NEW MEXICO PRISON POPULATION
FORECAST: *FY 2017—FY 2026*

National Trends

- The total U.S. prison population (state and federal) totaled 1,561,500 at yearend 2014. This was a decrease of approximately 15,400 prisoners over yearend 2013.

- The federal prison population decreased in size for the second year in a row. There were 5,300 fewer prisoners under the jurisdiction of federal prisons in 2014 than 2013. At yearend 2014, the number of inmates held in federal prisons was 210,567.

- The aggregate state prison population decreased in 2014. There were 10,126 fewer prisoners under the jurisdiction of state prisons in 2014 than 2013. At yearend 2014, the number of inmates held in state prisons was 1,350,958.

- The female prison population increased in 31 states, including Texas, Kentucky, Missouri, Nebraska, Iowa, North Dakota, Wyoming, Colorado, Arizona and New Mexico. The female inmate population in Texas increased by 500 (+3.6%) from 2013 to 2014. From 2013 to 2014, the female inmate population in North Dakota grew from 157 to 204, a 30% increase.

- On December 31, 2014, female inmates comprised 7.3% of the population in all state prisons.

New Mexico Trends
Females: The most notable trend in New Mexico is the continuing, significant increase in the female inmate population.

In New Mexico, females comprise approximately 10% of the total inmate population.

In FY 2011, the high count for the female inmate population was 629 inmates.

FY 2012 high count: 649 female inmates;
FY 2013 high count: 661 female inmates;
FY 2014 high count: 704 female inmates;
FY 2015 high count: 782 female inmates.

The high count in FY 2016 has been 791 female inmates.

Males: In FY 2011, the high count for the New Mexico male inmate population was 6,175 inmates.

FY 2012 high count: 6,151 male inmates;
FY 2013 high count: 6,188 male inmates;
FY 2014 high count: 6,344 male inmates;
FY 2015 high count: 6,558 male inmates.

The high count in FY 2016 has been 6,727 male inmates.

Short-Term Forecast

Females:
In FY 2017, the projected high count for the female inmate population is 786.

In FY 2018, the projected high count for the female inmate population is 810.

Males:
In FY 2017, the projected high count for the male inmate population is 6,775.

In FY 2018, the projected high count for the male inmate population is 6,853.

INTRODUCTION
This prison population forecast was prepared by the New Mexico Sentencing Commission. The forecast is designed to assist the New Mexico Corrections Department (NMCD) in assessing immediate and future inmate populations. This report also includes information that may be of interest to policy makers during discussions of the correctional system. Sentencing Commission staff met three times (October 2015, May 2016 and June 2016) with NMCD staff to review inmate population trends and to discuss factors that may affect the forecast.

The prison population time series forecasts used to produce this report are based on historical prison population data. It is understood that there are many factors that drive prison populations, including arrest rates, the number of criminal cases filed in district courts, conviction rates, the availability of diversion programs, sentence lengths, admission and release rates, earned meritorious deductions and parole readiness. The historical prison population data is a result of all those factors.

This report includes national prison population trends, prison population trends in New Mexico, factors that influence prison population, data regarding admissions to and releases from prison, and short-term and long-term forecasts for the male and female populations.

The Sentencing Commission strives to produce inmate population projections within the range of 3% of the actual populations for males and females. During FY 2016, the projections for the male inmate population were within 3% of the actual population in every month (See Appendix A).

For the female inmate population, the projections were outside of the 3% range in

10 of 12 months (See Appendix A). The projections exceeded the actual population.

Going forward, Sentencing Commission staff will brief legislators, other policy makers, and Sentencing Commission members on the forecast. Members of the Sentencing Commission include representatives from law enforcement, the judiciary, the District Attorney's Association, the criminal defense bar and the New Mexico Corrections Department. Commission members will be asked for their input on policies and practices in the criminal justice system that could potentially affect prison populations.

NATIONAL TRENDS

The U.S. Department of Justice publishes annual reports regarding trends in the U. S. prison population. The reports use data collected pursuant to the National Prisoner Statistics Program. Data has been collected on an annual basis since 1926. The most recent full-year reports are **Prisoners in 2014** and **Correctional Populations in the United States, 2014**. These reports provide data on prisoners under the jurisdiction of federal and state correctional authorities from yearend 2013 to yearend 2014.

The following data points were included in the reports:

- The total U.S. prison population (state and federal) totaled 1,561,500 at yearend 2014. This was a decrease of 15,400 prisoners over yearend 2013.

- The federal prison population decreased in size for the second year in a row. There were 5,300 fewer prisoners under the jurisdiction of federal prisons in 2014 than 2013. At yearend 2014, the number of inmates held in federal prisons was 210,567.

- The aggregate state prison population decreased in 2014. There were 10,126 fewer prisoners under the jurisdiction of state prisons in 2014 than 2013. At yearend 2014, the number of inmates held in state prisons was 1,350,958.

- The female prison population increased in 31 states, including Texas, Kentucky, Missouri, Nebraska, Iowa, North Dakota, Wyoming, Colorado and New Mexico. The female inmate population in Texas increased by about 500 (+3.6%) from 2013 to 2014. From 2013 to


Figure 1. Comparison of Confined Male Population By Crime Committed
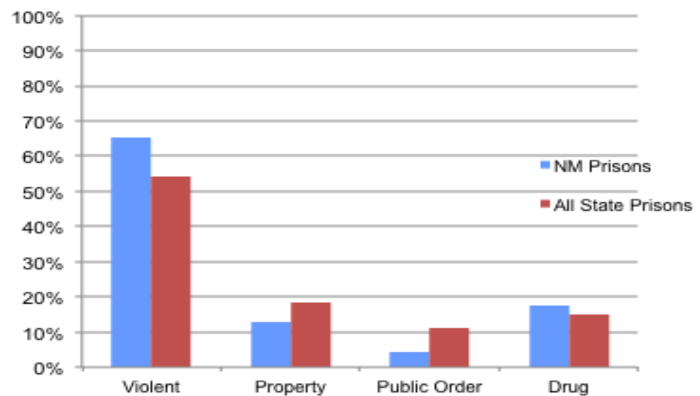
2014, the female inmate population in North Dakota grew from 157 to 204, a 30% increase.

- Adult correctional systems in the United States supervised an estimated 6,851,000 persons at year end 2014. That number includes inmates under the supervision of local jails, state prisons, and federal prisons, and also includes persons living in the community while supervised on probation or parole.

- Compared to other state prisons, New Mexico houses a higher percentage of inmates convicted of violent offenses. According to the Bureau of Justice Statistics, on December 31, 2013, the percentage of male inmates confined in all 50 state prisons

Figure 2. Comparison of Controlled Female Population By Crime Committed
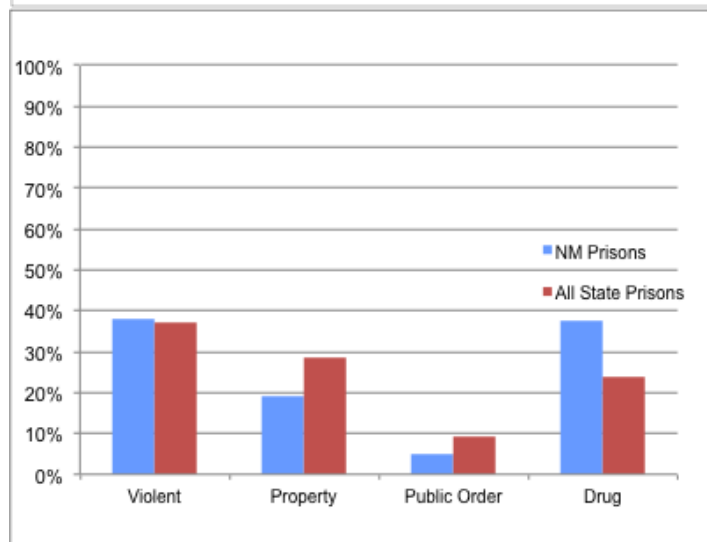
convicted of a violent offense was 54.4% . In New Mexico on June 30, 2015, 65.1% of males were convicted of a violent offense.

