

CRIMINAL JUSTICE CONSENSUS COST-BENEFIT WORKING GROUP

FINAL REPORT

**A STUDY COMMISSIONED BY
ACT No. 61
2013-2014 LEGISLATIVE SESSION
STATE OF VERMONT**

Submitted to:

The Vermont Senate Judiciary Committee
The Vermont House Judiciary Committee
The Vermont Joint Committee on Corrections Oversight

Submitted by:

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April, 2014

This project was supported with funds from the Bureau of Justice Statistics, United States
Department of Justice through Grant Number 2011-BJ-CX-K014

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THE VERMONT CENTER FOR JUSTICE RESEARCH

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ACKNOWLEDGMENTS

The Vermont Center for Justice Research (VCJR) acknowledges the hard work, attention to detail, and collegiality of those who generously served as members of the Cost-Benefit Service Delivery Teams and project consultants.

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EXECUTIVE SUMMARY

INTRODUCTION

Pursuant to Act 61 this project had the following goals: 1) determine the costs of the criminal and juvenile justice system including costs to victims; 2) develop “Throughput Models”¹ of the criminal justice system to identify how cases proceed through the system and to serve as a tool to assess the costs of policy changes; 3) analyze the cost benefits of the Bennington County Integrated Domestic Violence Docket Project using the Results First Model²; 4) assess the quality of justice data collection systems for the purpose of conducting cost-benefit analysis; and 5) investigate the need for and the most appropriate entity within state government to manage an ongoing criminal justice cost benefit model.

Given that the project was limited to approximately six months, the results reported in this report should be viewed more as a proof of concept than as a final product. All of the objectives set forth in Act 61 were accomplished. In some cases, however, costs associated with particularly complicated or highly-specific criminal and juvenile justice activities were more loosely estimated or left unaddressed than would have been the case if there had been a longer study period. With that caveat in mind, the report provides a wealth of information regarding criminal and juvenile justice costs and provides a firm foundation on which to base additional analysis.

RESEARCH METHODS

Act 61 directed the Vermont Center for Justice Research (VCJR) to manage the project. The VCJR adopted a collegial data collection and review model whereby agencies developed marginal and opportunity costs rather than using a “data collection by external expert” approach. Two Working Groups were established – the Executive Working Group and the Technical Working Group. The Executive Working Group was comprised of criminal and juvenile justice agency heads, and the Technical Working Group was made up of financial managers and subject matter experts from the agencies named in Act 61. The Technical Working Group was further divided into Service Delivery Teams, one for each criminal/juvenile justice function and one for victims. Each Service Delivery Team was assigned a staff coordinator either from VCJR or the Legislative Joint Fiscal Office (JFO).

The Service Delivery Teams worked throughout the fall of 2013 to develop both *marginal* and *opportunity* costs for their respective duties. A *marginal cost* is the amount the total agency budget changes when there is a small change in the workload of the agency. An *opportunity cost* is the value of what could have been done with resources if they had not been committed to

¹ A graphic which illustrates the flow of criminal cases through the criminal justice system together with the associated opportunity costs.

² The Pew-MacArthur Results First Initiative, a project of the Pew Charitable Trusts and the John D. and Catherine T. MacArthur Foundation (with additional support from the Annie E. Casey Foundation), works with states to implement and customize an innovative cost-benefit analysis tool that helps them invest in policies and programs that are proven to work.

something else. For example, when there are small reductions in a particular crime, the time which was devoted to handling that crime can be diverted to other activities within an agency.

A statewide criminal and juvenile justice cost model was developed from the cost estimates developed by the teams. Service Delivery Teams were given the flexibility to develop data collection methods appropriate to their service area. Staff coordinators, with the assistance of technical consultants from the Pew-MacArthur Results First Initiative, ensured that the research methods were valid and comparable between teams.

The analysis of “benefits” in this cost-benefit project was based on the Vermont Results First Model. This model was developed by The Pew-MacArthur Results First Initiative based on work conducted by the Washington State Institute for Public Policy. Initial development of the Vermont Results First Model for criminal justice services was undertaken by the Legislative Joint Fiscal Office with assistance from the VCJR. The Vermont Results First model is a state-specific cost-benefit tool that analyzes the costs and benefits of potential investments in evidence-based programs. The model incorporates Vermont criminal justice system costs, calculates program benefits associated with reduced system use and avoided victimizations within the state, and presents Vermont-specific return on investment statistics for individual programs and combinations of programs. In compliance with Act 61, this report describes the methods used to calculate Vermont-specific criminal justice costs for the cost-benefit model, reports findings of the cost analysis, provides a case study on the findings of the Vermont Results First model for the Bennington County Domestic Violence Docket, and provides recommendations for the continued use of the cost-benefit model.

CONCLUSIONS

1. The project demonstrated that a collegial research design utilizing the expertise of subject matter experts is a viable approach to developing: 1) valid cost models; 2) cost models which are understood by stakeholders; and 3) cost models which are endorsed by stakeholders.
2. Analyses of *marginal costs* for the Vermont criminal and juvenile justice systems suggest that only limited budget savings can be obtained by small reductions in crime. The research demonstrated that marginal cost savings are primarily accrued by reducing overtime and reducing services that are provided by contracted services providers. Small reductions in crime will reduce costs to victims, an important consideration, but these savings do not accrue to the state budget.
3. Planning and budgeting activities on the part of criminal/juvenile justice agencies can benefit from the identification of *opportunity costs*. For example, when there are small reductions in a particular crime, the time which was devoted to handling that crime can be diverted to other activities within an agency.
4. Throughput Models of the Vermont Criminal/Juvenile Justice System based on analysis of specific crimes is a valuable tool for: 1) examining expenditures made by individual criminal/juvenile justice agencies when processing crimes; and 2) identifying the overall taxpayer and victim costs of particular types of crime. Throughput Models can also be used as an important tool to more accurately predict the cost of policy changes in criminal/juvenile justice.

5. The Vermont Results First model was demonstrated to be a useful tool for assessing the cost-benefit ratio of the Bennington County Integrated Domestic Violence Docket Project (IDVD) and other innovative corrections programs. The model determined that for every \$1 invested in the IDVD there is an expected long-term benefit of \$1.89. Therefore, the IDVD program is cost-effective.
6. There is little in the way of electronic data to document the amount of time that criminal and juvenile justice professionals spend on their duties. One notable exception is the computer-aided dispatch systems managed by the Department of Public Safety and other police departments which track time-on-scene data for law enforcement personnel for particular crimes.
7. Electronic data for the Throughput Models are maintained through cooperative data exchange relationships between the Vermont Center for Justice Research and the Department of Public Safety, the Vermont Court Administrator's Office, and the Department of Corrections. With the exception of arrest data from the Department of Public Safety, data quality is generally good. The Throughput Model could be made more robust if data exchanges also included State's Attorneys and the Office of the Defender General whose management systems are currently inadequate for this purpose.
8. The data systems at Vermont criminal/juvenile justice system agencies are sufficient at this time to generate the requisite information to update and manage the Vermont Results First Model. The information was obtainable, but the process relied upon a considerable amount of manual work on the part of agencies which is inefficient and costly. If legacy systems were replaced by more technologically-advanced systems, data collection for the Vermont Results First model (as well as other policy/research initiatives) would be more efficient, less costly, and probably more accurate.
9. The Cost Benefit Working Groups concluded that the Vermont Results First criminal justice component is a useful planning tool and the Vermont Center for Justice Research is best positioned to manage the criminal and juvenile justice sections of the model.

RECOMMENDATIONS

The work accomplished by the Technical Working Group during the six months allotted to the project is quite extraordinary. However, it is important to note that this is only the first iteration of the project. Given the important insights generated by the analysis, the Working Groups recommend continued development of the model consistent with the following points:

1. The State of Vermont needs to reinvigorate its commitment to supporting evidence-based programming in criminal and juvenile justice. It is essential that when new programs are developed funding is earmarked for program evaluation. The costs associated with creating and monitoring data systems for project management and evaluation are not trivial. If the State is committed to evidence-based planning and programming, adequate funding for these activities needs to be provided. In particular resources should be available to evaluate projects in a manner consistent with the Vermont Results First model. The creation of valid evaluation data supports

the data-driven approach embodied in the Vermont Results First model and provides for a common basis upon which to assess program value.

2. The Working Groups should revisit the marginal costs research undertaken during this project to identify step-wise marginal costs. Step-wise marginal costs occur when the total agency budget changes because a certain workload or capacity threshold is reached -- for example, when the inmate population of a correctional center decreases enough to close an entire housing unit. This information is critical to understanding the impact that reductions in recidivism or changes in criminal/juvenile justice policy might have on the criminal/juvenile justice system.
3. Since marginal and opportunity costs in criminal/juvenile justice are primarily driven by staff costs, the importance of accurate time study data for various criminal/juvenile justice duties cannot be overemphasized. Vermont criminal and juvenile justice agencies should work to identify financial resources to support periodic time studies in order to maintain the validity of both the criminal justice Throughput Model and the Vermont Results First model.
4. The results of the opportunity cost analysis undertaken in this study should be made available to criminal and juvenile justice agencies, and technical assistance should be provided to agencies who wish to develop strategies for including opportunity costs in their planning and budgeting practices.
5. Resources should be identified to make the Throughput Models a more robust tool for criminal/juvenile justice planning at the state, regional, county, and local levels. In particular, the Throughput Model should be further developed to include intermediate sanction data and regular updates to mirror changes in criminal and juvenile justice policy and practice.
6. The State of Vermont should continue developing the Vermont Results First model as a way to identify innovative programs that achieve a strong benefit-to-cost ratio. The Working Groups noted, however, that there are staff resource costs associated with developing the Vermont Results First model which include data collection (much of which is now manual) and analysis. Continued effort will require a major commitment from participating criminal/juvenile justice agencies as well as the Legislature to be creative about finding resources to support the improvements in technology and analysis methods required to support a robust cost-benefit analysis program in Vermont state government.
7. The responsibility for coordinating data collection, analysis, and updates of the Vermont Results First criminal justice model component should be assigned to the Vermont Center for Justice Research (VCJR). VCJR should also be responsible for disseminating information developed for the model to other state agencies for analysis.

THE LEGISLATIVE CHARGE

Act 61

Sec. 3. CRIMINAL JUSTICE CONSENSUS COST-BENEFIT WORKING GROUP

(a)(1) A Criminal Justice Consensus Cost-Benefit Working Group is established to develop a criminal and juvenile justice cost-benefit model for Vermont for the purpose of providing policymakers with the information necessary to weigh the pros and cons of various strategies and programs, and enable them to identify options that are not only cost-effective, but also have the greatest net social benefit. The model will be used to estimate the costs related to the arrest, prosecution, defense, adjudication, and correction of criminal and juvenile defendants and victimization of citizens by defendants.

(2) The Working Group shall:

(A) develop estimates of costs associated with the arrest, prosecution, defense, adjudication, and correction of criminal and juvenile defendants in Vermont by using the cost-benefit methodology developed by the Washington State Institute for Public Policy and currently used collaboratively by the Joint Fiscal Office and the PEW Charitable Trust for the Vermont Results First Project;

(B) estimate costs incurred by citizens who are the victims of crime by using data from the Vermont Center for Crime Victim Services, supplemented where necessary with national survey data;

(C) assess the quality of justice data collection systems and make recommendations for improved data integration, data capture, and data quality as appropriate;

(D) develop a throughput model of the Vermont criminal and juvenile justice systems which will serve as the basic matrix for calculating the cost and benefit of Vermont justice system programs and policies;

(E) investigate the need for and the most appropriate entity within state government to be responsible for:

(i) revising the statewide cost benefit model in light of legislative or policy changes, or both, in the criminal or juvenile justice systems;

(ii) updating cost estimates; and

(iii) updating throughput data for the model.

(3) The Working Group shall be convened and staffed by the Vermont Center for Justice Research.

(4) The costs associated with staffing the Working Group shall be underwritten through December 31, 2013 by funding previously obtained by the Vermont Center for Justice Research from the Bureau of Justice Statistics, U.S. Department of Justice.

(b) The Working Group shall be composed of the following members:

- (1) the Administrative Judge or designee;
- (2) the Chief Legislative Fiscal Officer or designee;
- (3) the Attorney General or designee;
- (4) the Commissioner of Corrections or designee;
- (5) the Commissioner for Children and Families or designee;
- (6) the Executive Director of State's Attorneys and Sheriffs or designee;
- (7) the Defender General or designee;
- (8) the Commissioner of Public Safety or designee;
- (9) the Director of the Vermont Center for Crime Victim Services or designee;
- (10) the President of the Chiefs of Police Association of Vermont or designee;
- (11) the President of the Vermont Sheriffs' Association or designee; and
- (12) the Director of the Vermont Center for Justice Research.

