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# Understanding the Marketing and Management of trails using PESTEL Analysis

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# UNDERSTANDING THE MARKETING AND MANAGEMENT OF TRAILS USING PESTEL ANALYSIS

BY

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ABSTRACT

UNDERSTANDING THE MARKETING AND MANAGEMENT OF TRAILS USING PESTEL ANALYSIS

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Trails are an important resource for local communities because they provide health, social, economical, and environmental benefits ("Headwaters Economics", 2016). When trails are made accessible in towns, it facilitates communal connection, draws in tourists, increases support for conservation lands, and creates safer trails. Trails are valuable to towns because they are an integral piece of their livelihood, therefore the management of trails should be researched to understand how to sustain public use. For this study, twelve (N = 12) conservation commissioners, town managers, and other trail stakeholders from two counties in a Northeastern state were interviewed about how they manage their trails. Results of the study were analyzed and coded, utilizing a marketing theory called PESTEL. Six PESTEL categories were used to interpret stakeholder comments on how trails are managed. The findings of the research show how managing and marketing trails to promote access and use could potentially maximize trail benefits for town communities.

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## Introduction

Trails offer major economic, health, social, and environmental benefits to communities ("Headwaters Economics", 2016). The Outdoor Industry Association (2017) noted that trail users annually spent $20 billion dollars on trail gear in the United States, contributing to the nation's economy. Trails also provide areas for engaging in physical fitness, creating social relationships, and connecting with nature ("Headwaters Economics", 2016). The benefits of trails can only be maximized if these spaces are known, taken advantage of, and are well managed. Currently in Northern New England, there is a diverse group of trail stakeholders including conservation commissioners, town managers, and private owners who utilize a wide variety of management techniques. "However, most research has focused on the effectiveness of only two basic management approaches: information/education programs and use rationing/allocation. While these are important management approaches and deserve continued research attention, other management practices warrant additional attention" (Manning & Lime, 2000, p. 43). A management strategy that has yet to be used in the literature is called PESTEL analysis.

PESTEL is a framework that can be used to analyze how external political, economic, social, technological, environmental, and legal factors effect trail management ("Professional Academy", 2018). Today, there has not been a study on trails using the PESTEL lens. Ultimately, the intent of this study was to identify what external factors are affecting trail management, and assess those factors to provide management recommendations to ensure benefits of trails are maximized. Specifically, the purpose of this study was to understand stakeholder's perceptions of the political, economic, social, technological, environmental, and legal influences on the management of municipal

trails. To accomplish this, twelve (N=12) interviews with trail stakeholders were conducted to better understand what role external factors play in helping individuals and communities realize benefits from trails, and what the benefits and barriers are to managing trails.

## Literature Review

### PESTEL Analysis

PESTEL is a marketing theory used to analyze how political, economic, social, technological, environmental, and legal external factors influence or impact an organization ("Professional Academy", 2018; "Oxford College", 2016). See Figure 1 for model. PESTEL has been used to examine management strategies for recreation and tourism. Vitkienė (2009) utilized PETSEL to understand how external, macro-factors affected coastal recreation and tourism business organizations. The six external factors of PESTEL were also used in another study that examined management strategies for resources to create sustainable tourism (Agaru, Iagaru, Ciortea, & Chindris, 2016). PESTEL has not yet been used to specifically analyze the management of trails. This literature review will focus on the six external factors of PESTEL, and how they relate to trails. Current research about trails and outdoor recreation spaces gives insight into the various political, economic, social, technological, and environmental benefits and issues that occur with having trails in communities.

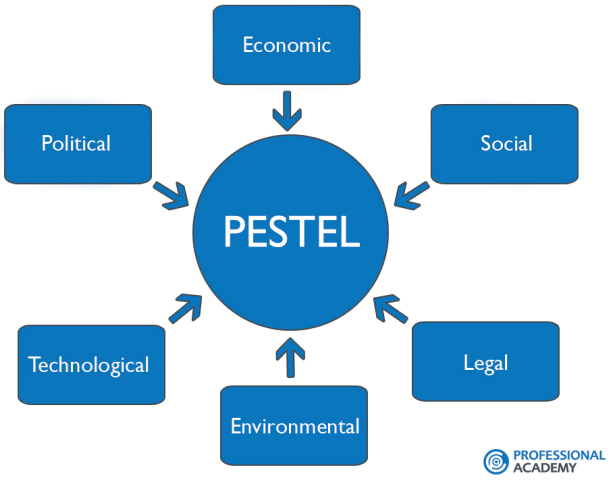


**Figure 1.** PESTEL Analysis Model

**Political**

The political external factor of PESTEL is defined as how government policy affects a field ("Oxford College", 2016). Research on trails and their relationship to policies and government intervention is sparse. Current research mainly explores the role of government officials in policy making around the development of trails. Irwin (2002) studied how preservation policies should be created for designing open space to fully optimize benefits of residential property values. Gnagey and Grijalva (2016) also researched open space, but specifically looked at how the value of outdoor recreation should be used to inform zoning, restrictions, and government purchases. Olafsson and Petersen (2014) studied how local government should utilize various tools when planning outdoor recreation spaces, including GIS technology. Because current literature mainly focuses on policies and government planning, additional research needs to be conducted in this area. This study will fill the gaps by interviewing town managers to understand their political perspectives with trail management.

