, MA. The Gelly's historic nature also provides a compelling argument for reuse. Though it's not a conventionally attractive building, which is often a hallmark of historically preserved buildings, it is certainly a historically important one for the city: important enough that the Historical Society made a 45-minute film documenting its history and significance in the global, regional, and local economies.

Furthermore, though Leggat McCall insisted that the buildings would not be feasible for reuse, it is possible that the company had not looked into the topic of reuse considering that it was recently accused of neglecting to consider reuse in another redevelopment project. Last spring, the company had been looking to raze and eventually redevelop Worcester's Notre Dame

des Canadiens church, which is considered a "downtown iconic landmark" in Worcester. In May 2016, a member of the Worcester Historical Commission charged that Leggat McCall had, in addition to being imprecise about its redevelopment process or plans, allowed the church to deteriorate, thereby decreasing the viability of reusing it. Additionally, the Worcester Historical Commission said that the company had not released to the public any research it had done about the feasibility of adaptive reuse of the church.[cxl]

Finally, there are some economic arguments for reuse. If a new developer were to reuse the Gelly partially based on its historical significance, it could be eligible for state tax breaks, which would help pay for the costs of retrofitting the structures for the uses I've outlined. This would require that the city and/or developer apply for the state historic rehabilitation tax credit program. To do this, it would first have to apply for the placement of the building on the National Register of Historic Places, or be eligible for listing as determined by the Massachusetts Historical Commission, which might be a less time consuming option.[cxli] Considering that Woburn only has eight sites listed on the National Register of Historic Places—compared to 68 in Winchester, 69 in Stoneham and 90 in Reading—it seems that getting another site registered as historic would help bring more amenities and visitors into the community anyway, in addition to reducing the costs of reuse.[cxlii]

For all of these reasons, I urge Woburn to consider adaptive reuse of the buildings at the Gelly for the retail, employment and educational components of the site.

Preserve forested land and create green space

The final component of my proposal calls for the preservation of some of the undeveloped land on the site, which comprises over half of the entire property. This aspect of my

proposal would probably be the toughest sell for many developers, who, in the words of Tina Cassidy, will always want to maximize the amount they can build in order to maximize their bottom line. Indeed, the city, nearby residents, and developers alike might not realize the potential benefits of that forested land, because it had been privately owned by the Gelly for so long and therefore inaccessible to the public. But what if parts of it were maintained and turned into a series of trailways that people could walk through?

As Mark E. Hostetler notes in his book about ways that developers can preserve biodiversity, when people are not exposed to natural landscapes and biodiversity, they tend to undervalue these concepts.[cxliii] At the same time, he writes that many studies have found that urban residents worldwide "desire contact with nature in an urban setting and have strong aesthetic preferences for community designs that incorporate natural areas."[cxliv] Additionally, homes constructed near preserved natural areas tend to have higher property values, suggesting that if a developer were to preserve some of the undeveloped land at the Gelly, they would be able to sell the market price homes on site at a higher rate.[cxlv] This could increase the property values of surrounding homes in East Woburn over time as well.

Furthermore, Woburn now has an opportunity to create an attractive, regional outdoor destination; the Massachusetts Department of Transportation just announced plans to construct a tri-community bikeway between Stoneham, Woburn and Winchester, with one portion passing right by the entrance to the Gelly off of Montvale Ave.[cxlvi] Though the project was just announced, Stoneham resident and former East Woburn resident Cameron Bain had been trying to get the project going since the 1980s, with minimal support from the Stoneham, Winchester and Woburn city governments.

Bain, who has devoted his life to increasing recreational opportunities in Stoneham, started a community effort called the Friends of the Tri-Community Greenway, which devised the original route of the greenway/bikeway. Since part of his proposed route went through the very top of the Gelly's property, Bain had tried years ago to convince Kraft Foods to allow him and others involved in the campaign to complete the greenway through the property. But the company would not work with him, which Bain believes was because they didn't want people coming near their property for fear that they would notice "environmental" and "security" issues happening at the plant. He also tried to convince Kraft Foods to allow for the construction of the greenway in the forested area of the property behind the plant, but they wouldn't agree to that either because they had installed wells there to satisfy the plant's high demand for water.