- The percentage of women confined in New Mexico convicted of a violent offense was slightly higher than the national percentage. In New Mexico on June 30, 2015, 38.2% of female inmates were convicted of a violent offense. On December 31, 2013, the percentage of female inmates confined in all state prisons convicted of a violent offense was 37.1%.

NEW MEXICO TRENDS

Females: The most notable trend in New Mexico is the continuing, significant increase in the female inmate population. In New Mexico, females comprise approximately10% of the total inmate population.

In FY 2011, the high count for the female inmate population was 629 inmates. There has been a significant upward trend in subsequent fiscal years:

FY 2012 high count: 649 female inmates;
FY 2013 high count: 661 female inmates;
FY 2014 high count: 704 female inmates;
FY 2015 high count: 782 female inmates.

The high count in FY 2016 has been 791 female inmates.

There has also been a significant upward trend in the percentage of females incarcerated in county jails in New Mexico.   From 2010 to 2015, the percentage of female inmates incarcerated in county jails in New Mexico has increased from 12.9% to 17.2% of the total jail census.

Males: In FY 2011, the high count for the New Mexico male inmate population was 6,175 inmates. In subsequent fiscal years, the male inmate population has increased by 6.2% from FY 2012 through FY 20215.

FY 2012 high count: 6,151 male inmates;
FY 2013 high count: 6,188 male inmates;
FY 2014 high count: 6,344 male inmates;
FY 2015 high count: 6,558 male inmates.

The high count in FY 2016 has been 6,727 male inmates.

FACTORS INFLUENCING PRISON POPULATION

In an effort to better understand the increase in the female inmate population, in August 2012, NMSC

published a report entitled **"New Mexico's Female Prisoners: Exploring Recent Increases in the Inmate Population"** (Kristine Denman, Linda Freeman, and Nona Gronert August, 2012) . Findings set forth in the report included the following:

- The data suggests that the female prison population is being driven by length of stay rather than new admits, though periodic spikes in admissions do play a role;

- There is some indication that the female inmate population has been changing over time. Long-term trends indicate that incarcerations for violent crimes among women have increased. More recently, drug trafficking admissions have consistently exceeded admissions for drug possession, and there have been more return/new admissions as opposed to admissions for probation/parole violations.

- The number of women eligible for parole, who are serving some portion of their parole term in prison, has increased over time.

The New Mexico Statistical Analysis Center/Institute for Social Research published a study entitled, **"Prison Program Utilization and Recidivism Among Female Inmates in New Mexico"** (Kristine Denman, April 2015). Findings set forth in the report included the following:

- Women who participated in educational programming were less likely to re-offend;

- Matching, recommending and promoting programming appropriate to criminogenic needs may decrease future offending; and

- Post-release supervision was associated with decreased adjudications and incarcerations for new offenses.

For this report, NMSC staff gathered data regarding the female population incarcerated in county jails. From 2010 to 2015, the percentage of female inmates incarcerated in county jails has increased from 12.9% to 17.2% of the total jail census.

As noted in previous population forecast reports authored by the NMSC, there are a number of factors that may explain the relative stability of the **total** New Mexico state inmate population in recent years. Those factors include the following:

- The number of new filings in district courts for criminal cases has been flat for several years (See Appendix E).

- Felony drug court programs and other specialty courts are established throughout New Mexico. Drug courts and other specialty courts are not a direct diversion from prison in most cases, but successful participation in specialty court programs may break the cycle of contact with the criminal justice system and eventual imprisonment.

- New Mexico is one of a small number of states where the jail population is similar to the prison population. On June 30, 2015, the jail census in New Mexico was 6,163. On that same date, there were 7,128 inmates held in state prisons. A reduction in the population of the Bernalillo County Metropolitan Detention Center is responsible for the majority of reduction in the county jail population.

- The adult parole board may impose sanctions other than a return to prison for parole violators whose infractions are technical in nature.

NMSC staff meets on a regular basis with NMCD staff to review inmate population trends and to discuss factors that may affect the forecast. Discussions have included the following subjects, which may have an impact on prison populations in the future:

- In 2015, the NMCD increased the number of staff assigned to the department's Recidivism Reduction Division. The department has a self-imposed goal of reducing recidivism by 10% within the next three years;

- In 2014, the NMCD revised its policies regarding review of inmate files to better ensure accurate discharge dates;

- In 2014, the NMCD revised its policies regarding lump sum awards of earned meritorious deductions. The criteria for lump sum awards are now more restrictive, including an emphasis on completion of programming. The reduced availability of lump sum awards will increase inmate's length of stay;

- The NMCD continues to work with the PEW-MacArthur Foundation, the Legislative Finance Committee and the New Mexico Sentencing Commission on implementation of the Results First Initiative. The initiative employs an evaluation model to identify cost effective programs that reduce recidivism. Also, the NMCD is working directly with PEW staff on an inventory of inmate programming in facilities;

- In 2015, the NMCD adopted policy CD-1000000, regarding utilization of evidence-based programming and promising practices in its development of programming for offenders. The policy includes a stated goal that no less than 70% of programming be evidence-based.

- The number of female, "release eligible inmates," still incarcerated due to not having an approved parole plan, reached a high count of 56 in December 2013. On May 18, 2016, that number had been reduced to 21 female inmates who were release eligible but still incarcerated at NMCD.

- In 2015, the New Mexico Corrections Department opted out of the behavioral health collaborative and no longer pays the 12% administrative fee on every dollar spent for services. Based upon those savings and capital outlay dollars received for transitional living facilities, the department will increase the number of transitional living facility beds for offenders. The New Mexico Corrections Department now contracts with Maya's Place for 16 transitional living facility beds for females in Albuquerque. Also, The Pavilions was recently opened in Los Lunas and currently has 9 beds for females at that facility, with plans for future expansion.

- In 2015, the NMCD began working on a project to expand the use of the COMPAS Risk and Needs Assessment. COMPAS has been in use at the agency since 2008. The number of licenses for COMPAS was increased from 50 to 500, and now includes expansion of this tool to the Probation and Parole Division for use with all offenders placed on community supervision.

- In 2015, the New Mexico Supreme Court implemented a new case management system for the Second Judicial District Court. A primary goal of the system is to reduce pre-trial length of stay for inmates in the Bernalillo County Metropolitan Detention Center (BCMDC). If successful, reduced pre-trail stay in BCMDC may yield increased length of stay for inmates subsequently adjudicated and incarcerated in state prisons; and

- The enactment of Senate Judiciary Committee Substitute for Senate Bill 42, as amended (Laws 2015, Chapter 127), regarding provision of Medicaid enrollment for incarcerated persons. This should

increase the availability of medical and treatment services for inmates upon discharge.

CURRENT OPERATIONAL CAPACITY

On May 24, 2016, the operational capacity for male inmates in the New Mexico Corrections Department was 6,982 beds. Correctional facilities for male inmates and their respective operational capacities are as follows:

- Penitentiary of New Mexico, located in Santa Fe (864)

- Central New Mexico Correctional Facility, located in Los Lunas (1,226)

- Southern New Mexico Correctional Facility, located in Las Cruces (768)

- Western New Mexico Correctional Facility, located in Grants (352)

- Roswell Correctional Center (340)

- Springer Correctional Center (296)

- Lea County Correctional Facility, located in Hobbs (1,279)

- Guadalupe County Correctional Facility, located in Santa Rosa (601)

- Northeast New Mexico Detention Facility, located in Clayton (626)

- Otero County Prison Facility, located in Chaparral (630)

On May 24, 2016, the operational capacity for female inmates in the New Mexico Corrections Department was 794 beds. 792 of those beds are in the New Mexico Women's Correctional Facility, located in Grants. Two beds for females are in the Central New Mexico Correctional Facility, located in Los Lunas.