**Economic**

Economic factors of PESTEL are identified as employment opportunities, fiscal implications, and costs of materials ("Oxford College", 2016). The economic impacts trails can have on communities have been widely researched. Current research suggests that outdoor recreation and trails support the economy by increasing tourism, boosting business profits, and creating jobs in local communities ("Outdoor Industry Association", 2012; Pollock, Backler, Williams & Mack, 2011; Gies, 2009). The Outdoor Industry Association (2012) looked at the effects outdoor recreation can have on local economies, showing that tax revenues generated by outdoor recreation users are approximately $39.9 billion for federal taxes and $39.7 billion for states and local taxes (p. 1). Other studies also suggest that residences built next to a trail or public recreation space can increase property values (Crompton, 2000; Nicholls & Crompton, 2005; Racca & Dhanju, 2006). Geis (2009) suggests that public outdoor spaces such as trails can encourage better economic development, and even lower health care costs for community members. This aligns with research that states there are significant health benefits to having outdoor spaces and trails in communities.

Outdoor recreation and trails are linked to health benefits that can impact a local economy. As previously stated, trails have been found to be one of the most cost effective ways to decrease health costs for local communities (Abildso, Zizzi, Selin, Gordon, 2012; Wang, Macera, Scuddler-Soucie, Schmid, Pratt, Buchner, 2005). People who have greater access to outdoor recreation areas and trails are more likely to exercise and decrease health risks, such as obesity or other cardiovascular diseases (Rosenberger, Bergerson, Kline, 2009; Brownson, Housemann, Brown, Jackson-Thompson, King,

Malone, Sallis, 2000; Giles-Corti, Broomhall, Knuiman, Collins, Douglas, Donovan, 2005). This study will seek to further understand economic influences, and how trail stakeholders are leveraging those to positively impact their local community.

**Social**

The social factor of PESTEL is defined as the social environment of an organization or field ("Oxford College", 2016). Outdoor recreation can impact people socially, as trails and other outdoor spaces have the ability to bring people together. Studies have shown that outdoor recreation can improve people's social ties, create a sense of community, and can unite new and familiar faces (Corning, Mowatt, Chancellor, 2012; Zhou, Rana, 2012; Bowker, Bergstrom, Gill, & Lemanski, 2004). Specifically, Corning, Mowatt, and Chancellor (2012) said that trails "allowed neighbors to make new friends, some [participants] even referred to them as trail friends, or people that they only saw on the trail but who were now a part of their social life" (p. 282). Trails create a place for families to walk or where people can take their dogs and become more socially connected. Social connections that are formed outdoors can also improve mental health. Physical exercise has shown to decrease symptoms of depression and anxiety, while increasing self-esteem and a positive mood overall (Landers, 1997; Fontaine, 2015). Social connections and shared beliefs of people in the population can influence how managers and stakeholders utilize and market their trails to residents.

**Technological**

Technological factors of PESTEL are outlined as any technological invention or development that impacts the organization ("Oxford College", 2016). Various authors discuss how a variety of technological marketing tools greatly affect trail users. Mitchell,

Purcell, Rainie, and Rosenstiel (2011), and Clark, Bungum, Meacham, and Coker (2015) suggest that using multiple sources of information such as providing print and electronic materials is more effective than using single sources of information. In addition, demographics affect how people learn about trails. Age is one of the most influential demographics when it comes to how people find out about information in their community. If someone is under forty years old, they will find out information from the Internet first, whereas older age cohorts tend to learn through print sources first (Mitchell, Purcell, Rainie, & Rosenstiel, 2011; Clark, Bungum, Meacham, & Coker, 2015). This study will seek to further understand how technology is used to manage trails, and what implications or impacts it creates.

**Environmental**

Environmental factors of PESTEL are defined as how sustainability and the ecological environment are impacted by the topic of study ("Oxford College", 2016). Trails specifically have been noted for their benefit to the environment. According to the Trails and Greenways Clearinghouse (1999), trails provide conservation areas and protect water and air quality by providing buffers and a place for natural resources to flourish. Trails and outdoor recreation areas have also been increasingly used as classrooms, which teach children about the value and importance of nature (Wirth & Rosenow, 2012; "National Park Service", 2008). Lastly, trails can promote healthier transportation opportunities such as walking or biking instead of taking a car; which benefits both the user for their health and also the environment ("Federal Highway Administration", 1992; "National Park Service", 2008). Overall, the benefits of outdoor recreation space and trails have been widely researched, but there is a gap in research on how trail

management strategies can impact the environment.

When it comes to mapping trails, there are also negative impacts to the environment noted. Research suggests that managers have difficulty promoting trails for use and handling the degradation that comes with increased participation (Olive & Marion, 2009; Tomczyk & Ewertowski, 2012). According to one study, it was a source of conflict in deciding to market trails, as one stakeholder said, "increased promotions might overburden the trail facilities" (Walker, Evenson, Davis & Rodríguez, 2011, p. 52). Over usage is a topic of discussion and a concern for trail stakeholders. On one hand trails should be promoted and used recreationally, while natural resources and especially sensitive areas should also be protected. Further research should investigate how management affects overuse, and also how this can be overcome.

**Legal**

The legal factors of PESTEL are identified as any topic relating to health and safety, as well as any restrictions, and regulations put in place by an organization ("Oxford College", 2016). Safety was a topic of concern noted by local home owners in current studies. Research shows that property owners living adjacent to public trails are concerned with decreased privacy, increased noise, and also a decrease in percieved safety, which are all considered legal factors (Corning, Mowing, & Chancellor, 2012; Crompton, 2001). However, most homeowners stated that the benefits of living next to trails outweighed any negative aspects or concerns they were having (Corning, Mowing, & Chancellor, 2012; Crompton, 2001). Further research should be conducted to determine what other legal issues or concerns exist when managing trails.

