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A Review of Documented Community Impacts due to Spaceport Development

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As the annual number of space launches continues to increase, new spaceports may need to be created in order to keep up with demand. Development of successful and sustainable spaceports requires a holistic understanding of the impact they have on the host community. Economic factors have historically been the primary drivers in the development of new spaceports, but purely quantitative economic data often fails to fully capture the lived experience of local residents. Technical research is beginning to address the environmental impact of spaceports, but little literature exists on the social impact of spaceport development and operation. Additionally, existing literature typically focuses on an individual spaceport, resulting in a research gap regarding community effects common to multiple developments. Failure to properly identify, understand, and address these commonalities may lead to increased cost, both monetarily and socially, for new spaceport developments in the future. This paper seeks to present a synthesis of existing literature on the community effects of spaceport developments throughout the world, placing a focus on non-economic social impacts. Commonalities between developmental approach and community structure are analysed with the intent to draw parallels between spaceport developments despite situation differences. Finally, a list of core documented impacts noted throughout the literature is presented.

I. Introduction

Space is a quickly-expanding industry, growing at a rate of 9% annually and expected to reach $1.8 trillion by 2035 [1]. Rising, too, are the number of space launches, with both private and public spaceflight seeing an increase in the number of annual launches. A 2022 report projected a launch rate of about 2,500 satellites a year from then until 2031, with current launch rates closely matching this expectation [2, 3]. With this rising interest in space launches comes the need for facilities capable of supporting them. Creation and operation of these new spaceports has a major impact on their host communities, and successful and sustainable spaceport development will require a holistic understanding of what these community impacts are.

Much has been written on the potential economic benefits new spaceport developments are projected to bring to their host communities, both domestically and abroad [4–6]. However, relying on this quantitative economic data alone comes with drawbacks. The recent failures of Marquette Spaceport in Michigan [7] and Spaceport Camden in Georgia [8], where community backlash was successful in terminating both developments, highlight the importance of capturing the perspective of local residents and proactively addressing their concerns. These examples have historical precedent; in 1992, community outcry in Australia about the appropriation of indigenous land for spaceport use was successful in scrapping plans for what would have been the world's first commercial spaceport in Cape York [9].

Environmental impact is one prominent community impact, with technical research addressing such issues as soil acidification and sonic impact [10, 11]. Limited literature, however, considers the social impact of spaceport development on their host communities. What literature exists hails largely from the social sciences, namely anthropology, sociology, and history, as well as investigative journalism. Additionally, existing literature often focuses on examining the community impact of one specific spaceport, leaving a gap in research discussing commonalities in community spaceport effects. By synthesising existing literature, a list of these common community effects can be derived, setting the stage for a deeper understanding of how and why certain spaceports have excelled or failed at social integration to their host

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communities. Subsequently, a set of social and technical best practices for new developments could be created, which could serve as a centralized reference for effective and beneficial spaceport development in the future.

This paper aims to address the first step of this process and provides a preliminary synthesis of existing literature regarding the effects of spaceport development on communities around the world. In doing so, it directs interested readers towards relevant works and further research gaps. This paper places focus on impacts beyond economic return, and analyzes commonalities between the spaceport developmental approach and community structure to highlight common themes that emerge despite situational differences. Finally, this paper applies the initial list of core documented community impacts from the literature to candidate spaceport locations indicated in the preliminary results of a spaceport facility location planning model [12].

II. Methodology

The literature review process used to determine if, how, and to what extent existing literature discusses the community impacts of spaceport development drew inspiration from a scoping literature review [13]. Focus was first placed in determining what literature within the field of engineering addresses community impacts, with four major engineering online databases consulted: IEEE, SCOPUS, Compendex and Inspec. Search inclusion and exclusion criteria are captured within Table 1; publication date filters were not applied within the search to capture research conducted during the creation of longer-running spaceports, such as Kennedy Space Center and Baikonur Cosmodrone.

Table 1 Inclusion/Exclusion criteria for the online database search.