SHORT-TERM FORECAST

The short-term forecast sets forth inmate population projections for male and female inmates for the next two fiscal years (FY 2017 and FY 2018).

MALES:

In **FY 2017**, the projected high count for the male inmate population is 6,775.

In **FY 2018**, the projected high count for the male inmate population is 6,853.

Both of those figures are slightly less than the current operational capacity for male inmates of 6,982 beds.

FEMALES:

In **FY 2017**, the projected high count for the female inmate population is 786.

In **FY 2018**, the projected high count for the female inmate population is 810.

The FY 2018 projected high count exceeds the current operational capacity for female inmates of 794 beds.

LONG-TERM FORECAST

It is important to remember that the long-term forecasts are based upon current sentencing statutes and current New Mexico Corrections Department policies and practices. It is not difficult to imagine that statutes, policies and practices may be different in FY 2026. Even if our level of confidence diminishes as we move further into the future, the long-term forecasts may spur useful discussions among policy makers and criminal justice professionals.

MALES: In FY 2026, the projected high count for the male population is 7,469.

FEMALES: In FY 2026, the projected high count for the female population is 988.

Table 1. Highest Actual Monthly Populations for 2002 through 2016 and Projected Monthly Highs for 2017 through 2026

| Fiscal Year	Male Population	Female Population	Change in Male Population	Change in Female Population
2002	5,410	530		
2003	5,643	568	4.31%	7.17%
2004	5,811	600	2.98%	5.63%
2005	6,001	636	3.27%	6.00%
2006	6,134	696	2.22%	9.43%
2007	6,174	713	0.65%	2.44%
2008	6,012	629	-2.62%	-11.78%
2009	5,879	619	-2.21%	-1.59%
2010	6,177	614	5.07%	-0.81%
2011	6,175	629	-0.03%	2.44%
2012	6,151	649	-0.39%	3.18%
2013	6,188	661	0.60%	1.85%
2014	6,344	704	2.52%	6.51%
2015	6,558	782	3.37%	11.08%
2016	6,727	791	2.51%	1.14%
2017	6,775	786	0.71%	-0.64%
2018	6,853	810	1.14%	2.96%
2019	6,950	833	1.40%	2.76%
2020	7,016	856	0.94%	2.69%
2021	7,090	879	1.04%	2.62%
2022	7,170	901	1.12%	2.44%
2023	7,243	923	1.01%	2.38%
2024	7,317	945	1.01%	2.33%
2025	7,394	966	1.04%	2.17%
2026	7,469	988	1.00%	2.23%

Notes: Highest actual monthly populations for 2002 through 2016 are shown in darker background color.

ADMISSIONS AND RELEASES

Figure 3 shows the relationship between admissions and releases for male inmates relative to the monthly high population figure for each month from July 2011 - December 2015. Positive percentages indicate months where admissions outpaced releases. Admissions have outpaced releases in nearly every month since November, 2013, but the difference between admissions and releases is quite small. This data confirms the relative stability of the male inmate population since FY 2012. Figure 4 illustrates the relationship between admissions and releases for female inmates relative to the monthly high population figure for each month from July 2011 and December 2015. The difference between admissions and releases is significant, which accounts in part for the growth in the female inmate population.

Figure 3. Monthly Male Net Change (Admissions-Releases)
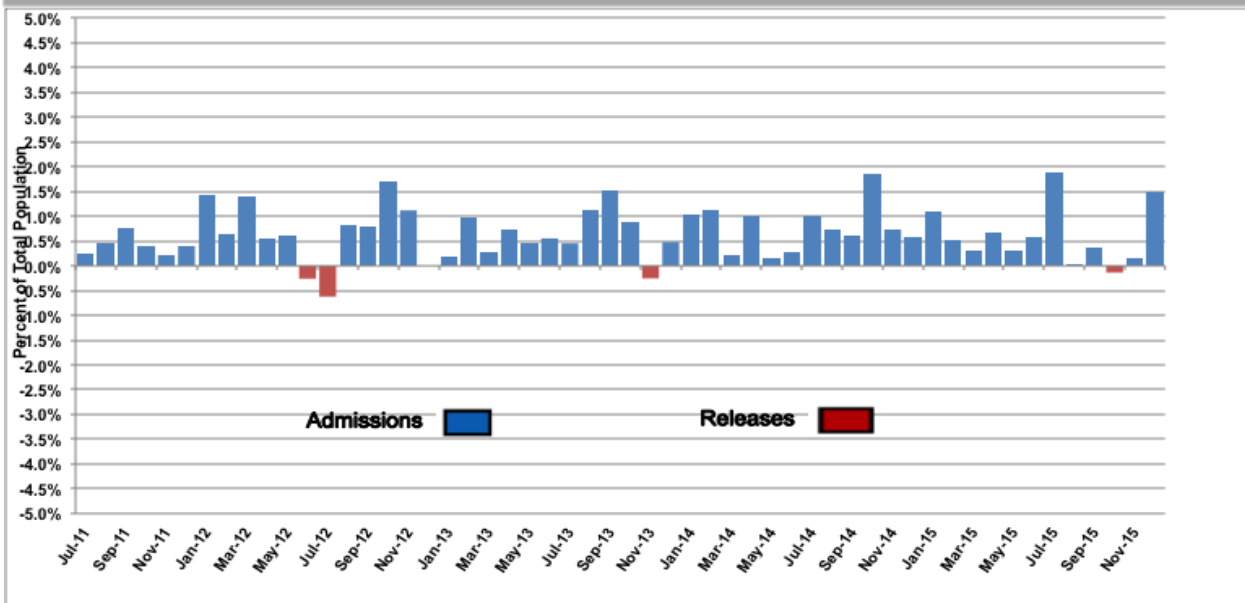
Figure 4. Monthly Female Net Change (Admissions-Releases)
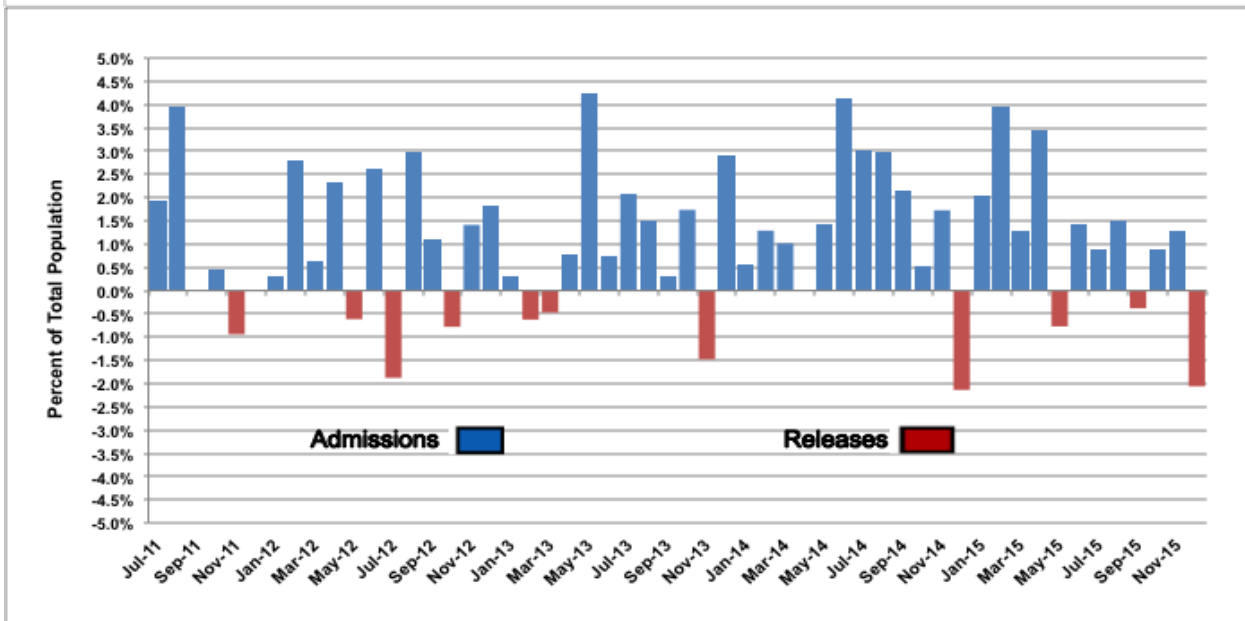
NEW ADMISSIONS AND PAROLE ADMISSIONS

Figure 5 shows the trends for new and parole admissions for male inmates. The data reflects admissions for the time period July 2011 through December 2015. Admissions for new offenses outpace parole admissions in every month during that time period.

