



Ministry of
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Ministry of Justice Statistical Bulletin

PRISON POPULATION PROJECTIONS 2007-2014 **England and Wales**

August 2007

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KEY POINTS

- This bulletin presents the latest projections of the prison population in England and Wales for the period August 2007 to June 2014. The projections are based on assumptions about future criminal justice trends (e.g. sentencing) and incorporate the anticipated impacts of policy and process initiatives that have agreed implementation timetables.
- Three scenarios (High, Medium and Low) have been projected based on future sentencing trends. The Medium scenario assumes recent sentencing trends continue into the future. These trends show no increases or decreases in custody rates or determinate sentence lengths. The High/Low scenarios reflect a 1% per annum increase/decrease in custody rates and a 0.5% per annum increase/decrease in the average custodial sentence lengths (determinate). Other impacts included in the projections such as those of legislation and processes are applied equally to all scenarios.
- Projected prison populations for the three scenarios are given in Table 1. By the end of June 2014 the demand for prison spaces is projected to increase to between 88,800 and 101,900.

Table 1: Projected prison population (end June figures)¹

YEAR	High	Medium	Low
2008	83,600	82,700	81,800
2009	89,400	87,800	85,800
2010	93,000	90,500	87,500
2011	94,200	90,900	86,900
2012	96,400	92,100	87,200
2013	99,100	93,800	88,000
2014	101,900	95,600	88,800

- The scenarios are not precise forecasts of what will happen to the prison population and are subject to considerable error margins. The assumptions are based on extensive consultation but do not include impacts for any future measures for which implementation timetables are not yet known. The alternative scenarios are considered equally likely.

¹ All projected figures are rounded to the nearest 100.

1. INTRODUCTION

This bulletin presents the latest prison population projections for England and Wales for August 2007 to June 2014. The projections are produced to aid policy development, capacity planning and resource bidding and allocation within the Criminal Justice System (CJS) and the National Offender Management Service (NOMS).

The projections present three possible future scenarios (High, Medium and Low) that have been agreed through cross-CJS stakeholder consultation. These scenarios take account of effects of all CJS measures, both legislative and procedural, that have been implemented up to July 2007 and have realised their full potential. In addition, they include recent observed trends and possible future trends in sentencing and measures that have been implemented recently or have an agreed national implementation timetable including:

- views of future sentencing trends, i.e. changes in custody rates², average custodial sentence lengths (ACSLs) for determinate sentences and tariffs for indeterminate sentences;
- impacts of measures introduced by the Criminal Justice Act 2003 (CJA 2003);
- Offences Brought to Justice (OBTJ) contributing to Narrowing the Justice Gap (NJG)³ resulting from crime trends, police detections and arrest activities;
- impacts of Simple, Speedy, Summary Justice (CJSSS) influencing the speed of trials at the courts;
- other legislative, CJS process, and administrative measures that have a bearing on the levels and trends of the prison population, such as End of Custody Licence (ECL) and the Sentencing Guideline Council (SGC) guideline on reduction of sentence length for guilty pleas.

The impacts of legislative measures and policies without an agreed implementation timetable are not included in the projections. Annex B provides details of the assumptions underlying the prison population projections.

The High, Medium and Low projections are produced through a complex modelling exercise using several models spanning the CJS. Annex C gives a description of the modelling methodology used to generate the prison population projections. This also includes an assessment of modelling errors and caveats.

2. RECENT TRENDS

The total prison population has increased significantly since the mid-1990s, rising from 61,470⁴ in June 1997 to 77,980 in June 2006 (see Chart 1). The population has continued to grow over the last 12 months reaching 79,730 on 30th June 2007. This represents a net increase of 1,750 (or 2%) since June 2006, with the sentenced population increasing by 3% and the remand population decreasing by

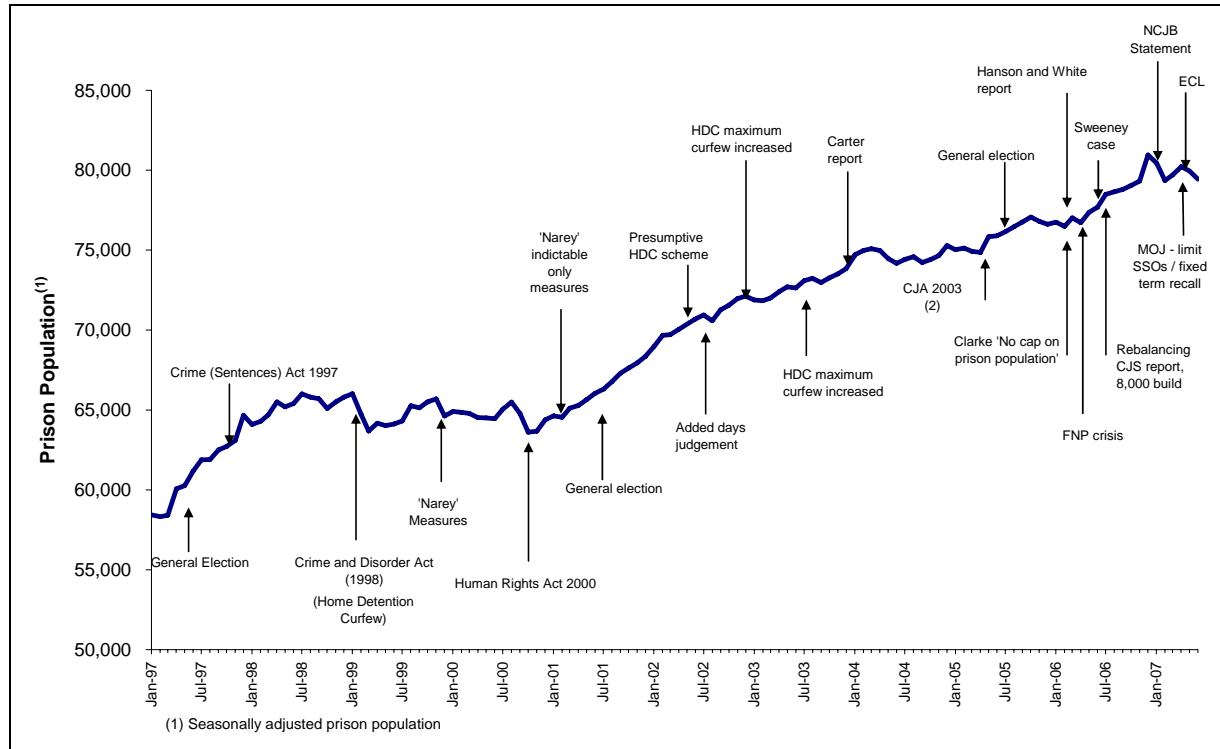
² The custody rate is the proportion of those sentenced at court given a custodial sentence.

³ Narrowing the Justice Gap is one of the delivery targets for the Criminal Justice System.

⁴ Prison population figures given in this section have been rounded to the nearest 10.

2%. Over the same period, the male population climbed by 3% to 75,450 and the female population fell by 4% to 4,280.

Chart 1: Actual prison population since 1997 with policy interventions and other key events



Custody rates and average custodial sentence lengths⁵ (ACSLs) for indictable offences increased significantly between 1997 and 2004, climbing from 22.6% and 15.7 months to 25.3% and 16.1 months respectively. Over the same period, the numbers of offenders sentenced for indictable offences remained relatively constant, fluctuating between 317,530 and 340,304 per year. These data are consistent with sentencing behaviour (i.e. the custody rates and ACSLs) being the dominant driver behind the observed growth in the prison population. After 2004 a direct comparison cannot be made with previous trends of ACSL as the introduction of Indeterminate sentences for Public Protection (IPP) in April 2005, bias the measure towards a decreasing trend.⁶ Provisional data for 2006 indicate a custody rate of 24.4% and a determinate ACSL of 15.4 months for all indictable offences.⁷

⁵ Refers to determinate custodial sentence lengths.

