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**Juveniles Charged as Adults and Held in
Adult Detention Facilities:
Trend Analysis and Population Projections**

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**By
Maryland Department of Juvenile Services
Office of Budget and Fiscal Services
Governor's Office of Crime Control & Prevention**



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Executive Summary

In Maryland, juveniles who are alleged to have committed a delinquent act and are determined to require secure detention are typically held in one of the state's juvenile detention facilities. Under certain circumstances, Maryland law authorizes youth to be held in adult pre-trial detention facilities. Youth may be admitted to an adult detention facility and detained pending trial if:

- the youth has been directly charged as an adult because the juvenile court does not have jurisdiction due to the age of the juvenile and the nature of the alleged offense.¹
- after a hearing, the juvenile court waives its jurisdiction to the adult court.

Conversely, if the youth is eligible for a transfer of jurisdiction to juvenile court, Maryland law permits an adult court, after review of the youth's charges and circumstances, to order a youth to be held in a juvenile detention facility.²

The focus of this report is the population of youth charged as adults and held in adult detention facilities (in accused status) in Maryland. The Maryland Department of Juvenile Services (Department) partnered with the Governor's Office of Crime Control & Prevention (Office) to develop a forecast of the population of juveniles charged as adults and detained in state and local detention facilities. Data collected as part of the Compliance Monitoring Data Collection System maintained by the Office were used for this purpose. Compliance data are systematically collected by the Office to ensure that Maryland meets the requirements of the Juvenile Justice and Delinquency Prevention Act with regard to juveniles held in adult jails (e.g., sight and sound separation from adult offenders). The Office collects these data biennially from detention facilities in Maryland and they are deemed the best available electronic source of juvenile admissions to pre-trial adult detention facilities.

There were issues that limited the amount of data available for analysis and necessitated an estimation of length-of-stay for juveniles in adult facilities changing from accused status to sentenced status. (The data issues pertaining to this population are described in Section 1.) Based on the assumption of 8-month maximum stay for missing release date:

- The annual average daily population increased from 159 to 201 during FY2011 and FY2012, and then decreased during the last three fiscal years, falling to 128 in FY2015.
- In March 2014, the monthly average daily population peaked at 173, the highest it has been since January 2013.

¹ Maryland Department of Juvenile Services, *Department of Juvenile Services: Overview of the Youth Charged as Adults Population*, December 2012.

² Md. Code, Criminal Procedure, §4-202

In 2014, the Department entered into an agreement with Baltimore City such that the Department will house qualified juveniles who have been charged as adults and would otherwise be held in the City’s adult pre-trial detention center. Juveniles housed by the Department through this agreement are included in the population figures discussed above.

During the 2015 session of the Maryland General Assembly, the law³ regarding pre-transfer detention for youth charged as adults was amended to create a presumption that youth charged as adults should be held in a juvenile detention facility. Effective October 1, 2015, the court shall order a youth charged as adult who is eligible for transfer to the juvenile system to be held in a juvenile detention facility while pending that transfer decision unless: (1) the youth is released on bail, recognizance or other pre-trial condition;(2) there is no capacity in the secure juvenile facility; or (3) the court finds that detention in a secure juvenile facility would pose a risk of harm to the child or others, and states the reasons for the finding on the record.

Admissions and length-of-stay are critical drivers of the population. Data indicate:

- The number of juveniles charged as adults admitted to pre-trial detention decreased by 35% between FY2011 to FY2014, and then increased by 14% from FY2014 to FY2015.
- Juvenile admissions in FY2015 were mostly males, black, and age 17.
- Juveniles charged with robbery and assault offenses together accounted for nearly two-thirds of total admissions in both FY2011 and FY2015.
- Length-of-stay for juveniles held in adult facilities decreased from FY2012 to FY2015, while the length-of-stay for juveniles held in Department-operated facilities increased.

Population Projections

Population of Juveniles Charged as Adults and Held in Adult Detention Facilities in Accused Status and Maryland Department of Juvenile Services Facilities

	Year	Average Daily Population
Historical	FY2011	159
	FY2012	201
	FY2013	159
	FY2014	147
	FY2015	128
	FY2016*	146
Projected	FY2016	160
	FY2017	174
	FY2018	151
	FY2019	143
	FY2020	158

*146 for FY2016 in historical is the average of daily population for July through October 2015.

³Chapter 422, 2015 Laws of Maryland. see Md. Code, Criminal Procedure, §4-202

Projections for the population of juveniles charged as adults and held in Maryland's adult detention facilities (specifically those in accused status) and juvenile detention facilities were developed using an estimate of 8-month maximum length of stay for any missing release date. Projections were produced using a set of statistical techniques known as time-series forecasting. Such models implicitly assume that current policies and practices will continue into the future. The projections are shown in Section 3 disaggregated by facility. Moreover, the trend of monthly average daily population in FY2015 and the first few months of FY2016 are provided in Section 3 to explain the increase of projected population in FY2016 and FY2017.

Such projections may assist the Department to identify ways in which some of the youth charged as adults in Maryland might be served in a juvenile detention facility rather than an adult pre-trial facility. However, not all youth charged as adults are eligible for transfer to a juvenile detention facility. Maryland statute prohibits the transfer of cases to juvenile court if:

- 1) the youth was convicted in an unrelated case of an offense excluded from the jurisdiction of the juvenile court, or
- 2) the alleged crime is murder in the first-degree and the accused youth was 16 or 17 years of age when the alleged crime was committed.

Juveniles whose cases are ineligible for transfer from adult court to juvenile court may not be transferred to a juvenile detention facility while awaiting trial. The data available for this study, however, do not include information necessary to consistently identify those prohibited from transfer due to a previous conviction ((1) above). Only a small number of juveniles charged with violations of adult probation, indicative of a prior conviction in the adult system, could be identified. The data do permit the identification of youth ineligible for transfer due to a first-degree murder charge ((2) above).⁴ The historical and projected average daily population is shown below excluding ineligible juveniles charged with violations of probation or first-degree murder.

⁴ Only completed acts were identified here.

**Population of Juveniles Charged as Adults and
Held in Adult Detention Facilities in Accused Status and
Maryland Department of Juvenile Services Facilities***

	Year	Average Daily Population
Historical	FY2011	154
	FY2012	194
	FY2013	154
	FY2014	142
	FY2015	121
Projected	FY2016	154
	FY2017	168
	FY2018	145
	FY2019	137
	FY2020	152

* Excluding juveniles 16 years of age or older charged with first-degree murder and juveniles returned to the adult system for a violation of probation.

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Introduction

Maryland juveniles who are alleged to have committed a delinquent act and are determined to require secure detention may be held in juvenile detention facilities or, under certain circumstances, adult pre-trial facilities. A juvenile may be admitted to an adult detention facility and detained pending trial if he or she has been directly charged as an adult because the juvenile court does not have jurisdiction.⁵ Maryland's juvenile courts do not have jurisdiction over:

- a youth at least 16 years old alleged to have committed certain violent crimes;
- a youth at least 16 years old alleged to have violated certain traffic or boating laws;
- a youth at least 14 years old alleged to have committed an act that, if committed by an adult, would be a crime punishable by death or life imprisonment, and;
- a youth who has previously been convicted as an adult of a felony and subsequently is alleged to have committed an act that would be a felony if committed by an adult.⁶

Youth may also be detained in an adult detention facility if the juvenile court waives its jurisdiction to the adult court. A juvenile court may waive its jurisdiction in a delinquency case involving a child who is 15 years or older, or a child who has not reached his/her 15th birthday but is charged with committing an act which, if committed by an adult, would be punishable by death or life imprisonment.⁷ The juvenile court may waive its jurisdiction only after it has conducted a waiver hearing and determined that the child is unfit for rehabilitation in the juvenile system. Conversely, Maryland law permits an adult court, after review of the youth's charges and circumstances, to order a youth with an adult charge to be held in a juvenile detention facility if the youth is eligible for a transfer of jurisdiction.⁸ Youth found to be appropriate for juvenile detention may remain there pending a transfer hearing to determine if jurisdiction should remain in the adult court or be transferred to the juvenile court.

During the 2015 session of the Maryland General Assembly, the law⁹ regarding pre-transfer detention for youth charged as adults was amended to create a presumption that youth charged as adults should be held in a juvenile detention facility. Effective October 1, 2015, the court shall order a youth charged as adult who is eligible for transfer to the juvenile system to

⁵ Maryland Department of Juvenile Services, *Department of Juvenile Services: Overview of the Youth Charged as Adults Population*, December 2012.

⁶ Md. Code, Courts and Judicial Proceedings, §3-8A-03

⁷ Maryland Department of Juvenile Services, *Department of Juvenile Services: Overview of the Youth Charged as Adults Population*, December 2012.

