A Site-Specific Analysis of Golf Course Impact within Charlottesville, VA

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Introduction

As climate change threatens sea level rise and extreme weather events become more frequent, runoff and the stormwater management practices that must be implemented to control it become increasingly relevant (EPA, 2024, p.1). In tandem, imperviousness continues to grow as urban areas expand, leading to a lack of infiltration that can cause flooding and other hazards (University of Nebraska, 2014, p.1.). With these trends occurring across the world, it is not surprising that locally, Charlottesville's public golf course Meadow Creek is facing similar issues, requiring further stormwater management to fix the flooding of the 17th hole.

Beyond reevaluating the stormwater practices to fix the utility of Meadow Creek, a broader questioning of the intent behind these alterations is also required: is a golf course the most efficient use of this land for supporting the Charlottesville community? Golf course management is inherently localized, with the resources and efforts going into its maintenance drastically affecting the impacts of the course on its surrounding community (Salgot and Tapias, 2006, p.221). Depending on this management, golf courses can positively affect the environment through recreation and wildlife protection, or they can deplete resources and propel a lack of accessibility. Within this paper, an analysis of the many societal and technological factors involved in this current land use will be conducted using Actor-Network Theory in order to determine the best outcome for this parcel of land.

Actor-Network Theory

Actor-Network Theory introduces the idea that any phenomenon must be explained by human and non-human actors; to consider only social or technological factors would create an inaccurate picture of the situation at hand (Nickerson, 2024, p.2). Its popularity as a sociotechnical framework grew as a counter to technological determinism, or the idea that

technology overpowers all social factors and dictates its own future trajectory without any outside influences. Within Actor-Network Theory, or ANT, both technological and social factors are given consideration when predicting an outcome on how any given technology will affect a human setting.

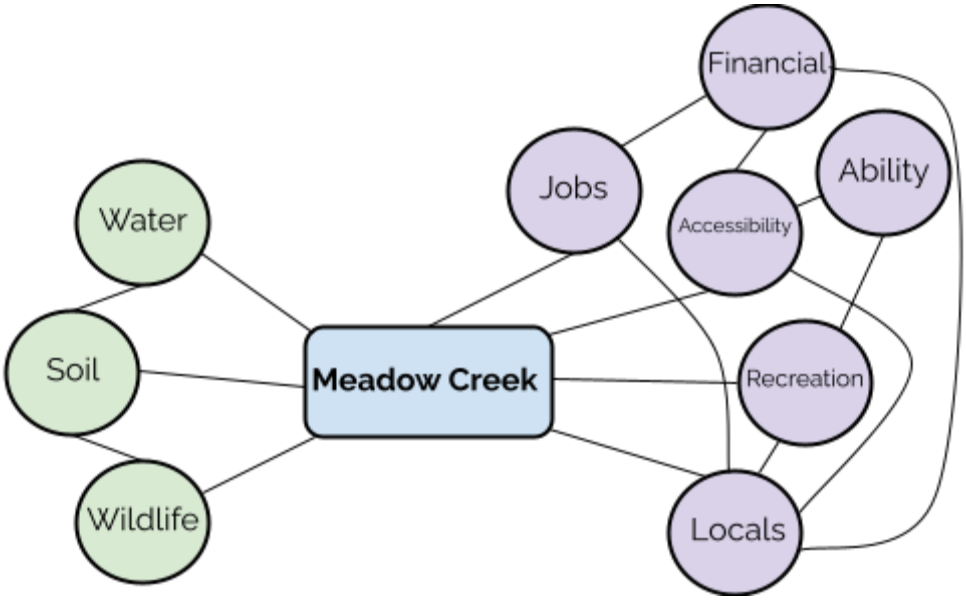
Bruno Latour, one of the creators of ANT, published "Where Are The Missing Masses?" amongst other writings to discuss the idea of non-human technologies still affecting humans. His position in this piece was that humans are not the only factors that shape society; there are many other technologies and "artifacts" that play a large role in how we function that are worth studying as well. He explains that certain technologies, like seatbelts in cars and doors, have reinforced certain behaviors and therefore taken away agency to make decisions for oneself. Within these situations, it is important to consider how technology impacts society even without outright awareness, and in all of these examples he provides, both human and non-human actors work together to produce outcomes.