⁶ Offenders receiving an IPP would previously have received a lengthy determinate sentence that would have been included in the ACSL measure prior to the introduction of IPPs. These longer sentences are now effectively excluded from the calculation as the length of IPPs are indeterminate in nature. Therefore this will result in a decrease in average custodial sentence lengths for more serious offences sentenced at the Crown Court.

⁷ Sentencing statistics quoted for 2006 are **provisional** and may change prior to finalisation. Final 2006 data will be published in the annual bulletin of sentencing statistics later in the year.

Beyond sentencing, a number of other factors have also contributed to the growth in the prison population over the past decade including:

- greater numbers of offenders recalled to prison for breaking the conditions of their licence, reflecting legislative changes in 1998 and 2003;
- increased use of indeterminate sentences following the introduction of Indeterminate sentences for Public Protection (IPPs) in April 2005;
- the introduction of Suspended Sentence Orders in April 2005 for which offenders in breach can be taken into custody; and
- inflation in the time certain types of offender remain in prison (particularly in recent years) as the use of Home Detention Curfew for the early release of offenders has diminished and the parole rate has fallen.

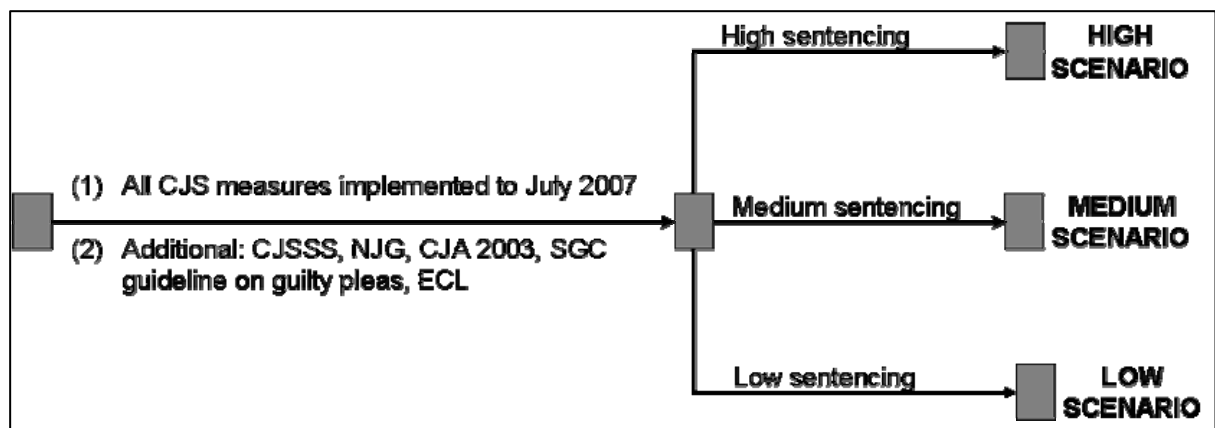
Projecting the prison population therefore requires an understanding of how sentencing behaviour changes together with knowledge of how legislative and process changes are likely to influence the prison population in the future.

3. MODELLING METHODOLOGY AND SCENARIO ASSUMPTIONS

The 2007-2014 prison population projections represent the outputs of a complex modelling exercise using several models spanning the CJS (see Annex C). These models use various data sources including sentencing trends, prison receptions, discharges and populations, demographics, crime trend trajectories and criminal histories of offending by offence type. The models also incorporate upstream constraints within the CJS (e.g., capacity of courts to process cases) and assumptions on how these factors are anticipated to change in the future to construct projections for the demand for prison places.

The High, Medium and Low scenarios (see Chart 2) represent three alternative views of the possible future prison population. These have been agreed in consultation with key stakeholders including the National Offender Management Service (NOMS), Her Majesty’s Prison Service, The Parole Board, Sentencing Guidelines Council Secretariat, Office for Criminal Justice Reform, Border and Immigration Agency, Youth Justice Board, Home Office, related Ministry of Justice entities, and NOMS Research Development and Statistics Unit.

Chart 2: Scenarios tree



The scenarios only include measures where an implementation timetable has been agreed (see Annex B) and represent how the future is viewed by CJS stakeholders at the present time with current knowledge of the future. Whilst the stakeholder consultation endeavours to capture all possible factors that significantly impact the future prison population (including sentencing behaviour, changes in legislation and administrative practice) not all influencing factors can be foreseen. For instance, high profile media coverage of events and statements related to the CJS can induce subtle behavioural changes in sentencing practice and/or CJS processes that can have a significant effect on the prison population (e.g., the Jamie Bulger murder in 1993⁸). Such events are often impossible to predict. The scenarios therefore represent possible futures based on assumed sentencing trends and the realisation of legislative and procedural changes; they are not predictions of what will happen to the prison population.

The assumptions underlying the three scenarios include sentencing trend assumptions, legislative impacts and process changes as outlined below. Unless otherwise stated, specific legislative and process impacts are equally applied to each scenario.

3.1 Sentencing trend assumptions

Historically, the main factors driving the growth in the prison population have been the custody rate, average custodial sentence length, and the type of sentence given to offenders by the courts. The Crown Court has the greatest long-term impact on the prison population, while magistrates’ courts also make a contribution in the short term and to the churn of the population.

Based on observed trends in sentencing over the period 2000–2006⁹, High, Medium and Low sentencing trend assumptions have been agreed by stakeholders (see Table 2). Given that trends in sentencing are difficult to predict (particularly in the medium to long term), it is assumed that these sentencing trend scenarios are equally likely to happen.

Table 2: Sentencing assumptions

	Year-on-year changes		
	High scenario	Medium scenario	Low scenario
Custody rate	1.0%	0.0%	-1.0%
Average custodial sentence length (determinate)	0.5%	0.0%	-0.5%

⁸ See ‘Figure 1.3 Prison population – policy interventions and other key events’ in Offender Management Caseload Statistics 2005, HOSB 18/06, December 2006, pp 6.

⁹ There is a time lag in receiving sentencing data from the courts and police, particularly for data from magistrates’ courts. Therefore if significant deviations from the long-term trend occur in the months immediately before the projection, these will not be captured.

3.2 Legislative impacts

The legislative impacts included in these projections are primarily due to measures introduced by the CJA 2003 (see Annex B). The effects of some measures introduced by the CJA 2003 have reached their full potential and are included in the baseline data for these projections (e.g. Community Order, Suspended Sentence Order). Assumptions made for previous projections (January 2006 and July 2006) have been monitored and revised to reflect the latest trends seen for those CJA 2003 measures that have not as yet reached their maximum steady-state impact.

The projections also include the expected impact of the revised SGC guideline on guilty pleas¹⁰.

3.3 Process impacts

The impacts of activities that occur in the various agencies of the CJS, such as the police and courts, are captured by the Criminal Justice System model, e.g., crime trend trajectories, detection and arrest rates, processing times at courts, etc.. The projections include the impact of CJS activity relating to Narrowing the Justice Gap (OBtJ), and CJSSS which have agreed measures that are expected to be implemented in 2008.

