



Developing Data Dashboards to Drive Criminal Justice Decisions

An Innovation Fund Case Study from Allegheny County, Pennsylvania, and San Francisco, California

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Jurisdictions across the country are seeking ways to better understand their justice-involved populations and guide their decisions with data. Justice system processes span independent agencies, such as police departments, courts, prosecutor's and defender's offices, and sheriff's departments. As a result, data need to be integrated to examine big-picture questions about the criminal justice system, such as who is in jail and why. Data integration requires commitment from leadership, technical and analytic expertise, and stakeholder support. Even after successful integration, shifting the culture to data-driven decisionmaking can be difficult. To tackle this challenge, many jurisdictions are producing criminal justice system data dashboards, which can effectively communicate data to decisionmakers (see box 2). Dashboards have two purposes: to guide high-level decisions across agencies, and to support program and line staff in their daily responsibilities.

This case study, part of a series highlighting work supported by the Safety and Justice Challenge Innovation Fund, examines the experiences of Allegheny County, Pennsylvania, and the City and County of San Francisco, California, as they integrated data across numerous criminal justice decision points and other nonjustice systems. Urban Institute researchers conducted four semistructured small-group or individual interviews and three group interviews in Allegheny County and seven semistructured small group or individual interviews in San Francisco with stakeholders who helped design and execute dashboards, as well as leaders and end users who ultimately rely on dashboards in their decisions. Transcripts of the 45- to 60-minute interviews were analyzed to identify common themes and recommendations from all stakeholders. Urban researchers also drew from regular calls

with each county’s project team, written program material, and performance measurement reports. With the increased interest in using dashboards across the country, the experiences of Allegheny County and the City and County of San Francisco can offer lessons on what it takes to design, deploy, and effectively use dashboards.

BOX 1

The Safety and Justice Challenge Innovation Fund

The John D. and Catherine T. MacArthur Foundation launched the Safety and Justice Challenge Network in 2015 to create fairer, more effective local justice systems. Twenty competitively selected jurisdictions received financial and technical support to rethink justice systems and implement data-driven strategies to safely reduce their jail populations. In 2016, MacArthur partnered with the Urban Institute to expand this network by establishing the Innovation Fund to test bold and innovative ideas on how to safely reduce the jail population while maintaining or enhancing public safety. Innovation Fund jurisdictions received small grant awards, light touch technical assistance, and access to the Challenge’s peer learning network.

Why Data Integration and Dashboarding

The impetus for creating dashboards in both counties came from a long history of relying on data to make better decisions. Key stakeholders in each county shared a desire to better identify drivers of their jail population and a recognition that system change requires a collaborative, cross-agency approach.

Allegheny County’s history of relying on data to inform decisions is demonstrated by its Department of Human Services’ [Data Warehouse](#). A repository of person-specific information, the Data Warehouse integrates data from 29 sources across the county such as the police department, courts, jail, behavioral health and child welfare agencies, and school districts. The Data Warehouse puts “the power of integrated data into the hands of staff and providers” (Allegheny County Analytics 2018, 3). Allegheny County also has experience translating data to the public through [Allegheny County Analytics](#)’ visuals, reports, and datasets. Building upon their history of using data, Allegheny County sought to dive deeper into the data to better understand their jail drivers. In 2015, the county executive commissioned the Institute of Politics (IOP) at the University of Pittsburgh to analyze the criminal justice system in depth. Through a Criminal Justice Task Force that included 40 regional leaders, the IOP examined how to make Allegheny County’s criminal justice system more fair and less costly while still prioritizing public safety (IOP 2016). This process led to several priority recommendations, one of which was the need for up-to-date data and analysis to better understand the system at all decision points and to regularly track key performance metrics.

San Francisco has been similarly engaged in ongoing processes to better understand its criminal justice system. Participation in the Justice Reinvestment Initiative spurred conversations around

challenges facing San Francisco’s justice reform efforts, notably the disparate impacts on people of color at every justice system stage and the limited availability of data to answer key questions about the system (Burns Institute 2016). San Francisco needed to more deeply understand the dynamics of the justice-involved population to ensure better outcomes for the community and safely reduce the number of people in jail.

