Oregon Corrections Population Forecast

October 1, 2011

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Office of Economic Analysis

Background

The Office of Economic Analysis (OEA) produces the semi-annual Oregon Corrections Population Forecast which provides projections of the offender populations supervised by the Oregon Department of Corrections (DOC). The forecast estimates the number of inmates in the state prison system, offenders on probation, parole, post-prison supervision, and felony offenders serving sentences of 12 or fewer months in county jails.

Executive Order 95-06 and Oregon Revised Statute 184.351 direct the Department of Administrative Services (DAS) and the Corrections Population Forecasting Advisory Committee to produce the forecast. The forecast is mandated to estimate monthly populations over a ten-year period and is published April 1 and October 1 of each year. State agencies, in particular the DOC and the Oregon Criminal Justice Commission (CJC), are mandated to use the forecast for budgeting and policy development where the offender population is concerned.

The Advisory Committee, whose members are appointed by the Governor, is comprised of individuals with knowledge of the criminal justice system. Advice from the Committee forms the basis for forecast assumptions regarding policy and practices in the criminal justice system and the impact of law and policy changes on the corrections populations. Committee members bring to the forecast process decades of diverse experience in the public safety system. They meet several times prior to each forecast release to discuss forecast-related issues such as trends in crime, potential impact of new laws, changes in public safety policy or practices, and to advise technical aspects of the forecast process.

Corrections Population Forecasting Advisory Committee

Honorable Julie Frantz (Chair)	Multnomah County Chief Criminal Judge
Aaron Felton	Board of Parole & Post-Prison Supervision
Jason Carlile	Linn County District Attorney
Greg Hazarabedian	Public Defender Services of Lane County
Craig Prins	Criminal Justice Commission Executive Director
Donald Rees	Multnomah County Deputy District Attorney
Max Williams	Director Department of Corrections
Jeffery Wood	Director Marion County Community Corrections
(two vacant)	

The general forecast process, the publication of the forecast (this document), and technical aspects of performing the forecast (e.g., data analysis), are managed by OEA, in partnership with the CJC, and with substantial assistance from the DOC.

For more information or questions regarding the forecast please use the following contact information:

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Trends and Forecast Methodology

Inmate Population

The inmate forecast uses a model which simulates inmates entering prison, their length of stay in prison, and final release. The primary driver of the forecast in the short term is the release rate of the existing prison population. In the long term, new intakes drive population trends. The rate of intakes and releases results in turnover of about half the inmate population every two years.

The length of stay for inmates is critical in modeling releases from prison. The fundamental information for estimating an inmate's length of stay – the inmate's sentences – is known for most current inmates. With sentence information, releases can be modeled in a semi-deterministic manner. It is important to note that the length of an inmate's stay is not a simple fixed number of months that is known when they enter prison. Standard upper and lower bounds are computed by DOC based on how the inmate's sentences combine, but deviation both within and without the bounds must be handled statistically. The long term prison population depends primarily on future intakes (number and lengths of stay). In contrast to releases, future prison intakes cannot be mechanically determined based on any current information. The baseline (before accounting for law changes) intakes are forecasted based on the historical trend. The trend integrates demographics, criminal justice practices, and other factors which influence intakes and sentence lengths. The forecast assumes future intakes will be similar to what is observed in trends from the recent past.

As a technical note, modeling the prison population relies on both the number of intakes each month and how long each will stay (length of stay is needed to establish release timing). The forecast handles this by simulating the full distribution of lengths of stay; in other words, the forecast tracks the number of intakes broken down by lengths of stay in one month increments up to 10 years. The total time in months adding up all the individual lengths of stay for intakes is termed 'intake volume', and is measured in bed-months. For example, if intakes occurred at a fixed level of 10,000 bed-months per month for many years, the prison population size will eventually equal 10,000 beds. That would represent a steady-state population level where intakes exactly equal releases every month.

Prison intakes are the major determinant of the long term prison population size, so it is valuable to have factors which are predictive of future intakes. Changes in criminal sentencing laws are a major factor used in the forecast for predicting future changes in intakes. When sentencing laws change, the full effect on prison populations can take years to be fully realized, but an attempt is made to estimate and incorporate the complete policy impact in the forecast as soon as the law is passed.

Various other factors have been suggested and checked for possible value in predicting future prison intakes. These include trends related to crime, the economy, student assessments, and court filings. Generally speaking, there were no obvious causal (or predictive) relationships to prison trends which the forecast can rely on. Therefore, the future intakes used in the forecast are based on intake trends from the recent past with the adjustments for law changes.

