

Traffic in Tempe has been an issue for a while now. On an average weekday nearly 300,000 vehicles travel through the I-10 Broadway Curve. (ADOT, 2020) This section of roadway is a crucial part of hundreds of thousands of peoples daily route. With the current amount of traffic flow, the city is already struggling to improve traffic conditions. In 2040 the projected traffic at the roadway curve is 375,000, making a 25% increase in traffic by 2040 (ADOT, 2020) Without a proper plan to increase the safety and efficiency of the I-10 Broadway Curve, the sudden increase of roadway users will in turn increase the amount of congestion on the roadway, and naturally deem this roadway as more unsafe. Though, the City of Tempe is committed to reducing the number of fatal and serious injury crashes to zero. In order to improve the flow of traffic within the Arizona community, the Tempe City Council must work alongside the Arizona Department of Transportation to find new ways to reduce traffic.

Our team did a survey on 151 college students within the Tempe area based on their perceptions of traffic in Tempe. We found that 122 students out of 151 used a car as a form of transportation on a daily basis. The second most common form of transportation was walking, which 66 students had selected. The other 40 students transport around Tempe by using bikes, buses, scooters, and skateboards. With vehicular transportation being a popular choice in Tempe, this shows how a relatively small percentage of students contribute to the overwhelming congestion in Tempe streets.

Traffic congestion and unsafe behaviors during rush hour and other busy times of day are common causes of car accidents and motorists, pedestrians, construction companies, and government entities can be held liable for causing property damage, personal injuries, and wrongful deaths. In a report from the Arizona Department of Transportation, an average of approximately 2.77 people were killed in accidents each day in 2018 (Escamilla Law Group,

2020). This report also found that most fatal accidents were caused due to poor traffic management, and risky driver behavior. By creating a safe environment for drivers, motorcyclists, and pedestrians this will lower the number of collisions, injuries, and fatalities. Also according to the Kelly Law group in Arizona, says that there are 125,000 motor vehicle crashes annually in Arizona. From a statistical standpoint there are almost 3 fatalities each day from car crashes which totals up to 1,000 deaths per year due to traffic accidents. On top of that there are over 150 people injured each day from accidents as well which adds up to 55,000 or more injuries annually. If the traffic system does not get better the number of deaths and injuries will increase even more. In addition, our survey showed that traffic congestion made 115 people late to their destination in the Tempe area due to traffic and 103 people have witnessed an accident in Tempe out of 151 people who took the survey. This shows that on both occasions that traffic congestion and unsafe behaviors during different times of the day can lead to accidents. As a result, this is why Tempe should start making the change to have the idea of adaptive signal technology in their traffic lights.

For students of Arizona State University traffic is one of the main issues while walking or driving to campus. A reported 74% of the 51,585 enrolled students on the Tempe campus in 2018 living off campus, enduring traffic is one of the expected trade-offs that come with attending the No. 1 school in innovation. In fact, hundreds of thousands of motorists travel on the highways in the greater Phoenix area on a daily basis, putting many drivers at risk for serious collisions on the major thoroughfares. (Escamilla Law Group, 2020). For a State that prides itself on innovation and technology, this number is far too high. When compared to the modern and robust city of Tampa, FL. The problem in Tempe can be defined by poor traffic management, constant unorganized construction, and failure to implement modern traffic management systems. These shortcomings must be dealt with in the sake of public safety. To address these

same problems in Tampa. The Tampa Hillsborough Expressway Authority spent 5 years and \$17 million developing a smart traffic network system that resolves congestion, delays, crashes, pedestrian safety, and transit conflicts(Vadakat, 2019) . In order to provide safety and efficiency on the roads, the Tempe City Council should follow closely in the footsteps of Tampa in order to manage the flow of traffic but also keep the fatality rate down during traffic hours. To accomplish safer roads there must be a plan implemented to manage traffic.