⁸ Md. Code, Criminal Procedure, §4-202

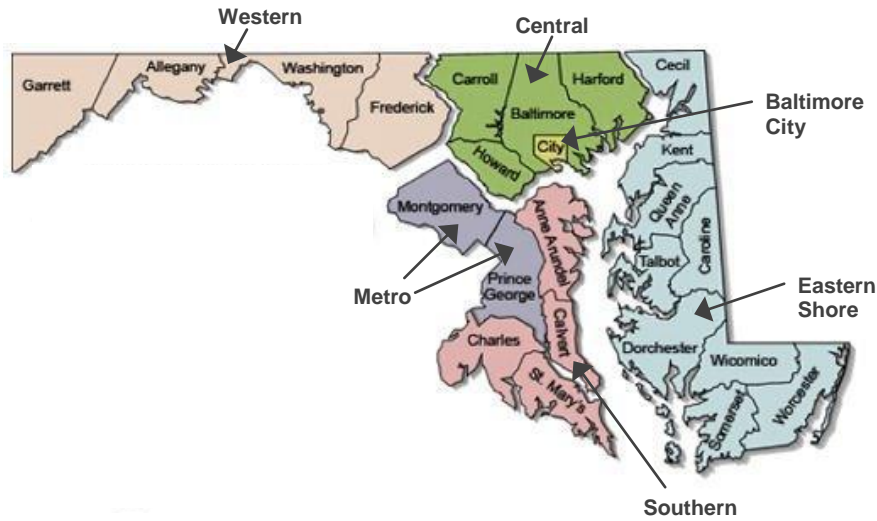
⁹ Chapter 422, 2015 Laws of Maryland. Md. Code, Criminal Procedure, §4-202

be held in a juvenile detention facility while pending that transfer decision unless: (1) the youth is released on bail, recognizance, or other pre-trial condition; (2) there is no capacity in the secure juvenile facility; or (3) the court finds that detention in a secure juvenile facility would pose a risk of harm to the child or others, and states the reasons for the finding on the record.

This report focuses on the population of youth who are charged as adults and held in Maryland's adult detention facilities (in accused status) as well as in juvenile detention facilities. The Maryland Department of Juvenile Services (Department) partnered with the Governor's Office of Crime Control & Prevention (Office) to forecast the population of juveniles charged as adults and detained in state and local detention facilities. In Section 1, trends in the population, admissions, and length-of-stay are discussed. Important data issues pertaining to the population are also described in this section. In Section 2, factors that may contribute to changes in the population are examined. Projections of the population through FY2020 are presented in Section 3. The projections may assist the Department in identifying ways in which some of the youth charged as adults might be served in one of Maryland's juvenile detention facility instead of an adult pre-trial facility.

The Department's regions referenced in this report are shown on the map below.

Maryland Department of Juvenile Services Regional Map



Region I - Baltimore City

Baltimore City

Region II - Central Maryland

Baltimore County
Carroll County
Harford County
Howard County

Region III - Western Maryland

Allegany County
Frederick County
Garrett County
Washington County

Region IV - Eastern Shore

Caroline County
Cecil County
Dorchester County
Kent County
Queen Anne's County
Somerset County
Talbot County
Wicomico County
Worcester County

Region V - Southern Maryland

Anne Arundel County
Calvert County
Charles County
St. Mary's County

Region VI - Metro

Montgomery County
Prince George's County

Section 1 Population of Juveniles Charged as Adults and Held in Maryland’s Adult Detention Facilities

The population of juveniles charged as adults and held in Maryland’s adult detention facilities was calculated based on admission records collected as part of the Compliance Monitoring Data Collection System maintained by the Office. Compliance data are systematically collected on a biennial basis from local jails and detention centers in Maryland.¹⁰ These data were available in electronic format beginning in January 2008. Examination revealed, however, that data prior to FY2011 were not complete for all months and for all facilities.¹¹ Therefore, population figures were computed using data between FY2011 and FY2015. Due to missing data, the population computed for the early months of FY2011 may be lower than the actual population during that time period.

For juveniles charged as adults and admitted to adult pre-trial detention, some may be released, once certain conditions are met, to await trial. Other juveniles will remain in jail through the conclusion of their trial. If a confined juvenile is found guilty, his or her status will change from “accused” to “sentence.” Due to data limitations, the average daily population calculated from Compliance Monitoring Data Collection System admission and release dates cannot be disaggregated to determine the number of juveniles who became sentenced during their period of confinement.¹² In essence, the average daily population calculated represents an upper bound of the population of juveniles in accused status, since the actual population will not be higher and in most, if not all, months it will be lower than those figures.

¹⁰ Given the biennial nature of the Compliance Monitoring Data Collection System data collection effort, the facility release date – a field critical to the forecast – was often missing. Each local jail or detention facility was therefore asked to review their Compliance Monitoring Data Collection System submissions for accuracy and completeness and to fill in missing release dates. An excel spreadsheet was forwarded to each facility for this purpose. Each facility returned an updated spreadsheet to the Maryland Department of Juvenile Services for analysis.

¹¹ In early 2010, Office changed data collection systems and adopted a web-based system for submissions. During this conversion period, the Office relied in large part on hard copy submissions. Accurate counts of juvenile admissions to adult jails or detention facilities were not available between January and May 2010. In addition, a single facility was missing admissions prior to June 2010.

¹² Compliance Monitoring Data Collection System data are collected at the point of admission to a detention facility. A youth’s legal status (whether accused or sentenced) is recorded at this point in time. If a youth’s status changes from *accused* to *sentenced* during the course of their confinement period, the change in legal status is not documented. Therefore, for these youth, it is not possible to distinguish days served in pre-trial detention from days served post-sentence.

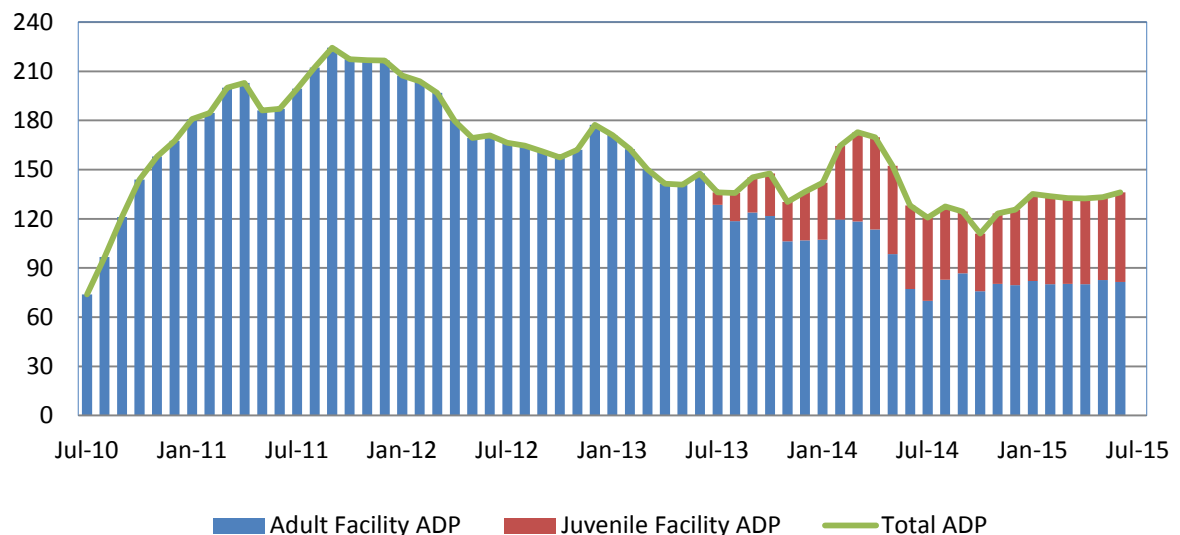
Compliance Monitoring Data Collection System data contain some missing release dates. The Department’s analysis revealed that during 2011, the median circuit court case processing time from arrest to adjudication was 8.2 months (i.e., half of the cases were concluded in less than 8.2 months and half were concluded after more than 8.2 months). To estimate the population with missing release dates, it was assumed that all juveniles charged as adults and admitted to adult detention facilities had become sentenced if they remained confined beyond eight months. Average daily population was then calculated using days served up to eight months for cases with missing release date.

In July 2013, an agreement was reached between the Department of Juvenile Services, the Department of Public Safety and Correctional Services, the Circuit Court for Baltimore City, the Baltimore City State’s Attorney, and the Public Defender regarding youth charged as adults in Baltimore City. Specifically, the parties mutually agreed that all youth charged as adults who are eligible for a transfer to the juvenile system will be housed in the Department-operated juvenile detention facilities while awaiting their transfer hearing. Juveniles housed by the Department through this agreement are included in the population trend analysis in this report unless other specified.

