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Mountain Biking Tourism Impacts in Rural Michigan

Mountain biking-related tourism is increasing, potentially increasing impacts to rural communities with mountain biking trails. Discussions with managers of two trail systems in Michigan, USA, highlight immediate direct and diffuse community economic impacts, equity issues (access, representation, and safety), and economic-equity intersections. Insights assist communities considering mountain biking tourism amenities and identities.

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Table of Contents

Summary

Mountain biking and mountain biking tourism are on the rise. With this increase comes the potential for increased impacts, especially in rural communities promoting their mountain biking trail systems. We present the case of two such trails in Michigan, USA – The Dragon Trail and the DTE Energy Foundation Trail – to exemplify how trail and community managers discuss two areas of tourism impacts and their intersections: economics and equity. Major highlights include economic phrasings of immediate direct impacts and more diffuse community impacts; specifically, equity considerations of barriers to access and representation and safety, and their intersection when discussing local as well as tourist use of these trails. This case serves as insight for communities considering developing mountain biking tourism amenities and identities, as well as how the discussion on impacts may vary across contexts.

The Value and Interest of the Case Study

Mountain biking (MTB) entered the scene of popular recreational sports in the 1980s and has since taken off globally (IMBA, 2022). More recently, there has been another spike in local and tourist MTB participation, thought to be linked to recreation patterns during the COVID-19 pandemic, when people were encouraged to recreate outside solo or with small numbers of family and friends (Beery *et al*., 2021). However, MTB has had longer and more mixed tourism impacts in small towns across the USA (e.g., Nickerson *et al*., 2013; Meltzer, 2014).

With increased participation, it is increasingly important to understand the impacts MTB tourism has on local, rural communities where MTB-specific trails are located and tourists gather. Little research has focused on understanding MTB's equity impacts (e.g., marginalization by socio-economic status, gender, race/ethnicities). Most of the research has focused on the economic impacts.

This case provides insight from two communities in rural Michigan, USA, on how equity and economic impacts are interwoven and influencing MTB experiences, these communities, and their tourism.

Background and Context

With the demand for mountain biking (MTB) increasing and its popularity accelerated during the COVID-19 pandemic in rural communities, the infrastructure associated with MTB-specific trails can have regional

impacts. For example, some sites have seen substantial economic benefits from influxes of "weekend warrior" MTB enthusiasts who ride, dine, and stay locally. Yet, little information exists on MTB impacts, especially on advancement of economic benefits, equity considerations, and sustainable community planning. Michigan is a USA state with a strong and strengthening MTB presence. It is home to at least six major MTB trail systems that are experiencing increased use. These trails have the potential to bring in tourism and related spending, foster community pride, and even attract new residents seeking livelihoods proximate to such amenities (lifestyle seekers) (Chakraborty and Keith, 2000). Conversely, there are significant barriers to accessing this experience, such as safety, cost, and lack of inclusivity.

Our overall intent was to find out more detailed knowledge about MTB impacts due to the increased participation, help inform sustainable community resource planning, and understand dimensions of equity and economic impacts in this tourism development context. We frame this study using the Integrated Recreation Amenities Framework (Perry *et al*., 2020), which details impacts as having social, managerial, and resource components generally, with specific types of impacts within each category. It also holds conceptual space for additional impacts that are specific to contexts and application of recreation research to particular fields (e.g., tourism) over time. Furthermore, it asks the user to consider different spatial and temporal scales of inquiry, to address smaller/shorter and larger/longer impacts. In this case, we explicitly examined one managerial impact (economics) and one additional impact (equity), while attending to multiple areas of social (e.g., the tourist experience) and resource (e.g., the trails and associated infrastructure) impacts. We also focus on the shorter- and longer-term impacts and the sites as two individual studies and at the mid-Michigan regional level. Most MTB research, as a recreation or tourism study, has focused purely on the social impacts, with another substantial body focused on the topic of economics within the managerial impacts, and mostly related to site-specific short-term examinations of impacts. Using this framework and other studies in the field (e.g., Rowe *et al*., 2016; Buning *et al*., 2019; Buning and Lamont, 2021), we have highlighted a gap in our knowledge about MTB impacts in the recreation-tourism intersection: the need for specific inquiry into how equity, particularly barriers to access, and economics are discussed by local communities, how they overlap as concepts, and how they are framed at different spatial-temporal scales.

