

156756

**U.S. Department of Justice
National Institute of Justice**

This document has been reproduced exactly as received from the person or organization originating it. Points of view or opinions stated in this document are those of the authors and do not necessarily represent the official position or policies of the National Institute of Justice.

Permission to reproduce this copyrighted material in micro-
fiche only has been granted by
Cincinnati Police Division

to the National Criminal Justice Reference Service (NCJRS).

Further reproduction outside of the NCJRS system requires permission of the copyright owner.

City of Cincinnati



156756

NOTES

Office of City Manager

OCT 18 1995

Division of Internal Audit
Room 138, City Hall
Cincinnati, Ohio 45202
(513) 352-4085

Date: 6/2/95
To: William Gustavson, Director,
Safety Department
From: Greg Hanfbauer, Internal Audit Manager
Copies to: Pat Titterington, Bill Deters
RE: Cost Analysis of the Impact of the
Institution of the Rapid Indictment
Program

Greg L. Hanfbauer
Manager

The Internal Audit Division's cost analysis of the impact of the institution of the Rapid Indictment Program (RIP) finds RIP to be both efficient and cost-effective. The enclosed report details the findings.

At your convenience, we will be glad to help the Police Division adopt the software programs necessary to facilitate evaluation of RIP data and generation of some or all of the statistical tables found in the enclosed report.

We appreciate the excellent cooperation of the Administration Bureau's Planning Section and the contribution of each district and unit in the accumulation of all the necessary records and data elements.

Also, we will be happy to answer any questions which you may have after reading this report.

Cost Analysis of the Institution of the Rapid Indictment Program

The Rapid Indictment Program (RIP) for felony offenses yields substantial savings to the Police Division. By eliminating all preliminary hearings, and taking cases straight to the Grand Jury and RIP Unit, the Police Division saves on the costs associated with thousands of annual court appearances.

Through cooperative effort with the Police Division, the Internal Audit Division has analyzed the financial impacts of RIP on the annual cost of police officer court appearances and City Prosecutor personnel. Results are based on records and other information gathered through the assistance of the districts and units of the Patrol and Investigation Bureaus, and especially, the Planning Section of the Administration Bureau.

Rapid Indictment produces an annual net benefit to the City of Cincinnati of over \$752,000 (See Table 1) through the reduction or redirection of expenditures associated with police officer court appearances and City Prosecutor personnel. The impact on expenditures associated with police officer court appearances is RIP's more significant effect.

The majority of the benefit associated with court appearances, 96%, is generated through the 86% reduction in the quantity of court appearances made by officers. The average daily number of court appearances decreased from a pre-RIP average of 42.44 (See Table 2) to a post-RIP average of 5.81 (See Table 3) for an average difference of 36.63 (See Graph 1; The distance between the two parallel lines representing daily averages denotes the difference). The other 4% is generated through a combination of the effects of RIP and the implementation of schedule rotations.

RIP and schedule rotations account for a 25% decrease in the average cost for the remaining court appearances. The cost of court appearances decreased from a pre-RIP average of 3.39 (See Table 2) earned hours per court appearance to a post-RIP average of 2.54 (See Table 3). This resulted in an average difference of .85 earned hours per court appearance (See Graph 2).

The difference in average cost per court appearance is due to the relative redistribution of on-duty verses off-duty court appearances. The lower costing on-duty court appearances increased from 15% of all court appearances to 45%, whereas, the higher costing off-duty court appearances dropped from 85% to 55% of all court appearances (See Table 4).

The 30% increase in on-duty court appearances is estimated to be attributed to a 22% increase due to the effects of schedule rotations and an 8% increase due to the effects of RIP (See Tables

5 & 6; Also see the appendix for further details). Schedule rotations and the large reduction in the overall number of court appearances allow better management of court time. Court schedules can be set up so as to take advantage of an officer's on-duty time. And the RIP effect is due to RIP's relative reduction of court appearances for the Criminal Investigation Section (CIS) as compared to all other major units. CIS has a much higher relative amount of on-duty court appearances in both the pre-RIP and post-RIP sample period, and in the post-RIP sample period, CIS accounts for a higher relative number of all court appearances (See Table 7).

