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Sense of Pace:
How the Placemaking Practice of Distance Running Impacts Outdoor Recreation Land Use Planning

1. Introduction

Maple leaves, the color of fresh butter, shimmer overhead while geese fly v-like across the still-visible moon. Dewy grass folds underfoot, leaving a path of fresh footsteps through the meadow as the rich, distant scent of cow manure drifts in from neighboring pastures. I cross into the woods near The Knoll, bouncing along the pine needle trail and hoping over gnarled roots. As I run, the landscape informs my thoughts. I miss my parents while passing the flowers we cut together on their visit the prior weekend. Then I am awash in gratitude for my friends as my feet travel over the grassy slope where we held a sunset picnic the night before. The Knoll, a key outdoor recreation area during my college experience, holds hundreds of memories and passing through the space feels comforting, familiar, like home.

Distance running demands sensory awareness of surroundings. This awareness joins people to place through physical connection with the land, the creation of emotional social bonds, and the repetition of routine. In this regard, distance running serves as an individual placemaking practice, which lends itself to observations and suggestions that can inform land use planning.

I combine personal distance running experience with cartography and existing literature in order to study the sport through a humanistic approach. Through autoethnographic research, I apply placemaking and sports geography literature to a case study on distance running and sense of place in Middlebury, Vermont. Middlebury is a “must-see destination” for outdoor recreators as it provides opportunities for “hiking, biking, golf, kayaking, fly fishing, bird watching, alpine

and cross-country skiing", as posed by the first paragraph on the state of Vermont's Middlebury Tourism website (State of Vermont, "Downtown Middlebury" 2021). While Middlebury is a haven for outdoor enthusiasts, its outdoor amenities are neither equitably distributed, nor safely accessible to pedestrians. Based on observations made while distance running, I suggest land use planning decisions that improve the accessibility and equity of Middlebury, Vermont's outdoor recreation.

2. Literature Review

Prominent cultural geographer Yi-Fu Tuan defines sense of place as the personal, emotional meaning that humans apply to and construct within otherwise "undifferentiated space" (Tuan 1980). It is through the application of personal meaning that people transform space into place (Tuan 1980). Sense of place is informed by an individual's life circumstances and is therefore unique to each person, yet its formation is a universal experience (McEwen 2014). Sense of place not only exists spatially, but also temporally as it can be influenced by preconceived notions of a space or impact our memories of space (McEwen 2014; Holland 2020). It can also develop over a range of geographies -- from the feelings of a singular body, or an individual's sense of place, to the self-identity of a town, or collective sense of place (Barnfield 2020).

Human understandings of place are informed by political, social, and ideological values and are therefore susceptible to change over time (Holland 2020). In this sense, spaces connote meaning through the actions and ideas that take place within them (Allen-Collinson and Hockey 2015). One such action, distance running, temporally and spatially "reanimates place in relation to landscape, community, history, and intimacy" (Bale 1996; Holland 2020, 259). Distance

running serves as a placemaking practice by affecting both individual and collective sense of place through “material, experiential, cognitive and philosophical means” (Peng 2020, 2).

Recent contributions to sports geography illuminate the tie between sports and sense of place and have paved the way for researchers to further specify the connection between running and sense of place. Distance running is defined as running that occurs on trails or roads, rather than a track, and this paper discounts training in which the achievement of specific time splits defines an athlete’s success. Beyond these constraints, the term “distance” is intentionally vague and subjective so as to encompass all running activity besides indoor and outdoor track.

This paper focuses on road and trail running rather than track running because regulated, monotonous track infrastructure is less conducive to the creation of sense of place than the varied environments experienced along roads and trails. To this point, Bale (1996) brings attention to placelessness in athletics, which is achieved through the construction of near-identical stadiums, tracks, and turf fields. Placelessness levels the playing field by erasing the natural diversity of place that would otherwise influence athletes through varied, individual sense of place development (Bale 1996). While track-based athletes may still experience variation across environmental factors such as altitude, air quality, and weather, the homogenous structure of track stadiums eliminates surfaces, slopes, and scenic views. In doing so, tracks regulate athletes' relationship to place and remove the individual factor in sense of place creation (Bale 1996). Tuan (1989) offers a similar insight on the role of placelessness in sports, noting that society’s gravitation towards instant gratification has favored shorter sports events and running distances. Tuan (1989) points out that these shorter events are also easiest to hold in a placeless environment such as a track. For this reason, this paper focuses on distance running. Although

the term “distance” is purposely ambiguous and subjective, this type of running employs greater attention to place and lesser attention to the immediate achievement of certain times.

2.1 Methodology in the Literature

Authors who employed ethnographic approaches to studying running as a placemaking practice relied on participants’ sensory awareness to conduct their research. Touch is expressed in the tangible connection between athlete and topography and manifests in an athlete’s physical interaction with their environment. Therefore, the sense of touch, as applied to running, is reactionary to the environment, whereby sight, smell, and hearing are observational of the environment. For this reason, sensory awareness through sight, smell, and hearing exist as a methodology for measuring sense of place in runners. Physical connection to the land, however, is explored in section *2.2* as one of the literature’s three means through which running serves as a placemaking practice.

Andrews (2017) calls for the realm of sports geography to focus on “spatial sport studies”, which emphasize an athlete’s sensory and cognitive experience engaging with their environment. This perspective compliments that of Bale (1992), who writes that sports are inherently geographic in their measurement of an athlete’s time moving through space. Both Andrews (2017) and Bale (1992, 1996) create the foundation for understanding sports as a bridge between person and place, or a placemaking practice. Rodaway (1994) furthers this idea through his conclusion that athlete’s use of sight, touch, smell, and hearing enables connection with the land.

Distance runners’ usage of senses occurs through both the physical experiences of smell, sight, touch, and sound, as well as the sensations of rhythm and momentum (Hockney 2006; Andrews 2017). Lorimer (2012) suggests that running requires an athlete to engage all senses in

order to navigate a landscape, thus bringing increased awareness to place. Through autoethnographic evidence, Hockney (2006) demonstrates the ways in which his physical senses inform his spatial awareness. For example, the temperature feels colder as altitude increases and the sound of nearby cars trigger a feeling of unsafety (Hockney 2006). This heightened awareness of senses is what Bale (1996, 170) refers to as "zen running", where an individual is "at one with oneself and the environment". Tuan (1986, 157) expresses this same sensory experience as a form of running in which the sport is "an immersion in the world". The autoethnographic components of this paper place emphasis on the senses of sight, smell, hearing, and touch.

2.2 Distance Running and Sense of Place

Sports geography literature finds distance running to create individual sense of place through three main avenues: physical connection with land, the creation of place-based emotional social bonds, and the repetition of routines.

2.2.1 Physical connection with land

The sensation of touch physically connects runners to place, which in turn influences emotional connection to place. Lorimer (2012) and Brown (2017) pin physical connection with land as the direct bridge between the immediate geography of the human body and the larger geography of the surrounding environment. Merleau-Ponty (1962) supports Lorimer (2012), noting that running enables an athlete to "see the world through the point of view of the body", intentionally moving in reaction to surroundings. Bale (1996) expresses this same idea, stating that the upright running position of the human body inherently positions an athlete to connect with the topography ahead of them.

Physical connection to land also impacts an athlete's movements. Holland (2020) points to the way that runners must shape their routes to the landscape -- dancing over rocks, slowing on climbs, and dodging both physical obstacles, like fallen trees, and emotional obstacles, like areas that feel unsafe. Beverly (2020) adds that interacting with the landscape can help runners discern place and time. For example, a runner in Vermont might kick up pine needles while a runner in Colorado kicks up dust. Likewise, mud suggests late spring rains and leaves obscure the trail come fall. The reactionary relationship between athlete and landscape is reflected in Barnfield's (2017) study of running in the post-socialist urban landscape of Sofia, Bulgaria. In this study, runners chose urban routes that offer the least resistance to pedestrians (Barnfield 2017). In this sense, an athlete's physical environment impacts the speed, effort, and pace of a run so as to inform the rhythm of a given route and deepen an athlete's sense of place (Andrews 2017; Hockney 2006).

Lorimer (2012, 83) distinguishes between love and fear of place in his description of how "fatigue is the trigger switch transforming topophilia into topophobia." This quote illustrates how running is a sensory experience that evokes both emotional and physical reactions to place. Long climbs demand patience, downhills provide a weightless feeling, snow and mud call for shorter steps (Lorimer 2012). In reacting to the varied surfaces and slopes of a route, runners experience a series of emotional shifts (Lorimer 2012). For example, Brown (2017) finds that the sensation of running on uneven surfaces evokes positive feelings in athletes. On the other hand, aforementioned running tracks remove topographical variation so as to create a placelessness that eliminates emotional variation and sense of place between runners (Bale 1996).

Peng (2020) refers to the relationship and interaction between athletes and topography as "landscape socialization". He finds that those who are more physically connected to their

topography also feel more emotionally connected to these landscapes (Peng 2020). This emotional connection to place, informed by both sensory and social triggers, is a second means through which running serves as a placemaking practice.

