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Oregon Statewide Data Dashboard Initiative:

Dashboard Toolkit

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Introduction

Summary

The Statewide Data Dashboard Initiative was created due to a generous grant-funding opportunity from the Arnold Foundation. The goal of this proposed project was to make interactive data dashboards available to all 36 counties in Oregon Community Corrections, potentially impacting the practice of 500 probation and parole officers and the 32,000 felons they supervise. These dashboards track the fundamentals of supervision such as workload, client risk levels, and racial disparities in the criminal justice system. This project made this data available statewide, advancing the ability of policymakers to set performance benchmarks in community supervision with supporting systems to track progress. As part of this project, a statewide implementation team of community corrections directors was established to routinely review the dashboards and innovate new methods of using these dashboards to coach officers and communicate policy goals. Taken together, these new dashboards drove community supervision policy conversations into new directions and promoted continuous quality improvement in these areas. This toolkit is intended to document the process of developing these dashboards, including the successes and challenges that the implementation team faced during the development phase. Toolkit users will find information regarding each individual dashboard's metrics, scripts that were used to generate this data, and a sample style guide.

Goals

1. The overall goal of this project was to expand the availability of new interactive dashboard technology to promote the use of data informed practice and policy development in community corrections departments across the state of Oregon.

2. Additionally, these dashboards created a shared foundation for state and local policy leaders to establish baselines and set new performance goals advancing community supervision practices.

Project Conceptualization

In Oregon, all probation and post-prison officers use a statewide database named DOC-400. There is tremendous benefit to having all officers use the same central database (albeit an antiquated one), as the reality is that clients frequently transfer across jurisdictional boundaries. Prior to this project, the main obstacle has been extracting data in user-friendly formats that actually promote fidelity monitoring to evidence-based practices. For example, it is difficult to implement risk, need, and responsivity principles if you are unable to view all of your risk tools in one place. The use of data dashboards shows tremendous promise as a method to improve the implementation and maintenance of evidence-based practices to help bridge the science to service gap.

In 2014, Multnomah County purchased a Tableau Server license that allowed our team to develop a series of dashboards that allowed unit managers and officers to interact with the data that they input into DOC-400. This web-interface allows staff to access their data from any device that has internet access (laptop, iPad, mobile phone). The server environment is also secure so that our dashboards can explore

sensitive data fields such as arrest data or location data. Many free or public facing dashboard services are not compliant with the regulations pertaining to CJIS, HIPAA and 42 CFR, limiting their application to community supervision.

As other Counties in Oregon were made aware of the Multnomah dashboards, they sought their own. It became clear that it was not feasible for each county to set-up their own server platform or hire analysts to develop their dashboards, nor is it necessary. If Multnomah County hosted the dashboards centrally, the service could be made available to all counties. If counties agreed to standardize rather than customize their dashboards, they could collectively share an analyst to develop their dashboards. To test the concept, Multnomah County began hosting dashboards for one additional county, Washington County, on the Multnomah County server. This successful pilot informed how the approach could be implemented on a larger scale and helps mitigate the risks associated with this type of IT project.

In 2019, Multnomah County sought funding from the Arnold Foundation to extend the Oregon Community Corrections Dashboard Project to include all thirty-six counties in the state. With the generous support of the Arnold Foundation, Multnomah County was able to scale up their operations to build a suite of ten dashboards which would be functional and useful for counties of all sizes and demographics. This was accomplished through extensive conversations with statewide representatives in leadership positions, unit managers, and probation officers. Ultimately, this iterative process allowed our team to align the functionality of the dashboard with the field goals of the stakeholders.

Team Capacity

In order for this project to run smoothly, the following staff were required:

- **A project manager** who was responsible for the oversight of the project, gathering information from the counties for dashboard customization, ensuring that the collaborative relationships were maintained, and led the research team to support the development and implementation of the dashboard designs.
- **Two data analysts** with prior experience building Tableau dashboards. The ten dashboards were split evenly between the analysts who integrated the DOC-400 data into Tableau and were responsible for assuring the quality of the data.
- **An IT project manager** who was responsible for coordinating tasks between the varied IT professionals who worked together to stand up a new architecture.
- **A development analyst** who was responsible for building, de-bugging, and monitoring the data stream which fed the dashboards.
- **A graphic designer** who was responsible for ensuring that the dashboards were user-friendly by preparing the layouts of the dashboards and adding clarity to the visualizations.

Stakeholder Involvement

All dashboards were tested by a group of community corrections stakeholders from around Oregon. This group, called our Community of Practice, met together every-other month to view a dashboard together and talk about any improvements that could be made. Community of Practice members also completed a survey regarding each dashboard to further gather feedback on improving the utility of each dashboard. The Multnomah County implementation team then modified each dashboard based on the recommendations of the Community of Practice members. Modified dashboards were presented at the next Community of Practice meeting for the group's approval.

Members of the Community of Practice team represented the following Oregon Counties:

Clackamas County
Deschutes County
Douglas County
Grant County
Jackson County
Josephine County
Klamath County
Lake County
Linn County
Marion County
Polk County
Umatilla County
Washington County
Yamhill County

LOCAL

Dashboards

Field Contacts Dashboard

Purpose

The primary system of record for Oregon probation departments is a 35 year-old system originally designed for prison management and programmed in COBOL, a computer language obsolete 40 years ago. It is, to put it mildly, not user friendly; the interface uses green text on black backgrounds (known as a "green screen" long before movie special effects invented a technique that shares the same name), and often breaks when a mouse is used.

One thing the system lacks is a way for a PPO to view their caseload at a glance, to view summary information such as name, address, supervision flags, risk level, phone number, and time since last contact all at once. This type of report would allow PPOs to make quick and accurate decisions on where to focus their efforts, prioritizing JIIs most in need, identifying nearby JIIs to cut down on travel time, and even checking supervision condition details on their phone while in the field. The Field Contacts dashboard is an attempt to create that tool.

Example Scenarios

A PPO conducting a home visit sees a beer can on the table, and needs to check whether this JII has "no alcohol" as part of their supervision conditions.

A PPO is doing surprise home visits, and wants to find the high-risk JIIs who have had the longest time since their last home visit.

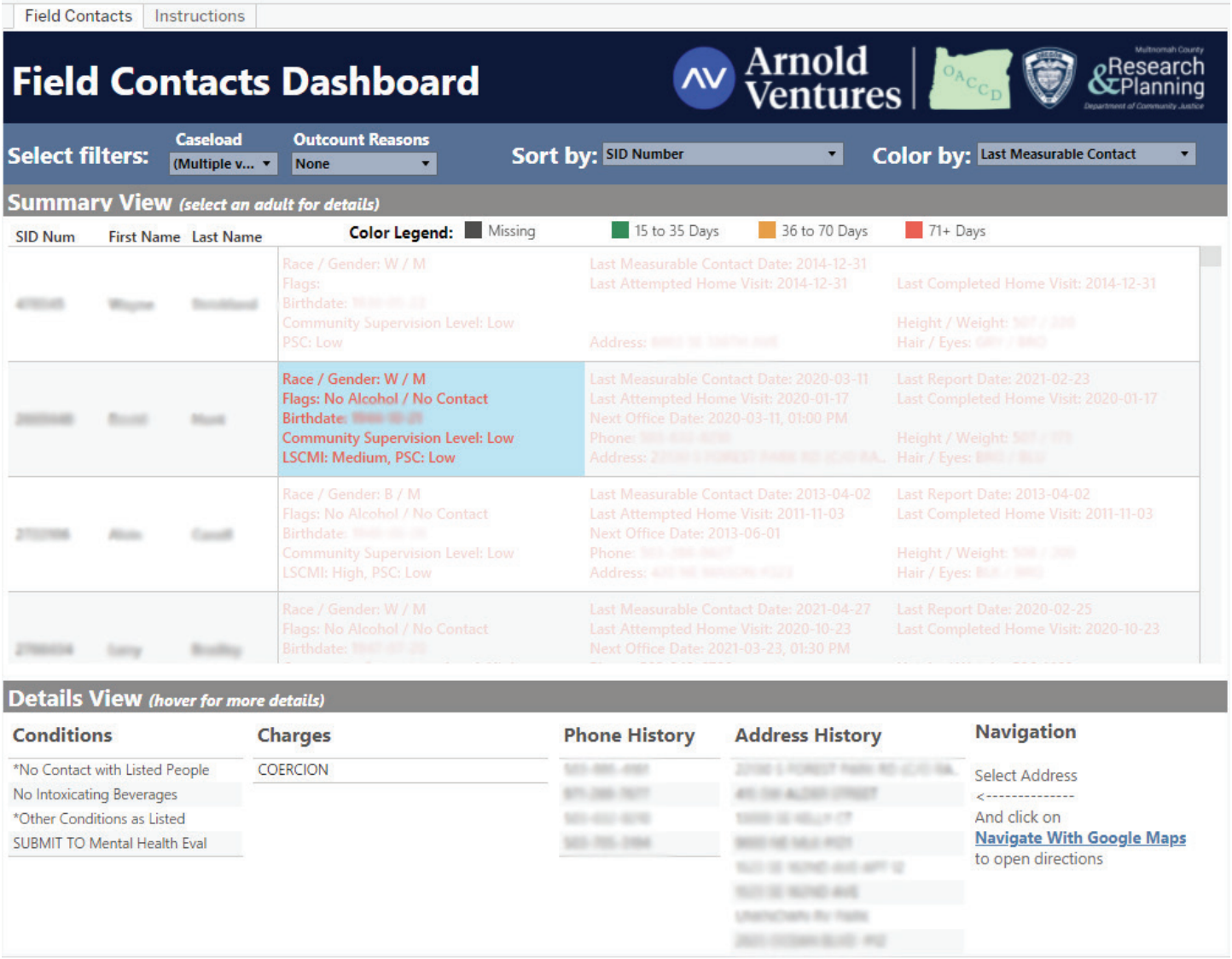
Fundamental Assumptions

As a field contacts dashboard, this tool is intended to be used for case management, and shows only the most current information. There is no historical data available.

Visuals

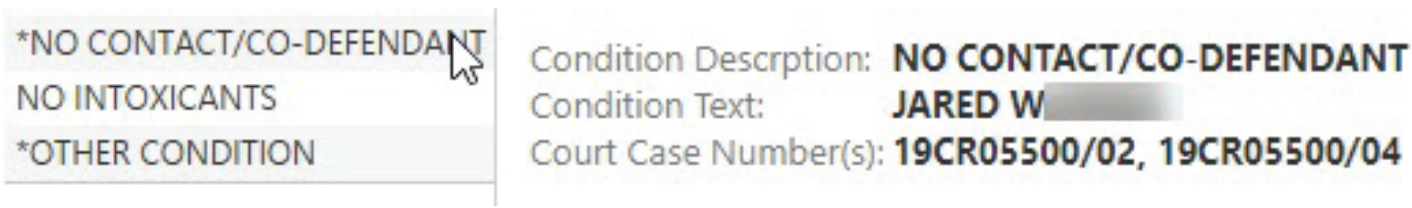
Main View

This dashboard's main view shows a summary of basic information on each JII.
PPOs can select any JII to display detailed lists of supplementary information in the area below.

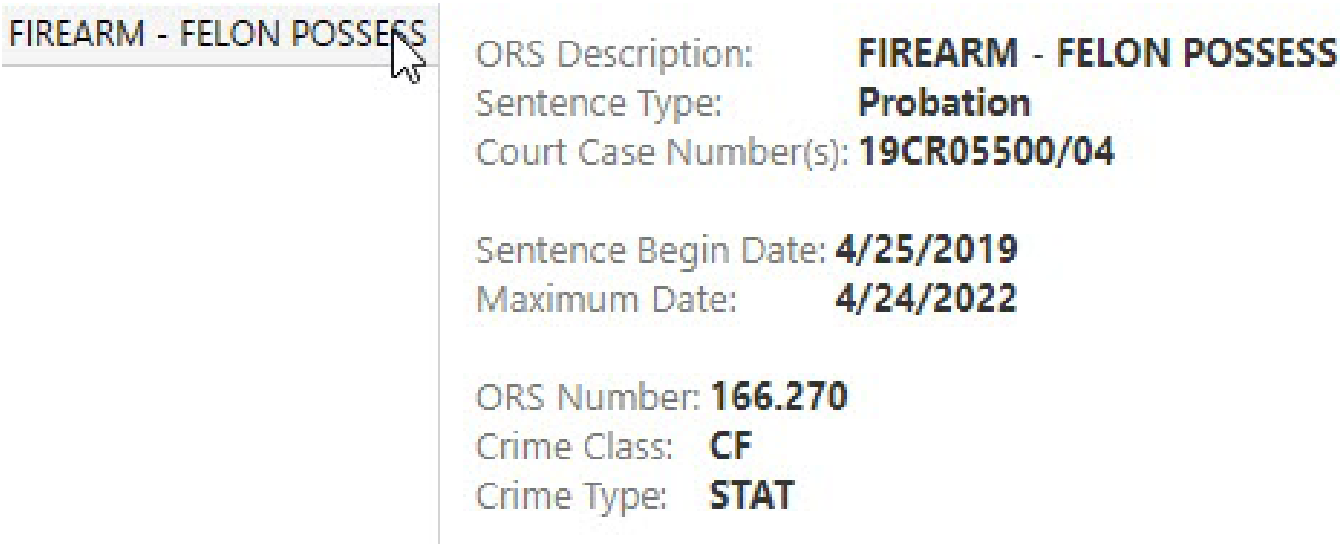


Tooltips

Tooltips provide extra information in the details lists. The Conditions tooltip shows the court case numbers that condition is attached to, and any text in the comments field of that condition (such as the specific individual on a No Contact condition, as below).

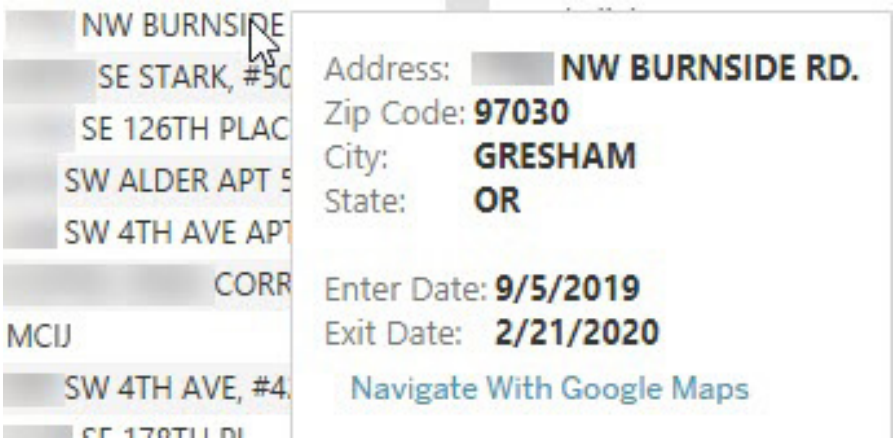


The Charges tooltip shows all active charges and their court case numbers, the sentence and sentence start date, as well as the maximum date (an estimate of when the sentence will expire).



The Phone History tooltip shows the phone number and the start and stop dates for that phone number. The start date is when that phone number was first added to the system, and the stop date is when it was replaced by a new phone number as the JII's current phone.

The Address History tooltip shows the full address and the enter and exit dates. The enter date is when that address was first added to the system, and the exit date is when it was replaced by a new address as the JII's current address. There is also a link that will automatically bring up a Google Maps navigation to the location.



Variables and Filters

Navigation

Filters: Use these to select your caseload, and choose whether to display offenders currently on outcount.

Sort and Color by: Choose whether to sort offenders by SID, name, zip code, or risk level (highest to lowest). You can also choose how you would like to color code: by risk level, last measurable contact, or last home visit.

Summary View: You can scroll up and down to see basic information on every offender in your caseload. Click on any offender to see their details below.

Details View: After selecting an offender, this will show all supervision conditions, current charges, and historical phones and addresses. Hovering over items in this area will give further information. For instance, hovering over addresses will show dates and zip codes.

Conditions: Supervision conditions where extra information has been entered are marked with a *. Hover over to see the full text! This is especially useful for No Contact conditions.

Charges: Charges in this list will be highlighted if they will soon expire. Orange text means a charge will expire within 60 days, red text means a charge will expire within 30 days, and purple text means a charge has already expired.

Address History: When selecting or hovering over an address, you can click the "Navigate With Google Maps" link to open a new window with Google Maps navigation instructions to that address.

Summary View Definitions

Flags: Simply displays whether the JII has any No Alcohol or No Contact conditions. To see who contact is forbidden with, click on a person and hover over the list of conditions that appears below.

Risk Levels: Shows the current community supervision level, and the most recent LS/CMI, WRNA, and PSC risk levels. If the JII has not had an assigned community supervision level or risk assessment, the missing field will be blank.

Last Measurable Contact Date: The most recent date of any chrono that uses the codes listed as a measurable contact, as adopted by OACCD on 9/9/20. These are WHO code O (Offender) and TYPE codes O, H, CORT, DAYR, E, FLD, J, TX, VV, and TV.

Last Completed Home Visit: The most recent date of any chrono that uses the codes listed as a completed home visit, as written in the FAUG Chrono Business Rules. These are TYPE code H (Home) and WHO codes O, BF, FA, GF, H, PRNT, R, W, and X.

Last Attempted Home Visit: The most recent date of any chrono that uses the codes listed as a completed home visit or attempted home visit, as written in the FAUG Chrono Business Rules. These are the code combinations listed above for completed home visits, as well as TYPE code H and WHO code N (No Contact).

Last Report Date and Next Office Date: These dates are taken from the Edit Offender Data screen in CIS.

Reference

Measurable Contacts approved by OACCD:

- O (Office) - O (Offender)
- H (Home Visit) - O (Offender)
- CORT (Court) - O (Offender)
- DAYR (Day Reporting) - O (Offender)
- E (Employment) - O (Offender)
- FLD (Field) - O (Offender)
- J (Jail) - O (Offender)
- TX (Treatment) - O (Offender)
- VV (Virtual Visit) - O (Offender)
- TV (Telephone Visit) - O (Offender)

FAUG Chrono Business Rules

PLACE CODE	PERSON CODE		HOME VISIT TYPE
H (Home Visit)	**O**	Offender	**Completed Home Visit**
H (Home Visit)	**BF** **FA** **GF** **H** **PRNT** **R** **W** **X**	Boyfriend Family Girlfriend Husband Parent Roommate Wife Collateral	**Completed Home Visit**
H (Home Visit)	**N**	No Contact	**Attempted Home Visit**

NOTE: The Place code AH is no longer to be used. A visit to the residence (H - Home) of an offender where no one (N – No Contact) is found to be at home is the definition of an attempted home visit.

Data Source

This dashboard's summary view pulls from many sources including demographics, risk assessments, and sentence and charge tables. While extensive, we only want the current status of each field so pulling together the information is generally straightforward.

Actually displaying the information, however, becomes complicated. Tableau is designed to show only one value per cell, and we want to display around 20 pieces of information. One row per person would normally involve 20 columns, which would be clearly unreadable. It became clear that we would need to "trick" Tableau into displaying more information in each cell. After much design, testing, and iteration, we arrived at a solution.

Each JII has three rows in the data set, one row for each column we want to appear in Tableau. The data-set row corresponding to each Tableau column also has five data-set columns representing the five rows of data we want to appear in that Tableau column. In essence, moving from the data set to Tableau will work like moving from a tall file to a wide file, transposing rows and columns. Here is an example of the data set rows for one JII:

T_NAME	County	Caseload	Caseload_Description	Col	Row1	Row2	Row3	Row4
	LINN	61		1	Race / Gender: W /...	Flags: No Contact	Birthdate: 19...	Commur
	LINN	61		2	Last Measurable Co...	Last Attempted Home Visit: ...	Next Office ...	NULL
	LINN	61		3	Last Report Date: 20...	Last Completed Home Visit: ...	NULL	Height /

In Tableau, we assign the JII as the row and the Col field as the column. Since Col goes from 1 to 3 across the three data rows, this results in three columns and one row per JII, giving us three cells. In each of the cells, we display the five data-set columns Row1 to Row5 vertically as below:

	Col=1	Col=2	Col=3
JII	<from dataset row where Col=1> Row1 Row2 Row3 Row4 Row5	<from dataset row where Col=1> Row1 Row2 Row3 Row4 Row5	<from dataset row where Col=1> Row1 Row2 Row3 Row4 Row5

Note that this solution prevents us from using the column headers to label the data as usual, since each column has at least five different types of data. Instead we add the data label to the value itself, so a birthdate of "1/1/2000" becomes a string of "Birthdate: 1/1/2000."

Meanwhile, each of the details lists (conditions, charges, phone history, and address history) are separate tables, with one row per item and thus many rows per person. These tables can simply be linked to the summary view data by the JII's ID.

Tableau Calculations

The only notable Tableau calculations are used to enable the sorting and coloring features. The sorting and coloring options are picked from a predetermined list using a parameter. Hidden variables set themselves to the appropriate sorting or coloring values, and are then used to sort of color the data.

This is notable only because not all sorting and coloring options appear on every dataset row, so we need to use simple level of detail expressions to look across rows where necessary. For instance, we can find the last home visit complete date (contained in Row2 where Col=3) using this Tableau calculation:

```
DATE({ FIXED [SID Num] : MAX(IF [Col]=3 THEN RIGHT([Row2],10) ELSE '' END) })
```

Broken down, this means:

DATE(
Needed to convert the string we recover into a date.

{ FIXED [SID Num] :
This tells Tableau to calculate one value for each different SID Number.

MAX(
Finds the max between two empty strings (where Col=1 and Col=2) and one date (where Col=3), which will always be the date.

IF [Col]=3 THEN RIGHT([Row2],10)
Find the value in the Row2 dataset column where Col=3. The date will be the last 10 characters of that value (yyyy-mm-dd is 10 characters long).

ELSE '' END) })
If this wasn't the Col=3 row, return an empty string.

Lessons Learned

- Tableau can be surprisingly malleable in the format of what it displays, innovative visuals can be achieved.
- PPOs were very specific about what field they felt they needed. Fields such as flags (for quickly determining if there were no alcohol or no contact orders to be aware of) or height / weight / hair / eyes (needed to issue detainers) are present thanks to feedback we received from officers. It is critical to incorporate user feedback in the building process.

Database Documentation

Dashboard Summary

Field Contacts is a *detail* report. A summary of a JII's contact history is compiled in the top half of the report. Details about the JII's individual history is displayed on the bottom half of the screen.

The Field Contacts report is based on five tables:

t_FieldContactsBaseStack: Data that is displayed in the summary section of the report is compiled in this table during the database load process.
t_FieldContactsCondition: List of conditions
t_FieldContactsCharge: List of charges
t_FieldContactsPhoneHistory: History of known phone numbers
t_FieldContactsAddress: History of known addresses

Summary View

The summary section of the report is based on the t_FieldContactsBaseStack table. The Col column on t_FieldContactsBaseStack identifies each of the columns on the *Summary View* displayed.

The five rows of data that appears in each cell in the Summary View table is stored in a column named row1, row2… row5 on the t_FieldContactsBaseStack table. In the column name row1 data related to the JII is prefixed by a descriptive label so that it can be consistently displayed on the report.

For example, where Col = 1:

Row1 = **Race / Gender:** < JII gender >
Row2 = **Flags:** < flags related to the JII >
Row3 = **Birthdate:** < JII's birthdate >
Row4 = **Community Supervision Level:** < JII's data >
Row5 = **LSCMI:** < LS/CMI score >

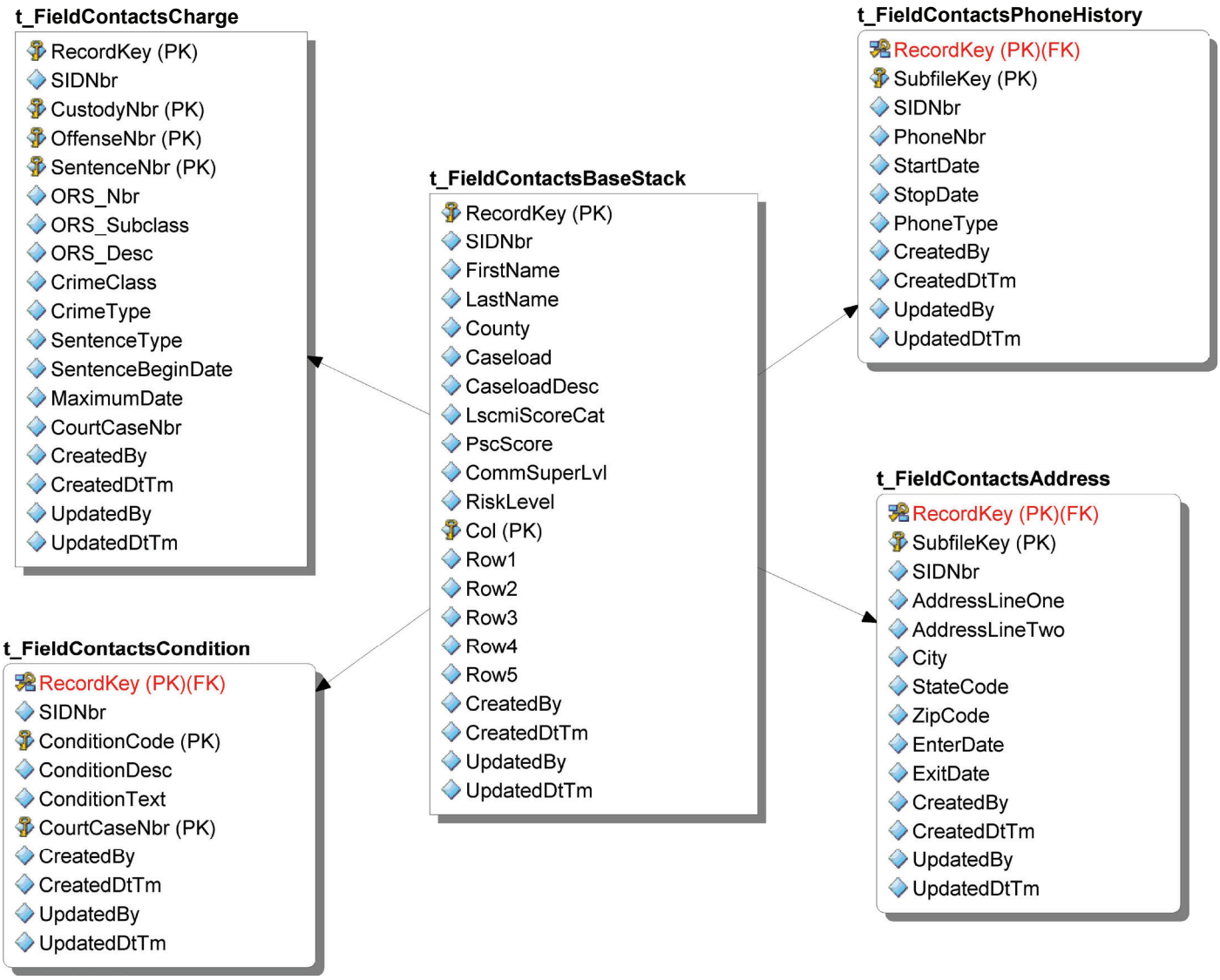
In this way, data for the Summary View is stored in the t_FieldContactsBaseStack table for easy display on the dashboard.

Detail View

The person identifier (RecordKey) from the summary section is used to connect to each of the related tables below to display details and history in the lower Detail View half of the report.

Conditions: Join to the t_FieldContactsCondition table to return one row per sanctioned condition (one sanction event can include several violated conditions).
Charges: t_FieldContactCharges contains a description of charges for each case.
Phone History: From the t_FieldContactsPhoneHistory table, get the history of known phone numbers for the JII selected in the Summary View
Address History: Get list of known addresses from the t_FieldContactsAddress table.

Field Contacts Dashboard Model



Monthly Reconvictions Dashboard

Purpose

The Monthly Reconvictions dashboard was conceived of as an alternative to traditional recidivism measures. Traditional recidivism measures are either "Yes" or "No," and once a Justice Involved Individual (JII) recidivates, once no amount of further good – or bad – behavior can change that. Furthermore, to ensure comparability, traditional recidivism measures usually only track specific cohorts for a uniform length of time instead of the entire supervised population for however long they're on supervision. These traditional measures are not wrong, but this dashboard seeks to provide a more fluid and reactive measure of recidivism.

