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ITS: Real Progress, Great Future

One of the truths that drew me to the complex field of transportation is the inherent utilization of it in every person's unique routine. With its numerous modes and endless causes, transportation makes up the core of mobility and connectivity for any kind of person. From the first paved road to the first transcontinental U.S. railroad to the first in-car global positioning system, real and intelligent progress in transportation is considered by many to be the foundation of the sustenance and future of the United States.

For those of us in the transportation field, a common goal exists to improve the efficiency, safety, and security of every network. Transportation researchers and professionals constantly strive for useful techniques to calm a dilemma or innovate a solution, and even as a child, I was of this mindset. In an effort to conjure up a beneficial invention, my childhood-self envisioned popup communication blurbs from each vehicle on the roadway. These signs would publically display destinations, warnings, or a friendly "please slow down," "get off your phone," or "move, I am late to something really important." With this type of information made public, a computer could certainly group vehicles according to destination, allowing for an easier flow on a busy street. As silly and impractical (not to mention it being an invasion of privacy) as this idea sounds today in my adult world, the idea breaks down to a simple desire and necessity for enhanced communication among transportation system constituents—a goal that an intelligent transportation system could surely attain.

Months ago, I was able to visit the Tennessee Department of Transportation's (TDOT) Transportation Management Center (TMC) in Memphis, Tennessee. This TMC houses and operates the TDOT SmartWay program, which is a program that employs a number of intelligent transportation techniques through four TMCs to enhance safety and mitigate traffic congestion across the state of Tennessee. With an extensive array of screens displaying nearly every point of the Memphis road network, employees at the TMC monitor traffic activity and interpret what they see in order to dispatch incident response vehicles to those in need. Also known as the Freeway Service Patrol, these vehicles are equipped useful tools to help manage incidents on

the busiest roadways in the region. By taking these measures and implementing other strategies to speed the removal of stalled cars or debris in the major roadways, the TDOT SmartWay has successfully avoided many congested situations and potential safety issues. In addition to the data gathered by video surveillance, roadway traffic sensors are used to harvest information about the speed and frequency of traffic. All of the information is combined and presented to the public in an online, interactive map application so that they may make a more informed decision along their routes. In this application, the public has access to live traffic data (including the location of construction zones, current accidents, or other types of roadway congestion). By sharing this information, the TDOT SmartWay program provides valuable intelligence to the public. An additional transportation technique of the Memphis TMC, known as the Dynamic Message Signs (DMS), is in use throughout the metropolitan area and is used to communicate to the driver useful information that is meant to deter unsafe driving practices or persuade a driver to take an alternative route. Again, this enhanced communication is an extremely important tool for progress in the efficiency and security of the driver population in Memphis.

The facilities of Memphis' TMC were impressive, and I was excited to see such a concept in place. As a Memphis driver, I have seen messages like "construction ahead, expect delay," "move over for emergency vehicle (while approaching an emergency vehicle)," and "there have been this many fatalities in your state this year- please do not be next." While this concept is not advertising personal messages for each vehicle or automatically grouping platoons of vehicles traveling to a similar destination, it is not a far cry from the advanced transportation system I daydreamed about as child. Even if the results of these intelligent techniques have not yet been quantified in research, the "real progress" of enhancing communication in this way cannot be denied. We should continue with innovative and intelligent methods to improve the safety, security, and efficiency of our transportation modes.

In addition to enhanced communication, safety, and efficiency, intelligent transportation practices could be used to ensure that the overlapping, conflicting, and ever-changing desires of a given systems' stakeholders may be blended to better appease each group. In research for my thesis, I am exploring ways to promote livability in residential areas that have a heavy presence of freight traffic. You can see that an increase in freight traffic would probably induce higher economic gain for the industry partners, while the resulting increase in congestion would have numerous negative effects on the residents in close proximity. Congestion on a roadway

can be responsible for harmful effects like diminished air or water quality, increased noise pollution, increased delay or vehicle miles travelled, and can be hazardous to one's safety. By incorporating intelligent transportation measures into any alleviation strategy, it may be possible to mitigate negative externalities of heavy freight on a given corridor for its residential population while simultaneously sustaining the economic benefits of increased commerce in the surrounding area.

The importance of intelligent transportation cannot be overstated. Physical development in United States transportation infrastructure is still compared to the growth of our population, so it is even more imperative that we influence progress in intelligent transportation systems to secure a future transportation network that will meet our population's needs. As we continue to develop technology and innovation, transportation safety, security, and efficiency will be promoted.