2.2.2 Emotional social bonds

Through social bonding and sensory response to the environment, distance running creates emotional bonds to place, which, in turn, help athletes develop sense of place. Running brings people together to emotionally connect over participation in the sport (Frondorf 2014). While this is true of most sports, the potential for distance running in particular to create such bonds is supported by the its existence at the intersection of research on the power of nature, outdoor recreation, and sports to all bring people together in meaningful ways that create emotional ties to place (Peng 2020; Austin et al. 2009; Frondort 2014). When running with others, training routes transform into social spaces with emotional value (Hockney 2006; Hanold 2016). Increasing awareness beyond the individual self enables runners to undergo an emotional response to interaction with others in their vicinity (Shipway 2010). In this sense, running is a "solitary, yet intimate experience" (Lorimer 2012, 86). Taking part in running alongside other athletes deepens one's sense of place through the development of shared, place-based emotions.

To illustrate the connection that running creates between people and place, Holland (2020) points to a performance art piece that altered distance runners' sense of place through the creation of deep social bonds (McEwen 2014). Performance participants paired off, tied one's hand to the other's, and proceeded to run 100km together (Holland 2020). This performance, like many training miles shared between runners, pushed participants to incorporate cognizance of their training partner into their practice of running with sensory awareness (Hockney 2006). In

this way, running with others builds social bonds while also increasing awareness of place (Hockney 2006).

The significance of social and emotional bonding to sense of place is further reflected in Vink and Varro's (2019) study of sense of place at running race events in Rotterdam, Netherlands. In this study, runners explain how the "shared embodiment" of a challenging run creates emotional bonds, which deepen their sense of place (Vink and Varro 2019, 963). This aligns with Kyle and Chick's (2007) findings that people feel stronger attachment to places where they have spent time with people they care about.

In bringing people together in space for a common purpose, running forms "each individual journey" into "a collection of journeys within a place", thus "cohesively developing a sense of place" (Holland 2020, 261). Rom (2017) demonstrates this idea with a case study of Leadville, a Colorado town that lost its sense of community and identity when the local mine shut down and left nearly the whole population unemployed. To mitigate their dire financial circumstances, Leadville hosted a 100 mile race, which became an increasingly popular phenomenon and now defines the town's identity as a running mecca (Rom 2017). Running creates connections across diverse groups of people, in this case miners and ultrarunners, thus helping to deepen both collective and individual sense of place through the creation of emotional social bonds.

2.2.3 Repetition of routines

In addition to physical connection to the landscape and the creation of emotional social bonds, distance running serves as a placemaking practice through the repetition of routines. Tuan (1980) suggests that developing a sense of place depends upon the passage of time. Rootedness to place, he posits, "occurs at the unconscious level with the passage of time and the

accumulating of experiences" (Tuan 1980, 329). The repetitive experience of running training routes helps to form athletes' sense of place through the concept of rootedness.

Individuals experience rootedness when they become so comfortable in a space over time that actions within that space become second nature so as to make the individual feel fully at home (Tuan 1980). The action of running achieves this level of familiarity through rhythm. Rhythms are the repetitive temporal and spatial instances that make up an individual's routines, like getting lunch at noon every day or breathing in line with your running steps (Andrew 2017). Rhythms are essential to success in running and depend on the ability of the body to sense and register them (Andrews 2017). Training routes offer a space where the spatial practice of running is a rhythm and can therefore become familiar enough over time as to root the individual in the space and further their sense of place (McEwen 2014; Hannold 2016). In increasing familiarity with routes, runners also increase their ability to "read" their surroundings through the creation of mental maps (Lynch 1960). More legible surroundings include those with landmarks, including notable buildings or natural structures (Lynch 1960). As an environment is repetitively travelled through, such as with a runner's repetition of their training routes, these mental maps increase in detail and further sense of place (Lynch 1960). Additionally, as memories are compiled overtime, these mental maps are embedded with further meaning and subjective understanding of space (Lynch 1960).

An athlete's sense of place is informed and deepened through the remembrance of previous experiences that occurred in a given place. Madgin et al (2016) argue that past runs impact future sense of place because running creates temporally attached experiences. As a runner trains on the same route over and over again, their previous social connections and physical actions accumulated in that space impact their sense of place (Holland 2020). For

example, if an athlete runs a route with a close friend, the conversations and emotional bonds of that relationship become spatially bound to that route in the athlete's memory. If then, a week later, the same athlete runs the same route again alone, they will likely remember the run with their friend and revisit those positive emotions of bonding, thus creating a temporal tie between run and place (Madgin et al 2016). It is for this same reason that athletes often play better at their home games, as there is a depth of memory and emotional tie to that space (Bale 1996). Allen-Collinson and Hockney (2015) elaborate that not only does sense of place on training runs take into account both present and past actions in that space, it can also be positively or negatively impacted by good and bad prior runs. If a route, for example, were run on a brutally hot summer day and the runner felt dehydrated and dizzy along the way, this experience would impact their sense of place on that route during future runs. For these reasons, sense of place can be everchanging, just like a place itself. Lefebvre (1991) summarizes these ideas in his notion that training routes are not only physical spaces, but also constructed from athlete's thoughts, ideas, and memories that happen in that space.

Hockney (2006) uses examples of Madgin et al's (2016) theory when expressing how running helped establish his sense of place. He remembered former training runs in England when he saw a certain type of tree and certain smells would trigger memories of earlier training runs (Hockney 2006). Pearce (2021) adds to this notion with his study of how an athlete's physical reactions to topographical features, particularly footfall patterns, trigger memories associated with the given topography. In this sense, memories are embedded in the slopes, surfaces, and terrains of training routes and repetitively running training routes uncovers memories associated with these routes and other routes that share similar topography (Pearce 2021). For this reason, Pearce (2021) claims that an athlete's repetitive use of space over time

can render it familiar, even if that space itself is not noteworthy or special, thus deepening an athlete's sense of place through the repetition of routines. In these ways, both emotional bonds and physical connections to space impact the experience of that space in not only the present but also the past and future in that space. This adds a temporal lens to the means through which distance running serves as a placemaking practice.

2.3 Outdoor recreation land use planning

Although the significance of sense of place has been questioned in recent decades due to globalization and homogenization, Newell and Canessa (2018), Walker and Chapman (2003), and Kyle and Chick (2007) illustrate that sense of place does impact residents' views on land use planning decisions. It is therefore key that planners consider sense of place when making land use decisions such as those regarding outdoor recreation spaces.

Newell and Canessa (2018) demonstrate the importance of 'geovisualization', or resident's mental conceptualization of a given area, in resource planning and development. These geovisualizations included sense of place factors such as "nature protection values, community and economic well-being values, place identity and place dependence" (Newell and Canessa 2018, 1). The degree of these factors in each individual's geovisualizations were found to correlate with their views on conservation, development plans, and resource extraction (Newell and Canessa 2018). This mirrors Walker and Chapman's (2003) finding that National Park visitors' development of sense of place impacted their willingness to practice conservation measures such as Leave No Trace. As Kyle and Chick (2007) explain, this development of sense of place is often impacted by the place's social and emotional environment, as much as its physical setting.

In order to increase the consideration of sense of place in land use decisions, the literature suggests increased attention to the overlap of Kyle and Chick's (2007) social, emotional, and physical planes. To accomplish this, Klinenberg (2018), Tuan (1974), and Frug (1996) each call for widespread social infrastructure, or spaces like public parks which facilitate social interaction. At the same time, Barnfield (2020) and Qvistrom (2016) argue for increased accessibility to these outdoor recreation amenities.

Klinenberg (2018) points to the need for more third spaces, or settings outside of home and work. Tuan (1974) discusses topophilia, or love of place, and the value that a place gains when its residents develop positive emotional connection to existing social infrastructure. He points to the pushback that urban planners often receive when rebuilding beloved stadiums, which suggests that emotional connection to place may outweigh aesthetic design or modernization (Tuan 1974). Frug (1996) increases the scale of this idea, arguing that the suburban American landscape fragments society through zoning and homeownership and isolates residents through car-centric cities. He argues that rejecting this urban layout would increase interaction between diverse lifestyles, creating a greater "sense of community" (Frug 1996, 1047).

Public outdoor recreation areas are examples of third spaces and social infrastructure. However, as reflected by Barnfield (2020) and Qvistrom (2016), interaction between diverse individuals in third spaces depends on equitable access to such areas. The literature therefore concludes that manipulating the physical environment to cater to equity and accessibility can, in turn, facilitate the creation of a positive sense of place.

2.3.1 Accessibility

Existing literature expresses that increased accessibility to outdoor recreation spaces increases resident attachment to place. Peng (2020) argues that increasing residents' understanding of their surrounding landscape will also increase their engagement in land use policy and their emotional investment in land use changes. In terms of outdoor recreation planning, this positive feedback loop suggests that increased resident access to a town's outdoor recreation spaces would increase the number of residents who care about the town's land. Expanded pedestrian infrastructure can increase access to outdoor recreation and further residents' empathy and positive feelings for a given place (Holland 2020; Barnfield 2020). Cities should strive to provide easily accessible outdoor recreation areas for a diverse range of ability levels, experience levels, and affordability (Latham and Layton 2019).