To that end, the Monthly Reconvictions dashboard tracks all supervised JIIs on a monthly basis, providing many smaller short-term recidivism estimates. Repeat recidivists are counted multiple times, while JIIs with only a single recidivism event who go on to show improved behavior are only counted once.

Example Scenarios

A change in law or enforcement has made vehicle theft a more attractive crime, and a manager wants to check how much more often it is occuring.

A manager is planning new service levels, and wants to understand how recidivism rates differ between JIIs at different risk levels.

Fundamental Assumptions

This dashboard defines recidivism as reconvictions, which we measure as any time a JII already on county supervision has a new criminal conviction recorded in the Department of Corrections' Corrections Information System (CIS). All charges with the same conviction date are considered part of a single conviction, although in the rare case when a JII has two different conviction dates in the same month it will be counted as two separate convictions. Reconvictions do not include non-criminal charges such as failure to appear or post-prison violations. Many misdemeanor convictions are not entered into CIS, and so cannot be counted.

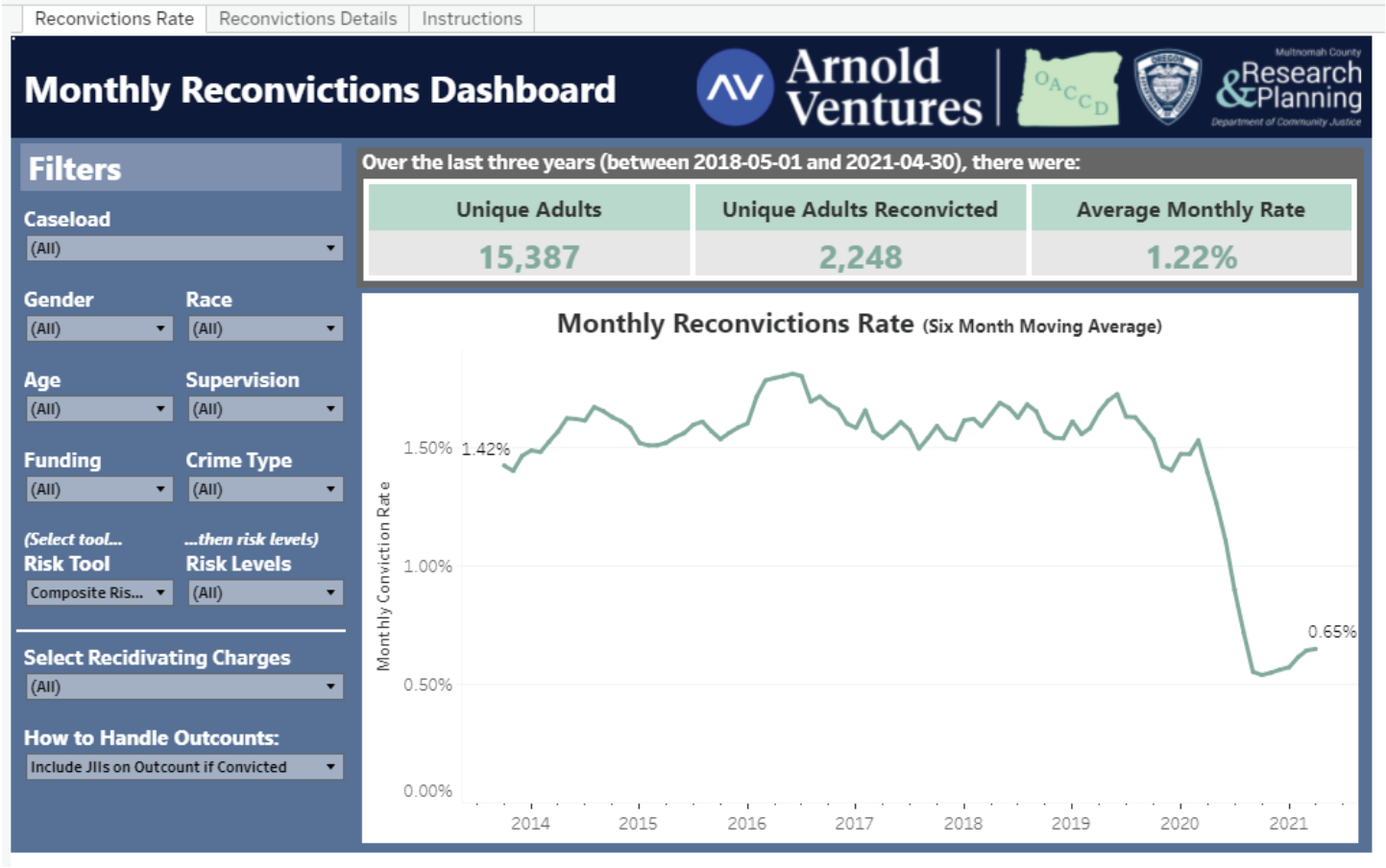
The monthly reconviction rate is displayed as a six-month moving average, which means the value displayed at each month is actually the average of the last six months (i.e., that month and the previous five months). Moving averages are used to better show long-term trends when individual points have too much random noise (e.g., when analyzing stock market performance). Even with this adjustment, the reconvictions rate often moves rapidly up and down due to chance (even more so the fewer JIIs in your the population). Be cautious reading too much into these short-term fluctuations. Try using known events (such as the decrease in convictions due to COVID-19 beginning summer 2020) as a baseline for what a true change should look like. Rapid changes up and down with no clear reason are almost certainly random noise, especially if the peaks and valleys look as if they are "capped" by an invisible horizontal boundary they never cross.

Each JII is reassessed at the start of each month with the best information up to that date, and the filters act on those monthly statuses. As an example, if a JII on supervision in 2019 is 34 years old from January to June and is 35 years old from July to December, the age category filter "25 to 34" would include that JII from 1/1/2019 to 6/30/2019, but the age category filter "35 to 44" would include that JII from 7/1/2019 to 12/31/2019.

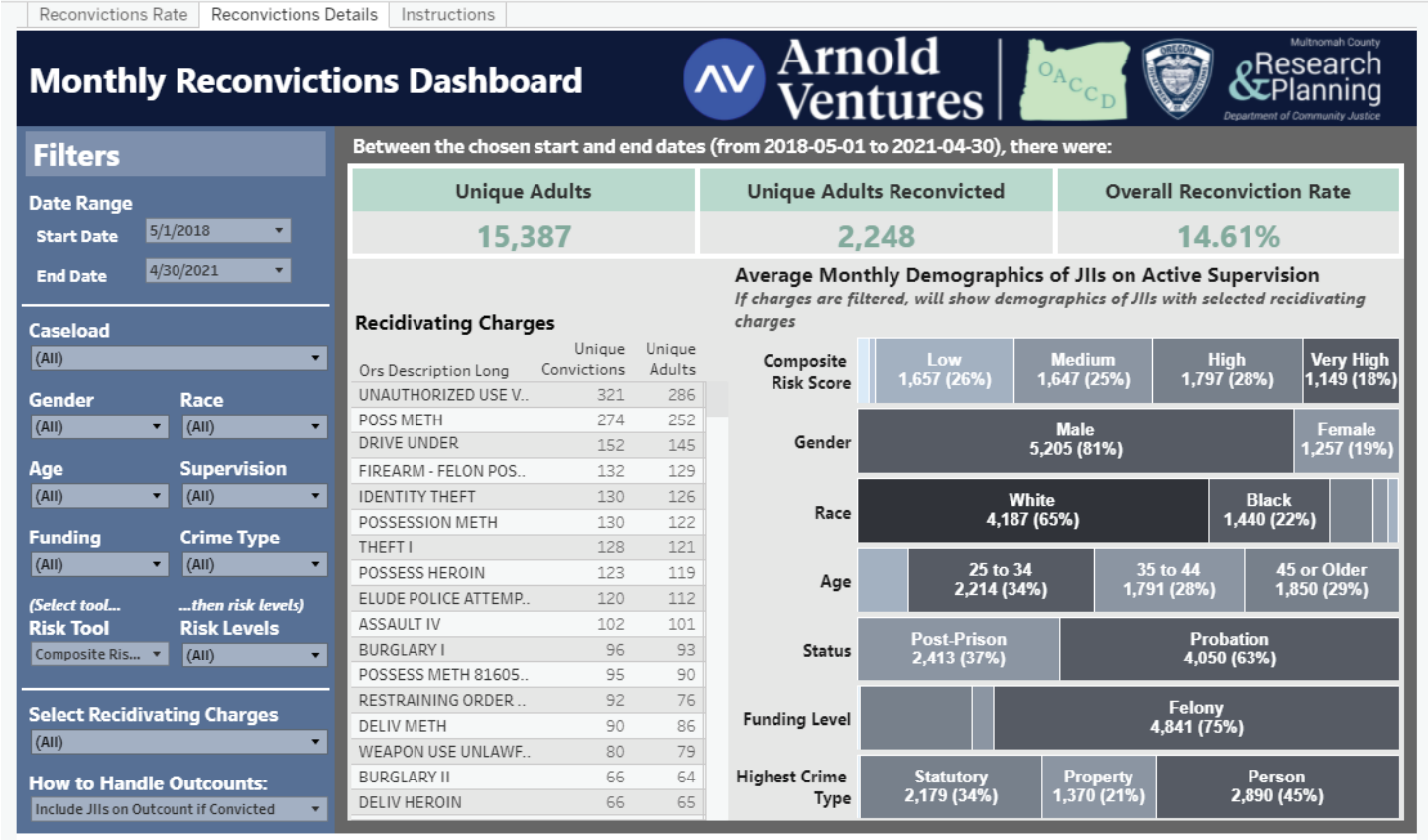
Visuals

Main View

This dashboard has two tabs; the first for examining reconvictions over time and the second for examining specific charges and demographics. On the first tab, the left side contains filters that can be used to hone in on desired populations. The top shows several summary statistics of interest, and the center has a trend line showing the monthly reconviction rate over time.

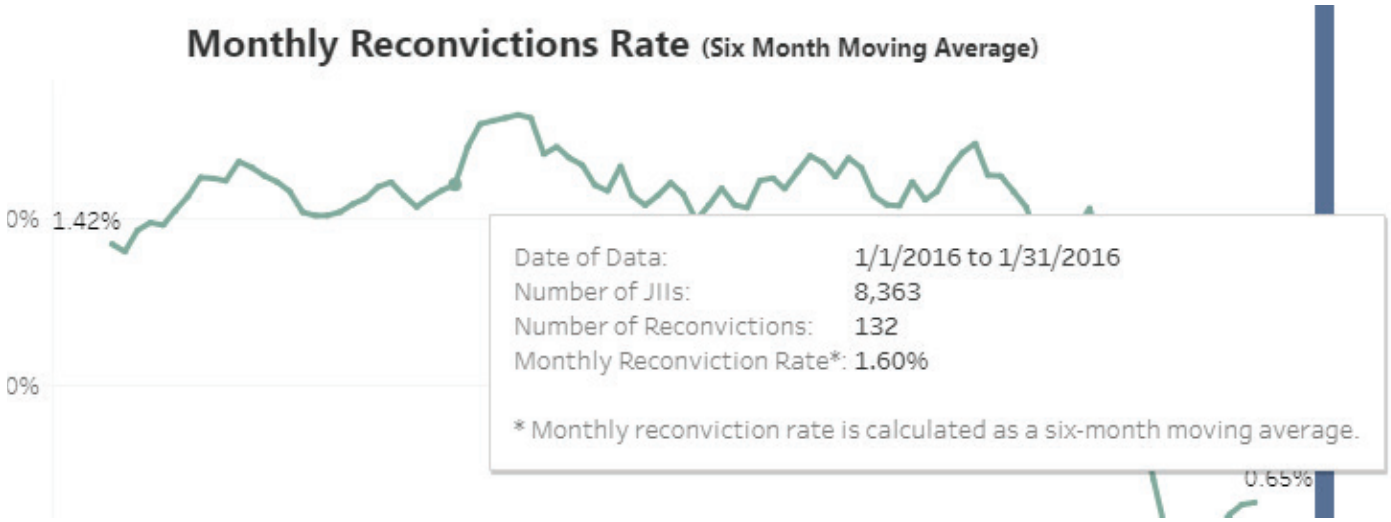


The second tab similarly has filters on the left and summary statistics at the top. In the center is a table showing the number of reconvictions for various charges, and a horizontal bar chart representing JII demographics. If reconviction charges have been filtered, the demographics show the average monthly JIIs on active supervision. If certain charges have been selected, however, the demographics switch to showing the number of JIIs reconvicted on the selected charge(s).



Tooltips

Tooltips provide a breakdown of how the recidivism rate is calculated. For each month, they display the number of JIIs on supervision that month, the number of times those JIIs were reconvicted during the month, and the monthly reconviction rate calculated as a six month moving average.



Variables and Filters

Date Range only appears on the second tab, and can be used to define the time frame of the charge list and demographics on that screen.

Supervision Status filters based on the JII's probation or post-prison status at the start of each month. All statuses are classified as either similar to probation (e.g., diversion and conditional discharge) or similar to post-prison (e.g., parole and early prison leave). If a JII has any post-prison sentences, they are classified as post-prison; otherwise, they are classified as probation.

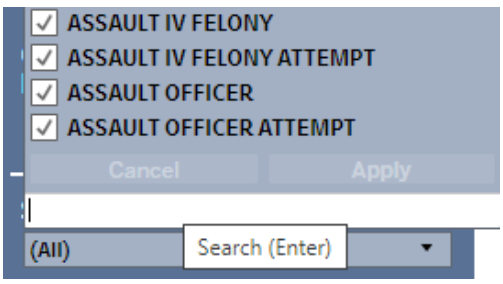
Funding filters based on the highest funding level of all the JII's charges active at the start of each month, ranking "Felony" highest, followed by "Funded Misdemeanor," and finally "Unfunded Misdemeanor." Note that the charges referred to here are the existing charges a JII is on supervision for, not the recidivating charges. However, once a reconviction has been added, the charges involved will be active and calculated as part of this filter in subsequent months.

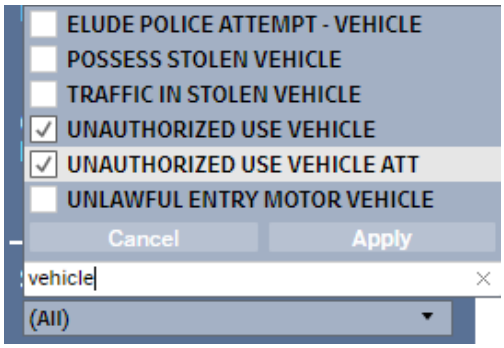
Crime Type filters based on the highest priority crime type of all the JII's charges active at the start of each month, ranking "Person" highest, followed by "Property," and finally "Statutory." Note that the charges referred to here are the existing charges a JII is on supervision for, not the recidivating charges. However, once a reconviction has been added, the charges involved will be active and calculated as part of this filter in subsequent months.

The **Risk Tool Filters** allow you to select one of five different risk tools on the left, and then choose specific risk levels on the right. This will show only JIIs whose most recent assessment at the start of each month matches the selected risk levels.

The risk tool option **Composite Risk Score** merges results from the PSC, LS/CMI, and WRNA into a single view. For each JII, it prioritizes their most reliable available risk-score (in order of priority: WRNA, then LS/CMI, then PSC). Then the scores are grouped based on similar recidivism rates, as normed in Multnomah County. For example, a Composite Risk of "High" is made by combining "Medium" WRNA and PSC scores with "High" LS/CMI scores, as these three groups have the most similar recidivism rates.

You can **Select Recidivating Charges** to view the frequency of occurrence or the demographics of JIIs reconvicted of those charges. To do so efficiently, use the search box that appears when you click on the dropdown. First, click (All) to unselect every charge. Then, search for the charges that interest you, click their selection box, and finally click Apply. You may have to try several variations; for example, when trying to find all UUMV (Unauthorized Use of a Motor Vehicle), you might try searching for "UUMV" or "Motor" before finding that "Vehicle" works, as it is one of the words DOC uses in the charge name.





How to Handle Outcounts can be used to switch how the dashboard deals with JIIs on outcount status. Since the dashboard checks the status of all JIIs on the first of each month, JIIs who begin a month on outcount are normally considered inactive and not included. This switch lets you choose between including JIIs on outcount who receive a new conviction (the default) and not including JIIs who begin the month on outcount at all.

Data Source

We use database records to determine the historical status of each JII on the first day of each month. Each row in our dataset is the demographic and supervision information for that JII on the start of the month, whether that JII was reconvicted that month, and summary information on that reconviction if it occurred. In the rare case when a JII has two different conviction dates in the same month there will be two rows in that month, one for each conviction (this doubling needs to be accounted for later in the Tableau calculations). Additionally, dummy rows (with caseload number and month but no JII information) were added for any caseloads that had no active JIIs during a month, as these are needed for Tableau to properly show empty caseloads.

Tableau Calculations

Using this dataset, most calculations are simple for Tableau to calculate (counts of unique JIIs or reconvictions). Some need slightly more specificity, and are explained below.

The first tab's "Average Monthly Rate" in the upper right corner is calculated as the average of monthly rates, not the rate for all months. In other words, it should be the sum of all months' reconviction rates, divided by the number of months. In Tableau you can find this using this level of detail calculation and filtering out all but the last 36 months:

{ INCLUDE [Start Date] : COUNTD([Person-Reconviction]) } / { FIXED [Start Date] : COUNTD([Record Key]) }

Here, [Person-Conviction] is a combination of record key and reconviction date, so it can be used to find the number of different reconviction events.

The second tab's "Overall Reconviction Rate" in the upper right corner is calculated as the number of unique reconvictions divided by the number of unique adults. It does tend to increase significantly as users select longer time periods.

The most complicated calculations are part of the demographics table in the second tab. Each demographic uses this Tableau calculation (switching [Gender] with the appropriate demographic). Note that, to make these work, all filters except the list of charges have been set as context filters, a Tableau concept that means the filter is applied before any level of detail expression. The sole exception is the charge list filter, which (by default) is applied after the FIXED expression and before the EXCLUDE and INCLUDE expressions.

```
IF SUM({ EXCLUDE [Gender] : SUM([Number of Records]) }) = SUM({ FIXED : SUM([Number of Records]) })
```

This statement checks to see if the total number of rows in the data { FIXED : … } is the same as the number of rows available to the gender filter ({ EXCLUDE [Gender] : … } counts across all values of gender,

and is needed because this is applied to the gender demographic bar). Because the charge list filter is applied after FIXED but before EXCLUDE, this IF statement will be true if and only if no charges have been removed using the filer.

```
THEN SUM({ EXCLUDE : COUNTD([Person-Supervision Date]) } / { EXCLUDE [Gender] :
COUNTD([Start Date]) })
```

In the case that the charge filter has not been used, this displays the average number of people per month; [Person-Supervision Date] is a combination of record key and month, so this evaluates as the sum of all monthly population counts divided by the number of months.

```
ELSE COUNTD([Record Key]) / SUM({ FIXED [Ors Description Long] :
COUNTD(STR([Gender]) + '_' + STR([Record Key])) })
  * SUM({ FIXED [Ors Description Long] : COUNTD([Record Key]) })
```

In the case that the charge filter has been used, this displays the JIIs using COUNTD([Record Key]). The two level of detail expressions add an adjustment in case the JII was reconvicted multiple times while at different risk levels (for instance, reconvicted for twice for assault charges, once when at medium risk and a second time when at high risk). By multiplying the number of JIIs by the number of times a JII appears divided by the number of different demographic identities, any JII in that circumstance is divided between the number of demographic identities they belonged to.

```
END
```

Finally, a WINDOW_SUM table calculation is applied to turn the counts provided by this calculation into percentages.

Lessons Learned

Originally, the dashboard builders intended to automatically switch the demographics between the average monthly population and raw counts of convicted JIIs based on the filters chosen by the user. However, that work turned out to be overly complicated and unnecessary.

Database Documentation

The purpose of this report is to analyze the number of people on supervision along with the number reconvictions and the rate of recidivism. The line chart on the Reconvictions Rate page displays the monthly rate of reconvictions. Hovering over the line graph displays the number of JIIs on supervision and the number of reconvictions used in the rate calculation. This section describes the code behind the creation of the database tables that support this dashboard.

Displayed Report Values

The Monthly Reconviction Dashboard is based on a single table called Reconviction. The table was constructed in several steps to create one row for each month that a JII's is under supervision.

In a star schema, the grain of the Reconviction "fact table" would be person-month. RecordKey is the unique person identifier on the Reconviction table. StartDate is set to the first day of every month that the JII is under supervision. If a JII is in supervision for 18 months, eighteen StartDates will exist for that supervision period. The grain of the Reconviction table allows monthly metrics to be derived by counting RecordKey and StartDate. The person-month grain supports monthly analysis for this dashboard.

Metrics that are displayed on this report are not stored on the Reconvictions table but were derived in the Tableau dashboard as:

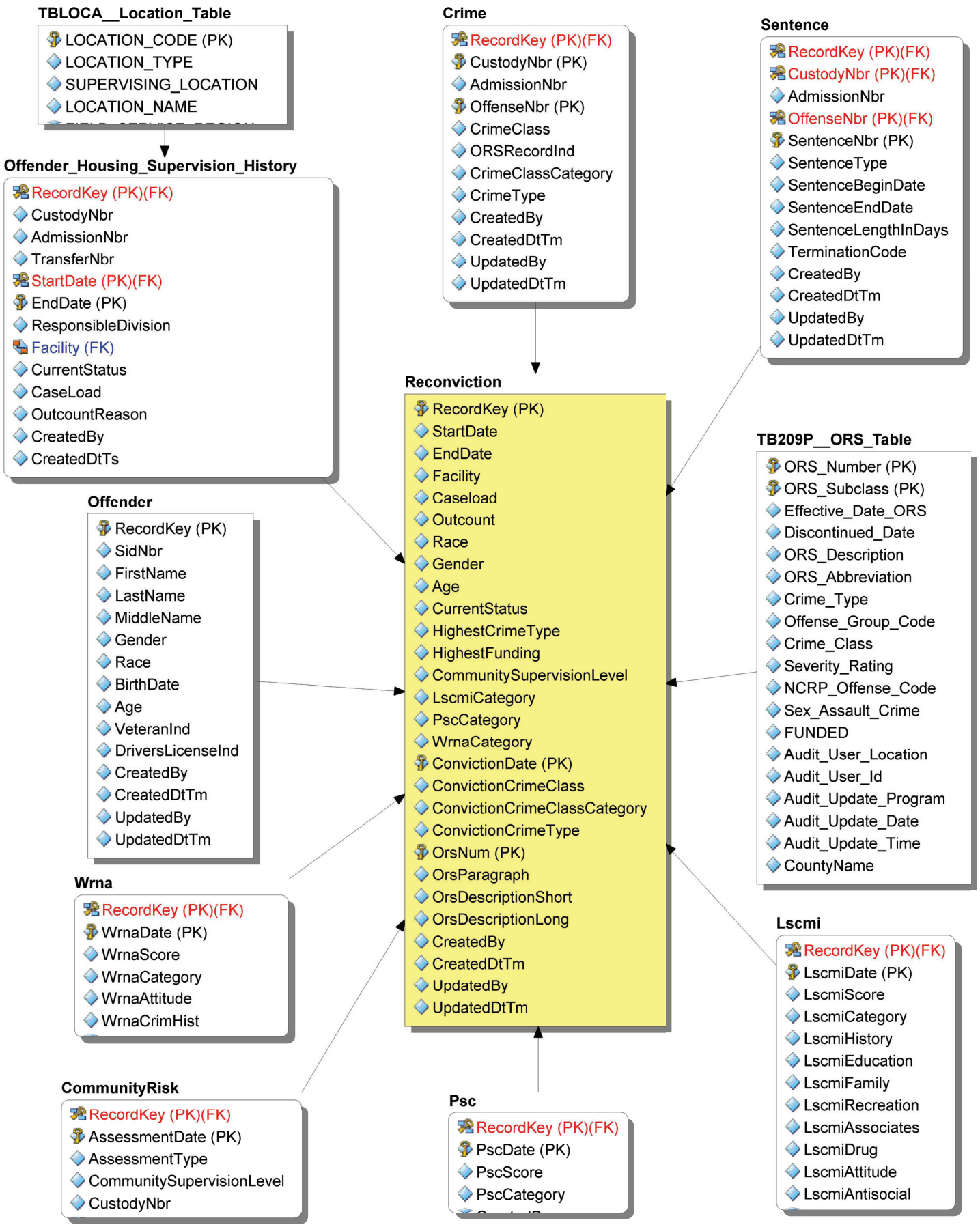
- **Count of JIIs on supervision by month:** This metric is a count of distinct RecordKey and StartDate.
- **Count of reconvictions:** A JII can have multiple convictions. Conviction count is derived by performing a distinct count of the RecordKey, StartDate and ConvictionDate where a ConvictionDate exists (is not null).

From these metrics, a rate of recidivism is calculated and displayed on a line graph on the Reconvictions Rate page. The Reconvictions Details page, contains a table of Recidivating Charge count totals and a collection of aggregated category groupings shown in stacked bar graphs.

Filter Values

The data diagram shows database tables that were the source of Reconviction attributes that are used to populate Filter lists in the dashboard (see Image). See Table 1 to see which Reconviction table attributes are used to populate Reconviction Dashboard filter dropdown lists and to find descriptions of how Reconviction attributes were derived.

Monthly Revocations Dashboard Model



Dimension Table	Dashboard Filter	Reconviction Table Attribute
	Start Date	Notice that the values in the Start Date dropdown are the first day of each month. Selecting a value in the Start Date dropdown will return all supervisions that have occurred within the selected start month and subsequent months.
Offender	Gender, Race	**Attributes:** Gender, Race
	Age	**Attribute:** Age: this is a grouping of ages into ranges **Values:** 24 or younger 25 to 34 35 to 44 45 and older
Offender_Housing_Supervision_History (OHSH)	Caseload	**Attributes:** Caseload
	Outcount	**Attribute:** Outcount populated from OutcountReason on the OHSH dimension table. Cases that are active (outcount=0) are cases where a conviction happened that month. The effect of the charge, combined with including all outcounts at the start, is to get all active people and all inactive people who are convicted **Values:** 0 - No JIIs on Outcount Included 1 - Include JIIs on Outcount if Convicted
	Supervision	**Attribute:** CurrentStatus. Populated from the CurrentStatus from the OHSH dimension table. Also shows as Status in the Reconviction Details bar chart. **Values:** Post-Prison or Probation
Sentence		**Attributes:** ConvictionDate: used to derive the reconviction metric
	Funding	**Attribute:** ConvictionCrimeClassCategory: used to derive HighestFunding **Values:** FE - Felony FM - Funded Misdemeanor UM - Unfunded Misdemeanor
	Crime Type	**Attribute:** ConvictionCrimeType: used to derive HighestCrimeType **Values:** STAT - Statutory PROP - Property PERS - Person
CommunityRisk LSCMI Psc Wrna	Risk Tool	The most recent risk category from each of the risk assessment tools **Attribute:** ComntySupervisionLevel Value: Community Supervision Level **Attribute:** LscmiCategory Value: LS/CMI **Attribute:** PscCategory Value: PSC **Attribute:** WrnaCategory Value: WRNA
TB209P__ORS_Table	Recidivating Charges	Reference table contain ORS codes and descriptions **Attributes:** ORSDescriptionLong

Population Served Dashboard

Purpose

The Population Served Dashboard combines the demographic-, risk-, and conviction-information of the supervised population over time. This gives stakeholders the ability to answer high-level questions about the number of Justice Involved Individuals (JIIs), with some particular-combination of characteristics, who were supervised during a period of time (down to the monthly level).

Example Scenarios

A local non-profit that specializes in serving women from the Latino community is applying for a grant to provide intensive counseling and treatment services for women who are so-called 'high risk'. To complete their grant application, they need to know how many JIIs fit this profile in a typical year.

Facing a budget shortfall, and possible cuts to discretionary services, managers are trying to determine how many JIIs are being supervised without any support from state funding.

Fundamental Assumptions

- Risk scores are meaningful; it is appropriate to center supervision-strategies on a person's risk score.
- The assessment instruments being used yield meaningful risk scores.

