

Thesis Project Portfolio

Concrete Canoe Design Competition

(Technical Report)

The Modern Decline in the Third Place and the Loneliness Epidemic

(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science

University of Virginia • Charlottesville, Virginia

In Fulfillment of the Requirements for the Degree

Bachelor of Science, School of Engineering

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Department of Civil Engineering

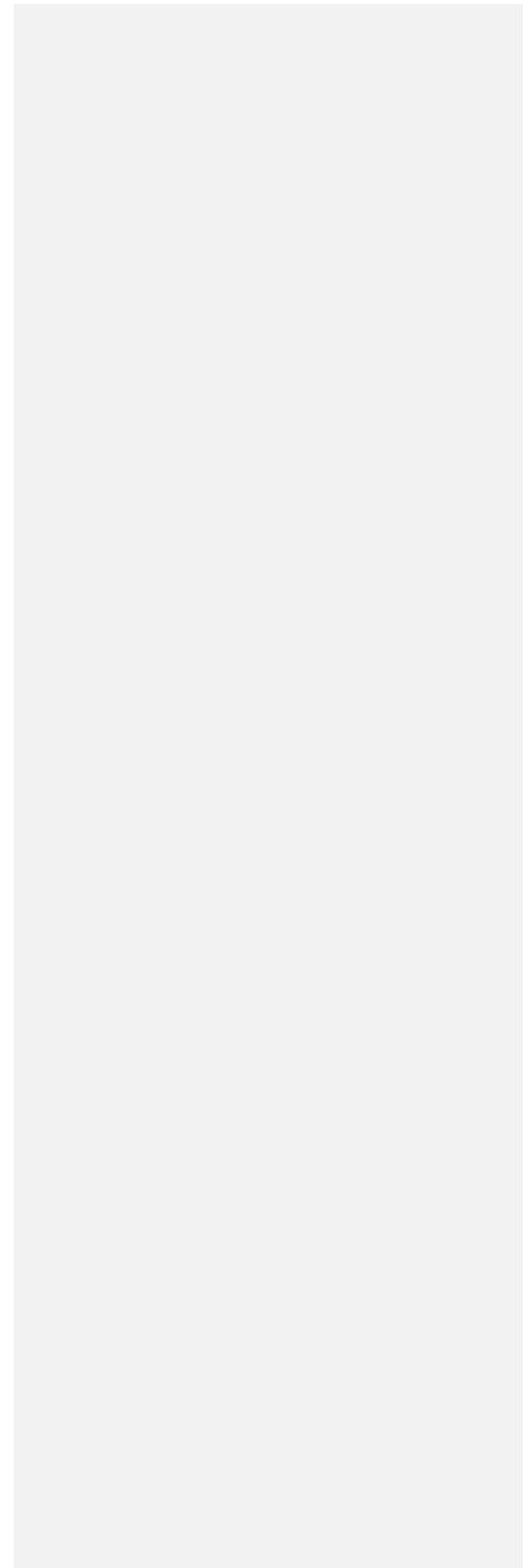
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Executive Summary

The importance of the entwining notions of construction and community cannot be overstated. Our capstone team undertook the task of designing a concrete canoe that would be reproducible and commercially available to compete in the ASCE Concrete Canoe Competition. This was an opportunity to participate in the design and construction of a product, involving the process from construction scheduling to mix and hull design to actual construction and presentation. My STS Thesis discussed the decline of third places, a theory created in 1989 by Ray Oldenburg. I discuss the increasing disappearance of third places, or social gathering spots, in the United States following the creation of the theory. This capstone was built upon the pillars of economic, environmental, and social sustainability, especially seen in the creation and management of a secondary junior concrete canoe team who would take up the torch of the concrete canoe club after the senior and founding capstone members left. To build upon the importance of community in all facets of life, I reviewed the existence of third places and determined if they are decreasing in number, thereby decreasing social sustainability in communities across America.

To bring the concrete canoe, named the Row-Tunda, into being, a series of teams were created and captains selected. The total teams spanned mix design, hull design, construction, and project management in order to successfully meet the ASCE Request for Proposal. The final concrete mix was determined to be a lightweight 73 lb/ft³ cement made with minimal hydraulic cement to support the goal of sustainability. The hull design was improved upon last year's, featuring a shallow vee shape with a ridge to support both stability and pinpoint turning. The implementation of a female mold further enforced sustainability and met the goal of creating a reproducible canoe. However, this endeavor was not without its challenges. Mix material supplier issues, funding scares, and technical problems came up throughout the life of the

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project, but weekly Capstone meetings allowed the leaders of the project to create solutions that would keep the project moving. Despite the challenges, a competitive product was created and the UVA team earned a 2nd place overall finish at the 2024 ASCE Virginia Symposium.

My STS report discussed the potential continued loss of third places following the theory's creation in 1989, covering the years 1990 to 2020. To determine if the loss was continual I reviewed zoning policies, the change in urban sprawl and supporting pedestrian infrastructure, and change in existing businesses relevant to the concept of Third Places.

Upon reviewing the policy and literature, it appears that the loss of businesses categorized as third places is on the rise in the last thirty years. While there have not been significant shifts in national walkability and accessibility, however, there is hope for movement toward more accessible third places in the future. Urban planners have begun recognizing the importance of constructing community framework into the bones of the city. For both walkability and safety reasons, independent initiatives have begun to put more sidewalks in place in each state, and multiple DOT organizations have had long standing policies of implementing bike paths within newly constructed roads. Although the businesses encompassing third places are on the decline, there is hope that expanding infrastructure will still bring connectedness among communities.