The Intelligent Community

Essay Topic A

A community is a group of people with a common characteristic or interest living together within a larger society. The United States of America, the State of Tennessee, and the city of Memphis are all communities in which people are defined by their common heritage, their nationality, and many other characteristics. But what a community needs as much as a common denominator among the individuals is a way of connecting them to each other. Without connectivity, how can these people remain tied together?

Connectivity can be established many ways; the Internet, television, and telephones are some of the most recent examples. But the oldest form of connectivity that has remained constant till this day is the transportation infrastructure—the roads and highways of this nation. It has been this characteristic that has brought individuals across the land; it is the main contributor that has connected each part to the whole. The quality and control of this country's transportation systems has helped maintain its lasting success.

While transportation has allowed for this country to grow and thrive, it is probably one of the most over-looked necessities by the general public. It is one that, when damaged or under-construction, is suddenly appreciated, and then swiftly forgotten when fixed. And unfortunately, a growing population brings a growing demand for better facilities and higher-capacity roads. This presents a problem for transportation engineers, who must balance the demand for more facilities and greater connectivity, quicker repairs, safe designs, and a decrease in the impact of vehicles on the environment. Advances in

sustainable and intelligent transportation systems have begun to make this balance possible. Still, as the country grows, so must its transportation technology and systems.

So what does this mean for the country's future in transportation? Certainly, we can only move forward in the way of intelligent transportation systems. Just as the growth of this country has been synonymous with the growth of its transportation systems, the growth of this country will be impaired without continual improvements and advancements in intelligent systems and design. In order to continue the advancement of our transportation systems, the national ITS architecture has designated more than 29 user services to facilitate drivers and their needs [1].

One of the first issues ITS approaches is that of increasing the capacity of highways without actually building more lane-miles of roadway. This has been accomplished by providing effective means of pre-trip travel information and en-route driver information; both methods inform the driver of possible delays, so an alternate route can be found [1]. This lessens the congestion and noise on the highways because vehicles are traveling at higher velocities more frequently. CO and VOC emissions are reduced as a result of these higher velocities, and avoiding capacity enhancement projects will reduce environmental impact [1].

Encouraging drivers to either carpool or use modes of transportation other than single-occupancy vehicles is another facet of the ITS user services. Advantages include fewer CO and VOC emissions, fewer vehicles and less congestion on the highway, and reduction in fuel consumption.

Another important service, one that includes incident detection and proactive traffic management has become a forerunner in roadway safety analysis. Recent advances in underground and microwave sensor data collection have allowed researchers to look into pre-crash conditions and patterns [2]. This data in "traffic safety could lead to the emergence of a new proactive paradigm in traffic management" [2]. The development of detecting crash patterns can lead to an overall increase in safety and efficiency of highways.

Other user services include incident management, which aims at efficiently managing and removing roadway incidents; traffic control, which helps to control traffic flow by implementing traffic-signal systems and ramp meters; and emission testing and mitigation, which identifies high-emitting vehicles so they can be repaired or removed from the roadway [1].

While the implementation of intelligent transportation systems is an effective means of aiding in capacity demands, safety and impact reduction, it is not the sole answer to our transportation dilemmas. This is where the people within this large community must make a decision about their own impact and contribution to the cause. Ultimately, it is up to the intelligent community, the individuals who come together as whole, to make the effort to use the services provided and reduce their own daily vehicle usage. It is up to the community of the country to understand new technologies and methodologies and make them part of our habits and lives. ITS plays a large role in protecting and servicing the society we live in, as they provide the tools and knowledge for us to have safer, more efficient roadways.

Hopefully one day, the balance of efficiency, safety, and reduced environmental impact can be reached in our ever-expanding community. This will demand research and technology to grow alongside the growth of the population. There are many tools we require for this happen: intelligent transportation systems research and development is one of them. ITS is a valuable asset to our community; with it, our community can continue to expand and thrive, as it has, for many more years to come.

Works Cited

[1] Charles A Miller, "A Discussion of Intelligent Transportation Systems Environmental Impacts," *The Institute of Transportation Engineering Online Journal,* vol. 69, no. 2, pp 85-89, Feb. 1999.

[2] Mohammed Abdel-Aty, Ph.D., P.E, Anurag Pande, Ph.D. and Liang Hsia, P.E., CGC, "The Concept of Proactive Traffic Management for Enhancing Freeway Safety and Operation," *The Institute of Transportation Engineers Online Journal,* vol. 80, no. 4, pp 34-41, April 2010.