Visuals

Main View

1 Filters

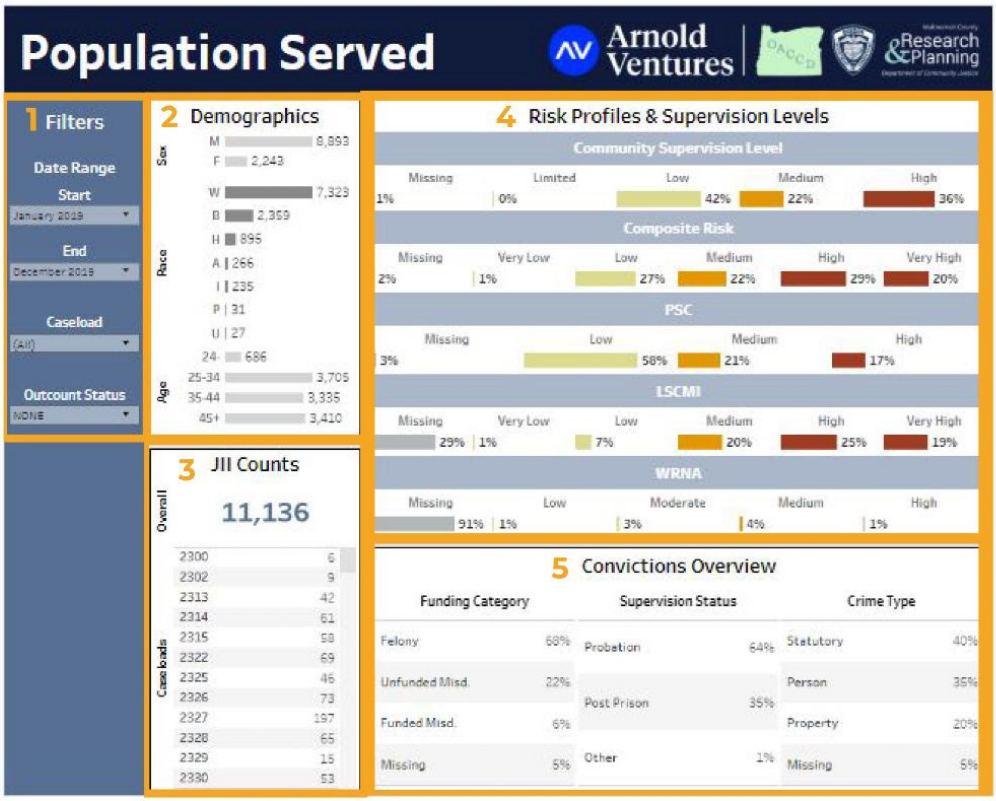
Use the Start and End filters to set the Date Range for your analysis. Additionally, you can filter by one or more individual Caseloads, and/or Outcount Status. The default Outcount Status is "None".

2 Demographics

Counts for Sex, Race, and Age based on what is recorded for each person in DOC400.

3 JII Counts

Adds up the number of unique Justice Involved Individuals (JII's) who were on supervision for all, or part of, the currently selected Date Range. Shows the overall count as well as the individual Caseload counts.



4 Risk Profiles & Supervision Levels

Community Supervision Level looks at the overall ratio of supervision levels (in the selected Date Range) for each person supervised during that time. If a particular person was supervised at more than one Community Supervision Level in the selected Date Range, the dashboard will reflect only their last recorded Level for that period.

The Composite Risk merges results from the PSC, LS/CMI, and WRNA into a single-view. For each person, the chart prioritizes their most reliable, available risk-score (in order of priority: WRNA, then LS/CMI, then PSC). Then the scores are grouped based on their relative severity. For example, a Composite Risk of "High" is made by combining "Medium" WRNA and PSC scores with "High" LS/CMI scores.

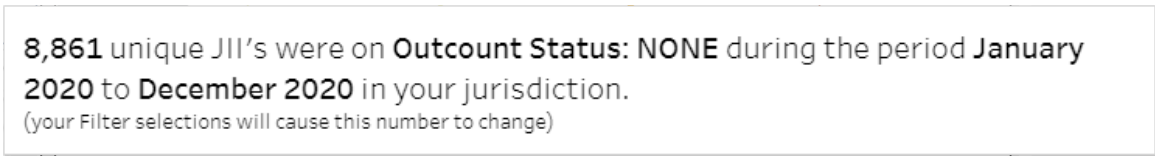
The PSC, LS/CMI and WRNA measures show the ratios for each risk instrument separately.

5 Convictions Overview

Funding Category shows the accumulated funding levels for the supervised population (in the selected Date Range). Supervision Status shows the mix of Probation and Post-Prison supervision. Crime Type compares each JII's most severe conviction by general-category (based on the DOC Severity Score).

Tooltips

Sample tooltip popup for 'Overall JII Count'



Variables and Filters

Time and Status

With respect to time, users select a starting- and ending-month/year for their analysis. The smallest interval of time available is one calendar month, which is found by selecting the same month/year for both the Start and End parameters. This gives the end-user the flexibility to generate measures for a variety of time intervals (e.g. biennial, annual, semi-annual, quarterly, monthly). As for Outcount Status, the main purpose of this filter is to include or exclude JIIs on Abscond status from the population measures. Other, less-common statuses are also available in the filter.

Demographics

The demographic variables used in this dashboard are the generic Sex, Race, and Age (as defined by Oregon DOC). For Sex and Race, the options mirror those that are available in the source system. For Age, the total range of ages was distilled down to four 'buckets' so as not to be visually overwhelming.

Risk Profiles & Supervision Levels

The largest area on the dashboard, this section gives a visual comparison of the level that people are supervised at (their Community Supervision Level) versus the level of risk they were found at by one (or more) of the risk assessment instruments (the PSC, LS/CMI, and/or WRNA). Because of differences between these instruments, a Composite Risk measure was created for the purpose of making a better apples to apples comparison. In the abstract, if our risk assessment tools are accurate and our processes for assigning Community Supervision Level are effective, we would expect the graphics for Community Supervision Level and Composite Risk to show equal proportions of High-, Medium-, and Low-Risk JIIs.

Conviction Categories

This part of the dashboard expands three different population-categories which are relevant to administrators: Funding Category, Supervision Status, and Crime Type.

Funding Category shows the share of JIIs for which a jurisdiction receives state funding to cover the costs of supervision. It's not uncommon for a jurisdiction to supervise some number of JIIs for which they do not receive state funding because it was determined to be in the interest of the community. Only felony convictions and a limited number of drug-related misdemeanors are state funded. An example of an unfunded case (which the jurisdiction is basically supervising for free) might be a JII with a misdemeanor conviction for DUI.

Supervision Status shows the balance of Probation versus Post-Prison cases. There are several meaningful differences between these types of cases, especially when considering the possible outcomes for a JII who is not successful on supervision.

Crime Type considers the most serious* conviction for each JII in the population, and aggregates them. These ratios can serve as a simplified measure of community safety. Person-to-person crimes such as assault are normally considered the most dangerous, whereas Statutory crimes such as failure-to-appear generally pose less danger to people in the community; Property crimes are in the middle.

*The 'seriousness' of a particular crime, for our purpose, is determined by its severity rating which comes from a scoring system implemented by Oregon Department of Corrections, which is the custodian of record for this data.

Conviction Categories

Overall is the total number of JIIs who match all applied filter-criteria for a jurisdiction.

Caseload is the total number of JIIs who match all applied filter-criteria for each caseload within a jurisdiction.

Data Source

For each JII in the accompanying data set, there is one row for every month of their supervision. If a person was on supervision for a year, they will have 12 rows in the set. For variables where multiple values can exist in the same month, such as having two PSC scores because the assessment was run at two different times that month, we used whatever value was true at the end of the month.

Tableau Calculations

The calculations used in this dashboard are simple counts and percentages. The complexity of this dashboard, insofar as it is complex, comes from the many different combinations of filters that can be applied. But these filter selections always distill down to a headcount and/or percentage of total JIIs for any particular variable. As for how the counts are made, they're all based on the *count of unique (or distinct) persons* who meet all filtering criteria for the selected time period.

Composite Risk Score

The Composite Risk Score, though not a true calculation, is best described here. At different times within a custody cycle, a person may be subject to multiple and repeated use of several risk instruments (PSC, LS/CMI and/or WRNA) to aid in determining the intensity of supervision most appropriate for them. Though the results of these risk instruments will look similar--something like "Low", "Medium", or "High Risk"--the instruments themselves have different focuses, and give different weight to some of the same variables. These differences create an 'apples to oranges' situation when trying to aggregate the risk level for a large and diverse population.

The Composite Risk Score addresses this by considering only the latest and best risk score for each person, for a given period of time, and then scores are grouped based on their relative severity. For example, a Composite Risk Score of 'High' is made by combining 'Medium' WRNA and PSC scores with 'High' LS/CMI scores.

Lessons Learned

Requests for information of the variety “How many JIIs did you supervise during [year] with [x, y, z] characteristics?” often come from outside community-partners in service of a very specific use case. In an effort to make the dashboard maximally flexible so as to be capable of answering all the imaginable ‘what ifs’, it also becomes larger and more cumbersome. There comes a point in development where adding more content to the dashboard makes the analysis less and less clear.

Database Documentation

Population Served Dashboard helps answer some of the critical questions (not limited to below) from the Department of Community Corrections.

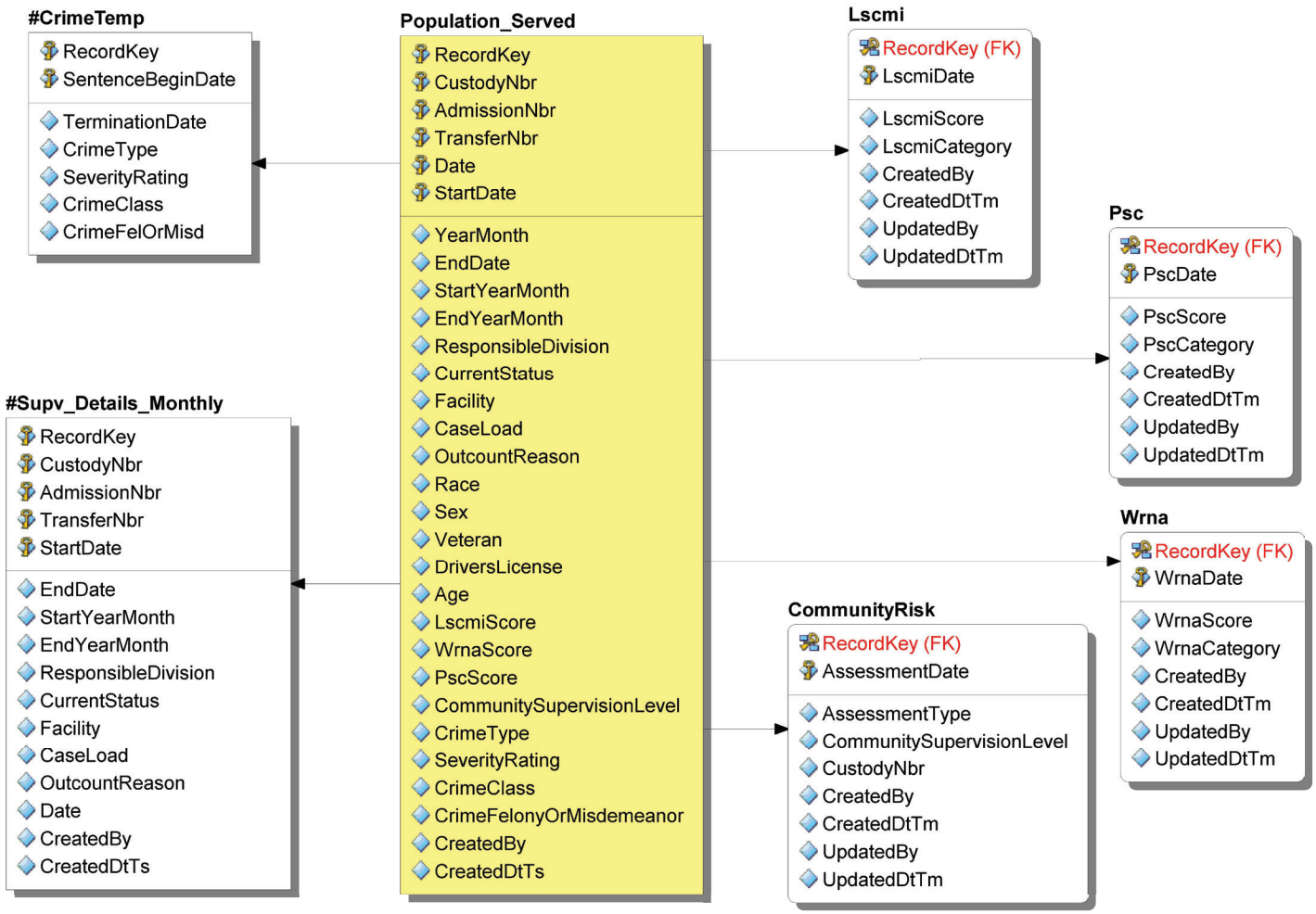
- How many felons do we have on supervision
- How many misdemeanors and felonies?
- If misdemeanors, how many of them are funded/unfunded
- Population risk levels
- Gender, race and age distribution
- Crime Severity - Statutory, Property and Person

The Population Served dashboard was built on the Population_Served table which was specifically designed for this dashboard with all analytic elements built in. The diagram below is intended to represent the following description of the stages involved in the constructions of the Poplutation_ Served table.

Stage	Stage summary
Date	Create a date dimension for every month that a person is in supervision
LSCMI	Create an LSCMI dimension with LSCMI start and end dates; a year/month and LSCMI score attributes. #Lscmi has the most recent interview date in a month for a person.
WRNA	Create an WRNA dimension with Wrna start and end dates; a year/month and WRNA scores attributes
PSC	Create an PSC dimension with PSC start and end dates; a year/month and PSC score attributes
Community Risk	Create an Community Risk dimension with start and end dates; a year/month and Community Supervision Level attributes
Charge Detail (#CrimeTemp)	A dimension that compiles offense detail information such as sentence begin and termination dates and brings in crime class, crime type, severity ratings and a derived funding code

Population Served Dashboard Model

Note: The Population Served Dashboard does not use a star schema, however the stored procedure that constructs the Population_Served table is segmented into stages described in this document that could be reconstructed as a star schema.



Risk Assessments Dashboard

Purpose

The Risk Assessments dashboard gives population-measures for the results of the LSCMI, WRNA and PSC risk tools overtime. For the LSCMI and WRNA tools, the dashboard also gives information about the different risk domains that are added together to make up the overall risk score for those instruments, which allows you to evaluate which risk domains are the biggest problem (contributing most to the overall risk scores) for your population.

Example Scenarios

A community partner that runs outreach programs for women that are Justice Involved Individuals (JIIs) wants to know what they should be focusing on to best help their clients.

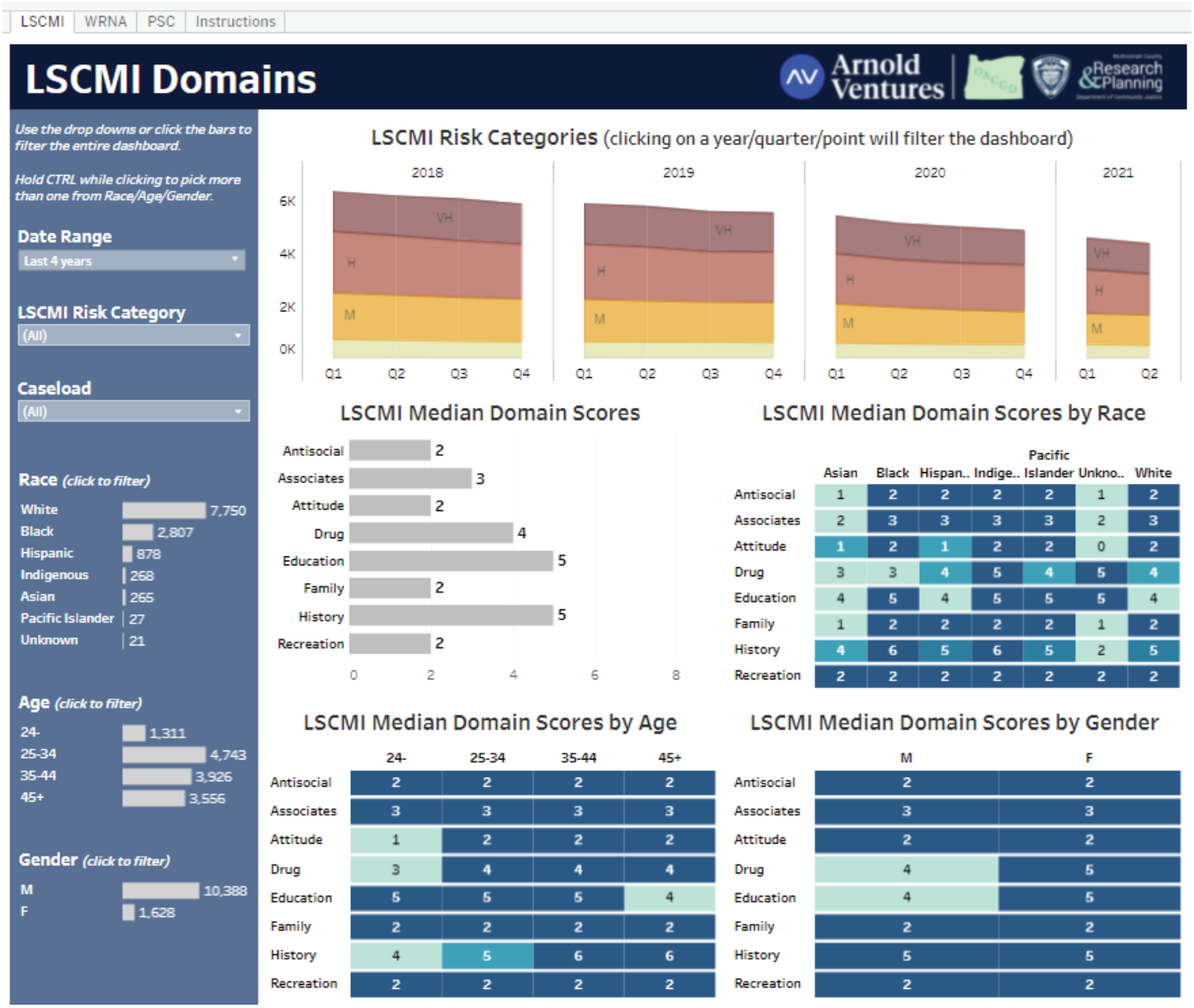
Senior leadership suspects that their supervised population of JIIs is more volatile than it once was, resulting in higher costs of supervision. If they can confirm this suspicion then they will petition for more funding to cover the increasing safety costs.

Fundamental Assumptions

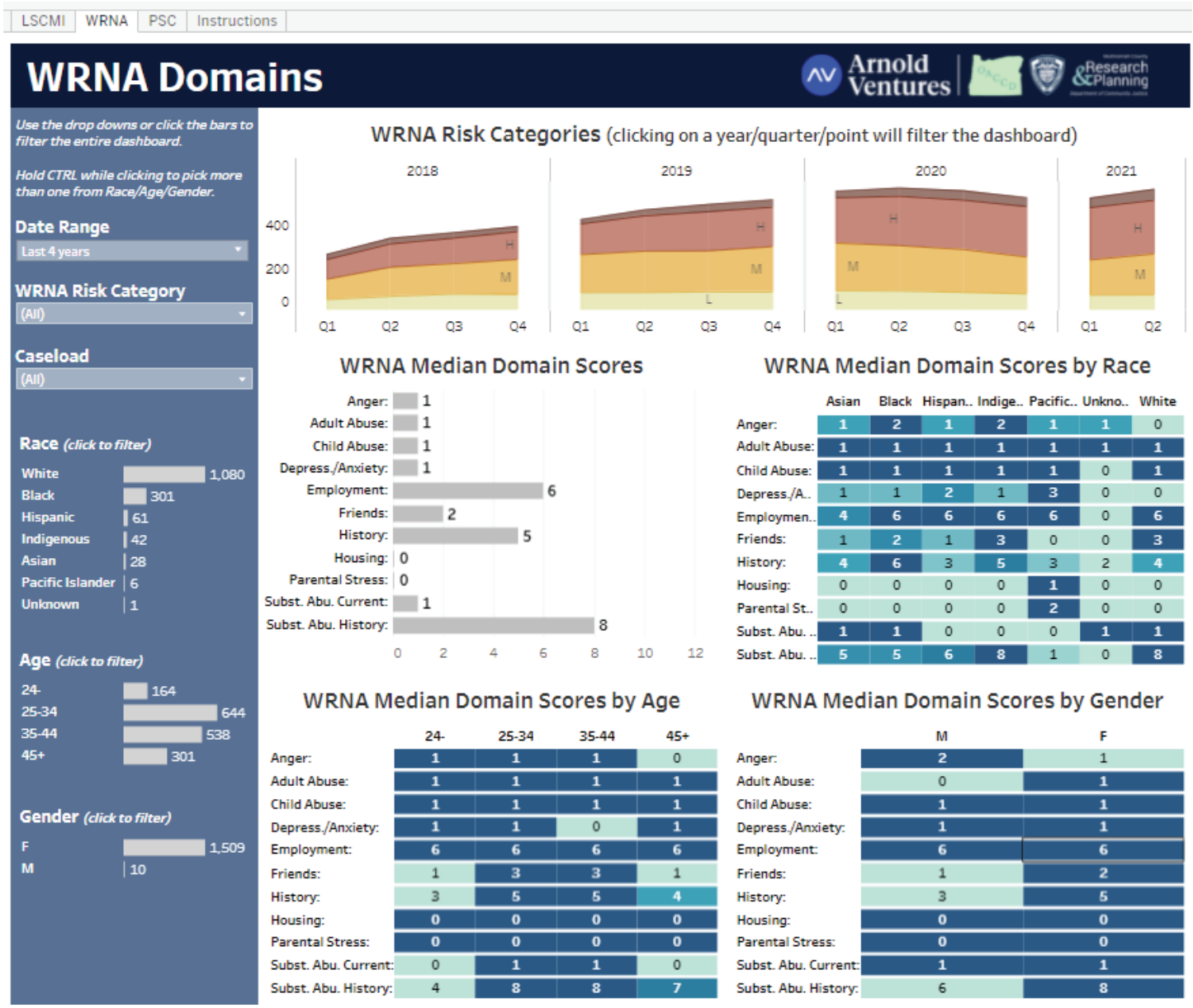
- The WRNA and LS/CMI assessments provide meaningful information about how to best help individuals be successful on and after community supervision.
- The risk score a person receives correctly predicts, on average, how likely a person is to violate conditions of their supervision and/or commit new crimes.

Visuals

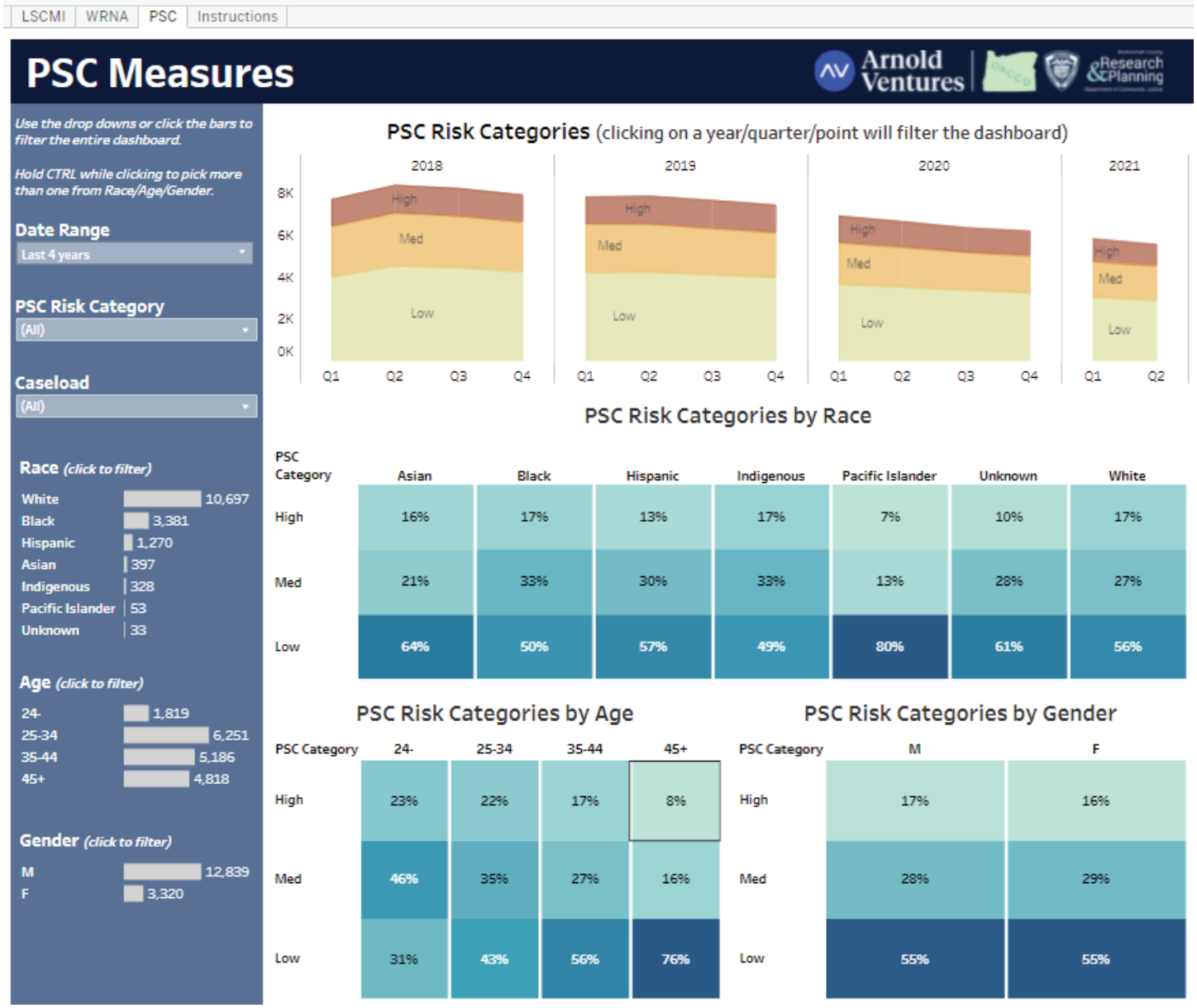
LS/CMI



WRNA

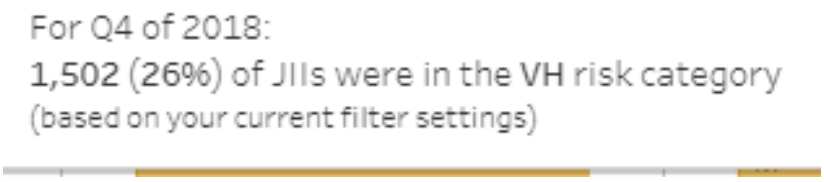

LSCMI
WRNA
PSC
Instructions
WRNA Domains
Arnold Ventures
Research & Planning
Use the drop downs or click the bars to filter the entire dashboard.
Hold CTRL while clicking to pick more than one from Race/Age/Gender.
Date Range
Last 4 years
WRNA Risk Category
(All)
Caseload
(All)
Race (click to filter)
White 1,080
Black 301
Hispanic 61
Indigenous 42
Asian 28
Pacific Islander 6
Unknown 1
Age (click to filter)
24- 164
25-34 644
35-44 538
45+ 301
Gender (click to filter)
F 1,509
M 10
WRNA Risk Categories (clicking on a year/quarter/point will filter the dashboard)
2018
2019
2020
2021
400
200
0
H
M
L
Q1
Q2
Q3
Q4
WRNA Median Domain Scores
Anger: 1
Adult Abuse: 1
Child Abuse: 1
Depress./Anxiety: 1
Employment: 6
Friends: 2
History: 5
Housing: 0
Parental Stress: 0
Subst. Abu. Current: 1
Subst. Abu. History: 8
0 2 4 6 8 10 12
WRNA Median Domain Scores by Race
Asian Black Hispan.. Indige.. Pacific.. Unkno.. White
Anger: 1 2 1 2 1 1 0
Adult Abuse: 1 1 1 1 1 1 1
Child Abuse: 1 1 1 1 1 0 1
Depress./A.. 1 1 2 1 3 0 0
Employmen.. 4 6 6 6 6 0 6
Friends: 1 2 1 3 0 0 3
History: 4 6 3 5 3 2 4
Housing: 0 0 0 0 1 0 0
Parental St.. 0 0 0 0 2 0 0
Subst. Abu. .. 1 1 0 0 0 1 1
Subst. Abu. .. 5 5 6 8 1 0 8
WRNA Median Domain Scores by Age
24- 25-34 35-44 45+
Anger: 1 1 1 0
Adult Abuse: 1 1 1 1
Child Abuse: 1 1 1 1
Depress./Anxiety: 1 1 0 1
Employment: 6 6 6 6
Friends: 1 3 3 1
History: 3 5 5 4
Housing: 0 0 0 0
Parental Stress: 0 0 0 0
Subst. Abu. Current: 0 1 1 0
Subst. Abu. History: 4 8 8 7
WRNA Median Domain Scores by Gender
M F
Anger: 2 1
Adult Abuse: 0 1
Child Abuse: 1 1
Depress./Anxiety: 1 1
Employment: 6 6
Friends: 1 2
History: 3 5
Housing: 0 0
Parental Stress: 0 0
Subst. Abu. Current: 1 1
Subst. Abu. History: 6 8

PSC

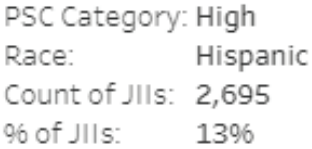


Tooltips

Sample tooltip popup for 'LSCMI Risk Categories'



Sample tooltip popup for 'PSC Risk Categories by Race'



Variables and Filters

Time and Supervision Level

All measures are quarterly, and the analysis is meant to look at how prior quarters lead up to the current quarter; users are able to select the limit on how far back this goes. The Risk Category filter allows the user to limit the analysis to JIIs with the same amount of 'riskiness', as determined by the risk assessment/tool. There are many scenarios where it is unhelpful or even misleading to lump together lower- and higher-risk JIIs in an analysis.

