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This document is a rough draft beginning of the Strategic TSIS Plan for the five year period 2011-2015. It is published on www.SafeHomeAlabama.gov for the purpose of obtaining any comments that you might have for the purpose of its improvement. It is expected that the final version will be made available in the June 2011 time frame.

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DRAFT Traffic Safety Information Systems (TSIS) 2011-2015 Strategic Plan

Background and Problem Statement

Alabama's Traffic Safety Information System (TSIS) component includes all of the hardware, software and data needed to generate information that impacts either the frequency or the severity of traffic crashes. Just the definition of these various files and systems is an enormous project, and the problems involved in coordinating the inter-agency activities to support safety decision-making create serious issues in every state. The large number of agencies involved at both the state and local levels include a wide range of activities throughout the traffic safety community, including collection, editing, forwarding, data entry, processing and the distribution of generated information. More recently the impact of case management systems in addition to the crash case have come into the purview of the state's TSIS. Examples of these include the state's electronic citation (eCite), which begins with the issuance of an electronic citation and proceeds electronically through the court system to ultimately impact the driver history record. Alabama's Model Impaired Driver Access System (MIDAS) is another example, which intensively tracks alcohol and drug impairment cases from citation through treatment or incarceration.

These issues began to be addressed in Alabama when the National Highway Traffic Safety Administration (NHTSA) awarded Alabama a contract in July 1994 to coordinate and facilitate the creation of a strategic plan for traffic information systems within the state. The first step in this process was the performance of a Traffic Records Assessment (TRA) for the state of Alabama. The major result of the TRA was a set of over 50 recommendations for improving the traffic information system, which became the basis for the state's Strategic Plan. Two subsequent TRAs have been conducted for the state, the most recent being completed in February 2011. This chapter summary of the TSIS Strategic Plan will respond to recommendations from this most recent assessment.

The following are the key events that have driven the planning process over the past decade:

- The Alabama Traffic Information Systems Council (ATISC) was created in 1994 as a prerequisite to obtaining funding from the National Highway Traffic Safety Administration

(NHTSA) for the original Strategic Planning project.

- The Alabama Traffic Records and Safety Committee (ATRSC) was formed and had its first meeting on May 3, 2000. It commissioned the update to the Traffic Records Assessment and the Strategic Plan.
- The Alabama Traffic Records Coordinating Committee (ATRCC) was organized with a membership to include policy level representatives of the key safety data systems within the state. Membership included the data managers, data collectors, and major data users for each of the following system components: Traffic Crash, Roadway Inventory, Citation/Adjudication, EMS/Injury Control, Driver License/Driver History, and Vehicle Registration and had its first meeting on March 28, 2006. The State TRCC prescribed by Section 408 should have the authority of overseeing the planning and improvement of the key safety data systems within the state. The State TRCC will be expected to approve the strategic plan and implementation plan on an annual basis.
- A Traffic Safety Information System (TSIS) five year plan was developed in 2006 and updated in 2007. With slight modifications, that planning document has provided guidance over the past five years on all TSIS efforts. That plan was forward looking and has served quite well in bringing into existence several new and revolutionary systems, including CARE ADVANCE (dashboard interfaces), eCite and eCrash.
- The five-year plan given in this chapter was developed after the February 2011 Traffic Records Assessment conducted by NHTSA. It reflects their recommendations but goes on to specify definitive actions that not only address the issues cited but build upon the many commendations that were made in that document.

