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Author(s): Pamela K. Lattimore; Christopher P. Krebs; Phillip Graham; Alexander J. Cowell

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November 2004

Evaluation of the Juvenile Breaking the Cycle Program

Final Report

Pamela K. Lattimore
University of South Carolina
RTI International
Christopher P. Krebs
Phillip Graham
Alexander J. Cowell
RTI International
3040 Cornwallis Road
Research Triangle Park, NC 27709

RTI Project Number 07572

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Executive Summary

In 1998, the Lane County, Oregon Department of Youth Services (DYS) was awarded a cooperative agreement from the National Institute of Justice (NIJ) to implement a Juvenile Breaking the Cycle (JBTC) program. The Lane County JBTC was designed as a demonstration with a juvenile arrestee population of the Breaking the Cycle (BTC) model demonstrated with adult arrestees in Birmingham, AL; Tacoma, WA; and Jacksonville, FL. In 1999, NIJ awarded a grant to RTI International to evaluate the effectiveness of the JBTC program. This report provides the results of the JBTC evaluation, including those from the process evaluation, the outcome evaluation, and the cost-effectiveness evaluation.

Lane County Juvenile Breaking the Cycle Program

The Lane County JBTC is an ambitious effort to effect major changes in the lives of juvenile arrestees by enlisting a spectrum of county and state agencies to provide (1) immediate identification of substance abuse problems at the time of arrest (or apprehension), (2) assessment to establish the degree of the substance abuse problems and the presence of other psychological or criminogenic risk factors, (3) the integrated delivery of services, and (4) the systemic use of sanctions, incentives, and rewards to encourage compliance with treatment and desistance from criminal involvement. The program was designed to take advantage of what had been learned from research on the development and evaluation of multifaceted interventions to address the complex configuration of problems that many drug-involved juvenile offenders have. In particular, JBTC built upon what had been learned about the implementation and effects of programs that attempt to integrate substance abuse treatment with other programmatic interventions (mental health, family, etc.) and monitoring activities (urine analysis, court monitoring, etc.).

A summary logic model for the JBTC program is shown in **Exhibit E-1**. As can be seen, JBTC is designed to effect system change, leading to better coordination, the integration of services, and enhanced service delivery. The JBTC program outcomes are the implementation of activities across multiple domains. These domains include intake and processing, assessment and case management, urinalysis (UA) testing, court monitoring and DYS supervision, and treatment and services. Services and treatment domains include substance abuse treatment,

mental health services, education services, and family and social services. Sanctions, incentives, and rewards (SIRs) are used to punish negative behaviors and encourage positive behaviors. These activities are intended to produce improved individual outcomes, including increased participation in treatment, reduced delinquency and substance use and improved mental health, school performance, and family relationships. Successful attainment of these individual outcomes among large numbers of delinquent youth, in turn, could lead to improvements that would be measurable at the community level, including less drug use and delinquency, reduced social costs, and a safer more stable community.

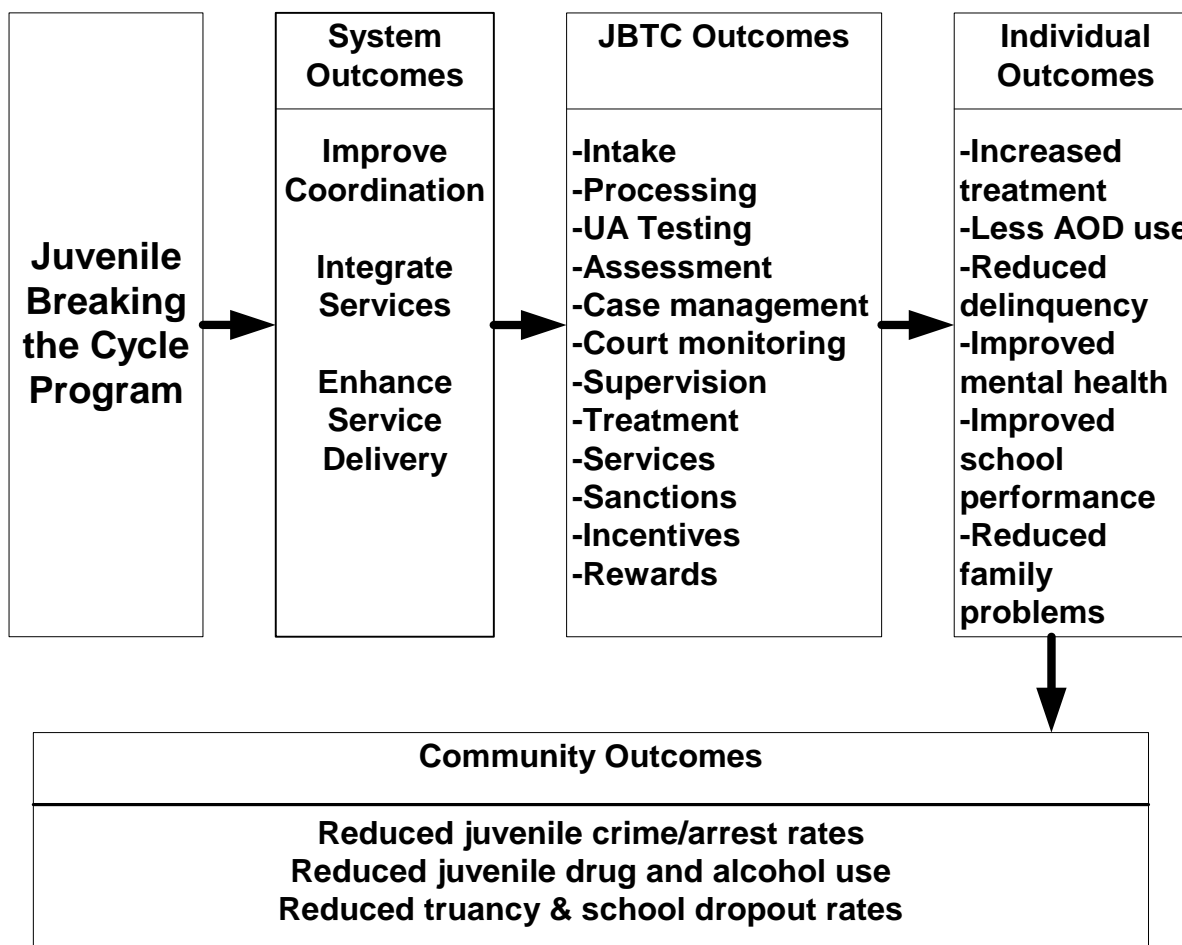


Exhibit E-1. Juvenile Breaking the Cycle Program Summary Model.

Consistent with the BTC program model, youth are identified as substance involved (alcohol and/or other drug or AOD) shortly following an encounter with police that led either to an arrest or a citation. Following the police encounter, a youth is either turned over to DYS or cited and released. Those sent to DYS are processed by intake personnel, who administer a risk assessment. If the assessment identifies the youth as having AOD problems and as high risk, the youth is assigned to JBTC. Only those with AOD problems and who have been determined to be high risk assessments are candidates for JBTC.

The Lane County JBTC program was coordinated by the JBTC Policy Board, a Steering Committee composed of representatives from the Juvenile Court, the DYS, and members of various community sectors, including law enforcement, non-profit organizations, schools, state and local government, social/human services, substance abuse treatment providers, and mental health services providers. The Policy Board provided oversight and direction for the program implementation. Key components of the Lane County JBTC are:

- Implementation of a management information system (MIS) to provide easy access to data by all participating agencies.
- Drug testing and risk assessment of all juvenile offenders upon entry into the juvenile justice system.
- Placement of the offenders into appropriate treatment and provision of services.
- Monitoring of and compliance with treatment conditions imposed by the court.
- Imposition of a range of sanctions, incentives, and rewards (SIRs) to increase and reinforce compliance.

A simple model of the JBTC system is shown in **Exhibit E-2**. The linkages between the Juvenile Court, DYS and the community of services providers indicate both the organizational relationships and the flow of data through the MIS to describe assessments, needs, treatment progress, compliance with requirements, and SIRs.

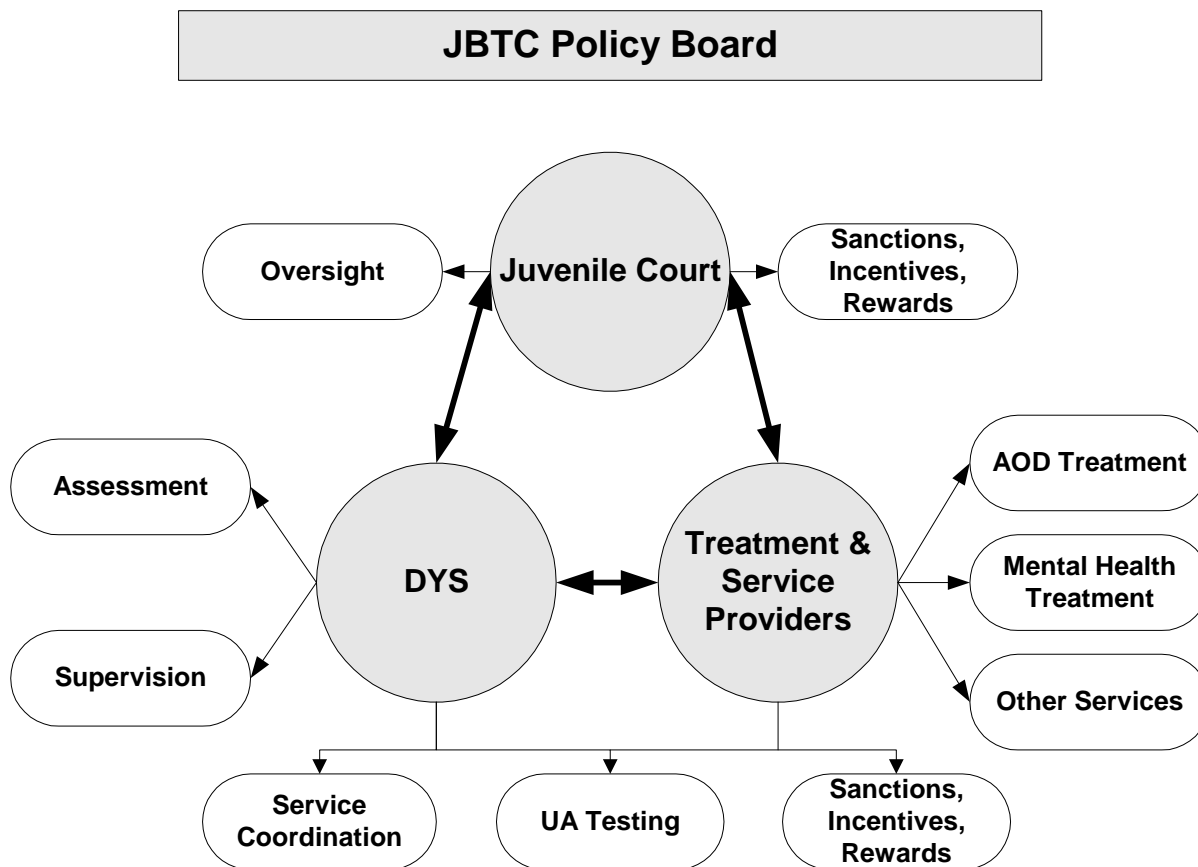


Exhibit E-2. Lane County JBTC Program.

Lane County was successful in implementing many of the key components of the JBTC program, although some work remains to be done. DYS staff members and representatives of the services community indicated during interviews and focus groups that JBTC had improved communication and coordination between agencies working with high risk youth. JBTC was also viewed as having increased the availability of appropriate services—particularly AOD treatment—to which youth could be referred and to have resulted in better services for girls. Staff felt that improvements were still needed in the types of family and mental health services to which youth could be referred and that more services were needed for the rural areas of the county.

The increased use of urinalysis to detect illicit drugs and to hold youth accountable for their substance use was also viewed as a significant benefit of the JBTC program. Adjustments

were made to the administration of testing during JBTC implementation to improve its usefulness. These changes included changing from a structured testing schedule to a random-testing schedule and increasing testing from five to seven days a week. These changes were implemented towards the end of or after data collection for the evaluation had been completed and therefore likely did not impact our findings. Sanctions, incentives, and rewards also were viewed favorably, with respondents feeling that they were effective—although some expressed the need for greater standardization and noted that occasionally parents were concerned by the rewards and incentives, viewing them as rewarding criminal behavior.

The JBTC MIS system was an integral component of the Breaking the Cycle program. Its importance has implications both for the JBTC program and the replication of similar projects in other juvenile justice systems. The MIS functioned as the central communication portal that connected DYS service coordinators, probation counselors, and other juvenile justice staff internal to Lane County DYS with service providers (e.g., substance abuses treatment facilities) outside the agency. The MIS allowed for more efficient coordination of services to JBTC youth and increased accountability of those agencies providing specific treatment services. More efficient coordination was achieved through DYS staff's ability to review each others' staff notes, and case notes entered into the MIS by court supervisors (e.g., juvenile court judge) and other DYS staff. Accountability was achieved through the review of detailed and concise treatment notes that were entered by service providers via the MIS. Treatment provider information also allowed for the appropriate remuneration for services rendered that were linked to the provision of treatment notes and service delivery dates provided in the MIS.

The successful implementation of any program similar to JBTC is likely to be dependent on the availability of a well-designed MIS that supports program operations and management. JBTC benefited from the development, implementation, and refinement of an MIS that was developed prior to the implementation of JBTC with funds secured from a similar, although less comprehensive, 5-year project. This aspect of MIS design and development suggests that any replication of a similar project must allot sufficient time to develop a system prior to programmatic implementation of services to juvenile offenders. An alternative approach would require the acquisition and modification of an existing system to minimize delays in programmatic implementation.

The RAP Court program, which operated as a juvenile drug court in concert with the JBTC program, was also seen as highly effective in managing the behavior of high risk youth. A deficiency of the RAP Court program is capacity, as the court can serve only 25 youth. There is also a need to carefully select the judicial administrator(s) of such a component to ensure their judicial demeanor is appropriate for this type of program.

Impact of Lane County JBTC Program

A quasi-experimental design with a non-equivalent comparison group was used to evaluate the impact of the JBTC program. Although Lane County originally expected to have sufficient numbers of eligible JBTC participants to allow random assignment to the JBTC program, a decline in the number of referrals to DYS that occurred concurrently with program implementation eliminated the option of a true experimental design for the JBTC outcome evaluation. During the initial planning phase of the evaluation, a variety of alternative designs were considered. Ultimately, the decision was made to recruit subjects from the population of all youth who received a risk assessment at DYS.

We fully expected that this decision would result in significant differences between our treatment group (the JBTC participants) and comparison group (non-JBTC participants). Unlike many studies where selection bias looms as a potential threat to findings because treatment subjects are 'better' on important measures than comparison subjects, if DYS adhered to their plan to take only the highest risk youth into JBTC, we expected that JBTC participants on average would be more serious on a variety of measures than those who were not referred to the program. To accommodate the expected selection bias, we identified a statistical approach that used our repeated measures of outcomes to control for both the expected selection bias and maturation bias.

The impact of JBTC was assessed by evaluating the outcomes of a sample of 306 youth who were risk assessed by DYS between April 2000 and November 2001. Of the 306 youth recruited into the evaluation, 149, or 49%, were enrolled in JBTC and 157 were not enrolled in the JBTC program. The JBTC participants differed from the non-JBTC participants on many of the measures that historically have been associated with higher rates of recidivism and substance abuse. The JBTC subjects were assessed as higher risk than the non-JBTC participants and had more extensive and more serious criminal histories. JBTC participants were more likely to

report AOD use and to have begun use at a younger age. These subjects were also more likely to have been in treatment or a shelter prior to assessment and to have family members with criminal records and serious alcohol or drug problems. Finally, the JBTC youth were more likely to report being diagnosed with a mental health problem. These findings suggest that DYS implemented intake into JBTC as planned. In particular, the differences between the JBTC participants and those who were not included in JBTC are consistent with DYS's plan to target the program to those youth deemed highest risk.

The statistical approach used for the outcome evaluation corrected for the selection bias that resulted from our quasi-experimental design and for maturation bias that occurs if the phenomenon of interest is likely to change over time without intervention. Results of these models suggest that JBTC resulted in the following outcomes for participants when compared with those who did not participate.

- **Increased access to substance abuse treatment**
- **Reduced use of marijuana**
- **Reduced likelihood of arrest during the second of two 6-month follow-up periods**
- **Reduced average number of arrests during the second of two 6-month follow-up periods**

Additionally, descriptive data from the 6- and 12-month follow-up interviews suggest that JBTC may have improved school outcomes and family relationships for participants. Participation in JBTC did not appear to effect alcohol use or the use of illicit drugs other than marijuana.

For our cost-effectiveness analysis, we estimated the cost per youth from the taxpayer perspective, and calculated the incremental impact of JBTC on costs while controlling for a variety of factors. The results show that on average at the 6-month follow-up, a youth in JBTC required \$1535 more tax-payer resources during the previous 6 months than a youth who was not in JBTC. At the 12-month follow-up, on average, a youth in JBTC incurred \$457 in additional costs during the previous 6 months than a youth who was not in JBTC.

The greatest cost drivers were treatment and detention. As youth were referred to the treatment system, case management costs also increased. Over the two follow-up periods, the incremental cost associated with treatment and detention fell markedly, which in turn reduced the incremental total cost for the later period.

By combining the incremental cost estimates with the results of effectiveness analyses, we estimated the additional funds necessary to avert youth from marijuana use and arrest. The cost-

effectiveness ratio estimates indicated that at the 6-month follow-up, if the only impact of JBTC had been the reduced use of marijuana, the cost of diverting a youth from using marijuana was \$4,739. Reflecting an overall decrease in incremental costs from the first to the second follow-up, this cost at 12 months fell to \$1,590. The cost at 12 months of diverting a youth from being arrested was \$3,751, again under the assumption that only arrests were affected (and, e.g., not marijuana use).

1 Introduction

In 1997, the National Institute of Justice (NIJ) began a demonstration project to test the effectiveness of early intervention in the ‘criminal careers’ of drug-involved offenders. The Breaking the Cycle (BTC) program was marked by identification of drug use at the time of arrest, followed by drug testing and treatment to eliminate drug use and, hopefully, drug-related criminal offending. The first three programs targeted adult arrestees and were located in Birmingham, AL, Jacksonville, FL, and Tacoma, WA. The results of an evaluation of these three programs were recently published by the Urban Institute (Harrell et al., 2003) and were somewhat mixed, but showed reduced drug use in two sites, lower self-reported criminal activity in all three sites, lower arrest rates in two sites, and reduced family problems in all sites. These findings were observed in spite of implementation problems in all sites. Perhaps most significantly, Harrell and her colleagues reported that “BTC had an important and lasting effect on the demonstration sites. BTC innovations generated considerable local political support and are continuing with substantial local funding in all three sites.” (Harrell et al., 2003, p 2).

Subsequently, NIJ funded a demonstration of a BTC program directed at juvenile offenders. The Juvenile BTC (JBTC) program proposed by Lane County, OR, was funded by NIJ beginning in 1998. The Lane County JBTC is an ambitious effort to effect major changes in the lives of juvenile arrestees by enlisting a spectrum of county and state agencies to provide (1) immediate identification of substance abuse problems at the time of arrest (or apprehension), (2) assessment to establish the degree of the substance abuse problems and the presence of other psychological or criminogenic risk factors, (3) the integrated delivery of services, and (4) the systemic use of sanctions, incentives, and rewards to encourage compliance with treatment and desistance from criminal involvement. The impact of the delivery of JBTC is expected to result in changes to the juveniles participating in the program, to the agencies developing, implementing, and delivering JBTC, and to the community within which these changes occur.

RTI International, along with its subcontractor NPC Research, Inc., was funded by NIJ in 1999 to conduct a comprehensive evaluation of the JBTC program. The evaluation included process, outcome, and cost-effectiveness components. The process evaluation was designed to examine JBTC program implementation, specifically assessing the degree to which program elements were implemented and identifying the impediments to implementation. The outcome evaluation was designed to identify the effects of JBTC on interim and longer term outcomes

such as adherence to program requirements, results of urine testing, school performance, and rearrest for new offenses. Finally, the cost-effectiveness study was designed to assess the value of outcomes achieved by JBTC considered in the context of program costs. This report provides the results of the JBTC evaluation.

In the remainder of this section, we provide background on the rationale for JBTC, a description of the Lane County JBTC program as conceptualized, and an overview of the evaluation design. In subsequent sections, we provide the results of the process evaluation (Section 2), the outcome evaluation (Section 3), and the cost-effectiveness evaluation (Section 4). Conclusions and recommendations are presented in Section 5.

1.1 Background: The Rationale for JBTC

There is extensive evidence that juvenile offenders are often involved with alcohol and/or drugs, and that substance use is one of the etiological factors contributing to delinquent behavior. At the time JBTC was under consideration by NIJ, the Arrestee Drug Abuse Monitoring (ADAM) program conducted urine testing of juveniles recently arrested in 12 cities. For the year 1997, 42% to 66% of the juveniles arrested in these cities were found to have drugs in their urine (National Institute of Justice, 1998). Most of the detected drug use was for marijuana, but 4% to 15% of the youth in the 12 cities were positive for cocaine use, and from 4% to 21% were found to have two or more drugs in their urine at the time of arrest. Moreover, juveniles were involved in 14% of all drug arrests in 1996, and juvenile drug arrests increased by 120% between 1992 and 1996 (Snyder, 1997).

Juvenile offenders who come to the attention of the juvenile justice system tend to disproportionately abuse alcohol and other drugs (Howell, Krisberg, Hawkins, & Wilson, 1995; Snyder & Sickmund, 1996; NIJ, 1999). Further, they often have multiple problems in addition to their illegal behavior, such as educational difficulties, family problems, and mental health disorders (Brown, Gleghorn, Schuckit, Myers & Mott, 1996; Donovan & Jessor, 1985; Elliott, Huizinga, & Menard, 1989; Huizinga, Loeber, & Thornberry, 1993, 1997; McKay & Buka, 1994). For these reasons, the JBTC program with its substance abuse focus and its inclusion of several other legal and social service interventions was developed to provide a comprehensive yet focused approach for dealing with juvenile offenders.

Many characteristics of the JBTC model are featured in effective treatment and rehabilitation programs that were developed for juvenile offenders who are likely to have

multiple psychological and behavioral problems. One example is the Multisystemic Therapy (MST) intervention that was implemented and evaluated in Missouri and South Carolina, also known as the Missouri Delinquency Project and the Family and Neighborhood Services Project, respectively (Henggeler et al., 1991; Henggeler, Melton, & Smith, 1992). The MST intervention was developed as an alternative to incarceration, hospitalization, or residential treatment for serious juvenile offenders and featured case management through intensive individual and family counseling by clinical psychologists. MST was implemented in South Carolina through a cooperative effort between the Juvenile Court, the Department of Mental Health, and the Department of Youth Services. The MST evaluations indicated lower rates of rearrest and substance abuse for intervention participants than for youth who were assigned to a control group, who refused to participate, or who dropped out of the MST intervention. A subsequent cost-effectiveness study revealed that MST was somewhat more expensive than incarceration, hospitalization, or residential treatment, but that the additional costs would be offset by lower rates of recidivism (Schoenwald et al., 1996).

Another example is a two-month residential and aftercare intervention that was implemented and evaluated in Maryland (Sealock, Gottfredson, & Gallagher, 1997). The residential treatment program featured case management through individual counseling and cognitive/behavioral skills training, while the aftercare component included family therapy and support groups. Evaluation results indicated that youth who participated in the residential treatment program were significantly less likely to report drug use and delinquency. Further, program participants demonstrated a longer period of time from entry into the study until rearrest than comparison youth. However, the aftercare component of the intervention did not appear to have any beneficial effects on participants.

Results for the MST and the Maryland residential treatment studies provide support for the JBTC model as they both found positive effects of individualized case management approaches with additional services for the families of drug-involved juvenile offenders. However, these studies did not focus on the effectiveness of several important features of the JBTC model: regular drug testing, graduated sanctions and incentives, and court supervision of offenders' progress towards rehabilitation. In general, few studies carefully examine the effectiveness of these key components of the JBTC model (McBride, VanderWaal, VanBuren, & Terry, 1997).

A survey of juvenile detention centers revealed that the majority (73%) of survey participants were not using drug testing (e.g., urinalysis) to identify youth with substance abuse problems and to assess their treatment needs and progress towards rehabilitation (Crowe, 1998). The limited use of drug testing prompted the Office of Juvenile Justice and Delinquency Prevention (OJJDP) to develop training and technical assistance curricula for juvenile courts and other agencies that provide substance abuse treatment services for juvenile offenders (Crowe, 1998). The Office of Justice Programs (OJP) also promoted drug testing through the Juvenile Drug Court Grant Program, administered through the Drug Courts Program Office (Roberts, Brophy, & Cooper, 1997). Through this grant program and with training and technical assistance, many Juvenile Courts and treatment agencies began using drug testing for identification of drug-involved juvenile offenders and for planning their treatment and rehabilitation.

