



# The New Safety Net IT Ecosystem:

**Multi-cloud, Hybrid Cloud & the API Backplane**

An Integrated Solution for Sonoma County - Partnering with IBM and SimpliGov

# Table of Contents

<b>Abstract</b>	<b>1</b>
<b>Chapter 1</b> Business Landscape, Goals & Challenges	<b>3</b>
<b>Chapter 2</b> The Concept of Operations	<b>5</b>
<b>Chapter 3</b> Solution Description	<b>7</b>
<b>Chapter 4</b> Solution Impact & Observations	<b>14</b>

# Abstract

Safety Net in the public sector involves services and programs across multiple departments - health, behavioral health, social services, housing, justice - coming together to help individuals with complex needs.

Interdepartmental collaboration is the key to improved client outcomes. Another key to improved outcomes is the Departments' enablement of a network of Contracted Service Providers (CSPs), and Community Based Organizations (CBOs). In addition to providing services directly, departments must also provide the central trove of resources that their partners can use to render services.

This new operational model is supported by an emergent information technology architecture, where the Department provides the core systems and surrounding Application Programming Interfaces (APIs). Various departments line of business application is able to interact by calling and orchestrating these APIs. The economics of this model are sound and its elasticity unbeatable. Each party does what it does best - the Department manages data, stipulates business rules, ensures compliance, and evaluates performance; the CSPs and CBOs can build point of service applications informed by their close proximity to the client. In this model, new programs for public assistance and healthcare can be launched rapidly through the effective use of the Departments' existing resources. The ecosystem shares the burden of the launch, such that the services reach the client at the time of need, and not weeks or months later.

Sonoma County is one of the first Counties to have undertaken this paradigm shift. Through a recent information technology initiative, Sonoma County has provisioned a Care Coordination hub and an API backplane, to which various Care Management and process automation systems attach. The hub brings together data from various back-end systems - medical, behavioral health, social services, housing, and justice - to compose the holistic picture of the client. Access to various aspects of this holistic picture are controlled by client consent and Department policies to maintain compliance with regulations such as HIPAA and CFR 42 Part 2. The hub provides the Master Data Management, business rules engine, authorization and consent, and alerts and notifications. Watson Care Management and process automation systems access the hub through a set of HL7 FHIR APIs. (The HL7 FHIR standard for RESTful APIs has been endorsed by the Center for Medicaid Services (CMS), and is now widely used across the Healthcare industry.)

Sonoma County's architecture enables its Departments' and business partners to leverage the API backplane to quickly build out applications and client portals. Interdepartmental Multidisciplinary Teams (IMDTs) can readily build out care plans with a 360-degree view of the client's progress. To further facilitate the new operational model, Sonoma County has provisioned a process automation platform that attaches to the API backplane. Users can compose care plans, forms, and workflows on this platform, and build automations that interact with the central hub, without dependency on programmers.

Another aspect of the evolution of public sector enterprises and the dispersion of its boundaries has been the move to multi-cloud and hybrid cloud. The different departments and the CSPs and CBOs run their systems on different clouds, each with its own security apparatus and hosting nuances. Some Department systems remain on-premise because of legacy constraints or special data protection requirements. What emerges is a complex tapestry of interconnected clouds and applications, all of which must subscribe to some central architecture and manifest on a single pane of glass.

Sonoma County's move to multi-cloud and hybrid cloud has been value-driven and security conservative. The Care Coordination hub and the API backplane are hosted on-premise; Sonoma County thereby retains physical control of client data. Systems that attach to the API backplane can access the necessary data and perform the necessary operations, but a physical transfer of the data out of the enterprise only occurs when there is a specific need and client consent. Business processes at Sonoma County span multiple clouds and the on-premise hub but manifest to the user as a single, unified flow. A perfect example of multi-cloud plus hybrid cloud computing is Sonoma County's use of a process automation cloud system to capture client consent in the hub, and then exercising that consent when a Care Management cloud system requests client data from the hub. Both systems interact with the hub through the same HL7 FHIR APIs, and both subscribe to the same access control policies. The various cloud systems are accessible from anywhere and on any device. Social workers providing services to the homeless, for example, can access systems from their tablets and smartphones while in the field. All connections are authenticated through Sonoma County's Multi-Factor Authentication (MFA) solution, which maintains Sonoma County's robust security posture.



