

CORTLAND COUNTY NEEDS ASSESSMENT
Final Report

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Carter Goble Associates, Inc.
A Carter Goble Lee Company





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INTRODUCTION

In order to determine the future capacity of a jail system, we must examine its history. Using the county's population trends, crime patterns, arrest numbers, and historical jail data, we can predict the future bed needs of a jail system through careful analysis. This data is provided by various sources, as cited.

Population

Cortland County has maintained a steady population between 1996 and 2005, experiencing an overall decrease of 0.6% as shown by Table 1. In 2003 the population grew by 0.9%, or 449 individuals. This is a larger change than the county experienced in any other year from this span. This data is provided by the US Census Bureau as reported in March 2006.

**Table 1
Historic County Population**

Year	Population	No. Change	Yearly % Change ¹
1996	48,726		
1997	48,619	-107	-0.2%
1998	48,755	136	0.3%
1999	48,734	-21	0.0%
2000	48,599	-135	-0.3%
2001	48,647	48	0.1%
2002	48,473	-174	-0.4%
2003	48,922	449	0.9%
2004	48,921	-1	0.0%
2005	48,622	-299	-0.6%

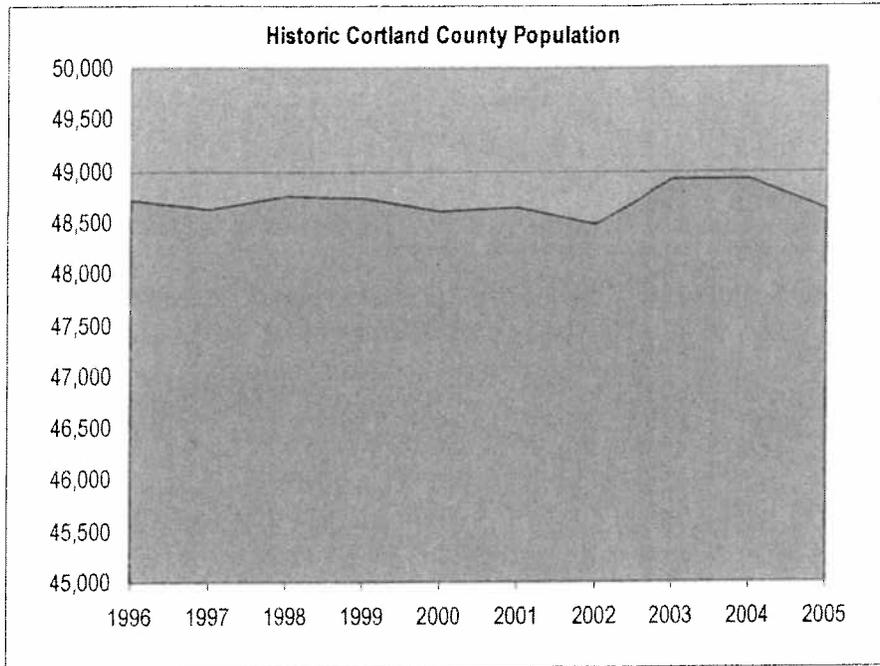
Source: US Census Bureau, March 2006

¹ Carter Goble Associates

Figure 1 below is a graphic illustration of the data of Table 1, reflecting the population trends of Cortland County between 1996 and 2005. It shows a relatively large increase in population in 2003, and a relatively large decrease in 2005. Overall, the population has not changed significantly since 1996.



Figure 1



Source: US Census Bureau, March 2006

The population growth as projected by Hudson Valley Regional Council and Cornell University is illustrated by Table 2 below. The table shows the projected population of Cortland County in 5 year intervals through 2025. This projected trend shows a decline in population of 2%, or 867 individuals, between 2005 and 2025.

Table 2
Projected County Population

Year	Population	No. Change from 2005 ¹	% Change from 2005 ¹
2005	48,599		
2010	48,506	-93	0%
2015	48,378	-221	0%
2020	48,131	-468	-1%
2025	47,732	-867	-2%

Sources: Hudson Valley Regional Council, Cornell University

¹ Carter Goble Associates



CRIMINAL JUSTICE STATISTICS

Crime

Reported crime data collected from Virginia University Uniform Crime Index Report and Division of Criminal Justice Services is shown in Table 3 below. University Uniform Crime Index Report only provided data up to the year 2002, so the data for 2003-2005 was provided by the Division of Criminal Justice Services. The crimes illustrated are "index crimes," high level offenses compiled by the Uniform Crime Reports (UCR) and published annually by the FBI in order to gauge fluctuations in volume and rate of reported crime. Index crimes are divided into two categories: violent crimes and property crimes. The violent crimes included are murder, rape, robbery, and aggravated assault, while the property crimes included are burglary, larceny-theft, and motor vehicle theft.

Crime rates are calculated as the number of crimes reported per 1,000 persons. The data shows a 40% drop in the overall rate of index crimes in Cortland County; however, some types of crime are up. Forcible rape has increased by 63% since 1996. The number of murders has increased by a deceptively high 300% due to four murders being reported in 2005 versus one in 1996, but no murders were reported in any of the intermediary years. Arson and robbery reports have also increased, but only by two incidents each. Property crimes have taken a significant drop of 42% overall, due to a large decrease in larceny-theft and motor vehicle theft, while violent crimes as a whole have remained mostly stable. As of 2005, the crime rate is at 28 offenses per 1,000 persons – a 40% drop from the 46.3 rate in 1996.

**Table 3
Historic Reported Crime**

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	10 Year Change ³
Population¹	48,726	48,619	48,755	48,734	48,599	48,647	48,473	48,922	48,921	48,622	-0.2%
Index Crime - Violent											
Murder	1	0	0	0	0	0	0	0	0	4	300.0%
Forcible Rape	16	13	23	14	11	11	17	20	24	26	62.5%
Robbery	13	11	14	9	14	8	13	19	10	15	15.4%
Aggravated Assault	96	82	88	66	80	82	63	56	73	84	-14.3%
Violent Crime Total	128	106	125	89	105	101	93	95	107	129	0.8%
Index Crime - Property											
Burglary	323	348	314	292	235	223	208	197	217	280	-13.3%
Larceny-theft	1,705	1,488	1,367	1,284	1,252	1,233	1,154	1,041	1,009	894	-47.6%
Motor vehicle theft	86	72	59	52	41	32	38	33	41	42	-51.2%
Arson	12	6	13	5	7	7	4	8	17	14	16.7%
Property Crime Total	2,126	1,914	1,753	1,633	1,535	1,495	1,414	1,279	1,284	1,230	-42.1%
Index Crime Total	2,254	2,020	1,878	1,722	1,640	1,596	1,507	1,374	1,391	1,359	-39.7%
Index Crime Rate²	46.3	41.5	38.5	35.3	33.7	32.8	31.1	28.1	28.4	28.0	-39.6%

Sources: Virginia University Uniform Crime Index Report (Reporting 1996-2002), Division of Criminal Justice Services, NY (Reporting 2003-2005)

¹ US Census Bureau, March 2006

² Total Offenses per 1,000 population.