Some small-scale studies have been conducted and provide limited support for the effectiveness of drug testing in the treatment and rehabilitation of juvenile offenders. For example, Miller, Scocas, and O'Connell (1998) evaluated a Juvenile Drug Court Diversion Program in Delaware that featured case management through individual, group and family counseling and random urinalysis for youth with misdemeanor drug arrests and little criminal history. Juveniles in the drug court compliance group had significantly less frequent and severe criminal activity than youth in a comparison group both during the program and after 3, 6, 9, and 12 months. The recidivism rate was also significantly lower for youth in the compliance group (23% vs. 43%).

Like drug testing, research on the effectiveness of graduated sanctions and incentives has been limited. Although a number of promising approaches to the treatment and rehabilitation of juvenile offenders (e.g., MST) have been classified as "immediate" or "intermediate" sanctions programs (Krisberg et al., 1995), evaluative studies have failed to determine whether graduated sanctions and incentives, per se, are effective. What can be determined from studies with juvenile offenders is that graduated sanctions and incentives are difficult to implement consistently because of the heavy caseloads of juvenile court counselors and other caseworkers and treatment providers (Krisberg et al., 1995). Even with consistent implementation, graduated sanctions may fail if treatment services are not faithfully implemented and do not meet the specific needs of drug-involved juvenile offenders. However, a recent study on the effectiveness

of both graduated sanctions and drug testing in the Washington, D.C. Adult Drug Court program (Harrell, 1998) found that the rearrest rates among sanctions program participants were substantially lower than rearrest rates among defendants in a control group after 100 days (2% vs. 6%), 200 days (3% vs. 11%), and one year (11% vs. 17%). Interestingly, there was a high rate of attrition (60%) from the substance abuse treatment program, suggesting that the graduated sanctions and drug testing program alone had a significant effect on subsequent arrests.

1.2 The JBTC Model in Lane County

JBTC was implemented in 1998 by the Lane County Department of Youth Services (DYS). DYS was responsible for identifying potential JBTC participants, providing case management, conducting urinalysis tests, and coordinating services. The program was designed to take advantage of what had been learned from research on the development and evaluation of multifaceted interventions to address the complex configuration of problems that many drug involved juvenile offenders have. The JBTC model was expected to be an improvement upon existing treatment and rehabilitation interventions for drug-involved juvenile offenders because juvenile offenders tend to have co-occurring psychological and behavioral problems that require multi-faceted approaches (Elliott, Huizinga, & Menard, 1989; McKay & Buka, 1994; McBride, VanderWaal, VanBuren, & Terry, 1997). In particular, JBTC built upon what had been learned about the implementation and effects of programs that attempt to integrate substance abuse treatment with other programmatic interventions (mental health, family, etc.) and monitoring activities (urine analysis, court monitoring, etc.).

A summary logic model for the JBTC program is shown in **Exhibit 1-1**. As can be seen, JBTC is designed to effect system change, leading to better coordination, the integration of services, and enhanced service delivery. The JBTC program outcomes are the implementation of activities across multiple domains. These domains include intake and processing, assessment and case management, urinalysis (UA) testing, court monitoring and DYS supervision, and treatment and services. Services and treatment domains include substance abuse treatment, mental health services, education services, and family and social services. Sanctions, incentives, and rewards (SIRs) are used to punish negative behaviors and encourage positive behaviors. These activities are intended to produce improved individual outcomes, including increased participation in treatment, reduced delinquency and substance use and improved mental health, school performance, and family relationships. Successful attainment of these individual

outcomes among large numbers of delinquent youth, in turn, could lead to improvements that would be measurable at the community level. If JBTC is effective at the individual level and if the program could be provided broadly to all at-risk youth in Lane County, ultimately the JBTC could bring about community-wide improvement as a result of individuals and systems being changed, through less drug use and delinquency, reduced social costs, and a safer more stable community.

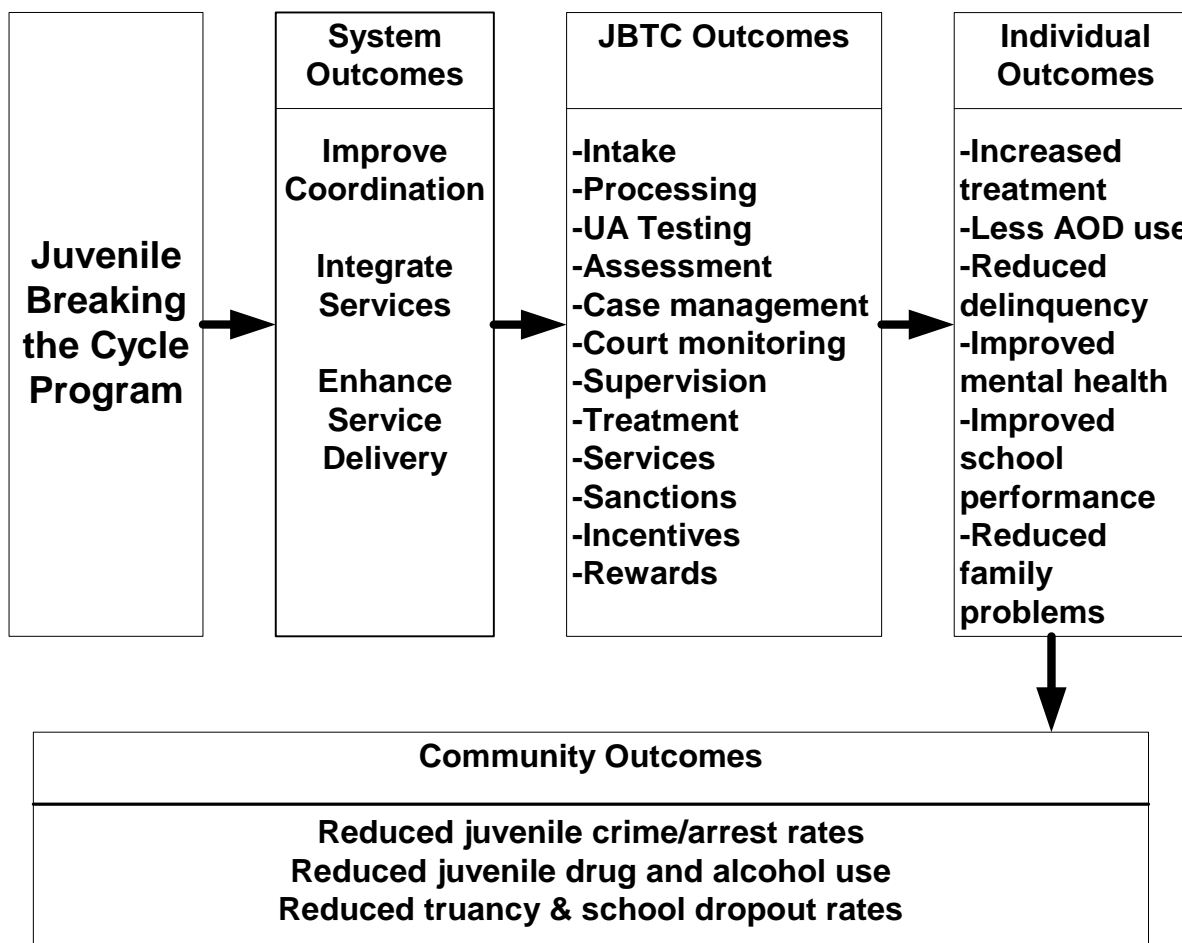


Exhibit 1-1. Juvenile Breaking the Cycle Program Summary Model.

Consistent with the BTC program model, youth were to be identified as substance involved (alcohol and/or other drug or AOD) shortly following an encounter with police that led either to

an arrest or a citation. **Exhibit 1-2** shows the case flow that was established by DYS to identify potential JBTC participants.

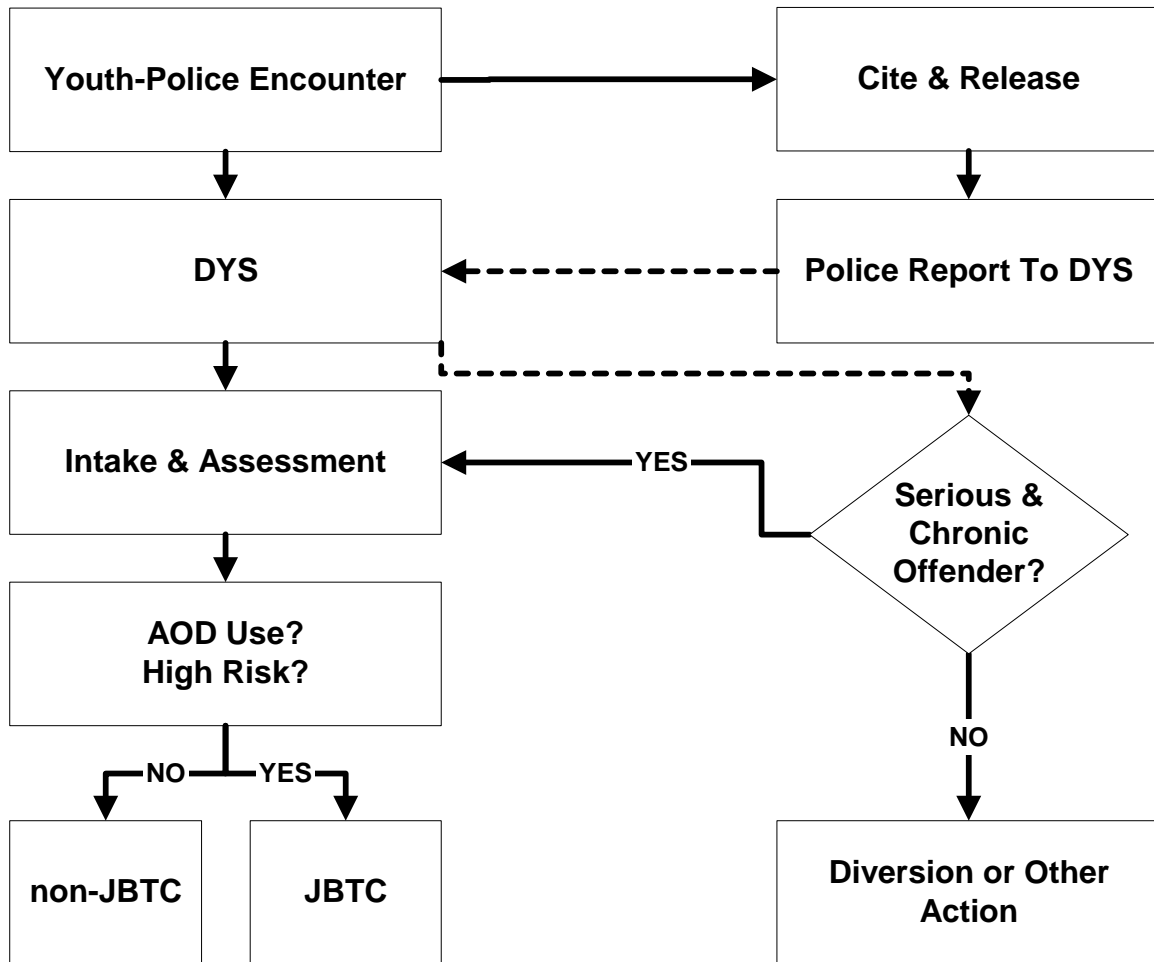


Exhibit 1-2. Identification of JBTC participants.

As shown in **Exhibit 1-2**, following a police encounter, a youth is either turned over to DYS or cited and released. Those sent to DYS are processed by intake personnel, who administer a risk assessment. If the assessment identifies the youth as having AOD problems and as high risk, the youth is assigned to JBTC. Only those with AOD problems and who have been determined to be high risk assessments are candidates for JBTC. The requirement that

youth be ‘high risk’ was a deviation from the adult BTC model that sought to provide BTC to all AOD-involved arrestees if they were released pre-trial. In the Lane County JBTC program, those with only AOD problems or those assessed only as high risk are not considered for JBTC, although they may still receive other programs or services. For those cited and released, a police report is sent to DYS. If the subsequent DYS review determines the youth is a ‘serious and chronic’ offender, he/she is sent for intake and assessment. If these youth are identified with AOD problems and assessed as high risk, they are also candidates for JBTC; those who do not meet these criteria are not considered for JBTC.

Exhibit 1-3 shows the comprehensive JBTC intervention that is intended to identify and provide services from local juvenile justice, social service, and educational systems to impact individual outcomes for high-risk, substance-using youth. Collaboration and coordination are integral to assuring that a comprehensive response to needs is provided. Specific components of the model include justice system oversight (court monitoring, urinalysis testing, and imposition of sanctions, incentives, and rewards), substance abuse treatment, mental health services, educational services, and family/social services. The fully implemented JBTC program includes:

- drug use monitoring with urine testing and continuing assessment of an individual’s drug use;
- judicial monitoring of testing and the use of sanctions, incentives, and rewards; and
- coordinated substance abuse treatment, mental health, and social services with case management, and integration of services across multiple agencies.

Integral to the JBTC model is a management information system (MIS) through which information is collected and exchanged across multiple systems to monitor progress and assess effectiveness. These activities are expected to improve individual outcomes including delinquent/criminal behavior, substance use, mental health, educational attainment, and interpersonal relationships.

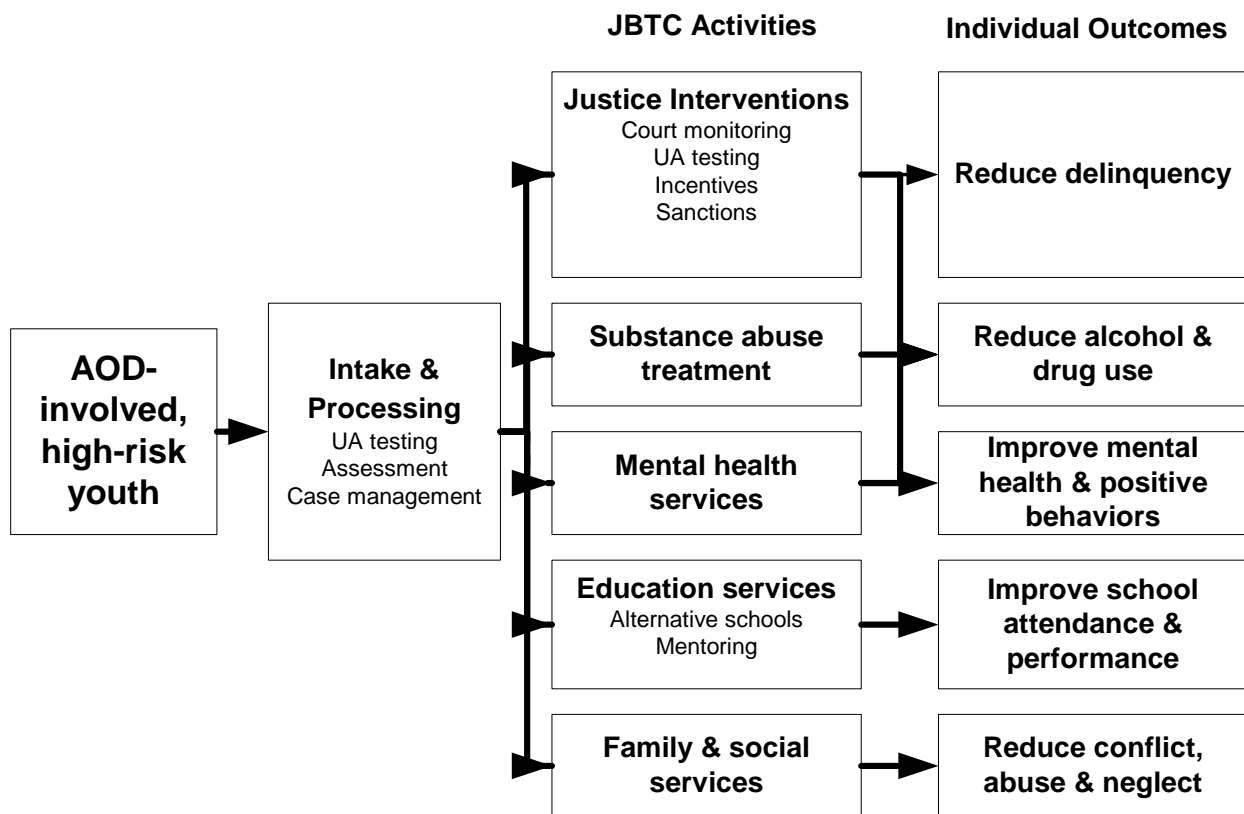


Exhibit 1-3. Juvenile Breaking the Cycle Program Services and Outcomes.

In competing for the JBTC Program, Lane County proposed to build upon its existing Youth Intervention Network (YIN) program. The Lane County YIN program was funded by the Center for Substance Abuse Treatment (CSAT) to foster collaboration and cooperation between government and community-based agencies, including the Department of Youth Services (DYS) and Juvenile Court, Police Department, treatment service providers, and public schools in Lane County. The JBTC model both extended and expanded the services for drug-involved juvenile offenders that had been provided through the YIN. Key improvements to the YIN program provided by JBTC included regular drug testing, systematic implementation of graduated sanctions, incentives, and rewards, and regular court supervision of offenders' progress.

JBTC treatment and services include AOD treatment, mental health services (if indicated), educational services, and family/social services. Sanctions, incentives, and rewards are provided by all components of the program. Active court oversight was reserved for only a relatively small subset of the JBTC cases. In addition to the impact on individual outcomes, another goal of

JBTC is to improve the coordination among the agencies providing services to the youth. The implementation of the Lane County JBTC program is discussed in Section 2.

1.3 Evaluation Overview

Exhibits 1-1 through **1-3** provide the framework for the evaluation of the Lane County JBTC. Our process, outcome, and economic analyses were designed to assess the extent to which JBTC was successful in facilitating change in the delivery of services—including better integration and coordination—and in positively affecting individual outcomes, including substance use and delinquency. The research hypotheses for the evaluation are discussed in section 1.3.1. Section 1.3.2 describes the evaluation methods.

1.3.1 Research Hypotheses

The research hypotheses underlying the JBTC evaluation encompass the delivery of services (process evaluation), individual-level outcomes (outcome evaluation), and cost effectiveness (economic evaluation). Case management and court monitoring, following initial assessment, provide the core of the JBTC approach—coordinating the responses of the criminal justice system, substance abuse providers, mental health services, the educational system and family and social services to assure that there is continuity and a comprehensive approach to meeting substance abuse and other needs of drug-involved juvenile delinquents. The relationships among the agencies providing these services are to be coordinated and integrated—formally through the development of agreements including memoranda of understanding and operationally through case management and the sharing of data and other client-level information. The systems-level hypothesis, which was tested by the process evaluation, is the following:

- **JBTC will improve coordination between the relevant agencies and providers, resulting in higher levels of integrated services and enhanced service delivery.**

Additional program-level hypotheses were also tested that relate to JBTC implementation of specific program components and intermediate outcomes, including:

- **Urine testing/surveillance will increase.**
- **Sanctions, incentives, and rewards will be developed and implemented.**
- **Substance abuse treatment participation, retention, and completion rates will increase.**
- **Use of appropriate mental health services will increase.**

- **Use of educational services, including alternative schools and mentoring, will increase.**
- **Use of family and social services, including, for example, family preservation services and programs such as the Center for Family Development’s Youth in Recovery program, will increase.**

Exhibit 1-3 indicates the core hypotheses to be tested with respect to individual outcomes. Specifically, JBTC and the component services are expected to produce the following results for participants in the program:

- **Reduced delinquency.**
- **Reduced alcohol and drug use.**
- **Improved mental health and positive behavior.**
- **Improved school attendance and performance.**
- **Improved family relations, including reduction in abuse and neglect where indicated.**

To the extent that JBTC is effective in improving outcomes for participants, it is important to determine whether JBTC is also cost effective. The economic analysis addressed the following hypothesis:

- **JBTC will generate cost savings for Lane County.**

1.3.2 Methods

Process evaluation data were collected through key stakeholder interviews, focus groups, and surveys of key stakeholders. The outcome evaluation was based largely on data collected through interviews conducted by NPC Research staff with JBTC participants and other youth under DYS supervision. The interview data were augmented with DYS administrative records and treatment records (primarily counseling sessions) obtained from the Oregon Client Process Monitoring System (CPMS). The cost-effectiveness analyses used outcome data supplemented with detailed cost data gathered by RTI economists. Details of these data collection activities are provided in this section.

1.3.2.1 Process Evaluation Approach

The process evaluation focused on the first 18 months of the project. This component of the evaluation allowed for the identification of initial and subsequent systems outcomes through three separate but interrelated process evaluative phases:

1. a formative phase that incorporated the systematic use of empirical procedures as a way of providing ongoing information to influence decision-making, resource allocation, and program operations (McClintock, 1987);
2. a process phase in which data were collected to assess and document the fidelity of program implementation; and
3. a program description phase in which descriptive and qualitative data were collected to augment the interpretation of outcome evaluation findings.

To guide the collection and use of process information, the FORECAST (FORmative Evaluation, Consultation, and Systems Techniques) system was employed. Developed at the University of South Carolina, the FORECAST system requires the development and subsequent repeated testing of a program’s logic model (Goodman & Wandersman, 1994). All data (e.g., the observation of meetings, interviews, focus groups, surveys, and document reviews) were evaluated as a part of the evolving logic model of the JBTC program components as well as their translation into specific program activities. Within the FORECAST system, conceptual models of the problem and of program action were developed through reviews and revisions by the JBTC program staff and the evaluation team.

A number of data sources were queried for the process evaluation. The data collection activities for the process evaluation are shown in **Exhibit 1-4**.

Exhibit 1-4. JBTC Process Evaluation Data Collection Strategies

Data Collection	Timing	Source	Administration	Objective
1. Logic Model	Spring 2000	JBTC supervisory staff	Face-to-face Interview	Develop a JBTC logic model
2. Barriers to Collaboration Survey	Spring 2000	JBTC Policy Board	Telephone Survey	Assess early impressions regarding the collaborative effort.
3. Drug Court (RAP Court) Observation	Quarterly beginning the Spring of 2000	Drug Court and MIS database	Record Abstraction from MIS	Document the drug court processes
4. Key Informant Interview	Fall 2000, Fall 2001	DYS staff, Treatment providers	Face-to-face Interview	Assess implementation of the JBTC program model
5. Collaboration Survey	Fall 2000, Fall 2001	JBTC Policy Board	Mail Survey	Assess the extent to which the JBTC partners have collaborated

Data Collection	Timing	Source	Administration	Objective
6. Integration Survey	Fall 2001	Treatment Providers	Mail survey	Assess implementation and coordination of JBTC services
7. Collaboration Interview	Spring 2001	JBTC Executive Committee	Face-to-face Interview	Assess the extent to which the JBTC partners have collaborated
8. Focus Groups	Spring 2001	Drug Court Team (DC), JBTC youth	Focus Groups	Assess Drug Court Team's and JBTC participants' perceptions

As can be seen in the exhibit, the process evaluation incorporated both quantitative and qualitative techniques to collect data from the following sources:

- **JBTC program participants and staff members via focus groups;**
- **policy board members via survey questionnaires;**
- **mental health and substance abuse treatment agencies via service integration survey questionnaires; and**
- **key informants such as service providers via face-to-face interviews.**

The process evaluation findings are presented in Section 2 of this report.

1.3.2.2 Outcome Evaluation Approach

A quasi-experimental design with a non-equivalent comparison group was used to evaluate the impact of the JBTC program. Although Lane County originally expected to have sufficient numbers of eligible JBTC participants to allow random assignment to the JBTC program, a decline in the number of referrals to DYS that occurred concurrently with program implementation eliminated the option of a true experimental design for the JBTC outcome evaluation. During the initial planning phase of the evaluation, a variety of alternative designs were considered. Ultimately, the decision was made to recruit subjects from the population of all youth who received a risk assessment at DYS.

We fully expected that this decision would result in significant differences between our treatment group (the JBTC participants) and comparison group (non-JBTC participants). Unlike many studies where selection bias looms as a potential threat to findings because treatment subjects are 'better' on important measures than comparison subjects, if DYS adhered to their plan to take only the highest risk youth into JBTC, we expected that JBTC participants on average would be more serious on a variety of measures than those who were not referred to the

program. To accommodate the expected selection bias, we identified a statistical approach that used our repeated measures of outcomes to control for both the expected selection bias and maturation bias. (See Section 3 for details.)

