

## ***Byrne Grant Deliverables Executive Summaries***

***Deliverable A:*** *Analyze the current LEX System technical foundation and ongoing initiatives such as probation and parole functionality, making recommendations for long term sustainability.*

**Executive Summary:** The first step in the re-direction of the LEX data sharing initiative is to review and estimate the existing technologies in place. The CI application is the core product that acquires and displays participating agency's RMS data.

At this point, the CI application is operational and has experienced performance, scalability and stability issues. Through observation, demonstration and testing it has been concluded that the application lacks sufficient performance and stability to be considered "production" in that term's generally accepted definition. Complex queries intermittently do not complete and update the user interface screen. During concurrency testing, with multiple users, new hardware, new software in a controlled environment, results were inconsistent. In interviews with users – responses indicated that the application has low usage due to performance issues.

Isolating and correcting factors that contribute to instability evaded Metatomix as the original application developer. The current support providers – DOBBS, RAM has likewise been unable to address the performance and stability issues since the problem is intermittent and difficult to recreate.

The issues with stability and performance contribute to CI's inability to meet the core objectives of its mission – a daily operational support application for law enforcement users in the acquisition, analysis and reporting of local crime information.

It is recommended that the application be replaced as soon as possible with a replacement that supports current targeted user requirements. The replacement product should provide an architecture supporting additional analytic use – specific to CLEAR initiative requirements.

Hardware, infrastructure and some software components will be reusable. Any additional funds to maintain the system should be carefully weighed against the operational value of the overall system in its current state.

**Revised Deliverable B:** *As revised in Byrne Grant quarterly report July 2011: The longer term objective of the LEX organization is to leverage data acquisition strategies in support of the implementation of multiple tactical and analytic tools. More directly, it is our goal to acquire law enforcement data from the participating agencies once – for multiple uses. We will conduct needs analysis and requirements gathering from which the highest value solutions will be selected. Potential vendor products that meet these objectives will be identified. This effort is a component of the local initiative known as CLEAR (Countywide Law Enforcement Analytic Resources). The deliverable for this effort will include the publication of business requirements and needs analysis.*

Executive Summary:

**The CLEAR initiative intends to apply analytic tools to the sharing of data among law enforcement agencies.**

*Data analytics is the science of examining raw data with the purpose of drawing conclusions about that information*

Analytic tools – tools that organize, model and extract intelligence from structured and unstructured data, are key to supporting law enforcement agencies who have adopted intelligence led, and predictive policing strategies. As in most newly defined stratagems, the quantification of terms and clarity of tactics is key to successful enactment. There are as many visions of what pro-active policing means and how best implemented as there are tools available in a rapidly expanding marketplace.

Intelligence led policing – agreement on terms:

Intelligence has two flavors in the law enforcement environment; intelligence as information or awareness, similar to the Webster's definition, and intelligence that has legal guidelines in terms of its creation, distribution, and retention. This report will refer to information that falls under the guidelines of 28 CFR, Part 23 as Criminal Intelligence. Criminal Intelligence is focused on criminal activities that "involve some degree of regular coordination and permanent organization involving a large number of participants over a broad geographical area."

Operational intelligence, the gathering of data concerning crime activities, supports forward looking actions and strategies based primarily on analysis of events in the past. Acting on these analyzed events specific to an individual or crime trend is referred to as intelligence led policing. As an example – identifying individuals who have high recidivism, tracking their release from incarceration and more assertedly monitoring their actions – is intelligence led policing.

The same scenario taken to the next level – where profiling all attributes of the event – perpetrator behavior, location, past modus operadi, timing, and current environment – provides the ability to forecast the next event (crime) – is predictive policing.

