

# 2015 Achievement Awards Virginia Association of Counties

## APPLICATION FORM

All applications must include the following information. Separate applications must be submitted for each eligible program. **Deadline: June 1, 2015.** Please include this application form with electronic entry.


### PROGRAM INFORMATION

Locality: Henrico County  
Program Title: TEMPO Dashboard  
Program Category: Criminal Justice and Public Safety

### CONTACT INFORMATION

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### SIGNATURE OF COUNTY ADMINISTRATOR OR CHIEF ADMINISTRATIVE OFFICER

Name: John A. Vithoukas  
Title: County Manager  
Signature: 

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**Overview**

The Henrico County Police Division TEMPO (Technology Enhanced Modern Policing Operations) workgroup was formed on April 24, 2012, to develop and implement Police Divisions new brand of policing. As the workgroup progressed Henrico County Information and Technology was brought in as a partner to take the workgroups technological ideas to the next level by expanding on them bringing the project to fruition; creating the TEMPO Dashboard. The TEMPO Dashboard is a portal that links the full suite of Police Division computer applications from one program, deriving its data from the Police Division's Computer Aided Dispatch, GIS, and Operational programs including Incident Crime Report, Arrest, Field Interview Reports, and warrant databases, combined with mapping technology to plot crime relevant information based on an officers location displayed on their MDC in real time. It also provides a forum for enhanced communications between officers so they can accurately share information between zones, Stations, or countywide faster and easier. The TEMPO Dashboard was a joint initiative between the Henrico County Police Division and Henrico County Information Technology that represents the efficient use of technology to enhance the Henrico County Police Officer's ability to better analyze, understand, track, and address crime and quality of life issues from their vehicle while increasing officer safety and awareness in order to improve the overall police services provided to the citizens of Henrico County.

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**Summary of Program**

On April 12, 2015, Chief Douglas A. Middleton met with 34 members of the Henrico County Police Division which represented a cross section of the entire Division. His direction during this meeting was for the workgroup to develop a model of policing for Henrico County, based on the tenants of Intelligence-Led Policing, which would be representative of the entire division moving forward. A model that encompassed the vision of the Henrico Police providing the highest quality of customer service, embracing technology, becoming a more effective, efficient and fiscally responsible agency. Based on this charge the workgroup developed and launched the Henrico County brand of policing, TEMPO (Technology Enhanced Modern Policing Operations). One premise that was created through this process is the TEMPO dashboard which was launched in March 2014.

The TEMPO dashboard is a joint venture between the Henrico County Police Division and Henrico County Information Technology to develop a program that improves policing in Henrico County through the efficient and effective use of technology, improving officer safety and overall quality of services to Henrico County residents and guests. This partnership has enhanced both divisions' abilities to serve their customers with no additional costs to the county or taxpayers. The dashboard has proven to be economical and effective in improving our policing efforts.

Every sworn officer in Henrico County is issued a mobile data computer (MDC) which they use to access all of the Divisions computer programs, databases, VCIN (Virginia Criminal Information Network), NCIC (National Criminal Information Center), and enter reports so they

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are instantly accessible for analysis in order for officers to track and react to crime patterns and trends in real time. The TEMPO dashboard ties all these resources into an easily navigable and usable portal to access the above resources, accomplishing the ultimate goal of the TEMPO dashboard; putting the resources in the hands of the end users so they may better fight, prevent, and deter crime while improving officer and citizen safety.

The TEMPO dashboard has become an excellent resource for officers, staff, and analysts as they work to have positively impact crime and improve quality of life. The dashboard has exceeded our initial expectations and continues to grow, with many potential options for growth being considered. Through the partnership developed between Police and Information Technology the citizens of Henrico County will continue to reap the benefits of this unified approach to fighting crime.

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## **TEMPO Dashboard**

### **Description of the Program**

Chief Douglas A. Middleton met with a group of 34 officers on April 24, 2012 and tasked them with looking policing models, to include Intelligence Led-Policing, in order to identify the model best suited for use by the Henrico Police Division moving forward. With budgets being hit by the economic downturn it was imperative to find a model that could serve as the basis for what the Police Division does to fight, reduce, and prevent crime in an efficient and economically sound way. Chief Middleton clearly expressed his support of the workgroups efforts and stated his expectations for the framework of this model:

1. Directing our attention to the value of information-gathering;
2. Transforming that information into intelligence by vetting it through an effective analysis system;
3. Gaining from that process a better understanding of our local crime problems; and
4. Addressing those crime problems through unified efforts, resource sharing, and development of enforcement initiatives that are focused on future prevention of crime.

“At the core of what we accomplish through ILP is the improvement of quality of life for our citizens; reducing violence in our community; and providing a safer environment in which our police officers work. Officer Safety must be a key principle in all our LP efforts; both during the application of ILP initiatives, and by long-term reductions in crimes which could threaten their safety and the safety of our citizens.”