## Methods

### Participants

To investigate perceptions about how trails are currently marketed and managed twelve ($N = 12$) trail stakeholders from two counties in a Northeastern state participated in key informant interviews. The key informants consisted of conservation commissioners, town managers, town administrators, an assistant city manager, and a member of an open lands committee. Cluster sampling by geographic location and snowball sampling was used to identify which trail stakeholders would be selected to participate in the study. The number of participants asked to partake was dependent on the responses the research assistant was receiving; the assistant stopped data collection when it appeared that data reached saturation and no new information was learned from the interviews.

### Procedure

This study utilized an emergent design (Creswell, 2009); there was a list of questions each participant was asked but additional questions were added after examining initial findings. An interview protocol was developed for the research assistant to follow when conducting the key informant interviews. All questions were written out prior to the interviews, so that the interviewer would have a general guideline to follow during the interviews, but further probing questions were asked if further information was desired. For example, some interviewees were asked to elaborate on some questions if the answers were unclear or out of the ordinary. The two sets of interview questions can be found in the appendix. The first set of nineteen questions were ask to conservation commissioners and other trail stakeholders to gain background knowledge of the trails,

and to understand how their trails were managed and marketed. There were a total of nineteen questions, but only sixteen were used as part of this study (see Appendix for questions). After interviewing the conservation commissioners and other trail stakeholders, there was still a gap in knowledge about the political, economic, and legal aspects of mapping trails. In order to fill that gap of data, town managers were interviewed using five additional questions, directly relating to political, economic, and legal topics, to gain a better understanding of these external factors.

**Data Analysis**

Once the data were collected, it was analyzed using the PESTEL framework. The goal was to take these various perspectives to understand the bigger picture of how trails are being managed through their perspectives. To accomplish this, the General Inductive Analysis approach was used (Thomas, 2006). The participants' answers were coded using PESTEL, categorized, and themed for patterns and discrepancies. To begin this process, the interviews were transcribed and read through by both the principal investigator, the research assistant, and a third party. After reading the transcripts, the research assistant began to code the comments, categorizing the data by utilizing PETSEL. Steps were taken to maintain validity throughout the data analyzing aid interpretation process. The first validity check sent to the participant's transcriptions for them to read through and make any edits they wanted. This ensured that what they said was correct and that they were represented properly. When analyzing the data, multiple forms of triangulation were used. Data triangulation occurred when the transcriptions were crosschecked with the town's website and maps in order to ensure agreement between the sources. Investigator

triangulation and peer debriefing was also used as the principal investigator, the research assistant, and the research assistant's graduate advisor looked at the analyzed data.

The research assistant's role was to be to contact the participants, collect the data, and then analyze it utilizing PESTEL with the principal investigator. The principal investigator and research assistant both have experience with trails as users. Both researchers have a potential bias in their belief that trails should be widely marketed and accessible. While the principal investigator has a professional role in the promotion of trail use, the research assistant does not have any professional roles related to trails. The benefit of the research assistant conducting the interviews is that it limits bias, as it is not backyard research (Creswell, 2009). Some participants have had prior contact with the principal investigator in the past, so they may have been more willing to partake in the interviews. The principal investigator and research assistant mitigated this by reaching out to conservation commissioners beyond the scope of personal connection. The ethical issues or dilemmas with this study were minimal as trail stakeholders' participation in this project was voluntary. To protect the participants during the research process, the study received approval from the UNH Institutional Review Board (IRB) for the Protection of Human Subjects. Participants were notified of their rights as research subjects in an initial email asking if they would partake in the study.

## Results

Results of this study are categorized and presented using the PESTEL framework. Below are representative quotes from trail stakeholders that discuss all major themes of the external marketing factors, including political, environmental, social, technological,

environmental, and legal. After analyzing quotes, subthemes emerged and are additionally indicated within the major theme.

**Demographics**

The sample size consisted of twelve ($N = 12$) trail stakeholders. Seven participants ($n = 7$) were from County A, and five participants ($n = 5$) were from County B. The positions of the trail stakeholders included town administrators, town managers, conservation commissioners, an assistant city manager, and a member of an open lands committee. The gender breakdown for the participants was three females ($n = 3$) and nine males ($n = 9$). See table 1 below for full descriptives.

**Table 1**. Descriptive Statistics of Trail Stakeholders

| Participant # | County | Positions | Gender (F/M) | Pseudonym |
|---|---|---|---|---|
| 1 | A | Town Administrator | M | David |
| 2 | A | Town Administrator | M | George |
| 3 | A | Assistant City Manager | M | Mark |
| 4 | A | Chair of Conservation Commission | M | Peter |
| 5 | A | Chair of Open Lands Committee | F | Sarah |
| 6 | A | Conservation Commissioner | M | Michael |
| 7 | A | Chair of Conservation Commission | F | Olivia |
| 8 | B | Conservation Commissioner | M | Thomas |
| 9 | B | Chair of Conservation Commission | M | Richard |
| 10 | B | Chair of Conservation Commission | F | Madison |
| 11 | B | Town Manager | M | Patrick |
| 12 | B | Town Manager | M | Henry |

**Political**

The political external marketing factors in PESTEL Analysis are defined as government intervention, environmental law, and government policy and how these interacts with the economy (Professional Academy, 2018). Current literature regarding political management of trails was sparse; researchers mainly focused their studies on

policies for designing open recreational space. This study more specifically emphasized the politics of managing trails, including who should be in charge of the maintenance and funding of trails and how increasing access impacts political support for funding trail efforts.