Figure 6 shows the trend for new and parole admissions for female inmates. The data reflects admissions for the time period July 2011 through December 2015. However, admissions for new offenses outpace parole admissions in every month.

Figure 5. Quarterly NMCD New and Parole Admissions for Males: July 2011-December 2015
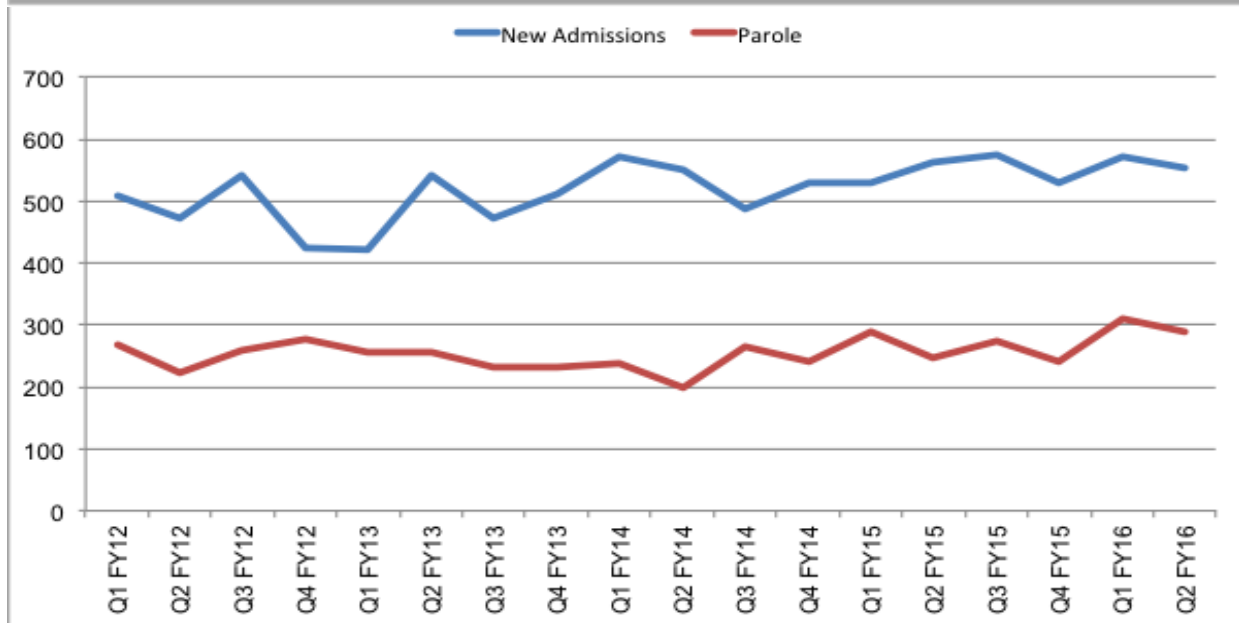
Figure 6. Quarterly NMCD New and Parole Admissions for Females: July 2011-December 2015
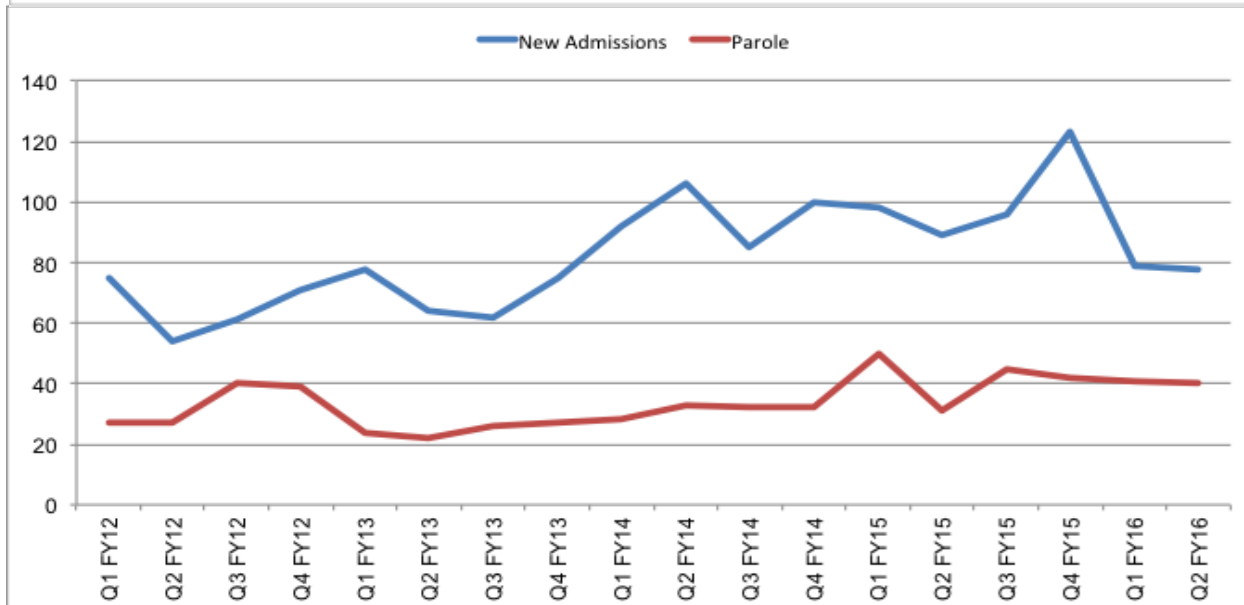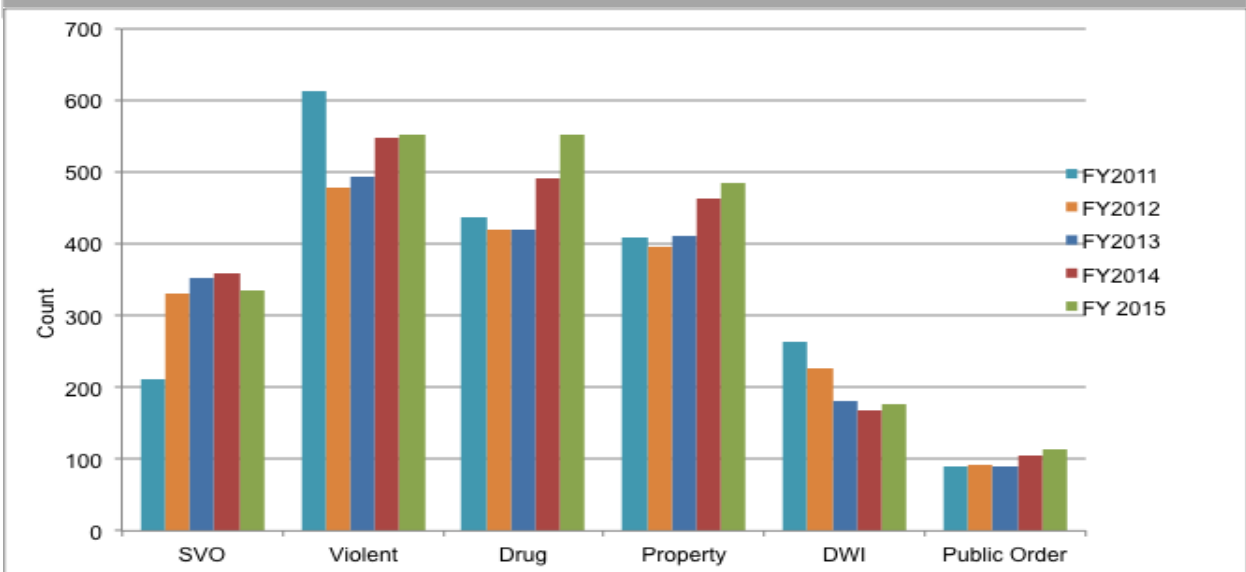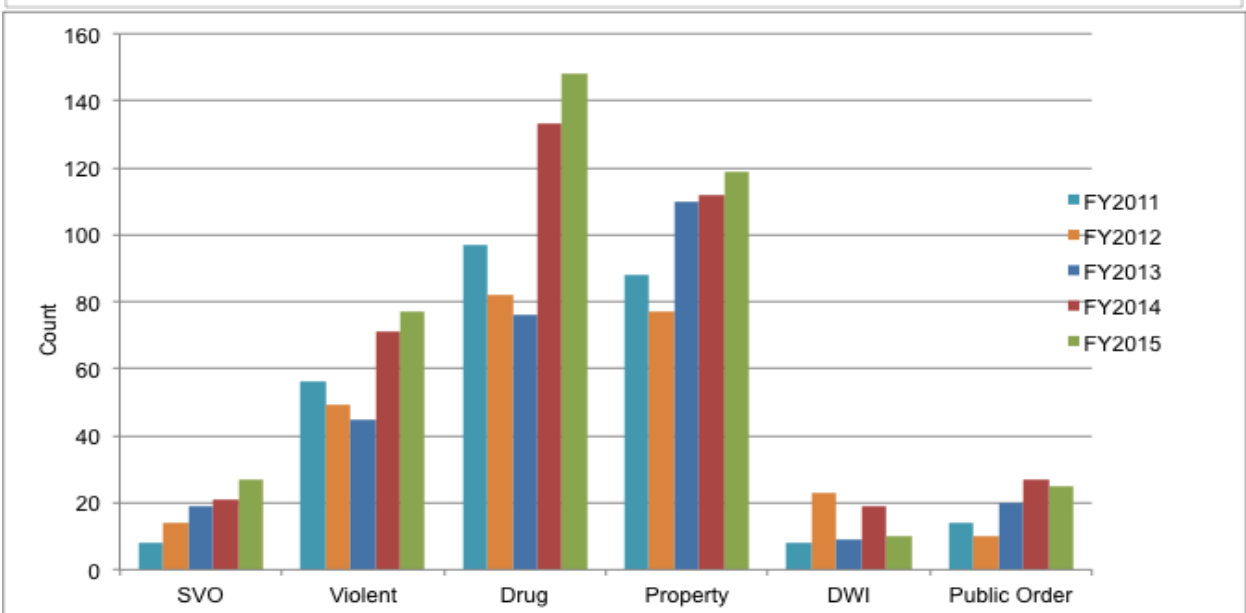
NEW ADMISSIONS BY CHARGE TYPE