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The workgroup identified policing models used all over the world and looked at their pros and cons. They also looked at models employed, in part or whole, by the Police Division from 1934 to present. Four models were identified: Traditional, Problem Oriented Policing, Community Problem Solving Policing, and COMPSTAT. It was discovered that none of these models were ever ingrained in officers as the Divisions model of policing, with many officers never really knowing what each of these models involved or how it applied to their job. For this reason, the workgroup decided they not only needed to identify the policing model, but create a brand of policing that every person in the Division, sworn or civilian, would be able to understand, utilize, explain, and embrace as the “Henrico Way” of policing. Thus, the brand name TEMPO was developed.

TEMPO is the Henrico County Police Division way of policing with a heavy emphasis on intelligence led policing and utilizes identified best practices from other models to effectively police Henrico County. Information sharing is vital to everything police do. In order to improve the information sharing, several ideas were explored with the creation of a “forum” for officers to exchange information and ideas among the platoon, shift, Station, or Division level being central to this idea. A smaller subgroup was assigned to look into how they could create this forum to share ideas and information. The group focused their efforts on commercially developed and off the shelf software that could accomplish in part what they envisioned. The workgroup identified several inhibitors with over 600 computers in the field, the costs associated with purchasing, licensing, and maintaining software for such a large agency proved to be a significant impediment. The workgroup also found that the programs they had looked at did not

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meet all their needs and in some cases were not compatible with the technology they already had in place.

The TEMPO workgroup reached out to Henrico County Information Technology since they have been writing applications to collect and store data for the Police Division over the past 30 years. This collaboration was clearly different. What started as Information Technology assuming a consulting role turned into their total immersion, developing new applications and programs which opened up new ways of making information and actionable intelligence available to officers sooner, easier to obtain, and relevant to the area they were working.

Based on the one initial idea, a forum to share information, the workgroup and Information Technology took this concept to a much higher level and envisioned a dashboard that would be the center of all information available to the end user, officers on the road. A place where they could access police applications to garner all the available information when handling calls for service or developing crime initiatives from their mobile data computer.

The TEMPO Dashboard serves many functions. It is data warehouse based and derives its data from the Police Division's Computer Aided Dispatch (CAD), GIS, and Operational systems including Incident Crime Reports (ICR), Arrest, Field Interview Report (FIR), and Warrant databases. An officer in his vehicle can look at the home screen on the dashboard and have access to all these databases as well as information such as pictures of the Divisions most wanted persons, officer safety information and bulletins, forum subscriptions, and other statistical reports. Please refer to Figure 1.

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Information Technology used mapping software which is linked to the various databases and allows officers to map crime information such as incident crime reports (ICR's), arrest warrants, and other data sources to geographically specific areas and view it on their MDC screen. They are able to create custom data maps in order to track crime in their assigned areas. Each icon on the map represents the location of a report where the officer can scroll over icon and open the report to view it in summary form or click on the report number in the summary and pull up the full report. Please refer to Figure 2. This was empowering technology, putting resources in the hands of officers to improve their policing capabilities.

A big part of Intelligence-Led Policing is technology, and using it to help manage and identify where resources should be deployed. The combination of Police and Information Technology was a in part due to budgetary constraints. The software that was being researched and considered bore a considerable cost. By including Technology support this project was accomplished without any further funding allocation, and the group was able to expand the capabilities of the dashboard several times over what was initially envisioned.

Traditionally policing was reactive. Officers would respond to crimes and then try to solve them by arresting the offender. As policing evolved models started to focus on trying to deter and prevent crimes. As the economy eroded, it called for the Police Division to look at a different way of policing in order to minimize their costs (salaries, equipment, and training) and maximize their results. TEMPO focuses on directing resources to the root of problems that have been



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identified and create partnerships in order to enhance the effectiveness of the strategies employed and using all available resources to eradicate and prevent crime.

Part of what makes the TEMPO Dashboard so impressive and worthy of recognition is there was no additional cost for the county to accomplish this project. The technology, equipment, and personnel that went into the development and implementation of this project were already in place. In responding to the economic downturn, the Police Division and Information Technology partnered to minimize the impact on the county budget, succeeding by accomplishing this assignment totally in house, and in a way that it could continue to evolve.

Throughout this project, the only costs incurred were the salary of each of the county employees on this team that worked on creating and building the dashboard. During this two year process, the time of each person was not tracked in order to come up with a cost analysis. However, these same employees would have been working the same hours but on different projects. For this reason, there was not any increased expenditure for the county.

Keeping true to the initial concept there are no anticipated capital or operational costs as the workgroup continues to identify new ways to make the TEMPO Dashboard an even more effective tool.

The TEMPO Dashboard has provided revolutionary access to information in a matter of seconds in order to improve an officer's ability to analyze crime, crime problems, and devise crime strategies in order to solve and prevent crime. The TEMPO Dashboard has put the resources in

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the hands of the officer in the field, improving their overall effectiveness, efficiency, and safety in the field.