(c) On or before November 15, 2013, the Working Group shall report its preliminary findings to the Senate Committee on Judiciary, the House Committee on Judiciary, and the House Committee on Corrections and Institutions. The Working Group shall issue a final report to the General Assembly on or before January 1, 2014.

INTRODUCTION

BACKGROUND

In November 2011, Senate President Pro Tempore John Campbell and Speaker of the House Shap Smith jointly submitted a letter of invitation to the Pew-MacArthur Results First Initiative³ requesting help to “guide our thinking about our budget development system design.” They committed to piloting the model in 2012 and designated the Legislative Joint Fiscal Office (JFO) to lead the implementation effort with “extensive Administration support and data assistance.” Over the last two years, the Vermont Center for Justice Research (VCJR) has been working with the JFO to develop a Vermont-specific cost-benefit model using the Results First approach. JFO and VCJR staff members have been trained in the cost-benefit methodology by staff from the Pew-MacArthur Results First Initiative (hereafter, Results First).

Act 61 represents the continued interest by Vermont state government in the Vermont Results First model and the need to develop more detailed information regarding criminal justice costs. The VCJR was able to secure partial funding for the work required under Act 61 from the Bureau of Justice Statistics, U.S. Department of Justice.

OBJECTIVES

In light of the legislative charge, the following objectives were developed to define and guide the project:

1. Develop both the opportunity and marginal costs for each phase of the Vermont Criminal and Juvenile Justice Systems to include the costs associated with arrest, prosecution, defense, adjudication, and corrections of both adult and juvenile offenders.
2. Develop both opportunity and marginal costs for crime victimization to include taxpayer and victim costs.
3. Develop Throughput Models of the criminal justice system using the offense types identified in the Results First model to identify how cases proceed from arrest through conviction and sentencing. This model combined with the marginal and opportunity costs identified above will provide a detailed cost model for criminal justice.
4. Analyze the cost benefits of the Bennington Integrated Domestic Violence Docket using the Vermont Results First Model which will include the criminal justice and victim costs developed above.

³ The Pew-MacArthur Results First Initiative, a project of The Pew Charitable Trusts and the John D. and Catherine T. MacArthur Foundation (with additional support from the Annie E. Casey Foundation) works with states to implement and customize an innovative cost-benefit analysis tool that helps them invest in policies and programs that are proven to work.

5. Assess the quality of justice data collection systems and make recommendations for improved data integration, data capture, and data quality as appropriate.
6. Investigate the need for and the most appropriate entity within state government to be responsible for: 1) revising the statewide criminal justice cost benefit model in light of legislative or policy changes, or both, in the criminal or juvenile justice systems; 2) updating cost estimates; and 3) updating throughput data for the model.

VERMONT RESULTS FIRST MODEL

The Vermont Results First model is a state-specific cost-benefit tool that analyzes the costs and benefits of potential investments in evidence-based programs. The model incorporates Vermont criminal justice system costs, calculates program benefits associated with reduced system use and avoided victimizations within the state, and presents Vermont-specific return on investment statistics for individual programs and combinations of programs. This methodology is based on a model developed by the Washington State Institute for Public Policy (WSIPP) and supported by the Pew-MacArthur Results First Initiative (Results First)⁴. The model is part of a larger approach to analyzing budget choices based on the available evidence that programs and policies are effective. The Results First approach enables states to identify opportunities to invest limited funds to generate both better outcomes for citizens and achieve substantial long-term savings. Vermont is one of a growing number of states that are customizing this approach to the state-specific context and using its results to inform policy and budget decisions⁵.

Part of this report summarizes the findings of a cost-benefit analysis of the Bennington County Integrated Domestic Violence Docket Project⁶ using the Vermont Results First model. To demonstrate the value of the Results First model, a cost-benefit analysis was conducted for the Bennington County Integrated Domestic Violence Docket. Estimates were cautiously constructed to reflect the difficulty that can be encountered when implementing programs. Several factors need to be considered when interpreting these findings. The predicted costs, benefits, and return on investment ratios for each program were calculated as accurately as possible but are, like all projections, subject to some level of uncertainty. It is important to recognize that program

⁴ Results First uses a highly sophisticated econometric model that analyzes the costs and benefits of potential investments in evidence-based programs. The model uses the best available program research to predict the outcomes of each program in Vermont, based on the state's unique population characteristics. It calculates the cost to produce these outcomes and their discounted long-term dollar value, including separate projections for benefits that would accrue to program participants, nonparticipants, and taxpayers, combined to produce a total state bottom line. The model then calculates the overall return on investment that Vermont would achieve if it chose to fund a program or combination of programs, and determines the probability that each program would generate net benefits to the state if key assumptions were different than predicted. The econometric model was developed by WSIPP and is the culmination of over 15 years of development; the model was validated by independent panels of national experts in 2010 and 2012.

⁵ Vermont is one of 14 states and 3 California counties currently using the Results First approach to support policy and budget decisions. Initial development of the Vermont Results First Model for criminal justice services and programs was undertaken by the Legislative Joint Fiscal Office (JFO) with assistance from the VCJR. JFO continues to develop the Vermont Results First Model in additional policy areas.

⁶ Bennington County Integrated Domestic Violence Docket Project: Outcome Evaluation.
http://www.crgvt.org/uploads/5/2/2/2/52222091/idvd_final_rreport_12-9-11b.pdf

fidelity – how well programs are implemented – is critically important to achieving the predicted outcomes. The model assesses evidence-based programs that are designed to follow specific treatment models, and failure to operate these programs as prescribed can dramatically reduce their outcomes.⁷ Thus, safeguarding the state’s investment in evidence-based programs requires ongoing efforts to assess program delivery and, when necessary, taking corrective actions to hold managers accountable for program outcomes.

RESEARCH METHODS

Developing a statewide criminal and juvenile justice cost-benefit model in six months is no easy task. Apart from the logistics, data access, and limited knowledge about cost-benefit analysis among agencies, is the very natural resistance to a process which might result in agencies getting a smaller piece of the fiscal pie. Some of the initial questions from agencies included in the project were: Why are we doing this? How will the data be used? Will our agency be adversely affected by the outcome? Will our work on the project be of use to us or will it be shelved? Who is going to collect and analyze the data?

In light of these concerns VCJR developed a stakeholder-focused model for developing the cost benefit data. Based on the assumption that project control and knowledge are the most effective strategies to reduce resistance, the VCJR adopted a collegial data collection and review model whereby agencies developed methods to calculate marginal and opportunity costs with the assistance of a staff coordinator rather than using a “data collection by external expert” approach.

As per the directive in the charge from Act 61, the VCJR began developing the Criminal Justice Consensus Cost-Benefit Working Group (hereafter, Working Group) in June, 2013 and convened the first meeting of the Working Group on August 14, 2013. VCJR decided to form two groups – The Executive Working Group and the Technical Working Group. The Executive Working Group was made up of the agency heads or their designees as indicated in Act 61. The Technical Working Group was made up of the financial managers from the agencies named in Act 61. The Technical Group was further divided into Service Delivery Teams -- the Law Enforcement Team, Adjudication Team (Defender General, State’s Attorneys, Attorney General, and Court Administrator); the Corrections Team, the Juvenile Justice Team, and the Victims Team. A Coordinator from either the VCJR or the Legislative Joint Fiscal Office (JFO) was appointed to head each Service Delivery Team. The Coordinator was responsible for convening the Service Delivery Teams, recruiting additional members as necessary, and staffing the Teams. Technical assistance was provided by consultants from Results First throughout the project. Teams met at least twice a month during the process of developing their cost data.

⁷ For example, Washington State’s experience with Functional Family Therapy for juvenile offenders found that program outcomes closely matched those predicted by the model when the program was appropriately implemented, but recidivism among juvenile offenders actually rose when the program was not implemented competently. See Barnoski, R., Aos, S. (2004). Outcome Evaluation of Washington State’s Research-Based Programs for Juvenile Offenders (Document No. 04-01-1201). Olympia: Washington State Institute for Public Policy.

A special training session was held on August 27, 2013, for the Technical Working Group. Its purpose was to train Financial Managers in the Results First methodology for collecting criminal justice cost figures.

A Midterm Assessment Meeting for both Executive and Technical Working Groups was held on October 22, 2013 to evaluate the progress of the project and bring stakeholders up-to-date on the work of the other Service Delivery Teams. A key goal of the Midterm Assessment Meeting was to secure acceptance from all teams regarding: 1) the methods being used by the teams; and 2) their preliminary findings. This buy-in on the part of stakeholders was critical because the methods used by the different teams to identify costs varied. A major goal of the collegial process was to ensure support for the final product from stakeholders. As such, it was important that teams agreed on the approaches that were being taken by their colleagues to estimate costs.

On November 12, 2013 the Principal Investigator provided a progress report on the project to the Joint Legislative Corrections Oversight Joint Committee.

After data collection was completed, the draft cost analysis was sent to the Principal Investigator to assemble. A draft of the cost model was returned to the Team Coordinators to review. A draft report was subsequently written and disseminated to the Team Coordinators, all members of the Working Groups, and the consultants from Results First for review. The Team Coordinators, the Executive Working Group and the Technical Working Group were convened for a discussion of the draft report. A draft of the Executive Summary which contained the conclusions and recommendations was developed based on input from the Coordinators, Working Groups, and the consultants. A final draft of the report was subsequently developed and distributed to all parties for review. A final report was developed based on input from all parties and submitted to the Legislature in April, 2014.

CALCULATING CRIMINAL JUSTICE COSTS

By partnering with the Results First Initiative, Vermont adopted WSIPP's cost-benefit methodology, as incorporated into the Results First computer application, for conducting the analysis.⁸ This report focuses on analysis of the costs of per-unit resources used when convictions or adjudications for crime occur. Other components used in the cost-benefits analysis of crime-reduction policy options will be discussed elsewhere.

The Vera Institute of Justice has developed a very helpful and readable reference showing methods of calculating costs for cost-benefit analysis entitled, *A Guide to Calculating Justice-System Marginal Costs* (hereafter, *The Guide*). The material in this section either relies heavily on the Vera Institute's work or directly quotes from *The Guide* to explain cost analysis concepts used in cost-

⁸ Lee, S., Aos, S., Drake, E., Pennucci, A., Miller, M., Anderson, L., & Burley, M. Return on investment: Evidence-based options to improve statewide outcomes: Technical Appendix and User-Manual, (Document No. 12-04-1201B). Olympia: Washington State Institute for Public Policy, 2012. Retrieved from: <http://www.wsipp.wa.gov/pub.asp?docid=12-04-1201>

benefit analysis⁹. The methods suggested in *The Guide* are consistent with the training and materials provided by Results First staff.

In this model the marginal costs are calculated. According to *The Guide* the marginal cost is the amount the total cost changes when a unit of output (also referred to as workload) changes over time.¹⁰ Said another way, the marginal cost is the amount of change in an agency's total operating cost when outputs such as arrests, prosecutions, or incarcerations change over time because of changes to policies or programs¹¹. Marginal costs are distinguished from average costs (total budget divided by the total workload) because average costs include fixed costs such as administration and other overhead costs that aren't necessarily affected by changes in policy or programming. Further, marginal cost should be measured over the long-term, as the implications for criminal justice policies examined in cost-benefit analysis have incremental impacts on taxpayers' resources and victimization over the long-term.

TYPES OF GOVERNMENT COSTS

The Guide suggests a very useful framework for understanding government costs:¹²

The costs of government agencies are said to be variable, fixed, or step-fixed. Identifying these costs is the first step in calculating marginal costs.

Variable costs are those costs directly related to workload and change immediately as workload increases or decreases. Examples of variable costs include overtime, contracted services, and travel costs.

Fixed costs, in contrast, are those that remain fixed over a given period and are not usually affected even if the workload changes. Examples of fixed costs include rent, utilities, central administration, and equipment.

Step-fixed costs remain constant for a certain range of workload, but can change if the workload exceeds or falls below that range. The most common examples of step-fixed costs are staff salaries and benefits. These step-fixed costs are sometimes said to be tiered, because positions are typically added or subtracted only if the workload reaches a certain threshold. For example, a probation department might not hire a new officer in response to a small increase in its caseload, but is likely to wait until the caseload reaches a point at which the work would fully occupy the time of an additional officer. Similarly, the Department of Corrections cannot reduce jail staffing if the inmate population decreases slightly, but if the decline is sufficient to close an entire housing area, the corrections department could eliminate the positions related to that unit.

⁹ Christian Henrichson and Sarah Galgano, *A Guide to Calculating Justice-System Marginal Costs* (New York: Vera Institute of Justice, 2013).

¹⁰ Henrichson and Galgano, 4.

¹¹ Henrichson and Galgano, 5.

¹² Henrichson and Galgano, 6.

To this list of governmental expenses is added the notion of “opportunity costs.”

