North Carolina
Government Data Analytics Center
Program

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Executive Summary

Since 2007, North Carolina state government's data integration and business intelligence efforts have been led and managed by the Office of the State Controller (OSC). During this time, the program has developed, implemented and maintained a variety of program efforts ranging from early support of agency projects, to the development and statewide deployment of an integrated criminal justice system, to current efforts with fraud, waste and compliance analytics as well as general program reporting and analytics.

Session Law 2012-142, HB 950, expanded the State's current data integration and business intelligence initiatives by creating the OSC Government Business Intelligence Competency Center (GBICC) to manage the State's enterprise data integration and business analytics efforts. Session Law 2013-360, SB 402, amended Article 9 of Chapter 143B and codified the data integration and business intelligence, changed the name of the program to the Government Data Analytics Center (GDAC), and authorized recurring administrative appropriations. Session Law 2013-360, SB 402, also directed the transfer of the GDAC program to the Office of the State Chief Information Officer (SCIO) effective July 1, 2104. OSC and the GDAC program staff worked collaboratively with the SCIO to support the development of a transition plan for the transfer.

The GDAC manages enterprise program activities as well as the development and support of analytics projects and systems including the North Carolina Financial Accountability and Compliance Technology System (NC FACTS) fraud, waste and improper payment detection project, the Criminal Justice Law Enforcement Automated Data Services (CJLEADS) criminal justice system, and state reporting and analytics efforts. Consistent with OSC's past data integration efforts which have been "scoped to success," the GDAC has had a targeted focus and has been incrementally expanding the scope of applications as expertise and capacity grows. As the GDAC enterprise efforts have matured, the program has learned that analytic efforts cross specific project areas. As a result, the GDAC is in the process of reorganizing its staff and operations to better support enterprise efforts. The GDAC will consist of three program areas:

- GDAC Program Management and Business Services
- CJLEADS Operations and GDAC Technical Environment
- GDAC Solution Development

The major accomplishments for the last quarter include:

GDAC Program Management and Business Services

- Execution and expansion of new and existing data sharing agreements
- Preparation of business operations for NC FACTS Release 1
- Continued CJLEADS business services

CJLEADS Operations and GDAC Technical Environment

- Continued CJLEADS Operations
- Completion of CJLEADS database upgrade to Oracle Exadata, resulting in an average 60% improvement in database performance
- Continuing development efforts for Release 10 of CJLEADS as well as support for NC Sheriffs' Association Pistol Purchase Permit Revocation reporting and other legislatively mandated programs
- Implemented technical infrastructure for GDAC including development, test, and production environments for the user administration utility and data analysis and reporting environments
- Expanded data storage capacity
- Expanded secure terminal server access for data analysis and testing efforts
- Migrated GDAC data to Oracle Exadata
- Implemented key GDAC security and compliance component

GDAC Solutions – Fraud and Compliance Alerts (NC FACTS)

- Finalizing NC FACTS Release 1 - target deployment December 2013
    - The Department of Commerce – Division of Employment Security – unemployment insurance (UI) wage and tax analysis and alerts
    - Secretary of State Corporation Network Link Analysis
- Finalizing NC FACTS Release 1.1 – target deployment January 2014
    - The Department of Commerce – Division of Employment Security – unemployment insurance (UI) claims and benefit analysis and alerts
- Developing NC Industrial Commission Workers' Compensation Insurance Compliance alerts - target deployment Q1 2014
- Developing State Health Plan of North Carolina (SHPNC) health claims, membership and pharmacy analysis – target deployment Q2 2014

GDAC Solutions – Reporting and Analytics

- Finalizing P-card Reporting to be included in Release 1 – target deployment November 2013
- Completed interim State Health Plan Analytics Repository migration with final migration to GDAC production environment target deployment December 2013

This report provides detailed status on the GDAC activities as well challenges, financials, and future efforts.

I. GDAC Background

The Office of the State Controller has led and managed the North Carolina data integration and business intelligence initiative since its inception in 2007. Following the Building Enterprise Access for NC's Core Operation Needs (BEACON) Strategic Plan for Statewide Data Integration, the program has provided education on the value and capabilities of an enterprise analytics program, established governance and security policy and procedures, developed enterprise solutions including CJLEADS and NC FACTS, and provided business operations for the enterprise initiatives.

Session Law 2012-142, HB 950, expanded the State's existing data integration and business intelligence initiatives by creating the OSC Government Business Intelligence Competency Center (GBICC) to manage the State's enterprise data integration and business analytics efforts. Session Law 2013-360, SB 402, amended Article 9 of Chapter 143B, codified the data integration and business intelligence, changed the name of the program to the Government Data Analytics Center (GDAC), and provided recurring operational funding. The GDAC manages enterprise program activities as well as the development and support of analytics projects and systems including the North Carolina Financial Accountability and Compliance Technology System (NC FACTS) fraud, waste and improper payment detection project, the Criminal Justice Law Enforcement Automated Data Services (CJLEADS) criminal justice system, and state reporting and analytics efforts.

Session Law 2013-360, SB 402, also directed the transfer of the GDAC program to the Office of the State Chief Information Officer (SCIO) effective July 1, 2104. OSC and the GDAC program staff have worked collaboratively with the SCIO to support the development of a transition plan for the program.

To obtain further information about business intelligence, the GDAC vision and program requirements, please see the February and June 2013 North Carolina Government Business Intelligence Competency Center Program Reports located at
http://www.osc.nc.gov/GDAC/GDAC_Feb_2013_Legislative_Report.pdf
http://www.osc.nc.gov/gdac/gdac_June_2013_Legislative_Report.pdf

II. GDAC Major Accomplishments

GDAC resources have focused their efforts this quarter on completing the CJLEADS database migration and preparing for CJLEADS Release 10. In addition, activities have included finalizing technical and functional components in preparation for the first production release of NC FACTS and the GDAC Reporting in the 4th quarter of 2013. The initial NC FACTS/GDAC implementation will lay the foundation upon which all subsequent releases will be built. More detail about these activities is provided in the corresponding sections of this document.

GDAC accomplishments include:

GDAC Program Management and Business Services

- Executed or amended Data Access and Usage Agreements
  - Department of Transportation, Division of Motor Vehicles (DMV) to allow for the full SSN to be provided for data matching purposes per new legislation
  - Division of Employment Security (DES) and NC Industrial Commission (NCIC) to allow for cross matching of DES and NCIC data for unemployment insurance and workers' compensation insurance analysis

- Initiated preliminary procedures for user administration and training for the first NC FACTS release

- Continued CJLEADS end user and user administration training and annual audit activities

CJLEADS Operations and GDAC Technical Environment

- CJLEADS Operations
  - Completed the CJLEADS database migration from Asterdata to Oracle on July 31, 2013 as Release 9.3
    - Reduced extract, transform and load (ETL) of batch data sources from an average of 22-24 hours to a new average of 10-11 hours post Oracle migration
    - Improved performance in response time for data inquiries and reporting functions, from an average database calls of 5.1 seconds using Aster to an average of 1.3 seconds in the Oracle
  - Continued development efforts for Release 10
  - Began working on efforts to support new statutory requirements

- GDAC Technical Environment
  - Implemented NCSEAT Test, Development and Production environment
  - Implemented GDAC terminal server
  - Implemented GDAC Test, Development and Production environment
  - Added 6.3TB of storage
  - Migrated GDAC environment to Oracle Exadata

- Security and Compliance
  - Integrated NCSEAT application tool with NCID
  - Implemented NCSEAT production
  - Integrated NCSEAT with NC FACTS to provide user access and role based security
  - Completed DES security role definition in NCSEAT for NC FACTS

- Integrated NCSEAT with GDAC Reporting tools to provide user access and role based security
- Completed DES and Pcard security role definition in NCSEAT for GDAC Reporting
- Completed compliance review of data within the GDAC and redacted or removed any sensitive or confidential data not needed for matching or analytics
- Established Oracle Vault to capture a log files associated with records accessed for auditing purposes

GDAC Solutions – Fraud and Compliance Alerts (NC FACTS)

- The Department of Commerce - Division of Employment Security – unemployment insurance (UI) analysis and alerts
  - Completed "quick hit" analysis and analytic model design and development
  - UI Findings to date:
    - Undocumented Succession - employers moving employees to another company in order to avoid taxes
      - Alerts Identified: 335 cases
      - Results: 12 cases analyzed total of $1,566,299.57
    - Fictitious Business- Isolation Alerts - fictitious companies established, claimants draw unemployment based upon wages from the fictitious company
      - Approximately 90 cases shared
      - Alerts Identified: 15 cases
      - Claimants involved: 169 claimants
      - Results: 5 cases analyzed
      - Paid to date: $228,523.00 in UI claims
      - Potential: $838,017.00 if not stopped
    - Claimants incarcerated in local jails:
      - Claimants involved: 30 claimants
    - Probation or Parole absconders receiving Unemployment
      - 141 matches found on 12/17/2012
  - Finalized DES data extracts for use in the NC FACTS analytics
  - Developed DES functional and data ETL programs
  - Integrated analytical models into the NC FACTS tools
  - Tailored SAS Fraud Framework (SFF) screens to meet DES users' business specifications and work flow
  - Completed unemployment tax alerts development and started Quality Assurance (QA) testing for planned implementation November 2013
  - Conducting User Acceptance Testing (UAT) in late October 2013
  - Finalizing NC FACTS unemployment tax unemployment claimant benefits alert generation for planned implementation date in January 2014