Recruitment for the evaluation began April 15, 2000.¹ This enrollment period initially was set at 12 months but was later extended to 19 months (through November 15, 2001) to increase the sample. Contact information for each potential subject was provided shortly after risk assessment to the interview data collection staff members who were located in an office at DYS.² Parental consent was obtained prior to interviews and the youth were also asked to assent to the interview. We conducted three waves of interviews with and collected administrative data on a baseline sample of 306 recruited youth. The first interview occurred within about one month of the youth receiving a risk assessment at DYS. The second interview was conducted approximately six months after the baseline interview, and the third interview was conducted approximately six months after the six-month follow-up interview, or 12 months after the baseline interview. Interviews were conducted in person by trained NPC researchers. The baseline interview took about 30 minutes and the follow-up interviews took between 1 hour and 1.5 hours to complete. Respondents were given gift certificates for local shopping malls as compensation for their participation (\$15 card for completion of the baseline interview, \$20 for completion of the 6-month interview, and \$25 for completion of the 12-month interview).

Of the 925 youth who were administered risk assessments by DYS during the evaluation study recruitment period, we received contact information on 587 youth (62%) from DYS in a timely manner (i.e., immediately after risk assessment).³ We actively recruited these 587 youth and were able to successfully recruit and interview 306 or 52%. The inability to locate a parent in order to obtain parental consent and to find the youth accounted for the majority of non-

¹ The final design for this evaluation was the only feasible design available at the start of the evaluation. Reduced numbers of referrals to DYS limited the target population of potential eligible JBTC participants and eliminated the possibility of a true experimental design. As the program was getting underway at the time the evaluation grant award was made, a pre-program comparison group could not be identified and interviewed.

² During the early stages of the evaluation, this notification was less routine than had been designed, resulting in some subjects being 'missed' for inclusion in the evaluation. Discussions with DYS eventually resolved this issue.

³ The procedures established to obtain referrals and information on risk-assessed youth soon after intake and risk assessment were inadequate, particularly during the early part of the evaluation. Multiple DYS staff members had to provide the information and coordination between these staff and the field interview staff was difficult to establish in a manner that assured that cases weren't lost to the evaluation. These communication issues were resolved as the evaluation progressed.

participants. Of the 281 youth we were not able to recruit, 55% could not be located and 45% refused to participate or had parents who refused to provide consent. .

We conducted a response bias analysis to assess the extent of any differences between those we were able to recruit and those we were unable to recruit. For this analysis, we compared those youth who were recruited into the study to all other youth who were risk assessed during our recruitment period, regardless of whether DYS provided their information to us or whether they had an actual opportunity to participate in the evaluation study. This comparison was appropriate since our target population was youth who were risk assessed by DYS.

During the baseline recruitment period, approximately 925 youth were administered risk assessments by DYS. Of these, 306 (33%) were approached and agreed to participate in the JBTC program evaluation study. We interviewed 50% (146 of 290) of the youth who were in JBTC and 25% (160 of 635) of those who were not. We obtained administrative data from DYS on these 925 subjects and conducted a response-bias analysis to compare the characteristics of those who participated in the study with those of those who did not. Overall, those who were recruited into the study differed significantly from those who were not. In particular, study participants as a group were younger and had higher risk assessment scores than those who did not participate.⁴ These differences are not surprising if the JBTC participants were the highest risk youth since our sample included a disproportionately large number of JBTC participants. Also, those who participated in the study were more likely to be female than those who did not. The gender differences are somewhat surprising—but less so given reports from interviewers that girls were more compliant in terms of willingness to participate and showing up for interviews.

We subsequently stratified the population by JBTC status to examine for differences between study participants and non-participants. The purpose of these analyses was to determine how typical the participating JBTC youth were compared with the non-participating JBTC youth, as well as how typical the participating non-JBTC youth were compared with the non-participating non-JBTC youth. The results of these analyses inform our ability to draw inferences

⁴ Discussions with staff and with the field interviewers suggest that the outcome of our recruitment was expected. Specifically, the lowest risk youth have the least exposure to DYS and are more likely to have parents who view the DYS experience as an aberration and who prefer to remove the youth from any reminder of the event that led them to DYS, increasing their reluctance to allow the youth to participate in interviews.

from the outcome evaluation. Specifically, if we found few or no differences between participants and non-participants in each group, we could confidently conclude that observed differences in outcomes could be properly allocated to all JBTC participants when compared with all other DYS-assessed youth.

These stratified analyses suggest that the participating JBTC subjects were similar to the non-participating JBTC subjects in terms of age and risk assessments; the gender difference remained, with girls disproportionately represented in the study. For the non-JBTC youth, the analyses suggest that study participants were younger and had higher risk scores (except for the substance abuse subscale); there was no difference in the gender representation between participants and non-participants in this group.

We provide additional detail on these analyses in **Appendix 1**. Given that JBTC was targeting higher risk youth in Lane County, the fact that the study recruited the riskiest subjects among the non-JBTC youth suggests that the quasi-experimental comparison group may be more comparable to the JBTC group than it otherwise may have been. *Nonetheless, the results of the recruitment process, reflected in our response-bias analyses, suggest that our comparisons using interview data should be interpreted as how well JBTC participants fared in comparison with the riskier DYS youth who did not participate in JBTC.*

We collected administrative data and interview data from those who agreed to participate in the interviews. Administrative data, including demographic characteristics, and risk assessment scores were obtained from DYS for all; additional data on criminal history were obtained for those from whom consent was obtained. In addition, administrative data describing treatment episodes were obtained from CPMS for those who participated in the interviews. The CPMS data include basic information on substance abuse and mental health counseling episodes funded by Oregon's health system.

We conducted 306 baseline interviews, 208 six-month follow-up interviews, and 183 twelve-month follow-up interviews (subject retention rates of 68% and 60% at 6- and 12 months, respectively).⁵ An analysis of the factors associated with retention in the study showed that only

⁵ During the course of the data collection, we received information suggesting that one of the interviewers had been falsifying interviews. NPC Research conducted a thorough investigation of these charges and used a variety of collateral information to verify the validity of individual interviews. As a result of this investigation, we removed interview data from the project dataset. In total, 64 interviews were removed (20 baseline interviews, 28 6-month follow-up interviews, and 16 12-month follow-up interviews). A total of 42 youth had at least one interview removed, and of these, 25 youth were removed from the study and 17 youth were retained in the study.

gender was significantly associated with retention. In particular, girls were more likely than boys to complete 6- and 12-month interviews.

The reasons for attrition were diverse. Many of the youth involved in the evaluation were considered to be high-risk and lived somewhat unstable lives, which made locating them for follow-up interviews challenging. We often encountered disconnected telephone numbers or discovered that respondents had moved out of the area, despite our best efforts to keep track of such events. Two respondents died during the course of the evaluation and one sustained a brain injury that precluded him from continuing to participate. Some respondents went away to college and others ended up in the adult justice system, incarcerated in other parts of the state.

For the outcome evaluation (Section 3), we estimated models using only administrative data in addition to models that relied upon the survey data. The models estimated from administrative data were not impacted by sample attrition. Section 3 presents additional information on the study participants and the results of the outcome evaluation.

1.3.2.3 Cost-Effectiveness Study Approach

Cost-effectiveness analysis involves collecting and analyzing cost data, collecting and analyzing effectiveness data, and then combining the results from the cost and effectiveness analyses. The chosen perspective of the analysis determined which agencies' and organizations' cost data we collected and analyzed. Identification of the perspective is important as this perspective determines the relevant cost domains and how they should be measured (Gold et al., 1996; Hargreaves et al., 1998).

The cost-effectiveness analysis was conducted from the perspective of the taxpayer. Thus, we included costs incurred by publicly funded agencies and organizations that are directly involved with the JBTC program and participants. We categorized these agencies and organizations into the following domains: police; assessment; detention; treatment; case management; supervision; and incentives, and rewards. We did not include costs directly incurred by youth in JBTC nor did we include any costs incurred by the youth's families. All data captured employee benefits and, to the extent possible, administrative overhead. This overhead reflects support services, such as secretarial support, as well as maintenance and utility costs that would vary with the resources directly provided to youth participating in the program.

We collected data on each study participant's use of resources. Multiplying this measure of utilization by the cost per unit of resource produced an estimate of the cost incurred for each youth.

The effectiveness analyses used the results from the outcome evaluation. The cost data were combined with the effectiveness results to estimate a cost-effectiveness ratio for each statistically significant effectiveness outcome. The cost-effectiveness ratio expresses the cost of achieving a one unit change in the effectiveness measure. For example, consider the outcome of rearrest within one year. The cost-effectiveness ratio generates an estimate of the additional cost necessary to avert one more youth from being arrested within one year.

Additional information on the development of the cost data and the cost-effectiveness results are included in Section 4.

2 JBTC Process Evaluation

The purpose of this section is to provide the results of the process evaluation that examined the system level and service delivery components of JBTC. This comprehensive process evaluation relies on data gathered through interviews with key community stakeholders, interviews with JBTC staff, interviews with staff at the Department of Youth Services, focus groups with JBTC staff, focus groups with JBTC participants, surveys of community stakeholders and service providers, and the review of quarterly reports, program documents, and various databases (such as the Management Information System). Although the findings from the process evaluation can serve multiple purposes, the two major purposes are to provide feedback to DYS for program modification and improvement, and to provide context for appropriately interpreting findings from the outcome evaluation. Thus, this section of the report provides a synthesis of the process evaluation-related data collection activities and findings, including analysis of the planning and implementation process; a description and analysis of each JBTC component; an identification of challenges and barriers to collaboration and program implementation; and an assessment of model fidelity.

2.1 *Process Evaluation Background*

The JBTC strategy represents the integration of a systems model and a service delivery approach designed to improve substance abuse, delinquency, and other related outcomes among juvenile offenders (see **Exhibit 1-1**). The systems model incorporates the policies, processes, and procedures developed by Lane County for juvenile offenders managed by the Department of Youth Services. The service delivery approach refers to the specific activities and services available and the mechanisms that provide access to those activities and services. The underlying theory guiding the implementation of JBTC is that early identification of AOD use, close supervision, and ongoing treatment will reduce AOD use and criminal behavior among juvenile offenders.

The Lane County JBTC program was coordinated by the JBTC Policy Board, a Steering Committee composed of representatives from the Juvenile Court, the DYS, and members of various community sectors, including law enforcement, non-profit organizations, schools, state and local government, social/human services, substance abuse treatment providers, and mental

health services providers. The Policy Board provided oversight and direction for the program implementation. Key components of the Lane County JBTC are:

- Implementation of a management information system (MIS) to provide easy access to data by all participating agencies.
- Drug testing and risk assessment of all juvenile offenders upon entry into the juvenile justice system.
- Placement of the offenders into appropriate treatment and provision of services.
- Monitoring of and compliance with treatment conditions imposed by the court.
- Imposition of a range of sanctions, incentives, and rewards (SIRs) to increase and reinforce compliance.

A simple model of the JBTC system is shown in **Exhibit 2-1**. The linkages between the Juvenile Court, DYS and the community of services providers indicate both the organizational relationships and the flow of data through the MIS to describe assessments, needs, treatment progress, compliance with requirements, and SIRs.

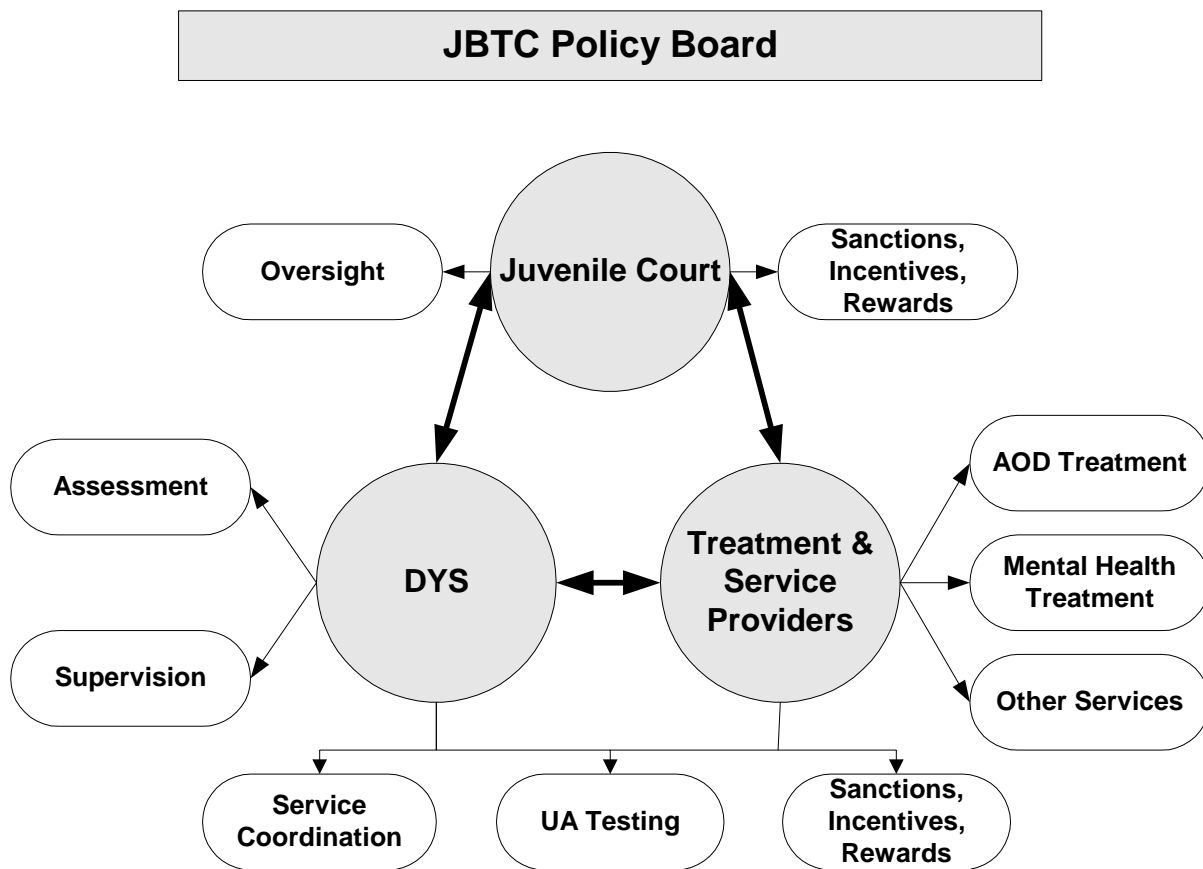


Exhibit 2-1. Lane County JBTC Program.

2.2 Planning and Implementation—Building on the Youth Intervention Network

The implementation of JBTC in Lane County was influenced substantially by an earlier project—the Youth Intervention Network. In 1996, DYS in Lane County was one of three sites selected to receive a five-year cooperative agreement from the Center for Substance Abuse Treatment (CSAT) to implement the YIN, a program designed to deliver services to substance-using youth in the juvenile justice system. The goals of the Lane County YIN site were to: (1) identify and provide necessary services to juvenile offenders with substance use/abuse problems; (2) improve the effectiveness of AOD treatment for juvenile offenders through a coordinated system of care for the youth and their families; and (3) reduce juvenile crime rates.

Under the administration of the Oregon Office of Alcohol and Drug Abuse Programs and the Lane County DYS, the YIN facilitated substance use screening, assessment, and referral services; risk assessments for recidivism; the development of diversion programs; and the delivery of treatment to juvenile offenders with identified substance use/abuse issues. These services were delivered by a number of collaborating agencies, including five adolescent AOD treatment programs, mental health service providers, schools, community-based health centers, private and public employment agencies, recreational services providers, and other community institutions such as the police department. DYS served as the initial point of contact for juveniles and housed the project management, assessment, and case management staff, as well as the YIN Management Information System (MIS), an ancillary but critical component.

Results of the YIN project included improvements in the screening and assessment of juvenile offenders, development of a coalition of the substance abuse treatment providers, and increases in the range of services available to adjudicated youth in Lane County (YIN Evaluation Team, 2001). These results provided a substantial basis on which to build the JBTC program.

The JBTC process evaluation examined the transition from the YIN to JBTC. Informants interviewed during focus groups and in-depth, face-to-face interviews suggested that the YIN was beneficial to JBTC and that JBTC was a successful follow on to the YIN. According to these informants, the transition from the YIN to the JBTC model was not a difficult transition, especially because the “foundation had already been laid by the YIN.” One respondent indicated, “YIN seems to have made the planning and implementation process more efficient.”

Another stated, “JBTC is the benefactor of the YIN.” However, most DYS staff and managers perceived the transition from the YIN to JBTC as a welcome one. Each recognized and considered JBTC as an opportunity to improve upon the system-level processes and services developed under the YIN.

2.3 Program Components and Assessment

The JBTC program components were developed and implemented in Lane County in accordance with DYS policies and screening goals. All activities associated with each program component were documented and collectively archived in a Management Information System (MIS). Like the intervention and service-oriented components, the MIS is considered an essential component of the JBTC model and its presence would be expected in any replication of the program. The program components described and evaluated below are:

- urinalysis testing,
- substance abuse assessment and treatment,
- mental health assessment and services,
- case management that includes supervision by a probation counselor and service coordination by a service coordinator, and
- judicial oversight (including drug court for some participants).

Below, we describe each of the components, provide staff perceptions, and discuss the extent to which each component was implemented with fidelity. Fidelity is defined as the degree to which the actual program implementation in Lane County replicates the conceptual model that the National Institute of Justice (NIJ) had envisioned. Evaluations often include assessment of two types of fidelity: content and process. Content fidelity describes the extent to which some prescribed program or activity occurred as planned (e.g., all program components or treatment sessions were completed as planned) and process fidelity assesses whether a program or activity was implemented in the intended manner (e.g., pedagogical style). For this evaluation, we examined the content fidelity of each JBTC component and when possible the process fidelity of some components.

2.3.1 Management Information System (MIS)

The MIS is an electronic information management system maintained on a computer network that is designed to effectively and efficiently collect and store information on JBTC youth. The MIS allows for the retrieval of data by DYS staff (e.g., service coordinators,

probation counselors) and personnel at other agencies (e.g., program supervisors, and service providers) who are involved in the supervision or treatment of these juvenile offenders. At intake, a client record is created for all youth scheduled to be screened and assessed. This record includes the youth's name, Juvenile Justice Information System (JJIS) number, demographic information, and the nature of the charge. The MIS also contains a standardized risk assessment to determine if an offender is at "risk to re-offend." If the risk screen and the assessment indicate that an offender is high risk with AOD issues, additional sections of an AOD assessment are completed and entered into the MIS. Once an offender is referred to an AOD treatment program, treatment information is entered in the MIS, and is available to the DYS probation counselor/case manager, service coordinator, and the juvenile court. Other examples of treatment information included in the MIS are attendance and progress notes, which are also available to the case manager, service coordinator, and the court. Likewise, information is entered by the court clerk at each court appearance of the youth. Specific information entered includes appearance date, program notes, and outcomes. Other data stored in the MIS include results of the urine tests and information about the administration of and youth's responses to sanctions, incentives, and rewards.

DYS staff reported that data access and retrieval were greatly improved because of the MIS. Staff also reported that the MIS provided a system of accountability and "checks-and-balances"; served as a "one-stop-shop" for the retrieval of different kinds of information from multiple sources; and greatly improved communication within the DYS and between the DYS and the outside service-provider community.

These positive reports were balanced by concerns that data entry into the system was time consuming and that the MIS was a separate system that was not integrated with the statewide information system (i.e., JJIS). DYS personnel enter data in JJIS for all youth and enter data into the JBTC MIS for JBTC participants. These two systems house some of the same data, but also contain different information. Because these systems are not fully integrated, staff had to access both systems to retrieve comprehensive information on offenders. Furthermore, Probation Counselors (probation officers) reported spending more time utilizing the JJIS, while Service Coordinators most often utilized the JBTC MIS. Most respondents expressed a desire to integrate the systems to ensure complete data.

Despite these concerns, the MIS represents the cornerstone of managing an effort like JBTC and in this context was developed as intended with a strong degree of fidelity. A thorough review of the system and interviews with key users of the system suggests that JBTC implementation was significantly improved by the MIS. However, other communities may have difficulty implementing a comparable MIS since the development of Lane County's MIS began during the implementation of the five-year YIN program and prior to the implementation of JBTC. For other sites to replicate this component of the model would require allocation for the time and resources needed to develop, test, and implement a similar system.

2.3.2 Urinalysis (UA) Testing

UA testing is a major component of the JBTC model that allows DYS to identify and monitor drug use and inform intervention and treatment strategies. DYS staff and treatment providers regularly administer drug tests to all JBTC program participants. The frequency of UA testing depends on the program phase in which the youth is involved and can be as frequent as twice weekly. The results of each test are entered into the MIS and reported to the JBTC youth, his/her parents or legal guardians, and sometimes reported to the Rehabilitation and Progress (RAP) Court (the JBTC drug court) judge. This program component not only facilitates timely drug testing following arrest, but it allows for continual assessment of drug use during a youth's involvement with the juvenile justice system.

DYS staff expressed overwhelmingly positive perceptions of the UA testing implemented in conjunction with the JBTC program. Testing was unanimously viewed as one of the most effective system enhancements for JBTC youth because it allows for more comprehensive screening, which better informed intervention strategies and treatment planning. Testing allows for continuous monitoring of drug use during participation in JBTC. The staff also reported that the UA testing requirement motivated youth to reduce marijuana use to avoid sanctions. Staff members also reported receiving requests from parents to test their child in circumstances such as the youth exhibiting strange behaviors or not returning home overnight.

Although the UA testing requirement of the JBTC model is viewed positively by the JBTC staff, its implementation presented some unanticipated challenges and unintended consequences. A substantial challenge was to identify procedures for conducting the large increase in UA tests required by JBTC procedures. Depending on a youth's substance-using history, as many as two UA tests could be required each week. As caseloads increased, UA testing administration

became more difficult to coordinate and manage. However, through collaborative efforts, the probation counselors have partnered with the service coordinators and the treatment providers to manage the increased UA testing load.

Staff also had to modify procedures to thwart youth who were trying to alter their urine specimens (e.g., by adding water to the sample or by using someone else's urine). Staff members are not permitted to directly supervise a youth urinating to provide a urine sample, which affords youth the opportunity to tamper with or adulterate their specimen. Once concerns about potential tampering of UA samples occurred, DYS implemented the use of temperature strips that signal that a specimen is not at the proper temperature and likely has been altered.

A final challenge was to establish procedures that would minimize the opportunities for youth to manipulate their drug use to avoid detection. During the early stages of JBTC implementation, drug tests were scheduled so that youth could anticipate when they would be tested. Concern by staff that youth were timing their drug use to avoid detection led to the implementation of a random (or more random) testing schedule.

Another important unintended consequence of the UA testing program reported by staff and some youth was that some youth switched from using drugs that are detectable by UA tests for several days (e.g. marijuana) to alcohol or other illicit substances, which are not detectable in urine for more than 12-36 hours.

The urinalysis drug testing was reported to have had significant impact on marijuana use. However, some youth reported that they changed their AOD use, switching to alcohol and illicit drugs that do not remain detectable as long as marijuana. This behavior—substituting alcohol or certain illicit drugs for others—may have resulted from the non-random administration of the UA tests during the early implementation of JBTC. With non-random testing, some youth may have used illicit drugs (e.g., methamphetamine) between scheduled UAs that would cycle out of their system prior to their next scheduled testing. Case managers and probation counselors detected these patterns and changed to a more random UA administration schedule to detect more illicit drug use.

2.3.3 Alcohol and Other Drug (AOD) Abuse Treatment

The JBTC program requires that youth be screened for substance use and abuse during intake. If AOD use or abuse issues are identified, a service coordinator is assigned who is

responsible for contacting and referring the youth to a treatment provider whose program best meets the youth's needs. Such treatment services can be provided in an inpatient or outpatient program setting. Service coordinators also try to ensure that services are gender-specific, as well as culturally relevant.

In general, staff perceptions of the AOD treatment services were mixed. Positive staff perceptions of AOD treatment services were associated with JBTC providing a clearly identified set of service providers and agencies that specialize in AOD treatment for adolescents. In addition, staff viewed the funding resources provided through JBTC as helpful. Most respondents also credited the JBTC model with the development of female-specific programs and services, including the provision of inpatient AOD treatment beds for females that were funded exclusively with JBTC funds.