Demographics

The demographic variables used in this dashboard are the generic Sex, Race, and Age (as defined by Oregon DOC). For Sex and Race, the options mirror those that are available in the source system. For Age, the total range of ages was distilled down to four 'buckets' so as not to be visually overwhelming.

LSCMI & WRNA & PSC Risk Categories

These time series show both the relative- and absolute-number of JIIs in each risk level, by quarter.

LSCMI & WRNA Median Domain Scores

For the LSCMI and WRNA tabs, this chart lists out the social and behavioral domains that are the focus of their respective risk assessments. The median score is listed for each domain so that users can see at a glance which domains are contributing the most points to the overall risk scores for that population; this also implies where supervision efforts might be focused to yield significant improvements for JIIs in that population.

LSCMI & WRNA Median Domain Scores by Race/Age/Gender

These charts serve the same function as the first 'Median Domain Scores' chart, except that they allow for more nuance by adding an axis for one of the demographic dimensions.

PSC Risk Categories by Race/Age/Gender

For the PSC, these charts consider each demographic variable, and they display the relative ratio of the three PSC risk levels (Low, Medium, and High) for that particular variable.

Data Source

For each JII in the accompanying data set, there is one (and only one) row for every month of their supervision. If a person was on supervision for a year, they will have 12 rows in the set. For variables where multiple values can exist in the same month, such as having two PSC scores because the assessment was run at two different times that month, we used whatever value was true at the end of the month.

Tableau Calculations

Calculating a median Domain score:
AGG(MEDIAN([Lscmi Antisocial]*))*

Calculating Risk Category ratios:
Start with *CNT*(RecordKey), then apply a 'Percent of Total' table calculation (table *down*)

Lessons Learned

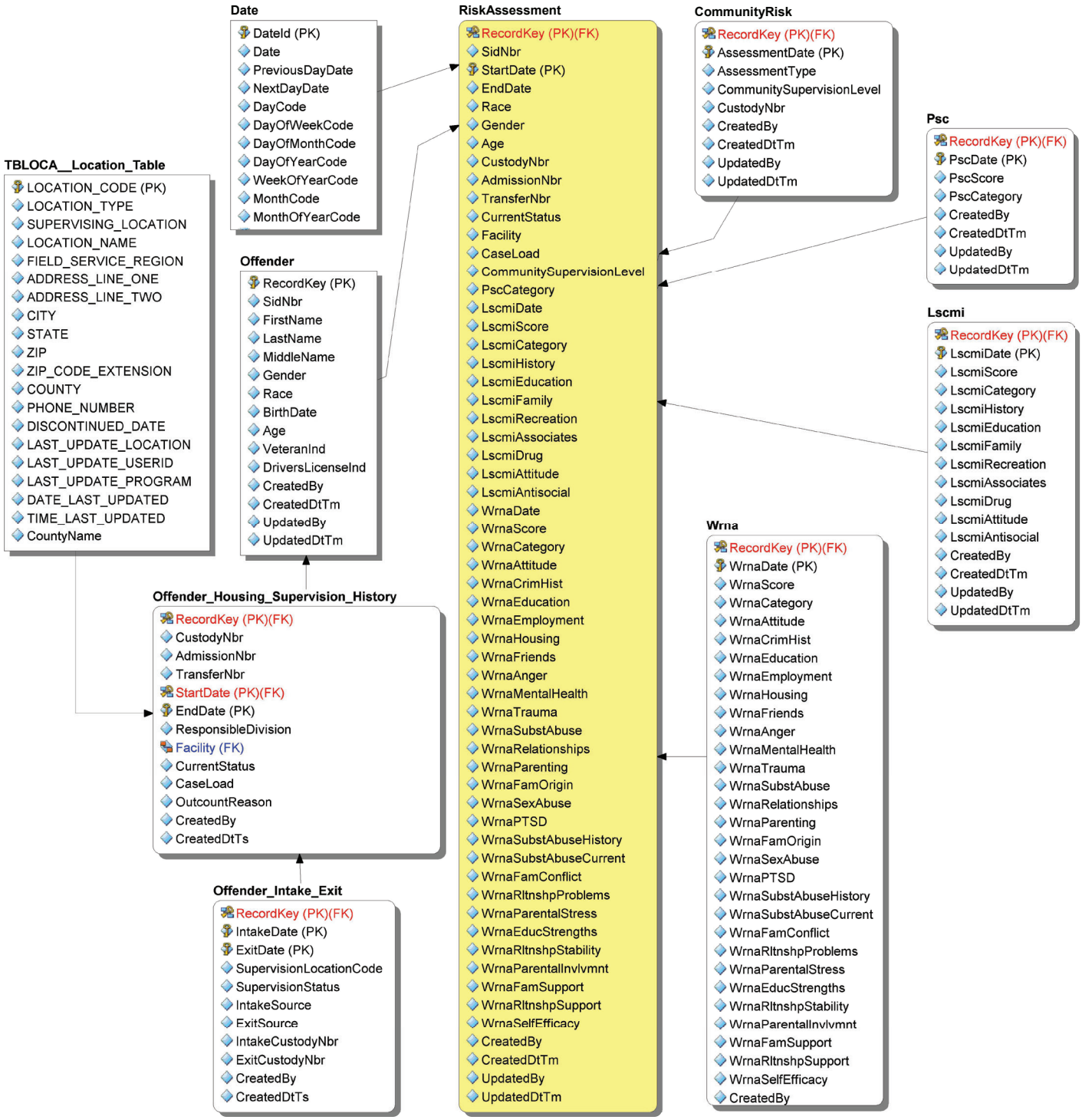
It's not very useful to try and set a standard for a measure that had been ignored until now, and for which you're not yet sure what *normal* looks like.

Database Documentation

The Risk Assessment Dashboard is based on one flattened table that contains all elements for analysis in one row. The table is called Transform.RiskAssessment. It is designed optimally for modern day analytical reporting tools.

The diagram below shows database tables that were used to compile data for the RiskAssessment dashboard. This visual helps to see the layout of the query that was written to generate the Transform. RiskAssessment table when looking at the database stored procedure that generates the Transformation. RiskAssessment table.

Risk Assessment Dashboard Model



Sanctions Dashboard

Purpose

Sanctioning is a complex topic with many areas of interest. This dashboard gives you the tools to answer as many sanction-related questions as possible, from trends over time to records of each individual sanctioning event.

Each county may have different sanction recording policies (which sanction codes are used), sanction enforcement policies (when to give sanctions to JIIs), and sanction category policies (which sanctions are considered similar to each other and belong in the same category). To accommodate these differences, this dashboard offers more customization options and long lists of discrete sanction types for users to define their own priorities.

Example Scenarios

A manager wants to know how sanction usage and jail bed counts have changed over time.

County leadership wants to ensure that long-term jail sanctions are only being given for severe violations.

A manager wants to confirm that their probation officers are making active use of alternative community sanctions.

County leadership wants to more closely examine the roots of overall sanctioning disparities shown in the Racial and Ethnic Disparities dashboard.

Fundamental Assumptions

This dashboard defines one sanction as a completed Sanction Reporting Form (SRF) entered into the Corrections Information System (CIS). A single SRF may have multiple sanction types (Electronic Monitoring, Jail, Written Reprimand, etc.) and multiple conditions violated (obey all laws, abide by PO directives, no intoxicating beverages, etc.). We only count given sanctions (not recommended sanctions) and SRFs with a “completed” status. Interventions are considered a type of sanction, and included without differentiation. Sanctions with zero custody units are included as zeroes in custody unit averages.

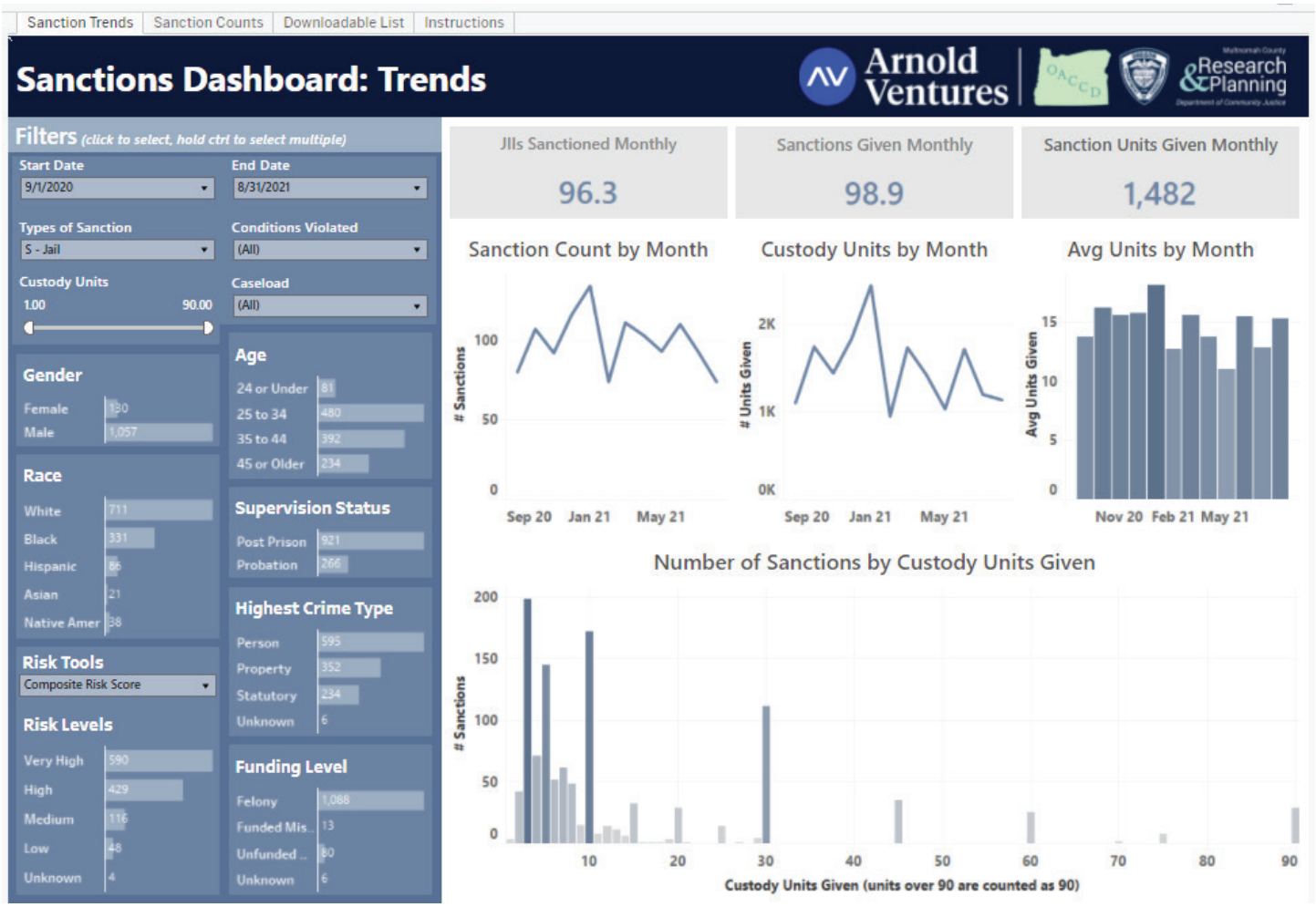
Except for the “JIIs Sanctioned Monthly” summary value, all counts are based on the number of sanctions and not the number of unique JIIs.

The most commonly used sanction is for jail time, which is also the sanction of greatest interest to leadership. Several charts in this dashboard make the most sense when used to examine jail sanctions, and may be blank or not helpful for other types of sanction (although they will, of course, never be incorrect).

Visuals

Main Views

This dashboard has three tabs, which you can navigate between in the upper left. The first tab, ***Sanction Trends***, should be used if you want to view changes over time. The left side has a set of filters, many of which double as demographic bar charts. To the right of the filters are three summary values at the top, three small monthly charts in the middle, and a chart of the number of sanctions by custody units given at the bottom. This chart shows how frequently different sanction lengths are given. Sanctions with zero custody units are not shown, so the chart will be empty if you select only sanction types that don't involve custody units. You can hover over each bar to see details of those sanctions, including SID numbers. For readability, sanctions with custody units given of more than 90 days are displayed as part of the bar at 90 days.

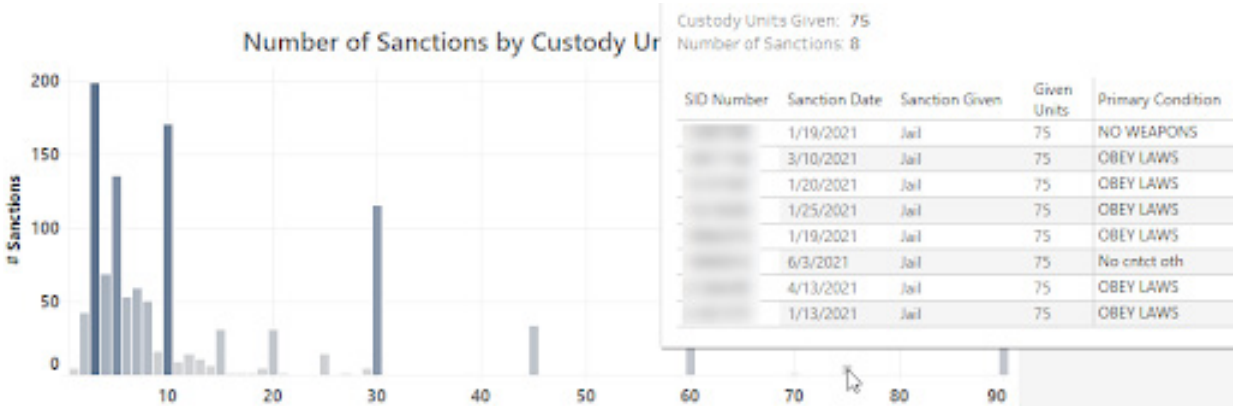


The ***Sanction Counts*** tab shares the left-side filters and top summary values with the previous tab. a list of each individual sanction, and should be used if you want to investigate the circumstances behind each event. Underneath the top summary values are three charts: one in the center showing a long list of every individual sanction event by JII, and two charts on the right showing the count of sanctions types and conditions violated. In the list of sanctions, you can hover over the primary condition violated to see a list of all conditions violated.

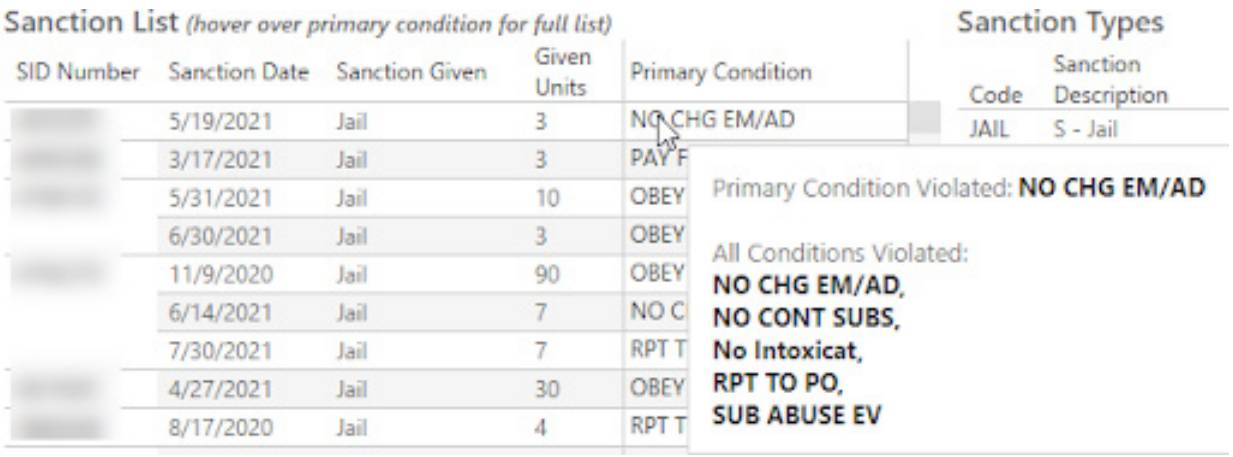
The ***Downloadable List*** tab has a single large table with detailed information on every sanction event. This can be used to download a list of sanctions into an Excel or similar file.

Tooltips

There are two special tooltips. First, hovering over bars in the sanctions by custody units chart will show a list of all sanctions of that length.



Second, hovering over the primary condition in the Sanction Counts and Downloadable List tabs will show a list of all violated conditions.



Variables and Filters

Navigation

Start Date and ***End Date***: Use these to define the time frame of the sanctions. Be aware that certain features (such as the charts of sanction counts and units per month) are more informative with many months, while other features (such as the list of all individual sanctions) can be overwhelming if not restricted to a few months at a time.

Types of Sanction: This is a list of all present types of sanction. The Department of Corrections (DOC) classifies some types as sanctions (DOC code "S") and others as interventions (DOC code "V"); we differentiate between the two using their DOC codes. Because it is the most requested, by default only the jail sanction type is selected. Note that this list only shows sanction types that are present, so options may be unavailable if other filters remove all such cases from the data. A sanction event with multiple sanction types will be counted if at least one type has been selected by this filter.

Conditions Violated: This is a list of all present violated conditions. Note that this list only shows conditions that are present, so options may be unavailable if other filters remove all such cases from the data. A sanction event with multiple violated conditions will be counted if at least one violated condition has been selected by this filter.

Supervision Status filters based on the JII's probation or post-prison status on the sanction date. All statuses are classified as either similar to probation (e.g., diversion and conditional discharge) or similar to post-prison (e.g., parole and early prison leave). If a JII has any post-prison sentences, they are classified as post-prison; otherwise, they are classified as probation.

Funding Level filters based on the highest funding level of all the JII's charges active on the sanction date, ranking "Felony" highest, followed by "Funded Misdemeanor," and finally "Unfunded Misdemeanor." Note that the charges referred to here are the existing charges a JII is on supervision for, not new charges that may have prompted the sanction.

Highest Crime Type filters based on the highest priority crime type of all the JII's charges active on the sanction date, ranking "Person" highest, followed by "Property," and finally "Statutory." Note that the charges referred to here are the *existing* charges a JII is on supervision for, not new charges that may have prompted the sanction.

Risk Tools allow you to select one of five different risk tools on the left, and then choose specific ***Risk Levels*** below. This will show only JIIs whose most recent assessment on the sanction date matches the selected risk levels.

The risk tool option ***Composite Risk Score*** merges results from the PSC, LS/CMI, and WRNA into a single view. For each JII, it prioritizes their most reliable available risk-score (in order of priority: WRNA, then LS/CMI, then PSC). Then the scores are grouped based on similar recidivism rates, as normed in Multnomah County. For example, a Composite Risk of "High" is made by combining "Medium" WRNA and PSC scores with "High" LS/CMI scores, as these three groups have the most similar recidivism rates.

Data Source

This dashboard uses the new Tableau feature to create relationships between tables, similar to joins in a SQL database. A table of sanction Events with one row per event (including demographic information on the JII sanctioned) is joined on the sanction ID number to a table of sanction Conditions (one row per condition violated per sanction) and a table of sanction Types (one row per sanction type per sanction). This results in the simple relationships below:

Tableau Calculations

Thanks to the relationship, Tableau can create all charts in this dashboard without any complicated or level of detail calculations. Charts counting the number of sanctions use data fields from the Events table, charts counting sanction conditions or types use data fields from the Conditions or Types tables (using a CountDistinct function instead of a Count function as necessary), and filters on demographics in the Events table seamlessly extend to the related Conditions and Types filters - and vice versa.

Lessons Learned

Tableau's relationship feature is an excellent way to handle data at more than one level. Without it, trying to move between events, types, and conditions would be much more complicated.

Database Documentation

The Sanction dashboard has two pages, Sanction Trends and Sanction Counts. Sanction Trends has a variety of graphs that shows the number of sanctions and sanction units for JIIs over time. Sanction Counts displays, in table format, a detail list of sanctions by JII, and aggregate lists of Sanction Types and Conditions Violated.

Data for the Sanction Dashboard comes from three tables: t_SanctionEvent, t_SanctionCondition and t_SanctionType (see Image, tables in yellow).

Sanction Event

t_SanctionEvent is the primary table. Most of the filter criteria is populated from this table.

Dashboard Filter (data element)	Database Table / Column
SID Number	SIDNbr
Start Date / End Date	SanctionDate
Conditions Violated	PrimaryCondition
Caseload	Caseload
Gender, Age, Race	Gender, Age, Race
Supervision Status	CurrentStatus
Risk Tools • Community Supervision Level • Composite Risk Score • WRNA • LS/CMI • PSC	On the dashboard, this is a list of the literal values that appear in the Risk Tools dropdown list. Selecting one of the Risk Tool values from the list will set the display of Risk Levels that are relevant to that Risk Tool. The dashboard defaults to Composite Risk Score
Risk Tool Selection When a Risk Tool is selected • Community Supervision Level • Composite Risk Score • PSC • LS/CMI • WRNA	**Risk Level value group** Risk Level is populated by the related data element CommunitySupervisionLevel CompositeCategory PscCategory LscmiCategory WrnaCategory
HIghest Crime Type	HighestCrimeType
Funding Level	HighestFunding

t_SanctionCondition

t_SanctionCondition provides the list of conditions found in the Conditions Violated dropdown list. This allows filters to be placed on a single condition or on a group of conditions. This supports analysis of individual sanction conditions by all other filter criteria.

In the body of the report, the following is also furnished by the t_SanctionCondition table:

- The specific Primary Condition for a JII that is displayed on the Sanction List in the report body (Note: hovering over the record for a JII in the Sanction List give a full list of All Conditions Violated)
- The aggregated Count of Sanctions by Condition Violated

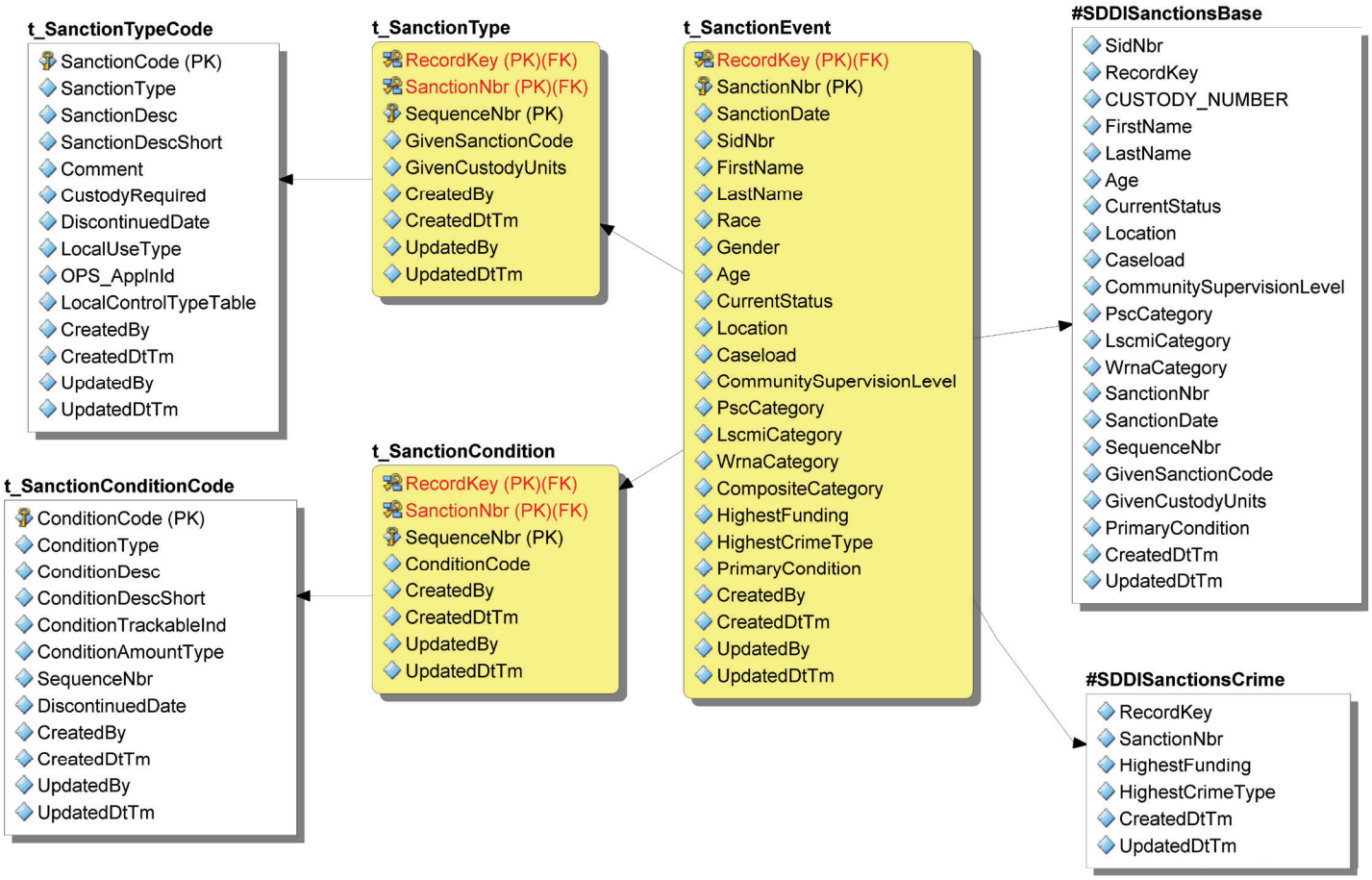
t_SanctionType

The t_SanctionType table delivers the list of sanctions found in the Types of Sanction dropdown list and the Custody Units slide control found on the left side of the dashboard. This allows analysis of individual sanction types by all other filter criteria.

In the body of the Sanction Counts displays:

- in the Sanction List by JII in the report body, Sanction Given along with the calculated value for Given Units.
- the aggregated count and a sum of Given Units in the Sanction Types section on the left side of the body of the report.

Sanctions Dashboard Model



Workload Dashboard

Purpose

The Workload dashboard is designed to give users a quick view of caseload sizes across the department, and allows examination of community supervision levels within each caseload. This is a great tool for managers to balance workload across their PPOs, or to check whether caseload sizes are drifting up or down over time.

Example Scenarios

A new JII has been assigned to supervision, and the manager needs to assign them to a caseload with the most capacity.

A manager wants to review whether PPOs are moving low-risk JIIs into designated low-risk caseloads in a timely manner.