Summary of the TSIS Planning Process

TSIS coordination activities are required in the areas of crash records, emergency response and other medical records, traffic citations, roadway characteristics (construction, maintenance, traffic volumes, etc.), driver history, vehicle history and other demographic data. The coordination of this planning process is a microcosm of the overall ongoing coordination that is required to move the state ahead effectively in applying information technology to its transportation systems. Through a series of meetings, individual efforts and contacts, information was submitted and synthesized into the plan. It is difficult to summarize such a comprehensive plan in a nutshell. However, the following points summarize the anticipated advances that will be brought about by implementing the actions recommended by these planning activities, and they provide a *vision* that defines the goals that the implementation of this plan will realize over the next five years:

- All police and EMS vehicles (both state and local) will be equipped with laptops or other equipment that will enable the direct entry and retrieval of all relevant records (e.g., including crashes, citation, criminal and medical records).
- Global Positioning System (GPS) and Geographical Information Systems (GIS) technologies will enable officers and EMS personnel to automatically enter accurate locations directly into their respective crash, citation, EMS run and other records, and to optimally map out quickest routes and alternative routes to emergencies around congestion.

- Bar coding and other electronic encryption on drivers' licenses, vehicle registrations and other identification cards will enable accurate and complete driver and registration data to be entered directly into the all records that consume these data.
- Records will be immediately available at the local levels, and software will be provided to enable them to obtain any information to define problem locations, to perform problem identifications, and to formulate improved countermeasures on a continuous basis.
- All UTC and crash records will be automatically uploaded to the central databases, saving considerable data entry costs and resulting in totally complete and consistent records that are readily available for analysis and case management.
- A centralized index of all roadway data will exist that will enable future users of these data to access the data needed. GIS will enable the roadway characteristics data to be merged with crash data to provide the basis for surfacing those roadway characteristics that have the maximum potential for crash frequency and severity reduction.
- The FHWA Highway Safety Manual (HSM) and Interactive Highway Safety Design Manual (IHSDM), along with the AASHTO Safety Analyst systems, will be implemented to the extent that they are seen to improve both (1) the safety of overall roadway designs, and (2) the ability of the current Cost-benefit Optimization for the Reduction of Roadway Caused Tragedies (CORRECT) to produce roadway improvements that produce the maximum safety benefits. This will necessitate that roadway characteristics are made available to roadway designers and high crash location investigation teams as required by the systems and manuals listed above.
- Case number cross references will enable the merging of crash and medical/EMS data to enable optimal deployment of EMS resources and the development of new countermeasures. In the interim key data elements in the EMSIS and Trauma data systems will be used to merge these data.
- Internet dashboard portals that include both analytical and GIS capabilities that will enable any and all of this information to be viewed on virtually any computer in use. This increased visualization in map form will enable decision-makers to better understand the true nature of problems, especially those which go beyond solutions at point locations and involve comparative analysis.
- A unified approach to court records will exist such that the violation and criminal histories will be available to all courts throughout the state in real time.
- All traffic safety efforts within the state will be recorded for and published in a common web site that will provide a reference back to the various web sites of the agencies and service organizations that are performing these activities. Called SafeHomeAlabama.gov, this web site will be kept current by efforts of members of all of the participating organizations.

While this scenario might seem futuristic, *all of the technology needed to implement it is currently available.* This plan will enable this technology to be rolled out throughout Alabama in a systematic way, while taking advantage of the successful pilots in Alabama and throughout the country.

It is impossible to make such major changes without significant impacts on current operations. Thus, it is essential that these changes be phased in over the next five years to minimize this downside. This plan is the first step in that direction. It should not be considered a static end in itself. Rather, it is a working document that can and should be updated on a regular basis and especially as progress is made. Some of the items planned are already in the process of being implemented, and their mention in this plan is to see that these items are brought to completion.