## CHAPTER 1

# Business Landscape, Goals & Challenges

Efforts by counties to address the complex interrelationships between health outcomes, economic uncertainty, housing instability, substance use disorders, criminal justice engagement, and social inequity have largely been met with limited success. One of the primary obstacles has been the siloed nature of funding, service delivery, and data sharing between Sonoma County departments.

# A Quick Example

For example, a typical client may have had information in three different electronic health record systems, Avatar, SWITS, and a health clinic, homeless services data in the Homeless Management Information System, Social Services information in CalWin, and food assistance information in CalFresh. These silos impact the ability for health and social service, housing, and other Safety Net providers to efficiently and effectively deliver services and share data, resulting in fragmented service delivery, service gaps, missed handoffs, client confusion, and poor outcomes.

In addition to facing coordination, communication, and integration challenges between Sonoma County departments, we also faced these same challenges when working with CBOs and CSPs. The ability to work effectively with community partners such as the Federally Qualified Health Centers, the regional hospitals, contracted providers, and the network of non-profit social service departments is critical to successful client outcomes. Sonoma County did not have effective tools for success such as electronic referrals, universal consent to share information, treatment plans, and provider notes that would provide a critical understanding of the client's complex needs. These barriers reinforced information silos resulting in slower access to service, duplication of effort, and inefficient care delivery to the client.

**To make the initiative a success, Sonoma County needed to transform business processes to deliver services through the new IMDT. In summary, challenges faced include;**

- ➔ **Complex client needs demand person-centric care.**
- ➔ **Client information dispersed in several systems and programs.**
- ➔ **Lack of data sharing methods leads to information silos.**
- ➔ **Ability to effectively collaborate with multiple stakeholders and CBOs/CSPs.**
- ➔ **Improve patient outcomes within resources available.**

Sonoma County recognized the need for a better way to address the needs of its most vulnerable individuals and families. Doing that required, the organization, tools, and technology to transform how services could be delivered to participants. Despite efforts to identify shared clients and coordinate their care between departments, Sonoma County didn't have an interdepartmental multidisciplinary team representing all Safety Net Departments, nor a system of governance. Additionally, there wasn't a way to integrate information across the siloed databases that serve those departments. In addition to these structural challenges, were resource and budget constraints that necessitated a solution that would result in better client outcomes within existing capacity. As a result, the Sonoma County Board of Supervisors prioritized ACCESS Sonoma to address these problems through the passing of a Board resolution.



