Violent Crime Reduction Plan Hot Spot Intervention Evaluation: Phase 1

Michael Smith Rob Tillyer University of Texas at San Antonio

Delivered to the Dallas Police Department September 9, 2021

The University of Texas at San Antonio

UTSA Criminology & Criminal Justice

Table of Contents

TABLE OF CONTENTS	I
TABLES	I
FIGURES	I
BACKGROUND	1
METHODOLOGY	1
RESULTS	2
VIOLENT CRIME EVALUATION	2
2020 to 2021 Comparison	
2021 Treatment Evaluation	
ARREST EVALUATION	10
CALLS FOR SERVICE EVALUATION	
SUMMARY AND CONCLUSION	13
APPENDIX	15

Tables

TABLE 1: YEAR TO YEAR VIOLENT CRIME COMPARISON	2
TABLE 2: VIOLENT CRIME SUMMARY	
TABLE 3: CALLS FOR SERVICE SUMMARY	12
TABLE 4: VIOLENT CRIME SPECIFIC SUMMARY	
TABLE 5: DIVISION VIOLENT CRIME SUMMARY	
TABLE 6: ARREST SUMMARY	

Figures

Background

In early May 2021, the Dallas Police Department presented to the Public Safety Committee of the Dallas City Council a strategic plan to reduce violent crime in the city. The plan outlined near, mid, and long-term strategies to reverse the rising trend of violence in Dallas and lower the number of victims of violent crime. The near-term approach involved implementation of a hot spots policing strategy to increase police visibility in micro-locations characterized by high levels of violent street crime and to target repeat violent offenders in those locations. The evidence-based plan, including the hot spots strategy, was developed in collaboration with criminologists from the University of Texas at San Antonio who have been providing programmatic and analytic support to the DPD as the plan got underway in early May.

This report is the first in a series of interim reports that will outline the implementation and impacts of the overall Violent Crime Reduction Plan and its constituent components. Specifically, this report covers the first 90-day implementation period that began May 7, 2021 with the initial roll-out of the hot spots strategy and which covers an approximate 90-day period through August 1, 2021.

Methodology

The UTSA research team analyzed the geographical occurrence of violent street crime (murder, robbery, aggravated assault) in Dallas during 2020 and the first quarter of 2021 to identify violent crime hot spots in the City where police resources initially should be focused in accordance with the Crime Plan. Utilizing an existing Dallas map layer of 330'x 330' grids, the UTSA team, working with DPD crime analysts and managers, sought to identify a subset of grids that accounted for a disproportionate amount of violent crime. Results of this analysis revealed the following features of how violence is concentrated in Dallas in a relatively small number of places:

- In 2020, 5.9% of the 101,402 grids in Dallas accounted for <u>all</u> reported violent street crime
- In the first quarter of 2021, only 1.6% of grids accounted for <u>all</u> reported violent street crime incidents
 - 59 grids (0.06%) reported three or more violent crime incidents, and they accounted for 10.3% of all violent crime incidents in Q1

Based on this analysis and available DPD resources, the UTSA team recommended that DPD begin its hot spots strategy by focusing on the top 50 grids that together accounted for approximately 10% of the reported violent street crime in Dallas. Eventually, this list was winnowed down to 47 target grids that would receive the initial hot spots treatment during the first 90-day implementation period.

The hot spots strategy involved two different treatments. Eighteen grids received a high visibility treatment that involved placing patrol cars in grids with their emergency lights illuminated during peak crime times and days of the week as revealed by UTSA's analysis.

Twenty-nine grids received an offender-focused treatment that involved targeting repeat and high-risk violent offenders by specialized Division-based Crime Response Teams (CRTs). The evaluation plan calls for a review of crime, arrest, and calls for service data every 90 days and for adjustments to be made to the targeted grids based on those reviews. The results reported below detail the impact of the hot spots strategy from May 7 -August 1, 2021.

To gauge the effects of the strategy during this initial 90-day period, we draw upon comparative data from 2020 and from the first four months of 2021. The intervention week shown below was week 19 (week of May 10, 2021) in the series.

Results

Violent Crime Evaluation

2020 to 2021 Comparison

Table 1: Year to Year Violent Crime Comparison

	Jan-Aug 2020	Jan-Aug 2021	Percent Change
All Violent Crime	5,392	5,054	-6.3%
Murder/Manslaughter	121	118	-2.5%
Total Robbery	2,019	1,519	-24.8%
Robbery: Individual	1,596	1,248	-21.8%
Robbery: Business	423	271	-35.9%
Total Aggravated Assault	3,301	3,498	6.0%
Agg Assault: No Family Violence	2,289	2,408	5.2%
Agg Assault: Family Violence	1,012	1,090	7.7%

Table 1 above and Figure 1 below compare violent crime trends throughout the city from January 1 through August 1, 2021 to the same period from 2020. Overall, violent crime in Dallas is down 6.3% in 2021 compared to the same period last year. Examining the data by crime type reveals large decreases in robberies (business and individual) and a small reduction in murders of 2.5%. Aggravated assaults, both family violence-related and non-family violence-related, are up slightly so far in 2021 over last year.