**Political and Economic**. Patrick discussed the political and economic questions of funding by stating:

> The fundamental question is: who is going to construct the trail, and then who is going to maintain the trail? Is that the Conservation Commission? Where is the money going to come from? Is it coming from the general fund budget, is it coming from the Conservation Commission, is coming from other entities?

George discussed the political and economic intersection of trails by discussing how access affects policy and support for trails:

> …There's a high ethic for land conservation and be to good stewards of the land… there's often talk about at what point is enough, enough? How much conservation do we really need? …Some people think we have too much, others feel we will never have enough. And that's the debate…should we acquire more or not? But to the extent we already have it, there's pretty universal agreement that we should manage it as well as we can with the available resources. And we should be proactive, and we should try to encourage public access as much as possible. And part of that is not political per se, but the reality [is] why would someone support spending money on conservation land, either buying more land or maintaining what we have, if they never use it?

Many stakeholders discussed that the largest political issues they faced revolved around who assumes the financial responsibility of the trails in town, and how increasing access could create a greater public support for funding trails.

**Economic**

Economic factors in PESTEL are defined by macro and mirco-economic factors including development, growth, demand, and disposable incomes of consumers ("Professional Academy", 2018). Trail stakeholders discussed both the economic benefits and economic investments when managing and marketing trails. The economic benefits discussed include transportation, increase in jobs, and tourism. An additional economic factor discussed is that budgeting for trails may be favorably increased if access and support of trails grow.

**Economic Benefits.** Current research address how trails provide transportation opportunities that are healthier and more environmentally friendly ("Federal Highway Administration", 1992; "National Park Service", 2008). In this study, transportation was identified as an economic benefit. Mark describes this when stating,

> There is an economic development component because it's bringing people that live outside of the direct commercial portion of the urban core and giving them an opportunity to walk to the transportation center, which is in the heart of downtown. And certainly there's restaurants and retail around it … there's all these commercial nodes there as well. So I think it provides opportunity for economic development as well as the aforementioned entities.

Michael also described how transportation and connectivity of trails could create work for the economy,

> One of the other things that we have talked about, but haven't made any appreciable progress, is to get some connections on the trails among the nearby towns… that might be a good way to stimulate more work along that line.

This study supported existing research on the economic benefits of trails. Existing research discusses how trails support tourism, boost business profits, create local jobs, and increase tax revenues ("Outdoor Industry Association", 2012; "Northern Forest Canoe Trail", 2011; Gies, 2009). Congruent with those findings, trail stakeholders in this study suggested that restaurants and business in town economically benefit from local hikers and tourists. Peter discussed how local business could be affected by tourism driven by the trails:

> We also think that the properties can be an amenity that would drive traffic into town. So businesses would have people come and hike, and personally I think more hikers in town would be great and then maybe buy a cup of coffee or sandwich afterwards, so. Develop the properties at some level, and I think develop, a very light development like signage and maybe trail improvement could get more people out there.

This suggests that if trails have increased advertising and are better managed, then usage will likely increase and positively affect the local economy. Olivia discussed both economic and conservation benefits:

> …I think that's a great way for New Hampshire to make sure that the tourists keep coming, and to encourage towns to do some resource planning so that we keep our state beautiful and protect the most important

> natural resource areas.... I mean, I think tourism is the second largest industry in the state.

Michael also mentioned increased support for resources by stating,

> Increased use of the trails gets increased appreciation for the resources that are on these lands. The more people that are interested in the resources, the more favorably they might be inclined to budgeted activities to improve and care for the resources.

Existing research suggests that living next to a trail can increase property values, which could be reason citizens chose to live there. (Crompton, 2000; Nicholls & Crompton, 2005; Racca & Dhanju, 2006). Similarly, Henry suggests that trails can be an economic driver as it brings in more citizens to towns due to their recreational value:

> I think it's good that the community has to be able to market, you know, to show that if people are looking for a community to move into New Hampshire. I think it's a marketing asset for us to be able to say: we have all of these trails in town that people can use recreationally.

**Economic Investment.** Unlike economic benefits, current research has not extensively explored economic investment. Many trail stakeholders in this study discussed how access is important for trails both because of the investment, and how it can further affect maintenance costs. Quotes from stakeholders emphasize the benefits they saw in promoting access, in relation to investment. Peter discussed the economic development benefits of trail mapping by stating, “Yeah, we would definitely like to make sure everyone knows they [trails] are available…because the investment in conserved land is a

real cost associated with that, and so if people are paying this money to conserve land, they should have the right to use it."

In this current study, many trail stakeholders and managers suggested that they did not have the funding or staff to be able to maintain their trails. Many participants discussed the issues with budgeting and needing volunteers to improve trails. Patrick described this dilemma by stating, "I do not have a trail budget per se. We have not enough money to put into trails. So it, again on the surface it's a little bit like everybody loves apple pie but nobody wants to peel the apples".

