

Appendix 1: A Brief Commentary on the Present Approach to Estimating ‘Bed Savings’

1.1.1 Introduction

The internal Department of Justice document “Bed Savings Equations for the Corrections Long-term Management Strategy Initiatives” noted that the main indicator of success of the Corrections Long-term Management Strategy (CLTMS) was to be a reduction in the prisoner population “from that which would otherwise be experienced through natural growth”. While it was envisaged that this indicator would be indexed by a number of intermediate performance measures and key indicators, the “one final measure” of the impact of the CLTMS was to be an estimate of “bed saving”. This indicator was interpreted as an estimate of the reduction in the number of persons serving custodial terms in all Victorian prisons from a ‘bench-mark’ date (at present this is June 30, 2001) below that which would have occurred through “natural growth.”

Present Bed-savings Calculations

The equation underlying the current estimates of bed savings was reconstructed in the “Bed Savings Equations” document from the Department of Justice proposal that resulted in the ERC funding for the CLTMS for the period 2001 – 2005. This equation is designed to take into account: (a) The relative lengths of prison sentences and community-based orders; (b) the possibility that part of any increase in the use of community-based dispositions will result from a net-widening effect; and (c) the nature of different kinds of community-based orders (ranked in order of their likely impact on the prison population from Parole Orders [high impact] to Community Work Orders [low impact]). By acknowledging that there may be a differential impact on prison beds associated with different kinds of community dispositions, the underlying rationale for the bed-savings calculations provides the opportunity to differentially weight these different orders in calculating estimates of beds saved. At present, this possibility is utilised in only a very simple way: Parole Orders, Intensive Correctional Orders, Combined Custody and Treatment Orders, Drug Treatment Orders, Community-based Orders (CBOs), CBO (Post-breaches) and CBO (Imprisonments) are given equal weights, whereas Fine Default Orders and CBO (community work orders) are given a weight of zero and are thus effectively excluded from any estimates.¹

¹ There is an interesting overlap here between the exclusion of these two types of orders from the estimates and the additional incorporation of a net-widening component in the rationale underlying the bed-savings estimates. Fine Default Orders and Community Work Orders are the two order types possibly most likely to be ‘vulnerable’ to net-widening in the sense of a

1.1.2 Preliminary Commentary – Assumptions Underlying the Bed-savings Estimates

The practical result of the reconstruction of the rationale for a procedure for estimating bed savings and the subsequent derivation of appropriate formulae is that those community-based orders that range in rank order from Parole Orders to CBO (Imprisonments) are each given a weight of $1/3$ (0.3333). The combined ‘impact’ of community-based orders at any point in time subsequent to the bench-mark date (at which the estimate is assumed to be zero) on the size of the prison population is calculated by summing across the specific estimates for each order.

The assumptions underlying this approach appear to be:

1. That there is an actual ‘substitution’ effect. That is, that an increase in the number of community-based dispositions will have a direct (albeit it not necessarily one-to-one) impact on the numbers of persons in the prison system through the ‘substitution’ of community orders for prison sentences.
2. Conversely, that an increase in the number of community-based orders does not arise from other sources, e.g. net-widening, changes in the nature of offences over time, or changes in the nature of offenders over time (e.g. an increase in first-time offenders). The possibility of net-widening is acknowledged in the present calculations by assuming that one-third of *all* community dispositions will result from this source. (This assumption is in one sense clearly incorrect for some types of community disposition. For example, a Parole Order has a direct and immediate one-to-one effect on prison numbers. This has resulted in an alternative proposal for differentially weighting different types of community order in the bed savings calculations.
3. That the substitution effect will impact on short-term sentences only, that the average length of a ‘short-term’ sentence is six months, and that this is equivalent in sentencing practice to a one-year community-based order.
4. And, finally, that there will be no “natural” growth in the prison population after the bench-mark date. There appears to be no mechanism in the present calculations for estimating a “natural” growth rate nor the application of an appropriate correction.

‘displacement’ effect from the possibility of a fine to a community-based disposition. By not including these two order types in the summation of the estimates and by incorporating a discount for net-widening in the rationale for a previous step in the calculations there is the possibility of ‘double-counting’ of net-widening. This issue requires further investigation.

The validity of the estimates of bed savings rests on the plausibility of these (and possibly other) assumptions². While it has not been possible to investigate these assumptions in any detail for this interim report the data presented in the previous section enable some comment on the 'substitution' assumption.

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The smoothed fits to the time-series described previously were simplified by locating the closest polynomial function to represent them.³ It was found that a cubic polynomial function provided a very close approximation to the smoothed fit to prisoner time-series and, similarly, that a quartic function provided a very close approximation to the smoothed fit for the time-series of community orders. The fitted functions were then used to generate 'predicted' values for the numbers of prisoner receptions and community order registrations each month over the period for which the data were available. Assuming that the two chosen polynomial functions represented a reasonable mathematical approximation for the trends that are evident in these two variables, the predicted values can be used provide an estimate of the 'true' changes in their magnitude that is net of the errors involved in the actual estimates. This might be done from month to month, or from any 'bench-mark' date in the time series.