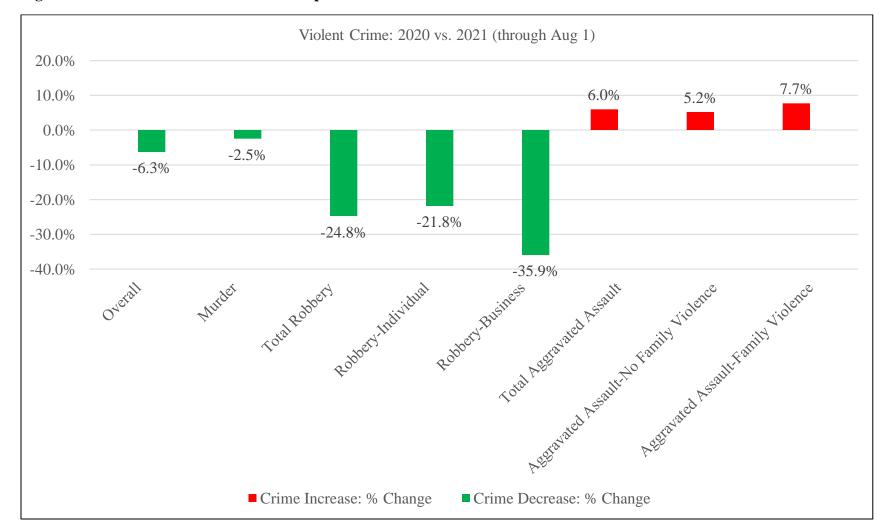


Figure 1: Year to Year Violent Crime Comparison

2021 Treatment Evaluation

	Pre-Intervention		Post-Int		
	Total Incidents	Average per week (N=18)	Total Incidents	Average per week (N=12)	Percent Change
City-Wide	2,815	156.4	2,131	177.6	13.6%
Non-Treatment/Catchment Grids	2,404	133.6	1,883	156.9	17.5%
Treatment Grids	196	10.9	71	5.9	-45.7%
Catchment Grids	215	11.9	177	14.8	23.5%
Treatment Grids Only					
Offender Focused Grids	135	7.5	47	3.9	-47.8%
High Visibility Grids	61	3.4	24	2.0	-41.0%

Table 2: Violent Crime Summary

Table 2 above and Figure 2 below show changes in violent crime in 2021 since the implementation of the hot spots strategy during the week of May 10, 2021 (week 19 in the series). The pre-intervention period consists of 18 weeks (Jan 4-May 10), and the post-intervention consists of 12 weeks (May 10-August 1). As shown in Table 2, the average weekly number of reported violent crimes increased by 13.6% city-wide after the hot spots strategy went into effect. Since the summer months typically carry with them higher rates of reported crime, this increase was not unexpected. We also measured change in the 47 treatment grids, catchment areas immediately surrounding the treated grids, and in the grids outside of the treatment and catchment areas. *Importantly, reported weekly violent crime averages decreased by almost half (-45.7%) in the treated grids after the hot spots intervention*, while weekly averages outside the treatment and catchment areas *increased* by 17.5%.

The catchment areas represent grids immediately surrounding each treatment grid and were analyzed separately to check for crime displacement. Crime in the catchment grids increased at a higher rate than in non-catchment grids (23.5% versus 17.5%), which may represent a modest displacement effect. However, the impact of the significant crime reduction that occurred in the treatment grids can be seen in the more modest increase in average weekly crime city-wide (13.6%) compared to the catchment grids or non-treatment/non-catchment grids. In other words, because crime was reduced so significantly in the treatment grids and because they represent a disproportionate share of violent crime, the hot spots strategy mitigated the increase in violence that might otherwise have been seen throughout the city. Figure 2 below provides a visual representation of the changes in average weekly reported violent crime in the treatment, catchment, and non-treatment/catchment grids as well as by crime type within the treatment grids (right side of the figure).

We also examined differences across treatment types – high visibility grids compared to offender-focused grids. While crime was down significantly across both treatment types, it was down slightly more in the offender-focused grids (-47.8%) than in the high visibility grids (-41.0%). We will continue to monitor the effects of the two treatment types in the next 90-day period to see whether these treatment differences persist.

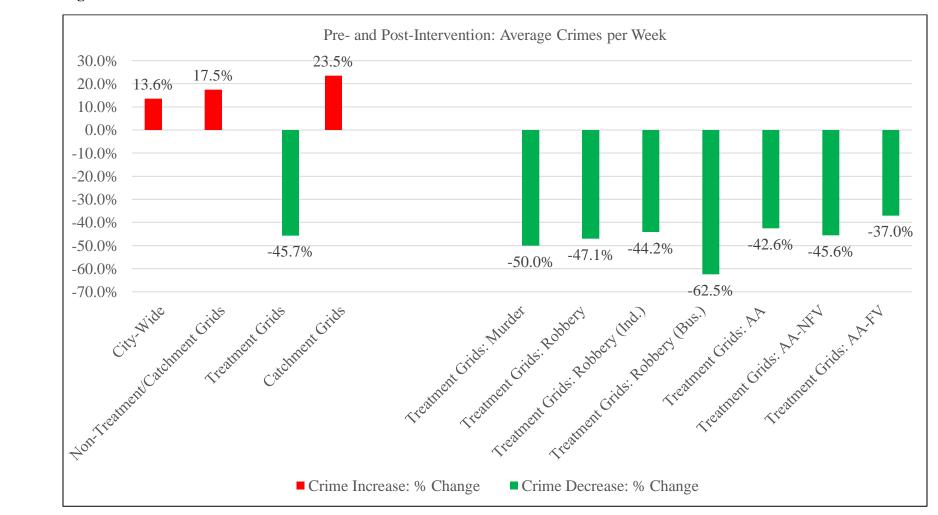


Figure 2: Pre- and Post-Intervention Violent Crime

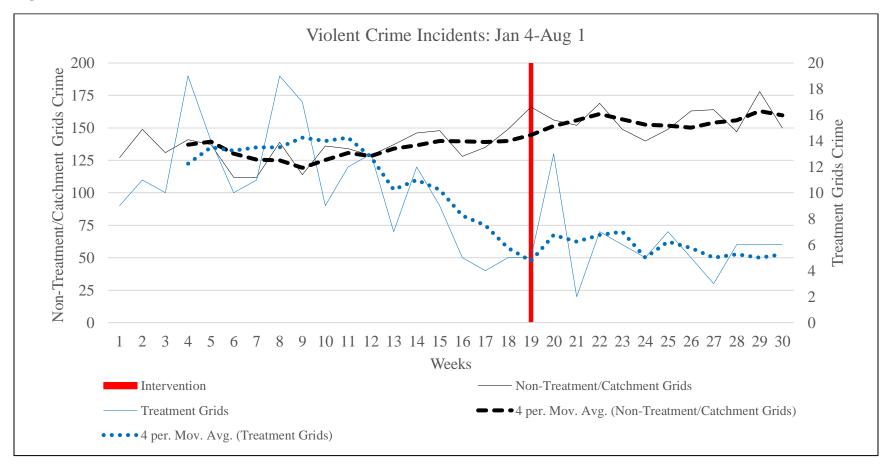




Figure 3 shows the longitudinal trends in weekly reported violent crime before and after the hot spots intervention. The solid lines represent the actual count of violent crime per week in non-treatment/catchment areas (in black) and the count of violent crimes in the treatment grids (in blue). The black dashed line represents the four-week moving average of reported violent crimes in grids outside the treatment or catchment areas (left-side axis) pre and post-intervention (red vertical line), while the blue dotted line represents the four-week moving average of violent crimes in the 47 treatment grids (right-side axis). Again, crime increased in areas outside the treatment and catchment areas post-intervention, and it decreased in the treatment areas even before the treatment went into effect and then continued to decrease before flattening out post-intervention.