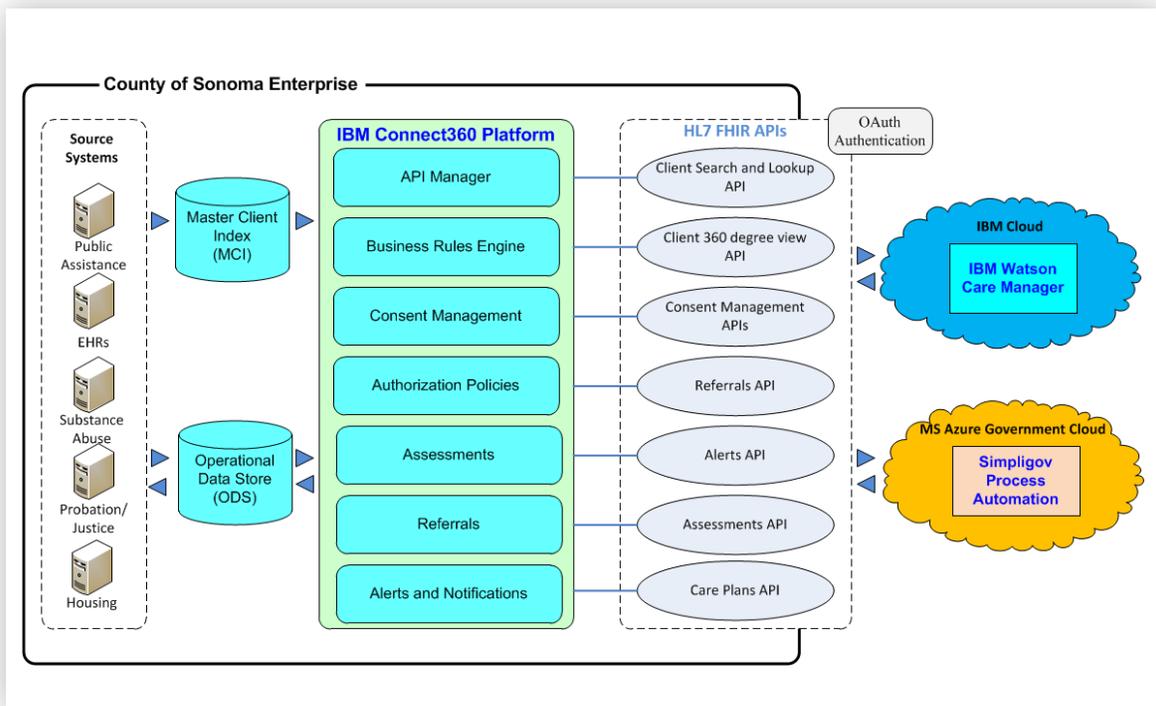
## CHAPTER 2

# The Concept of Operations

Sonoma County addressed these challenges of cross-enterprise collaboration and Person-centric care through the new Concept of Operations. Sonoma County provisioned a data hub - the IBM HHS Connect360 platform - that brought together the composite Client picture from various Department systems including Public Assistance, Behavioral Health, Substance Abuse, Justice and Housing. IBM Watson Care Manager (WCM) and SimpliGov Process Automation systems connected to this data hub using a series of HL7 FHIR APIs.

# How It Works

Clients with complex needs are referred to Care Management and enrolled in the appropriate cohorts. Interdepartmental Multidisciplinary Teams (IMDTs) use WCMs to build care plans based on the client's holistic picture and maintain situational awareness about the client through Alerts and Notifications. The client data is protected by an Authorization & Consent layer that enforces Sonoma County's access control policies. SimpliGov is used to capture client consent at various points of service across the ecosystem. This consent is a key factor in client data sharing across Sonoma County departments, agencies, and community service providers.



**Figure 1: Concept of Operations**

The Concept of Operations is based on a scalable architecture where additional systems may easily be attached to the hub. The SimpliGov platform is used to automate Sonoma County processes such as assessment creation and approval, leveraging data from the hub. The elegance of the solution derives from all connected systems leveraging the same set of standard APIs on the hub. This maximizes efficiencies and ensures scalability. These systems rely on the same access control policies in the hub, and they use the Sonoma County's Multi-Factor Authentication (MFA) and secure network for user access. All API calls between systems are authenticated through the same OAuth API. While the data hub is on-premise, and the WCM and SimpliGov systems are on different clouds, the solution comes across as seamless. This robust and uniform security treatment is a distinguishing feature of Sonoma County's multi-cloud/hybrid cloud implementation.



## CHAPTER 3

# Solution Description

Solutions to complex problems can be elegantly simple when vendors partner for integrated offerings. The IBM Health and Human Services Connect360 platform, a subset of the broader IBM HHS Integration Fabric and SimpliGov's Automation Platform, providing a fully integrated client-facing process solution enables the modern health care and social services enterprise.

# IBM

IBM Connect360 brings together a 360-degree view of clients, thus enabling person-centric care and provider performance management. Various departmental and business partner applications integrate business processes by invoking APIs on the Connect360 platform. Aside from providing this layer of APIs, Connect360 also enforces business rules for API operations through a user-configurable Business Rules Engine. Most importantly, Connect360 provides an Authorization and consent layer that executes Department data sharing policies, and supports compliance with regulations such as HIPAA and CFR 42 Part 2. The solution is built to the NIST 800-53 Moderate baseline. It also adheres to Open Group/W3C/HL7 standards for interoperability and meets the MITA Interoperability Condition.

## Some of the common Use Cases enabled by the IBM Connect360 platform:

- ➔ **Client search and look-up** – Departmental and business partner applications use HL7 FHIR APIs to search and look-up the Master Client Index (MCI), using a probabilistic search engine. The MCI itself is formed by matching client data from various systems, using multidimensional matching, fuzzy logic, and machine learning.
- ➔ **Client and provider 360-degree views** – Departmental and business partner applications use HL7 FHIR APIs to obtain the holistic view of clients and providers. This holistic view is assembled using a Master Data Management (MDM) driven federated callout to various source systems. The client's holistic view is protected through Authorization and consent.
- ➔ **Consent Management** – Departmental and business partner application use HL7 FHIR APIs to capture, modify or, terminate client consent. The platform encapsulates the Departments' access control policies in fine-grained Attribute-Based Access Control (ABAC). Consent is a key variable within this ABAC system.
- ➔ **Referrals and Alerts** – A user-configurable, open-source Business Rules Engine is employed to generate automated referrals for services, based on the composite client view. The Rules Engine also drives multichannel alerts to keep Care Managers abreast of client and provider status.
- ➔ **Assessments** – The platform provides HL7 FHIR APIs and business rules for standard assessments, which care management applications can invoke to evaluate clients, and determine their eligibility for services.
- ➔ **Care plans** – The platform provides HL7 FHIR APIs for care management applications to obtain, exchange, transition, and consolidate care plans.