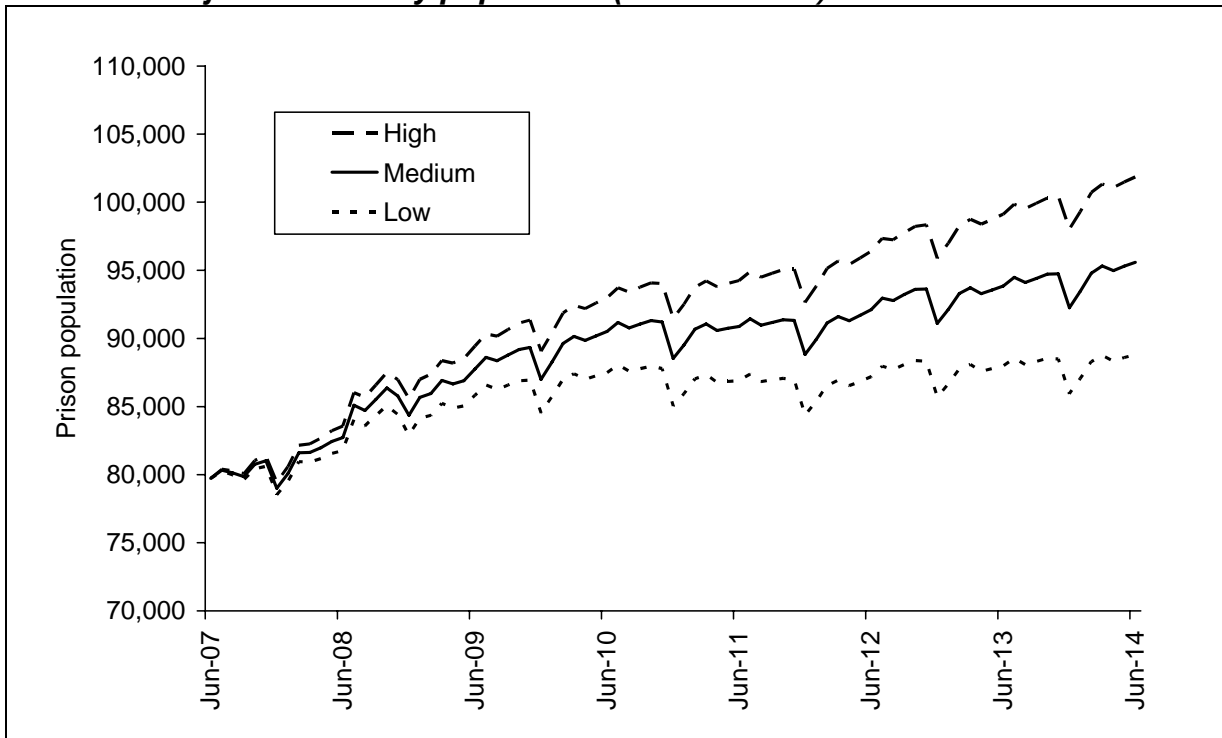
End of Custody Licence (ECL) was introduced on 29th June 2007. This allowed certain non-violent offenders to be released on this special licence up to 18 days early. For the purposes of these projections, ECL is assumed to last for one year, although no firm decision about this has been made.

¹⁰ Reduction in Sentence for a Guilty Plea. Definitive Guidance. Sentencing Guidelines Council. Revised 2007.

4. RESULTS

The three scenarios give rise to a projected prison population of between 81,800 and 83,600 by the end of June 2008, between 87,500 and 93,000 by the end of June 2010 and between 88,800 and 101,900 by the end of June 2014 (see Chart 3). Annex A presents the annual projected end June populations and average financial year populations from 2008–2014 together with further breakdowns of the projected population by gender and the sub-populations of remand, sentenced and non-criminal categories. Monthly projections for each scenario are also presented in this annex.

Chart 3: Projected monthly population (all scenarios)



5. DISCUSSION

As Chart 3 illustrates, the prison population projections increase between 2007 and 2010 for all three scenarios. Subsequently during 2010 and 2011, the projected prison populations remain relatively flat before increasing again during 2012 to 2014. These trends reflect the cumulative impacts of the various sentencing, legislative and procedural assumptions that are used to generate the projections.

This section discusses how specific modelling assumptions have contributed to the overall projections. Please note the individual impacts discussed will not sum to the total prison population projections. This is because the overall projections take account of interactions within the CJS that are absent when individual assumptions are considered in isolation.

5.1 Sentencing trends

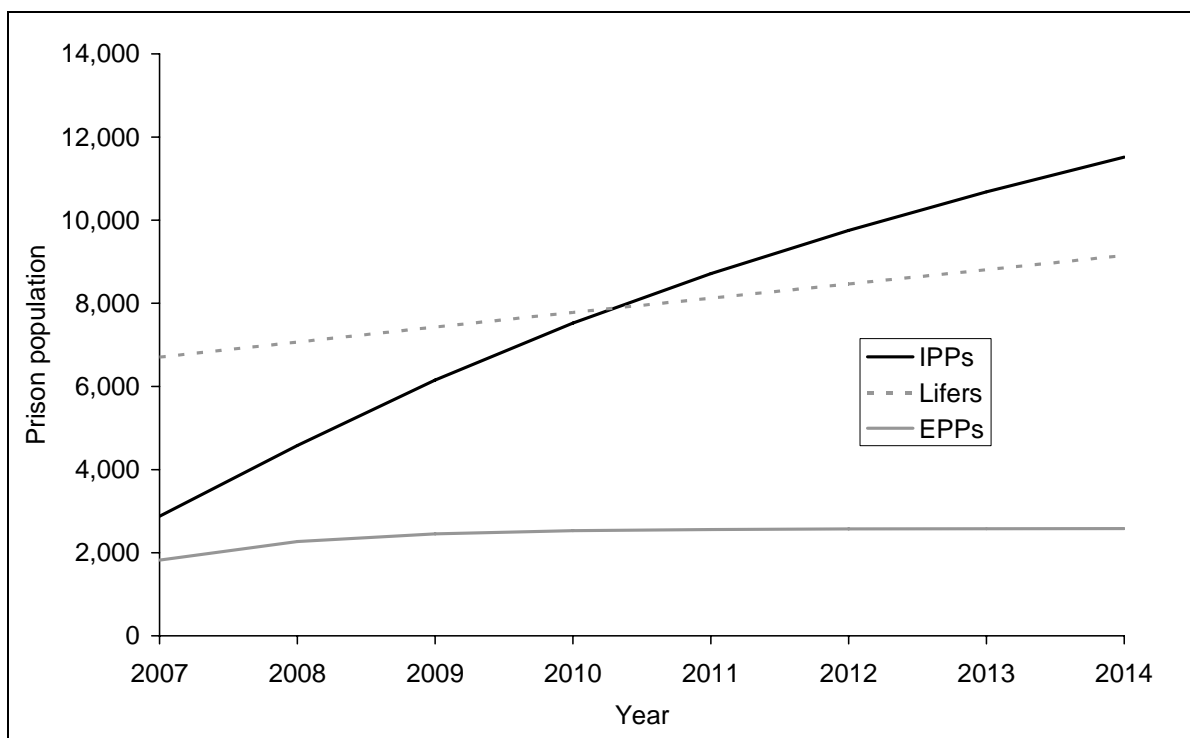
For the Medium scenario, the custody rate and average custodial sentence length for determinate sentences is assumed to be constant going forward. As such, the change in growth (from current population levels) in this scenario stems from the legislative and process impacts included. The difference between the High, Medium and Low scenarios directly reflects the different sentencing trend assumptions used in these scenarios to generate the projections.

5.2 Criminal Justice Act 2003 (CJA 2003)

5.2.1 Indeterminate sentences for Public Protection

Indeterminate sentences for Public Protection (IPPs) were introduced in April 2005 as part of the CJA 2003. The rate at which IPP sentences are issued has stabilised at around 145 per month and this rate is assumed to be constant over the time period of the projection. Those who are now getting an IPP would previously have received a relatively long determinate sentence. However, IPP sentences are expected to increase the prison population over the period of the projections, as those with these sentences are assumed to serve longer in prison than they would have done with standard determinate sentences. As these sentences are generally long, the changes in the prison population caused by IPP take several years to fully impact (see Chart 4). Much of the underlying growth in the High, Medium and Low scenarios can therefore be attributed to the use of IPP sentences.

Chart 4: Populations of EPP¹¹, IPP and life sentence prisoners



¹¹ Extended sentences for Public Protection.