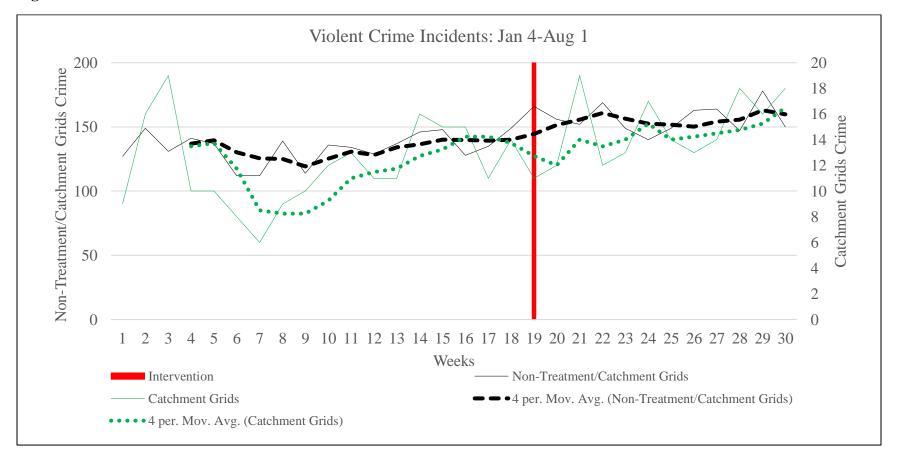


Figure 4: Non-Treatment/Catchment Violent Crime vs. Catchment Grid Violent Crime

Figure 4 shows the increases in average weekly reported crimes in the catchment grids (green dotted line) and non-treatment/catchment grids (black dotted line) pre and post-intervention (red vertical line). Violent crime has continued to increase modestly in areas that were not treated with the hot spots intervention, but the increase has been slightly steeper (particularly in the later weeks) in the catchment grids, which again could indicate a modest displacement effect.



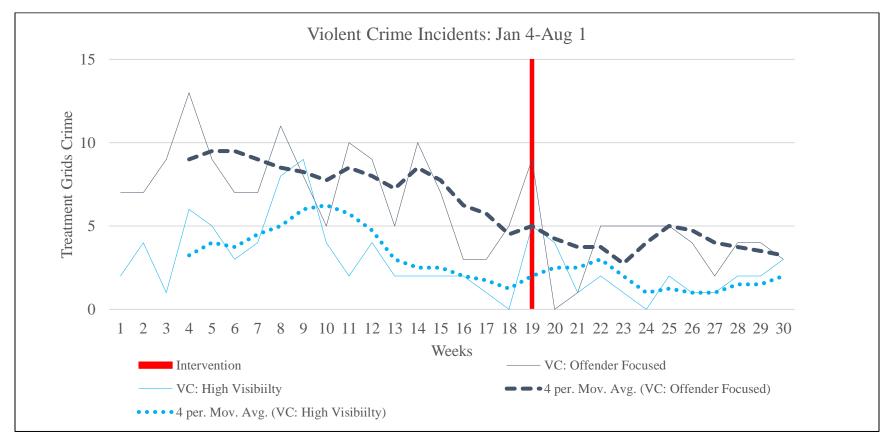


Figure 5 shows the decreases in reported weekly averages of violent crime pre and post-intervention by intervention type. Across both the high visibility (blue dashed line) and offender-focused (black dashed line) interventions, crime has gone down in the treated grids, and those decreases have been maintained post-intervention.

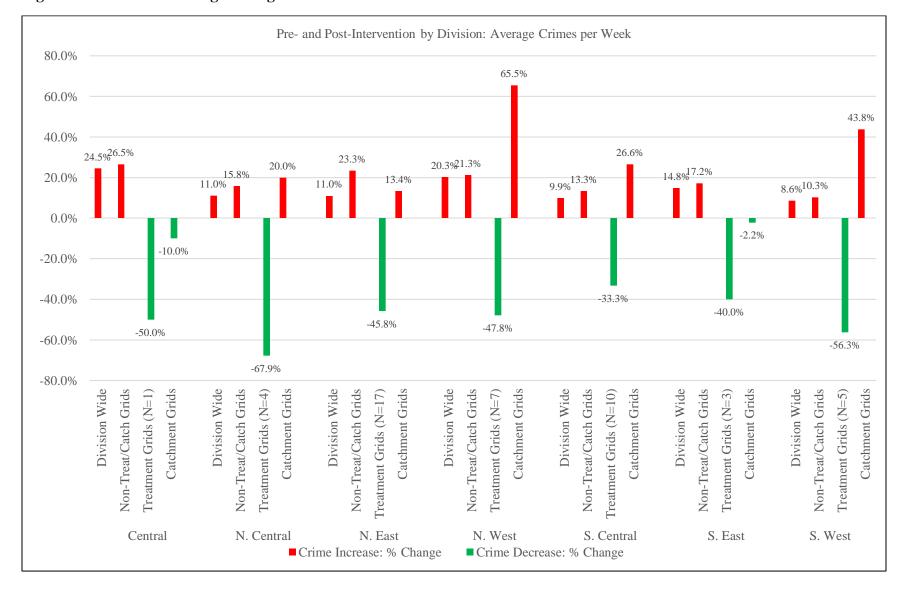


Figure 6: Division-Percentage Change in Violent Crime

Figure 6 shows changes in average weekly violent crime counts within the seven patrol divisions *before and after* the hot spots strategy was implemented. Changes are shown division-wide and within non-treatment/catchment grids, treatment grids, and catchment grids for each division. For example, average weekly violent crime was up 24.5% across the entire Central Division post-intervention, but it was up even more (26.5%) in the non-treated areas. This is because violent crime was down 50% in the treatment grids and down slightly in the catchment areas, and those areas helped hold down what would have been larger increases in the entire division without the hot spots treatment. Similarly, violent crime was down significantly in the treatment grids across all divisions, which helped to hold violent crime in check (although still increasing) within each of the division. The hot spots strategy had the greatest impact on the targeted grids in the North Central Division, and evidence of potential displacement into the catchment grids was greatest in the Northwest and Southwest divisions.