The Tempe City Council conducted multiple studies and gathered an immense amount of research in order to pinpoint the main issues and brainstorm potential solutions to the problem. In order to gain insight into the crash occurrence in the City of Tempe, there was an analysis of crash data performed for years 2012-2017. The results of the analysis provided an overview of road safety in the city of Tempe and provided them with a clear idea of crash trends and patterns for fatalities and serious injuries sustained. It was also made clear that the measures being taken currently are insufficient. They then illustrated the results of the analysis and provided an overview of road safety in the City of Tempe using line and bar graphs and pie charts. More specifically, they developed a systemic safety plan, which is the process of evaluating an entire system using a defined set of criteria in order to identify candidate locations for safety investments to reduce the occurrence and potential for severe crashes. By utilizing their crash data, the city of Tempe will conduct regular systemic safety studies in order to determine crash types and different risk factors. They will also screen and prioritize candidate locations, select countermeasures, and put projects into action. While they are doing a lot in order to ensure the solution to the problem is efficient, there is still much more to be done.

We would like to draw your attention to how the use of university shuttles has had a beneficial impact of creating less traffic congestion around many large campuses across the

United States. Arizona State University provides free shuttle services between all four ASU campuses. These shuttles are available every school day, and even on weekends during the academic semester, with the use of an ASU ID card all shuttles are free and provided to students around the Tempe campus.

Shuttle systems have been used throughout multiple large universities for years, and have made an impact by decreasing traffic around the school campus. Our team decided to further our research, and look into the shuttle systems at the University of Arizona. The main shuttle system used at U of A is Cat Tran. These shuttles are currently being used by students throughout the college due to their easy navigation routes, and a tracker system for students to find their next shuttle. This free shuttle service provides students with easy access to transportation and even comes with an app for students to download. The app Transloc Rider provides easy real time tracking of shuttles within the app, allowing students to move from their dorm to classroom in minutes. Another great shuttle system University of Arizona uses is U-Pass, this service allows students who may not have vehicles to move around town, this pass provides students with unlimited rides on the Sun Link streetcar, and Sun Tran buses. Thus leading to the use of less cars, and therefore traffic. The results of this research provided information on how students at the University of Arizona are using shuttles to their benefit, as well as how the university markets their free service.

The cost of it is free as long as you have your student ID with you, which will be more convenient for students who do not have a car and also for students who do not have to waste gas. Also, I have to look for parking and not worrying about paying or getting a ticket moving around a shuttle is an easy free way to do so.

To protect benefits to the community is it sustainable which helps air pollution carbon

monoxide, hydrocarbons, nitrogen oxides. It is a healthy lifestyle to help walk to and from public transportation (bus stops). It helps the safety of certified drivers and transits are involved in less accidents. It helps there be less gas and save money. Finally, Financial benefits. (more jobs, accessibility to jobs, more people moving around = more people spending money

When taking the survey most people were females that lived around the Tempe area. According to the survey, 73% have not traveled with any of the transportation listed and 54% are not familiar with the type of transportation that is given. Also, 69% are unaware of the free transportation that is given at ASU. But with the scales of 1-5, it has come that most people are undecided whether or not to take shuttle Flash or light rails. It can also be due to Covid because it can be scary being in a shuttle with a bunch of random strangers and also due to the fact that a lot of people stayed home this year and were unaware of what was going on, on campus.

This option is better than any other other option because ASU intercampus shuttles transport students, faculty and staff between the Downtown Phoenix, Polytechnic, Tempe and West campuses. They are also split into two colors, maroon and gold. The good thing about it is that they both run on weekdays from 6 a.m to 5 p.m. Also, if you miss it, it comes every 15 minutes and the hours between 5:30-11:30 it runs every 30 minutes. In addition, it takes around 50 minutes of travel time between the Polytechnic and Tempe campuses, and 10 minutes of travel time between each intercampus stops.

Shuttles have been being used throughout multiple large universities, they offer flexible time schedules, and they are also free for students. The effective use of these shuttles offer an eye attracting source of costless travel for students, the shuttles also reduce air pollution, and the sustainability grants a successful view towards long-term investors. The use of shuttles not only benefit the investors, but it benefits the community that the shuttles are within. The communities

are benefited with less traffic, less accidents, and more financial benefits. The active hours of the shuttles, its related community benefits, and compatible flexibility, creates the most efficient impact for less traffic congestion in the city of Tempe.

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