Opportunity costs are the costs associated with a foregone alternative: the value of what could best have been done with the resources if they had not been committed to that intervention or process.¹³ If you chose one alternative over another, then the cost of choosing that alternative is an opportunity cost. Opportunity costs are the benefits you lose by choosing one alternative over another one. Opportunity costs are associated with the total variable costs (including staff salaries) associated with performing a criminal justice function, for example, the cost of staff time associated with making an arrest in a domestic violence case. Police time that is invested in arrests for domestic violence cannot be spent on other police initiatives. In cost-benefit analysis measuring the time associated with resource use is important to measuring the value of the resource used. Later in this report an argument will be made that opportunity costs are more about time than money.

HOW TO CALCULATE MARGINAL COSTS

The Guide suggests two methods of calculating marginal costs – “the top-down” and “bottom-up approaches.”¹⁴ The top-down method requires the analyst to divide the change in total cost of a given activity by the change in total output. It’s called the “top-down” method because it uses *total* costs and then divides them by the change in output. To achieve valid marginal costs it is critical to include only variable costs – the costs related to the change in output. The “bottom-up method” involves identifying all of the costs related to a particular activity. Since most criminal and juvenile justice costs involve labor costs, the bottom-up method involves identifying all of the employees who are involved in an activity, identify what they do, determine how much time they spend doing it and then multiplying that time by their hourly rate. Both methods were used by Teams for this report though the predominant model involved the “bottom-up” approach.

DATA COLLECTION STRATEGIES

Law Enforcement Team

The Vermont Law Enforcement Cost/Benefit Project used a bottom-up approach and was comprised of three phases: data identification, data collection, and data analysis. A Law Enforcement Service Delivery Team determined which data to collect, the best approach to collecting the data, and how to organize it. The working group was comprised of Vermont law enforcement executives and staff that represented large, medium, and small sized police departments from across the state, sheriffs’ departments, and the Vermont State Police. Additionally, a technical consultant from Results First was part of the working group during various iterations of the project.

The first phase of the project involved data collection. The initial step was to determine how to classify the Vermont criminal statutes according to the Vermont Results First framework. The

¹³ Ann Netten, Identifying costs and costing complex intervention programs, in J. Roman, T. Dunworth, & K. Marsh, eds., *Cost-Benefit Analysis and Crime Control*. Washington, DC: The Urban Institute Press, 2010, 34.

¹⁴ Henrichson and Galgano, 8-10.

working group decided to use the criminal code tables in the Computer Aided Dispatch / Records Management System (CAD/RMS) used by Vermont's Department of Public Safety. These data were used as the starting point to align Vermont's codes to the Vermont Results First framework. All criminal codes entered into the CAD/RMS were identified and the working group reclassified them according to the Vermont Results First framework. For example, aggravated assault, domestic abuse, elderly mistreatment and child mistreatment were combined to form the Aggravated Assault and Domestic Violence category from the Result's First model. (See Table 1 below.)

The next step was to use the time data from CAD/RMS to determine the time a law enforcement officer spent on a case for each offense. The working group determined that three years of data would be the best time period from which to average offense arrest times and number of cases for each offense. In order to determine the average time for the Vermont Results First offenses, three-year averages were weighted to reflect the number of cases and time spent on each arrest. Table 1 below provides information for the number of cases and average time police spent on the scene for the Aggravated Assault and Domestic Violence crime type for the years 2010-2012.

Table 1
LAW ENFORCEMENT TIME STUDY: AGGRAVATED ASSAULT & DOMESTIC VIOLENCE

		2010		2011		2012		3 Year Average
VRF Category	Observed Offenses	# of cases	Average Time	# of cases	Average Time	# of cases	Average Time	
Aggravated Assault & DV	Aggravated Assault	4890	2:19:23	5287	2:32:48	6339	2:53:27	2:35:13
	Domestic Assault	526	2:25:17	583	3:07:10	685	3:30:21	3:00:56
	Elderly mistreatment	7	0:32:39	6	1:06:46	3	0:40:24	0:46:36
	Child mistreatment	131	1:48:28	190	3:41:09	203	3:00:35	2:50:04

The second step in data collection required the working group to identify for each offense the components of arrest that incurred expenses. Table 2 illustrates the arrest components for adult sexual offense as constructed by the cost/benefit working group.

Table 2
PERSONNEL INVOLVED WITH ADULT SEX CRIME ARREST

PERSONNEL
Dispatch
First Responding LEO(s)
Investigator
Supervisors
Forensic Interviewer
Admin/Case Prep Support
Crime Scene Processing LEO(s)
Sex Assault Nurse Examiner
Advocates
Enhanced Patrols
Media Handling/FOIA
Attorneys
Deposition, Hearings, Trial + prep
Public Order (Court Order Enforcement)

To complete the data collection phase, the working group created a standardized data collection form to ensure data compatibility across law enforcement agencies. The working group also decided to use Burlington Police Department salary rates for those who responded to adult sexual crimes because of the Department's experience with the Chittenden Unit for Special Investigations (CUSI). Vermont State Police's salary rates were used for all other offenses.¹⁵

Table 3 illustrates the data documentation process for Murder/Manslaughter crimes. Specific members within each law enforcement agency collected the data, and annotated the data source and the individual responsible for data collection.

Table 3
LAW ENFORCEMENT DATA DOCUMENTATION: MURDER/MANSLAUGHTER

	Murder/Manslaughter
Name of Analyst or Data Collector	JP Sinclair
Source of Data	Spillman/time sheets
Description of how time was calculated	Spillman/time sheets
Actual Data Used	Hourly rates are all based on the SFY 14 budget amounts
Description of how cost was calculated	payroll

¹⁵ Salary rates and data were collected from smaller and medium sized agencies and will be used in subsequent reports beyond the first phase of this project.

The analysis phase involved combining the average law enforcement time spent on each arrest with other expenses associated with each arrest to create opportunity costs. Marginal costs were restricted to overtime costs. Since certain offenses, specifically murder and arson, are outliers in both frequency and cost, the working group agreed that they should be examined independently and in further detail.

Adjudication Team

The Adjudication Team was comprised of representatives from courts, State's Attorneys and victim advocates, and the Office of the Defender General (ODG). Marginal Cost was defined as the cost of hours worked on particular types of cases that exceed the number of case-specific hours available during a normal work year. For this initial analysis, cost data does not include the cost of appeals, juvenile cases, post-conviction relief, and probation violations.

Courts

In 2009, the National Center for State Courts (NCSC) conducted a caseload study for the Vermont courts.¹⁶ In the Executive Summary the study authors indicate that *"The study provides an accurate picture of how judges and clerical staff are currently spending their time."*¹⁷ In particular the report calculates the minutes spent on cases which were subsequently used in this report to calculate the total annual number of hours worked and total marginal costs.

Though time analysis studies are an effective way to calculate the average amount of time spent per case, there can be methodological issues with this data collection strategy which affect the accuracy of estimates related to **total** annual hours. For the purposes of this report there are two principal concerns – the duration of the study and double counting.

Study Duration: The NCSC study on which the court analysis was based used a 30-day data collection period. Though this is the standard study duration for studies of this type, the 30-days of study may not have been representative of annual caseloads. Had the study period been an atypical period (more or less cases than usual) the total annual case-specific time may be too low or too high.

Double Counting: Judges and court clerical support staff were instructed to count all time associated with a case, even if it meant double counting their time. This was done in order to accurately identify opportunity costs associated with each crime in the study. However, this strategy artificially increases the total number of hours worked annually. For example, if a judge was waiting for the parties to a case to assemble in the courtroom for Case A and while waiting the judge reviewed motions for Case B, the waiting time would be counted for Case A and the time spent on the motions would be counted for Case B. Double counting is a common practice in time

¹⁶ Suzanne Tallarico and John Douglas, National Center for State Courts, *Vermont Weighted Caseload Study of Judicial Officers and Court Staff* (Denver, Colorado: National Center for State Courts, 2009).

¹⁷ Tallarico and Douglas, i.

studies. Though double counting does not affect the accuracy of time spent on types of cases, it can artificially increase the **total number of annual hours** worked when the number of hours worked per case is totaled for the year. For this preliminary study it was not possible to identify instances of double counting and as such the total number of hours worked annually by judges and court staff may be overestimated.

For this study the courts used a bottom-up method to estimate opportunity and marginal costs. Opportunity costs were determined by taking the number of case-specific hours spent by judges on the crimes included in this project as reported in the NCSC study, multiplied by the number of study crimes adjudicated in CY2010. This calculation provided both the total number of hours spent on study crimes and the amount of case-specific time spent on particular crimes in a year. Marginal costs were based on the cost of hours worked on particular types of cases beyond the 1,370 hours available annually to judges in Vermont for case-specific activities. According to the NCSC study, the *work-year value* for both Vermont judges and clerical support staff is 218 days per year¹⁸. The work-year value is the number of days per year which are available for criminal case processing after weekends, holidays, vacation, sick leave and training days are deleted. The case-specific hours per day was determined by subtracting the amount of time spent on non-case-specific work and court-related travel (103 minutes/day) from the 480 minutes per eight-hour day, yielding 377 case-specific minutes per day (82,186 minutes a year) or 1,370 hours of case-specific activities per judge per year.

Based on the volume of crimes included in the analysis and the time per case analysis included in the NCSC study, the 10.76 FTE Superior Court – Criminal Division judges statewide spent approximately 18,356 hours in CY2010 on case-specific activities related to adjudicating the crimes included in this study. However, based on the annual 1,370 case-specific work year, judges would be expected to work only 14,741 hours (1,370 hours X 10.76 judges). As such judges dedicate an additional 3,615 hours (18,356 hours worked minus 14,741 hours expected to work) to the adjudication process. The value of those additional hours is approximately \$260,280 (3,615 X \$72 per hour). As such, \$260,280 is considered marginal costs. Marginal costs were further calculated for each crime by figuring the percentage of surplus time and cost attributable to each type of crime

Similar analyses were conducted for clerical support staff such that opportunity costs were calculated to be \$1,740,554 (55,787 total hours X \$31.20 per hour) and marginal costs were \$348,941 (11,184 additional hours X \$31.20 per hour).

State's Attorneys, Assistant Attorneys General, and Victim Advocates

The State's Attorneys, Assistant Attorney Generals, and Victim Advocates did not have existing data to document the amount of time they spent on tasks related to the prosecution of crimes included in the study. As such, 33 State's Attorneys participated in a bottom-up style time study, tracking all time spent on study crimes for 25 days. The State's Attorneys and advocate time study was based on the research methods used in the National Center for State Courts (NCSC) study of the courts referenced above. The group used an online timekeeping system to keep track of their time by specific task. After a review of the time study information, the entries for 25 attorneys were

¹⁸ Tallarico and Douglas, 15.

designated as acceptable for analysis. In addition 20 victim advocates recorded time. After review, the time analyses from 18 advocates were deemed sufficiently accurate for analysis.

Though the State's Attorneys and advocate time study was based on the research methods used in the National Center for State Courts (NCSC) study of the courts, there were some deviations from the NCSC methods. These deviations may have caused overestimates of total opportunity costs and total marginal costs for prosecutors and advocates. Other estimates were unaffected. The estimate problems were likely related to the following combination of issues and highlight the difficulties in conducting this type of research.

- 1) **Study Duration:** The 25-day duration of the study may have been too short to accurately capture average case-specific time. A longer study or a study which collected data from randomly selected periods during the year may have resulted in different results.
- 2) **Training:** In light of the short timeline for the project, training time for State's Attorneys and advocates was limited. There was inadequate time for State's Attorneys and advocates to pre-test and practice with the data collection instructions and software.
- 3) **Minimum Unit of Time:** The minimum unit of time used to record time was 15 minutes. If a State's Attorney or advocate made a telephone call related to a case that lasted five minutes, the software would record the time as 15 minutes. If there were a high number of activities that lasted less than 15 minutes, total time estimates from the software would overestimate the actual time spent.
- 4) **Participation Levels:** Thirty-three of the 62 State's Attorneys statewide volunteered to participate in the time study. Data from 25 of the State's Attorneys were eventually used for the analysis; a participation level of 40%. If the data from those who volunteered were not representative of the entire group, the estimates may be different from the estimates derived from analyzing the time study results from a more complete or representative group.

These issues occur in varying degrees in all time studies including the NCSC study of the courts reported above. However there were two additional issues which were believed to have a substantial effect on time estimates for State's Attorneys and advocates -- double counting and pre-arraignment activities which do not end in the filing of a criminal case.

