A System Dynamics Perspective of the New York State Aggravated DWI Law

Rod MacDonald
Initiative for System Dynamics in the Public Sector
300 G Milne Hall
Rockefeller College of Public Affairs and Policy
University at Albany
135 Western Avenue
Albany, New York 12222
518-442-5772
Rod@isdps.org

Introduction

This paper examines the implications of an Aggravated DWI law passed in November 2006 in New York State. To examine the system-wide implications of the Aggravated DWI Law, a system dynamics computer simulation model was developed to capture the flow of drunk drivers through the criminal justice system[1] in New York State. This system captures people from the time of arrest, through adjudication and sanctions, and then tracks these people for 10 years to capture recidivism. The goal of this project was to provide insight about the implications of the Aggravated DWI law on other parts of the system. For example, how would the law influence the police, DAs, courts, the drinking driver program (DDP), probation, and alcoholism treatment providers, and would drunk driving be reduced? The Aggravated DWI law allows for a felony DWI charge for any individual arrested for drunk driving with a BAC[2] at or above 0.18%, regardless of previous alcohol convictions. In addition, the sanctions for an Aggravated DWI conviction are severe and require mandatory ignition interlock[3], license revocation and screening for alcoholism.

Back Ground

Drinking and driving remains an important public safety issue in the United States. Although the number of people dying in alcohol-related traffic crashes has been decreasing over time, the percentage of people dying in alcohol-related crashes nationwide, as a percentage of all crashes, has remained constant since 1997 (Dang 2007). During this same 10 year period, the percentage of fatalities occurring in alcohol-related traffic crashes in New York has also remained relatively constant (28% or 373 fatalities out of 1,317 in 2007). Improvements in vehicle safety through crumple zones, air bags, anti-lock brakes, etc. have worked to reduce the overall number of fatalities on the nation's highways. Despite these improvements, alcohol remains a key issue for traffic safety experts in New York State and across the nation.

The 1982 President's Commission on Drunk Driving raised awareness about drunk driving and initiated efforts to reduce the problem through education, increased enforcement, officer training programs to detect alcohol impairment, DA/court training, stricter sanctions and public service announcements to discourage people from drinking and driving. Over the years, the legal BAC level has been reduced, the drinking age increased, and some states began to rely on technological solutions, such as ignition interlock, to combat what has been termed the hardcore drunk driver (high BAC and/or repeat arrests for driving while intoxicated (DWI) McCartt and Northrup 2004). The percentage of traffic fatalities due to alcohol was reduced nationally from 59% to 39% between 1982 and 2004 according to National Institute for Alcohol Abuse and Alcoholism (Chen and Williams 2006). In New York State, alcohol-related fatalities

---

[1] The author realizes that good modeling practice is to model a particular problem and not a system. The problem modeled is the implications of the Aggravated DWI law on the various agencies and organizations responsible for drunk drivers at different stages of the arrest-adjudication-sanctions relicensing process.

[2] BAC refers to blood alcohol concentration and is a measure of the amount alcohol in a person's blood.

[3] An ignition interlock is a device placed on a vehicle that requires a breath test that measures BAC. A BAC above .01 will stop the car from starting and if it is detected while the car is being operated the device will honk the horn and flash the lights until the car is turned off.

have been reduced from approximately 52% to 28% during the same time period (Graph 1). With its first drunk driving law passed in 1910, New York has some of the oldest drunk driving laws in the nation. In addition, New York is the only state with a self-funded program targeted at the drunk driver, commonly known as the STOP-DWI Program. The traffic safety community in New York State believed that the Aggravated DWI Law would reduce fatalities, but was concerned about the resource implications of the new law and the number of people being charged under this law.
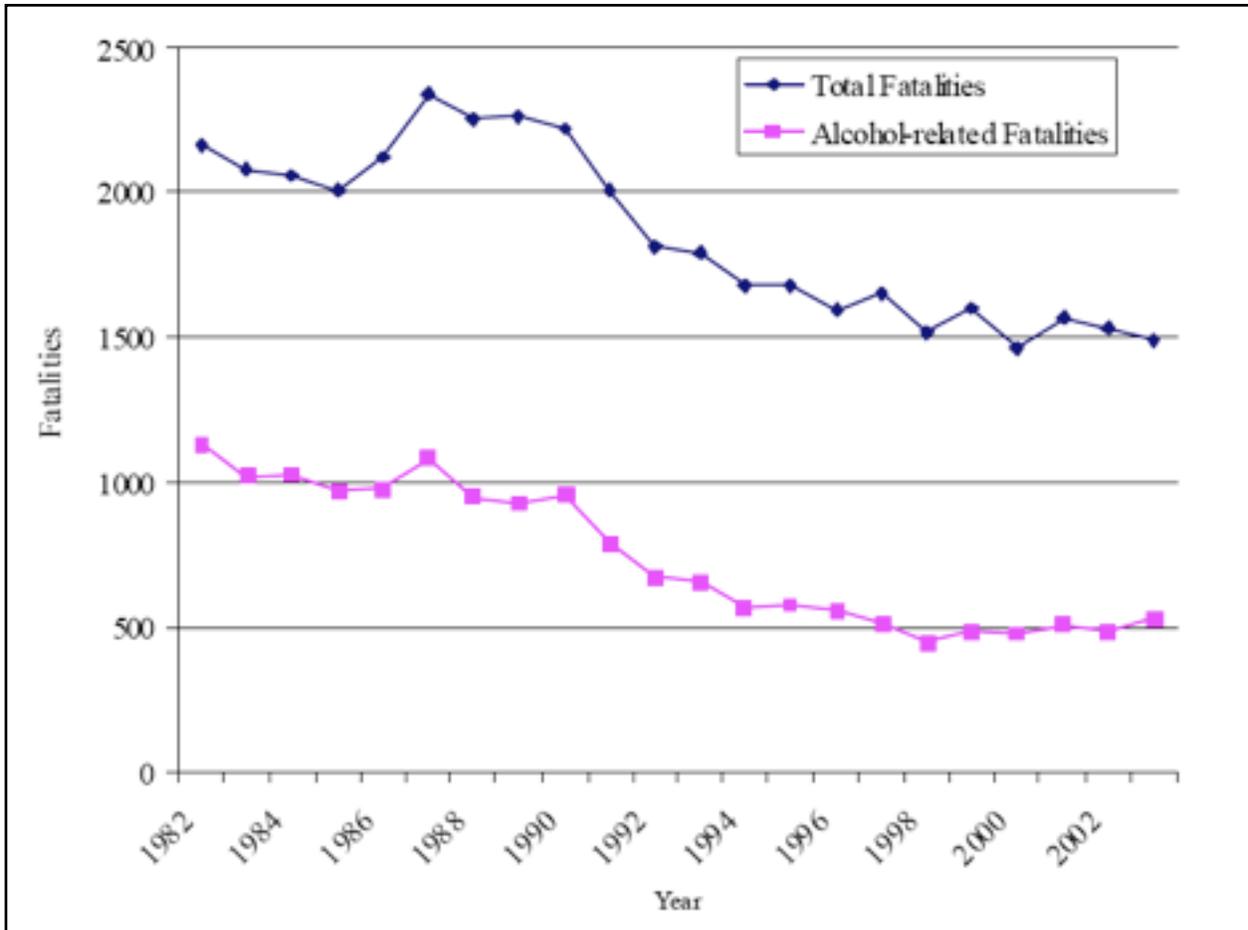
Graph 1: Total and Alcohol Related Fatalities in New York State 1982-2004

Building the Aggravated DWI Simulation Model (AGGSIM)

The formal simulation model for this study was developed with information obtained from the NYS Department of Motor Vehicles' crash and citation/disposition ticket systems, as well as from data available from public sources, previous reports prepared by DMV, and discussions with individuals from police agencies, DA's offices, the Drinking Driver Program, courts, probation, community service providers and OASAS[4] staff knowledgeable about the functions

---

[4] OASAS stands for the New York State Office of Alcoholism and Substance Abuse Services. OASAS monitors and sets standards for alcoholism treatment providers.

of their departments and agencies. The system experts interviewed during the model building process identified the structure and content of the model. This allowed for a model that was transparent. Furthermore, once the model was operational, the system experts attended a group meeting to review and discuss model assumptions and output. These discussions resulted in a model that focused on the potential implications of the Aggravated DWI law on the various agencies.