During the next 90-day treatment period, the targeted grids will be expanded slightly in some areas to account for adjacent high crime grids and to help minimize some of the displacement effects we may be seeing.

Arrest Evaluation

Using NIBRS crime categories, arrest data were evaluated using four measures prior to the intervention (Jan 4-May 9, 2021) and after the intervention (May 10, 2021-August 1, 2021):

- 1. All arrests
- 2. Part 1 arrests (murder & nonnegligent manslaughter; robbery of individuals; robbery of businesses; and aggravated assault without family violence)
- 3. Part 1+ arrests (murder & nonnegligent manslaughter; robbery of individuals; robbery of businesses; aggravated assault without family violence; simple assault; and weapons violations)
- 4. Warrant arrests (all warrant arrests)

Figure 7 below shows changes in the average number of weekly arrests city-wide and in treatment and non-treatment grids and by arrest type pre- and post- intervention. City-wide, arrests remained unchanged after the hot spots intervention while they were up slightly (5.2%) in the targeted grids. This is a remarkable success story for the hot spots strategy, which was purposely designed to avoid heavy-handed policing in the targeted grids. While violent crime was driven down by almost 50% (on average) in the targeted grids, it did not come at the cost of a large increase in overall arrests. Instead, the DPD made more Part I arrests for serious violent crime across the city, but significantly *fewer* (-40%) such arrests in the treatment grids. This likely represents a deterrent effect in the treatment grids and thus the need for fewer Part I arrests because violent crime was reduced so much in those areas. Consistent with the strategy, warrant-based arrests were up by more than 40% in the treatment grids as the DPD concentrated on arresting offenders in those areas with outstanding warrants.

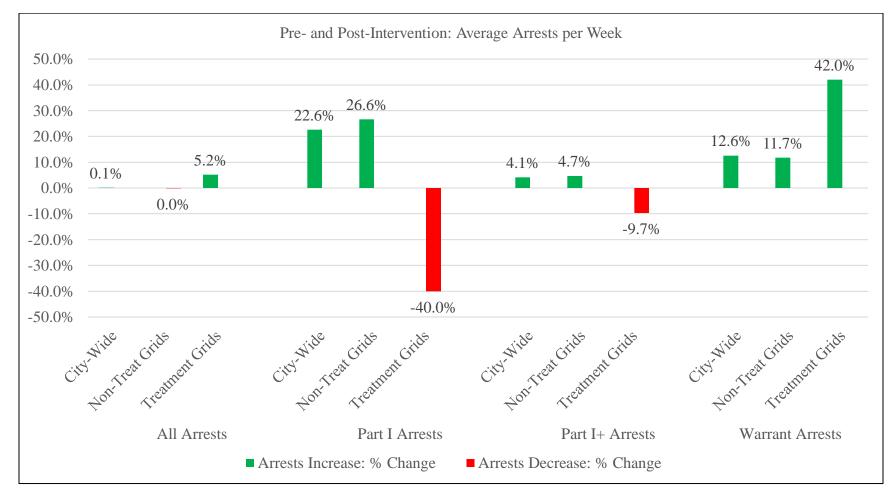


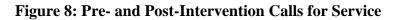
Figure 7: Pre- and Post-Intervention Arrests

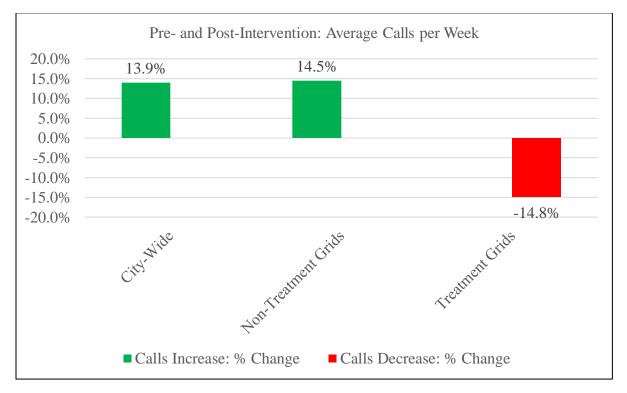
Calls for Service Evaluation

In evaluating the impact of the hot spots strategy on calls for service, we examined changes in violence-related calls by the public pre- and post-intervention.¹ Consistent with the violent crime trends seen in 2021 so far, violence-related calls for service increased city-wide and in the non-treated grids post-intervention. However, they *decreased* by 14.8% in the treatment grids, and this helped hold the city-wide increase to a lower level than it likely would have been without the intervention.

Table 3:	Calls for	Service	Summary	

	Pre-Intervention		Post-Ir		
	Total Calls	Average per $wask (N = 18)$	Total Calls for	Average per week	Percent Change
	for Service	week (N=18)	Service	(N=12)	
City-Wide	11,093	616.3	8,426	702.2	13.9%
Non-Treatment Grids	10,894	605.2	8,313	692.8	14.5%
Treatment Grids	199	11.1	113	9.4	-14.8%





¹ 14 - Stabbing, Cutting; 17 - Kidnapping in Progress; 19 – Shooting; 41/20 - Robbery - In Progress; 41/25 - Criminal Aslt -In Prog; 6G - Random Gun Fire; 6XE - Disturbance Emergency; 6XEA - Disturbance Emerg Amb; DAEF-Dist Armed Encounter Foot; DAEV-Dist Armed Encounter Veh; DASF-Dist Active Shooter Foot; DASV-Dist Active Shooter Veh.

Summary and Conclusion

This report analyzes changes in reported violent crime, arrests, and calls for service associated with implementation of the Dallas Violent Crime Reduction Plan in early May 2021. The first phase of the Plan consists of a hot spots strategy that focused police resources on small grids in the city (330'x 330') where violent crime disproportionately occurs. In Dallas, as in most U.S. cities, violent crime takes place in a relatively small number of places and is committed by a relatively small number of people. The Phase I Dallas violence reduction strategy recognizes this ecological distribution of crime. Beginning May 7, 2021, DPD, working with criminologists from the University of Texas at San Antonio, identified just 47 out of the 101,402 grids in Dallas that accounted for the highest levels of reported violent crime over the previous 16 months. Based on location-specific criteria, the target grids were assigned one of two treatments – either a high visibility strategy with increased police presence in lighted patrol cars during peak crime hours, or an offender-focused strategy involving specialized crime teams within each division who targeted repeat offenders and behavior associated with violent crime.