CIS also accounts for the slight increase in the weighted average cost per earned hour seen in Table 8. The average cost of an earned hour went from \$25.87 in the pre-RIP period to \$26.32 in the post-RIP period. The \$.45 per earned hour cost increase is due to the change in the relative distribution in rank of officers making court appearances. Relatively more Police Specialists are making court appearances due to CIS making relatively more court appearances and also employing relatively more Police Specialists.

Together the effects of RIP and schedule rotations account for a daily total decrease of 129 earned hours for court appearances (See Graph 3) or 90% of the pre-RIP total (See Table 9). The gross daily total value of the reduced number of earned hours is \$3,337.23.

The amount of the above figure which the Police Division realizes will depend on the daily costs of RIP, the amount of the fringe component which the police division pays on accumulated compensatory time, and the costs associated with the redemption of compensatory time. Compensatory time however has decreased from 30.6% of all off-duty earned hours to only 3.1% in the post-RIP period.

Other benefits of RIP include the reduction in the average amount of actual time which an officer spends in making a court appearance and the reduction in the ratio of earned hours to actual hours worked. RIP's decrease in the overall quantity of court appearances has reduced the amount of waiting time which officers spend in court and thereby reduced the average amount of actual time spent in court. Actual time in court has gone from one hour and fifteen minutes to just one hour.

The ratio of earned hours to actual time worked has also decreased. It has gone from 2.76:1 to 2.58:1. An average reduction of eleven minutes is attributed to a greater relative decrease in average earned hours as compared to average actual hours worked.

The Police division's Rapid Indictment Program is both efficient and cost-effective. Once re-directed efforts are taken out, annual benefits in the range of \$631,000 should be realized (See Table 1).

Table 1

A)

Costs and Benefits of the Institution of the
Rapid Indictment Program

	Cost	Benefit (Savings)
Value of Police Officer Earned Hours for Court Appearances		\$829,377.47
Value of City Prosecutor Earned Hours for Preliminary Hearings & Felony Review		\$91,626.39
RIP Unit (3 Officers)	\$163,024.90	
Equipment	\$4,600.00	
Supplies	\$1,000.00	
Total	\$168,624.90	\$921,003.86
Net Savings		\$752,378.97

B)

Costs and Realized Benefits of the Institution of the
Rapid Indictment Program (Less Re-Directed Effort)

	Cost	Benefit (Savings)
Value of Police Officer Earned Hours for Court Appearances		\$800,017.50
RIP Unit (3 Officers)	\$163,024.90	
Equipment	\$4,600.00	
Supplies	\$1,000.00	
Total	\$168,624.90	\$800,017.50
Net Savings		\$631,392.61

Table 2

Pre-Rapid Indictment Program Sample

Court_Date	Sum of Earned Hours (EH)	Appearances (Apps)	Cost (EH/Apps)
03-Sep-93	140.07	53	2.62
07-Sep-93	139.44	37	3.75
13-Sep-93	184.14	45	4.06
17-Sep-93	69.78	20	3.53
22-Sep-93	134.22	37	3.61
18-Oct-93	174.08	45	3.84
22-Oct-93	116.59	36	3.23
29-Oct-93	143.27	40	3.62
03-Nov-93	149.23	45	3.29
05-Nov-93	151.75	38	3.95
12-Nov-93	153.03	62	2.48
19-Nov-93	157.36	49	3.22
24-Nov-93	137.23	48	2.88
30-Nov-93	95.90	33	2.95
01-Dec-93	159.86	43	3.72
08-Dec-93	221.38	65	3.40
16-Dec-93	191.72	55	3.51
22-Dec-93	152.60	36	4.23
28-Dec-93	17.89	6	3.08
10-Jan-94	186.47	56	3.34
Average	143.80	42.44	3.39
N =	20.00	20.00	20.00
Sample Standard Dev.	44.67	13.65	0.46
Estimated Std Error	9.99	3.05	0.10
95% Confidence Interval			
Upper Limit	164.68	48.82	3.60
Lower Limit	122.92	36.06	3.17