The system dynamics approach places an emphasis on examining feedback-oriented explanations for the implications of the Aggravated DWI law. Figure 1 identifies the four primary alcohol charges available to an arresting officer in New York State (in the center of the diagram) and the agencies and organizations that may particip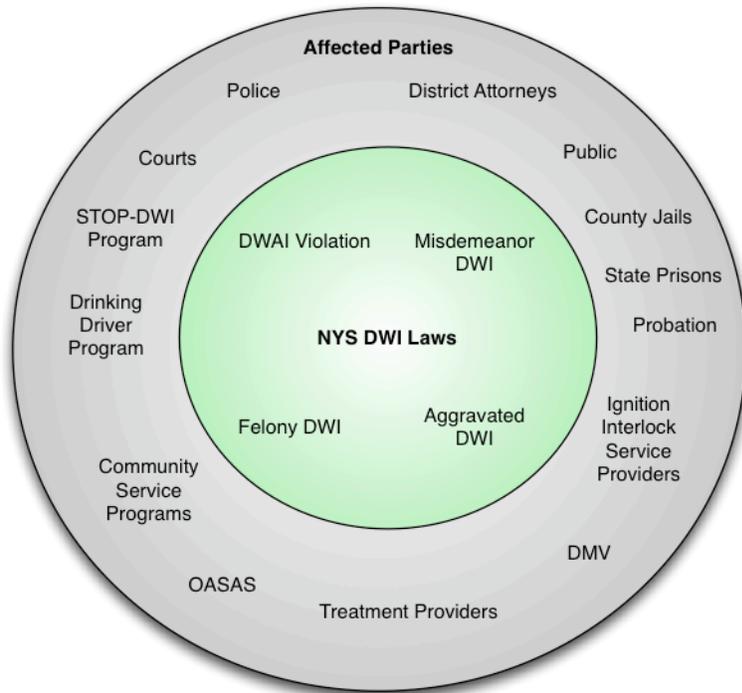ate in the arrest/adjudication process (the outer ring). These different entities may come in contact with the drunk driver at different times or concurrently during the process of arrest, adjudication and sanction. Resources for government agencies are provided through general government revenues. However, in New York State, funds from fines go to the STOP-DWI Program office at the county level of government. These funds are allocated to local county programs to conduct enforcement, education, and rehabilitation type initiatives to reduce drunk driving. Funds may be used to hire or pay for overtime of government employees to work on impaired driving-related enforcement efforts or develop and deliver educational programs. Overall, New York State has one of the most comprehensive programs in the nation aimed at reducing drunk driving.

Figure 1: Drunk-Driving Charges and Agencies and/or Organizations Involved in the Process

Background on New York State DWI Laws

Figure 2 presents an overview of the drunk driver system in New York State from a stock and flow perspective. On a first offense, a drunk driver can be charged and convicted of DWAI, a Misdemeanor DWI or an Aggravated DWI.

DWAI: Drivers convicted of DWAI result from two situations: 1) the original charge was for

DWAI, or 2) the original charge was for DWI, but was pled down to DWAI. Legally, anyone with a BAC between of 0.05% and 0.07% can be charged with a DWAI. A conviction for DWAI results in a fine and the suspension of driving privileges for 90 days. It could entail a jail term of 15 days, but jail time for this offense is not typical. Furthermore, a DWAI is considered a traffic violation and does not result in a criminal record. However, since November 2006, those charged with DWI who plea down to DWAI are required to attend a Drinking Driver Program (DDP), at their own expense, as part of the sanction. Furthermore, the DDP evaluates participants to determine if they should be referred to an alcoholism treatment program. If a driver is referred for treatment, the driver must then complete treatment in order to have their full driving privileges restored.

Analysis of available BAC data show that only six percent of those arrested have a BAC that meets the DWAI requirements (i.e., 0.05% - 0.07%), yet approximately 50 percent of convictions are for DWAI. This represents a plea bargaining process whereby great efforts are undertaken to avoid trials. It also reflects the perception in the system that a first drunk driving offense could happen to anyone and that these people are not criminals.

Misdemeanor DWI: This is typically charged by the district attorney for people with a previous DWAI offense (within the last 10 years) or for drivers with a BAC equal to or greater than 0.08%. Figure 2 indicates that there are two inflows into the Misdemeanor DWI. Most district attorneys will plea down drunk driver offenses when the BAC is 0.12% or less to a DWAI on a first offense. However, this varies from jurisdiction to jurisdiction in New York State. The Misdemeanor DWI is a criminal offense and conviction results in a criminal record. In addition, license suspension or revocation[5] is for one year and fines are assessed. The law also allows for incarceration, probation and ignition interlock; however, these are not typically applied to those convicted of a Misdemeanor DWI unless extenuating circumstances, such as an accident or personal injury, exist.

Felony DWI: Felony DWI is charged for those arrested two or more times in the pervious 10 years for a drunk driving offense. There are different classes of felony charges that may be brought against a drunk driver depending on the circumstances that lead to the arrest. The different classes of felonies that can be charged carry prison terms ranging from 1 to 7 years. Although felony convictions do not generally lead to prison sentences, they do lead to probation, community service and ignition interlock. As shown in Figure 2, DWI felonies are only charged after a drunk driving conviction on a lesser charge. Although people do end up in prison for felony DWI offenses, the number is small so prison sentences are not captured in the model.

---

[5] A license suspension refers to a condition where the license is not valid, but still exists. A revocation is the removal of a driver's license from a person. The administrative procedures and hurdles for getting a new license after it is revoked are greater than for a license that was suspended.

Aggravated DWI: In order to deal with what is termed the hard-core[6] drunk driver, New York State enacted an Aggravated DWI law in November 2006 whereby offenders with a BAC of 0.18% or above could be charged with a felony on a first drunk driving offense. The law requires an evaluation for alcohol abuse, mandatory ignition interlock, license revocation for at least one year, fines, a felony criminal record and the possibility of a jail sentence with a maximum length of 1 year. The model was developed specifically to deal with the implications of this law, which was enacted in November 2006.