Fundamental Assumptions

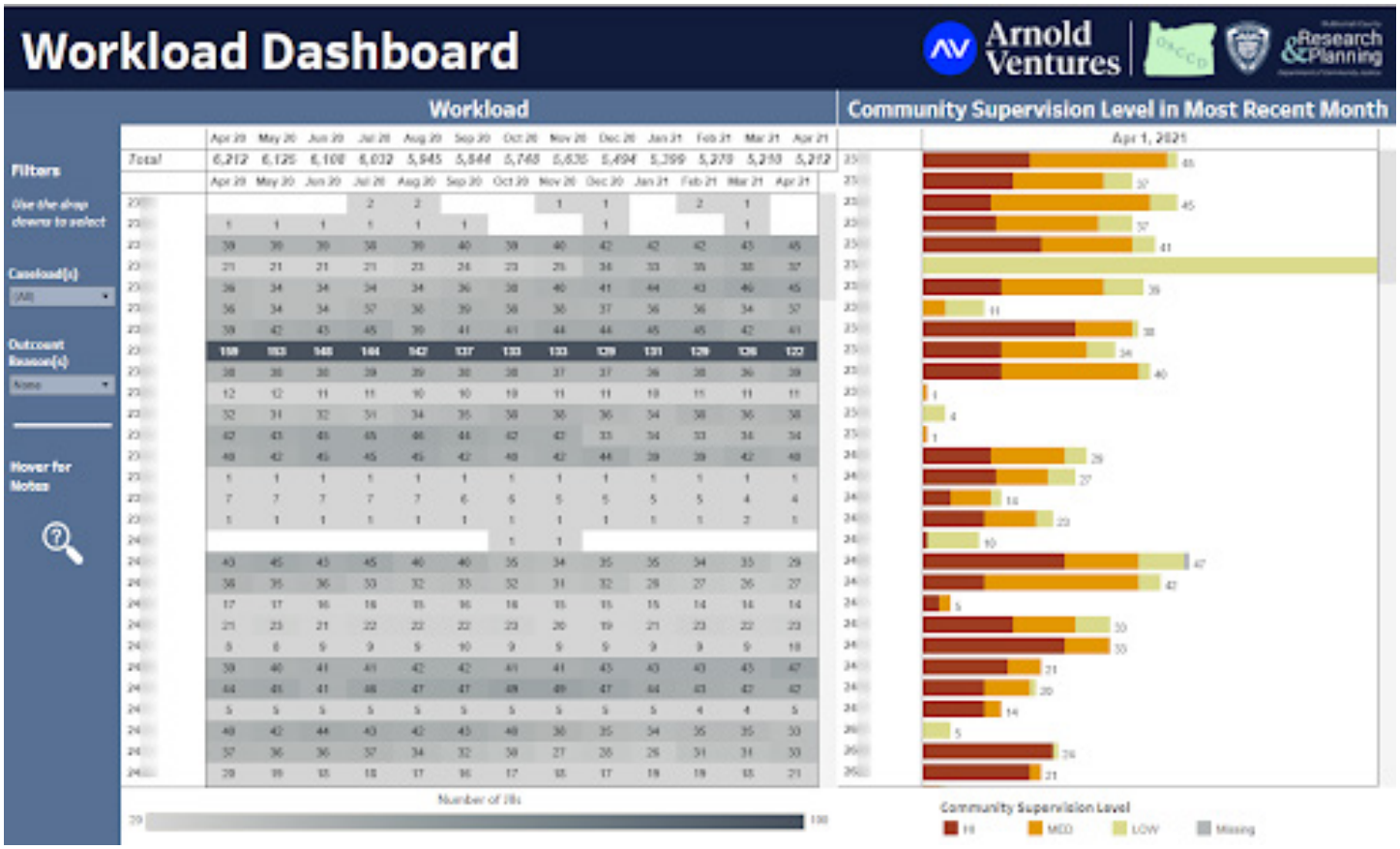
- Users don't need up-to-the-day knowledge of caseload sizes.
- Trends further back than a year aren't interesting enough to include.
- Managers care a lot about the community supervision level of JIIs when determining caseload sizes.

Visuals

Main View

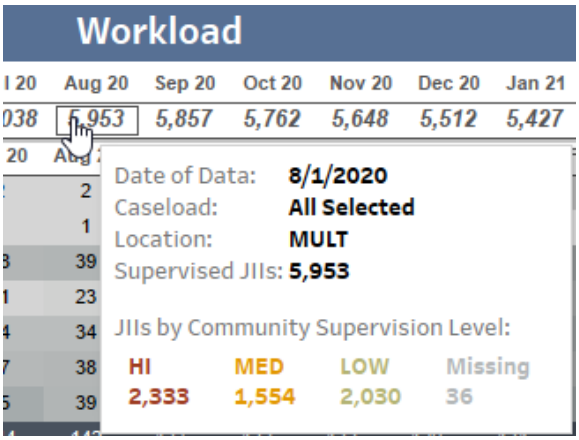
On the left is a historical view of caseload sizes over the past year (taken from a snapshot of what each caseload looked like on the first day of each month). Cells are shaded by caseload size to quickly pick out small, medium, and large caseloads, but we manually capped the shading for very small or very large caseloads so most of the difference in shading happens in normal-sized caseloads.

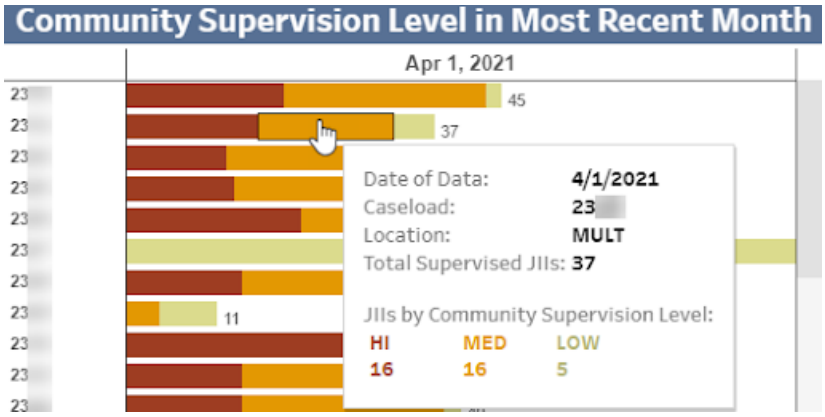
On the right is a more detailed view of just the most recent month's data, allowing managers to see the most recent spread of community supervision levels in each caseload at a glance.

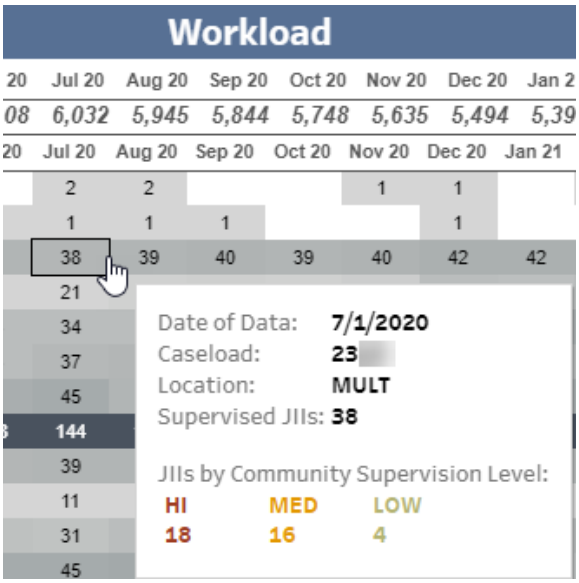


Tooltips

Tooltips provide breakdowns of the exact number of JIIs on High, Medium, or Low community supervision levels.







Variables and Filters

This dashboard has only two filters; we designed it this way because it was our first dashboard (so we were uncertain what filters would be generally requested), and because it works perfectly well in its intended function of caseload size tracking without any demographic or other filters. Indeed, extra filters may only succeed in confusing users.

Caseload

This allows users to select which caseloads they want to see (most likely, managers will want to select only the caseloads they manage).

Outcount Reason(s)

This defaults to only showing active JIIs in each month (those with no outcounts), but users can choose to add back in JIIs on outcount statuses such as Abscond.

Data Source

We use database records to determine the historical caseload, community supervision level, and outcount status of each JII on the first day of each month. This creates a simple table where each row is a person, date, caseload, community supervision level, and outcount reason (person + date form the unique identifier).

Tableau Calculations

With data as described above, Tableau can easily create the charts shown by simply counting: set up a Tableau table with caseload as rows and date as columns, and each cell counts the number of data-table rows with that combination of caseload and date.

The tooltips are more difficult, and require use of Tableau's Viz-in-Tooltip feature to create a small separate visualization of JIIs by community risk level, and embed that visualization in the tooltip of the appropriate main-page chart.

Lessons Learned

- You will find increasingly small errors for as long as the dashboard is active. Make sure updates can be rolled out easily.
- Some things just won't work, and you'll need to find a way around it even if it's ugly. As an example, the Total row needs to be in a separate chart from the rest of the "Workload" historical data, because the Viz-in-Tooltip won't work properly for both Totals and non-Totals. But caseloads have a scrollbar and the Total doesn't, so the columns won't align correctly and we need a second date header for just the Total:

We can't manually shrink the width of the total sheet one scrollbar-worth to align it again, because for small counties (and any selection of a small number of caseloads), the scrollbar in the caseload chart will disappear, leaving the Total now misaligned as too narrow rather than too wide.

Database Documentation

The Workload Dashboard provides a count of supervision per caseload by month. The dashboard report and the data for Caseload and Outcount Reason filters are supplied by the Workload_Dashboard table in the database. The diagram below shows how the Workload_Dashboard table was constructed.

Significant elements of the dashboard include:

Workload: The Workload table report shows caseload counts by month. This is a count of JIIs on each caseload. RecordKey is the JII Identifier that is counted. The join to the Date dimension allows caseload activity to be grouped by month.

Community Supervision Level: This display by caseload is provided by CommunitySupervisionLevel on the Workload_Dashboard table. Workload_Dashboard was populated from the CommunityRisk table.

Caseload filter: CaseLoad on the Workload_Dashboard table is populated from the Offender_Housing_Supervision_History (OHSH) table's CaseLoad column. The filter allows individual or groups of caseload results to be displayed.

Outcount Reason filter: This supports analysis for individual or groups of outcount reasons. The filter list is populated from OutcountReason on the Workload_Dashboard table which in turn was populated from the OHSH table.

Workload Dashboard Model

STATEWIDE

Dashboards

Dosage Dashboard

Purpose

With the Dosage of Supervision dashboard we are attempting to conceptualize supervision as a form of treatment for our Justice Involved Individuals (JIIs). This analysis is exploratory in nature, with the hope being that viewing supervision through a treatment lens will reveal useful patterns which will expand our understanding of what helps (or hinders) whether or not a JII is successful on supervision.

Example Scenarios

To ensure that her jurisdiction is receiving the correct amount of state funding, the director wants to know the share of JIIs that have been assessed with the Public Safety Checklist (PSC). (A JII who is lacking a PSC assessment will be left out of the budget-allocation-calculation, which is bad.)

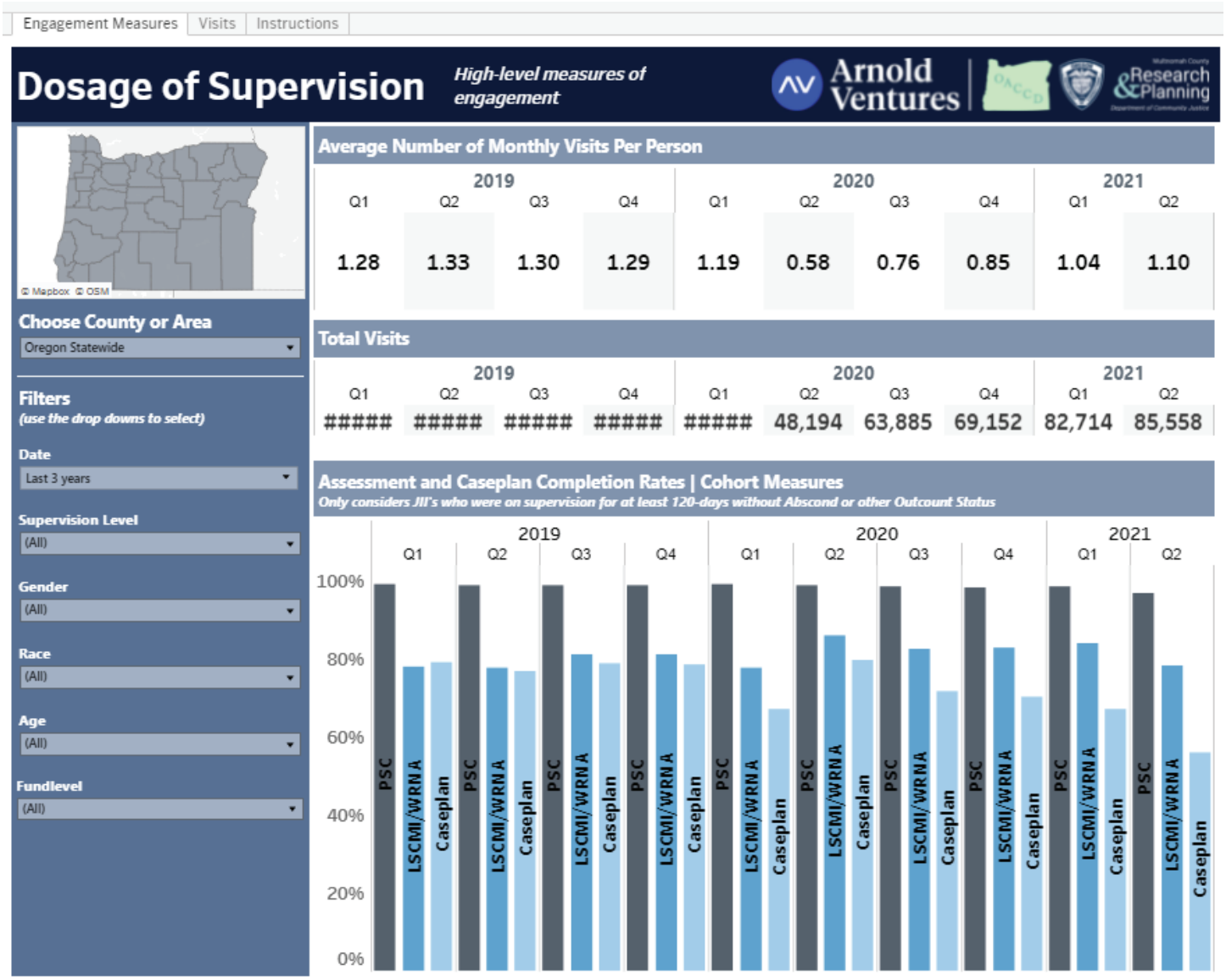
Managers have made a concerted effort through their staff to give more in-person attention to the highest risk JIIs, and they want to know if this seemed to have any effect on the number of JIIs successfully completing supervision during that time or immediately afterwards.

Fundamental Assumptions

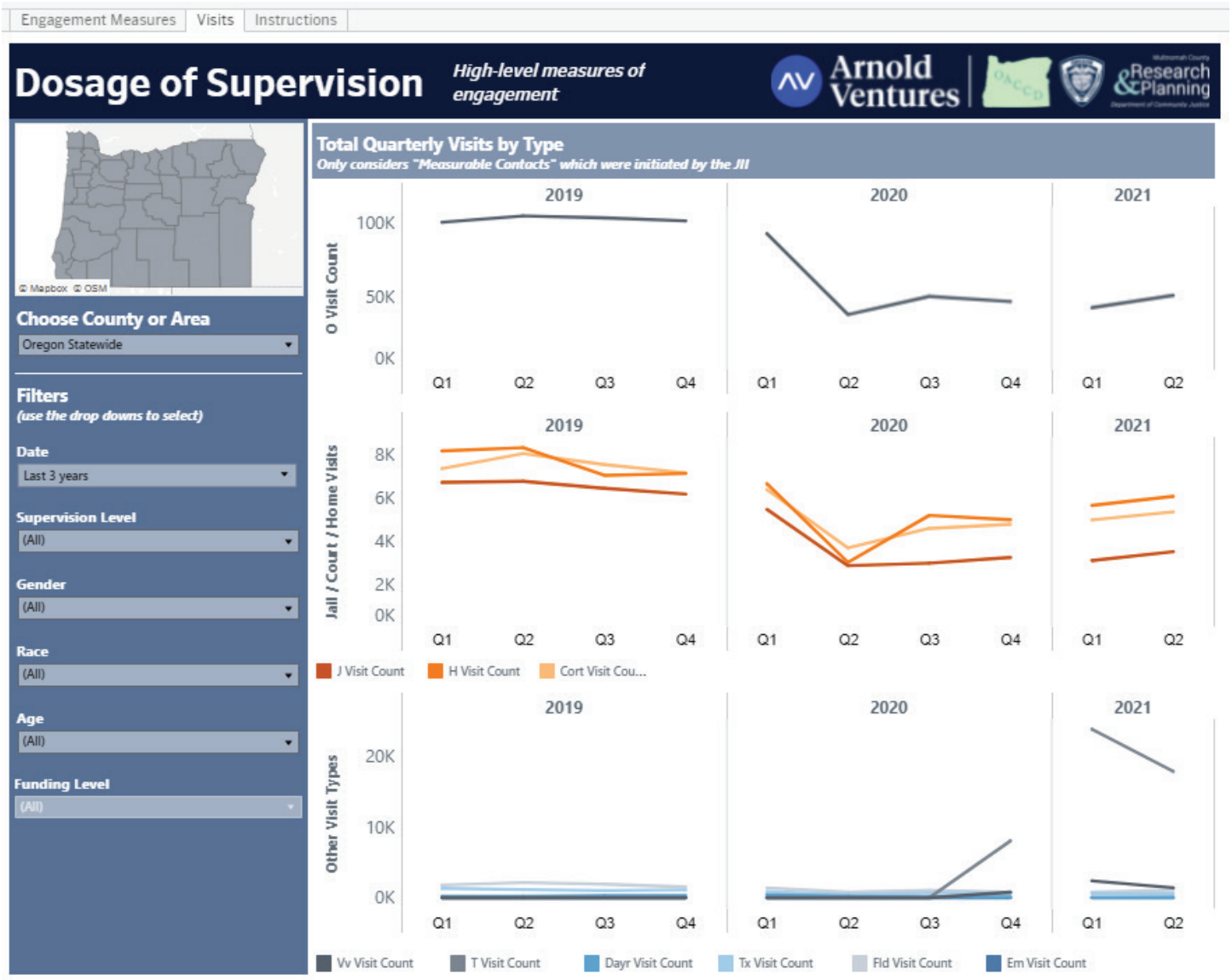
- Engaging with Community Corrections is a net-positive for JIIs, and that more engagement is better than less.
- JIIs with higher risk profiles will need—and benefit from—higher levels of engagement than those JIIs who are determined to be lower risk, according to the standardized risk assessments.

Visuals

Engagement Measures



Visits



Tooltips

Sample tooltip popup for 'Assessment and Caseplan Completion Rates'

Sample tooltip popup for 'Total Quarterly Visits by Type'

Variables and Filters

Time and Supervision Level

All measures are quarterly, and the analysis is meant to look at how prior quarters lead up to the current quarter; users are able to select the limit on how far back this goes. The Supervision Level filter allows the user to limit the analysis to JIIs with the same amount of 'riskiness', as determined by the jurisdiction. There are many scenarios where it is unhelpful or even misleading to lump together lower- and higher-risk JIIs in an analysis.

Demographics

The demographic variables used in this dashboard are the generic Sex, Race, and Age (as defined by Oregon DOC). For Sex and Race, the options mirror those that are available in the source system. For Age, the total range of ages was distilled down to four 'buckets' so as not to be visually overwhelming.

Average Number of Monthly Visits Per Person

The total number of visits divided by the number of JIIs on supervision in the same quarter, divided by three to make it 'monthly'.

Total Visits

The count of all recorded visits for the quarter.

Assessment and Caseplan Completion Rates | Cohort Measures

Shows completion rates for three of the primary bureaucratic milestones of supervision: PSC assessment, LSCMI/WRNA assessment, and Caseplan completion ('completion' meaning that a tailored plan for successful supervision was created and given to the JII).

Total Quarterly Visits by Type

Total visits for each quarter divided up by the nature of the visit. Office visits are displayed individually, whereas Jail, Court and Home visits are displayed together; and all other visit types are displayed together in a third grouping.

Data Source

The data set for this dashboard is organized around a variety of subqueries that, in the end, aggregate a host of quantifiable elements for each quarter/year and jurisdiction.

Tableau Calculations

The Dosage dashboard doesn't use any calculations beyond basic arithmetic. Because this dashboard is exploring relationships that are not yet known to be meaningful, it's not yet possible to take liberties with these very basic measures and use them to answer more sophisticated questions. Moving forward, if this analysis suggested some causal relationship(s) that proved to be robust, then those measures could be used as building blocks in other, deeper analyses.

Lessons Learned

The lessons learned are really what we hope to get from this analysis. With this dashboard we're probing the hypothesis that having more supervision--and particularly face-to-face interaction between a JII and their supervising officer--results in more people successfully completing their court ordered supervision. It's difficult to draw conclusions at this time due the many changes to in-person interactions that have been made as a response to the COVID-19 pandemic. Until a new normal has been firmly established it's not possible to assess the help (or harm) created by the new contact standards.

Database Documentation

Code: stored procedure p_LoadDosage

The diagram below is a representation of tables that were sourced to build the t_Dosage table on which the Dosage Dashboard relies.

The Dosage dashboard uses only the t_Dosage table. The p_LoadDosage stored procedure that creates the t_Dosage table has multiple stages. Those stages are captured in temporary tables within the stored procedure. Representing the temporary table on the diagram is intended to help describe the thought process employed in the creation of data for the Dosage Dashboard.

Dosage Dashboard Filters and Displayed Report Features

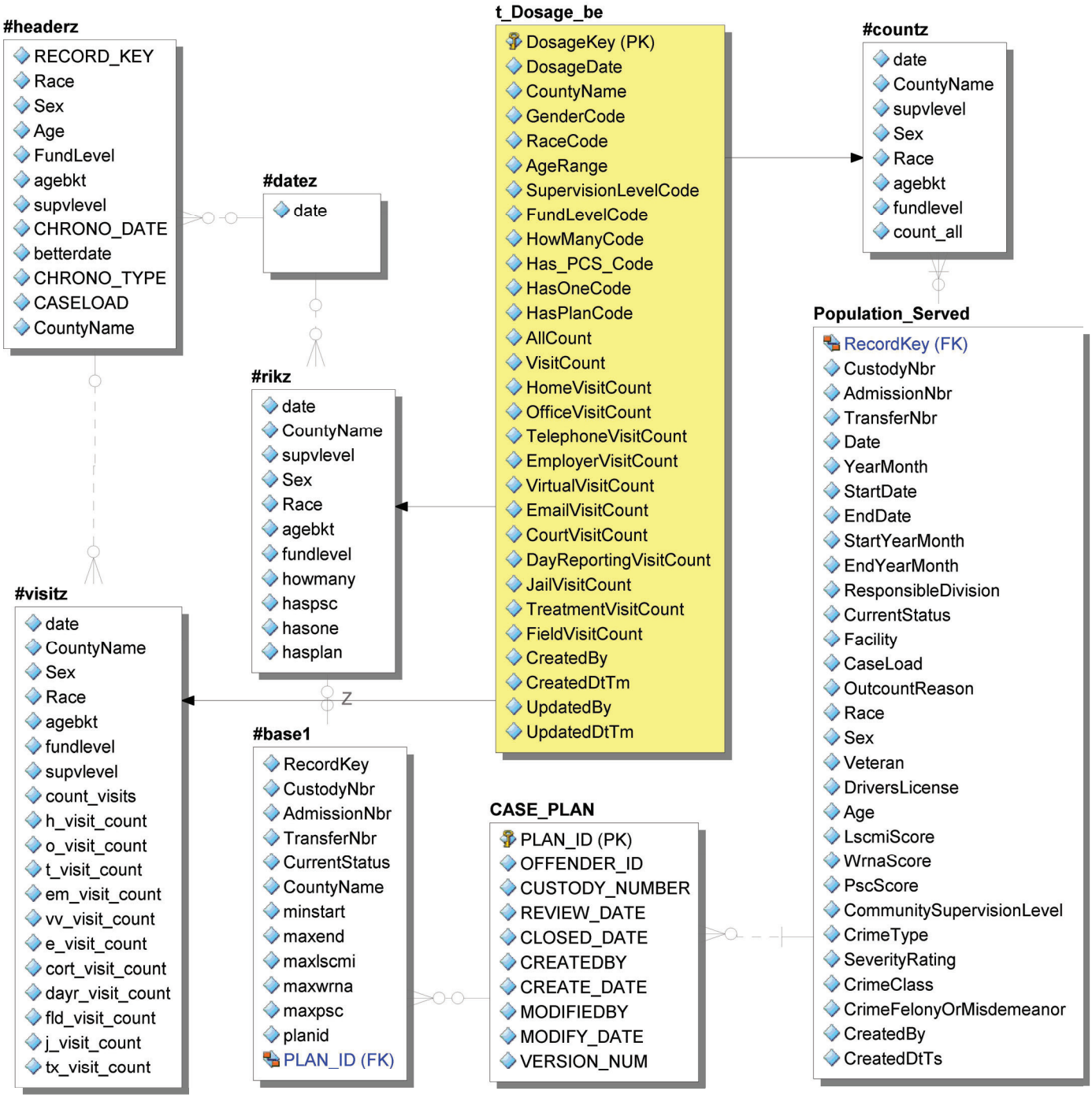
Demographic Filters (derived from #headerz): #headerz supplies data for the demographic filters on the Dosage dashboard.

Visit Analysis (derived from #visitz): Visit counts by type of visit are displayed on the line graph. Visit count was obtained by pivoting the CHRONO_TYPE column found on the #headerz table where CHRONO_TYPE is one of these H (Home), O (Office), VV (Virtual Visit), E (Employment), CORT (Court), DAYR (Day reporting), FLD (Field Visit), J (Jail), TX (Telephone), TV(Treatment Visit).

County, Risk Scores and Age Filters (derived from #base1): #base1 uses the Population_Served table to derive max start and end dates, LCSMI, WRNA and PSC scores, supervision and funding levels for each JII by County. This stage also creates a grouping for all ages by the age ranges, All, 24-, 24-34, 34-44 and 45+. Age is captured at each date a dosage was served.

Risk Analysis (derived from #rizk): The stage that creates the #rizk temp table derives several elements for the dashboard including Fundlevel, whether a JII has a case plan (hasplan) a Public Safety Checklist (PSC-haspsc) or an LS/CMI or WRNA score (hasone).

Dosage Dashboard Model



Racial & Ethnic Disparities Dashboard

Purpose

The criminal justice system is fraught with difficult, racially charged realities. While opinions may differ, it behooves us all to stay apprised and examine how our individual decisions contribute to potential disparities in the overall impact on different populations. This dashboard seeks to inform users in an intuitive way about disparities they may want to investigate further.

Example Scenarios

Leadership plans to lead with race, and wants to find which areas of DCJ practice show the greatest disparities to be addressed.

After determining disparities to address, leadership can find which areas in the state might be good partners to share knowledge and ideas.

Fundamental Assumptions

This dashboard adjusts for the different sizes of various racial groups by reporting the number of events per 100 Justice Involved Individuals (JIIs) on supervision. This is calculated by finding the number of events during a year and dividing by the total number of unique JIIs on active (non-outcount) supervision during that year. For example, if during 2014 there were 4,000 African Americans on active supervision at some point in the state and 2,000 jail sanctions were given to African Americans throughout the state, then the statewide 2014 African American Jail Sanction number would be (2,000 / 4,000) x 100 = 50 per 100 JIIs.

For both privacy and reliability reasons, we only display data for racial groups during years where there were at least 30 JIIs eligible for a measure and at least 5 JIIs who received that measure. If that criteria isn't met, the mark will be blank. If all marks for all years of a racial group are blank, that group will not appear on the dashboard. If all racial groups are hidden, the dashboard will appear completely empty.

The grey band represents a 10% difference from the white population. In other words, if a circle is within the gray area it means that racial group was between 90% and 110% of the value for whites during that year. This is not a statistical measure, but can be considered an informal benchmark for minimal practical disparity.

Visuals

Main View

In the upper left is a map of Oregon showing which counties are currently displayed (changing the county or area will change which counties are highlighted in the map). Below this is a set of filters for users to adjust the JII population.

At the top center/right is a dropdown allowing the user to change the displayed measure of disparity. Below this is a central chart displaying the current measure of disparity for the selected county or area as circles. Statewide reference values can be toggled on or off and appear as horizontal lines, although they are hidden by default due to potential confusion from the large number of marks on screen.
At the bottom, the same values displayed in the vertical bar chart are repeated in a table.