Criteria	Inclusion	Exclusion
Online Citation	Full title, abstract and work available through University of Michigan (UM) accessible resources	Full work is unavailable through UM accessible resources
Language	Published/reported in English	Published/reported in a non-English language
Focus	Research/publication must explicitly discuss impact (economic, or non-economic) on the host community	Research/publication does not discuss impact on host community
Type	Research/publication discusses a spaceport, defined as a location capable of orbital launch	Research/publication discusses a launch location not capable of orbital launches

The search keyword of "spaceport community impact" was used across databases; note that in some cases, when this phrase was entered it was automatically reformatted by the database as indicated. The results of this search are captured in Table 2. Within engineering literature, it was discovered that relevant literature was focused on either the economic impacts of a spaceport on a host community or analysis of sonic impact from rocket launches. A singular accessible paper appeared across engineering literature after search criteria was applied, which examines the Mid-Atlantic Regional Spaceport as a case study discussing the economic viability of commercial spaceports [14]. Although it provides valuable information regarding the economic impact of a spaceport on the community, social impacts were not directly discussed and the paper was ultimately set aside.

Thus as of June 2024, literature which directly examines the social impacts of spaceport development on a host community did not appear in engineering databases. These scarce results required an expansion in scope; two general academic online databases were consulted, with the results of the search captured in Table 3.

The literature discovered through this process fell largely into two categories: reviews of established spaceports through anthropological, sociological or historical lenses, and governmental reports for developing and proposed spaceports. Perhaps unsurprisingly, this indicates that the social sciences are more cognizant of the impact spaceport developments have on their host communities.

Table 2 Engineering database search results.

Database	Keyword(s) (as formatted by database)	Initial Search Results	Results After Filtering	Results After Paper Analysis
IEEE	"spaceport community impact"	n = 0		
	"spaceport" AND "community impact"	n = 0		
	"spaceport"	n = 0		
SCOPUS	"spaceport" AND "community" AND "impact"	n = 9	n = 3	n = 0
Compendex	"spaceport community impact"	n = 12	n = 1	n = 1
Inspec	"spaceport community impact"	n = 6	n = 1	n = 1

Table 3 General database search results.

Database	Keyword	Initial Search Results	Results After Filtering	Results After Paper Analysis
Web of Science	"spaceport community impact"	n = 1	n = 0	
JSTOR	"spaceport community impact"	n = 117	n = 10	n = 9

Anthropological texts appeared most frequently, with several works in the field directly examining the social impact of spaceports. Two works in particular stood out; the work of Peter Redfield, examining the Guiana Launch Center in French Guiana [15], and that of Sean T. Mitchell, examining the Alcântara Launch Center in Brazil [16]. Historical literature captured the development of Kennedy Space Center in the US. A review of Brevard County, FL, detailed the infrastructure, demographic, and economic changes experienced by the community during the establishment of the spaceport in the 1960s [17], and a social study from the era provided insight into the questions posed by researchers at the time [18].

In order to account for relevant literature that falls outside of the academic realm, such as investigative journalism, Google and Google Scholar were consulted. Similar keywords such as "spaceport community impact" and "spaceport community response" were used to discover relevant spaceports and publications. Economic impact assessments appeared in the literature at this stage, providing insight into motivating factors to spaceport developments and differing approaches to environmental and social governance [19–21]. Investigative journalism captured community responses to recent spaceport developments, both domestically and abroad. A variety of publications were collected to provide insight into multiple viewpoints and narratives surrounding these spaceports, including international, national and local publications. Three spaceports appeared most prominently in this realm: the domestic spaceports of Spaceport America in New Mexico and SpaceX's Starbase in Texas, and the developing spaceport in Biak, Indonesia [22–27].

