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# Oregon Corrections Population Forecast

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April 1, 2010

Volume XVI, No. 1

## **Background**

The Office of Economic Analysis 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, and 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 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 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. Technical aspects of the forecast, in particular those concerning offender sentencing and prison population management, are handled in partnership with the CJC and with substantial assistance from the DOC.

### **Corrections Population Forecasting Advisory Committee**

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Multnomah County Deputy District Attorney  
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# Trends and Forecast Methodology

## *Inmate Population*

The inmate forecast uses a model which simulates the flow of inmates from intake to prison, through their stay, and departure as prisoners are released. 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. Since sentence information is known for existing inmates, releases can be modeled based on historical release patterns, whereas new intakes are forecasted.

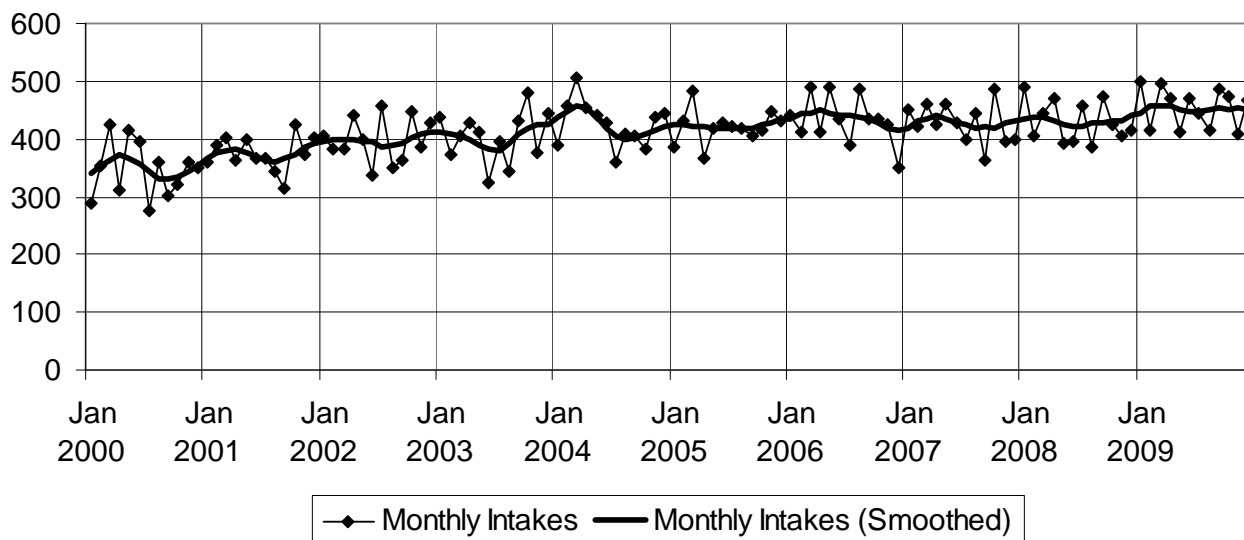
Intakes are forecasted based on the historical trends for intakes. The trend integrates demographics, criminal justice practices, and other factors which influence intakes and sentence lengths. This trend builds to a baseline forecast. The forecast generally relies on trends observed over the past 10 years.

Trends in criminal activity do not historically correlate with the prison population and therefore are not used directly for forecast trend. Criminal activity (e.g., as measured by arrests and reported crime) has generally decreased in Oregon over the past decade, while the prison population has increased significantly. The increase is primarily due to changes in sentencing laws, such as Measure 11 and repeat property offender laws, both of which lengthened prison sentences and sent more offenders to prison.

The intake forecast relies on the number of intakes per month and estimated length of stay for each. Integrating intakes with length of stay provides an apt measure for forecasting since length of stay influences the population prospectively.

Monthly prison intakes increased gradually from year 2000 into 2004, then remained relatively flat until late 2008. There is a slight upturn in late 2008 associated with increased intakes for person-to-person crimes through mid 2009. The upturn is then maintained through 2009 due to increased intakes of repeat property offenders resulting from new sentencing law (see discussion of law changes later in this report).

