WHY ARRESTEE DNA LEGISLATION CAN SAVE INDIANA TAXPAYERS OVER $60 MILLION PER YEAR January 2009 (amended Feb 2010)

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Executive Summary

The social benefits of reducing crime are obvious. The fiscal benefits, however, are somewhat less intuitive, and too often overlooked. Indiana taxpayers currently spend over $1.5 billion per year funding the direct state and local government costs of police protection and judicial services[1]. The purpose of this study is to illustrate why adoption of "arrestee DNA" legislation in Indiana (i.e. the collection of DNA from those arrested) will significantly reduce this financial burden on taxpayers.

The governmental investment to collect DNA from arrestees - and to increase collection of DNA from crime scenes - is estimated to be $9.5 million per year. This investment can be recouped entirely by simply increasing Indiana's DNA Sample Processing Fee (currently assessed by the trial courts) from $2 to $24, making the legislation **budget-neutral from inception**.

In time, the policy will be far better than budget-neutral; it will actually save significant tax dollars. For each reported crime, Indiana taxpayers currently spend an average of over $2,000 for officer response, investigation, prosecution, and adjudication. Because criminals tend to be repeat offenders, each conviction prevents an average of 7 to 8 future crimes, yielding a potential fiscal benefit of over $15,000 per conviction. By increasing the DNA database of "Known Persons" against which crime scene evidence can be searched to identify potential suspects, the analysis shows that near-term cost **savings of over $60 million per year** can result from passage of an arrestee DNA law in Indiana.

While all states currently collect DNA from convicted felons, 15 states[2] have recently expanded those laws to also provide for DNA collection from arrestees (similar to the requirement to furnish a fingerprint upon arrest). In so doing these states have armed their public safety communities with an incredibly valuable crime solving, and crime *prevention* tool. This evolution builds on the well established success of convicted offender DNA collection and databanking programs. The FBI reports that with a mere 6.3 million convicted offender profiles in the CODIS database, over 77,000 crime investigations have been aided to date[3]. The Indiana State Police reports that when biological crime scene evidence is uploaded to CODIS in search of potential leads, 40% of those searches yield a matching suspect[4]! It only stands to reason that increasing the number of profiles in the Known Persons database will increase the number of crime-scene evidence matches. More matches will increase the number of crimes solved, enhance the efficiency of crime fighters, and streamline the adjudication process. DNA database expansion will not only remove criminals from the streets, earlier in their criminal careers, but also increase the deterrent our justice system presents to prospective new criminals. Finally, expanded use of the DNA database to solve crimes will exonerate more individuals who have been wrongly accused.

Fiscally responsible legislators should ask and understand how all policies impact the financial bottom line, particularly in the current economic context. The objective of this study, therefore, is to pragmatically determine the extent to which implementing DNA collection from all arrestees will yield a positive fiscal return to Indiana taxpayers, notwithstanding the myriad of intangible benefits which will certainly also ensue. **The conclusion is that, on balance, collecting DNA from arrestees will *not* cost the state money, it will actually *save* money.**

More important is the cost of NOT passing this legislation, which would be measured not only in the missed opportunity to save taxpayers money, but also the socioeconomic costs of avoidable human tragedy and victimization. If Indiana wants to stop its "brain drain" and convince potential employers and employees to locate here, it is important to have a low cost of living and low cost of doing business (lower taxes). This initiative saves Indiana taxpayers money by reducing crime rates. Equally important, however, is that reduced crime rates in Indiana mean a more conducive environment in which to live and raise a family.

Arrestee DNA legislation is an example of public policy which makes good sense both fiscally, and socially.

[1] Bureau of Justice Statistics, Justice Expenditure and Employment Statistical Extracts, NCJ 224394 (2006)
[2] Current list at www.dnasaves.org
[3] Per www.fbi.gov website
[4] Per Kristine Crouch, Indiana CODIS Administrator

Background

How DNA is Used to Solve Crimes

An attempt to quantify the fiscal benefits of arrestee DNA legislation must begin with a discussion of how DNA is used to solve crime. Using forensic DNA techniques to link individuals with crimes has produced a revolution in the way crimes are solved. DNA can help conclusively eliminate or implicate an individual as the perpetrator of a crime, even for crimes where there are no suspects!

Forensic DNA testing is a vastly more precise and reliable means of human identification than other methods, including fingerprinting. DNA profiles are uploaded by crime labs to a computer database program controlled by the FBI known as CODIS (Combined DNA Index System), which allows DNA profiles to be compared across the nation from one crime lab to another. The CODIS architecture contains several distinct databases, including one with DNA profiles of Known Persons, and another containing DNA profiles developed from Crime-scene Evidence. Each database contains a series of number pairs representing an individual's genetic profile at each of 13 locations (loci) on the DNA molecule.

How Known Persons Profiles are Obtained

Current Indiana law requires individuals convicted of a felony to provide a DNA sample to the Department of Correction (DOC), the County Sheriff, or the agency supervising the individual (IC 10-13-6-10). The DNA sample is collected by buccal swab (swabbing the inside of the felon's cheek with a Qtip®-like cotton swab). These swabs are sent to the Indiana State Police which then develops a DNA "profile" (i.e., a set of 13 number pairs) which uniquely identifies that person. A "Unique Identifier" is assigned to this profile which is kept in a secure database by the Indiana State Police along with the name, social security number, last known address, etc. of the convicted felon.. The "Unique Identifier" and the DNA profile are then uploaded to the CODIS database of Known Persons (Figure 1) [note that the felon's name, social security number, etc. are NOT uploaded to CODIS]. In addition to DNA profiles being obtained involuntarily from convicted felons, DNA profiles are occasionally obtained voluntarily as part of a plea agreement from those convicted of misdemeanors.

How Crime-scene Evidence Profiles are Obtained

At crime scenes, biological evidence is collected by law enforcement personnel for DNA analysis. The biological evidence may include blood, hair, semen, skin-cells (from clothing), and/or saliva (from cigarettes, coke cans, bottles, etc). If an investigator determines that the evidence is of probative value, it is analyzed by a crime lab. If a DNA profile is obtained, it is uploaded to the CODIS Crime-scene Evidence database (Figure 1).

CODIS Database Example

The FBI periodically runs a program within CODIS that attempts to match Known Persons profiles with Crime-scene Evidence profiles, first at the local and state levels (where most matches are made), then nationally. As each database grows, the possibility of finding a matching profile in the complementary database grows.

