New Green Building vs. Historic Preservation: Which Is More "Green"?

Hypothesis: The most sustainable form of construction is preserving the existing built environment.

BACKGROUND AND PROJECT MOTIVATION





THE 1772 FOUNDATION Dreserving American Historical Dreasures

- The 1772 Foundation makes grants for historic preservations.
- Project Motivation: develop a quantitative tool that substantiates the business and environmental case for historic preservations
- Example building: 1804 Anna Clapp Harris House, Dorchester, MA

METHODOLOGY

- Created two-part tool: "Green" Building and Preservation
- Used existing carbon calculator to determine important factors
- Classified important factors as either one time construction emissions or ongoing operational emissions

GREENDEAVOR CARBON CALCULATOR **DASHBOARD** GREEN BUILDING **PRESERVATION** Summarizes the results of the Green Building and Preservation sections 1. Summarizes the emissions from each option. Summary of Findings Green Building Emissions Total Emissions over Expected Lifetime reservation Emissions 4. Both the Green Building and the Preservation models are divided into two sections—One Time Construction Total Emissions over Expected Lifetim Emissions and Ongoing Operational Emissions. They are almost identical CO₂ Savings in terms of the drivers and the impacts of those drivers. **TEST RESULT** expected lifetime where both options are equal Based on data for the planned preservation of the Anna Clapp house and an alternative construction, 2. The Lowest Emissions box chooses our model estimated that the preservation emits 40-60 percent less CO₂ than the new construction. 3. The Year of Indifference box the lower of the two options and calculates the Expected While the results will differ from property to property, in this case, preservation is more green. calculates the difference between Lifetime value that results in the Total Emissions over the equivalent CO₂ emissions for Expected Lifetime of each option. both options.

RECOMMENDATIONS FOR FUTURE IMPROVEMENTS

- The model could be expanded to look at non-residential buildings.
- •Including the origin of construction materials would increase accuracy.
- Different types of vegetation could be included to make the model more robust.
- Transportation is included in the embodied energy of the buildings, but might be disaggregated to increase accuracy.
- The model only accounts for CO₂; it could also consider other sustainability issues such as water consumption or waste generation.



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