The following chart depicts the difference in these two levels of policing:

*Private Sector Business Intelligence Process in the **Law Enforcement Environment:***

BI vs. BA	Business Intelligence <i>Intelligence-Led Policing</i>	Business Analytics <i>Predictive Policing</i>
Answers the questions:	What happened? When? Who? Where? How many? Is this trending + / - ? What are the patterns? Where are the relationships?	Why did it happen? Will it happen again? Who will commit the next crime? Where will it happen next? What will happen if we change <i>x</i> ? Will this trend + / - ? What else does the data tell us that we never thought to ask?
Includes:	Reporting (KPIs, metrics) Automated Monitoring/Alerting (thresholds) Dashboards Scorecards OLAP (Cubes, Slice & Dice, Drilling) Ad hoc query	Statistical/Quantitative Analysis Data Mining Predictive Modeling Multivariate Testing

Crime Analyst and Investigative Analyst:

There are many flavors of law enforcement data analysis. For the purpose of this report, we will break down analytics into two categories – analysis focused on crime and analysis focused on the perpetrators of crime. Where they connect is at the point where studying crime patterns and algorithmic predictive models identifies suspect lists – narrowed to a single perpetrator. To this extent – investigative analysis can often time become the culmination or end product of broader crime analysis. An operational conclusion is the ability to perform continuous crime analysis – in preparation or support of specific case or task force operations focused on a narrower crime event.

Crime Analysts – focus on the attributes of crime. What crimes, in what areas, during what times of day, perpetrated by what cross section of the citizenry. This type of trend or pattern study is supported specifically by the data created in the operational process of the agency(s) daily activities and the associated reports produced. This type analysis often is done beyond a single jurisdiction. Regional, countywide, statewide, nationally and even globally – the ability to connect a single occurrence to broader patterns is key to providing strategies of mitigation.

Crime Analysis supports both the development of operational strategy and measurement of tactical results. The plan to mitigate crime – based on trends and patterns, can be evaluated by measuring the same trends and patterns. Results measurement – often presented in CompStat type meetings – must be flexible in identifying when a trend has peaked or subsided and tactical variations are required.

Investigative Analysts – focus on individuals or related crimes with the objective being the identification of the perpetrator(s). This type of analysis is specific to persons of interest, and in that respect, will draw from data sources contributing to profile development of suspects and accomplices. Data sources valuable in this effort beyond law enforcement data include feeds like Facebook, Google +, utility records, employment databases, and private information providers like Accurint or TLO.

#### Business Requirements:

The Business Requirements of Crime Analysis and Investigative Analysis will vary with regard to “persons search”. Trend and pattern analysis – the effort of aggregating events to identify movement – increasing or decreasing occurrences over a spatial and temporal pattern does not require an individual name. It does however require nameless suspect/perpetrator and victim demographics to measure movement in the profiles of perpetrators and victims.

Investigative analysis will start with the need for lead generation and suspect listing. This process will become more granular until the perpetrator is identified or the leads are exhausted without conclusion. In this regard the focus on all spatial, temporal, and event detail is focused on the individuals on the suspect list. When a specific suspect is identified for arrest, the focus on spatial awareness is intensified to the point of apprehension.

Deployment of CLEAR tools: Analytic tools require data. Crime analysis tools typically require crime event focused data. This data in some ways is easier to acquire and study because the event data is being created by the users – the agencies themselves. Investigative analysis tools focus on lead generation, and that in turn, requires information on persons of interest. Strategic data in this analytic effort is often outside the data being created and maintained by the agency(s) doing the analysis.

External data can present challenges in acquisition and integration. There may be legal, ethical and technical issues that must be overcome to acquire the data necessary to narrow the focus on persons of interest. These challenges will be addressed on a case-by-case basis as specific analytic tools are chosen to be placed in service.

It is imperative the tool selected to replace the LEX (CI) software supports follow-on analytic tool deployment. Acquisition routines for extracting RMS / CAD / Jail Management data can be leveraged to support data acquisition for CLEAR tools.

Depending on the replacement product – there will be some amount of additional or modified data access work to be done for specific toolsets. Every software application acquires tools specific to that tool's user interface requirement. The gap between what is being acquired and what is necessary or desirable for other tools or additional functionality will require augmented or modified routines.

The other challenge to analytic tool deployment on the existing software data acquisition schema will be realized if a federated search product is selected. There are two types of query tools – ones that perform federated searches and those that perform consolidated searches. Federated means the data is acquired from the targeted (multiple) data sources as the query is executed. Consolidated searches are run against a repository of previously aggregated data. Federated tools have considerably less complexity in their effort to accurately overlay the data from many sources.

This challenge is especially apparent in the identity (names) resolution effort. Identity resolution is challenging in any scenario of disparate data – and is exacerbated by scale. This challenge is specifically challenging in the Investigative Analysis realm.