"I don't know what environmental issues there were, if they've come up, but there were probably a lot of issues there," Bain said. "And that's why they didn't want the bikeway. They didn't want you riding in front of the gate, while a truck goes by that smells like the worst cargo you've smelled in your life. Every once in a while, they would turn a truck around because the stuff is so rotten."

Now, with the plant closed and with funding from MassDOT, the bikeway will in fact pass through the very tip of the Gelly's property.[cxlvii] This bikeway might increase the number of people coming to the site, and likewise, people visiting the site might then be inclined to explore the bikeway, as Bain pointed out to me. What if the city were to construct a trailway leading from the bikeway into the unforested part of the site, connecting bikers and walkers to the woods in the back area of the site and to the educational center and farmers' market? Given that the people who will use the tricommunity bikeway will likely be more interested in sustainability and the outdoors than most people, they would probably be more likely to stop by the site if it

were sustainably constructed and contained a healthy mix of preserved, forested space that was accessible to the public.

Keeping most of the trees on site would also help address another major issue in Woburn: traffic. One of Mayor Galvin's qualms with constructing a large amount of retail units at the Gelly was that it would increase traffic coming off of I-93 and throughout the Montvale Ave. area. Keeping the number of housing units built on the site to a low number in order to preserve some of the forested land would minimize the traffic changes in the area and maintain a small-town feel. Additionally, given the site's proximity to I-93, keeping much of the trees in place would help reduce the negative impacts associated with traffic, such as air pollution. Trees are an important resource for removing pollutants such as nitrogen dioxide, sulfur dioxide, ozone and carbon monoxide from the atmosphere. Other benefits of trees include the conservation of biodiversity, as they provide habitats for many organisms and valuable ecosystem services such as the reduction of stormwater runoff. [cxlviii]

Though most developers might be tempted to clearcut all of the trees on the site in order to make the most money, I hope that the city will recognize the opportunity it has to serve the needs of the residents living near this site, who have long dealt with unpleasant odors emitted from the Gelly, not to mention water contamination several decades back. By preserving some of the forested land on the site, residents in the new housing as well as in the existing homes nearby would be granted the healthy, vibrant natural environment that everyone deserves. This could provide additional economic benefits in the long run given the positive impacts that an accessible natural environment has on property values.

Employ phytoremediation to cleanup the site

Before any of these reuse options could be implemented, the site would certainly need to be cleaned up. According to Gause, the developers or non-profit organization that purchases the site will be the ones to handle the cleanup, rather than Kraft Heinz or the city of Woburn. One of the primary pollutants on the site, according to Gause, is fuel oil, which has been successfully removed from industrial sites using plant-based cleanup methods collectively known as phytoremediation techniques.[cxlix] Recent technological advancements have also make it possible to remove polychlorinated biphenyls (PCBs), another major pollutant on the site, from contaminated soil and water.[cl]

Phytoremediation involves growing plants on a contaminated brownfield to remove hazardous chemicals from the soil, air, and water. Plants have adapted diverse metabolic and absorption capabilities over time, and they have transport systems that can selectively absorb contaminants or nutrients from soil and water. The process is ecologically friendly, cost-effective, and often cost saving; sometimes, plant-based methods can cost as little as 3% of traditional cleanup costs.[cli]

The process leaves the existing soil intact, thereby differing significantly from the invasive, industrial tactics sometimes employed during the cleanup of brownfields, such as removal and disposal, soil washing and thermal desorption (which uses heat to remove contaminants).[clii] These technologies and processes can make the soil infertile and unsuitable for agriculture.[cliii] Moreover, according to polls and studies, the general public largely supports the process of phytoremediation, as it is a natural, low-energy process that is also visually and aesthetically pleasing.

The only major pollutant present on the Gelly site that probably cannot be removed using phytoremediation is asbestos.[cliv] With the exception of asbestos removal, employing phytoremediation is a logical way to begin redevelopment efforts in a sustainable manner.

Conclusion:

In a way, the story of Woburn is a story of immigrants—first Irish and Italian immigrants who became an important part of the community despite underrepresentation and prejudice, and now immigrants from Asia and South and Central America who similarly face political underrepresentation, segregation, and language barriers in Woburn.[clv] Woburn's story also reveals how the United States has changed over the last century, suggesting that many of our country's leaders have turned their backs on middle and working class people and failed to provide the jobs and government services that citizens had in years past. Others might understand Woburn, with its lack of public gathering spaces, limited public transit, and limited green space, as an example of the disorganized, unsustainable local and regional planning decisions that characterize much of the country.