Table 3

Post-Rapid Indictment Program Sample

Court_Date	Sum of Earned Hours (EH)	Appearances (Apps)	Cost (EH/Apps)
29-Sep-94	18.90	12	1.63
30-Sep-94	29.88	10	2.86
06-Oct-94	44.88	13	3.51
19-Oct-94	19.19	7	2.75
26-Oct-94	28.10	9	3.02
31-Oct-94	1.49	1	1.28
02-Nov-94	3.49	1	3.00
07-Nov-94	9.88	5	2.13
29-Nov-94	4.05	6	0.70
01-Dec-94	23.20	6	3.99
08-Dec-94	25.28	7	3.62
15-Dec-94	6.41	5	1.38
16-Dec-94	0.00	0	
20-Dec-94	13.43	8	1.65
22-Dec-94	3.49	1	3.00
28-Dec-94	32.21	12	2.77
03-Jan-95	0.58	1	0.50
06-Jan-95	1.51	3	0.43
10-Jan-95	15.12	3	4.33
Average	14.79	5.81	2.54
N =	19.00	19.00	19.00
Sample Standard Dev.	13.06	4.03	1.20
Estimated Std Error	3.00	0.92	0.28
95% Confidence Interval			
Upper Limit	21.09	7.75	3.12
Lower Limit	8.50	3.87	1.97

Table 4

A)

Number of Court Appearances

	On-Duty	Off-Duty	Total
Pre-RIP	123	726	849
Post-RIP	53	64	116

B)

Percentage of Court Appearances

	On-Duty	Off-Duty	Total
Pre-RIP	14.52%	85.48%	100.00%
Post-RIP	45.26%	54.74%	100.00%

Note: Number of Court Appearances is based on a 20 day random sample from each period.

Table 5

Changes in the Distribution of Court Appearances by Shift
Under the Rapid Indictment Program & Schedule Rotations

Shift	Original	Distr.	RIP & SR	Distr.	Change
1	233	32.9%	54	59.3%	26.5%
2	230	32.4%	20	22.0%	-10.5%
3	246	34.7%	17	18.7%	-16.0%
Total	709	100.0%	91	100.0%	

B)

Changes in the Rapid Indictment Program Distribution of Court
Appearances by Shift Due to Schedule Rotations

Shift	RIP	Distr.	RIP & SR	Distr.	Change
1	15	41.7%	22	61.1%	19.4%
2	12	33.3%	9	25.0%	-8.3%
3	9	25.0%	5	13.9%	-11.1%
Total	36	100.0%	36	100.0%	

Note: 1) Both RIP and schedule rotations change the relative distribution of court appearances by shift. By increasing the relative number of shift one court appearances, the relative number of on-duty court appearances may also be increased. This is desirable in order to decrease the costs of court appearances. 2) Figure A shows that RIP and schedule rotations account for a 26.5% increase in shift one court appearances. Figure B shows that schedule rotations account for a 19.4% increase in shift one court appearances. And RIP is assumed to account for the remaining 7.1% increase in court appearances.

Table 6

Changes in Shift One and On-Duty Court Appearances

	Pre-RIP	Post-RIP	Change
Shift 1	32.90%	59.30%	26.40%
On-Duty	14.52%	45.26%	30.74%

B)

Ratio of Percentage Increase in Shift 1 Court Appearances to
Percentage Increase in On-Duty Court Appearances:

1 : 1.164394

C)

Analysis of Percentage Increase in On-Duty Court Appearances

	Change in Relative Percentage Shift 1 Court Appearances	Associated Change in Relative Percent On-Duty Court Apps
Schedule Rotation Effect	19.40%	22.59%
Rapid Indictment Effect	7.10%	8.15%
Total Change	26.50%	30.74%

Note: The distribution of schedule rotation and RIP effects on the relative percentage of on-duty court appearances are based on the relative percentage of shift one court appearances and an assumption of a linear relationship between the two.

Table 7

Average Cost per Court Appearance by Unit

Unit	Pre-RIP Data			Post-RIP Data			% Change in Cost
	Court Apps	Earned Hours	Cost	Court Apps	Earned Hours	Cost	
1	172	621.80	3.61	10	33.80	3.23	-10.62%
2	85	321.95	3.79	2	9.30	4.00	5.46%
3	114	395.16	3.47	8	36.05	4.43	27.71%
4	138	487.99	3.53	14	31.80	2.28	-35.37%
5	66	267.84	4.04	7	23.82	3.41	-15.52%
CIS	64	174.06	2.72	36	67.44	1.87	-31.26%
SC	151	401.47	2.66	10	39.53	3.78	42.24%

Table 8

Earned Hours by Rank

	Pre-Rip	Weights	Post-RIP	Weights
Police Officer	2338.07	81.3%	182.69	61.7%
Police Specialist	482.17	16.8%	100.86	34.1%
Police Sergeant	53.87	1.9%	12.34	4.2%
Criminologist	1.88	0.1%	0.00	0.0%
Total	2876.00	100.0%	295.89	100.0%

Note: Earned hours are for a 20 day random sample of each period.