This project illustrates how two different divisions within a county government, with two absolutely different responsibilities and objectives can work together to become a more effective government, enhancing each other's ability to do their jobs. Due to the success of this effort, both divisions have started to look at other opportunities to incorporate into the dashboard, such as including information for the Division of Fire (fire hydrants, known hazardous locations, etc.). One of the biggest accomplishments of this project is bringing different departments together to work on one common goal that is mutually beneficial and improves the services for residents and guests of Henrico County.

The TEMPO Workgroup and Information Technology have made several presentations to other county divisions and entities, such as the County Manager and Board of Supervisors, in their efforts to extend the collaborative nature of this project and its success in hopes of creating additional partnerships within the county.

**The Results/Success of the Program**

The TEMPO Dashboard has far exceeded initial expectations. Starting as a "forum" for officers to communicate crime information that was not captured in reports between beats, zones, and stations, through the use of their mobile data computers this project quickly evolved into a much larger holistic approach to providing real time information and intelligence available to officers 24 hours a day 7 days a week. Combining the thought processes of information technology and

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crime prevention practitioners opened the flood gates of ideas, only limited to the resources of the physical technology currently in place within the County. The group quickly developed ideas that would make the job of the officer easier, providing them immediate access to data that was previously not available to them, all from one central location.

As an example of a successful application of the dashboard technology one platoon conducted a warrant service special during their four day tour. Prior to the creation of the dashboard officers attempting to serve active warrants had to do significant work prior to the warrant attempts to find what active warrants were out. They would print off a list of all the active warrants. If they attempted a warrant at a location they would pull it up on their MDC and update the comments, to reflect what they found for the next person attempting service. This was a time consuming and cumbersome approach. With the implementation of the TEMPO Dashboard, an officer would pull up active warrants on the dashboard map which would show all active warrants in that particular area. They could roll over the icon to obtain the basic information and click on it for the full report. Once the service was attempted they would update the data. One platoon of midnight shift officers in our Central Station used this technology to focus their “downtime” between calls to serve active warrants. During their tour, the officers served 36 warrants. This represented a huge success. With the upcoming addition to the dashboard called “Follow Me.” An application that populates the officer’s map displayed on their MDC which is linked to their GPS position and updates as they drive through an area displaying and plotting crime relevant data, we are expecting continued success on our warrant services.

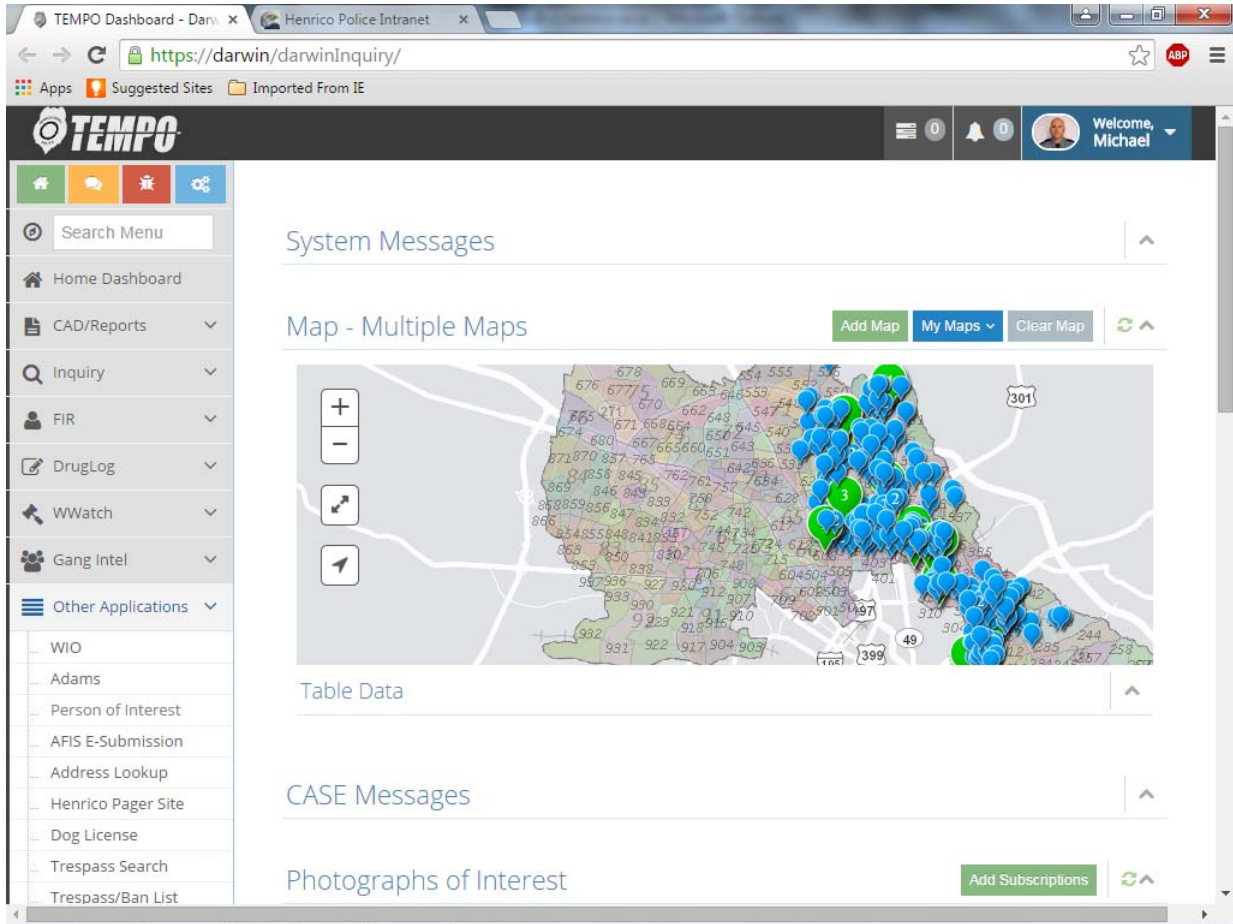
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The TEMPO Dashboard has been successful in assisting officers with identifying persons. There have been numerous occasions where officers encounter persons who provide false information in their efforts to avoid apprehension or summons. By utilizing the dashboard the officers have been able to properly identify the suspect they are dealing with saving the officer time, the courts time, and saving innocent citizens from potential legal action to clear their name and potential arrests for fail to appear situations.