All of these interpretations of Woburn's history are correct, and they could also be applied to many communities throughout the United States. Even the more extreme events that happened in Woburn, such as the leukemia and water contamination crises, have also happened elsewhere. Today, there are 1,337 Superfund sites on the EPA's National Priorities List,[clvi] and water contamination issues much worse than the one that took place in Woburn continue to come to light. In addition to high-profile case studies such as the ongoing lead contamination problems in Flint, Mich., a recent Reuters investigation found that there are nearly 3,000 communities across the country where lead poisoning rates are even higher than those in Flint.[clvii] So much of

the United States, it seems, is suffering from environmental injustices, the loss of steady employment,[clviii] and growing inequality.[clix]

For these reasons, Woburn also reveals the problems that arise when communities are primarily motivated by market forces and profit, rather than welfare and the wellbeing of citizens. Woburn has historically tried to attract jobs, bring in more revenue to the city, and keep taxes low. The problem is, even though Woburn did everything it could to support its tanning industry, its chemical industry, and the Gelly, these businesses still ended up leaving. The city tried to prioritize economic needs, sometimes at the expense of land, air, and water quality and citizens' interests, but economic problems ultimately persisted nonetheless.

My hometown, Hastings, has a very different approach to community development, one that values its citizens and the environment more than large corporations. Its lack of chain stores demonstrates its commitment to supporting local businesses, and its willingness to preserve forested land and ban plastic bags from commercial enterprises shows that it values sustainability, even if this is sometimes costly for the village. However, Hastings has not proven its commitment to affordability or diversity, with limited affordable housing and limited jobs within the village. This seems to be something that many progressive communities have struggled with—how do we make our communities livable, educated, sustainable, and creative without driving up the cost of living and excluding certain people?

This question itself reveals a major limitation of market forces: they often force communities to make choices that almost always hurt lower-income people. For example, now that the MBTA Green Line is expected to extend into Somerville, many residents are concerned that the cost of living is going to increase even more than it has in the past decade or two.[clx] Because access to public transportation tends to correspond to a higher cost of living in that

neighborhood, low-income neighborhoods often lack adequate public transportation.[clxi] When public transit is built in such neighborhoods, the original residents—who might actually rely on public transit more than wealthier newcomers—are sometimes priced out. By this logic, to keep neighborhoods affordable, communities must not invest in public transportation or other public services that could make them more desirable places to live because this will drive housing prices up.

Rather than follow this flawed logic, planners and politicians need to recognize the injustices associated with these choices: Build public transportation and accept that it will push people out of your community, or continue to disenfranchise those without cars and contribute to climate change. Build public parks and allow this to increase the cost of living in your community, or continue to deny residents access to green space. Demand safe, reliable employment and fair wages even if this angers industries, or continue to accept the mistreatment of workers at the hands of employers. Demand that polluting industries clean up their acts and risk driving them out, or allow them to stay in your community so that citizens can keep their jobs at the expense of public health and clean air and waterways. Even the Gelly created an unfair tradeoff for Woburn: while the plant employed hundreds of workers in the area, it also created environmental and public health problems for those who worked there and for those who lived nearby.

What would Woburn and communities throughout the world look like if they stopped worrying so much about appeasing and attracting businesses that exploit workers and the environment? What would communities look like if they stopped thinking of housing as a commodity and instead as a right? What would they look like if they recognized their moral responsibility to address climate change by building infrastructure that encourages public

transportation, walking, and biking, as well as green energy? What would they look like if they began to value social capital as much as they valued real capital?

Throughout this thesis, I strive to make many different arguments—economic, historical, social, and environmental—in support of my proposal for reuse of the Gelly. But I also urge readers and planners not to limit themselves to these arguments. Instead of only asking, "How can we make this space economically viable, environmentally sustainable, and attractive to residents and outsiders alike?" planners, local residents, and political leaders should also ask, "What is the morally right thing to do with this space?" My proposal doesn't solve the Boston area's housing problems, global climate change, poor job prospects, or income inequality. But it does offer a way that one community can take a stance on some of the world's and its own residents' problems through a small but significant development project. I hope that the city and any potential for-profit or non-profit developers of the site will seriously consider it.

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