⊞ URBAN INSTITUTE

2100 M STREET, NW   WASHINGTON, DC 20037

Lorraine C. Washington
Senior Contracts Administrator
Office of Grants, Contracts and Pricing

Direct Dial: 202.261.5713
Facsimile: 202.728.0231
E-mail: lwashing@urban.org

March 10, 2011

Ruth Ann Abrams
Assistant Secretary and Contracting Officer
Postal Regulatory Commission
Suite 200
901 New York Avenue, NW
Washington, DC 20268-0001

REF: Social and Community Benefits of the Postal Service
       Contract 109909-10-0017 (UI Project 08557)

Dear Ms. Abrams:

Enclosed please find the Urban Institute's enhanced progress report for the Community Security and Public Safety Study, one of three studies being conducted for PRC under the above-referenced contract. In accordance with our contract, as amended in December 2010, we suspended work on this project at the end of January 2011. This report documents tasks that were completed during the obligated portion of the contract and identifies remaining work.

Questions of a technical nature should be addressed to the Principal Investigator, Nancy Pindus, at 202.261.5523 or npindus@urban.org. Contractual matters should be addressed to me.

Sincerely,

Lorraine C. Washington

URBAN INSTITUTE

2100 M STREET, N.W. / WASHINGTON D.C. 20037

TO: Matthew Robinson, Margaret Cigno, Michael Ravnitzky, Ruth Ann Abrams, Postal Regulatory Commission

FROM: Nancy Pindus, John Roman, Samantha Hetrick, and Meagan Cahill

DATE: March 11, 2011

SUBJECT: Enhanced Progress Report: Community Security and Public Safety

REF: Social and Commercial Benefits of the Postal Service
Contract 109909-10-0017 (UI Project 08557)

On December 30, our contract with the Postal Regulatory Commission (PRC) was amended to reflect a partial deobligation of contract funding. To accommodate this change, work on the Community Security and Public Safety study was suspended after revising the study design and specifying data needs. This memo provides an enhanced progress report for the Community Security and Public Safety study, documenting tasks completed during the obligated portion of the contract and identifying remaining work.

Study Context and Purpose

This study was one of three studies for which the Urban Institute received funding from the PRC in August 2010. The three studies responded to a request for proposals issued by the PRC to quantify the social value of postal services. The three Urban Institute studies have the central organizing theme of social value for communities and individuals, and address: community security and public safety; economic benefits of being located near a post office; and the transportation and price leadership role of USPS.

The purpose of the Community Security and Public Safety study is to address how exogenous changes to postal services in the District of Columbia (DC) affect community security and public safety. Our design includes examination of the role of mail carriers and post offices on neighborhood safety and crime.

We hypothesize that the presence of mail carriers may deter some offending, may increase detection of offenses though the identification of suspicious or unusual behavior, and may provide social benefits by identifying and assisting ill residents or crime victims. Little research has focused specifically on the relationship between the presence of postal personnel in neighborhoods and crime rates. However, there is evidence that the presence of visible uniformed personnel who are well-recognized by the public play an important role in the social control of neighborhoods. Formal social controls, such as police on patrol, for example, have a positive influence on the reduction of crime. Informal social controls, such as neighbors maintaining a visible presence outside their residences, may also reduce offending. We posit that mail carriers exert informal social controls on offending that may be larger than those of private citizens, but not as large as a formal police presence, through their ability to either deter or observe and respond to potential criminal behavior.

Summary of Project Activities

During the period from September 1, 2010 through January 31, 2011 we updated the study design included in our original proposal to reflect decisions concerning geographic focus and data needs. We assessed the data requirements for this study and prepared a list of data we will need on postal operations. We also contacted USPS and the National Association of Letter Carriers (NALC) to request data needed for this study.