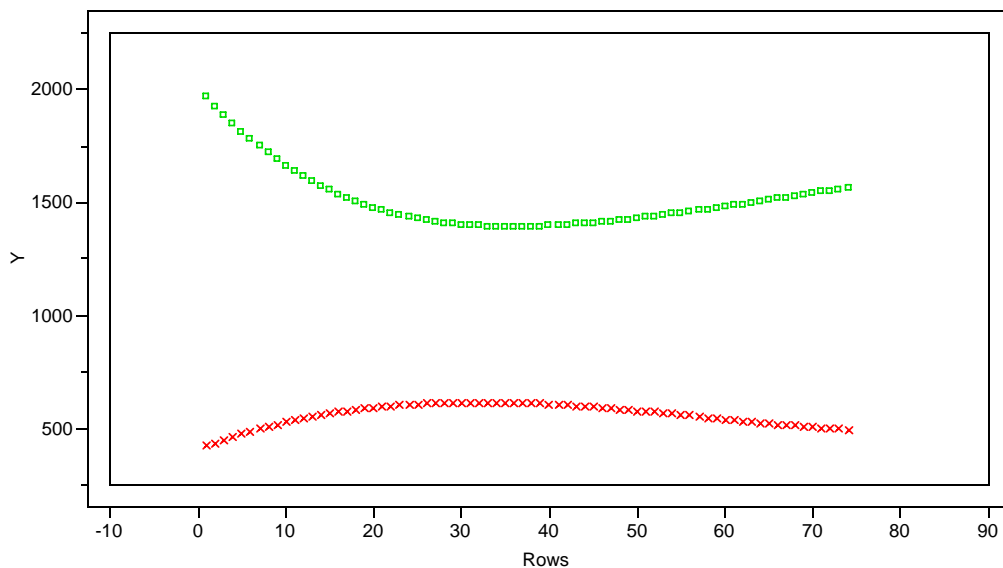
² For example, there seems to be an implicit assumption in the conceptualisation of 'bed savings' that diversion of offenders from prison to less costly community alternatives will save taxpayer dollars. A simple method of determining economic benefit might be to subtract the cost per day for each prisoner from cost per day of managing an offender in the community. However, *cost-effectiveness* is more difficult to assess because of the possibility that *true diversion* is not occurring (e.g. net-widening). The economic benefits may also vary for different types of community sanctions. Home detention for instance might be less cost-effective than prison if (a) it is not fully implemented (i.e. low offender numbers and high total expenditure might lead to higher costs per day than prison); (b) offenders placed on home detention are those that might otherwise have received parole (back-end) or an intensive corrections order (front-end); (c) the percentage of home detainees sent back to prison for breaches is greater than those on parole or an intensive corrections order; (d) prison beds made available through a home detention program are filled immediately with new inmates (for a more detailed discussion of see Palumbo, Clifford & Snyder-Joy, 1992). Further examination might provide a clearer understanding of the relationship between bed savings and cost-effectiveness.

³ A polynomial function is a simple mathematical equation that contains terms that are squared (for quadratic), cubed (for cubic), raised to the fourth power (for quartic) and so on. Polynomial functions describe curved lines of varying complexity. This procedure of using a precise mathematical function to represent the data removed the subjectivity involved in choosing a particular degree of 'flexibility' for the smoothed fits. A line fitted by smoothing can be made to vary continuously from one that links every data point by a line segment up to a fit that closely approximates a straight line through the entire series.

This has been done for three 'bench-mark' dates to a final date of July 2004 in Table 5.4.1 below. The 'bench-mark' dates are: December 2000 (Week 30 in the time-series - that is approximately the time at which a change in the slope of both variables commenced); June 2001 (Week 36 in the time-series - the 'bench-mark' date for the present bed savings calculations), and June 2002 (Week 48, the month preceding the period of implementation of the main CCS redevelopment activities). The end of the time-series is taken as July 2004 (Week 73). Figure 5.4.1 shows the form of the two functions that were fit to the data.

	Dec 2000 - July 2004	June 2001 - July 2004	June 2002 - July 2004
Change in Prisoner Receptions	-118.9	-117.1	-89.0
Change in Community Order Registrations	156.2	165.5	136.5
Ratio: PR/CO	0.76	0.71	0.65

Table 5.4.1: Changes in Prisoner Receptions and Community Order Registrations from Selected 'Bench-mark' Dates



Y × Predicted Prisoner

■ Predicted Community Orders

Figure 5.4.1: The Form of the Polynomial Functions Fit to the Time-series of Prisoner Receptions and Community Order Registrations

1.1.3 Conclusion

The provisional estimates of changes in prisoner receptions and community order registrations presented in Table 3 provide initial evidence that there may have been a considerable substitution effect during the period under examination of the order of approximately two-thirds. That is, one community order registration appears to have resulted in a reduction of approximately two-thirds of one prisoner registration. It must be acknowledged that prisoner receptions and community order dispositions may be generated by different mechanisms operating over similar time periods, and thus this apparent substitution effect might be smaller than estimated or, indeed, non-existent. Additional data, particularly qualitative information on the impact of the CCS redevelopment activities on the thinking and choices of magistrates, the Adult Parole Board and community corrections officers will be needed to validate this interim conclusion.