This report details the results of the hot spots strategy over its first 90 days – from the week of May 10, 2021 through August 1, 2021. Overall, Dallas experienced rising levels of violent crime during the first half of 2021 consistent with many other cities in the U.S. (Rosenfeld & Lopez, 2021). City-wide, violent crime rose by 13.6% during the initial summer months (May-July) compared to first 18 weeks of 2021, yet it was still down -6.3% from January-August 2021 compared to the same period in 2020. The hot spots strategy played a significant role in keeping violent crime in check during the first 90 days of implementation. In the 47 targeted treatment grids, violent crime was down almost -46% compared to the 18-week pre-intervention period, and the decreases were similar across grids receiving the two treatment types. The reductions were greatest in the target grids for murder and business robberies, but all categories of violent crime were down significantly in the targeted areas.

Part of the initial evaluation of the hot spots strategy involved examining crime in catchment areas immediately surrounding each targeted grid to check for crime displacement. When police resources are focused on hot spots, crime can sometimes be displaced to areas nearby, and we found some evidence that this may be occurring. Post-intervention, crime increased to a greater degree in the catchment areas than it did in non-treatment/non-catchment grids, although some divisions experienced a diffusion of benefits (i.e., crime reductions without direct treatment). The Crime Plan calls for 90-day analyses (reported here) and adjustments to the hot spot grids every 90 days. In the second 90-day period (September-November 2021), the boundaries of targeted hot spots will be expanded slightly in some cases to include adjacent high crime grids. In this way, the DPD hopes to reduce the potential for crime displacement in future 90-day periods.

This initial evaluation also examined the impact of the hot spots strategy on arrests and calls for service in the last 90 days. Despite the increased focus and police resources devoted to the targeted treatment grids, total arrests were up only slightly (5.2%) over pre-treatment levels in the target grids despite the almost 50% decrease in violent crime associated with the implementation of the strategy in those areas. Consistent with the strategy, warrant-based arrests increased by 42% in the target grids as DPD focused on clearing outstanding arrest warrants in

those grids. Finally, violence-related calls for service decreased by almost 15% in the treated grids compared to comparable increases in non-treated areas. Again, this suggests that the hot spots strategy had a measurable impact on reducing violence-related calls to the police in the treatment grids during the first 90-day period. The Appendix provides further crime-specific analyses of violent crime, additional information on division-level crime, and graphs of arrests in the treatment and non-treatment grids during Phase I.

Moving forward, DPD will make adjustments to the target grids in the next 90-day implementation period (September-November 2021). Many of the initial hot spot grids are no longer "hot" following the treatment, and new grids will be substituted based on UTSA's crime analysis. A key take-away from this initial 90-day evaluation is that the hot spots strategy is having its intended effects. Violent crime is down significantly in the targeted grids, and because those grids contribute disproportionately to violent crime in Dallas, the strategy is helping to keep violent crime at lower levels city-wide than it otherwise would have been without the treatment impacts. As the city heads into the fall, which typically has lower levels of violence than the summer months, the year-over-year reduction seen in violent crime so far in 2021 can hopefully be maintained or even increased. The fall also will see the beginning of the second component of the Violent Crime Reduction Plan, which is focused on lowering crime and criminogenic conditions in networks of violent places.

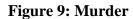
Appendix

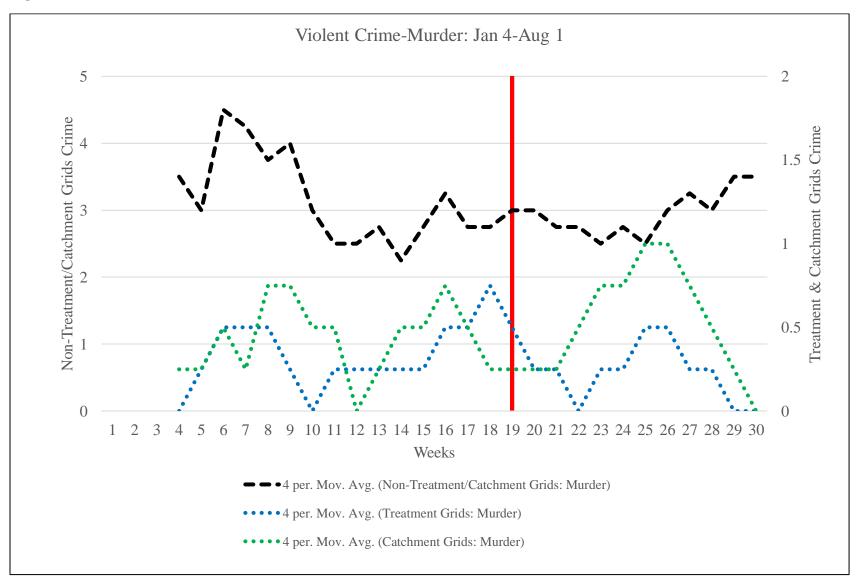
Table 4: Violent Crime Specific Summary

	Pre-Intervention		Post-Inte		
	Total Incidents	Average per week (N=18)	Total Incidents	Average per week (N=12)	Percent Change
City-Wide: Murder	70	3.9	45	3.8	-3.6%
Non-Treatment/Catchment Grids:					
Murder	57	3.2	37	3.1	-2.6%
Treatment Grids: Murder	6	0.3	2	0.2	-50.0%
Catchment Grids: Murder	7	0.4	6	0.5	28.6%
City-Wide: Robbery Non-Treatment/Catchment Grids:	878	48.8	610	50.8	4.2%
Robbery	771	42.8	530	44.2	3.1%
Treatment Grids: Robbery	51	2.8	18	1.5	-47.1%
Catchment Grids: Robbery	56	3.1	62	5.2	66.1%
City-Wide: Robbery (Individual) Non-Treatment/Catchment Grids:	718	39.9	504	42.0	5.3%
Robbery (Ind.)	630	35.0	438	36.5	4.3%
Treatment Grids: Robbery (Ind.)	43	2.4	16	1.3	-44.2%
Catchment Grids: Robbery (Ind.)	45	2.5	50	4.2	66.7%
City-Wide: Robbery (Business) Non-Treatment/Catchment Grids:	160	8.9	106	8.8	-0.6%
Robbery (Bus.)	141	7.8	92	7.7	-2.1%
Treatment Grids: Robbery (Bus.)	8	0.4	2	0.2	-62.5%
Catchment Grids: Robbery (Bus.)	11	0.6	12	1.0	63.6%
City-Wide: Aggravated Assault (AA)	1,913	106.3	1,510	125.8	18.4%
Non-Treatment/Catchment Grids:	1 1 .	00.0	1.244	112.0	24.00
AA	1,616	89.8	1,344	112.0	24.8%
Treatment Grids: AA	141	7.8	54	4.5	-42.6%
Catchment Grids: AA	156	8.7	112	9.3	7.7%
City-Wide: Aggravated Assault (AA-No					
Family Violence)		72.7			