Sonoma County's architecture enables its departments and business partners to leverage the API backplane to build out applications and client portals quickly. Sonoma County uses the WCM cloud SaaS to run multiple initiatives at scale, including care transitions, complex case management, chronic disease management, and social program management. WCM leverages the Connect 360 platform for Client Search & Lookup and 360-degree client views. Interdepartmental Multidisciplinary Teams (IMDTs) build care plans in WCM and monitor the client's progress. The IMDTs drive person-centric care by leveraging the 360-degree client view that spans health, behavioral health, social services, housing, and justice. Clients with complex needs can be automatically referred to WCM through Connect360 business rules, and automated alerts keep the IMDT informed on the client's holistic situation. WCM and Connect360 together help Sonoma County account address the social determinants of health, thereby improving client outcomes.

Another system that attaches to the API backplane is the SimpliGov process automation platform. SimpliGov SaaS on the Azure Government cloud uses the Connect360 Client Search & Lookup and Consent Management APIs to capture and manage consent from dispersed points of service. This consent is instrumental in forming the policy-compliant holistic client view that allows the MDTs in WCM to operate effectively. Sonoma County can use the SimpliGov platform to enable its various departments and network of CSPs and CBOs to tap into the Connect360 platform. Using the Connect360 APIs, these departments and business partners can leverage the composite client identity, transacting through a single, holistic client picture.

## SimpliGov

In conjunction with SimpliGov, Sonoma County developed a client-facing process solution for capturing and modifying consent that is fully integrated with Connect 360 via its API backplane. This process can now be used by a variety of departments, service providers, and care managers.

The SimpliGov Automation Platform is a SaaS solution built on the Azure Government Cloud that empowers government agencies and departments to rapidly develop and implement eform, e-signature, and workflow solutions. It utilizes intuitive drag-and-drop form and workflow design tools permitting total customization by the user. It also provides a built-in e-signature feature for workflows, SimpliSign, has deep integrations with Adobe Sign, DocuSign, and SecurSign, and integrates seamlessly with legacy systems and third-party products. This provides flexibility and scalability to accommodate additional document or process-specific workflows, allowing governments to transform and optimize their processes rapidly.