In selecting these impacts of focus, and these budding MTB tourism sites in particular, we intend for this case study to assist other communities and MTB tourism destinations to understand potential impacts and/or contextualize the impacts they may already be experiencing. Additionally, this will inform MTB and broader recreation and nature-based tourism research by detailing community and regional impacts through a lens of sustainability and engagement.

A tale of two trails

We identified two trail systems in rural Michigan to target for our inquiry. The Dragon Trail and DTE Energy Foundation Trail ("DTE") in south-western and south-eastern Michigan, respectively, provide a key case study (Fig. 1). These trails represent emergent and established MTB sites, with associated issues of attracting use and managing high tourism use levels. Local communities expect the sites to boost regional rejuvenation. However, much remains unknown about the perceived site and regional economic and/or equity impacts. Both trails are poised to be regional economic catalysts. Both also have areas of concern for MTB equity and inclusion (e.g., marginalization by socio-economic status, gender, race/ethnicity, degree of rurality). Though both trails allow multiuse, they are advertised for and primarily attract MTB tourists.

The Dragon (www.thedragon.us) (Fig. 2) is located near Big Prairie and White Cloud, Michigan (The Dragon Trail, 2023). White Cloud has been designated the "Trail Town" by Pure Michigan (the state's tourism brand – www.michigan.org) due to its access to multiple trail systems, including the Dragon (Newaygo County Exploring, 2023). The site is about 45 min north from Grand Rapids, the second largest city in Michigan, and in a rural/remote area next to private residences, forested tracts, and parks. The Dragon Trail was established in 2019, with additional sections added in the following years. It is slated for completion in late 2023. The trail circumnavigates Hardy Dam Pond (the "Dragon" name stemming from the shape of this outline) and has multiple entrances for bikers to use. Some entrances are located at parks and one at a marina, each with an entrance fee (7–10 USD, daily). As construction of the 40+ mile (65+ km) loop trail is ongoing, MTB tourists can currently ride trail segments point-to-point or out-and-back within the completed 29 miles (47 km). An economic analysis guided the development of the Dragon (Orlando and Miller, 2014).

The DTE (www.dtetrail.org) (Fig. 3) is a more established trail network, centrally located in south-west Michigan near Chelsea (DTE Energy Foundation Trail, n.d.). The first section was completed in 2016, with additional segments added in 2017–2019. Chelsea is a small town, (population of 5300 residents (Chelsea Chamber, 2023)), located off major highways running between the metropolises of Detroit (the USA's 10th largest city), Ann Arbor (home to the University of Michigan), and Lansing (Michigan's capital). It has ample access to restaurants, cafes, and

Fig. 1. Locations of the Dragon Trail (The Dragon) and the DTE Energy Foundation Trail (The DTE) within Michigan, USA.

Fig. 2. The Dragon Trail, with its multiple entry points and completed and in-progress segments as of late 2023 (courtesy of www.thedragon.us).