Intake Trends

The number of prison intakes each month increased gradually from 2000 to 2004, then remained relatively flat until late 2008. In early 2009, and lasting into 2010, intakes increased about 5 percent above the previous average level (from 2004-2008). In the latter half of 2009, much of the increase can be attributed to new sentencing laws per Measure 57 which caused a shift from probation to prison sentences for some offenders.

The graph below shows the number of new inmates entering prison each month (heavy line), and the number of inmates leaving each month (light line). Over the past year, entries have averaged about 410 per month, which is slightly less than the long term average (the average since 2004 is about 420). New inmates are expected to stay, on average, around 36 months. This would lead to a steady-state population numbering around 14,700 (36 months * 410 inmates per month = 14,760).

Number of Prison Admissions each Month
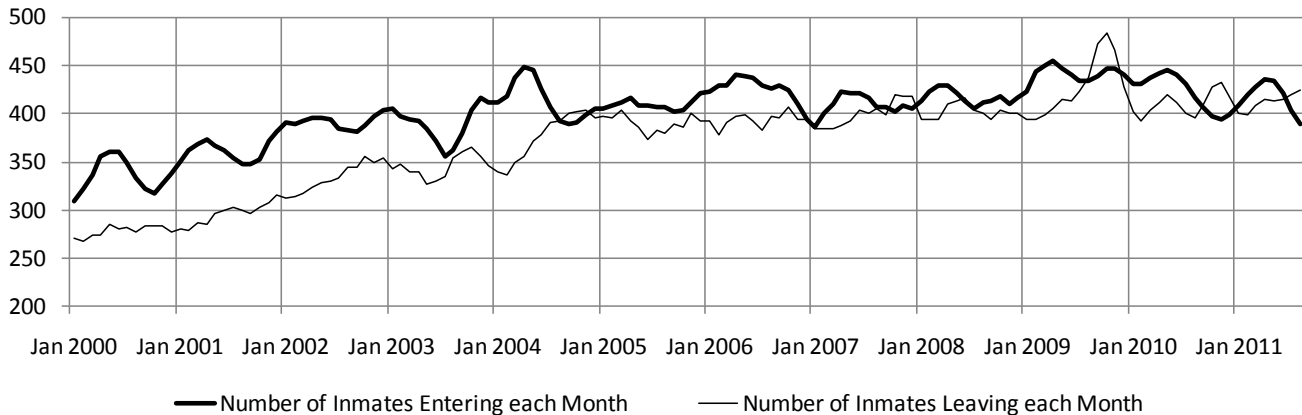
In addition to the simple count of intakes, lengths of stay for new intakes also impact the future prison population. From 2004 to 2007 the estimated average length of stay for new intakes was decreasing slowly due largely to time-served reductions for alternative incarceration program participants. This trend ended in 2008, when the average length of stay rose for a year before stabilizing. Although difficult to measure, the average length of stay appears to have started falling once more in recent months.

Since the forecast counts intakes, releases, and the number of inmates in a slightly different way than DOC reporting; small differences in counts are expected and not of concern.

Conceptually, the forecast model operates as a sequence of discrete months, feeding forward from one month to the next. Each month starts with the base population for the month; i.e., a distribution of expected length of stay for inmates who are in the prison population on the first day of the month. Lengths of stay less than one month represent inmates who will be released prior to the next month and are removed from the model. The number of intakes and distribution of their lengths of stay is projected for each month and flows into the base population for the next month. The equation below represents the elements:

Population Base (Month 2) = Population Base (Month 1) + Intakes – Releases

The model uses a top-down approach, operating at the level of the population in aggregate, then disaggregating as necessary to sub-groups (e.g., gender, risk level, type of offense) based on the contribution of each to the aggregate. This is in contrast to a bottom-up approach which would forecast each sub-group separately, and later aggregate to the whole. The top-down approach is desirable because observed trends can be more easily interpreted in terms of how individual sub-groups differ from the aggregate, as opposed to how each sub-group combines to the aggregate. This approach has also demonstrated more accuracy.

