



COLLEGE OF CRIMINOLOGY  
AND CRIMINAL JUSTICE

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# Managing Broward County's Jail Populations

## Jail Population Forecast for Broward County

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Florida State University  
College of Criminology and Criminal Justice  
Center for Criminology and Public Policy Research

# Forecast of Broward's Jail Population: 2010 through 2020

## Purposes:

1. Provide the BCSO with data on the dynamic nature of their jail system over a long period of time.
2. Generate a forecast of their future population – totals, males, and females

## Methodology – Data Sources

1. BCSO Management Information System – bookings (n=519,515), releases (n=519,728), and active populations from January 2002 to December 31, 2009. Dates, gender, race, ethnicity, age, charge types, pre-trial decisions, etc.
2. Florida Demographic Data – Historical and Forecasted by gender, race, ethnicity, age, and county from 1980 to 2020.

## Methodology – Analytic Techniques

- I. Descriptive statistics on jail populations, bookings, and releases.
- II. Demographic Based Jail Forecasting Model:
  - 1. Identified 46 gender, race, ethnic, and age groups in jail on December 31, 2009.
  - 2. Calculated the proportion of the resident population within each of the 46 groups in jail.
  - 3. Applied each proportion to the resident population demographic forecast for each year – 2010 to 2020.
  - 4. Summed the 46 values for each group to derive the demographic based jail forecast.

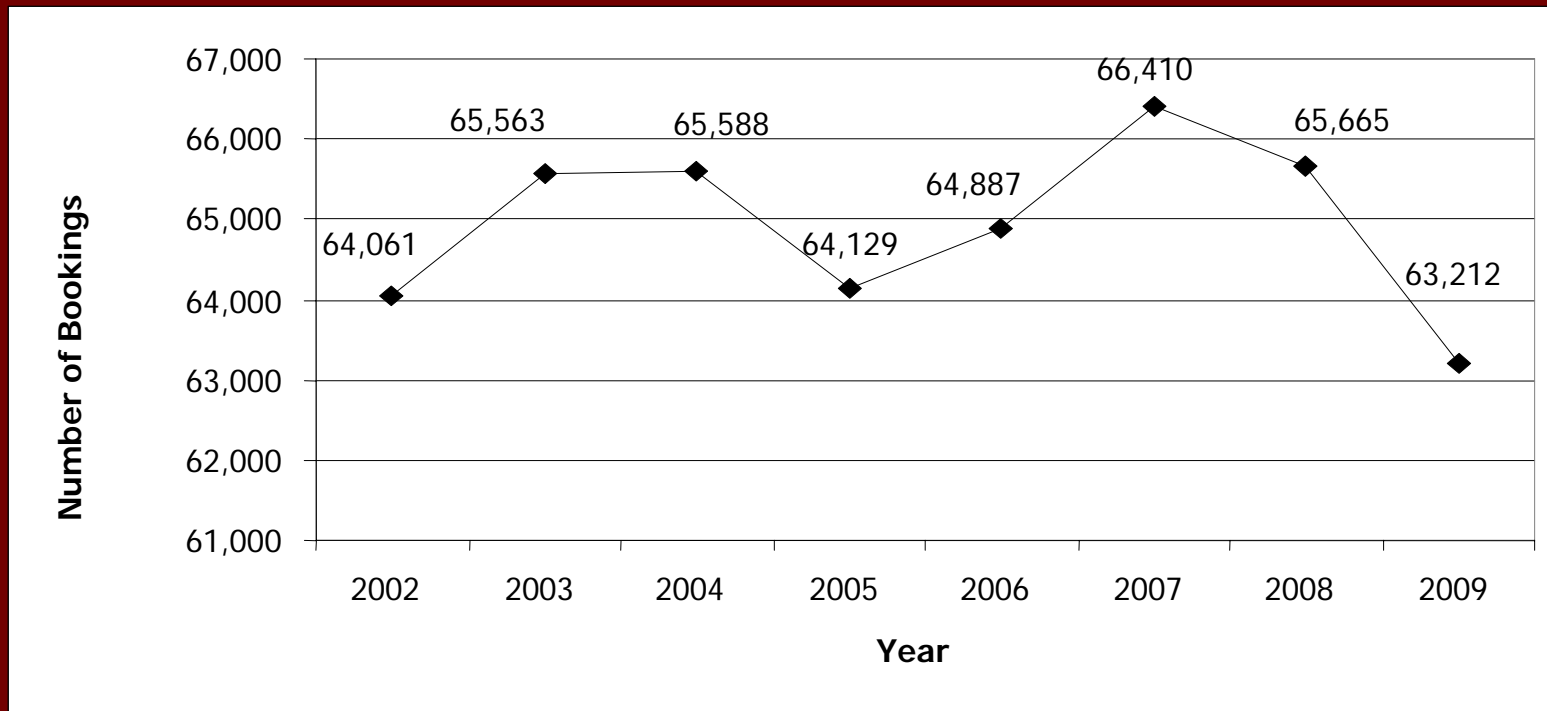
# Methodology – Analytic Techniques

- III. Autoregressive Integrated Moving Average (ARIMA) models.
- Forecasting method that uses historical trends to predict the future with more recent values contributing more to the forecast than earlier values.
- Historical monthly average daily populations of the jail (ADP) from January 1995 to December 2009 – 180 data points.
- Forecasts for males and females generated.

# Historical Jail Booking Trends - Annual

- From 2002 through 2009, annual jail bookings ranged from a high of 66,410 in 2007 to a low of 63,212 in 2009.
- A recent downward trend in the total number of jail bookings from 2007 to 2009 with a decline of 5% from 2007 through 2009.
- Jail bookings are currently at the lowest levels since the beginning of the decade.