The Safety and Justice Challenge Innovation Fund grant came at an opportune time, allowing both Allegheny County and San Francisco to enhance their capacity to make data-driven decisions on local justice practices. Their Innovation Fund-supported dashboarding projects built on several years of prior efforts to better understand their jail populations and preestablished access to reliable data in electronic format. According to stakeholders, the 15-month grant period introduced a useful time pressure to complete the work, and it was a feasible time frame given the already strong foundation of available data and experience making data-driven decisions.

We were talking about [creating dashboards] for a very long time and we wanted to do it. We had a representative group of folks getting together, but I don’t think absent the grant...it would have happened at the same level.

—San Francisco stakeholder

BOX 2

Defining a Data Dashboard

A data dashboard is an information management tool that presents real-time data and pulls together key metrics into a visual format. Dashboards connect large amounts of data in the form of tables, charts, and graphs, and they provide a central location for hosting key information about a system. The data visualization simplifies complex datasets to help users better comprehend what the data mean in practice, trends in the data, and outcomes. Data dashboards vary in their appearance and can be created using a variety of data analysis and visualization programs. Further, they are user friendly and can be actively manipulated into multiple visualizations to better understand key metrics.

Designing Data Dashboards: The Process

Though the process of creating data dashboards unfolded differently in Allegheny County and San Francisco, it was broadly similar in ways that can be summarized in seven steps (figure 1). We elaborate upon each step below, illustrating them with the specifics of how Allegheny County and San Francisco approached the work.

FIGURE 1

Process Map for Data Dashboarding



Step 1: Identify the Purpose and Questions

The first step is to identify the purpose and questions to be answered through a dashboard. Allegheny County wanted to monitor key decision points within the criminal justice system and use this information to inform day-to-day operations and systemwide policy decisions. San Francisco had a narrower goal: understanding recidivism outcomes for local justice-involved populations to make informed policy decisions.

Allegheny County created both operational and system-level dashboards. Operational dashboards provide a detailed view of a specific program or operations within an agency, to help staff make better day-to-day decisions. For example, figure 2 shows the dashboard on participation in the county’s reentry program. This dashboard allows stakeholders and reentry program staff to effectively monitor the program in real time. This includes monitoring how well the program is meeting its goal of serving only medium- and high-risk people leaving jail, examining entries and exits to estimate how many resources are needed to serve the population, and understanding the demographic makeup of participants.

FIGURE 2
Allegheny County Jail Collaborative Reentry Dashboard



Source: Allegheny County Department of Human Services.

Systemwide dashboards, in contrast, show high-level data trends and point-in-time information to guide multiagency working groups and agency leadership in making policy decisions. For example, figure 3 shows an overview by the number of people detained in the jail by Allegheny County Adult Probation on any given day. This dashboard also examines trends and allows stakeholders to identify changes to detention patterns in real time. Criminal justice stakeholders regularly monitor this information, including adult probation leadership, criminal court judges, and the county manager.