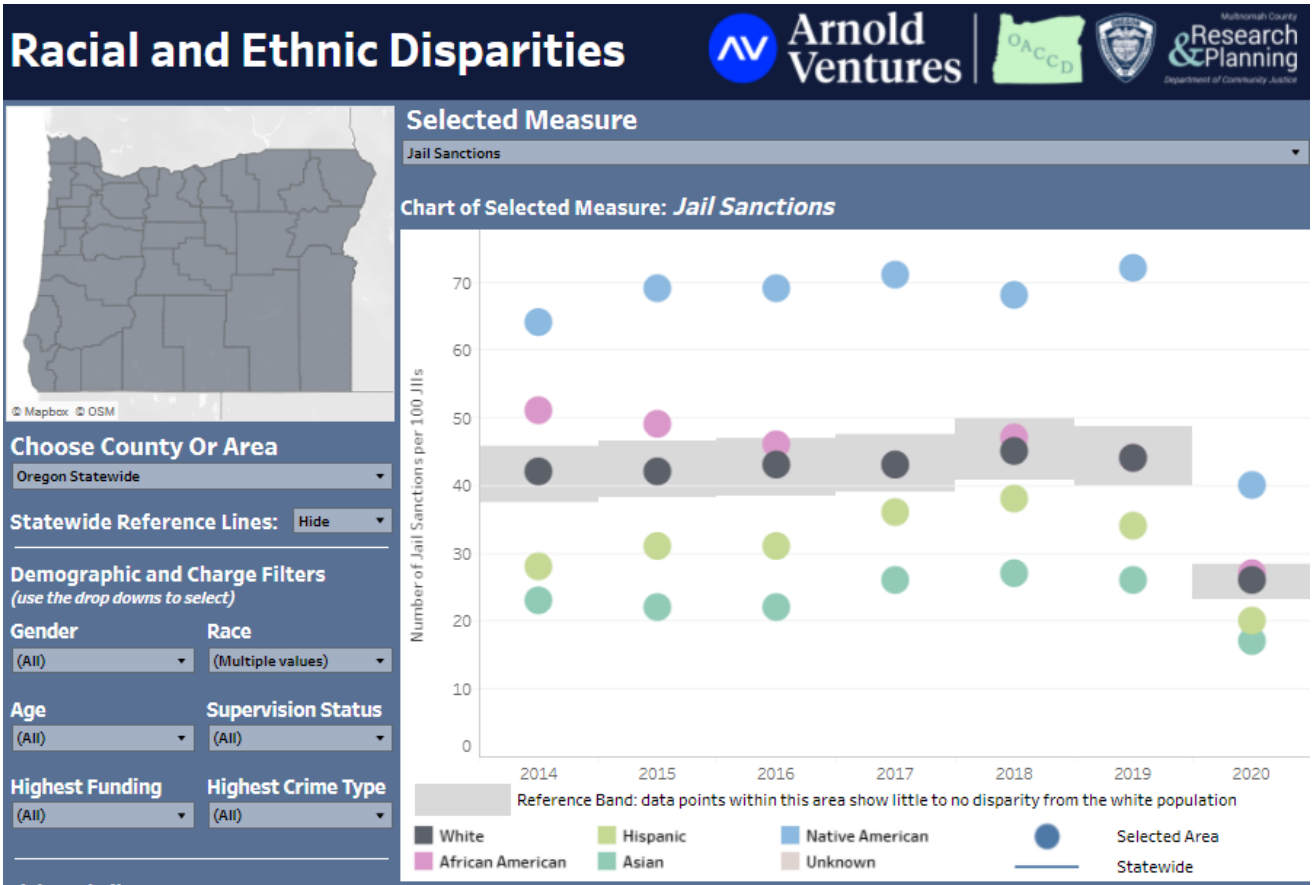
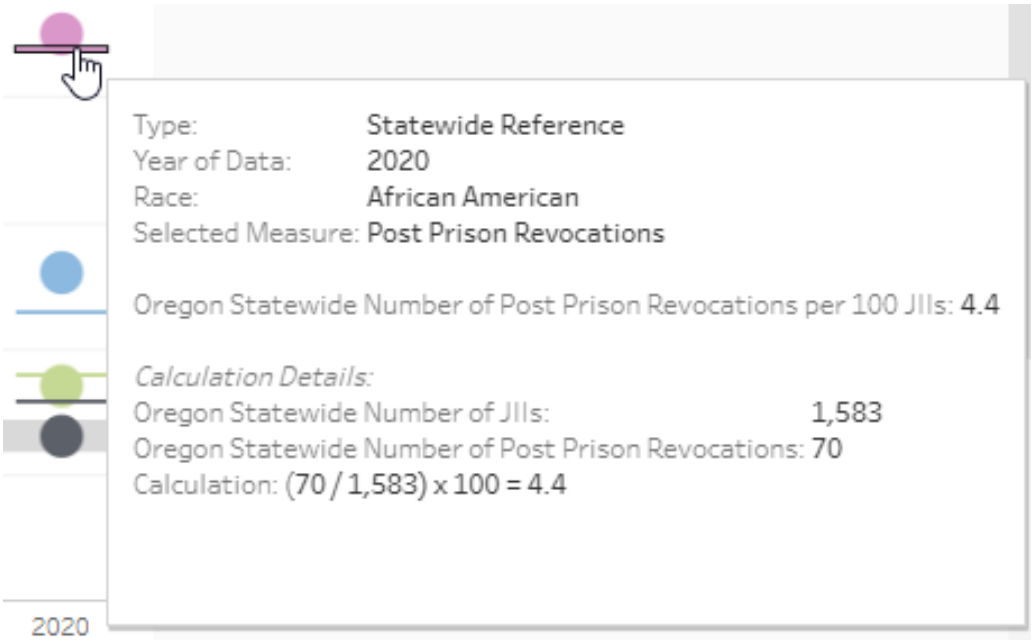


Table of Selected Measure: *Jail Sanctions*

	Race	2014	2015	2016	2017	2018	2019	2020
Number of JIIs	White	49,191	49,231	48,892	48,738	48,145	47,644	42,164
	African American	4,185	4,160	4,176	4,234	4,161	4,010	3,553
	Hispanic	4,341	4,397	4,476	4,336	4,322	4,355	3,882
	Asian	971	970	939	886	859	819	722
	Native American	1,200	1,212	1,259	1,231	1,247	1,162	1,068
	Total	59,888	59,970	59,742	59,425	58,734	57,990	51,389
Number of Jail Sanctions	White	20,429	20,873	20,833	21,079	21,804	21,106	10,871
	African American	2,120	2,034	1,903	1,824	1,973	1,745	958
	Hispanic	1,234	1,352	1,380	1,581	1,660	1,479	786
	Asian	220	211	209	233	234	216	120
	Native American	773	842	870	880	850	839	424
	Total	24,776	25,312	25,195	25,597	26,521	25,385	13,159
Number of Jail Sanctions per 100 JIIs	White	42	42	43	43	45	44	26
	African American	51	49	46	43	47	44	27
	Hispanic	28	31	31	36	38	34	20
	Asian	23	22	22	26	27	26	17

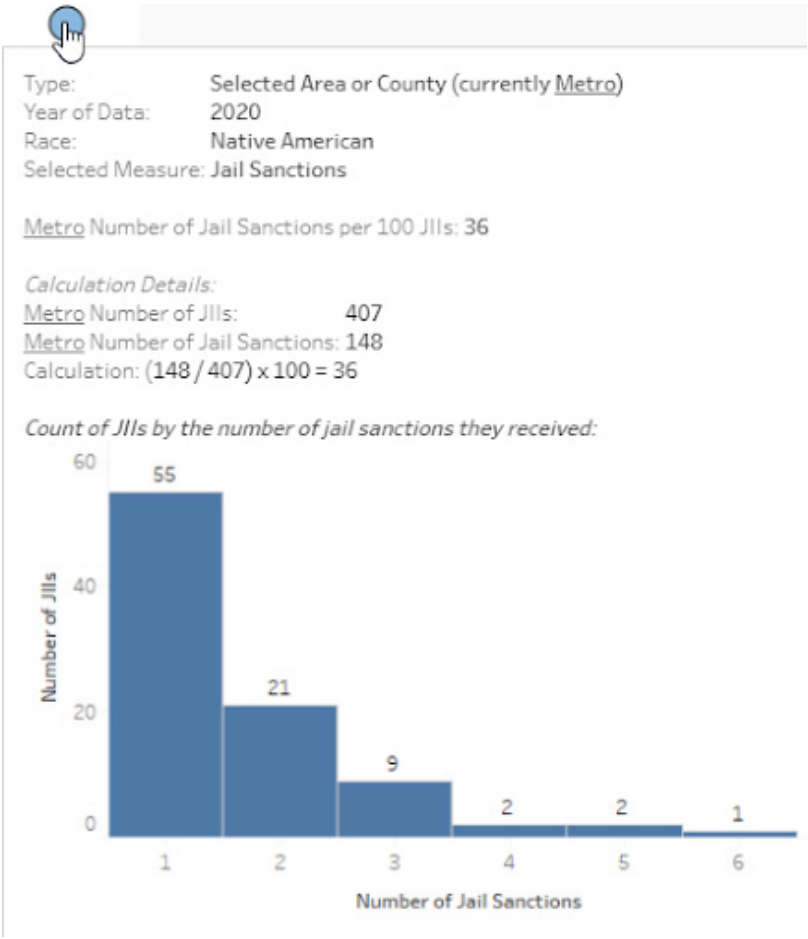
Tooltips

The only special tooltips are in the main bar chart display, and provide both information on how the value was calculated as well as user guidance to ease any possible confusion. The tooltips are slightly different between the "chosen area" circles and the "statewide reference" horizontal lines:



In this case, we selected the Metro area as an example, which changes the underlined text in tooltips to make clear that this was a user selection that can be changed.

Due to concern that a small number of JIIs could receive enough jail sanctions to significantly skew the overall jail sanction rate, we added a chart to the jail sanction tooltips counting the number of JIIs who received the number of jail sanctions listed on x-axis.



Variables and Filters

Filters

Note that the displayed statewide total will change based on your selections, so selecting “Male” in gender will show the measure of disparity among males in both your selected county or region (the vertical gray bars) and the statewide reference (the horizontal dark blue lines).

You can select your county, the four Oregon economic regions, or the entire state in the ***County or Area filter***. You can also choose whether to show or hide the horizontal ***Statewide Reference Lines***.

Among the ***Demographic and Charge*** filters, the first three demographic filters are simple and allow you to examine the data by gender, race, or age. Since this dashboard already shows separate data for each racial group, selections on the race filter will only add or remove data for that race. This can be useful if you’re only interested in comparing a subset of the racial categories. The other filters require more explanation:
Supervision Status filters based on the JII’s probation or post-prison status at the start of their community supervision episode. All statuses are classified as either similar to probation (e.g., diversion and conditional discharge) or similar to post-prison (e.g., parole and early prison leave).

Highest Funding filters based on the highest funding level of any charge active at any time during a JII’s supervision episode, ranking “Felony” highest, followed by “Funded Misdemeanor” and finally “Unfunded Misdemeanor.”

Highest Crime Type filters based on the highest priority crime type of any charge active at any time during a JII's supervision episode, ranking "Person" highest, followed by "Property" and finally "Statutory."

Finally, the ***Risk Tool Filters*** allow you to select one of five different risk tools on the left, and then choose specific risk levels on the right. This will show only JIIs whose most recent assessment at the end of their supervision episode matches your selected risk levels.

The risk tool option ***Composite Risk Score*** merges results from the PSC, LS/CMI, and WRNA into a single view. For each person, it prioritizes their most reliable available risk-score (in order of priority: WRNA, then LS/CMI, then PSC). Then the scores are grouped based on similar recidivism rates, as normed in Multnomah County. For example, a Composite Risk of "High" is made by combining "Medium" WRNA and PSC scores with "High" LS/CMI scores, as these three groups have the most similar recidivism rates.

Measures of Disparity

Below are definitions and notes for each of the measures you can find in this dashboard.

Jail Sanctions: Counts the number of Sanction Reporting Forms (SRFs) where the sanctions given used the JAIL code. This does not include post-prison revocations, and does not include any sanctions delivered when POs bring a JII back to court without filling out an SRF. Multiple jail sanctions given as part of a single SRF are counted as a single sanction.

Reconvictions: Intended as a measure of recidivism, this counts the number of times a JII is convicted of a new crime while on active supervision, if the new crime is entered into CIS. All charges and cases convicted on the same day are counted as single reconviction.

Probation Revocations: Counts the number of times JIIs had their probation revoked, including both felony and misdemeanor revocations. Multiple charges or cases revoked on the same day are counted as a single revocation. Only includes JIIs with at least one active probation sentence.

Post-Prison Revocations: Counts the number of Sanction Reporting Forms (SRFs) where the sanctions given used the REVO code, signifying a post-prison revocation. This does not include any post-prison revocations delivered when POs bring a JII back to court without filling out an SRF. All charges or cases revoked as part of a single SRF are counted as a single revocation. Only includes JIIs with at least one active post-prison sentence.

Initial Sentence Length – Years of Probation: Counts the number of years of probation a JII is sentenced to when they first enter supervision as a probationer. Does not include additional sentences from new convictions when a JII is already on supervision, and does not track actual time spent on supervision. Since only new probationers are eligible for this measure and all new probationers have it, our privacy and reliability requirements are relaxed on this measure and only require at least five new probationers to display it.

Initial Sentence Length – Years of Post-Prison: Counts the number of years of post-prison a JII is sentenced to when they first enter supervision as a post-prisoner. Does not include additional sentences from new convictions when a JII is already on supervision, and does not track actual time spent on supervision. Since only new post-prisoners are eligible for this measure and all new post-prisoners have it, our privacy and reliability requirements are relaxed on this measure and only require at least five new post-prisoners to display it.

Data Source

This dashboard's data source is a single row per JII per year, including demographics, intake and exit years, and a count variable for each measure of disparity as described above.

All our regional dashboards accomplish security in the same way. First, each row is joined in Tableau's data source view with the three categories it belongs to: the specific county, the area it belongs to, and Oregon statewide (this creates three copies of each row, but Tableau creates them as virtual copies so they do not take up extra storage space). Selecting an area such as Metro will filter down to one copy of each row that belongs to Metro, selecting Oregon statewide will filter down to one copy of each row that belongs to Oregon statewide, and selecting the user's county will filter down to one copy of each row that belongs to their county. Inside the dashboard, filters are created to prevent users from seeing any category besides their own county, the five areas, and Oregon statewide. This works because security in Tableau happens at the Tableau Server layer: without permissions, users are unable to access individual rows in the area or statewide data, and unable to even see any individual county options besides their own.

Tableau Calculations

The selection of disparity metric is done with a parameter, and individual variables created that change based on that parameter, as shown below:

```
CASE [Selected Measure Parameter]
    WHEN 'Jail' THEN ([JailSanctionCnt])
    WHEN 'Convict' THEN ([ReConvictionCnt])
    WHEN 'ProbRevo' THEN ([ProbationRevocationCnt])
    WHEN 'PostRevo' THEN ([PostPrisonRevocationCnt])
    WHEN 'LenProb' THEN ([SentenceLengthOnProbation])
    WHEN 'LenPost' THEN ([SentenceLengthOnPostPrison])
END
```

To show the statewide reference at all times, we added a simple level of detail expression to the parameter switch, letting us aggregate all Oregon Statewide virtual rows for each year:

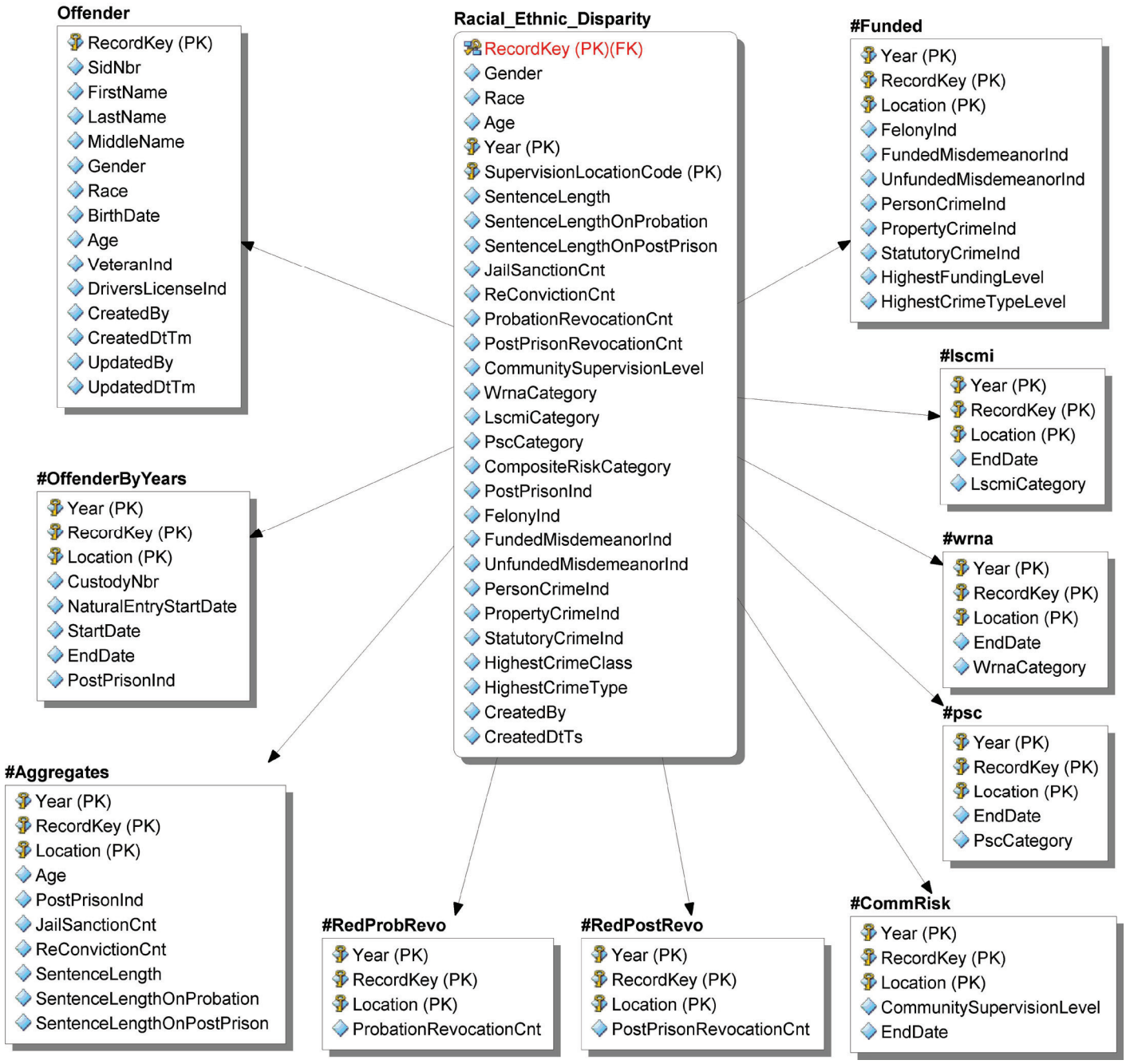
```
{ FIXED YEAR([Date Used]) :
AVG(IF [County Or Area Name]='Oregon Statewide' THEN
    CASE [Selected Measure Parameter]
    WHEN 'Jail' THEN ([JailSanctionCnt])
    WHEN 'Convict' THEN ([ReConvictionCnt])
    ...
    END
ELSE NULL
END)
}
```

Database Documentation

Racial & Ethnic Disparity is a classic dashboard design that supports an analysis of the frequency and length of time a JII is sentenced to custody or community supervision by a variety of filters.

Racial & Ethnic Disparity runs on a single table called Transform.Racial_Ethnic_Disparity. Racial_Ethnic_Disparity is loaded from a stored procedure that utilized temporary fact and dimension tables. A physical star schema was not implemented at the time the dashboard was completed. This section of the document describes the temporary fact and dimension tables that are used to load the Racial_Ethnic_Disparity table. To implement the following design as a star schema could benefit future ad hoc analysis and reporting.

Racial and Ethnic Disparities Dashboard Model



Star Schema Elements

Leadership wants to compare the system load of jail and prison days used for different kinds of revocations.

Fact Table is compiled from temp tables that calculate metrics that are populated on the Racial_Ethnic_Disparity table:

- #Aggregates
- #RedPobRevo
- #RedPostRev

The Grain is set by #OffenderByYear as: Year, RecordKey (Person identifier), Location

Metrics include:

- Probation revocations provided by #RedPobRevo
- Post prison revocations provided by #RedPostRevo

The remaining metrics come from the #Aggregates temp table

- Count of jail sanctions
- Count of reconvictions
- Sentence length
- Length of probation sentence in days
- Length of post-prison supervision in days

Dimensions:

- Offender: demographic attributes
- #Funded: Provides a number of filters
  - Felony indicator
  - Funded misdemeanor indicator
  - Unfunded misdemeanor indicator
  - Person crime indicator
  - Property crime indicator
  - Statutory crime indicator
  - Highest funding level
  - Highest crime type level
- Risk Tool Filters
  - #lscmi: LSCMI category
  - #psc: PSC category
  - #wrna: WRNA category
  - #CommRisk: Community supervision level

Revocations Dashboard

Purpose

Although uncommon, probation and post-prison revocations are events with major effects on both individuals and the criminal justice system as a whole. As the highest-level response to JII behavior a PPO can bring to bear, it behooves us to understand how often they're used, why they occur, and their consequences are – something this dashboard is design to help do.

Example Scenarios

Leadership wants to compare the system load of jail and prison days used for different kinds of revocations.

A manager wants to count the frequency of revocation events, and whether it has changed over time.

Fundamental Assumptions

A ***Probation Revocation*** occurs any time a charge in CIS has its attached probation sentence closed due to violations. Unfortunately, there is no further source in CIS for details on why probation revocations happened. JIIs are considered eligible for probation revocations during a year if they have an active probation sentence and are on active community supervision (no outcounts) at any point in the year, or if they experience a probation revocation while inactive. All closed sentences on the same date are considered part of a single probation revocation event.

A ***Post-Prison Revocation*** occurs any time an additional sentence of "Post-Prison Supervision Violation (PPSV)" is added to a JII's record. We then attempt to match those events to Sanction Reporting Forms (SRFs) to find details on why the post-prison revocations occurred. JIIs are considered eligible for probation revocations during a year if they have an active probation sentence and are on active community supervision (no outcounts) at any point in the year, or if they experience a probation revocation while inactive. All PPSV sentences on the same date are considered part of a single post-prison revocation event.

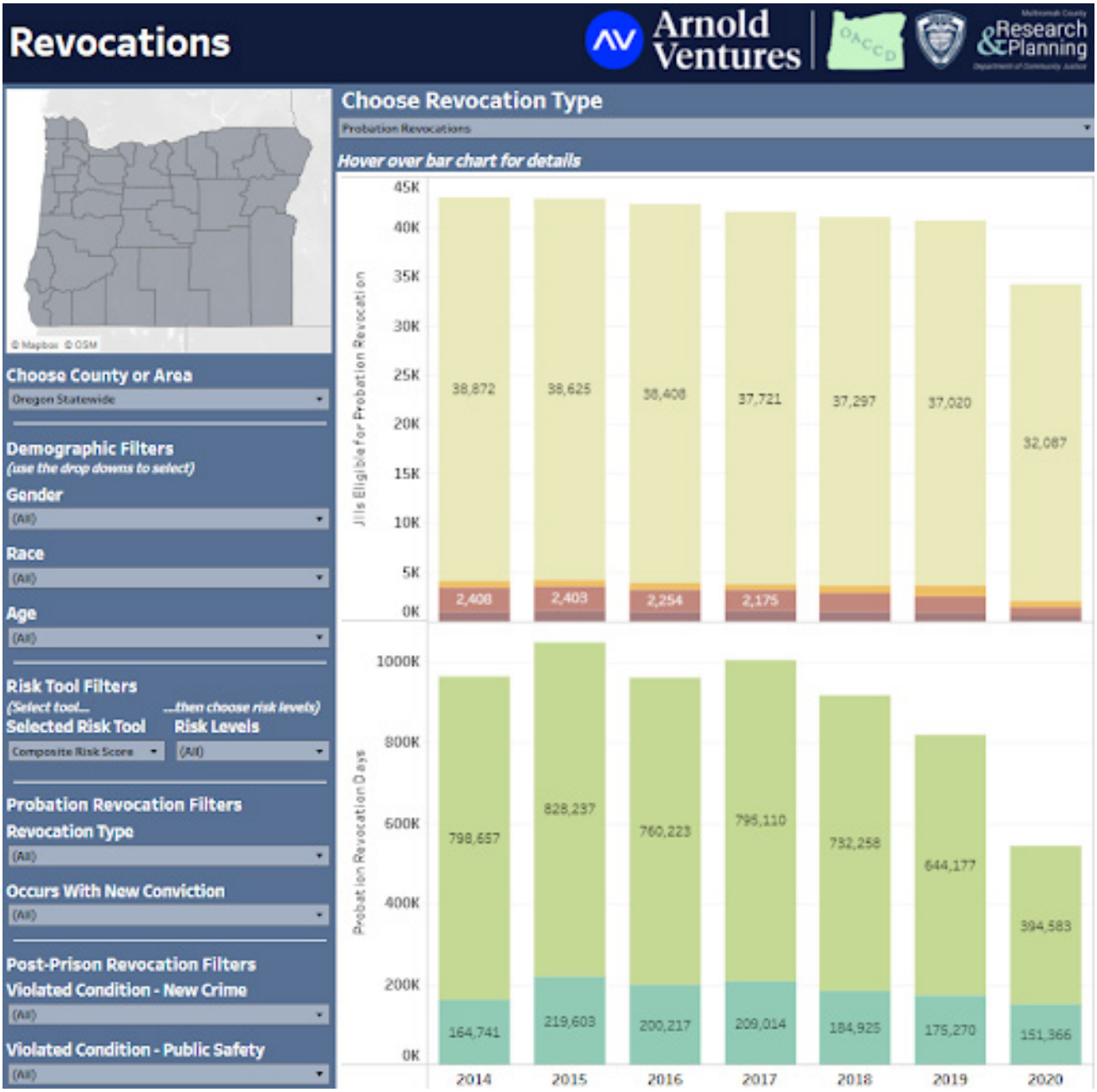
Duplicates are removed unless a JII receives two different types of the same revocation on different dates, because we were unable to think of a good way to decide which to keep. Therefore, a JII who received a probation revocation to jail and then later in the same year a different probation revocation to prison would be counted in both the revocation to jail and revocation to prison categories. However, a JII who received two different probation revocations to jail would only be counted once in that category.

Visuals

Main View

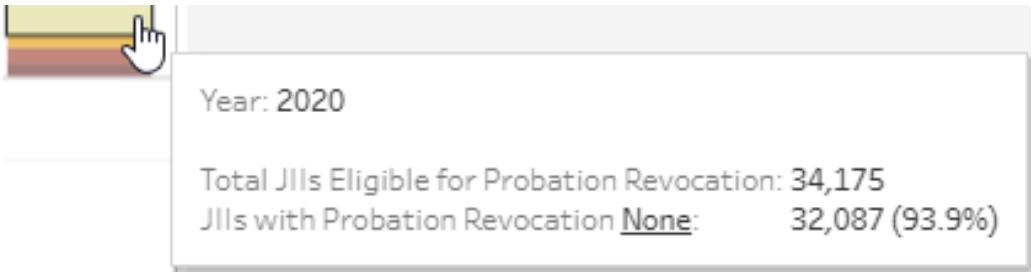
In the upper left is a map of Oregon showing which counties are currently displayed (changing the county or area will change which counties are highlighted in the map). Below this is a set of filters for users to adjust the JII population.

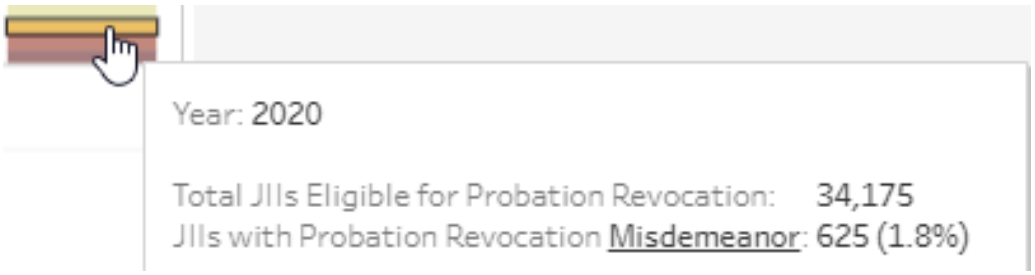
At the top center/right is a dropdown allowing the user to toggle the displayed revocation type between probation and post-prison. The central chart is split between two vertical bar charts: the top chart displays the number of JIIs who received revocations out of all those eligible, while the bottom chart displays the number of revocation days handed out.