Community Corrections Populations

The community corrections forecasts rely primarily on the relatively stable historical trends in the respective populations. For the parole and post prison supervision population, the forecast uses historical trends adjusted for projected outflows from the inmate population.
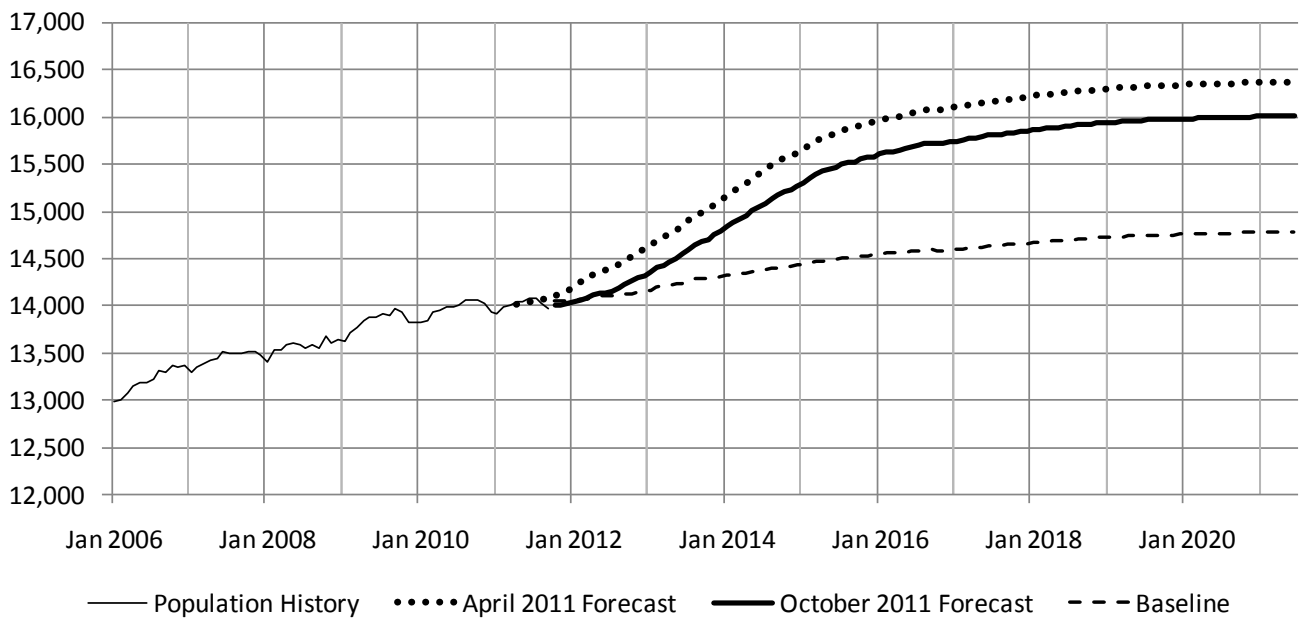
Forecast

Prison Inmate Population

The number of inmates housed in Oregon's prisons, currently about 14,000, is expected grow to 16,000 inmates by the end of the decade, with much of that growth occurring over the next four years. This is a reduction, compared to the prior forecast, of about 100 inmates in the short term, and about 360 in the long term. The reduction is due primarily to legislative action (SB 395) in 2011 which is expected to significantly reduce the prison impact of Measure 73 (2010) which was assumed in the April forecast.

The graph below shows the prison inmate population count from 2006 to current, the current forecast (heavy line), the prior forecast (dotted line), and the baseline scenario. The baseline is an estimate of what the prison population would be if there had not been any sentencing law changes since 2007.

Prison Inmate Population Forecast

Prior Forecast Tracking

The actual inmate population has tracked below the April 2011 forecast level, with a maximum difference of about 100 beds. The difference can be attributed largely to passage of SB 395. After adjusting for that, the prior forecast tracked very well.

Community Corrections

The forecasts for Local Control, for Parole/Post-Prison Supervision, and for Probation populations reflect very minor changes to match the most recent data on actual population sizes.

Community corrections includes felony offenders who are supervised by the Department of Corrections, but are not in prison. The forecast projects the felony probation caseload, local control population (incarceration in jail), and post-prison supervision and parole (Parole/PPS). Each group is forecasted separately for budgeting purposes. The community corrections forecasts rely primarily on the relatively stable historical trends in the respective populations. This methodology will need to be revisited should changes in public policies significantly alter the existing system.