III. Common Effects

The following community effects were drawn from the aforementioned literature sources, and appeared at multiple spaceports. Although these effects are often interlinked, not all effects appear at all spaceports or to the same degree. By comparing and contrasting how these effects arise at various spaceport locations worldwide, a preliminary understanding can be gained as to how spaceport developments benefit or disadvantage their host communities. Four primary effects stood out within the literature: economic prioritization – the potential economic benefits of a spaceport to a host community is a common non-technical developmental driver; resource scarcity – the lack of infrastructure and resources often experienced at new spaceports experience during early stages of development; community resistance – the level of resistance a community expressed towards a spaceport depends on whether the development compliments or disrupts with the established way of life and perceptions of the land; and community reinvestment – the tendency for established spaceports to work towards acquiring social license by reinvesting into a community, particularly through education and outreach programs. Figure 1 displays a map of the spaceport locations analysed and the corresponding effects noted in the host community, and Figure 2 shows an aerial view of each developed spaceport to provide an idea of the general

landscape surrounding each location.

Fig. 1 Map of examined spaceports and corresponding community effects.

Fig. 2 Aerial spaceports view – clockwise from top left: Spaceport America [28], SpaceX Starbase [29], Kennedy Space Center [30], Alcântara Launch Center [31], Guiana Space Centre [32].

A. Prioritization of Economic Potential

The potential for increased economic opportunities is an oft-cited, non-technical driver for spaceport development, both domestically and abroad [5, 20]. Common economic selling points include increased job opportunities due to the advent of new companies, and tourism revenue from the novelty of space launches. Location and socioeconomic factors, such previous existence or lack of a spaceport within the nation or state, color the particular approaches taken to sell a spaceport to the community.

Literature discussing spaceports that served as the "firsts" of their respective countries or communities note how the ability to display technological and economic strength appear as developmental drivers. Through a lens of national or local pride, a spaceport serves as a symbol of status and recognition, casting the community or nation that hosts it into the spotlight. The expansion of the US Air Force Base Cape Canaveral Launch Area to become Kennedy Space Center is indicative of this; while economic factors and prior investments in the area allowed Florida to secure the bid for the location, the spaceport and broader space program served as a display of the United States's technological strength and capability during the Cold War Space Race [33, 34]. Similar sentiments of using a spaceport to display technological and political strength were noted in the creation of Alcântara Launch Center in Brazil, and Guiana Space Centre in French Guiana [15, 16]. At the latter location, proponents of the spaceport expressed their hopes that the spaceport would bring "an era of prosperity" to the region while detractors highlighted how local officials were not consulted when the spaceport location was selected [15].

The potential political opportunities a spaceport may bring also feature as a point of interest when assessing new spaceport locations, such as in Australia and Indonesia [6, 35]. In the case of the developing spaceport in Biak, Indonesia, the location on the equator, which lowers fuel cost to orbit, has the potential of drawing increased technological attention to the area and allow for Indonesia to develop stronger international relations [35–37].

Though less overt, similar themes of displaying technological strength and increasing community pride by developing a spaceport can be seen in the public narratives of Spaceport America and SpaceX's Starbase. Officials from the city of Brownsville, home to SpaceX's Starbase, are quoted as expressing excitement and pride towards the private space company's expansion and spaceport development, conveying hopes that the novelty of the spaceport would draw new visitors and residents to the city [38]. Spaceport America frequently highlights their status as the world's first commercial spaceport, with early announcements featuring hopes that the spaceport would become a central hub for commercial spaceflight and space tourism [22, 39, 40].

Common to both these domestic spaceports was their frequent positioning as economic saviors of their respective host communities. Sierra County, NM and Cameron County, TX, the respective locations of Spaceport America and Starbase, have historically struggled economically and held poverty rates far exceeding the national average [41, 42]. To many government and state officials, the prospective jobs and tourism revenue brought by a spaceport would help economically revitalize these struggling areas [22, 25]. Examining the economic growth that Spaceport America brought to the county, 2022 economic impact review conducted by New Mexico State University found that the majority of revenue was generated by rental and usage costs rather than tourism [19]. In comparison, Kennedy Space Center has a well-developed history of tourism as the United States's longest-running spaceport, and generated an economic effect of approximately $148.3 million for the state of Florida in the year 2021 [43]. This indicates that tourism revenue may be influenced by other factors, such as spaceport location, age and historical importance.