FIGURE 3

Detainer Overview Dashboard

Probation Reports

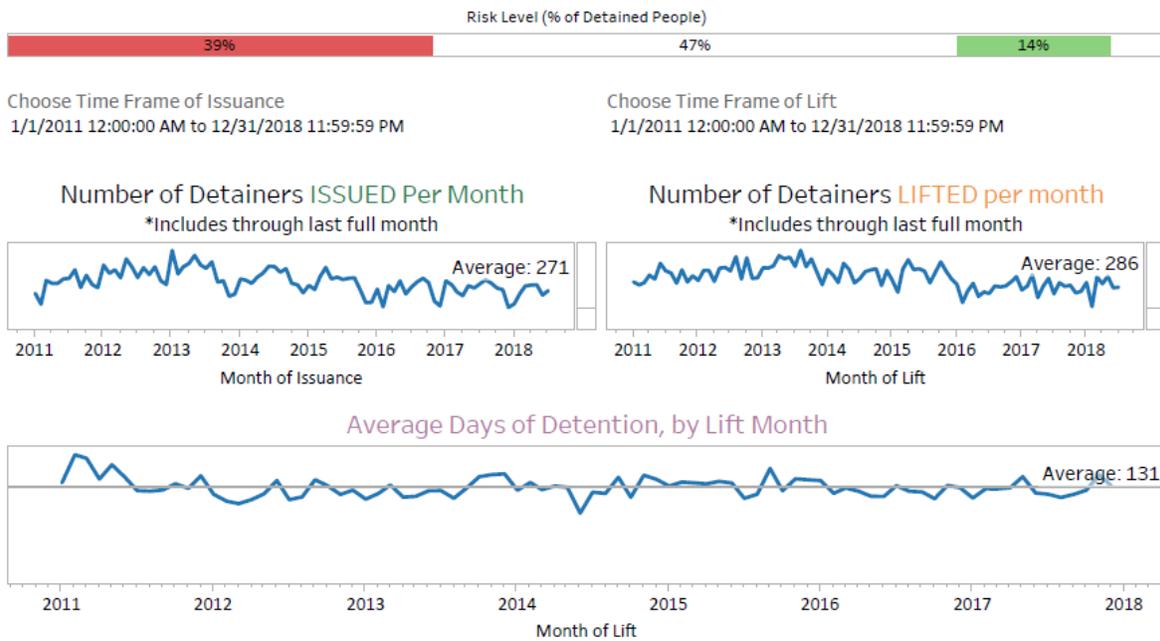
Dashboard 1: Detainers

Benchmark: Detain only for public safety concerns

Choose Detainer Location
Multiple values

Reasons
All

There are **1,045** people detained, which is a **-1%** change from 1 month ago and a **-5%** change from 1 year ago



Source: Allegheny County Department of Human Services.

Through conversations with key stakeholders, San Francisco identified the goal of better understanding recidivism to pinpoint issue areas that require further analysis, identify opportunities to explore policy modifications, and establish a baseline. Though recidivism can be understood generally as offending or misconduct after a justice system encounter (prior arrest, incarceration, etc.), establishing and operationalizing a clear jurisdiction-level definition of recidivism can be difficult. San Francisco invested significant time at the outset to identify key points of subsequent criminal justice contact critical to understanding policy and operations. The Justice Dashboard measures the rate of rearrest, re-arraignment, and reconviction on a new criminal charge for people convicted to local custody or supervision in calendar years 2013 and 2014. Applying a common definition of subsequent criminal justice contact to all adults in the local cohort provides insight on how outcomes differed by individual characteristics and justice system responses.

Step 2: Structure the Team

The second step is to create a team that covers all the roles and responsibilities to successfully execute the work involved in creating a dashboard. This includes four key components: (1) the lead agency, which ensures the work moves forward; (2) a core team overseeing the details of the work; (3) people with analytical skills; and (4) a broader collaborative entity providing high-level oversight and support. As shown in figure 1, this process often occurs simultaneously with step 1, as it did in both Allegheny County and San Francisco. Both places had a collaborative body in place when they began identifying the questions they sought to answer with the dashboards, and they filled out their project teams as work progressed.

Different types of agencies served as the dashboard lead in each place. Allegheny County's CountyStat program led the county's dashboard project, in collaboration with the county's Department of Human Services and criminal court, and the San Francisco District Attorney's Office (SFDA). Within each agency, a few key individuals took ownership of the project and were the seeds of the core teams responsible for reporting back to their agencies and justice collaborative bodies, securing support from other partners as necessary, designing the dashboards, and adhering to the project timeline. San Francisco formalized its core project team, designating a subgroup of its Sentencing Commission—the Recidivism Work Group (RWG)—to come up with a definition of and metrics for recidivism, and to ultimately guide the creation of the Justice Dashboard. In addition to representatives from the SFDA, the RWG included policy and research staff from the Sheriff's Department (SFSD), Public Defender's Office, Adult Probation Department, Department of Public Health, Police Department, and community stakeholders at the Ella Baker Center and Public Policy Institute. Creating the right core team, staffed with strong analysts and supported by leadership, was important for both counties.