Both DYS staff and service providers reported that as a result of JBTC they developed and have maintained positive working relationships. According to service providers, these positive working relationships are an improvement over the quality of these relationships during the YIN project, when service providers were in intense competition with each other for DYS clients.⁶

Although JBTC resulted in improvements in the provision of AOD treatment, concerns remain about the limited availability of some needed services. These services include inpatient treatment slots/beds and transitional housing. In addition, staff members expressed concerns about the lack of service providers and agencies in the county's rural areas. Additionally, staff and service providers reported inadequate services for dually diagnosed offenders. These limitations resulted in some staff expressing frustration in their inability to match client needs with appropriate services and the need to "go to the next best thing" when they were unable to secure the most appropriate services.

2.3.4 Mental Health (MH) Services.

During intake processing, each youth receives a mental health screening. If mental health issues are identified or suspected, the youth is referred to a mental health specialist for a

⁶ During the YIN project, agencies were asked to provide comprehensive services to adolescents and their families in an effort to empower consumers by providing multiple choices for services. Multiple agencies responded to this request by developing new programs for substance-using juvenile offenders. Some agencies had "specialized" in providing such services for a number of years prior to implementation of the YIN. These agencies felt betrayed by the YIN, while the "new" service providers felt they invested resources into the development of programs and services and did not receive the number of clients they anticipated. Since JBTC, such issues appear to have been resolved.

comprehensive mental health assessment. Similar to the AOD process, DYS staff members use the assessment as the basis for referrals of JBTC youth to a treatment provider whose program best meets the youth's mental health needs. Treatment options include inpatient and outpatient program settings. Each provider is granted access to the MIS so they can review relevant information on the youth and enter treatment-related information (e.g., progress notes).

Staff perceptions regarding MH treatment services are similar to those regarding AOD treatment services. There is consensus that mental health assessments are adequately administered to JBTC participants. Staff members indicate that the JBTC model facilitates mental health assessment administration and generates resources to fund needed MH services. The MH specialist conducts comprehensive assessments and provides comprehensive reports that outline multi-systemic and multi-level perspectives for understanding the client's MH status and needs.

However, staff members also cited dissatisfaction with the MH services available to JBTC youth. In particular, there were concerns that available MH services seem to focus on medicating clients, monthly contact appointments, and prescription refills. In the opinion of some of the JBTC staff members, the efficacy of this approach from a follow-up and treatment perspective is questionable. These staff members consider the Lane County MH service-delivery model to be awkward and not equipped to meet the needs of juvenile offenders.

Although the provision of mental health assessments represented a marked increase in mental health-related services, those assessments did not necessarily translate into the provision of specialized mental health services. Staff indicated that the JBTC model increased the use of assessments and resources for MH services. Much of this improvement was credited to the on-site presence of a mental health specialist who provided comprehensive reports that outlined multi-systemic and multi-level perspectives on a client's MH status and needs. For these stated reasons, it was determined that the provision of mental health services was implemented with moderate success and fidelity.

For example, Multi-Clinical Treatment (MCT) was identified as a mental health service included in the constellation of services available to JBTC youth. The MCT model includes in-home services that use a family-centered approach to facilitate behavioral change. Many of these services are provided by a behavioral specialist trained in this particular modality. Because MCT was provided by one of the treatment providers, the evaluation was unable to assess it in

terms of content fidelity. Instead we examined the process fidelity or the extent to which treatment providers delivered the services within the appropriate conceptual framework.

Some JBTC staff members stated that MCT was unavailable to JBTC youth and their families and that the program was not clearly understood. On the other hand, some JBTC staff members indicated satisfaction with MCT services and reported having no problems accessing services for their clients. When probed about the lack of consensus, proponents of this model indicated that it was rarely, if ever, used outside of RAP court and that the MCT model had recently been significantly modified. Lastly, they suggested that some people may not have a clear understanding of the program. This confusion was further exacerbated because MCT was adapted from an existing, better-known therapeutic intervention called Multi-Systemic Therapy (MST). In fact, the local providers' attempts to modify this program may have driven the limited extent to which MCT was understood and used by DYS staff. These findings suggest that MCT was not implemented as intended regarding content or in the appropriate approach or delivery mode which requires intensive and frequent contact with a behavioral specialist.

2.3.5 Sanctions, Incentives, and Rewards.

The use of sanctions, incentives, and rewards (SIRs) is based on a theory of behavior modification designed to support and encourage positive behavior and compliance. DYS' application of SIRs was incorporated into the JBTC strategy in an effort to provide swift and appropriate responses to the behaviors of JBTC youth, which reflected either positive progress (which was rewarded) or non-compliance (which was sanctioned). Through the JBTC planning process, standardized policies were established to ensure consistency in the administration of SIRs.

Sanctions were defined as punishment for violating conditions of probation and judicial oversight and included detention, reduced privileges, home arrest, or curfews. They were administered in response to non-compliant behaviors, such as a positive UA or a missed curfew. *Incentives* were defined as attempts to motivate appropriate behavior, for example, an increase in privileges. *Rewards* were defined as positive reinforcement for appropriate prosocial behavior, for example, a food or clothing voucher. This system of sanctions, incentives, and rewards was utilized by various staff participating in JBTC (e.g., the RAP Court judge, service coordinators), and probation counselors.

When presented with the definitions of SIRs, staff members indicated a clear understanding of the terms; however, they also indicated overlap at times between the incentives and rewards. When asked to elaborate on the differences between incentives and rewards, participants offered the following:

- Incentives are planned, smaller, and given between phases.
- Rewards are spontaneous (unanticipated by client), bigger, and more special than incentives.

According to the JBTC staff, rewards were easier than incentives to administer because rewards are more clearly defined. Incentives, on the other hand, are more individualized and were used to motivate a youth to engage in better or more appropriate behavior. Thus, incentives were not always given based on positive behavior, but instead to encourage positive behavior making the provision of them more subjective than rewards which were based on positive behavior. JBTC staff members indicate the SIRs approach made tangible incentives and rewards available to youth and this availability allowed for immediate response, which is often important when trying to modify, extinguish, or maintain select behaviors. Both service coordinators and probation counselors utilized this approach and believe it was an effective asset that increased their work productivity.

Although the SIRs approach was well-received and highly utilized, the JBTC staff identified the following challenges to using this approach:

- Probation counselors had limited flexibility in terms of the sanctions they could employ
- Program participants requested items just because they knew the items were available
- Program participants perceived the administration of the SIRs as unfair
- Parents in some cases viewed the rewards and incentives as promoting criminal behavior

An overall assessment of the sanctions, incentives, and rewards (SIRs) system indicated that involved staff found it to be effective. Specifically, SIR availability allowed for immediate response, which staff thought important when trying to modify, extinguish, or maintain select behaviors. Both service coordinators and probation counselors utilized this approach and regarded it as a valuable tool to improve their ability to improve youth behavior and maintain desired outcome. However, challenges were identified that, once addressed, could further improve the efficacy of this approach. Specific examples included parental perceptions that some sanctions were too lenient. Such challenges were often exacerbated because parents of different youth compared SIRs and stated disapproval if they perceived disparities or inequities in their

distribution. The presence of non-adjudicated siblings in a household with JBTC youth presented another challenge. Some parents/guardians felt that JBTC youth were rewarded (or given incentives) for undesirable or inappropriate behaviors, which sent contradictory messages to siblings about the consequences of delinquent behavior. Such challenges were more prominent among families with limited resources, likely because such families were not financially able to provide comparable incentives and rewards to non-delinquent siblings.

The parameters outlining the administration of SIRs were not well-defined to make an overarching assessment of the level of fidelity to the intend provision. However, findings do suggest JBTC staff administered SIRs in the intended spirit and purpose of the approach. JBTC demonstrated an understanding of purpose of SIRs and a willingness to use SIRs to improve youth behavior.

2.3.6 Judicial Oversight and Juvenile Supervision

In an effort to closely monitor youth in the JBTC program, the Lane County Juvenile Court system established a separate docket to review the progress of JBTC youth via “progress hearings.” Initially, each JBTC youth had a court review hearing every 30 days. This time frame could be altered (increased or decreased) based on progress made or problems encountered by the youth. In addition to these routine hearings that were provided to all JBTC participants, a comprehensive and integrated system of supervision for monitoring JBTC youth was established that includes service coordination, probation, and judicial oversight. The RAP Court, which is the JBTC drug court, was provided to only a small proportion of the JBTC participants.

Within the *Service Coordination* component of juvenile supervision, each JBTC youth is assigned a service coordinator, who administers assessment protocols and identifies and secures the service and/or treatment needed by JBTC youth. These services may include AOD treatment, MH treatment, and school-related services. It is the responsibility of the service coordinator to coordinate the services needed by JBTC youth and monitor their progress. The role of the service coordinator provides structure to the linkage between the juvenile justice and treatment arenas. Based on their assessments, service coordinators make recommendations to the probation counselors who supervise JBTC youth. JBTC youth meet with their assigned service coordinators prior to meeting their probation counselors, which often results in the early identification of the youth’s treatment/service needs and options.

The progress hearing component of juvenile supervision is referred to as *judicial oversight*. The court mandates intervention plans, including drug testing, AOD treatment, and mental health services. The consistent application of SIRs is also an important characteristic of *judicial oversight*, which is provided by the judge, probation counselors, and the service coordinators. Communication among these representatives of the court regarding the status and progress of JBTC youth is enhanced by their access to the MIS.

Overall, JBTC staff members stated that the roles of service coordinators and probation counselors, in concert, provided for intensive supervision, which benefited the JBTC youth. Staff perceptions of juvenile supervision were favorable and supportive. For example, probation counselors expressed great appreciation for service coordinators, with whom prior to JBTC, they had a “strained” relationship. In turn, service coordinators were viewed as having “lightened the load for the probation counselor,” who otherwise would have assumed the responsibility of coordinating services. Services, however, were not deemed to be adequate for dually-diagnosed youth.

In terms of fidelity, Case Management, which includes service coordination and supervision (i.e., probation), was well-integrated and effective at achieving its intended goals. Through open dialogue and discussion, probation counselors and service coordinators were able to develop an efficient system of managing JBTC youth. Findings also suggest that DYS was able to secure the necessary level of care and services from AOD treatment agencies for JBTC youth despite the limited availability of inpatient treatment slots/beds.

Drug (RAP) Court. The drug court component of Lane County JBTC was the RAP Court. This court, under the jurisdiction of one juvenile court judge, had a capacity of 25 youth and, thus, was not able to oversee the entire JBTC population. A subset of JBTC participants was assigned to the RAP Court; most were randomly assigned but some were placed into the court through actions by the RAP Court judge or DYS staff. Eligibility for this drug court component was based on the following conditions:

- Youth is eligible for JBTC services (high-risk youth with AOD issues)
- A petition is filed for the youth’s case
- Youth is assessed at intake by the Drug Court service coordinator

Youth assigned to RAP court had frequent contact with the RAP Court judge and other JBTC staff. The distinctive features of this drug court included frequent contact with the judge,

frequent use of SIRs, regular UA testing, and more family involvement in the court proceedings and the supervision of the youth.

DYS staff perceived RAP Court as one of the most effective system enhancements. Respondents described the goals of RAP Court as follows: to eliminate AOD use, prevent recidivism, and reunite families or at least improve family functioning. Respondents indicated that RAP Court was the only program component exclusively available to JBTC youth. The interest in RAP Court is very high, and is perceived by some as a “separate” program from JBTC because of the significant resources needed for its operation.

Respondents viewed RAP Court as a holistic, comprehensive approach to working with drug-involved juvenile offenders. The RAP Court:

- allows for weekly monitoring of youth through staffing and case reviews,
- requires regular court appearances,
- provides ongoing supervision, and
- provides a mechanism by which youth are held accountable for their behaviors.

Respondents believe the phases and the SIRs used to hold youth accountable is a major contributor to the success of the RAP court and the youth it serves. Staff also believe the RAP Court model allows for weekly contact between RAP Court staff members and treatment providers, thus promoting a high level of communication. This process was described as extremely collaborative. Finally, the RAP Court judge was cited by many as a critical factor and seen a major contributor to the success of this program component. He is perceived as being aware of treatment services available to youth and their families, and staff commented on how well he gets to know the participating youth.

The RAP Court component of JBTC is potentially a dynamic component of any intervention designed to impact drug offending youth because of its intense and frequent contact with the court. However, our evaluation of this component clearly suggests that how and who administers this component may also play a significant role in its success. The RAP Court judge was charismatic but firm and able to quickly get the attention of the participating youth to understand the conditions of their involvement in the RAP Court component of JBTC. While these observations are not conclusive or suggestive of a positive impact of the RAP Court component, they do suggest that the fidelity of this component has to consider the “who” as much as the “how”. Based on this approach, we can conclude that the RAP Court content for properly implemented and the RAP Court process was influenced by the RAP Court judge. In

other words, this component was implemented properly, but it is not certain whether the current judge's style and approach was effective.

2.4 Barriers to Collaboration and Program Implementation

JBTC included a range of stakeholders internal and external to the Department of Youth Services who collaborated to implement the JBTC program. To assess the collaborative process, a *Barriers to Collaboration & Implementation Survey* was administered in fall 2001 to members of the JBTC Policy Board (N=33) to assess the pre-JBTC environment and the current JBTC environment after JBTC reached full implementation stage. Members of various community sectors, including law enforcement, non-profit organizations, schools, state and local government, social/human services, substance abuse and mental health treatment, and juvenile corrections comprised the JBTC Policy Board. Each was asked to identify and examine any potential barriers to the development and implementation of JBTC.

Three major issues related to **either** collaboration or implementation were identified by the Policy Board respondents.

- **Collaboration:** Almost all (85.7%) of the respondents indicated that collaboration, initially, was not viewed as an effective means toward achieving the substance abuse treatment goals identified by Lane County. However, fewer respondents (42.9%) indicated this issue as a current major barrier; suggesting that over time, respondents began to view collaboration more favorably with respect to implementing multi-agency projects.
- **Resources:** Almost half (42.9%) of the respondents initially identified insufficient resources for staffing and/or programming as a major barrier to collaboration and implementation at some point during the process. The same percentage of respondents identified this issue as a current barrier to collaboration and implementation. Therefore, insufficient resources continue to be a barrier in the view of some Policy Board members.
- **Community Awareness:** Almost a quarter (23.8%) of the respondents believed inadequate community awareness and understanding of the seriousness of drug use among youth was a major barrier to collaboration and implementation. However, fewer respondents (14.3%) identified this issue as a current barrier, suggesting that community awareness of this issue may have increased over time.

Respondents were also asked to indicate the aspects of the program's development and implementation that they would change or enhance, given their current knowledge. The most common responses were related to funding, the referral process, and specific aspects of programming, including the need for the development and provision of services in rural communities. Feedback regarding funding focused on the need to obtain funding beyond that

currently being provided by the Federal government. The process of referring youth to service providers was also discussed by respondents. Specifically, they indicated that the referral process was not balanced across the agencies and that JBTC staff seemed to have their favorite programs to which they referred the majority of clients. Respondents identified the need for a “fair,” “objective,” and more “balanced” process by which referrals are made.

Respondents also identified specific aspects of programming that they would change. They expressed ideas about channeling more money into female-specific programs from the onset. Another programmatic aspect identified was the desire for better assessment strategies and criteria for identifying at-risk youth. Finally, respondents identified a mismatch of services between the rural and urban communities. Specifically, they said the services in the rural communities were inadequate, or, in many instances, non-existent. Respondents said they would have allocated funds for the development and delivery of services in rural areas.

2.5 Summary

The process evaluation reveals that Lane County was successful in implementing many of the key components of the JBTC program. DYS staff members and representatives of the services community indicated that JBTC had improved communication and coordination between agencies working with high risk youth. JBTC was also viewed as having increased the availability of appropriate services—particularly AOD treatment—to which youth could be referred and to have resulted in better services for girls. Staff felt that improvements were still needed in the types of family and mental health services to which youth could be referred and that more services were needed for the rural areas of the county.

The increased use of urinalysis to detect illicit drugs and to hold youth accountable for their substance use was also viewed as a significant benefit of the JBTC program. Adjustments were made to the administration of testing during JBTC implementation to improve its usefulness. These adjustments included changing the administration of the testing so that it was random rather than scheduled and incorporating temperature strips to prevent tampering with provided urine samples.

The RAP Court program, which operated as a juvenile drug court in concert with the JBTC program, was also seen as highly effective in managing the behavior of high risk youth. A deficiency of the RAP Court program is capacity, in that the court can serve only 25 youth.

There is also a need to carefully select the judicial administrator(s) of such a component to ensure their judicial demeanor is appropriate for this type of program.

3 JBTC Outcome Evaluation

The JBTC program was designed and delivered to produce certain outcomes in participating youth. The primary outcomes sought by JBTC are reduced delinquency and substance use. Secondary outcomes include increased access to substance abuse treatment and mental health services, and improved school performance and family functioning. To evaluate the JBTC program along these dimensions, we collected data on youth who were referred to and received risk assessments at the Lane County DYS during the baseline recruitment period, which ran from April 15, 2000 to November 15, 2001.

We conducted three waves of interviews with and collected administrative data on a baseline sample of 306 youth. The first interview occurred within approximately one month of the youth being risk assessed at DYS. The second interview was conducted approximately six months after the baseline interview, and the third interview was conducted approximately six months after the 6-month follow-up interview, or 12 months after the baseline interview. We conducted 306 baseline interviews, 208 6-month follow-up interviews, and 183 12-month follow-up interviews. As discussed in Section 1.3.2.2, the only significant difference between youth who were retained in the study over time and those who dropped out of the study was that those who were retained were more likely to be female than those youth who were not retained.

In the following section, we describe those recruited into the evaluation, comparing the JBTC participants with the youth who were not enrolled in JBTC. In Section 3.2, we present the results of the multivariate outcome models.

3.1 JBTC Program Evaluation Participants

This section of the report describes the youth who were recruited into the JBTC program evaluation. The sample descriptive statistics are presented below in **Exhibit 3-1**. The statistics are from baseline data and describe the sample either at the time of the baseline interview or over the six-month period before the baseline interview. Statistics for the entire sample and the JBTC and non-JBTC participants are shown. The p-values for tests of equivalence of the JBTC and non-JBTC groups are also included; the p-values are for chi-square statistics for nominal/ordinal measures and for t-tests for continuous measures. Overall, the results in Exhibit 3-1 suggest that where statistically significant differences exist, the JBTC group had values that implied higher

risk in the sense of theoretical or empirical linkages to delinquency and other anti-social behaviors when compared with the non-JBTC group.

Exhibit 3-1. Descriptive Data on the JBTC Evaluation Sample

Variable	Whole Sample (N = 306)		JBTC Sample (N=149)		Non-JBTC Sample (N=157)		p-value*
	n	%	n	%	n	%	
Gender							
Male	214	69.9%	104	69.8%	108	68.8%	0.52 ^x
Female	92	30.1%	45	30.2%	49	31.2%	
Age (at baseline)							
Mean	15.25		15.48		15.02		0.0001 ^t
Range	9 - 18		10 - 18		9 - 18		
Race							
White	236	77.1%	107	71.8%	125	79.6%	0.068 ^x
Non-white	70	22.9%	39	26.2%	29	18.5%	
Risk Scores							
Mean school risk score (range)	2.15 (0-5)		2.6 (0-5)		1.68 (0-4)		0.0001 ^t
Mean Family risk score (range)	2.73 (0-7)		3.44 (0-7)		1.99 (0-6)		0.0001 ^t
Mean crime risk score (range)	2.41 (0-7)		2.92 (1-7)		1.89 (0-6)		0.0001 ^t
Mean drug risk score (range)	1.4 (0-4)		2.3 (0-4)		0.49 (0-3)		0.0001 ^t
Mean total risk score (range)	8.9 (0-20)		11.48 (3-20)		6.25 (0-17)		0.0001 ^t
Housing (at baseline)							
Living in house, apartment, etc.	264	86.3%	121	81.2%	143	91.1%	0.013 ^x
Living on the street	9	2.9%	5	3.4%	4	2.5%	0.75 ^x
Living in a shelter or facility	32	10.5%	22	14.8%	10	6.4%	0.024 ^x
School							
Enrolled (at baseline)	237	77.5%	101	67.8%	136	86.6%	0.0001 ^x
Been Suspended (ever)	258	84.3%	132	88.6%	126	80.3%	0.025 ^x
Family							
Caregiver income from job (at baseline)	239	78.1%	109	73.2%	130	82.8%	0.081 ^x
Family member with severe AOD problem (ever)	203	66.3%	110	73.8%	93	59.2%	0.005 ^x
Family member with a criminal history (ever)	210	68.6%	116	77.9%	94	59.9%	0.002 ^x
Self-Reported Violence (ever)							
Victim	207	67.6%	110	73.8%	97	61.8%	0.019 ^x
Perpetrator	172	56.2%	93	62.4%	79	50.3%	0.037 ^x
Delinquency (prior 6 months)							
Arrested	90	29.4%	58	38.9%	32	20.4%	0.0001 ^x
Mean number of arrests (range)	1.42 (1-6)		1.63 (1-6)		1.22 (1-3)		0.0001 ^t
Mean number of arrests for those arrested (range)	2.43 (2-6)		2.62 (2-6)		2.09 (2-3)		0.006 ^t
Mean severity score (range)	2.21 (0-16)		2.89 (0-16)		1.57 (0-16)		0.003 ^t
Mean severity score for those arrested (range)	7.53 (4-16)		7.43 (4-16)		7.71 (4-16)		0.987 ^t
Maximum severity score (range)	16 (0-16)		16 (0-16)		16 (0-16)		0.0001 ^t
Substance Use (prior 6 months)							
Tobacco	204	66.7%	129	86.6%	75	47.8%	0.0001 ^x
Alcohol	206	67.3%	121	81.2%	85	54.1%	0.0001 ^x

Variable	Whole Sample (N = 306)		JBTC Sample (N=149)		Non-JBTC Sample (N=157)		p-value*
	n	%	n	%	n	%	
Marijuana	200	65.4%	131	87.9%	69	43.9%	0.0001 ^X
Illicit Drugs other than Marijuana	98	32.0%	67	45.0%	31	19.7%	0.0001 ^X
Crack Cocaine	7	2.3%	6	4.0%	1	0.6%	0.061 ^X
Powder Cocaine	24	7.8%	21	14.1%	3	1.9%	0.0001 ^X
Amphetamine	48	15.7%	35	23.5%	13	8.3%	0.0001 ^X
Inhalants	12	3.9%	8	5.4%	4	2.5%	0.25 ^X
Hallucinogens	60	19.6%	39	26.2%	21	13.4%	0.006 ^X
Heroin	6	2.0%	6	4.0%	0	0.0%	0.013 ^X
Barbiturates	16	5.2%	12	8.1%	3	1.9%	0.016 ^X
Designer Drugs	29	9.5%	20	13.4%	9	5.7%	0.03 ^X
Substance Abuse Treatment (prior 6 months)							
Received Treatment	22	7.2%	12	8.1%	10	6.9%	0.66 ^X
Used illicit drugs and received treatment	18	9.0%	11	8.3%	7	10.1%	0.33 ^X
Mental Health Diagnoses (prior 6 months)							
Depression	47	15.4%	30	20.1%	17	10.8%	0.026 ^X
ADD/ADHD	16	5.2%	8	5.4%	8	5.1%	1 ^X
Bi-polar disorder	8	2.6%	5	3.4%	3	1.9%	0.489 ^X
Post Traumatic Stress Disorder (PTSD)	8	2.6%	6	4.0%	2	1.3%	0.163 ^X
Obsessive Compulsive Disorder (OCD)	10	3.3%	8	5.4%	2	1.3%	0.054 ^X

*p-value for test statistics comparing JBTC and non-JBTC values; ‘X’ indicates a chi-square test and ‘t’ indicates a t-test.

Demographic Measures. The JBTC and non-JBTC youth were demographically similar at baseline. The majority (70%) of those recruited into the evaluation study are male, a proportion that was also true of the JBTC (70%) and non-JBTC (69%) participants. Participants in the study ranged in age from 9 to 18. The overall mean age of 15.25 years at baseline was similar for JBTC youth (15.48) and non-JBTC youth (15.02), although this difference of about half a year was statistically significant. Approximately 77% of the evaluation participants, or 236 youth, identified themselves as white.⁷ Approximately 72% of the JBTC youth and about 80% of the non-JBTC youth participating in the evaluation identified themselves as white.⁸

Risk Scores. Youth are administered a risk assessment that evaluates them on four dimensions—school, family, crime and drugs. The scores for each of these dimensions are summed to produce a total risk score. Higher risk scores indicate the youth is at greater risk.

⁷ Of the 70 youth (23%) who identified themselves as non-white, 6 are black, 18 are Hispanic, and 46 are of another race, which includes Asians, Native Americans, and those who are multi-racial.