The following gives a summary of the plan according to the six components into which they were organized:

- *Citation and Adjudication Component* includes the extension and roll out of the electronic citation, a proposed DUI defendant intake system, a method for moving digital information directly to the field officers using available cell phones, a statewide Internet-based incident reporting network, and technological advances to make the traffic citation reporting and processing system totally paperless.
- *Crash Component* includes the complete roll-out of eCrash, further integration of GIS capabilities into eCrash and CARE, the generation of an updated Crash Facts Book, and the development of the Alabama Dashboards for Visualization Analysis and Coordinated Enforcement (ADVANCE) to produce a more effective interface to deliver CARE-generated information. This will also require a second version of eCrash to be developed based on the availability of automated location systems and feedback as to improvements needed to make the eCrash data entry system more effective and improve data quality.
- *Driver Component* calls for more effective driver licensing information (including pictures) to be distributed to the field through the extremely successful Law Enforcement Tactical System (LETS). This will require a more effective Driver History database that is updated automatically by eCrash and eCite.
- *EMS-Medical Component* includes continued support for the implementation of the National Emergency Medical Services Information System (NEMSIS), an ambulance stationing research project, the development of a spinal injury database, and a pilot project to reduce EMS delay time to the scene of crashes with a moving map display. This will be accomplished by the implementation of the Mobile Officers' Virtual Environment (MOVE) in EMS vehicles and the processing of trauma center and EMS run time data through CARE and ADVANCE.
- The *Roadway Component* involves a wide diversity of projects in support of the State's IHSDM/HSM/SA initiatives. This will include the integration of roadway features into CARE and the integration of Crash Modification Factors (CMFs) into the CORRECT system using the facilities of the CMF Clearinghouse. To effectively locate crashes on the roadway, it is essential that ALDOT complete their various projects along these lines so that they can be integrated into eCrash and used by CARE to fully utilize its GIS displays capabilities.
- *Vehicle Component* plans include a statewide distribution network that will make vehicle information immediately available to all consumers of these data in the state, including the LETS system.

- An *Integration Component* was added to the other functionally oriented categories to consider those projects that transcend and have the goal of integrating several databases. A major effort is proposed to populate the current Safe Home Alabama web portal so that it will integrate all of the information generated by all agencies and present it in one unified source to the traffic safety community. General TSIS management activities are also included in this component.

The TSIS Strategic Plan, which is summarized in the chapter, is a mechanism to attain the coordination that is essential to the goal of optimal traffic safety resource allocation. It is a *working document* that can and should be continuously updated and adapted to system development needs as they come into better focus. Its immediate objective is to document a plan for developing those technological advances that can be implemented within Alabama to best advance the cause of traffic safety.

With such a large complex system involving literally hundreds of data sources and thousands of data elements administered by dozens (but involving hundreds of different) agencies, one might ask if coordination is even possible. The answer depends entirely upon the willingness of each of the involved individuals to put aside departmental interests in order to attain the goal of maximizing the safety interests of the state's roadway users. To this end, the Alabama Traffic Records Coordinating Committee (TRCC) has the responsibility to coordinate the many interdepartmental development efforts that are expected to be forthcoming from this plan.

The following agencies participate in TRCC and share coordination responsibilities for traffic safety and their corresponding information systems:

- Alabama Administrative Office of Courts has coordination responsibilities for all of the courts, which involves violation, adjudication, and criminal (including driver) histories.
- Alabama Department of Public Safety, which is responsible for the collection of violation and crash data, and is the custodian of several databases in this regard;
- Alabama Department of Transportation, which is responsible for building and maintaining safe roadways, and has also recently assumed responsible by federal legislation for a wide variety of countermeasures that are not roadway related;
- Alabama Department of Public Health, which has jurisdiction over all Emergency Medical Services, hospital, and trauma registry data;
- Alabama Department of Revenue, which handles the vehicle registration functions;
- Local police, departments of transportation, hospitals and emergency services;
- National Highway Safety Administration (NHTSA), which has had general responsibility for driver and vehicle countermeasures;
- Federal Highway Administration, which has in the past been mainly focused on roadway engineering countermeasures, but has recently been given flexibility by federal legislation for the distribution of other countermeasure funding as well; and
- Federal Motor Carriers Safety Administration, which has interests in commercial vehicle and driver safety.