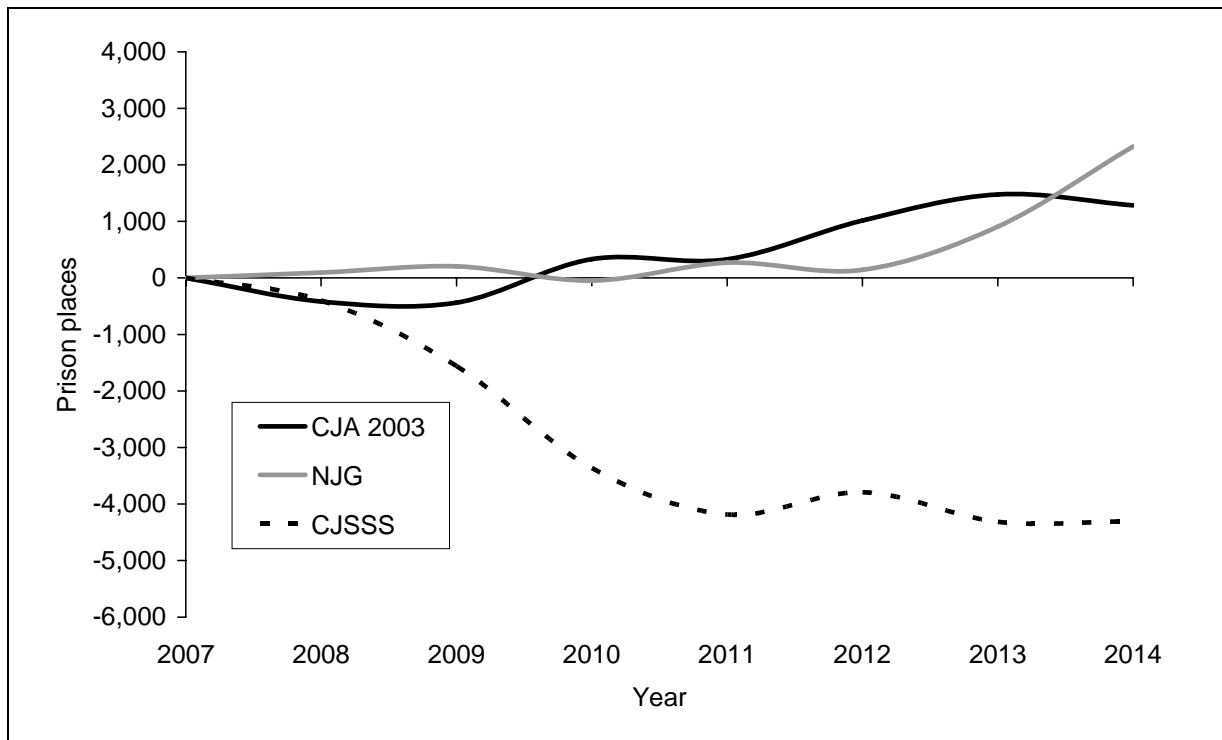
5.2.2 Future impact of initiatives in the CJA 2003 excluding IPPs

Beyond IPP sentences, the CJA 2003 introduced a series of measures that have yet to fully impact upon the prison population¹². These include:

- Extended sentences for Public Protection (EPP); and
- Automatic halfway release for those with custodial sentences of 12 months and over.

The estimated combined impact of these initiatives is presented in Chart 5 (solid black line). This shows demand for prison places falling during 2007 and 2008 before increasing from 2009 onwards. In the short-term this behaviour is consistent with automatic half-way release reducing the prison population as prisoners are released earlier than they would have been under previous arrangements¹³. From 2009 onwards demand for prison places starts to grow in part reflecting an increase in the EPP population (see Chart 4).

Chart 5: Impacts of the CJA 2003 (excluding IPPs), NJG and CJSSS on the prison population modelled in isolation¹⁴



¹² The impacts due to the new community order, suspended sentence order, minimum term for firearms offences, and the charging programme are deemed to have reached their full impact and are included in the baseline data used to generate the projections.

¹³ Before the introduction of automatic half way release prisoners were released between the half and two-thirds points of their sentence.

¹⁴ This chart shows the impact on the total population of CJA 2003, NJG and CJSSS compared to not implementing these measures.

5.3 Narrowing the Justice Gap (NJG)

The impact of the continued implementation of the Narrowing the Justice Gap measure (which includes assumptions on future crime trends and sanction detection rates) is shown in Chart 5 (grey line). The impact of NJG, in the absence of CJA 2003 and CJSSS, is projected to be minimal until 2012, after which demand for prison places climbs to over 2,000 by the end of the period of the projections. Although sanction detections (including charges, summons and cautions) are assumed to increase through the projection period, decreases in crime levels mitigate the effect on the prison population in the short to medium term.

5.4 Simple, Speedy, Summary Justice (CJSSS)

CJSSS (Simple, Speedy, Summary Justice) is a new way of working that encompasses a simpler set of processes and procedures in the courts. It aims to improve the way cases are managed and dealt with. The impact of CJSSS is shown in Chart 5 (dashed line). The assumptions used for modelling CJSSS result in the courts having the capacity to deal with more cases. These include reductions in pre-trial reviews and hearings, more early guilty pleas and increased use of Penalty Notices for Disorder. In the absence of CJA 2003 and NJG impacts, CJSSS provides the courts with the capacity to process cases more quickly, reducing waiting times. This reduces the remand population markedly.

5.5 Other policy and process impacts

The estimated impact of the revised SGC guideline on guilty pleas¹⁵ is expected to increase the prison population by around 850 places by 2010. This contributes to the growth in the prison population during the first three years of the projections.

End of Custody Licence (ECL)—introduced on 29th June 2007 and assumed to last for one year (although at the time of publication no firm decision about this has been made)—is expected to reduce the prison population by 1,300 places for the period that it is operational. This results in a step change of 1,300 in the projected prison population in mid-2008.

¹⁵ Reduction in Sentence for a Guilty Plea. Definitive Guidance. Sentencing Guidelines Council. Revised 2007.

6. CAVEATS ON MODELLING THE PRISON POPULATION

The prison population is influenced by diverse factors that can mean that the actual future prison population may not be the same as that projected:

- Sentencer behaviour, policy decisions and the criminal justice process can respond to a multitude of environmental factors such as high profile criminal cases and public debate;
- implementation of new policies and processes that are currently being considered but as yet do not have an agreed implementation timetable (e.g., the current Criminal Justice and Immigration Bill, and Lord Carter's Review of Prisons);
- measures for which a quantitative assessment of the impact is currently not possible (e.g., the Bail Accommodation Scheme which provides accommodation and support in the community allowing greater use of bail and Home Detention Curfew);
- unknown future policy, process and political changes.

The impacts of such factors can vary significantly, and contribute to the uncertainty associated with the projections.

The assumptions underlying these projections have been captured through a consultative process that included all major stakeholders. The assumptions are based on analysis (where reliable data are available) and 'expert judgement' from policy makers, key deliverers and system influencers. The assumptions are therefore likely to be more robust for those measures and processes that have a well-defined boundary than those that do not.

The projections can easily fluctuate between $\pm 2\%$ and $\pm 3\%$ of estimated figures due to statistical modelling variation. The margins of error on any 'expert judgement' assumptions cannot be computed and will add to this variation. A discussion of the accuracy of the modelling and related caveats is presented in Annex C.

ACKNOWLEDGEMENTS

These projections have been produced by the Sentencing Statistics and NOMS Projections Team in the embedded Research Development and Statistics unit in the National Offender Management Service (RDS NOMS). Special thanks are due to all colleagues in RDS NOMS who have contributed to this process and the following external modelling teams that contributed to these projections:

- Office for Criminal Justice Reform: RDS OCJR CJS Modelling Team
- Dangerous & Severe Personality Disorder Programme: DSPD Modelling Team
- Economic and Resource Analysis unit, Home Office: Crime Modelling Team

Acknowledgement is also made of the following groups of stakeholders for their input to these projections:

- National Offender Management Service
- Her Majesty's Prison Service
- The Parole Board
- Sentencing Guidelines Council Secretariat
- Office for Criminal Justice Reform
- Her Majesty's Court Service
- Youth Justice Board
- Home Office
- Border and Immigration Agency

CONTACTS

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Previously published bulletins on the prison projections can be downloaded from: <http://www.homeoffice.gov.uk/rds/nomsproj.html>

The Ministry of Justice and NOMS Research Development and Statistics website: <http://www.justice.gov.uk/publications/publications.htm>

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ANNEX A: ADDITIONAL TABLES

This annex includes the following data tables:

- Table A1: Tables of overall projected prison population
 - Table A2: Breakdown of projected prison population for high, medium and low scenarios
 - Table A3: Monthly values of projected prison population for high, medium and low scenarios
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Table A1: Tables of overall projected prison population

Projected prison population (at the end of June)

Year	High	Medium	Low
2008	83,600	82,700	81,800
2009	89,400	87,800	85,800
2010	93,000	90,500	87,500
2011	94,200	90,900	86,900
2012	96,400	92,100	87,200
2013	99,100	93,800	88,000
2014	101,900	95,600	88,800

Average projected prison population (financial year)

Year	High	Medium	Low
2008/09	85,900	84,800	83,500
2009/10	90,300	88,400	86,100
2010/11	93,200	90,500	87,200
2011/12	94,500	90,800	86,600
2012/13	97,200	92,600	87,400
2013/14	99,600	94,100	87,900

Table A2: Breakdown of projected prison population for high, medium and low scenarios (2007 figures correspond to actual population data. The components within tables may not add to the total as they have been rounded independently)

	High scenario									
	Remand			Sentenced			Non-criminal Total	Total		
	Male	Female	Total	Male	Female	Total		Male	Female	Total
2007	11,953	891	12,844	62,194	3,387	65,580	1,295	75,389	4,330	79,719
2008	12,200	900	13,200	65,600	3,600	69,100	1,300	79,000	4,500	83,600
2009	12,300	1,000	13,300	71,000	3,800	74,900	1,300	84,600	4,800	89,400
2010	12,400	1,000	13,400	74,300	4,000	78,300	1,300	88,000	5,000	93,000
2011	12,500	1,000	13,400	75,500	4,000	79,500	1,300	89,200	5,100	94,200
2012	12,500	1,000	13,500	77,500	4,100	81,600	1,300	91,300	5,200	96,400
2013	12,600	1,000	13,600	80,000	4,200	84,300	1,300	93,800	5,300	99,100
2014	12,600	1,000	13,600	82,600	4,400	86,900	1,300	96,400	5,400	101,900

	Medium scenario									
	Remand			Sentenced			Non-criminal Total	Total		
	Male	Female	Total	Male	Female	Total		Male	Female	Total
2007	11,953	891	12,844	62,194	3,387	65,580	1,295	75,389	4,330	79,719
2008	12,100	900	13,000	64,900	3,500	68,400	1,300	78,300	4,500	82,700
2009	12,100	900	13,100	69,700	3,700	73,400	1,300	83,100	4,700	87,800
2010	12,200	900	13,100	72,300	3,800	76,100	1,300	85,700	4,800	90,500
2011	12,200	900	13,100	72,700	3,800	76,500	1,300	86,100	4,800	90,900
2012	12,100	900	13,100	73,900	3,800	77,800	1,300	87,300	4,800	92,100
2013	12,100	900	13,000	75,600	3,900	79,500	1,300	89,000	4,900	93,800
2014	12,100	900	13,000	77,300	3,900	81,300	1,300	90,700	4,900	95,600

	Low scenario									
	Remand			Sentenced			Non-criminal Total	Total		
	Male	Female	Total	Male	Female	Total		Male	Female	Total
2007	11,953	891	12,844	62,194	3,387	65,580	1,295	75,389	4,330	79,719
2008	12,000	900	12,900	64,100	3,400	67,500	1,300	77,400	4,400	81,800
2009	12,000	900	12,900	68,100	3,500	71,700	1,300	81,300	4,500	85,800
2010	11,900	900	12,800	69,900	3,500	73,400	1,300	83,000	4,400	87,500
2011	11,900	900	12,700	69,500	3,400	72,900	1,300	82,600	4,300	86,900
2012	11,800	900	12,700	69,900	3,400	73,200	1,300	82,900	4,300	87,200
2013	11,700	900	12,600	70,800	3,400	74,100	1,300	83,700	4,300	88,000
2014	11,600	800	12,500	71,700	3,400	75,000	1,300	84,500	4,300	88,800

Table A3: Monthly values of projected prison population for high, medium and low scenarios

	High	Medium	Low		High	Medium	Low
Jul 2007 ⁽¹⁾	80,326	80,326	80,326	Jan 2011	92,500	89,500	85,900
Aug 2007	80,300	80,100	80,000	Feb 2011	93,800	90,700	87,000
Sep 2007	80,100	79,900	79,600	Mar 2011	94,200	91,100	87,300
Oct 2007	81,000	80,800	80,400	Apr 2011	93,800	90,600	86,800
Nov 2007	81,400	81,000	80,600	May 2011	94,000	90,700	86,800
Dec 2007	79,400	79,000	78,500	Jun 2011	94,200	90,900	86,900
Jan 2008	80,600	80,100	79,500	Jul 2011	94,900	91,400	87,400
Feb 2008	82,200	81,600	81,000	Aug 2011	94,500	91,000	86,800
Mar 2008	82,300	81,600	80,900	Sep 2011	94,800	91,200	87,000
Apr 2008	82,700	82,000	81,200	Oct 2011	95,000	91,400	87,100
May 2008	83,200	82,400	81,600	Nov 2011	95,100	91,300	87,000
Jun 2008	83,600	82,700	81,800	Dec 2011	92,600	88,800	84,400
Jul 2008	86,000	85,100	84,100	Jan 2012	93,800	89,900	85,400
Aug 2008	85,700	84,700	83,600	Feb 2012	95,100	91,100	86,500
Sep 2008	86,600	85,500	84,300	Mar 2012	95,700	91,600	86,900
Oct 2008	87,500	86,400	85,100	Apr 2012	95,400	91,300	86,500
Nov 2008	87,000	85,800	84,400	May 2012	95,900	91,700	86,800
Dec 2008	85,600	84,300	82,900	Jun 2012	96,400	92,100	87,200
Jan 2009	87,000	85,700	84,100	Jul 2012	97,300	93,000	88,000
Feb 2009	87,400	86,000	84,400	Aug 2012	97,200	92,800	87,700
Mar 2009	88,400	86,900	85,200	Sep 2012	97,800	93,200	88,100
Apr 2009	88,200	86,700	84,900	Oct 2012	98,200	93,600	88,400
May 2009	88,500	86,900	85,000	Nov 2012	98,300	93,600	88,300
Jun 2009	89,400	87,800	85,800	Dec 2012	95,900	91,100	85,700
Jul 2009	90,300	88,600	86,600	Jan 2013	97,000	92,100	86,600
Aug 2009	90,200	88,400	86,200	Feb 2013	98,200	93,300	87,800
Sep 2009	90,700	88,800	86,600	Mar 2013	98,700	93,700	88,100
Oct 2009	91,100	89,200	86,900	Apr 2013	98,400	93,300	87,600
Nov 2009	91,300	89,300	86,900	May 2013	98,700	93,600	87,800
Dec 2009	89,100	87,000	84,500	Jun 2013	99,100	93,800	88,000
Jan 2010	90,400	88,300	85,700	Jul 2013	99,800	94,500	88,500
Feb 2010	91,800	89,600	87,000	Aug 2013	99,500	94,100	88,100
Mar 2010	92,400	90,200	87,400	Sep 2013	99,900	94,400	88,300
Apr 2010	92,200	89,800	87,000	Oct 2013	100,300	94,700	88,500
May 2010	92,600	90,200	87,200	Nov 2013	100,400	94,700	88,500
Jun 2010	93,000	90,500	87,500	Dec 2013	98,000	92,300	85,900
Jul 2010	93,700	91,200	88,100	Jan 2014	99,300	93,500	87,000
Aug 2010	93,400	90,800	87,600	Feb 2014	100,700	94,800	88,300
Sep 2010	93,800	91,100	87,800	Mar 2014	101,300	95,300	88,700
Oct 2010	94,100	91,300	88,000	Apr 2014	101,100	95,000	88,300
Nov 2010	94,100	91,200	87,800	May 2014	101,500	95,300	88,600
Dec 2010	91,500	88,500	85,000	Jun 2014	101,900	95,600	88,800

⁽¹⁾ Actual value

ANNEX B: STAKEHOLDER ASSUMPTIONS

This annex describes the following:

- Sentencing trends and scenarios
 - Legislative assumptions
-

The following assumptions have been agreed by stakeholders representing the following entities:

- National Offender Management Service:
 - Dangerous and Severe Personality Disorder Programme;
 - Estate Planning and Development Unit (Strategic Planning);
 - Lifer Review and Recall Unit;
 - Offender Assessment and Management;
 - Planning and Finance Unit;
 - Population Management Unit;
 - Prison Population Task Force;
 - Public Protection Unit;
 - Rebalancing Sentencing Team;
 - Release and Recall Unit;
 - Research Development and Statistics – NOMS;
 - Sentencing Policy and Penalties Unit;
 - Youth Justice and Children’s Unit
- Her Majesty’s Prison Service
- The Parole Board
- Office for Criminal Justice Reform:
 - Project Delivery Unit;
 - Research Development and Statistics – OCJR
- Sentencing Guidelines Council Secretariat
- Her Majesty’s Court Service
- Youth Justice Board
- Home Office:
 - Crime Reduction and Community Safety Group – Public Order Unit;
 - Economic and Resource Analysis Unit
- Border and Immigration Agency:
 - Enforcement and Removals;
 - Analysis and Modelling Services

B1. SENTENCING TRENDS AND SCENARIOS

The sentencing trend assumptions reflect the underlying year-on-year percentage changes in custody rates and average custodial sentence lengths. Three scenarios are used (High, Medium and Low):

- The Medium Scenario assumes that both custody rates and average sentence lengths remain unchanged, i.e., there is no year-on-year change in

custody rates and average custodial sentence length throughout the whole period (2007 to 2014).

- The High Scenario assumes that there will be a year-on-year increase in custody rates of 1% and a year-on-year increase in average custodial sentence lengths of 0.5%.
- The Low Scenario assumes that there will be a year-on-year decrease in custody rates of 1% and a year-on-year decrease in average custodial sentence lengths of 0.5%.

These assumptions hold for each of the gender and offence groups used in generating the prison population projections.

B2. LEGISLATIVE AND PROCEDURAL ASSUMPTIONS

The legislative and procedural assumptions incorporated into these projections apply to legislation which either has a fixed implementation date in the future, or is already currently implemented but the effect on the prison population has yet to be fully realised.

B2.1 Criminal Justice Act 2003

B2.1.1 Indeterminate sentences for Public Protection (IPPs)

- Assumptions on length of stay of IPP sentences are set out in Table B1.

Table B1: Assumptions of time served for IPP offenders

IPP risk type	Percentage	Tariff (months)	Stay post tariff (months)	Total time served (months)	Total time served (years)
High risk long term stay	32.5%	34	140	174	14.50
High risk treatable	32.5%	34	70	104	8.67
Low risk	35.0%	34	54	88	7.33
Total	100.0%	34	87.15	121.15	10.10

- The number of offenders given IPP sentences is assumed to remain stable at 145 per month throughout the modelling period.
- IPP recall rate is assumed to be equivalent to lifer recall rate at approximately 24%.

B2.1.2 Extended Sentences for Public Protection (EPPs)

- Historic data indicates that, on average, 75% of an EPP sentence is served. This figure has been assumed to remain the same over the period of the projections.
- The number of EPP starts is assumed to increase from 100 per month in April 2007 to a maximum monthly value of 110 by early 2008, remaining constant thereafter.
- EPP recall rate is assumed to be equal to the determinate sentence (12 months or more) recall rate, which is approximately 30%.

B2.1.3 Suspended Sentence Order (SSOs)

- SSOs are assumed to be fully saturated with approximately 3,300 starts per month from June 2007 onwards.
- SSO breach rate is assumed to be 34.5%, based on historic data.

B2.1.4 Remaining Criminal Justice Act 2003 measures

All other measures included in the CJ Act 2003 are now either fully implemented and have achieved full steady state or there is no agreed timetable for their implementation.

B2.2 Criminal Justice System Simple, Speedy, Summary Justice (CJSSS)

CJSSS assumptions have been agreed through a separate consultation carried out by OCJR and are assumed to be implemented in April 2008. CJSSS assumptions included in these projections were those agreed in April 2007.

- Number of pre-trial reviews and hearings reduced to two in magistrates' courts and Crown courts.
- More early guilty pleas: 10% of late guilty pleas changed to early guilty pleas in the magistrates' courts.
- Penalty Notices for Disorder given to adults to increase by 50,000 per year from April 2008 to March 2013.

B2.3 Narrowing the Justice Gap

The continued implementation of the Narrowing the Justice Gap measure includes assumptions on future crime trends and sanction detection rates.

Sanction detections (including charges, summons and cautions) for violence, sexual offences, burglary and robbery are assumed to increase by one third of a percent per year through the projection period while the remaining sanction detections are assumed to increase by 0.033% per year. Increases in the use of Penalty Notices for Disorder and conditional cautions are also assumed.

Crime trends are taken from version 2.9 of the Crime Trajectory Model (15th June 2007).

B2.4 End of Custody Licence (ECL)

ECL is assumed to be in operation until 28th June 2008 (12 month period).

B2.5 Home detention curfew (HDC)

HDC is fully saturated and there are no agreed plans to change the eligibility requirements for HDC.

B2.6 Criminal Justice and Immigration Bill

No impacts associated with the Criminal Justice and Immigration Bill 2006–07 are included in the 2007 Prison Population Projections because there is no fixed implementation date for measures in the Bill which may impact the prison population at the time of publication.

B2.7 BIA Policies and legislation

No specific legislation included in projections. It has been assumed that the number of non-criminal prisoners will remain constant at 1,300.

B2.8 Sentencing guidelines

Sentencing Guidelines Council (SGC) revised guideline for the reduction in sentence for a guilty plea came into force on 23rd July 2007. This revision is assumed to increase demand for prison places by around 850, building up over a two year period.

ANNEX C: MODELS, MODEL SPECIFIC ASSUMPTIONS AND MODELLING CAVEATS

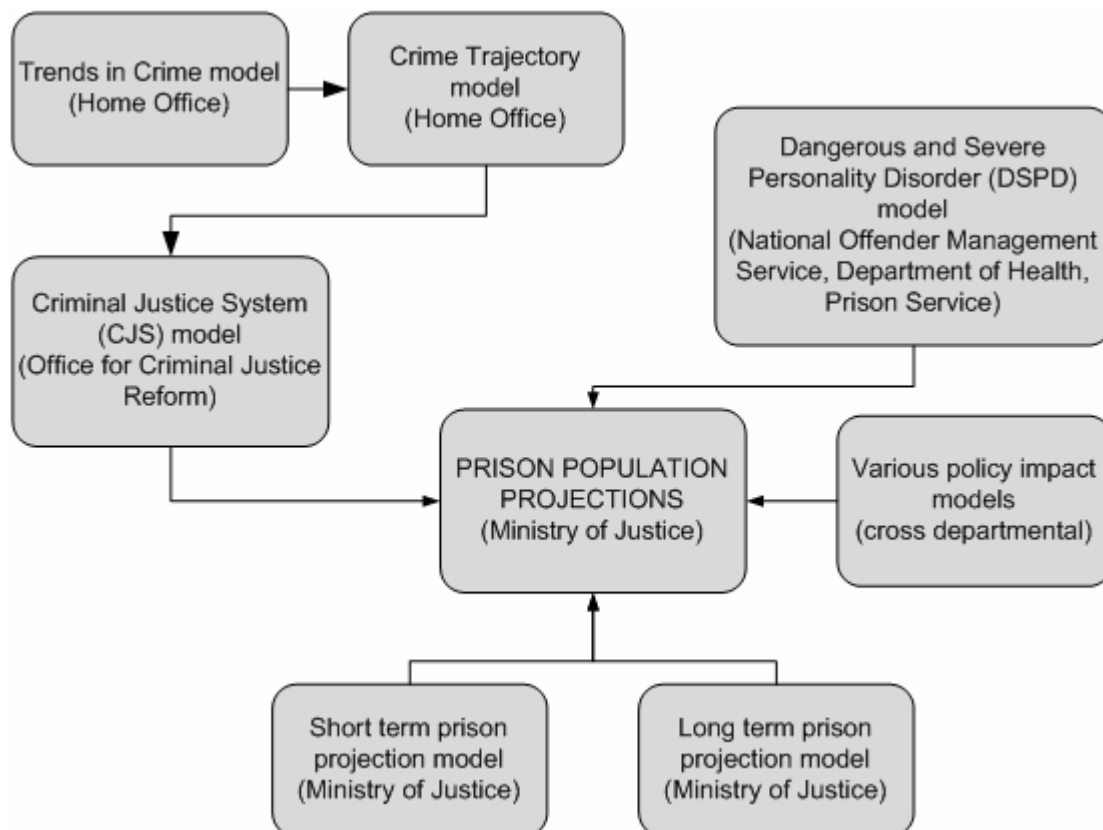
This annex describes the following:

- Overview of the modelling approach
- Short Term Prison Projections (STPP) Model
- Long Term Prison Projections (LTPP) Model
- Dangerous and Severe Personality Disorder (DSPD) Model
- Criminal Justice System (CJS) Model
- Combining the STPP, LTPP, DSPD and CJS model projections
- Assessment of modelling errors and caveats

C1. OVERVIEW OF THE MODELLING APPROACH

The outputs of four models (the STPP, LTPP, DSPD and CJS models) have been used to generate the 2007-2014 prison population projections (see Figure C1). This annex presents an overview of these models and demonstrates how the model outputs have been combined to create the final prison population projections.

Figure C1: Prison projections modelling system



C2. SHORT TERM PRISON PROJECTIONS MODEL

Monthly prison population projections from June 2007 to June 2009 are generated using the Short Term Prison Projections (STPP) Model. This is a trend-based model that takes into account the current prison population, known information about the likely release dates for that population, projected numbers of receptions and projected rates of discharge from those receptions. The model provides end of month projections for up to two years ahead.

Within the STPP model the prison population is subdivided into 44 subpopulations based on the following criteria¹:

- Custody type (Remand, Sentenced, Recall and Non-criminal)
- Gender (Male and Female)
- Age (Under 21, 21 to 24, 25 and over)
- Sentence length (Less than 6 months, 6 months to less than 1 year, 1 year to less than 4 years, 4 years to less than life, Life sentences, Indeterminate sentences for Public Protection (IPP))

The total prison population projection represents the sum of the individual population segment projections.

Three methodologies are used within the STPP model to generate the projections:

C2.1 Receptions / Discharge Distributions Method

This methodology is based on measuring the difference between the inflow (receptions) and outflow (discharges) from prisons each month to assess the net change in the prison population through time. It uses an X-12 ARIMA time series approach² to generate seasonally adjusted reception projections from historic data. In turn historic discharge distributions are used to estimate future monthly discharges. The difference between receptions and discharges through time gives the net change in the prison population. This approach is suitable for population segments where complete historic discharge distributions are available (e.g. those with relatively short custodial sentences).

C2.2 Population X-12 ARIMA Method

This method is based on predicting the future population based on historic population data. It uses an X-12 ARIMA time series approach to generate seasonally adjusted projections. This approach has been adopted where discharge distribution information is incomplete. This makes it a more suitable approach for population segments with longer custodial sentences (4 years or more).

¹ Not all combinations are possible. For example sentence length bands are not applicable to the remand population.

² X-12 ARIMA is a seasonal adjustment program for generating forecasts from monthly time series data. It has been developed by the US Census Bureau and is approved for government use by the Office of National Statistics. Further information can be found at www.census.gov/srd/www/x12a

C2.3 User Defined Method

For a small number of sub-populations neither the Receptions / Discharge Distributions method nor the Populations ARIMA method is satisfactory owing to a lack of suitable historic time series data. In such cases population projections have been defined outside the STPP model in collaboration with stakeholders.

For the 2007-2014 prison population projections user profiles have been used for:

- *Non-criminals* – Prison populations are small and have historically been volatile. In consultation with stakeholders we have assumed the non-criminal population will remain unchanged at 1,300 per month throughout the period of the projections.
- *Indeterminate sentences for Public Protection (IPPs) and Life sentences* – No reliable data are currently available for IPP discharges as this sub population has only existed for two years. IPP projections have therefore been taken from the DSPD model, which has been designed specifically to model this sub population (see Section C4). Life sentences have also been taken from the DSPD model, as these projections are considered more robust than those generated using the Populations X-12 ARIMA method.

For consistency the same methodology has been used for each group of population segments (see Table C1). The STPP model projections do not explicitly incorporate assumptions about custody rate trends and sentencing trends. However, with the Receptions / Discharge Distribution method and the Population ARIMA method historic trends in sentencing behaviour are used to build projections. Therefore the short-term projections may be considered to implicitly incorporate recent trends in sentencing.

Table C1: Overview of the modelling methodologies used in the STPP model by prison population segment

Receptions / Discharge Distributions Methodology	Population ARIMA Methodology	User Defined Profiles
Recalled prisoners ³	Sentenced prisoners 4 or more years determinate sentences	IPP prisoners (From DSPD model ⁴)
Remand prisoners		Life sentence prisoners (From DSPD model ⁴)
Prisoners sentenced to less than 4 years		Non Criminals

³ Due to recent inflation in the detention period of recall prisoners, discharge distributions for recall segments have been increased by between 6% and 7.5% from November 2006 onwards to align the population forecasts with actual recall population data for 2007. This correction yields accurate forecasts for 2007 and is deemed a reasonable approximation for the prison projection forecasts.

⁴ The DSPD model projects total numbers of offenders with IPP and life sentences who are held in the prison estate. The STPP model has been used to apportion these projections by gender and age groups.

C3. LONG-TERM PRISON PROJECTIONS MODEL

The Long-term Prison Projections (LTPP) model projects annual prison populations (at the end of June each year) split by sex and sentenced and remand categories. From the numbers born each year since 1928⁵, it estimates the number of first-time offenders sentenced each year since 1964. Similarly, it estimates the number of those released from prison that re-offend and are sentenced (and when they are sentenced). Using known historic custody rates and custodial sentence lengths and the sentencing trend assumptions for the future, each quarter the newly sentenced prisoners are added to the prison population. Those that have come to the end of their sentences are subtracted. The model incorporates information about the gender, age, offence type, and number of offences that offenders commit throughout their criminal histories.

The LTPP model has been used to generate three future scenarios (high, medium and low) by changing the custody rates and average custodial sentence lengths (see Annex B). These annual projections have been converted into monthly projections by interpolating between June estimates and applying seasonal factors taken from X-12 ARIMA projections of the total prison population for males and females separately based on published prison population data.

C4. THE DANGEROUS AND SEVERE PERSONALITY DISORDER (DSPD) MODEL

The DSPD model has been developed to assess the impact of the DSPD Programme on the wider prison, hospital and community provision over a 60 year period (1965–2024). The model uses a system dynamics approach by taking account of stocks and flows through the prison system and covers the following four categories of prisoners:

- Indeterminate sentences for Public Protection (IPPs)
- Extended sentences for Public Protection (EPPs)
- Lifers
- Determinate Sentence Prisoners on sentences of 4 years or more, to less than life.

The model is informed by the best available research and statistical data regarding a number of variables (including sentence rates, sentence lengths, lengths of stay in custody, length of community supervision, breach and reconviction rates) and can be used to project the future prison population on a month by month basis for the above categories of offenders. Key assumptions underlying this model have been agreed with relevant stakeholders across the Criminal Justice System (see Annex B).

⁵ Demographic information for live births is taken from the Office for National Statistics data.

C5. THE CRIMINAL JUSTICE SYSTEM (CJS) MODEL

The CJS model is a discrete event simulation model that has been designed to assess the impact of policy initiatives on the Criminal Justice System of England and Wales. As an input it takes the projections for the numbers of imprisonable offences committed each year from the Crime Trajectory Model⁶ and simulates how these offenders flow through the CJS. The model includes capacity and resource constraints. It defines limited CJS resources (people and facilities). These are drawn upon to perform timed activities. Where there is more than one possible course of action there is a definable likelihood of the defendant following one route over another. Thus a defendant's progress is determined by the capacity of resources, the duration of activities and the chances of progressing by a given route. It enables assessment of the combined impact of multiple CJS policy initiatives that may impact on the prison population on a monthly basis.