In the hypothetical Figure 1 scenario, when the two CODIS databases are cross-searched, a match or "hit" will be generated indicating that Unique Identifier #98765-4321 is linked to the crime scene evidence. CODIS-unit members of the Indiana State Police then cross-reference their secure database with the "Unique Identifier" to establish the name of the convicted felon. This is a powerful investigative tool for the detective, particularly if there were otherwise no leads to follow! It is this ability to identify suspects in the absence of any other leads which makes the CODIS system so powerful.

CODIS searches are also done within the Crime-scene Evidence database to identify multiple crime scenes which can be linked to the same individual. While these

Known Persons Database Entries:

Unique Identifier	Lab	Loc1	Loc2	…	Loc11	Loc12	Loc13
12345-6789	OHIO BCI	12,11	13,12	…	9,2	14,10	7,5
98765-4321	IN State Police	**7,5**	**10,8**	**…**	**13,8**	**12,7**	**12,11**

Crime-scene Evidence Database Entry:

Agency	Case #	Description	Lab	Loc1	Loc2	…	Loc11	Loc12	Loc13
Marshall Cty Sheriff, IN	2005-5112	profile from blood stain on broken glass in residence	IN State Police	**7,5**	**10,8**	**…**	**13,8**	**12,7**	**12,11**

Figure 1. Exerpts from CODIS databases.

evidence-to-evidence matches do not generate suspect leads, they are very powerful in convicting offenders quickly and of higher charges once their DNA profiles are obtained (e.g. by virtue of requiring a habitual criminal, arrested for an unrelated offense, to submit his DNA profile pursuant to arrestee DNA legislation).

Consider the following all too common example. A string of burglaries and sexual assaults are all committed by the same person. Several of these crimes have yielded biological evidence and the resulting DNA profiles have been uploaded into the Crime-scene Evidence database within CODIS giving investigators critical evidence for the successful indictment of "John Doe" for multiple crimes, even though they have no idea who John Doe is; they merely know his DNA profile. As a habitual criminal, John Doe is quite likely to be arrested at some point for an unrelated misdemeanor, perhaps even spending time in jail.

Since Indiana limits the collection of DNA to convicted felons only, a heinous criminal like John Doe is able to slip through the fingers of law enforcement, possibly touching the justice system several times, despite the existence of evidence which would easily condemn him to a long prison sentence. It makes no sense to "blindfold" our law enforcement agencies to the most important information about those from whom they seek to protect the public. Perpetuating a system which allows law enforcement to hold a violent criminal in custody only to release him back into the population because investigators are arbitrarily prevented from "connecting the dots" is folly, both socially and fiscally. With an arrestee law in place, the first time John Doe is arrested he will be linked to his long record of anonymous violent crimes, and can be removed from the population and the opportunity to do further harm – saving the government's cost to investigate, prosecute, and adjudicate those prevented crimes!

This John Doe scenario is by no means hypothetical. In 2005, the city of Chicago published a study on preventable crimes[5] profiling eight such John Does who slipped through the system due to lack of arrestee DNA collection. Tragically, had an arrestee collection law been in place in Illinois, 60 violent crimes would have been prevented, including 53 rapes and murders… just from these eight individuals. The fact is 70% of America's crime is committed by only 6% of its criminals[6], and it is this subset of the population for whom inclusion in CODIS will yield the most benefit. If one accepts the premise that a high positive correlation exists between the subset of the population which is arrested, and the subset of the population which commits crimes, then logic dictates that law enforcement should be uploading DNA profiles from all arrestees into the CODIS Known Person database[7].

The Efficacy of Forensic DNA

A selection of compelling CODIS and DNA statistics show the power of these tools in solving and reducing crime.

* The Indiana State Police reports that 40% of the crime scene evidence uploaded into CODIS yields a suspect "hit"[8].
* The Urban Institute, in a study funded by the National Institute of Justice, reports that when DNA is recovered from a domestic burglary crime scene, the suspect identification rate increases from 15 to 46 percent. About half of suspects identified are ultimately convicted, and about one in four convicted offenders received custodial sentences. The study further estimates that each of these detections prevented an additional 7.4 crimes from being committed[9].
* From October 2005 through September 2007, the city of Denver participated in a grant project funded by the National Institute of Justice ("the burglary project"), the

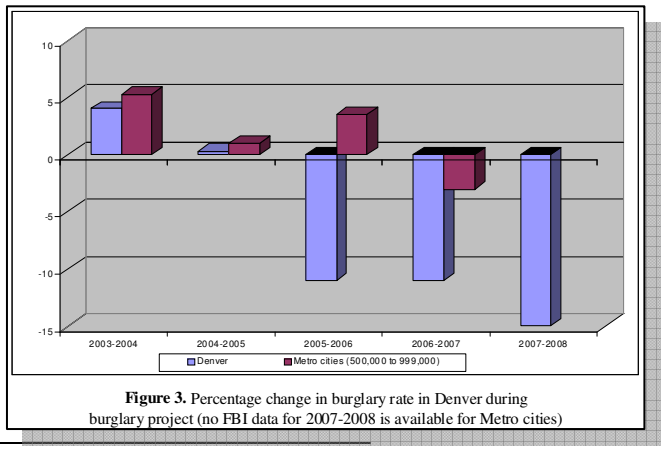

Figure 3. Percentage change in burglary rate in Denver during burglary project (no FBI data for 2007-2008 is available for Metro cities)

[5] http://www.dnasaves.org/files/ChicagoPreventableCrimes.pdf

[6] James E Hooper, "Bright Lines, Dark Deeds: Counting Convictions Under the Armed Career Criminal Act", Michigan Law Review, Vol. 89 (1991)

[7] Provided, of course, that adequate provision is made for the expungement of DNA profiles from the acquitted – which current federal laws already do.

[8] Per Kristine Crouch, Indiana CODIS Administrator

[9] Urban Institute Justice Policy Center, "The DNA Field Experiment: Cost-Effectiveness Analysis of the Use of DNA in the Investigation of High-Volume Crimes", Washington, D.C, (March 2008)

aim of which being to explore whether DNA was a cost-effective tool for investigating and prosecuting high-volume property crimes. Over a 2 year period, 600 DNA profiles were developed from burglary cases, 245 (41%) of which yielded CODIS hits. The resulting increase in convictions had a substantial and immediate impact on the Denver crime rate. In the two years of the project, the number of burglaries was reduced by 26%[10]. The Denver report estimates cost savings to the police department and victims of $5 million and $37 million, respectively.