- NC Industrial Commission Workers' Compensation Insurance Compliance
  - Researched data quality issues by identifying data standards issues that cross agency lines – fulfilling GDAC statutory requirements and NCIC business needs
    - Integrated DES and SOS data providing evidence of business activity and number of employees to significantly improve the identification of viable alerts for NCIC compliance efforts
      - Initial false positive rate for compliance alerts was 75%, with nearly 30% being closed businesses, 35% being exempt from the law, and 10% having coverage policies in place
      - 25% of alerts were actual possible non-compliance issues
      - Identification of specific additional data items to further reduce false positive rate will provide NCIC with clear action plan for negotiating for that information
      - Identification of business processes that limit utility of specific data elements will improve quality of results, reduce false positives, and make alerts more efficient
  - Reviewed a small sample of initial "quick hits" to support the NCIC's compliance and enforcement mission
    - 18% of companies that did not have coverage (according to the alerts) have since renewed, based on investigator contact as part of research effort

- Secretary of State Corporation Network Link Analysis
  - Completed analytic design and development currently in the testing and Quality Assurance (QA) phase
  - Planned implementation is December 2013

- State Health Plan of North Carolina (SHPNC)
  - Transformed health claims, membership and pharmacy data to develop health care alerts
  - Completed data analysis and integrated the data into SAS Fraud Framework (SFF) standard health care analytic models
  - Developing "quick hit" analysis
  - Completed a review of standard member related alert scenarios with SHPNC identifying those scenarios that are of interest. Will provide initial results for feedback and refinement of alerts scenarios to meet the Plan's business objectives.
  - Planned first release early 2nd quarter 2014.

- Department of State Treasurer (DST) Retirement Division
  - Prioritized retirement business objectives and needs.
  - Delayed project start due to DST resource constraints – will meet again in January 2014 to develop a project plan and schedule.

- Department of Transportation – Division of Motor Vehicles
    - Integrated DMV vehicle and driver information into the GDAC environment for future analytics
    - Updated the DMV data extract to include the full SSN in accordance with the law

GDAC Solutions – Reporting and Analytics

- P-card Reporting
    - Integrated NCAS, BEACON, and Bank of America transaction data to allow a combined view of the card holders expenditures per administrative agency
    - Developed five reports to support P-card Administrators with the management and internal control of P-card expenditures

- State Health Plan Analytics Repository Migration
    - Migrated the SHPNC analytics repository to the GDAC environment to resolve significant technical issues and save money
        - Reduced time to run analytic reports from 12 hours to less than one hour.
        - Eliminated software license costs estimated at over $91,000.
        - Reduced costs associated with server space and maintenance of a separate data repository
        - Developed a single data ETL to support both SHPNC fraud alerts and reporting and analytics

III. GDAC Program Management and Business Operations

The vision for the GDAC is to transform existing data assets into an information utility for the State's policy and operational leaders for their use in making program investment decisions, managing resources, and improving financial programs, budgets, and results. Throughout the nation the emphasis on leveraging data assets can be seen in the growing number of organizations that are appointing Chief Data Officers to manage these initiatives.

Governance, enterprise support and standardization become key areas of focus in establishing an enterprise approach to data sharing and analytics. While technology plays a key role in effective data analytics, the success of an enterprise initiative depends upon State stakeholders who are engaged and who recognize that the return on investment can be dollars saved, future cost avoidances, or that outcomes achieved through operational efficiencies or enhanced compliance. Strong communications and the ability to manage change and make the initiative relevant to the stakeholders require significant effort to ensure the advantages of the program make clear "what's in it for them" to the agencies and end users.

A. Program Management

Project Governance

A key function of the GDAC is the management of data sharing and integration initiatives, including identifying opportunities where data sharing and integration can generate greater efficiencies and improved service delivery by State agencies, institutions and departments. With limited resources and funding, the GDAC works with agencies to define their analytic needs, determine access to required data sources, and scope the level of effort to support the analytics development. As more organizations request the assistance of the GDAC, prioritization of these needs will be based on level of effort and cost, return on investment, and available resources.

The GDAC team is focused on understanding the State's enterprise data analytics needs as well as identifying and recognizing the value of existing data integration solutions. To maximize the value of the State's resources, the GDAC must evaluate both opportunities to integrate data sources into the GDAC for analytics as well as opportunities to interface with existing integration and warehousing solutions. For example, the P20W longitudinal study is progressing toward a data broker solution that will allow access to various sources of education information for analytic purposes. The GDAC is working closely with the education and workforce data studies to understand how GDAC data sources can support P20W longitudinal studies, while potentially accessing data from the P20W solution for other enterprise needs.

To ensure the long-term success of the program, the GDAC must ensure that business intelligence efforts throughout the State meet the State's established standards. This includes:

- Guidelines and procedures for collaboration work and oversight of business intelligence efforts throughout the State
- Project prioritization guidelines to determine the most effective allocation of GDAC and other business intelligence resources
- Standardized methods to develop business case justification, cost/benefit analysis and program metrics, and standardized approaches for conducting on-going impact assessments
- Regular oversight and review of State licensing and BI capabilities to reduce redundancy, ensure consistency in standards and technology and to achieve economies of scale
- Understanding of other similar BI environments developed for specific purposes, but whose applicability may be broader than originally envisioned.

Data Governance

Enterprise data sharing and analytics, or making data readily available to those who need it to make business decisions, raises questions related to data security, expectation of privacy and control. The GDAC has spent considerable resources, time and effort on establishing robust, expansive data governance. Data sharing agreements outline data that can be shared, how it can be used and who can use it. Significant security protocols have been established to protect the data from any unauthorized use and auditing capabilities have been implemented to track and control access to the data. Governance also sets clear expectations for data content, quality, and standards.

The GDAC is developing a comprehensive master data management tool to document the State's data sources and definitions, as well as any quality issues associated with the data in terms of accuracy, currency, and completeness. Evaluating a data source at the enterprise level with varying business perspectives can point out these types of data quality concerns. Based on this knowledge, the GDAC can work with the data source agency to identify ways to improve and expand the capture of quality data to support more accurate analysis and decisions.

1. Enterprise Reporting Repository

The enterprise GDAC program provides a central repository to store, manage and analyze a broad array of information. The central repository reduces duplicative data integration design and development work, data storage and repetitive maintenance and support. Information incorporated into the repository for one purpose can be leveraged to support a variety of analytics. For example, the Division of Employment Security (DES) data, incorporated into the GDAC repository for NC FACTS fraud analytics, coupled with data from the North Carolina Industrial Commission (NCIC) in accordance with data sharing agreements, can now be used to support worker's compensation insurance compliance analysis.

The enterprise repository provides a shared environment with common security, user access, improved usability and consistent look and feel. A shared repository also allows for shared business services including training, help desk support and user administration.

While there are benefits of a shared repository, the enterprise nature of the repository will create additional complexity in the areas governance, security and cost allocation.

The following table provides a list of all data sources currently integrated into the enterprise repository.

GBICC – Integrated Data Sources

NCAS	BEACON	Division of Employment Security
Purchasing Card Transactions	Employee and Position Data	Benefits Payment Information
Payment Data	Employee Earnings Information	Case Management Data
Vendor Information		Employer Tax Information
CJLEADS	**State Employees Health Plan**	**Division of Motor Vehicles**
DPS - Prison	Medical Claims Detail	Driver's License Data
DPS - Probation	Pharmacy Claims Data	Vehicle Registration Data
DPS – Local Jail	Provider and Member Information	
AOC - Criminal Court Records	**Secretary of State**	**Industrial Commission**
DOJ - Concealed Handgun Data	Corporation Information	Workers Compensation Insurance
DOJ - Sex Offender Registry	UCC Information	
Wildlife – Web Service	**DHHS - Center for Health Statistics**	**Other – External Sources**
	Vital records – Deceased Information	Bank of America P-Card Data
		Social Security Death Master File

Future Data Sources

- Retirement Information
- Unclaimed Property
- Education
- DHHS

2. Enterprise Data Management

In conjunction with the Enterprise Reporting Repository, the GDAC has initiated the development of a data registry framework. Data inventory, standards, and management are critical to the ability to provide quick, agile, and consistent data content to meet the State's business needs. Research on industry standards and approaches to the concepts of data inventory, master data management, and data standardization is ongoing. The framework under consideration will capture information data sources including data dictionaries, update frequencies, data quality issues, and costs, if the data is purchased from an external source. Centrally managed, this registry will ensure that data integrated into the GDAC analytics repository provides reliable, timely information in clearly defined formats enabling stakeholders to analyze and interpret the data with common understanding. The registry may help the State identify data quality and standards issues where statutory and policy changes may be needed.