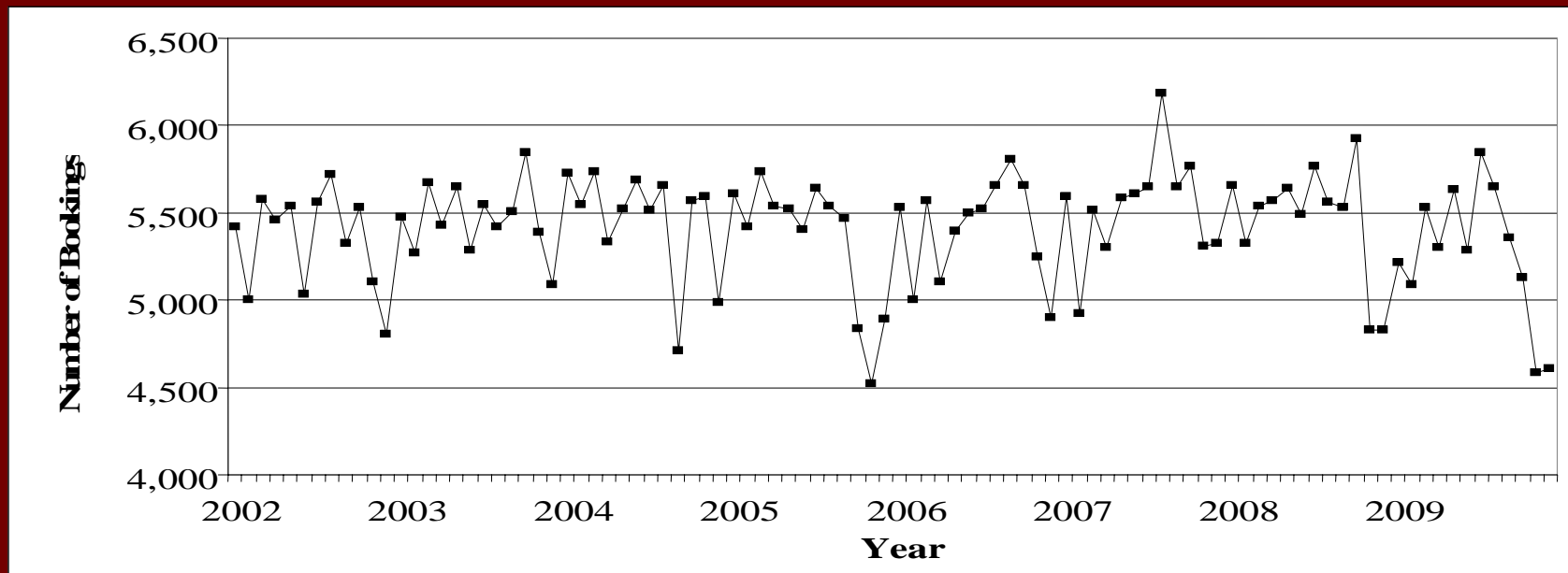
**Total Jail Bookings by Year: 2002-2009**



# Historical Jail Booking Trends - Monthly

- From January, 2002 through December, 2009, monthly jail bookings in Broward County fluctuated from a low of 4,524 in November, 2005 to a high of 6,188 in August, 2007.
- There are seasonal fluctuations in jail bookings. Specifically, jail bookings tend to peak during the late summer months and then decline shortly thereafter.

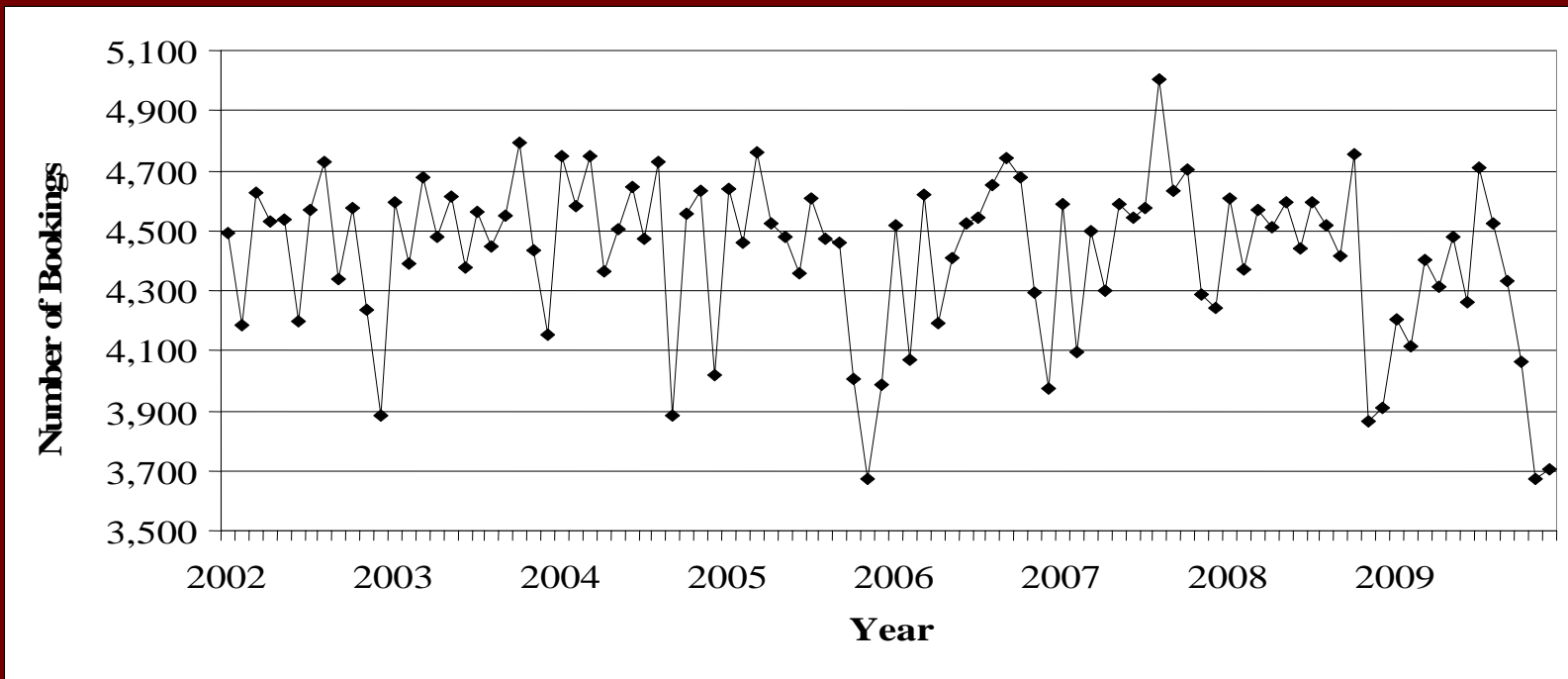
Total Jail Bookings by Month: 2002-2009



## Historical Jail Booking Trends - Males

- The number of males booked into jail have ranged from a high of 5,004 in August 2007 to a low of 3,670 in November 2010.
- There are seasonal fluctuations in jail bookings for males that parallel the fluctuations in the total number of bookings for Broward County.