Double Counting: As was the case for the court study, State's Attorneys were instructed to count all time associated with a case, even if it meant double counting their time. This was done in order to accurately identify opportunity costs associated with each study crime. However, this strategy artificially increases the total number of hours worked annually. For example, if a State's Attorney was waiting in court for an arraignment on Case 1 and while waiting was reviewing new charges for Case 2, the waiting time in court would be counted for Case 1 and the time spent on the new charges would be counted for Case 2. Double counting is a common practice in time studies. It probably affected the estimates of judges to some degree but the effect on State's Attorney and advocate estimates is believed to be more substantial. Though double counting does not affect the

accuracy of time spent on types of cases, it does artificially increase the **total number of annual hours** worked. For this preliminary study it was not possible to identify instances of double counting and as such the total number of hours worked annually by State's Attorneys is overestimated. Resolving this methodological issue should be a focus for the next iteration of the model.

Pre-Arrest Activities: In addition to prosecuting cases, State's Attorneys are also responsible for a variety of activities which may or may not result in a criminal case being filed with the court. For example, State's Attorneys routinely advise law enforcement officers regarding criminal procedure. They review search warrants and facilitate law enforcement's applications to the court for those warrants. They are responsible for 48-hour rule compliance and unattended death compliance. They coordinate custody orders for juvenile emergencies. They screen cases for prosecution, diversion, and other alternative programming. The time spent on these activities was recorded and added into the time spent on a case. However, not all of these activities result in an actual criminal case being filed with the court. Cases that are not filed in court are not included in the total number of cases for a year. The calculations required to determine the average number of hours for a case uses a denominator of total number of cases filed, not the number of cases worked. Because the number of cases filed is less than the number of cases worked, the denominator is smaller, thus increasing the average hours per case and in turn increasing the total annual hours. Differentiating between time spent on activities that led to an actual charge and those that did not was not possible given the scope and time limits of this project

These methodological issues make it difficult to interpret the total annual opportunity and marginal costs developed for the State's Attorneys and advocates. Clearly the totals are not directly comparable to those of the court or the Office of the Defender General because different methodologies were used by the respective groups to calculate their time. Though the times associated with case-specific activities are reasonable preliminary estimates given the limits of the research methods, because of the double counting and pre-arrest activities the annual totals for all State's Attorney activities are overestimated. However, based on the experience with the data collected by the courts and the Office of Defender General, it is safe to assume that State's Attorneys and advocates contribute hours to the adjudication process above the normal case-specific work year of 1,526 hours and are comparable to the hours contributed by judges, court clerical staff and defenders.

Using a bottom-up approach, the prosecution time in hours spent per charge was calculated for each type of charge based on the average number of days it takes to dispose a case and data from the 25 days of tracking. Using the number of cases disposed of during CY 2010, the total annual time in hours spent on a particular type of charge was calculated by multiplying the prosecution time spent per case by the total number of cases. For example, on average prosecutors spend approximately 89 hours prosecuting a sex crime case. Since there were 252 sex crimes prosecuted statewide in CY 2010, prosecutors spent approximately 22,428 hours prosecuting sex crime cases during that year. Total opportunity costs of \$9,322,939 associated with the prosecution of all charges was calculated by multiplying the total number of prosecution hours for all crimes (247,687 hours) by the median hourly salary and benefits cost per State's Attorney (\$37.64 per hour).

Marginal costs were based on the cost of hours worked on particular types of cases that are above the normal case-specific work year of 1,526 hours (218 days multiplied by 7 hours of case-specific

activity). According to their time analysis study, State's Attorneys spent 247,687 hours prosecuting the study crimes in CY2010. However, based on the normal case-specific work year of 1,526 hours per prosecutor, the 62 State's Attorney and four Assistant Attorneys General who prosecute cases, there are only 100,716 hours of case-specific prosecution time available in a given year. As such prosecutors dedicate an additional 146,971 hours per year to case-specific activities (247,687 hours prosecuting minus the 100,716 hours in the case-specific work-year). The value of those additional hours is approximately \$5,531,988 (146,971 X \$37.64 per hour). As such the \$5,531,988 is considered marginal costs. Marginal costs were further calculated for each crime by figuring the percentage of surplus time and cost attributable to each type of crime.

Similar analysis was conducted for victim advocates such that opportunity costs were calculated to be \$1,924,536 (57,466 X \$33.49/hour) and marginal costs were \$1,212,446 (33,486 X \$33.49/hour).

Defender General

The Office of the Defender General (ODG) did not have existing data to document the amount of time staff spent on tasks. Rather than conducting a time study as did the courts and State's Attorneys, the ODG estimated time spent on cases by analyzing the following sources of time data: 1) invoices from assigned counsel; 2) invoices from ad hoc counsel; and 3) American Bar Association standards for defense caseloads. Though this is an innovative strategy and does provide alternative methods for measuring opportunity and marginal costs, since no time analysis was conducted based on the experience of defense attorneys who were employees of the ODG the strategy could result in estimation problems. Defenders who are employees of the ODG handle approximately 72% of ODG cases, assigned counsel handle approximately 26% of cases, and ad hoc counsel handle approximately 2%. Estimating case-specific time based on 28% of the ODG workforce could create estimation issues if the case-specific activities of defenders who are employees of the ODG differ in a substantial way from those of assigned and ad hoc counsel. Use of the ABA standards brings an element of standardization to the estimates but the use of national standards could result in estimation problems if the case-specific time of ODG employees is not comparable to the ABA standards.

Total hours spent on each type of charge was determined by multiplying the estimated number of hours per case times the total number of cases handled by the ODG during CY2010. Docketing information from the Court Administrator's Office was used to determine which criminal cases arraigned during CY2010 received legal representation services from the ODG (staff, ad hoc counsel, and contract attorneys). For example, it was estimated that ODG attorneys spend an average of 416 hours defending murder cases. Since there were eight murder cases defended in that year by ODG attorneys, the total number of hours spent defending those cases was 3,328 (416 hours/case multiplied by eight cases).

Marginal costs were based on the cost of hours worked on particular types of cases that are above the normal case-specific work year of 1,526 hours (218 days multiplied by seven hours of case-specific activity). In CY2010, attorneys from the ODG spent an estimated 87,688 hours defending the crimes discussed in the report. However, based on the normal case-specific work year of 1,526 hours per defender, the 48 FTE defenders (31.9 public defenders, 13.3 assigned counsel, and 2.8 ad hoc defenders) there are only 73,248 hours of case-specific prosecution time available in a

given year. As such defenders dedicate an additional 14,440 hours a year to case-specific defense services. The value of those additional hours is approximately \$577,901¹⁹ and is considered marginal costs. Marginal costs were further calculated for each crime by figuring the percentage of surplus time and cost attributable to each type of crime. For example, the marginal costs for defending an Aggravated Assault /Domestic Violence type charge is \$45.43 vs. \$508 for a sex crime charge.

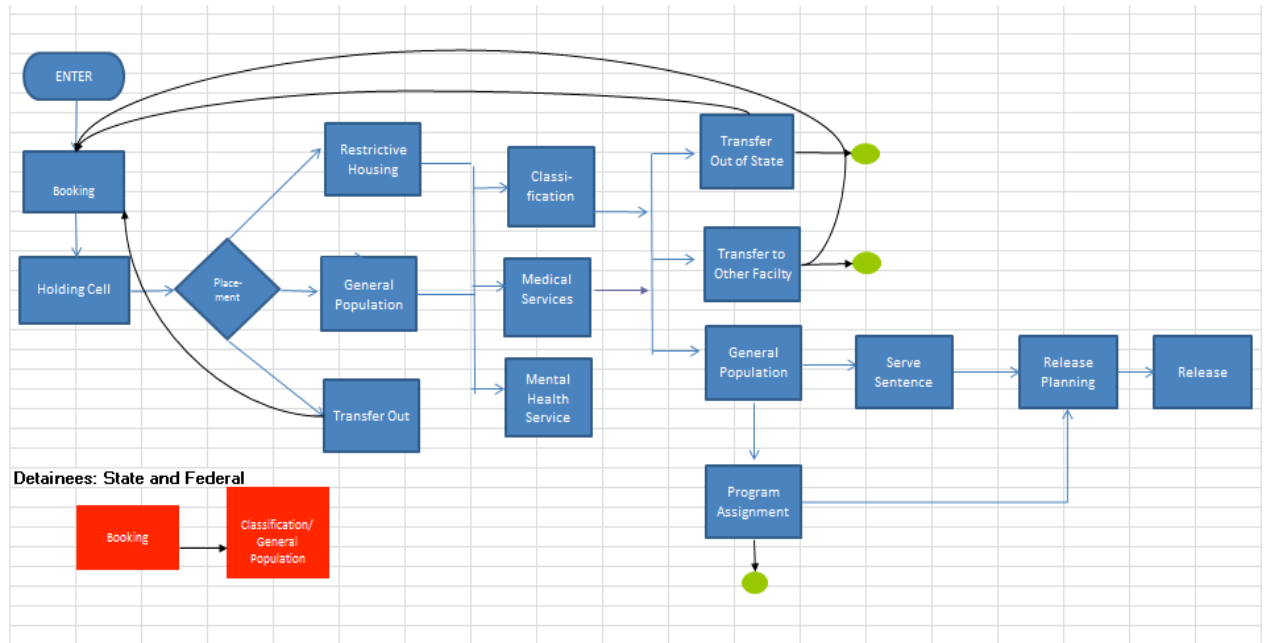
Department of Corrections

The Department of Corrections (DOC) did not have existing data to document the amount of time spent on various tasks. DOC, however, utilized an alternative approach to estimating work times to the “time study” approaches used by the Adjudication Service Delivery Team. Utilizing a bottom-up methodology, the DOC approach involved the use of subject matter experts to estimate the amount of time spent on activities. Whenever possible the staff members who performed the task were consulted about the details of the process and the time it took to complete the process. Staff members from both DOC facilities and community supervision programs were consulted.

DOC started the project by creating flow charts of the primary work processes of the Department. The following flow charts were created: *Facility Flow Chart*, *Field Supervision Flow Chart*, and *Out of State Flow Chart*. A sample flow chart appears in Figure 1 below.

¹⁹ Costs of extra hours were calculated by multiplying labor costs for each type of ODG defender by the number of hours each type of defender generated.

Figure 1
CORRECTIONAL FACILITY FLOW CHART



Subject matter experts from the Department were asked to participate in the flow chart development. Each chart was developed at separate meeting using the following strategy:

1. Each flow chart identifying the various Department processes was roughed out using flip charts;
2. Associated tasks were identified for each process on the chart;
3. The time it takes for each task was estimated by the subject matter experts;
4. The flow charts and tasks were subsequently drafted into electronic form and reviewed by the subject matter experts. If necessary, additional information was added to the flow charts to make them as complete and accurate as possible; and
5. Time estimates were then verified through discussions with the staff members responsible for tasks.

A second step in the process was to develop task lists for the Detention and Violation Processes. This was completed using DOC directives that outline each process. Time estimates were developed using the same process as above.

Once the tasks were developed, the DOC business office provided salary and information to the Team in order to prepare cost estimates. The cost estimates take the average hourly rate for the

staff members who complete the task and multiply that by the number of minutes it takes to complete the task. The final products were reviewed by all participants and the Commissioner. Table 4 shows a sample opportunity costs table.

Table 4
OPPORTUNITY COSTS ASSOCIATED WITH RISK MANAGEMENT SUPERVISION

TASK	TIME	COST
Furlough Renewals/Changes	15	\$8.52
Furlough Schedules	15	\$8.52
Office and Field Appointments	40	\$22.71
Collateral Contacts	60	\$34.06
Respond to Violations: Paperwork, Court, etc.	240	\$136.25
Parole Violation Reports, includes 2 hours of travel	240	\$136.25
Crisis Management	240	\$136.25
COSA Meetings	90	\$51.09
Urine Analysis	30	\$17.03
Parole Summaries	45	\$25.55
Request for Discharges	30	\$17.03
Attend Treatment Team Meetings, Per week	60	\$34.06
Co-Facilitate Program Meetings (CSSII) (IDAP)	420	\$238.43
Transitional Housing Contacts	30	\$17.03
Tracking GPS	15	\$8.52
Schedule Work Crew	10	\$5.68
ICOTS Violations	60	
Total Time Effort for Risk Management Supervision	27 Hours	\$896.97

Juvenile Justice

The Department for Children and Families, Family Services Division (DCF-FSD) did not have existing data to document the amount of time they spent on various tasks. The Juvenile Justice Service Delivery Team subsequently adopted a method for estimating the amount of time spent on activities similar to the approach used by DOC which was to use subject matter experts to estimate the amount of time spent on activities.

The team developed marginal cost estimates associated with adding one delinquent youth to the DCF-FSD caseload. Estimates were developed from the DCF-FSD budget, other financial documents, and time estimates from subject matter experts with DCF-FSD.

Nearly all youth are screened and provided additional support by a Balanced and Restorative Justice (BARJ) contracted service provider while the youth works toward completing probation requirements. The team obtained marginal cost estimates associated with these case intake/management services from documents prepared for DCF's budget, and time estimates from

Cheryle Bilodeau, DCF Policy and Operations Manager & Juvenile Justice Director, who consulted with supervisors throughout the state.