Figure 7 illustrates new admissions by charge type for male inmates. Table 2 provides additional detail. For all five fiscal years illustrated in Figure 7, violent offenses are the largest category for new admissions. Also, new admissions for serious violent offenders continues to trend upward. For several fiscal years, new admissions for drug offenses have been evenly divided between drug possession and drug trafficking offenses. The number of new admissions for felony DWI offenses continues to decline.

Figure 8 illustrates new admissions by charge type for female inmates. Table 3 provides additional detail. For all five fiscal years, property offenses and drug offenses are the largest categories for new admissions. Although it remains a small total number, new admissions for serious violent offenses have been trending upward. Between FY 2012 (23) and FY 2013 (9), there was a significant decline in new DWI admissions, but in FY 2014 (19) that trend ceased.

Figure 7. Males New Admissions by Charge Type and Year (FY2011-2015)

### Figure 8. Females New Admissions by Charge Type and Year (FY2011-2015)

Table 2. Male Admissions Over Time	FY2011	FY2012	FY2013	FY2014	FY2015
New Admissions					
Violent Crimes					
SVO	211	331	353	360	336
Other Violent (e.g., kidnapping, robbery, child abuse)	314	233	219	257	238
Sex Crime	78	60	40	57	59
Assault & Battery	221	185	235	234	256
Property Crimes					
Burglary	214	229	203	238	232
Other Property (e.g., larceny, arson, fraud)	195	168	208	226	253
Drug Crimes					
Drug Trafficking	212	211	221	235	268
Drug Possession	226	209	199	257	285
Public Order Crimes					
DWI	263	226	182	169	176
Other Public Order (e.g., possession of weapon by felon, bribery of witness, escape from custody)	90	93	89	105	113
Parole	938	1,028	979	945	**1,074**
Other Admission Types (e.g., probation, diagnostic)	559	468	422	443	**367**
TOTAL	**3,521**	**3,441**	**3,350**	**3,526**	**3,657**

Table 3. Female Admissions Over Time					
	FY2011	FY2012	FY2013	FY2014	FY2015
New Admissions					
Violent Crimes					
SVO	8	14	19	21	27
Other Violent (e.g., kidnapping, robbery, child abuse)	43	33	25	54	51
Sex Crime	2	1	2	2	4
Assault & Battery	11	15	18	15	22
Property Crimes					
Burglary	18	18	19	34	30
Other Property (e.g., larceny, arson, fraud)	70	59	91	78	89
Drug Crimes					
Drug Trafficking	61	44	34	62	74
Drug Possession	36	38	42	71	74
Public Order Crimes					
DWI	8	23	9	19	10
Other Public Order (e.g., possession of weapon by felon, bribery of witness, escape from custody)	14	10	20	27	25
Parole	127	133	99	125	168
Other Admission Types (e.g., probation, diagnostic)	83	79	74	81	82
TOTAL	**481**	**467**	**452**	**589**	**656**

Appendix A.

| Table 4. MALE ACTUAL, FORECAST and PERCENT DIFFERENCE: FY 2016				Table 5. FEMALE ACTUAL, FORECAST and PERCENT DIFFERENCE: FY 2016			
DATE	ACTUAL	FORECAST	% DIFF	DATE	ACTUAL	FORECAST	% DIFF
Jul-15	6,625	6,517	-1.63%	Jul-15	786	806	2.54%
Aug-15	6,641	6,533	-1.63%	Aug-15	791	812	2.65%
Sep-15	6,624	6,551	-1.10%	Sep-15	790	820	3.80%
Oct-15	6,625	6,555	-1.06%	Oct-15	790	833	5.44%
Nov-15	6,626	6,560	-1.00%	Nov-15	785	831	5.86%
Dec-15	6,678	6,542	-2.04%	Dec-15	778	833	7.07%
Jan-16	6,654	6,530	-1.86%	Jan-16	765	828	8.24%
Feb-16	6,678	6,553	-1.87%	Feb-16	779	843	8.22%
Mar-16	6,727	6,570	-2.33%	Mar-16	769	847	10.14%
Apr-16	6,707	6,583	-1.85%	Apr-16	756	855	13.10%
May-16	6,694	6,576	-1.76%	May-16	760	852	12.11%
Jun-16	6,674	6,573	-1.51%	Jun-16	764	855	11.91%