There are many other success stories. The most relevant example deals with the annual report and the main objective of policing, reducing and solving crimes. The Henrico County Police Division 2014 Annual Report was published on March 10, 2015. This report provides an overview of accomplishments for the year and provides statistical information on crime in the county. For 2014, the crime rate per 1,000 residents was 26.57. This is the lowest rate since the Division started tracking it. There is no coincidence this rate has gone down the past two years in part due to the work done by the TEMPO workgroup, and specifically the introduction and development of the TEMPO Dashboard. With the use of the dashboard officers are more aware of crime trends and patterns in their assigned areas so they are able to much quicker employ strategies to solve crime, or prevent it in the future.

# TEMPO Dashboard Henrico County, Virginia

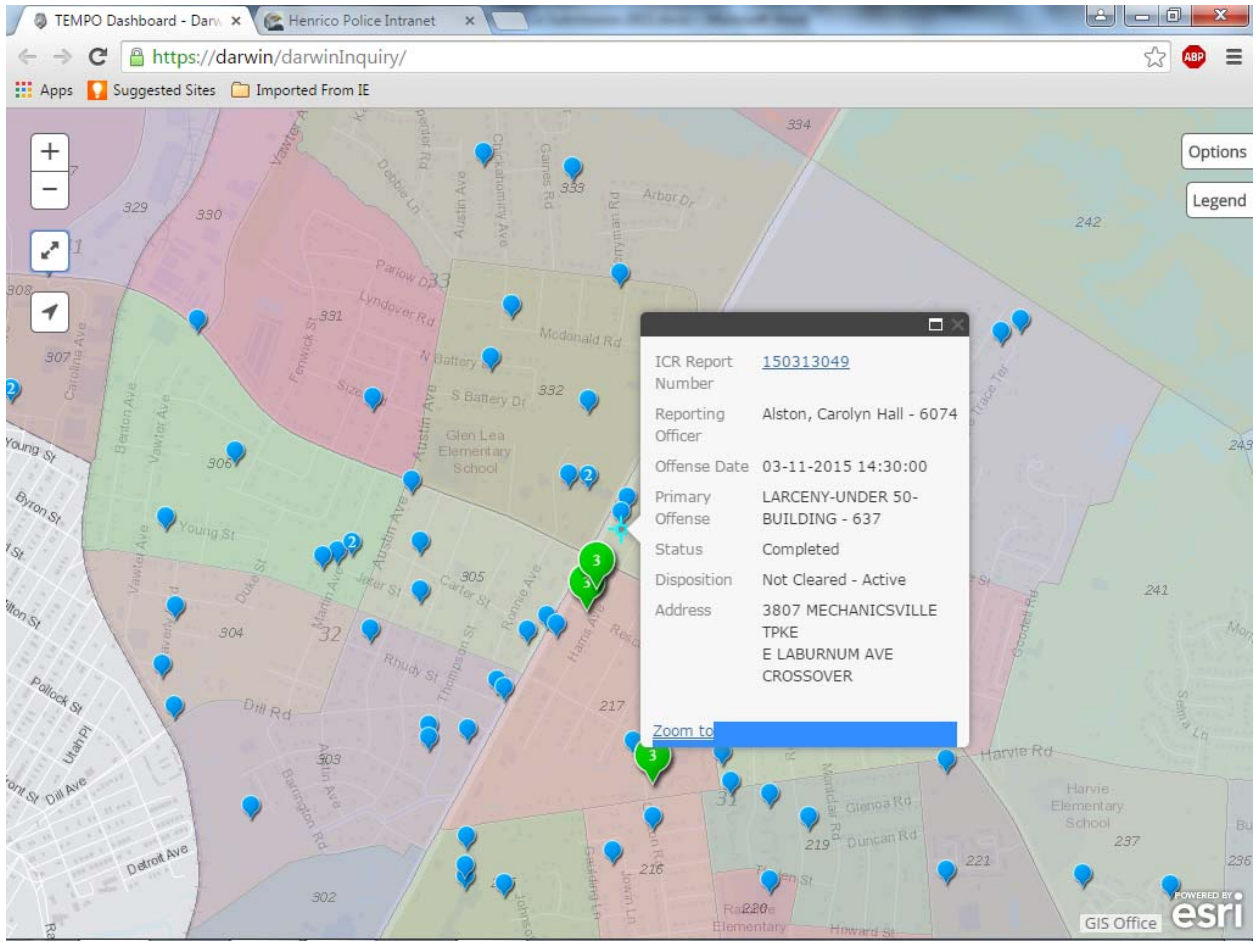
Figure 1