Research Questions, Data Sources, and Study Design

This study will examine the impacts that the presence of USPS (i.e., mail carriers, post offices) has on community security and public safety. We will focus our efforts in the District of Columbia (DC). We chose DC for two reasons. First, we anticipate that changes in criminal activity from the presence of USPS will be smaller than the effect of changes in more formal social controls, such as changes in the routine activities of police. Thus, we must examine relatively dense neighborhoods where there are higher levels of criminal activity. Second, in our experience, DC has exceptional data that is publicly available (see dc.data.gov). While we anticipate having to collect some additional data (and we have other DC data currently in our possession), direct access to publicly available data will substantially increase both the number of questions we can ask and answer the speed with which the study can be completed. Using data from DC, we will answer the following research questions:

- What is the impact of changing hours of postal retail services on crime in the District of Columbia (i.e., post office closures, modification in hours of operation, postal holidays)?

- What is the impact of modifying patterns in postal carrier routes on crime in the District of Columbia?

- How are crime rates influenced by areas with postal carriers for short periods of time (e.g., lunch and break locations)?

- What types of incidents are being reported by postal personnel in the District of Columbia? Specifically, what is the prevalence of postal carrier-initiated calls for service to police? When are postal carriers making calls, and what are they doing at that time? What types of carriers are placing the calls? What types of neighborhoods are the calls by postal personnel originating from?

- What type of training is provided to USPS personnel regarding community security and public safety reporting?

These questions will be answered by quantitatively and qualitatively analyzing data on USPS personnel, routes, hours of operation, locations, and daily activities, as well as data describing neighborhood characteristics and data on criminal incidents. Our primary sources for these data will be the Postal Regulatory Commission (PRC), National Association of Letter Carriers (NALC) and the Metropolitan Police Department (MPD). In addition, we will conduct up to nine interviews with USPS postal carriers, selected from each of the seven police districts in DC, to validate the data received on their schedules, routes, and activities from PRC and NALC and ensure that a realistic portrait was drawn for USPS personnel. In October 2008, USPS and NALC agreed to an Interim Route Adjustment Process to evaluate and adjust routes quickly to respond to

the decline in mail volume. In 2009, almost every route in the country was adjusted and revisited, and route evaluations and adjustments continue to be revisited (Postal Record June 2010). Documentation of the changes will provide a rich source of data and may provide opportunities for a design that includes interruptions of service.

Data collection to-date consists of identification and confirmation of potential data sources. UI currently houses an extensive collection of neighborhood and crime data for DC. These data holdings include police calls for service, reported incidents, and arrests from the Metropolitan Police Department (MPD) for 2000 through 2009, which will be used for this study. UI has also created a series of files that can be assembled to provide several layers of information about the characteristics of the neighborhoods (e.g., socio-economic indicators, land use, and crime rates) along the postal carrier routes, which will be introduced into the analytic models. Our goal in developing a layered dataset is to create a dataset that can answer more precise questions about the effect of USPS routines on crime. These include sub-group analyses to study whether there are attributes of the neighborhood physical environment that cause crime to be more or less responsive to the presence of USPS personnel (for example, do USPS personnel deter more crime in mixed use neighborhoods compared to residential neighborhoods, or does the neighborhood density mediate the effect of the presence of USPS personnel?). We also will examine whether the effect of USPS personnel on crime is mediated by the differences in the socio-economic status of neighborhood residents.

The geographic focus of the analysis will be the block level, the smallest geographic level at which the study can be conducted. This is a Census geography that contains one city street block. We will eliminate block groups with more than 50 percent commercial density form the analysis. The next step is developing the criteria for including each neighborhood in the analysis. This process includes identifying the types of crime to be included (e.g., sex abuse will be excluded) and the times of day that will be examined. Our plan is to limit the study to times when carriers are likely to be in the neighborhood. Thus we will include crime occurring between the hours of 8 AM and 6 PM.

Given the requirements of the analytic methods that will be used, we will also define a minimum number of crimes for each year per geographic unit that is required to be included in the study. To determine the final criteria for inclusion in the study, we will include land use data to identify parcels classified as residential, given that theoretically those areas would likely see the greatest effects on crime levels based on the presence or absence of a postal carrier. Having identified our sample of neighborhoods, we will obtain postal carrier route data and overlay the information to identify exactly which carrier is delivering mail, where the carrier is moving, and on what day and time. This will also require that PRC and NALC provide data on any interruption in service, change in routes, and carrier identification.