ANT frameworks are created through assemblages and actants (Nickerson, 2024, p.3). Assemblages are the larger combination of actors that make up the system. In the case of this analysis, Meadow Creek serves as the assemblage, with factors such as people, jobs, water, and accessibility making up the actors. The main tenant of ANT – that has often proved to be controversial – is that each of these human and non-human factors are weighted equally, with the understanding that they have the same magnitude of impact on the assemblage. The ideas of generalized symmetry and free association further advocate for breaking down the barriers between technological and societal factors, saying they should be analyzed in the same manner and that they are not inherently different (Nickerson, 2024, p.2).

Throughout this analysis, the human and non-human factors that have shaped Meadow Creek thus far will be equally examined, as ANT strongly advocates for. This STS framework relates well to Meadow Creek as the sport of golf inherently connects its non-human technology to people through the land it resides on and the natural environment; though the course is non-human, recreation, accessibility, and jobs all relate back to people and the ability to affect quality of life. The study of human and non-human interactions with Meadow Creek will allow the positive or negative nature of the course to be determined, which can help dictate appropriate land use of this area for the future.

Meadow Creek Through ANT

Meadow Creek currently exists as a complex assembly of actors that allow the course to function as intended, save the flooding complications being technically addressed on the 17th hole. Currently, this golf course is a public course primarily for local recreational use. Outside of its primary purpose, human factors such as jobs, accessibility, housing, and the people themselves are all main components of what makes this system function. Through ANT, non-human factors are equally important in the assessment of the golf course's impact, with these factors including, water, soil, wildlife, and the land itself. While the golf course appears to be fulfilling its primary purpose, these stakeholders and their views will be analyzed in order to fully understand the potential of this land use. A diagram of the interconnectedness of these mentioned actors can be found below, though it should be noted that this list is not comprehensive and that the ties between all actors are significant and weighted equally.



Human

While jobs, accessibility, recreation and housing are not inherently "alive" factors, their proximity to human interaction is significant and will be discussed under the umbrella of human factors. Such non-objects are still relevant for discussion under ANT and still leave a strong impact on the overall viewing of Meadow Creek's impact and what should be subsequently done with the land.

In relation to jobs, Meadow Creek provides a steady employment opportunity in its current land use. Like any commercial endeavor, as community members continue to engage with the business, those employed at Meadow Creek will retain their jobs and be able to further their careers. Indeed shows multiple job listings currently available at Meadow Creek, proving that despite their current renovations and hole closures, the course is still a healthy business that supplies a positive financial opportunity to many locals. When considering whether the current land use best benefits job opportunities, it is inconclusive as long as the potential new land use is unknown. Prioritizing more non-human factors may result in further environmental protections, which would decommercialize the area and take away jobs. If the land use was further

commercialized, job opportunities would likely increase due to a greater number of businesses on the parcel, as golf courses don't offer many jobs given the immense space they encompass. It is also important to acknowledge that under any land use change, the current employees would lose their jobs, resulting in a direct negative impact on these stakeholders. The factor of job opportunities is a worthwhile actor in determining success of land use, though largely inconclusive without a proposed alternative.

Accessibility, both in a physical and financial sense, is also an actor within this assemblage. Meadow Creek is a public golf course, meaning that golfing opportunities are more affordable than those provided by a private membership. That said, the initial high investments of golf can make the land an unproductive space to many who are still unable to afford it (Onyango, 2025, p.2). Comparing the average cost to golf within Virginia to that charged at Meadow Creek shows that the course offers about average cost for 18 holes, around $55 (Dimengo, 2024, p.7). Golf can also be physically demanding to some, which would further prevent local interaction. That said, the lifetime-sport nature of golf does make it more accessible than many other activities. All in all, Meadow Creek offers minor accessibility concerns financially and physically, but not in a significant way that would impact the nature of the land use.

The people of Charlottesville themselves and their opinions regarding this land use are also an actor to consider. While all of the previous factors are human-centered, specifically highlighting the views of locals on the course is relevant. No official census or research has been conducted on the public opinion of Meadow Creek, but online forums such as Reddit and TripAdvisor praise the course and seem to approve of the land use, calling it a cost-effective course that offers great recreation. These forums tie together the idea of recreation and quality of

life into the impacts of Meadow Creek; the public for the most part agrees that the primary focus of recreation is fulfilled, and that the course should remain a part of this parcel's current land use.