Screen shot of the TEMPO Dashboard as seen once opened. This is the top half of the home screen with the different databases, search tools, and applications listed along the left side. For each of the main headings, there is a drop down with additional tools. The “Other Applications” tab is opened for illustration purposes in this screenshot. The current map displayed is in a small screen format with ICR’s in the 30, 40, and 50 zones over the past 30 days displayed. The map can be blown up and is featured in an additional screenshot.

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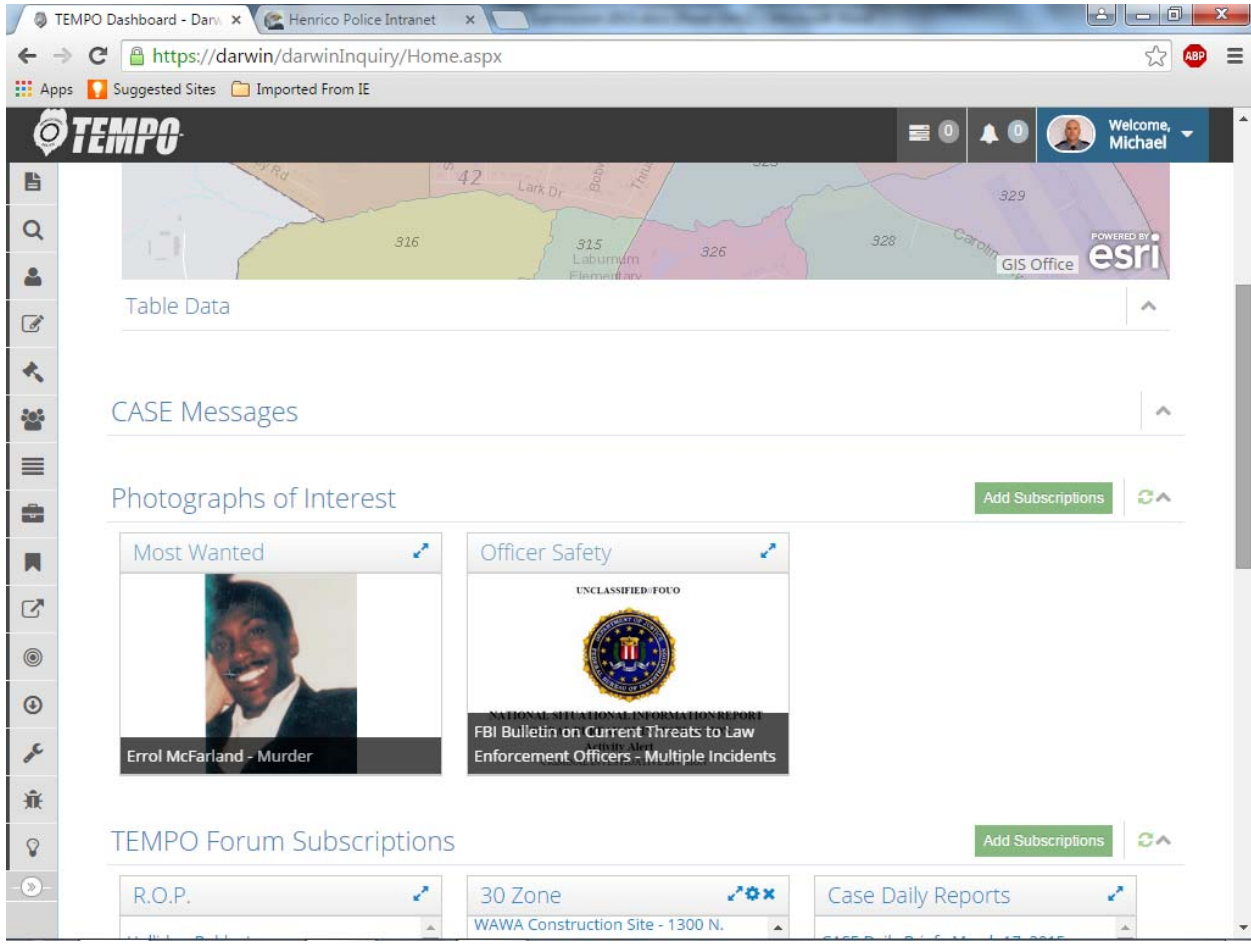
Figure 2



This is a view of the map in full screen mode and zoomed down to better identify incident report locations. The example displayed on the screen is what an officer sees when he rolls over the report icon. By clicking the hyperlinked report number in full incident report is opened in another window. This allows for easy access to reports based on time (30 days) and a geographical area. An officer could zoom in even more, down the specific houses on a street if they so desired.