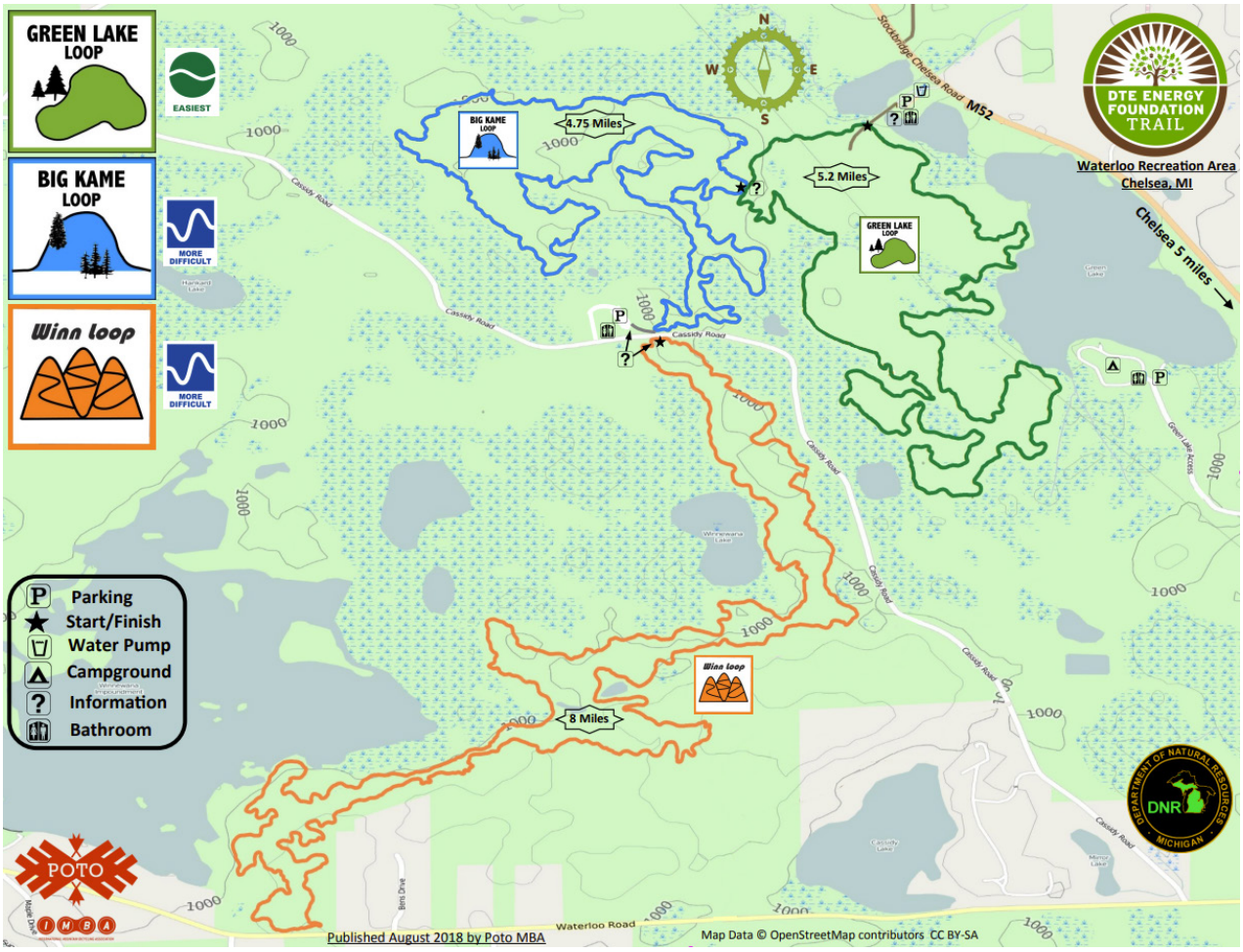

Fig. 3. The DTE Energy Foundation Trail, with its multiple loops graded by difficulty and proximity to Chelsea (5 m/8 km) via its town-trail connection (courtesy of www.dtetrail.org).

lodging options. The historic town is popular for MTB tourists to add into their day of riding on the DTE and nearby. Cyclists are commonly seen in their kits at restaurants and cafes. Chelsea connects various MTB and multiuse trail systems (e.g., DTE, Border to Border, Potawatomi), facilitating town-trail and trail-trail access via bidirectional paths. Additionally, the town is located near Waterloo and Pinckney State Recreation Areas. A Michigan Department of Natural Resources Recreation Passport is needed to park in the DTE parking lot (11 USD, annual), which is small and can fill early in the day (especially during weekends), or cyclists can park in Chelsea. The DTE features multiple loops for a total of 20+ miles (32+ km), advertising for a range of experience levels to navigate trail features.