The purpose of listing these agencies is to demonstrate the immense problem involved in coordinating the development of an effective statewide traffic safety information system. Coordination is quite difficult even within many of the larger of these state departments. In the past there were very few formal inter-departmental procedures established to organize and operate the data systems. Most of the essential interactions between agencies have been handled with informal relationships between individuals within the departments who had common traffic safety information interests. Little, if any, of this interaction has been dedicated to the design and development of systems for the future. Also, diminishing resources have tended to put a strain on the informal relationships that have served the state so well in the past.

Planned Projects

The following is a brief statement of the projects planned within each of the six TSIS component areas (overall TSIS management is considered within the Integration Component):

- Citation and Adjudication Component
 - Completion of the eCite roll-out. This will result in a total roll-out of eCite and elimination of all paper citations statewide.
 - DPS Motor Carrier integration with National FMCSA initiatives. This project will support the DPS Motor Carriers unit in bringing about in-state regulation of motor carriers and the integration of these systems with the National FMCSA ongoing initiatives. This includes at least five major software developments as given in the FMCSA documentation.
 - Full implementation of the *Virtual Citation*. The development of the technology infrastructure necessary to support the full implementation of the recently passed legislation by the Alabama legislature that allows for electronic citations to serve as an “alternative approach” to tickets completed using the Alabama Uniform Traffic Citation form, including the development of the technology to print the notice to appear, as well as the technology to support electronic swearing.
 - Handheld software development. Since it will no longer be necessary to print the full citation form, a project is necessary to create citations using PDA/tablet/handheld technologies, which will lead to a major integration of the law enforcement and the courts, ultimately leading to a paperless information flow through the system.

- Crash Component
 - Implementation of the ALDOT GIS projects. This is essential so that these project results (and/or other alternative approaches) can be applied to upgrade eCrash to include the ability of officers to obtain *all* required location data (coordinates, node numbers, link numbers, road names, road codes and milepoints) by a single click on a map available in the officer’s vehicle.

- Map-Click project. This is a software system that will use as input available GIS-smart maps that have layers for coordinates, node numbers, link numbers, road names, road codes and milepoints. The reporting officer (or other data collector) will use existing GPS (if available) to obtain the general location of the crash (or any other event or object) on the map. The data collector will then expand the map so that a precise location can be selected. Clicking on that spot on the map will put all of the data into the record – the recording officer might check this data for general reasonableness, but generally will not be required to enter any other data into the record. As long as the *same maps* are used to generate GIS outputs as are used in the underlying Map-Click data collection perfect accuracy is not required, and thus it is not necessary for perfect maps to be generated in order for this system to work. It is, however, necessary that all of the layers of data be present because if this system does not generate all of the required data it will not be accepted by the law enforcement community and will not be of much value since its use will not be universal.
- Version 2 of eCrash. This will integrate the “Map-Click” capability as well as making major upgrades throughout the eCrash reporting system. A list of these upgrades is currently being assembled.
- CARE upgrades. These will augment CARE’s current GIS map-generation capabilities with spatial and attribute filter dropdowns, the ability to export these filters and the ability to create templates for the various types of printers that might be employed in map production, including the consideration of the security and confidentiality issues that need to be resolved as this technology is deployed on web-based systems for engineering, law enforcement and other uses.
- CARE scripting capability. This will enable standard reports to be easily designed and then run from CARE. It will essentially “capture” a series of CARE commands and save them into a program. When a user wants to reproduce that functionality, this will be available by means of entering a command and parameters to direct the saved script.
- Upgrade to the Crash Facts document. The Alabama Crash Facts Book was designed in the 1984 time frame, right after a change in the crash reporting form. There are two needs that must be addressed at this time: (1) enabling the generation of this information on a routine basis directly out of CARE, and (2) preparing for the change in the crash reporting form that will accompany the implementation of the e-crash. This project will accomplish both by putting into CARE a system by which a series of steps used to generate information can be incorporated into a script and re-used. This will insure that the results are uniform and consistent from year to year, and that the information is totally up-gradable as new data formats are applied.
- Final roll-out of eCrash. The eCrash system was a major project that has obvious positive effects on timeliness, consistency, completeness, uniformity (including MMUCC compatibility), and efficiency of the state’s crash reporting. It is imperative that the entire state either use eCrash or submit eCrash compatible data electronically so that the full utility of these innovations can be achieved.