The stochastic nature of the simulation model means that two runs of the model will not produce identical results (though they will be close). By performing several runs confidence can be placed on the results obtained. For the 2007-2014 prison population projections, 10 runs of the CJS model were performed for a scenario combining three key pieces of legislation:

- The continuing impact of the Criminal Justice Act 2003
- The effect of Narrowing the Justice Gap measures
- The impact of implementing the Simple, Speedy, Summary justice (CJSSS) programme

Details of the assumptions used in the combined scenario are described in Annex B. This scenario has been compared with a baseline run that excludes these measures to give the net impact of the timetabled legislative changes. The net impact has subsequently been smoothed using a 12 month centred average.

C6. COMBINING THE STPP, LTPP, DSPD AND CJS MODEL PROJECTIONS

To generate the final prison population projections, selected outputs from the STPP, LTPP, DSPD and CJS models have been combined as follows:

C6.1 Normalising the short-term projections

For the first two years of the prison population projections (2007-2009) the STPP model has been used to project the remand, recall (excluding IPPs) and determinate sentenced populations including EPPs. The DSPD model has been used to estimate the IPP recall and IPP sentenced populations. Due to slight differences in the datasets upon which the STPP and DSPD models are based and published prison population data, the combined results have been normalised to align them with published prison

⁶ The Crime Trajectory Model estimates the numbers of imprisonable offences committed per year taking account of legislation that is anticipated to impact crime levels in the future. This model is fed by the Trends in Crime Model that estimates overall crime levels based on socio-economic factors.

population data for July 2007. This correction is small (less than 0.2%) and does not affect the projected trends.

C6.2 Aligning the short-term and long-term results

For the final five years of the prison population projections (2009-2014) the LTPP model has been used to project the remand, recall and sentenced populations excluding IPPs. The DSPD model has been used to estimate the IPP (sentenced plus recalls) and EPP populations. The combined long-term results for the medium scenario have been adjusted to match the June 2009 normalised short-term results. This assumes the short-term projections are more accurate than the long-term projections in the short-to-medium term and preserves trends from the LTPP projections in the long term.

The same adjustment factor is applied to the high, medium and low scenario from the LTPP projections for July 2009 onwards. Prior to this date, the short-term projections have been realigned to meet the high and low scenarios assuming that sentencing behaviour changes at a constant rate over the two-year period for which the short-term model is used.

C6.3 Incorporating the impact of legislation

The combined short- and long-term projections represent the baseline case without the impact of legislative and/or operational changes that have yet to affect demand for prison places. The anticipated impacts of policy changes with known implementation timetables have therefore been summed to this baseline to generate the final prison population projections as follows:

- Outputs of the CJS model – The net impact of the continuing implementation of the Criminal Justice Act 2003, Narrowing the Justice Gap and the CJSSS programme have been taken from the CJS model and added to the baseline projections.
- Additional legislative impacts – The net impact of End of Custody Licence (ECL), and changes to Sentencing Guidelines Council (SGC) revised guideline on guilty pleas have been individually calculated and factored into the baseline (see Annex B for the underlying assumptions). These impacts have been calculated individually in consultation with stakeholders.

Legislative impacts have been assigned to the high, low and medium scenarios equally.

C7. ASSESSMENT OF MODELLING UNCERTAINTIES AND CAVEATS

The prison population projections for 2007-2014 represent an amalgamation of projections from a variety of models. As several of the models incorporate predictive assumptions based on the expert knowledge of stakeholders (e.g., future sentencing trends), assigning an overall analytical error to the projections is difficult.

However, it is possible to reasonably estimate the errors associated with individual models.

C7.1 Uncertainties associated with the STPP model projections

An empirical estimate of accuracy of the short-term projections has been made by comparing results generated using historic data from January 2000 to June 2005 with actual prison population data from July 2005 until June 2007. The average absolute deviation of the total modelled prison population relative to the actual prison population over the two year period falls below 1%. This level of accuracy is comparable to the estimated statistical error associated with the model⁷ (which equals ~0.7%). Therefore assuming recent trends in prisoner receptions, discharges and, where appropriate, populations, continue in the short to medium term, the STPP projections may be expected to yield a similar level of accuracy for the next two years.

C7.2 Uncertainties associated with the LTPP model projections

If sentencing behaviour changes are known in certainty through time, the LTPP model can accurately reproduce the actual prison population. The observed accuracy of the model for the period 1990 to 2006 is 1.4%.

There are several sources of uncertainty, of which only some are quantifiable. It is impossible to quantify uncertainties in the model caused by offending or sentencing behaviour not included implicitly or explicitly in the model. This could mean that assumptions that do not accurately reflect future CJS trend behaviour can result in an error in the projected prison population.

There are two kinds of uncertainty that can be estimated: (1) the effects of random error in the estimation of the parameters of the model and (2) statistical fluctuation inherent in the nature of the processes being considered.

The values of the parameters were refined so that the model accurately reproduced historical data as well as could be expected (if not better) from statistical fluctuations. Thus, on the assumption that the structure of the model accurately reflects the way people end up in prison, this source of uncertainty may be ignored. The only source of uncertainty to consider is the variation caused by statistical fluctuations.

There is an uncertainty in the proportion born each year that will at some time be found guilty. This is assumed to be normally distributed with a standard deviation 3% of the mean. This results in an uncertainty in the new arrivals to prison of a little more than 40% of this level. Taking this as an upper estimate of the fluctuation in the prison population gives an uncertainty of around 1% to 1.5%.

A second source of fluctuation is an observed fluctuation in remand receptions of around 5%. This turns into a fluctuation in the total population of $\pm 0.5\%$ to $\pm 1.0\%$.

⁷ Assuming the net change in the prison population through time conforms to a Poisson process, it is possible to estimate the theoretical variability in the population using $\pm 2\sqrt{N}$ where N is the size of the prison population. This yields a statistical error interval of $\pm 0.7\%$ (95% confidence level).

Note that this is not actually a fluctuation inherent in the nature of the processes of the model, but an observed fluctuation in the observations. As such, it may change over time.

The expected fluctuation in the total population for any one year is around $\pm 2\%$. This uncertainty should be expected to increase in proportion to the size of any sub-population being examined.

C7.3 Uncertainties associated with the DSPD Model

Compared to actual prison population data between July 2006 and June 2007, results produced by the DSPD model differ by an average of 1.7% for lifers, 2.6% for EPPs and 3.4% for IPPs. The accuracy of the model in replicating the actual population has been relatively consistent over time for lifers. However, the model has become more accurate at replicating the IPP and EPP population through time (between April and June 2007, projections were within 1% of the actual figures). This increased accuracy reflects improvements in the quality and quantity of data on IPP and EPP sentences over this period.

Validation of the model is essential and on-going. Due to the dynamic nature of the Criminal Justice System the underlying variables and values are continually reviewed as further evidence emerge.

C7.4 Uncertainties associated with the CJS model

The average variation for the difference between the baseline and scenario CJS model runs used for the projections corresponds to a 95% confidence interval of approximately $\pm 6,000$ prison places, or around $\pm 7.5\%$. The accuracy of the impacts from the CJS model may be greater than these numbers suggest as the model outputs are smoothed using a moving average before being incorporated into the projections. This smoothing process will in part average out some of the underlying variability. As with any simulation model the accuracy of the CJS model output also depends on the number of simulated runs considered, with increasing number of runs producing greater certainty on the aggregate impacts generated.

It is important to note that the CJS model is a simplified picture of the CJS. It is based on probabilities calculated from historical data, corrected data (where data from across the CJS is not consistent), and 'best estimates' where data is not available. As a result, the model gives an indication of likely future CJS performance but there is some scope for uncertainty.