Figure 9. Actual Male Prison Population and Forecast: July 2012 to June 2018
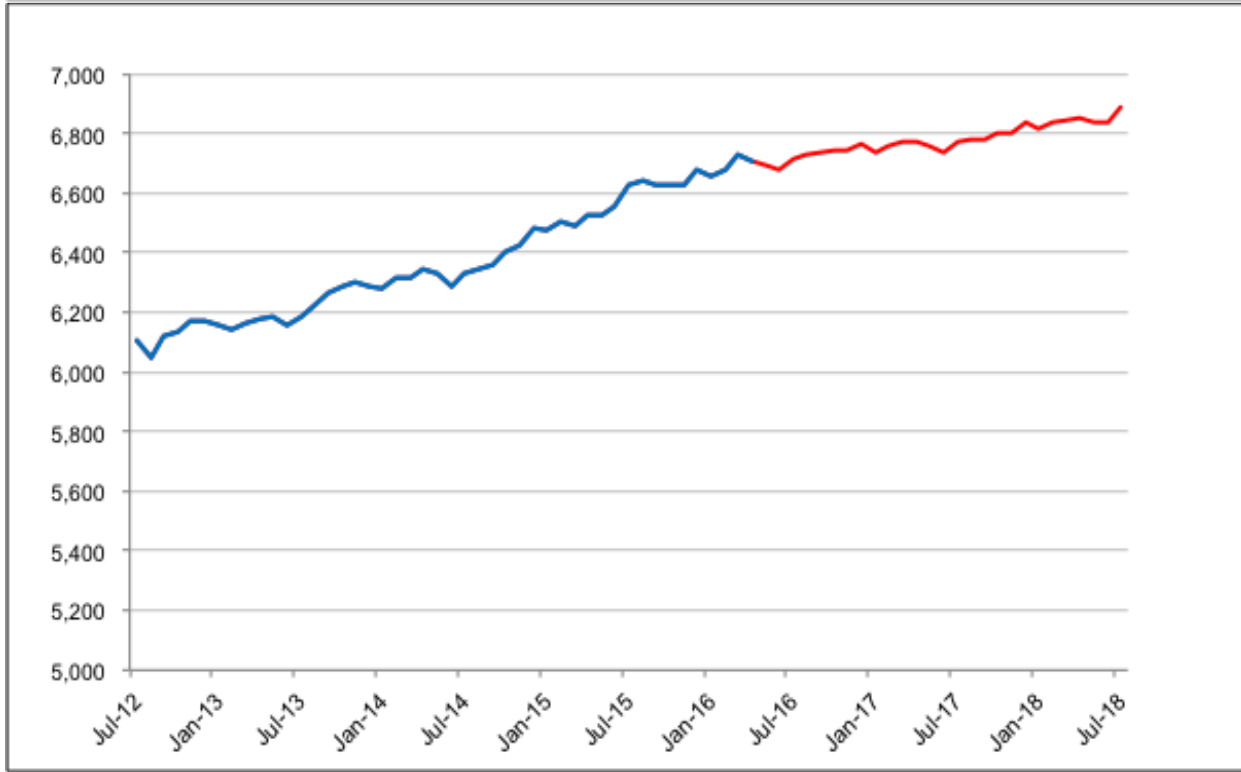
Table 7. MALE POPULATION PROJECTIONS: July 2016 to June 2026

Month	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
January	-	6,738	6,817	6,906	6,980	7,054	7,132	7,206	7,281	7,357	7,432
February	-	6,761	6,838	6,928	7,001	7,075	7,153	7,228	7,302	7,378	7,453
March	-	6,773	6,846	6,950	7,016	7,089	7,170	7,243	7,317	7,394	7,469
April	-	6,775	6,853	6,945	7,016	7,090	7,168	7,242	7,317	7,393	7,468
May	-	6,757	6,839	6,930	6,999	7,074	7,153	7,227	7,302	7,378	7,452
June	-	6,735	6,838	6,918	6,985	7,065	7,142	7,215	7,291	7,367	7,441
July	6,718	6,775	6,885	6,959	7,027	7,109	7,184	7,257	7,334	7,409	-
August	6,730	6,783	6,894	6,969	7,035	7,118	7,193	7,266	7,342	7,418	-
September	6,733	6,783	6,887	6,966	7,032	7,113	7,189	7,262	7,338	7,414	-
October	6,742	6,798	6,893	6,974	7,043	7,121	7,198	7,271	7,347	7,423	-
November	6,743	6,804	6,894	6,975	7,045	7,123	7,199	7,273	7,349	7,424	-
December	6,762	6,838	6,931	7,004	7,077	7,156	7,230	7,305	7,381	7,456	-

Figure 10. Actual Female Prison Population and Forecast: July 2012 to June 2018
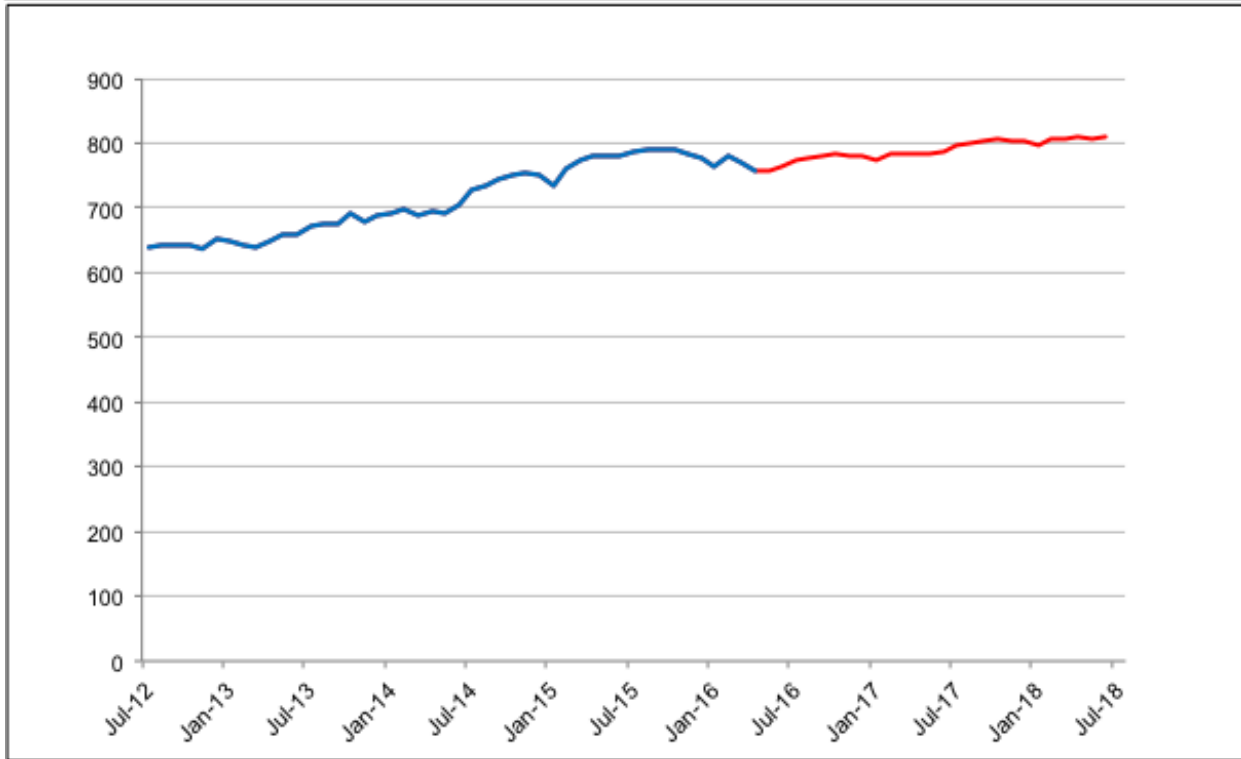
Table 8. FEMALE POPULATION PROJECTIONS: July 2016 to June 2026

Month	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
January		774	798	821	844	867	889	911	933	955	976
February		784	807	831	854	876	899	921	943	964	986
March		784	807	830	853	876	898	920	942	964	985
April		785	809	832	855	877	900	922	944	965	987
May		785	808	831	854	877	899	921	943	965	986
June		786	810	833	856	879	901	923	945	966	988
July	775	796	820	843	866	888	911	933	955	976	
August	778	801	825	848	871	893	915	938	959	981	
September	781	805	828	851	874	897	919	941	963	984	
October	783	807	830	853	876	898	921	943	964	986	
November	781	804	827	850	873	895	918	940	961	983	
December	780	803	827	850	872	895	917	939	961	982	

Introduction

Prison population forecasts are essential for prison administrators and policy makers to make management and budget decisions. Prison population forecasts are also significant for legislators to make informed decisions when passing laws that potentially affect prison populations.