---

[6] The hard-core drunk driver is defined as those with a high BAC and/or multiple arrests for drunk driving offenses.
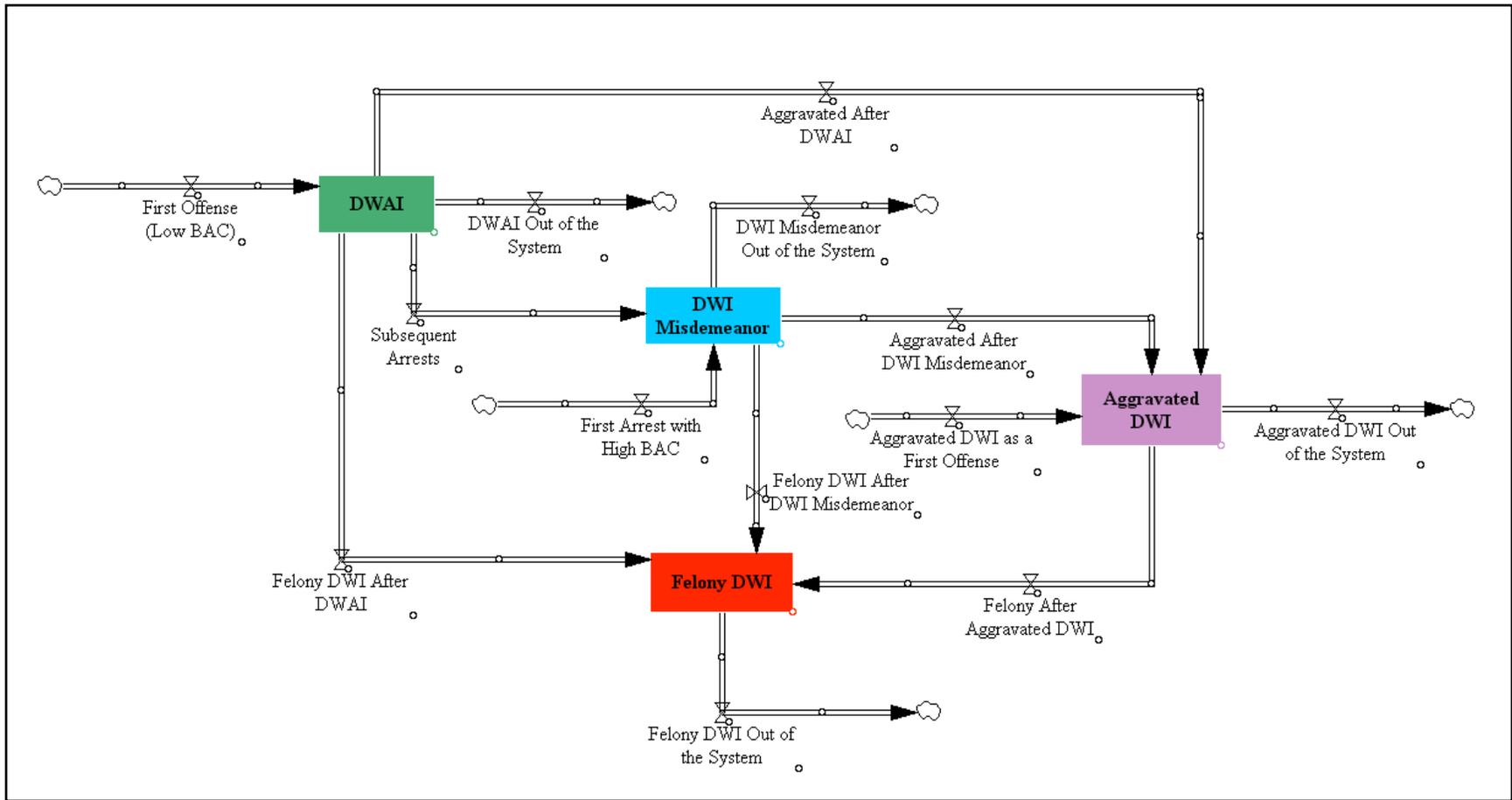
Figure 2: Overview of New York State's Drunk-Driver System

Historical Data

Graph 2 shows that alcohol-related fatalities as a result of motor vehicle crashes, decreased between 1982 and 2007. However, the decline leveled off around 1997 and has remained relatively constant since then. Experts in the field of traffic safety attribute the fall in alcohol-related fatalities to behavioral changes brought about by increased enforcement, education campaigns, and stiffer sanctions that began in 1982. In addition, the introduction of technology in vehicles in the form of crumple zones, airbags and the integrity of the passenger compartment have helped increase survivability in many crashes. However, the traffic safety community remains concerned with behavioral changes that influence decisions to drive or not drive after consuming too much alcohol. These behavioral changes need to be made prior to alcohol consumption because judgment is very unreliable when impaired.
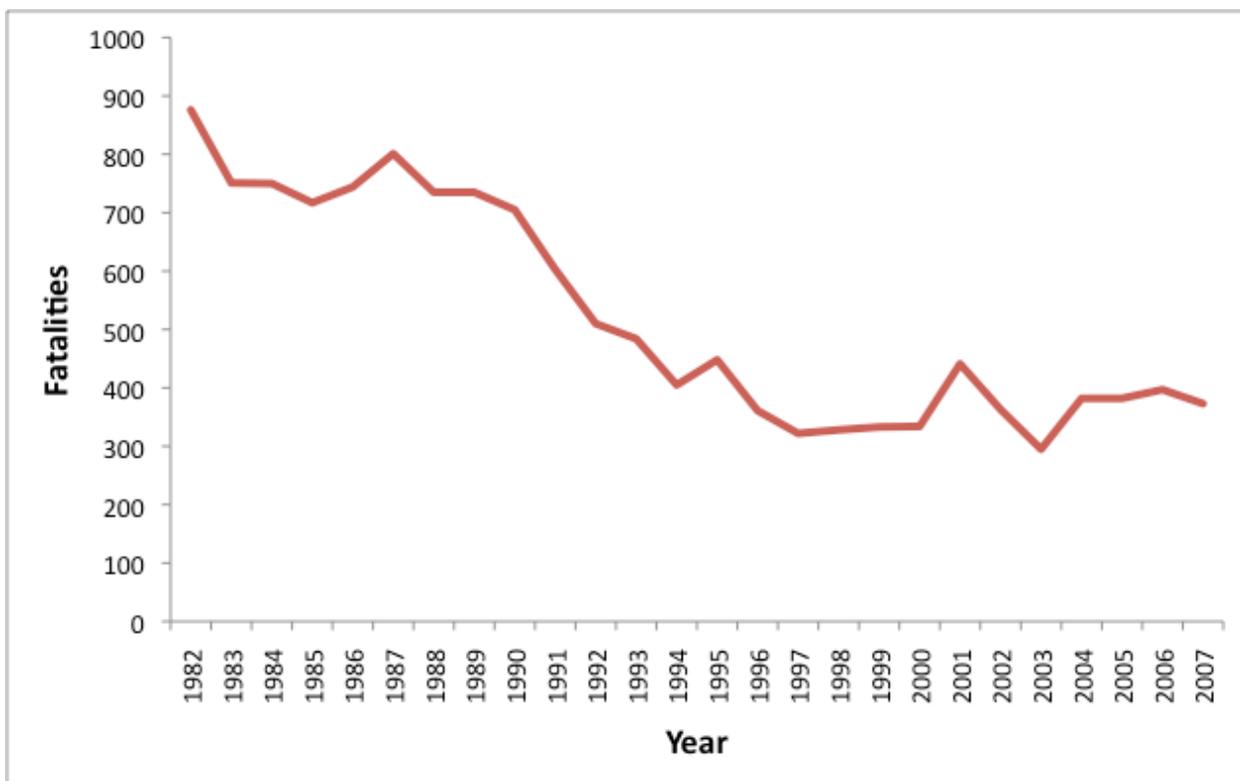