Accessibility can be gauged through pedestrian comfortability. As Allen-Collinson and Hockney (2015), Deelan et al. (2019), Qvistrom (2016), Brown (2017) and Barnfield (2020) all mention, pedestrian areas are more comfortable, accessible, and likely to be used when they provide residents with positive sensory experiences. Hockney (2006) and Allen-Collinson and Hockney (2015) discuss how positive sensory experiences inherently indicate safety while negative sensory experiences increase pedestrian stress levels. This is key to arguments such as those of Qvistrom (2016) and Deelan et al. (2019) who state that the noise and proximity of cars along pedestrian areas creates feelings of unsafety, while the sight of greenery along these spaces creates a sense of calm. Likewise, Allen-Collinson and Hockney (2015), Qvistrom (2016), and Brown (2017) argue that variation in pedestrian areas, such as a combination of trails and sidewalks, piques bodily engagement and interest. The importance of sensory experience also arises in Barnfield (2020)'s suggestion that amplified lighting and restricted noise pollution along

paths encourage pedestrian usage. Sensory experience therefore impacts both feelings of safety and degree of engagement within pedestrian areas.

2.3.2 Equitable Distribution

The built environment can help to mitigate social isolation, facilitate informal socialization, and support interaction between diverse groups of people by increasing third spaces (Shipway 2010). Public outdoor areas, such as parks and greens, facilitate a sense of community by encouraging outdoor recreation, which serves as a form of informal socialization (Shipway 2010). Latham and Layton (2019) claim that outdoor public spaces encourage more residents to take part in athletic pursuits because these outdoor spaces allow people to experience socialization and publicness through the comfortable social role of playing a sport. Deelan et al. (2019) find that more pedestrians, particularly those new to outdoor recreation and exercise, are most likely to use connectivity spaces that include lively crowds. Similarly, Barnfield (2020, 8) states that outdoor recreationists experience a positive feeling of "distributive sensation" when taking part in recreation activities in public areas with other recreationists. In other words, sharing in outdoor recreation activities together promotes positive, shared feelings toward that given outdoor space.

While public outdoor recreation space is key to building a sense of community and sense of place, it is crucial that these spaces be equitably distributed throughout the built environment. The development of equitably distributed outdoor recreation spaces provides opportunity for the creation of emotional social bonds between people of various backgrounds and offers all residents an equal opportunity to use these amenities.

3. Methodology

In the fashion of Hockney (2006), Beverly (2020), Lorimer (2012), Holland (2020), Allen-Collinson and Hockney (2015), Shipway (2010), Bale (1996), and Tuan (1986), I incorporated personal distance running experience into a study of running as a placemaking practice. I then visualized the autoethnographic component in a series of choropleth maps and an interactive OpenLayers webmap. This project thus adds to the small amount of literature on the sensory experience of sports and distance running in particular.

3.1 Participatory Research

I recorded my own sense of place while running the Trail Around Middlebury (TAM) and every public street in Middlebury, Vermont. Similarly to Allen-Collinson and Hockney (2015), I produced narration and videos during the runs using a GoPro and the iPhone Voice Messenger app. This media was transcribed for usage in the written product. After particularly sensory running experiences, I also completed short reflective writing pieces. These recordings and reflections tracked environmental factors, weather, terrain, feelings of safety or lack thereof, and people I saw or ran with. They also noted how running engages each of my senses and enables connection to familiar places in new ways. I considered how the layout of Middlebury, Vermont, both in a conservation and urban planning sense, makes the area more or less pedestrian accessible in terms of infrastructure and safety.

My recordings and writings are descriptive and observational, however, in order to have a consistent means of measuring sense of place, I analyze negative and positive senses of place in Middlebury through a series of place-related questions. These questions are based on surveys administered by the U.S. National Forest Service (U.S. National Forest Service, “Place Attachment Items”) to measure the sense of place of visitors and residents in or near protected lands, as well as the work of Deutsch (2009), Jacksonville State University’s “Sense of Place

Survey", and Jorgensen and Stedman (2003). I recorded answers to these questions after running each street and section of the TAM.

Table 1.
Sense of Place Questionnaire

Concept	Question
Safety	I feel safe while running this route.
Emotional social bonds	I feel emotionally attached to this route. It has meaning to me.
Emotional social bonds	I have developed meaningful relationships while running this route.
Physical connection to land	I identify with or find meaning in the physical landscape of this route.
Repetition of routines	I have strong memories associated with this route.
Pedestrian access	I feel this route is easily "runnable" (i.e. a good place to run with few infrastructure barriers)

Note: Answered on a scale of 1-5 where 1 means strongly disagree and 5 means strongly agree.

The data from my answers illuminate my sense of place by indicating the impact of certain concepts, as seen in the left hand column of Table 1, on my sense of place. Additionally, these queries inform sense of place mapping in both the choropleth maps and webmap.

In order to control for external factors that could impact my sense of place, I kept a consistent effort level on all runs or made note of any significant variation. Additionally, I ran the following routes on both a weekday and a weekend, during the fall and winter season, and during the morning (between sunrise-noon) and afternoon (11am-sunset). While it is not feasible to run all routes during various times of day, days of the week, and seasons, these routes consist of the most popular amongst Middlebury College students and will offer an idea of how temporal differences impact sense of place on a single route. These routes include:

1. Pulp Mill Covered Bridge Loop
2. Creek Road
3. South Street Extension
4. The on-campus section of the TAM (The Red Kelly Trail, Class of '97 Trail, and the Knoll)
5. Battell Woods section of the TAM

All runs were carried out with the intent of gauging the primary factors contributing (or not) to my sense of place. This measure indicates specific ways that this placemaking practice could inform outdoor recreation land use planning decisions. These observations help build an argument for the importance of considering sense of place in land use decisions and urban planning more broadly. Through these means, the autoethnographic research indicates how distance running as a placemaking tool could impact sense of place through adjustments in the accessibility and equity of outdoor recreation.

3.2 Mapping Sense of Place

After completing and documenting the participatory running research, I visualized this information in a series of choropleth maps and an OpenLayers webmap, seen in Figure 1, depicting the numerical rating of each concept in Table 1. These maps contain an outdoor-recreation specific base map of Middlebury, Vermont. This base map is overlaid with the town's public streets. The street layers are shaded to demonstrate how each Table 1 concept contributes to the creation of sense of place in the designated area.

In the choropleth maps, each map represents a different concept, which is symbolized through a color ramp ranging from reds and oranges, where the concept is poorly represented, to shades of green, where the concept is strongly represented. The choropleth maps are designed with land use and urban planners in mind as a primary audience, so this color choice is designed to draw urban planners' attention to the areas with most need for improvement and the areas that serve as the best models. The coloring of these sections is based on a ranking of the given

concept from 1-5 for each road and TAM section. The one exception is the map of social bonds to place in Middlebury, in which the ranked scores for both social concept questions will be averaged on the maps.

In addition to the choropleth maps, this paper is also paired with an OpenLayers web map depicting the suggestions in this paper, the Table 1 concept scores of each road and TAM section, and the sum potential of each Middlebury road and TAM section to contribute to sense of place development. The sum potential values represent the summed results of the questionnaire in Table 1, with the two social conceptual questions averaged, for each road and TAM section. A higher number of "5 - strongly agree" answers will yield a higher score. If, for example, I chose all 5s for all 6 of a route's questions, then that route's score would be 25, as the two social questions would average to one 5. In addition to coloring, this OpenLayers map also depicts major outdoor recreation opportunities, a suggested bike path route, trail - road intersections, and suggested landscaping. When clicked, these aspects display information including scores, notes, or videos of the given idea or area.

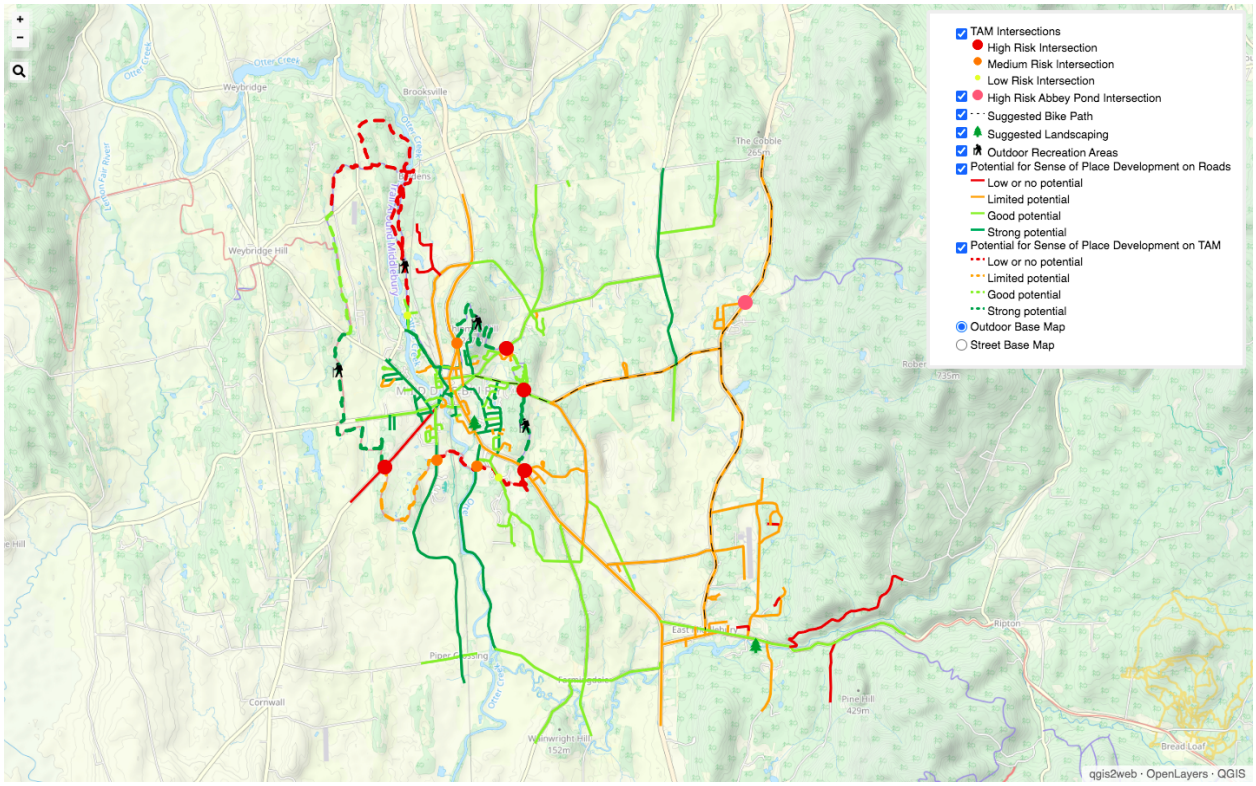

Figure 1. *OpenLayers Map*
This map depicts urban planning suggestions, areas of focus, and potential for sense of place development on roads and the TAM in Middlebury.