- Driver Component
 - DUI driver data intake and reporting system. The eCite system uses MOVE to automatically query LETS to determine if the offender has a criminal record, outstanding warrants or protection orders, or is otherwise dangerous to the arresting officer (e.g., has offenses involving firearms). This project will enlarge this capability to touch the MIDAS system for DUI information to provide a final link back to the field so that the officer can determine if the individual has a history of DUI offenses. It will also provide the linkage from the officer to MIDAS to initiate or augment a current case record. DUI (drugs and alcohol) accounts for about 40% of fatalities in the state of Alabama, and this is seen as an information tool that will be a major deterrent to DUI.
 - Incident data availability. Comparable to the DUI driver data intake and reporting system discussed above, a system is needed to enable officers and law enforcement agencies to obtain full access to the ULTRA system. ULTRA is a statewide initiative sponsored by ACJIC for recording, summarizing and reporting incidents before and after they arise to the status of resulting in arrests.
 - LETS upgrades for traffic safety. The Law Enforcement Tactical System (LETS) project has without question been the most successful law enforcement IT project conducted within Alabama in the past decade. This project will take advantage of this momentum for traffic safety by integrating into LETS provisions by which serial traffic violators can easily be identified either directly by officers with networked laptops or PDAs, or by dispatchers as the officers check in. Electronic citation information will enable officers to know if a driver has been given a recent warning or related citation. LETS has also been quite successfully used at DUI and safety belt enforcement check stops. Close to \$1 million has already been invested into LETS; this allocation will be leveraged to assure that traffic safety applications obtain full use of the system.

- EMS-Medical Component
 - National Emergency Medical Services Information System (NEMSIS). This project involves further development and continued implementation of the new Emergency Medical Service Information System (EMSIS) software. The software will assure continued NEMSIS compliance.
 - EMS-Trauma data integration through CARE. A prototype system for the EMSIS data has proven its value in providing valuable information from this EMS run database. To integrate trauma data into this system a two-phased approach will be performed: (1) the refinement of the current CARE/EMSIS system and the incorporation of trauma data under CARE, and (2) the integration of these datasets into a third dataset using key variables for case matching. Consideration for the best match methods in Phase 2 will be an integral part of the first phase.
 - Alabama CODES project. The NHTSA Crash Outcome Data Evaluation System (CODES) will be used as a model in moving forward toward a linkage of state-wide

crash, EMS, or trauma registry for a limited pilot test in Alabama. This will enable the current CODES project initiative to expand their coverage and become much more effective in the studies that are being performed.

