According to Thomas P. Hughes, Technological Momentum is a mixture of Social Construction of Technology and Technological Determinism. Specifically, he combines the two by adding time as an important factor. So, as a technology first emerges it is shaped by society as the technology develops in certain ways that answer society’s specific problems. However as time passes and society becomes more reliant on the technology to solve these problems, the technology begins to shape society.

When GPS first emerged, its primary goal was to help the military. As explained earlier, GPS helped the military with issues in navigation, missile delivery, and search and rescue. Once civilians were granted access to the GPS signals, there new social groups formed that could benefit from the use of the technology. In turn, different needs of these social groups aided the development of GPS technology. Three of these social groups include law enforcement, emergency services, and the average traveler.

The first problem that GPS solved was improvements in automobile and aircraft navigation. For automobile travelers it could be quite scary travelling to unfamiliar places at night and it is very dangerous to decipher a map while driving on the highway. So, when GPS came about for automobile navigation, society definitely found a use for it in everyday automobile travel. Today, the majority of automobile drivers find comfort in using a GPS system to provide directions to new locations. Additionally, GPS has been applied to aircraft navigation. When civilians had restricted access of GPS signals, the airlines were uneasy about using the technology in their navigation because they were afraid that after becoming reliant on the navigation system, the government would “degrade the civilian signal,” putting their travel accuracy in jeopardy. However, once they discovered that “by enhancing navigational accuracy, GPS would increase airspace usage by decreasing aircraft separations and reduce fuel burn and CO2 emissions” the technology could also be applied to air travel (Where?).

The next social group associated with the technology of the GPS is emergency services such as the fire department or the EMT’s at the hospitals. Often when a person calls in an emergency, they are too shocked to get all the words out. So it takes a lot of time for the person answering the emergency call to calm the speaker down and discover their whereabouts. The amount of time it takes to do this could delay the ambulance or fire truck from arriving at the scene of the emergency in a timely fashion and could risk the accident getting worse or someone’s life. So, engineers started developing ways to determine where the emergency scene is by utilizing GPS technology. Not only would GPS allow the emergency vehicle driver to find the location much faster, GPS trackers in the telephones used to call emergency numbers can also help determine the location of the scene of the crime. Like using a GPS tracker in a soldiers backpack to locate a wounded warrior, GPS trackers in landline telephones and cellular phones can find the location of a person calling in an emergency. The “automatic location of callers who report emergencies using their mobile phones is known as ‘Enhanced 911’” (Where?). Since this application of GPS is so useful, today it is required for all cellular phones to be equipped with GPS tracking chips. If this technology would be removed from society today, it could be assumed that there would be an increased number of emergency calls that were arrived at too late due to difficulty locating the accident. Thus, after emergency responders found a use for GPS technology, they became reliant on the system and would be less reliable without it.

One of the problems that the law enforcement social group faced was keeping track of registered sex offenders. In California specifically, there was backlash after a young 9 year old girl was “sexually abused and murdered” by a registered sex offender. As the fear of sex offenders swept the country, it was required that law enforcement ensured public safety by knowing the whereabouts of sex offenders, no matter the severity of their crime. Additionally, society found other criminals coming out of jail as a significant threat to their safety and it was demanded that criminals out on parole were also kept under strict supervision of the authorities. Considering all of the information GPS was able to provide the military as to the whereabouts of the troops, GPS proved to be a reliable technology to help the police. And then came the development of the ankle bracelet. A special anklet equipped with a GPS is given to those sex offenders and criminals that are living in the outside world. This allows police and parole officers to look on a computer and learn the whereabouts of specificcriminals. If they find anyone of their delinquents out of their specified limits or in an area near a crime, they can then find the criminal and arrest them again. This reassures the public that their safety is of upmost importance and constantly being watched. The development of the GPS ankle bracelet is just one example of SCOT in action. As issues of public safety rose, law enforcement was able to respond by finding a new use of the technology.

Finally, the timing capabilities of GPS prove to be of upmost importance in the United States. Since the GPS technology is based on the most accurate time keeping device, the atomic clock, GPS signals even more applications apart from positioning. The use of these atomic clocks “allows [for] the precise synchronization of communications systems, power grids, and other critical infrastructures [(including the internet), which lead to] a consequent increase in efficiency and reliability,” (Where?). Today, our society places upmost importance in speed, efficiency, and reliable methods of communication, whether via telephone or internet. So, without the GPS signals to ensure the quality performance of these other important technologies, society would have to take a few steps back.

Once society became reliant on GPS to ease their travels and ensure their safety, it would be difficult for them to lose the technology. In Mark Williamson’s article “Where Would We Be Without It,” he recognized the need “to have a backup system in case GPS signals switched off.” The need was “not because drivers would have to read map books again but because so much of society relies on the signals.” GPS signals have many more applications than the ones specified above and it would be difficult for society to resort to their old methods of transportation and law enforcement without it.

**Future Problem**

Now that GPS has developed such a high standing in society today, it is important to focus on issues that are growing with increased reliance on GPS technology. One such problem we have begun facing with increased use of technology is the “continuing erosion of privacy due to technology,” (CAR 752) GPS one of those technologies that have become obtrusive since it has more frequently been used by law enforcement as “warrantless tracking… of an individuals every moment in an automobile,” (CAR 753)

In 2010 Yasir Afifi discovered that the FBI had been tracking his car with GPS for three to six months without reasonable justification as to why (CAR 753). The D.C. Circuit Court declared that this is an obstruction of privacy as they had been tracking the victim without warrant for a “significant duration of time,” (CAR 753). This is a controversial issue since the Supreme Court had previously declared that “[a] person traveling in an automobile on public thoroughfares has no reasonable expectation of privacy in his movements from one place to another,” (CAR 754). However, it has been found that “watching where an individual goes in an automobile… can paint a precise picture of that individual’s life” (CAR 755). This may not necessarily be true with single stops, but if a person makes frequent stops to specific bars, doctors, houses, etc. a lot of assumptions and inferences about their life can be made without necessarily being true.

Two years later, the Supreme Court made an important decision regarding the use of technology in law enforcement during the case *United States v. Jones.* The Washington D.C. police had suspected night club owner Antoine Jones of being involved in a cocaine drug deal, so the placed a GPS tracker on his car. Watching his whereabouts for a month, they concluded that he was dealing cocaine and sentenced him to prison.

After his sentence was overturned by the United States Court of Appeals for the District of Columbia, the case was appealed to the United States Supreme Court that declared the use of GPS trackers on the car as illegal. Specifically, Justice Scalia, explained that “the government installation of a GPS device on a target’s vehicle and its use of that device to monitor the vehicle’s movements constitutes a ‘search,’” so by the Fourth Amendment a court warrant would be needed to perform that ‘search,’ (JONES). Since the D.C. Police did not have a court ordered search warrant to place the tracking device on Jones’ car, they illegally had obtained information on Jones’ activity.

Now that GPS is a permanent technology in American’s lives issues such as privacy will become more prominent, so it is important to develop laws that deal determine how the technology could be used. GPS started out as an important technology to improve upon the United States Military and has now become a part of everyday life. As we become more reliant on the technology, it will begin to shape our society as depicted by our reliance on the technology to ensure ease in transportation and ultimate safety. But as we use the technology to improve upon our lives, we will need to regulate exactly how that technology can be used to still uphold our traditional American values.