³ Carter Goble Associates

Figure 2 below is a graphic illustration of data from Table 3, showing the total number of reported index crimes in Cortland County for each year, separated by violent and property crimes. It clearly shows that violent crime has been stable, while property crime has undergone a steady decline since 1996.

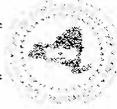
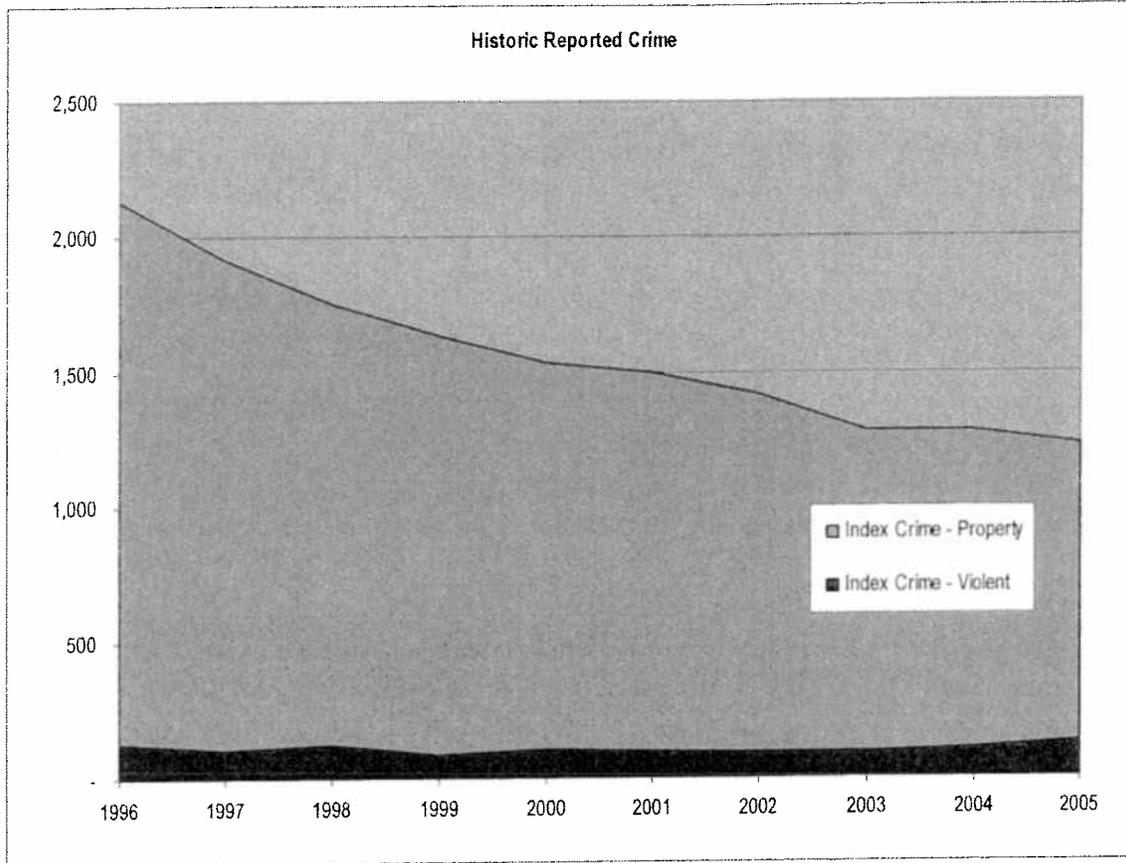


Figure 2



Sources: Virginia University Uniform Crime Index Report (Reporting 1996-2002),
Division of Criminal Justice Services, NY (Reporting 2003-2005)

Arrests

While reported crime data is an indicator of the crime rate in Cortland County, it does not correlate directly with actual arrests. In order to predict the future needs of a facility, it is necessary to examine the actual arrest data for that community. Table 4 illustrates arrest data, also from Virginia University Uniform Crime Index Report and Division of Criminal Justice Services. Again, University Uniform Crime Index Report provided data up to the year 2002, and the Division of Criminal Justice Services provided the data for 2003-2005. The data shows that murder arrests are relatively unchanged from year to year, with typically one or no arrests per year, but that forcible rape arrests have increased significantly in the past two years. Violent crime arrests overall have increased by 10% since 1996. Conversely, property arrests are down 27% since 1996. This is a result of larceny-theft arrests, the most arrest-heavy index crime in the county, dropping by 43% since 1996 despite all other property crime arrests being up. The significant decrease in larceny-theft arrests has also led to a decrease of 20% in overall arrests. In 2000, total arrests were up after a brief decline in 1999. Arrests declined again in 2001, but over the following two years they increased until spiking again in 2003. 2003 had a total of 381 index crime arrests, a 64% increase over the 233 arrests in 2001. Since then, arrests have fallen again, with 289 made in 2005.

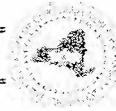


Table 4
Historic Arrests

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	10 Year Change ²
Population¹	48,726	48,619	48,755	48,734	48,599	48,647	48,473	48,922	48,921	48,622	-0.2%
Index Crime - Violent											
Murder	1	-	2	-	1	-	-	1	1	1	0.0%
Forcible Rape	4	4	6	7	8	5	7	5	18	14	250.0%
Robbery	12	3	7	10	15	11	11	15	14	8	-33.3%
Aggravated Assault	52	51	41	38	55	35	43	56	41	53	1.9%
Violent Total Arrests	69	58	56	55	79	51	61	77	74	76	10.1%
Index Crime - Property											
Burglary	26	47	32	48	40	35	55	58	54	51	96.2%
Larceny-theft	259	180	112	110	155	138	173	231	196	147	-43.2%
Motor vehicle theft	4	3	89	8	5	6	17	10	9	9	125.0%
Arson	2	-	2	-	-	3	2	5	7	6	200.0%
Property Total Arrest	291	230	235	166	200	182	247	304	266	213	-26.8%
Index Crime Total Arrests	360	288	291	221	279	233	308	381	340	289	-19.7%