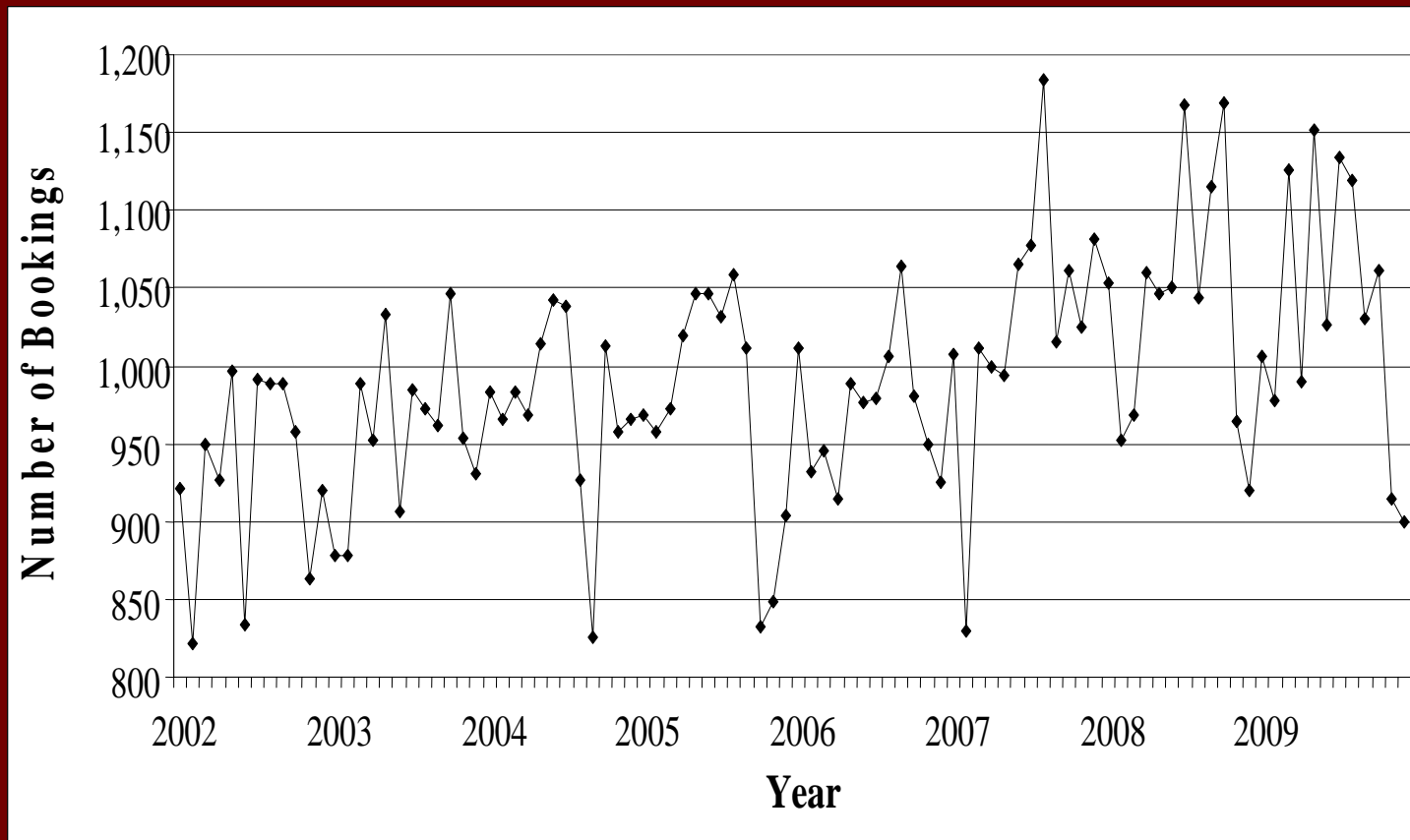
**Jail Bookings by Month: 2002 – 2009 Males Only**





# Historical Jail Booking Trends - Females

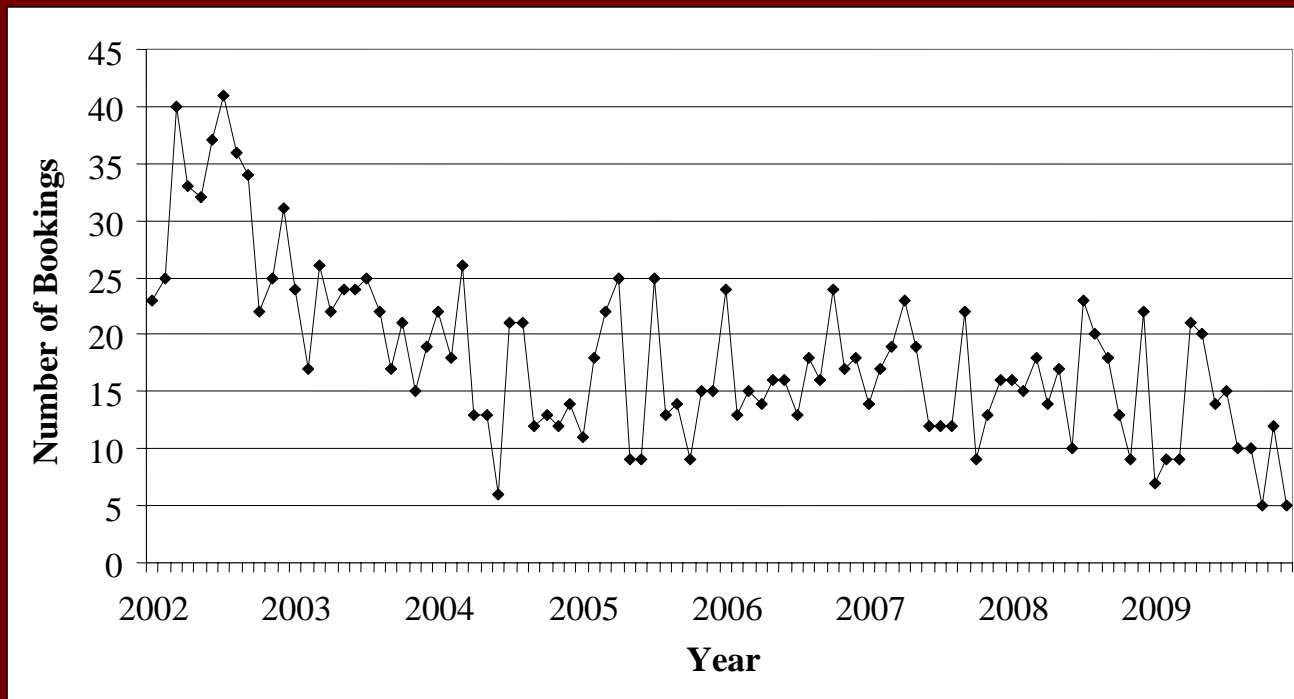
- Between 2002 and 2009, female bookings ranged from a low of 821 in February 2002 to a high of 1,184 in August 2007.



# Historical Jail Booking Trends - Juveniles

- Juveniles booked into jail declined significantly from 2002 to 2004 and has reached its lowest level over the past seven years in October and December 2009 (5).