Analysts with in-depth understanding of data systems, knowledge of key program and jail operations, and data visualization skills are critical members of a core team. Allegheny County had analysts within the Department of Human Services, the jail, and the courts who regularly worked with various datasets and created reports. This existing capacity allowed Allegheny County to accelerate the initial stages of establishing the requirements to integrate data. Allegheny County also had an established contract with an IT provider, Deloitte, which fulfilled the technical requirements necessary to integrate data.

San Francisco did not have a dedicated team of analysts at the outset, and their data systems were not integrated across multiple agencies, necessitating more work in the initial steps of the design process. To provide the project with the needed analytical capacity, San Francisco hired a fellow whose sole responsibility was to coordinate the dashboard project and who had the skills necessary to develop the dashboard when they reached the prototype-building stage. The fellow oversaw the RWG meetings, the preparation and integration of multiple datasets, and the development and execution of the dashboard. Additional analytical expertise came from Sentencing Commission member Dr. Steven Raphael, an economist and professor of public policy at the University of California, Berkeley, Goldman School of Public Policy. Dr. Raphael worked closely with the fellow throughout the process, especially at the initial stages to troubleshoot data issues. To further instill confidence in the process, San Francisco

hired a consultant (a well-known, trusted expert on San Francisco’s criminal justice data) to validate the data cleaning and analysis by checking a random sample of 50 cases in the cohort.

Outside the lead agency and core team, both counties had stakeholders from across their system who regularly provided input at during dashboard development and design. These stakeholders gave input at regular working group meetings or individual meetings while examining prototypes relevant to their respective job functions. In Allegheny County, stakeholders convened regularly as part of the Criminal Justice Task Force and as part of a Jail Collaborative. San Francisco created its Sentencing Commission—led by the SFDA and composed of key stakeholders from across the system—in 2012 before engaging in this work to analyze local sentencing patterns and explore opportunities for reform. Stakeholders included the courts, jail administrators, public defender’s office, and community leaders. The Sentencing Commission, like Allegheny County’s Task Force, responded to the dashboard process and provided critical feedback.

Step 3: Access and Prepare the Data

Once the team is established and the goals for creating a dashboard are clearly understood, the third step is to establish the technical requirements to integrate data. This stage of the process is multitiered and can be particularly time intensive for jurisdictions that do not have already integrated data systems.

Accessing and preparing the data for integration and presentation via dashboards begins with clearly identifying what data points are needed from each participating agency. The process for doing so will differ somewhat by dashboard type. For operational dashboards, analysts should work closely with the data-providing agency to understand the measurement parameters specific to the operational area of focus. For instance, when creating an operational dashboard for probation, Allegheny County analysts worked directly with the probation department to ensure they understood the data and its implications, as well as what would be most useful to display through the dashboards. For systemwide dashboards, this process can be more time intensive because it involves developing a common set of definitions and metrics that multiple agencies will use consistently and understanding the different ways agencies use the data—before integrating the data.

Obtaining the data for integration can be a lengthy process requiring the establishment of data sharing agreements that create protections for sensitive information and procedures for providing information. Strong working relationships across agencies are important at this stage because they allow for greater trust and quicker facilitation of agreements. Allegheny County was able to expedite this process because it had existing relationships and policies around data sharing and integration. Allegheny County analysts could pull data directly from the Data Warehouse and were embedded within county criminal justice agencies. As a result, dashboards could be shared without creating data sharing agreements. County leaders in Allegheny recognized that, while client data are sensitive and should be protected, all county agencies are part of one system and have countywide data governance policies that make it easy to share data across county agencies without data-sharing agreements (ACA 2018, 2).