Methods: Site Visits, Networking, and Interviews

To better understand these trails and their economic and equity issues, we conducted site visits (fall 2022) and interviews with site managers and tourism-focused entities (early 2023). Site visits involved noting uses and conditions. After reflection on these visits and themes in the literature, we connected with local and regional stakeholders – tourism boards, MTB advocates, civic leaders, park managers, and recreation inclusion groups, each of whom has part of their work portfolio related to tourism concerns. This spanned seven 45–90 min interviews via video or audio-only calls (three per site and one at the state level). We followed a comparative case study approach and iteratively coded for concepts and overarching themes (Stake, 2010; Saldana, 2015). In these conversations, we asked questions such as who is the typical MTB tourist on these trails, how are first-time/novice MTB tourists supported, and what economic impacts have been experienced within the community (intended and unintended).

Initial economic and equity themes

In general, economic impact concepts in these discussions related to the scale of impact on businesses and the surrounding area, increased tourism, business development, property value changes, trails' proximity

to metropolitan areas, and changes in local income/wealth. Major themes of economic concepts related to short-term, direct impacts and long-term community impacts. For equity, concepts illustrated areas of lack of diversity representation, perceptions about safety, costs and fees, availability of transportation, and availability of MTB and trail education materials. Major themes of equity concepts related to barriers to access and representation and safety. We illustrate this case of MTB tourism by describing these major economic and equity impact themes and their intersections in the following sections. Major themes are also summarized in Fig. 4.

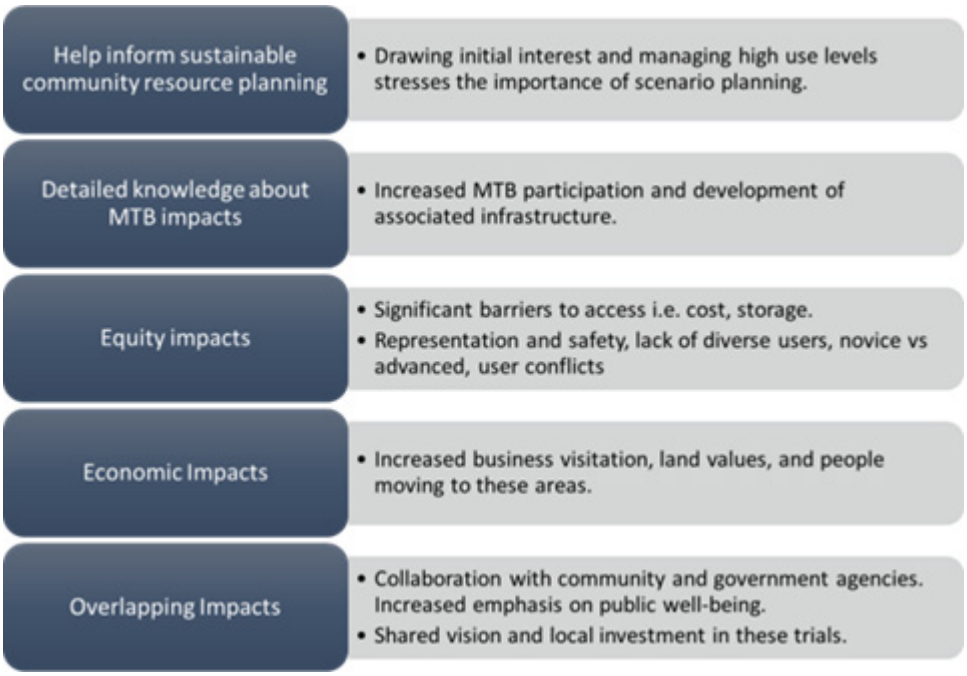

Fig. 4. Highlights of main findings, initial goals, and takeaways on mountain biking tourism impacts.

Case Illustration

Managerial: Short-term direct economic impacts

Direct impacts are more easily noticed by tourists and locals because they include concrete experiences such as buying a coffee from a local cafe or purchasing gear at the local bike shop. Interviewees associated with the Dragon related direct impacts to tourists' increased use of local gas stations, cafes, campsites, and temporary lodging (e.g., AirBnB, motels). Although the DTE has also experienced increased visitation to businesses, the economic impact was noticed on a broader scale, with increased focus on indirect and induced impacts such as an influx of people moving into the area and building housing to accommodate the newcomers. The differences in scales of perceived impacts across the two trails could relate to the length of time each trail has been in the recreation habitat and on the MTB tourist map. It presents an illustration of how conversations on economic impacts evolve as an MTB trail's novelty wanes.