If trails are not publicized and well maintained, they are minimally used. As stakeholders discussed the benefits, they mentioned that having more people come to their trails could mean an increase in spending on local businesses, and also an increase in their budget for conservation. According to the National Park Service (2008), "the value of open space to the public is enhanced by providing access" (p. 2). This suggests that if access is increased through advertising and better maintenance, people in communities will be more likely to support their trails both monetarily and with their time through volunteering. George describes this cycle when stating, "…when they [residents] do use it and realize how terrific it is and how lucky we are to have it, they'll be supportive of helping to manage it. Maybe volunteering or spending town resources on it. So it's like a virtuous cycle we're trying to create". Trail stakeholders are suggesting throughout the economic external factor that increasing access could lead to greater economic benefits and increased financial trail support.

**Social**

Social factors of PESTEL are described as any beliefs, characteristics, and attitudes of the population observed ("Professional Academy", 2018). In terms of trails, both social benefits of trails and social motivations for using trails were examined.

**Social Benefits.** Community building, mental and physical health were all described by trail stakeholders as benefits that come with having accessible trails.

Existing research suggests that trails can strengthen community ties (Corning, Mowatt, & Chancellor, 2012; Zhou & Rana, 2012; Bowker, Bergstrom, Gill, & Lemanski, 2004). Congruent with these findings, participants in this study discussed how trails impact their communities. Mark describes how the trail functions as a community builder:

> One of the things we found early on when we invited people to get involved was they hadn't met their neighbors, or they weren't as aware of people that weren't directly around them, and bringing people together to talk about this trail as we were going to create it really provided some impetus for neighborhood conversation and community building.

Patrick discussed community, but also elaborated on its ties to shaping towns:

> …I think over time, and I'm talking the next 50 years or longer, that some of these trails will be more and more critical to a community identity. You have populations grow and as there's greater pressure to spend time outside in a recreation setting…I think they're going to be more and more valuable. But right now at this juncture, I think the groundwork is just being laid.

George discussed how community and environment were connected:

> It creates a sense of place for the community. You know, it's a place were you can live and feel good driving around. We've tried to create a human environment …that could be in synergy as much as possible with the natural environment, and it helps create a nice quality of life for people. I think it builds quality of life.

Researchers in other studies have found a link between spending time outside and increasing mental health (Landers, 1997; Fontaine, 2015). David described the mental and physical health benefits of trails in this quote,

> I think the benefit is obviously people getting out, getting exercise and walking that's valuable and getting with nature I think has a calming effect and that would be good if a lot of people who were too uptight went out and chilled out on the trail.

**Social Motivation**. Social motivation for trail use is understudied in the existing research. In this study, familiarity has been used to describe why some trails are more used than others. Additionally, recreational programming was seen as a useful tool to spread awareness and comfort with additional trails. George describes how his own family and other users will consistently use the same trails because it is time consuming and difficult to branch out to unknown trails:

> So if I have a morning with my family I don't go there [an unknown trail] because I know I have two hours with my family, and I don't know if I can do it in two hours…there's no way for me to know what I'm going to experience there unless I've already done it, and I don't even have the time to do it. So that holds people back from going to the [unknown] property, it's hard.

George describes how programming has been used to bridge the gap in trail knowledge and comfort,

> There will be a guide with them, you know, the guide might be a specialist in butterflies or birds, plants…That introduces residents to this great trail system and once they get out there once, and they know where to park, and they know where it goes, and they know how long it takes, they're comfortable going out and using it again and telling other people about it.

**Technological**

Technological factors of PESTEL examine how technology is changing the way products are marketed. In this case, trails are marketed through media, websites utilizing GIS or GPS data. Current literature around technology mainly focused on how users of different demographics utilized technology to discover trails (Mitchell, Purcell, Rainie, & Rosenstiel, 2011*;* Clark, Bungum, Meacham, & Coker, 2015). Instead of focusing on demographics, trail stakeholders and managers below discuss the challenges they face with technology and how it impacts access.

**Technological Barriers.** Participants discussed the desire to map trails in order to create increased access, but are facing technological barriers. Michael suggests this barrier when stating:

> …the only barriers I see would be the technical aspect of being able to access and utilize the system effectively. Because we are all volunteers and not necessarily tech savvy, I think the technical competence would be the primary barrier.

Thomas discussed how a technological barrier is they do not have the technical skills and knowledge needed to create online maps using geospatial data (GIS):

> I think it's the technology part that's a bigger challenge … because there are plenty of people who will go out and walk around, but none of us know what to do once it's on the GPS. How do we get it off onto a computer into a program, onto a topographical map and print it out?

Peter discussed partnerships that could be created to overcome this barrier by stating,

> One good source would be…students who might be studying land usage, GIS, and I think the high school could also potentially build a collaboration…so you have high school kids and college kids. And I think there are a lot of trail enthusiasts in town who would be up for volunteering as well.

Marketing trails online through social media and websites is a facet to creating trail awareness, but the challenges are described by Mark below,

> It is marked, and we have a Facebook page and we have a formal web site for it. I think that it's probably hidden. It's not as well advertised as it could be. I think like many recreational amenities in a community, those that know it really enjoy it, and those that might not have stumbled upon it at this point may not be as aware. But we are trying to do more promotion.