Design of the repository will continue during the final quarter of 2013, and formal development will begin in 2014 with current projects as the pilot data sources.

3. Security and Data Integrity

A new tool called NCSEAT has been developed and implemented that integrates with the State's identity management tool NCID for user authentication. Every web-based GDAC solution will leverage the NCSEAT enterprise solution for consistent authentication and support of application security requirements. NCSEAT processes and forms have been developed for internal management.

To support audit requirements, GDAC is in the final design stages of an enterprise audit mechanism. Oracle Vault, a component of the enterprise database architecture, will be leveraged to capture log files associated with records accessed via any GDAC solutions. Like NCSEAT, the enterprise implementation of the audit capability will be used for all GDAC solutions, reducing future development time. The audit option will be in production prior to the implementation of the first NC FACTS solution.

To ensure compliance with appropriate data security associated with regulations such as Payment Card Industry (PCI), DMV, and IRS, a data review was conducted to evaluate all data residing in the GDAC repository. Whenever possible, sensitive or confidential information not needed for data matching and/or analytics is redacted or removed from the GDAC environment.

B. GDAC Program Approach

1. Administration

Consistent with OSC's past data integration efforts which have been "scoped to success," the GDAC has had a targeted focus and has been incrementally expanding the scope of applications as expertise and capacity grows. As the GDAC enterprise efforts have matured in the last few years, the program has found that analytic efforts cross specific project areas. Organizations, for example, interested in generating fraud, waste and improper payment analytics also need assistance with program metrics, predictive analysis, and reporting capabilities such as executive dashboards.

The GDAC, to date, has operated as three separate projects – CJLEADS, NC FACTS and the GDAC. To more effectively leverage the staff resources of the GDAC and to ensure an enterprise vision for all solutions, the GDAC will reorganize the program and staff to support the following GDAC efforts:

- GDAC Program and Business Services
    - GDAC Program Activities – support the development and management of GDAC governance and program policies
    - Business Services – provide business services for all GDAC programs including training, documentation, help desk, auditing and user administration by leveraging the existing CJLEADS business operation staff
- CJLEADS and GDAC Technical Environment
    - CJLEADS - continue to support and enhance the operations of the 24x7 statewide criminal justice system with a focus on supporting the needs of the criminal justice community
    - GDAC Technical Environment – support and enhance the operations of the GDAC technical environment and its implemented analytics solutions
- GDAC Solution Development
    - Data Integration - solution development will identify key sources of data in performing the extract, transformation, load and quality analysis of that data to support enterprise analytics
    - Fraud and Compliance Alerts – NC FACTS will leverage the SAS Fraud Framework not only for fraud, waste and improper payment detection but also to support other areas of compliance analytics and alerts such as worker's compensation coverage compliance
    - Reporting and Analytics – solution development will leverage SAS reporting and analytics tools to support business needs for program management metrics and analysis such as the State Health Plan of NC's analytics repository

2. Iterative Design and Development

The enterprise analytics solutions require a unique approach to systems development. In typical IT transactional solutions, a clear project scope is defined, business and data requirements are documented and based on those requirements an application is designed, built, tested and delivered to the business users. Development of data analytics solutions, however, operates in a very different manner. While some data analysis is based on known business rules, often analytics projects are evaluating the data to seek out unknown patterns, anomalies, and relationships to see what the data can reveal to the business owners. The result is an iterative process that allows the program and its participating agencies to explore the data to find the most effective analytic logic, algorithms, and output.

GDAC development generally begins with the identification of questions to be answered or problems to be solved. From that, development progresses with exploratory data analysis where the technical team evaluates the content and quality of new data sources that will help answer the questions being posed. Next, the team develops "quick hit" analysis based on known business rules provided by the data source agencies. These quick hits allow the agency to verify the use of the data and evaluate basic analytic results. Agencies can then change the data being provided, adjust and refine the business rule logic and ask for additional information or analysis. By working with the agency to refine the initial analytics, these quick hits can provide actionable information that the agency can begin to use in their work processes.

While the agency reviews quick hits, the GDAC focuses on expanding the scope of the analysis. The team begins to look for the unknown factors in the data. Using general knowledge of a business area, data patterns, trends and anomalies, the analysts begin to look at "what the data shows us." As new results emerge, the team again reviews results with the data source agency to validate the accuracy and relevance of the findings. Some findings prove to be "false positives" while other findings may need additional data or logic refinement. This iterative approach of developing results, reviewing with the business owner, and refining the analysis ensures that the final analytics deliverables clearly meet the business need. Standardizing this approach to analytics development will allow projects to become mature more quickly and provide the agencies with the analytics they need sooner and in the form most efficient for their use.

C. GDAC Business Services

GDAC business services provide a wide range of solution and end user support for all GDAC projects and operational systems. Leveraging the experience, best practices, and lessons learned from the implementation and statewide deployment of

CJLEADS, the CJLEADS Business Operations staff will now assume support services for all GDAC solutions.

Business services will include:

- GDAC program policy and procedure management - developing, maintaining and ensuring compliance with standards and best practices in accordance with the GDAC enterprise approach
- GDAC End User Administration – developing policies and support processes for NCID user authentication as well as oversight of delegated user administrators and GDAC solution end users
- GDAC Training – developing training documentation including user guides, job aids, class materials and well as administering training registration systems for end users and user administrators
- GDAC Help Desk and End User Support – providing end user support for system access and issue resolution
- GDAC Business Process Support – providing partner agencies with assistance in implementing and documenting new processes to leverage GDAC analytic tools
- GDAC Auditing – managing regular and recurring audit procedures to ensure appropriate and authorized use of all GDAC solutions in accordance with GDAC governance policies

GDAC Business Services are currently working with the NC FACTS team to establish training documentation, user administration procedures and forms, and help desk support procedures in preparation of the first release of fraud alerts for Division of Employment Security. Support and documentation for the initial reporting and analytics release is also underway.

CJLEADS training and end user support continues as well.

- Since 2010, over 26,700 end users have been trained in more than 2,315 CJLEADS classes, including classroom, web-based classes and night classes
- 82 certified "Train-the-Trainers" have conducted 790 classes for their organizations
- On average, over 100 user inquiries are managed weekly by CJLEADS help desk support on a 24x7x365 basis

In accordance with CJLEADS policy, the team conducts annual audits of all licensed end user organizations. In addition to the annual audit process, the GDAC Business Services team periodically receives audit investigation requests from agencies related to possible fraudulent usage of the system or an agency's internal investigation process. The team has assisted agencies with 15 requests to date in 2013.

IV. CJLEADS Operations and GDAC Technical Environment

A. CJLEADS

Since 2008, the Criminal Justice Law Enforcement Automated Data Services (CJLEADS) application has served the criminal justice community, saving time, money, and lives.

Consistent with the General Assembly's intent to serve criminal justice professionals and improve the safety of North Carolina's citizens, CJLEADS has two primary objectives:

1. To provide a comprehensive view of an offender through a single application, allowing for positive identification of an offender through a photographic image.

2. To provide an "offender watch" capability to alert criminal justice professionals when an offender has a change in status.

CJLEADS is used statewide by over 26,700 criminal justice users including judges, prosecutors, clerks of court, magistrates, prison officials, probation and parole officers and law enforcement at the State, federal and local levels. The CJLEADS team maintains regular communications with end users and deploys two to four application releases each year to ensure the application is continuously improved to meet the needs of the criminal justice community.

Recurring funding for CJLEADS annual operating expenses has been reduced to $6,544,068. Last year, the General Assembly provided one-time funding to support a system upgrade to an Oracle enterprise database solution. Since the initial pilot, CJLEADS has deployed nine production releases, each one providing functional or data enhancements in response to the needs of the criminal justice community. With annual expenses of approximately $7.6 million, however, CJLEADS will be required to rely on the limited remaining one-time project funding to supplement this year's operating expenses. The FY 2013-2015 budget of $6.6 million, with no expansion, will result in CJLEADS' continued operations and essential maintenance but future functional or data enhancements will be minimal