Managers at both sites expressed that the greatest economic impact was seen and felt in businesses via increased patronage and demand. Both communities are seeing new businesses open, and long-shuttered businesses re-opening with renewed demand to justify it (e.g., coffee shops, campgrounds). Managers at the Dragon have noticed an increase in vehicle passes bought each year since the opening of the trail. These passes spark multiday tourism. One interviewee shared that they rent out 11 cabins near the trail and before the Dragon, the cabins did not sell out in most years. However, since the trail opened, they have been selling out, with over half of the renters either hikers or cyclists. Because the Dragon has multiple access points surrounding the lake, managers can see where/when people enter and which entrances receive heightened use. The largest jump has been at the small marina on Hardy Pond, which usually sells 80,000 vehicle passes per year. Another entrance point located on a beach sells 400,000 passes a year. In 2021, the small marina's sales surged and matched those of the beach, due to its designation as a Dragon trailhead. These site-specific impacts have spurred interest in activities and amenities throughout the communities. For example, a manager stated that the town of White Cloud, near the Dragon, has seen more local outdoor physical activity and community interest in experiencing

local natural areas alongside the increased tourism and that the demand for parks has also increased. Plans are now under way to respond to this tourism influx with new outdoor recreation tourism economy jobs.

Another direct, short-term theme concerned the infrastructure on the trails and supporting/sustaining them. The DTE can have 1500 users in a weekend, but originally only had a single designated parking lot of 50 spaces. Though since expanded to meet the demand, the lot is still regularly overflowing with vehicles. Vehicles exceeding the capacity park on the natural surface trail and the major highway outside the lot. Interviewees expressed that there was concern during trail development that if parking was discussed as an issue, the trail could be shelved before breaking ground because of strong feelings against large areas dedicated to vehicles. The Dragon's parking difficulties are not as urgent as the DTE's, due to the multiple entrance points, but there is limited parking space at each and the conversation may evolve in a similar direction if specific trailheads become more desirable for access than others. The DTE presents a case for what could be a fast outpacing of demand for the supply. Beyond parking, infrastructure challenges include adding picnic tables and bike racks outside businesses near the DTE to facilitate drop-by cyclists and recognize the influx of MTB tourists now enjoying Chelsea as part of their leisure time. Site managers have also installed on-site amenities (e.g., vault toilet, water access) and increased waste management services so as to not have trash buildup. As one manager stated, "We didn't know we were creating Disneyland in Chelsea," regarding the sheer amount of trail tourism. Some of these challenges could be on the Dragon's horizon as it becomes more established.

Managerial: Long-term community economic impacts

Longer term impacts were more readily shared about the DTE, due to its more established nature, but managers of the Dragon are also beginning to see longer term impacts.

Both attract tourists, with people hailing from Chicago (Illinois), Indiana, across Michigan, and Ontario (Canada). In a 2022 economic impact report, the Dragon reported over 21,000 tourists from May to August, with over half identifying as non-local (The Right Place, 2022). One manager for the DTE commented that they could not think of another outdoor attraction in Washtenaw County that regularly attracts this volume of use, including the annual county fair (a large event). Not only has the number of tourists increased to each site, but some are coming to stay (i.e., lifestyle seekers) and buying properties close to the trail. Prior to breaking ground on the Dragon, local community members thought the trail would negatively affect their property values. Managers commented that the opposite has proven true. Land values adjacent to the Dragon have increased 25–50%. Land parcels that have sat stagnant on the market for years and "properties with falling down buildings" are now sought-after, due to their trail proximity. This demand has spurred additional studies on a new hotel and brewery to be established nearby. Of course, the cautionary tale exists of lifestyle seekers displacing locals and driving prices beyond local affordability. Another cautionary tale is that in the rush to purchase properties close to these trails, those seeking the amenities may be limiting the ability for these trail networks to expand and are even purchasing properties that would intrude on the current trail integrity if the landowner retracted access.