While the choropleth maps target land use and urban planning professionals, the OpenLayers map offers an accessible public-facing map of outdoor recreation access and equity. Moreover, this webmap engages Middlebury residents in the conversation about the significance of sense of place as a consideration in land use planning. Hopefully, this conversation can prompt reflection on residents' own sense of place, which they can bring to their personal engagement in land use decisions.

4. Results

In engaging my senses and noting my observations, I found that my experiences of placemaking while running in Middlebury aligned with the three themes I discerned from existing literature -- physical connection with topography, emotional social bonds, and repetition of routines. It is important to note that these are interrelated categories. For example, an athlete's

physical interaction with their environment can evoke emotional reactions. Repetition of running a route might later trigger memories that deepen positive or negative emotional ties to a place. Likewise, previous social and emotional interactions impact future sense of place. Repetition of running in a physical landscape can also trigger emotional connections to similar topographies. For this reason, running observations are only included in one of the three literature review categories, but are likely also relevant to the other categories. With respect to each of these themes, this section explores my running observations and conclusions.

4.1 Repetition of routines

My even footsteps tap along the straightaway of Cady Road -- *one, two, exhale, one, two, exhale.* Acres of open field and fallow crops lay to my left and right, offering few immediate landmarks. I totter along the white line, trusting that any oncoming traffic will switch lanes rather than make me hop down the small embankment into the field. Ahead, a mountain range stretches the horizon, its leftmost hills harboring the town of Bristol, Vermont.

Despite my unfamiliarity with my immediate surroundings, the range ahead brings back peaceful memories of the Munger Street home I lived in over the previous summer. I remember watching the sun rise over the same mountains during pre-work summer runs down East Munger Street. My current view informs me that Cady Street is just a few miles south from the route in my memory. I immediately feel more at home. Sure enough, five miles later, I turn left onto Cobble Hill Road, wind through East Munger Street, and empty onto Munger Street. Middlebury's natural landmarks, such as mountains and parks, increase Middlebury's legibility and serve as orientation points for my mental mapping of the town. My ability to create a mental image of my position within my surroundings increases my feelings of familiarity and sets a positive sense of place.

My personal memories overlay my mental map of Middlebury, embedding the area with further meaning. The town's natural landmarks also exist as constants in my personal sense of place development. My body instinctively places footwork down the rooty, switchbacked Painter Road side of Chipman Hill while my mind wanders. As a student, I have moved between living situations nearly every three months for four years. This transience encouraged the use of new running routes, pushing me to wander down whichever roads lay closest to my next dorm. While this exploration of roads widened my understanding of Middlebury, my consistent use of the TAM deepened my emotional and physical connection to the town. As four years of runs and emotions compiled within the space of that trail system, it took hold of a complex record of my college memories. The TAM serves as a home itself -- familiar, comforting, constant -- which helped me feel at home in Middlebury writ large.

The repetition of the popular training routes shown as mentioned in section 3.1 illuminates the impact of seasons and time of day on running experience. As I run down Creek Road on a Sunday morning mid-fall, I almost feel rude to wear headphones considering the amount of walkers to whom I smile and wave hello. This is a surprising contrast to runs on this road on weekday afternoons where my only human interactions are with barrelling pickup trucks and men fishing after work at the corner of Three Mile Bridge Road and Creek Road. In contrast, a run around down Weybridge Street and the Pulp Mill Bridge loop during weekday afternoons is met with dozens of friendly waves as other students dip outside post-class.

The time of my runs not only impacts my social interactions, but also my feelings of safety. With winter's 4pm curfew on daylight, I find myself choosing South Street Extension over most other routes because the hospital provides some street lighting. One night, after misjudging how long a run would take, I dash down Morse Road and onto South Street

Extension with an unsettling fear that I would never have experienced a few hours earlier. Where a romantic tree tunnel once framed the road, an eerie den now beckons. My mind travels to a night run with friends over the summer, where we laughed at the novelty of a similar tree tunnel blocking out the stars. The darkness feels less friendly now. I remind myself that the shadows are all in my head, but can not feel quite assured enough to slow my pace from a near sprint homeward.

4.2 Physical connection with land

In reflecting on my physical connection to Middlebury, I focused on how my body reacts to my physical environment and also how these surroundings heighten or lessen my feelings of safety.

Field runs mean tripping. During the earlier months of the semester, I tripped over grasshoppers as I ran along the open field of the TAM's Jackson trail. Small yellow butterflies flit alongside me through the Knoll, threatening to dart underfoot at any moment as I skip around them. Eventually my footing grows surer as the weather cools and slower moving wooly bear caterpillars take their spots.

My careful, and at times clumsy, footwork continues along the TAM into the woods near Weybridge Street. As the seasons change from summer to fall, I watch the TAM grow more treacherous with red and gold maple leaves stacked in a thick layer over the roots and rocks beneath. In response, I pick up my knees higher, taking smaller steps and assuring I do not drop all my weight onto an unstable ankle.

I run smoothly along the single track behind Brooker House on the Class of '97 trail, flowing up and down, keeping effort consistent over the rolling hills. I usually choose the TAM, with its roots and rocks and cow stiles, when I want an engaging and adventurous run. If I'm

looking for a more mindless, meditative outing, I will seek out long, gravel roads. On Creek Road, Morse Road, Halpin Road, Happy Valley Road and South Street Extension, my feet turnover rhythmically and, with little mind to traffic or unstable terrain, my mind wanders. During both these meditative road runs, as well as highly engaged trail runs, running provides a bridge between physically connecting to the landscape and feeling a more-than-physical connection between the Self and the surrounding environment.

Few elements ruin the feeling of safety like traffic. Trails and gravel roads feel calm, but as I enter onto Route 7, Case Street, Route 125 or Route 30, that feeling instantly dissipates. As I head into a steep climb up Case Street to Cobble Hill Road, a frustrated Nissan Altima speeds past the car in front of it, swerving into my lane to do so. I jump to the edge of the foot-wide shoulder, but, blocked by a guard rail, am so narrowly missed that I feel the windy suction as the Nissan rages past.

Cars pose a threat to all creatures that move by foot. Each time I cross Route 7 I remember a skunk that was hit at that intersection and, in a tragic attempt to save himself, sprayed the car just before impact. The scent lingered for days and made me run faster and with heightened awareness of my surroundings. Roadkill, while commonplace and distant from the seat of a car, feels far more impactful when you, another being running alongside traffic, must physically step over the dead bodies. As roadkill lay on nearly every street in Middlebury, from raccoons and skunks to snakes and caterpillars, it forced me to more critically consider the safety of pedestrianism in Middlebury.

Not only do I fear that cars will threaten my physical safety, but roads that cater more to cars than pedestrians also increase how visible I feel in my identity as a female runner. In spaces with more cars and little pedestrian infrastructure, I feel vulnerable to those observing and

driving past. My feeling of safety as a woman running alone decreases on roads such as Cross Street, East Main Street, and Route 7, where cars are often stopped and drivers stare at passing runners. The same goes for roads such as Cady Road, Three Mile Bridge Road, Shard Villa Road, and Morse Road, where I often cross paths with singular vehicles in unpopulated areas. In response to these surroundings, I run faster, making wide berths around oncoming vehicles and often remove my headphones to increase sensory awareness.

In addition to my gendered position on safety, rural and industrial surroundings also increase my awareness of my privilege as a long distance runner. On the fourth hour of a run this fall, I crossed through Lower Foote Street on my way back towards town. The air smelled strongly of manure, Dairy Road led rightwards toward one of the largest cow barns I had ever seen, and Tractor Supply sat at the nearest intersection. The only people in sight presented masculinely and performed tasks of physical labor. As I jogged by, decked out in a running vest and sporty clothes, I felt glaringly out of place. In contrast with the farming tasks performed on either side of the road, it felt frivolous to spend my full Saturday afternoon exerting energy on a task with little impact beyond my own enjoyment. It is a tremendous privilege to have leisure time and energy for the outdoors. I also felt aware of how far I had traveled by foot, along busy roads with narrow shoulders, to reach this part of town. Areas within Middlebury's industrial and agricultural land uses, particularly those surrounding the town's central quarry, have limited access to outdoor amenities.