Marginal cost estimates for Woodside Juvenile Rehabilitation Center were developed from Woodside's and DCF-FSD's budgets, as well as transportation reports prepared by Margo Bryce, Quality Assurance Administrator. Woodside's Director, Jay Simons, assisted in the development of these estimates, as did Juvenile Justice Administrator, Lindy Boudreau.

Marginal cost estimates for residential placements other than Woodside were developed from contracts with these facilities provided by DCF-FSD's Revenue Enhancement Unit.

Table 5 is an example of how the Juvenile Justice Service Delivery Team estimated marginal costs for Woodside. Notice that only variable costs (not fixed costs) are included in the model.

Table 5
MARGINAL COSTS FOR WOODSIDE JUVENILE REHABILITATION CENTER

Woodside Detention & Treatment Services	Unit	Who	Unit Cost	Total Cost
Secure Transport	1 transport to Woodside	Sheriff	65/hr + mileage	\$462
Transports by Woodside staff	2hrs 40m	Woodside Staff	34.75/hour X 2 people	\$185
Medical (contracted)	0.5 hrs	Fletcher Allen	110/hr	\$55
Psychiatric services	1 hr	Fletcher Allen	140/hr	\$140
Discharge summary	1 hr	Howard Center	26.83/hr	\$27
Food	Year		2,572	\$2,572
Laundry	Year		480	\$480
Support of persons	Year		1,079	\$1,079
Plus BARJ Intake/Case Management Cost				\$900
Estimate of Marginal Cost for Detention & Treatment Services (per youth per year)				\$5,700

Victims

Cost-benefit analysis for criminal justice policies includes the perspective of society in order to demonstrate the impact on public safety. The value of social benefits achieved by a program or policy's recidivism reduction effect is measured by avoided victimizations. Calculating marginal and opportunity costs for victims is quite different from calculating these costs for more traditional criminal justice agencies. The principle difference is that the majority of costs in this sector involve compensation or restitution to victims rather than those associated with the provision of government services. As such, marginal costs for services to victims are discussed in terms of taxpayer costs, tangible victim costs, and intangible victim costs. Taxpayer costs are associated with the administrative costs required to provide compensation awards, the compensation awards made to victims from dedicated funds, and costs to provide restitution services to victims. Tangible costs are defined as direct out-of-pocket expenses which the victim incurs as a result of being victimized. Examples of tangible costs include medical expenses, property loss, or property damage. Victim intangible costs include pain and suffering as a result of a violent victimization.

In terms of taxpayer costs, the Victims Service Delivery team developed opportunity costs for providing services to victims through the Compensation Program and Restitution Unit using a top-down model. All other teams used a bottom-up approach. Interviews with program staff determined that the time associated with processing compensation and restitution cases did not vary by the type of crime. Variation in processing time is related more to the nature of the victim's loss than the crime. Though some claims were more complicated to process because of the need for extra documentation of loss, the complexity of the case was not necessarily determined by the nature of the crime. For example, in terms of processing time, some property crimes may require considerable loss documentation while others might be straightforward. The documentation of tangible loss as a result of an assault might be considerably less than for a major burglary. As such it was determined that a top-down approach would provide a valid measure of taxpayer cost.

The principal strategy for determining taxpayer costs for each program was examining the FY2012 and FY2013 annual budgets for both the Restitution Unit and the Compensation Program. Care was taken to exclude all fixed costs from the analysis. An average cost of services was determined by taking the total budget (excluding fixed costs) for each program and dividing it by the total number of claims processed by the respective units. The average taxpayer cost for processing a restitution claim was \$316. The average taxpayer cost for processing a compensation claim was \$648. In this context the taxpayer costs are opportunity costs and not marginal costs.

Since compensation claims made to victims of violent crimes are made from a compensation fund which is supported by a surcharge on court fines and traffic tickets, compensation awards are technically made from taxpayer funds. That is, if the fund was not used to support victim compensation claims it could be redirected to other purposes. As such the Team determined that it was necessary to determine the taxpayer costs associated with these awards. Average compensation claims were calculated by dividing the total compensation awarded to victims of each type of crime divided by the total claims filed for FY2012. For example, a total of \$248,358 was awarded to the 214 victims of sex of assault and domestic violence who filed a compensation claim resulting in an average award of \$1,328. The taxpayer costs associated with compensation awards are marginal costs in that for each reduction in victimization the compensation fund accrues the benefit of a claim neither filed nor paid.

The Restitution Program provides payments to victims from the Restitution Fund. The Restitution Fund receives its revenue through surcharges on criminal and civil fines. Since the Restitution Program collects restitution from offenders in order to reimburse the Fund it was determined that payments to victims were not a taxpayer expense and therefore no taxpayer costs for restitution payments were calculated.

Tangible (out-of-pocket) costs and intangible (pain and suffering) costs for victims are very difficult to determine. Given that neither compensation awards nor restitution payments represent the true tangible or intangible loss to the victim due to payment caps, unallowable expenses, insurance deductions, etc., it was not possible to obtain valid cost data from Vermont victim claims. As such the Team relied on a standard method for estimating tangible and intangible costs developed by McCollister et al.²⁰ The McCollister method was recommended by the technical consultant from Pew Charitable Trusts. Table 6 presents tangible and intangible victim costs using this model.

TABLE 6
TANGIBLE AND INTANGIBLE VICTIM COSTS

	Murder	Felony Sex Crimes	Robbery	Agg. Assault	Felony Property
Tangible	\$737,517	\$5,556	\$3,299	\$ 8,700	\$1,922
Intangible	\$8,442,000	\$ 198,212	\$4,976	\$13,435	0

COST ANALYSIS RESULTS: MARGINAL COSTS

Based on the data collection and analysis described in the previous sections, the Service Delivery Teams have developed the following marginal cost analysis tables. Table 7 displays **marginal** costs associated with arrest, adjudication, and victim services. Table 8 displays **marginal** costs associated with correctional services. In both tables, monetary figures which appear in bold are actual benefits that could be accrued for each crime that is prevented. Figures that do not appear in bold represent opportunity costs to the agency.

²⁰ McCollister, French & Fang, "The Cost of Crime To Society," *Drug and Alcohol Dependence* 108 (2010): 98-109.

Table 7
MARGINAL COSTS ASSOCIATED WITH ARREST, ADJUDICATION, AND VICTIM SERVICES*

	MURDER	SEX CRIMES	AGGRAVATED ASSAULT & DOMESTIC VIOLENCE	PROPERTY CRIMES	DRUG CRIME	DUI	PUBIC ORDER & MOTOR VEHICLE
Police	\$19,188	\$1,060	0	0	0	0	0
Court	\$471	\$471	\$170	\$137	\$122	\$164	\$102
Prosecutors	NA	\$1,983	\$575	\$397	\$419	\$208	\$221
SA Advocates	NA	\$2,290	\$690	\$548	\$531	\$243	\$250
Defenders	\$2,437	\$509	\$45	\$36	\$26	\$11	\$23
Victim Services Processing Costs	0	0	0	0	0	0	0
Victim Compensation Payments / case	\$1,579	\$857	\$1,328	NA	NA	\$4,693	NA
Victim Tangible	\$737,517	\$5,556	\$8,700	\$1,922	NA	NA	NA
Victim Intangible	\$8,442,000	\$198,212	\$13,435	0	0	NA	NA

*Figures that appear in **BOLD** are actual financial benefits which could be accrued for each crime that is prevented. Figures that do not appear bold represent opportunity costs to the agency.

Table 7 above provides the marginal costs for the Vermont Results First crime categories: Murder, Sex Crimes, Aggravated Assault and Domestic Violence, Property Crimes, Drug Crime, DUI, and Public Order and Major Motor Vehicle offenses. The marginal costs for each crime are presented by criminal justice agency and function. Marginal cost figures that appear in bold are actual benefits which could be realized for each crime that is prevented. Marginal cost figures that are not bolded are benefits which are benefits which would accrue internally to the agency only. That is, given that the provision of adjudication processes are so heavily dependent on uncompensated labor of participants, the reduction in a small number of crimes would only allow those agencies to refocus or redirect activity that was related to the prosecution of cases.

Police

Marginal costs associated with arrests for Murder (\$19,188) and Sex Crimes (\$1,060) are actual benefits because those costs are associated with police overtime involved with the criminal investigations of those crimes. Reductions of arrests for the other Vermont Results First crimes would not generate marginal cost benefits because overtime is not authorized for these types of crime. Essentially, marginal costs associated with arrest are restricted to overtime hours.

Courts

Only minimal marginal cost benefits are associated with small reductions in the number of cases adjudicated. This is because the Court's budget for judges and clerical staff relies heavily on the additional time that judges and clerical staff contribute over and above the time associated with a normal case-specific work year. A reduction in a small number of cases would only reduce the amount of extra time contributed by judges and clerical staff. No real budget savings can be achieved until case reductions are such that Court services can be provided within the limits of a normal case-specific work year for judges and clerical staff. Subsequent to that point, budget savings could be achieved if reductions in the number of cases were sufficient to reduce the number of hours necessary to provide Court services. In the interim, prior to a normal case-specific work year being established, small reductions in the number of cases might allow the Court to refocus or redirect activity that was related to the adjudication of cases.

Prosecution & Victim Advocates

Only minimal marginal cost benefits are associated with small reductions in the number of cases adjudicated. This is because the Department of State's Attorney's budget relies heavily on the additional time that State's Attorneys contribute over and above the time associated with a normal case-specific work year. A reduction in a small number of cases would only reduce the amount of extra time contributed by State's Attorneys. No real budget savings can be achieved until case reductions are such that prosecution services can be provided within the limits of a normal case-specific work year for prosecutors. Subsequent to that point, budget savings could be achieved if reductions in the number of cases were sufficient to reduce the number or hours necessary to prosecute cases. In the interim, prior to a normal case-specific work year being established, small reductions in the number of cases might allow State's Attorneys to refocus or redirect activity that was previously related to case prosecutions.

Defenders

Only minimal marginal cost benefits are associated with small reductions in the number of cases adjudicated. This is because the Defender General's budget for defense services relies heavily on the additional time that defenders contribute over and above the time associated with a normal case-specific work year. A reduction in a small number of cases would only reduce the amount of extra time contributed by defenders. No real budget savings can be achieved until case reductions are such that defense services can be provided within the limits of a normal case-specific work year. Subsequent to that point, budget savings could be achieved if reductions in the number of cases were sufficient to reduce the number or hours necessary to provide defense services. In the interim, prior to a normal case-specific work year being established, small reductions in the number of cases might allow the Defender General to refocus or redirect activity that was related to the defense of cases.

Victim Services

No marginal cost benefits are associated with small reductions in the number of claims processed by the Compensation Board or the Restitution Unit. The lack of marginal benefits for victim services is because the principal cost of providing these services is staff labor. Since overtime is not authorized for these programs the only benefit that would accrue is when staff positions are eliminated due to major declines in criminal offenses. These step-fixed costs were not identified in this preliminary model.

There are, however, considerable marginal cost benefits which would accrue with even small reductions in crime. These benefits would accrue to either taxpayers, due to reductions in claims against the Compensation Fund, or directly to victims who would experience neither the tangible nor intangible loss as a result of a crime being prevented.

Correctional Services

Table 8 below presents the marginal costs for Correctional Services for both adult and juvenile offenders. The table does not present costs by Vermont Results First crime categories because generally the cost of incarceration, supervision, or residential placement does not vary with the type of offense for which the subject was convicted. Additional costs for these services are more likely based on risk and/or programming decisions than on the offense. As such, in this iteration of the cost model, the marginal costs are presented for all offenders without differentiation. Marginal costs figures that appear in bold are actual benefits which could be realized for each crime that is prevented.

Table 8
MARGINAL COSTS ASSOCIATED WITH CORRECTIONAL & JUVENILE JUSTICE SERVICES*

ACTIVITY	COSTS
Corrections: Community Supervision	0
Corrections: Correctional Center	0
Corrections: Out-of-State	\$71/day 25,915/year
Juvenile Justice: Intake/Case Management	\$2.50/day \$900/year
Juvenile Justice: Woodside Juvenile Rehabilitation Center	\$15.61 /day \$5700/year
Juvenile Justice: Residential Placement	\$115.78 /day \$42,263/year

*Figures that appear in **BOLD** are actual benefits which could be accrued for each crime that is prevented.

No marginal costs are associated with the provision of adult community supervision or administration of correction centers because the main costs for providing these services are for staff labor. Since overtime is not authorized for these programs (or is not based on the number of offenders that need to be supervised), the only benefit which would accrue is when staff positions could be eliminated due to reduced caseloads or closing a wing of a correctional center or the entire facility. These step-fixed costs were not identified in this preliminary model. DOC has identified some marginal costs associated with contracting for out-of-state secure prison beds. Any

reduction in the number of offenders sent out-of-state accrues a benefit based on a reduction in per diem charges for out-of-state lodging.