**Figure 1 - Number of Prison Intakes each Month**



Lengths of stay for new intakes impact the prison population more prospectively than the simple count of intakes. Year 2004 to mid 2007 saw decreases in average length of stay for new intakes. Since mid 2007, that average has increased due to increases in intakes for person offenses which carry long sentences. Also, since mid 2009, longer sentences for repeat property offenders and for certain drug offenses have resulted from recent law changes.

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:

$$\text{Population Base (Month 2)} = \text{Population Base (Month 1)} + \text{Intakes} - \text{Releases}$$

The model uses a top-down approach, operating at the level of the population in aggregate, then disaggregating as necessary to subgroups (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 subgroup 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 subgroups differ from the aggregate, as opposed to how each subgroup combines to the aggregate. This approach has also demonstrated more accuracy.

### ***Community Corrections Populations***

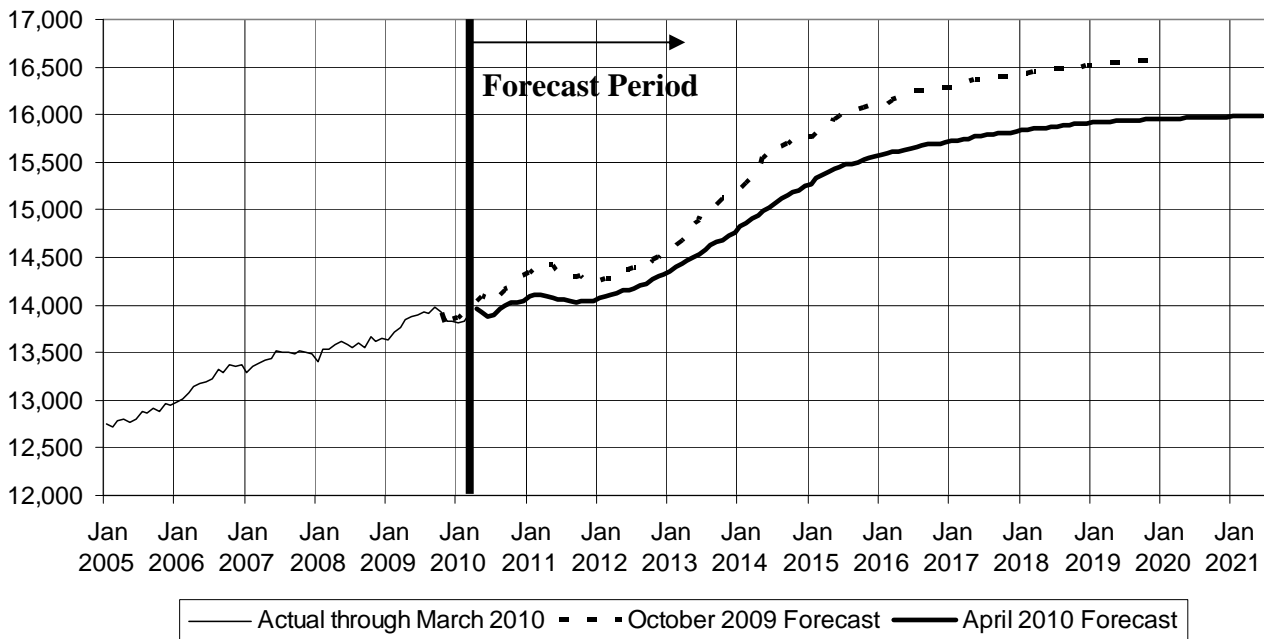
The community corrections forecasts rely primarily on the relatively stable historical trends in the respective populations. The local control population showed a significant drop from long term trend in 2008, most likely due to changes in individual county practices in an effort to reduce jail populations. 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 prison population on March 1, 2010 was slightly over 13,900, or 1.2 percent higher than one year before. Over the next two years, the population is expected to change very little; increases resulting from Measure 57 are offset by decreases resulting from increased earned time (HB 3508 and SB 1007). From 2013 through 2015, the population will grow at a rate of 3 to 4 percent annually. The growth is due to several factors including Measure 57 repeat property offender sentencing, Measure 57 drug offender sentencing, baseline growth, growth attributable to intakes in 2008-2009, and the reduction of the increased earned time effect. The population will reach 15,000 by mid 2014, and will approach 16,000 by the end of the decade.