1. Statewide Operations Statistics

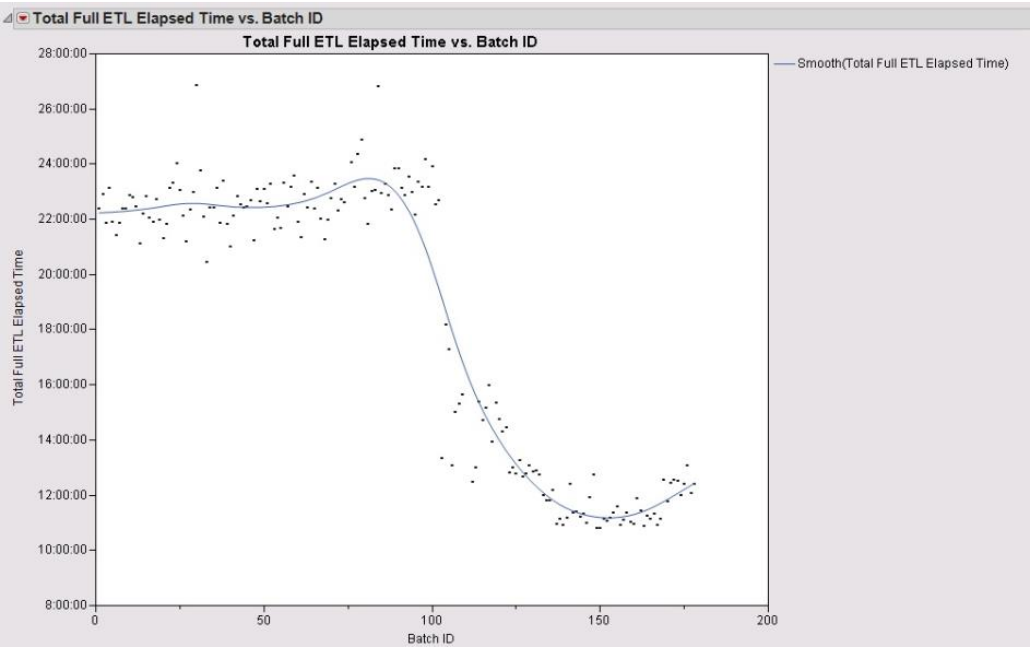
CJLEADS is being used statewide by over 26,700 criminal justice professionals. 535 federal, state, and local law enforcement organizations are licensed to use CJLEADS.

Since initial deployment in June 2010, criminal justice professionals have conducted over 23.7 million searches and accessed nearly 19.6 million offender and DMV records. Over 9,600 users access CJLEADS each week.

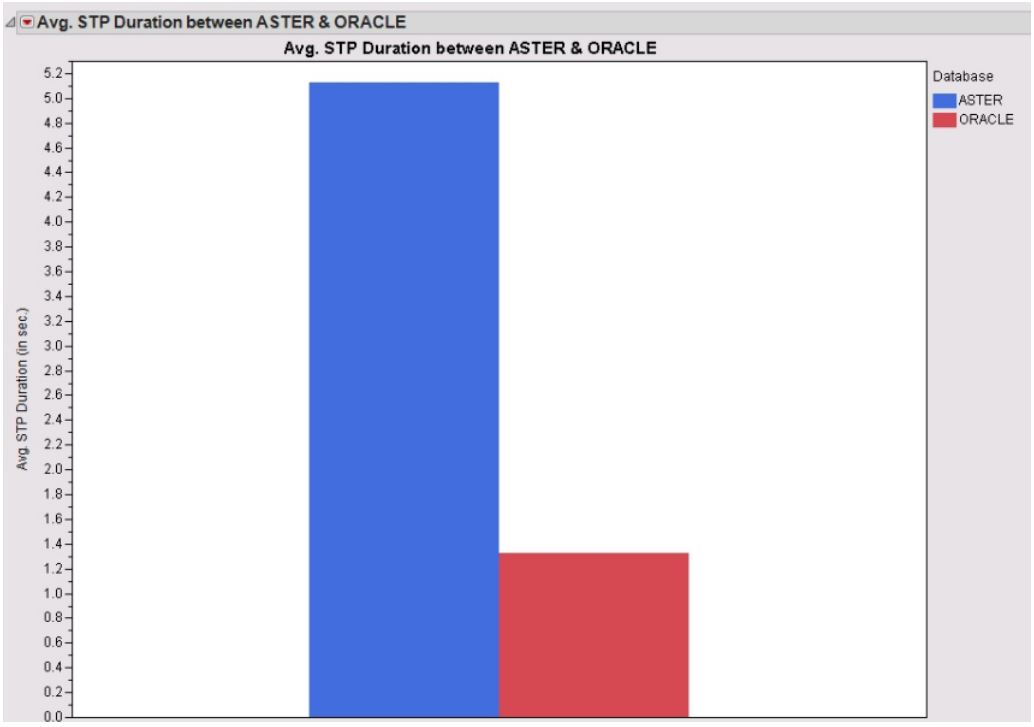
2. CJLEADS Database Upgrade and Environment Refresh

The CJLEADS database migration from Asterdata to Oracle was completed on July 31, 2013 as Release 9.3. In addition to the database migration to Oracle Exadata, other components of the architecture were upgraded and refreshed to support the new environment. The SAS software was upgraded to the latest version, new hardware with faster CPUs and more memory and various network appliances were refreshed and storage was updated. The database and technical infrastructure upgrades have eliminated support issues, performance deficiencies during defined periods of the day, and the limited ability to work with large datasets.

CJLEADS already has realized significantly improved performance levels in extracting, transforming and loading (ETL) data. Prior to the database migration and environment refresh, the ETL process ran 22-24 hours. Post-migration, the ETL now runs 10-11 hours. Data received from the data sources is now processed and clustered a full 10 hours sooner than before, making refreshed data available sooner to criminal justice professionals.



The response time for data inquiries and reporting functions has also decreased significantly. Database calls averaged around 5.1 seconds using Aster and now average only 1.3 seconds in the Oracle environment.



Improved performance coupled with new technology will provide an enterprise foundation to support the ability to add new data and functionality to meet future business needs justifies the expense of the migration.

3. CJLEADS Application Enhancement

Consistent with the legislative mandate to provide a comprehensive profile of an offender, CJLEADS strives to continuously improve the application with the development of additional functionality and data. However, with no expansion funding, over the next two years minimal data and functional enhancements will be produced. The following functionality is scheduled for deployment in the next release of CJLEADS:

Release 10 – Scheduled Winter 2014

- Division of Community Corrections (DCC) Watch List will generate probation watch lists and alerts for DCC officers who are responsible for supervising/monitoring active probationers, active absconders and expired absconders.
- Wildlife Hot Keys will implement hot keys to enable wildlife officers to quickly enter wildlife license and vessel numbers, much like the existing functionality for DMV licenses and plates.
- Group Watch List Member Notification will integrate the ability for a CJLEADS group watch list member to send a notification to other group watch list members.

- Pretrial Report will automate a current manual process of aggregating information in preparation for a court case as requested by Pretrial Services.
- U.S. Courts Report will generate a chronological criminal history for offenders who have court case alerts within a specified date range.
- Pending Offenses Report will generate a list of offenders based on a selected offense category that have a pending charges and upcoming court dates for that offense category. Offense categories include Breaking and Entering, Larceny/Theft, Drug Offenses, Assault and Battery, Kidnapping, Gang, and Manslaughter, etc.

Future Functionality

All analytic and enhancement efforts are currently focused on development to support statutory requirements including:

- Pistol Purchase Permit Revocation Alerts - The North Carolina Sheriff's Association requested CJLEADS assistance with developing data integration and analytic capabilities to support new pistol permit revocations related to Session Law 2013-369, HB 937. CJLEADS will work with several pilot Sheriffs' Offices to define governance, security, data standards and revocation requirements to provide Sheriffs with system generated alerts for possible revocation. If successful, following the pilot deployment, the revocation analytics will be available to all Sheriffs' offices statewide.
- Division of Mental Health Support – the Department of Health and Human Services, Division of Mental Health requested CJLEADS assistance in helping Local Management Entities (LME) know when individuals in their case management load have been arrested and booked into custody in county jail facilities. Currently LMEs manually contact nearby jail facilities daily to determine if they need to provide support to an incarcerated individual. A CJLEADS data extract will provide basic information to allow the LMEs to more easily review booking information for all jails statewide, reducing the administrative time in the Sheriff's offices.
- North Carolina Sentencing and Policy Advisory Commission – the North Carolina Sentencing and Policy Advisory Commission performs recidivism and Justice Reinvestment Act analysis for reports to the General Assembly. The Sentencing Commission currently receives data from a number of data sources to integrate and analyze for the report findings. The Sentencing Commission is discussing the possibility of moving their analytics to the GDAC environment to leverage the enterprise data repository. As an interim measure, however, CJLEADS will provide a one-time jail data extract, the one data source the Sentencing Commission does not currently have, to support the April 2014 report analysis.

- Federal Interface – Division of Criminal Information (DCI) - Both the courts and law enforcement have repeatedly requested access to a federal interface to allow users access to federal and other states' information via CJLEADS. CJLEADS submitted a request to the FBI for an Originating Identifier (ORI), but was denied. CJLEADS has been working with the State Bureau of Investigation, North Carolina's CJIS Security Agency to evaluate an alternative management approach to enable access to key federal data, especially Hot File status (a flag to indicate whether or not there is or is not information about wanted persons, stolen vehicles and stolen weapons on file with the DCIN) for North Carolina law enforcement officers. While considerable time and resource has been spent on this effort, to date no significant progress has been made toward establishing an approach for gaining access to federal information.

B. GDAC Technical Environment

The GDAC technical environment is a series of hosted environments at the SAS data center facilities. Unlike CJLEADS which requires 24x7 highly available operations, the GDAC technical environment is designed to be support business hour operations.

