

# **Evaluating Charlottesville's Plans for an Eco-Friendlier Transportation System**

A Research Paper submitted to the Department of Engineering and Society

Presented to the Faculty of the School of Engineering and Applied Science  
University of Virginia • Charlottesville, Virginia

In Partial Fulfillment of the Requirements for the Degree  
Bachelor of Science, School of Engineering

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Spring 2020

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**

Transportation systems have an enormous effect on our environment at both local and global level. As societies seek to reduce their impact on the environment, improving the sustainability of transportation systems has increasingly become a major agenda for many cities (Schipper, 2002).

Transportation is a major source of greenhouse gas emissions. According to the EPA (2019), transportation accounted for 29% of total U.S. greenhouse gas emissions in 2017. Petroleum-burning vehicles and the development of transportation infrastructure both contribute to such emissions. The emissions are a major contributor to climate change and consequent sea-level rise and frequency of severe storms (Solomon et al., 2009).

Habitat, wetlands, and other natural land and biological formations are also severely impacted by transportation. Today, the most common methods of transportations require significant land and invasive construction. According to Jackson & Jackson, “Roads and roadsides cover approximately one percent of the United States, yet it is estimated that 15-20% of the land is directly affected by roads and vehicles” (2000). They explain that transportation systems directly destroy biological and geological formations, harming biodiversity and increasing the risk of flooding.

There is no such thing as a transportation method that has zero negative consequences on the environment. Even with something as primitive as walking, a path has to be created for people to walk on and humans breathe out CO<sub>2</sub> into the process. However, walking and biking are easily the most environmentally-friendly transportation methods. In a published National Geographic article, the ranking of sustainable transportation within a city from worst to least was

in the order as follows: gasoline car, train, bus, electric car, bicycle/walking (*This Graphic Maps the Energy Efficiency of Modes of Transportation, From Planes to Cars*, 2018). To evaluate a city's plan to improve transportation sustainability, it is key to analyze how it plans to mitigate the use of less eco-friendly transportation methods and how it plans to make greener methods more available and encouraged.

There are great benefits besides just the reduction of environmental footprint. Litman (2012) states that adding public transportation systems typically lead to a healthier population by encouraging walking, decreasing pollution, and reducing rate/severity of traffic accidents.

Charlottesville, Virginia is a small city of about 50,000 people (U.S. Census, 2018); about 1,200 cities in the U.S. are of similar size (U.S. Census, 2019). Transportation is a major contributor to greenhouse gas emissions in the city; in fact, "transportation makes up almost a third of the carbon emissions generated within the city limits" (Tubbs, 2019). Furthermore, Tubbs also adds that the city's population is steadily growing. Despite the growing population, Tubbs mentions that public transportation utilization has been steadily declining since the early 2010s. As there are countless cities of similar size in the U.S., Charlottesville's effort to make its transportation system more sustainable may set an example for similar cities.

Throughout this paper, I bring awareness towards the work done by many groups around Charlottesville to make the city's transportation system eco-friendlier. I complete a review on the work done by the government, university, and grass-root organizations. Finally, I argue that the city as a whole is not doing enough and can more quickly develop an eco-friendlier transportation network by unifying and combining the various stakeholders' efforts from the city government to the grassroots level.

## **Analysis: Plans and Actions to Reduce Transportation's Environmental Footprint in Charlottesville**

### **Participants and their objectives:**

In a study of various cities' sustainability efforts, Hikichi (2003) contends Charlottesville is taking a balanced approach by maintaining the current transportation system but planning for an eco-friendlier future. While it is clear that there is no single entity in the city spearheading the push for a greener transportation system, many groups around the city and the state are involved in the mission. The city government of Charlottesville, Alliance for Community Choice in Transportation (ACCT), UVA Parking and Transportation, the Mid-Atlantic Transportation Sustainability University Transportation Center (MATS UTC), and the Virginia Department of Transportation Environmental Program (VDOT EP) are striving to influence the future of the city's transportation system.