**Figure 2 – Prison Inmate Population Forecast**



## Prior Forecast Tracking

The prior forecast has tracked very closely with the actual population over the last six months. Offsetting errors associated with the impact of Measure 57 and HB 3508 netted to near zero: the impact for repeat property offender sentencing change (an increase) was smaller than estimated, and the impact for the release of inmates subject to Immigration and Customs Enforcement deportation orders (a decrease) was also smaller than expected. Impacts from other law changes, e.g. Measure 57 drug offenses and HB 3508 earned time, were generally on par with estimates used in the previous forecast.

**Community Corrections**

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.

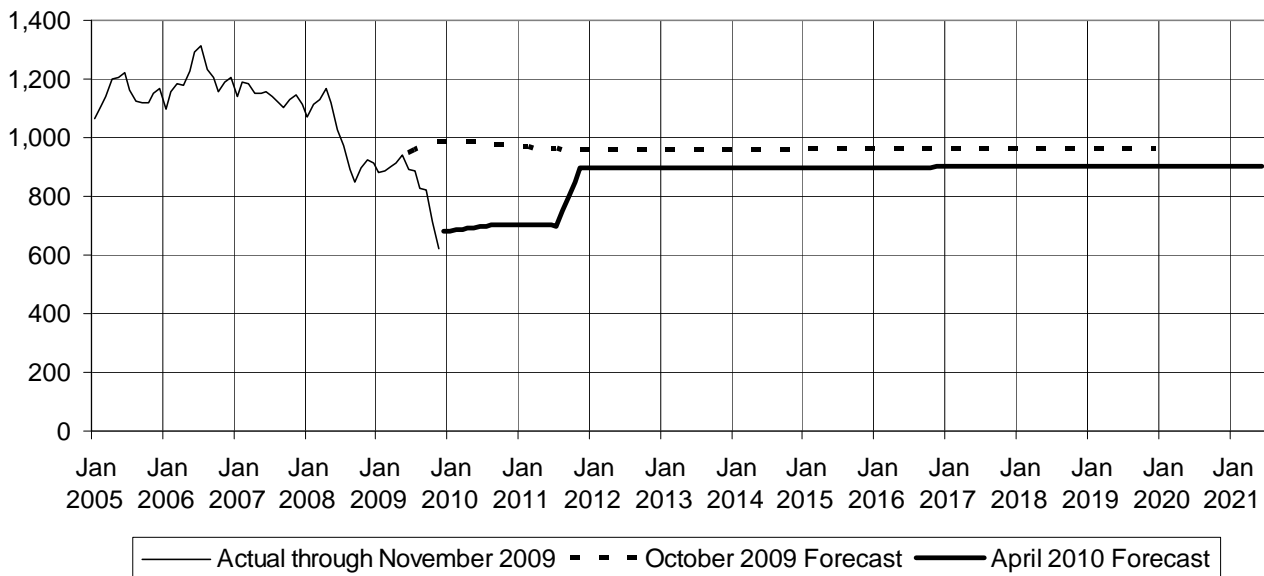
The local control population dropped significantly in mid 2008, departing from historical trend. Anecdotal information indicates that the drop is associated with county-level efforts to decrease jail populations, and that these new practices will continue in the future. The forecast incorporates a continued reduction of approximately 100 beds associated with this change. An additional transitory reduction of approximately 200 beds is factored in for the cap (60 day maximum) on the length of stay in jail for probation revocations put in place by HB 3508. It sunsets in mid 2011.

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.