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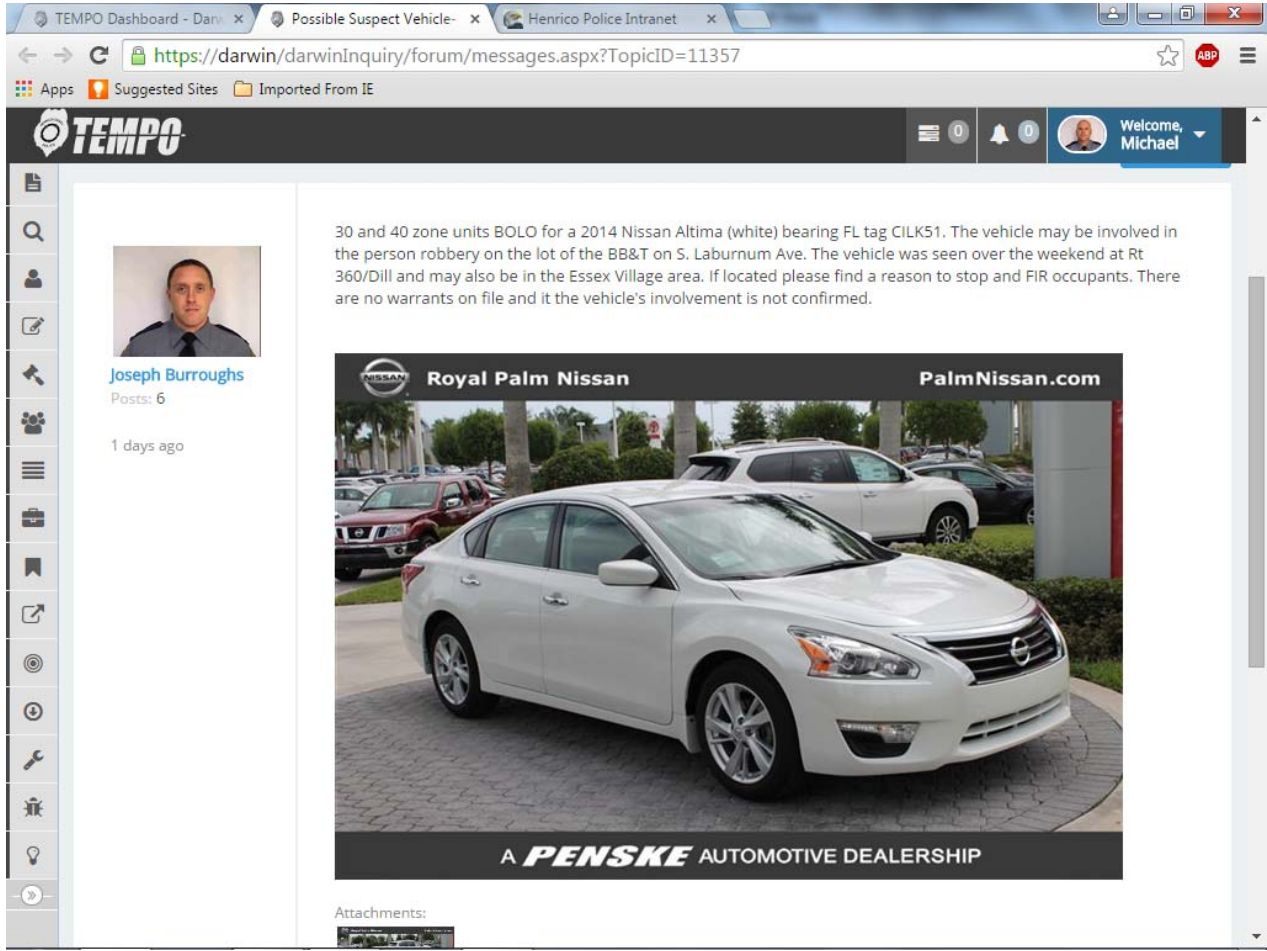
Figure 3



This is a screenshot of the lower half of TEMPO Dashboard home page. In this view you can see the “Most Wanted” heading along with “Officer Safety” and different “TEMPO Forum Subscriptions” the user can subscribe to. This creates a custom dashboard, displaying the information that is germane to an officer’s individual need.