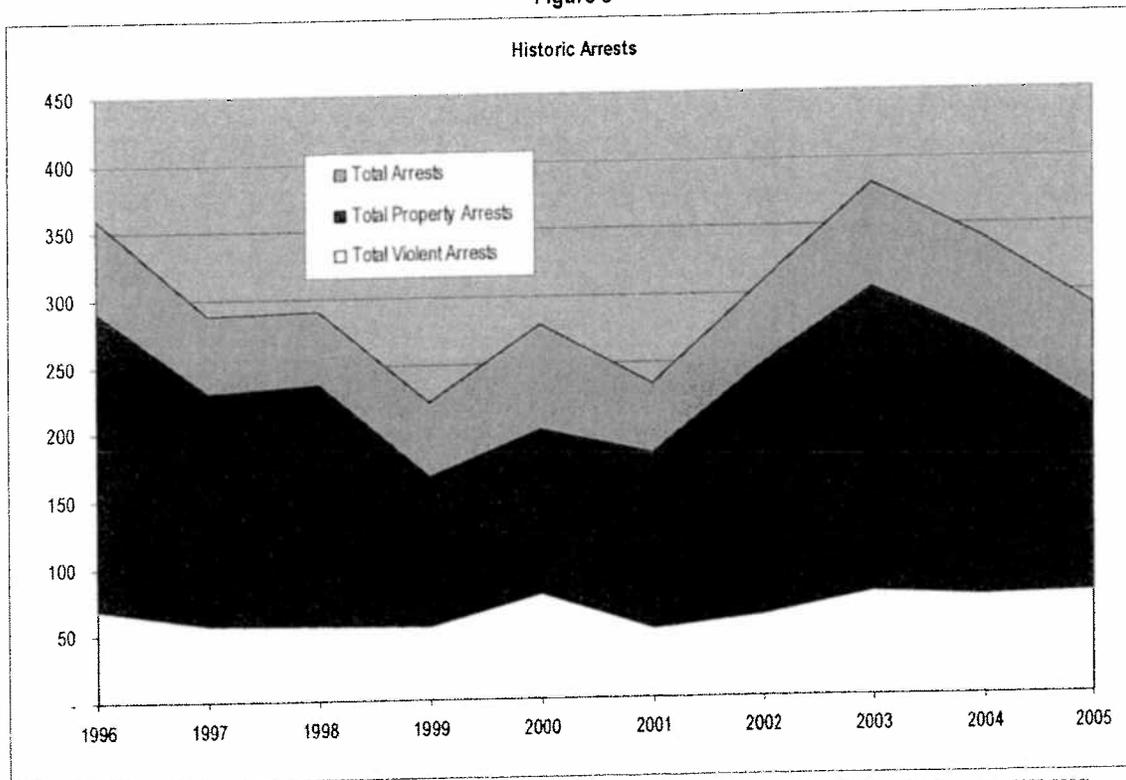
Sources: Virginia University Uniform Crime Index Report (Reporting 1996-2002), Division of Criminal Justice Services, NY (Reporting 2003-2005)

¹ US Census Bureau, March 2006

² Carter Goble Associates

Figure 3 below graphically illustrates data from Table 4, showing the number of arrests per year separated by property crime arrests, violent crime arrests, and total arrests. It shows a small spike in overall arrests in 2000, followed by a larger spike in 2003 after a two-year increase in arrests.

Figure 3



Sources: Virginia University Uniform Crime Index Report (Reporting 1996-2002), Division of Criminal Justice Services, NY (Reporting 2003-2005)



Incarceration Rate

Incarceration rate (IR) is calculated as the ratio of a jail's average daily population (ADP) to total county population, expressed as a rate per 1,000 persons. Table 5 below shows that the incarceration rate for Cortland County has not significantly changed since 1998, dropping from 1.3 inmates per 1,000 persons to 1.2 inmates per 1,000 persons. This stability can be explained by the county's largely unchanged county population and ADP.

Table 5
Historical Incarceration Rate

	1998	1999	2000	2001	2002	2003	2004	2005	% Change ³
County Pop.¹	48,755	48,734	48,599	48,647	48,473	48,922	48,921	48,622	0%
ADP²	64	64	59	49	54	61	66	58	-9%
Incarceration Rate³	1.3	1.3	1.2	1.0	1.1	1.2	1.3	1.2	-9%

Sources: ¹ U.S. Census Bureau, March 2006

² Cortland County Jail Statistical Report

³ Carter Goble Associates

JAIL STATISTICS

A jail's population is examined by three basic measures:

- The admissions or intake (ADM)
- The average daily population (ADP)
- The average length of stay of inmates (ALOS)

Admissions is the number of inmates processed into the facility. Average daily population measures the approximate number of inmates in the facility on a given day. Average length of stay is the average amount of days spent by inmates in the facility. The relationship between these factors is expressed by the following formula:

$$ADP = (ADM \times ALOS) / 365$$

Average Daily Population

Changes in crime and arrest rates affect the admissions and population of a jail. The average daily population (ADP) of a jail is a measurement of the average bed count of persons housed in the jail on a yearly basis. ADP is a census based number, rather than being formula derived.

ADP indicates the typical bed space needed by a jail system, which makes it a very useful measure of future space needs. When a facility's ADP is within 5% of its rated capacity, it is considered operationally overcrowded, as the ability to "move" in accordance with classification requirements is compromised.





During some short periods of time, a facility may experience a brief spike in its population. For this reason, future space needs can not be predicted based on ADP alone. In order to account for these spikes, a "peaking factor" is calculated for each historical year. The three months with the highest ADP values are averaged together as the "three month high." The peaking factor is then calculated as the percentage difference between the three month high and the year's overall ADP.

Table 6 below illustrates the monthly ADP from 1998-2005, with the three highest months of each year highlighted.

Table 6
Historical Average Daily Population

	1998	1999	2000	2001	2002	2003	2004	2005
January	60	59	72	48	48	57	69	57
February	67	51	66	47	52	65	69	55
March	72	64	58	43	49	63	68	61
April	68	65	65	46	49	55	73	58
May	58	66	60	40	51	57	70	57
June	61	66	57	43	55	64	75	75
July	63	66	58	56	50	71	74	56
August	62	63	56	58	53	53	68	56
September	67	68	57	56	51	51	61	58
October	60	71	57	52	63	63	57	57
November	63	65	52	52	66	66	51	51
December	66	63	48	51	62	62	58	58
Annual	64	64	59	49	54	61	66	58

Source: Cortland County Jail Statistical Report

Table 7 below illustrates the yearly ADP from 1998-2005, as well as the three month high and peaking factor for each year. The ADP of 2005 was 58 inmates, a 9% decrease from 1996, and about equal to the 8-year average of 59 inmates. The relatively low ADP in 2001 may be a reflection of that year's decreasing arrests, just as the abnormally high ADP in 2003-2004 may reflect the 2003 spike in arrests. The period of increasing ADP from 2001 through 2004 also follows a trend of increasing ALOS for those years. The highest peaking factor recorded was 18% in 2002, but the 8-year average is 12.1%. The peaking factor for 2005 was 11%, close to the 8-year average.