The decision made by the city government of Charlottesville has a huge effect on the city's transportation systems. It plays a large role in developing zoning laws that affect everything from where houses and businesses are placed to where the roads are routed (Adel, 2019). The city government also runs Charlottesville Area Transit (CAT), which is the main source of public transportation in the city (Tubbs, 2019).

ACCT is a local advocacy for green and safe transportation. It promotes "sustainable land use and transit-oriented communities through education and leadership" and advocates public investment in safer and more sustainable transportation (City of Charlottesville, 2010). It is a grassroots-level organization that has taken significant initiatives of organizing events that promote sustainable transportation. The group has also commissioned studies on feasibility of eco-friendly transportation projects (McNair, 2005).

UVA Parking and Transportation (UVPT) plays a major role in the city since the University of Virginia's transportation system is intertwined with Charlottesville's. UVPT encourages alternatives by publicizing them to university employees and students (UVPT, 2009). To fulfill its goal of "reducing the University's transportation carbon footprint," the department has added more efficient buses to its fleet (Kelly, 2018). It is funded by the University of Virginia, which has its own agenda for reducing overall greenhouse gas emissions (Kelly, 2017). The university's Transportation Working Group (2019) promotes and explores sustainable modes of transportation; the results of their studies significantly affect the decisions made by the university. According to the UVA Parking and Transportation Master Plan (2019), which foresees major issues with parking at the university in the future, developing infrastructure to support walking/biking will be a major focus, along with increasing shuttling and bus services from outskirts of the university to within.

MATS UTC is a coalition of universities headquartered in Charlottesville that researches methods to make transportation more sustainable in participating cities, including Charlottesville. The group states that it aims "to accelerate adoption of sustainable practices in the provision of transportation services" in the region (MATS UTC, 2019).

The Virginia Department of Transportation Environmental Program (VDOT EP) funds green transportation projects that affect Charlottesville. The department claims it "works hard to balance environmental issues with transportation needs" (VDOT, 2019). For example, VDOT EP has investigated a more sustainable pavement material which would reduce greenhouse gas emissions (Santos et al., 2017). While VDOT plays a major role in maintaining transportation networks within Charlottesville, it has played a minimum role in catalyzing the growth of more sustainable transportation networks.

### **Consolidating participants' vision for transportation in Charlottesville:**

As mentioned in the previous section, there are many groups that are actively working to make transportation in Charlottesville more sustainable. In order to understand their interaction, it is important to understand the similarities and differences in their objectives. All of the groups share the common goal to make the transportation system in the city greener, but each one also has various other unique reasons such as improving safety and wellness, reducing traffic problems, and making transportation equitable for all people regardless of demographics. There is significant evidence that the growth of sustainable transportation within a city correlates with the improvement of these other factors.

First of all, there are groups whose main goal is to increase the adoption of sustainable transportation methods. This includes groups such as MATS UTC. The group aims to “serve the [city] through applied research, education, workforce development, and technology transfer focused on environmental sustainability” (MATS UTC, 2019). They aim to be a resource to industry and government in the region and provide consulting services.

There are groups whose goal is to improve the safety and wellness of people in the city. According to the Safety and Health Magazine, researchers from the National Highway and Traffic Safety Administration and Federal Transit Administration found that “metro areas where residents average more than 40 bus or train trips a year have about half the traffic fatality rates of metro areas where residents average fewer than 20 trips annually” (*Public Transportation Is 10 Times Safer, Analysis Shows*, 2018). It is also shown that areas of the world where people are more likely to use public transportation methods, walk, or bike have significantly healthier population (Michalaka et al., 2018). Groups like ACCT have been pushing their agenda by

lobbying the city and by encouraging city residents to bike, walk, and use public transportation (City of Charlottesville, 2010).

Groups like the UVPT and VDOT place an importance on using more sustainable transportation methods to reduce traffic and transit system maintenance cost. According to the Institute of Transportation & Development Policy, “by encouraging a shift to transit, cycling, or walking, cities can reduce CO2 emissions and air pollution, increase public transit ridership, and enjoy safer and more livable urban environments, with less time wasted sitting in traffic” (*Traffic Reduction*, n.d.).

