History of ISD

In 1967, three major police agencies in Missouri -- the Kansas City Police Department (headed by Colonel Clarence Kelley), the St. Louis Metropolitan Police Department (headed by Colonel Eugene Camp), and the Missouri State Highway Patrol (headed by Colonel E.I. Hockaday) organized a joint project to develop a local, state, and national network of computers and terminals. The system's operation would safeguard the lives of both law enforcement officers and the general public.

The first central computer, an IBM 360/40 mainframe, was installed at the Patrol in April 1969. Two months later, computer operations were placed in the newly created Data Processing Division, with Charlie Bernskoetter named as director. Located in the basement of GHQ (currently PIED theater), there were two programmers, a keypunch supervisor, and three keypunch operators.

Within a short period of time, the interface to the Missouri Department of Revenue computer, which maintained the driver and motor vehicle (DMV) files, was completed. Then, Highway Patrol programmers developed and implemented a basic message switching system and a stolen vehicle system, along with computer interfaces to the ALERT System operated by the Kansas City Police Department and the REJIS System operated by the St. Louis Metropolitan Police Department. Additional interfaces were developed for linking the MULES computer with the FBI's National Crime Information Center (NCIC) System, which maintains national records on all stolen vehicles, stolen property, and wanted persons; and the Law Enforcement Teletype System (LETS).

MULES (Missouri Uniform Law Enforcement System) was christened in August 1970. Even though online network processing at this time was a rare accomplishment in data processing, these three agencies embarked on a project envisioned to improve efficiency and service. Two broad objectives were established for MULES: to provide continuous 24-hour-a-day instant access to police files, and to provide storage and distribution of basic offender data for all criminal justice agencies.

"MULES (Missouri Law Enforcement System) came about in the late '60s," said Mr. Harry Duncan, retired Communications Division director, in an interview in April 2005. "There was a federal grant for improvement of the police communications system in Missouri. Kansas City and St. Louis police departments and the Patrol were involved and divvying up this money. The guy from Kansas City came up with that name (MULES). I got in on those kinds of things not because I was important, but because the assistant superintendent or the superintendent, who didn't know much about communications and needed information about technical questions. It was a pretty smooth transition into MULES.

I was chairman of the committee in the late '60s that purchased computers for the Patrol, which used up a whole room. I went to New York

where IBM put on a school for police executives. That means Colonel Waggoner should have gone, but he didn't want to. He said, 'You go.' I had a little experience with computers. People didn't understand computers in those days. When we decided to make this move, it was thought an officer would be able to check a license at the scene. It wasn't long before it branched out into all kinds of things -- and wasn't just for enforcement. Then, the FBI got into the business. We soon communicated with the FBI, St. Louis, and Kansas City. (St. Louis and Kansas City had their own systems.) Then it branched into counties and cities.

People in our department and in Patrol's computer section trained other agencies. It took three days of training or so."

The Statewide Traffic Accident Records System (STARS) became operational in January 1972. This system stores data about all traffic accidents for use by criminal justice agencies and commercial insurance companies.

In 1972, Colonel Hockaday created the Information Systems Division, and hired Dr. Robert Bradley as division director on March 31. At this point, the statewide MULES project team decided to standardize computer software on the ALERT System. Highway Patrol staff work was directed toward converting to the ALERT system and developing the Stolen Property and Wanted Person systems. In July 1973, these systems were completed and added to MULES.

At this time, there were approximately 40 terminals connected to these systems and an aggregate total of 400,000 transactions were processed each month. The terminals basically consisted of teletype paper tape and buffered typewriter terminals.

By 1974, the MULES Network had grown considerably and video display terminals were now supported. On January 31, 1974, the computer interface to the new National Law Enforcement Telecommunications System (NLETS), which replaced the LETS system, was installed. Police agencies in Missouri finally had high-speed message switching to their counterparts in other states, as well as access to statewide (MULES) and national (NCIC) files. Approximately 131 terminals were now directly connected to the central (Patrol) computer either sending or receiving over 1.4 million transactions each month. In terms of job processing, each month over 5,996 job steps were run on the MSHP computers.