Table 7
Historical ADP and Peaking Factor

	1998	1999	2000	2001	2002	2003	2004	2005	Average
ADP ¹	64	64	59	49	54	61	66	58	59
3-Month High	69	68	68	57	64	67	74	65	66
Peaking	8.0%	6.9%	15.0%	14.9%	17.7%	11.1%	12.1%	11.0%	12.1%

Sources: ¹ Cortland County Jail Statistical Report

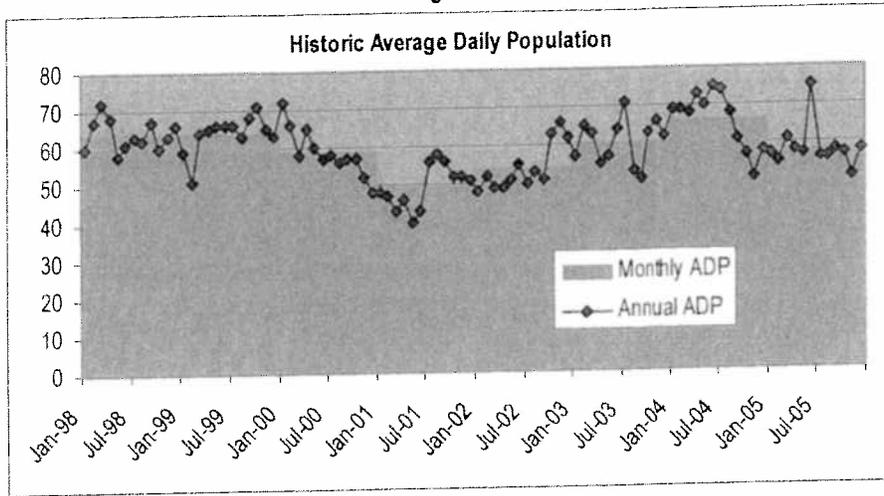
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Figure 4 below is a graphic illustration of the historical ADP in Cortland County's jail system from 1998 through 2005. It illustrates both monthly and annual ADP.





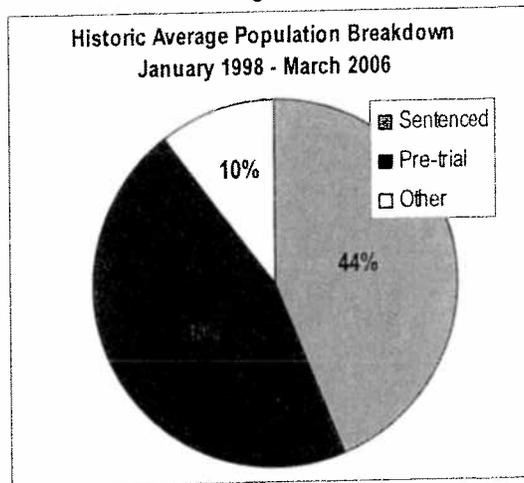
Figure 4



Source: Cortland County Jail Statistical Report

Figure 5 is a graphic illustration of the average breakdown of inmates from January 1998 to March 2006. The inmates are broken down by sentenced, pre-trial, and "other," which includes state readies and parole violators. The ratio of sentenced to pre-trial is about equal, with pre-trial inmates comprising 46% of the jail's population, sentenced inmates comprising 44%, and other inmates comprising 10%.

Figure 5



Source: Cortland County Jail Statistical Report

Table 8 shows the jail's annual ADP, broken down by sentences, pre-trial, and other inmates. It shows that pre-trial ADP has increased by 24%, from 24 inmates to 30 inmates. On the other hand, sentenced ADP has decreased by 10%, from 29 inmates in 1998 to 26 inmates in 2005. The ADP of other inmates has decreased by 52%.



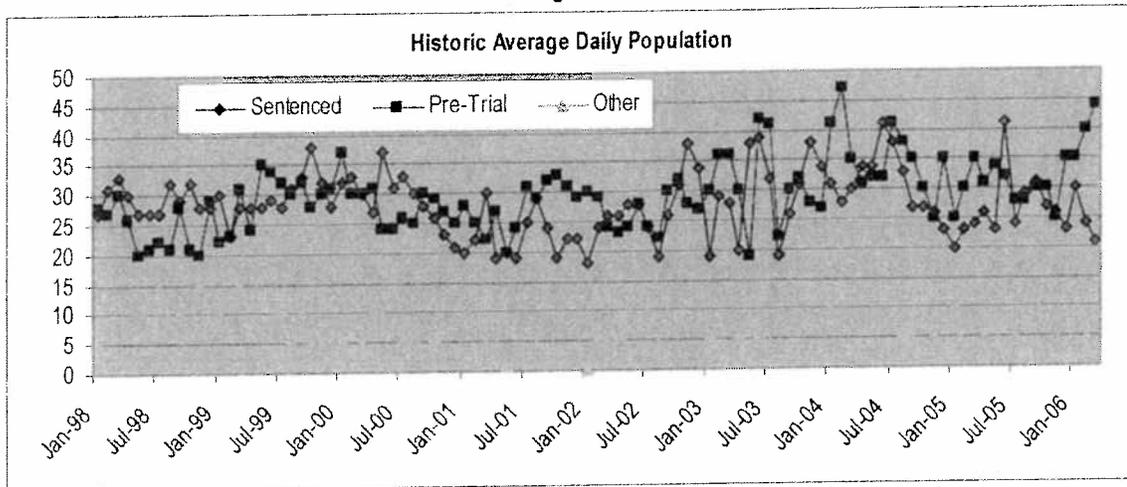
Table 8
Historic Average Daily Population

	1998	1999	2000	2001	2002	2003	2004	2005	Average	% Change
Sentenced	29.3	29.7	29.3	22.6	26.8	29.4	31.0	26.4	28.1	-9.7%
Pre-trial	24.4	29.3	28.2	27.6	26.8	31.1	35.2	30.3	29.1	23.9%
Other	10.3	10.3	7.4	3.9	5.1	4.7	6.0	4.9	6.6	-52.0%

Source: Cortland County Jail Statistical Report

Figure 6 shows a monthly breakdown of the jail's ADP, broken down by pre-trial, sentenced, and other inmates. ADP of pre-trial is on an increasing trend, while ADP of sentenced inmates has decreased a bit. From 1998 to 2001, the jail's population was rarely dominated by inmates of one type, and the population often fluctuated to favor one type over the other for a few months. Since around the beginning of 2001, however, the pre-trial population has almost outnumbered the sentenced population in all but a few months.