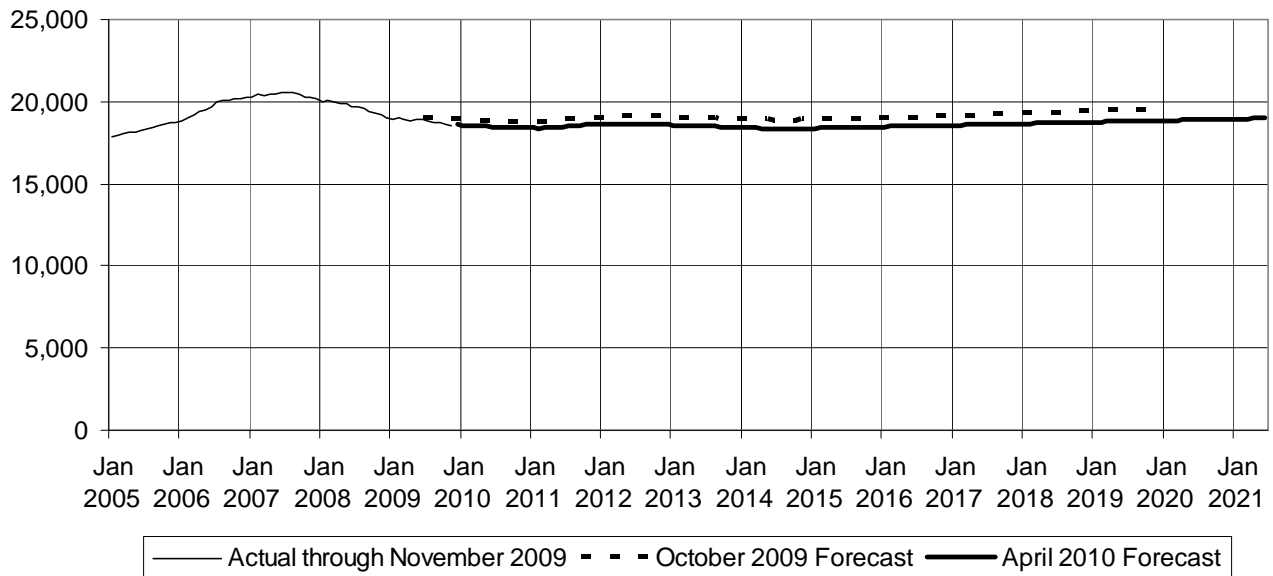
The parole population incorporates adjustments for both the suspension of Measure 57 and for the increased earned time included in HB 3508.

The three graphs below show the actual population (known through November 2009), the current forecast (heavy black line), and the previous forecast (dashed black line) for the local control, the probation, and the parole/PPS population groups.