Analysis Liaison Libraries: Through interviews with agency analysts it became apparent there is a wide variance in the formalization and application of analytic output. Some agencies have no analyst, some have several. Many analysts are used for investigative support and public information creation. Some analysts are applied to development of CompStat statistics and presentation.

There are some intelligence led policing efforts underway. Those are detailed later in this report. To date, there is no predictive policing strategies in operation. The development of predictive policing algorithms and routines will be challenged by the quantity and quality of the data being aggregated countywide. Predictive modeling algorithms are not simplistic. It is recommended that the Analyst Liaison Program be supported to create an analyst center for expertise – pooling the talents of the 30 or so analysts countywide.

Creation of re-useable algorithms and routines, for the varying analytic tools, will be stored in libraries on the LEX Portal. This will ensure ever-increasing improvement of

the analytic product, and assist analysts in all agencies in developing an analytic strategy.

The Analytic Requirement: One challenge emerging as analytic expertise evolves is the operational use of analytic output. Defining an “analytic requirement” that is integrated into operational strategy is a new paradigm for many organizations. In the past, investigative analysis was applied to case operations. The movement to intelligence led and predictive policing models requires focused analytic output in support of operational tactics. Collaboration among analysts to create supportable models – gleaned from data in either a discovery or confirmation analytic effort (defined later in report), can be integrated into operational strategies.

***Deliverable C:*** *Review the Palm Beach Regional Fusion Center policies and procedures and draft LEX policies and procedures to ensure two-way communication conduits between the local law enforcement agencies and the Fusion Center. Draft LEX policies and procedures for communications between LEX and the Palm Beach Regional Fusion Center.*

Executive Summary: Planning for the next phase of the LEX data sharing initiative includes the development of operational information sharing processes. These processes occur across the law enforcement environment in all size agencies, in daily operations, in special case investigations and through individually developed police bulletins. The development of so much information poses three challenges:

1. The ability to read / review / analyze so much potentially important information
2. The ability to distribute, without omitting, information timely to the correct recipient(s)
3. The ability to retrieve data in support of analysis on trends or individual investigation(s)

There are thirteen (13) recommendations that are presented to address the challenges listed above. Six are operational and seven are technical / automation enhancements.

Operational Enhancements:

1. Identify and quantify the types of data bulletins and their content to be stored on the Virtual Fusion Center / LEX Portal site
2. Identify / create a position (LEX Representative) responsible for data review and dissemination – integrated into proposed regional agency groupings
  - a. Between the Fusion Center and State / Federal / Private Partners
  - b. Between the Fusion Center and Municipal agencies
  - c. Within PBSO

3. Develop shared analytic products and training within the Analyst Liaison Program
4. Conduct training that details the operational use of the Fusion Center
5. Develop multi-agency teams to provide input on design, content, operations, functionality, and security of the PBSO Virtual Fusion/LEX Portal
6. Establish a Data Security Officer position

Technical / Automation Enhancements:

1. Acquire a key word / terms evaluator (Google type appliance) to be applied in multiple locations – to augment document review
2. Develop or acquire structured report generating applications for user data to be stored on the Virtual Fusion Center / LEX Portal
3. Enhance the Virtual Fusion Center / LEX Portal interface to resemble a workspace portal
4. View the Virtual Fusion Center / LEX Portal with a System Development Life Cycle (SDLC) approach – treat the Fusion Center as an application and develop accordingly
5. Extend user access to the most strategic internal PBSO systems
6. Extend user access to the Analytic tools available
7. Enhance data access for the Analytic tools – as data becomes available (CI replacement as an example)

Information Sharing Perception and Reality: This study was initiated to improve the information flow between the many law enforcement agencies in Palm Beach County. Many agencies want access to PBSO information. The first question asked in several interviews was, "What information are you looking for from PBSO?" This question brought a variety of responses. The two most common were:

1. "We would like to see their daily operational information, CAD, RMS."
  - a. *Perception* – they don't want to share it
  - b. *Reality* – PBSO technically does not have the ability to grant access to many of their operational systems. At one point there was an attempt to access the mainframe data from their RMS system and include it in the LEX (CI) interface. The effort was labor intensive, costly, had high recurring cost and provided little value. That cost and challenge, coupled with the system migration plan that was underway (Intergraph) re-directed the LEX (CI) initiative to go after other agency data.
2. "There is information they don't share, and could, through the Fusion Center."
  - a. *Perception* – they are not making information available
  - b. *Reality* – 1. Some information is not made available to the Virtual Fusion Center from the other PBSO bureaus. 2. The Virtual Fusion Center has a wealth of information; however it takes time, and more than casual use to

acquire an understanding of the layout and storage schema. There are some items / functions not yet complete and some “threads” that at this point, do not contain information. The site relies on users to set alerts to the many folders and directories for updates. The Virtual Fusion Center is a developing platform that has huge potential to serve as a multi-system data aggregator and multi-agency collaboration site – there are currently over 400 users – 265 of which are Palm Beach County municipal law enforcement members.

Another challenge to the Fusion Center is the complexity of their mission. This complexity has created misunderstanding. Fusion Centers are often seen as Department of Homeland Security initiatives without focus on local crime. While it is true that the mission of each Fusion may vary – the Palm Beach County Fusion Center has chosen to be an *All Crimes All Hazards* entity. There are many audiences, and Fusion services vary based on the audience. Analysis or investigative collaboration will be specific to a Homeland Security Investigations (HSI) representative versus a local detective. Trend analysis and profile algorithms developed within the Analysis Liaison Program will be different than the link analysis done for HSI.

The All Crimes All Hazards mission requires the inclusion of Public Safety, Private Partners and Homeland Security Investigations in the Fusion Center. This enables communications between organizations as necessary and *as it relates to crime*. As an example, when Fire/Rescue works an overdose – law enforcement may want to know the details. When a bombing or anthrax crime is in progress, Emergency Management (EM) needs to know. The presence of non-law enforcement agencies does not mean law enforcement data is being shared beyond a need-to-know basis. The Fusion Center is about law enforcement.

There is considerable effort under way in support of multi-jurisdictional crime investigations. Recently, the Virtual Fusion Center has been developing new site pages dedicated to specific crime / task force efforts. This effort includes bulletins and links to associated agency cases along with photos and other evidential material.

While this information is available – the reality of the Fusion Center being an All Crimes entity is confusing when you view the PBSO organizational breakdown. There are investigative departments and information silos outside the Virtual Fusion environment. There are some silos at PBSO due to inadequate technology and some are in place by design. This logically raises two issues – what information is not available for review in identifying larger crime initiatives, and how is the collaboration of fusion crime efforts replicated in an isolated investigative unit? PBSO is currently working through these issues.

**Deliverable D:** *Develop a comprehensive systems integration plan to include the Palm Beach County LEX foundation, the Palm Beach Regional Fusion Center, the South Florida Virtual Fusion Portal, Countywide License Plate Recognition data, analytical tools (including predictive policing), as well as integrating with other regional data sharing initiatives based upon various defined end user group requirements. Deliverable: LEX Systems Integration.*

**Executive Summary:** The most important element of this Integration Plan will revolve around making sound decisions for establishing a solid information sharing environment. This will entail giving the business users the proper information in the correct file format to satisfy the business tool and/or business process. Connecting the tools and information together will effectively and efficiently enhance their job functions, while at the same time eliminate the manual way of performing the same task, and increasing available man hours for taking on new responsibilities.

In the past, the information sharing environment was limited to the LEX CI (Criminal Investigation) application with no access to the underlying data. Today, the LEX organization has an expanded vision which includes the migration of its CI inquiry system, and the CLEAR initiatives. These new business intelligence interests will require the move to a larger, richer information sharing environment.

The LEX organization will need to determine the right strategy that will support the opportunity for analytic tools, data analytics, intelligence led policing, predictive analysis, risk forecasting, link analysis, behavioral analysis, ad hoc query, and manual process automations, in addition to an inquiry search tool to replace the current CI application.

While it is important to replace the LEX CI product as soon as possible, it is more important to do so in a way that will ensure that it incorporates into the broader vision for the LEX program. This means a product should be selected that plays well with other vendor technologies. With the preference for Microsoft's SharePoint technology, LEX will need a product that is open enough to easily be able to extract data for publishing on a SharePoint site.