⁸ Of the 39 JBTC youth (26%) who identified themselves as non-white, 5 are black, 9 are Hispanic, and 25 are of another race. Of the 29 non-JBTC youth (19%) who identified themselves as non-white, 2 are black, 8 are Hispanic, and 19 are of another race. Race/ethnicity data were not reported by three JBTC and three non-JBTC youth.

The mean risk scores for youth participating in the JBTC evaluation were 2.15 for school, 2.73 for family, 2.41 for crime, 1.4 for drugs, and 8.9 for total risk. The mean risk scores for JBTC participants were significantly higher than those of the non-JBTC participants. JBTC participants had mean risk scores of 2.6 for school, 3.44 for family, 2.92 for crime, 2.3 for drugs, and 11.48 for total risk. Mean scores for non-JBTC youth participating in the evaluation were 1.68 for school, 1.99 for family, 1.89 for crime, 0.49 for drugs, and 6.25 for total risk.

Youth were typically considered to be high risk, and, therefore, likely to be considered for JBTC, if their total risk scores were above 10. However, in some cases intake staff would “override” a risk score below 10 and classify a youth as high risk. This override was often done in an effort to make sure a youth would receive treatment when the youth had a high score on the drug component but scored relatively low on the other components.

Housing. Most of the youth participating in the JBTC evaluation study (264, 86.3%) reported living in a house or apartment at baseline, whereas 9 (2.9%) reported living on the street or in a shelter and 32 (10.5%) reported living in a treatment or detention facility. Most of the JBTC participants (121, 81.2%) reported living in a house or apartment at baseline, whereas 5 (3.4%) reported living on the street or in a shelter and 22 (14.8%) reported living in a treatment or detention facility. Most of the non-JBTC youth participating in the evaluation (143, 91.1%) reported living in a house or apartment at baseline, whereas 4 (2.5%) reported living on the street or in a shelter and 10 (6.4%) reported living in a treatment or detention facility. Overall, JBTC youth were less likely to be living in a house or apartment and more likely to be living in a residential treatment or detention facility at baseline than were non-JBTC youth.

School. Of those participating in the evaluation, 237 (78%) reported having completed or being enrolled in school, whereas 68 (22%) reported no longer attending school. When asked about whether they had ever been suspended from school, 258 (85%) answered affirmatively, whereas 46 (15%) reported that they had never been suspended from school. JBTC participants were less likely than non-JBTC participants to report having completed or being enrolled in school (67.8% versus 86.6%, respectively). JBTC participants were more likely than non-JBTC participants to report having been suspended from school (132 or 88.6% vs. 126 or 80.3%, respectively).

Family Characteristics. Most evaluation study participants (239, 80%) reported that their primary caregiver received most of their income from salary or wages, but 58 (20%) reported

that their primary caregiver received most of their income from social services or illegal activity. The majority of JBTC participants (109 or 73.2%), and 130 (82.8%) of the non-JBTC participants, reported having a primary caregiver who received most of their income from salary or wages.

Two-thirds of study participants (203, 67%) reported having a family member with a severe problem with alcohol or drugs. Significantly more of the JBTC participants (110 or 73.8%) than the non-JBTC participants (93 or 59.2%) reported having a family member with a severe problem with alcohol or drugs.

Most of study participants (210 or 73%) also reported having a family member with a criminal history. JBTC participants were more likely than non-JBTC participants to report having a family member with a criminal history (116 or 77.9% and 94 or 59.9% of the JBTC and non-JBTC participants, respectively).

Self-Reported Violence. The majority of study participants reported being a victim of violence: 207 youth (68%) reported having been a victim of a physical attack at some time in their life in which the perpetrator was trying to cause serious harm. JBTC participants (110 or 73.8%) were more likely than non-JBTC participants (97 or 61.8%) to have reported being a victim of a physical attack.

The majority of study participants also reported being a perpetrator of violence: 172 youth (57%) reported having attacked someone at some time in their life with the idea of seriously hurting them. JBTC participants were more likely than non-JBTC participants to report being a perpetrator of a physical attack (62.4% versus 50.3%, respectively).

Delinquency. Data from the Oregon Juvenile Justice Information System (JJIS) were used to determine the extent to which youth participating in the study were involved with the juvenile justice system. All measures of delinquency reported here exclude the instant offense, which is the arrest that led to the youth being eligible for the study.

During the six months before the baseline interview, 90 of the JBTC evaluation study youth (29%) had been arrested at least once in addition to the instant offense. The proportion of JBTC participants with at least one additional arrest was 38.9% (n=58)—almost double the 20.4% (n=32) of non-JBTC youth who were arrested during this time.

JBTC youth were not only more likely to have experienced an arrest, but had experienced more arrests during the six months prior to the baseline interview. The mean number of arrests

experienced by youth participating in the evaluation was 1.42. For JBTC and non-JBTC youth, the means were 1.63 and 1.22, respectively. Conditional on having an (additional) arrest, the sample was arrested an average of 2.43 times in the 6 months before baseline. The JBTC and non-JBTC youth who had been arrested were arrested at least once, on average, were arrested 2.62 and 2.09 times, respectively, during this period.

Each arrest recorded in JJIS is given a severity score that indicates the seriousness of each charge for which the youth was arrested. Severity scores range from 1 to 19, with 19 being the most serious (murder). Scores of 1 and 2 indicate status offenses and supervision violations, respectively. For analysis purposes, we adjusted the severity scores by reducing scores of 1 and 2 to 0, since these scores reflect arrests or contacts for non-criminal charges. As these are ‘non-criminal’ charges, we omitted these charges when we analyzed arrest severity. Scores of 3-6 reflect arrests for misdemeanor property or other offenses. Scores of 7-10 reflect arrests for misdemeanor person or violent offenses. Scores of 11-14 reflect arrests for felony property or other offenses. Scores of 15-19 reflect arrests for felony person or violent offenses. The highest severity score associated with JBTC and non-JBTC youth in the study in the six months before baseline was 16. The lowest score for JBTC and non-JBTC youth was 4.

For the total sample of 306 youth, the mean severity score for arrests in the six months prior to risk assessment was 2.21. These figures do not include the instant offense. The mean scores for JBTC and non-JBTC youth were 2.89 and 1.57, respectively. These figures may appear to be rather low, but the means include zero values for any youth who was not arrested or who had severity scores in the 1 to 2 range for an arrest. If the sample is restricted to the 90 youth who were arrested for a criminal charge in the six months prior to risk assessment in addition to their instant offense, the mean severity score was 7.5 (sd = 3.46). There was no significant difference in the mean severity scores for JBTC and non-JBTC youth. For JBTC youth, the mean score was 7.43 (sd = 3.40) and for non-JBTC youth, the mean score was 7.71 (sd = 3.61).

Substance Use. During the baseline interview, youth were asked whether they had used various substances. Those youth who responded affirmatively were then asked more detailed questions about the age of first use, recency of use, frequency of use, etc. for that substance. Self-reported data were collected for lifetime, six months prior to baseline, and thirty days prior to baseline for alcohol, tobacco, and ten illicit drugs (or drug categories).

Exhibit 3-2 shows self-reported lifetime use of tobacco products, alcohol, marijuana, and other illicit drugs excluding marijuana. As can be seen, most of the 306 youth participating in the JBTC evaluation reported using tobacco products (245, 80.1%), alcohol (259, 84.6%), and marijuana (253, 82.7%) at some time in their life. About half of the youth (150, 49.0%) reported using an illicit drug other than marijuana at least once in their lifetime. For specific illicit substances, 119 youth (38.9%) reported using hallucinogens, 67 (21.9%) reported using amphetamine or methamphetamine, 49 (16.0%) reported using “designer drugs” such as ecstasy, 48 (15.7%) reported using inhalants, 42 (13.7%) reported using powder cocaine, 34 (11.1%) reported using barbiturates or tranquilizers, 14 (4.6%) reported using crack cocaine, and 14 (4.6%) reported using heroin at least once in their lifetime.

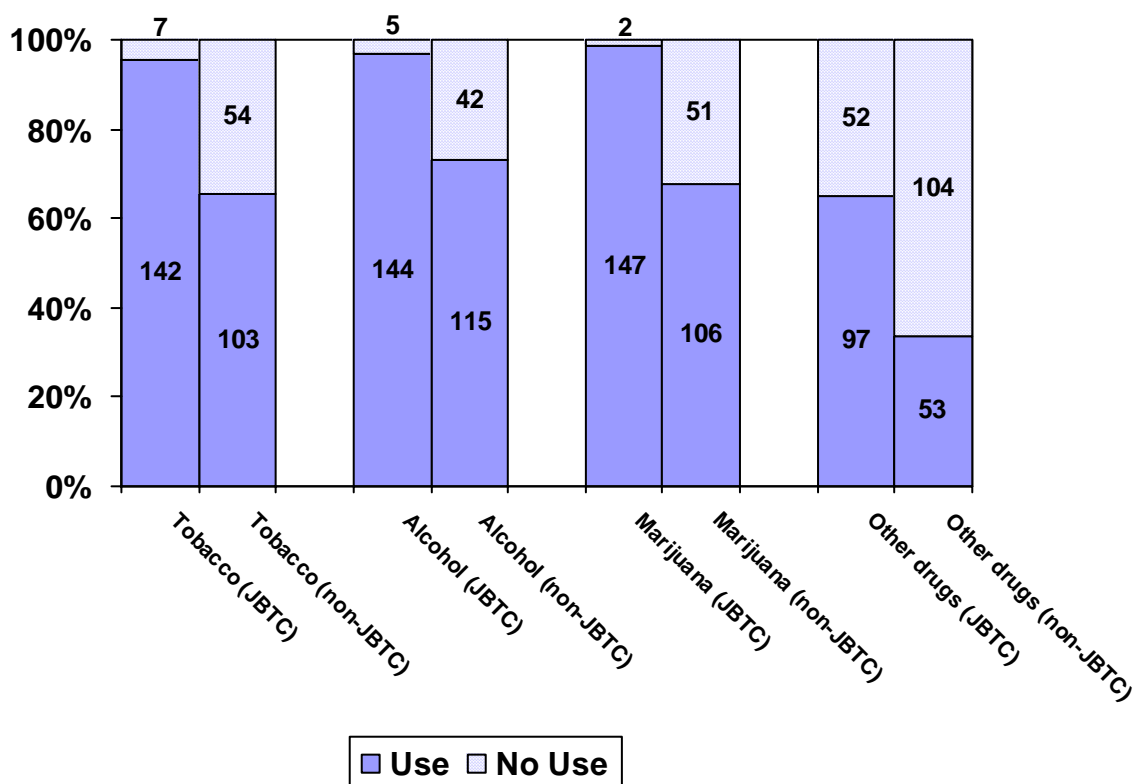


Exhibit 3-2. Self-Reported Lifetime Substance Use

(The numbers of JBTC and non-JBTC youth reporting use are indicated on the columns.)

Nearly all of the 149 JBTC youth reported using tobacco products (142 or 95.3%), alcohol (144 or 96.6%), and marijuana (147 or 98.7%) at some time in their life. Nearly two-thirds of the JBTC youth (97 or 65.1%) reported using an illicit drug other than marijuana at least once in

their lifetime. For specific illicit substances, 82 youth (55.0%) reported using hallucinogens, 50 (33.6%) reported using amphetamine or methamphetamine, 33 (22.1%) reported using “designer drugs” such as ecstasy, 32 (21.5%) reported using inhalants, 31 (20.8%) reported using powder cocaine, 24 (16.1%) reported using barbiturates or tranquilizers, 10 (6.7%) reported using crack cocaine, and 11 (7.4%) reported using heroin at least once in their lifetime.

A majority of the 157 non-JBTC youth reported using tobacco products (103 or 65.6%), alcohol (115 or 73.2%), and marijuana (106 or 67.5%) at some time in their life. About a third of the non-JBTC youth (53 or 34%) reported using an illicit drug other than marijuana at least once in their lifetime. For specific illicit substances, 37 youth (23.6%) reported using hallucinogens, 17 (10.8%) reported using amphetamine or methamphetamine, 16 (10.2%) reported using “designer drugs” such as ecstasy, 16 (10.2%) reported using inhalants, 11 (7.0%) reported using powder cocaine, 10 (6.4%) reported using barbiturates or tranquilizers, 4 (2.5%) reported using crack cocaine, and 3 (1.9%) reported using heroin at least once in their lifetime.

As AOD use was a criterion for JBTC participation, the high rates of self-reported use by JBTC participants is not surprising. The high rates of self-reported use by the non-JBTC youth are perhaps more surprising. These lifetime figures, of course, include experimentation (e.g., one time use) and experimentation that may have occurred sometime earlier. The self-reported use in the past 6 months informs this issue.

Exhibit 3-3 shows the numbers of JBTC and non-JBTC youth who reported tobacco, alcohol, marijuana, and other drug use during the six months prior to the baseline interview. As can be seen, most of the 306 youth participating in the JBTC evaluation reported using tobacco products (204, 66.7%), alcohol (206, 67.3%), and marijuana (200, 65.4%) in the six months prior to the baseline interview. About a third of the youth (98, 32.0%) reported using an illicit drug other than marijuana in the six months prior to the baseline interview. With regard to specific illicit substances, 60 youth (19.6%) reported using hallucinogens, 48 (15.7%) reported using amphetamine or methamphetamine, 29 (9.5%) reported using “designer drugs” such as ecstasy, 24 (7.8%) reported using powder cocaine, 16 (5.2%) reported using barbiturates or tranquilizers, 12 (3.9%) reported using inhalants, 7 (2.3%) reported using crack cocaine, and 6 (2.0%) reported using heroin in the six months prior to the baseline interview.

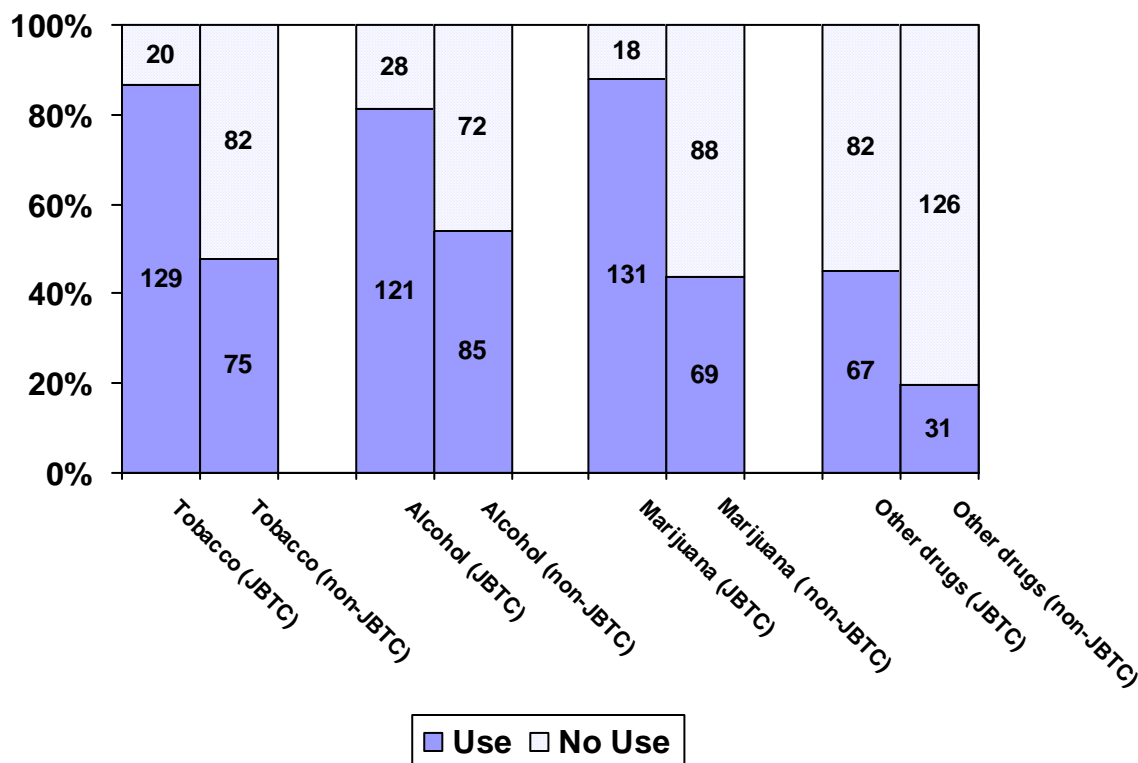


Exhibit 3-3. Previous Six-Month, Self-reported Substance Use.

(The numbers of JBTC and non-JBTC youth reporting use are indicated on the columns.)

Most of the 149 JBTC youth reported using tobacco products (129, 86.6%), alcohol (121, 81.2%), and marijuana (131, 87.9%) in the six months prior to the baseline interview, while about half of the JBTC youth (67, 45.0%) reported using an illicit drug other than marijuana in the six months prior to the baseline interview. With regard to specific illicit substances, 39 (26.2%) reported using hallucinogens, 35 (23.5%) reported using amphetamine or methamphetamine, 20 (13.4%) reported using “designer drugs” such as ecstasy, 21 (14.1%) reported using powder cocaine, 12 (8.1%) reported using barbiturates or tranquilizers, 8 (5.4%) reported using inhalants, 6 (4.0%) reported using crack cocaine, and 6 (4.0%) reported using heroin in the six months prior to the baseline interview.

About half of the 157 non-JBTC youth reported using tobacco products (75, 47.8%), alcohol (85, 54.1%), and marijuana (69, 43.9%) in the six months prior to the baseline interview.

About a fifth of the non-JBTC youth (31, 19.7%) reported using an illicit drug other than marijuana in the six months prior to the baseline interview. With regard to specific illicit substance use, 21 (13.4%) reported using hallucinogens, 13 (8.3%) reported using amphetamine or methamphetamine, 9 (5.7%) reported using “designer drugs” such as ecstasy, 3 (1.9%) reported using powder cocaine, 3 (1.9%) reported using barbiturates or tranquilizers, 4 (2.5%) reported using inhalants, 1 (0.6%) reported using crack cocaine, and 0 (0%) reported using heroin in the 6 months prior to the baseline interview.

The final time period in which youth were asked to self-report substance use was the thirty days prior to the baseline interview. It should be noted that for many of these youth, this period occurred entirely or mostly following the arrest that lead to their inclusion in the study. **Exhibit 3-4** shows the numbers of members of both groups self-reporting substance use in the previous thirty days.

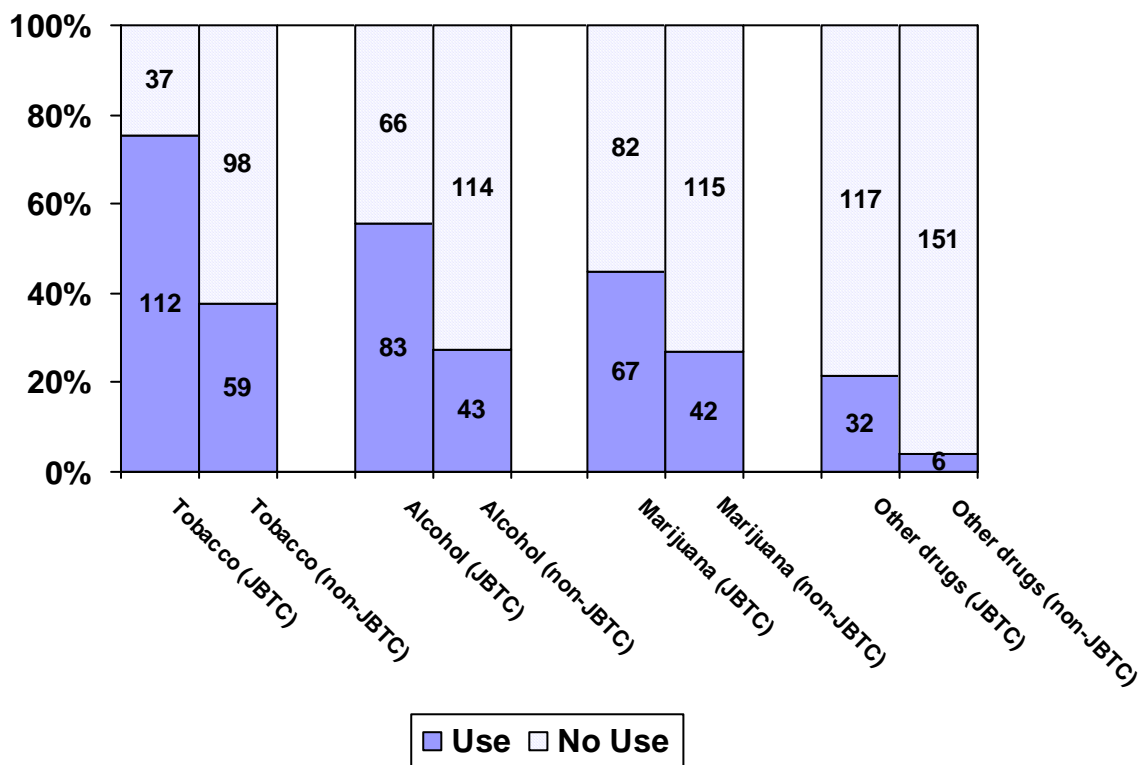


Exhibit 3-4. Previous 30 Days, Self-Reported Substance Use.

(The numbers of JBTC and non-JBTC youth reporting use are indicated on the columns.)

Over half (171, 55.9%) of the 306 youth participating in the JBTC evaluation reported having used tobacco products, 126 (41.2%) reported using marijuana, and 110 (36.0%) reported using alcohol in the 30 days prior to the baseline interview. As for illicit drugs other than marijuana, 38 youth (12.4%) reported use in the 30 days prior to the baseline interview.⁹

A majority of the 149 JBTC youth (112, 75.2%) reported using tobacco products, 83 (55.7%) reported using marijuana and 67 (45.3%) reported using alcohol in the 30 days prior to the baseline interview. As for illicit drugs other than marijuana, 32 youth (21.5%) reported use in the 30 days prior to the baseline interview.¹⁰ The non-JBTC participants were less likely to report substance use during the 30 days prior to the baseline interview. About a third of the 157 non-JBTC youth (59, 37.6%) reported using tobacco products, 43 (27.4%) reported using marijuana and 42 (26.8%) reported using alcohol in the 30 days prior to the baseline interview. As for illicit drugs other than marijuana, only 6 youth (3.8%) reported use in the 30 days prior to the baseline interview.¹¹

Youth who participated in the JBTC evaluation were also asked how old they were when they first used a substance. For the 306 evaluation study participants, the mean ages of onset for the most commonly reported substances are 11.1 years for tobacco, 12.2 years for alcohol, 12.1 years for marijuana; 13.9 for hallucinogens; and 14.3 years for amphetamine/methamphetamine. JBTC participants reported slightly younger ages of onset than non-JBTC participants for most substances—10.7 versus 11.6 years for tobacco, 12.1 versus 12.2 years for alcohol, 11.6 versus 12.9 years for marijuana, 13.7 versus 14.4 years for hallucinogens, and 14.2 versus 14.4 years for amphetamine/methamphetamine, respectively.

⁹ With regard to specific illicit substance use, 23 youth (7.5%) reported using hallucinogens, 21 (6.9%) reported using amphetamine or methamphetamine, 12 (3.3%) reported using “designer drugs” such as ecstasy, 8 (2.6%) reported using barbiturates or tranquilizers, 7 (2.3%) reported using powder cocaine, 3 (1.0%) reported using inhalants, 3 (1.0%) reported using crack cocaine, and 2 (0.6%) reported using heroin at least once in the 30 days prior to the baseline interview.

¹⁰ With regard to specific illicit substance use, 17 youth (11.6%) reported using hallucinogens, 18 (12.1%) reported using amphetamine or methamphetamine, 8 (5.4%) reported using “designer drugs” such as ecstasy, 6 (4.0%) reported using barbiturates or tranquilizers, 5 (3.4%) reported using powder cocaine, 2 (1.2%) reported using inhalants, 6 (4.1%) reported using crack cocaine, and 2 (1.4%) reported using heroin at least once in the 30 days prior to the baseline interview.

¹¹ With regard to specific illicit substance use, 2 youth (1.2%) reported using hallucinogens, 3 (1.8%) reported using amphetamine or methamphetamine, 2 (1.2%) reported using “designer drugs” such as ecstasy, 2 (1.2%) reported using barbiturates or tranquilizers, 2 (1.2%) reported using powder cocaine, 1 (0.6%) reported using inhalants, 1 (0.6%) reported using crack cocaine, and 0 (0.0%) reported using heroin at least once in the 30 days prior to the baseline interview.

AOD Treatment. Data from the Client Process Monitoring System (CPMS) were used to determine which youth participating in the JBTC evaluation study received substance abuse treatment. The CPMS is Oregon's system for maintaining data on services rendered by publicly funded behavioral health programs. All state-licensed providers of substance abuse treatment are required to submit client-level data on the treatment they have administered.¹² These data exclude any treatment that was paid for with private funds (e.g., health insurance) and, therefore, may undercount treatment provided. There is no reason to assume, however, that this undercount would differ for our two study groups.