The narrative of a spaceport as an economic savior can also be seen in the proposed development of Spaceport Sweden in Kiruna. As a mining community that has nearly depleted its natural resources, Kiruna is noted as a location which would benefit from the tourism draw of a spaceport [20, 21]. Additionally, Kiruna has previous ties to space research through the nearby sub-orbital launch site of Esrage Space Center [44]. This prior history with space activities, in tandem with Sweden's prominent environmental and social governance policies, may allow for a smoother transition in community perception of the spaceport [45].

B. Resource and Infrastructure Scarcity

Scarcity in resources and infrastructure was noted across multiple spaceport developments, particularly within the early stages of development. In the early years of Kennedy Space Center, new residents flooded into the Brevard County area following spaceport job demand, overtaxing the existing infrastructure. This failure to keep up with population expansion created a host of social and health concerns. Short-term solutions led to new problems, such as increases in health concerns due to usage of septic tanks in place of sewage infrastructure [17]. Additionally, population growth in Brevard county was unlike other city developments; the developing spaceport was geographically located away from the growing residential communities rather than at their center, resulting in a unique social climate which drew the attention

of social scientists of the time [18]. This difference in civil infrastructure resulted in long commute times which, in tandem with intensive work hours at the spaceport, was linked to an increase in social issues such as alcoholism and infidelity [17]. Though these concerns were later resolved with time and continued expansion, it demonstrates the necessity of adequate resource management and infrastructure planning as a part of early stage spaceport development.

The comparably long-running spaceport of Guiana Space Centre in Kourou, French Guiana still suffers from similar resource and infrastructure scarcity as Kennedy Space Center did during its early developmental stage. The initial years of Guiana Space Centre saw split community support; some residents embraced the new technical developments of the community and the modern economic structure the spaceport brought, while others mourned work independence and highlighted how job prerequisites increased racial inequity in the area [15]. These days the spaceport remains a major economic pillar in French Guiana, with a significant portion of spaceport investments returning to the local economy according to a 2020 publication [46]. However, due to land and production tool scarcity within the nation, French Guiana remains dependent on imports from France, of which it is an overseas department [47, 48]. As such it is difficult to ascertain how much of the existing resource and infrastructure scarcity experienced by residents in Kourou is due specifically to development of the spaceport.

For residents at Alcântara, however, the development of a spaceport was noted to have directly contributed to the resource scarcity experienced by the community. Documented extensively in Mitchell's 2017 work *Constellations of Inequality*, the creation of Alcântara Launch Center heavily disrupted and restructured the existing local community. The removal of access to previously public land and resources stifled the ability of local residents to remain resource independent. Land acquisition resettled residents from their homes into government-crafted homes and agricultural villages, a change which required them to shift from communal agricultural practices to individualized ones, with no support provided for this new style of farming to be successful. As land became overtaxed due to this change in farming practices, residents were forced to become dependent on spaceport jobs whose salaries were described by one community member as "misery wages" [16]. This failure to provide adequate infrastructure and support to residents resettled by spaceport development led to a decrease in local quality of life and a fracturing of community.

C. Disruption of Community Lifestyle

Throughout the literature, community backlash is heavily tied to how much a spaceport disrupts the existing way of life. Greater changes to natural resource access and established economic structure corresponds to increased push-back from local residents. This effect is perhaps most clearly seen in locations such as Alcântara Space Center in Brazil, and the proposed spaceport in Biak, Indonesia. The existing community structure of both locations is closely tied to land and natural resource access and thus are more greatly affected by land acquisition for spaceport development purposes. As previously mentioned, land acquisition at Alcântara required residents to resettle into government-created housing and shift their way of life, with the corresponding loss of access to natural resources reducing the ability for residents to remain self-sufficient. Mitchell documents the perspective of residents as having lost abundance and community wealth due to the creation of the spaceport, with trust in government officials undercut [16].