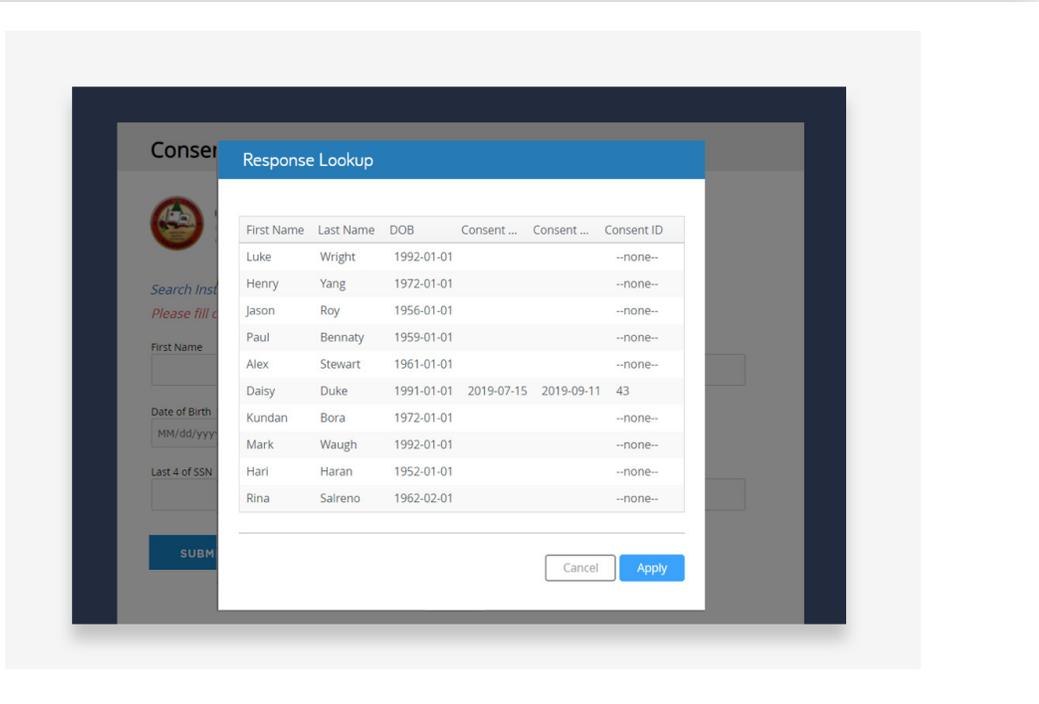


Figure 3: Example of the Returned Search Pop-up

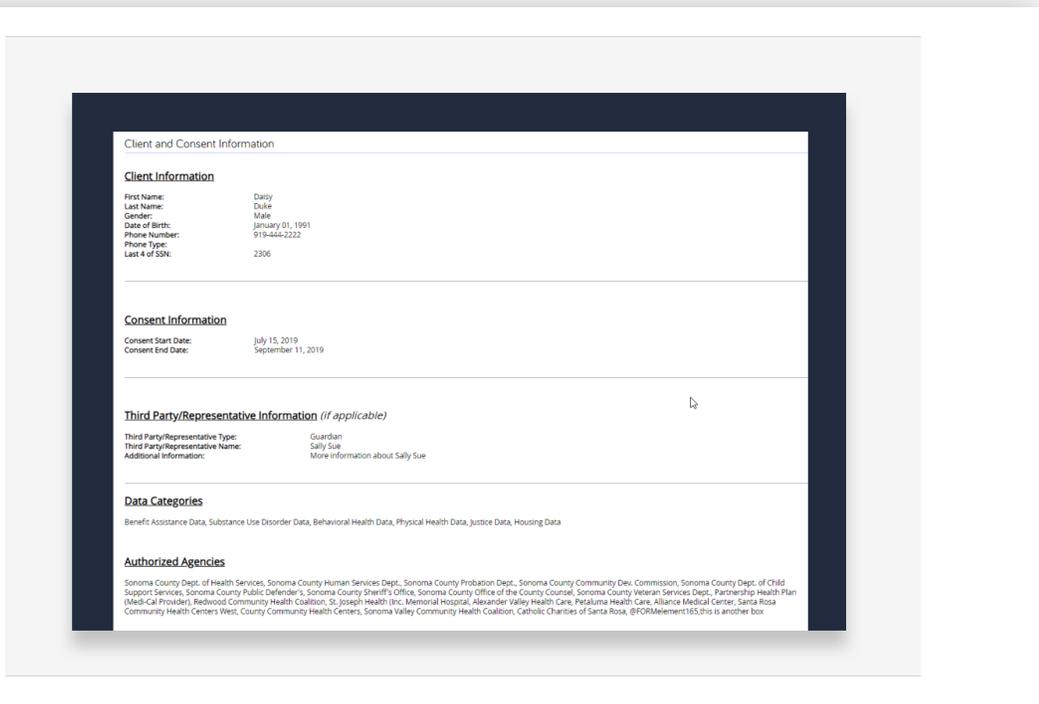


Figure 4: Example of the 'Client & Consent Information' view

**Modify Consent Below:**

Consent Information on File

Consent Start Date: July 15, 2019  
 Consent End Date: September 11, 2019

Would you like to modify your consent start and/or end date?