According to the CPMS data, only 22 (7%) of the 306 youth participating in the JBTC evaluation study received AOD treatment services in the six months prior to participating in the risk assessment that indicated their eligibility for the study. Of the 149 JBTC youth, only 12 (8.1%) received substance abuse treatment in the six months prior to risk assessment. Of the 157 non-JBTC youth, only 10 (6.4%) received AOD treatment in the six months prior to risk assessment.

Mental Health Diagnoses and Treatment. Youth were asked whether they had been diagnosed by a professional as having depression, Attention Deficit Disorder (ADD)/Attention Deficit Hyperactivity Disorder (ADHD), bi-polar disorder, Post-Traumatic Stress Disorder (PTSD), or Obsessive Compulsive Disorder (OCD) in the six months prior to the baseline interview. Of the 306 youth participating in the JBTC evaluation, 47 (15.7%) reported having been diagnosed with depression, 16 (5.3%) reported having been diagnosed with ADD/ADHD, 10 (3.3%) reported having been diagnosed with OCD, 8 (2.7%) reported having been diagnosed with PTSD, and 8 (2.7%) reported having been diagnosed with bi-polar disorder.

JBTC youth were more likely than non-JBTC youth to report having been diagnosed with depression (20.7% versus 11%, respectively). A slightly larger, but not significant, percentage of JBTC youth were more likely to report have been diagnosed with OCD (5.5% versus 1.3%, respectively). There were no differences between the two groups between those reporting having been diagnosed with ADD/ADHD (5.5% versus 5.2%, respectively, for JBTC and non-JBTC

¹² Youth were also asked whether they had received substance abuse treatment and the nature of the treatment they received. However, we have doubts about the validity and reliability of these reports because of inconsistencies in the responses to certain questions. Additionally, de-briefing conversations with interviewers indicated that youth had trouble understanding the treatment items or deciding whether they had received treatment services. We therefore relied on the CPMS data to indicate whether a youth received substance abuse treatment.

youth), with PTSD (4.1% versus 1.31%, respectively), and with bi-polar disorder (3.4% versus 1.95, respectively).

Of the 306 youth, 123 (40.3%) reported receiving some sort of mental health counseling or treatment in the six months prior to the baseline interview. JBTC and non-JBTC youth were about equally likely to have reported receiving treatment (38.3% versus 42.3%, respectively). We believe, however, that these self-reported MH treatment data may not be reliable. The field interviewers suggested that many of the subjects had a difficult time understanding what constitutes mental health treatment. Further, we examination of the CPMS administrative data revealed only a few subjects who had received mental health counseling that was covered by Oregon's health care system. The impact for the evaluation is not being able to assess the extent to which subjects received mental health services, one goal of JBTC.

Summary. The JBTC participants differed from the non-JBTC participants on many of the measures that historically have been associated with higher rates of recidivism and substance abuse. The JBTC subjects were assessed as higher risk than the non-JBTC participants and had more extensive and more serious criminal histories. JBTC participants were more likely to report AOD use and to have begun use at a younger age. These subjects were also more likely to have been in treatment or a shelter prior to assessment and to have family members with criminal records and serious alcohol or drug problems. Finally, the JBTC youth were more likely to report being diagnosed with a mental health problem.

These findings are not surprising and suggest that DYS implemented JBTC as planned. In particular, the differences between the JBTC participants and those who were not included in JBTC are consistent with DYS's plan to target the program to those youth deemed highest risk. As we noted in the Introduction, we selected an approach for the outcome evaluation that controlled for this selection bias, as well as the maturation bias seen so often in studies of negative behaviors. We turn to these analyses now.

3.2 *Multivariate Analyses*

The substantial differences between the youth participating in JBTC and youth not participating in JBTC are a reflection of the non-experimental design of the study. High-risk youth—those who scored above a certain value (i.e., 10 on a 0-20 scale) on the risk assessment or those who were deemed by DYS intake staff to be high-risk regardless of their risk assessment score—were deemed eligible for participation in JBTC. Eligible youth then had to agree to

participate in JBTC. Such non-experimental conditions can lead to selection bias that should be controlled, to the extent possible, using appropriate analytic techniques. Selection bias is most problematic when groups differ on characteristics that are correlated with expected differences in the outcomes of interest—the circumstance of this evaluation.

Another potential source of bias is known as maturation. Maturation bias occurs when the outcome naturally evolves or changes over time irrespective of the presence of an independent variable of interest such as a program. Arrests often occur at a peak of criminal activity since engaging in many delinquent acts increases the likelihood of an arrest. The arrest may in turn serve as a catalyst for change or the offender may return to more conventional or normal behavior that would have occurred even without the intervening arrest or any subsequent intervention. Either will lead to observed lower rates of arrest following the instant arrest. Testing the impact of an intervention without accounting for the potential effect of maturation bias can confound the intervention effect with the impact of maturation.

Our statistical approach to analyzing the data from this non-experimental study controls for much of the potential selection and maturation bias. These models follow methodology similar to that used in Heckman (1978) and Murray (1998), among others. The models rely on the availability of multiple or repeated measures for each subject—in a sense allowing a subject to serve as his or her own comparison.

We demonstrate the form of our outcome models using the example of marijuana use in the past thirty days (*MJ*). Specifically, we estimated the following logit model for youth *i* in time period *t*:

$$MJ_{it} = \beta_0 + \beta_1 JBTC_i + \beta_2 Time1_{it} + \beta_3 Time2_{it} + \beta_4 Intervention1_{it} + \beta_5 Intervention2_{it} + \gamma^* Z_{it} + e_{it}$$

MJ_{it} equals 1 if youth *i* reported using marijuana during time *t* and equals 0 otherwise. *JBTC* equals 1 if the youth is in JBTC, and equals 0 if the youth is not in JBTC. The *JBTC* variable is included in the equation to control for selection bias due to unobserved variables. If people were randomly assigned into groups, then the coefficient estimate for *JBTC*, β_1 , would be 0. The variable *Time1* equals 1 if the observation is at the six-month follow-up interview, and 0 otherwise, and *Time2* is similarly constructed for the twelve-month follow-up interview. The follow-up variables are included in the models to control for maturation bias. For example, if

youth were not, on average, reducing their marijuana use between baseline and the six-month follow-up interview, regardless of the intervention, then the estimate for β_2 would equal 0.

The most important variables in the above equation are the interactions between the follow-up variables (*Time1* and *Time2*) and group (*JBTC*), denoted *Intervention1* and *Intervention2*. These interaction terms capture the effect of the JBTC program (Murray, 1998). *Intervention1* equals 1 only if the observation is for a person who is in JBTC and for an interview conducted 6 months after baseline; otherwise, *Intervention1* equals 0. The corresponding coefficient, β_4 , measures the degree to which JBTC is associated with marijuana use in the previous six months. Similar reasoning applies to *Intervention2* and its associated coefficient, β_5 . If the JBTC program is effective at reducing marijuana use, we would expect the two coefficients, β_4 and β_5 , to be negative and statistically significant.

Z represents covariates that are included to control for selection bias due to observed variables. Included in Z are age, gender, race/ethnicity, time at risk, and participation in the juvenile drug (RAP) court program. These variables are a parsimonious set of all available covariates, which were selected for the final specification based on significance tests using the full set of covariates in previous specifications.

The choice of outcome models was guided by the logic model for JBTC (**Exhibits 1-1 and 1-3**). In particular, JBTC was expected to increase access to treatment, reduce substance use, and reduce criminal behavior. Our dependent variables are derived from both administrative data and self-report data from subject interviews. Our independent variables include the constructed variables *JBTC*, *TIME1*, *TIME2*, *Intervention1*, and *Intervention2*, as well as variables constructed from the baseline interview (age, gender, race/ethnicity) and administrative sources (time at risk and RAP court participation). For models in which the dependent variable was derived from administrative data, we estimated the models for the full sample (i.e., for the 306 study participants). For self-reported dependent variables, we were constrained to include only observations for subjects for time periods in which we had interview data.

Sections 3.2.1 through 3.2.3 present the results of analyses examining the effect of JBTC participation on AOD treatment, AOD use and recidivism (arrest). Other individual outcomes of interest included improvements in positive indicators including education success and family relations. Items relevant to these questions were not included in the baseline interview, so we were not able to use the modeling approach described above to investigate these outcomes. We

were able to develop some descriptive measures that allowed us to study these potentially positive effects of JBTC. The results of these analyses are presented in Section 3.2.4.

3.2.1 AOD Treatment

We used the Oregon State Client Process Monitoring System (CPMS) to determine which youth received substance abuse treatment. We identified subjects who received AOD treatment during the following three periods: six months before baseline, six months between baseline and the six-month follow-up interview, and the six months between the six- and 12-month interviews. The percentage of each group for whom treatment was identified for each period is shown in **Exhibit 3-5**. As can be seen, JBTC resulted in a dramatic increase in participation in AOD treatment during the six months following baseline. Specifically, 58% of JBTC participants received AOD treatment between the baseline and 6-month interviews. These increases did not persist, however, and only 15% of JBTC participants received AOD treatment between the 6- and 12-month interviews. There was little change in the percentage of non-JBTC youth who received treatment over the 18 month period. Although JBTC was supposed to serve those at highest risk, many of those in the non-JBTC group also had reported AOD use.

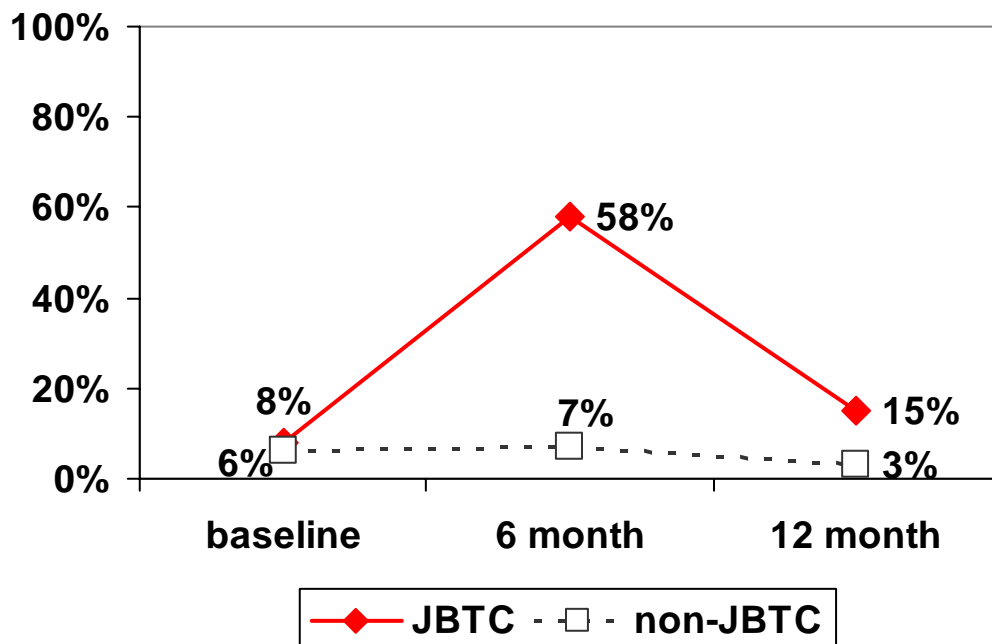


Exhibit 3-5. Administrative Reports of AOD Treatment Received in the Previous Six Months.

The logistic regression model results for receiving substance abuse treatment are presented in **Exhibit 3-6**. *As the odds ratios indicate, participation in JBTC is significantly associated with receiving substance abuse treatment in both the first and second six-month periods of JBTC.* Participation in JBTC in the first six months after baseline increased the odds of a youth receiving substance abuse treatment by 13.95 times. Similarly, participation in JBTC in the second six months after baseline increased the odds of a youth receiving substance abuse treatment by 3.78 times.

Exhibit 3-6. Logistic Regression Model of Receiving Substance Abuse Treatment

	Odds Ratio	Standard Error	95% Confidence Interval	
Male	0.635	0.15	0.40	1.01
Age	1.072	0.06	0.96	1.20
Nonwhite	0.881	0.23	0.53	1.46
Time at risk	0.994	0.00	0.99	1.00
RAP court	1.158	0.31	0.68	1.97
Intervention1	13.950***	8.28	4.36	44.65
Intervention2	3.782*	2.45	1.06	13.45
Time1	1.067	0.50	0.42	2.69
Time2	0.466	0.24	0.17	1.29
JBTC	1.250	0.57	0.51	3.05

* Statistically significant at the 0.05 level; ** statistically significant at the 0.01 level; *** statistically significant at the 0.001 level

3.2.2 AOD Use

The multivariate results of the logit models on self-reported substance use are presented in this section. We modeled use of alcohol, marijuana, and illicit drugs other than marijuana during the previous six months.

Alcohol Use. The percentages of subjects in our two study groups who reported alcohol use in the previous six months are shown in **Exhibit 3-7**. The baseline data points are the values that were reported in the earlier discussion of baseline characteristics. As can be seen, 81% of

JBTC participants compared with 54% of non-JBTC youth reported having used alcohol in the six months prior to the baseline interview. At the six-month interview, the percentage of JBTC participants reporting alcohol use dropped to 65%, a much more substantial decrease than that observed for the non-JBTC subjects. At the 12-month interview, however, the percentage of each group reporting alcohol use had returned to percentages essentially equivalent to those observed at baseline—79% of JBTC and 54% of non-JBTC participants.

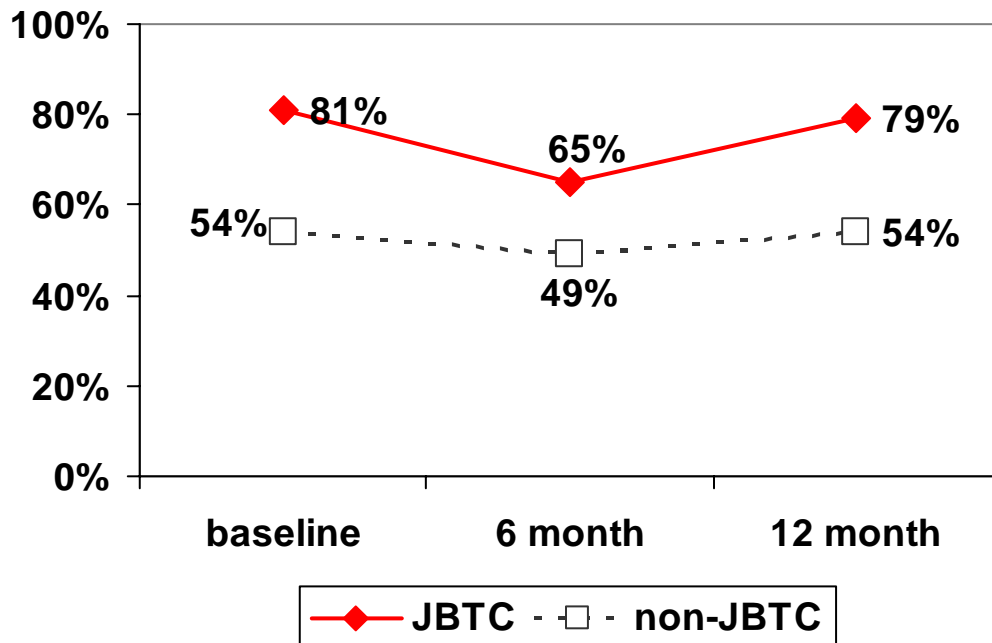


Exhibit 3-7. Self-Reported Alcohol Use In The Previous Six Months.

Results for the logit model of alcohol use are presented in **Exhibit 3-8**. *Participation in JBTC had no significant affect on whether a youth reported using alcohol in the first six months of JBTC (Intervention 1) or in the second six months of JBTC (Intervention 2)*. The significance of the JBTC measure in the models confirms that at baseline the JBTC and non-JBTC groups were different in terms of the outcome of interest. The only other variable significantly associated with alcohol use is age. As youth get older, the odds that they will use alcohol increases. For every year increase in age, the odds that a youth will use alcohol increase by 1.37 times.

Exhibit 3-8. Logistic Regression Model of Alcohol Use

	Odds Ratio	Standard Error	95% Confidence Interval	
Male	0.966	0.24	0.59	1.58
Age	1.369***	0.08	1.22	1.54
Nonwhite	1.154	0.32	0.67	1.99
Time at risk	0.998	0.01	0.99	1.01
RAP court	1.183	0.57	0.46	3.04
Intervention1	0.542	0.19	0.27	1.09
Intervention2	1.046	0.45	0.45	2.44
Time1	0.808	0.17	0.54	1.21
Time2	0.995	0.24	0.62	1.60
JBTC	3.104***	0.88	1.78	5.41

* Statistically significant at the 0.05 level; ** statistically significant at the 0.01 level; *** statistically significant at the 0.001 level

Marijuana Use. Self-reported marijuana use during the three six-month periods is shown in **Exhibit 3-9**. As reported earlier, JBTC participants were more than twice as likely as non-JBTC youth (89% versus 44%, respectively) to report having used marijuana in the previous six months. Self-reported marijuana use declined dramatically for the JBTC participants over the three interviews, although 50% and 57% of these subjects reported using marijuana at the 6-month and 12-month interviews, respectively. There was relatively little difference in self-reported marijuana use from period to period by the non-JBTC group--similar to the relatively constant reports of alcohol use by the non-JBTC youth. The results for marijuana differed from those for alcohol in that the 12-month reports remained substantially lower for JBTC participants than those observed at baseline.

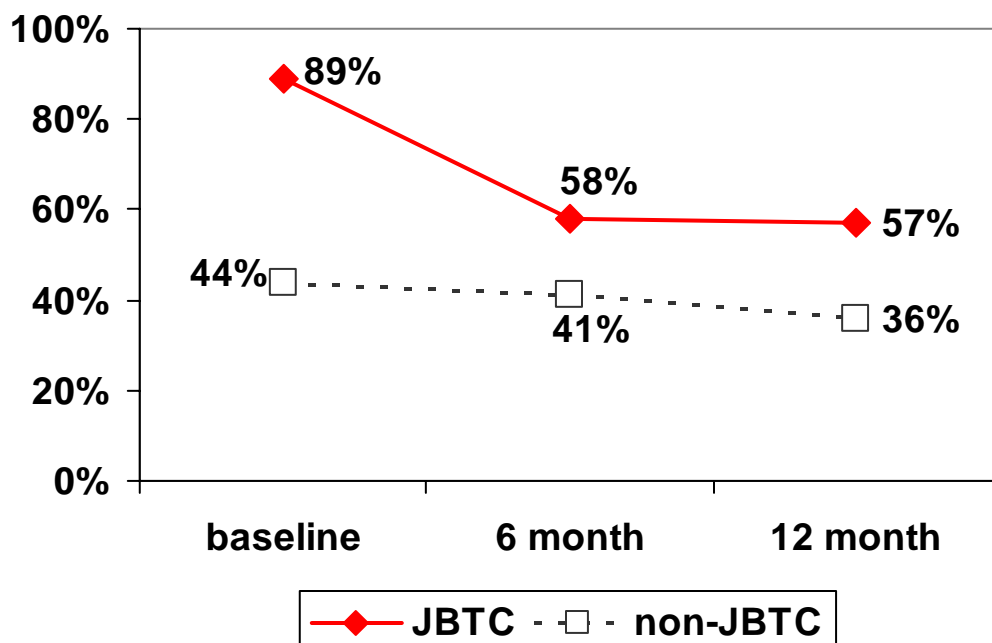


Exhibit 3-9. Self-Reported Marijuana Use in the Previous Six Months

The results of the estimation of the logit model for marijuana use are presented in **Exhibit 3-10**. *Participation in JBTC is significantly associated with a reduction in marijuana use in both the first and second six-month periods of JBTC.* Participation in JBTC in the first six months after baseline (*Intervention1*) reduced the odds of a youth using marijuana by 6.85 times (1/0.146). Similarly, participation in JBTC in the second six-month period after baseline (*Intervention2*) reduced the odds of a youth using marijuana by 6.52 times (1/0.181). As was the case with alcohol, as youth get older, the odds that they will use marijuana increase. For every year increase in age, the odds that a youth will use marijuana increase by 1.2 times.

Exhibit 3-10. Logistic Regression Model of Marijuana Use

	Odds Ratio	Standard Error	95% Confidence Interval	
Male	0.945	0.22	0.60	1.48
Age	1.197**	0.07	1.07	1.34
Nonwhite	1.074	0.26	0.67	1.73
Time at risk	0.990	0.01	0.98	1.00
RAP court	0.799	0.31	0.37	1.72
Intervention1	0.146***	0.06	0.06	0.33
Intervention2	0.181***	0.08	0.08	0.44

	Odds Ratio	Standard Error	95% Confidence Interval	
Time1	0.859	0.19	0.56	1.32
Time2	0.701	0.17	0.43	1.14
JBTC	10.882***	3.64	5.65	20.98

* Statistically significant at the 0.05 level; ** statistically significant at the 0.01 level; *** statistically significant at the 0.001 level

Use of Illicit Drugs Other than Marijuana. Self-reported use of illicit drugs other than marijuana is shown in **Exhibit 3-11**. JBTC youth were much more likely at all interviews to report having used an illicit drug than were non-JBTC youth. Although there were small declines for both groups from the baseline reports to the 6-month interview reports, reports increased slightly at 12 months. Overall, there was little change for either group over the 18 months included in the three interviews.

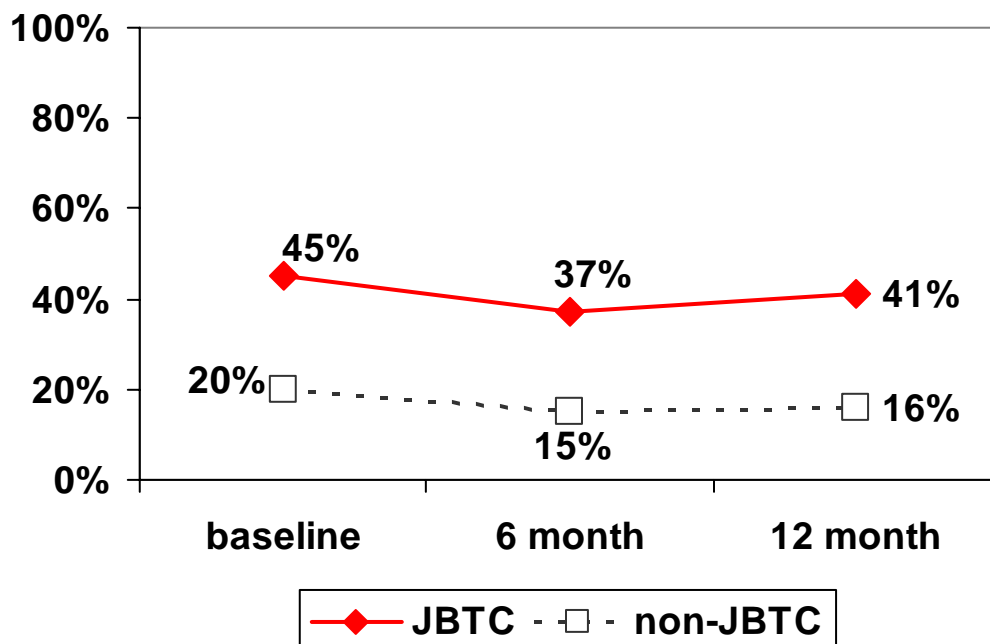


Exhibit 3-11. Self-Reported Use of Illicit Drugs Other Than Marijuana in the Previous Six Months.

The logistic regression model results for use of illicit drugs other than marijuana are presented in **Exhibit 3-12**. *Participation in JBTC had no significant effect on whether a youth used illicit drugs other than marijuana in the first (Intervention1) or second (Intervention 2) six-*

month period of JBTC. The only variables significantly associated with use of illicit drugs other than marijuana are age and gender. As youth get older, the odds that they will use illicit drugs other than marijuana increase. For every year increase in age, the odds that a youth will use illicit drugs other than marijuana increase by 1.17 times. Interestingly, females are significantly more likely than males to use illicit drugs other than marijuana. The odds of a female using an illicit drug other than marijuana are 1.65 times higher than they are for males.