4.3 Emotional social bonds

Revisiting old training routes throughout Middlebury felt like a run down memory lane. The emotional connection between others and place rang particularly strong along areas where friends lived or where I had previously run with others. Running up Park Street, I yearned to stop

by the Leatherworks apartments where three of my friends simmered Shakshuka on the stove upstairs. On Main Street, Short Shannon, and South Main Street, my mind floated back to nights mingling with new friends and old over potluck dinners, seasons of 'The Bachelorette', and cozy craft nights. I spot a few of my Professor's homes along Seymour Street, Morningside Drive, and Short Shannon Street, which underscores my lack of sense of place in areas where I know no homeowners such as Peterson Terrace, Rolling Acres, and most other suburban developments.

I do not always know the people I connect with along routes. Neighbors carving pumpkins on High Street wave as I run by, a house offers free cucumbers and tomatoes to passersby on Weybridge Street and I snag a hydrating snack, a sign advertises free apples and I ponder how many I can comfortably carry home. Knowing and feeling connected to the people behind the built environment turns these routes from spaces into places.

The connection between place and emotional social bonds extends to people I run with, as well as those I see along runs. Pulp Mill Bridge Road and Seymour Street spark memories of hundreds of late afternoon jogs with friends -- barely squeaking in three miles before early winter sunsets. As I round a curve in Creek Road, I cringe at the memory of an awkward first date run, but as I scramble up a TAM hill near Belden Falls, I sink into bittersweet nostalgia of a more meaningful one. Cresting the hill up Elm Street in town still sparks anxiety as I remember struggling to keep up on a particular MiddRuns outing, while a trip down Weybridge Street makes me chuckle as I remember racing a friend back to our rooms in Coffrin Hall.

The following section explores how these running observations and experiences apply to placemaking and outdoor recreation land use planning in Middlebury.

5. Discussion: Application to Middlebury

Based in both existing literature and autoethnographic research, this paper issues three arguments for how the observational and sensory qualities of distance running as a placemaking

practice can inform outdoor recreation land use planning in Middlebury. First, the repetition of distance running routines in Middlebury demonstrates that the town already contains outdoor recreation areas, namely parks, which create a foundation for experiencing physical, social, and temporal bonds to place. Second, the physical connection to land while running in Middlebury indicates that the town lacks safe pedestrian accessibility to these outdoor recreation areas. Third, the emotional social bonds formed while running in Middlebury illustrate that, although the town's outdoor recreation areas are strong candidates for third spaces, these areas are inequitably distributed. Increased pedestrian accessibility to outdoor recreation space and more equitable distribution of said outdoor recreation spaces can improve both individual and collective sense of place in Middlebury. Figures 2 and 3 visually represent the need for more pedestrian accessible and equitably distributed outdoor recreation spaces.

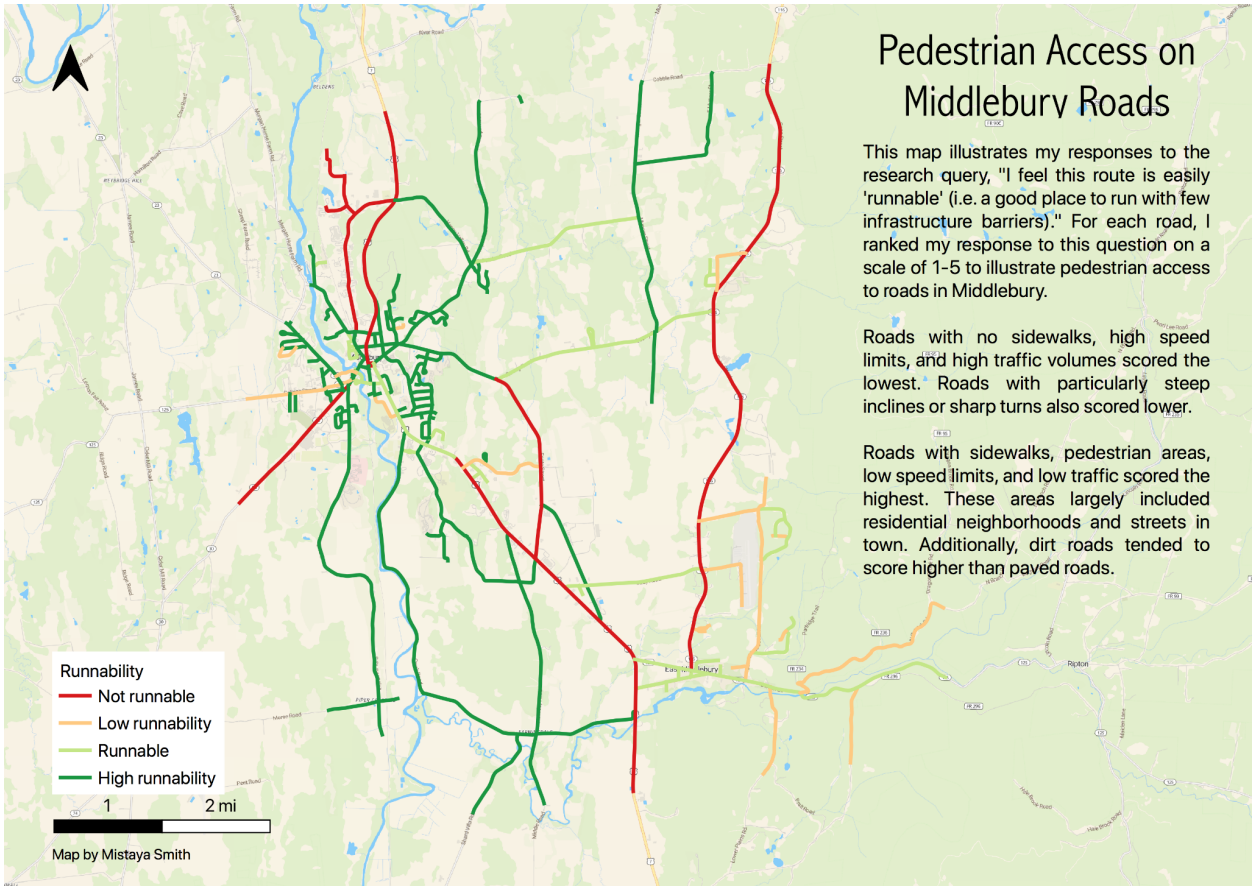

Figure 2. *Pedestrian Access on Middlebury Roads*
This map depicts accessibility for pedestrians on each road in Middlebury. The pedestrian accessibility of each road impacts resident access to outdoor recreation areas.

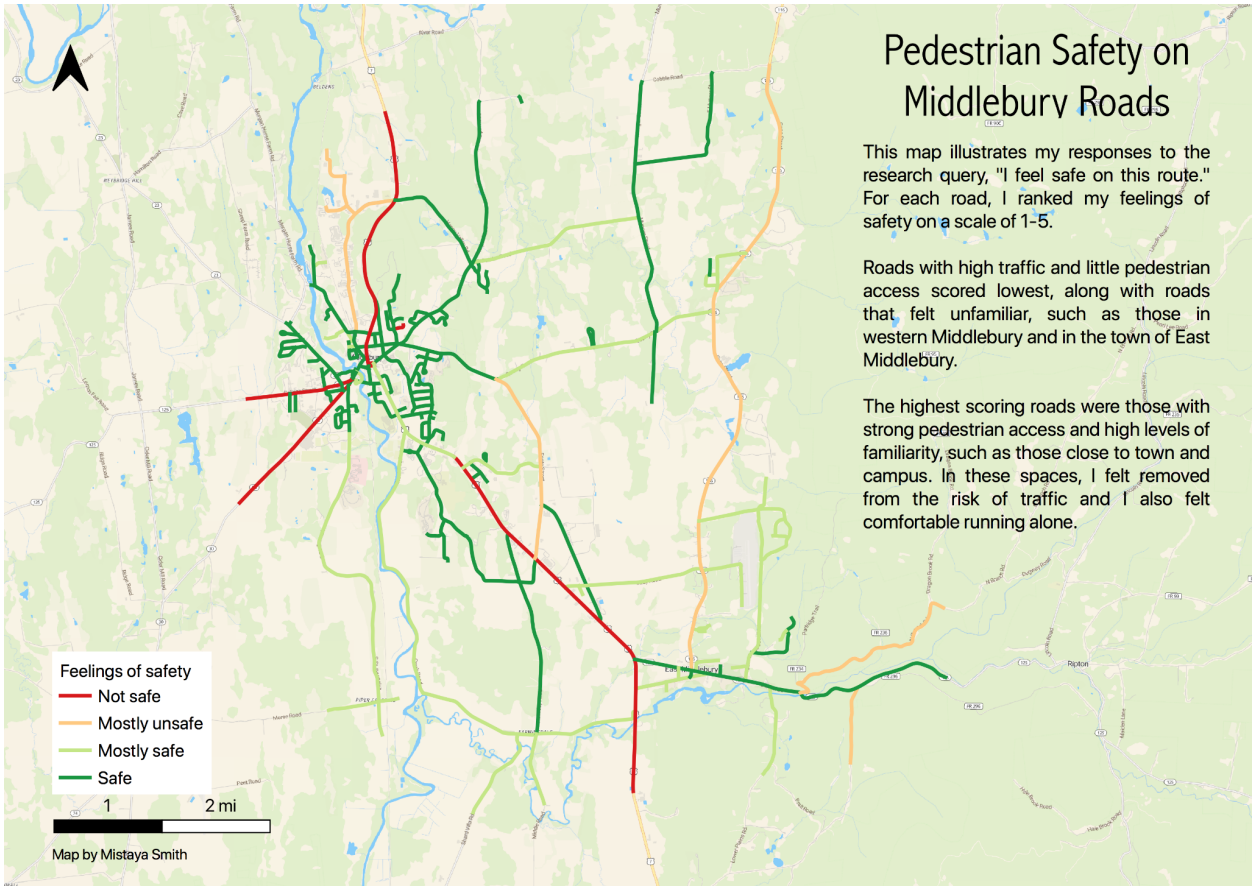

Figure 3. *Pedestrian Safety on Middlebury Roads*
This map depicts safety felt by pedestrians on each road in Middlebury. The safety of pedestrians impacts the perceived accessibility of outdoor recreation areas.