B)

Average Cost of an Earned Hour Based on Relative Distribution of Earned Hours by Rank For Pre-RIP and Post-RIP Periods

	Cost/Hour	Cost/Hour & Fringe Benefits	Pre-RIP Weighted Cost	Post-RIP Weighted Cost
Police Officer	\$18.93	\$25.45	\$20.69	\$15.71
Police Specialist	\$20.44	\$27.48	\$4.61	\$9.37
Police Sergeant	\$22.08	\$29.68	\$0.56	\$1.24
Criminologist	\$16.25	\$21.85	\$0.01	\$0.00
Average Cost of an Earned Hour			\$25.87	\$26.32

Note: Figures based on 1995 compensation rates.

Table 9

Average Daily Total Cost in Earned Hours

Pre-RIP	143.80
Post-RIP	14.79
Daily Cost Reduction	129.01
% Daily Cost Reduction	89.7%

B)

Average Daily Actual Cost (Off Duty Earned Hours Only)

Pre-RIP	136.76
Post-RIP	12.32
Daily Cost Reduction	124.44
% Daily Cost Reduction	91.0%

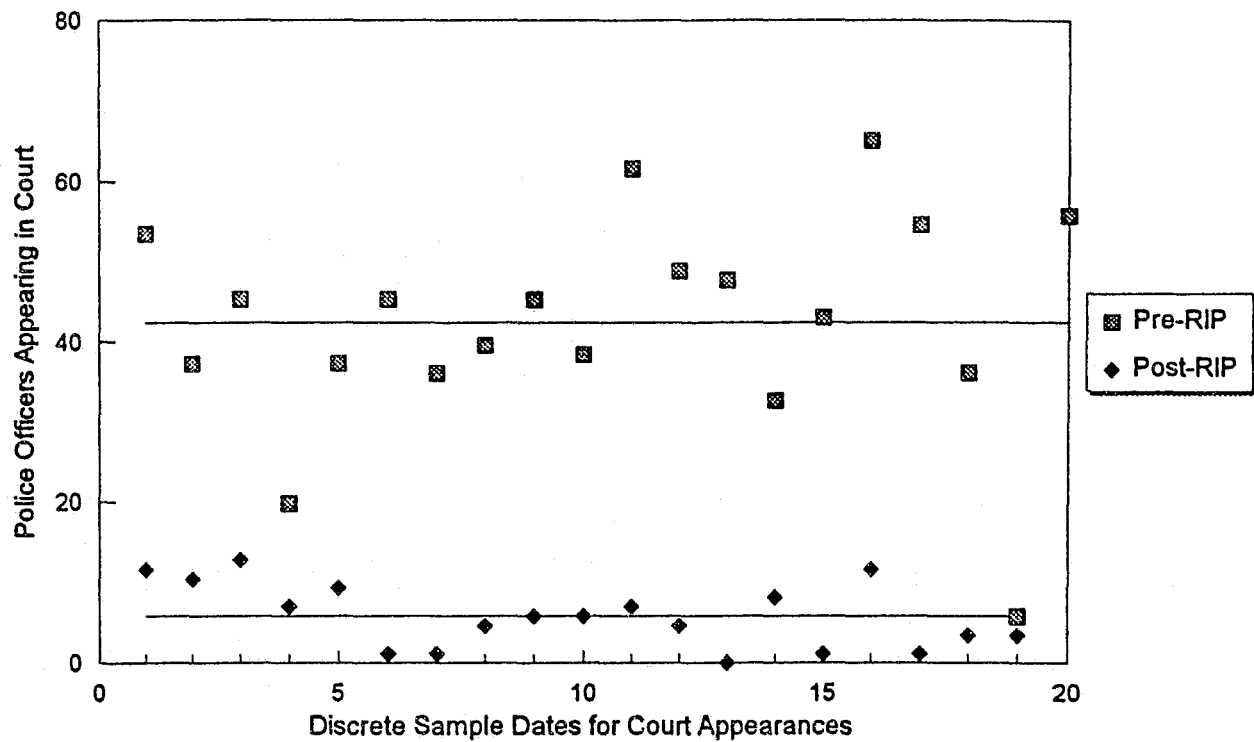
C)