The growth of prison populations in the past 30 years has made prison population forecasts necessary. In 1970, the state and federal prison population was less than 190,000. The latest report by the U.S. Department of Justice put the 2013 state and federal prison population at nearly 1.6 million. U.S. Department of Justice 2014). Between 1970 and 2011 the U.S. state and federal prison population grew by approximately 700% (PEW Public Safety Performance Project 2011). The prison population increase slowed between 1990 and 2000, but still grew by 69% over that time period (U.S. Department of Justice 2001). Martinez (2009) made the argument that prison population forecasts are crucial due to the length of time it takes to build a new prison. After legislators have approved funding for construction of a new prison, it can take two years for a prison to be built and staffed. Without prison population forecasts and with a continuing trend of increasing prison populations, prisons would become overcrowded for years before relief from a new prison comes to fruition.

Legislative and policy decisions have a direct impact on prison populations. According to a report produced by the Federal Bureau of Investigation in 2004, U.S. crime rates decreased in the previous10 years, but the prison population for that time period increased. The cause of the prison population increase has been attributed in part to changes in sentencing laws, including: longer prison sentences for some crimes; three strikes legislation; stricter habitual offender laws; an increase in mandatory minimum stays;

tougher policies imposed on criminals in prison, on parole or probation; and the war on drugs (Martinez, 2009).

Prison Population Forecast Models: Then and Now

Since the 1960s, trying to project future prison populations has proven difficult. In 1984, the Federal Bureau of Prisons (BOP) announced:

> ". . . The 'state of the art' for predicting prison populations is still in its infancy and accurate and reliable methodologies simply do not exist. Our review of numerous prison population projection studies conducted by national experts reveals, with the wisdom of hindsight, that their projections have continually been in error."

In 1984, the General Accounting Office (GAO) surveyed the BOP, the District of Columbia, and the 50 states to find what methods were used to forecast prison populations. The GAO found that states used more than one method to forecast. Fifty-two percent analyzed admissions and releases to forecast prison populations. Nineteen states (38%) used trend analysis based on past prison populations, 17 (34%) performed a simulation of policies and practices then assessed how changes would impact the prison population. Thirteen states (26%) performed linear regressions using factors such as unemployment rates, which seemed to correlate to prison populations when the rates are lagged six months to a year. Twelve states (24%) used multiple linear regression, 20% projected future populations based on design or rated capacity of their facilities. Two states based projections on a "consensus statement" or group opinion (GAO, 1984).

In 2008, the American Correctional Associations in its journal, *Corrections Compendium*, published results of a survey of US and Canadian correctional systems. The agencies were asked to project their populations for the years 2008, 2010 and

2012. The survey found 28 U.S. correctional systems perform internal projections. The systems used a variety of methods including stochastic models, which mimic the actual flow of the correctional system based on current and future probabilities of being admitted to prison under a particular legal status, with a certain sentence for a certain crime, and being released at a certain time based on probabilities of receiving good time and being released on parole, a flow model method pioneered in Texas, auto-regression integrated moving average (ARIMA), and a micro-simulation model. These micro simulation models are designed to mimic the flow of (1) the current prisoner population, and (2) the expected new admissions over the projection horizon based on these internal factors (PEW Public Safety performance Project 2011). Agencies also reported analyzing their own historical population data and conducting a general simulation of admissions, lengths of stay, and departures. If not developed and performed within their systems, the departments identified outside sources such as JFA Associates, the Connecticut Office of Policy and Management, a local university, the Criminal Justice Estimating Conference, and specific state agencies and boards. Twenty-seven agencies reported their figures were considered to be accurate or reasonably so, higher by 5 of the agencies and lower by 7 of the agencies (Corrections Compendium, 2008).

Traditionally, prison populations were estimated using time series or trends analysis. This was easy to do since the historic counts were readily available and it required little skill to use such methods. These methods were very inaccurate, especially in an environment where policy is very dynamic. Time series models can show only what has already occurred. They can not estimate the future populations based on current or future criminal

justice policies and sentencing legislation (PEW Public Safety Performance Project 2011).

In the past it was thought that the total number of citizens in the population primarily affected the prison population. Based on this assumption, prison populations were expected to reach their pinnacle in the 1990s and start their decline with baby boomers passing out of the crime age population (18-36) (Barnett, 1987). As we now know, the rate of growth of prison populations has slowed, proving the inadequacy of predicting prison population growth on the total population of citizens in the community.

Prison population forecast models based on historical population data, admissions, lengths of stay, and departures are limited to the scope of population growth trends and legislation that are current at the time the forecast is run (Barnett, 1987). More advanced models such as the flow, stochastic, autoregression integrated moving average (ARIMA), and micro-simulation models are considered to be more accurate than models based on primarily historical data and can be adjusted to include changes in policies and practices (Martinez, 2008).

Conclusion

Experts agree that predicting prison population is not an exact science. Predicting prison populations is a combination of facts and probabilities (Martinez, 2009). The state of the art prison population forecast model does not currently exist. The rapid advancement of computer technology should be utilized to produce the state of the art prison population forecast model. Experts believe the state of the art prison population forecasting model should be:

- A computer simulated model (BOP 1984, Martinez 2008)
- Intuitive so those who do not regularly deal in statistical mathematical concepts could understand the prediction output and could input their own queries (Martinez 2008)
- Able to answer 'what if' scenarios to help legislatures make informed decisions when passing laws that affect prison populations (Martinez 2008)
- Capable of taking into account the vast number of variables to produce an accurate forecasting model (BOP 1984, Martinez 2008).

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APPENDIX C: METHODOLOGY

The prison population time series forecasts used to produce this report are based on observed prison population data. It is understood that there are many factors that drive prison populations, including demographic trends, arrest rates, the number of criminal cases filed in district court, conviction rates, the availability of diversion programs, sentence lengths, admission rates and release rates, availability of earned meritorious deductions and parole readiness. The observed prison population is a result of all those factors and others. When new laws or polices come to bear which significantly affect the prison population, it is recommended that a new long-term forecast be produced which incorporates new data that reflects the changes.

Time series forecasting consists of examining historical prison population data, identifying potential methods for the forecast, fitting the data to a model which will use the data to produce a forecast into the future, and then testing the model. Testing includes assessing the overall model fit, producing estimates and comparing those estimates to actual data to see how well the chosen model performs. Diagnostic checks are applied to the differences between the estimated and actual counts to ensure that the model adequately explains and extracts all information that the historical data has to offer. It may turn out that more than one model specification fits the data well. When choosing between different candidate models, there are fit statistics produced for each model that can be compared.

The methodology described above was augmented at various steps by conversations with colleagues who have historical knowledge regarding prison population trends, factors that drive population and insight into population patterns. Moreover, Sentencing Commission staff held quarterly meetings with New Mexico Corrections Department staff to discuss inmate population trends. This information was crucial for choosing the starting date from which to forecast for males and females, respectively.

Next, examination of the daily and monthly high counts for males and then females was conducted via graphical analysis of the historical data plotted against time. As a result of this analysis, we came to the two following conclusions: 1) that the men's and women's population should be modeled separately and 2) that using monthly high population counts would be the best way to proceed.