The local control population dropped significantly in mid 2008, departing from historical trend. Anecdotal information indicates that the drop is associated with county-level efforts to decrease jail populations, and that these new practices will continue in the future. The forecast incorporates a continued reduction of approximately 100 beds associated with this change. An additional transitory reduction of approximately 200 beds was factored in for a cap (60 day maximum) on the length of stay in jail for probation revocations put in place by HB 3508.
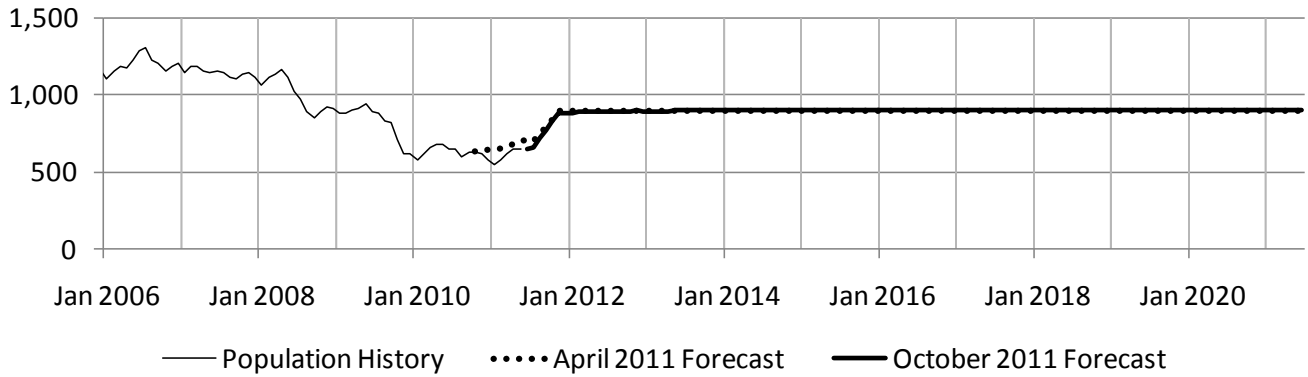
Note Regarding Measure 73 / SB 395 Impact: The combined effect of Measure 73 and SB 395 will increase the number of people serving jail sentences for DUII offenses, and may increase the number of DUII offenders in jail prior to sentencing. Traditionally, the jail impact of offenders awaiting sentencing has not been included in the local control forecast. For DOC budgeting purposes, a separate forecast will be done for the jail time served prior to sentencing, and jail time served as part of a sentence, for DUII offenders falling under Measure 73.

The probation population forecast baseline follows historical trend with adjustments to reflect the most recent population numbers, the temporary suspension of Measure 57, and for revoked probationers serving less jail time.
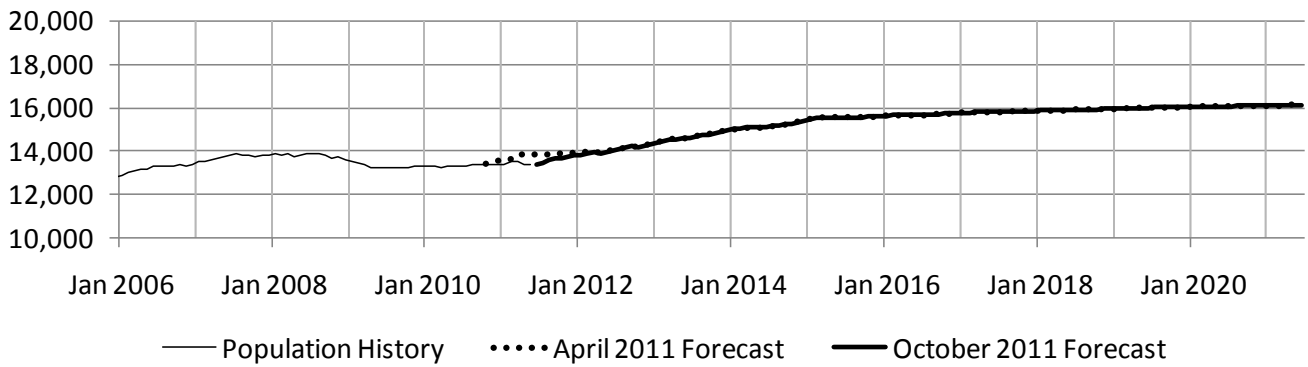
The parole population incorporates adjustments for both the suspension of Measure 57 and for the increased earned time included in HB 3508.