Social impacts regarding equity: Barriers to access

Concerns over the cost of entry to the MTB sport was the managers' most consistent and prevalent message. One manager succinctly stated, "When it comes to mountain biking the barrier is very high. The cost is crazy. That must be acknowledged." Having access to a mountain bike and the proper safety equipment is a high barrier for most people. The cheapest bikes can range from 200–400 USD, but generally bikes are within the 1000–4000 USD range (Shumpert, 2022). This does not include safety gear, bike transport, or entrance fees to the MTB trailheads. Both trails require an access fee, and for the Dragon, this could currently be multiple fees due to the segmented nature of the ride, with multiple entrances. Dragon tourists have brought up this issue, asking for a single trail fee, but that is currently not possible due to the mix of private campgrounds, marinas, etc., acting as entrance points. Managers for the DTE also brought up that those who live in apartments, on upper stories, or without garages contend with issues of bike storage and transportation, which could be a large deterrent for those who might otherwise enjoy MTB and visiting this trail. Transporting a bike requires a vehicle big enough for the bike to fit inside, support a rack, or have a bed (e.g., pickup truck). For tourists, this issue is magnified by distance. Those who live further away and cannot transport the bike must ride to the trailhead, adding undesirable miles to the day and perhaps tipping the balance against a visit. Both sites are entertaining the idea of bike rentals or bike shares, so people do not have to purchase their own bike. However, this presents issues of attracting businesses willing to rent/share, as bikes are costly and so is the liability and potential cost of repairs if damaged.

Social impacts regarding equity: Representation and safety

Representation in MTB and at these trails is a concern. This is largely influenced by the average cyclist profile: white male, aged 35–54 years, making over 100,000 USD per year, and having a bachelor's degree or higher (Roberts *et al*., 2018; Buning *et al*., 2019; Buning and Lamont, 2021). This niche demographic dominates MTB tourist profiles to the Dragon and was heard within the manager interviews. Managers of the Dragon profiled 124 trail users in 2021 and found over 58% of respondents are aged 35–54 years old, 72.36% identify as male, and over 55% have a household income above 100,000 USD (Smith, 2021). In the interviews, managers also stated that the typical user is white and male. Many commented on the lack of female identifying cyclists on the trails. One manager approximated that 10% of the cyclists are female identifying, which was low but still an improvement from past numbers. Managers emphasized that new cyclists and MTB tourists are welcomed and supported by those within the MTB community, but that the cost still plays the biggest role in determining sport participation. However, just creating a welcoming space for newcomers and those who do not identify as a white or male could help diversification. The DTE sees affinity groups for diverse identities from the Michigan cities of Ypsilanti and Ann Arbor coming out to ride. With those groups actively using the trail and others seeing a greater diversity of people, this could encourage others to try and ride. This is important, because if a new user comes to the trails and only sees those who look different from themselves, it can be difficult to feel a sense of welcome, belonging, and safety within the MTB community and on any particular trail (Wolf *et al*., 2018).

The dichotomy between new and experienced cyclists can be an issue for those wanting to enter the sport (Taylor, 2010). By seeing experienced cyclists, newer cyclists can experience an internal challenge, asking themselves "Can I really do this?" (Roberts *et al*., 2018; Griffin *et al*., 2020). For these two trails, with most MTB tourists suspected of being experienced cyclists who have ridden for multiple years, this can deter people before they even begin (Taylor, 2010). One promising development is implementing site-based skills clinics that can be focused on new cyclists, including children, Black, Indigenous, and People of Color individuals, women, and differently abled cyclists.

The final theme identified by managers was safety. Representation and safety can go together, especially when considering gender and racial diversity. With the Dragon being in a more remote and secluded area, one manager stated that there is a potential of not wanting to ride alone as a non-white non-male cyclist. Managers lamented how to address this concern and are trying ideas to have potential cyclists get more familiar and comfortable with the trials, such as in the skills clinics. This could represent positive progress toward addressing the barriers to access and representation of cyclists, encouraging more diverse MTB tourism (Taylor, 2010; Griffin *et al*., 2020).

