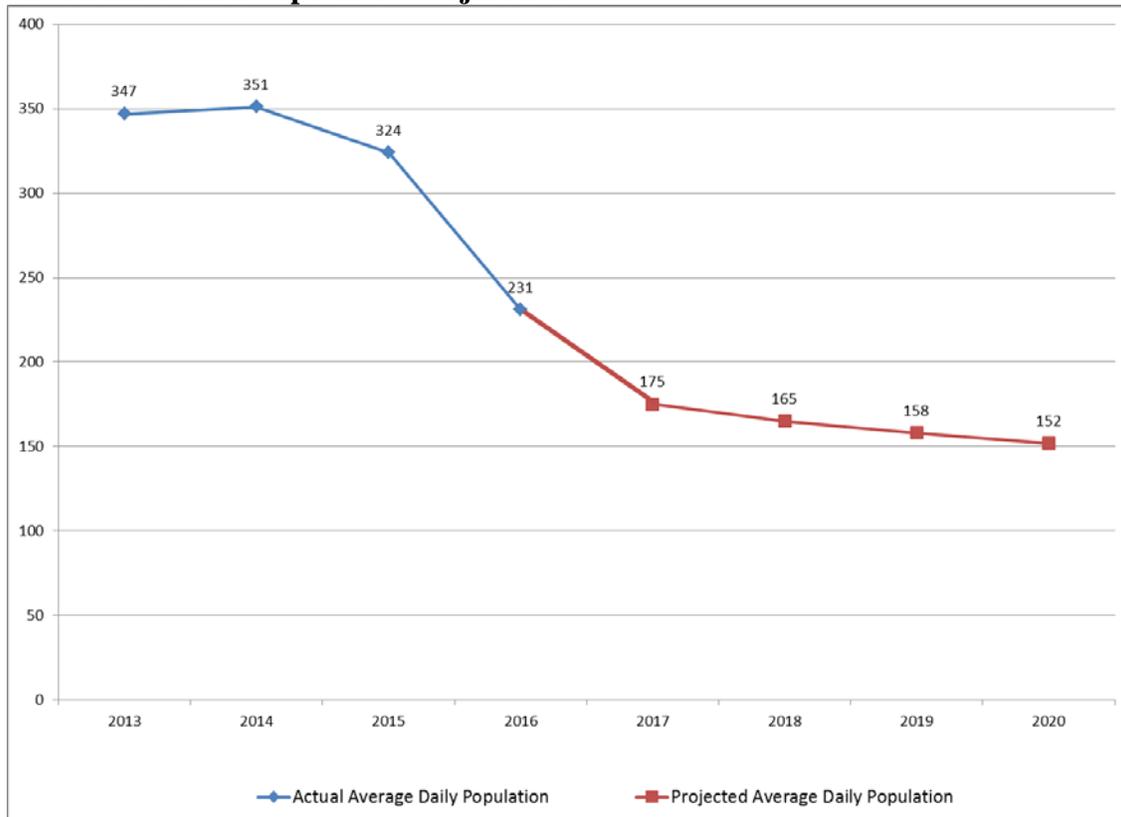# SECURE POPULATION PROJECTIONS

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Figure 1: Secure Care Population Projections

Based upon the actual number of new commits and parole violators recently (December 2015 to November 2016) returned to the Arizona Department of Juvenile Corrections (ADJC), and their associated actual lengths of stay, the ADJC average daily secure care population is projected to change from 231 in fiscal year (FY) 2016 to:

Fiscal year	Projected Average Daily Secure Care Population
2017	175
2018	165
2019	158
2020	152

These projections assume no changes in rates observed during 2016 for the following two key factors: the relative proportion of ADJC admissions given court-ordered minimum lengths of stay and actual lengths of stay served by ADJC youth. Also the proportion of parole violators who are returned for hearings and then are revoked are assumed to remain at the same level throughout the forecast period. All projections assume that the growth in the at-risk Arizona juvenile population will not affect the number of ADJC new commitments and that recent juvenile crime drop trends will continue.