The GDAC hosted solution consists of three separate technical environments. The development environment is used by SAS to conduct initial data integration, code development and testing, and preliminary data analysis. When development activities are complete, data and analytics logic and models are promoted to the test environment. The test environment is used by the SAS team to perform Quality Assurance testing to ensure that the functional components of the application meet business requirements and specifications. The State project team and partner agencies use the test environment to perform User Acceptance testing to validate the functionality of the system as well as the analytic outputs. When all data and functionality is thoroughly tested and approved, the data and analytics logic is promoted to the production environment where it is released to the end user community.

SAS has implemented the development and test environments and will soon release the production environment in preparation for the initial release of NC FACTS and reporting and analytics.

With all GDAC analytic solutions, SAS provides secure access to a terminal server to support data analysis and verification activities. In accordance with GDAC governance, GDAC project team members strive to protect the security and integrity of all confidential information in the GDAC repository. The terminal server provides a mechanism where SAS and State project team members can share and review confidential information via secure access to this protected server. This eliminates any need to transmit sensitive information via email or other non-secure mechanisms.

In addition to the development, test and production environments, SAS has implemented the NC SAS Enterprise Authentication Tool (NCSEAT). NCSEAT is an enterprise user authentication and authorization tool that has been developed to support all State

solutions hosted at SAS. NCSEAT integrates with the State's standard identity management technology, NCID. The integration with NCID, allows the GDAC to ensure that users attempting to gain access to GDAC solutions using authorized NCID accounts that adhere to State security policies. NCSEAT also provides the ability to manage key solution authorizations including role-based security and user attributes.

V. GDAC Solutions Development

A. GDAC Fraud and Compliance Alerts (NC FACTS)

The fraud and compliance alert capability for the GDAC will be incorporated into the NC FACTS solution. The alert analysis, generation, research and disposition will work similarly for all fraud, waste, improper payment and compliance efforts. Analysis will begin with the iterative process outlined earlier in this document to match and evaluate data, generate "quick hits," refine the analytics, and provide resulting alerts for review and investigation by the business organization.

The alert process will be incorporated into a web-based user interface that will allow users to view alerts, "drill in" and research background information related to those alerts, disposition alerts by assigning to appropriate investigators, perform case management, and finally closing out the alert with a resolution of the investigation.

The alert generation process will incorporate criteria defined by the business organizations to help prioritize alerts that represent higher risk, greater financial exposure, or perhaps repeat activity. This prioritization will allow organizations to most effectively direct their limited resources to focus on the most egregious alerts. The user interface will increase staff efficiency by providing access to critical data related to an alert through a single system, minimizing research and investigative legwork.

The following efforts are currently underway in fraud and compliance alerts:

1. Unemployment Insurance Alerts for Department of Commerce – Division of Employment Security

Analytic efforts for Division of Employment Security are focused on two business areas. The first evaluates employer wage and tax reporting data to identify anomalies where data and/or activity that may indicate misrepresentation of employees, wages, and associated unemployment taxes as well as potential fictitious businesses established to avoid UI tax payments or collect fraudulent UI benefits. The second area of analysis focuses on benefit eligibility and payment information to identify fraudulent or improper UI benefit payments.

NC FACTS has delivered 425 potential alerts to the DES tax compliance unit. DES has investigated a number of these employer related alerts and has indicated

that the first 12 alerts reviewed proved to be actionable cases with a potential impact of approximately one and a half million dollars.

The investigation of unemployment claimants and eligibility has identified over 830 alerts associated with potentially improper or fraudulent unemployment insurance claims including payments to individuals who are deceased, incarcerated in prison or jail, or receiving wages from an employer. While DES is investigating these payment alerts, the business process takes time and often requires information from the employer and claimant interviews to determine if fraud or overpayment has occurred. At this time, DES has not provided an estimated potential savings from the analysis, but has indicated that the ability to prioritize the alerts will assist them in optimizing resources for investigations, stop future payments, and support recovery efforts.

While DES continues to review and take action on the alerts delivered to date, NC FACTS is working with SAS to prepare for the first production release of DES alerts by calendar year end of 2013. Activities include:

- Completion of the analytics design and development based upon user input from review and investigation of "quick hits"
- Completion of agency data extracts and finalization of Extract, Transformation, and Load (ETL) programs
- Integration of analytics models in the SAS Fraud Framework
- Completion of the design of user interface screens to meet user specifications and business work flows

DES alerts in NC FACTS will be implemented in a phased approach. The staggered implementation of these NC FACTS components will allow deployment and training efforts to focus on a targeted area and fine-tune the solution prior to the release for the next functional component. The employer tax and wage alerts are currently in quality assurance review. Following QA and subsequent user acceptance testing, DES tax alerts are targeted for deployment in December 2013. DES benefit alerts are being finalized. Following QA and user acceptance testing, benefit payments alerts are planned to be deployed in January 2014.

2. Worker's Compensation Compliance and Employee Misclassification Alerts for North Carolina Industrial Commission

Worker's compensation fraud and employee misclassification are closely related and both result in exposure to the State, its economic and business environment, and its workforce. Risk to employees increases when businesses fail to properly report their employees and provide workers' compensation coverage. An employee injured in a work-related accident may find that they are not properly covered and incur unexpected medical expenses and lost wages. When these workers have no insurance coverage and no means to pay, the State incurs the costs of medical treatment and social services. The failure of some businesses to

properly report their employees and pay for workers' compensation coverage results in a competitive advantage over businesses that comply with State law (and build the cost of coverage into the cost of their products and services). Conversely, when employees inappropriately or fraudulently receive a worker's compensation benefit, the employer and insurance companies bear the cost of the fraudulent expenses. In January 2013, the Joint Legislative Committee on Worker's Compensation Insurance Coverage Compliance and Fraud Prevention and Detection and the Employee Misclassification Taskforce, recommended that the NCIC work with the GDAC to develop workers' compensation fraud and employee misclassification analytics.

Phase I of the effort focuses on identifying businesses operating in the State of North Carolina but failing to carry required workers' compensation insurance. Using data from the NCIC, DES, and Secretary of State, the analysis identifies active businesses, matches them with worker's compensation insurance coverage data, and provides alerts for any companies that appear to lack appropriate coverage. In addition, the analysis also searches for policy gaps in coverage, failure to renew coverage, and unexpected cancellations of coverage. Initial quick hit alerts based on gaps in coverage in the NCIC data have been provided as actionable leads for NCIC staff investigation purposes. The NCIC user interface will provide the ability to prioritize compliance alerts, research alert background information via a single system, and reduce staff time researching in multiple systems.

The GDAC is working with NCIC to operationalize the workers' compensation compliance alerts, monitoring, and communication processes, and to develop the operational and performance reports.

Key accomplishments this quarter include:

- DAUA executed with Division of Employment Security (DES) and the NCIC to allow cross functional data sharing for matching businesses actively reporting wages against workers' compensation coverage data.

- Supplemental programming support incorporated a new data feed for the NCIC claims management to reduce separate data streams, minimize the potential for inconsistent data in the separate systems, and enable claims update to be included for compliance lead generation. This effort is complete and will be deployed into production soon.

- The preliminary design for the user interface for worker's compensation insurance compliance alerts was developed. Based on vendor and NCIC feedback, design refinement is underway and will be complete by the end of 2013.

- The preliminary process for prioritizing compliance alerts were defined. Refinement of the alert prioritization will continue throughout the first release of the project to ensure the proper cases are being surfaced for investigation.

- Initial results were provided to NCIC investigators to validate and refine the data record matching and alert generation criteria. Over 405 cases were surfaced to investigative staff to research and provide feedback on the accuracy of the data and the alert criteria. With a 75% false positive rate in the first iterations, data quality and integration issues were identified and are being addressed. On the other hand,18% of the "quick hits" resulted in companies reacquiring coverage. While this percentage was based on a very small sample of the data, this type of statistical indication of coverage re-compliance will be measured to determine the impact of enhanced monitoring of coverage through automation and quality information.

- A reciprocal data match process provided DES with preliminary results for businesses carrying worker's compensation coverage but failing to report wages to DES. These initial alerts are under review and the analysis will be refined based on feedback from DES.

- An approach for calculating an order of magnitude of non-compliance has been devised and is being tested to refine both operational staffing requirements and initial outcome/performance and operating reports. By the end of 2013, additional metrics and associated reports will be established to measure the impact on the insurance industry of improved participation and compliance. Metrics will also estimate the impact of reducing the State's costs for public assistance support, due to enhance workers' compensation insurance coverage

- GDAC analysts have been working with NCIC Compliance staff to document proposed business processes and workload allocation to ensure that once the Alert Tool is implemented, NCIC will be positioned to effectively act on the results in a systematic manner. Workflow documentation will be complete by October 2013, with refinements as needed during design phase

Phase I of the Alert System for Compliance will be complete by the end of 2013, with user acceptance testing and implementation of Phase I alerting available in the first quarter of 2014.

Phase II of the project will include adding other key sources of information such as available and needed. Subsequent phases will also include interface with a new case management tool that NCIC is developing, and will expand to look at employee misclassification.