During this engagement, efforts have been focused on primarily the existing regional solutions. With the information that has been obtained, it is clear that other solutions must also be considered. LEX users want an investigative tool that performs quickly, is reliable, and provides value in terms of sorting through voluminous amounts of data and information. With the considerable knowledge gained, an RFI (Request For Information) or a RFP (Request For Proposal) may be the best way to obtain more definitive information. This process may add delays to the CI replacement timeframe. The LEX 5013C organization has greater flexibility in their procurement options and may be a better alternate route to utilizing to the county procurement process. LEX has a

grand vision, which based on funding, must be pursued in a step-by-step fashion. With an RFI or RFP you will be able to find an affordable replacement for LEX CI and possibly identify the next vendor that will assist with the integration and data repository requirements.

Management should be prepared for the fact that this will be a buy and build environment involving multiple vendors. The key will be strong project and vendor management. ISS staff is well suited to serve in this capacity and in small, specific, application development initiatives. It will be crucial not to overburden the limited ISS staff with an all in-house development scenario. You must include vendors with proven experience and performance with ETL (Extract, Translate and Load) aggregation of disparate RMS data, systems integration, NEIM justice standards, CJIS Security expertise and virtualized data warehousing-like capabilities. ISS is well positioned to manage these procurement initiatives and hold the other vendors to task, while continuing to maintain the existing system, and learning to provide technical maintenance in specific areas of the program.

After replacing CI, the key will be to develop an open, yet secure, flexible and scalable architecture platform to tie the new CI application together with various CLEAR tools with advanced audit capabilities. An affordable product for CI that has low maintenance costs, or allows ISS staff to have access to the source code for maintenance, would be ideal. Products like ThinkStream.com, FATPOT.com, Enforsys.com, Information Builders and DOBBS, RAM should also be evaluated with a side-by-side comparison to the current LEX CI product. This may require site visits to customer locations. LEX does not want a product that restricts the re-use of the data by holding it in a proprietary data structure that might ultimately inhibit the nature of a law enforcement data clearinghouse that will be needed in Palm Beach County. Strong emphasis should be placed on the contracting effort to make sure that software source code is owned by the LEX organization.

For accountability, a multi-agency Development Team will be required to determine how the portal, tools and applications should be designed for various users of law enforcement information (Command staff, Analysts, Investigators, Detectives, Patrol and Dispatch). It is recommended that logical user groups be brought together to define the requirements for each user, including technical development staff from ISS, the Sheriff's Office and local Police Agencies.

***Deliverable E:*** *Assist in Defining a Pilot Project for regional crime analysis, outlining data to be shared and relevant conditions, processes and procedures to ensure security and quality of information. Deliverable: Regional Crime Analysis Business Plan*

Executive Summary: The over-arching goal of the LEX organization is the cooperative sharing of law enforcement information. The two primary components at play in this pursuit is the relevant data and the tools through which users gain situational awareness and decision making support. A third component is collaboration between the agencies and staff that respond to the calls for service and devise strategies applied to pro-active policing efforts.

### **Palm Beach County Law Enforcement Work-Space Portal Pilot**

Under the direction of the LEX organization there are two data and tools initiatives under way – replacing the initial LEX Criminal Investigations (CI) application and creating a data foundation to support add-on analytic tools under the Countywide Law Enforcement Analytic Resources (CLEAR) initiative. A third effort is deployment of a work-space portal, currently referred to as the LEX Portal.

A work-space portal will provide users a comprehensive computer environment where tools and information are combined with communication and collaboration. Applications, structured report generators and viewers and situational awareness dashboards will be combined with collaboration tools. The environment will be tailored for specific users – to include flexibility for each user to customize their own workspace. The work-space portal will provide the gateway to applications – including the CI replacement and analytic (CLEAR) tools. The LEX Portal is also intended to provide an interface to Law Enforcement bulletins, Regional Intelligence Meetings (RIMs) reports, BOLOS, dashboards of crime statistics, multi-jurisdictional crime task force coordination, messaging, analytic routines and algorithms, and discussion threads – specific to user types.

*Imagine a Google, Yahoo, or MSN web page portal – designed to consolidate all your pertinent information and work-tools in one location.*