Seven basic online systems were now operational on the Highway Patrol computers:

- o Stolen Vehicles/Wanted Persons
- o Stolen Property
- o Highway/Weather
- o Statewide Traffic Accident Records System (STARS)
- o Attorney General Case Docketing
- o Grant Management Information System
- o Message Switching

The above systems comprised about 1,057 computer programs. Because of the increasing demand for new systems oriented toward complex case management structures, the decision was made to develop all new systems utilizing advanced database management and teleprocessing languages for programming. These products were installed in early 1974, and systems development was standardized on this new software.

By 1976-77, the Highway Patrol was using two computers to process an increasing transaction load (now over 2 million per month) and an increased job-processing load (12,598 per month). The number of terminals on the network had increased to 155.

MSHP staff had developed several new online, real-time database systems for Highway Patrol purposes. As these administrative systems became more heavily utilized, the demands from users for more computer resources and higher availability grew. The MULES/I System (processed on the primary computer) was still running under the original ALERT software, and transaction rates were beginning to overwhelm the system at peak periods of the day. Furthermore, the stability of MULES/I had also decreased to the point where it was becoming difficult to sustain 94 percent availability, which was less than desired.

The administrative systems running on the backup computer with more modern software had proven to be extremely reliable (98 percent+), with response times of less than three seconds on local terminals and less than eight seconds on remote terminals. All indications were this software would run equally well for the MULES police systems (which are all store-and-forward transactions).

Because of the growing workloads, instability, and complexity of the entire MULES system, two decisions were made in early 1976 that would set the stage for the development of the MULES/II system: First, a more powerful operating system would be needed for the computers. Second, the MULES/I system had to be converted to more modern database/telecommunications software.

These two conversion projects were initiated within the same year and took almost all staff resources until 1979. The easiest project was the conversion of the administrative systems to a new operating system. Staff worked on converting the necessary batch programs for several months. Then, over a weekend in October 1977, the online systems and the databases were all converted to the new operating system.

The cutover to the new MULES/II was accomplished in September 1978, with the development of over 46 separate functional enhancements to the MULES/I system.

System workloads, however, continued to increase at an annual rate of 20 percent. By July 1979, the monthly MULES transaction rate reached 1.6 million on the primary computer and the administrative systems on the backup computer accounted for another 1 million transactions per month. The increased workloads on both computers greatly restricted time for batch processing and

testing. The effort to maintain two separate online systems was also affecting staff efficiency and morale.

It became imperative to acquire a new computer with sufficient power to allow all online systems to be processed on one computer, thus freeing the backup computer to serve as a test and batch processing machine. After an extensive bid procedure, a new computer was acquired and installed in September 1979, in the new Highway Patrol Annex Building. The system consisted of an Amdahl 470V/5 mainframe with four megabytes of memory running OS/SVS, 24 IBM 3350 disk drives, eight IBM 3330 disk drives, and nine IBM 3420 tape drives. The facility was protected with a large, uninterruptible power supply (UPS) as well as a diesel generator. The UPS was eventually replaced in 2004, while the generator continues in service.

In December 1979, staff completed work on the merging of the two online systems that then ran on one computer. The MULES/II System was now operational with increased reliability and efficiency. Communications with systems at ALERT, REJIS, NCIC, and NLETS consisted of dedicated 4800 baud lines.

The MSHP staff continued to expand the functionality of MULES/II System services and networking to other state and local agency sites throughout the 1980s.

The MULES System is nationally recognized for the level of service provided to its users and for the high level of technology employed in its systems and regional ALERT and REJIS networks. It has been an exciting project, with a growing level of participation by smaller police agencies, prosecutors, and criminal justice agencies throughout the state.

The Statistical Analysis Center (SAC) was established in 1983. SAC is designed to provide research and information services to state agencies and local governments in the areas of traffic safety and criminal justice.

On May 28, 1986, Missouri became a member of NCIC III, an automated system to provide for the interstate exchange of criminal history record information.

A reorganization of divisions within the Patrol became effective March 1, 1987. In this reorganization, ISD was moved from the Support Services Bureau to report to the Assistant Superintendent's office.

A contract was awarded July 28, 1988, for the installation of an Automated Fingerprint Identification System (AFIS) at GHQ. The system became operational in 1989.