Average Daily Re-Directed Effort (On Duty Earned Hours Only)

Pre-RIP	7.04
Post-RIP	2.48
Daily Cost Reduction	4.57
% Daily Cost Reduction	64.8%

Graph 1

Number of Police Officers Appearing in Court per Day

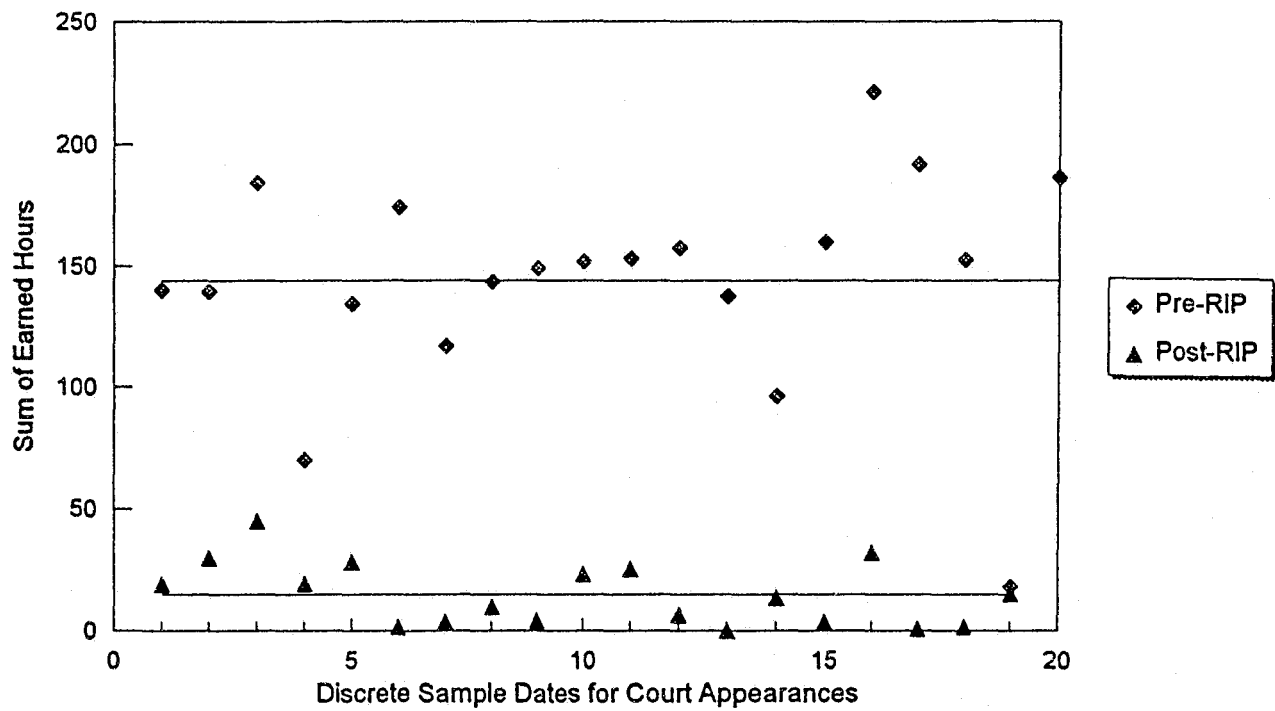


Based on a random sample between 9/93-1/94 and 9/94-1/95

Graph 2

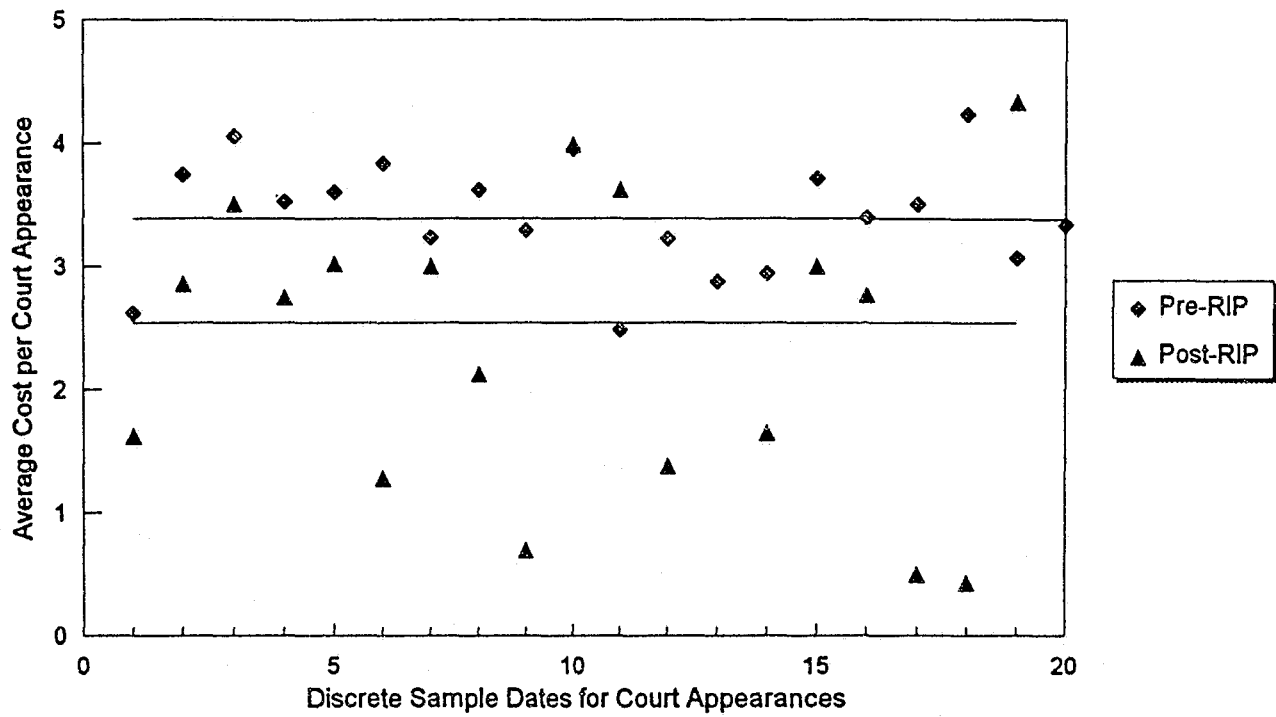
Police Officer Compensation for Court Appearances

Daily Sum of Earned Hours



Based on a random sample between 9/93-1/94 and 9/94-1/95

Daily Average Cost per Court Appearance



Based on a random sample between 9/93-1/94 and 9/94-1/95
Cost is measured in Earned Hours

Appendix

Annual Cost of the RIP Unit

The RIP Unit employs two police officers and one police specialist full-time to present cases to the Grand Jury.

Annual Savings for City Prosecutor Personnel

City Prosecutor personnel spent on average four hours a day involved in preliminary hearings and two hours a day involved in preparation for the next day's cases. Also, two hours a day were devoted to the Felony Review program designed to divert cases from court hearings. Altogether, City Prosecutor personnel devoted eight hours a day, or one full-time employee, to activities which RIP alleviated.

The value of the benefit to the City Prosecutor is estimated based on the average value of salary and fringe benefits of the three prosecutors which each handled the above activities one third of the time.

Annual Savings for Court Appearances

Annual savings are calculated based on:

(Average Daily Savings in Earned Hours * Value of an Earned Hour * Annual Number of Court Days) - (Annual Cost Increase of the Remaining Earned Hours)

Annual Cost Increase of the Remaining Earned Hours = Average Daily Remaining Earned Hours * Added Cost per Earned Hour * Annual Number of Court Days

Annual Savings = (129.01 EH * \$25.87 * 249 days) - (14.79 EH * \$.45 * 249 days)

Annual realized savings are 96.46% of the above figure and annual redirected savings are 3.54% of the above figure based on the kind of earned hour saved. Out of the daily earned hours saved, 129.01, off-duty earned hours accounted for 124.44 hours and on-duty earned hours accounted for 4.57 hours. Off-duty earned hours are realized savings whereas on-duty earned hours become redirected effort. The officer is out in the field instead of in court.

Areas Beyond the Scope of this Analysis

1) This analysis assumes administrative impacts remain constant. No potential benefit or cost to administration caused by RIP is assessed although it is likely that administrative benefits occurred because of less scheduling being necessary.