San Francisco took a more traditional approach to accessing and integrating its data, as it had not established data integration infrastructure like Allegheny County's Data Warehouse. The SFDA had to create data sharing agreements with several different county agencies to receive their data. This process was lengthy, but agencies were cooperative because of what county stakeholders identified as a shared agreement about the importance of sharing and receiving data to better understand the system.

A final phase of preparing the data for integration and use is cleaning them. Cleaning data is the process of identifying inaccurate, corrupt, or missing data in a dataset and taking steps to correct for or account for this missing or inaccurate information. Cleaning data can be time intensive. Allegheny County worked closely with identified end-users (i.e., jail staff and other criminal justice system decisionmakers) to better understand what they saw as missing or inaccurate in the data. San Francisco, on the other hand, was in earlier stages of integrating its data. After executing data sharing agreements and accessing agency level datasets, the SFDA fellow and Dr. Raphael integrated and cleaned the datasets. Because San Francisco had limited internal data analysis capacity, it needed to have a research partner to help with data cleaning to provide additional expert advice and guidance. As the fellow worked through the various datasets, she brought questions and concerns back to the RWG to discuss implications and definitions. This was an iterative and time-consuming process that required attention to detail, feedback from stakeholders, and support through their research-practitioner partnership. This stage can uncover unexpected challenges or concerns, such as inconsistencies in how or whether Latinx identity is recorded (box 3).

BOX 3

Determining Latinx Identify in San Francisco

An important goal of creating the Justice Dashboard was to better understand and mitigate racial and ethnic disparities in San Francisco's justice system. However, the SFSD was the only justice agency that tracked ethnicity consistently and was able to provide data. While other agencies were looking to update their data systems to align with the SFSD in this arena, the RWG took interim steps to provide the best estimate of Latinx ethnicity for the Justice Dashboard, so it would not have to wait to examine questions of disparity for Latinx San Franciscans. First, the RWJ used the ethnicity listed in the Jail Management System (JMS) and attached it to the case number, thus placing the person in the recidivism cohort. If JMS did not have an ethnicity listed for someone, often because that person did not have a subsequent booking, Census data were used to impute Latinx ethnicity for people with surnames for which the proportion of the Census respondents that self-identify as Latinx is 85 percent or higher.