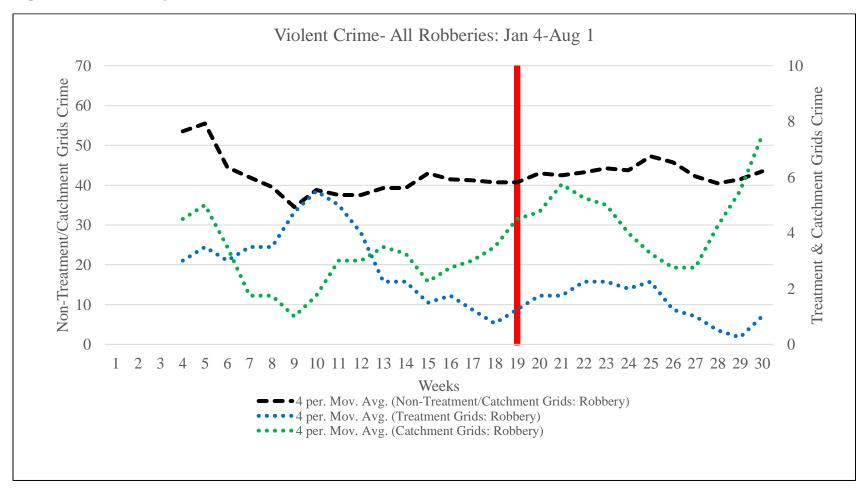
Non-Treatment/Catchment Grids:					
AA-NFV	1,104	61.3	935	77.9	27.0%
Treatment Grids: AA-NFV	91	5.1	33	2.8	-45.6%
Catchment Grids: AA-NFV	114	6.3	77	6.4	1.3%
City-Wide: Aggravated Assault (AA-					
Family Violence)	604	33.6	465	38.8	15.5%
Non-Treatment/Catchment Grids:					
AA-FV	512	28.4	409	34.1	19.8%
Treatment Grids: AA-FV	50	2.8	21	1.8	-37.0%
Catchment Grids: AA-FV	42	2.3	35	2.9	25.0%

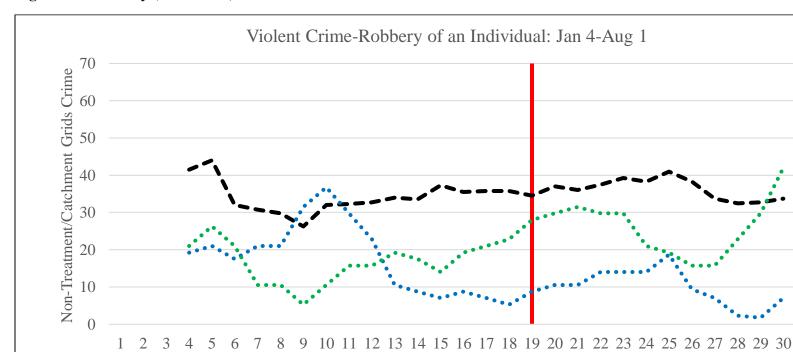
Crime specific total exceed the overall total as some incidents involved more than one crime.











10

8

6

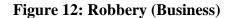
2

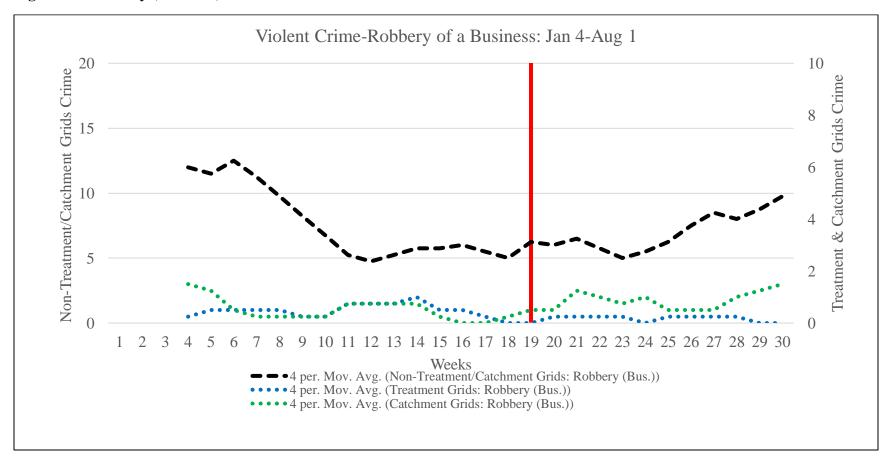
0

Treatment & Catchment Grids Crime

Figure 11: Robbery (Individual)

Weeks ••••4 per. Mov. Avg. (Non-Treatment/Catchment Grids: Robbery (Ind.)) •••••4 per. Mov. Avg. (Treatment Grids: Robbery (Ind.)) •••••4 per. Mov. Avg. (Catchment Grids: Robbery (Ind.))