**Technology and the Environment.** Richard discussed how technology and environmental impact intersect and impact each other,

> …Just a select group of people knew about them [trails]. And that trails were in very good shape because they weren't overused. Then the Internet came along, people started GPSing the trails, the parking lots are full. That's a wonderful thing, right? More people are using the trails. But, it's this huge, huge increase in erosion of the trails. And now the trails are not in very good shape. So, it's like the

> story of Little Red Indian and the Canoe, I don't know if you ever read that as a child. But it was about a kid whose dad made him a canoe. He went down the river and a squirrel wanted to get in. And so he said, "Yeah, come on in squirrel" then a raccoon wanted to come in the canoe. So he said, "Yeah, come in raccoon". Then the deer wanted to come in, and the canoe started getting more and more unstable and they went down the river and Moose said, “I'd like to come in”. And of course the moose broke the canoe in half. So, you know it's great to be generous, it's great to be generous and let everyone into your canoe but after a while it 's going to break.

**Environmental**

Environmental factors are described in PESTEL as how to make sustainable efforts despite depleting resources (“Professional Academy”, 2018). Many trail stakeholders discussed how the built environment impacted connectivity, access, and use. Current researchers focus on how increased trail use leads to degradation of environmental resources (Olive & Marion, 2009; Tomczyk & Ewertowski, 2016). In congruence with these findings, trail stakeholders in this study also discussed environmental impacts of trail users. Environmental benefits to increasing trail access were also discussed by trail managers, which is a current gap in the existing literature.

**Built Environment and Connectivity.** Patrick describes how connectivity is something the built environment lacks: “One of the challenges particularly in New England is that trails often do not connect to anything”. Peter also discussed this by stating that community connectivity could be improved with a wider network of trails,

> I would say there are maps that are pretty high level…and what is lacking is a linkage that kind of something that shows the whole network of trails. You might get to one place and you would see, okay I see this ten-acre trail system here but it doesn't necessarily tie into the greater network. There is a ton of land, which is conserved, and you can draw the whole network and it would be a pretty cool, pretty huge system.

**Environmental Impact**. Multiple trail stakeholders discussed how greater access leads to greater environmental impact, including overuse and land degradation. George describes this issue when stating, "…it's so heavily utilized it's taking a toll on land and actually degrading the land. So then the conversation is, okay we've got more public access than we can handle. How do we better manage it so it doesn't damage the property?"

Additional participants elaborated on how use affects local resources. Peter discussed water protection in saying,

> A lot of land is conserved for water protection, so you don't want certain development to occur that might impede water protection. So if you rode a trail, that would dump a lot of filth, dog waste, into the waterway, and that's not healthy. So there is a conflict there between water protection and erosion.

Richard described how access is welcome, but on less environmentally sensitive areas:

> I would say we would be interested in increasing the use of the rail trail. The other, [trail name], I don't think we're necessarily interested in seeing that used heavily because it's a pretty nice wildlife resource. And so, while the public is welcome to use it, because the public helped pay for it…we're not looking for it to

> become like say a recreational center for neighboring towns. Because it has a big wildlife value. Now the town forests, I think we would welcome increased use there.

Peter suggested that managing and allowing only certain uses on a trail can help lessen environmental impact by stating, “Yeah, and really the use of the hikers and the runners and all that is very low impact. So that’s my views of the world!” George described additional management techniques to combat erosion:

> You know, that's a challenge. So we've started to look at… how many community events will be allowed down by the water because the usage is compacting the soil which is contributing to erosion and runoff…So we've taken steps to manage how many events are happening, where we've moved events to other parts of the property where there are high points.

Sarah stated how increased use could both impact the environment and also benefit the trail,

> The more use, [the] more degraded and maintenance required. But also the more use the healthier your community. So, yeah, overall the goal is to yes, let people know about the trails and increase the maintenance capacity. Actually the more people know about it maybe they'll donate or something. I don't know, we don't have the fund really to maintain the trails; it's just volunteers once a year who go out there and try to clean it up and fix things.

**Environmental Benefit.** Michael discussed how awareness of trails affects user appreciation by saying, “Increased use of the trails gets increased appreciation for the

resources that are on these lands." Madison also stated how appreciation affects land stewardship: "It's a well-appreciated area. There isn't even trash on the trail because the people who use it respect it, and if somebody ahead of them drops something, they pick it up". David also elaborated this theme of increased use and environmental stewardship: "The same for environmental problems that arise. The quicker you observe and see it- you know, the 'see something, say something' applies to trails as well to a lot of other things."

**Environment and Legal Issues.** Mark described how not only user impact affects environment, but also legal easements can affect the land negatively too, "the other thing, from an environmental standpoint, is there are some areas where we did not believe we needed easements… you have to cut down wildlife in order to have a trail that meets certain guidelines".

**Legal**

Legal factors include rules, regulations, health, and safety operations. For trails, many stakeholders discussed easements, ADA accessibility, and mitigating legal risks. These topics have not been widely investigated in the current literature. Legal issues that have been discussed in the current literature that were also discussed by participants in this study related to landowners, neighboring residents to trails, and risk management and legal liability.

**Easements.** Many participants, including Patrick, discussed easements and how they affect trail management:

> …Trailheads, parking, marking the trail, maintaining the trail, advertising the trail and all of those issues…are associated with the conservation easement and trails.

Another stakeholder George discussed how access is not necessarily the issue, but acquiring the easements can be a challenge:

> We really work to conserve it. And one of the elements we like to include with our conservation acquisitions is public access and while that's not always possible, it typically is. The challenge though is having the resources, sort of acquiring the land, or acquiring easements. It's sort of, although challenging to do in of itself, in terms of public access, that's sort of the easy part.

