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Streets for People: Best Practices in Repurposing Roadway Spaces

Walkable Cities

A Thesis Prospectus

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By

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On my honor as a university student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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Introduction

Over the past two decades, US cities started to redesign urban spaces to allocate motor vehicles, bikes and improve community spaces and the pedestrian infrastructure (via street markings). The first meaningful redesign projects started in Portland, Oregon. These focused on enhancing traffic flow caused by merging non-motor vehicles with motor vehicles in the streets. This was possible by repurposing curbside parking (e.g., adding walk signs to cross the street, bike racks, seats) and street sections (e.g., adding more open plazas that will encourage outdoor dining and foster outdoor sharing). These projects have remarkably increased healthy public interaction around the world while also easing traffic congestion.

My Capstone design team aims to understand better the recent repurposing of streets using several research questions. We will develop a survey/interview process to answer these questions alongside the US-based city transportation engineers and planners who oversaw the repurposing of these street spaces. As a team, we will advance to compile the lessons learned and the best practices to suggest additions and changes to the current National Association of City Transportation (NACTO) 's urban street design guidelines.

My STS research paper focuses on investigating the idea of walkability in the United States and how the state of Virginia compared to New York implement, conceptualize, and battle over walkability. This idea is directly related to my Capstone group project by one seeking to understand the repurposing of streets and the other one focused on the

implementation and understating of the projects that directly affected walkability; How come the majority of the cities in the United States are designed to increment driving rather than to create a more walkable infrastructural space. My goal is to change cities' designs from vehicle travel lanes and parking into open spaces where residents walk, bike, dine outdoors, and experience the neighborhoods. This transition can be done by enforcing rules and changes that would allow technology along with powerful influencers to shape the design of cities into walkable ones.

Technical Topic

In recent years, many different street redesigns started to catch popularity due to the Covid-19 Pandemic. Covid-19's Pandemic urge of social distancing was the significant factor for which the majority of the cities in the world were in desperate seek of open areas that will help preserve the day-to-day flow of cities (Engel, 2020). The reduction of traffic during this time was the significant factor for which many cities were able to transform into open spaces by establishing in parking and vehicle lanes; citizens could see themselves walking, biking, dining while also practicing social distancing. The emergency status Covid-19 created worldwide gave local leaders the power to take immediate action to manage street areas. (Fraser, 2020). (Combs and Pardo, 2021) created a database of over 1,300 examples of public sector-led efforts to allocate the demands of space for walking and non-motorized travel modes in over 520 cities worldwide. Due to the pandemic, a straw poll indicated that more than half of the participants accorded that there was limited to non-public engagement surrounding these projects (Combs, T., Pardo, C.F., Streetplans,

Epiandes, MobilityWorks, & Datasketch (2020)), leaving to limited data regarding the public and agency perceptions of these repurposed streets.

As a result, the goal of our Capstone team in this capstone project is to analyze recent repurposes of streets in the United States before synthesizing the lessons learned with the purpose of suggesting the additions and changes with respect to the NACTO urban Street design guidelines. Faculty members supervise us, T. Donna Chen (Department of Engineering Systems and Environment), Andrew Mondschein (school of Architecture), and Luca Cian (Darden School of Business) alongside our mentor Austin Angulo.

As a team, we have a weekly meeting involving all members. Currently, we have developed a scoping project to lay out the tasks for the rest of this and the upcoming semester. We have been using the dataset Created by (Combs, T (2020)) with input from contributors worldwide regarding local actions taken to support walking and cycling since the pandemic started. After analyzing the dataset, we concluded that our investigation would be focused on the United States; the redesign projects that will be studied arise from 48 different projects, 12 from each of the following regions of the United States: Northeast, South, West, and Midwest. We have selected redesign projects varying from small to large cities and a range of project sizes. We have shared this information with the faculty in charge before moving into the next step; As a group, we expect that by the end of November, the survey and interview questions will be complete and distributed to the list of cities/projects approved by our Capstone supervisors. We have planned on ending the

fall semester with responses from many cities and projects that will be looked into at the start of the Spring.

We are scheduling to start the spring semester by conducting Zoom interviews with engineers or planners and expect it will take us the months of January and February to achieve them. We should obtain this result by mid-February and start compiling and analyzing the data right away before coming up with new design alternative ideas. The last part of our capstone team project focuses on investigating the design alternatives we seek to suggest changes to the current guidelines or propose new ones. We will be working with renderings and diagrams to help improve and understate our project goal for these suggestions.