* With arrestee DNA collection on the books since 2003, Virginia has received over 5,000 hits on its database, with nearly 500 of these matches directly attributed to arrestees' profiles. Approximately 80% of hits would have been missed if the database was limited to only violent offenders. Further, approximately 40% of violent crimes solved were perpetrated by individuals with previous property crime convictions.[11]

The consensus is clear that forensic use of DNA in concert with the CODIS system is highly effective, explaining why investigators rely increasingly on DNA to solve crimes, and why many states are adopting arrestee legislation to leverage this success.

Governmental Costs of Crime

The Nature of a Criminal Career

Rare is the individual who in a singular lapse of reason commits a crime, and then returns to a life of law abiding citizenship, never to offend again. In reality, most offenders are repeat offenders. Studies in which inmates were interviewed about their previous crimes have shown that, on average, each inmate committed 8 undetected crimes for each single offense that was prosecuted[12]. Put another way, the current justice system only successfully penalizes about 11% of the crimes committed by each offender in the system. In extreme cases, it has been shown that a serial burglar can be individually responsible for more than 200 crimes a year.[13]

Rarer still is the offender whose first crime is a violent felony like rape or murder. It has been well established that the typical criminal career progresses in an escalating fashion. Criminals commonly "cut their teeth" with less serious crimes such as petty theft or drug violations. After establishing a successful track record of getting away with these crimes without consequence, many will inevitably progress to more serious property crimes, violent crimes, sexual assaults, and eventually even murder. A number of pertinent statistics illustrate the nature of career criminality:

- Based on 2006 Indiana Department of Corrections admission data, 34% of the offenders classified as new commitments had a prior Indiana commitment to a DOC facility.
- According to NIJ, "Individuals who commit property crimes have a higher recidivism rate than those who commit other types of offenses, and their demonstrated potential to engage in more serious, violent behavior makes analyzing DNA evidence from property crimes not just an option, but a matter of necessity."[14]
- A review of New York's first 1,000 CODIS hits showed that the vast majority were linked to crimes like homicide and rape, but of these, 82 percent of the offenders were already in the database as a result of a prior conviction for a "lesser" crime such as burglary or drug violations.[15].

This combination of habitual offending and escalating severity of crime means there is a powerful multiplying effect of each crime which is successfully prosecuted. Prosecution impacts not only the single crime at issue, but also the large number of subsequent more serious and costly crimes which are potentially avoided having convicted the offender and broken the criminal cycle. Rehabilitation efforts are much more likely to succeed if employed before offenders have become hardened by a life of crime, so measures such as arrestee legislation which can accelerate the identification of criminals earlier in their careers will yield exponential results in terms of prospective crime reduction and governmental cost reduction.

[10] Ashikhmin, Berdine LaBerge, Morrissey and Weber, "Using DNA To Solve High-Volume Property Crimes In Denver: Saving Money, Lowering Crime Rates and Making Denver Safer", The PROSECUTOR, Volume 42 / Number 3 (2008)
[11] www.dfs.virginia.gov/statistics/index.cfm
[12] Smith, Ailling, Lane, "The Application of DNA Technology in England and Wales," ,Washington, D.C., (Jan. 2004)
[13] Chaiken, J.M. and Chaiken, M.R., "Varieties of Criminal Behavior", Washington, DC: US Department of Justice NCJ 87680, (1982)
[14] Zedlewski, Murphy, "DNA Analysis for "Minor" Crimes: A Major Benefit for Law Enforcement", NIJ Journal No. 253, (January 2006)
[15] Ibid.