3. State Health Plan of North Carolina

The SHPNC mission is to provide quality health care products and services for the health and well-being of their members while ensuring fiscal responsibility and transparency. NC FACTS tools will support the SHPNC and its ability to identify suspicious activity associated with provider billing and member benefits.

NC FACTS will implement the standard health care scenarios available within the SAS Fraud Framework. The first analysis will support a review of professional, hospital and drug claims in an effort to identify providers and members whose services seem to fall outside of the range of their peers. Since SHPNC has an existing contract with their vendors to perform fraud analysis, it is expected that the NC FACTS analysis will focus on areas of fraud where the vendors may not have had previous insight.

Key efforts to date include:

- Data associated with providers, members, health care claims, and pharmacy claims have been loaded in to the GDAC environment.
- Data analysis has been completed and the integration of the data into standard health care analytic scenarios is underway.
- The SHPNC has completed a review of standard member related alert scenarios, identifying those scenarios of interest to the Plan.

NC FACTS will begin to provide initial results for review, feedback and refinement of alert scenarios to meet the Plan's objectives. The first deployment of SHPNC alerts is targeted for second quarter 2014.

SHPNC analysis represents significant challenges with the implementation of a new benefit enrollment vendor as well as the planned implementation of two new plans to support Medicare advantage programs. With the implementation of these efforts, NC FACTS may need to include new and/or changed data sets. To mitigate this issue, NC FACTS will conduct analysis in a phased approach, generating "quick hits" using current vendor data and incorporating new vendor data into subsequent releases.

4. North Carolina Secretary of State

The North Carolina Secretary of State Corporations Division is responsible for the examination, custody and maintenance of the legal documents filed by more than 400,000 corporations, limited partnerships and limited liability companies. The Secretary of State ensures uniform compliance with the statutes governing the creation of these entities, record the information required to be kept as a public record, and provide that information to the public.

Network analysis has been applied to the data available within the Secretary of State's Corporation database to display the relationships among registered corporations. A pilot release is planned for December 2013 to assist the Division of Employment Security with employer tax account analysis and to provide the Secretary of State with corporation link capabilities.

5. Future Efforts

As current development areas are nearing deployment, additional areas of fraud and compliance are being evaluated for analysis.

- NC FACTS has signed data sharing agreements and met with the Department of State Treasurer (DST) to prioritize retirement business analysis objectives and needs. Due to DST resource constraints, however, further work on retirement analytics planning has been delayed until January 2014.
- Based upon the DES and Worker's Compensation compliance solutions, next steps with the NC Industrial Commission and DES will be to use the cross-matched data to begin analysis for employee misclassification, underground economies, and worker's compensation fraud.
- The Department of Justice Medicaid Investigative Division has met with the GDAC to discuss possible solutions to support their investigation of Medicaid fraud cases. This effort will require collaboration and data sharing from Department of Health and Human Services.

B. GDAC Reporting and Analytics

The reporting and analytics capability for the GDAC will share the same technical environment as the NC FACTS fraud and compliance alerting solutions. This common technical infrastructure and data repository provide access to all integrated data to support agency program analytics, metrics, predictive analysis and executive dashboards. The GDAC reporting and analytics will provide access to a variety of tools that allow the user to run standard, system-generated reports, create ad hoc reports, and view data in tabular as well as visual representations.

The following efforts are currently underway in reporting and analytics:

1. State Health Plan Analytics Repository

The North Carolina State Health Plan for Teachers and State Employees (SHPNC) relies on data warehousing to support their business operations. SHPNC receives monthly membership and claims processing data extracts from its third-party vendors to support reporting and analytics. Following the SHPNC transfer to the DST, a decision was made to migrate the SHPNC data and analytics repository into the DST IT environment. Existing DST

infrastructure and limited experience with the software resulted in the migrated repository experiencing significant performance degradation and limited SHPNC's ability to meet its analytics needs.

The SHPNC was evaluating options and the costs of migrating to a vendor environment as the GDAC was becoming operational. Following discussions about the GDAC mission and capabilities, SHPNC determined that the GDAC environment presented a viable, cost effective solution for their analytic needs. With initial planning in January 2013, the SHPNC analytics repository was migrated to an interim GDAC platform by in May 2013 and was accepted by the State Health Plan.

The migration into the GDAC environment has resolved significant technical issues and results in cost savings and cost avoidance.

- Analytic reports which formerly ran in twelve hours are now completed in less than one hour.
- DST has eliminated software license costs estimated at over $91,000.
- DST/SHPNC cost avoidance by reducing server space and maintenance of a separate data repository.
- Single data ETL to support both SHPNC fraud alerts and reporting and analytics

An early estimate of the cost to build a new stand-alone, vendor-hosted SHPNC data analytics repository was $3 million. Even upgrades to the technical infrastructure and servers at DST to meet performance requirements would have been a significant cost to DST and SHPNC. As a result, incorporation into the GDAC was a logical, cost effective solution.

The SHPNC repository will be migrated into the GDAC fully operationalized production environment by the end of 2013. In addition, the GDAC continues to work with SHPNC on data extract modifications related to new vendors associated with the SHPNC's contract changes which began July 1, 2013.

2. **Procurement Card Analysis and Reporting**

During an evaluation of North Carolina Accounting System (NCAS) data, the GDAC staff, in conjunction with the Office of the State Controller's Risk Mitigation Section, conducted an internal controls review of procurement cards (P-card) using data from multiple sources. By incorporating Bank of America transaction detail with BEACON employee status and with NCAS data, the analysis provided insight into agency and individual usage of P-cards and identified an opportunity for enhanced integrated reports to assist agencies in strengthening and improving internal controls. These reports allow the NC Department of Administration's Division of Purchase & Contract (P&C) to review individual agencies' activities in furtherance of P&C's statutory obligation

to oversee compliance with cash and accounting requirements and to better administer the State's contract with the P-card vendor.

The project reviewed P-cards from an internal control perspective and documented requirements for P-card reporting. GDAC developed timely, expanded analytical reports which reduce manual review of activities, provide insight at the transaction and the aggregate level, improve oversight regarding P-card assignment and employee status, and improve internal control and adherence to State procurement and cash management policies and procedures.

The reports have been shared with the four pilot agencies and with the Department of Administration P&C Division management. In November 2013, GDAC will implement on-demand P-card reports for the pilot agencies and will establish and train users on direct access to reports for their respective departments. GDAC will also work with P&C on centralized user authorization responsibility and identify additional enterprise-wide reports that are needed. P&C will work with GDAC and the remainder of the agencies who use P-cards to train them in the use of these reports