It is important for groups like the city of Charlottesville to improve transportation access to all groups. In Charlottesville, it is “indicated that more than 9,000 ‘jobs would be foregone if employees did not have transit to travel to and from work’” (Woods, 2020). Woods mentions that transportation social inequity is still large in Charlottesville and the city is taking steps to improve this through public transportation and other cost-effective ways.

Although there are various groups in Charlottesville with their own unique agenda and perspective on improving the transportation system, it is clear that they will all benefit from the adoption of eco-friendlier transportation methods in Charlottesville.

### **Proposal for Charlottesville**

Although many transportation-advocacy groups around the city have been working on their own plans to improve the city’s transportation system, it is clear that the city as a whole has not been making significant progress towards sustainable transportation over the past decade. Tubbs adds that over the past decade, the quality of CAT bus routes has worsened, and as a result, ridership has declined (2019). Additionally, UVA, which serves over 20,000 students and staff, hasn’t made significant progress in expanding the University Transit Services (internal bus

system) (*UVA Parking and Transportation Master Plan*, 2019). An attempt was made to “merge all three [CAT, UTS & Jaunt] into a Regional Transit Authority”; however, this failed despite the fact that it would improve public transit coordination which would allow the city to pursue more impactful projects and would increase the availability of public transportation to many more residents of Charlottesville (Tubbs, 2019). Tubbs adds that the failed merger was the result of lack of coordination between the city government and UVA. The lack of coordination in the city has been a significant roadblock on the city’s path toward sustainable transportation systems. T. Litman and D. Burwell, two renowned transportation experts, state:

Sustainability requires more comprehensive and integrated planning, which accounts for a broad set of economic, social and environmental impacts, including those that are difficult to measure. Sustainability planning requires adequate stakeholder involvement to allow diverse perspectives and preferences to be incorporated (Litman & Burwell, 2006).

Charlottesville has tremendous groups who are invested in improving the city’s transportation system; thus, as Litman suggests, comprehensive planning among the various groups would go a long way towards helping Charlottesville develop a concrete plan for the future of its transportation system.

Evidence from cities around the world that have successfully made their transportation network eco-friendlier has proven that the city government needs to play a significant role, and sometimes the biggest part, in bringing the stakeholders together to solve transportation problems. For example, the city government of Bogota, Colombia has done a tremendous job of improving the city’s public transportation infrastructure (Goldman & Gorham, 2006). The authors mention that the city met demands from various groups and institutions around the city by developing a “bus rapid transit” system that is fast and ubiquitously available to all residents



regardless of their demographics. The city also utilized grass-root efforts to organize events like “car free days” that encourage people to break car-driving habits. Bogota has been successful as a result of its city government’s proactiveness and its ability to bring various stakeholders together.

The city government of Charlottesville has a tremendous opportunity to bring dedicated groups together to make the city’s transportation system eco-friendlier. The groups, despite having slightly different agendas, would benefit from the city’s push to improve its transportation system. The researchers at MATC UTC have done research on optimizing public transportation and can provide significant guidance as the city develops an improved transportation system (MATS UTC, 2019). ACCT can raise awareness at the grassroots level to encourage people to take more sustainable modes of transportation. UVPT is very important for transportation in Charlottesville since many of its students and staff live in the city and contribute to traffic and emissions. As explained in the UVA Parking and Transportation Master Plan (2019), the organization is placing significant focus on investing in sustainable transportation modes like biking and walking. This plan could be significantly more powerful if done in coordination with the various transportation groups around the city. Overall, it is apparent that there are many independent groups that are making a positive impact on transportation in Charlottesville, but by improving coordination among these groups, the city government can help the city move more efficiently and quickly towards a greener transportation system in Charlottesville.

## **Conclusion**

Over the course of this report, I mention the importance of greener transportation systems and summarize work done by various major organizations around Charlottesville to improve the

transportation network. I highlight the strengths of each organization; however, the flaws of uncoordinated, independently-acting organizations, which makes it difficult to solve such a large-scale problem, is difficult to ignore. Ultimately, I conclude that the city government of Charlottesville should do more to play a leading role in executing a coordinated plan of action and appropriately delegating specific tasks to each organization according to their strengths to move us towards a greener Charlottesville.

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