Tooltips

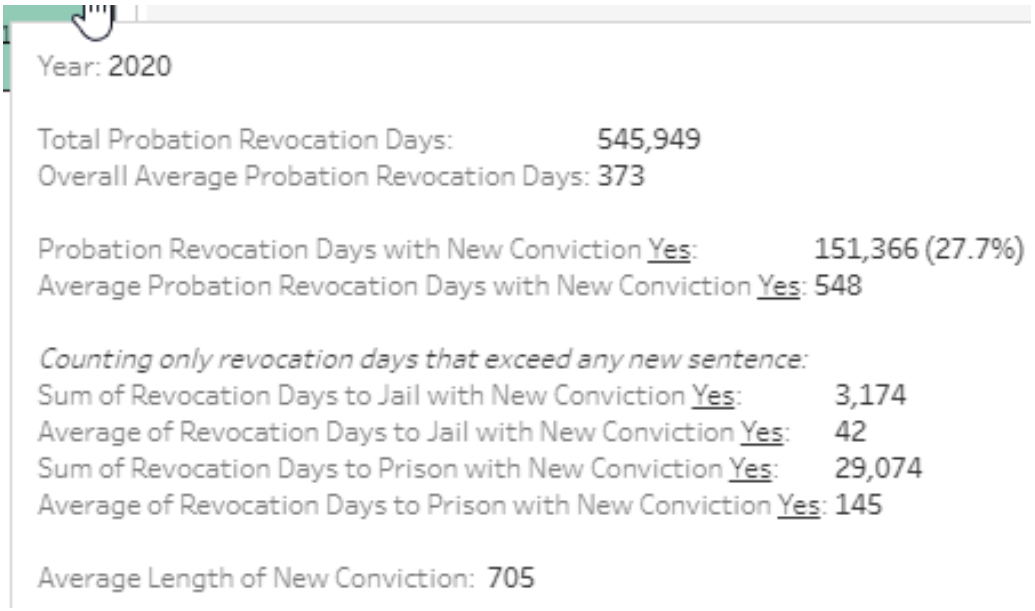
Throughout this dashboard, we use underlined text to denote descriptive text that changes between segments of the bar chart. This can be seen in the (otherwise simple) tooltips for the number of JIIs who received revocations:





The total number of eligible JIIs (34,175) is a reference to the whole population and doesn't change between tooltips, and thus has no underlined text, unlike the number of JIIs who receive different types of revocations (32,087 with no revocation, 625 with misdemeanor revocations).

The number of probation revocation days is an area of significant interest from leadership, and has the most information in its tooltip. It includes references for all probation revocations and numbers for the chosen segment category (with or without a new conviction). However, due to concerns around bed capacity, we included a secondary breakdown by destination, differentiating between revocations served in prisons and jails.



The tooltip for probation revocations occurring alongside new convictions also includes a calculation showing the average length of new convictions.

The tooltip for post-prison revocation days only includes the reference to all post-prison revocations and the numbers for the chosen segment category.

Variables and Filters

Filters

You can select your county, the four Oregon economic regions, or the entire state in the ***County or Area*** filter. Unlike other regional dashboards, this dashboard is designed around sums and counts instead of percentages and ratios, and so does not display a statewide reference level.

The ***Demographic and Charge*** filters are simple and allow you to examine the data by gender, race, or age.

The ***Risk Tool Filters*** allow you to select one of five different risk tools on the left, and then choose specific risk levels on the right. This will show only JIIs whose most recent assessment at the end of their supervision episode matches your selected risk levels.

The risk tool option ***Composite Risk Score*** merges results from the PSC, LS/CMI, and WRNA into a single view. For each person, it prioritizes their most reliable available risk-score (in order of priority: WRNA, then LS/CMI, then PSC). Then the scores are grouped based on similar recidivism rates, as normed in Multnomah County. For example, a Composite Risk of "High" is made by combining "Medium" WRNA and PSC scores with "High" LS/CMI scores, as these three groups have the most similar recidivism rates.

Probation Revocation Filters

Type of Revocation is whether a probation revocation sent the JII to prison, to jail, or was a misdemeanor revocation (sentences resulting from a misdemeanor revocation are not recorded in CIS). The "none" category is for all JIIs who were eligible for a probation revocation but did not receive one. Note that revocations to jail still represent felonies and DOC custody, but the JII spends the time in a local control facility in a process known as "prison served locally."

Although we are generally lacking reasons for probation revocations, we can see if a probation revocation ***Occurs With a New Conviction***. This is a good indication that the probation revocation occurred due to new criminal activity and not a technical violation (the reverse, unfortunately, is not true: a probation revocation with no new conviction does not indicate the lack of new criminal behavior).

Post-Prison Revocation Filters

Violated Condition – New Crime indicates whether or not the SRF linked to the post-prison revocation shows that the JII violated General Condition 10 – Obey all Laws. "Unknown" means we were not able to link an SRF to that post-prison revocation.

Violated Condition – Public Safety indicates whether or not the SRF linked to the post-prison revocation shows that the JII violated one of the conditions DCJ has labelled as clear dangers to public safety. These conditions are possession of weapons, contact with victims, and sex offense conditions. "Unknown" means we were not able to link an SRF to that post-prison revocation.

Data Source

This dashboard uses the new Tableau feature to create relationships between tables, similar to joins in a SQL database. A table of JII demographics with one row per JII per year is joined on the JII ID number and year to a table of post-prison revocations (one row per post-prison revocation event) and a table of probation revocations (one row per probation revocation event). This results in the relationships below:

All our regional dashboards accomplish security in the same way. First, each row is joined in Tableau's data source view with the three categories it belongs to: the specific county, the area it belongs to, and Oregon statewide (this creates three copies of each row, but Tableau creates them as virtual copies so they do not take up extra storage space). Selecting an area such as Metro will filter down to one copy of each row that belongs to Metro, selecting Oregon statewide will filter down to one copy of each row that belongs to Oregon statewide, and selecting the user's county will filter down to one copy of each row that belongs to their county. Inside the dashboard, filters are created to prevent users from seeing any category besides their own county, the five areas, and Oregon statewide. This works because security in Tableau happens at the Tableau Server layer: without permissions, users are unable to access individual rows in the area or statewide data, and unable to even see any individual county options besides their own.

Tableau Calculations

Thanks to the relationship, Tableau can create most charts and tooltips in this dashboard without any complicated or level of detail calculations. Charts counting post-prison revocations use data fields from the PostPrison table, charts counting probation revocations use data fields from the Probation table, and filters on demographics in the Demographics table seamlessly extend to the related PostPrison and Probation tables - and vice versa (using a CountDistinct function instead of a Count function as necessary).

Because we want to display total numbers in each tooltip, we do still need to use a few simple level of detail calculations. As necessary for the desired totals, we used this calculation:

{ EXCLUDE [*BarChartDimension*] : AGG([*SumaryVariable*]) }

Where *BarChartDimension* is the variable segmenting the bar chart by color, AGG is the aggregation function (SUM, AVG, COUNT, etc.) and *SumaryVariable* is the measure we want an overall total for. As an example, the chart summing probation revocation days is segmented by new convictions, so the appropriate formula would be:

{ EXCLUDE [New Conviction] : SUM([Probation Revocation Days]) }

Lessons Learned

Tableau's relationship feature is an excellent way to handle data at more than one level. Without it, trying to move between events, types, and conditions would be much more complicated.

Database Documentation

The key features brought together in this dashboard is the ability to identify probation revocations that sent a person to jail or prison and revocations that occurred post prison.

The code that was written to create the tables on which the dashboard relies was written in stages represented here in a star schema-like rendering[1]. The dashboard is based on three tables that were constructed in database stored procedures in three stages.

t_RevocationDemographics table
t_RevocationProbation table
t_RevocationPostPrison table

Stage 1 - Demographics and risk categories:

Stage 1 sets up a JII's demographic attributes (Age, Race, Gender) and assessed risk profile (Community Supervision Level, PSC, LS/CMI, WRNA risk category scores). This also assembles a base list of every person that is in a supervision program.

[1]A physical star schema did not exist at the time the Revocation Dashboard was created. Custom code was written to create tables on which the dashboard relies. In documenting the code, a star schema thought process was revealed. It became apparent that star schema terminology and rendering was appropriate to describe the construction of the code behind this dashboard.

To support analysis by year, a year band was created that captures active supervisions whether the supervision started before January 1, ended after December 31, spanned a full year or started or ended within the year.

Stored procedure: p_LoadRevocationDemographics loads the t_RevocationDemographics table
Star Schema Features: t_RevocationDemographics resembles a transaction fact table that sets a date boundary around supervision activities.

- **Metrics:** none
- **Attributes / filters:** CommSuperLvl, PscCat, LscmiCat, WrnaCat, CompositeCat

Stage 2 - Probation revocation:

Stage 2 builds on the Stage 1 active supervision by year list with indicators for whether a person had an active probation or post-prison sentence and indicators that flag whether a probation was revoked. New convictions within the year are flagged and the length of sentences associated with revocations or new convictions are calculated.

Stored procedure: p_LoadRevocationProbation loads the t_RevocationProbation table.
Star Schema Features:

- Metrics: RevocationLength, NewConvictionLength. Metrics are precalculated lengths of sentence that can be analyzed individually or rolled up into an aggregated sum or count for a group of sentences by type, location or other category.
- Attributes: ProbationSentence, PostPrisonSentence, PostPrisonRevocation, PostPrisonRevocationWithNewCrime PostPrisonRevocationWithPublicSafety

Stage 3 - Post-prison revocation:

Stage 3 builds on the Stage 1 active supervision by year list with indicators flagging whether a sentence was probation or post-prison and whether a revocation occurred. Indicators for whether a revocation was related to a new crime or related to dangers to public safety and a calculation for sentence length is also added.

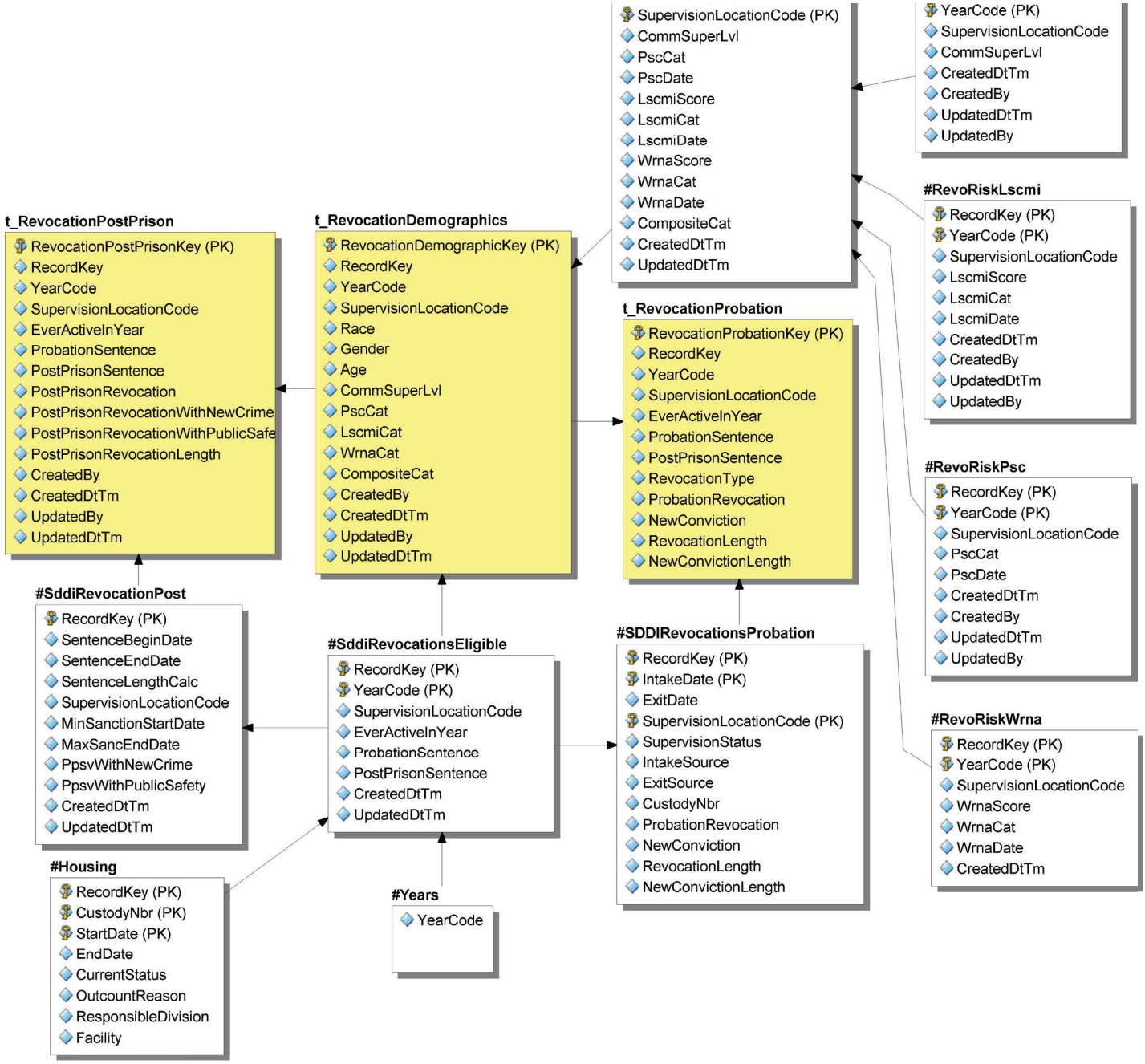
Stored procedure: p_LoadRevocationPostPrison loads the t_RevocationsPostPrison table
Star Schema Feature:

- Metric: PostPrisonRevocationLength
- Attributes: ProbationSentence, PostPrisonSentence, PostPrisonRevocation, PostPrisonRevocationWithNewCrime, PostPrisonRevocationWithPublicSafety. These are true/false indicators available as filters on the dashboard.

Revocations Data Diagram

In the diagram below, tables shown in yellow represent the dashboard tables on which the Revocation Dashboard is based. This “star schema-like” visual was provided to communicate the process of creating the dashboard tables. Temporary tables, shown in white and prefixed with the ‘#’ symbol are included in the image to help describe the process that fed into the construction of the dashboard tables.

(Data diagrams are not physical database schematics. Data for dashboards was constructed using stored procedures. These diagrams have been provided to help visualize code processes and potentially assist in a future implementation of a star schema.)



Step	Step summary	Star Schema Features
#Years	To support analysis by year, a year band was created that captures active supervisions whether the supervision started before January 1, ended after December 31 or started or ended with the year.	Dimension Table Attribute: YearCode
#Housing	Brings in housing, supervision status and location information.	Dimension Table Attributes: ResponsibleDivision, CurrentStatus, OutcountReason, Facility(County Code)
#RevoRiskPsc	Joins the #SDDIRevocationEligible list to the PSC risk assessment table to gather the most recent PSC date and risk category	Dimension Table Attribute: PscCat
#RevoRiskLscmi	Joins the #SDDIRevocationEligible list to the OMS EVALUATIONS table to gather the score and category from the most recent LS/CMI interview	Dimension Table Attributes: LscmiScore, LscmiCat
#RevoRiskWrna	Joins the #SDDIRevocationEligible list to the OMS ASSESSMENT_SUMMARY_RSL table to gather the score and category from the most recent WRNA assessment summary	Dimension Table Attributes: WrnaScore, WrnaCate
#RevoRiskCom-mLvl	Joins the #SDDIRevocationEligible list to the CIS risk assessment header table to get community supervision levels	Dimension Table Attribute: CommSuperLvl
#RevoRisk	Collates data from each risk "dimension" into a single row in a temp table	Dimension Table Attributes: CommSuperLvl, PscCat, LscmiScore, LscmiCat, WrnaScore, WrnaCat, CompositeCat
#SddiRevoca-tionsEligible	Finds all sentences with probation or post prison sentence types that occurred within each year. This is the 'eligible' list of sentences that could potentially be revoked. Gathers Probation and PostPrison sentence attributes for the t_RevocationDimension fact table	Fact Table Attributes: EverActiveInYear, ProbationSentence, PostPrisonSentence
#SddiRevoca-tionsPost	Find post-prison revocations by listing all post-prison revocation sentences. Gathers post prison attributes and metrics for the t_RevocationPostPrison table	Fact Table Metric: SentenceLengthCalc Attributes: PpsvWithNewCrime, PpsvWithPublicSafety
#SddiRevoca-tionsProbation	Find probation revocations by listing every intake and whether it ends in a revocation or not. Gathers sentence metrics and probation, revocation and new crime attributes.	Fact Table Metric: RevocationLength, NewConvictionLength Attributes: ProbationRevocation, NewConviction

Success on Supervision Dashboard

Purpose

Traditionally, community supervision agencies focus on measures of violation rather than compliance, evaluating services and outcomes based on failure rates. This dashboard is an effort to shift our focus to what is working in probation and post-prison. We looked for indicators of success so we could acknowledge efforts that are moving in that direction. We offer this to our employees to better highlight their role in making positive change, and to the field of Community Corrections as the beginning of a framework for sharing our collective success.

Example Scenarios

A journalist has questions about us, and communications wants to describe our positive work to them.

A new policy is implemented, and leadership wants to check if outcomes change in response over time.

Leadership between counties can collaborate using this dashboard as a shared, consistent information source, without exposing their private numbers.

Fundamental Assumptions

The basic unit of analysis in this dashboard is ***Supervision Episodes*** (i.e., the time while a JII is on a specific county's community supervision), not JIIs, since every time a person begins supervision is a new chance to succeed in improving their life. Therefore, we measure success on cohorts of all JIIs who either begin or end a supervision episode each year, as appropriate for each type of success. For instance, "successful completion" tracks supervision completion so it uses cohorts of JIIs who end supervision in each year, while "never absconded" tracks performance while on supervision so it uses cohorts of JIIs who begin supervision in each year. We have formalized supervision episodes as beginning with a JII's ***ENTRANCE*** into the county and ending with their ***EXIT*** from that county.

New probation sentences on JIIs not already on supervision, exits from prison onto post-prison supervision, and transfers from other counties all count as an ***ENTRANCE*** onto county supervision. Completion of all outstanding sentences, going to prison, or leaving for another county all count as an ***EXIT*** from county supervision. Starting or ending outcount status, jail sanctions, new convictions sentenced to additional community supervision, and post-prison revocations do not count as an entrance or exit.

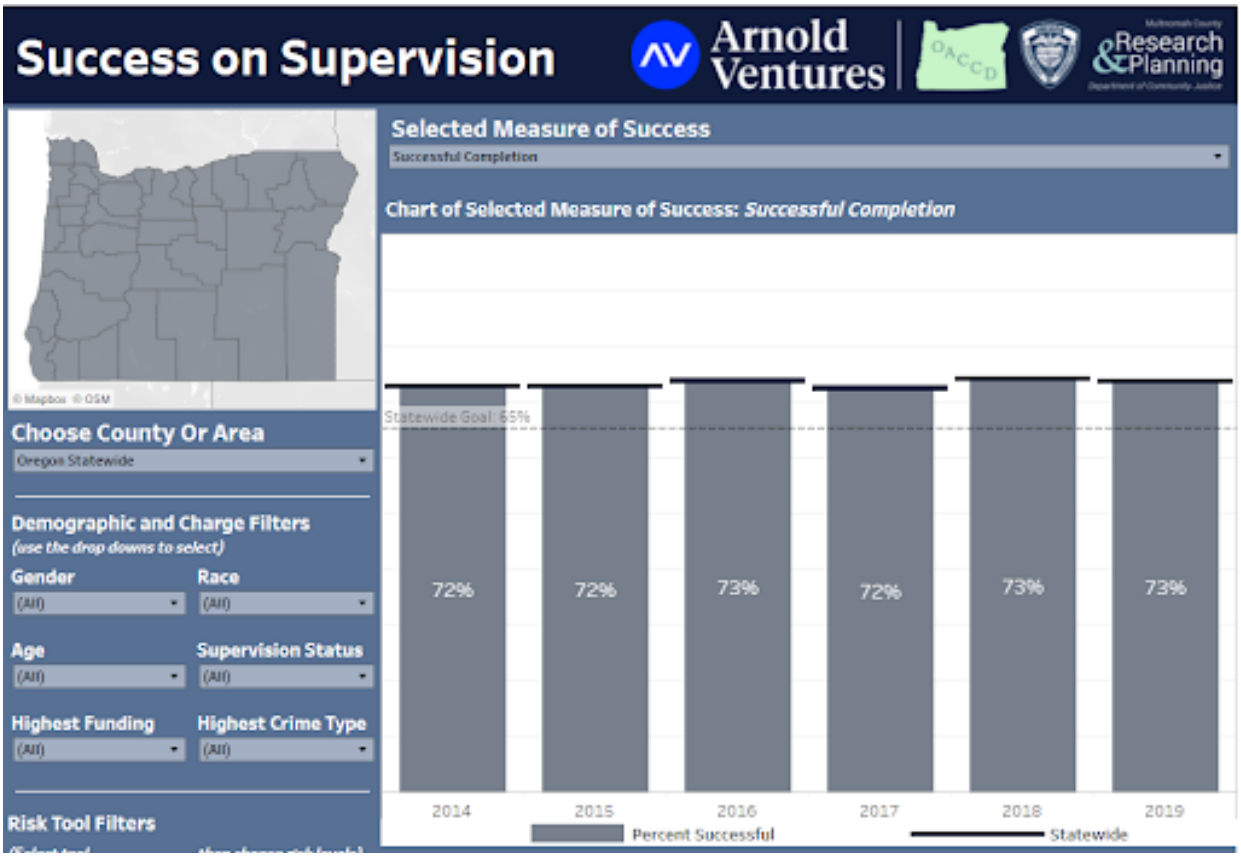
The only exception is that cases ending in an exit to another county within 45 days of entrance are removed entirely, as they are considered to represent JIIs who intend to transfer to their new county from the start of their supervision process.

Visuals

Main Views

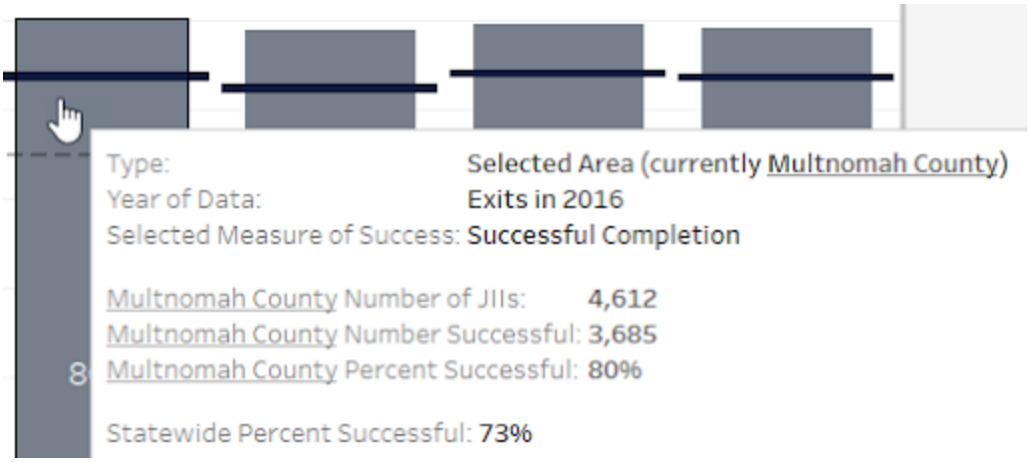
In the upper left is a map of Oregon showing which counties are currently displayed (changing the county or area will change which counties are highlighted in the map). Below this is a set of filters for users to adjust the JII population.

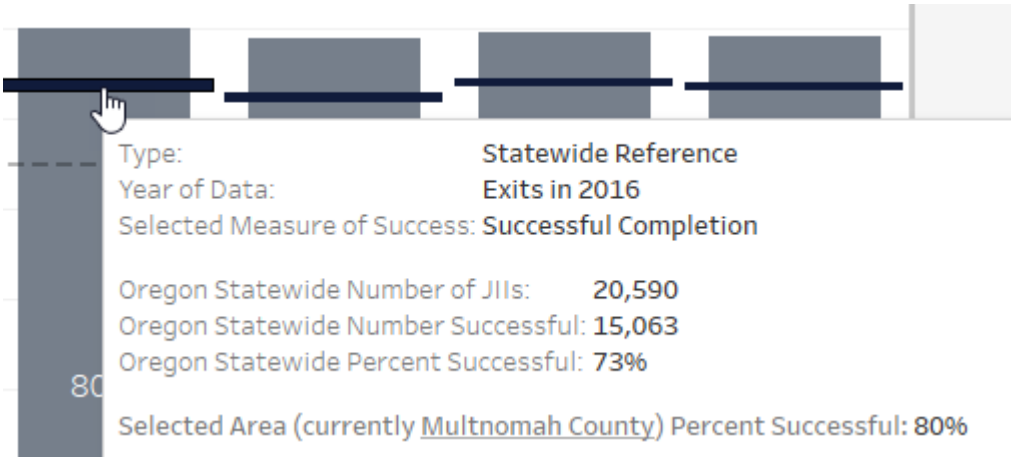
At the top center/right is a dropdown allowing the user to change the displayed measure of success. Below this is a central chart displaying the current measure of success for the selected county or area as vertical bars, the current measure of success statewide as horizontal dark blue lines, and a statewide goal chosen by OACCD as a horizontal dotted line. At the bottom, the same values displayed in the vertical bar chart are repeated in a table.



Tooltips

The only special tooltips are in the main bar chart display, and provide both information on how the value was calculated as well as user guidance to ease any possible confusion. The tooltips are slightly different between the vertical “chosen area” bars and the horizontal “statewide reference” lines:





In this case, we selected Multnomah County as an example, which changes the underlined text in tooltips to make clear that this was a user selection that can be changed.

Variables and Filters

Filters

Note that the displayed statewide total will change based on your selections, so selecting “Male” in gender will show the percent of successful males in both your selected county or region (the vertical gray bars) and the statewide reference (the horizontal dark blue lines).

You can select your county, the four Oregon economic regions, or the entire state in the ***County or Area*** filter. Among the ***Demographic and Charge*** filters, the first three demographic filters are simple and allow you to examine the data by gender, race, or age. The other filters require more explanation:

Supervision Status filters based on the JII’s probation or post-prison status at the start of their community supervision episode. All statuses are classified as either similar to probation (e.g., diversion and conditional discharge) or similar to post-prison (e.g., parole and early prison leave).

Highest Funding filters based on the highest funding level of any charge active at any time during a JII’s supervision episode, ranking “Felony” highest, followed by “Funded Misdemeanor” and finally “Unfunded Misdemeanor.”

Highest Crime Type filters based on the highest priority crime type of any charge active at any time during a JII’s supervision episode, ranking “Person” highest, followed by “Property” and finally “Statutory.”

Finally, the ***Risk Tool Filters*** allow you to select one of five different risk tools on the left, and then choose specific risk levels on the right. This will show only JIIs whose most recent assessment at the end of their supervision episode matches your selected risk levels.

The risk tool option ***Composite Risk Score*** merges results from the PSC, LS/CMI, and WRNA into a single view. For each person, it prioritizes their most reliable available risk-score (in order of priority: WRNA, then LS/CMI, then PSC). Then the scores are grouped based on similar recidivism rates, as normed in Multnomah County. For example, a Composite Risk of “High” is made by combining “Medium” WRNA and PSC scores with “High” LS/CMI scores, as these three groups have the most similar recidivism rates.

Measures of Success

There are many ways to measure of success using operational data. Our chosen definitions for each measure are as follows.

Successful Completion tracks what percent of all JIIs who exited each year were successful, excluding any neutral exits. Successful exits are those where the probation or post-prison sentences on all cases expire, and the JII returns to the general population. Unsuccessful exits are those where the JII returns to prison or has their last open case closed with a revocation (including misdemeanor revocations). Neutral exits are transfers to another community supervision jurisdiction, and are not counted. This is similar to full body closures and uses the same termination code classifications, but classifies prison as an unsuccessful exit, whereas full body closures do not count prison as an exit at all (because the person remains open in the CIS database).