Figure 6



Source: Cortland County Jail Statistical Report

Admissions

Admissions (ADM) are another census based number that refers to all persons admitted to a jail regardless of their length of stay. ADM data does not differentiate between individuals released that same day and those who are incarcerated for longer periods of time.

Table 9 shows the admissions in Cortland County over the last eight years. Since 1998, the annual admissions have averaged about 1,000. Despite a brief spike in admissions in 1999 and 2000, admissions in 2005 are actually 1.5% lower than in 1998. While male admissions are down 4%, female admissions have increased by 20% since 1998. A recent trend of increasing average length of stay has kept ADP from dropping despite the relatively low admissions of recent years, compared to 1999 and 2000.



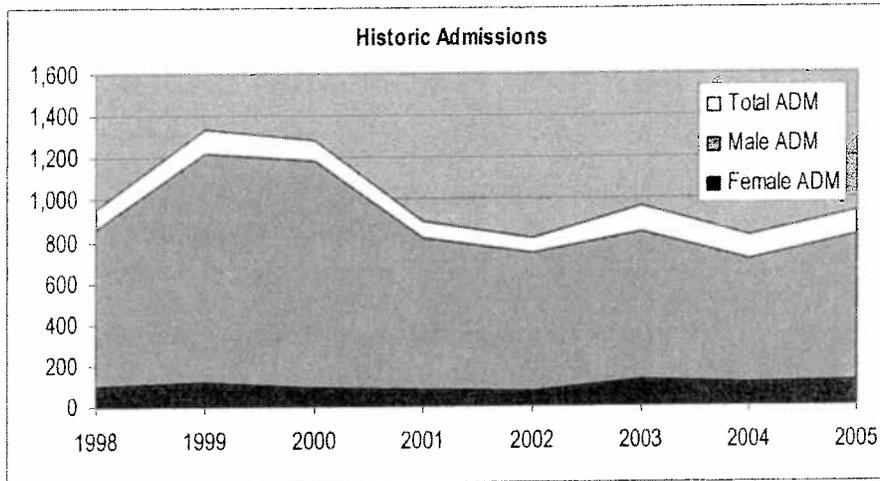
Table 9
Historical Admissions

	1998	1999	2000	2001	2002	2003	2004	2005	Average ¹	Percent Change ¹
Overall	958	1,342	1,281	894	813	968	819	944	1,002	-1.46%
Male	857	1,221	1,187	811	741	845	707	823	899	-3.97%
Female	101	121	94	83	72	123	112	121	103	19.80%

Sources: Cortland County Jail Statistical Report
¹ Carter Goble Associates

Figure 7 below is a graphic illustration of the admissions data from Table 9, showing male, female, and total admissions. It shows that female admissions are relatively stable, and that total admissions are driven by admissions of male inmates.

Figure 7



Source: Cortland County Jail Statistical Report

Average Length of Stay

Average Length of Stay (ALOS) is the average number of days that an inmate stays in the jail. It is calculated by multiplying the ADP by 365 and dividing that number by the annual admissions.

The average length of stay in Cortland County is shown in Table 10 below. The county's ALOS has seen a significant increase in the past five years, particularly in the period from 2000 to 2004, where it increased from 17 days to 29 days, an average increase of 3 days per year. In 2005, ALOS fell to 23 days but was still about equal to the seven-year average. The average length of stay over the entire seven year period is 22 days, while the average of the last 5 years is 24 days. ALOS has risen 30% since 1999. Male ALOS has increased 28% since 1999. Female ALOS is up as well, having increased by 62% since 1999. Male and female ALOS was unable to be calculated for 1998 due to male and female ADP being unavailable for that year.

A sharp increase of ALOS can indicate delays in efficiently moving cases through the system for the pre-trial population or longer sentences for the locally sentenced population.





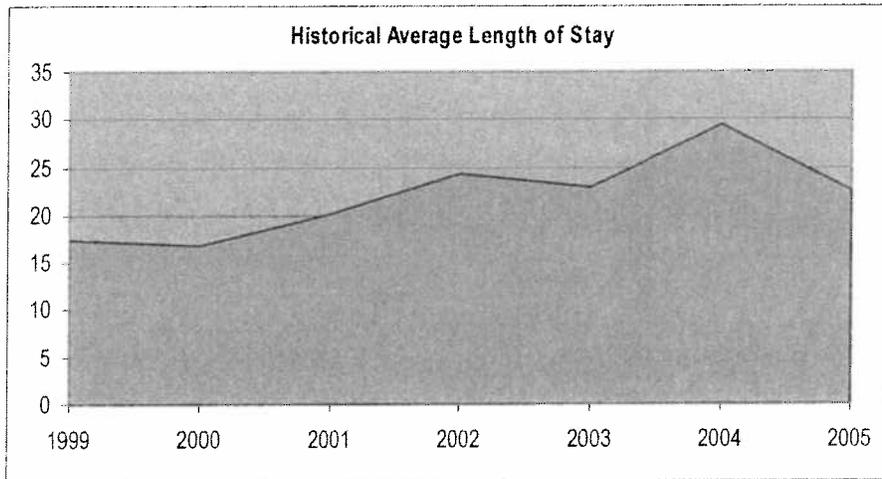
Table 10
Historical Average Length of Stay

	1999	2000	2001	2002	2003	2004	2005	Average ¹	Percent Change ¹
Overall	17	17	20	24	23	29	23	22	29.56%
Male	18	17	21	25	23	31	23	22	27.61%
Female	13	15	15	22	19	20	21	18	61.54%

Sources: Cortland County Jail Statistical Report
¹ Carter Goble Associates

Figure 8 below is a graphic representation of the county's ALOS from 1999 to 2005, which shows the steady increase of ALOS from 2000 to 2004.