George also elaborated on how public access can be affected by easements:

> …There have been issues too with ,you know, public access under certain conditions, so there is some easements where the ,you know, the landowner has the ability to fence an area for farmland. You know, there will be easement typically where they can't develop their public assets as long as the landowner's not using the parcel for active agriculture, because we don't want people walking through the cows.

**Risk Management.** Parking was a challenge for many stakeholders, as described below by David,

> …And that's happened with some of our recreation areas and then cars start parking on the road and they start causing traffic issues. That whole issue of parking, getting to the trail, and where you park for the trail is probably what I see is the biggest drawback to publicizing it.

Although this was seen as a barrier, David described that increasing access helped mitigate risks, because "the more people that use a trail, the less likely you are to have

vandalism in my opinion because there are more eyes out there to see and to stop it as is first starts".

**Accessibility.** Madison describes below how they are trying to make their trail ADA accessible,

> We have a lot of public support, plus the…conservation commission is in the process of having a company design additional usages for our conservation areas and to do some trail enhancement and adding parking. Some trails will make wider so they are universally accessible, and some will require building bridges….We are looking to expand what we've got.

**Proximity to Homes and Private Land Owners.** Current studies have shown that legal factors affect local home owners who live next to trails because they are concerned with privacy, safety, and noise (Corning, Mowing, & Chancellor, 2012; Crompton, 2001). Study participants discussed private homeowners and their proximity to trails. George discussed having to manage public access and respecting private homeowners when stating:

> We've acquired conservation land, and it's near residential homes and the homeowners who live near the property might express concern because they may not want the public traipsing in the woods in back to their house. They want it to be, you know, empty and private for them. But we've placed a high value on public access and we try to accommodate that where we can.

Madison also discussed how their residents were worried about new developments and impeded their ability to create new trails:

> We have had to have two developments already that have asked to have their trails removed, to not have to be required to have to put them in…We don't really get to talk to the residents. It is normally the governing board of the association that comes and says, you know, the residents are really against this and I find it in the over 55 developments. I don't know why people get so paranoid, but they do.

**Increased Safety with Access.** According to previous studies, homeowners were initially concerned with living in close proximity to trails, but their concerns were outweighed by the many benefits (Corning, Mowing, & Chancellor, 2012; Crompton, 2001). In previous studies and in this current study, landowners and residents were concerned with safety and privacy, but the data in this study suggests that trails increase safety, particularly where access is increased.

Sarah below describes how many residents are concerned with trails near their neighborhood, but that it actually increases their safety,

> …I understand that the urban core section where such neighborhoods will be behind someone's backyard and there was some concern at first, you know, we don't want people walking in our yard. It turns out that they were nervous about nefarious activities occurring out there. And it turns out that the trail that lessened that activity and they have more people walking in the… mounted police some horses go through and kind of keep an eye on things. Not as often as they like, but that did not cause the terrible activities that people thought it would.

According to Madison, safety is a benefit of increasing access because "…the more people on the trails, the better they are. It's the trails that aren't being used that cause

problems with kids drinking and doing naughty things out in the woods. The more activity, it keeps them safer". She then elaborated to say that,

> We have found that we have one area…that wasn't used very often, and we were having all kind of trouble. We were finding syringes, and things laying around in the parking lot. And it's because it's not a well-known place. But in the [other tail] we never have anything like that. That's used all the time.

When asked if marketing made trails better, she stated, "I definitely believe that it will make it better. The more people who are there, the more witnesses, so nothing happens". Although many homeowners are concerned with having trails near their property because it means an increase of individuals near their homes, it may actually be beneficial to market the trails and increase access. The more active trail users, the safer the trails are according to the trail stakeholders.

## Discussion

Utilizing the PESTEL lens is an effective way to understand stakeholders' perceptions of challenges and best management practices. It allows for a holistic view of management tasks, and also provides an opportunity to explore the intersection of these external factors. It became clear that political, economic, social, technological, environmental, and legal aspects of managing trails were not individual influencers, but that these factors were drivers together, and were often intertwined. For instance, a participant discussed both how political and legal external factors are interconnected when stating, "The other thing from an environmental standpoint is there are some areas where we did not believe we needed easements…it's kind of funny that you have to take

a rural trail if you have to create, you have to cut down wildlife in order to have a trail that meets certain guidelines." A variety of external factors were co-related, in that they were often discussed together. Examples include Political-Legal, Technological-Environmental, and Economic-Environmental.

It is important to understand the intersection of the PESTEL categories, because often times the results suggest strategies to overcome management issues. For example, a political issue discussed was that there is a lack of voting support for increasing conservation land and creating funding for current trail maintenance. An economic factor that could be used as a solution to this is increased awareness of trails. As more community members utilize trails, a greater stake in their maintenance is created. This may lead to a greater willingness to pay. Additionally, participants discussed how managing their trails with the goal of increasing usage might lead to increased benefits and greater public support. Increased benefits included increasing political support, boosting the local economy due to transportation and tourism, creating a stronger sense of community, and maintaining safer trails.