Graph 2: NYS Alcohol-Related Fatalities in NYS 1976-2006

Graph 3 contains the number of persons arrested (TSLED Agencies Only)[7] for drunk driving in New York State from 1999 to 2007. The graph shows that the number of people arrested has remained relatively constant in recent years. The TSLED database tracks tickets from the time they are issued until they are adjudicated in the courts, providing a clear picture of how people move through the criminal justice part of the system. In total, approximately 64,000 people are arrested statewide for drunk driving each year. In addition to those drivers ticketed under the TSLED system, the 64,000 number includes tickets written in New York City and the five

---

[7] TSLED stands for the Traffic Safety Law Enforcement and Disposition.

western townships in Suffolk County on Long Island; the ticket data from these jurisdictions, however, can not be linked electronically to the corresponding conviction data.
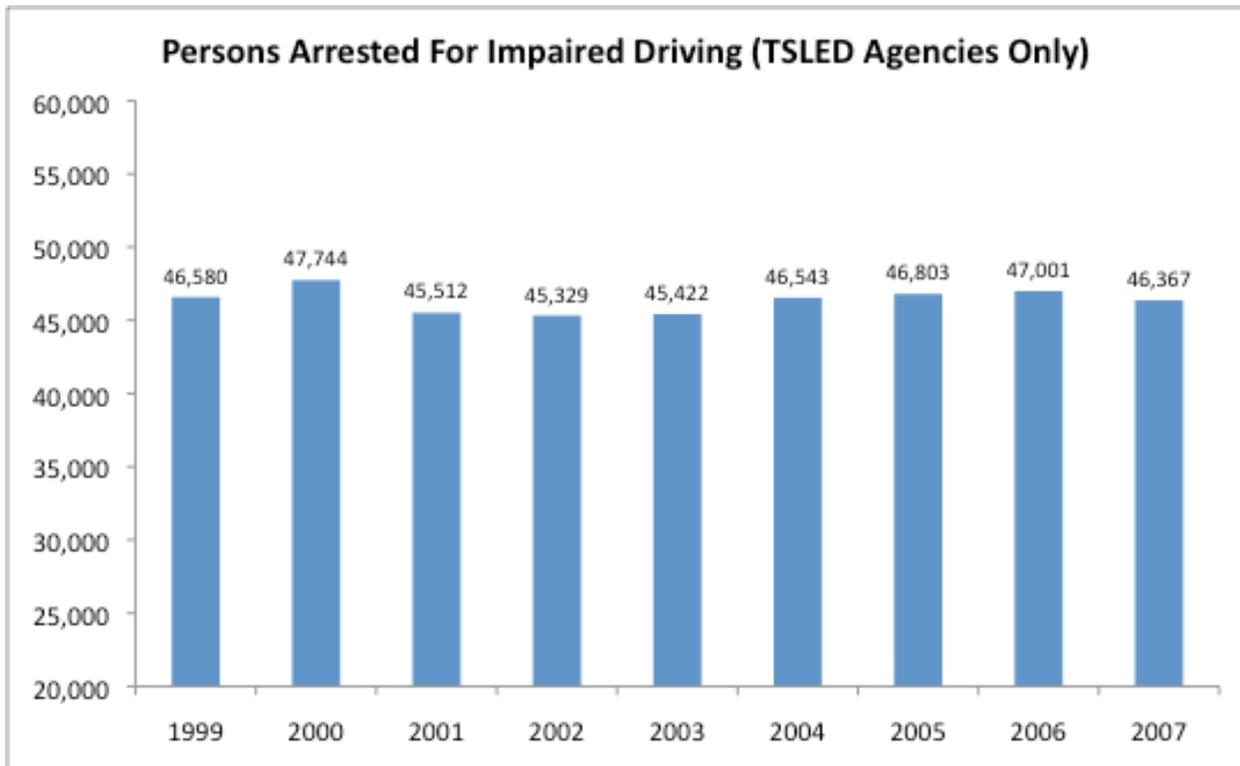

Graph 3: Persons Arrested for Drunk Driving in NYS 1999-2007 (TSLED Agencies Only)

Although the actual number of people arrested for drunk driving fluctuates from year to year (Graph 3), the model was initialized in equilibrium to better understand the changes that would occur after the implementation of the Aggravated DWI law.

People are tracked in the system for 10 years as drunk driving charges are based on the previous drunk driving history of the individual. Ongoing data collection indicates that approximately 21 percent of arrests are of people arrested at least once in the last 10-years. Therefore, using the TSLED data of approximately 46,000 arrested each year, there are 36,340 first-time offenders and 10,660 recidivists arrested each year. The model was initialized in equilibrium and simulated for a 30-year period, 2002 to 2032.

Graph 4 shows the results for the four conviction stocks identified in Figure 2. They start out and remain in equilibrium for the first 4 years and then in 2006 the Aggravated DWI Law is introduced. The number of people with DWAI, Misdemeanor and Felony DWIs matches up with historical data; because the Aggravated DWI Law did not come into existence until 2006, this category is at zero. The introduction of the law results in a gradual increase in the number of Aggravated DWI offenders in the Aggravated DWI Monitoring Pool. The Aggravated DWI Monitoring Pool settles into a steady state with just under 40,000 individuals in the monitoring pool around 2020.
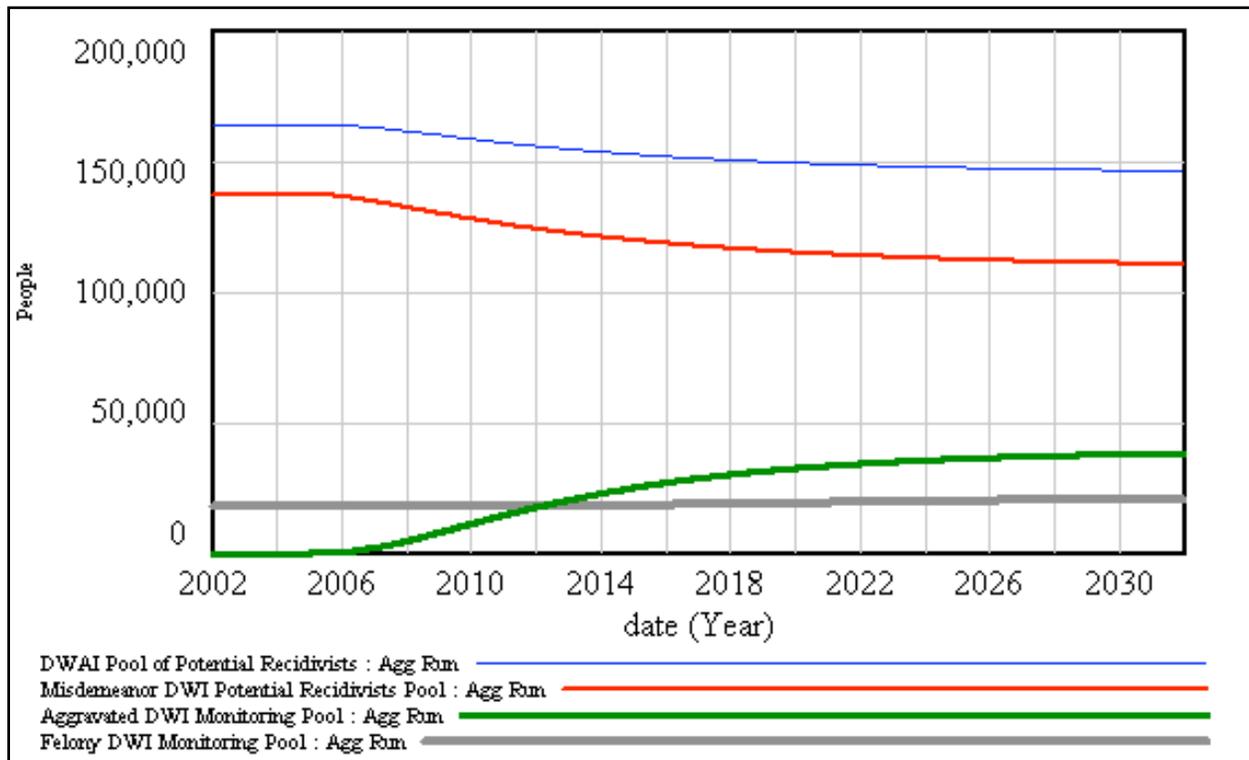
Graph 4: Monitoring Pools When Aggravated DWI Law is Implemented in 2006