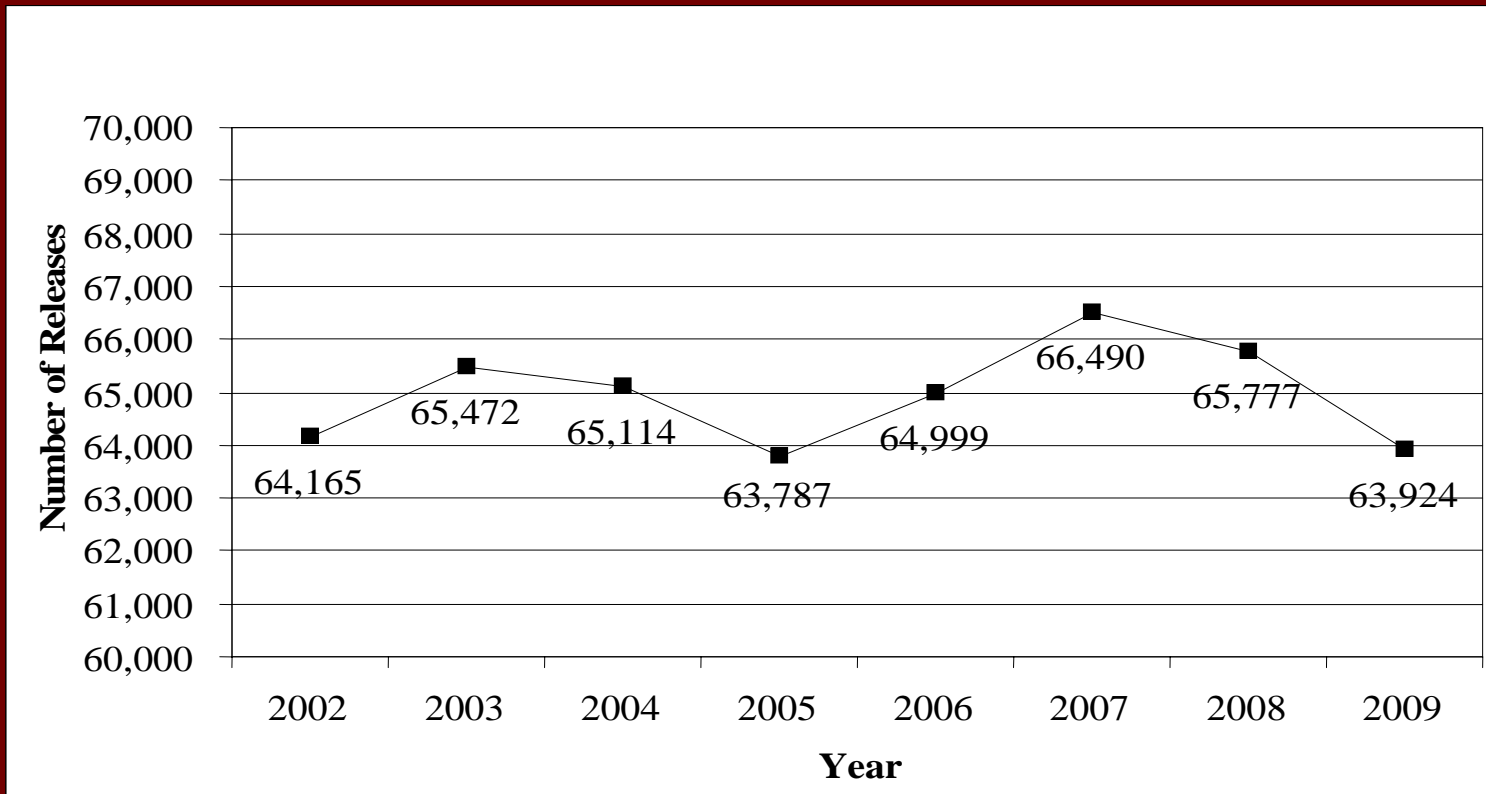
Jail Bookings by Month: 2002 – 2009: Juveniles Only



# Historical Jail Release Trends - Annual

- The number of releases from jail have fluctuated from a low of 63,787 in 2005 to a high of 66,490 in 2007.
- The number of jail releases has declined by 4% from 66,490 in 2007 to 63,924 in 2009.

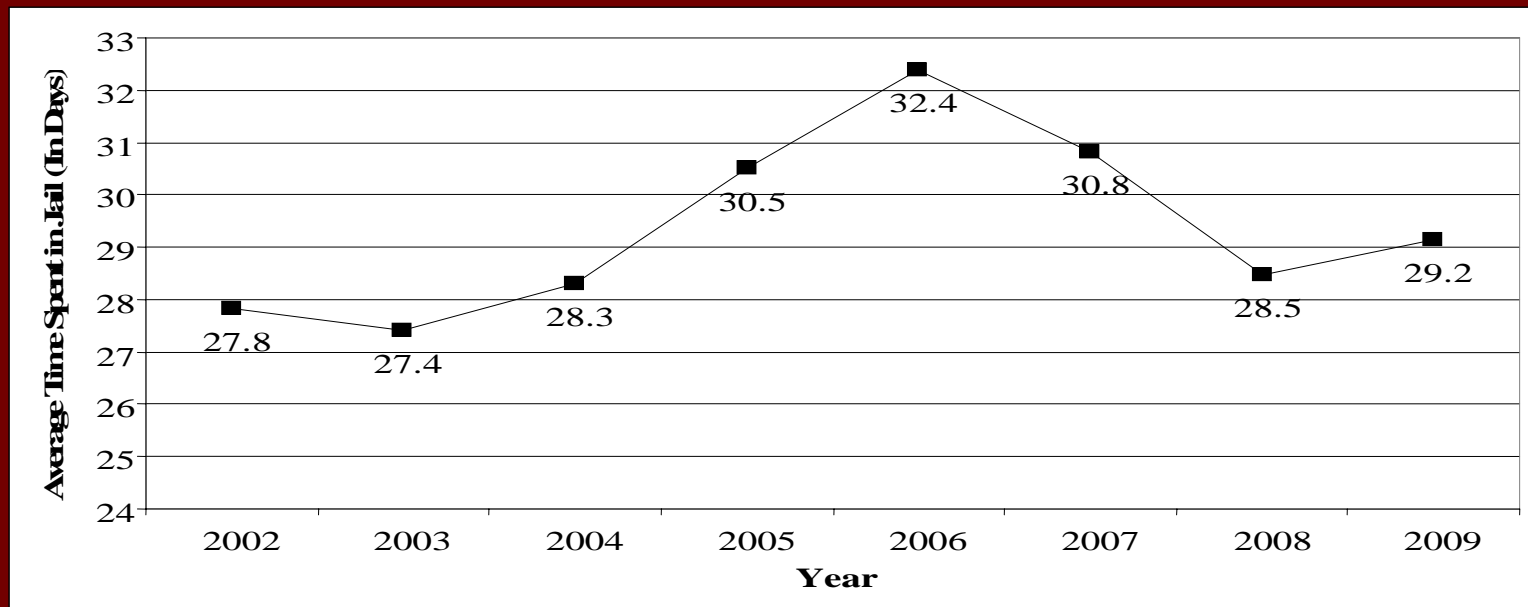
Total Jail Releases by Year: 2002-2009



## Jail Release Trends – Average Length of Stay

- From 2003 to 2006 there was a steady increase in the average number of days spent in jail for all individuals, from 27.4 days in 2003 to 32.4 days in 2006.
- Since 2006, the average length of stay for all individuals has declined, although for 2009 the number slightly increased from what occurred in 2008.

