Group Members

Aiden Moran, Jacob Ross, Nathan Ketterlinus, Peter Knight, Sarah Welsh, Kylie Baur

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**TRAFFIC ISSUES**

Traffic congestion is a prevalent issue in the Baltimore Metropolitan area. There are two types of congestion, recurring and non-recurring. Recurring congestion occurs when the volume of traffic is greater than the road's size, and non-recurring congestion occurs due to accidents and weather conditions. Both types contribute to the overall congestion of traffic, which the 2015 MD State Highway Mobility Report says is "detrimental in several ways''. It then says, "this includes increased costs to the individual user, environmental impacts and degrading the overall quality of life" (1).

Not only does traffic congestion cost individuals money, but it also costs the entire region money. In 2014, it was estimated that the cost of congestion in the Baltimore Metropolitan region was 686 million dollars, making Baltimore the second most congested region in Maryland (1). This has unfortunately only gotten worse with time, and from 2018 to 2019 the statewide cost of congestion increased by over 1 billion dollars, with a large percentage of this congestion occurring in the Baltimore Metropolitan area (2).

Efforts have been made to reduce the amount of congestion found in Maryland. One method, called "vehicle probe data" is gathered using Automated Traffic Recorders or ATRs. That data is then used to "develop metrics to measure congestion" (2). However, this method of gathering and utilizing data has existed for some time now. It is mentioned in both the 2015 Highway Report and the 2020 Highway Report, and as we've already discussed, congestion has only gotten worse over time. To solve this issue, we may need to start investing in other technologies or inventing new ones.

Cities tend to try adding more roads to fix the issue of bad traffic. But this is not only costly and resource heavy, but it also creates an “induced demand”. Time and time again, as more roads are added, more cars appear to fill these roads. As this hasn’t worked, it is in our best interests to invest in technology to help improve traffic conditions. One form that is particularly interesting is signal priority and signal preemption. Signal priority is when extra green time is given for larger vehicles, like buses, trucks, etc. And signal preemption automatically providing green lights (and red for all other directions) for emergency vehicles when they are approaching an intersection (3). Both need communication equipment for these larger vehicles to request priority or preemption as they approach the lights. Ensuring these vehicles don’t get stuck at red lights can help clear up space at intersections and could solve a lot of traffic concerns in the BMA. Additionally, providing priority to public transportation could encourage more people to utilize those services, further helping reduce traffic.

1. <https://www.roads.maryland.gov/OPPEN/Congestion%20Trends1.pdf>
2. <https://roads.maryland.gov/OPPEN/2020_mobility_report.pdf>
3. <https://tsmowa.org/category/intelligent-transportation-systems/traffic-signal-priority-preemption#:~:text=Signal%20Preemption,%2C%20train%2C%20or%20light%20rail>

**EDUCATIONAL ISSUES**

When it came to thinking of an area within the Baltimore Metropolitan area that is experiencing issues, the first issue I thought of was education. Some communities within the Baltimore area face disparities in educational opportunities, including access to quality schools, resources, and support systems. This can contribute to even larger issues as a result like cycles of poverty and inequality. The Baltimore Metropolitan area faces several educational issues that impact students, families, and communities. Some of the key challenges include achievement gaps, school funding, school safety, teacher shortages, dropout rates, infrastructure and facilities, and special education services.

There are persistent disparities in academic achievement between different students from different racial, ethnic, and socioeconomic backgrounds. Funding disparities also exist between schools in wealthier and poorer neighborhoods. As well as some schools in the Baltimore area face safety concerns, including violence, bullying, and inadequate security measures. Addressing these educational issues requires a multifaceted approach involving collaboration among schools, policymakers, community organizations, and families. Ways to address these educational issues can be through technology.

While technology alone cannot solve complex educational issues such as achievement gaps, school funding disparities, and school safety concerns, it can be a valuable tool when integrated thoughtfully in effort to substantially alleviate the issues. Technology can be used for better personalized learning and adaptive learning platforms. Educational technology can provide personalized learning experiences tailored to individual student needs. Additionally, adaptive learning software can adjust content and difficulty based on students’ performance. Next, school safety can be enhanced through technology. For example, surveillance and monitoring systems. Technology such as security cameras, access control systems, and emergency notification platforms can help monitor and respond to safety threats more effectively. It’s important to know that technology should be implemented as part of a comprehensive approach that also addresses underlying systemic issues. Collaboration among educators, policymakers, technology developers, and community stakeholders is key to leveraging technology effectively to improve educational outcomes and create safer, more equitable learning environments. Technology can and should be utilized to help alleviate these issues in the Baltimore Metropolitan area.

**CRIME ISSUES**

Baltimore is known to be a dangerous city. Statistically, Baltimore has a total crime rate of 48.36 crimes per 1000 residents, with there being twice as many property crimes as violent crimes (1). Data from the Baltimore County Police Department shows that the most common crime committed in the last 12 months is auto theft, followed by larceny (2).

While Baltimore has had a crime rate well above the national average for some time now, the area can leverage the benefits of technology and big data to attempt to bring it back down. While it would be naive to assume that an even more well-equipped police force will adequately solve the root causes of crime in the city, it can hopefully alleviate the loss of lives and damage to property that plagues the city. The foremost priority of data driven policing should be to inform, not predict. The NACDL opposes data-driven policing methods like the targeting of “at risk” individuals or place- and person-based predictive models because “they are ineffective; lack scientific validity; create, replicate and exacerbate ‘self-perpetuating cycles of bias’” (3).

Instead, technology can be leveraged to streamline the process of getting the police involved with reported crimes in real time. The goal is to get police involved before a crime is committed or the perpetrator can flee the scene of the crime. Consider the effectiveness of small outposts across the city where officers can get to the scene of any crime in less than 5 minutes. While the location for these outposts can be determined using technology, technology can also be used to speed up the time it takes to alert police that a crime is occurring. Imagine an app people could download where the press of a button sends an alert to the closest outposts in real time. The location of the report could be automatically determined by the reporting phone. Think of this as the next logical step of the blue police phone poles all over college campuses, but for an entire city.

1. <https://www.neighborhoodscout.com/md/baltimore/crime>
2. <https://www.baltimorepolice.org/crime-stats>
3. <https://www.nacdl.org/Content/Recommendations-on-Data-Driven-Policing>