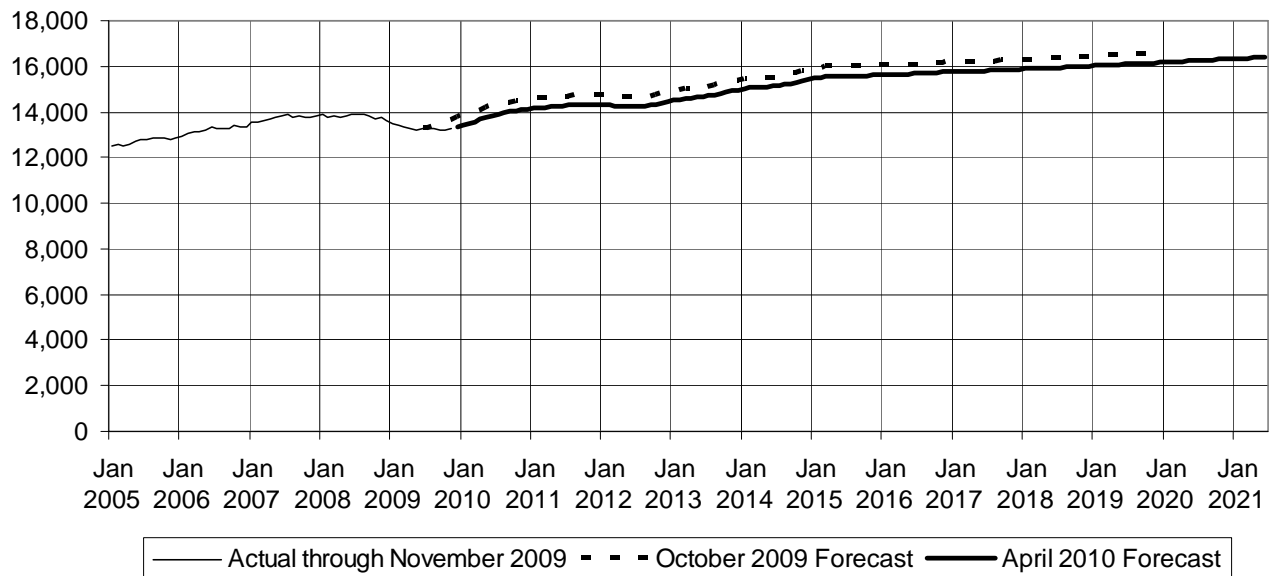
**Figure 3 – Local Control Forecast**



**Figure 4 – Probation Caseload Forecast**



**Figure 5 – Parole/PPS Caseload Forecast**



## Law Change Impacts

Measure 57 (2008), House Bill 3508 (2009), and Senate Bill 1007 (2010) have a significant impact on the prison population. Aspects of Measure 57 were modified by HB 3508, which was in turn modified by SB 1007. Loosely speaking, the effects are: Measure 57 established tougher sentences for repeat property crime offenders and drug offenders; HB 3508 temporarily suspended parts of Measure 57 and established 30 percent earned time; SB 1007 partially cancelled 30 percent earned time. The combined effects of those laws were grouped as follows for the forecast analysis.

RPO – Tougher sentencing for repeat property offenders (longer sentences, more prison sentences vs. probation). Established by Measure 57. Effective January 2009. Temporarily suspended by HB 3508 from February 2010 to January 2012.

Drug Prior – Tougher sentencing (no downward departure) for drug delivery/manufacture offenders with a prior conviction. Established by Measure 57. Effective for crimes committed on/after Jan. 1, 2009. Temporarily suspended by HB 3508 from February 2010 to January 2012

Drug Quantity – Tougher sentencing (longer prison terms) for certain drug offenses involving a substantial quantity of drug. Established by Measure 57. Effective January 2009.

Earned Time – Increased maximum possible time reduction for good behavior: up to a 30 percent reduction vs. 20 percent. Established by HB 3508. Effective July 2009 to July 2013. Suspended by SB 1007 from March 2010 to July 2011. Restricted by SB 1007 from July 2011 to July 2013.

Other minor law changes which are factored in the forecast include the tougher treatment of Assault III for intoxicated drivers (HB 3508), the redefinition of "mentally incapacitated" in the context of sex offenses (HB 2343), and tougher treatment of sexual abuse when the offender is the victim's sports coach (HB 2476).

For the forecast, these effects are factored in as add-ons to a baseline forecast. The baseline case is what the forecast would be in the absence of the law changes.

The forecast does not rely on estimates of the RPO and Drug Prior effects from now until 2012. Because those effects are suspended from now until 2012, they impact the forecast only through the sentences of inmates already in prison; since that impact is known in data, it is not estimated.

Forward from mid 2012, the forecast increasingly relies on the estimated impact of RPO and Drug Prior effects on new intakes. The estimated impact on intakes is based on analysis of sentencing from the latter half of 2009 in comparison to the latter half of 2008 (i.e., using 2008 as a control). Changes in sentencing (percentage of prison sentences vs. probation sentences, sentences lengths, etc.) from 2008 to 2009 were attributed to the law changes. The estimated impact on sentencing is applied to the forecast by adjusting intakes when the RPO and Drug Prior effects resume in 2012.

The estimated impact of Measure 57 on intakes that is derived from the 2008 / 2009 comparison differs from that used in the previous forecast. The previous forecast estimates were based on assumptions about how the law would be applied; they were done before data was available on the actual application of the law. The observed increase in sentence lengths and increase in the percentage of prison sentences for qualifying property offenses were roughly 30 percent lower than was assumed.