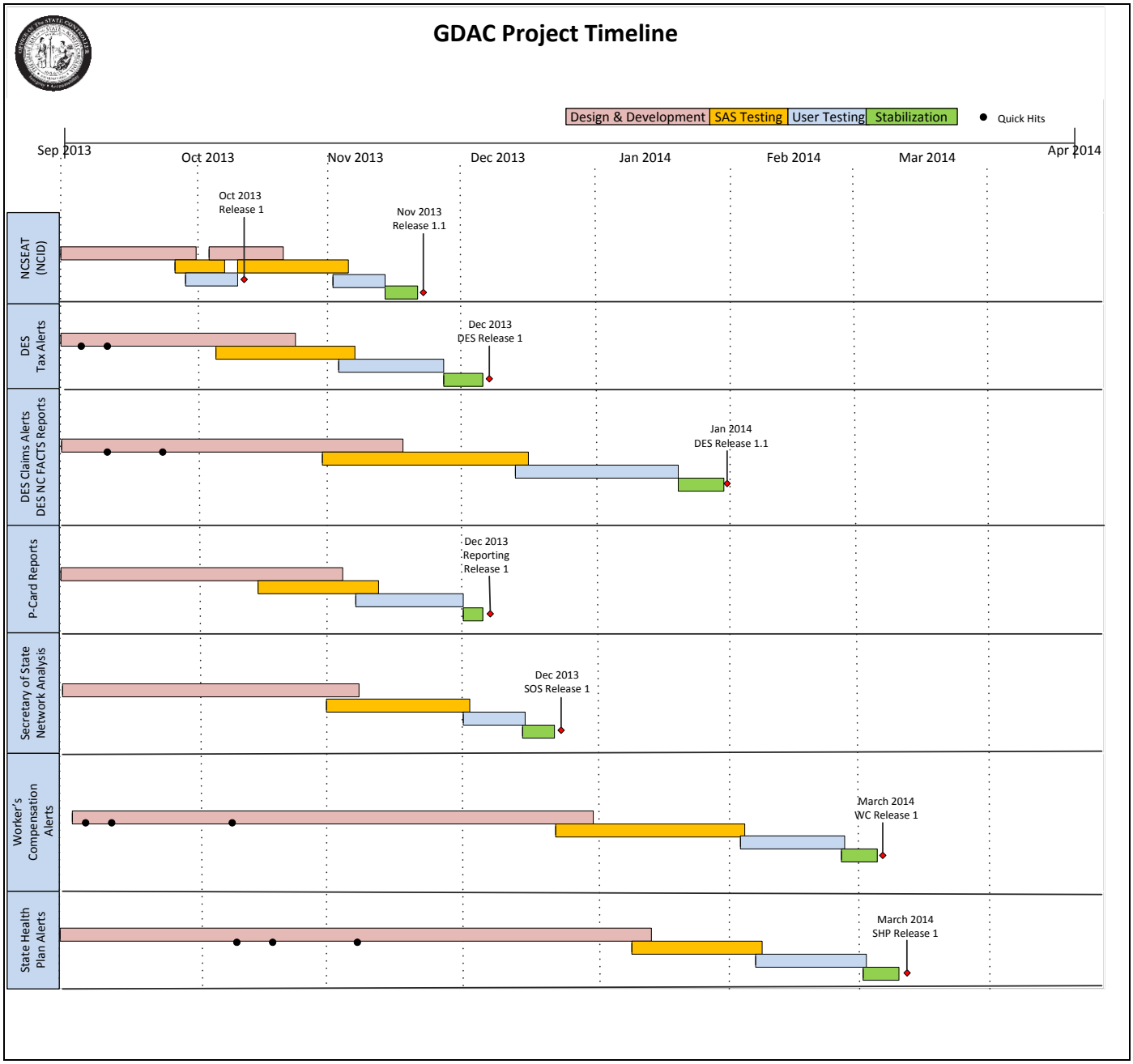
3. **Division of Employment Security**

As the Division of Employment Security progresses through its unemployment insurance fraud analysis, they have recognized the value of additional program analytics. The GDAC is working closely with the NC FACTS and DES teams to identify key program metrics and analysis needs as well as executive-level reporting for DES management. Further development in this area, however, is being deferred until after implementation of the Fraud Analytics for DES set to launch in the final quarter of 2013.

4. **Education and Workforce Data**

Recently enacted legislation directs the GDAC to coordinate individual-level student data and workforce data from all levels of education and the State workforce. The GDAC program resources have researched the P20W Longitudinal Study as well as the Common Follow-up Program to understand the State's current efforts in these business areas. GDAC continues to meet with the parties engaged in the current effort, and will coordinate the data sharing agreements, where appropriate and allowed by law, for data required to enhance the accuracy and completeness of the P-20W study.

A timeline for the deployment of these GDAC solutions is provided below:



VI. GDAC Challenges and Opportunities

While the CJLEADS and NC FACTS programs have been underway for some time, the GDAC is still in the early stages of policy and program development. Institutionalizing an enterprise program like the GDAC inherently comes with new challenges and new opportunities. Some of challenges and opportunities are discussed below.

A. **Agency Commitment/Resource Limitations**

The GDAC alerts, reporting and analytics solutions, offers state agencies new and advanced tools that add value to compliance, fraud, waste and overpayment identification efforts as well as program management analysis. Agencies have begun to see the value in the program's mission and have expressed interest in participating in this enterprise initiative . Currently there are several significant project initiatives that have been proposed from Department of Justice Medicaid Investigation Division, the North Carolina Sentencing and Policy Advisory Commission, and the Department of State Treasurer.

To successfully implement new analytic solutions, subject matter expertise is needed from the partner agency to assist with understanding and evaluating the data, developing data extracts, providing business knowledge, defining the business needs, and reviewing and validating the analytic results. While the agencies recognize there are potential efficiencies and information to be gained from these analytic efforts, agency resource limitations continue to inhibit active in engagement in the GDAC program.

To address this issue, the GDAC team has provided business process re-engineering support, as needed, to assist client agencies in identifying new process and procedure efficiencies. To minimize the impact on technical resources within agencies, the GDAC program team has also encouraged the use of existing data extracts when possible. Existing extracts may not be as comprehensive as developing specific extracts, but may include sufficient data to begin analysis and can be adapted as additional data needs are identified.

GDAC will continue to identify specific business and technical resources needs and possible mitigation strategies to present for legislative consideration in the future.

B. Data Sharing

As noted in previous quarterly reports, the data needed for effective enterprise analysis includes highly sensitive and secure information. The GDAC governance approach, based on our citizens' expectation of privacy, is focused not only on leveraging enterprise data for analysis but protecting that information to the highest extent possible for access only by authorized users of the GDAC system.

The ability to protect Personal Identifying Information (PII), adhere to security and compliance requirements for the Health Information Portability and Accountability Act (HIPAA), and meet the constraints associated with other state and federal laws and regulations associated with tax information, educational, and employment data, is critical to sharing information across the enterprise. The GDAC has worked closely with agencies, our vendor, and legal counsel to develop the required policies, procedures, contractual agreements, and memorandums of understanding or agreements to define the parameters associated with data sharing within this initiative. Stringent application security, including physical security, user authentication, role-based security, and data encryption among others, are key components in the implementation of the enterprise fraud detection system.

New statutory language gives broader authority for data sharing to GDAC. In the coming months the GDAC will conduct outreach activities with additional agencies who serve as data stewards of key data sources and attempt to develop agreements for data sharing. While some agencies are limited in sharing data due to statutory, regulatory or legal regulations, GDAC will continue to work closely with client agencies to develop data sharing agreements and governance that allow legally permissible data sharing in a controlled and managed manner.

C. Program Funding/Measurement of Benefits Realized

The GDAC program's enabling legislation was codified by the legislature during this past legislative session and established recurring funding for the administration of the program. The legislation promotes the use of analytics to support a broader vision of a State culture focused on fiscal responsibility and accountability at all levels of State government. Funding for the analytic tools, vendor hosted technical environment and analytic services, however, continue to be authorized as non-recurring funds. Also noteworthy, in FY 2014-2015, $5M dollars of the program cost is to be funded from anticipated dollar savings resulting from analytic output.

North Carolina State Government serves its citizens and is responsible for ensuring that taxpayer dollars are used in a fiscally appropriate manner. Statutory compliance, enhanced business analytics, and the ability to identify fraud, waste, and improper payments begins with fostering a culture within State government

focused on accountability and transparency. While the GDAC anticipates the ability to report significant return on investment for dollars spent, the potential recovered overpayment, cost avoidance, improved process efficiencies, and better informed business decisions may not result in sufficient funds available to cover program costs.

Recovered dollars, for example, may by federal, or by State law be obligated to specified programs and cannot be returned to the General Fund for program expenses. Additional savings from prevention of fraudulent or improper payments before they are made are of significant value to the State, but again do not represent funds returned to the General Fund. While future dollars savings may result from statutory changes in the future, funding for the analytic tools, technical environment and analytic services will be required in FY 2014-2015.

During this reporting period, emphasis has been placed on refining how to report the impact of enhanced analytics on agencies. Return on investment will be based on a combination of fraudulent payments identified and recovered, improper payment prevention through better controls and deterrence, cost avoidance and internal operating improvements, as in the case of the State Health Plan (mentioned earlier in this report). The GDAC program offers other key benefits including an enterprise repository of data that will continue to grow and mature for better business decisions, and key documentation about data quality and standards issues.

Subsequent reports will provide specific cost-benefit information on each GDAC solution, as well as the other operational impacts of the GDAC efforts, as they are deployed and measureable results are documented.

VII. GDAC Budgets

The original CJLEADS pilot estimate was approximately $2 million. With the success of the initial pilot application, the General Assembly subsequently adopted legislation directing OSC to enhance the CJLEADS pilot to a 24x7x365 highly available production application, continue the development of additional data and functionality, and deploy the application to criminal justice professionals statewide. The total estimate for the three-year cost estimates, including initial pilot startup costs in FY 2008-09, was $27 million to support 30,000 criminal justice professionals statewide. The total cost of statewide deployment was $24,620,475, approximately 9% under budget. As consistently reported, annual operations and maintenance costs are approximately $8 million.

The FY 2013-2014 recurring appropriation for CJLEADS is $6.5 million. While the General Assembly has previously appropriated non-recurring funds for specific CJLEADS enhancements like the recent Oracle database upgrade, it has been necessary to use one-time project funding to supplement the CJLEADS operations budget. Additional recurring funding is needed to support the CJLEADS enhanced enterprise

architecture, on-going operations, and opportunities to protect the State's investment in CJLEADS by enhancing the application to keep pace with evolving technology and legislative changes.

The following chart details this year's CJLEADS funding and expenditures:

As of August 30, 2013	FY 2013-2014 Budget	Actuals	Available Balance
CJLEADS Funding			
Recurring Funding	$6,544,068		
Carry-Over From Prior Year	$778,373		
Anticipated Withdrawal from On-Time Monies Held	$275,000		
	$7,597,441		
CJLEADS Expenditures			
Total Project FY 2013 - 2014			
State Project Team Expenditures	$1,595,297	$257,508	
Hosting Contract Services	1,400,000		
Development/Support Contract Services	2,600,000	2,450,000	
SAS ELA Renewal	2,000,000		
CJLEADS Total	**$ 7,595,297**	**$ 2,707,508**	**$ 4,887,789**

CJLEADS return on investment analysis is provided on the next page.