**Average Days Served in Jail for Jail Releases: 2002-2009**

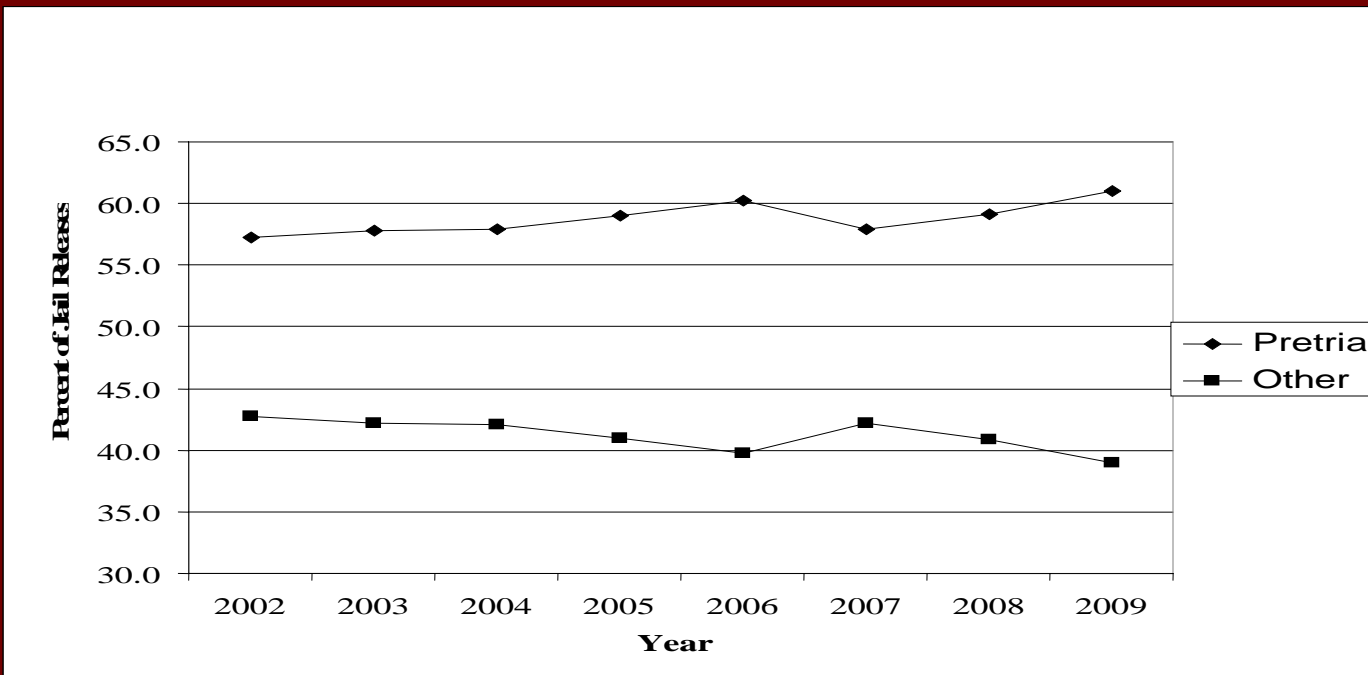




## Historical Trends – Pre-trial Release

- With the exception of a marked decrease from 2006 to 2007, the percent of jail releases that have had a pretrial status has increased.
- In 2002, 57.3% of all jail releases were individuals who had a pretrial designation. By 2009, that percent had increased to 61.0%.

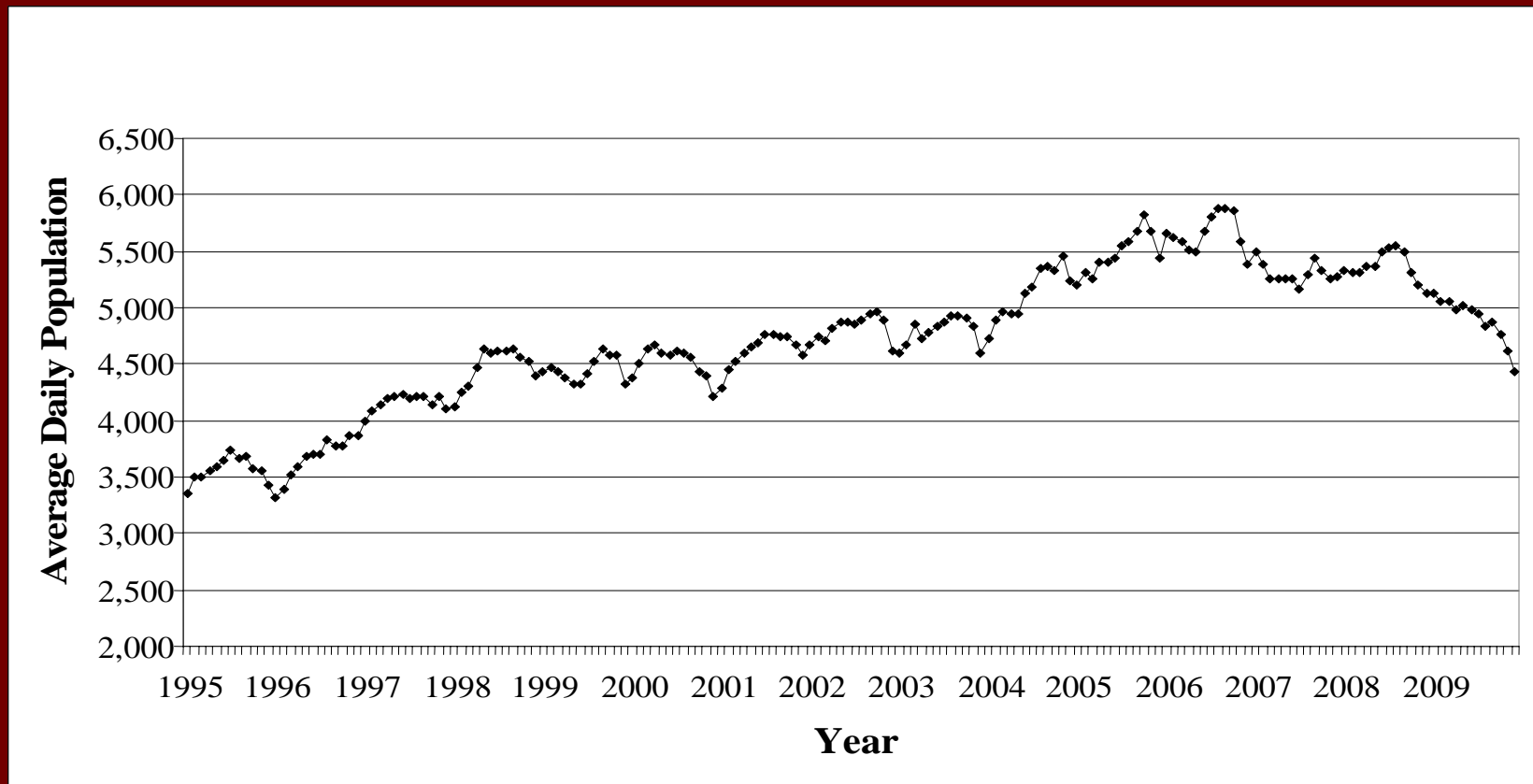
Percent of Jail Releases – Pretrial vs. Other: 2002-2009



# Historical Trends – Jail Population (ADP) - Totals

- From 1995 to 2006 the annual ADP increased from 3,567 to 5,661 - Up 59%.
- Since 2006, the ADP has been declining - from 5,661 to 4,888 in 2009 - a 14% decrease.