The historical monthly average daily population trend for juvenile charged as adults and held in both adult and juvenile detention facilities is presented in Figure 1.1 below. Based on the assumption of upper bound of length of stay (8-month) for cases with missing release date,

- the annual average daily population increased from 159 to 201 during FY2011-FY2012, and then decreased during the last three fiscal years, falling to 128 in FY2015.
- In March 2014, the monthly average daily population peaked at 173, the highest it has been since January 2013.

Figure 1.1
Population of Juveniles Charged as Adults and Held in Maryland's Detention Facilities



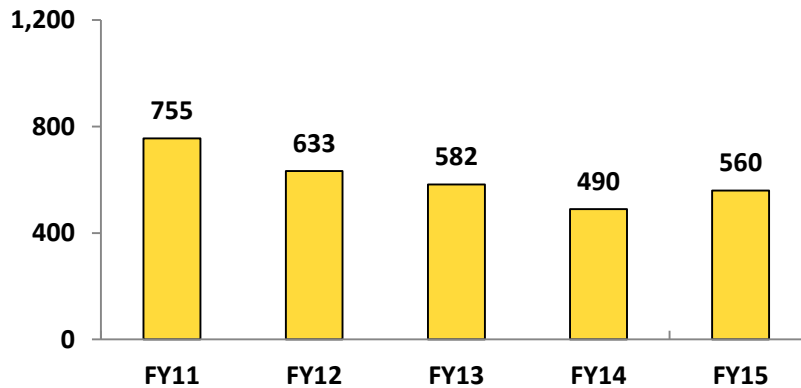
Average Daily Population FY2011-2015*

Fiscal Year	Adult Detention ADP	Juvenile Detention ADP	Total Detention ADP
FY2011	159	N/A	159
FY2012	201	N/A	201
FY2013	159	N/A	159
FY2014	112	35	147
FY2015	80	48	128

* Average daily population was calculated based on an assumption of 8-month maximum length of stay if juveniles had missing release date from detention facilities.

For any criminal justice population, the number of admissions is a key determinant of the size of the overall population. Available data indicate that, in FY2011, 755 juveniles charged as adults were admitted to adult pre-trial detention facilities (Figure 1.2). For this population, annual admissions decreased in FY2012 and FY2014 from 633 to 490, and then increased to 560 in FY2015. There were 26% fewer admissions in FY2015 than in FY2011.

Figure 1.2
Juvenile Charged as Adults and Admitted to Detention Facilities (Accused Status)*



* In order to avoid double-counting juveniles who were transferred to or from other facilities, figures shown here exclude admissions to the Baltimore City Detention Center and admissions to the Maryland Department of Juvenile Services juvenile facilities as courtesy holds.

The number of admissions is shown by facility in Figure 1.3 below. In Baltimore City, incoming arrestees are brought to the Central Booking and Intake Center. From there, juveniles who remained confined may be transferred to the Baltimore City Detention Center. All juveniles admitted to Baltimore City Juvenile Justice Center were also placed through Central Booking and Intake Center. Therefore, total admissions in this section excluded admissions to Baltimore City Detention Center and any other Maryland Department of Juvenile Services juvenile facilities to avoid over-counting.

Figure 1.3
Juveniles Charged as Adults and Admitted to Adult Detention Facilities
(Accused Status) and Maryland Department of Juvenile Services Juvenile Detention Facilities by
Facility, FY2013-2015

Facility	FY2013	FY2014	FY2015
Allegany County Detention Center	1	0	0
Anne Arundel County			
Jennifer Road Detention Center	25	26	29
Ordnance Road Correctional Center	3	7	3
Baltimore City			
Baltimore City Central Booking and Intake Center	161	146	156
Baltimore City Detention Center	113	118	138
Baltimore County Detention Center	94	85	123
Calvert County Detention Center	0	3	1
Caroline County Detention Center	1	2	3
Carroll County Detention Center	1	0	5
Cecil County Detention Center	7	2	6
Charles County Detention Center	12	3	7
Dorchester County Detention Center	2	3	1
Frederick County Detention Center	5	4	3
Garrett County Detention Center	1	0	0
Harford County Detention Center	14	7	8
Howard County Detention Center	11	12	8
Kent County Detention Center	1	0	0
Montgomery County Detention Center*	64	48	101
Prince George's County Detention Center	133	97	83
Queen Anne's County Detention Center	0	2	1
Somerset County Detention Center	3	4	2
St. Mary's County Detention Center	6	1	1
Talbot County Detention Center	4	4	2
Washington County Detention Center	14	6	6
Wicomico County Detention Center	14	22	6
Worcester County Jail	5	6	5
Juveniles charged as adults and held in Maryland Department of Juvenile Services (DJS) Facilities by agreement:			
Baltimore City Juvenile Justice Center	0	131	111
Other DJS Facilities	0	58	85
Total Admissions**	582	490	560

*Data from Montgomery County Detention Center and Montgomery County Correctional Facility were combined in the forecast due to data issues. Two years of admissions appear to have been misattributed in the Compliance Monitoring Data Collection System database. Where youth were transferred directly from one Montgomery facility to the other, the admission records were combined to create a single, continuous period of confinement.

**Total Admissions exclude admissions to the Baltimore City Detention Center and admissions to the Maryland Department of Juvenile Services facilities in order to avoid double-counting juveniles transferred to or from other facilities.

Juveniles charged as adults and admitted to detention facilities in FY2015 were mostly males, black, and age 17 (Figure 1.4). Males accounted for approximately 91.3% of the total admissions to adult detention facilities in FY2015. In FY2015, 80.4% of juveniles charged as adults and admitted in adult facilities were Black. White youth made up about 13.9% of the admissions, while other race groups (including Hispanic, Indian, Asian, and Other) accounted for 5.7%. For age at admissions, 17-year-old juveniles represented more than half (57.3%) of the total admissions, followed by 16-year-olds (36.4%).

Figure 1.4
Juveniles Charged as Adults and Admitted to Adult Detention Facilities
(Accused Status) by Sex, Race and Age at Admission, FY2015

	Admissions to Adult Facilities
Sex	
Male	511
Female	49
Race	
Black	450
White	78
Hispanic/Other	32
Age	
14	10
15	18
16	204
17	321
18-20	3
Error/Missing	4
Total*	560

*Total Admissions exclude admissions to the Baltimore City Detention Center and admissions to the the Maryland Department of Juvenile Services facilities as courtesy hold in order to avoid double-counting juveniles transferred to or from other facilities.

Comparing FY2011 and FY2015, the distribution of offenses for admitted juveniles has not changed significantly for most offense categories (Figure 1.5). In FY2011, robbery/carjacking accounted for 38.3% of all juveniles charged as adults and admitted pre-trial, while assault accounted for 25.8%. Together, these two offense types represented nearly two-thirds of admissions in FY2011. In FY2015, the percentage of admitted juveniles charged with robbery/carjacking increased to 40.5%, while assault stayed stable as FY2011 for 25.5%. Despite the increase in robbery/carjacking, these two offense types continue to account for the majority of juveniles charged as adults and admitted to pre-trial detention (66.0% in FY2015).

Figure 1.5
Juveniles Charged as Adults and Admitted to Adult Detention Facilities
(Accused Status) by Offense Category, FY2011 and FY2015*

Offense Category	FY2011	FY2015
Murder/Manslaughter	11.2%	14.1%
Rape/Sex Offense	3.7%	3.4%
Robbery/Carjacking	38.3%	40.5%
Kidnapping/False Imprisonment	0.1%	0.4%
Assault	25.8%	25.5%
Firearms & Other Weapons	11.6%	12.3%
Burglary	1.3%	1.1%
Arson	0.1%	0.2%
Theft	0.9%	0.2%
Narcotics	2.9%	0.7%
Other	2.4%	1.6%
Unknown	1.3%	0.0%
Total Admissions**	755	560

*Percentages may not add to 100% due to rounding.

**Total Admissions exclude admissions to the Baltimore City Detention Center and the Maryland Department of Juvenile Services juvenile detention facilities in order to avoid double-counting juveniles transferred to or from other facilities.

In addition to admissions, length-of-stay is a critical factor affecting the size of the population. Length-of-stay was calculated for all juveniles who had been charged as adults and held in pre-trial facilities. A subset of these juveniles, however, changed from accused status to sentenced status during their period of confinement. As noted above, the number of juveniles who switch from accused to sentenced status cannot be determined due to data availability. Length-of-stay for all juveniles released from pre-trial facilities corresponds to the upper bound limit of the population. In cases where release date is missing, length-of-stay was calculated based on the assumption of eight months processing time from arrest to adjudication. For juveniles charged as adults and released from adult detention facilities during FY2011-FY2015, data indicate that 86% of them stayed less than 8 months (excluding releases from the Baltimore City Central Booking and Intake Center).