Although the simulation results shown in Graph 4 seem obvious, they indicated that the Aggravated DWI Law was only affecting those who would have been arrested regardless of the law. What the Aggravated DWI Law did was generate another category, with stricter sanctions than DWAI and Misdemeanor DWI, in the hope of deterring people arrested with a BAC that was 0.18% or above. The initial run showed that the law only moved people around within the system and did not change the overall number of drunk driver arrests. Instead of being arrested, charged and convicted of DWAI or Misdemeanor DWI, people were moving directly to an Aggravated DWI and into the Aggravated DWI Monitoring Pool. The DWAI Pool of Potential Recidivists and the Misdemeanor DWI Potential Recidivists Pool both fell, offsetting the arrests and convictions of those going into the Aggravated DWI Monitoring Pool.

As shown in Graph 5, there were changes in the number of people in the Felony DWI Monitoring Pool. The number increased by approximately 3,000 as a result of the new law. This occurred for two primary reasons. First, once arrested and convicted for an Aggravated DWI, a subsequent arrest will be for either another Aggravated DWI or a Felony DWI. People cannot move out of the felony category back to a violation or misdemeanor conviction. Second, people re-arrested and convicted from the DWAI Pool of Potential Recidivists for an Aggravated DWI bypass the misdemeanor step in the process and move to the Felony DWI conviction quicker. The combination of these factors leads to the observed increase in people in the Felony DWI Monitoring Pool.
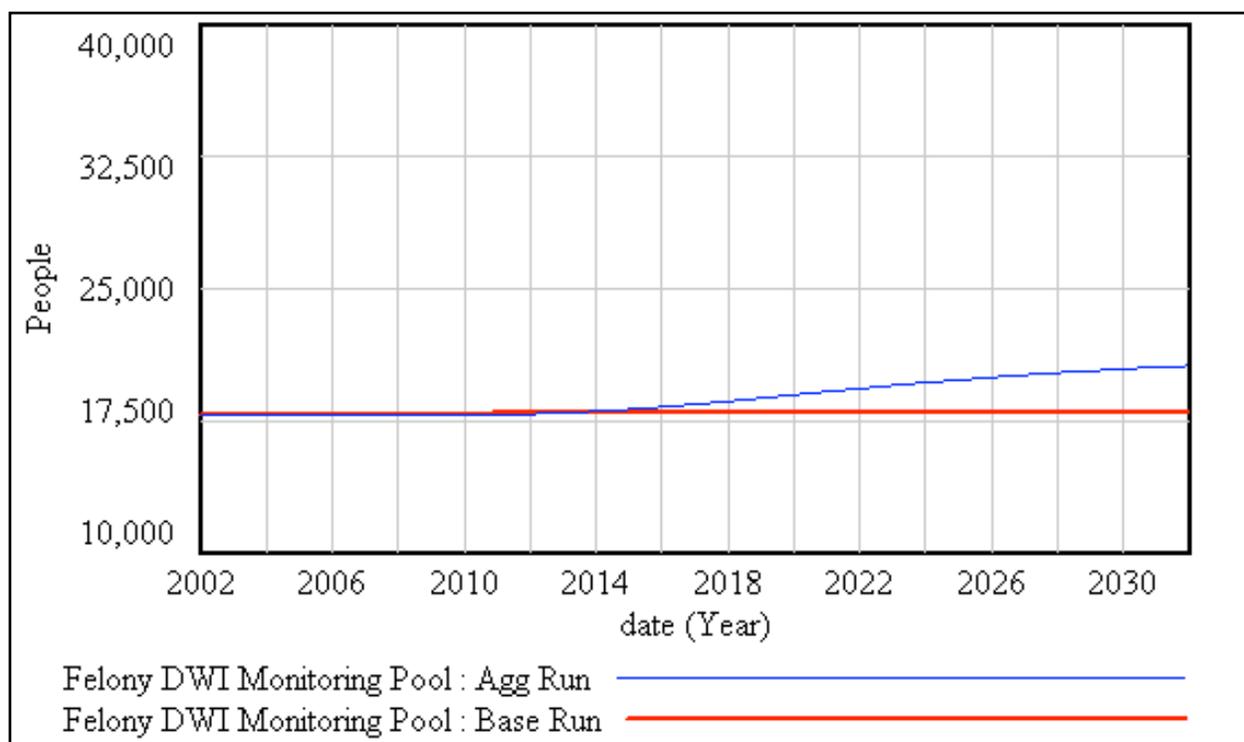
Graph 5: Felony DWI Monitoring Pool After Aggravated DWI Law is Implemented

Recidivism

Recidivism was formulated in the model by multiplying the number of people in the monitoring pools[8] (these are the people eligible to be recidivists) by the number of times they drink and drive in a month, which, in turn, is multiplied by the probability of being arrested. The literature (Beitel, Sharp and Glauz 2000) indicates that the probability of being arrested is somewhere between 1 in 50 and 1 in 2000. A probability of 1 in 200 was selected as being reasonable and in line with much of the literature. The number of people in the monitoring pools is known because the time frame for monitoring is set by law and the number of people convicted on an annual basis is known. The number of recidivists arrested per year is also known, leaving, as the only unknown, the number of times people in the potential recidivist pools drink and drive per month. Solving for this indicated that drivers in the monitoring pools had to drink once every two months or .5 times per month. This estimate was initially used for all recidivist pools in the model, and it generated the appropriate number of recidivists observed in the historical data. However, the idea that the Aggravated DWI Law did not have an effect on reducing the incidence of drunk driving on the people in the Aggravated DWI Monitoring Pool was not accepted by the group of experts. Based on the advice of the experts, the number of times people in the Aggravated DWI Monitoring Pool drink and drive was then reduced by 50 percent compared to the other pools of potential recidivists.

---

[8] The monitoring pools from which recidivism can occur is limited in the model. In order to simplify the model, people were not allowed to recidivate while awaiting adjudication and while their license was suspended or revoked.