Third Party Action \*

- Null or Remove Current Third Party
- Add or change Third Party
- Keep Current Third Party Information

Third Party Information

---

**Data Categories and Authorized Agencies**

Authorized Agencies \*

<input checked="" type="checkbox"/> Department of Health Services, Sonoma County	<input checked="" type="checkbox"/> Human Services Department, Sonoma County
<input checked="" type="checkbox"/> Probation Department, Sonoma County	<input checked="" type="checkbox"/> Community Dev. Commission, Sonoma County
<input type="checkbox"/> District Attorney, Sonoma County	<input checked="" type="checkbox"/> Dept of Child Support Services, Sonoma County
<input checked="" type="checkbox"/> Public Defender's Office, Sonoma County	<input checked="" type="checkbox"/> Sheriff's Office, Sonoma County
<input checked="" type="checkbox"/> Office of the County Counsel, Sonoma County	<input checked="" type="checkbox"/> Veteran Services Dept., Sonoma County
<input checked="" type="checkbox"/> Partnership Health Plan (Medi-Cal Provider)	<input checked="" type="checkbox"/> Redwood Community Health Coalition
<input checked="" type="checkbox"/> St. Joseph Health (Inc. Memorial Hospital)	<input checked="" type="checkbox"/> Alexander Valley Health Center
<input checked="" type="checkbox"/> Petaluma Health Center	<input checked="" type="checkbox"/> Alliance Medical Center
<input checked="" type="checkbox"/> Santa Rosa Community Health Centers	<input checked="" type="checkbox"/> West County Health Center
<input checked="" type="checkbox"/> Sonoma Valley Community Health Center	<input checked="" type="checkbox"/> Catholic Charities of Santa Rosa
<input checked="" type="checkbox"/> Other	

**Figure 5: Example of the 'Modified Consent' view**

With SimpliGov-Connect360 workflow integration, Sonoma County governmental end-users can now search, view, modify, and update individual consent instances, as well as create new consents for existing clients within Connect360. The integrated workflow also allows end-users to create a new client consent in the event the client is not already registered with Connect360.

This universal consent enables authorized providers to view client data within IBM systems such as Connect-360 and Watson Care Manager. Without having an active consent authorized, providers will not have access to client information. The categories that the consent form covers are: physical health, behavioral health, justice, substance use disorder, benefits assistance, and housing data.



## CHAPTER 4

# Solution Impact & Observations

Sonoma County's support for the ACCESS Sonoma County initiative comes in multiple forms from political sponsorship to executive leadership and direct staff, and community buy-in all are critical to the success of the Initiative.

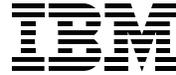
# The Bottom Line

The foundation of ACCESS is its governance structure. It is governed by the Safety Net Collaborative consisting of department heads from all of Sonoma County's safety net departments and is backed by strong support from the Sonoma County Board of Supervisors. These department heads have committed substantial resources to provide highly talented staffing for the IMDT. Finally, the Board of Supervisors and the Safety Net departments have committed the financial resources to ensure that the data hub is developed to provide effective tools to support IMDT care management that is critical for improved client outcomes.

ACCESS Sonoma's first cohort of participants served by the IMDT was the group of residents who remained in the emergency shelters weeks after the fires. The IMDT frequently met as a group and with the clients, connecting the fire victims with housing health and social services through private, public, and faith-based organizations. While at the shelters, the clients were fully dependent on Sonoma County for services and shelter. As a result of the IMDT outreach and care coordination efforts, most of the clients are now in stabilized housing and are receiving needed services while being actively case managed. While managing the care of the fire victims, the team concurrently worked with the IBM technical team to design and develop the core of the Integrated Data Hub and Watson Care Manager solution, setting the stage for long-term IMDT success.

In the summer of 2018, the IMDT began work on the next cohort; residents who are homeless and have complex mental health, physical health or substance use challenges and may be involved with the criminal justice system. Sonoma County partnered with regional community health clinics and justice partners to conduct outreach and engagement with citizens most likely to match the criteria. To date, Sonoma County has conducted outreach with over 1300 at-risk residents and engaged over 870 of those residents in assessment, referral for services, and provision of direct services. The IMDT is providing intensive care management to the highest need clients in need of intensive care management. The inclusion of community clinic partners added an important connection with physical health providers that typically serve this population. While the path to stability and self-sufficiency for this population generally has a longer horizon, Sonoma County has seen positive results by helping the clients find shelter, establishing primary health care, ensuring they stay consistent with their mental health appointments, and connecting them with substance use treatment.

Upcoming cohorts of residents to be served by the IMDT include mentally ill offenders who qualify for diversion from the criminal justice system and state hospitals who will be more appropriately served by receiving ongoing, community, mental health treatment. The goal of the IMDT is to avoid sending mentally ill offenders to jail or state hospitals by providing intensive care management coordinated between mental health treatment providers and criminal justice diversion staff. Sonoma County Superior Courts are partners in this effort.



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