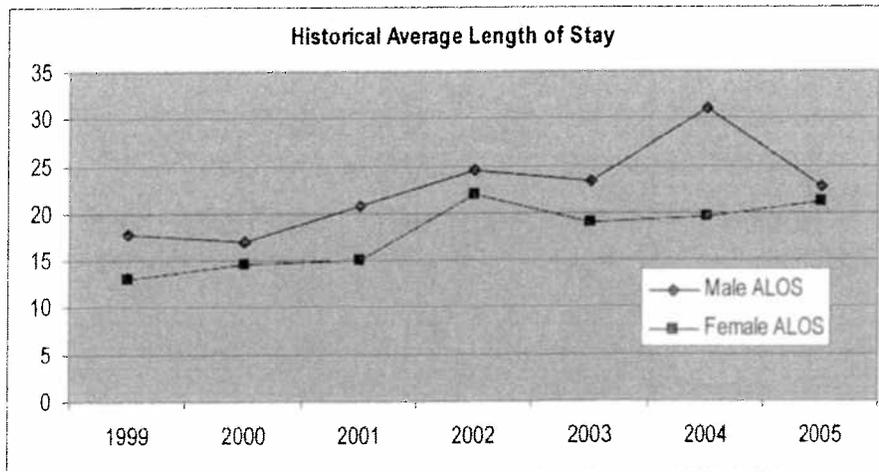
Figure 8



Source: Cortland County Jail Statistical Report

Figure 9 below is a graphic representation of male and female ALOS from 1999 to 2005. It shows that the ALOS of both male and female inmates has seen an increasing trend over the last 7 years.

Figure 9



Source: Cortland County Jail Statistical Report





CORTLAND COUNTY CRIMINAL JUSTICE SYSTEM

The Cortland County Jail's average daily population is controlled by the criminal justice system within the county. Historical data of crime and arrests, general population, court processing and jail population provide critical data regarding factors that impact on the jail's average daily population. However, local criminal justice policy and practice provide insight into the data. Judicial sentencing practices, prosecutorial decision making, probation violation practices and law enforcement initiatives impact how best to interpret historical data. In that regard, interviews were conducted with key local criminal justice participants in order to gain insight into local criminal justice practice in Cortland County.

Law Enforcement Initiatives – Between 2002 and 2004 State, County and municipal area law enforcement agencies instituted a drug enforcement task force that resulted in a high number of arrests within the Cortland County region. These initiatives were reflective of the high number of arrests in 2003. The task force strength was reduced due to lower staffing initiatives of some of the agencies involved in the task force efforts. As a result the drug task force efforts were diminished for a period of time. Staffing issues have recently been resolved and the drug task force efforts are being revitalized. The results of this revitalization should be realized in the near future. All agencies have committed to the efforts of the drug task force for the foreseeable future. These efforts are anticipated to increase the arrest rates previously realized in 2003. As these arrests increase, it is anticipated that admissions to the jail will have a corresponding increase.

Criminal Courts – The criminal courts are meeting time standards for disposing of criminal cases. New York State and American Bar Association standards for case completion are met or exceeding in the past year. Efforts to complete case disposition in a more efficient manner have resulted in a fast track Pre-Sentence Investigation (PSI) process. This process reduces the amount of time for completion of the PSI. As a result, the length of stay within the county jail has not exceeded acceptable levels. While the length of stay has risen by five days since 1999 (17 days to 22 days), it has been on decline since 2004 when only one judge was sitting (second judge was out for extended period due to illness). The reduction in the length of stay in the jail is an indication of good case processing of pre-trial cases. Additionally, the number of trials has remained within an acceptable level.

Indications are that the number of felony cases has increased during the past two year period. Cortland County had the reputation of having the highest number of sex abuse cases per capita in the State. Local jail sentencing practices has remained somewhat of a stagnant protocol. The most common practice is to sentence to the jail in one of two forms; 1) 6 months jail, as part of a five-year term of probation and 2) intermittent sentences (weekends). This practice has been a major reason the jail population has approximately 50% of its average daily population (ADP) as locally sentenced. Intermittent sentences are traditionally used for offenders who are gainfully employed and the courts feel require jail sanctions.

The courts have been using a variety of alternative to incarceration programs as a result of overcrowding at the jail. Electronic monitoring is being used as an alternative for pretrial defendants. The program is new and has had a measure of success thus far. The Probation Department operates the Alternatives to Incarceration program in the county. The Electronic Monitoring program has only been in existence for approximately six months with about 12 cases under the program thus far. A new Drug Court has also



been implemented that will hopefully have a positive impact on future jail populations, but that uses intermittent sentencing as part of the protocol.

District Attorney – The current D.A. has been in office for approximately 2 ½ years, although he has been with the D.A. office for more than twenty years. The D.A. indicated that while he has not implemented any new policies regarding plea bargaining practice, he has taken a more focused view on case reviews within the office that may result in more trials than in the past. He also has been instrumental in resurrecting the Police Drug Task Force. He has a belief that if the jail were not overcrowded there are people in the community today that would be in the jail. He was not in total agreement with the new electronic monitoring program that has been developed for the pretrial population. He did acknowledge that the program has been somewhat successful in the short period since its inception.

Probation Office – The probation office is charged with operating the Alternative to Incarceration (ATI) Program in Cortland County. The County has been operating a pretrial release program since 1985 as part of the ATI Program. In 2004 the ATI Program was incorporated into the Probation Department. The Pretrial Release program reviews pretrial defendant's backgrounds and provides a recommendation to the court as to release pending trial. As a result of this activity, they are very familiar with the pretrial population in the jail. They use an objective assessment tool in determining release recommendations. As mentioned previously, they have begun to use electronic monitoring as an enhancement toward release conditions. The Electronic Monitoring (EM) program has been in existence for about a year and is used sparingly by the courts as a result of jail overcrowding. EM is used as a condition of pretrial release as well as a condition of probation. At the time of the interview there were six people on Electronic Monitoring, 4 on probation and two on pretrial release. There have been a total of twelve people on EM since its inception.

The office also supervises those who have been found guilty of an offense and placed on probation by the courts. At the time of the interview there were approximately 520 criminal cases on active probation. Probation terms are shortened as a result of compliance over an appropriate time period. The probation office also feels that there are persons that have been released that would be incarcerated if not for jail overcrowding, especially females.



PROJECTIONS

Seven projection models were developed from the various data sources collected. Models 1-3 are general population based, Models 4 and 5 were developed as mathematical extrapolations of the jail average daily population and are used for demonstrative purposes, Models 6 and 7 are statistical based projections with different focus and emphasis, relying on R-Square values for reliability. Two sets of projections were initially developed, one using 10 year historical data and another using five year historical data for average daily population projection models. It was determined that the ten year historical data presented an overall trend that was not representative of current trends and practices. After interviews with key criminal justice practitioners it was agreed that the five year historical trend was more realistic toward future growth patterns.