Graph 6 shows the Aggravated DWI Monitoring Pool for the Base Run, with the Aggravated DWI Law in effect and with the reduced incidents of drinking and driving for people in this pool. The reduced incidence of repeat drunk driving among people in the Aggravated DWI Monitoring Pool results in an increase in the number of people in the Aggravated DWI Monitoring Pool. This occurs because fewer people are getting re-arrested and convicted and moving into the Felony DWI Monitoring Pool. However, even though the reduction in recidivism is a benefit, overall the implications for the system are minor. This again drove home the point that the actions taken against hardcore drunk drivers are occurring at the back of the system and result only in minor improvements. No overall change that will drive down the incidence of drunk driving and the resulting injuries and fatalities occurs.
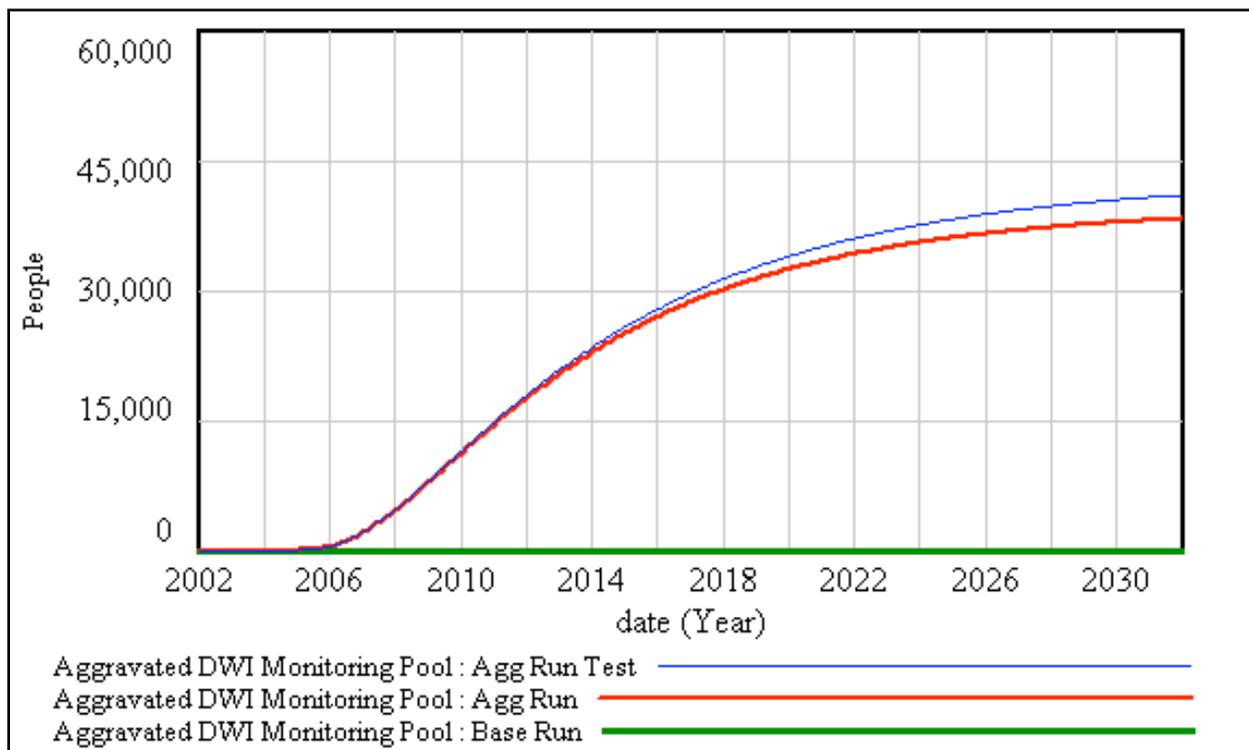
Graph 6: Aggravated DWI Monitoring Pool with Recidivism Rate for the Pool Reduced

In order to test this line of reasoning a bit more, an additional simulation was run whereby the Aggravated DWI law was deemed to be completely effective in reducing recidivism for those convicted on this charge. Graph 7 indicates that those in the Felony DWI Monitoring Pool are decreased when those from the Aggravated DWI Monitoring Pool do not recidivate. This occurs for two reasons. First, a portion of people recidivating from the DWAI Potential Recidivists Pool and the Misdemeanor Pool of Potential Recidivists are convicted and end up in the Aggravated DWI Monitoring Pool from which they do not recidivate.