The three graphs below (next page) show the population history (light line), the current forecast (heavy line), and the previous forecast (dotted line) for the local control, the probation, and the parole/PPS population groups.
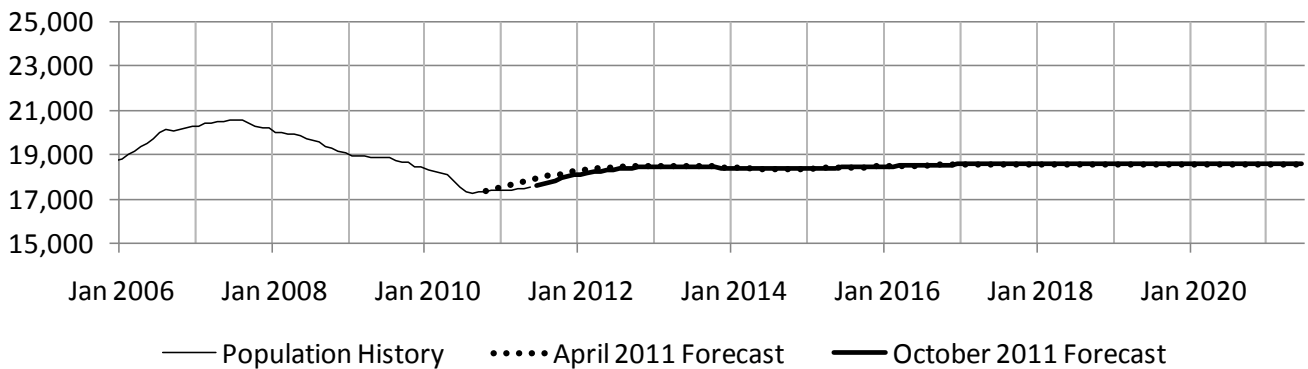
Local Control Forecast

Population History · · · · · April 2011 Forecast —— October 2011 Forecast

Parole / Post-Prison Supervision Forecast

Population History · · · · · April 2011 Forecast —— October 2011 Forecast

Probation Forecast

Population History · · · · · April 2011 Forecast —— October 2011 Forecast

Law Change Impacts

This forecast is based on current laws and practices, meaning that projections assume crime and sentencing laws and practices will not change over the 10 year forecast horizon. Laws currently in effect, including recent changes, are incorporated in the forecast. For recent law changes, the forecast applies specific adjustments; for older law changes, the effects are part of the baseline data and are not accounted for separately. The forecast adjustments for recent law changes generally derive from the financial/fiscal impact statements for the associated bill or ballot measure until new data become available.

To clarify:

- If a current law specifies future changes, such as sunset provisions or suspension/reinstatement provisions at some future date, those future changes are assumed in the forecast.

- If a legislative bill or ballot measure has not yet become law, the forecast does not adjust for it, no matter how likely the policy change is.

The most recent law change impacting the forecast is the passage of Measure 73 (M 73) in November 2010 which changed sentencing for some repeat offenders convicted of driving under the influence of intoxicants (DUII), and certain sex offenders. The law is expected to increase the number of prison sentences for DUII offenders on their third conviction, thus bringing an increase in the prison population. The longer sentences for sex offenders will have little impact the prison population over the next 10 years. The forecast incorporates an estimate of the prison population increase based on the financial impact estimate published in the Voters' Pamphlet. The Voters' Pamphlet estimate gave an upper and lower range; the forecast uses the lower range which, on review of recent data and methodology, represents the most likely outcome.

Previous law changes, in particular Measure 57 (2008), House Bill 3508 (2009), and Senate Bill 1007 (2010), have had canceling effects which resulted in a relatively small net impact on the current population.

The impact of these law changes will remain relatively small until 2013 when sentencing minimums under Measure 57 resume and the limited 30 percent earned time provided under House Bill 3508 returns to 20 percent. In 2013, these changes are estimated to bring significant population growth, adding approximately 1,000 inmates to the prison population by 2017.

The April 2010 forecast report includes additional detail regarding the law changes and the complex timing of when various provisions of law are expected to be reflected in populations.

Forecast Detail Tables

Monthly forecast numbers for the population of prison inmates, probation cases, local control jail population, and parole/post-prison cases are in spreadsheet format as an appendix to this document. The spreadsheet also breaks down the inmate population by gender and security risk level. See the following link:

http://oregon.gov/DAS/OEA/corrections.shtml.

Forecast Risks

The forecast assumes that current laws and current criminal justice practices continue as they are now. It also assumes trends in criminal activity continue and demographics follow expected trends. If those or other assumptions fail, the forecast is at risk.