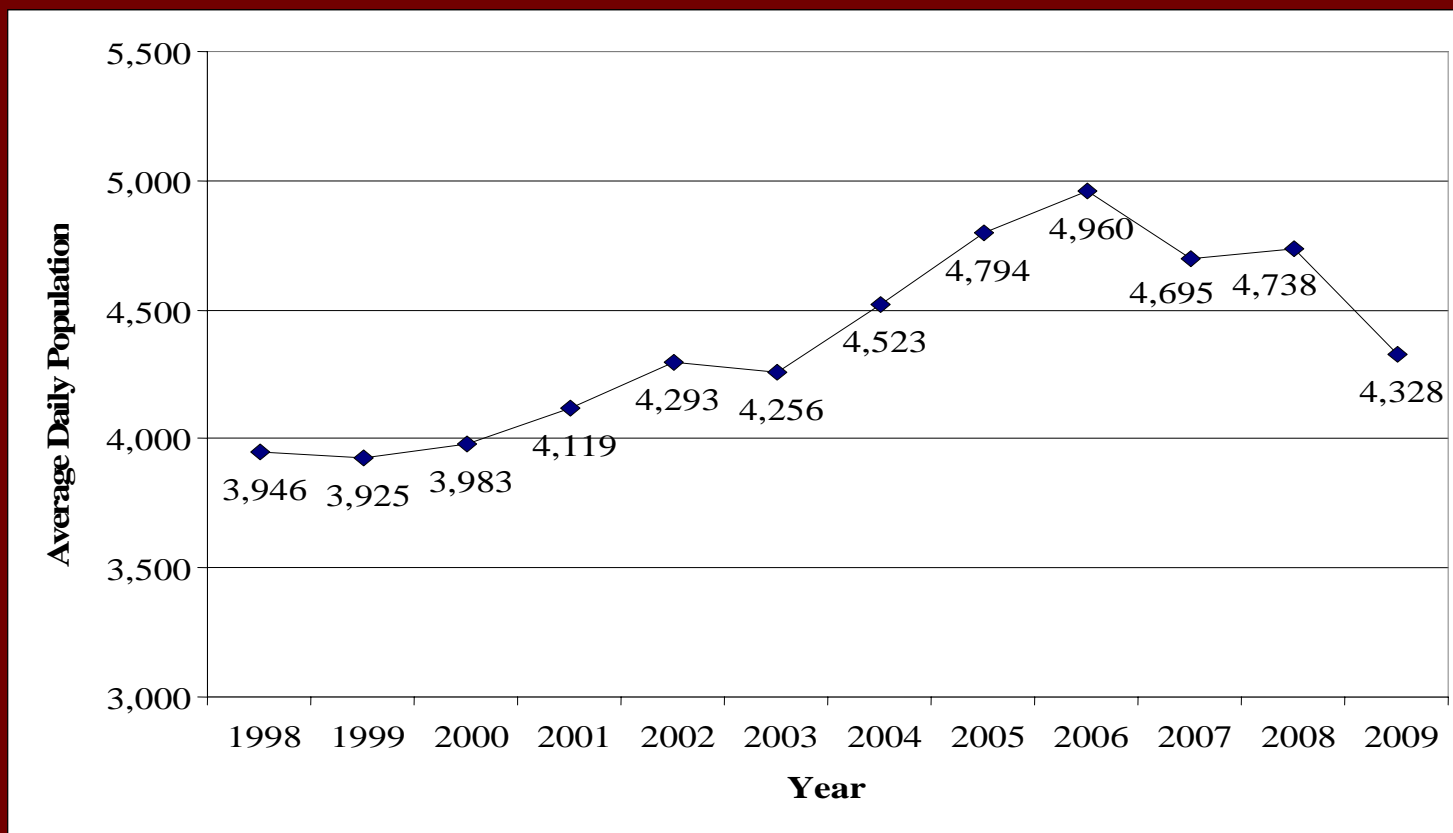
Total Average Daily Jail Population by Month: 1995-2009



# Historical Trends – Jail Population (ADP) - Males

- From 1998 to 2006 the annual male ADP increased from 3,946 to 4,960 – a 26% increase.
- Since 2006, the ADP for males has been declining, 4,960 to 4,328 in 2009 - a 12% decrease.