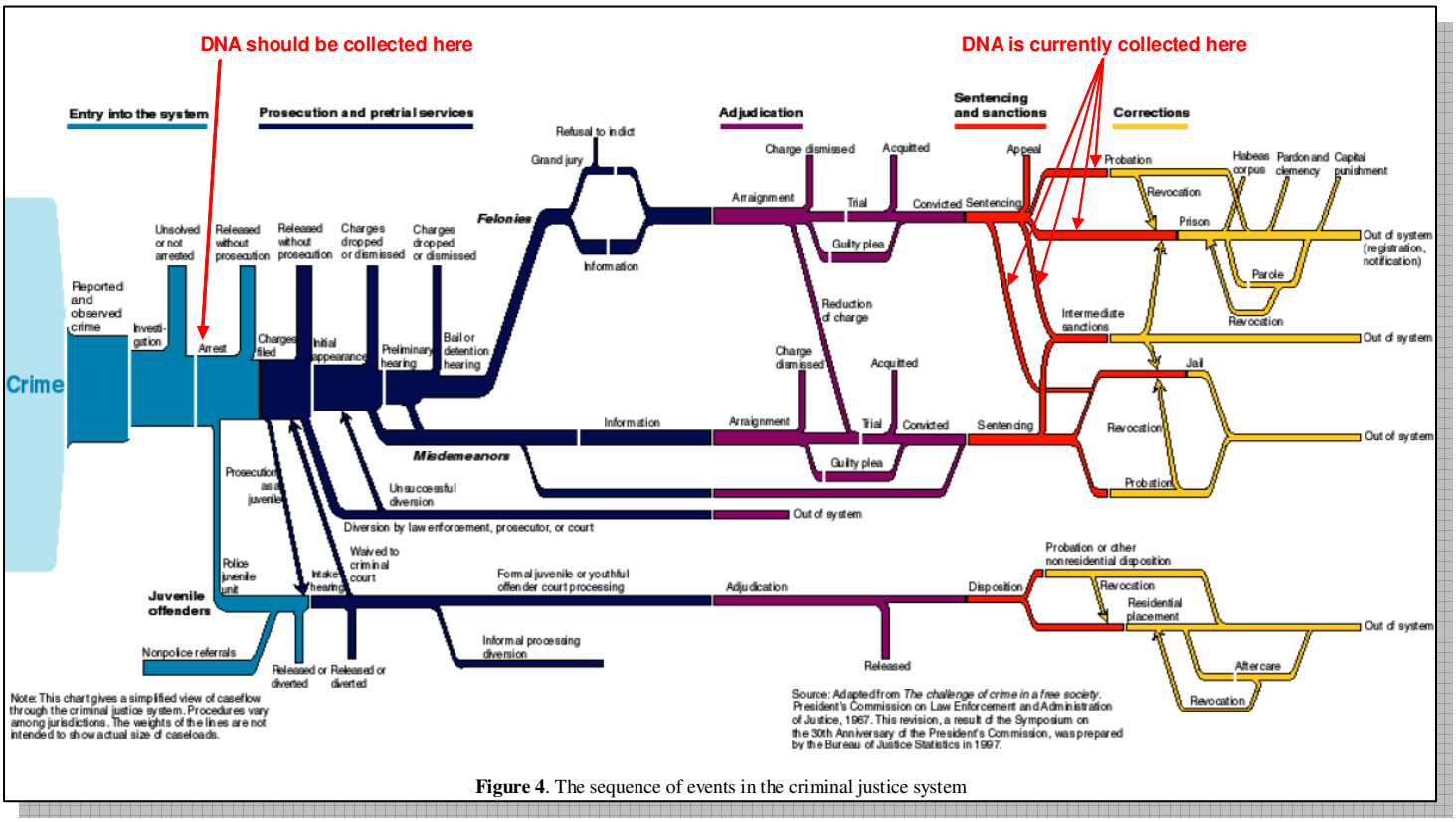

Figure 4. The sequence of events in the criminal justice system

The Flow of a Case Through the Justice System

The flow of any given offense through the justice system can be divided into 5 distinct phases; entry, prosecution, adjudication, sentencing, and corrections. As illustrated in Figure 4, most crime occurs outside of this system. Only that portion which is observed and reported funnels into the justice process, and from that point forward cases are progressively filtered out at each step, leaving only a small portion which enters the final corrections phase. Due to habitual offending and recidivism, once criminals escape this criminal justice process through any of the numerous exit points, they most likely go back to the beginning and cycle through again and again.

Indiana's current convicted offender DNA legislation only captures DNA at the narrowest corrections phase (only for non-juvenile convicted felons), missing the opportunity to capture the broader subset of all arrestees (Figure 4). In addition to yielding a larger, more effective database, consolidating collection of DNA samples on arrest (at the same time fingerprints are taken) can be more efficient than the current system which involves collections at disparate prisons, jails, and probation offices around the state. The Indiana State Police currently collects approximately 2,000 convicted offender samples per month for uploading into CODIS, but the Indiana Legislative Services Agency has estimated that this figure will increase to almost 20,000 per month on the adoption of an all-arrestee DNA law[16].

At this pace, the size of Indiana's subset of the Known Persons CODIS database will double in a mere six months. Recall that 40% of crime-scene evidence the Indiana State Police searches against CODIS currently yield Known Person matches, with only 117,000 subject profiles in the Indiana database. With double the number of searchable Known Persons profiles, the 40% hit rate will certainly increase. Due to the multiplier effects discussed earlier, even a very modest increase can have significant positive impact to the state.

Methodology

The Indiana Legislative Services Agency has calculated the cost to collect DNA from all Indiana felony and misdemeanor arrestees to be between $4.3 million and $6.7 million annually in excess of current spending to collect DNA from convicted offenders only[17]. This calculation does not, however, consider the fiscal benefit

[16] Legislative Services Agency Fiscal Impact Statement LS6769
[17] Ibid.

of removing more habitual criminals from the streets, and thus avoiding the cost of crimes they are unable to commit. To estimate this cost-savings, the following steps were followed:

(A) We attempt to quantify the number of incremental convictions which might be expected in Indiana under an arrestee DNA law [up to 4,041 convictions – Figures 5 & 6]. Two proxies are studied for this purpose; the state of Virginia, and the United Kingdom.

(B) Seven key cost drivers were identified throughout the justice process, and actual historical cost data from the respective agencies within Marion County Indiana were analyzed to determine the average unit cost of each activity. From these average cost figures, an expected cost per crime is derived [$2,043 – Figure 9].

(C) A matrix was developed plotting a range of potential incremental convictions against a range of estimates of the number of crimes prevented per conviction. The product of these assumptions and the average cost of $2,043 yields an expected annual cost savings of up to $66 million (Figure 10).

Impact of arrestee DNA collection in Indiana

The Virginia Model

By U.S. standards, Virginia was an early adopter of arrestee DNA legislation, implementing an arrestee law January 1, 2003. Since adoption, Virginia has seen an average of 81 Crime-scene Evidence CODIS hits per year against Virginia arrestees (in addition to nearly 700 annual hits against convicted offenders). However, Virginia only collects DNA from certain violent and sex crime arrests, rather than from all arrests as contemplated in Indiana's proposed legislation. According to FBI arrest statistics for 2005[18], Virginia's qualifying arrests comprised only 2.7% of crimes that would qualify for collection in Indiana. Assuming the same proportion of hits applied to the broader set of all arrestees, one would expect that the average hit rate would increase to approximately 2,973 hits per year if Virginia collected from all arrestees.

The 2007 Uniform Crime Report (UCR) tells us that Indiana experienced 12% greater incidence of serious crimes than Virginia, requiring an additional adjustment to properly index Virginia's experience rate to Indiana (Figure 5). This method predicts that Indiana should yield approximately 3,329 hits per year from an expanded arrestee database. Finally, we know from the Urban Institute's DNA Field Experiment that approximately half of suspects identified from CODIS hits are ultimately convicted, so we can project an additional 1,665 potential annual convictions resulting from Indiana arrestee DNA collection if experience similar to Virginia is realized.

Average Virginia arrestee hits/ year	81	*(1)*
% of all qualified arrestees collected	2.7%	*(2)*
Projected hits from all arrests	2,973	
Indiana vs Virginia Crime rate index	1.12	*(3)*
Projected Indiana arrestee hits	3,329	
Conviction rate	50%	*(4)*
Incremental Indiana convictions	1,665	

(1) www.dfs.virginia.gov/statistics/index.cfm
(2) FBI Arrest Statistics (VA qualifying arrests / all VA arrests)
(3) 2007 UCR (Indiana Part I Crimes / Virginia Part I Crimes)
(4) Urban Institute, DNA Field Experiment

Figure 5. Potential annual DNA convictions in Indiana based on the Virginia model

The UK Model

England has long employed a more ambitious approach to forensic DNA than the U.S. Since its inception in 1995, the National DNA Database in the UK has never been limited to only convicted offenders. Instead, the stated objective of DNA collection programs in the UK is to maintain a database containing DNA profiles from the entire active criminal population. To that end, crime fighters in England can collect DNA from anyone arrested for, or suspected of committing, "any recordable offense". As of 2005, the UK national database contained about 3.1 million subject profiles, or 5.1% of the total UK population[19].