Step 4: Build a Prototype

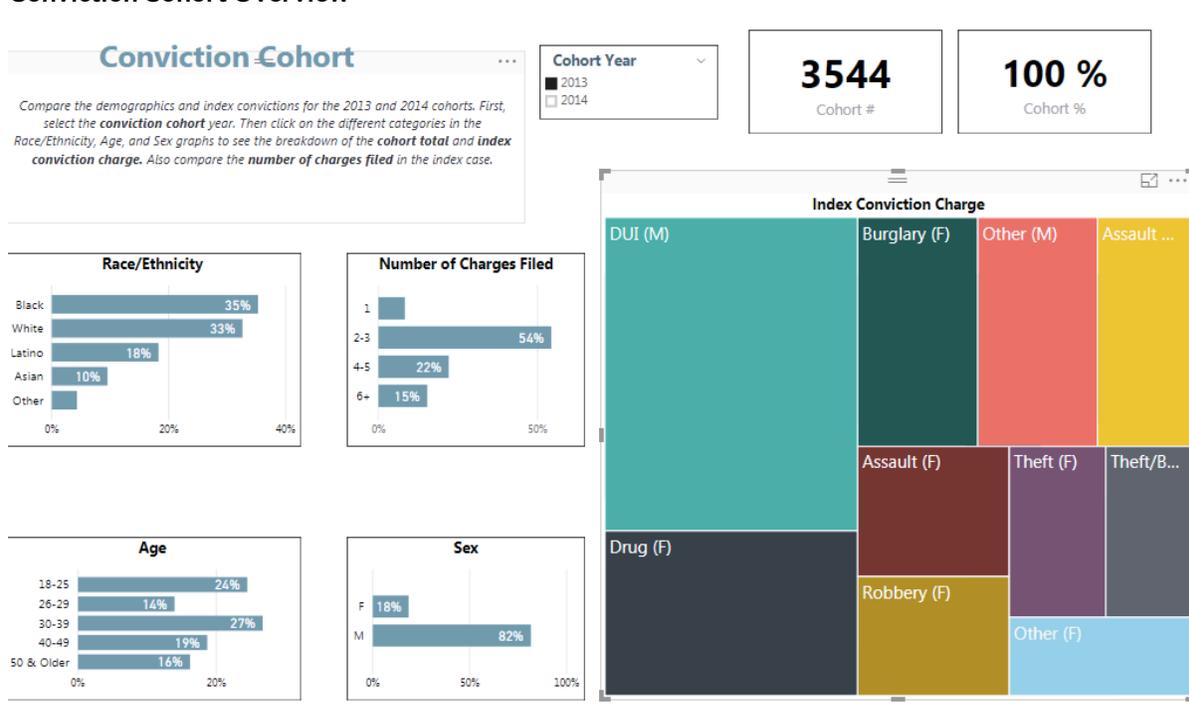
Once data were defined, cleaned, and ready to be presented in a visual format, both sites built an initial prototype. The prototypes were vehicles to elicit direct responses from key stakeholders. The prototypes were shared with key stakeholders—including policymakers and practitioners—to vet the

results and respond to the visual presentation of the data. Subsequent rounds of prototyping can be required when new data are identified as necessary or important to incorporate into the dashboard.

Both counties invested significant time in designing the visual presentation of their data, and both enlisted help from outside entities. Allegheny County built its prototypes in house with assistance from Deloitte, a contracted IT provider, and analytics staff. San Francisco partnered with a UC Berkeley professor to use her data visualization course to host a “Design Sprint.” The Design Sprint was a culminating event for the course where students presented their final project mock-ups of criminal justice data dashboard designs for San Francisco. The students were provided with a “dummy” dataset that did not contain actual system data but was structured in the same way, to allow them to design visualizations that would fit the real data. The SFDA, SFSD, and Adult Probation all sent representatives to judge the students’ work. The projects allowed San Francisco partners to see multiple strategies for data visualization and they incorporated aspects from several projects into their final dashboard design.

In creating the dashboard, Allegheny County chose to use [Tableau](#) and San Francisco chose to use [Microsoft PowerBI](#), two software applications that allow end users to filter, customize, and automate data. Allegheny County built 16 dashboards, a combination of operational and systemwide dashboards for a spectrum of touch points in the justice system. San Francisco developed a single dashboard with multiple tabs that focused on a cohort of people who were convicted in 2013 and 2014. San Francisco’s dashboard allows for examination of subsequent criminal justice contact for this cohort based on select demographic factors, index conviction charge, and criminal history as demonstrated in figure 4.

FIGURE 4
Conviction Cohort Overview



Source: Illustrative data from San Francisco District Attorney’s Office.

Step 5: Test the Prototype

Dashboard creation is iterative; incorporating multiple opportunities for partners to review and provide feedback helps surface and mitigate concerns about the data and enhance support. It was critical for both San Francisco and Allegheny County to present the initial prototype to key stakeholders, including county leadership and agency level practitioners, receive feedback, revise the dashboard based on feedback and present the revised version back to stakeholders. This process can repeat as many times as necessary to generate consensus that the data are accurate, presents the right information, and is displayed in a way that clarifies what is happening. Different stakeholders will need to review the dashboard prototypes for system-wide dashboards and operational dashboards. Allegheny County worked with program staff to address data quality issues and improve visuals for its operational dashboards. For systemwide dashboards, the county worked with multiple agencies across the system to better understand the data and data visualizations.