The computed length-of-stay in days is shown in Figure 1.6. The average length-of-stay for juveniles charged as adults and held in adult facilities declined from 102.5 days to 77.2 days from FY2012 to FY2015, while length-of-stay for juveniles held in the Maryland Department of Juvenile Services facilities as courtesy hold increased from 65.1 days to 93.1 days from FY2014 to FY2015.

Figure 1.6
Average Lengths-of-Stay (Days) for
Juveniles Charged as Adults and Held in Detention Facilities*

	Juveniles Released from Adult Facilities	Juveniles Released from DJS Detention Facilities
FY2012	102.5	N/A
FY2013	95.5	N/A
FY2014	86.9	65.1
FY2015	77.2	93.1

*Length-of-stay was computed excluding juveniles admitted to the Baltimore City Central Booking and Intake Center as these juveniles should be transferred to another facility. Figures also exclude juveniles admitted with a code indicating he/she was a federal hold.

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Section 2 Factors Contributing to Change in the Population

Many factors may affect the number of youth who are charged as adults and held in adult pre-trial facilities in Maryland. At the broadest levels, these may include demographic changes, trends in crime rates and offenses reported, and the volume and patterns of arrests.

According to population estimates from the Maryland Department of Planning, Maryland’s 11- to 17-year-old population declined by 0.9% between FY2013 and FY2015 (Figure 2.1). Change in this subpopulation, however, has varied considerably across the different regions of the state. For Baltimore City and Metro Region, the data show that the number of juveniles in this age group has decreased by 18.8% and 3.0% respectively during this time period. For the Central, Western, and Southern regions, increases in this age group ranged from 3.8% to 5.3%. In the Eastern Region, the population grew by less than 1%.

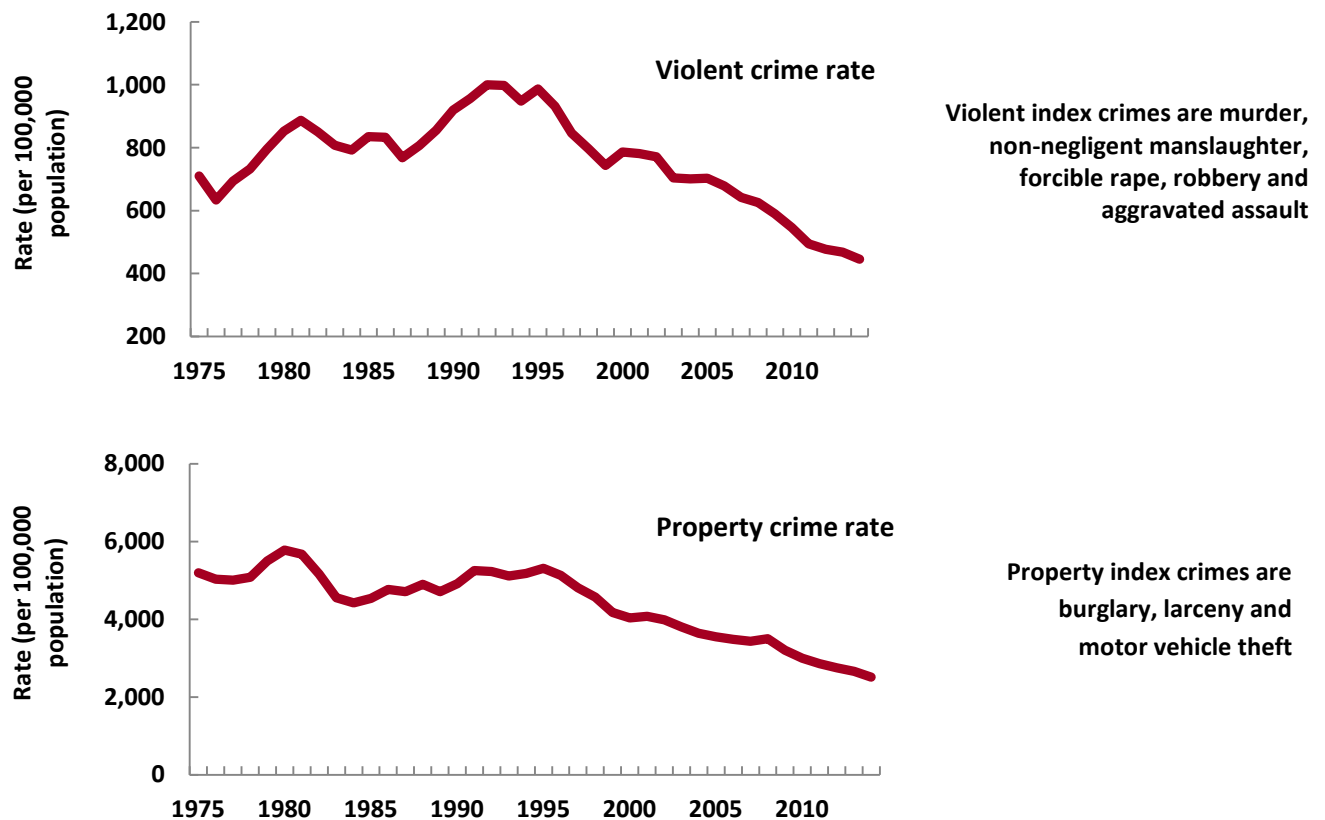
Figure 2.1
Population of Maryland 11 to 17 Years of Age by Maryland Department of Juvenile Services Region

Region	FY2013	FY2014	FY2015	Change FY2013-FY2015
Baltimore City	60,124	58,966	48,825	-18.8%
Central Region	136,757	135,756	141,989	3.8%
Western Region	42,880	42,389	45,151	5.3%
Eastern Region	39,881	39,248	40,146	0.7%
Southern Region	80,580	80,142	84,382	4.7%
Metro Region	175,748	174,769	170,456	-3.0%
Total	535,970	531,270	530,949	-0.9%

Source: Maryland Department of Planning, Population Estimation for the State of Maryland
 Note: Data for each Fiscal Year above were population estimates on July 1st of each year.

Crime rates in Maryland, as in much of the nation, have declined over the past 20 years. Maryland’s violent index crime rate has decreased by 55% since its peak in 1992 and, in 2014, it was the lowest recorded over the last 40 years (Figure 2.2 upper panel). Maryland’s property index crime rate has also decreased significantly. Between 1995 and 2014, the property crime rate decreased by 53% and is at a 40-year low (Figure 2.2 lower panel). Crime rates in Baltimore City, which are substantially higher than the statewide average, dropped steeply after 1995.

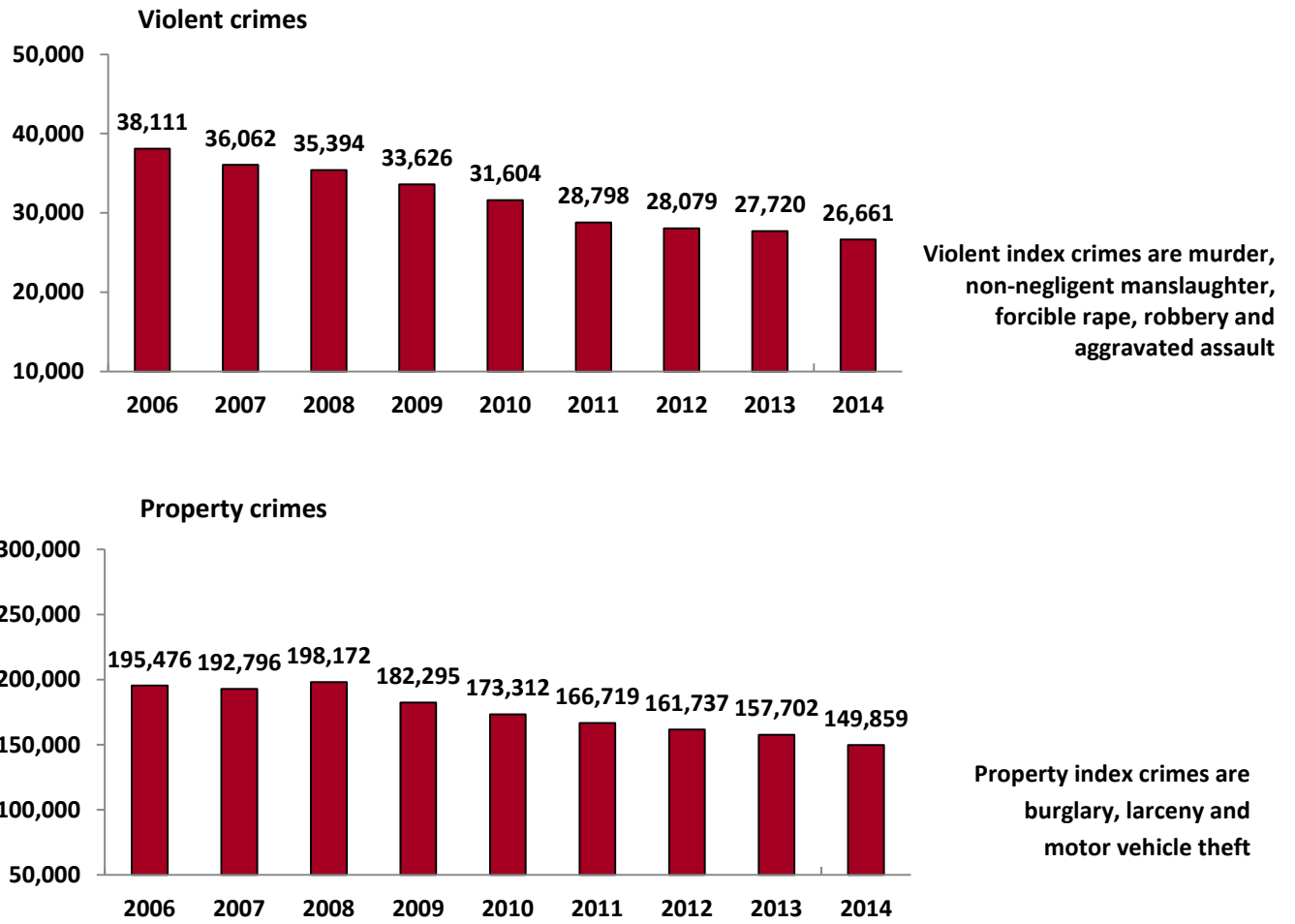
Figure 2.2
Index Crime Rates in Maryland, 1975-2014