Working with the male and female population time series data separately, we moved from graphical analysis to fitting and diagnosing models. In previous forecasts, it was apparent that each time series called for a different methodology in order to produce the forecasts. For the males, an Exponential Smoothing (ES) model was used and for the females the Box Jenkins method was used to specify an Autoregressive Integrated Moving Average (ARIMA) model. However, trend analysis by fiscal year for both males and females illuminated a marked difference between FY 2015 and FY 2016 (through April, 2016). The male trend decreased in FY 2016, but remained positive. The slope of the female trend line changed from positive to negative. In consideration of these recent changes, the ES model was tested for both. However, more robust ARIMA specifications were chosen for both the males and the females.

MALES

The historical monthly high data for males included the time range beginning April, 2004 through April, 2016. The starting date was chosen after initial examination of the historical data, discussions among staff and then performing model fitting and diagnostics. The Winters Additive (WA) model (an ES model) had performed well for the last four years, and it tested well as usual for the current time frame. However, it was found that an ARIMA model was best suited to handle the male data given recent trend changes. The reason is that for the ES method, the forecasts are based on weighted averages where the future values are weighted averages of past population observations, with more recent observations given more weight in the forecast than population observations in the more distant past. The ARIMA model utilizes more information from the data system. The primary difference in the two methodologies is that the auto and partial autocorrelation functions are examined graphically to identify potential models. These show how correlated each value is with its past value for a number of periods in the past. They also aid in ARIMA model identification, including whether a difference is needed to account for non-random patterns in the data, such as seasonal effects.

Choosing an appropriate forecasting model for the men entailed utilizing the Box Jenkins method to specify an ARIMA model as well as testing the WA model. The data was fit to a series of seasonal ARIMA models. After careful consideration of the changes the system of data had recently exhibited, an ARIMA model was chosen. The data was found to follow an

autoregressive (AR) of order 2, moving average (MA) of order 1. The seasonal components are: (AR) of order 2 and seasonal difference of order 1. Predicted and actual values were compared for the time period of July 2015 – May 2016. Of particular interest is the percent difference between the two. The percent difference ranged from -0.77% to 0.99%. The values for April and May are 0.67% and 0.02%, respectively.
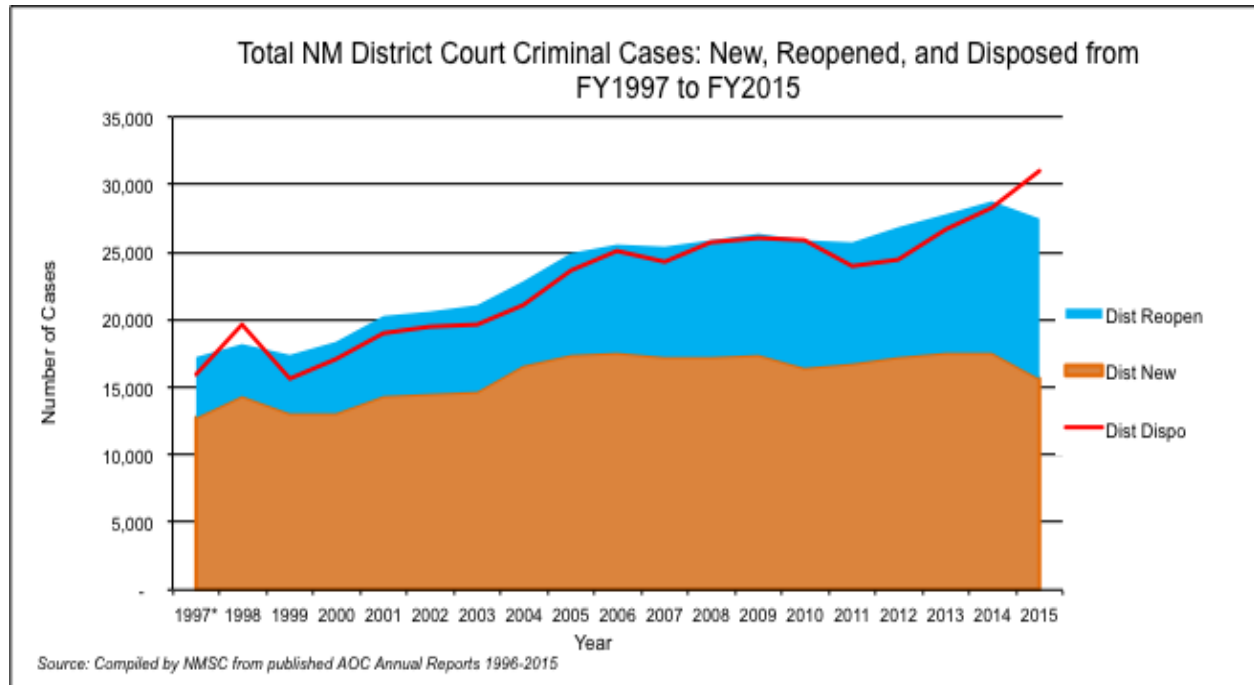
FEMALES

The historical monthly high data for females includes the time range beginning July 2010 through April 2016. The starting date was chosen after performing graphical analysis and conversations with colleagues regarding recent history specific to the female population. The information regarding recent history was important in choosing a time frame in which the population could be expected to exhibit a relatively stable pattern. However, it should be noted that FY 2016 (through April, 2016) is the only FY to show an overall downward trend within our chosen time frame. This is in sharp contrast to the trend exhibited in FY 2015.

Choosing an appropriate forecasting model for the women entailed utilizing the Box Jenkins method to specify an ARIMA model, as has been done for the last four years. However, the starting date and process were changed for the current forecast: last year the forecast used a starting date of July, 2011 as well as a two-step process. It performed well in the very short-term; most likely because of the steady increase in rate of the population in FY 2014 and FY 2015 (through April, 2015). It did not capture the more recent decreasing rate. Given the recent changes, it was deemed prudent and relevant to use all available information the data had to offer for this forecast, including the FY 2011 data, which exhibits a relatively flat trend.

Specification of the forecasting model for the female population entailed exploration and testing of ES models first. Next, the data was fit to a series of seasonal ARIMA models. After careful consideration of the changes the system of data had recently exhibited, and the relatively high uncertainty regarding the direction of and magnitude growth for the future population, an ARIMA model was chosen. The data was found to follow an autoregressive (AR) of order 3, seasonal difference of order one and seasonal (MA) of order one.

This model tested better than the other ARIMA candidates. It also performed well with respect to the ability to capture the recent downward trend.

Predicted and actual values were compared for the time period of July 2015 – May 2016. Of particular interest is the percent difference between the two. The percent difference ranged from -0.52% to 2.20%, with seven of the 11 differences less than 1.0%. The values for April and May are 1.80% and -0.50%, respectively.

Total NM District Court Criminal Cases: New, Reopened, and Disposed from FY1997 to FY2015

Source: Compiled by NMSC from published AOC Annual Reports 1996-2015

New Mexico District Court Criminal Cases FY1997 to FY2015				
Year	New Cases	Reopened	New + Reopened	Total Disposed
1997	12,743	4,570	17,313	15,905
1998	14,290	3,848	18,138	19,635
1999	13,101	4,327	17,428	15,625
2000	12,995	5,300	18,295	17,119
2001	14,349	5,991	20,340	18,972
2002	14,449	6,141	20,590	19,453
2003	14,718	6,372	21,090	19,660
2004	16,522	6,349	22,871	21,007
2005	17,439	7,530	24,969	23,708
2006	17,482	8,071	25,553	25,083
2007	17,206	8,139	25,345	24,224
2008	17,226	8,657	25,883	25,648
2009	17,359	8,983	26,342	26,111
2010	16,509	9,396	25,905	25,963
2011	16,796	8,888	25,684	24,018
2012	17,169	9,616	26,785	24,365
2013	17,572	10,285	27,857	26,649
2014	17,591	11,140	28,731	28,304
2015	15,701	11,749	27,450	30,952