It is also important to note that land itself often has complex cultural ties. The land on which Alcântara Space Center sits was acquired from and is surrounded by a largely quilombola population, descendants of enslaved African persons brought to Brazil. Land access and ownership is not only a central pillar of community economic structure, but is also a part of community identity [16]. Alcântara residents and those in surrounding communities pushed back at further spaceport expansion attempts, partnering with activists to lobby against further development and receive legal recognition of their displacement [49]. In April 2023, the Brazilian government issued a public apology for resettling residents to create the spaceport and offered financial reparations [50].

A similar story of removed resource independence and community tension appears in Biak, Indonesia, which houses a large indigenous population. Similar to Alcântara, communities in Biak are economically and culturally structured around land and resource access, with land inheritance passed down through generations. Acquisition of the land for spaceport purposes would not only disrupt this tradition of inheritance but would also undermine carefully wrought family agreements, a move residents say would spark community conflict and hereditary killings [26]. The region also carries a complex history of military violence and intimidation, which has colored the process of land acquisition for the developing spaceport [27, 51].

However, sentiments of resistance still appear at spaceports developed in communities that are less directly tied to land and natural resource access. Prior to the expansion of Cape Canaveral Launch Area to become Kennedy Space Center, residents of Brevard County utilized the land and beach for leisure activities, such as hunting and fishing [17].

The dominant narrative surrounding Merritt Island during the early stages of Kennedy Space Center's development

is one of empty wilderness and minimal human presence, mirroring that of Alcântara prior to the development of Alcântara Launch Center [16, 34]. Existing residents of Brevard County were required to move in order to make way for the spaceport, with land was acquired for the expansion of Kennedy Space Center through both purchase and government condemnation [34]. Dissatisfied with potentially losing land rights to the government, some residents initiated lawsuits in an attempt to keep their property [17]. Spaceport development also restricted public access to popular beaches and hunting locations, a move met with criticism by residents who cherished the ability to enjoy the natural landscape [17, 52]. NASA's move to designate the area surrounding Kennedy Space Center as Merritt Island National Wildlife Refuge helped to shift community perspective towards the spaceport. Later re-issuance of public hunting and fishing permits, as well as the general success of the space program, further solidified positive community sentiment [17].

The loss of beach access and worries about wildlife disruption during the early developmental stages of Kennedy Space Center are echoed in the community reaction to the creation of SpaceX's Starbase in Boca Chica, TX. Residents have expressed reluctance to relinquish land ownership, and dissatisfaction with beach closures due to testing has led native groups and environmental activists to pursue legal action against the company [24, 25, 53]. However, it is important to note differences between the circumstances of Starbase and Kennedy Space Center's development when drawing these parallels. Not only was Kennedy Space Center constructed during the height of the Space Race, when public attitudes towards space-related activity were intertwined with national pride, it is a public spaceport created through an expansion of a then-existing Air Force base. By contrast, Starbase is a private spaceport placed in a community which lacked previous aerospace activity. Though both communities take pride in preservation of the natural landscape and uninhibited access to the land, Brevard County's previous experience with Cape Canaveral Launch area likely contributed to decreased negative public sentiment towards the expansion into Kennedy Space Center, particularly with the designation of Merritt Island National Wildlife Refuge.

D. Community Integration through Reinvestment and Education

To minimize the aforementioned disruption of community way of life, spaceport operating companies may choose to strengthen their ties with the local community through a variety of programs. Chief among these is investment into local education. As previously discussed, spaceport development is often driven by the promise of economic potential and new job opportunities for local residents. This gain, however, comes with a prerequisite. In circumstances where existing ways of life contrast heavily with the development of a spaceport, local community members may not have the prior experience necessary to secure newly created spaceport jobs.

This latter scenario played out at Alcântara Launch Center, where residents expressed that they lacked the technical and scientific background to pursue the well-paying spaceport positions that had been marketed as a local community benefit. These new technology-focused jobs ran contrary to the existing way of life, which was tied closely to resource independence and natural abundance [16].