Source: Maryland State Police – Crime in Maryland UCR Reports

Because crime rates are affected by increases or decreases in the state’s population, the number of crimes reported to law enforcement was also examined. Mirroring the decrease in the violent crime rate, the number of violent index crimes reported to police has shown a marked decline. Since 2005, the number of violent index crimes has decreased each year (Figure 2.3 upper panel). While the number of property index crimes reported has generally decreased since 2004, an increase was recorded from 2007 to 2008 (Figure 2.3 lower panel). After 2008, the number of reported property crimes resumed its downward trend.

Figure 2.3
Number of Index Crimes Reported in Maryland



Source: Maryland State Police – Crime in Maryland UCR Reports

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Section 3 Population Projections

Projections of the population of juveniles charged as adults, including those confined in adult facilities (in accused status) and held in the Maryland Department of Juvenile Services operated detention facilities, were developed and are presented in this section.

The proposed projection models were generated using a common forecasting technique: auto-regressive integrated moving average analysis. auto-regressive integrated moving average forecasting assumes that there is a pattern in the historical values that can be identified. The goal is to define the pattern, understand the short-term and long-term trends, and identify any seasonal fluctuations. Time parameters are tested in a times-series model and the statistically significant parameters are retained. For forecasting purposes, a minimum of 60 observations, or data points, is preferred, particularly if a seasonal component is to be modeled.

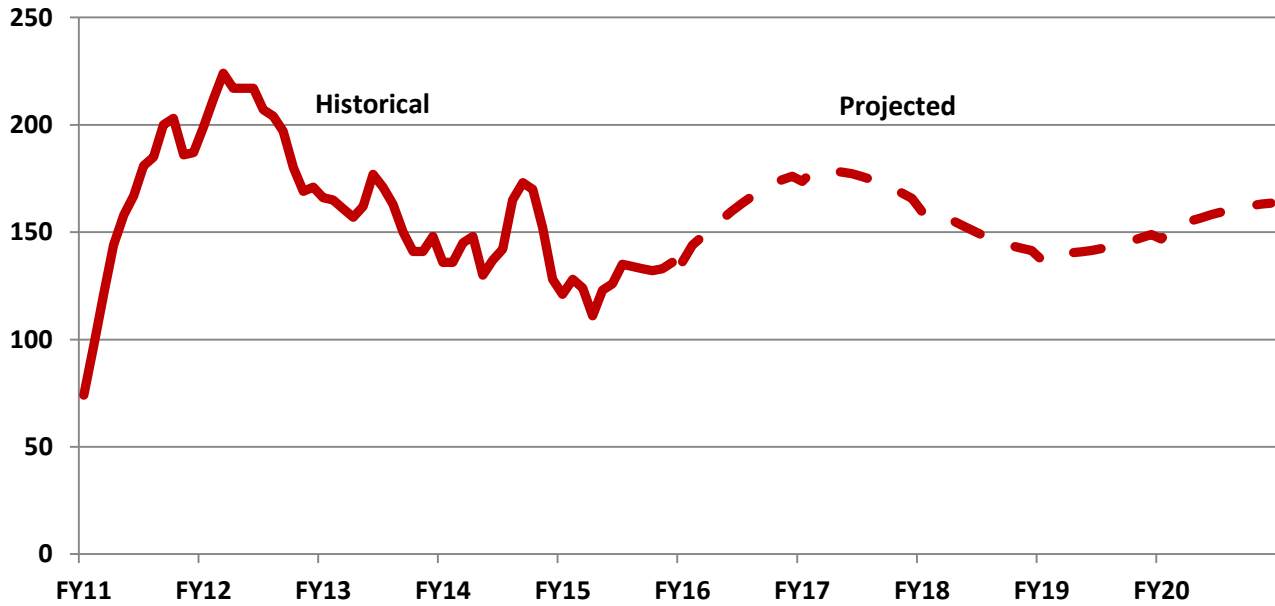
Admission records dating back to January 2008 were available for analysis, but, data prior to FY2011 were incomplete. (See Section 1 for a full discussion of the data limitations). Average daily population was calculated using data from FY2011 through FY2015; however, the population computed for the early months of FY2011 may be lower than the actual population during that time period. To achieve better forecast performance and generate the forecast for the next five fiscal years, all available 60 monthly data points were used for model development. When reviewing historical monthly average daily population data, the series demonstrate pronounced seasonality for month of July.

The final model selected is auto-regressive integrated moving average (2, 0, 2) plus a constant and a dummy variable for month of July. The model was selected based on rigorous statistical testing based on Akaike Information Criteria (see Appendix A for model selection steps and multiple model comparison). An exponential smoothing model (Holt-Winters with multiplicative) was also tested, but not used for the final model selection. These models implicitly assume that current policies and practices (for example, prosecutors' charging practices and juvenile court decisions to waive jurisdiction) will continue into the future.

In this section, projections of the average daily population for each fiscal year from FY2016 through FY2020 are presented in Figure 3.1. (For better understanding of population variance, the monthly data table is also listed in Appendix B). While a 15-year forecast is desirable, such a long forecast horizon is not advisable given the relatively small number of data points available for building projection models. Therefore, five-year projections are presented here. The final model projected the average daily population will increase in FY2016 to 160 and FY2017 to 174, followed by a decrease to 151 in FY2018. The increase in admissions could be a factor that contributes to the population increase. Based on trend analysis of monthly average daily

population for FY2015 and the first few months in FY2016 (Figure 3.2), the population is expected to increase in the next two years.

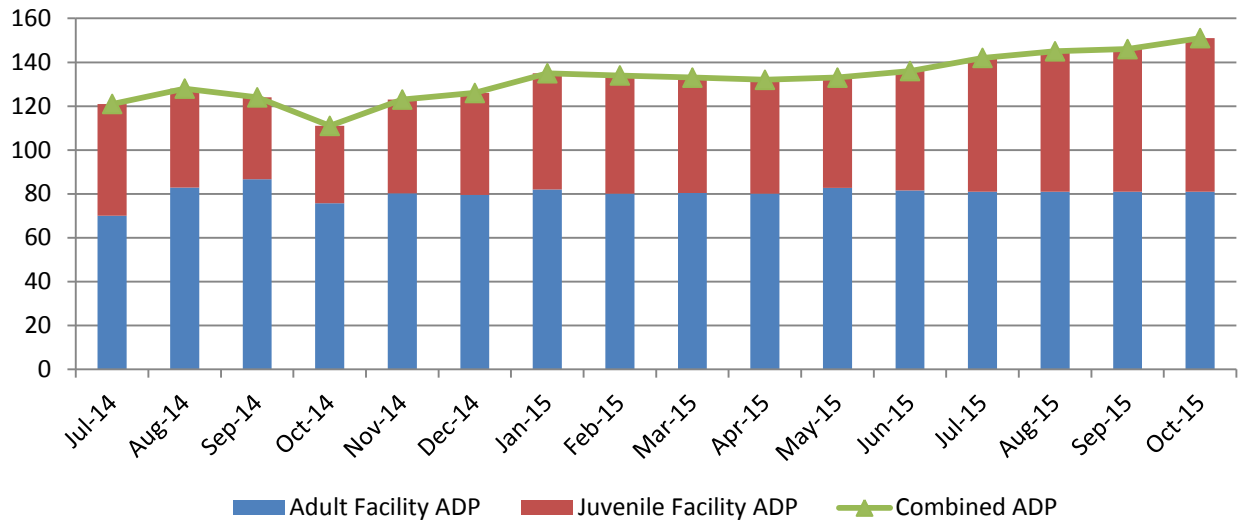
Figure 3.1
Historical and Projected Population of Juveniles
Charged as Adults and Held in Adult Detention Facilities and Maryland Department of
Juvenile Services -Operated Facilities



	Year	Average Daily Population
Historical	FY2011	159
	FY2012	201
	FY2013	159
	FY2014	147
	FY2015	128
	FY2016*	146
Projected	FY2016	160
	FY2017	174
	FY2018	151
	FY2019	143
	FY2020	158

*146 for FY2016 in historical is the average of daily population for July through October 2015.