Exhibit 3-12. Logistic Regression Model of Use of Illicit Drugs Other Than Marijuana

	Odds Ratio	Standard Error	95% Confidence Interval	
Male	0.607*	0.14	0.39	0.95
Age	1.172**	0.07	1.04	1.32
Nonwhite	0.894	0.22	0.55	1.46
Time at risk	0.991	0.00	0.98	1.00
RAP court	0.884	0.32	0.43	1.81
Intervention1	0.867	0.34	0.40	1.87
Intervention2	0.962	0.43	0.40	2.32
Time1	0.692	0.21	0.39	1.24
Time2	0.731	0.24	0.38	1.41
JBTC	3.359***	0.89	2.00	5.65

* Statistically significant at the 0.05 level; ** statistically significant at the 0.01 level; *** statistically significant at the 0.001 level

3.2.3 Recidivism

We used the Oregon State Juvenile Justice Information System (JJIS) to determine if a youth recidivated (i.e., was re-arrested) once they were enrolled in the JBTC evaluation study. Recidivism was modeled in the same manner as the substance use measures presented above. Since we are using administrative rather than self-reported interview data as the outcome, all 306 who were initially recruited into the JBTC evaluation study are retained in the recidivism models. We examined both any new arrest and the number of arrests. The baseline measures for both variables exclude the arrest that was associated with inclusion in the study.

Any Arrest. The percentages of each group who had one or more arrests during each of the three six-month periods are shown in **Exhibit 3-13**. At baseline, the JBTC youth were almost twice as likely as the non-JBTC youth to have been arrested at least one additional time beyond the arrest leading to their inclusion in the study. Specifically, 39% of JBTC youth compared with 20% of non-JBTC youth had one or more (additional) arrests during the 6 months

preceding the baseline interview. The results for the second 6-month period (i.e., 6 months post baseline or, for the JBTC youth, the first 6 months of program participation) are similar to those observed prior to risk assessment—a greater percentage of JBTC youth was arrested than non-JBTC youth (43% versus 18%, respectively). Notably, by the 12-month interview, the percentage of JBTC youth with one or more arrests was 22%, nearly equivalent to the 18% arrest rate for the non-JBTC group. The decline in the rate of recidivism was greater, therefore, for the JBTC youth than for their non-JBTC counterparts. Specifically, although the JBTC youth were deemed to be at much higher risk at baseline than the non-JBTC youth, by 12 months post-baseline, they were equally likely to have been arrested during the previous 6 months.

A number of variables are significantly associated with recidivism, measured as any arrest during the 6-month period. *As can be seen in Exhibit 3-14, participation in JBTC during the second six-month period (Intervention2) is associated with a decrease in the likelihood of arrest.* If a youth participated in JBTC, the odds that they were re-arrested during the second six-month period decreased by 2.36 times, a statistically significant effect at the 0.05 level.

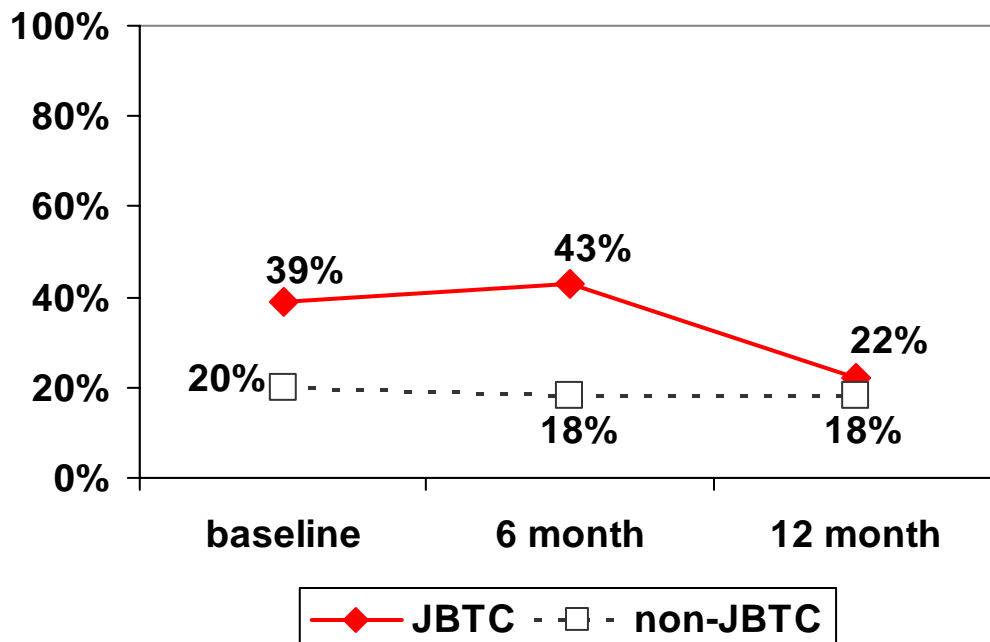


Exhibit 3-13. Percentage Arrested One or More Times in the Previous Six Months. (The baseline measure excludes the arrest associated with inclusion in the study.)

Other things equal, nonwhite youth had greater odds of re-arrest (odds ratio of 1.63), as did males (odds ratio of 2.10), while older youth had lower odds (odds ratio of 0.91). RAP court participants also had lower odds of re-arrest--participating in RAP court reduces the odds of a youth being re-arrested by 2.11 times (other things equal). Finally, additional time at risk (i.e., the time a youth is not in a residential or detention facility) is associated with a decrease in the odds that a youth will be re-arrested. Although the direction of this relationship seems counterintuitive, it likely reflects the fact that those who get arrested are being detained and thus are at risk for shorter time periods.

Exhibit 3-14. Logistic Regression Model of Likelihood of Re-arrest

	Odds Ratio	Standard Error	95% Confidence Interval	
Male	2.103***	0.39	1.46	3.02
Age	0.909*	0.04	0.84	0.99
Nonwhite	1.626**	0.29	1.15	2.31
Time at risk	0.988***	0.00	0.98	0.99
RAP court	0.474**	0.12	0.29	0.77
Intervention1	1.351	0.50	0.66	2.77
Intervention2	0.424*	0.17	0.19	0.94
Time1	0.744	0.20	0.43	1.28
Time2	0.793	0.25	0.43	1.46
JBTC	2.72***	0.76	1.57	4.70

* Statistically significant at the 0.05 level; ** statistically significant at the 0.01 level; *** statistically significant at the 0.001 level

Number of Arrests. In addition to modeling *if* a youth was re-arrested, we modeled the number of times a youth was re-arrested. **Exhibit 3-15** shows the mean numbers of arrests in each 6-month period for the JBTC and non-JBTC groups. For JBTC and non-JBTC youth, the mean numbers of arrests for this period were 0.63 (sd = 1.02) and 0.22 (sd = 0.46), respectively. Across all subjects, the mean number of arrests in the 6 months before participating in the evaluation (excluding instant offense) was 0.42 (sd = 0.81).

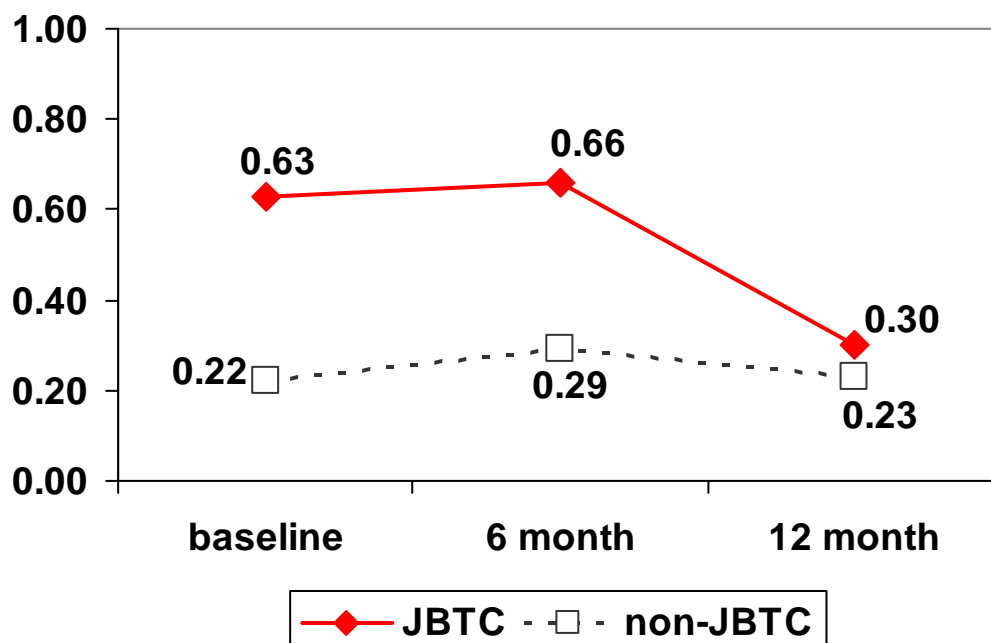


Exhibit 3-15. Average Number of Arrests in the Previous Six Months. (The baseline measure excludes the arrest associated with inclusion in the study.)

During the 6-month period between baseline and initial follow-up interview, the average numbers of arrests for the two groups were similar to the pre-baseline period (the baseline measure excludes the instant arrest)—of 0.47 arrests (sd = 0.891) overall; 0.66 (sd = 0.927) and 0.29 (sd = 0.819) arrests for the JBTC and non-JBTC youth, respectively. The average number of arrests for the JBTC participants was nearly equivalent to that of the non-JBTC group during the 6-to-12-month period—JBTC and non-JBTC youth had an average of 0.30 (sd = 0.610) and 0.23 (sd = 0.565) arrests, respectively. Overall, between the 6- and 12-month interviews, study participants experienced 0.26 (sd = 0.527) arrests.

We estimated negative binomial models of number of arrests during each six-month period. The results of this estimation are shown in **Exhibit 3-16**. As can be seen, a number of variables are significantly associated with the number of times a youth is re-arrested. In particular, *participation in JBTC during the second six-month period (Intervention2) is associated with a decrease in the number of re-arrests*. Being nonwhite and being male are

associated with an increase in the number of times a youth is re-arrested. Aging, however, is associated with a decrease in the number of times a youth is re-arrested. Participating in RAP court is also associated with a decrease in the number of times a youth is re-arrested and additional time at risk (i.e., the time a youth is not in a residential or detention facility) is associated with a decrease in the number of times a youth is re-arrested. Again, this relationship is due to the fact that those who get arrested, and especially those who are arrested multiple times, are being detained thus reducing their time at risk.

Exhibit 3-16. Negative Binomial Model of Number of Re-arrests

	Incidence Rate Ratio	Standard Error	95% Confidence Interval	
Male	1.785***	0.30	1.29	2.47
Age	0.874***	0.03	0.82	0.94
Nonwhite	0.394*	0.18	1.08	1.81
Time at risk	0.992***	0.002	0.99	1.00
RAP court	0.522***	0.09	0.37	0.74
Intervention1	0.745	0.21	0.43	1.30
Intervention2	0.385**	0.12	0.21	0.72
Time1	1.163	0.26	0.75	1.81
Time2	0.947	0.23	0.58	1.53
JBTC	3.133***	0.66	20.7	4.75

* Statistically significant at the 0.05 level; ** statistically significant at the 0.01 level; *** statistically significant at the 0.001 level

3.2.4 Educational Performance and Family Relationships

Evaluations of interventions often focus on negative outcomes (e.g., re-arrest) in an attempt to determine if the intervention under study was effective at preventing or reducing the prevalence of negative outcomes. Interventions, however, can also produce positive outcomes in addition to preventing negative outcomes. Youth were asked a number of questions about various aspects of their lives, some of which enabled us to determine how aspects of their lives changed over time. A number of education, family functioning, and employment measures were created and tested. Two measures on which the JBTC and non-JBTC participants differed significantly were educational performance and family relations. Questions that feed these measures were not asked at baseline because the Lane County DYS stipulated that the baseline interview be very brief. Youth were, however, asked about their educational performance and family relations during the 6- and 12-month follow-up interviews. The questions were phrased

so that youth were asked to indicate how a given situation has changed since six months ago. At the six-month interview, for example, youth were asked, “How is your educational performance now compared to 6 months ago?” The 6- and 12-month questions therefore reflect how the situation has changed since the baseline and 6-month interviews, respectively. Youth were then able to respond using the following responses: it’s better, it’s about the same, and it’s worse.

We combined the responses to these items from the 6- and 12-month interviews to identify the apparent trend over the 12-month period following baseline. In particular, we classified each trend as better, the same, or worse. The possible responses at each of the follow-up interviews and the overall trend are shown in **Exhibit 3-17**.

Exhibit 3-17 Response Combinations and Overall Trend for Positive Outcomes

Response Combination	6-month Interview Response	12-month Interview Response	Overall Trend
1	Better	Better	Better
2	Better	Same	Better
3	Better	Worse	Worse
4	Same	Better	Better
5	Same	Same	Same
6	Same	Worse	Worse
7	Worse	Better	Better
8	Worse	Same	Worse
9	Worse	Worse	Worse

Exhibit 3-18 displays the overall-response trends for the educational performance measure. A significantly larger proportion of the JBTC participants reported an improving trend in terms of education performance compared with youth who were not participating in JBTC (91% vs. 69%; $p < 0.01$). A larger proportion of the non-JBTC youth reported that their educational performance essentially remained the same over the 12-month period (0% vs. 21%; $p < 0.01$), while roughly equal proportions said their performance worsened.

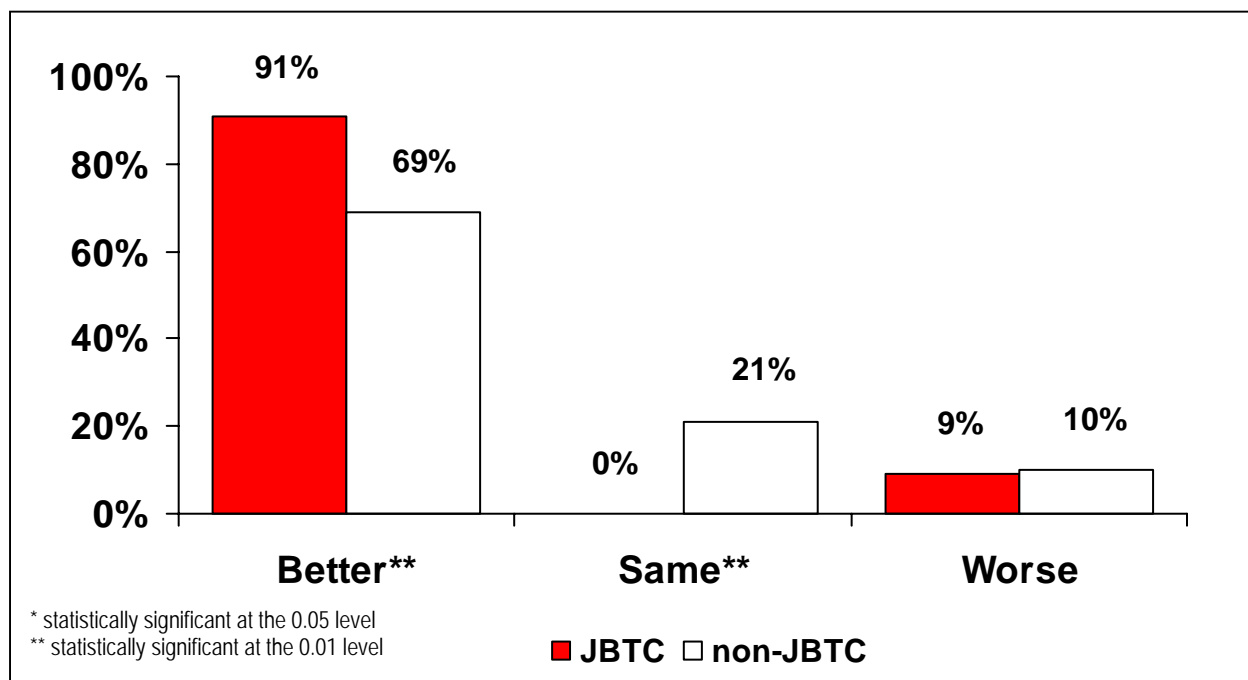


Exhibit 3-18. The Proportion of JBTC and Non-JBTC Youth Who Reported Doing Better, The Same, and Worse in Terms of Educational Performance

Exhibit 3-19 shows the overall-response trends for the family relations measure. Youth were asked, “How are you getting along with your family now compared to six months ago?” Again, youth were able to respond: better, about the same, and worse. A significantly larger proportion of the JBTC participants reported an improving trend in terms of family relations compared with youth who were not participating in JBTC (84% vs. 69%; $p < 0.01$). However, a larger proportion of JBTC youth also reported doing worse in terms of family relations (14% vs. 4%; $p < 0.01$). A larger proportion of the non-JBTC youth reported that their family relations essentially remained the same over the 12-month post-baseline period (2% vs. 27%; $p < 0.01$).

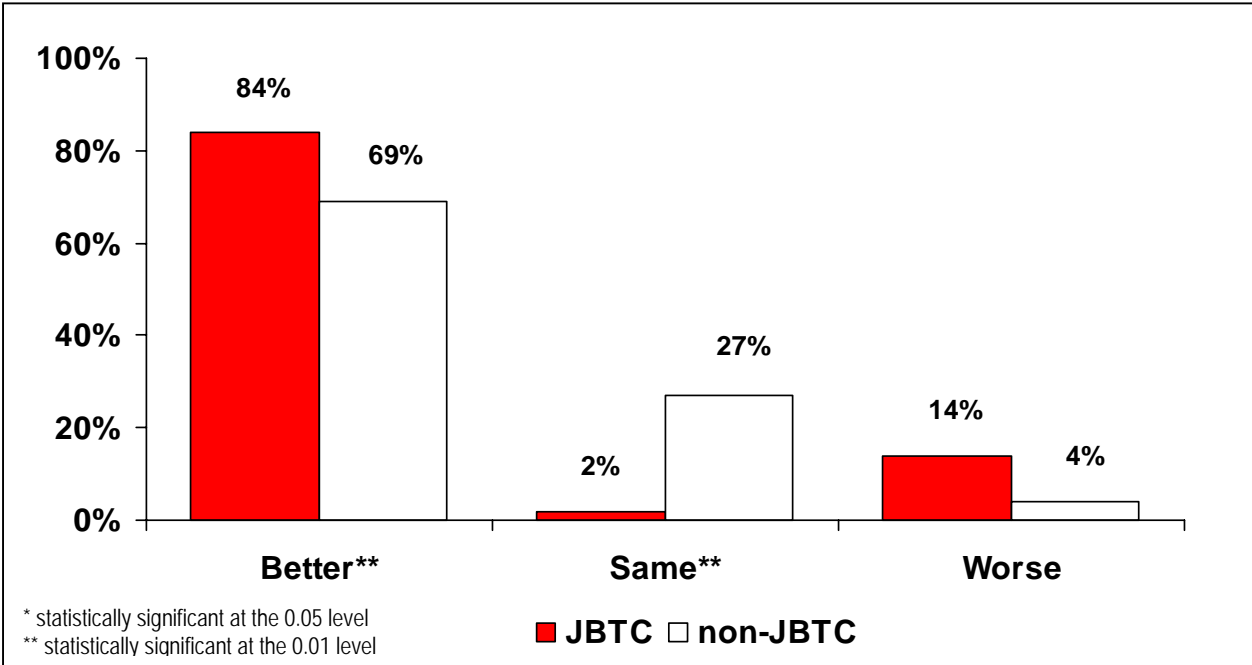


Exhibit 3-19. The Proportion of JBTC and Non-JBTC Youth Who Reported Doing Better, The Same, and Worse in Terms of Family Relations

3.3 Summary

Results from our analyses suggest that outcomes of the JBTC evaluation are largely positive. JBTC participation was associated with the following outcomes:

- Increased access to AOD treatment
- Reduced use of marijuana (but not alcohol, or illicit drugs other than marijuana)
- Reduced recidivism as measured by re-arrest

Additionally, descriptive data from the 6- and 12-month follow-up interviews suggest that JBTC may have improved school outcomes and family relationships for participants.

4 JBTC Cost-Effectiveness Evaluation Results

In this section, we build on the positive evaluation findings reported in the previous section and estimate the cost effectiveness of the JBTC program. We first provide details on the approach to the analysis and then present our findings.

4.1 *Perspective and Method*

When undertaking any cost-effectiveness analysis, one must first decide on the appropriate analytic perspective. The chosen perspective is important in determining the relevant cost domains and how they should be measured (Gold et al., 1996; Hargreaves et al., 1998). To estimate costs, we took the taxpayers' perspective, which includes the relevant costs incurred by all publicly funded agencies and organizations directly involved with JBTC. We did not include costs directly incurred by youth in JBTC nor did we include any costs incurred by the youth's families.

Cost-effectiveness analysis involves collecting and analyzing cost data, collecting and analyzing effectiveness data, and then combining the results from the cost and effectiveness analyses. The chosen perspective of the analysis determined which agencies' and organizations' cost data we collected and analyzed. We categorized these organizations into the following domains: police; assessment; detention; treatment; case management; supervision; and incentives and rewards. We collected data on each study participant's use of resources. Multiplying this measure of utilization by the cost per unit of resource used produced an estimate of the cost incurred for each youth. All cost data included employee benefits and administrative overhead. This overhead reflects support services, such as secretarial support, as well as maintenance and utility costs that would vary with the resources directly provided to youth participating in the program.

The effectiveness analyses used the results for the outcome evaluation, described in Section 3. The cost and effectiveness results were then combined to estimate a cost-effectiveness ratio for each statistically significant effectiveness outcome. The cost-effectiveness ratio expresses the cost of achieving a one unit change in the effectiveness measure. For example, consider the outcome of rearrest within one year. The cost-effectiveness ratio generates an estimate of the cost necessary to avert one youth from being arrested within one year.

4.1.1 Cost Estimation

We estimated costs over each of eight domains: initial screening and assessment, urine analyses, case management, detention, arrest, inpatient substance abuse and mental health treatment, outpatient substance abuse and mental health treatment, and incentives and rewards. For each domain, we collected utilization data on the number of times a study participant came into contact with agencies in the domain, and the unit cost of each contact. Most of the unit costs were derived from personal interviews with staff at the Department of Youth Services (DYS). Utilization data were obtained from the JBTC Management Information System (MIS), Oregon Juvenile Justice Information System (JJIS), and the Oregon Health Plan Client Process Monitoring System (CPMS).

For the court appearances and probation domains, we were able to estimate unit costs but were unable to obtain reliable utilization data, thus these domains were omitted from the analyses. This omission is likely to underestimate the costs associated with youth both in the JBTC program and those not in the program. Moreover, the JBTC program has a raised level of supervision and court involvement, thus, because youth in the JBTC program are likely to spend more time in court than non-JBTC youth, the additional cost of the JBTC program is likely underestimated.

For the treatment cost domain, the utilization data only reliably yielded whether a youth attended treatment during a period of time, rather than the intensity of treatment received. However, we needed to account for the intensity of treatment, because treatment intensity – number of outpatient visits or number of inpatient nights – determines costs. To impute treatment intensity, we used the DYS management information system to estimate treatment costs for youth in JBTC. These estimates were then used to impute by demographic characteristics for all youth. **Appendix 2** details the sources of utilization data and cost data and the unit costs.

After estimating unit costs and gathering utilization data in each domain, our methodology for estimating the costs of JBTC is straightforward. For example, the cost of detention for a study participant is the days in detention during the study period multiplied by the cost of detention per day. These costs were then averaged across participants who were in JBTC and compared to the average for participants not in JBTC.

4.1.2 Cost Results: Descriptive Statistics

Exhibit 4-1 shows the descriptive comparison of costs for the six months before the baseline interview. These estimates help describe participants immediately before they were recruited into the study. Over all domains combined, costs on average for those participants who were inducted into JBTC were \$501 and costs for those not inducted into JBTC were \$388. This difference was not statistically significant ($p=0.47$). Of the component domains, two had differences between the JBTC and non-JBTC groups that were statistically significant, arrest and assessment. The mean arrest costs for the JBTC participants were \$80, compared to the mean of arrest costs for non-JBTC participants of \$28 ($p<0.001$). This difference in arrest costs likely reflects a higher rate of offending by JBTC youth in the six months prior to baseline. The difference in the mean of assessment costs (\$6; $p<0.001$) was likely significant because assessment costs were more commonly borne by JBTC participants.

Exhibit 4-1. Average Costs (and Standard Deviations) by Domain and JBTC Status: Six Months before Baseline

Domain Cost	JBTC (N = 149)	non-JBTC (N=157)
Assessment *	\$5.64 (22.30)	\$0 (0)
Treatment	\$128.82 (559.19)	\$143.44 (594.16)
Case management	\$6.89 (44.82)	\$3.19 (34.09)
Detention	\$278.07 (1659.52)	\$210.53 (1500.66)
Urine analysis	\$2.10 (6.87)	\$2.99 (7.06)
Arrest *	\$79.74 (128.39)	\$28.18 (58.3)
Incentive	\$0.02 (.25)	\$0 (0)
Total Costs	\$501.28 (1730.69)	\$388.34 (1603.1)

* Statistically significant at the 0.05 level

Across both groups of participants, the most expensive domains were arrest, detention, and treatment. Detention costs on average were highest for both groups (\$278 for JBTC; \$211 for non-JBTC); treatment costs were the second most expensive domain (\$129 for JBTC; \$143 non-JBTC); and arrest costs were the third most expensive domain (\$80 for JBTC; \$28 for non-JBTC). These three cost domains account for approximately 97% of the total costs for both

groups of participants. As demonstrated below, to a large extent changes in use of resources in these domains drive the cost analysis results.