As a group of four, all of us will have the same role and participation in each process that will be happening through the project.

STS Research Proposal: Topic

Pedestrian-friendly areas are becoming more and more popular in cities around well-spread cities in the United States, such as New York City or Washington D.C(Brown, T.M, (2017)), but what is the problem with the rest of the cities in the United States? First of all, walkable cities are considered all cities and neighborhoods that, with the help of planning and design, minimize the presence of driving motor vehicles and increase the pedestrian presence in the environment (Hawken, 2017). That being said, the significant

factor preventing the growth of walkable cities is the arrival of automobiles. Cities were able to see a massive investment in highway systems to make it “feasible for people to settle many miles away from work” (Nady.R). Yes, this was a solution for many people, but fast-forwarding to today, we can see the harms it has created. This has resulted in two big problems: One being that the average greenhouse emissions (in million metric tons of CO₂) 1990-2019 by passenger cars in the United States was 700(Tiseo, 2021), and the other genuinely remarkable one is a term called “single-use zoning” or “zoning” which refers to when in a particular land only one kind of use is allowed in each zone depending on the function of each; for example, when retail stores have to be allocated with retail stores and cannot be allocated next to institutional areas or multi-family homes. The problem with this urban planning design idea is that it prevents a person from having the privilege of going to lunch, to the doctor, and back home, all by walking (Aditi A, 2018). This is the problem for the majority of the small to medium cities that have adapted to the designs brought by the automobile boom era.

Living in a walkable town has many pros, such as: reducing the number of fatal accidents in the area, controlling gas emission rates, creating an environmentally sustainable place, resulting in a healthier lifestyle, do significant to the economy. Providing an attractive, walkable area will only result in significantly increasing property values in the area and creating job opportunities. The upcoming generation of millennials is commanding this transition. The executive director of the Chicago Metropolitan Agency for Planning, Joe Szabos, emphasized during a board meeting that “62 percent of millennials would choose a city in where they do not have to own a car”, and thus accepting this starts

molding the city into having an optional use motor-vehicles and high accessibility to close walks to jobs and recreational places (Greenfield et al., 2017, Culliton, 2019). A perfect example of what I just mentioned is Manhattan in New York City, where it can be seen as a hub for millennials, providing them with high prices but high paying jobs (Culliton, 2019). Millennials' desires are just an example of what is going to be followed by the upcoming generations. Conclusion: All generations are seeking to move to a place where Economic success, personal and public health, safety, and accessibility are met (Gilson, 2021). These four categories are qualities that the level of the walkability of a city brings together.

Furthermore, the increase in demand to move to walkable cities is seen in (table 1) where cities are ranked based on their walkable score. A walkable score refers to a number that ranges from 0-100, measuring the walkability of an address. A score above 70 indicates a very walkable city, a score between 50-69 shows a somewhat walkable city, and below 50 indicates a car-dependent city (WalkScore 2021).

Table 1: Top 10 most walkable cities 2015 vs. 2021. (Florida, R., (2015), Gilson, D., (2021))

2015 Rankings			2021 Rankings		
Rank	City	Walk Score	Rank	City	Walk Score
1	New York, NY	87.6	1	New York City, NY	89.2
2	San Francisco, CA	83.9	2	San Francisco, CA	86
3	Boston, MA	79.5	3	Boston, MA	80.9
4	Philadelphia, PA	76.5	4	Miami, FL	79.2
5	Miami, FL	75.6	5	Philadelphia, PA	79
6	Chicago, IL	74.8	6	Chicago, IL	77.8
7	Washington, D.C.	74.1	7	Washington, DC	77.3
8	Seattle, WA	70.8	8	Seattle, WA	73.1
9	Oakland, CA	68.5	9	Oakland, CA	72
10	Baltimore, MD	66.2	10	Long Beach, CA	69.9

I find this comparison amazing mainly due to the improvements in walk score these cities have accomplished and because it makes me conclude that this growth is also related to the public, engagement and demand.

Driven cities are controlled by wide streets that often exclude the availability of bikes in the area. From my point of view, a city should be designed to allow citizens to complete most of their errands walking rather than by forcing them to jump from parking spaces. This is the case for a typical American city such as Lynchburg, Virginia, where most people own cars and need to drive them all the time due to its lack of public transportation, bike lanes, and street interactions.