Graph 7: Felony DWI Monitoring Pool When Aggravated DWI Recidivism is Zero
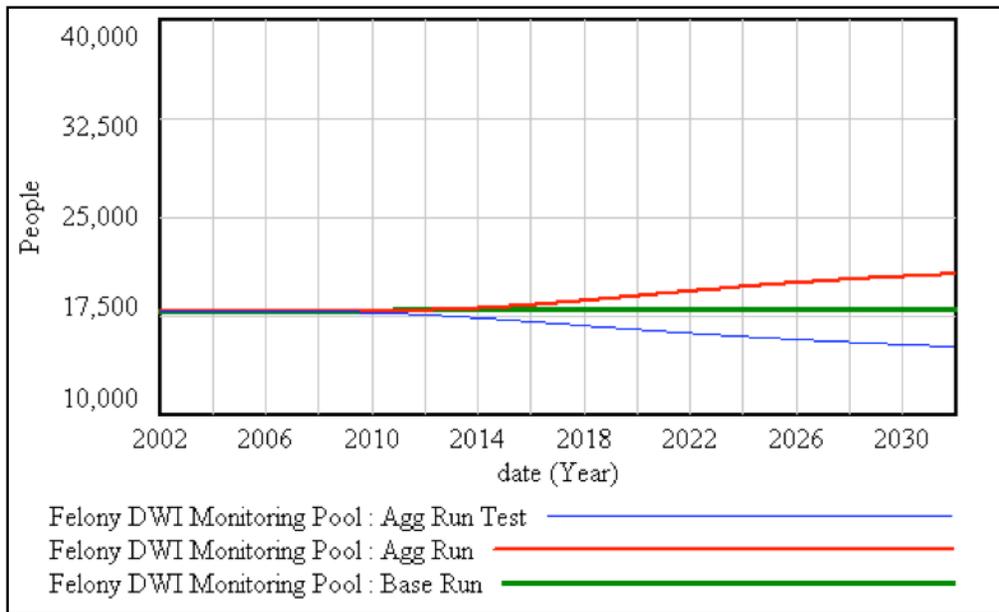
This got the group thinking about what would happen if all laws worked perfectly and recidivism were eliminated. In this scenario, shown in Graph 8, all sanctions work perfectly and recidivism is completely elimina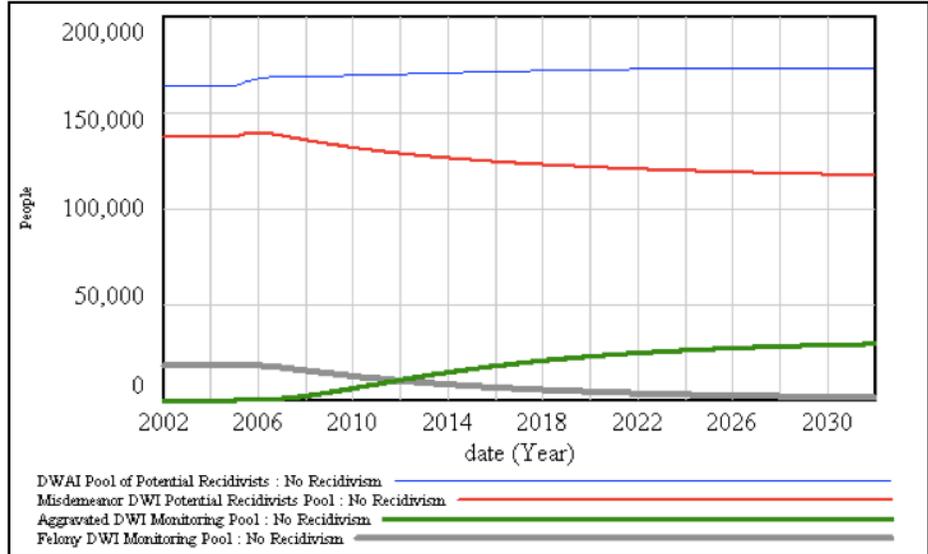ted from the system. The DWAI Pool of Potential Recidivists grows as people do not recidivate and move into the other categories. The Aggravated DWI Monitoring Pool increases when that law goes into effect, but it only grows as a result of people being arrested for the first time. The Misdemeanor DWI Potential Recidivists Pool decreases as people no longer recidivate into that pool from the DWAI Pool of Potential Recidivists. In addition, people are getting arrested and convicted of Aggravated DWI instead of DWI misdemeanor and therefore do not end up in the Misdemeanor DWI Potential Recidivists Pool on a first arrest. The Felony DWI Monitoring Pool approaches zero[9] since the only way to get a Felony DWI is to recidivate from one of the other pools and the possibility of this occurring has been eliminated.
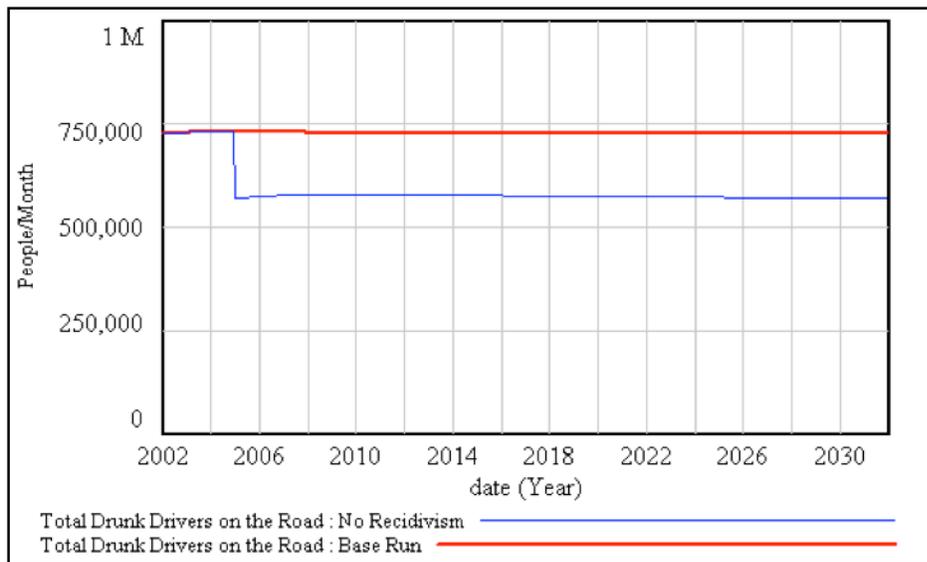
Graph 9 captures a key insight generated by the model in that eliminating recidivism reduces the number of Total Drunk Drivers on the Road by approximately 135,000. Although this is a substantial number and would improve traffic safety, the problem this points out is that there are still approximately 570,000 incidents of drunk driving occurring each month on New York State's roads by first-time offenders.

---

9 The reader should note that you would expect the Felony DWI Monitoring Pool to approach zero after ten years as that is the length of the tracking period. The formulation for the outflow from the Felony DWI Monitoring Pool is the level divided by the time constant and under this extreme condition this formulation does not accurately capture the aging process of this pool. However, it was felt that this formulation was adequate to meet the purposes of the model.

The concept that first-time offenders were generating many incidents of drunk driving on a monthly basis and that perhaps the potential recidivist drunk driver had been receiving too much attention was difficult for the experts assisting in the development of the model to grasp initially. The first reaction was that something had to be wrong with the

Graph 8: Recidivists Pools When Sanctions Work Perfectly and Recidivism is Eliminated from the System

model. To address this concern, the group traced through the logic of the model, examining various variables, and in a few instances the model output was the opposite of what the experts thought would happen. Closer examination, along with an explanation about why the behavior generated by the model was accurate, given the model's assumptions, gradually convinced people that their initial assumptions needed to be changed.

Graph 9: Total Drunk Drivers on the Road When Recidivism is Eliminated

The expert group was concerned that the focus on first-time drunk-drivers was based on assumptions, and to shift the focus from the hard-core drunk driver to the first-time offender would require closer scrutiny of the assumptions and the collection of additional data to support the model.

Model Assumptions about Pool of Potential First-Time Drunk Drivers

The poor results generated by the model, in terms of reducing the incidents of drunk driving in New York State, lead to a harder look by the modeling team at the front end of the system. Drunk drivers in New York State can conceptually be placed into two pools of people. There are those who have not been arrested for a drunk driving offense and those who have been arrested one or more times over the course of the last ten years. Those not arrested within the last ten years will be considered 'first time offenders', while those arrested within the last ten years will be considered 'recidivists'. It took months, but after time the team began to focus on the idea that the first-time offenders entering the system were remaining constant and represented approximately 36,340 new people each year who were not getting the message, and were driving drunk and entering the system through arrest.

One of the key questions raised was how big was the pool of potential first-time offenders and how often did they drink and drive? As previously noted, the average number of drivers arrested each year is known, and the probability of being arrested is based on estimates in the literature (Beitel, Sharp and Glauz 2000). However, the size of the pool of people who drink and drive often is not known. There are 11.5 million licensed drivers in New York State. Using that as a pool of potential drunk drivers, knowing that 36,340 are arrested each year and that the probability of being arrested is 1 in 200, it is easy to calculate how often they are drinking and driving. This works out to be approximately 0.64 times each per year. On the other hand, information exists on the number of recidivists caught each year. On average, approximately 46,000 drivers are arrested per year, and anyone arrested within a 10-year period is considered a recidivist. The result is a pool of approximately 460,000 people. An assumption is that the police cannot tell the difference between a first-time offender and a recidivist simply from their driving behavior and, therefore, the probability of being arrested is equal for these two groups. The people in the recidivists group drive drunk, on average, 6 times per year in order to generate the appropriate number of arrests.