**Average Daily Jail Population by Year: 1998-2009 Males Only**

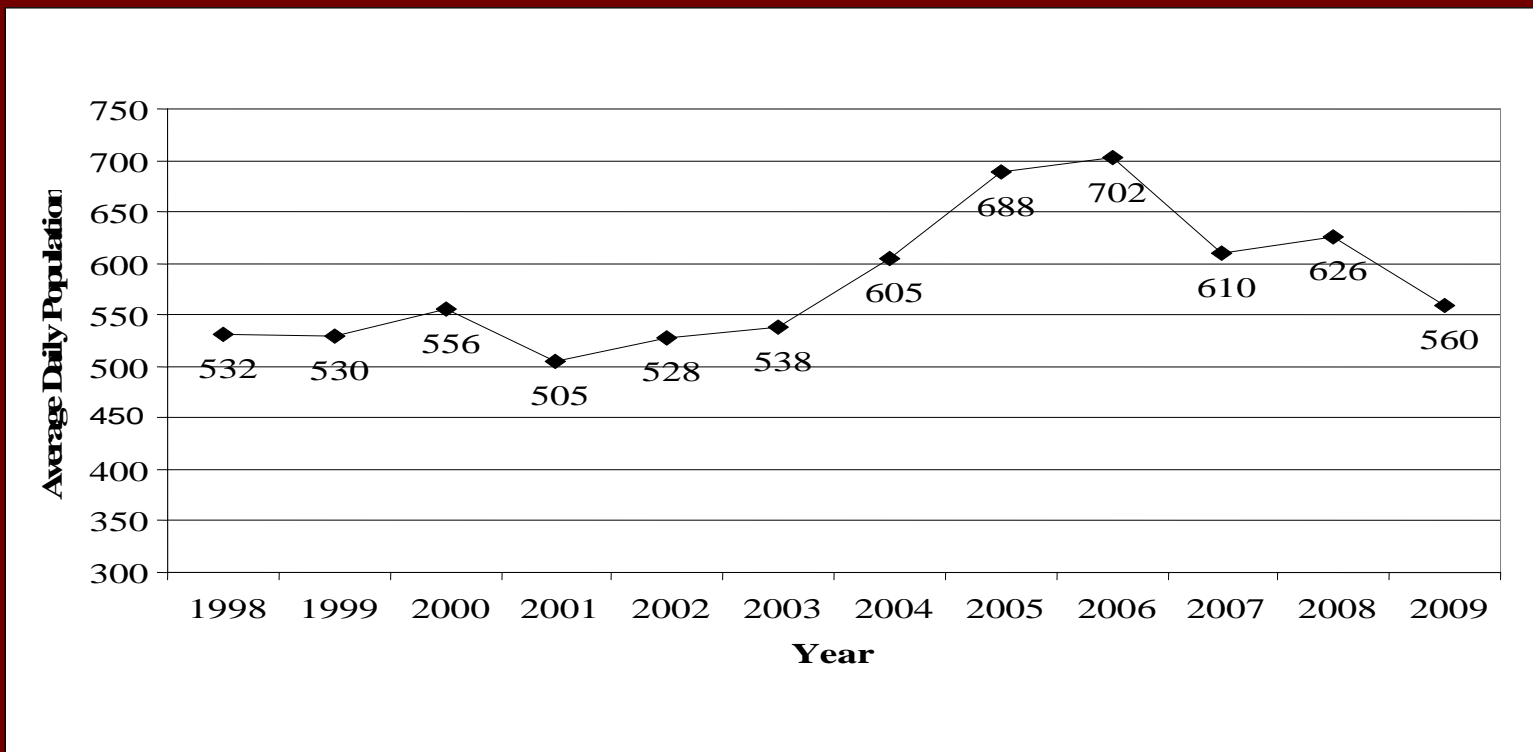




## Historical Trends – Jail Population (ADP) - Females

- After a relatively stable female jail population from 1998 to 2003 (range = 505 to 556), the ADP increased to a high of 702 in 2006.
- Since 2006, the female ADP has been declined to 560 in 2009 – a 20% decrease.

Average Daily Jail Population by Year: 1998-2009 Females Only



## Changes in Resident Demographics in Broward County: 2000-2009 and 2010 to 2020

- The 12 gender/race/age groups in the table below comprise 80% of the jail population and this is very consistent over time.
- The percent change in most of these groups in the resident population of Broward county from 2000 to 2009 increased and the top four groups (40% of the jail population) increased at a rate of 5.2% to 53.6%.
- Between 2010 and 2020, 10 of the 12 groups will either shift to decreasing or to increase at a slower rate than from 2000 to 2009.

Demographic Category	Percent Change in Total Number of the Total Population		Percent Change in Proportion of the Total Population	
	2000-2009	2010-2020	2000-2009	2010-2020
Male Black 18 To 24	32.1%	-5.1%	22.5%	-9.7%
Male Black 25 To 29	32.8%	8.2%	23.2%	2.9%
Male White 18 To 24	5.2%	-15.2%	-2.4%	-19.3%
Male Black 45 To 54	53.8%	-3.3%	42.7%	-8.1%
Male White 45 To 54	-1.5%	-27.2%	-8.7%	-30.7%
Male Black 30 To 34	16.4%	23.3%	8.0%	17.3%
Male White 25 To 29	-15.5%	0.3%	-21.6%	-4.6%
Male Black 40 To 44	11.8%	2.5%	3.7%	-2.5%
Male Black 35 To 39	6.6%	15.5%	-1.2%	9.9%
Male White 30 To 34	-30.6%	14.4%	-35.6%	8.8%
Male White 40 To 44	-25.5%	-21.1%	-30.8%	-25.0%
Male White 35 To 39	-36.7%	0.8%	-41.3%	-4.1%

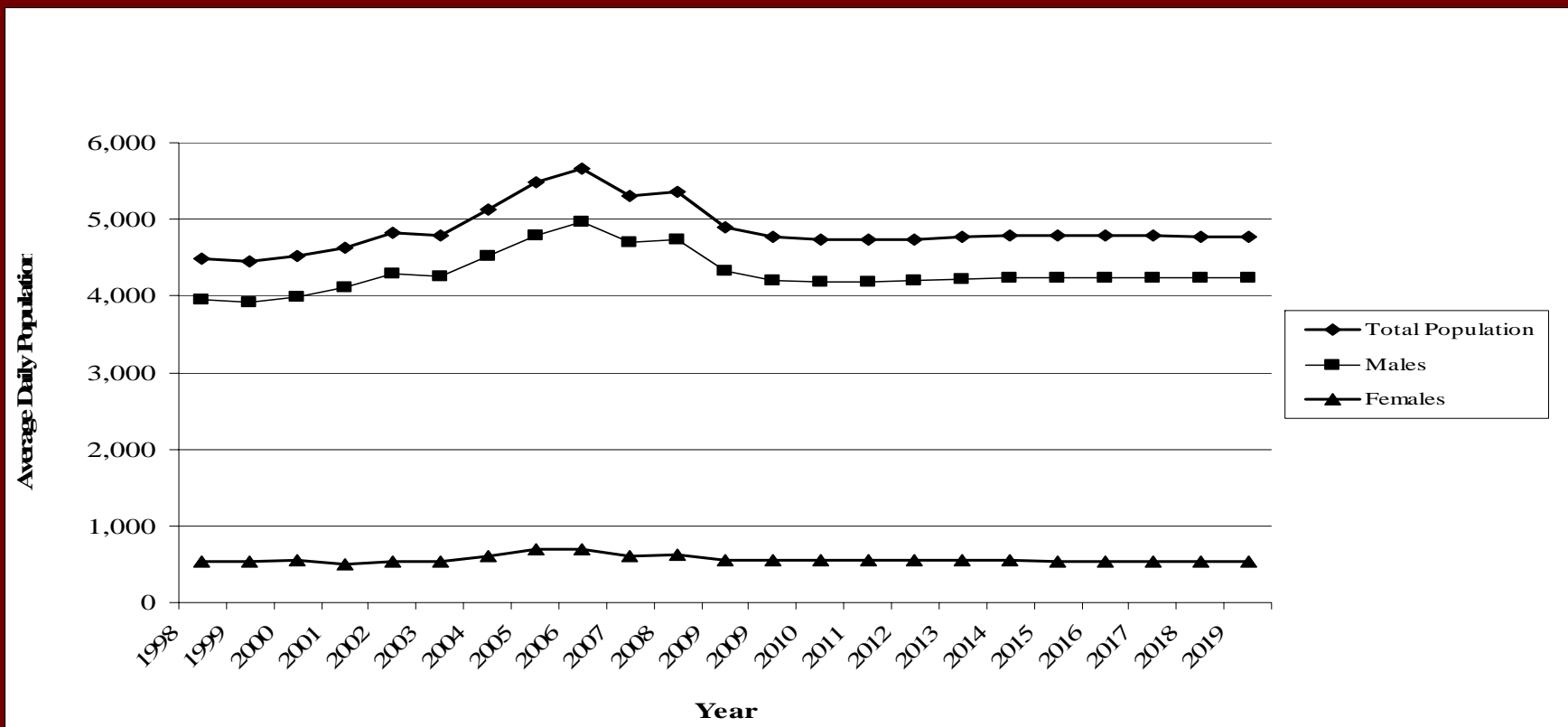
# Jail Forecast – Demographic Based Model

No significant increase in the jail population is expected over the next ten years.