With a greater use of trails, comes an increased concern of overuse and degradation. When Richard described how the Internet increased awareness of trails, he stated, "That's a wonderful thing right? More people are using the trails. But, it's this huge, huge increase in erosion of the trails". Ensuring the environment is protected should be a priority in managing trails. Although it seems like increasing trail usage would be counterintuitive to conservation, it is essentially a critical piece of the equation. Participants described that increasing usage in trails gave citizens an increased appreciation for what they had, creating environmental stewardship. Additionally, other

trail stakeholders discussed management strategies, such as not publicizing specific sensitive areas, creating policies and regulating activities to ensure less impact, and shifting usage to other locations to mitigate the risk of environment degradation. In terms of the social external factor, education was also utilized as a tool in order to bring groups of people on hikes to increase their comfort level and knowledge about trails. This could also be a powerful management tool, as it is an opportunity to inform participants on sustainable behaviors.

Limitations of this study include the small size and limited geographic reach of the sample. The sample also only consisted of trail committee members, conservation commissioners, town/city managers, and town administrators in two Northern New England counties. Due to this, the findings may not be generalizable to a larger population. A qualitative approach was taken because of the small sample size. To gain a broader and more generalizable understanding of this topic, further studies conducted could be quantitative methodologies, and reach a wider breadth of participants such as other trail committees, private trail owners, and other stakeholders.

Continued studies of trail management models and strategies may ensure that the benefits of trails are best realized in communities. Understanding how the PESTEL factors influenced trail management is a comprehensive and holistic way to view the issues, trends, and solutions facing the field. The political, economic, social, technological, environmental, and legal factors greatly influence, and positively support each other. Overall, management strategies should increase greater marketing of trails in order to create a cycle that can sustain the increased usage, informed by these external factors discussed.

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## Appendix

### Questions for Conservation Commissioners

Background Information

1. Do you have trails in your town? Can you briefly describe the trails you have (number, type, etc.)?

2. Do you know who owns these trails (town, land trust, state, etc)?

3. Who is responsible for the trails in your town (Conservation Commission, town staff, Trails Committee, Recreation Department/Committee, etc.)?

4. Are the trails regularly maintained? By whom (staff, volunteers, committees listed above, etc)?

Trail Use

5. Do you have any way of knowing who uses the trails?

6. Can you describe the level of use on town trails?
   *Choose From:*
   - *<25 users per day*
   - 25-100 users per day
   - >100 users per day

7. Do you have rules about who is or isn't allowed to use town trails (foot traffic, mountain biking, horses, ATV, snowmobile, etc)?

8. If there are no formal rules about allowable uses, are there uses that you don't want?

9. Are there conflicts among users of trails (i.e. between mountain bikers and hikers, horses and ATV, really any conflicts among 'competing' uses of trails, etc.)

10. Do you have trails that are used more than other trails, and why do you think this is?

11. Is your community interested in increasing the use of trails?

Mapping Trails

12. Are the trails mapped? In what format? Where can people find the maps (i.e. online, pdf, google maps, paper copies at Town Hall, Library, etc.)?

13. We are looking at putting together an online, state-wide map of trails. Is that something that would be of interest to your community?

14. Would your town be interested in including town trails on such a website?

15. Do you have any concerns about publicizing trails in this way?

16. Do you see potential barriers to adding town trails to an online, statewide map of trails?

Working with Volunteers

17. Knowing that mapping trails takes a lot of time, would you be interested in working with UNH Cooperative Extension to cultivate a group of volunteers to help you and other towns get trail maps online?

18. Would you need volunteers in order to accomplish that task?

19. Do you currently have volunteers that do trail work in your town? Are they town volunteers or outside groups (Boy Scouts, Girl Scouts, United Way, etc.)?

20. If not, who are stakeholders in your town that are potential trails volunteers?

**Questions for Town Managers**

1. Can you tell me about the trails in your town, such as marketing and accessibility?
2. What committees in your town work with trails?
3. What are some of the benefits of having trails for your community?
4. What are some of the challenges that you face in managing trails in your town?

a. What are the barriers to maintaining trails in your town?
b. What are barriers in acquiring land to create trails in your town?
c. What are the legal issues that come with managing trails in your town?
d. What are the barriers to promoting access or publicizing trails in your town?

5. The University of New Hampshire Cooperative Extension is working with the Trail Finder Project to inventory, map, and publicize public trails in New Hampshire.
    a. What are the benefits that you see in mapping and more widely publicizing public trails in your community?
    b. What are some of the political, environmental, legal, or other barriers that you think could arise with mapping and publicizing trails in your community?

## IRB Approval

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17-Aug-2016

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**IRB #:** 6501
**Study:** NH Trail Finder Project
**Approval Date:** 16-Aug-2016

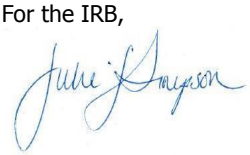
The Institutional Review Board for the Protection of Human Subjects in Research (IRB) has reviewed and approved the protocol for your study as Exempt as described in Title 45, Code of Federal Regulations (CFR), Part 46, Subsection 101(b). Approval is granted to conduct your study as described in your protocol.

Researchers who conduct studies involving human subjects have responsibilities as outlined in the document, *Responsibilities of Directors of Research Studies Involving Human Subjects*. This document is available at http://unh.edu/research/irb-application-resources. Please read this document carefully before commencing your work involving human subjects.

Upon completion of your study, please complete the enclosed Exempt Study Final Report form and return it to this office along with a report of your findings.

If you have questions or concerns about your study or this approval, please feel free to contact me at 603-862-2003 or Julie.simpson@unh.edu. Please refer to the IRB # above in all correspondence related to this study. The IRB wishes you success with your research.

For the IRB,



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