The Juvenile Justice Service Delivery Team did identify marginal costs associated with treatment services that are primarily provided by contractors. If there is a reduction in the number of juveniles who require case management services provided by contractors, or juveniles who need services from The Woodside Juvenile Rehabilitation Center (less medical exams, psychological services, personal care items, etc.) or children who require residential placement services provided by contract service providers, the Department for Children and Families accrues a benefit based on the reduction in needed services.

COST ANALYSIS RESULTS: OPPORTUNITY COSTS

In addition to marginal costs, the teams were asked to develop opportunity costs for a sample of their activities. Opportunity costs are being defined here as variable costs associated with the cost of providing a criminal justice service. In this context opportunity costs are more about time than money. For example, if a law enforcement agency can prevent a sex crime, they would have avoided approximately 160 hours of personnel time which amounts to approximately \$13,524. However, since those costs are primarily associated with personnel, the department would not save that \$13,524 because the reduction of one crime is not sufficient to reduce the overall staffing pattern of the department. However, it is reasonable to suggest that if the 160 hours it takes to investigate a sex crime was not expended due to the prevention of that crime, those hours could be redirected within the department. Perhaps those hours could be devoted to community outreach, crime analysis, training, or developing standards for accreditation. If several high investment crimes can be prevented through crime prevention strategies, effective treatment services, or community problem-solving, a considerable amount of time could be redirected in the department.

Information related to opportunity costs and associated time investments are important tools for criminal justice agencies for planning, organizational, and program development purposes. Realizing how much it costs in time and money to conduct a particular activity might well prompt a series of questions that could guide future management or legislative decisions. For example, using an example from the Department of Corrections, knowing that it takes 15-20 hours of staff time to conduct a pre-sentence investigation (PSI) might suggest the following questions: 1) Are there alternative pre-sentencing tools which might be as effective as a PSI but could be done more quickly?; 2) Are we using the PSI in the right circumstances?; and 3) Could the PSI format be revised to decrease the time commitment?

Table 9 through Table 17 below identify both the time in hours and opportunity costs which could be redirected within criminal and juvenile justice agencies each time a crime is prevented.

LAW ENFORCEMENT SERVICE DELIVERY TEAM

Table 9
OPPORTUNITY COSTS FOR VERMONT RESULTS FIRST CRIME TYPES

Crime	Time in Hours	Opportunity Cost
Murder/Manslaughter	1,063	\$38,246.00
Sex Offense – Adult Victim	258	\$13,524
Aggravated Assault/Aggravated Domestic	6	\$184
Felony Arson	68	\$7,402
Felony Burglary	5.75	\$204
Felony Larceny	3.25	\$98
Felony Auto	5.25	\$77
Drugs		\$130
Drugs with Drug Task Force or Investigative Support	185.5	\$8,139
DUI (No Accident or Injury)	2.5	\$75
DUI -- Drug Recognition Expert Only	2	\$407
Public Order – Disorderly conduct, unlawful mischief, simple assault	2	\$58
Major Motor vehicle –LSA, CNN, OOC, Excessive Speed	2	\$59

ADJUDICATION SERVICE DELIVERY TEAM**Courts**

TABLE 10
COURT TIME & OPPORTUNITY COSTS BY CRIME

CRIME	JUDGE TIME IN HOURS	COURT CLERICAL TIME IN HOURS	OPPORTUNITY COSTS
Sex Crime, Felony	7	11	\$847
Assaults, Felony	2.28	6.11	\$355
Assaults, Misdemeanor	0.81	3.08	\$154
Property Crime, Felony	2.93	5.33	\$378
Property Crime, Misdemeanor	0.57	2.37	\$115
Drug Crime, Felony	2.93	5.33	\$378
Drug Crime, Misdemeanor	0.57	2.37	\$115
DUI, Felony	1.28	3.40	\$198
DUI, Misdemeanor	0.65	2.72	\$132
Public Order, Felony	2.93	5.33	\$378
Public Order, Misdemeanor	0.57	2.37	\$115

State's Attorneys

TABLE 11
STATE'S ATTORNEYS TIME & OPPORTUNITY COSTS BY CRIME

CRIME	STATE ATTORNEY'S TIME IN HOURS	ADVOCATE TIME IN HOURS	OPPORTUNITY COSTS
Sex Crime, Felony	89.00	16.00	\$3,886
Assaults, Felony	41.65	9.46	\$1885
Assaults, Misdemeanor	20.46	4.84	\$932
Property Crime, Felony	23.03	10.55	\$1220
Property Crime, Misdemeanor	15.75	6.47	\$803
Drug Crime, Felony	35.03	7.40	\$1566
Drug Crime, Misdemeanor	14.40	5.27	\$719
DUI, Felony	23.32	6.74	\$1101
DUI, Misdemeanor	8.50	1.51	\$371
Public Order, Felony	20.46	8.08	\$1040
Public Order, Misdemeanor	8.31	3.09	\$443

Defender General

TABLE 12
DEFENDER GENERAL TIME & OPPORTUNITY COSTS BY CRIME*

CRIME	DEFENDERS TIME IN HOURS	OPPORTUNITY COSTS
Sex Crime, Felony	104	\$3,309
Assaults, Felony	52.00	\$1,711
Assaults, Misdemeanor	5.20	\$171
Property Crime, Felony	13.90	\$372
Property Crime, Misdemeanor	5.20	\$139
Drug Crime, Felony	18.50	\$321
Drug Crime, Misdemeanor	5.20	\$90
DUI, Felony	13.9	\$282
DUI, Misdemeanor	5.2	\$102
Public Order and Major Motor Vehicle, Felony	13.9	\$355
Public Order and Major Motor Vehicle, Misdemeanor	5.2	\$133

* Attorneys from the Office of the Defender General (ODG) are not required to defend all study crimes that are arrested or arraigned. Therefore, opportunity costs were calculated based on the average percentage of crime types that the ODG defends. The percentage of cases represented by the ODG is the number of cases defended by the ODG divided by the total number of cases disposed in CY2010. Percentages were only calculated for the following crime type and included both felonies and misdemeanors: sex crimes (74%), assaults (77%), property crime (62%), drug crime (40%), DUI (47%), Public Order and Major Motor Vehicle (59%).

DEPARTMENT OF CORRECTIONS SERVICE DELIVERY TEAM

TABLE 13
DEPARTMENT OF CORRECTIONS TIME AND OPPORTUNITY COSTS FOR SELECT TASKS

ACTIVITY	TIME IN HOURS	OPPORTUNITY COST
Response Management Supervision	22	\$819
Risk Management Supervision	27	\$939
Pre-Sentence Investigation	15 – 20	\$579
Intermediate Sanction Report	5	\$170
Home Detention Check	1- 2	\$63
Correctional Center Booking	1.33	\$65
Prisoner Classification	5.5 – 7.5	\$186
Level 1 Sanction Process	2.33	\$223

JUVENILE JUSTICE SERVICE DELIVERY TEAM

TABLE 14
DEPARTMENT FOR CHILDREN AND FAMILIES TIME AND OPPORTUNITY COSTS FOR SELECT TASKS

INTAKE & CASE MANAGEMENT SERVICES @ DISTRICT LEVEL	HOURS /YEAR PER CHILD	COST
Personnel Costs		
Case Assignment	0.25	\$11
Case Supervision	25	\$903
BARJ Pre-Screen	12	\$180
Court Time (Includes travel, wait, and courtroom time)	60	\$2,168
SSMIS Data Entry	12	\$347
YASI Full Screen	16	\$578
BARJ Supervision	48	\$720
FSDNet data entry of case notes/Background Checks	36	\$1,370

TABLE 15
WOODSIDE JUVENILE REHABILITATION SERVICES: ANNUAL AND COSTS PER CHILD

WOODSIDE JUVENILE REHABILITATION CENTER	TOTAL ANNUAL COST	COSTS PER CHILD/ YEAR
Personnel Costs		
Supervision Staff	790,127	-
Cook	115,505	-
Admin	65,598	-
Woodside Director	45,687	-
Case Management	1,267,748	-
Education	491,119	-
Medical (in-house)	164,178	-
Total	2,939,962	-
Contractual & Operational Costs		
Physicals	-	\$55
Psychiatric Services	-	\$140
Food	-	\$2,572
Laundry	-	\$480
Support of persons	-	\$1,079

TABLE 16
DEPARTMENT FOR CHILDREN AND FAMILIES TIME AND OPPORTUNITY COSTS
FOR TRANSPORTATION

TRANSPORTATION TYPE	UNIT	COSTS
Secure Transport	Per transport to Woodside	\$262
Non-secure transport by Woodside staff	Per transport to Woodside	\$185
Non-secure transport by Sheriff Department	Per transport	\$483
Non-secure transport by Family Services Division staff	60 hours/year	\$2,168
Travel associated with visits to youth in placement	72 hours/year	\$2,168

TABLE 17
DEPARTMENT FOR CHILDREN AND FAMILIES OPPORTUNITY COSTS
FOR RESIDENTIAL PLACEMENT

Residential Placements	ANNUAL COST
T-House	126,881
Becket	68,018
Becket @ Bennington	134,546
Depot	133,094
Park Street	175,466
NFI Group Home	139,769
Out of State Programs	96,094

VERMONT CRIMINAL JUSTICE THROUGHPUT MODEL

A *Throughput Model* is a type of flow chart which displays the amount of material or items passing through a system or process. For this report we are using the term Throughput Model to mean a graphic which illustrates the flow of criminal cases through the Vermont criminal justice system together with the associated opportunity costs. Throughput Models of the Vermont criminal justice system can be valuable tools for examining expenditures made by individual criminal/juvenile justice agencies to process crime and to identify the overall taxpayer and victim

costs of particular types of crime. The Throughput Model can be used as an important tool to more accurately predict the cost of policy changes in criminal/juvenile justice.

Throughput Models can answer questions such as, “How much do sex crimes cost Vermont taxpayers on an annual basis in terms of criminal justice and victim costs?” To answer that question it is important to understand the cost of arresting, adjudicating, and correcting each sex crime defendant. Victim compensation costs must also be included in the costs of sex crimes as victims are frequently both injured and emotionally harmed which can result in medical and psychological treatment expenses as well as lost wages and other expenses. In this report we have constructed throughput models for each of the crimes in the study in order to demonstrate the costs associated with each criminal justice process and a total cost associated with the crime. The throughput models are based on the opportunity cost data developed by the Service Delivery Teams.

SEX CRIME THROUGHPUT MODEL: 2010
Total Annual Opportunity Costs: \$6,108,824

LAW ENFORCEMENT²¹

ARRESTS 92 COSTS: \$1,244,208
--

ADJUDICATION²²

CASES ARRAIGNED 203 Cases COSTS: \$1,632,583

CONVICTIONS 128 Cases

CORRECTIONS²³

FINE 2 Persons

DEFERRED SENTENCE 29 Persons COSTS: \$7,028
--

PROBATION 39 Persons COSTS: \$5,866
--

INTERMEDIATE SANCTION 2 COSTS: NA
--

SPLIT SENTENCE 22 Persons COSTS: \$1,073,116

INCARCERATED 33 Persons COSTS: 2,146,023

VICTIM COMPENSATION²⁴

\$202,725

²¹ Based on data from the Vermont Criminal Information Center – Vermont Crime On-line. Arrest costs calculated at \$13,524 per arrest. Total arrests are underreported.

²² Costs based on average sex crime processing time multiplied by median hourly salary/benefits for judges, court clerical staff, state's attorneys, victim advocates, and public defenders.

²³ Deferred Sentence: Average probation supervision time was 502 days at \$14 /day; Probation: Average probation sentence 419 days calculated @ \$14/day; Split Sentence: Average incarceration of 286 days calculated at in-state cost of \$159/day plus average probation of 236 days at \$14/day; Incarceration: Average incarceration of 409 days calculated at the in-state rate of \$159/day.

²⁴ Victim Compensation based on FY12 data -- \$113,229 paid on 132 claims plus \$648 processing/case.

ASSAULT THROUGHPUT MODEL: 2010

Total Annual Opportunity Costs: **\$26,220,219**

LAW ENFORCEMENT²⁵

ARRESTS
2,131
COSTS: \$392,104

ADJUDICATION²⁶

CASES ARRAIGNED
2,629 Cases
COSTS: \$4,949,255

CONVICTIONS
1,417 Cases

CORRECTIONS²⁷

FINE
164 Persons

DEFERRED SENTENCE
254 Persons
COSTS: \$914,400

PROBATION
409 Persons
COSTS: \$1,453,995

INTERMEDIATE SANCTION
50
COSTS: NA

SPLIT SENTENCE
149 Persons
COSTS: \$2,717,313

INCARCERATED
388 Persons
COSTS: \$15,793,152

VICTIM COMPENSATION²⁸

\$423,032

²⁵ Based on data from the Vermont Criminal Information Center – Vermont Crime On-line. Arrest costs calculated at \$184 per arrest. Total arrests are underreported.