To close this gap between existing resident knowledge and that required for newly created jobs, spaceport operating agencies may choose to invest in educational programs. The French company Arianespace, which launches from Guiana Space Centre, currently provides scholarships to local students to pursue higher education [46]. In the United States, Kennedy Space Center has developed closed ties with the University of Central Florida, which was developed directly to support the spaceport's need for skilled engineers and technicians [17, 54].

Social license to operate refers to the necessity of reinvestment into the local community in order to secure public and community support for a new development [21, 55]. Though educational programs, such as the aforementioned collaborations between spaceports and higher education, are one potential pathway for acquiring this social license, different communities may be better served by alternative methods. At Alcântara, one Ukrainian-Brazilian space company sought to build community support by undertaking developmental projects that complemented the lives of local residents, providing milling equipment and handiwork classes to help support resident self-sufficiency [16]. Although local sentiment towards the spaceport at large remained negative, this reinvestment into the community allowed the company to develop closer ties and a better understanding of their role in the community.

Literature also highlighted the importance of environmental and social governance (ESG) measures in establishing community trust and long term success of new developments. In a 2016 paper examining the potential impact of new developments in northern Sweden on indigenous populations in the area, it was noted that undertaking social and environmental impact assessments when making location decisions would allow for a smoother transition in public perception of the new development [21]. Similar importance of proper ESG was also noted in Biak, where community voices and concerns went unaddressed due to failure to identify a single agency responsible for ESG. Shifting responsibility, in part due to the Biak spaceport development's status as a public-private partnership, was determined as

a primary reason that ESG measures were overlooked [56]. This failure exacerbated existing tensions in the region and negatively affected community perception of the spaceport, highlighting the importance of undertaking appropriate ESG measures early on in the developmental process.

IV. Application to Preliminary Candidate Spaceport Location Analysis

To gain an understanding of how these effects might be used within the decision making process, potential locations given by a facility location planning model (FLP) can be compared and contrasted. Examining the results of the evenly weighted scenario of the aforementioned spaceport facility location planning model yields the following potential communities: Humbolt, CA; Matagora, TX; Gulf, FL; Monroe, FL; Washington, ME and Dare, NC [12]. Given their proximity to existing and actively operating spaceports, namely Vandenberg Space Force Base, SpaceX's Starbase and Kennedy Space Center, the first four locations were not selected. This leaves the communities of Washington, ME and Dare, NC, as potential spaceport locations. Note that the FLP in [12] does not consider any aforementioned externalities that may impact surrounding communities.

The first of these remaining locations, Washington, ME, was shortlisted as a location of interest for the prospective Maine Spaceport Complex with focus on vertical launch [57]. The county is sparsely populated, with approximately 12 people per square mile, and its close proximity to water provides a technical benefit, as highlighted in figure 3 [57, 58].