In 2003, police in England investigated 998,000 crime scenes, 57,000 (6%) of which yielded DNA evidence which was submitted to the national database. This 6% DNA yield corresponds exactly to the yield in the Denver burglary project, and is further supported by similar studies in the UK pegging the range between 4% and 9%.

[18] Puzzanchera, C., Adams, B., Snyder, H., and Kang, W. "Easy Access to FBI Arrest Statistics 1994-2005", (2007) http://ojjdp.ncjrs.gov/ojstatbb/ezaucr/

[19] UK National DNA Database Annual Report (2005)

During the same year, 49,913 database identifications were made and, consistent with NIJ findings in the U.S., roughly 50% of these DNA identifications lead to convictions.

Per the UK National DNA Database Annual Report for 2005, when new suspect profiles are loaded into the Known Persons database, 1.8% are immediately matched to an existing unsolved crime. This rate has remained quite stable for many years. Additionally, when new crime scene profiles are added to the database, an immediate match is made on 46.5% of those cases against an existing subject profile. This rate has been steadily *increasing* as the size of the subject database grows, demonstrating the positive correlation between the number of searchable profiles and the probability of making identifications. Note that both of these measures are the immediate hit rate, and therefore do not capture the additional crimes solved by virtue of maintaining a given profile in the database over a period of time.

Evidence-to-subject matches		
Annual investigations in Marion County (Ex. A)	32,257	
Indiana vs Marion County crime rate index	4.7	*(1)*
Estimated Indiana investigations	152,867	
Portion of investigations yielding DNA	6%	*(2)*
Projected crime scene evidence searches	9,172	
UK identification rate per evidence search	46.5%	*(3)*
Estimated conviction rate per identification	50.0%	*(4)*
Projected Indiana convictions	2,132	
Subject-to-evidence matches		
New Indiana arrestee profiles per year	236,578	*(5)*
UK identification rate per new profile	1.8%	*(3)*
Estimated conviction rate per identification	50.0%	*(4)*
Projected Indiana convictions	2,129	
Total potential Indiana DNA convictions	4,262	
Current Indiana DNA convictions (est.)	221	*(6)*
Incremental Indiana convictions	**4,041**	

(1) 2007 Judicial service report (felonies disposed in Indiana / Marion County)
(2) DNA yield in both Denver Burglary Project, and Smith Ailling UK study
(3) UK National DNA Database Annual Report for 2005
(4) Urban Institute, DNA Field Experiment
(5) Legislative Services Agency Fiscal Impact Statement LS6769
(6) 50% of CODIS hits per Indiana State Police 2007 annual report

Figure 6. Potential annual DNA convictions in Indiana based on the UK model

Applying these data to Indiana yields an alternative estimate of Indiana convictions which can be expected from arrestee DNA collection (Figure 6). As the UK system is widely regarded as having the most effective and efficient approach to the use of forensic DNA technology in the world[20], one can not expect that Indiana would immediately achieve the same high conviction rate enjoyed by the UK justice system. However, at the projected collection rate of nearly 20,000 arrestee DNA samples per month, the size of Indiana's subject database would in fact match that of the UK as a % of population within less than 2 years. There is every reason to believe that as the Indiana database expands, and collection of DNA evidence from crime scenes expands, comparable results should be achievable.

Average Cost per Case

Two types of cost savings arise from the expanded use of forensic DNA, those from reducing the average cost to process a crime, and those from reducing the number of crimes that must be processed. This study focuses on the latter, and specifically costs incurred during the first 4 phases of the justice system (ie. Entry, Prosecution, Adjudication, Sentencing). These metrics are the easiest to quantify based on available data and will experience the most immediate and direct benefits of arrestee DNA collection. Though not quantified, discussion of several additional byproducts of arrestee DNA collection appears later.

Marion County (Indianapolis) is an ideal community on which to model the governmental costs associated with crime because Marion County has its own:

- Police department
- Dedicated crime lab
- Prosecutor's office
- Public Defender's office, and
- Municipal criminal court system

As such, budgets from each of these agencies can be evaluated contextually to estimate the average cost to process a case (crime).

To calculate the average or "typical" cost of major crimes it is inadequate to simply divide the total budget for a given department by the number of cases processed, because this would fail to capture the fact that a dis-

[20] It should be noted that UK courts have recently held that the DNA database actually may go too far, in that it does not provide for expungement of DNA from those who are arrested but then acquitted. U.S. DNA laws are not subject to this excess because federal law requires that all states provide a mechanism to expunge DNA from the database on acquittal.

proportionate amount of resources are devoted to the more serious crimes. "Serious" crimes for purposes of this study are UCR Part I crimes, as defined in the national Uniform Crime Report, administered by the FBI (UCR). Part I crimes are the most egregious, and therefore are the most likely to involve extensive investigation, prosecution, and adjudication resources. A schedule of UCR Part I crimes reported in Marion County for 2007 appears in Figure 7.

	Offenses	Arrests
Homicide	114	85
Rape	505	140
Robbery	4,046	996
Assault	5,176	2,192
Burglary	13,385	1,070
Larceny	29,224	4,625
Vehicle Theft	7,680	1,129
Arson	352	57
Part I Total	60,482	10,294
Other		43,558
All Arrests		53,852

Figure 7. UCR Part I crimes in Marion County per IMPD 2007 Annual Report

An excellent tool to calculate the resources devoted to these crimes is found in the annual Indiana Judicial Service Report. In 1996 and again in 2002, comprehensive time studies of the Indiana judiciary were performed whereby several thousand officials meticulously tracked their time by activity and type of case for an entire year. Using these weighted caseload measures and a standardized annual reporting system, continuous assessment of capacity and utilization throughout the Indiana judicial system can be monitored. Figure 8 summarizes data drawn from the 2007 Indiana Judicial Service Report, showing that although Part I crimes (felonies) accounted for only 4% of the total caseload, they consumed approximately 20.6% of total court resources on a weighted caseload basis. Accordingly, the adjudication cost calculations in Exhibit A use 20.6% of total court costs to determine the average cost per felony case. Similar allocations of total cost to felony cases for prosecution and public defense were made based on discussions with those respective offices.