Graph 10 presents the results of the analysis, showing the number of times first-time offenders drive drunk in order to generate the observed 36,340 arrests. Each of the 11.5 million licensed drivers in New York State would have to drive drunk 0.64 times per year in order to generate the appropriate number of arrests given the data and assumptions. What did not makes sense was that after getting arrested, convicted and undergoing sanctions that these same people would be almost 10 times more likely to drive drunk. That indicated to the group of experts that the pool of potential first-time offenders was much smaller than the total number of licensed drivers in New York State. The literature (National Institute on Alcohol Abuse and Alcoholism) indicates that 38 percent of the population does not drink any alcohol so a safe assumption is that the 11.5 million drivers could be reduced by 38 percent, leaving a pool of approximately 7,130,000 people. If the pool were this large, people arrested from this group would be almost 7 times more likely to drive drunk. Graph 10 captures the number of times that people would have to drink and drive, given a probability of arrest of 1 in 200, for the size of different pools of first-time offenders. The estimated range for the pool of drunk drivers is less than 1 million as observed in Graph 10. The experts felt that a deterrence effect should reduce the number of drunk driving incidents by 50 percent; as a result the experts settled on a

Pool of Potential First-Time Offenders in the model of 500,000.
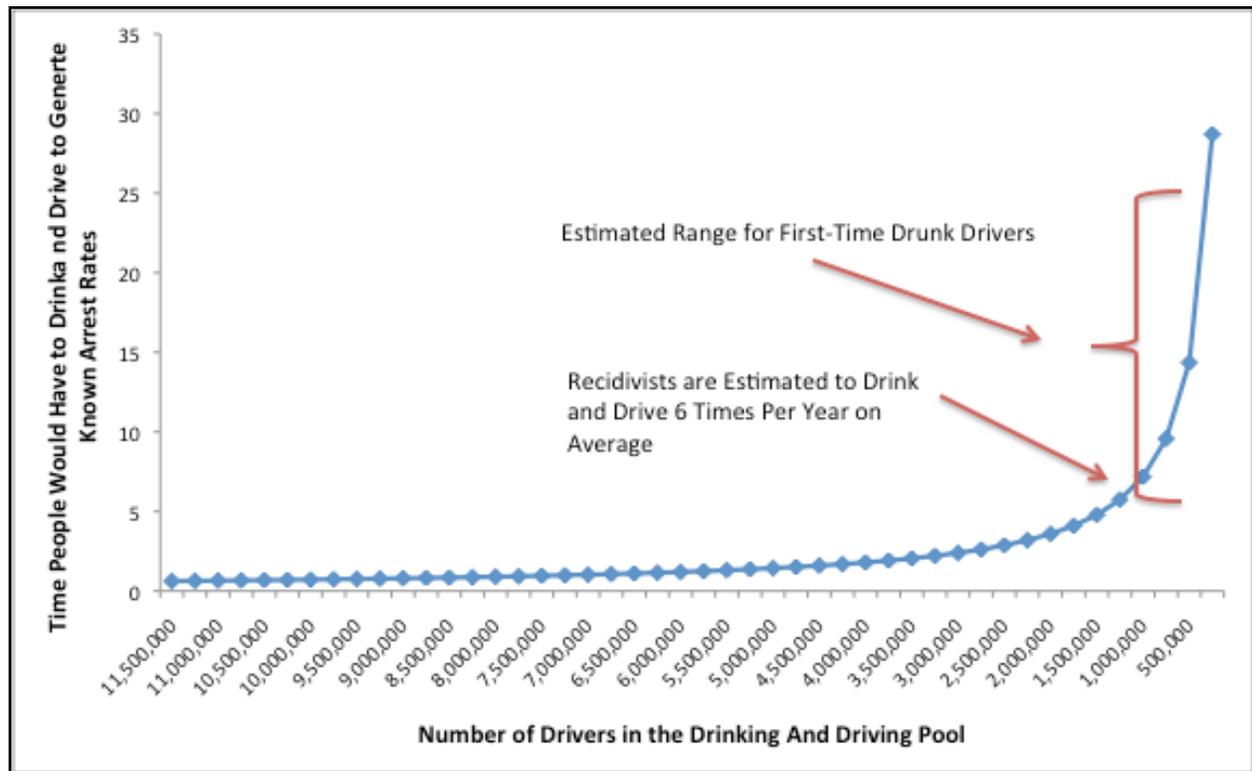
Graph 10: Incidents of Drinking and Driving Per Year Compared to Drivers in Drunk Driving Pool

The size of the pool of first-time offenders was the most troubling for the group of experts to understand and accept because most of them have spent their professional careers catching, prosecuting and sanctioning drunk drivers in an effort to make our roadways safer. Tremendous strides have been made as shown in Graph 2. The focus had always been on getting the "hard-core" drunk driver off the road and penalties and sanctions were progressively worse when people repeated the offense. What the model indicated to the group was that first-time offenders might have drinking and driving behaviors that were similar to those of the hard-core drunk driver. If this is the case, the approach toward first-time offenders needs to be re-thought.

This resulted in two actions being taken by the New York State Governor's Traffic Safety Committee. The first was to form a Task Force on Impaired Driving, with many of the participants in the modeling project being asked to head up teams in specific areas, i.e. enforcement, prosecutors, courts, probation, legislation and sanctions, treatment and evaluation, general deterrence, licensing, and research. The team leaders were given responsibility for selecting members for their respective teams from other experts or practitioners in the field. Their charge is to take a new look at the drunk driving problem and make recommendations about new policies, sanctions, actions, interventions and/or legislation

aimed at reducing the incidence of drunk driving in New York State. The initial team meetings were kicked off with a presentation of the simulation model and the lessons learned to date.

The second action implemented was a new impaired driving research project designed to establish how many motorists drink and drive and how often. Funded with a grant from the NYS Governor's Traffic Safety Committee, the primary components of the project will collect data through a statewide phone survey and focus groups, and conduct analysis of secondary data to develop a rigorous estimation about the size of the pool of first-time drunk driver offenders. The results will then be used in the model. This will be a critical component of the recommendations of the task force, since the shift from the repeat offender to the first-time offender requires a change in the mental models of those currently working in the system. The model output and the conclusions suggest that the focus should be on the first-time offender, but more evidence needs to be collected before decision-makers can generate the support to push the system in a new direction.

Conclusions

The Aggravated DWI simulation model (AGGSIM) was developed to examine the resource implications of a new DWI law that went into effect in November 2006. The law increased the penalties for those arrested for drunk driving with a BAC at or above 0.18%. The model showed that the initial resource concerns would only affect treatment and probation and that this would be partially offset as no new people were actually being brought into the system. Rather, people were being shifted around in the system and that an increase in one part of the system, those arrested and convicted of an Aggravated DWI, would be offset by decreases in other parts of the system, i.e., fewer Felony DWIs, Misdemeanor DWIs and DWAIs. The idea that a reduction in DWI would occur due to increased sanctions was only minor in the model and this lead to experts questioning the system as to the accuracy of the assumptions in the model.

The discussion of the assumptions and the simulation of new assumptions gradually changed the focus of the experts from what has been termed the back end of the system (sanctions for the hard core drunk driver) and got them to question why approximately 36,000 new people consistently enter the system as new offenders each year. This has resulted in the forming of a statewide Task Force on Impaired Driving that involves over 100 experts on 9 teams, with each team being responsible for making recommendations on how to reduce the number of drunk driving incidents in New York State. Finally, since the assumptions about the size of the pool of first-time offenders was deemed to be the weakest part of the model, funding has been provided to gather information about the size of that pool using additional research methods.

Bibliography

Beitel, George; Michael Sharp and William Glauz (2000). "Probability of arrest with driving under the influence of alcohol." Injury Prevention 6(2) 158-161.

McCartt, A.T. and Northrup, V.S. Enhanced Sanctions for Higher BACs: Evaluation of Minnesota's High-BAC Law.   DOT HS 809 677. Washington, DC: National Highway Traffic Safety Administration, 2004 May.

National Institute on Alcohol Abuse and Alcoholism
http://www.niaaa.nih.gov/Resources/DatabaseResources/QuickFacts/AlcoholConsumptio n/PercentAlcoholGender.htm

Yi, H., Chen, C.M., and Williams, G.D. Surveillance Report #76: Trends in Alcohol-Related Fatal Traffic Crashes, United States, 1982–2004. Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism, Division of Epidemiology and Prevention Research (August 2006)