Figure 3.2
Monthly Population of Juveniles Charged as Adults and
Held in Adult Detention Facilities and Maryland Department of Juvenile Services -Operated
Facilities, FY2015-FY2016*



Monthly Average Daily Population (ADP) FY2015-FY2016*

Month	Adult Facility ADP	Juvenile Facility ADP	Combined ADP
Jul-14	70	51	121
Aug-14	83	45	128
Sep-14	87	37	124
Oct-14	76	35	111
Nov-14	80	43	123
Dec-14	80	46	126
Jan-15	82	53	135
Feb-15	80	54	134
Mar-15	80	53	133
Apr-15	80	52	132
May-15	83	50	133
Jun-15	82	54	136
Jul-15	81**	61	142
Aug-15	81**	64	145
Sep-15	81**	65	146
Oct-15	81**	70	151

*FY2016 data shown above are for July 2015 through October 2015 only.

**Population data for adult facilities from July 2015 to October 2015 were estimated by the average monthly population from January through June 2015 due to data availability.

These projections may assist the Department of Juvenile Services to identify ways in which additional youth charged as adults might be served in a juvenile detention facility rather than an adult pre-trial facility. However, some of the juveniles charged as adults would not be eligible for transfer to a juvenile facility. Maryland law prohibits the transfer of cases involving juveniles who are at least 16 years of age and accused of first-degree murder; and juveniles who have been convicted in an unrelated case of an offense excluded from the jurisdiction of the juvenile court. The data available for this study, however, do not include information necessary to consistently identify those prohibited from transfer due to a previous conviction for an excluded offense. Only a small number of juveniles charged with violations of adult probation, indicative of a prior conviction in the adult system, could be identified. The data do permit the identification of youth excluded from transfer due to a first-degree murder charge.¹³ The historical and projected average daily population, excluding ineligible juveniles charged with violations of probation or first-degree murder, is shown in Figure 3.3 below.

**Figure 3.3
Historical and Projected Population of Juveniles
Charged as Adults and Held in Adult Detention Facilities and the Maryland
Department of Juvenile Services Facilities***

	Year	Average Daily Population
Historical	FY2011	154
	FY2012	194
	FY2013	154
	FY2014	142
	FY2015	121
Projected	FY2016	154
	FY2017	168
	FY2018	145
	FY2019	137
	FY2020	152

*Excludes juveniles 16 years of age or older charged with first-degree murder and juveniles returned to the adult system for a violation of probation. Previous convictions of these offenses were not applied due to data availability.

To generate the projections by facility, the characteristics of the population in FY2014 and FY2015 were examined. The resulting percentages are shown in Figure 3.4. A two-year average was used to calculate these percentages because the Department initiated a new policy in July 2013 to house some of the Baltimore City juveniles charged as adults and held pre-trial. Calculating an average over a three year period would not accurately reflect this new Department policy and its impact on the Baltimore City adult detention center population.

¹³ Only completed acts were identified here.

Figure 3.4
Percentage of Population by Facility, FY2014-FY2015

Facility	FY2014	FY2015	Average
Allegany County Detention Center	0.0%	0.0%	0.0%
Anne Arundel County			
Jennifer Road Detention Center	2.8%	2.0%	2.4%
Ordinance Road Correctional Center	0.0%	0.0%	0.0%
Baltimore City			
Baltimore City Central Booking and Intake Center	1.8%	2.4%	2.1%
Baltimore City Detention Center	16.0%	12.0%	14.0%
Baltimore County Detention Center	15.9%	19.1%	17.5%
Calvert County Detention Center	0.9%	0.1%	0.5%
Caroline County Detention Center	0.0%	0.2%	0.1%
Carroll County Detention Center	0.9%	0.0%	0.5%
Cecil County Detention Center	0.0%	0.6%	0.3%
Charles County Detention Center	0.3%	0.6%	0.5%
Dorchester County Detention Center	0.9%	0.0%	0.5%
Frederick County Detention Center	1.0%	1.7%	1.4%
Garrett County Detention Center	0.0%	0.0%	0.0%
Harford County Detention Center	2.9%	0.4%	1.7%
Howard County Detention Center	2.2%	0.7%	1.5%
Kent County Detention Center	0.9%	0.0%	0.5%
Montgomery County Detention Center	4.2%	5.7%	5.0%
Prince George's County Detention Center	19.3%	13.0%	16.2%
Queen Anne's County Detention Center	0.0%	0.0%	0.0%
Somerset County Detention Center	0.8%	1.1%	1.0%
St. Mary's County Detention Center	0.1%	0.0%	0.1%
Talbot County Detention Center	0.5%	0.1%	0.3%
Washington County Detention Center	1.2%	0.1%	0.7%
Wicomico County Detention Center	3.2%	2.5%	2.9%
Worcester County Jail	0.1%	0.4%	0.3%
Juvenciles charged as adults and held in Maryland Department of Juvenile Services (DJS) Facilities by agreement:			
Baltimore City Juvenile Justice Center	17.8%	25.9%	21.9%
Other DJS Facilities	6.1%	11.4%	8.8%
Total	100%	100%	100%

Projections of average daily population for FY2016-FY2020, broken out by facility, are shown in Figure 3.5. These projections include juveniles 16 years of age or older charged with first-degree murder; and juveniles returned to the adult system for a violation of probation.

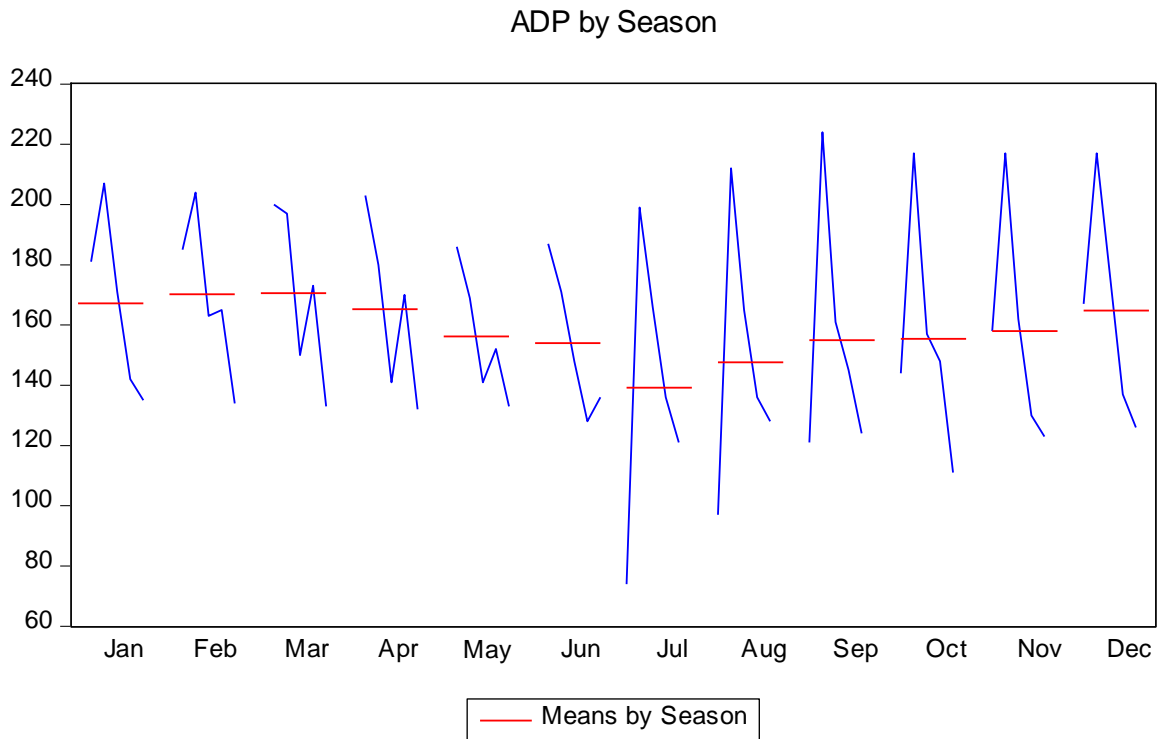
Figure 3.5
Projected Population of Juveniles Charged as Adults
and Held in Adult Detention Facilities and Maryland Department of Juvenile Services-Operated
Facilities