Non-Human

Weighted just as equally as the human components under ANT are the non-human environmental factors. Water is one of these controversial components. In the case of many golf courses, improper management can lead to the depreciation of nearby water bodies due to excessive water use (Wheeler & Nauright, 2006, p.431). This trend can be seen throughout many courses in the United States, and while in many cases sustainable solutions have been developed to accommodate such issues, water usage can still be an issue depending on local practices. Water usage habits at Meadow Creek are not well documented, but based on current water conservation efforts of Charlottesville, water usage does not appear to be a primary concern (*Current Drought Status*, 2024, p.1). Projects like the Meadow Creek stream restoration also imply that environmental conditions are often heeded in the area, so if water usage at the course was concerning, action would likely be taken to address this. With this combination of factors regarding water, it is likely that Meadow Creek is a golf course that does not threaten supply, making this a relatively appropriate land use for the area.

Nutrient pollution within water and soil also typically offers contention within golf course discussion. The use of fertilizers can often pose nitrogen and phosphorus load issues, leading to eutrophication and the decay of necessary biotic components in the ecosystem (Petrosillo, 2019, p.2218). Though no specific data exists locally for nutrient pollution, the technical portion of this capstone has begun to address this gap in knowledge with phosphate and nitrate testing within the ponds, which did reveal high concentrations in two of the course's bioretention ponds. While contamination levels are currently high, these factors could be

addressed, meaning land use should not necessarily be changed based on this data alone; other protocols could be prioritized to mediate these effects, though action in one way or another should be taken.

Golf courses have also had volatile relationships with wildlife. If built inappropriately, they can displace animals and necessary habitat, but if managed properly, they can serve as wildlife protection areas for threatened and endangered species, adding ecological value to the area (Salgot and Tapias, 2006, p.219). No studies discuss Meadow Creek's specific impact on wildlife, but the stream restoration project does list wildlife habitat as a reason behind the introduction of riparian buffers, showing that actions to protect wildlife may be commonplace for the area (*Public Works - Meadow Creek*, n.d., p.2). Further research and discussion would be preferable, but given the current data, Meadow Creek does advocate for wildlife protection, validating the course's land use.

Discussion

Throughout the analysis of human and non-human factors, Meadow Creek appears to be a sufficient use for this land. It offers jobs and recreation with little accessibility concerns, and locals seem to appreciate it. Environmentally, water and wildlife protections are prioritized, and while nutrient concentrations could be lower, other actions can be taken to remedy this other than changing the land use. Meadow Creek proves to be appreciated in its current state.

As a counterpoint, sufficiency does not mean the maximum utility of this area has been achieved. While all actors of this assembly prove to be satisfactory, non-human and human alike, there are definitely some that could be further maximized. For example, the housing crisis offers a potential alternative of replacing some of this land with affordable housing (Higgins, 2024, p.1). It could be suggested that redeveloping this area into a nature preserve, park, or other form

of recreation while including housing could increase all of the discussed non-human factors as well as accessibility, though at the cost of jobs. Other alternatives should be considered as well that align with the maximization of the actors listed in this analysis, especially under the ANT framework that all factors should be considered to an equal extent.

To return to "Where Are The Missing Masses?" Latour emphasizes that technologies have trained humans to be content with the current state. Just because this technology has been integrated into society does not mean it must remain through our continuous interaction and embracing of it. It is always best to understand and analyze the role a technology plays and to not fall into a complacent acceptance of its presence; just because the current state is sufficient does not mean there are no better alternatives.

In a world where growth is prioritized, the value of land only continues to rise in urban areas. With Charlottesville falling into this category, it is important to constantly reevaluate whether land, especially public land, is doing the greatest service for the greatest number of people. Utilitarian principles like these can help maximize the most good that a public organization can offer, which can lead to the betterment of society.

Conclusion

Meadow Creek is an assemblage composed of many non-human and human factors whose impacts can be studied to best determine what the land use should be used for. When studying job opportunities, accessibility, environmental impacts and more, it can be shown that Meadow Creek serves an important role in the Charlottesville community that locals appreciate. That said, complacency with technology and its current uses should always be challenged in order to maximize benefits across a city. Further studies should be conducted regarding the

specific local impacts that Meadow Creek offers across these actors in order to evaluate next steps for the land.

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