2) The quality of the prosecution is not assessed. It is not possible to say whether or not any good cases are being thrown out of court which normally would not be or are being down graded to misdemeanors.

3) No assessment is made of whether or not more cases are now going to trial, and thereby, increasing the cost of court appearances at later stages. (Appropriate records are not available)

4) The benefit of RIP to other parties such as judges, witnesses, and other court room attendants is not assessed because it is beyond the scope of this analysis.

Changes in the Distribution of Court Appearances by Shift

Both RIP and schedule rotations change the relative distribution of court appearances by shift; both increase the relative number of shift one court appearances. RIP works by alleviating relatively fewer shift one court appearances (RIP alleviates less CIS court appearances, and CIS has relatively more shift one/on-duty appearances than other units) and schedule rotations allow more court appearances to be scheduled while officers are working first shift and are on duty.

By increasing the relative number of shift one court appearances, the relative number of on-duty court appearances may also be increased. This is desirable in order to decrease the costs of court appearances. On-duty court appearances cost much less.

In order to determine the relative contributions of the schedule rotation effect and the RIP effect it was necessary to separate the combined effects. Table 5, figure A, first shows the original distribution of court appearances coming from each shift (this is just about equal) then shows the distribution of court appearances by shift under the effects of both schedule rotations and RIP.

Table 5, figure B, first shows the distribution of court appearances coming from each shift under RIP then shows the distribution of court appearances by shift under the effects of both schedule rotations and RIP. The difference between the effects of both schedule rotations and RIP in figure A versus B is due to sampling error. They are essentially the same.

What Table 5 shows is that RIP and schedule rotations account for a 26.5% increase in shift one court appearances, schedule rotations account for a 19.4% increase in shift one court appearances, and RIP is assumed to account for the remaining 7.1% increase in on-duty court appearances.

The statistics in figure B were based on a small random sample of court appearances in the post-RIP period only. The shift of arrest is assumed to specify the impact of RIP only. (If there

were no schedule rotations then the shift of the court appearance would be the same as the shift of arrest.)

Effect of Workload Changes

Differences in workload between the pre-RIP and post-RIP sample periods were examined and determined not to be significantly different.

FELONY ARRESTS			
	1993	1994	Percent Change
September	518	553	6.76%
October	526	493	-6.27%
November	445	476	6.97%
December	486	495	1.85%
TOTAL	1975	2017	2.13%

Estimation of 95% Confidence Intervals for Average Daily Number of Court Appearances, Cost per Appearance, and Sum of Earned Hours

Confidence intervals based on sample averages were created to show the ranges in which one would expect the true averages to lie. The sample averages are not the true averages but only reasonable approximations of it.

Confidence intervals were determined based on sample averages plus and minus a t statistic multiplied by the estimated standard error. A t distribution was used instead of the normal distribution in order to account for a small sample size, and the estimated standard error was calculated based on the sample standard deviation divided by the square root of the sample size.

Quantity and Price Effects

The reduction in the quantity of court appearances is due solely to RIP. RIP alleviates both on and off duty court appearances which translate into both redirected effort and realized savings respectively, although, the majority of the reduction in the quantity of court appearances translates into realized savings.

The quantity effect is determined by multiplying the decrease in the quantity of court appearances by the pre-RIP average cost per court appearance. The daily average is 124.18 earned hours.

The reduction in the average price (cost) of court appearances is due to both the schedule rotations and RIP. The whole amount is realized savings. This is how much less is being paid in earned hours per appearance.

The price effect is determined by multiplying the decrease in earned hours per court appearance by the post-RIP quantity of court appearances. The daily average is 4.9 earned hours.

The total daily reduction in earned hours is 129.08. The decrease in quantity is responsible for 96.2% of the savings and the decrease in price is responsible for 3.8% of the savings.

Records

For various reasons a small number of the records chosen in the random sample were either not available or not found by the Police Division. Each sample period had similar relative amounts of these records. To compensate for the missing records, estimators based on the averages found in the available records were included.

Sample Period

The sample periods chosen were 9/93 - 1/94 for the pre-RIP period and 9/94 - 1/95 for the post-RIP period. To the degree that this period may show some sort of seasonal bias the results would also show seasonal bias. Later studies should try to use a full year sample period.