On March 8, 1990, Governor John Ashcroft officially announced to the citizens of Missouri the Highway Patrol's new AFIS. The new system, referred to as PRINTS (Police Rapid Identification Network Terminal System) was located in the Criminal Records Division.

MULES celebrated its 20th anniversary during the annual training conference in Jefferson City in October 1990.

ISD was moved from the assistant superintendent's office to the Criminal Investigation Bureau, effective November 1, 1991.

Dr. Bradley retired effective November 30, 1993. He was succeeded by Gerry Wethington as director of the division. Gerry served in this capacity until he took the position of chief information officer for the state of Missouri on October 1, 2000.

January 1, 1995 marked the beginning of a new sex offender registration program in Missouri, coordinated by the Criminal Records Division. The program requires sex offenders to report to the sheriff and chief of police of the jurisdiction in which the sex offender will reside. The Patrol maintains the central registry file for sex offenders, which can be accessed through MULES.

The rollout of Lotus Notes within the Patrol began in July 1995. The initial implementation was installed on a server running OS/2. The Patrol received $1.6 million through the Department of Justice's National Criminal History Improvement Program (NCHIP). The funding was used to automate criminal history records at all levels of the criminal justice system.

Like most organizations, the Patrol was engaged in a massive conversion related to the year 2000 (Y2K) date problem. This consumed virtually all ISD resources for a period of nearly three years (1997-2000). This was also the genesis of the MULES/III project, which promised greater functionality and efficiency for the next generation of software.

In 1997, the Patrol's information technology infrastructure changed dramatically. With the assistance of the Office of Information Technology and the Office of Administration's Division of Data Processing, the Patrol's entire mainframe computing environment was moved from the Patrol's Annex building to the state's consolidated data center. This consolidation occurred because it was projected to save tremendous amounts of money while providing the same or better service.

Also in September 1997, personal computers (PCs) were installed in all of the zone offices. This gave some basic computing capability to every road officer, including the ability to create reports, fill out forms, work on spreadsheets, and use e-mail. The PCs had a dial-up connection back to GHQ, which allowed some data sharing capability.

Learfield Communications began providing the Patrol with space on their website in 1999. At missourinet.com, members of the media access information about traffic crashes and Patrol news releases. Having this information available on the Internet dramatically reduces the number of media calls to each troop headquarters.

In 2000, a pilot project was begun to implement laptop computers in the road cars. These mobile computing devices (MCDs) were Panasonic ToughBook model CF-27s. Wireless connectivity was provided by a Sierra Wireless trunk mounted modem, using CDPD technology through Verizon. Initial funding came from a $1.75 million federal grant, processed through the COPS office.

After an extensive interview process, Mr. Cliff Gronauer was hired as the director of ISD on November 1, 2001, from his previous position with the Missouri House of Representatives. In early 2002, the full-scale implementation of MCDs to all road officers was initiated. Much of this funding came from an additional $4 million federal earmark. At about the same time, each zone office was upgraded from a dialup connection to a dedicated 56kb data circuit.

From 2002-2004, ISD employees devoted the majority of their time and funding to rebuilding the IT infrastructure. Virtually every component of the network was replaced, all servers were replaced with rack-mount models, all of the desktop and laptop computers were replaced, and even the printers were upgraded. New software was acquired that allowed technicians to troubleshoot problems remotely, dramatically decreasing the average downtime while improving the level of customer service.

In mid-2005, ISD implemented the Patrol's first voice over IP (VOIP) phone system, making themselves the guinea pigs. By utilizing the existing data network to carry voice phone traffic, it should ultimately prove to be a significant cost saving move. This technology will eventually be implemented throughout the Patrol.

Because the CDPD technology was going to be cut off at the end of 2005, the wireless service for all the MCDs was converted from Verizon to Cingular. Cingular was chosen because they had an existing contract with the state, and they could provide much greater coverage of the entire state than any of the other carriers.

In April 2006, a consulting contract was awarded to MTG to help the Patrol draft an RFP to purchase commercial off-the-shelf software to replace the existing records management, dispatch, mobile computing, reporting, message switching, and criminal history systems. We anticipate this phase of the project will take approximately a year, while the ultimate replacement of all those systems will take three to five years. Once completed, the Missouri State Highway Patrol will have the most advanced, modern computer systems in the country (if not the world).