		Cased Disposed in 2007		Total Time Devoted		% of Resources Devoted	
Case Type	Avg time/ case (Min.) *x*	Statewide *y*	Marion County	Statewide *x * y = z*	Marion County	Statewide *z / Total*	Marion County
Murder	453	241	86	109,173	38,958	0.2%	0.4%
A Felony	420	2,734	635	1,148,280	266,700	2.5%	3.0%
B Felony	260	5,794	1,053	1,506,440	273,780	3.3%	3.1%
C Felony	210	9,966	2,107	2,092,860	442,470	4.6%	4.9%
D Felony	75	51,687	10,979	3,876,525	823,425	8.6%	9.2%
Subtotal		70,422	14,860	8,733,278	1,845,333	19.4%	20.6%
All Others	21	1,755,061	343,425	36,351,873	7,113,224	80.6%	79.4%
Total		1,825,483	358,285	45,085,151	8,958,557	100.0%	100.0%

Figure 8. Breakdown of judicial resources by category of crime per 2007 Judicial Service Report

Total Cost Savings

Figure 9 summarizes the seven key cost drivers identified in Exhibit A and their respective costs, as derived from a study of the costs of these services in Marion County. Based on the percentage of reported crimes which ultimately require each of the seven services (i.e. Officer Response, Investigation, Forensic Lab, Arrest, Prosecution, Public Defense, Adjudication), the per-case costs are expressed as an "expected cost" per reported crime. This allows for a calculation of the direct governmental cost which is avoided for each major crime which is prevented.

	# of Cases (Exhibit A) *X*	% of reported Crimes *X / 60,482 = Y*	Cost per Case (Exhibit A) *Z*	Expected Cost per Crime *Y * Z*
Offenses reported	60,482	100%		
Officer responses	32,257	53%	$ 159	$ 85
Investigations started	32,257	53%	$ 675	$ 360
Forensic lab used	11,577	19%	$ 600	$ 115
Arrests made	10,294	17%	$ 79	$ 14
Prosecution engaged	16,273	27%	$ 1,232	$ 331
Public defense required	9,782	16%	$ 1,195	$ 193
Cases adjudicated	14,860	25%	$ 3,846	$ 945
				$ 2,043

Figure 9. Expected direct governmental costs per crime reported

The NIJ and United Kingdom have respectively reported that for every DNA conviction, 7.4[21] to 7.8[22] additional crimes are avoided. Similarly, sexual assault offenders have been documented to commit an average of 8 sexual assaults[23] for each one which is detected. Chicago's previously noted Study on Preventable Crimes identified 60 violent crimes committed by 8 offenders which would have been prevented by felony arrest DNA collection – an average of 7.5 preventable crimes per offender. Using these figures, we can approximate an expected cost savings per conviction in the range of $15,100 to $16,300.

Recognizing that there will be a wide range of speculation as to the actual outcomes Indiana might experience upon implementation of arrestee DNA collection, the matrix at Figure 10 shows predicted annual cost savings across a wide range of assumptions for; x) the number of crimes prevented per conviction, and y) the number of new convictions attributable to arrestee DNA collection. Savings even at the low end of the prediction range are significant. At experience levels comparable to the UK, the analysis yields a potential **direct savings of well over $60 million per year**!

[21] Urban Institute Justice Policy Center, "The DNA Field Experiment: Cost-Effectiveness Analysis of the Use of DNA in the Investigation of High-Volume Crimes", Washington, D.C, (March 2008)

[22] Smith, Ailling, Lane, "The Application of DNA Technology in England and Wales," ,Washington, D.C., (Jan. 2004)

[23] Groth, Longo, McFadin, "Undetected Recidivism Among Rapists and Child Molesters" (1982)

New Convictions	Crimes Prevented per Conviction 4	5	6	7	8
873	7,132,685	8,915,856	10,699,027	12,482,198	14,265,369
1,665 Fig 5	13,603,574	17,004,467	20,405,361	23,806,254	27,207,147
2,457	20,074,463	25,093,078	30,111,694	35,130,310	40,148,926
3,249	26,545,352	33,181,690	39,818,028	46,454,366	53,090,704
4,041 Fig 6	33,016,241	41,270,301	49,524,362	57,778,422	66,032,482

Figure 10. Range of potential annual government savings at average cost of $2,043 per crime prevented

Why this Estimate is Conservative

This calculation represents a conservative estimate of cost savings because it is derived solely from the avoidance of future crimes which would have been committed by the convicted offender had he not been identified. It does not attempt to calculate the additional savings which will be realized due to the more efficient nature of DNA cases as opposed to non-DNA cases. These efficiencies occur throughout the justice process, and as the proportion of cases prosecuted based on DNA evidence increases, these savings will become significant. Following are a few of these efficiencies.

Investigation. Investigative resources required when a CODIS DNA match has identified a suspect are much less than a case with several (or no) leads to follow.

Prosecution and adjudication. Efficiency of prosecution and adjudication in DNA cases is increased for a number of reasons. Matching of suspect DNA to multiple crimes in the evidence database often allows for consolidated prosecution, and prosecution to higher charges, eliminating redundancies. Defendants in DNA cases are also dramatically more likely to plead guilty than in traditional cases. In the Denver burglary project, for example, 75% of DNA cases were pled to the highest charge, vs. only 30% of non-DNA cases. This obviously has the effect of significantly reducing prosecution, public defense, and adjudication costs for these cases (Figure 11).

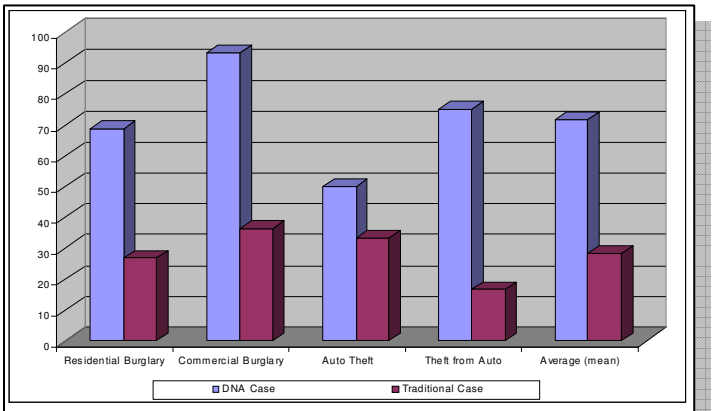

Figure 11. Percentage of Denver cases in which defendant pled to top charge in DNA vs non-DNA cases

Deterrence. The reduction in crime driving the cost savings estimated herein relates to the fact that as more criminals are prosecuted, those same criminals are unable to commit future crimes. This is quantifiable because statistics about habitual offending are available. In other words, we have calculated the expected savings based on a given population of criminals. An additional by-product of increased conviction rates which can not be quantified, however, is the deterrence of new individuals from entering the criminal population. It is logical that improved efficiency of the justice system will over time reduce the size of the criminal population, and UK statistics bear this out. After 10 years of DNA collection and databanking, crime rates have in fact begun to decrease significantly in the UK. During a period when crime levels have been rising throughout many countries in Europe, the total number of crime scene evidence searches (i.e. crimes investigated) against the UK National Database decreased by 19% from 2004 to 2005, continuing a downward trend which began in 2003[24]. Some of this decrease is certainly due to more criminals being in prison and therefore unable to commit crimes, but a portion of the decrease is due to there being fewer individuals inclined to pursue a life of crime.