Exhibit 4-2 shows how average costs by domain vary by JBTC status for the period from baseline to the six month follow-up. The average costs demonstrate that after the baseline interview JBTC participants used more treatment and more criminal justice resources. Moreover, JBTC participants incurred greater costs than non-JBTC participants in all domains and all these differences were statistically significant. The two domains with the most notable differences were detention and treatment. The mean detention cost for those in JBTC was \$2554, which was significantly larger than the \$795 for those not in JBTC. Similarly, the mean treatment costs of \$1,104 for those in JBTC were significantly higher than the costs for those not in JBTC (\$152).

Exhibit 4-2. Average Costs (Standard Deviation) By Domain and JBTC Status: Baseline to Six-Month Follow-Up

Domain Cost	JBTC (N = 149)	non-JBTC (N = 157)
Assessment*	\$77.65 (34.98)	\$4.16 (19.32)
Treatment*	\$1104.12 (1182.80)	\$151.95 (603.97)
Case management*	\$171.74 (171.96)	\$7.17 (46.31)
Detention*	\$2553.99 (3821.13)	\$795.06 (2880.32)
Urine analysis*	\$51.83 (102.87)	\$12.33 (12.77)
Arrest*	\$84 (117.19)	\$37.03 (103.46)
Incentive*	\$5.50 (11.98)	\$0.03 (0.4)
Total Costs*	\$4048.8 (3936.24)	\$1007.74 (3055.49)

* Statistically significant at the 0.05 level

Case management costs also increased for both those in JBTC and those not in JBTC, with a particularly large increase for those in JBTC. The mean cost for those in JBTC during this baseline to six-month follow-up period was \$172, compared to only \$7 for those not in JBTC. Reflecting the trend across all domains, total costs were higher when compared to the pre-baseline means previously presented and were much higher for those in JBTC than those not in JBTC. Mean costs across all domains for those in JBTC were \$4,049, more than four times the mean of \$1008 for those not in JBTC.

Exhibit 4-3 presents average costs by JBTC status for the final six-month period, that between the 6- and 12-month follow-up. These average costs make a useful comparison to those presented in **Exhibits 4-1** and **4-2**.

Detention costs for both groups of youth fell slightly from the previous period. Detention costs for JBTC youth were, on average, \$2,015 during this period, whereas the detention costs for non-JBTC youth were \$498, on average, a difference that is statistically significant at the 0.05 level. Although overall treatment costs fell from the preceding period (baseline to 6-month follow-up), treatment costs for both groups reflected the JBTC program’s emphasis on connecting youth to treatment. Average treatment costs were \$341 for JBTC participants and \$57 for non-JBTC participants; the difference in costs between those in JBTC and those not in JBTC was statistically significant at the 0.05 level.

Arrest costs for JBTC and non-JBTC youth were lower than the previous period. In the 6- to 12-month follow-up period, the mean was \$37 for JBTC youth and \$29 for non-JBTC youth. Reflecting the design of the JBTC program, average case management costs continued to rise from baseline; case management costs were \$207 for JBTC youth. For non-JBTC youth, case management costs continued to be low, with a mean of \$5 in the 6- to 12-month follow-up period. The difference in case management costs between the two groups was statistically significant. Costs over all domains were driven largely by detention, treatment, and case management costs. The mean total cost over the 6- to 12-month follow-up for those in JBTC (\$2,628) was significantly higher than that for those not in JBTC (\$592).

Exhibit 4-3. Average Costs (Standard Deviation) By Domain and JBTC Status: Six-Month To Twelve-Month Follow-Up

Domain Cost	JBTC (N = 149)	non-JBTC (N = 157)
Assessment	\$3.13 (16.86)	\$0.59 (7.45)
Treatment*	\$340.98 (1124.52)	\$57.48 (366.97)
Case management *	\$207.42 (184.02)	\$4.99 (36.60)
Detention *	\$2014.67 (4088.63)	\$498.38 (2686.72)
Urine analysis *	\$11.15 (46.48)	\$1.00 (5.33)
Arrest	\$37.33 (77.06)	\$28.98 (71.37)
Incentive *	\$13.93 (25.75)	\$0.38 (4.79)
Total Costs*	\$2628.61 (4234.96)	\$591.81 (2744.60)

* Statistically significant at the 0.05 level

4.1.3 Cost Results: Multivariate Analyses

Although comparing averages is instructive, it fails to control for three types of factors that may be driving any apparent association between JBTC status and cost. These factors are the same as those controlled for in the outcome evaluation described above in Section 3. The first type is the influence of variables observed in the data, such as gender. The second type is the influence of factors not observed in the data, such as a youth's motivation to engage in treatment. This consideration is potentially important, given that the simple averages presented in **Exhibit 4-1** suggest that JBTC youth are more involved in criminal activities at baseline, for example. The third type is the effect of maturation bias (sometimes called 'regression to the mean'). Youth likely enter the study at a time of crisis in their lives, thus improvements in outcomes could be expected regardless of whether they participate in JBTC. As discussed in Section 3, the analytic approach used here controls for potential bias caused by these factors and allows us to accurately estimate the association between JBTC and costs. Results are expressed as the incremental cost per youth associated with JBTC. **Exhibit 4-4** presents these results by domain as well as across all domains combined.

The results unambiguously show that the incremental total costs associated with JBTC were positive, and thus JBTC youth were more expensive to supervise and treat. All else held equal, the average youth used \$1535 ($p=0.001$) more resources under JBTC for the baseline to six-month follow-up period and \$457 more resources for the 6- to 12-month follow-up period ($p=0.04$). In the baseline to 6-month period, the domains that most greatly contributed to the total increment were treatment (incremental cost = \$958; $p=0.001$), detention (incremental cost = \$317; $p=0.09$), and case management (incremental cost = \$159; $p<0.001$). The fact that the detention cost estimate is not significant reflects the large standard error, which in turn reflects a large amount of overall variation in the length of detention periods experienced by youth.

The remaining four domains – assessment, urine analysis, incentives and rewards, and arrest – all had typically lower incremental costs compared to detention, treatment, and case management. Reflecting the fact that assessments occurred early on in the study and were more common among JBTC youth, the increment associated with assessment costs was higher in the baseline and 6-month period (incremental cost = \$66.94, $p = 0.001$) than the 6- to 12-month period (incremental cost = -\$5; $p = 0.08$). Similar reasoning holds for urine analysis costs where

incremental costs were higher in the baseline to 6-month period (incremental cost = \$42; $p < 0.001$) than the 6- to 12-month period (incremental cost = \$11.9; $p = 0.06$). Incremental incentive and reward costs were small, positive and statistically significant in both follow-up periods, again reflecting the fact that JBTC youth were given incentives and rewards, whereas non-JBTC youth were not.

Incremental arrest costs were negative for both periods, meaning that JBTC was associated with cost savings related to arrest in both periods. However, these savings were small. For the first follow-up period, a youth in JBTC cost \$9 less than a non-JBTC youth ($p=0.51$), and for the second follow-up period, a youth in JBTC cost \$50 less than a non-JBTC youth ($p=0.001$).

Total incremental cost associated with JBTC fell from \$1535 in the first follow-up period (baseline to 6-months) to \$457 in the second follow-up period (6-months to 12-months). This decrease reflects the finding that, with the exception of case management and incentive/reward costs, incremental costs in most domains fell, with the largest reductions in the domains that contributed most to the overall costs. Between the two periods, incremental treatment costs fell from \$958 to \$284 and incremental detention costs fell from \$317 to \$6.

Exhibit 4-4. Incremental Cost (Standard Deviation) of JBTC Program

Domain Cost	Baseline to 6 months	6 to 12 months
Assessment	\$66.94 (2.90) *	-\$5.02 (2.90)
Treatment	\$958.37 (118.11) *	\$284.53 (118.36)*
Case management	\$158.94 (13.15) *	\$201.27 (13.18) *
Detention	\$317.19 (183.98)	\$6.41 (184.45)
Urine analysis	\$41.87 (6.23) *	\$11.90 (6.25)
Arrest	-\$9.03 (13.72)	-\$49.51 (13.75)*
Incentive	\$5.66 (1.57) *	\$14.15 (1.57) *
Total Costs	\$1534.59 (218.16) *	\$457.43 (218.69)*

* Statistically significant at the 0.05 level

4.1.4 Combining Cost and Effectiveness

The most practical tool for assessing costs relative to effectiveness is the Cost-Effectiveness Ratio (CER). As described in the introductory section above, the cost-effectiveness ratio expresses the additional cost necessary to achieve an incremental change in an outcome. For the sake of practicality, we computed the cost-effectiveness ratio using total costs,

but did not compute the ratio for each of the domains that comprise total cost. Also, we limited the cost-effectiveness ratio analysis to the two outcomes with statistically significant effectiveness results—marijuana use and arrest.

The cost-effectiveness ratio is defined as:

$$\text{CER} = \Delta\text{cost} / \Delta\text{effectiveness}$$

CER is the cost-effectiveness ratio, Δcost is the difference between the average cost of those who participated in JBTC and the average cost of those who did not, and $\Delta\text{effectiveness}$ is the difference in average effectiveness for the two groups. For the effectiveness measure, we use the estimates from the outcome evaluation presented in Section 3. For the cost estimates, we used the incremental cost estimates previously presented. Because we independently evaluated the impact of JBTC for the 6-month and 12-month follow-up periods, we estimated separate cost-effectiveness ratios for the 6-month and 12-month follow-up periods.

Recall that significant effectiveness results were found for the 12-month arrest outcome and the 6- and 12-month marijuana outcomes. The results in Section 3 indicate that for the second follow-up (months 6 to 12), JBTC was associated with a reduction in the odds of a youth being arrested by 58%. With regard to any marijuana use, JBTC was associated with reductions in the odds of a youth using marijuana by 85% for the first follow-up and by 82% for the second follow-up period. **Exhibit 4-5** shows the cost-effectiveness ratio estimates that combine these effectiveness estimates with the cost estimates. The estimates show the additional average cost of using JBTC to either prevent one youth from being arrested or one youth from consuming marijuana.

Exhibit 4-5. Cost-Effectiveness Ratio Estimates for JBTC Program

<i>Outcome</i>	<i>Baseline to 6 months</i>	<i>6 to 12 months</i>
Marijuana use	\$4739	\$1590
Arrest	effectiveness not significant	\$3751

The estimates suggest that the cost of using JBTC to avert one youth from marijuana use was \$4,739 for the first follow-up period (baseline to 6 months) and \$1,590 for the second follow-up period (6 months to 12 months after baseline). The large reduction in the cost-

effectiveness ratio from the first to second follow-ups was driven by the reduction in the incremental cost between the two periods. The odds of marijuana use associated with JBTC remained similar across the two periods, but the incremental cost fell from \$1535 to \$457. The estimates also suggest that the cost of using JBTC to avert one youth from having at least one arrest was \$3,751.

The estimates of the cost-effectiveness ratio can be readily transformed into an approximate reinterpretation that may be useful for decision-makers. By taking the reciprocal of the estimates in **Exhibit 4-5**, the estimates can be re-stated to predict the reductions in marijuana use and the reductions in arrests associated with a \$10,000 increase in spending on JBTC. Specifically, for each additional \$10,000 spent on JBTC, we could expect to observe during the baseline-to-6 month period 2.11 fewer youth using marijuana. Following 6 months of services (i.e., during the 6-to-12-month post-baseline period), the \$10,000 would be expected to result in about 6 fewer marijuana users and about 3 fewer arrests.

Exhibit 4-6. Implied Reductions in the Number of Youth Who Avoid Arrest and Marijuana Use from Spending \$10,000 on JBTC

<i>Outcome</i>	<i>Baseline to 6 months</i>	<i>6 to 12 months</i>
Marijuana use	2.11	6.33
Number of youth with at least one arrest	effectiveness not significant	2.67

4.1.5 Summary

In this study, we collected detailed cost information for a comprehensive array of cost domains. We then estimated the cost per youth from the tax-payer perspective, and calculated the incremental impact of JBTC on costs while controlling for a variety of factors. The results show that on average at the 6-month follow-up, a youth in JBTC consumed \$1535 more tax-payer resources than a youth not in JBTC. At the 12-month follow-up, on average, a youth in JBTC incurred \$457 higher costs than a youth not in JBTC.

The greatest cost drivers were treatment and detention. As youth became connected with the treatment system, case management costs also increased. Over the two follow-up periods, the incremental cost associated with treatment and detention fell markedly, which in turn drove the fall in incremental total cost.

By combining the incremental cost estimates with the results of particular effectiveness analyses, we estimated the additional cost necessary to avert youth from marijuana use and

arrest. The cost-effectiveness ratio estimates indicated that at the 6-month follow-up the cost of diverting a youth from using marijuana was \$4,739. Reflecting an overall fall in incremental costs from the first to the second follow-up, this cost at 12 months fell to \$1,590. The cost at 12 months of diverting a youth from being arrested was \$3,751.

5 Conclusions

In 1998, the Lane County, Oregon Department of Youth Services (DYS) was awarded a cooperative agreement from the National Institute of Justice (NIJ) to implement a Juvenile Breaking the Cycle (JBTC) program. The JBTC Program is an ambitious effort to effect major changes in the lives of juvenile arrestees by enlisting a spectrum of county and state agencies to provide (1) immediate identification of substance abuse problems at the time of arrest (or apprehension), (2) assessment to establish the degree of the substance abuse problems and the presence of other psychological or criminogenic risk factors, (3) the integrated delivery of services, and (4) the systemic use of sanctions, incentives, and rewards to encourage compliance with treatment and desistance from criminal involvement. The program was designed to take advantage of what had been learned from research on the development and evaluation of multifaceted interventions to address the complex configuration of problems that many drug-involved juvenile offenders have. In particular, JBTC built upon what had been learned about the implementation and effects of programs that attempt to integrate substance abuse treatment with other programmatic interventions (mental health, family, etc.) and monitoring activities (urine analysis, court monitoring, etc.). This report provides the results of the JBTC evaluation, including those from the process, outcome, and cost-effectiveness evaluation components.

The process evaluation reveals that Lane County was successful in implementing many of the key components of the JBTC program. DYS staff members and representatives of the services community indicated that JBTC improved communication, coordination, and collaboration between agencies working with high risk youth. It is this level of collaboration, both internal and external to an organization, that allows for the proper implementation and more importantly institutionalized and sustained implementation of projects and initiatives that are originally funded through federal grants or contracts. JBTC was also viewed as having increased the availability of appropriate services—particularly AOD treatment—to which youth could be referred and to have resulted in better services for girls. Staff felt that improvements were still needed in the types of family and mental health services to which youth could be referred and that more services were needed for the rural areas of the county.

The increased use of urinalysis to detect illicit drugs and to hold youth accountable for their substance use was also viewed as a significant benefit of the JBTC program. Adjustments were made to the administration of testing during JBTC implementation to improve its usefulness. These adjustments included changing the administration of the testing so that it was random rather than scheduled and incorporating temperature strips to prevent tampering with provided urine samples.

The RAP Court program, which operated as a juvenile drug court in concert with the JBTC program, was also seen as highly effective in managing the behavior of high risk youth. A deficiency of the RAP Court program is capacity, in that the court can serve only 25 youth. There is also a need to carefully select the judicial administrator(s) of such a component to ensure their judicial demeanor is appropriate for this type of program.

Our outcome analyses indicate that youth who participated in JBTC increased their access to AOD treatment, reduced their use of marijuana (but not alcohol, or illicit drugs other than marijuana), and reduced their recidivism as measured by re-arrest and number of re-arrests compared to youth who did not participate in JBTC. These positive outcome findings are especially impressive considering that JBTC were deemed to be at higher risk than their comparison counterparts. Additionally, descriptive data from the 6- and 12-month follow-up interviews suggest that JBTC may have improved school outcomes and family relationships for participants.

We combined incremental cost estimates with the outcome evaluation results to estimate the cost of achieving each statistically significant outcome (e.g., averting a youth from marijuana use or arrest). The cost-effectiveness ratio estimates indicated that at the 6-month follow-up, if the only impact of JBTC had been the reduced use of marijuana, the cost of diverting a youth from using marijuana was \$4,739. Reflecting an overall fall in incremental costs from the first to the second follow-up, this cost at 12 months fell to \$1,590. The cost at 12 months of diverting a youth from being arrested was \$3,751, again under the assumption that only arrests were affected (and, e.g., not marijuana use).

In conclusion, the Lane County implementation of the JBTC Program was successful on several fronts. The collaborators were successful in implementing many key components of the program and continue to operate the JBTC program. Key stakeholders are aware of and continue to try to address weaknesses in the program, including limitations in mental health services and

development of appropriate and sufficient services for youth living in rural areas. Importantly, JBTC appears to have increased access to treatment during the first six months of program participation, which coupled with UA testing, significantly reduced marijuana use. The decline in marijuana use persisted into months 6 through 12 following entry into JBTC. During this later 6-month period, the arrest rate of JBTC participants dropped significantly and was nearly equivalent to the arrest rate of the comparison group.

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Appendix 1. Response Bias Analyses

Youth were recruited to participate in the evaluation of the JBTC program between April 15, 2000 and November 15, 2001. During this period, approximately 925 youth were administered risk assessments by DYS. Of these, we received contact information on 587 youth (62%) from DYS in a timely manner (i.e., immediately after risk assessment).¹³ Of the 587 youth we actively recruited for the study, we were able to interview 306 or 52%. The inability to locate a parent in order to obtain parental consent and to find the youth were the primary reasons interviews were not conducted. We had relatively few outright refusals when we were able to locate the parent(s) and youth. However, for this response bias analysis, we are comparing those youth who were successfully recruited into the study to all other youth who were risk assessed during our recruitment period, regardless of whether DYS provided their information to us or whether they had an actual opportunity to participate in the evaluation study.

Of the 925 youth, we interviewed 50% (146 of 290) of the youth who were in JBTC and 25% (160 of 635) of those who were not. We obtained administrative data from DYS on the 925 youth who had been administered a risk assessment and conducted a response-bias analysis in an effort to determine whether the youth who participated in the study are noticeably different from youth who did not. *Overall, those who were recruited into the study differed significantly from those who were not. In particular, study participants as a group had higher risk assessment scores than those who did not participate.* **Exhibit A1-1** summarizes the results of significance tests comparing study participants with those who did not participate in the study.

Exhibit A1-1. Study Participants Compared with Non-Participants

Variable	Group Means (s.d.)		Test statistic
	In Study	Not in Study	
AGE	15.10 (1.88)	15.86 (1.6)	-5.91643***
SUBRISK	1.37 (1.36)	1.15 (1.2)	2.339719*
SCHOOLRI	2.17(1.22)	1.60 (1.33)	6.368735***
FAMRISK	2.68 (1.72)	2.00 (1.78)	5.443017***
TOTRISK	8.77 (3.99)	6.55 (4.45)	7.575269***

¹³ The procedures established to obtain referrals and information on risk-assessed youth soon after intake and risk assessment were inadequate, particularly during the early part of the evaluation. Multiple DYS staff members had to provide the information and coordination between these staff and the field interview staff was difficult to establish in a manner that assured that cases weren't lost to the evaluation. These communication issues were resolved as the evaluation progressed.

	Group Means (s.d.)		
GENDER (% Male)	69.8%	78.5%	8.172**

***Significant at $p < .001$ level; ** significant at $p < .01$; * significant at $p < .05$

These differences were not unexpected. Specifically, the lowest risk youth have the least exposure to DYS and are more likely to have parents who view the DYS experience as an aberration and who prefer to remove the youth from any reminder of the event that led them to DYS, increasing their reluctance to allow the youth to participate in interviews. This finding is also not surprising because 48% of the youth in our sample were in JBTC, in other words they had been identified as high risk by DYS, whereas only 23% of the non-study sample was enrolled in JBTC. Also, those participating in the study were on average younger than those who did not (15.1 vs. 15.9 years), and study participants were more likely to be female (30% vs. 22%). The gender differences are somewhat surprising—but less so given reports from interviewers that girls were more compliant in terms of willingness to participate and showing up for interviews.

Because we knew there were major differences between the JBTC and non-JBTC youth, we stratified the population by JBTC status to examine for differences between study participants and non-participants but within and outside of JBTC. The purpose of these analyses was to determine how typical the participating JBTC youth were compared with the non-participating JBTC youth, as well as how typical the participating non-JBTC youth were compared with the non-participating non-JBTC youth. The results of these analyses inform our ability to draw inferences from the outcome evaluation. Specifically, if we found few or no differences between participants and non-participants in each group, we could confidently conclude that observed differences in outcomes could be properly allocated to all JBTC participants when compared with all other DYS-assessed youth.

These stratified analyses suggest that the participating JBTC subjects were not significantly different from the non-participating JBTC subjects in terms of age and risk assessment scores. Results are shown in **Exhibit A1-2**. The gender difference remained, however, with girls disproportionately represented in the study (32% vs. 15%). Again, this finding is not surprising because girls proved to be more reliable and responsive throughout the study.

Exhibit A1-2. Study Participants Compared with Non-Participants—JBTC Youth

Variable	Group Means (s.d.)		Test statistic
	In Study	Not in Study	
AGE	15.39 (1.56)	15.70 (1.45)	-5.91643***
SUBRISK	2.26 (1.19)	2.28 (1.08)	2.339719*
SCHOOLRI	2.61 (1.04)	2.44 (1.25)	6.368735***
FAMRISK	3.40 (1.59)	3.34 (1.85)	5.443017***
TOTRISK	11.35 (2.71)	11.29 (3.72)	7.575269***
GENDER (% Male)	68.5%	85.1%	11.63***

***Significant at $p < .001$ level; ** significant at $p < .01$; * significant at $p < .05$

As can be seen in **Exhibit A1-3**, for the non-JBTC youth, the analyses suggest that study participants were significantly younger (15.39 vs. 15.70 years) and had higher risk scores (except for the substance abuse subscale). There was no difference in the gender representation between participants and non-participants in this group.

Exhibit A1-3. Study Participants Compared with Non-Participants—Non-JBTC Youth

Variable	Group Means (s.d.)		Test statistic
	In Study	Not in Study	
AGE	14.82 (2.1)	15.91 (1.64)	-5.91643***
SUBRISK	0.53 (.89)	0.81 (1.01)	2.339719*
SCHOOLRI	1.74 (1.23)	1.35 (1.25)	6.368735***
FAMRISK	2.00 (1.55)	1.60 (1.54)	5.443017***
TOTRISK	6.32 (3.43)	5.11 (3.58)	7.575269***
GENDER (% Male)	71.1%	76.4%	1.832

***Significant at $p < .001$ level; ** significant at $p < .01$; * significant at $p < .05$

Given that JBTC was targeting higher risk youth in Lane County, the fact that the study recruited the riskiest subjects among the non-JBTC youth suggests that the quasi-experimental comparison group may be more comparable to the JBTC group than it otherwise may have been. Nonetheless, the results of the recruitment process, reflected in our response-bias analyses, suggest that our comparisons using interview data should be interpreted as how well JBTC participants fared in comparison with the riskier DYS youth who did not participate in JBTC.

Appendix 2. Cost Data and Utilization Sources

Exhibit A2-1. Sources for JBTC Program Evaluation Cost and Utilization Data

	Unit	Unit Costs	Utilization
Initial screening and assessment	Per assessment	Department of Youth Services (DYS) staff	JBTC Management Information System (MIS)
Court	Per appearance	Cowell et al., 2002; staff time estimates	Not available
UA	Per UA	DYS Staff	Oregon Juvenile Justice Information System (JJIS)
Case management	Per day	DYS Staff	MIS, number of days
Detention	Per night	DYS Staff	JJIS
Arrest	Per arrest	City of Eugene Police Department	JJIS
Probation	Per day	DYS Staff	Not available
Inpatient and residential drug abuse tx	Per youth	Oregon Office of Medical Assistance Health Plans (OMAP) fee schedule	Oregon Health Plan Client Process Monitoring System (CPMS) and MIS
Outpatient drug abuse tx	Per youth	OMAP fee schedule	CPMS and MIS
Incentives and rewards	Per incentive or reward	Study records	MIS and DYS staff

Note: All acronyms in the table are spelled out in the first instance of use.