ADJC POPULATION PROJECTION METHODOLOGY

A. Overview of the Methodology

Population forecasts should not be viewed so much as "crystal balls" used to predict the future, but as tools for understanding the origin and direction of population changes as well as how offenders move from one place within a system to the next. An effective planning model can be used in a number of ways. They are most effectively used to analyze the impact of new and proposed changes in laws, policies and administrative practices. Institutional planners may use it to project future population levels to better prepare for increases or decreases in demand for valuable bed space and programmatic resources. Policymakers can foresee the effects of alterations in existing laws or policies before their implementation. Researchers and planners can "sort out" and isolate the effects of specific practices that may otherwise be obscured in the complex web of correctional activity.

The Prophet Forecast and Simulation Model was used to produce the existing forecast of the ADJC secure population. The model is a computer-based simulation software program which provides a foundation for modeling the accumulation and flow of cases through a juvenile justice system and accurately projecting trends in population levels and compositions. The model is an example of what is sometimes called a "stochastic entity simulation model." It is stochastic in the sense that the model is conceptually designed around the movement of individual cases (juveniles) into, through, and out of the secure custody and parole populations based upon data describing how juveniles move through the system under current policies. [1] The model has been

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[1] The model makes use of "monte carlo simulation" techniques by generating random numbers to use in the process of simulating juvenile sub-group composition and lengths of stay associated with the system. Individual cases are processed by the model through a series of probability distribution arrays or matrices which allow computations of a case's "time" in a facility. The methodology allows for simulating how different types of juveniles flow through a system, and mimics decision making within the system.

developed to replicate the movement of cases through the system under existing policies, procedures and practices.

The Prophet Simulation software mimics the flow of juveniles into, and out of, a system defined by the researcher. No two systems are the same. Appropriately, there is no single "Prophet model." The software allows analysts to customize and construct models which mimic the actual flow of cases through systems based upon the unique sentencing structure and policy environments of the target system. Examples of model applications include the following:

- Projects both facility and community corrections populations.

- For juvenile justice systems: projects secure custody populations as well as various subgroups within secure custody.

- Allows analysts to accurately separate out the effects of legislation, policies and administrative practices impacting various sub-groups within the total population.

- Unique features of the model also allow analysts to "phase-in" or "sunset" a variety of policy options over the course of the forecast horizon.

- Provides forecast population and movement tables, by month, for up to a twenty year forecast horizon of the numerous sub-groups that compose a system. These tables help ensure that the model produces reliable near-term forecasts (one to five years) by allowing analysts to track the accuracy of the various components of a system.

- Can be adapted to provide forecasts by custody, supervision and classification levels.

The basic building blocks of the model are:
- **ID GROUPS:** Case identities of offender groups that are meaningful within the context of a State's record keeping system and are similar in the way they are processed through the correctional system e.g., male high risk, female medium risk, parole violators.
- **STATUS:** Stages or conditions associated with the operation of the system e.g., Regular Secure Custody, Pending Suspension/Revocation, and Parole.
- **FLOW:** Connections between statuses, which represent the "paths" a case could take through the system and the length of stay (or lag) in each status e.g., Secure to Parole, Parole to Discharge.

These basic building blocks -- ID Groups, Statuses and Flows -- and other features such as time served, make up a set of "personality" attributes tailored to the specific needs of decision-makers.

B.   **The ADJC Forecast Model**

The model developed for ADJC projects the total population held in secure facilities and differentiates between important subgroups of juveniles admitted to the facilities. Separate forecasts are produced which are based on gender, risk level and "status" within the secure population. Statuses include juveniles in "regular secure custody" -- the population in custody for new charges; "returned to secure custody" – the population returned from community supervision, and juveniles returned to secure custody who are "pending" a decision to revoke parole supervision. Separate population forecasts are produced for different categories of juveniles for each month over a five year forecast period. In addition, the ADJC model produces monthly projected admissions and releases for each juvenile category.

In an attempt to model and project "who" is admitted to secure custody, and "how long" juveniles currently remain confined (and are projected to remain confined), computer extract data files were analyzed on the flow of juveniles through the system during CY 2016. Guiding the analysis of juvenile movements reported during this period were such questions as: How many admissions were there? How many of the reported admissions were original admissions and how many were returned to secure custody pending revocation? What was the risk level for each juvenile? How long did admitted juveniles remain in secure custody or parole?

It is important to note that the forecasts that result from the development of the simulation model are based on critical assumptions about future trends in admissions, violation rates, lengths of stay, and changes in current decision making processes. The "accuracy" of resulting forecasts is dependent upon these assumptions.