5.1 Repetition of routines: Middlebury's land use planning strengths

Middlebury's existing outdoor recreation areas create a foundation within which residents and visitors can develop a positive sense of place. As demonstrated in Figure 4, sense of place is developed in spaces where repetitive use creates place-based memories. Middlebury contains outdoor recreation areas in the form of public parks -- namely Battell Woods, Means Woods, Chipman Park, Wright Park, and Abbey Pond -- the majority of which are connected by the TAM trail system. When visited repetitively, physical routines between residents and Middlebury's parks embed these natural destinations with emotional meanings that further the development of resident sense of place. In addition to these outdoor recreation destinations, Middlebury's urban

planning contains strong connectivity infrastructure in the form of both a sidewalk and trail system. The sidewalk system in Middlebury's vibrant downtown area connects to nearby residential areas, while the TAM trail system encircles downtown. Increasingly rural, agricultural, and industrial areas stretch out beyond downtown Middlebury and are disconnected from the centralized sidewalk and trail system. For the purposes of this paper, downtown Middlebury constitutes the yellow, red, and orange areas designated in Figure 6 in section *5.2*.

People develop "topophilia", or love of place, for spaces where they have the most positive sense of place (Peng 2020; Bale 1996). Many residents and visitors of Middlebury feel topophilia toward local outdoor recreation areas, which contributes to a positive sense of place in Middlebury (Bale 1996; Middlebury Community Values Mapping 2019, 2). For this reason, it is key that these spaces be prioritized in land use planning, but their accessibility and distribution must be improved. Sections 5.2 and 5.3 provide two suggestions aimed at creating a Middlebury in which public parks are more equitably distributed and pedestrian accessible so that all residents have the opportunity to develop topophilia and a positive sense of place through outdoor recreation (Tuan 1974).

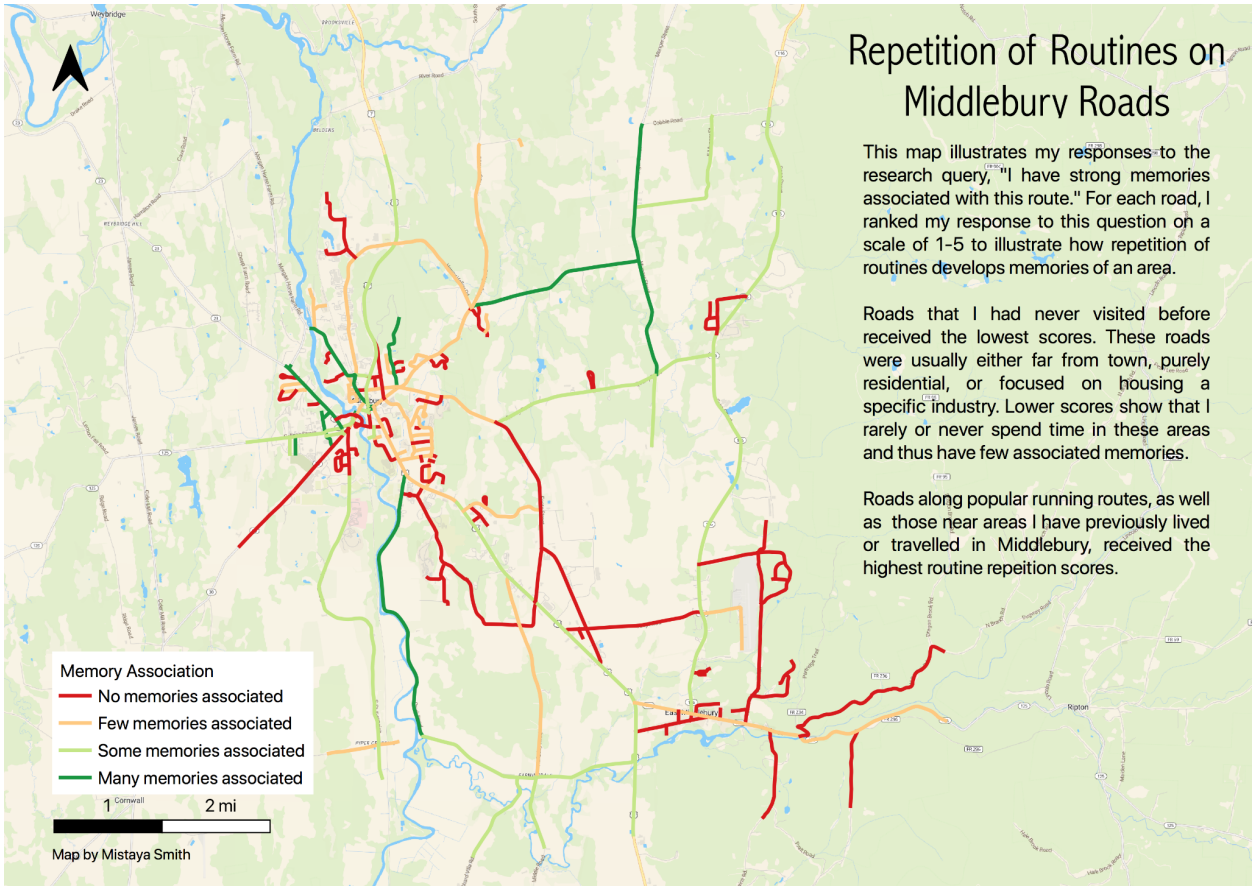

Figure 4. *Repetition of Routines on Middlebury Roads*
This map demonstrates how the repetition of running roads in Middlebury contributes to memory development and thus temporal sense of place development.

5.2 Physical Connection with land: Accessibility

Running from downtown through every street in Middlebury brought to light the lack of cohesion and pedestrian connection between the town's urban and rural land uses. This stratification, as shown in Figure 6, translates into unequal access to outdoor recreation spaces. Increasing the pedestrian accessibility of outdoor spaces would widen the group of people that develop topophilia for Middlebury's outdoor amenities, thus increasing the amount to which residents care about their surroundings. Middlebury should connect residents to outdoor recreation areas in an accessible and safe manner that considers the sensory experiences of residents.

In general, the largest, well maintained, and presumably expensive homes lie closest to downtown, particularly along South Main Street, South Street, and the sidestreets near Shaw's Supermarket such as High Street, North Street, Washington Street, and Buttolph Drive. Farms and farmhouses lie along the streets connecting to town, including Painter Road, Quarry Road, Munger Street, Creek Road, Three Mile Bridge Road, Cady Road, and South Street. Suburban neighborhoods exist throughout town, likely on former farmland, including those along Halladay Road, Foote Street, and Happy Valley Road. Industrial centers are stationed along Exchange Street, Case Street, and Route 7. These land uses are demonstrated in Figure 6, which indicates the separation between agricultural, industrial, residential and commercial space.

The town's land use separation brings to light the separation of people, particularly the way in which downtown Middlebury is separated from its more rural and agricultural outskirts. Although there are residences throughout the agricultural area, white in Figure 6, the greatest pedestrian connectivity exists in downtown, red, orange, and yellow in Figure 6. As an outcome, as one travels south and westward in Middlebury, the level of outdoor recreation accessibility decreases. As demonstrated in Figure 5, it is easiest to develop a sense of place in the areas where one spends the most time and feels most familiar. Therefore, greater access and connection to outdoor recreation areas will increase the potential for sense of place development in these areas.