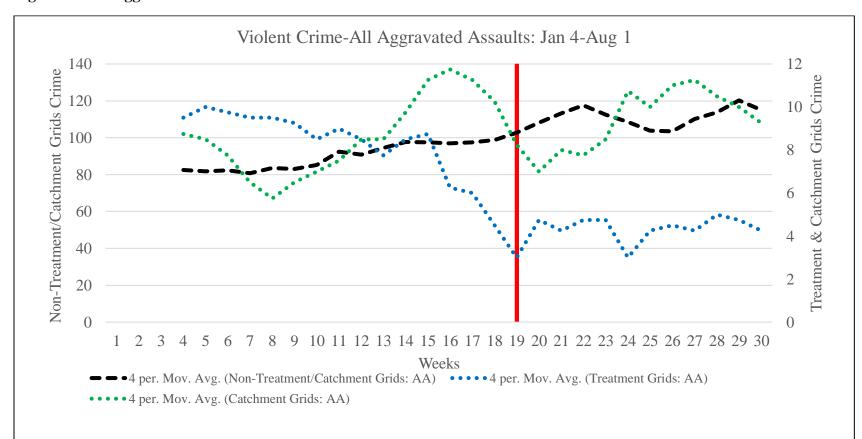


Figure 13: All Aggravated Assault

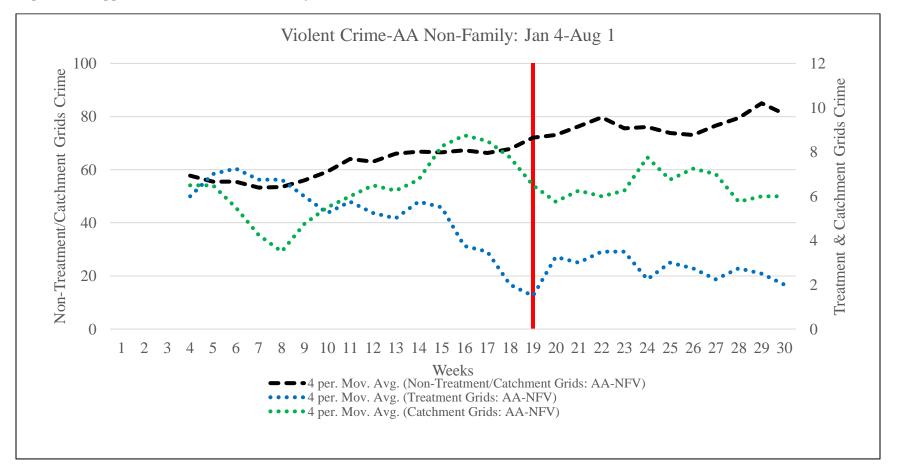


Figure 14: Aggravated Assault (Non-family Violence)

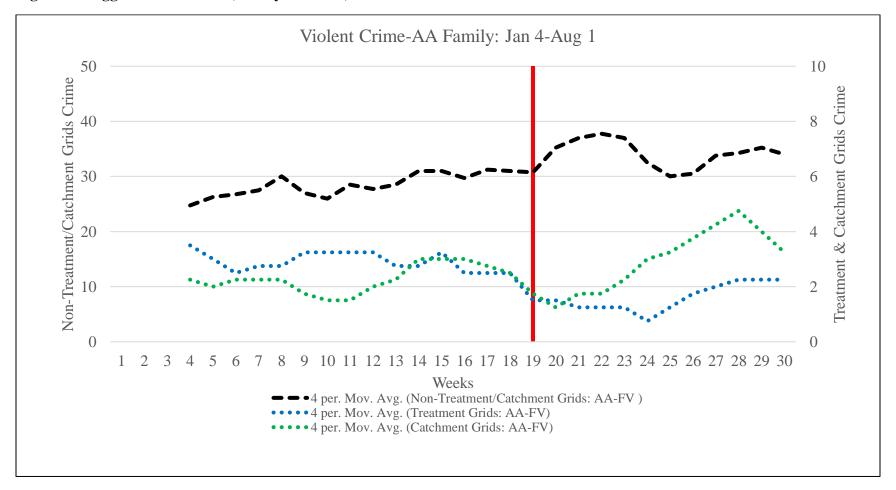


Figure 15: Aggravated Assault (Family Violence)

	Pre-Inte	rvention	Post-Intervention		
	Total Incidents	Average per week (N=18)	Total Incidents	Average per week (N=12)	Percent Change
Central: Division-Wide	288	16.0	239	19.9	24.5%
Non-Treatment/Catchment Grids	275	15.3	232	19.3	26.5%
Treatment Grids (N=1)	3	0.2	1	0.1	-50.0%
Catchment Grids	10	0.6	6	0.5	-10.0%
North Central: Division-Wide	231	12.8	171	14.3	11.0%
Non-Treatment/Catchment Grids	202	11.2	156	13.0	15.8%
Treatment Grids (N=4)	14	0.8	3	0.3	-67.9%
Catchment Grids	15	0.8	12	1.0	20.0%
North East: Division-Wide	469	26.1	347	28.9	11.0%
Non-Treatment/Catchment Grids	315	17.5	259	21.6	23.3%
Treatment Grids (N=17)	72	4.0	26	2.2	-45.8%
Catchment Grids	82	4.6	62	5.2	13.4%
North West: Division-Wide	313	17.4	251	20.9	20.3%
Non-Treatment/Catchment Grids	261	14.5	211	17.6	21.3%
Treatment Grids (N=7)	23	1.3	8	0.7	-47.8%
Catchment Grids	29	1.6	32	2.7	65.5%
South Central: Division-Wide	498	27.7	365	30.4	9.9%
Non-Treatment/Catchment Grids	421	23.4	318	26.5	13.3%
Treatment Grids (N=10)	45	2.5	20	1.7	-33.3%
Catchment Grids	32	1.8	27	2.3	26.6%
South East: Division-Wide	541	30.1	414	34.5	14.8%
Non-Treatment/Catchment Grids	503	30.1 27.9	414 393	34.3 32.8	14.8%
Treatment Grids (N=3)	503 15	0.8	595 6	52.8 0.5	-40.0%
Catchment Grids	13 23	1.3	15	0.3 1.3	-40.0%
	25	1.3	15	1.5	-2.270
South West: Division-Wide	475	26.4	344	28.7	8.6%
Non-Treatment/Catchment Grids	427	23.7	314	26.2	10.3%
Treatment Grids (N=5)	24	1.3	7	0.6	-56.3%
Catchment Grids	24	1.3	23	1.9	43.8%