In this research paper, I'm not seeking to make a city like Lynchburg resemble New York due to the magnitude of differences between them, ranging from people to Infrastructure. From a realistic standpoint, I seek to investigate possible scenarios where the car control cities in Virginia can adopt qualities the City of New York Posses. For example, methods such as: accelerating the growth of safe cycling, investigating locations having pedestrian injuries, and focusing on safety improvements on intersections that have immensely helped reduce New York cities' traffic fatality rate and increased the % of pedestrians that account for the traffic of the town (Sadik-Khan, 2010). This research paper has made me realize the room for improvement all the cities have and has influenced me to utilize a Sustainable Transition framework in which technology and powerful influencers work together to achieve this goal.

STS Framework and Explaining evidence: STS

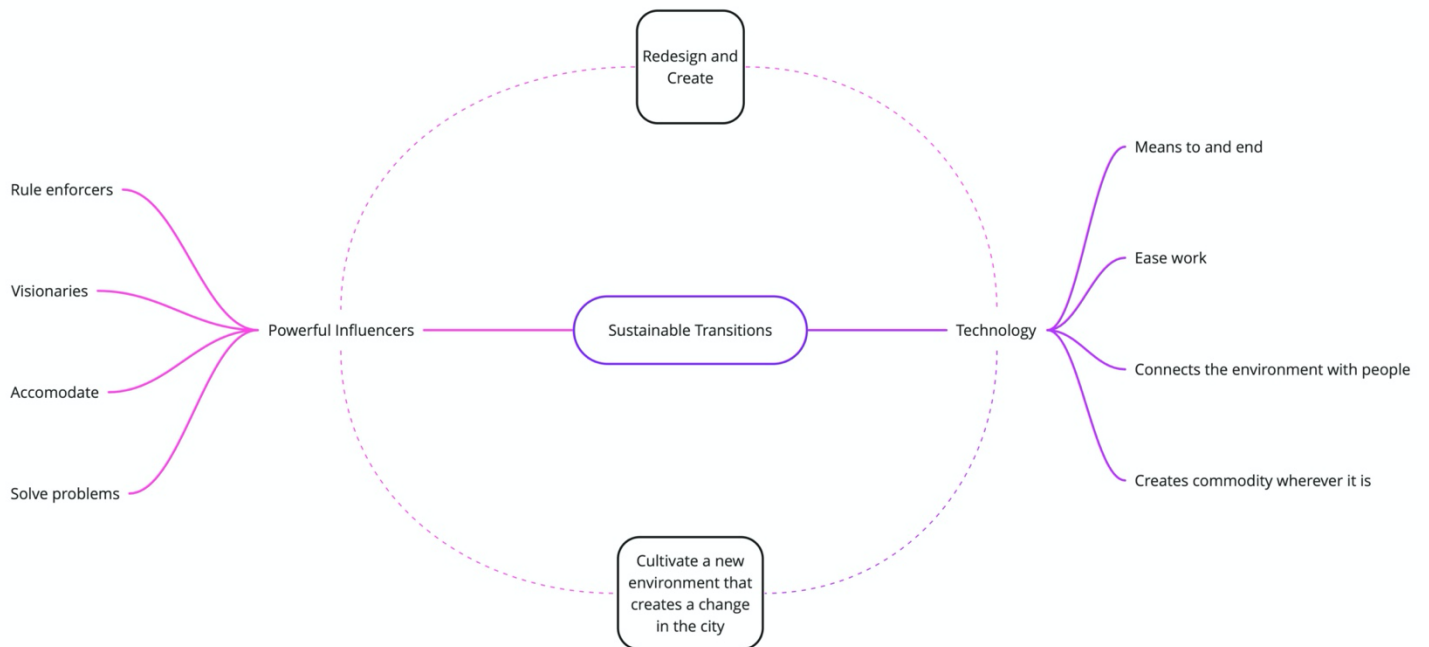
The overall goal to analyze the power Technology and Leaders have in shaping society comes from the Covid-19 Pandemic in where I was able to see how City Mayors and

Local Leaders were in charge of creating sustainable ways of enforcing social distancing along with fighting to keep urban spaces open; leaders were able to do this by enforcing small but game-changing guidelines such as no curbside parking, digital menus, the facemask, and many more. On top of this, the United States was also able to see how CO2 emission rates fell by 6.4% (Tollefson, 2021). From these good things, the pandemic brought to everyone's life is born my desire to work with a Sustainable Transition framework that brings together the idea of Technology working alongside leaders to investigate possible scenarios in where driven cities can adopt certain guidelines that walkable cities possess benefiting the quality of living in the city.