Facility	FY2016	FY2017	FY2018	FY2019	FY2020
Allegany County Detention Center	0	0	0	0	0
Anne Arundel County					
Jennifer Road Detention Center	3.8	4.2	3.6	3.4	3.8
Ordnance Road Correctional Center	0.0	0.0	0.0	0.0	0.0
Baltimore City	0.0	0.0	0.0	0.0	0.0
Baltimore City Central Booking and Intake Center	3.4	3.7	3.2	3.0	3.3
Baltimore City Detention Center	0.0	0.0	0.0	0.0	0.0
Baltimore County Detention Center	22.4	24.4	21.1	20.0	22.1
Baltimore County Detention Center	28.0	30.5	26.4	25.0	27.7
Calvert County Detention Center	0.8	0.9	0.8	0.7	0.8
Caroline County Detention Center	0.2	0.2	0.2	0.1	0.2
Carroll County Detention Center	0.7	0.8	0.7	0.6	0.7
Cecil County Detention Center	0.5	0.5	0.5	0.4	0.5
Charles County Detention Center	0.7	0.8	0.7	0.6	0.7
Dorchester County Detention Center	0.7	0.8	0.7	0.6	0.7
Frederick County Detention Center	2.2	2.3	2.0	1.9	2.1
Garrett County Detention Center	0.0	0.0	0.0	0.0	0.0
Harford County Detention Center	2.6	2.9	2.5	2.4	2.6
Howard County Detention Center	2.3	2.5	2.2	2.1	2.3
Kent County Detention Center	0.7	0.8	0.7	0.6	0.7
Montgomery County Detention Center*	7.9	8.6	7.5	7.1	7.8
Prince George's County Detention Center	25.8	28.1	24.4	23.1	25.5
Queen Anne's County Detention Center	0.0	0.0	0.0	0.0	0.0
Somerset County Detention Center	1.5	1.7	1.4	1.4	1.5
St. Mary's County Detention Center	0.1	0.1	0.1	0.1	0.1
Talbot County Detention Center	0.5	0.5	0.5	0.4	0.5
Washington County Detention Center	1.0	1.1	1.0	0.9	1.0
Wicomico County Detention Center	4.6	5.0	4.3	4.1	4.5
Worcester County Jail	0.4	0.4	0.4	0.4	0.4
Juveniles held in DJS facilities					
Baltimore City Juvenile Justice Center	35.0	38.0	33.0	31.2	34.5
Other DJS Facilities	14.0	15.2	13.2	12.5	13.8
Total	159.8	173.8	150.8	142.9	157.8

* Historical data from the Montgomery County Detention Center and the Montgomery County Correctional Facility were combined in the population count due to data issues. Thus, the forecast represents the combined population.

Appendix A
Population Projection Model Selection and Comparison

Seasonality Graph



Note: The above graph is a seasonal average plot for average daily population time series during FY2011 through FY2015. The population is lower for the month of July during that period. Therefore a dummy variable of July (value 1 for July and 0 for other months) was used in the final model.

Autocorrelations and Partial Autocorrelations

Date: 11/03/15 Time: 21:15

Sample: 2010M07 2020M06

Included observations: 60

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
. *****	. *****	1	0.881	0.881	48.967	0.000
. *****	. .	2	0.741	-0.158	84.211	0.000
. ****	. .	3	0.620	0.012	109.29	0.000
. ****	. .	4	0.529	0.049	127.86	0.000
. ***	. .	5	0.451	-0.020	141.59	0.000
. ***	. .	6	0.372	-0.048	151.14	0.000
. **	. .	7	0.296	-0.031	157.31	0.000
. **	. .	8	0.234	0.010	161.23	0.000
. .	. .	9	0.199	0.063	164.13	0.000
. .	. .	10	0.172	-0.014	166.33	0.000
. .	. .	11	0.107	-0.190	167.20	0.000
. .	. .	12	0.023	-0.089	167.24	0.000
. .	. .	13	-0.040	0.036	167.37	0.000
. .	. .	14	-0.067	0.056	167.73	0.000
. .	. .	15	-0.076	0.008	168.21	0.000
. .	. .	16	-0.107	-0.125	169.18	0.000
. .	. .	17	-0.137	0.021	170.80	0.000
. .	. .	18	-0.156	0.007	172.96	0.000
. .	. .	19	-0.167	-0.047	175.50	0.000
. .	. .	20	-0.160	0.034	177.87	0.000
. .	. .	21	-0.143	0.064	179.81	0.000
. .	. .	22	-0.144	-0.055	181.84	0.000
. .	. .	23	-0.153	-0.037	184.19	0.000
. .	. .	24	-0.151	-0.021	186.56	0.000
. .	. .	25	-0.150	-0.056	188.94	0.000
. .	. .	26	-0.158	-0.024	191.67	0.000
. .	. .	27	-0.183	-0.069	195.43	0.000
. .	. .	28	-0.211	-0.059	200.62	0.000

Note: Autocorrelation plots are a commonly-used tool for checking randomness in a data set. This randomness is ascertained by computing autocorrelations for data values at varying time lags. If random, such autocorrelations should be near zero for any and all time-lag separations. If non-random, then one or more of the autocorrelations will be significantly non-zero.

Augmented Dickey-Fuller Test for Unit Root

Null Hypothesis: DH_ADP has a unit root
 Exogenous: Constant, Linear Trend
 Lag Length: 1 (Automatic - based on SIC, maxlag=10)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.096172	0.0108
Test critical values:		
1% level	-4.124265	
5% level	-3.489228	
10% level	-3.173114	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(ADP)
 Method: Least Squares
 Date: 11/03/15 Time: 21:10
 Sample (adjusted): 2010M09 2015M06
 Included observations: 58 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DH_ADP(-1)	-0.187516	0.045778	-4.096172	0.0001
D(DH_ADP(-1))	0.317062	0.108400	2.924932	0.0050
C	39.43346	9.331345	4.225914	0.0001
@TREND("2010M07")	-0.294874	0.087908	-3.354364	0.0015
R-squared	0.412278	Mean dependent var		0.672414
Adjusted R-squared	0.379627	S.D. dependent var		10.71216
S.E. of regression	8.437304	Akaike info criterion		7.169675
Sum squared resid	3844.157	Schwarz criterion		7.311774
Log likelihood	-203.9206	Hannan-Quinn criter.		7.225025
F-statistic	12.62673	Durbin-Watson stat		1.910686
Prob(F-statistic)	0.000002			

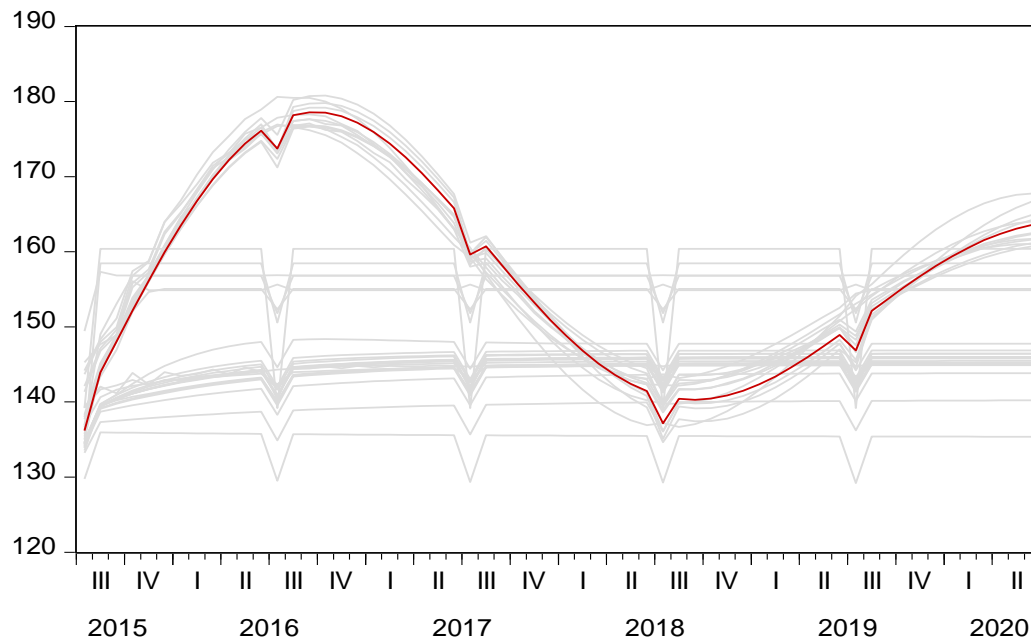
Note: Based on the above Augmented Dickey-Fuller test for unit root, the hypothesis of unit root can be rejected. The t-value for one lag of average daily population equals to -4.096172 which exceeds (in absolute terms) 5% critical value of -3.489228. The series should be best modeled as trend stationary with a constant. The 1st differencing models were tested through model auto-selection. However, differencing technique will not improve model statistics.