Why ALL arrestees?

Lawmakers may be tempted to consider legislation which would only collect DNA from a subset of arrestees (felony arrests for example) rather than from all arrestees. This would be a serious mistake for two reasons:

Efficacy. The cost savings estimated in this study are predicated on preventing the more serious crimes offenders progress toward during their criminal career. As such, the sooner law enforcement has an individual's profile on record, the sooner he can be linked to unsolved crimes and the fewer additional crimes he can commit before being stopped. If law enforcement must wait until he is arrested for a felony, society may have waited too long.

Is it ethically acceptable to allow a serial rapist (not yet linked to his crimes) to return to the streets because he was merely arrested for a misdemeanor? A system that eventually identifies him only once he commits a sufficient number of additional rapes to finally be convicted of a felony offers little comfort to the interim

[24] UK National DNA Database Annual Report (2005)

victims. If a misdemeanant were matched to other crimes based on his fingerprints, probable cause would exist to hold him in custody under our current system. It is inconsistent and illogical, therefore, to prevent a DNA match from providing the same public safety benefit.

One might legitimately argue to limit DNA collection to only "major" arrests if it were true that "minor" offenders never commit major crimes - but this is far from the truth. Figure 12 shows data from a sample of Virginia offenders who were convicted of non-violent crimes (drug possession and forgery), and the additional "major" crimes that were solved once their DNA was uploaded into CODIS[25]. The prevalence of violent crimes committed by these "minor" convicts underscores the importance of collecting DNA from all arrestees. Rather than *solving* these violent crimes, some might have been *prevented* had Virginia been collecting DNA earlier and from a broader subset of arrestees.

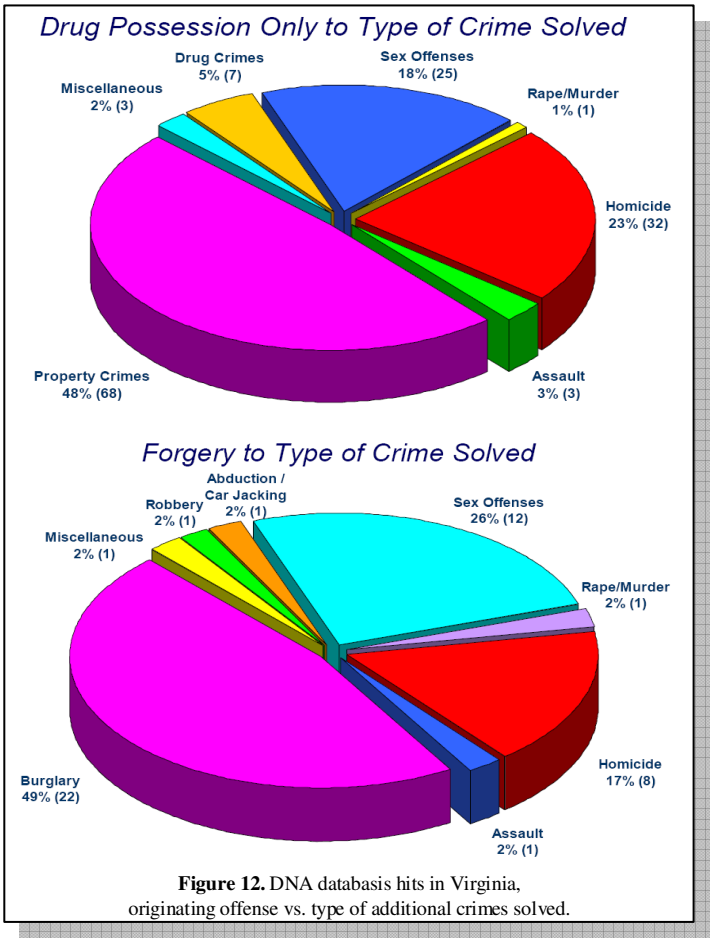

Figure 12. DNA databasis hits in Virginia, originating offense vs. type of additional crimes solved.

[25] National Center For Victims of Crime, "DNA Technology: Impact on Victims, Public Safety, and Possibilities for the Future", Washington, DC, (June 20, 2007)

Efficiency. Legislation that would limit DNA collection only to certain arrests, but not others, only creates unnecessary administrative burden on law enforcement officials. Additional resources would be spent training collectors on what samples should and should not be collected, policing adherence to this complex decision tree, and analyzing and dispatching cases of incorrect collections. And what happens if a DNA sample was mistakenly obtained for a non-qualifying arrest, and that DNA matched an offender to a previous violent crime? Would this evidence be legally admissible, or would investigators be forced to "pretend" they didn't know who committed the crime in question? The best way to minimize the administrative costs of DNA collection is to construct the simplest rules possible, collecting DNA from all arrestees. DNA is the 21st century equivalent of the fingerprint, so any time law enforcement is justified in establishing an individual's identity by their fingerprint or photograph, law enforcement is equally justified in establishing their identity by DNA.

Other Costs and Benefits

There are additional important indirect costs and benefits which are beyond the scope of this analysis. These costs include:

The cost to victims. While largely intangible, the cost of crime to its individual victims and society at large are substantial. The costs of stolen property, personal security expenditures, lost wages, and pain and suffering are all substantial. In the case of sexual assaults, direct tangible victim costs of over $111,000 per case have been documented.[26] The reduction in direct governmental costs per each crime prevented pale in comparison to the savings by victims.