Model 1 - Incarceration Rate

A projection model based on incarceration rate was created by finding the calculated average of the incarceration rates of the past five years, representing an upswing in ADP, and applying that average to projected future populations. The average incarceration rate was found to be 1.18 inmates per 1,000 persons. The ADP was then projected using the following formula:

$$\text{Projected ADP} = 1.18 \times (\text{Projected Population} / 1,000)$$

This model predicts an ADP of 56 in the year 2025.

Incarceration Rate	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2010	2015	2020	2025
Population	48,726	48,619	48,755	48,734	48,599	48,647	48,473	48,922	48,921	48,622	48,506	48,378	48,131	47,732
Incarceration Rate (1996-2005)						1.01	1.12	1.24	1.35	1.20	1.18	1.18	1.18	1.18
Incarceration Rate = ADP / (Population / 1000)											Projected ADP			
											57	57	57	56

Sources: U.S. Census Bureau (historical population 1996-2005)
Hudson Valley Regional Council (projected population 2010-2025)
Carter Goble Associates, August 2006

Model 2 - ADM per 1,000 Population

The next projection model predicts ADM based on the ratio of historical ADM to historical population. For each historical year, ADM was divided by population over 1,000, giving the ratio of ADM to 1,000 persons. Those yearly ratios were then averaged, yielding an average of 20.71 admissions per 1,000 persons in the county. Using the following formula, admissions were predicted for future years:

$$\text{Projected ADM} = 20.71 \times (\text{Projected Population} / 1,000)$$

Because this projection gives a predicted ADM value, another step must be taken to predict the ADP. The average ALOS of the last five years was calculated to be 24 days. ADP was then projected using the following formula:

$$\text{Projected ADP} = (\text{Projected ADM} \times 24) / 365$$

This model predicts an ADP of 65 in the year 2025.





ADM per 1,000 Population	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2010	2015	2020	2025
Population	48,726	48,619	48,755	48,734	48,599	48,647	48,473	48,922	48,921	48,622	48,506	48,378	48,131	47,732
ADM per 1,000 Population (1996-2005)				27.54	26.29	18.40	16.71	19.97	16.74	19.42				
											Projected ADM	1,006	1,003	997
													66	66
														66
														65

Sources: U.S. Census Bureau (historical population 1996-2005)
Hudson Valley Regional Council (projected population 2010-2025)
Carter Goble Associates, August 2006

Model 3 – Part 1 Arrests per Population

This projection model predicts ADM using historical arrests, historical ADM, and historical population. A ratio of total arrests to population was calculated, and a ratio of ADM to total arrests was calculated. When multiplied, these two ratios give a ratio of ADM to population. The ratio of ADM to population is then multiplied by the projected population to get the predicted ADM for that year.

$$(\text{Total Arrests} / \text{Population}) \times (\text{ADM} / \text{Total Arrests}) = (\text{ADM} / \text{Population})$$

$$(\text{ADM} / \text{Population}) \times \text{Projected Population} = \text{Projected ADM}$$

Since we want a projection of ADP, we again use the following formula, where 24 is the calculated average of the historical ALOS:

$$\text{Projected ADP} = (\text{Projected ADM} \times 24) / 365$$

This model predicts an ADP of 69 in 2025.

Historic Arrests per Population	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2010	2015	2020	2025
Population	48,726	48,619	48,755	48,734	48,599	48,647	48,473	48,922	48,921	48,622	48,506	48,378	48,131	47,732
Historic Arrests per Population	0.0074	0.0059	0.0060	0.0045	0.0057	0.0048	0.0064	0.0078	0.0069	0.0059	0.0061	0.0061	0.0061	0.0061
ADM per Arrests			3.2921	6.0724	4.5914	3.8369	2.6396	2.5407	2.4088	3.2664	3.5810	3.5810	3.5810	3.5810
ADM per Population			0.0196	0.0275	0.0264	0.0184	0.0168	0.0198	0.0167	0.0194	0.0220	0.0220	0.0220	0.0221
											Projected ADM	1,006	1,003	997
													70	70
														70
														69

Sources: U.S. Census Bureau (historical population 1996-2005)
Hudson Valley Regional Council (projected population 2010-2025)
Virginia University Crime Index Report (reporting 1996-2002), Division of Criminal Justice Services, NY (reporting 2003-2005)
Carter Goble Associates, August 2006

Model 4 - ADP by Percentage Change

This model predicts future ADP by using the historical annual percentage changes in ADP. The percentage change was calculated between each historical year from 2001 to 2005, since these years represent an upswing in ADP, and those values were then averaged. This average annual percentage change, 4.7%, was used to find the expected percentage change over a 5 year interval using the following formula:

$$\text{5-Year Percentage Change} = ((1 + 0.047)^5 - 1)$$

The annual percentage change can not simply be multiplied by 5, because the percentage change has to be applied to each individual year. Using the formula, the 5-year percentage change was found to be 25.9%. This percentage change was then applied to the known ADP for 2005, 58, to predict the ADP for 2010, and so on, until an expected ADP was found for 2025.

This model predicts an ADP of 146 in 2025.



ADP by Percentage Change	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2010	2015	2020	2025
ADP			64	64	59	49	54	61	66	58				
Annual Percentage Change							9.6%	12.0%	9.0%	-11.8%	25.9%	25.9%	25.9%	25.9%
	Projected ADP										73	92	116	146

Sources: Cortland County Jail Statistical Report
Carter Goble Associates, August 2006

Model 5 - ADP by Numerical Change

A fifth model predicts future ADP by using the historical annual numerical change in ADP. The numerical change was calculated between each historical year from 2001 to 2005, since these years represent an upswing in ADP, and those values were then averaged. This average numerical change, 2.25 annually, was multiplied by 5 to obtain an expected 5-year numerical change of 11. This value was then added to 2005's historical ADP of 58 to obtain an expected ADP for 2010, and so on, until reaching an expected ADP for 2025.

This model predicts an ADP of 103 in 2025.

ADP by Number Change	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2010	2015	2020	2025
ADP			64	64	59	49	54	61	66	58				
Number Change							5	7	5	-8	11	11	11	11
	Projected ADP										69	81	92	103

Sources: Cortland County Jail Statistical Report
Carter Goble Associates, August 2006

Model 6 – ARIMA

This projection was done using a computerized ARIMA (0,1,2)*(0,1,1) model (also called Box-Jenkins). This model has an R-square value of .604, and predicts an ADP of 114 in 2025.

