Thesis Project Portfolio

The Effect of COVID-19 on Construction Labor Productivity at the new Student Health & Wellness Center

(Technical Report)

Walkability In Cities As A Strategy To Promote Equity

(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

Ryan Naddoni

Spring 2023

Department of Civil and Environmental Engineering

Table of Contents

Sociotechnical Synthesis

The coronavirus (COVID-19) pandemic significantly effected nearly every person and industry on Earth. My capstone team's client, Barton Malow, specifically tasked us with analyzing the effect of the pandemic on construction labor productivity at one of their previous projects, the new Student Health and Wellness Center (SHWC) at the University of Virginia. The analysis included examining project documentation such as monthly reports, requests for information (RFIs), and the project's manpower summary sheet. The team also conducted an in-depth investigation into changes in the project's schedule over time using the scheduling software Oracle Primavera P6. The results of the analysis were finalized in a mid-year report that included a preliminary design and set of recommendations to better track labor productivity in the field even during major global events. The design portion of the project was completed in spring 2023 and entailed developing a prototype mobile app that construction professionals can use to better track labor productivity on their projects.

The goal of the socio-technical research paper was to identify key characteristics and best practices in regards to walkability that cities can implement in order to reduce social and economic inequity. Walkability as a characteristic of urban environments was analyzed through Langdon Winner's framework of *technopolitics.* Utilizing this lens alongside a case study approach, data on three notable cities, Tokyo, Washington DC, and Houston, was collected and analyzed to determine how walkable their environments are, and what characteristics facilitate and impede walkability. Following the analysis, I found that the key factors that distinguish walkable cities from others are the availability, quality, and complexity of mass public transit systems, the presence and application of mixed-use zoning, and the city's attitudes towards vehicular infrastructure. Moving forward, cities should acknowledge the need for vehicular

infrastructure and accommodate accordingly; however, priority should be given to improving and expanding mass public transit systems and removing single-use zoning if these cities wish to reduce inequity.