A sustainable Transition (figure 1) will have a significant effect if leaders are focused on convincing citizens that it is safe to dine outside or that it is safe to walk on the streets. New York's Open restaurant program is an excellent example of this; this program is focused on outdoor dining and is accomplished by suspending specific zoning locations (O'Conner et al., 2021). What is impressive about this is that it flourishes during the pandemic as a temporal solution. What I want you to realize with this example is that at the beginning, it was just a temporal solution for an ongoing problem, but its end was the desire for citizens. Now, it is a proposal to make the Open Restaurant Program permanent without critics (O'Conner et al., 2021). This is the type of power Local Leaders have; they are the tool for innovation. Technology and Leaders are just the arms of a Sustainable Transition. In my opinion, Technology is the reason everything is possible in today's world, and the potential a city has is not based on the lifestyle given to its members. To make

sure this future is met, I'm focused on learning that leaders have the power to change cities in a way where it will foster communal relationships and become an intriguing place to others.

Figure (1) Shows how Sustainable Transitions brings together powerful influencers and technology. This helps visualize the evolution of tools.



Next Steps

This research paper's primary goal will be to gather information through the plan interviews in my capstone project, which will give me the knowledge on how and when these redesign projects are being done. In the upcoming months, I'm going to be meeting

with several people involved in new redesign plans made to incentivize a pedestrian-friendly environment; along with that, I will gather information on how many of these small to big cities have reacted to these changes to analyze how was the public engagement affected by these projects. My priority is understanding the limiting factors for a city to transition into walkable and what results cities are getting from these small transitions.

References

Abdullah, M., Dias, C., Muley, D., & Shahin, M. (2020, November 04). Exploring the impacts of covid-19 on travel behavior and mode preferences.

Baldassini, A., Krieger, V., Munroe, K., & Schwab, K. (2021, July 21). NYC is moving towards creating a permanent open restaurants program. Retrieved

Brooklyn make way: Manhattan's Financial District is NYC's Millennial Hotbed. (2019, July 2).

Brown, T. (2017, May 17). The most walkable cities in America.

Castro, D. (2021, July 16). Making cities more walkable with better data and Technology.

Combs, T. (2020). Local Actions to Support Walking and Cycling During Social Distancing Dataset

Combs, T., Pardo, C.F., Streetplans, Epiandes, MobilityWorks, & Datasketch (2020). The "Shifting Streets" Covid-19 mobility dataset.

Culliton, K. (2019, July 02). This NYC neighborhood is the city's top 'millennial hotbed'.

Dalton, R. (2020, June 11). Making cities more walkable by understanding how other people influence our journeys.

Engel, A. (2020, May 21). NACTO releases streets for pandemic response and recovery.

Florida, R. (2015, April 7). 2015's Most Walkable U.S Cities.

Fraser, J. S. (2020, June 1). Revise the Covid-19 Declaration of Emergency and Closures and Public Use Limits.

Gilson, D. (2021, July 16). Streets built for people [2021 walkability benefits in cities].

Greenfield, J., Schmitt, A., Freemark, Y., & Jacobsen, S. (2017, May 12). If the future will be walkable, how do we make sure everyone benefits?

Hawken, P. (2017, April 18). Drawdown: The Most Comprehensive Plan Ever Proposed to Reverse Global Warming.

Lewis, R. (2017, November 03). Metro areas are getting more walkable, one foot at a time.

Mohn, T. (2020, June 04). The Traffic Trade-Off.

Nady, R. (2020, April 30). What Makes Walkable Cities.

"Shifting Streets" Covid-19 Mobility Dataset. (2021, September).

Shrikant, A. (2018, October 26). Why walkable cities are good for the economy, according to a city planner.

Tiseo, I. (2021, May 11). U.S. Passenger Car Emissions 1990-2019.

Tollefson, J. (2021, January 15). Covid curbed carbon emissions in 2020 - but not by much.

Viola, R., Roe, M., & Shin, H. (2010, August). The New York City pedestrian safety study & action plan.

Walk Score. (n.d.). Retrieved November 04, 2021, from <https://www.walkscore.com/live-more/canada/>

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