- Roadway Component
 - Statewide roadway data inventory. The state (including both ALDOT and many local jurisdictions) has spent millions of dollars on the creation and storage of roadway data. Yet, when a preliminary analysis was performed to determine the availability of the data for IHSDM/HSM implementation, it was found that there is no central repository of these data, nor is there even a centralized data dictionary so that it could be determined which data elements even exist. A critical first step is to create such a data dictionary that would list the data elements, where they are created, who is responsible for their storage and update, and the current use to which they are being employed. Without such a document any further data gathering might be found to be unnecessarily redundant, and there would be no hope that the current data will ever be fully employed in the IHSDM/HSM efforts. While this effort should begin with the data that exists for state, federal and Interstate (i.e., mileposted) routes, it should not be limited to these routes, recognizing that in 2009 about 46% of fatalities occurred on county roads and city streets.
 - Link-Node coordinates table. In order for the state to move from its current link-node system to a coordinate-based system it is essential that the coordinates of all current nodes be known and in a database so that the appropriate conversion can be made. The transition to a coordinate-based system is expected to occur with the roll-out of the next version of e-crash, and it was referenced above under the Map-Click project.
 - Geo-referenced county maps. This is further related to the conversion from a link-node crash location reporting system to one based on GIS coordinates. The centerlines for all county roadways must be obtained in order to make the reporting by coordinates effective for the county roadway systems. It is important to note that county roadways are the most over-represented for fatal crashes. All of the rationale for the link-node conversion applies to this project, although it is questionable that it needs to be totally completed prior to the implementation of Map-Click (which does not require perfect center-line accuracy).
 - Inventory of statewide GIS activities, databases and capabilities. Similar to the roadway data inventory described above, a review and documentation of those GIS efforts statewide is necessary to further coordinate and advance the state in this regard. It is recognized that the number and scope of statewide efforts are immense and most past efforts to coordinate them have not been successful. For this reason this inventory should only concentrate on the data and efforts as they impact traffic safety, recognizing that very few GIS efforts have been initiated for this purpose. Nevertheless, many of these efforts can contribute heavily to traffic safety and these should be included in this inventory.
 - IHSDM/HSM implementation project. This project is currently in its preliminary

investigation stages in order to formulate a plan for the implementation of IHSDM, HSM, and Safety Analyst. It is expected that over the next five years that these systems will be an integral part of the design and roadway improvement functions throughout the state.

- Vehicle Component
 - Statewide vehicle data network. A prototype project has been completed that if fully rolled out will reduce the time to receive vehicle registration updates from its current average of 45 days to under 72 hours. Accurate and timely vehicle information is essential to law enforcement officers engaged in traffic safety. This project will entail the training and other support efforts needed to fully roll out this software.
 - Vehicle registration cards. A vehicle registration card is as important as a license card when it comes to collecting accurate data. Currently the drivers' license card is swiped to provide data for eCite and eCrash. A vehicle registration card would pay its way very quickly in terms of saved officer time and nearly perfect data accuracy, and it would go a long way toward countering vehicle theft.
 - Vehicle data LETS integration. This project would take the current improved and timely data that is being obtained from the statewide vehicle data network and assure that it is available to all officers in the field on a time basis.

- Integration Component – this component contains the management elements essential to maintaining and effective integrated TSIS effort.
 - SafeHomeAlabama.gov. This web portal includes all state agencies, the legislature's newly re-constituted State Safety Coordinating Committee, and all known service groups. Its goal is to be totally comprehensive in keeping the entire traffic safety community aware of the most recent developments in traffic safety both in Alabama and Nationally. Much of the information generated will be directly obtained from the TSIS given in the plan. The rationale behind this web portal is that it is of no use to gather data unless it can be translated into useful information for countermeasure development. This is the first formal statewide system for distributing traffic safety information. While a prototype of the portal is currently in place and being updated by about 30 SHA Associates, the site needs further enhancement and continued effort to see that it is maintained with up-to-date information.
 - TSIS Coordinator. The state has never had a formal full-time TSIS coordinator. Example of the TSIS Coordinator responsibilities include: (1) Administer the allocation of the Section 408 funds, including the performance of full effectiveness and administrative evaluations of all activities within the TSIS Strategic plan, whether Section 408-supported or not; (2) Generally promote and be a champion for the integration of data and information systems among all of the involved departments; (3) Survey nationally TSIS innovations and make them known to the respective subject matter experts within Alabama; (4) Update the TSIS Strategic

Plan on at least a semi-annual basis; (5) Be the executive secretary and facilitate the activities of the TRCC; and (6) Assure the continued enhancement and maintenance of information within SafeHomeAlabama.gov. In the absence of a TSIS Coordinator the State Highway Safety Plan (SHSP) Steering Committee will provide this function to the extent possible.