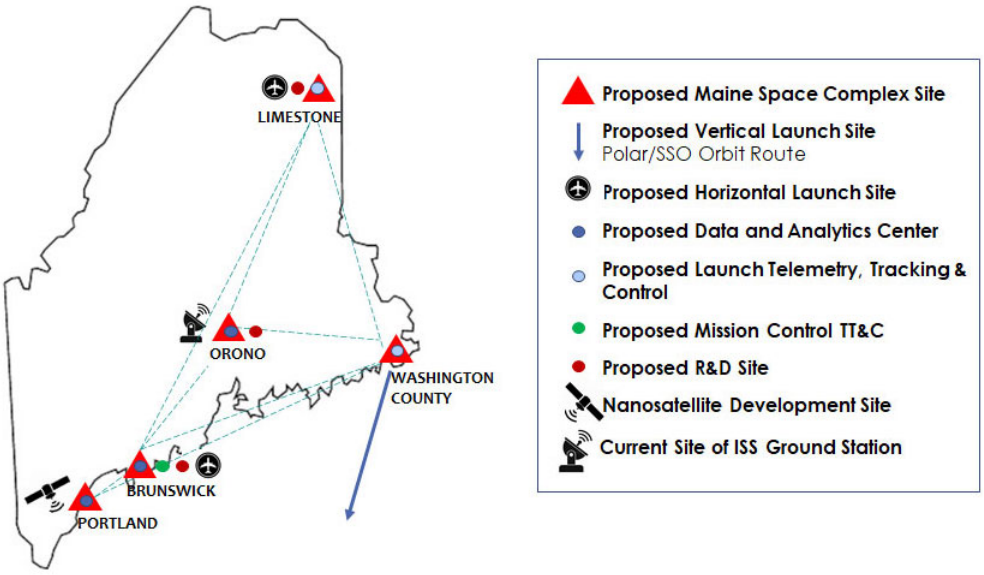

Fig. 3 Map of proposed Maine spaceport locations. [57]

A cursory glance at the Washington County website reveals the county's pride in its natural landscape and resources. Agriculture and farming plays a large role in supporting the county's economy, specifically that of wild blueberries and lobster. Focus is also placed on the natural beauty and diverse ecology of the area, painting a picture of an expansive Eastern shoreline that much of the county's population calls home [59]. Development of a spaceport, then, may be at odds with the county's existing economic focus on natural resource utilization and pride in ecological diversity. Successful implementation of a spaceport in this location would likely look to minimize disruption to the coastline ecosystem and work with residents to find methods of protecting the existing habitat while expanding space activities.

Though also adjacent to the Atlantic Ocean, Dare County, NC hosts a higher and denser population, with approximately 96 people per square mile [60]. The county is also holds previous ties to aerospace through the Wright Brothers National Memorial, commemorating the location of mankind's first successful journey into the sky [61].

Although this link may provide a springboard off which to begin developing social ties with a community, Dare, NC, also hosts several eminent ecological and historical sites, such as Roanoke Island and Pamlico Sound [62, 63]. These notable sites may prove to be difficult to work around when determining a suitable spaceport location.

Though estimates can be made as to how a spaceport may fare in one location or another, open discussion with each community is ultimately necessary in securing long-term success. The perceptions of residents about their community and their attitudes towards such a new development as a spaceport require qualitative data and conversation to uncover. By involving community members early on within the process, proactively engaging with environmental and social governance measures, and seeking ways to reinvest within the community throughout the developmental process, new spaceport developments can increase their chances of fostering positive sentiment and social legitimacy from the host community.

V. Conclusion

Social license to operate is ultimately central to community perception of spaceport development, and the support or resistance it may receive [21]. Understanding of the community identity and way of life, as well as the ability to integrate into the existing community structure, appears to decrease the disruption new spaceports bring to an area. Additionally, reinvestment into the community through programs tailored to complement the existing skills of residents may ease the developmental process and strengthen ties to the community.

As new spaceports continue to be developed, it is important to remain cognizant of how many equatorial locations – which have a technical advantage for launch – hold histories of slavery, colonialism and imperialism. Anthropological literature discussing Alcântara and French Guiana in particular examined the weight of these historical events on the culture of each region, and how differing cultural narratives influenced and were influenced by the development of a spaceport [16, 64, 65]. In his book *Space in the Tropics*, Redfield notes how similar the list of potential spaceport locations drawn to decide the placement of Guiana Launch Center was to a list of potential penal colonies created by France decades before [15]. Writing about Alcântara, Mitchell describes how the historical dominant narrative of the area took "a lens of decline," with the land described as devoid of people despite the existence of quilomobo communities [16]. Both publications provide unique perspectives of how perception of these developments were inextricably linked to community culture and history, and demonstrate the strength of social science research in understanding the overall impact of a spaceport on its host community.

Ultimately, the shortage of existing scholarly literature in engineering regarding these non-economic community impacts of spaceport development indicates the need for an interdisciplinary solution. Developing such an interdisciplinary framework to spaceport development will allow insights from the social sciences to be integrated into the engineering and policy-making process. Involving local communities within the decision-making process will help create spaceports that are tailored to align and compliment the needs and values of their host communities. By prioritizing community engagement and collaborative discussion, we can ensure that the next generation of spaceports are equitable and sustainable developments which benefit both the future of space exploration and the communities they serve.

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