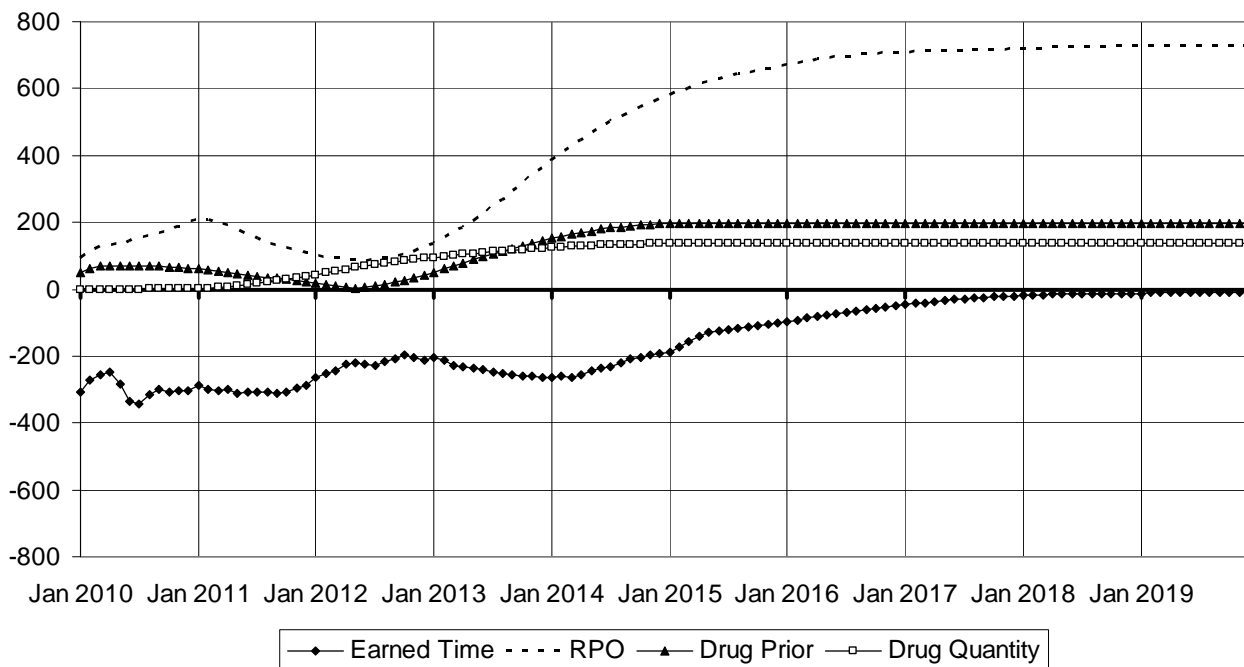
In the long term, the Measure 57 RPO, Drug Prior, and Drug Quantity estimates add about 1,050 beds to the baseline forecast. That is about 600 beds fewer than assumed in the previous forecast. Due to statistical variability in estimation, the magnitude to the effect could easily be high or low by 30 percent.

The impact of the Earned Time is based on sentences from the latter half of 2009 recalculated with 20 and 30 percent reductions under the parameters of the earned time law. This assumes that the makeup of sentences in the future is similar to 2009 and that few offenders are discretionarily denied 30 percent earned time. Previous analysis demonstrates that this approach is fairly accurate at estimating the impact of changes in earned time.

The impact of the Drug Quantity effect is based on analysis of sentencing for drug offenses in 2009. Since this effect simply makes long sentences even longer, it takes several years before there is an impact on the inmate population.

**Figure 6 - Estimated Impact of Law Changes**

Number of inmates. Positive values indicate an increase in the inmate population compared to baseline; negative values indicate a decrease compared to baseline.



The impact of Measure 57 RPO does not appear to differ across gender lines; the changes from 2008 to 2009 are similar between men and women.

This forecast assumes that following March 1, 2010, no further Immigration and Customs Enforcement detainees will be released based on Section 24 of HB 3508.

## **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>.

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## **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 dropped. If that pattern were to reverse itself over the coming decade, the corrections population could expand well beyond current forecast.

Law enforcement and judicial 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 concerning law enforcement, prosecution, plea bargaining, and sentencing.

### ***Current Environment of Change***

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 Measure 57 (2008), HB 3508 (2009), and SB 1007 (2010). Under current law, additional system changes will continue until 2013. The impact of these changes on the prison population will not be known for several years. As a result, forecast error is expected to be higher than normal for the current forecast and for several years to follow.

### ***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 associated with baseline forecast projections and forecast modeling. This forecast relies on modeling the release of current prisoners and projecting the intake of new prisoners. Although sentence 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 in 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 intakes 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. This means 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. 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 midpoint of a range (+/- 100) within which the actual population will fluctuate.