In the summer 2006, the Patrol awarded a contract to implement digital cameras in all of the road cars. The project will allow the troopers to wirelessly download the video to the zone PCs automatically. The video will be immediately available for review, and can be copied to CD for playback by prosecutors, courts, etc.

The division completed the development of a new system to replace the old Arrest/Incident/Investigation System and tie the SHP-325 and supplements to the Incident Reporting System in 2006. The new system automates functions and integrates data within the Division of Drug & Crime Control. ISD supported the Patrol's Field Operations Bureau, Communications Division, and others in setting up, integrating, and testing video conferencing between Patrol troops and General Headquarters using the Patrol's existing data network.

Division members completed many significant enhancements to the existing Sex Offender Registry System including: ensuring address on spreadsheet is home address and adding a name search for aliases. Map display enhancements included an expanded disclaimer for non-mappable addresses, a hover balloon, additional map layers, adding a map icon to offender's results lists, and implementing dynamic geocoding.

Several MULES enhancements took place during 2006. Division members completed the incorporation of all necessary modifications to the MULES Order of Protection file facilitating an interface to VINE (Victim Information and Notification Everyday). Also completed was the process of taking current entries and modifies of Stolen Parts and Plates out of older technology. Previously, the Patrol's Access Integrity Unit had to manually perform a direct NCIC entry that was cumbersome due to the format NCIC requires the data to be sent. Finally, ISD completed a project to upgrade the legacy MULES/ Order of Protection (OOP) system to be compliant with NCIC. It was upgraded using a Violence Against Women Act (VAWA) grant to allow both ex parte and full adult orders to be entered electronically through the Office of State Courts (OSCA).

In 2006, a Laboratory Information Management System (LIMS) was designed and developed by the division, with consultation and assistance from the Crime Laboratory. This was a highly successful effort. The system is regarded as one of the most advanced currently in use by a state crime lab. It provides a completely automated flow from the acceptance of evidence, through processing, and the return of reports and materials. Support is in place for drugs, firearms, toxicology, DNA, fingerprints, and trace analysis investigations.

Also in 2006: Division members completed the implementation of a security camera system in the General Headquarters complex and at all troops.

In 2007, the Information Systems Division completed a new and improved Time and Attendance reporting system. The new system utilizes a user interface developed with WebSphere, and a DB2 data repository residing on an AIX server. This upgrade allowed the primary processing platform to change from a mainframe environment to a server-base architecture.

A major upgrade to the MSHP public website was undertaken in 2008. Among the new features are real-time arrest reports, online access to the Patrol News, an Amber Alert portal, online access to news releases, and a variety of MSHP brochures. The new enhancements make it possible to download and print most of this information.

The MSHP Statistical Analysis Center (SAC) developed and deployed several new reporting systems during 2007/2008. One of these is a geographic web-based system that displays fatal crashes through representation on a Missouri state map. Website features include query by crash type, crash severity, day of the week, contributing circumstance, time period, and geographic location such as troop, county, and city.

Early in 2009, the SAC completed a full redesign of the MSHP Sex Offender Website, with a new look and improved navigation. In addition, several

functions were added including offender photographs, alias name searches, and interactive map searches. Website users can select parameters such as county, city, month, or year to control statistics displayed in the tables.

Continuing the effort initiated with the 2006 award to MTG to develop RFP (request for proposal) acquisition documents to replace key MSHP operational systems, actions commenced in mid-2007 to publicly solicit for these products. The overall acquisition effort encompasses five components. These are: Computerized Criminal History (CCH), State Message Switch (SMS), Computer Aided Dispatch (CAD), Mobile Computing System (MCS), and Records Management System (RMS). On January 8, 2008, the first RFP (CCH) was announced and was subsequently awarded on November 10, 2008. RFPs for the other systems were announced and awarded in 2009. Work is now under way to install and deploy these applications. During 2010, the full scale effort commenced on all five components. Prototypes and test systems were developed and use to move toward the final objective. The year concluded with 80% of the project completed.