Through this process, feedback in both San Francisco and Allegheny County tended to be around requests for additional information that appeared to be missing from the dashboard but would be useful; questions around data quality, sources, and accuracy; concerns around implications of the dashboard; and requests for modifications to better address needs. Both counties received feedback reflecting concerns that the dashboard could be used to show underperformance of a specific agency. These types of concerns can be common in data transparency efforts, and they are likely to surface at the prototype review stage and subsequent stages as the dashboards become more real, giving a visual for direct response. Such apprehension can be alleviated through engaging end users early in the design stage. Emphasize that the purpose of the dashboards is not to measure performance of one specific agency, but to emphasize a systems framework and understand what role each agency plays as a part of the whole.

For Allegheny County, this process composed much of its grant period and spurred the creation of many more dashboards than originally planned because the initial prototype generated interest at multiple levels to receive more information presented in a similar way. Once San Francisco had the prototype nearly complete, the core team took it on a “road show” where they visited staff at multiple agencies and presented the dashboard. They used the opportunity to engage stakeholders outside of the Sentencing Commission and generate feedback from as many practitioners as possible. For both jurisdictions, it was critical to not only incorporate feedback into each iteration, but to provide a direct response to feedback even if the feedback did not lead to a change in the dashboards. Actively responding to feedback solidified stakeholder buy-in and ensures use in the next stages of the process.

One of the reasons we have a lot of dashboards is that this administration wanted to make data driven decisions. [...] We also always try to measure things so we can see what we're doing well and not so well.

—Allegheny County stakeholder

Step 6: Train and Prepare End Users

Once key stakeholders sign off on the final prototype, analysts need to dedicate time to train and prepare the users of the dashboard on its intended purpose, how to access and use the dashboard, and how to interpret the information and communicate it to other decisionmakers. This helps ensure dashboard sustainability and utility, particularly if they are a new tool as was the case in both San Francisco and Allegheny County.

Despite a recognition of the importance of data, using dashboards was a shift in practice for both places, and such shifts can take time to integrate into routine use. For example, jail staff in Allegheny County initially had trouble finding the information quickly, but they worked with analysts to overcome this challenge and are now incorporating the dashboards into their daily routine. San Francisco's RWG was continually apprised in detail of the structure and meaning of the data in the Justice Dashboard, developing informed parties in all participating agencies. Once a live version of the dashboard was ready, the RWG walked the entire Sentencing Commission through how it worked and how it could be used.

Step 7: Deploy and Use the Dashboard

The last step in the process is to finalize the dashboards, with an eye toward ensuring sustainability and incorporating them into regular decisionmaking. Sustainability can be ensured by a decisionmaking body regularly reviewing dashboards, tasking one entity to provide maintenance to the dashboards, and by increasing transparency by publicly sharing the dashboards.

It is important to automate the data input while providing maintenance as data systems update and change to ensure dashboards remain useful and current. Ideally, one agency or entity would be tasked with ongoing maintenance and wrap this into their regular responsibilities. Technology is rapidly changing, and new systems are frequently introduced. If these systems are not integrated into the dashboards, the data represented will quickly become out of date and ultimately no longer useful. Dashboards are only useful if their data are accurate, reliable, and updated.

Sustainability is also supported when transparency is increased through the presentation of data to the public. When the public has access to key trends in the criminal justice system, it fosters additional conversation and advocacy around reform, potentially leading to future policy change. Publishing

dashboards publicly requires additional upfront work to ensure client confidentiality, however, both Allegheny County and San Francisco identified this as a goal of the dashboards.

Seeing the change in the way the decisionmakers think when they have the ability to interact with their data—it's revolutionary.