ADP by ARIMA (0,1,2) (0,1,1)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2010	2015	2020	2025	
R-Square = 0.5169											74	87	101	114

Source: Carter Goble Associates, August 2006

Model 7 – Multiplicative Winters Exponential Smoothing (Linear Trend, Multiplicative Seasonality)

A computerized exponential smoothing model was run projecting the data as linearly trended with additive seasonality. Additive seasonality means that the seasonal (in this case, monthly) deviations in ADP are given a numerical value by which they are added to or subtracted from the underlying series. This model has an R-square value of .5132, and predicts an ADP of 69 in 2025.

ADP by Exponential Smoothing	1996	1997	1998	1999	2000	2001	2002	2003	2004	2010	2015	2020	2025	
R-Square = 0.48 Linear Trend, Multiplicative Seasonality											65	66	68	69

Source: Carter Goble Associates, August 2006





Summary of Results

The various models presented here project a range of ADP in 2025 between 42 and 69. In Table 1 below, the predicted ADP of each model from 2010 to 2025 is illustrated.

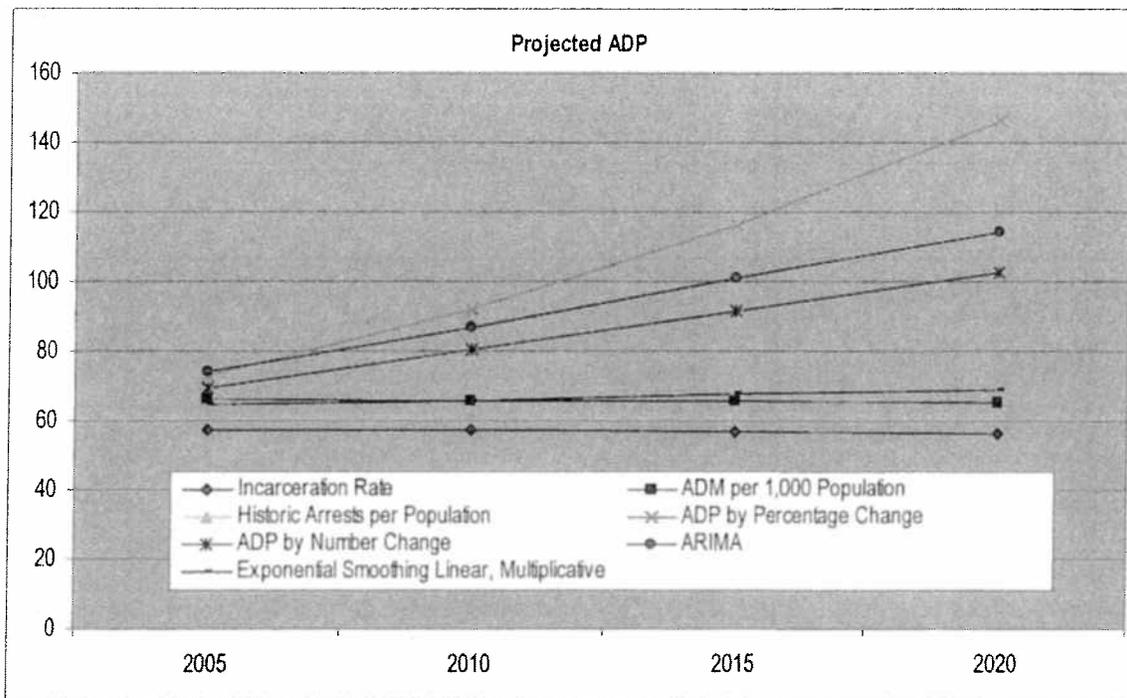
Table 11
Summary Projected ADP

Model	2010	2015	2020	2025
Incarceration Rate	57	57	57	56
ADM per 1,000 Population	66	66	66	65
Part 1 Arrests per Population	70	70	70	69
ADP by Percentage Change	73	92	116	146
ADP by Numerical Change	69	81	92	103
ARIMA	74	87	101	114
Multiplicative Winters Exponential Smoothing	65	66	68	69

Source: Carter Goble Associates

These results are illustrated graphically by Figure 1 below.

Figure 10



Source: Carter Goble Associates



Peaking and Bed Needs

Because the population of a jail often exceeds its average daily population, it is necessary that the “peaking factor” be represented. The average peaking factor in Cortland County over the past 10 years has been 12%. Additionally, a 10% classification factor is recommended. This means it is recommended that the jail be able to accommodate 22% more than the projected ADP for 2025.

Table 3 below shows the bed needs projected by each model for 2010 through 2025. Bed needs are the result of applying the peaking and classification factors, in this case 22%, to the projected ADP. The highest projected bed need is 179, by the ADP by Percentage Change model. The lowest projected bed need is 69, by the Incarceration Rate model.

Table 12
Summary Projected Bed Needs

Model	2010	2015	2020	2025
Incarceration Rate	70	70	69	69
ADM per 1,000 Population	81	80	80	79
Part 1 Arrests per Population	86	85	85	84
ADP by Percentage Change	89	113	142	179
ADP by Numerical Change	85	98	112	125
ARIMA	90	106	123	139
Multiplicative Winters Exponential Smoothing	79	81	83	84

Source: Carter Goble Associates

Recommendation

The jail is currently overcrowded, having to board out inmates (especially females) and create de-population programs by the courts in order to accommodate current needs, although general population growth and crime have either been stable or declining. Future growth of the general population in Cortland is anticipated to be stable with very little growth or no growth anticipated.

The driving force behind the current jail crowding has more to do with criminal justice practice and policy than historical and future growth patterns. A re-emphasis on drugs and possible out of county drug trafficking enforcement appears to be a driving force on future jail bed growth needs. It should also be noted that violent crime and arrests have been on the rise since 2001. These factors as well as the courts sentencing practices are having major impacts on the jail’s population.

The first three models are general population based. The general population growth rate is anticipated to be stable or declining. Historical data also does not support a strong relationship between general population and jail population.





Models four and five were developed more as demonstrative models than from strong statistical foundation and reflect straight line mathematical extrapolations. The last two models were developed based on statistical projection models. The higher the R value the stronger the predictability rating. The ARIMA model has a .60 R value while the Multiplicative model has an R value of .51.

Assuming that criminal justice practice in Cortland County remain as currently practiced and based on the historical data and system interviews, it is recommended that Cortland County should plan for approximately 140 jail beds by the year 2025.