The total annual ADP for Broward County in 2009 was 4,888.

The total annual ADP is projected to be 4,774 in 2020.

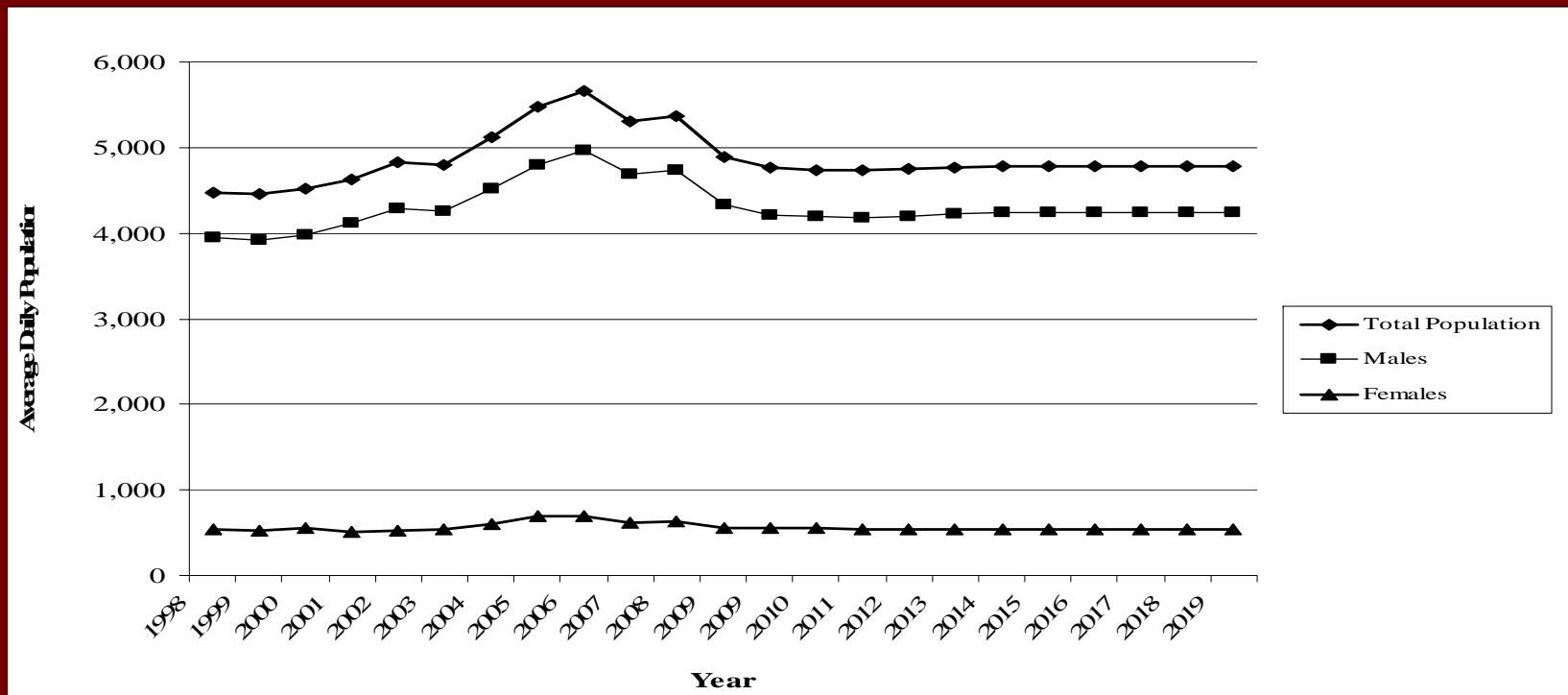
Historical and Projected ADP – Demographic Based Model: 1998-2020



# Jail Forecast – ARIMA Methodology

- A decline in the total ADP is projected from 2009 to 2010, followed by a gradual increase from 2011 to 2020.
- The total ADP for 2020 (4,716) is not projected to be any higher than the ADP for 2009.
- Similar projections in ADP trends are made for males and females separately.

Historical and Projected ADP – ARIMA Times Series Projection: 1998-2020



# Jail Forecast – Difference in Demographic and ARIMA Methodology

- Minimal differences between the demographic based and ARIMA jail forecasts, providing more confidence in the final forecast which takes the average of the two methods.

## Historical and Projected Jail Population – Difference Between Demographic Based and ARIMA Times Series Projection: 2010-2020

Projected Jail Populations (ADP)	Totals	Males	Females
2010	293	243	49
2011	197	195	3
2012	137	157	-20
2013	116	145	-29
2014	111	144	-33
2015	116	150	-35
2016	101	139	-38
2017	88	128	-40
2018	76	119	-43
2019	66	113	-46
2020	58	107	-49

## Jail Forecast – Final Projections: 2010 to 2020

- Final jail forecast indicates a continued decline in the jail population from 4,888 in 2009 to 4,620 in 2010 followed by very modest growth over the next ten years.

<b>Projected Jail Populations (ADP)</b>	<b>Totals</b>	<b>Males</b>	<b>Females</b>
2010	4,620	4,089	531
2011	4,640	4,092	549
2012	4,660	4,104	556
2013	4,685	4,126	560
2014	4,710	4,148	562
2015	4,731	4,168	563
2016	4,739	4,177	562
2017	4,742	4,181	561
2018	4,744	4,185	560
2019	4,745	4,187	559
2020	4,745	4,188	558

## Jail Forecast Versus Actual Population

- A preliminary examination of actual daily population (ADP) data from the BSO for 2010 indicates that the ARIMA forecast results are extremely close to the actual numbers.
- The forecast report includes predicted populations on an annual basis; however the raw data from the ARIMA model can be examined by month.
- The ARIMA model projected the ADP to be 4,460 for the months January through August 2010 and the actual ADP (as calculated and provided by the BSO) is 4,489—a difference of 29 inmates or 0.63 percent.