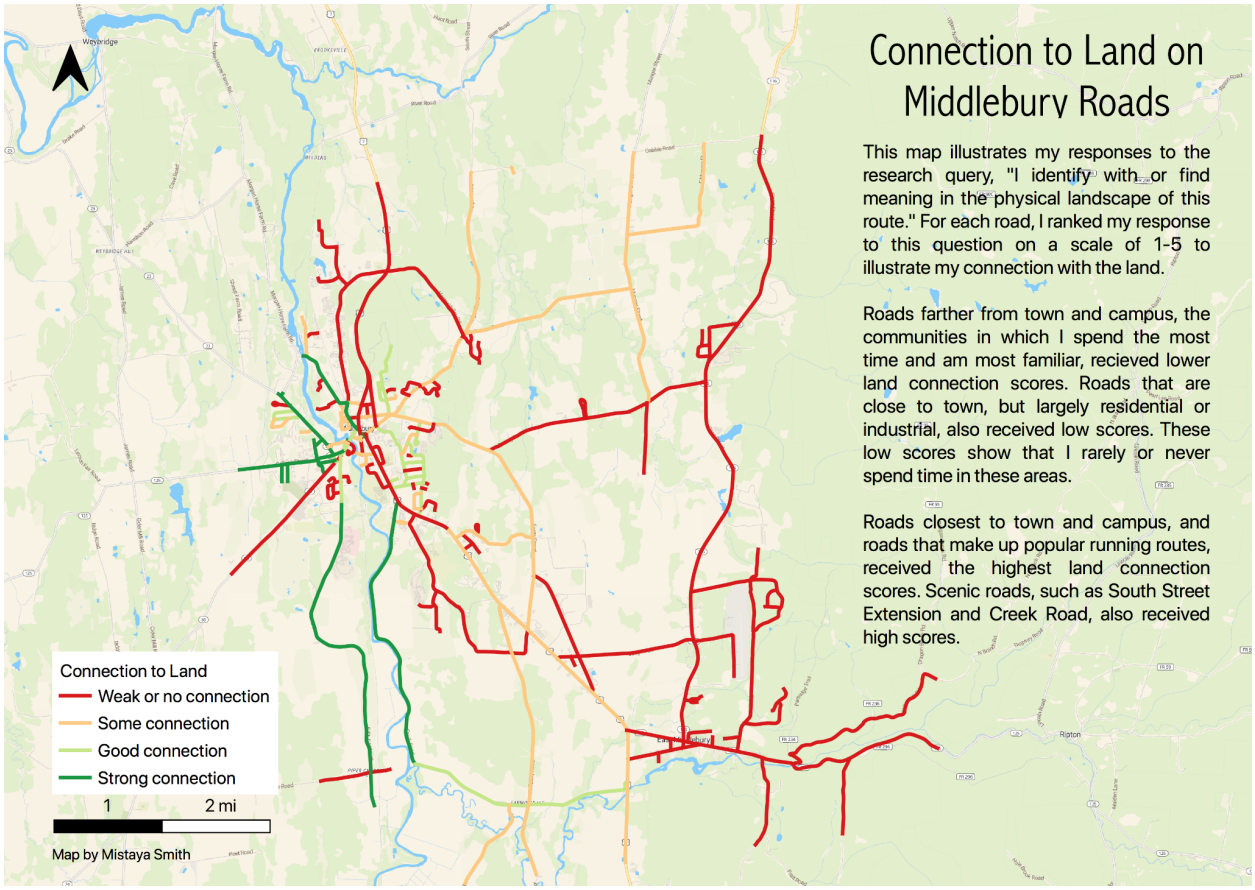

Figure 5. *Connection to Land on Middlebury Roads*
This map shows how connected to the land or physical environment I felt while running each road in Middlebury.

In establishing accessible and well-connected outdoor recreation areas, Middlebury will expand the amount of residents who feel connected and empathetic towards their environment, expand the benefits of outdoor recreation, and also increase connectivity and casual socialization between people of diverse backgrounds from all areas of town. In creating pedestrian connectors, Middlebury town planners should consider the sensory experience of these spaces.

Middlebury contains several outdoor recreation areas, including the TAM, Wright Park, Battell Woods, Means Woods, Chipman Park, and Abbey Pond. The downtown residential areas within the TAM loop have greater access to the town's outdoor recreation areas than the more rural residential areas outside of the TAM loop. Improving pedestrian connectivity between these outdoor recreation areas and residences within both urban and rural land uses would increase the

accessibility of outdoor recreation to all residents. Middlebury should expand pedestrianism within and beyond downtown and, in doing so, land use planners should consider the sensory experiences of these pedestrian areas.

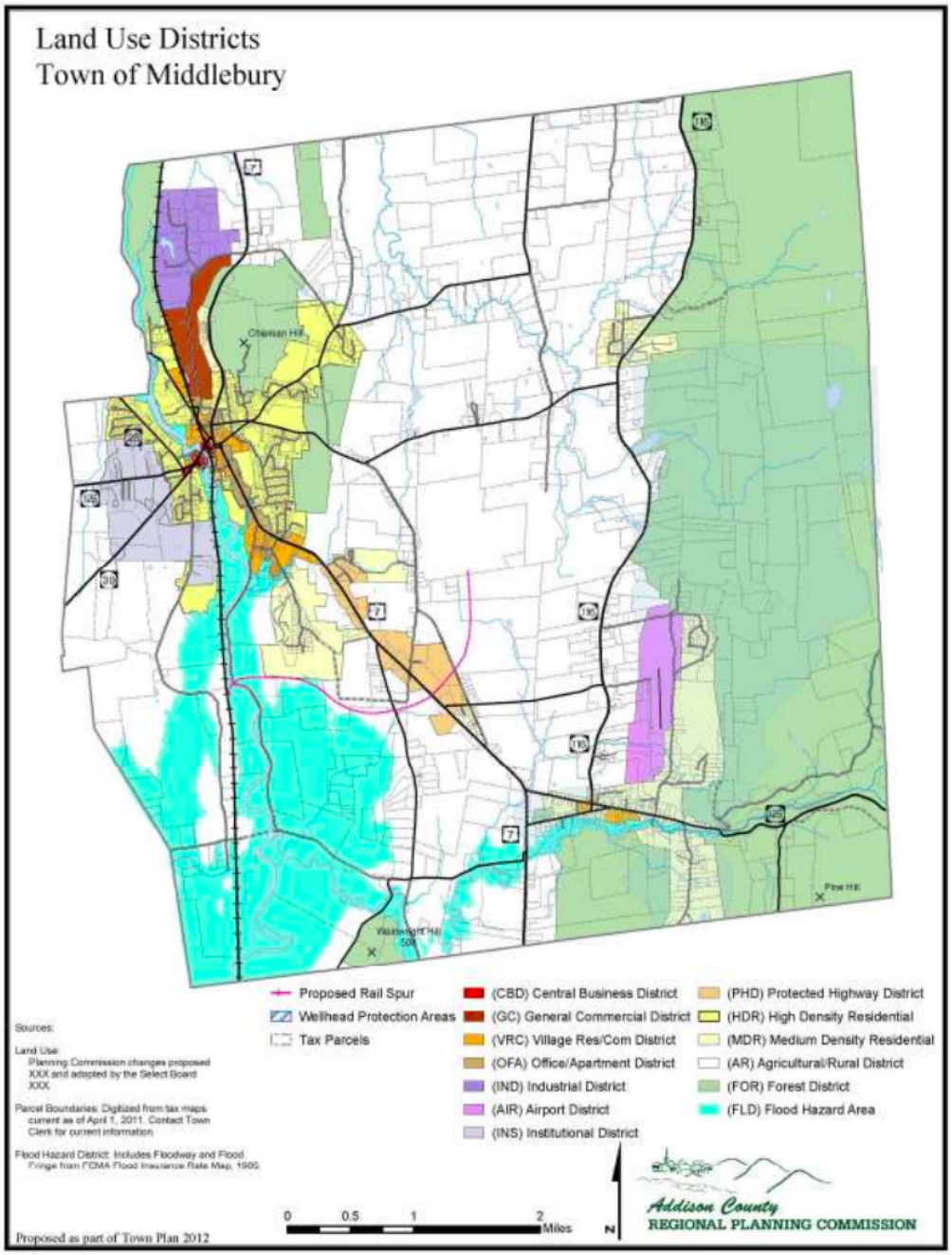

Figure 6. *Land Use in Middlebury, Vermont*
This figure demonstrates that land use in Middlebury is largely split between business and residential areas (orange, yellow, red) versus agricultural and rural areas (white).

Within downtown, planners should focus on increasing connectivity between sidewalks and trail systems. Beyond downtown, planners should utilize one of the four designs for bicycle infrastructure that are proposed in Colville-Andersen's (2018) *Copenhagenize.* These designs are based on vehicle speed limits on a given road, planning for greater space between cars and pedestrian pathways as speed limits increase (Colville-Andersen 2018). Such bicyclist or pedestrian pathways through Middlebury, with the addition of increased pedestrian connectivity downtown, would vastly improve pedestrian access to outdoor recreation.

As argued by Qvistrom (2016), pedestrian zones are most successful when they challenge the idea that natural and urban spaces should exist in separate spheres. This idea impacts the layout of the TAM, where the current layout positions parks and trails as a separate system from that of downtown's pedestrian sidewalks. Under this current design, access to the TAM relies on either car ownership or unsafe and lengthy foot travel along busy roads. An expanded sidewalk and trail system that aims to seamlessly blend the natural and built environments would increase pedestrian accessibility of the TAM.

Malmo, Sweden faced a similar issue to Middlebury in that the town had forest and trails on its outskirts, but needed to connect this outdoor recreation space to its downtown residential spaces (Qvistrom 2016). Malmo selected four sections of forest and invested in creating sensory-pleasing and safe connections between these areas and residents (Qvistrom 2016). In Middlebury, town planners could apply this same method by connecting the TAM trail heads by the system's four main public parks -- Battell Woods, Means Woods, Chipman Park, and Wright Park -- to the downtown sidewalk system.