Table 5: Division Violent Crime Summary

Table 6: Arrest Summary

	Pre-Intervention		Post-Inte		
	Total Incidents	Average per week (N=18)	Total Incidents	Average per week (N=12)	Percent Change
City-Wide: All Arrests	12,516	695.3	8,352	696.0	0.1%
Non-Treatment Grids: All Arrests	12,171	676.2	8,110	675.8	0.0%
Treatment Grids: All Arrests	345	19.2	242	20.2	5.2%
City-Wide: Part I Arrests	252	14.0	206	17.2	22.6%
Non-Treatment Grids: Part I Arrests	237	13.2	200	16.7	26.6%
Treatment Grids: Part I Arrests	15	0.8	6	0.5	-40.0%
City-Wide: Part I+ Arrests	2,486	138.1	1,725	143.8	4.1%
Non-Treatment Grids: Part I+ Arrests	2,383	132.4	1,663	138.6	4.7%
Treatment Grids: Part I+ Arrests	103	5.7	62	5.2	-9.7%
City-Wide: Warrant Arrests	2,663	147.9	1,999	166.6	12.6%
Non-Treatment Grids: Warrant Arrests	2,588	143.8	1,928	160.7	11.7%
Treatment Grids: Warrant Arrests	75	4.2	71	5.9	42.0%

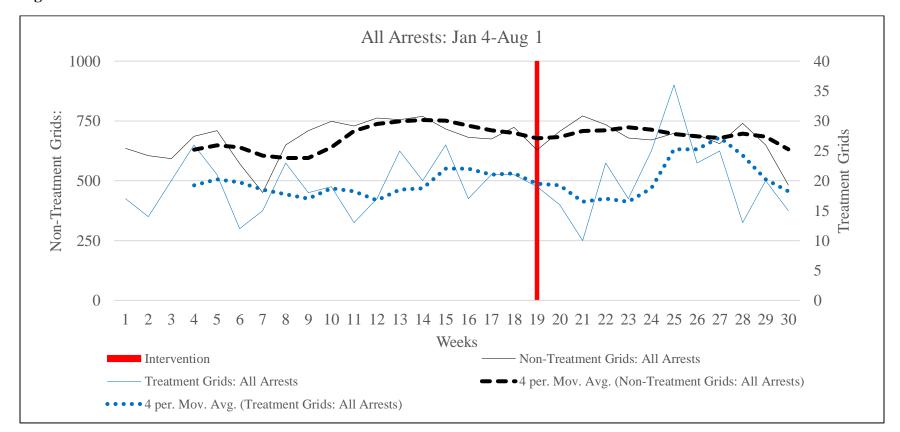


Figure 16: Non-Treatment Grids vs. Treatment Grids: All Arrests

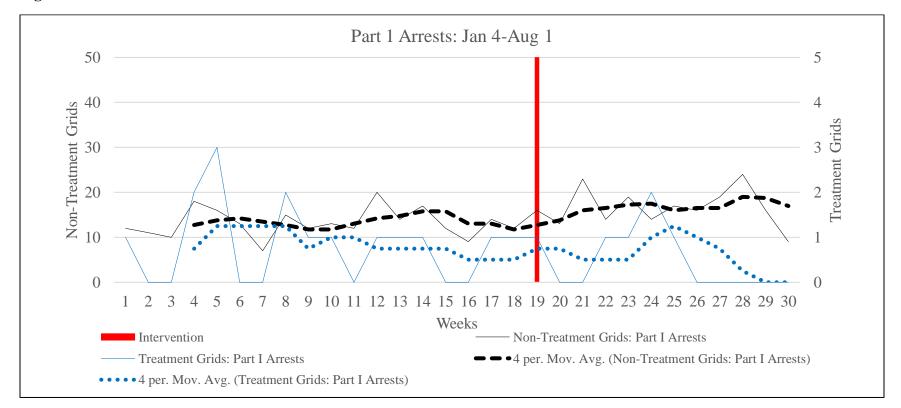


Figure 17: Non-Treatment Grids vs. Treatment Grids: Part I Arrests

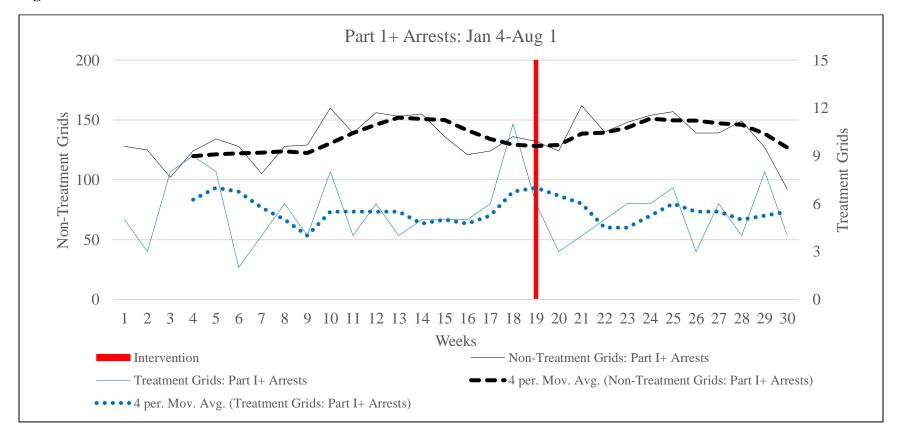


Figure 18: Non-Treatment Grids vs. Treatment Grids: Part I+ Arrests

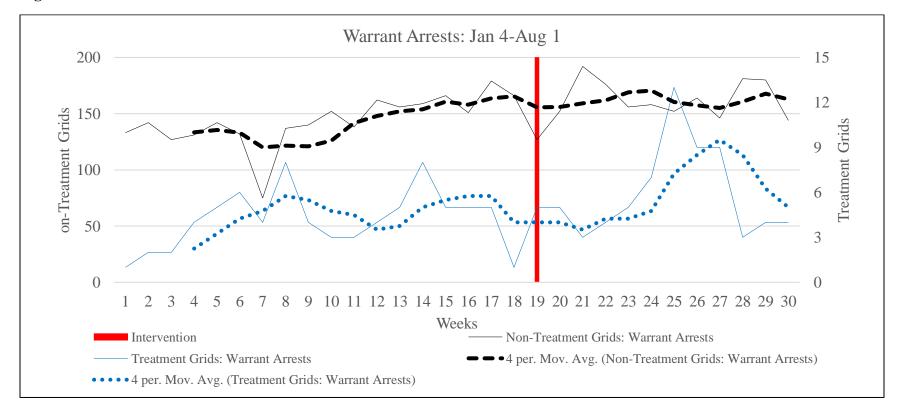


Figure 19: Non-Treatment Grids vs. Treatment Grids: Warrant Arrests