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Figure 4



This is a screenshot of a forum topic posted for a specific patrol zone. The robbery investigator has posted a file photo of a car matching the description from a recent robbery to illustrate to officers what the car should look like, reflecting the comparable make and model to the suspect vehicle being sought. The investigator is also able to post information on the offense and instructions for what they are asking the officers to do if the vehicle is located.



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Figure 5

## 20 Year Statistical Comparison Chart

YEAR	MURDER	FORCIBLE RAPE	ROBBERY	*ARSON	AGGRAVATED ASSAULT	BURGLARY	LARCENY	MOTOR VEHICLE THEFT	TOTAL	CRIME PER 1,000 POP.	**COUNTY POPULATION ESTIMATE
1995	15	55	198	97	264	1,618	6,793	549	9,589	40.01	239,683
1996	17	43	234	87	257	1,643	7,894	603	10,778	44.30	243,273
1997	22	52	321	89	249	1,857	8,403	750	11,743	47.42	247,632
1998	21	38	287	104	243	1,795	8,001	707	11,196	44.05	254,194
1999	14	53	247	100	230	1,595	10,059	646	12,944	49.94	259,179
2000	11	45	252	117	215	1,476	9,461	683	12,260	45.91	267,024
2001	16	44	300	181	222	1,462	9,666	759	12,650	46.60	271,440
2002	10	43	335	146	190	1,458	9,392	701	12,275	44.66	274,847
2003	24	38	346	118	193	1,652	9,589	749	12,709	45.21	281,069
2004	20	32	332	111	217	1,739	9,814	821	13,086	45.32	288,735
2005	14	42	319	83	232	1,518	8,962	717	11,887	40.52	293,382
2006	8	49	342	91	203	1,552	7,829	600	10,674	35.65	299,443
2007	17	32	391	127	192	1,431	7,858	559	10,607	35.06	302,518
2008	16	36	339	93	186	1,349	8,228	558	10,805	35.36	305,580
2009	12	32	275	67	174	1,305	6,895	474	9,234	29.92	308,672
2010	13	26	254	91	188	1,073	6,302	368	8,315	27.01	307,832
2011	9	32	238	101	151	1,133	6,289	390	8,343	26.76	311,726
2012	12	21	230	56	189	1,056	6,660	375	8,599	27.28	315,157
2013	12	23	205	44	200	1,004	6,634	374	8,496	26.71	318,137
2014	8	19	184	67	196	1,022	6,735	308	8,539	26.57	321,374

\*Arson investigations are handled by the Division of Fire

\*\*Population from Henrico County Department of Planning, as of December 2014 (3C Studies)

20 Year Statistical Comparison Chart from the Henrico County Police Division Annual Report 2014.



# The Technology Driving the TEMPO Dashboard

## Data Collection

Captured through :

- Computer Aided Dispatch
- Field Interview Reports
- Incident and Crime Reports
- Warrants
- Arrest
- Adult and Traffic Summons
- Person of Interest
- Gang Intelligence
- Pawn Shop Sales Tracking
- Drug and Vice Complaints

Custom applications designed and written by Henrico County Information Technology staff, collect and maintain the data that is at the heart of the TEMPO dashboard. Information Technology has been writing all custom application for the Division of Police for over the 30 years. At the center of the suite of Police data collection systems is a data warehouse. The data warehouse replicates and consolidates all Police data in a manner that allows reporting and analysis from one trusted data source. The full suite of custom Police information systems, in addition to the 911 Computer Aided Dispatch (CAD) systems, exports data to the data warehouse in either real-time or on suitable periodic basis.

A majority of the Police Division's applications gather information about criminal activity, provide citizen services, and manages the staff activities. Essentially, they facilitate meeting all the primary goals and objectives of the Police Division. These systems include but are not limited to Incident and Crime Reports (ICRs), Property & Evidence, and Warrants. Arrest processing and Traffic Summon entry is managed by a custom application and provides the data via interfaces to the Henrico Sheriff Office's jail management application, Virginia Supreme Court, and Virginia State Police. A case management system manages all aspects of the workflow of an investigation from the original incident report through the prosecution of the offender(s) and provides supervisors the ability to review and track reports through workflow queues. There are additional systems such as Field Interview Reporting (FIR), Person of Interest tracking (POI), Gang Intelligence, Drug & Vice Complaint, and Pawn Shop sales tracking.

## Data Presentation

Presented by :

- Microsoft IIS 7.0
- jQuery 1.9
- HTML5
- JitBit .Net Forum
- ESRI ArcGIS 10.2

Since each individual Officer needs a unique view into the data, the dynamic data presentation design is based upon the information that is relevant to their current duties. To accommodate this ever-changing need for different information, both the web page and database design is constructed to easily add new functionality and data without the need to alter the applications. Subscriptions, which automatically become available to all users, make connections between the web page and Microsoft SQL Server stored procedures. As soon as a user selects a subscription, the web page uses Microsoft's ASP.Net development environment, jQuery, and HTML5 creating dynamic content for the specific user. Users can view all available subscriptions and subscribe by completing fields that defines the data parameters. For example, an Officer could subscribe to an Incident and Crime Report pin map for all burglaries that occurred in their patrol zone in the last 10 days. Once a user makes the subscription, it persists on the dashboard until they remove it.