²⁶ Costs based on average assault crime processing time multiplied by median hourly salary/benefits for judges, court clerical staff, state's attorneys, victim advocates, and public defenders.

²⁷ Deferred Sentence: Average probation supervision time was 400 days at \$9 /day; Probation: Average probation sentence 395 days calculated at \$9/day; Split Sentence: Average incarceration of 98 days calculated at in-state cost of \$159/day plus average probation of 295 days at \$9/day; Incarceration: Average incarceration of 256 days calculated at the in-state rate of \$159/day.

²⁸ Victim Compensation based on FY12 data -- \$284,360 paid on 214 claims plus \$648 processing/case.

PROPERTY CRIME THROUGHPUT MODEL: 2010

Total Annual Opportunity Costs: **\$31,062,705**

LAW ENFORCEMENT²⁹

ARRESTS 2,885 COSTS: \$1,093,419

ADJUDICATION³⁰

CASES ARRAIGNED 3,534 Cases COSTS: \$4,690,878

CONVICTIONS 1833 Cases

CORRECTIONS³¹

FINE 311 Persons

DEFERRED SENTENCE 223 Persons COSTS: \$873,045

PROBATION 345 Persons COSTS: \$1,136,430

INTERMEDIATE SANCTION 75 COSTS: NA

SPLIT SENTENCE 147 Persons COSTS: \$2,005,227
--

INCARCERATED 719 Persons COSTS: \$21,263,706

VICTIM COMPENSATION

No Taxpayer Costs

²⁹ Based on data from the Vermont Criminal Information Center – Vermont Crime On-line. Arrest costs calculated at \$379 per arrest. Total arrests are underreported.

³⁰ Costs based on average property crime processing time multiplied by median hourly salary/benefits for judges, court clerical staff, state's attorneys, victim advocates, and public defenders.

³¹ Deferred Sentence: Average probation supervision time was 435 days at \$9/day; Probation: Average probation sentence 366 days calculated at \$9/day; Split Sentence: Average incarceration of 73 days calculated at in-state cost of \$159/day plus average probation of 226 days at \$9 day; Incarceration: Average incarceration of 186 days calculated at the in-state rate of \$159/day.

DRUG CRIME THROUGHPUT MODEL: 2010
Total Annual Opportunity Costs: \$10,586,916

LAW ENFORCEMENT³²

ARRESTS 1,554 COSTS: \$202,020

ADJUDICATION³³

CASES ARRAIGNED 1,661 Cases COSTS: \$2,022,051

CONVICTIONS 838 Cases

CORRECTIONS³⁴

FINE 298 Persons

DEFERRED SENTENCE 93 Persons COSTS: \$297,972
--

PROBATION 147 Persons COSTS: \$513,324

INTERMEDIATE SANCTION 21 COSTS: NA

SPLIT SENTENCE 63 Persons COSTS: \$744,282

INCARCERATED 213 Persons COSTS: \$6,807,267
--

VICTIM COMPENSATION

No Taxpayer Costs

³² Based on data from the Vermont Criminal Information Center – Vermont Crime On-line. Arrest costs calculated at \$130 per arrest. Total arrests are underreported.

³³ Costs based on average drug crime processing time multiplied by median hourly salary/benefits for judges, court clerical staff, state's attorneys, victim advocates, and public defenders.

³⁴ Deferred Sentence: Average probation supervision time was 356 days at \$9 /day; Probation: Average probation sentence 388 days calculated @ \$9/day; Split Sentence: Average incarceration of 58 days calculated at in-state cost of \$159/day plus average probation of 288 days at \$9/day; Incarceration: Average incarceration of 201 days calculated at the in-state rate of \$159/day.

DUI THROUGHPUT MODEL: 2010

Total Annual Opportunity Costs: **\$10,505,730**

LAW ENFORCEMENT³⁵

ARRESTS 2,654 COSTS: \$199,050

ADJUDICATION³⁶

CASES ARRAIGNED 3,006 Cases COSTS: \$5,227,727

CONVICTIONS 2,535

CORRECTIONS³⁷

FINE 1,352 Persons

DEFERRED SENTENCE 19 Persons COSTS: \$8,636
--

PROBATION 644 Persons COSTS: \$369,012

INTERMEDIATE SANCTION 42 COSTS: NA

SPLIT SENTENCE 255 Persons COSTS: \$699,593
--

INCARCERATED 208 Persons COSTS: \$4,001,712
--

VICTIM COMPENSATION³⁸

\$16,024

³⁵ Based on data from the Vermont Criminal Information Center – Vermont Crime On-line. Arrest costs calculated at \$75 per arrest; does not include higher costs for Drug Recognition Expert. Total arrests are underreported.

³⁶ Includes cases which were not originally arrested as DUI. Costs based on average DUI hours multiplied by median hourly salary/benefits for judges, clerks, State's Attorneys, Victim Advocates, and Defenders.

³⁷ Deferred Sentence: Average probation supervision time was 303 days at \$1.50 /day; Probation: Average probation sentence 365 days calculated at \$1.50/day; Split Sentence: Average incarceration of 13 days calculated at in-state cost of \$159/day plus average probation of 451 days at \$1.50/day ; Incarceration: Average incarceration of 121 days calculated at the in-state rate of \$159/day.

³⁸ Victim Compensation based on FY12 data -- \$14,080 paid on three claims plus \$648 processing/case.

PUBLIC ORDER & MAJOR MOTOR VEHICLE CRIMES THROUGHPUT MODEL: 2010

Total Annual Opportunity Costs: \$37,081,809

LAW ENFORCEMENT³⁹

ARRESTS 3,450 COSTS: \$200,100

ADJUDICATION⁴⁰

CASES ARRAIGNED 5,695 Cases COSTS: \$4,049,154

CONVICTIONS 3,356 Cases

CORRECTIONS⁴¹

FINE 1,210 Persons

DEFERRED SENTENCE 208 Persons COSTS: \$111,696

PROBATION 426 Persons COSTS: \$229,401

INTERMEDIATE SANCTION 93 COSTS: NA

SPLIT SENTENCE 150 Persons COSTS: \$769,050
--

INCARCERATED 1224 Persons COSTS: \$31,722,408
--

VICTIM COMPENSATION

No Taxpayer Costs

³⁹ Arrest costs calculated at \$58 per arrest. Total arrests are underreported.

⁴⁰ Costs based on average public order and major motor vehicle crime processing time multiplied by median hourly salary/benefits for judges, court clerical staff, state's attorneys, victim advocates, and public defenders.

⁴¹ Deferred Sentence: Average probation supervision time was 358 days at \$1.50 /day; Probation: Average probation sentence 359 days calculated @ \$1.50/day; Split Sentence: Average incarceration of 30 days calculated at in-state cost of \$159/day plus average probation sentence of 238 days at \$1.50/day; Incarceration: Average incarceration of 163 days calculated at the in-state rate of \$159/day.

VERMONT RESULTS FIRST MODEL: THE BENNINGTON COUNTY INTEGRATED DOMESTIC VIOLENCE DOCKET PROJECT

The Bennington County Integrated Domestic Violence Docket (IDVD) Project was initiated in September, 2007, as a special docket within the Bennington County Criminal/Family Division Courts. The goal of the IDVD project was to provide an immediate response to domestic violence events by coordinating Family and Criminal Division cases. Dedicated to the idea of *One Family, One Judge*, the IDVD Project was designed to allow a single judge, one day each week, to have immediate access to all relevant information regardless of the traditional docket and to gather all appropriate players at the table regardless of any traditionally limited roles. The IDVD Project focused on: 1) protection and safety for victims and their children as well as other family members; 2) providing immediate access to community services and resources for victims, their children, and offenders to help overcome the impact of prior domestic abuse and prevent future abuse; and 3) providing an immediate and effective response to non-compliance with court orders by offenders.

In December of 2011, the VCJR conducted an outcome evaluation of the IDVD⁴² and determined that the IDVD Project appears to be a promising approach for reducing post-program recidivism among defendants convicted of domestic violence. In terms of all three recidivism measures used in this evaluation (reconviction for domestic violence, reconviction for a violent offense, and reconviction for any crime) the participants from the IDVD Project recidivated less frequently or at a comparable level than did participants in the District Court group or defendants in a statewide domestic assault cohort. The most substantial difference between the groups involved the percentage of defendants who recidivated based on a reconviction for any crime. In this case the percentage of participants in the IDVD Project who recidivated was approximately 25% lower and 54% less often than was the case for defendants in the statewide cohort.

When considering whether or not a program should be replicated an analysis of the post-program behavior of participants is a major factor to consider. Another consideration of importance is the cost-benefit ratio for a project. That is, a project might be extremely successful at reducing recidivism, but if the project is too costly to sustain replication may not be a wise fiscal recommendation.

One of the objectives of this cost-benefit initiative was to conduct a cost-benefit analysis of the IDVD Project using the Vermont Results First Model. Based on the effect size calculated for the IDVD Project by Steven Lize, one of the Pew Charitable Trusts consultants on the project, the analysis shows a total long-term benefit of \$1,856 per program participant. The average cost per offender is estimated to be \$975. Other specialty courts in the Results First model have average costs in the area of \$1,200 per participant.

⁴² http://www.crgvt.org/uploads/5/2/2/2/52222091/idvd_final_rreport_12-9-11b.pdf

The benefit to cost ratio for the IDVD Project is \$1.90, indicating that the program is cost effective. More detailed breakdowns of these figures are discussed below:

Benefits to Taxpayers: \$286 Per Offender

The benefits are calculated from the marginal costs of the police, courts, prosecutors, defenders, and corrections resulting from the expected reduction in recidivism. This estimate represents the expected benefit from a single offender successfully completing the program and committing fewer crimes over a ten-year period.

Benefit to Other Beneficiaries: \$1,570 Per Offender

These are the benefits that are calculated from the tangible and intangible costs of crime for victims; sometimes also described as "Benefits to Society." Again, it represents the expected benefit from a single offender successfully completing the program and committing fewer crimes over a ten-year period.

Total Benefits: \$1,856

Total benefits include benefits to both taxpayers and victims.

Average Cost per Participant: \$975

Average costs for the IDVD Project were based on the costs associated with adjudicating probation violations for program participants, providing expanded supervision services, detention processing costs, and costs of detention.

Benefits Minus Costs: \$881

This figure represents the net benefits of the IDVD program per participant.

Benefit to Cost Ratio: \$1.90

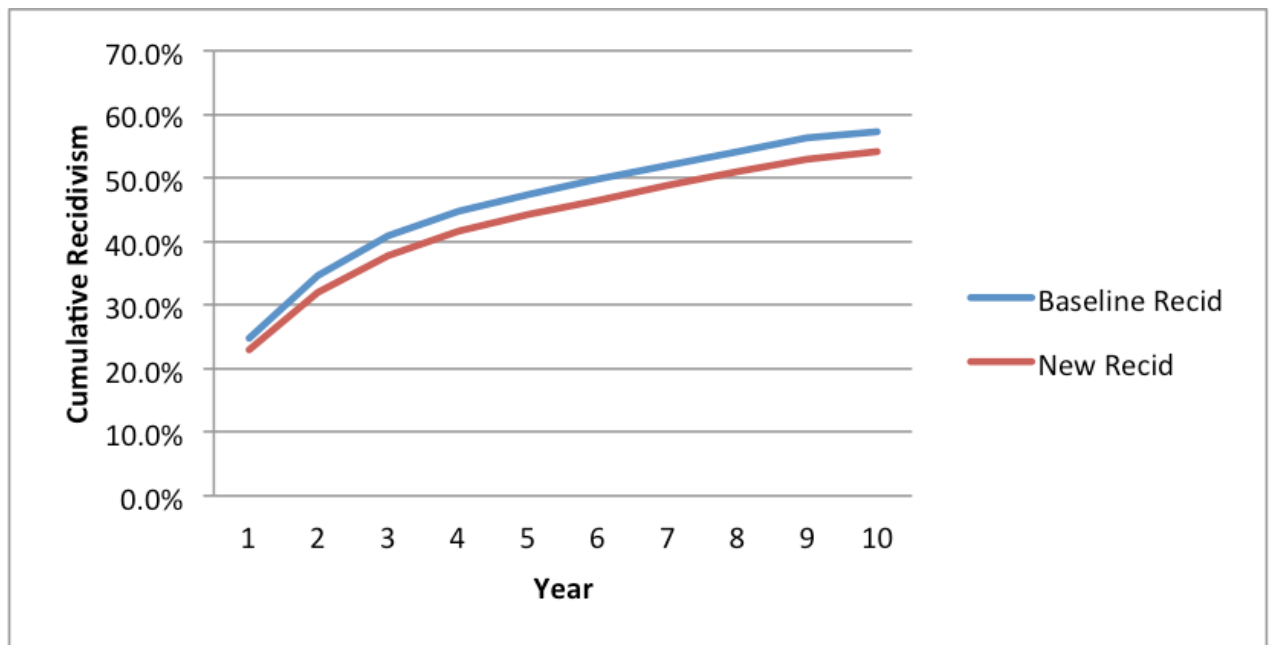
This figure indicates that for every \$1 dollar invested in the IDVD there is an expected benefit of \$1.90. Therefore, the IDVD program is cost effective.