Model Comparison Graph

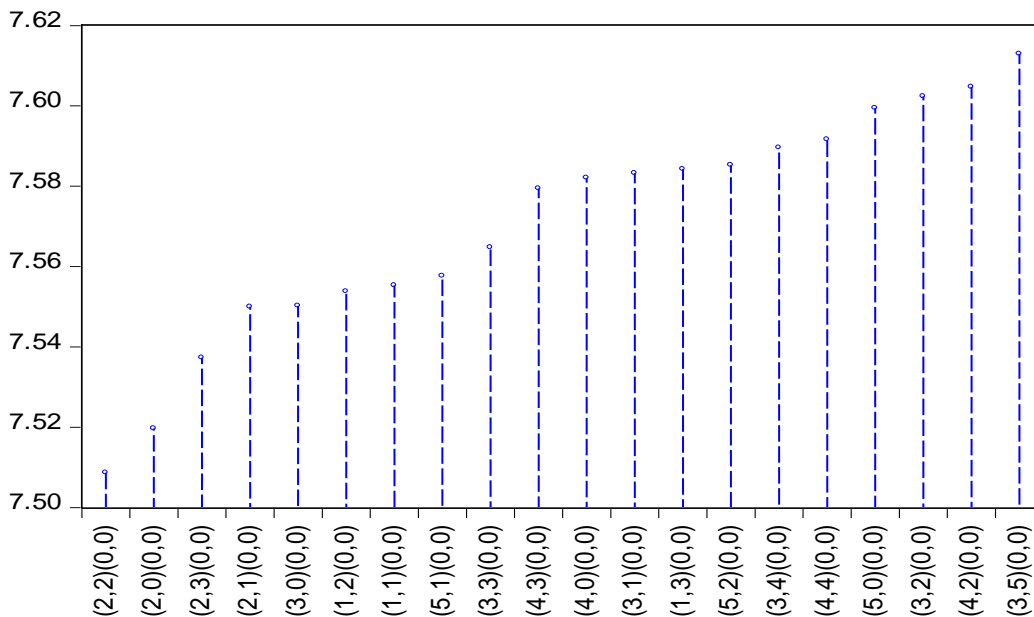
Automatic ARIMA Forecasting
 Selected dependent variable: ADP
 Date: 11/03/15 Time: 22:00
 Sample: 2010M07 2015M06
 Included observations: 60
 Forecast length: 60

Number of estimated ARMA models: 36
 Number of non-converged estimations: 0
 Selected ARMA model: (2,2)(0,0)
 AIC value: 7.50865890763

Forecast Comparison Graph



Akaike Information Criteria (top 20 models)



Model Comparison by AIC Value

Model Selection Criteria Table

Dependent Variable: DH_ADP

Date: 11/03/15 Time: 22:00

Sample: 2010M07 2015M06

Included observations: 60

Model	LogL	AIC*	BIC	HQ
(2,2)(0,0)	-218.259767	7.508659	7.752999	7.604234
(2,0)(0,0)	-220.590689	7.519690	7.694218	7.587957
(2,3)(0,0)	-218.118045	7.537268	7.816514	7.646497
(2,1)(0,0)	-220.498349	7.549945	7.759379	7.631866
(3,0)(0,0)	-220.506830	7.550228	7.759662	7.632149
(1,2)(0,0)	-220.613387	7.553780	7.763214	7.635701
(1,1)(0,0)	-221.659868	7.555329	7.729858	7.623597
(5,1)(0,0)	-217.730045	7.557668	7.871820	7.680550
(3,3)(0,0)	-217.941874	7.564729	7.878881	7.687611
(4,3)(0,0)	-217.382838	7.579428	7.928485	7.715963
(4,0)(0,0)	-220.461707	7.582057	7.826397	7.677632
(3,1)(0,0)	-220.497937	7.583265	7.827605	7.678839
(1,3)(0,0)	-220.526944	7.584231	7.828572	7.679806
(5,2)(0,0)	-217.556619	7.585221	7.934278	7.721756
(3,4)(0,0)	-217.686588	7.589553	7.938610	7.726088
(4,4)(0,0)	-216.748022	7.591601	7.975564	7.741790
(5,0)(0,0)	-219.983454	7.599448	7.878694	7.708677
(3,2)(0,0)	-220.071747	7.602392	7.881638	7.711620
(4,2)(0,0)	-219.142282	7.604743	7.918894	7.727625
(3,5)(0,0)	-217.388458	7.612949	7.996912	7.763138
(4,1)(0,0)	-220.492112	7.616404	7.895650	7.725632
(1,4)(0,0)	-220.521686	7.617390	7.896635	7.726618
(5,3)(0,0)	-217.551502	7.618383	8.002347	7.768572
(4,5)(0,0)	-216.672688	7.622423	8.041292	7.786266
(2,4)(0,0)	-220.368300	7.645610	7.959762	7.768492
(5,4)(0,0)	-217.430893	7.647696	8.066565	7.811539
(1,5)(0,0)	-220.508922	7.650297	7.964449	7.773179
(5,5)(0,0)	-216.521098	7.650703	8.104478	7.828199
(2,5)(0,0)	-220.108110	7.670270	8.019328	7.806806
(0,4)(0,0)	-224.898303	7.729943	7.974284	7.825518
(1,0)(0,0)	-228.182007	7.739400	7.879023	7.794014
(0,5)(0,0)	-224.492040	7.749735	8.028981	7.858963
(0,3)(0,0)	-233.041794	7.968060	8.177494	8.049981
(0,2)(0,0)	-241.958356	8.231945	8.406474	8.300213
(0,1)(0,0)	-260.228164	8.807605	8.947228	8.862220
(0,0)(0,0)	-292.433791	9.847793	9.952510	9.888754

Final ARIMA Model for Population Projection

Dependent Variable: ADP

Method: ARMA Maximum Likelihood (BFGS)

Date: 11/03/15 Time: 22:00

Sample: 2010M07 2015M06

Included observations: 60

Failure to improve objective (non-zero gradients) after 132 iterations

Coefficient covariance computed using outer product of gradients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	154.9845	9.097964	17.03508	0.0000
JULY	-3.644753	3.870854	-0.941589	0.3507
AR(1)	1.942668	0.027768	69.96135	0.0000
AR(2)	-0.960466	0.026198	-36.66131	0.0000
MA(1)	-0.627727	620.0820	-0.001012	0.9992
MA(2)	-0.372272	572.3755	-0.000650	0.9995
SIGMASQ	76.53416	15333.72	0.004991	0.9960
R-squared	0.926156	Mean dependent var		158.6167
Adjusted R-squared	0.917797	S.D. dependent var		32.46541
S.E. of regression	9.308192	Akaike info criterion		7.508659
Sum squared resid	4592.049	Schwarz criterion		7.752999
Log likelihood	-218.2598	Hannan-Quinn criter.		7.604234
F-statistic	110.7889	Durbin-Watson stat		2.080042
Prob(F-statistic)	0.000000			
Inverted AR Roots	.97-.13i	.97+.13i		
Inverted MA Roots	1.00	-.37		

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Appendix B

Monthly Projections of Juveniles Charged as Adults Held in Adult Detention Facilities and the Maryland Department of Juvenile Services Operated Facilities, FY2016-2020

Month	FY2016	FY2017	FY2018	FY2019	FY2020
July	136	174	160	137	147
August	144	178	161	140	152
September	148	179	158	140	154
October	152	179	156	140	155
November	156	178	153	141	157
December	160	177	151	141	158
January	163	176	149	142	159
February	167	174	147	143	161
March	170	173	145	145	162
April	172	170	144	146	162
May	174	168	142	147	163
June	176	166	141	149	164
Average	160	174	151	143	158