The TEMPO Dashboard integrates with JitBit .Net Forum and ESRI ArcGIS 10.2 mapping software. The .Net Forum software is customizable and seamlessly enforces the established application security. ESRI ArcGIS mapping software provides APIs to map the geocoded location data. Data encryption occurs during transmission via Hypertext Transfer Protocol Secure (HTTPS).

## Data Storage and Infrastructure

Environment :

- SQL Server 2012 Always-On
- Windows Server 2012
- Network Load Balancing
- VMware vSphere 5.1
- Dell PowerEdge R810 Server
- NetApp 6210 Filer

The data is stored within multiple Microsoft SQL Server 2012 Always-On databases. The Microsoft Windows Server Failover Cluster (WSFC) enables Availability Groups comprised of two synchronous instances, one asynchronous instance, and a file share witness located in two data centers. To ensure performance and added availability, the Windows servers are provisioned on VMware Virtual Machines (VMs) and have 16 dedicated CPU cores and 64 Gb of RAM. ESX Hosts are Dell PowerEdge R810 servers utilizing two Intel Xeon 10 core CPUs (2.40 GHz) and 128 Gb RAM. The environment has been designed to allow extension into cloud computing via Microsoft's Azure if desired. Application availability is ensured by utilizing three application servers also provisioned on VMware VMs within the two data centers using Microsoft's Network Load Balancing architecture to host IIS, ASP.Net, and .Net applications. The application servers are provisioned to have 2 dedicated CPU cores and 4 Gb of RAM. Storage is protected by a NetApp storage area network (SAN).



# The Officer Centric View of the TEMPO Dashboard

## Menus, Reports, Inquiries, and Notifications

### Inquire :

- Data Collection Systems
- Statistical Reporting
- Intel and Analytical Systems
- Inquiry of all Police Systems
- Notification of Task Status

Integrated into the TEMPO dashboard is a menu of all Police systems. From this menu, a user can access all the data collection systems, a suite of statistic reports and most all Police reporting, intelligence and analytical systems. Custom inquiry applications are available for searching significant fields for all the data collected. Just a few examples of possible inquiries are: name; aliases; nicknames; physical descriptions; vehicle descriptions; all property descriptions; offenses by type, date, time, and modus operandi (MO); and scars, marks, and tattoos. The inquiry also includes full text searching for all notes on any of the reports. Name inquiry is unique in that when a name is added to the TEMPO data warehouse, the system attempts to "fuse" the name with other names thought to be the same person. Names are matched based on an algorithm using last name, first name/initial, middle name, name suffix, aliases, nicknames, DOB, race, sex, SSN, Henrico Police ID, Virginia State ID, FBI ID and address. Name inquiry displays all reports and information from a "fused" set of names. The dashboard provides a notification panel that provides staff with data on the reports they have due and processes they need to complete in the overall documentation workflow.

## Location Mapping

### Displaying :

- Offenses
- Outstanding Warrants
- Field Interview Reports
- Police Calls for Service
- Police Unit Markout
- Gang Activity

Location data stored in the operational and data warehouse databases are geocoded using a Henrico county maintained geographic information system (GIS) utilizing ESRI mapping software. Currently, locations related to ICR Offenses, warrants, warrants for known gang members, Field Interview Reports (FIRs), Police Calls for Service, and Markouts are available for mapping. Patrol Zone, date ranges, and report dependent options allow for map customization and saving for repeated use by the Officer. Clicking on a mapped location will display a summary of the associated report with a link to the full report.

## Photo Slideshow

### Presenting :

- Most Wanted
- Amber Alerts
- Vehicles of Interest

The CASE unit maintains the photos and associated meta-data via a custom application. By adding at least one photo to a category, the corresponding slideshow is automatically displayed on all Mobile Data Terminals (MDTs) and Personal Computers (PCs) used by sworn Officers.

## Forum

### Discussing :

- Daily CASE Reports
- Operation T.O.P.
- Operation Shadow

The Forum enables the sharing of information between officers within post categorized into Patrol Zones, Stations, and Division Wide. Integrated security identifies the poster's user ID. Police Officers moderate the Forum and the information purged after 90 days if not updated. Besides text, post can have photos and documents attached. For easy monitoring, Officers can subscribe to Forum Topics of interest and the TEMPO Dashboard will display several of the most recent post.

## Future Features

### Reviewing :

- Productivity Metrics
- Crime Metrics
- Vicinity Mapping

The TEMPO Dashboard will provide productivity metrics so Officers and supervisors can monitor performance. The Officer will receive real-time feedback through these metrics by properly documenting their activities. Officer's individual needs will define additional Crime metrics provided via conventional tabular data and in graphical form. Vicinity mapping will determine the current location of the Officer's MDT and display crime data that occurred in the current SA and surrounding SAs.