Part of the process of estimating a return on investment involves assessing the riskiness of the estimates. Any rigorous modeling process, such as the one described here, involves many individual estimates and assumptions. Almost every step involves at least some level of uncertainty. The Results First model uses the "Monte Carlo" approach to model this uncertainty. The objective of the risk analysis is to assess the odds that an individual return on investment estimate may offer policy makers the wrong advice. For example, if we conclude that, on average, an investment in the IDVD Project has a ratio \$1.90 of benefits for each \$1 of cost, what are the odds, given the uncertainty in this estimate, that the program will not even generate one dollar of benefits for each dollar of cost? The Monte Carlo approach repeats the Vermont Results First model's calculations 1,000 times with random variations of the cost estimates, within a ten percent window. The Monte Carlo simulation has shown that the IDVD Project will statistically yield a positive net present value 58% of the time.

Figure 2 below shows the effect the program will have on recidivism over ten years. The blue line (top line) represents estimated recidivism rates for domestic violence offenders who do not

participate in the IDVD program. The red line (bottom line) is the estimated recidivism rates for domestic violence offenders who successfully complete the IDVD program.

Figure 2
IDVD PROGRAM EFFECT ON RECIDIVISM OVER 10 YEARS



Based on the data presented in Figure 2 above the IDVD Project appears to be a cost-effective approach for reducing post-program recidivism among defendants convicted of domestic violence.

DATA QUALITY

Section 3 (a)(1)(C) of Act 61 provided that the Working Group assess the quality of justice data collection systems and make recommendations for improved data integration, data capture, and data quality as appropriate.

TIME ANALYSIS DATA

The amount and type of time analysis data varied between the different agencies included in this cost study. The State's Attorneys and Victim Advocates conducted a time analysis which was designed specifically for this project. The Judiciary had a prior time study that was accessible for use in this study. The Law Enforcement Service Delivery team had access to computer-aided

dispatch systems managed by the Department of Public Safety and other police departments which track time-on-scene data for law enforcement personnel for particular crimes. Additional analyses of tasks were estimated by subject matter experts. The Department of Corrections and the Juvenile Justice Service Delivery Teams relied primarily on subject matter experts to estimate time for their various tasks. The Office of the Defender General (ODG) estimated time spent on cases using three methods: 1) reviewing invoices from ad hoc counsel; 2) reviewing invoices from private counsel who have contracts with the ODG; and 3) American Bar Association standards for defense caseloads. The Victim Service Delivery Team conducted a top-down analysis of opportunity and marginal costs which was based on budget analysis, not on time analysis.

Since marginal and opportunity costs in criminal justice are primarily driven by staff costs, the importance of accurate time analysis cannot be underestimated. The use of subject matter experts to estimate the time it takes to perform a task relies on memory and therefore is prone to estimation problems. Errors can be mediated when the estimates are made by groups of employees and reviewed by other groups (as was the case for all agencies using this method for the study), but reliance on memory, collective or otherwise, is still prone to error. Time analysis studies either using computerized systems as in the law enforcement analysis or online task tracking software as used by the State's Attorneys are the gold standard for this type of research.

Of course, time analysis studies are not without their own failings. In addition to the methodological concerns discussed previously in the Data Collection Strategies section above, this method creates an added burden on staff to account for their time in increments. That burden is especially heavy for salaried employees who are not used to doing so. Even with computerized time tracking software there is likelihood of human error – forgetting to enter data or incorrectly estimating times once the employee realizes they forgot to make an entry. The matter is further complicated by the fact that time studies quickly grow stale. For example, though the Judiciary's data from the 2009 study by National Center for State Courts was very helpful, it will soon be outdated and will need to be replicated. Finally, time studies need to be conducted over a relatively long period of time. Though the effort on the part of the State's Attorneys and Victim Advocates to collect original time data is laudable, the data collection only ran for 25 days. As a result no time data for murder cases could be collected.

Longer and/or random time studies which minimize double-counting are needed to increase validity and reduce the effects of data errors due to incorrect entry or time estimation.

THROUGHPUT MODEL DATA

Electronic data for the Throughput Model are maintained through cooperative data exchange relationships between the Vermont Center for Justice Research and the Department of Public Safety, the Vermont Court Administrator's Office, and the Department of Corrections.

For arrest data the VCJR accesses law enforcement data utilizing the Statewide CAD/RMS maintained by the Department of Public Safety, (DPS) or the VACLOUR system currently administered by the Burlington Police Department. Arrest data is also available from Vermont

Crime On-Line (VCON), a crime reporting system managed by the Vermont Criminal Information Center (VCIC). VCJR has negotiated long-standing User Agreements and research agreements with both DPS and VCIC. During the course of the analysis for the Throughput Models it was discovered that arrest data in VCON were underreported.

Prosecution and sentencing data is accessed from VCJR's Adjudication Database. The Adjudication Database maintains a file with over 20 years' worth of disposition and sentencing data from Vermont Superior Courts – Criminal Division. Juvenile docket and disposition information are obtained from the VCJR Juvenile Justice Databases. Both of these databases are based on monthly data extracts from the Court Administrator's Office. VCJR has a user agreement with the Supreme Court for access and use of this data which ensures the confidentiality of the maintenance, analysis, and dissemination of the records.

Data regarding how defendants actually serve their sentences is provided through a research agreement between VCJR and the Department of Corrections. Using data extracts provided by the DOC, the VCJR is able to determine the amount of time that defendants served in jail or on probation. This data is crucial for determining the cost of correctional services because cost is dependent not on the sentence imposed by the court but upon the type of services and the length of services actually used by the defendant.

Recidivism data necessary to evaluate program outcomes is obtained by VCJR from VCIC's criminal history system. VCJR employs proprietary software developed by VCJR staff to facilitate the analysis of these records.

VERMONT RESULTS FIRST MODEL

The data necessary for running the Vermont Results First Model are a combination of the data necessary to compute marginal costs, throughput, and recidivism. As indicated above the throughput and recidivism data are readily available. Though adequate time analysis was available for this project more rigorous time analysis needs to be developed in the future.

MANAGEMENT RESPONSIBILITY FOR THE COST-BENEFIT MODEL

The Cost Benefit Working Group strongly recommends that the work regarding the Vermont Results First Model criminal justice component continue to move forward. It further recommends that the Vermont Center for Justice Research be entrusted with the authority to: 1) revise the criminal justice component of the statewide cost benefit model in light of legislative or policy changes, or both, in the criminal or juvenile justice systems; 2) update cost estimates; and 3) update throughput data for the model. The reputation for objectivity that the Vermont Center for Justice Research has developed over the years, its expertise with criminal justice data systems, recently developed skills regarding cost models and the Vermont Results First model, and its neutral position as an organization outside of state government support this recommendation.

The Working Group further recommends that annual funding be appropriated to allow the VCJR to conduct the requisite research and updating associated with maintaining the model.

CONCLUSIONS

1. The project demonstrated that a collegial research design utilizing the expertise of subject matter experts is a viable approach to developing: 1) valid cost models; 2) cost models which are understood by stakeholders; and 3) cost models which are endorsed by stakeholders.
2. Analyses of *marginal costs* for the Vermont criminal and juvenile justice systems suggest that only limited budget savings can be obtained by small reductions in crime. The research demonstrated that marginal cost savings are primarily accrued by reducing overtime and reducing services that are provided by contracted services providers. Small reductions in crime will reduce costs to victims, an important consideration, but these savings do not accrue to the state budget.
3. Planning and budgeting activities on the part of criminal/juvenile justice agencies can benefit from the identification of *opportunity costs*. For example, when there are small reductions in a particular crime, the time which was devoted to handling that crime can be diverted to other activities within an agency.
4. Throughput Models of the Vermont Criminal/Juvenile Justice System based on analysis of specific crimes is a valuable tool for: 1) examining expenditures made by individual criminal/juvenile justice agencies when processing crimes; and 2) identifying the overall taxpayer and victim costs of particular types of crime. Throughput Models can also be used as an important tool to more accurately predict the cost of policy changes in criminal/juvenile justice.
5. The Vermont Results First model was demonstrated to be a useful tool for assessing the cost-benefit ratio of the Bennington County Integrated Domestic Violence Docket Project (IDVD) and other innovative corrections programs. The model determined that for every \$1 invested in the IDVD there is an expected long-term benefit of \$1.90. Therefore, the IDVD program is cost-effective.
6. There is little in the way of electronic data to document the amount of time that criminal and juvenile justice professionals spend on their duties. One notable exception is the computer-aided dispatch systems managed by the Department of Public Safety and other police departments which track time-on-scene data for law enforcement personnel for particular crimes.
7. Electronic data for the Throughput Models are maintained through cooperative data exchange relationships between the Vermont Center for Justice Research and the Department of Public Safety, the Vermont Court Administrator's Office, and the Department of Corrections.

With the exception of arrest data from the Department of Public Safety, data quality is generally good. The Throughput Model could be made more robust if data exchanges also included State's Attorneys and the Office of the Defender General whose management systems are currently inadequate for this purpose.

8. The data systems at Vermont criminal/juvenile justice system agencies are sufficient at this time to generate the requisite information to update and manage the Vermont Results First Model. The information was obtainable, but the process relied upon a considerable amount of manual work on the part of agencies which is inefficient and costly. If legacy systems were replaced by more technologically-advanced systems, data collection for the Vermont Results First model (as well as other policy/research initiatives) would be more efficient, less costly, and probably more accurate.

9. The Cost Benefit Working Groups concluded that the Vermont Results First criminal justice component is a useful planning tool and the Vermont Center for Justice Research is best positioned to manage the criminal and juvenile justice sections of the model.

RECOMMENDATIONS

The work accomplished by the Technical Working Group during the six months allotted to the project is quite extraordinary. However, it is important to note that this is only the first iteration of the project. Given the important insights generated by the analysis, the Working Groups recommend continued development of the model consistent with the following points:

1. The State of Vermont needs to reinvigorate its commitment to supporting evidence-based programming in criminal and juvenile justice. It is essential that when new programs are developed funding is earmarked for program evaluation. The costs associated with creating and monitoring data systems for project management and evaluation are not trivial. If the State is committed to evidence-based planning and programming, adequate funding for these activities needs to be provided. In particular, resources should be available to evaluate projects in a manner consistent with the Vermont Results First model. The creation of valid evaluation data supports the data-driven approach embodied in the Vermont Results First model and provides for a common basis upon which to assess program value.

2. The Working Groups should revisit the marginal costs research undertaken during this project to identify step-wise marginal costs. Step-wise marginal costs occur when the total agency budget changes because a certain workload or capacity threshold is reached -- for example, when the inmate population of a correctional center decreases enough to close an entire housing unit. This information is critical to understanding the impact that reductions in recidivism or changes in criminal/juvenile justice policy might have on the criminal/juvenile justice system.

3. Since marginal and opportunity costs in criminal/juvenile justice are primarily driven by staff costs, the importance of accurate time study data for various criminal/juvenile justice duties cannot be overemphasized. Vermont criminal and juvenile justice agencies should work

to identify financial resources to support periodic time studies in order to maintain the validity of both the criminal justice Throughput Model and the Vermont Results First model.

4. The results of the opportunity cost analysis undertaken in this study should be made available to criminal and juvenile justice agencies, and technical assistance should be provided to agencies who wish to develop strategies for including opportunity costs in their planning and budgeting practices.
5. Resources should be identified to make the Throughput Models a more robust tool for criminal/juvenile justice planning at the state, regional, county, and local levels. In particular, the Throughput Model should be further developed to include intermediate sanction data and regular updates to mirror changes in criminal and juvenile justice policy and practice.
6. The State of Vermont should continue developing the Vermont Results First model as a way to identify innovative programs that achieve a strong benefit-to-cost ratio. The Working Groups noted, however, that there are staff resource costs associated with developing the Vermont Results First model which include data collection (much of which is now manual) and analysis. Continued effort will require a major commitment from participating criminal/juvenile justice agencies as well as the Legislature to be creative about finding resources to support the improvements in technology and analysis methods required to support a robust cost-benefit analysis program in Vermont state government.
7. The responsibility for coordinating data collection, analysis, and updates of the Vermont Results First criminal justice model component should be assigned to the Vermont Center for Justice Research (VCJR). VCJR should also be responsible for disseminating information developed for the model to other state agencies for analysis.