Both sites have implemented trail education programs, aiming to educate users on how to navigate a multiuse trail that is MTB-focused (but also allows foot traffic – walking, hiking, running, etc.), that includes all ability levels and group types. There are perceptions of MTB trails excluding other uses, and that those on foot worry for their personal safety (Taylor, 2010; Wolf *et al*., 2018). This includes concern about the bidirectionality of the trails (cyclists could be coming in both directions) and the substantial chance that someone on foot would need to move off-trail to accommodate a cyclist moving at a higher speed. Within the MTB tourists on-site, there is also the fear between the more novice and more advanced cyclists. These conflicts among and within uses and users are common in recreation settings (Taylor, 2010; Wolf *et al*., 2018; Manning, 2022) and an area of emphasis in trail etiquette education. Fortunately, both trails have graduated levels of difficulty and cater to most ability and comfortability levels, which together are efforts at educating users, zoning uses and users to lessen trail conflicts, and allaying concerns about the trail being dangerous for non-MTB users and novice MTB users. There are sections and loops ranging from beginner/novice to advanced/technical. E-bikes are currently not allowed on either trail and would be a controversial addition due to their speed and potential environmental impacts. However, a manager at the DTE hopes that e-bikes might be permitted, for those who are differently abled to get a similar trail experience to other cyclists.

Community Vision and Investment: Overlapping Impacts

Some themes of this case merged economic and equity impacts. These illuminate how MTB-focused trails and MTB tourism can foster a sense of community wellness, encourage collaboration across agencies to promote sustainability, and highlight a community's strengths in trail stewardship (Freeman and Thomlinson, 2014; Roberts *et al*., 2018).

With the Dragon, it is unique in that multiple government agencies in two counties have agreed on the trail's construction and maintenance. Having a shared vision about the ultimate goals of this community asset was integral to their success (Kania and Kramer, 2011). This collective vision and action assisted in mitigating local

concerns. For example, community members worried about damage to their trees and properties but were heartened after the trail was constructed using sustainable design and an ecological survey to understand distributions and needs of the area's plants and animals. The trail was also constructed so it was not visible from neighboring properties, preempting some negative social impacts. Given this effort in design, engagement, and communication, the Dragon effort has encouraged locals, not just tourists, to use the trail and engage in more outdoor recreation in the community (Michigan's Dragon Trail and Mecosta County Visitors Bureau, 2022).

The DTE showed similar themes, but perhaps started at a point of more collective local investment. The city of Chelsea has a strong foundation of trail champions who are passionate about the outdoors and stewardship. One manager emphasized, "There's always been that large push in this community to make sure we're preserving and utilizing this amazing landscape we have all around us." Having a local trail – accessible without walking, riding, or driving on a main road – was viewed as special and desirable from the beginning. This viewpoint has remained, easing conversations about trail-town connectivity through further trail development. Recently, a focus within the community on improving mental and physical wellbeing, with related organizations supporting these aspects, has further emphasized the benefits of the trail to the community. Importantly, it provides youth with a place for after-school activity without needing a vehicle. Managers hope this focus will continue and that the trail will help motivate activity and outdoor recreation, like near the Dragon.

Pedaling Ahead

In this case study, we illustrate economic, equity, and intersectional tourism impacts of two MTB-focused trails in Michigan. In doing so, we highlight what MTB tourism development in other contexts might consider. We also encourage a broader view of the findings to be translated into other tourism and recreation fields. When introducing a new tourism activity to a rural area or elsewhere, we stress the importance of scenario planning with all parties involved to plan for potential high use and interest. Through extensive scenario planning, communities can plan for additional associated infrastructure that may be needed to combat the influx of visitors. Additionally, our study showed that although there are still significant barriers to access, representation, and safety concerns regarding this sport, there are also communities committed to addressing these areas by working to make the trails as inclusive as possible. By collaborating, having a shared vision and goals, communities can work together to help address these disparities. It is important to understand the intersectionality of these concerns and how each contributes to healthier MTB tourism, community development, and individual experiences. The case study also provides reflection on how MTB tourism development reflects other systems where barriers to access are affected by representation and feelings of safety and can be a model for addressing such disparities.

Conflict of interest

The authors declare no conflicts of interest.

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