In the outer years of the forecast, fundamental shifts in criminal tendencies in the general population pose a risk to the forecast. For example, over the past decade overall crime rates, including serious person crimes, have declined. If that trend were to reverse itself over the coming decade, the corrections population could expand well beyond current forecast.

Criminal justice system practices have a significant effect on the flow of individuals through the court system and into the prisons. Emphasis on specific criminal activity and plea practices, for example, can change based on law enforcement policy and prosecutorial discretion. The amount of discretion in the corrections system, in particular with respect to prosecution of crimes and punishments sought, introduces a considerable degree of uncertainty to the forecast. Even if there was never a change in criminal activity or laws in Oregon, the prison population could vary considerably based on administrative procedures, policies, and individual discretion exercised in law enforcement, prosecution, plea bargaining, and sentencing by judges.

Dynamic Environment

Fundamental changes in the corrections system, or its inputs, degrade the value of historical trends in forecasting and present a considerable risk to forecast accuracy. System changes establish new relationships between criminal activity and the prison population, and those relationships cannot be known until after stability in the system is reestablished. For example, Measure 11 had considerable indirect impact on the prison population via changed plea practices. It took several years following the implementation of Measure 11 for that effect to be known.

Starting in January 2009, there have been several significant changes in the corrections system from Ballot Measure 57 (2008), HB 3508 (2009), SB 1007 (2010), and Ballot Measure 73 (2010). Under current law, additional changes will continue until 2013. The actual impact of these changes on the prison population will not be known for several years, and could differ from the estimates this forecast relies on.

Future Policy Changes

In recent years, most forecast errors can be traced to changes in public policy rather than demographic or behavioral changes among potential prisoners. Given the dynamic policy environment we are currently in, policy changes represent the largest risk to the forecast.

As has been proven in recent years, voter initiatives have the potential drastically change the public safety system. Traditional legislative changes are also a possibility in the near term, given that the Legislature now meets annually, and will soon receive recommendations from the newly-formed Governor's Commission on Public Safety. In addition to law changes, changes in administrative practices by CJC, local courts, and the Parole Board stand to affect future populations.

Sources of Forecast Error

Forecast error is the difference between what was forecasted at a specific point in the future and what is actually observed when that time comes. Understanding the sources of forecast error is helpful in interpreting forecast risks.

The largest source of forecast error is associated with law changes which become effective after the forecast is released. Since the early 1990's, law changes have been the largest driver of the prison population. Their impact is not characterized in forecasts done prior to the change.

Forecasts released following major law changes can suffer from incorrect estimates of the impact of the law change on the prison population. This is because law changes often have a significant indirect impact that is not known until it is evidenced by data, sometimes months or years later.

Regardless of law changes, there are additional sources of error with baseline forecast projections. The forecast relies on modeling the release of current prisoners and projecting the intake of new prisoners. Although the sentences pronounced in court judgments are known, the actual length of stay of an inmate in prison can vary considerably from what is expected based on the judgment. This introduces error into the model. Situations which make the length of stay indeterminate include: resentencing to a longer or shorter sentence; indeterminate parole board sentences (before the guidelines); participation and success in Alternative Incarceration Programs; time served after failure on probation or parole; death of the inmate; transfer in/out of state; amount of earned time earned; absconding or return from absconding; temporarily out for medical reasons or court appearance.

Further out in the forecast horizon, error in projecting future prison entrants can be significant. The forecast accuracy depends on the accurate projection of the number future prison intakes and their lengths of stay. Error rates as little as one percent in intakes could add to an overall error of 1,000 beds over the forecast horizon. As such, the outer years of the forecast are very sensitive to the accuracy of assumptions regarding new intakes.

Finally, daily variation in the prison population due to intake and release activity is considerable. The population on a given day regularly deviates from the monthly average population by more than 100 beds. Therefore, the actual population on the first day of a given month can be expected to differ from the forecast value by 100 beds without concern. This also means that forecast values should be interpreted as the mid-point of a range (+/- 100) within which the actual population will fluctuate.

Appendix: Prison Population Forecast Values

Forecast values are published in spreadsheet format and can be viewed and downloaded from the link below. The spreadsheet includes forecast data tables for the prison and community corrections forecasts and some additional forecast-related data.

http://oregon.gov/DAS/OEA/corrections.shtml.