Never Absconded tracks what percent of all JIIs who entered each year were never moved to abscond or warrant status during their time on county supervision.

Never Returned to Supervision tracks what percent of all JIIs who exited each year successfully have not yet returned to any location tracked by CIS (prisons or community supervision).

Never Sanctioned for a New Crime tracks what percent of JIIs who entered each year never received a Sanction Reporting Form (SRF) that cited a violation of "general condition 10 – obey all laws" during their time on county supervision. This will not include any sanctions delivered when POs bring a JII back to court without filling out an SRF.

Never Sanctioned for any Violation tracks what percent of JIIs who entered each year never received any SRF during their time on county supervision. This includes SRFs classified as interventions as well as sanctions. This will not include any sanctions delivered when POs bring a JII back to court without filling out an SRF.

Never Convicted tracks what percent of JIIs who entered each year were never convicted of a new crime during their time on county supervision. This only counts convictions that are recorded in CIS.

Early Release tracks what percent of JIIs who exited each year were released before their scheduled time. This includes JIIs who were closed with an Early Termination, had at least one charge closed due to the Earned Discharge program, or were sent to bench probation (the numbers of each type of release are visible in the tooltip). The Earned Discharge program began in 2015, and records should reflect that introduction. This will not include neutral exits such as transfers to another community supervision jurisdiction.

Decreased Risk Level tracks what percent of JIIs who exited each year had decreased their community supervision level (CSL) since the beginning of supervision. Due to differences in county policies, we treated limited supervision (LTD) as low supervision. Any JIIs without at least one CSL assigned during their supervision was removed. For the sake of measurement, we looked only at the first and last CSL of each JII:

If the first CSL was high, it counts as a decrease if their last CSL was medium, low, or limited.

If the first CSL was medium, it counts as a decrease if their last CSL was low or limited.
If the first CSL was low or limited, we chose to count them as a decrease if their last CSL was also low or limited, since that is closest to the meaning of success.

Data Source

This dashboard's data source is a single row per supervision episode, including demographics, intake and exit years, and a yes/no indicator variable for each measure of success as described above.

All our regional dashboards accomplish security in the same way. First, each row is joined in Tableau's data source view with the three categories it belongs to: the specific county, the area it belongs to, and Oregon statewide (this creates three copies of each row, but Tableau creates them as virtual copies so they do not take up extra storage space). Selecting an area such as Metro will filter down to one copy of each row that belongs to Metro, selecting Oregon statewide will filter down to one copy of each row that belongs to Oregon statewide, and selecting the user's county will filter down to one copy of each row that belongs to their county. Inside the dashboard, filters are created to prevent users from seeing any category besides their own county, the five areas, and Oregon statewide. This works because security in Tableau happens at the Tableau Server layer: without permissions, users are unable to access individual rows in the area or statewide data, and unable to even see any individual county options besides their own.

Tableau Calculations

The selection of success metric is done with a parameter, and individual variables created that change based on that parameter, as shown below:

```
CASE [Selected Measure Parameter]
        WHEN 'ER' THEN AVG([EarlyReleaseInd])
        WHEN 'Complete' THEN AVG([SuccessfulCommunitySupervisionInd])
        WHEN 'Absc' THEN AVG([NoAbscondInd])
        WHEN 'Return' THEN AVG([NoReturnToSupervisionInd])
        WHEN 'SancNew' THEN AVG([NoNewCrimeSanctionInd])
        WHEN 'SancAny' THEN AVG([NoViolationSanctionInd])
        WHEN 'Convict' THEN AVG([NoNewConvictionInd])
        WHEN 'RedRisk' THEN AVG([ReducedRiskInd])
END
```

To show the statewide reference at all times, we added a simple level of detail expression to the parameter switch, letting us aggregate all Oregon Statewide virtual rows for each year:

```
{ FIXED YEAR([Date Used]) :
        AVG(IF [County Or Area Name]='Oregon Statewide' THEN
          CASE [Selected Measure Parameter]
          WHEN 'ER' THEN ([EarlyReleaseInd])
          WHEN 'Complete' THEN ([SuccessfulCommunitySupervisionInd])
          ...
          END
          ELSE NULL
          END)
          }
```

Lessons Learned

- If filters are set up in the Tableau workbook file, secure enforcement of those filters can be handled by Tableau Server.
- Users were very specific about the types of filters they wanted to be displayed, but priorities shift every legislative cycle. Filters that were very important last year may become obsolete with new laws or funding priorities.

Database Documentation

The Success on Supervision dashboard is based on a single database table called Supervision_Success. Supervision_Success was built in a database stored procedure in a series of steps that utilized temporary tables (temporary tables are denoted with a # prefix). The temporary tables shown on the data diagram are documented below as a way to describe the thought process used to create filters and data elements for the Success on Supervision dashboard (see Image). This section describes how the values on the dashboard are derived on the underlying Supervision_Success table.

Selected Measure of Success

Successful Completion: SuccessfulCommunitySupervisionInd on the Supervision_Success table is derived from #IntakeExit. #IntakeExit determines whether supervision was successful by evaluating ExitSource. If ExitSource is 'Completed' the supervision is deemed successful. Supervision is considered not successful if ExitSource is one of the following: 'MisdemeanorRevocation', 'Prison', 'PrisonServedLocally'.

Never Absconded (derived from #Absconded): On the Supervision_Success table, AbscondedInd is set from the Offender_Housing_Supervision_History table where OutcountReason is 'ABSC' or 'WARR'.

Never Returned to Supervision (derived from #ReturnedToSupervisionInd): On the Supervision_Success table, ReturnToSupervisionInd is derived by looking for a TransferInDate from the Transfer table that occurs after the ExitDate found on #IntakeExit

Never Sanctioned for a New Crime (derived from #Sanctions): On the Supervision_Success table, NewCrimeSanctionInd is set from CMSACN__Sanctioned_Condition. A sanction for a new crime has occurred if the value for CONDITION_CODE is GC10.

Never Sanctioned for Any Violation (derived from #Sanctions): On the Supervision_Success table ViolationSanctionInd, if there are any CONDITION_CODES for the case on the CMSACN__Sanctioned_Condition table, the case will be flagged as having a violation.

Never Convicted (derived from #Conviction): On the Supervision_Success table, NewConvictionInd is flagged if a Sentence begins between IntakeDate and ExitDate. If there is no sentence this will return a true result for Never Convicted.

Early Release (derived from #EDIS): On the Supervision_Success table, the value for four indicator flags are derived. Those four flags are EarlyReleaseInd, EarlyTerminationInd, EarnedDischargeInd and BenchProbationInd. They are derived from the TerminationCode column on the Sentence table where the four character TerminationCodes are translated as:

- EDIS = Earned Discharge
- EARL = Early Termination
- BNPB = Bench Probation

The breakdown of early release by category is displayed when hovering over the graph in the body of the Success On Supervision dashboard.

Decreased Risk Level (derived from #RiskLevel): On the Supervision_Success table ReducedRiskInd is determined by evaluating the risk level between the first and latest assessment dates.

Charge Filters

Highest Funding values are derived from #Funded. Funding is determined from CrimeClassCategory on the Crime table where:

- FE - Felony (funded)
- FM - Funded Misdemeanor
- UM - Unfunded Misdemeanor

Highest Crime Type values are also derived from #Funded. For the Supervision_Success table these values are sourced from the CrimeType column on the Crime table. They are translated as:

- PERS - PersonCrimeInd
- PROP - PropertyCrimeInd
- STAT - StatutoryCrimeInd

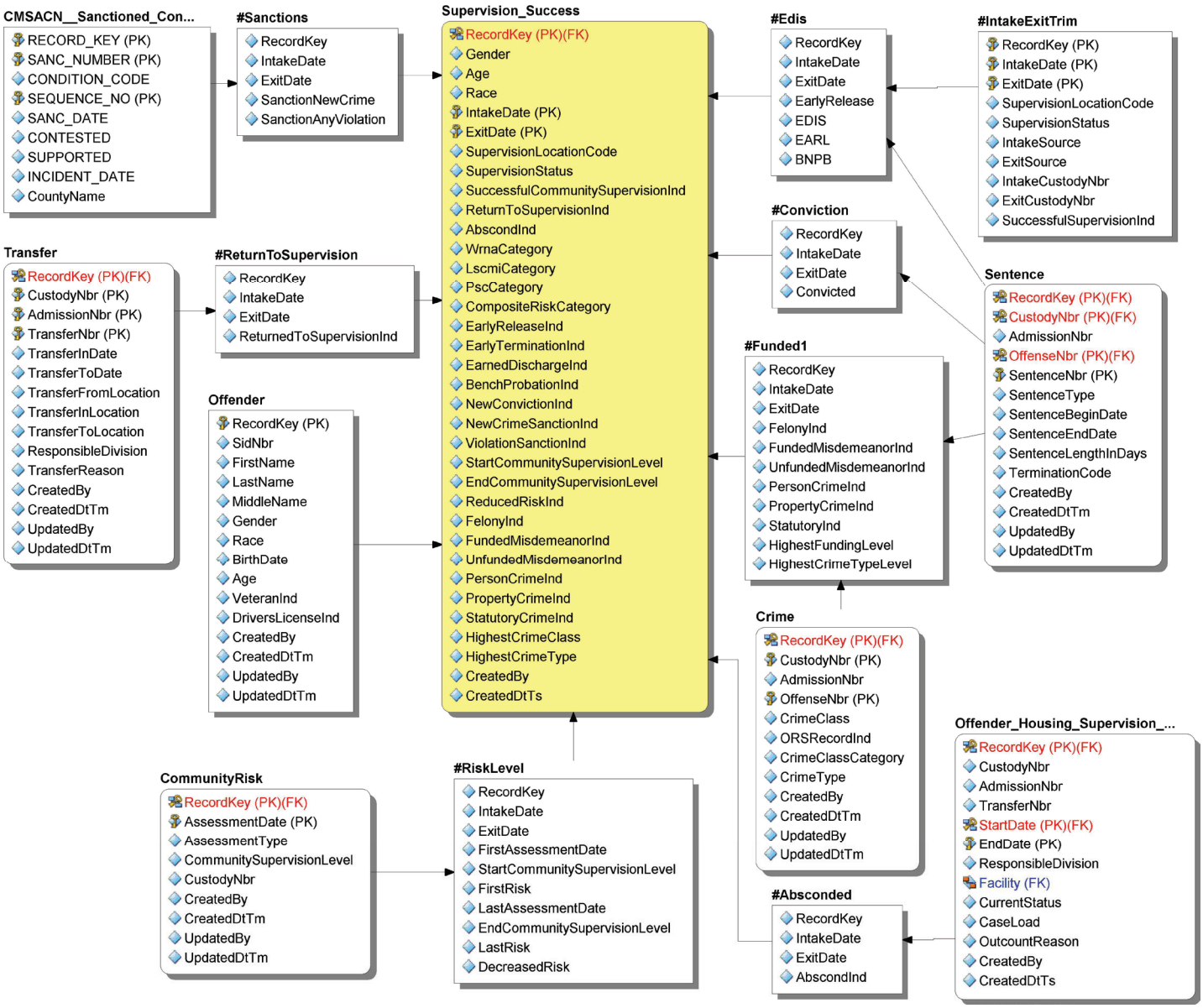
These indicators populate the Highest Crime Type dropdown list

- Person
- Property
- Statutory
- Unknown

Risk Tool Filters. This dropdown list is populated from the following Supervision_Success table columns:

- StartCommunitySupervisionLevel
- CompositeRiskCategory
- WrnaCategory
- LscmiCategory
- PscCategory

Success on Supervision Dashboard Model



Data

Management

Data Management

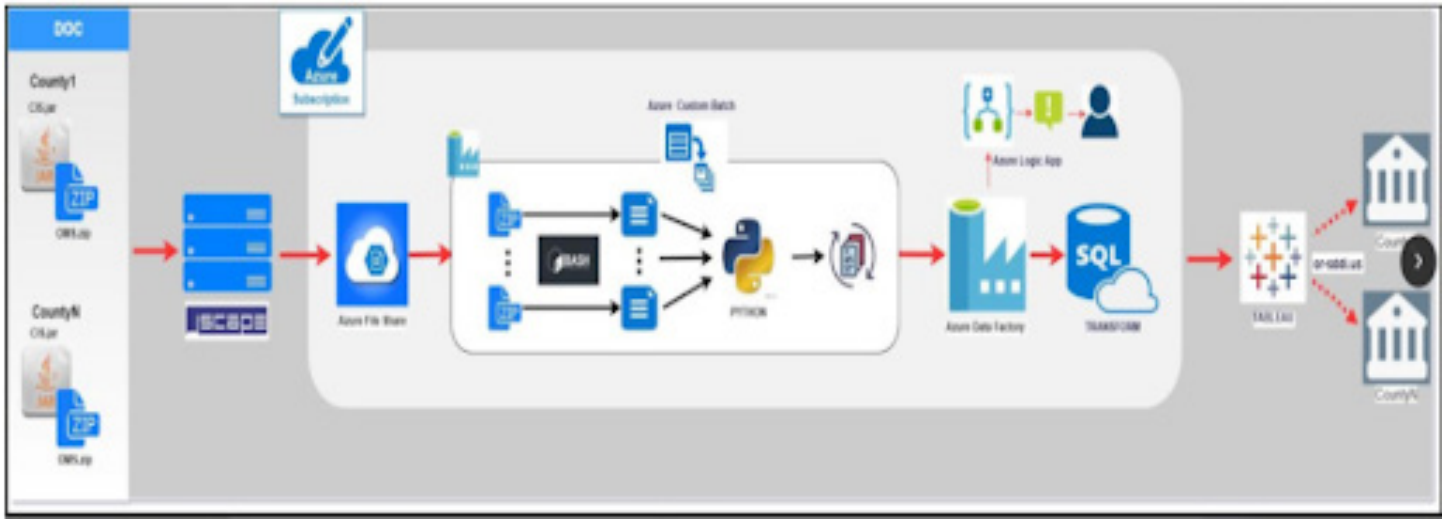
Source of Data

Data for the Oregon Statewide Dashboards is sourced from two Oregon Department of Corrections (DOC) state systems, the Corrections Information System (CIS) and the Offender Management System (OMS). CIS contains sentence, sanction and housing information for people who are currently in custody or have formerly been incarcerated. OMS is the primary source for risk assessments and caseload details for individuals on probation or in post-prison supervision programs.

There are thirty-six counties in Oregon. The Oregon Department of Corrections had processes in place to send extracts that contain data for individual counties. For the purpose of the statewide dashboard project, the State IT department continued with the established process and arranged to send thirty-six separate extracts, each containing data for one Oregon County. Extracts are received in thirty-six zip files. Thirty-six zip files are sent daily from CIS and another thirty-six zip files from OMS.

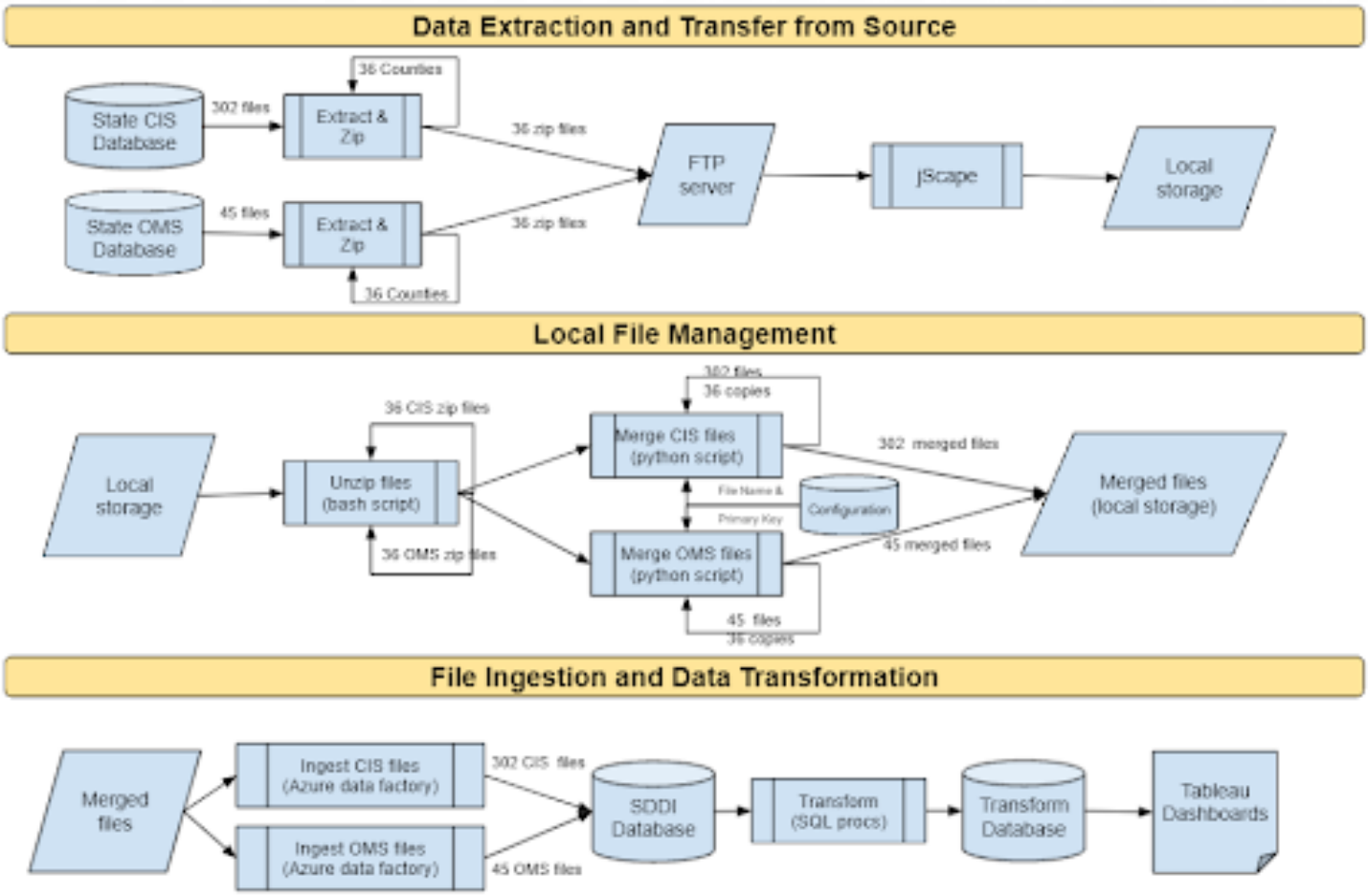
Each of the thirty-six zip files from CIS contain 302 comma separated (CSV) flat files that were extracted from the CIS database. The OMS zip files contain flat file extracts from 46 OMS tables.

Files that arrived from the Oregon Department of Corrections are placed on Azure storage drives. From there all processing of files and the ingestion and transformation of data is managed through Azure Data Factory pipelines. At the end of the process, data for the Statewide Dashboards is housed in a SQL Server database on the Microsoft Azure Cloud.



Four distinct phases comprise the process to receive and load data for the Statewide Dashboards:

- Extraction and transfer of data files from the State
- Management of files once they arrive on local servers
- Ingestion of preprocessed CIS and OMS files into staged database tables
- Transformation of data from staged tables into formats that support Tableau dashboards.



Data Extraction and Transfer from Source

The process to extract data from CIS and OMS is managed by the State IT deparment.

Data Extraction:

- Data from 302 tables from the CIS system are extracted into CSV files and compressed into zip files.
- Data from 46 OMS tables are similarly extracted and compressed.
- The extract is repeated for each of the thirty-six counties in Oregon from both CIS and OMS systems. Each of the zip files are named for the Oregon county whose data is contained within (ex. BENTCO.zip (Benton County), WASHCO.zip (Washington County, etc).
- Finally thirty-six zip files from CIS, each containing 302 CSV files and thirty-six zip files from OMS each with 46 CSV files are sent via sFTP to a local FTP server.
- From the local FTP server, JScape is used to transfer the zip files to an Azure storage drive.

Local File Management

An automated process is scheduled to run at 1:00 AM Monday through Friday to process the zip files when they arrive on Azure storage. Automation of the chain of events that occurs from this point forward is managed by an orchestrated series of Azure Data Factory (ADF) pipelines.

Automated series of file management events:

- ***Unzip the thirty-six CIS files*** into 36 new folders named for each county. Each of the 36 CIS folders contain 302 files. The 302 files are named the same in each of the 36 folders.
- ***Unzip OMS files*** into 36 new folders named for each county. Each of the 36 OMS folders contain 46 files. The 46 files are named the same in each of the 36 folders (i.e. in each of the 36 folders there is a CASE_PLAN.TXT file).
- Unix bash scripts are used to unzip files
- ***Merge CIS files***. Each of the 36 copies of the unzipped files in the CIS folders are merged into a single file. During this process, duplicate rows are removed from the final merged file. These will be loaded to the CIS staging database.
- ***Merge OMS files***. Merge each of the 36 OMS files into a single file with duplicates removed. These will be loaded to the OMS staging database.
- Python scripts using the Pandas library are used to merge files and ensure duplicate data has been removed. Merge and deduplication is the preprocess that prepares the files to be loaded into the CIS and OMS staging databases.

File Ingestion and Data Transformation

Ingest Files to Staging

An Azure data factory file load step (called an activity in ADF) picks the merged files off of Azure storage and bulk loads the data from each file into a corresponding table in the database. CIS staging tables are in a database schema named CIS. Likewise, OMS files are loaded into tables in an OMS schema.

Transform Data

A significant amount of data transformation is necessary to render a data structure that best serves the tools used in the writing of reports and analytical dashboards. Tableau is the reporting tool used for the Oregon Statewide dashboard project. From the CIS and OMS staging tables, stored procedures were used to build transformed tables that are used in the creation of Tableau dashboards. These tables are in a database schema called Transform.

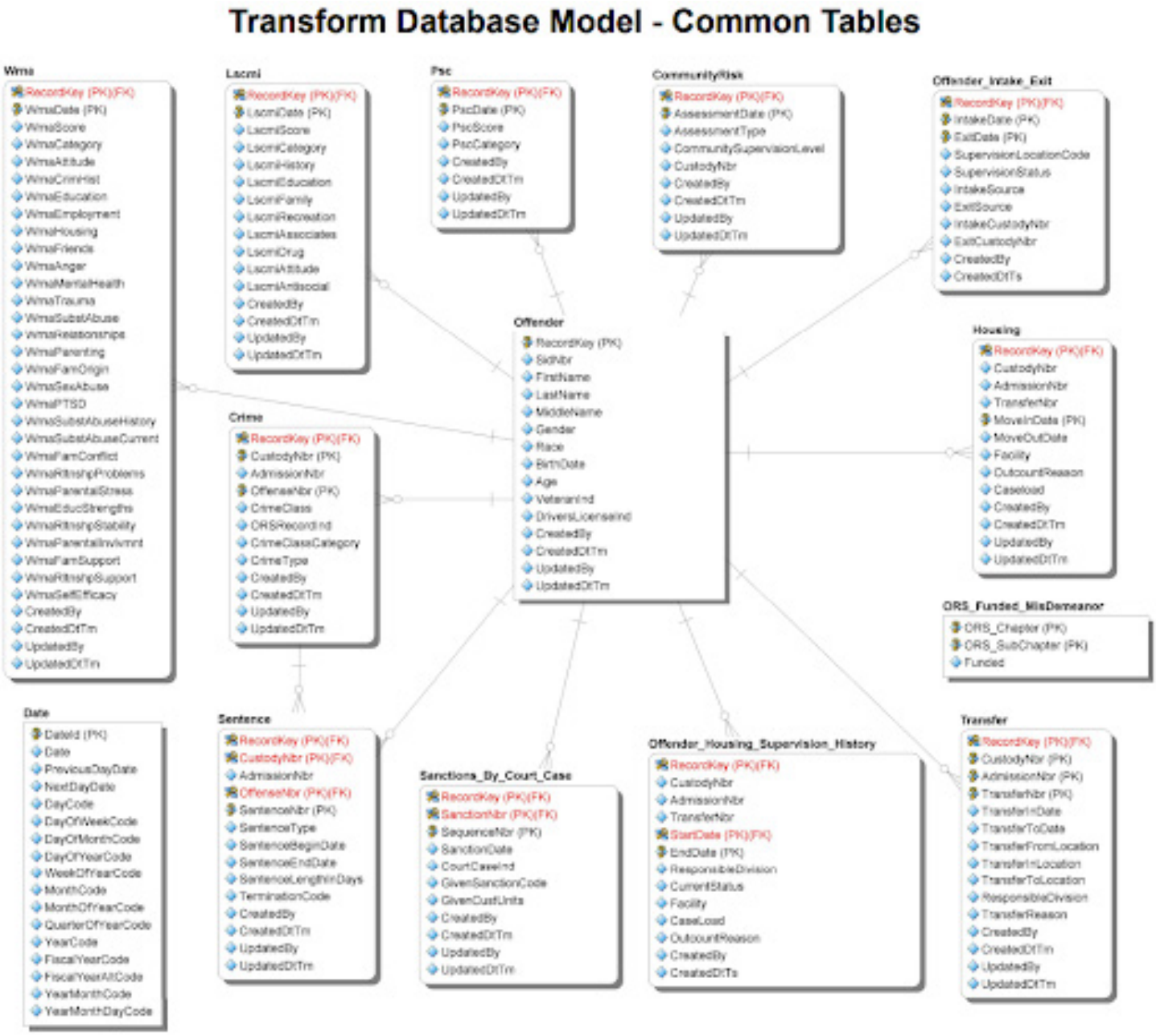
A Note About Dimensional Data Structures

In the business intelligence industry, dimensional models, also called star schema, are a preferred approach to designing data structures that can potentially be used to serve multiple dashboards. Star schema also provide flexibility that supports interactive ad hoc running of what-if scenarios prior to settling on a finalized dashboard report.

For complicated and multi-layered reports, data transformation may be approached by coding the creation of custom tables that are tailored to a specific report.

The Oregon Statewide Dashboard project has a combination of reusable common tables that were used in multiple dashboards and custom tables that were designed for specific dashboards.

In this project, each dashboard is supported by one or more custom tables that were designed specifically for the dashboard. Image 3 shows reusable common tables that were designed to be used in multiple processes in the building of dashboard tables. The documentation for each dashboard has a section that describes the custom tables that are used by that dashboard.



Dashboard Database Documents

The database documentation sections of this toolkit are primarily intended for a technical audience that would have access to the code that was written to generate database tables that serve data to the Statewide Data Dashboard Initiative dashboards. These sections of documentation may be more valuable and understandable by somebody who is looking at the underlying code for the purpose of editing code or creating new dashboard products.

Star schema had not yet been designed and were not available at the onset of this project. While analyzing and documenting custom code that is written to create tables that are tailored to specific dashboards, the shape of a star schema frequently emerges. Throughout this document, descriptions of the code behind each of the dashboards may include suggestions of star schema elements. Data diagrams are included for two reasons:

- To visually capture the thought process and staged approach that went into the design of the tables that are used by each Tableau dashboard
- To convey ideas for star schema or other database design possibilities for future phases of this project or other adaptations.

Background and Links

About This Document

This document is intended to contain full supporting documentation for the SDDI Arnold Grant Toolkit.

With every data transformation project a data dictionary and a mapping document is inevitably requested. At the writing of this document, the SDDI project was completing the first phase. In the first phase SDDI dashboards were constructed with manual code because dimensional database models did not yet exist. The intent and desire of this document is that it be of assistance in the reverse engineering of star schema for future in future phases of this and other analysis projects.

Database structures did not exist for SDDI dashboards during Phase 1 of this project. In Phase 1, data scientists created code to construct the structures they needed for Tableau dashboards using temporary and physical database tables. This document attempts to capture the stages of development that data scientists used by documenting the temporary tables used in the process. In many or most cases with little alteration, the temporary tables could be instantiated as physical star schema that could ease development efforts in future phases and be a foundation for additional exploration and ad hoc discovery

Data models in this document should not be considered physical database structures or an entity relationship diagram (ERD). These diagrams are representation of temporary and physical tables that were used in database stored procedures to construct the SDDI dashboards.

The Dashboards

The following are links to each individual dashboard's corresponding technical guide document. Please click on the title of the dashboard you are interested to open the web page for it's technical guide.

County-Specific Dashboards:

Field Contacts

Population Served

Monthly Reconvictions

Risk Assessments

Sanctions

Workload

Statewide Dashboards:

Racial and Ethnic Disparities

Success on Supervision

Revocations

Dosage of Supervision