—San Francisco stakeholder

Dashboards are most likely to be sustained when integrated into regular decisionmaking structures, so they become vital to a deeper understanding of a criminal justice system. In Allegheny County before the dashboards, the courts did not recognize how the practice of putting people on detainer for violations of probation had an impact on the jail population. Once the data were presented through dashboards, the probation office created a new procedure to only recommend detention when the person is a public safety risk and to conduct monthly reviews of detainees with each criminal court judge. San Francisco also identified previously unknown trends through its dashboard and is considering developing several new programs that could help target specific populations. For instance, the dashboard revealed high rates of subsequent criminal justice contact for transitional-age youth ages 18–25 and adults ages 30–39, but not for people ages 25 to 30. The county is now engaged in several conversations around filling the program gap in services and strategies for individuals ages 18–25 and 30–39.

What's refreshing with these dashboards is that before no one understood the basis of their efforts or the impact of their efforts. No one knew how their decisions impacted the jail population, and now we do.

—Allegheny County stakeholder

Lessons Learned

Practitioners interested in implementing similar efforts can take several lessons from the experiences of Allegheny County and the City and County of San Francisco.

Collaboration is key. A strong collaborative body and a history of collaboration provide a useful foundation for data dashboarding. Without the support of various agencies, it can be difficult to identify

the right questions to ask, acquire and understand data, develop a useful dashboard, and integrate the dashboard into decisionmaking.

Consult stakeholders continuously throughout the process. Engaging key stakeholders from both justice and nonjustice agencies who touch the criminal justice system was critical for both counties. Allegheny County and San Francisco found that engaging stakeholders at every single step in the process ensured support of the project and the creation of a useful tool.

Dashboard creation is iterative. While there are seven key steps in the dashboard design process, each step often occurs in conjunction with other steps, and the process is not linear. Both counties began at different points in the process and frequently went back to earlier steps.

Data integration requires strong analytic support. Data integration requires strong analytic capacity, a clear understanding of current systems, and an ongoing relationship with IT. Both counties solicited the help of outside parties, but both counties also established in-house capacity to engage in this work.

University-practitioner partnerships can be useful tools. San Francisco partnered with university faculty and students, to assist with troubleshooting data issues and to access multiple design ideas through the Design Sprint. Both partnerships provided helpful supplements to the capacity that government agencies brought to the table. Establishing mutually beneficial relationships not only benefits the county and the academics, but also the community.

Dashboards help expose inconsistencies in the data. Dashboards can reveal issues with record keeping and data entry that often can be addressed by an individual agency or change in policy.

Dashboards reveal unexpected and difficult realities. When data are incorporated into a visual format, they can reveal trends in a system that were previously undiscovered and require urgent attention.

Dashboards should be automated and provide real-time data. For dashboards to be useful without adding a burdensome task to one agency, they must be automated to regularly incorporate real-time data from across the system. While it is best for one agency to maintain a dashboard and update data systems as time progresses, the agency should not have to regularly pull data manually.

Communication and education help ensure support. Dashboard creation requires active communication and education to quell potential fears that the dashboard will be used as a punitive tool. This requires support from county leadership to reiterate and refrain from using a dashboard for purposes other than discovery and decisionmaking.

Conclusion

As technology develops and jurisdictions across the country endeavor to use technology to better understand and create a fairer and more effective justice system, data dashboards are becoming increasingly prevalent. The creation of dashboards is an iterative process that requires continuous cultivation of stakeholder support. Allegheny County and the City and County of San Francisco both

sought to understand their criminal justice system more clearly and incorporate in-depth data and current trends into routine decisionmaking. Allegheny County created system level and operational level dashboards that are routinely used by program level staff and leadership. San Francisco created a system level dashboard that looks at a specific conviction cohort as a starting point for understanding the breakdown of individuals in their criminal justice system.

Creating data dashboards is challenging, particularly at the data integration and data cleaning stages, but ultimately rewarding. San Francisco provides a test case for jurisdictions at the outset who are looking to undergo this process without already integrated data systems, and Allegheny County provides an example of dashboards being integrated across the system at every level to inform change. Even within a 15-month timeline, Allegheny County and San Francisco were able to create user-friendly dashboards that in the early stages of deployment provided new insights suggesting meaningful changes to their justice systems.

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