ROI Source								FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	
	Actual															
	Total Active Users (as of June 2013)	Actual Number of Records Accessed (FY 12-13)	Annual Records Accessed *(Estimated Usage Based on 3% Growth)*	Research Time Saved per Record Accessed (minutes)	Hours Saved (FY 12-13)	Annual Hours Saved (Projected Years)	Hourly Rate									
Improved Efficiency and Automation																
Judicial Staff																
Judicial	227	17,273	17,791	10	2,879	2,965	$30			$ 15,840	$ 32,920	$ 86,365	$ 88,956	$ 88,956	$ 88,956	
Clerks	855	44,012	45,332	10	7,335	7,555	$30			$ 44,790	$ 98,010	$ 220,060	$ 226,662	$ 226,662	$ 226,662	
Magistrates	483	50,111	51,614	10	8,352	8,602	$30			$ 100,800	$ 175,295	$ 250,555	$ 258,072	$ 258,072	$ 258,072	
Prosecutors	848	195,091	200,944	10	32,515	33,491	$30			$ 114,570	$ 364,805	$ 975,455	$ 1,004,719	$ 1,004,719	$ 1,004,719	
Sub Total	**2,413**	**306,487**	**315,682**		**51,081**	**52,614**				**$ 276,000**	**$ 671,030**	**$ 1,532,435**	**$ 1,578,408**	**$ 1,578,408**	**$ 1,578,408**	
Law Enforcement Staff																
Law Enforcement	22634	8,812,457	9,076,831	5	734,371	756,403	$25			$ 1,777,435	$ 9,953,331	$ 18,359,285	$ 18,910,064	$ 18,910,064	$ 18,910,064	
Law Enforcement Support	2133	186,504	192,099	5	15,542	16,008	$20			$ 24,765	$ 204,897	$ 310,840	$ 320,165	$ 320,165	$ 320,165	
Sub Total	**24,767**	**8,998,961**	**9,268,930**		**749,913**	**772,411**				**$ 1,802,200**	**$ 10,158,228**	**$ 18,670,125**	**$ 19,230,229**	**$ 19,230,229**	**$ 19,230,229**	
Corrections Staff																
Probation	2354	352,953	363,542	5	29,413	30,295	$20			$ 6,378	$ 453,830	$ 588,255	$ 605,903	$ 605,903	$ 605,903	
Prison Intake & Support	74	909	936	5	76	78	$20			$ 892	$ 1,962	$ 1,515	$ 1,560	$ 1,560	$ 1,560	
Sub Total	**2,428**	**353,862**	**364,478**		**29,489**	**30,373**				**$ 7,270**	**$ 455,792**	**$ 589,770**	**$ 607,463**	**$ 607,463**	**$ 607,463**	
Juvenile Justice Staff																
Court Counselors	25	2,003	2,063	5	167	172	$20			$ 4,533	$ 4,400	$ 3,338	$ 3,438	$ 3,438	$ 3,438	
Improved Efficiency & Automation Sub-total	**29,633**	**9,661,313**	**9,951,152**		**830,650**	**855,570**				**2,090,004**	**11,289,450**	**20,795,669**	**21,419,539**	**21,419,539**	**21,419,539**	
Improved Safety - Cost Avoidance																
			Number of Potential Lives Saved Annually			Value of a Life	Total Value									
Save four lives with integration of offender information			4			$ 1,125,000	$ 4,500,000			$ 2,250,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	
Total Improved Efficiency and Automation and Improved Safety										**$ 4,340,004**	**$ 15,789,450**	**$ 25,295,669**	**$ 25,919,539**	**$ 25,919,539**	**$ 25,919,539**	

Development Cost								
ANNUAL								
Actual Development Costs	$ 2,128,091	$ 7,643,027	$ 7,876,469	$ 7,876,469				
Estimated Development Costs					$ 7,705,737	$ 7,996,377	$ 7,996,377	$ 7,996,377
Total Costs	**$ 2,128,091**	**$ 7,643,027**	**$ 7,876,469**	**$ 7,876,469**	**$ 7,705,737**	**$ 7,996,377**	**$ 8,016,377**	**$ 8,016,377**
Estimated Implementation Savings			**$ 4,340,004**	**$ 15,789,450**	**$ 25,295,669**	**$ 25,919,539**	**$ 25,919,539**	**$ 25,919,539**
CUMULATIVE								
Total Costs	**$ 2,128,091**	**$ 9,771,118**	**$ 17,647,587**	**$ 25,524,056**	**$ 33,229,793**	**$ 41,226,170**	**$ 49,242,547**	**$ 57,258,924**
Estimated Implementation Savings			**$ 4,340,004**	**$ 20,129,454**	**$ 45,425,123**	**$ 71,344,661**	**$ 97,264,200**	**$ 123,183,739**
Return			**$ (13,307,583.25)**	**$ (5,394,602.25)**	**$ 12,195,329.50**	**$ 30,118,491.31**	**$ 48,021,653.13**	**$ 65,924,814.94**

Improved Efficiency and Automation	Efficiency savings for law enforcement is based on the actual number of DMV and offender queries during the month of May, 2012, with a 10% growth in FY 2013. Conservatively, if each inquiry saves a law enforcement officer has 5 minutes of research time,
	Courts personnel have indicated that they are saving 33% of the resource time required to research information, approximately 10 minutes per investigation. Savings associated with courts usage is based on the actual number of DMV and offender queries run
Improved Safety	The cost of a human life is estimated at 1.125 million. Computation of Human Life value requires a detailed analysis of many factors.
	For simplicity if an individual is murdered at 35 and has 30 years of future income of which 75% is spent on his/her family then the value of the life would equal (30*(50,000*.75)) The value of a human life would equal 1,125,000

Session Law 2011-145, HB 200, authorized funding of $9M in the biennium budget for the development of an automated fraud, waste and improper payment data integration program. These funds support OSC's state project team staffing and expenses ($1M) as well as contractual services for the design, development and implementation of data integration and business analytic models for fraud detection ($8M). To ensure the public-private partnership of this initiative, the State's data integration vendor is required to contribute resources in the amount of $5M over the next two years ($10M total). The vendor contribution will provide hosting hardware and technical environment infrastructure, software, support and services for design, development and implementation of data integration and business analytic model development.

Because data sharing challenges significantly inhibited data analysis and development in FY 2012, to ensure adequate progress continues to be made toward satisfying the General Assembly's public/private partnership mandate, OSC negotiated a contract extension with the vendor for an additional full year at no additional cost. Payments have been delayed accordingly.

Session Law 2012-142, HB 950 appropriated $5 million in non-recurring funds to support the enterprise BI program. Of that amount, the OSC was authorized to use $750,000 for the administration of the program. The remaining funds were reserved for initiatives recommended to and approved by the General Assembly.

The GBICC executed a contract with SAS to initiate business intelligence projects under the GBICC program. The contract provides analytics service resources and will leverage the NC FACTS technical infrastructure. The GBICC contract provides analytics licensing and services through December, 2013.

While recurring funding was provided in FY 2014 and FY 2015 for administrative support of the program, additional recurring funds will be required for vendor hosting, licensing, and analytic support to sustain long-term GDAC program efforts.

As of September 30, 2013	FY 2011-2012 Actual	FY 2012-2013 Actual	FY 2013-2014 Budget	FY 2013-2014 Actual
GDAC Funding				
NC FACTS FY 2011-2013 funds	1,500,000	7,500,000		
NC FACTS FY 2011-2013 carry forward **		497,228	4,948,048	4,948,048
GBICC FY 2012-2013 funds		5,000,000		
GBICC FY 2012-2013 funds carry forward **			3,947,843	3,947,843
GDAC FY 2013-2014 (R)			1,417,515	1,417,515
GDAC FY 2013-2014 (NR)			1,582,485	1,582,485
Total funding	$ 1,500,000	$ 12,997,228	$ 11,895,891	$ 11,895,891
GDAC Expenditures				
GDAC Project Team Expenditures	102,772	501,337	1,417,515	146,325
NC FACTS Vendor Contract **	900,000	2,700,000	4,400,000	
GDAC Vendor Contract **		900,000	5,100,000	
Total expenditures	$ 1,002,772	$ 4,101,337	$ 10,917,515	$ 146,325
Fund Balance	$ 497,228	$ 8,895,891	$ 978,376	$ 11,749,566

Vendor Fraud Detection Contribution	
Vendor Financial Contribution - Required by contract	10,000,000
Vendor Fraud Detection Expenditures - Actual	19,853,201
State Vendor Payments To Date	(3,600,000)
State Vendor Payment Owed **	(4,400,000)
Total SAS Contribution	11,853,201

** Due to challenges with data sharing in the early phases of NC FACTS and GDAC development, the vendor agreed to delay payments until key deliverables were completed. With accomplishments to date, remaining payments less a 10% holdback are scheduled to

With accomplishments to date, remaining payments less a 10% holdback are scheduled to be made by the end of the 2013 calendar year.