In addition to improving pedestrian connectivity between existing outdoor recreation areas and downtown residential areas, outdoor recreation areas further afield from town should

also be pedestrian accessible. For example, Abbey Pond, Middlebury's sole public park outside of the TAM loop, lies off of Case Street in proximity to several farms and residential areas that cater to a range of socioeconomic backgrounds, including a mobile home park and lower-income housing. Abbey Pond is a beautiful third space, but, due to the lack of shoulder and high traffic on Case Street, it is inaccessible to those without personal vehicles. The park, which is part of the Green Mountain National Forest, can also be accessed through a series of trails on Middlebury Gap, but these are not within town bounds and also require vehicle access. Abbey Pond could be pedestrian accessible if a bicyclist and pedestrian path connected residential areas along Case Street to the Abbey Pond Road trailhead. As a medium speed road, with speed limits of 40-miles per hour, Colville-Andersen (2018) suggests separation between pedestrians and vehicles through the means of a landscaped median, low wall, or curb barrier. A bike trail to public parks further afield from downtown Middlebury would demonstrate a commitment to equal access to outdoor recreation for residents across town land uses. As Barnfield (2020) states, a lack of pedestrian areas that connect residential areas to outdoor recreation destinations sends the message that the disconnected people do not belong in the outdoor spaces.

In terms of considering the sensory experiences of pedestrian areas, Middlebury's main challenge is traffic. Not only does traffic cause a physical threat, but unwanted attention from drivers can generate feelings of unsafety, which is often experienced through a gendered position. Middlebury should lessen the safety impacts of vehicle traffic through a barrier of interspersed trees or a hedge of shrubbery between the pedestrian zones and roads in high traffic pedestrian areas such as along Cross Street, Route 7, East Main Street, and Case Street. This approach would not only increase the positive impacts of green space for pedestrians, but also lessen sensory stressors. At the same time, so as not to create fully invisible, and therefore

potentially unsafe pedestrian areas, landscaping should be kept either low-cut, as in the case of a hedge row, or gapped, as with a row of small trees.

These suggestions strongly align with the Middlebury Town Plan community character goal, in which planners note that, "relatively short distances between buildings create a sense of community and walkability. New developments should incorporate a variety of architectural designs and include pedestrian amenities and linkages such as a central park or green, sidewalks, and trails" (Middlebury Town Plan 2017, 17). While Middlebury town planners are aware of the positive impacts of safe and accessible pedestrian areas, the benefits of such areas should be extended throughout the town and to residences within all designated land uses, urban and rural.

5.3 Social and Emotional Bonds Suggestion: Equitable distribution

Within both the literature and my own distance running experience, emotional social bonds strongly influence sense of place and, as demonstrated in Figure 7, are most likely to do so in areas with high familiarity. In Middlebury, access points to all public parks with the exception of Abbey Pond are located within the TAM loop. They are thus most easily accessible to those living near downtown, within more urban land uses. Abbey Pond, the one park that is located near primarily rural land uses, sits along the pedestrian-unfriendly Case Street. Its access is therefore vehicle reliant, which provides a further barrier to outdoor recreation and may therefore inhibit nearby residents from engaging with this area, growing familiarity, and establishing social bonds.

Within the TAM loop, on the other hand, there are multiple public parks and greens like the Middlebury Green, Marbleworks District, Battell Woods, Wright Park, Chipman Park, and Means Woods. These parks serve as social infrastructure for the College and residents of downtown Middlebury, but the inequitable distribution of such outdoor recreation spaces furthers

the imbalance in outdoor recreation accessibility between Middlebury's urban and rural land uses. A greater number of parks and public greens, spread more evenly throughout town, would ensure that residents in both urban and rural parts of town have an equal opportunity to enjoy Middlebury's outdoor recreation opportunities.

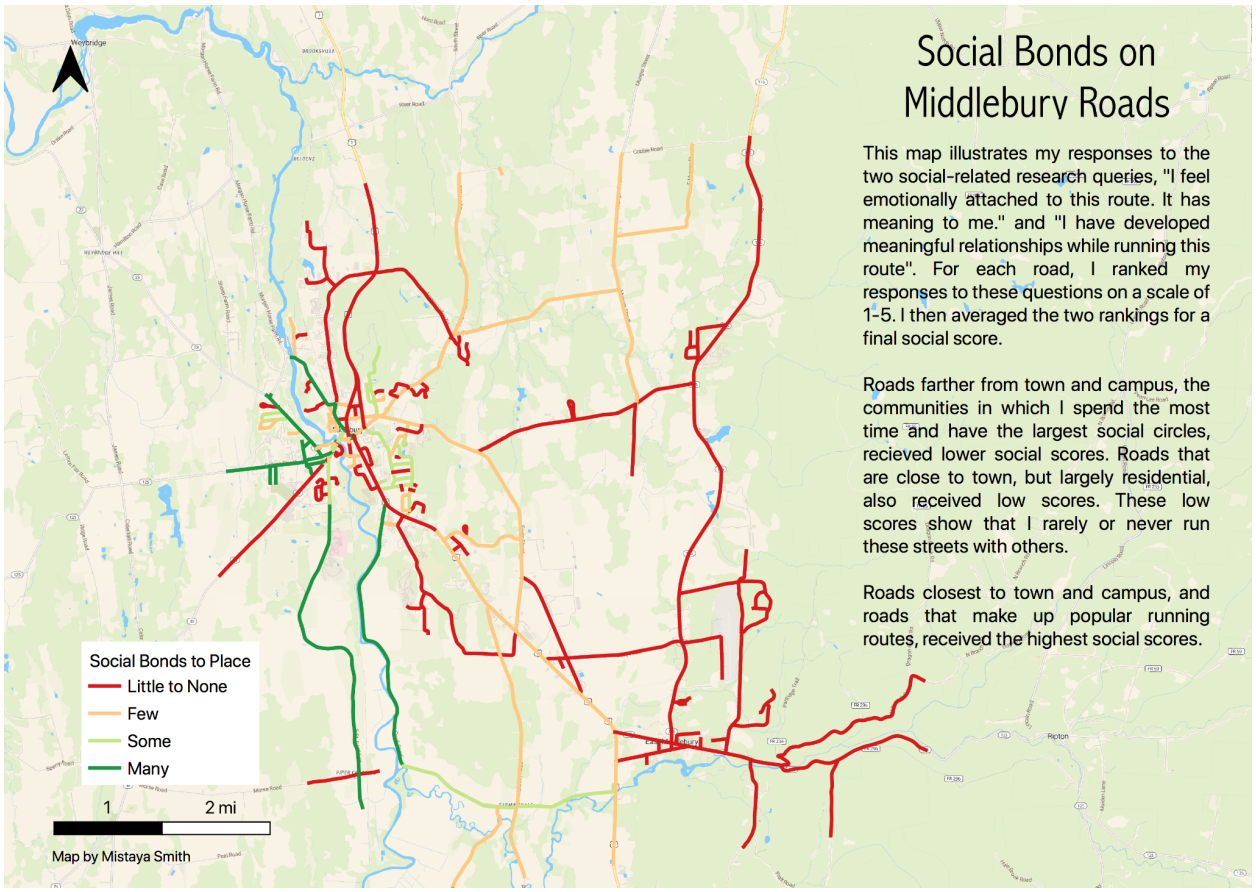

Figure 7. *Social Bonds on Middlebury Roads*
This map demonstrates how socially connected I felt to each road in Middlebury, based on both my experiences emotionally and socially bonding to place.

This suggestion adds to the Middlebury Town Plan's acknowledgement of the role that green space plays in community development. Under the 'Natural and Scenic Resources' section, town planners state that,

> "Many of us find ways to enjoy the nearby trails and parks in Middlebury, and more often than not we do this with each other either informally or with recreation clubs. The TAM

> [...] provide[s] easy access to the natural environment as well as opportunities for families and friends to spend time together. Our public parks such as Battell Woods, Chipman Hill, Means Woods, and Wright Park offer additional opportunities for experiencing the natural world" (Middlebury Town Plan 2017, 37).

This portion of the town plan demonstrates the value that Middlebury land use planners already place on local outdoor recreation areas. However, the language in the town plan overlooks the inequitable distribution of these spaces and the accessibility issues this may cause for residents without personal vehicles or significant leisure time. In addition to increasing pedestrian connectivity between outdoor recreation areas and both urban and rural residential areas, it is imperative that Middlebury plan to establish outdoor recreation areas within both urban and rural land uses.

6. Conclusion

Middlebury is home to notable parks and green spaces that provide the opportunity for residents to deepen their sense of place and build topophilia through outdoor recreation. By increasing pedestrian accessibility to outdoor recreation areas and more equitably distributing these spaces, the town of Middlebury could provide equitable, safe outdoor recreation access for residents living in all regions of town, both urban and rural. In improving access to Middlebury's outdoor recreation through the means outlined in this paper and illustrated in Figures 2-5 and 7, a greater portion of the town population could connect with the physical environment and cultivate place-based social bonds. Additionally, in more equitably distributing these outdoor recreation spaces, a greater number of residents could engage in, and make empathetic considerations about, land use decisions Middlebury. The OpenLayers webmap offers an opportunity for residents to visualize the significance of sense of place, and the aspects which contribute to its

creation, in hopes that this increased understanding can also increase resident empathy towards Middlebury land.

Resident empathy in land use decisions is particularly important as Middlebury's need for new development increases along with its population growth (Middlebury Town Plan 2017, 7). Development plans often risk positioning natural amenities as purely in existence for resource extraction and human use, rather than for their inherent worth as habitats and ecosystems. More equitably distributed and accessible outdoor recreation not only increases equity across town residents, but also positions Middlebury as an example of the potential for coexistence between the built and natural environments. As Middlebury faces a future of growth and development, it is crucial that residents feel emotionally connected to the land and have a strong sense of place in order to ensure thoughtful engagement in local land use policy choices. This resident engagement will further fuel planners' motivation to consider resident sense of place.

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