Evidence Processing Costs. Expanded use of DNA may increase the average cost per case processed by crime labs. At current market rates, the cost to process DNA for a typical case with 5 biological samples is around $1,500. In the case of the Marion County crime lab, for example, only 2.6% of forensic cases currently use DNA[27]. Their current average cost of $600 per case will, therefore, be skewed higher as the portion of cases with DNA increases to the 6% target identified in this study. Assuming the proportion of DNA cases currently processed statewide is

[26] Wickenheiser, R. A., "The Business Case for Using Forensic DNA Technology to Solve and Prevent Crime", J. BIOLAW & BUS., Vol.7, No.X, (2004)

[27] IMCFSA Annual Report (2006)

consistent with Marion County, approximately $2.8 million in incremental finding may be required for the entire state to process crime-scene DNA evidence.

Department of Correction costs. One premise of this study is that criminals are removed from the street earlier in their careers. On balance, no more criminals are convicted than what otherwise would be, they are merely convicted earlier in their criminal careers. In the long term, the total burden on the Department of Correction should decrease as more people are rehabilitated and/or deterred from criminal behavior. But in the very short term, increased conviction rates and longer sentences corresponding with DNA prosecutions will create a temporary "bloat" in incarceration levels and the associated costs. In contrast, the annual savings from reduced crime rates will inure to government and society in perpetuity, more than offsetting the short-term cost of this bloat.

Increasing property values. From the government's perspective, the inverse correlation between crime rates and property values has a significant impact on its tax base, providing a substantial fiscal incentive to reduce crime. Increasing property values will be a longer term byproduct of arrestee DNA collection, which benefits both taxpayers AND tax collectors.

Funding Sources

While this analysis shows that government should enjoy a net cash *benefit* from passing arrestee DNA collection, the anticipated savings will not occur on day one, leaving the question of how to fund incremental collection costs in the interim. Adding Legislative Services' estimated arrestee collection cost of $6.7 million and an additional $2.8 million estimated cost of increased crime-scene DNA processing gives a "worst-case" figure of $9.5 million in incremental spending to be recouped (absent realizing ANY of the cost savings outlined herein).

The Indiana trial courts currently generate over $240 million in revenue from various fees assessed against litigants, among which is a $2 DNA sample processing fee charged to anyone convicted of a felony or misdemeanor in Indiana. In 2007, this fee was assessed on approximately 569,300 cases, generating revenue of $1,138,600[28]. Increasing the fee from $2 to $24 should be sufficient to generate an additional $9.5 million in court fee revenue[29], completely funding the incremental costs of arrestee DNA collection, and ensuring that 100% of crime reduction savings realized by the program will fall directly to governments' collective bottom line.

In addition, federal grant funds may be available from the National Institute of Justice (NIJ), which has provided over $400 million to reduce DNA backlogs and increase the capacity and capabilities of State and local DNA Laboratories. Of that amount, over $70 million was allocated for state DNA database laboratories to assist them in reducing their backlogs of convicted offender and arrestee samples, increase the size of their State and the national DNA data base, and realize the full potential of DNA to solve crime and prevent future victimization. In 2008, state database laboratories obtained, upon request, up to $40 per database sample to offset the costs of DNA analysis, data review and upload of profiles obtained from arrestees and convicted felons to the Known Persons database within CODIS. Continued federal support is evidenced by the December 2008 Congressional reauthorization of the Debbie Smith Act through 2014, authorizing Congress to provide federal funding of over $150 million annually to State and local DNA Laboratories to improve the use of DNA. With an expansion of Indiana DNA collection to arrestees, it is quite likely that the Indiana State Police could receive financial assistance from the NIJ to cover some portion of its DNA expansion expenditures[30].

Conclusions

The expectation that expansion of the DNA database will lead to more convictions and reduce crime rates is very well supported. Lawmakers might question whether collection of DNA from arrestees is cost effective, and though few have questioned the intangible benefits to society, the actual return on investment from government's perspective has not, heretofore, been thoroughly documented.

This study dispels the notion that collecting DNA from arrestees will cost the state money. In fact, the analysis shows that arrestee DNA legislation is likely to be *cash positive* to state and local governments due to a net reduction in justice system expenditures. Arrestee DNA legislation is a rare example of legislative action that will enhance quality of life and public safety, and simultaneously save taxpayers money.

[28] Indiana Judicial Service Report, 2007

[29] Assumes that 75% of assessed fees are ultimately collected.

[30] www.dna.gov

Exhibit A. The Direct Governmental Costs of Crime

Entry		
Officer Response		
Source: Denver Burglary Project and IMPD 2007 Annual Report		
IMPD Patrol officer salary		51,571
Payroll Burden		34%
Overhead		26%
Fully loaded patrol officer cost	$	82,514
Fully loaded cost per hour	$	40
Man-hours per response		4
Average cost per officer response	**$**	**159**
Investigators		
Source: 2007 IMPD annual report and 2005 County Budget		
Annual investigator salaries	$	13,608,016
Payroll Burden		34%
Overhead		26%
Fully-loaded investigator cost	$	21,772,826
# of investigations		32,257
Average cost per investigation	**$**	**675**
Crime Lab		
Source: 2008 Marion County Budget and IMCFSA Personnel		
Total Annual Budget		6,948,245
DNA cases completed		305
Non-DNA cases completed		11,272
Total cases completed		11,577
Average cost per case	**$**	**600**
Arrest		
Source: 2007 IMPD annual report		
Arrests made for major crimes		10,294
Fully loaded patrol officer cost per hour	$	40
Man-hours per arrest (estimated)		2
Average cost per arrest	**$**	**79**
Prosecution		
Prosecutors Office		
Source: 2009 County Budget and Prosecutors Office personnel		
Marion Cty Prosecutors Office budget	$	22,396,687
% of Resources devoted to felony cases		89.5%
Costs associated with felony cases		20,045,035
# felony cases disposed		16,273
Average cost per case	**$**	**1,232**
Public Defense		
Source: 2009 County Budget and PD Agency personnel		
Marion County Public Defender budget	$	18,666,108
% of Resources devoted to felony cases		62.6%
Costs associated with felony cases		11,691,845
Felony cases assigned		9,782
Average cost per case	**$**	**1,195**
Adjudication/ Sentencing		
Source: 2007 Judicial Service Report		
Marion County court expenditures	$	57,146,023
Marion County court fee revenue	$	35,946,863
Net court costs	$	21,199,160
% of Resources devoted to felony cases (Fig. 8)		20.6%
Felony case court costs	$	4,366,720
# felony cases disposed		14,860
Average cost per case	**$**	**3,846**