We hypothesize that crime will be negatively correlated with the number of mail carriers in the neighborhood. During the typical time periods of mail delivery, crime rates will be lower than average for the neighborhood. Areas with post office closures will experience an increase in crime within the first few months, increasing in magnitude over time.

Analysis

In the proposed analysis, we will model the effect of informal social controls from USPS personnel on several dependent variables measuring crime. The general model will be:

$$Y_{it} = \alpha + \gamma X_{it} + \delta Z_{ikt} + \varepsilon \qquad (1)$$

In (1), Y is a vector of dependent variables (outcomes) for location's i=1...n measured at time t, where t=1, 2; X is a vector of location attributes; and Z is a binary indicator of whether USPS were active in that location at that time comparing treatment (k=1) locations to comparison (k=0) locations. To control for differences across locations and to isolate USPS personnel effects, we will run fixed effects models.[1]

The goal of this analysis is to identify the association between presence of USPS personnel and crime levels. Since we do not know whether changes in USPS personnel activities occurred at one time or were rolled out over time, we propose two general analytic strategies. If changes occurred all at once (which may be the case for any changes in carrier routes resulting from a change in policy), we propose to conduct a Regression-Discontinuity Design (RDD). The RDD simply compares the crime rates at time t and $t+1$ to determine whether crime rates went up or down at location i before and after the policy change (k drops out of this model). If changes are rolled out over time, we propose a Difference-in-Differences (DD) model which compares changes in crime at location i for a treatment group (which are the locations where there is a change in USPS personnel activities) with a control group (which are locations where there is *no* change in USPS personnel activities). Thus, we will compare the difference in crime in the treatment groups from time t, where USPS personnel were present, to time $t+,1$ where USPS personnel were not present. This is compared to the differences in crime rates at time t and $t+1$ in locations where the USPS personnel were always present.

We propose to test the effects of USPS personnel routine activities on several dependent variables. We will first test whether changes in routine activities affect crimes rates at all, and then test whether there are effects on specific types of crime that we hypothesize will be most likely to be affected (for example, robbery, burglary, larceny, and drug crime). Once we have tested these effects, we will then create a dependent variable which is the monetized value of all harms from crime. There is substantial literature that seeks to estimate the cost of crimes to victims. That is, it asks "what losses, both pecuniary and indirect, are experienced by the victim of a crime?" (Cohen 1994, Miller 1988, Miller and Cohen 2003, Miller, Cohen and Rossman 1994, Roman 2009). The values can be used to estimate the total harms from crime experienced in time t in location l before and after the change in routine activities. The coefficient on Z in model (1) can thus be interpreted as the net social benefit of USPS routine activities.

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[1] The fixed effects model separates the USPS personnel effect from the location effects, but carries with it the assumption that all of the location observations are drawn from the same distribution. That is, it assumes that each of the locations in DC are samples from the same distribution of crime by location. We will test this assumption by estimating the Q statistic that tests the null that fixed effects are more efficient than random effects and will select our model (fixed or random effects) accordingly.

To supplement these analyses, we will also conduct descriptive hot spot analysis, through creation of density maps and Point Pattern Analysis. Hot spot mapping will allow us to determine the level of crime in areas with post offices and along postal routes and to spatially depict the relationship between crime and USPS services over time. As described by Ratcliffe (2005), Point Pattern Analysis is designed to explore changes in the pattern of crime over time, and in this case we propose to use this technique to assess fluctuations in the clustering of crime based on alterations to USPS services (for example, post office closing, change in route, and substitute postal worker for extended period of time). This method is commonly used to detect displacement effects, or movement of crime to nearby areas, that may be the result of an intervention, which in this case would be postal services.

Data Needed on Postal Operations

Our design requires data on postal carrier routes and postal carrier activities, and we will need assistance in understanding the availability, format, and level of detail of such data and in obtaining access to a small number of carriers for interviews. The following is a preliminary list of data we seek on postal operations in order to proceed with this study:

- Information on postal carrier routes: schedule (time, day), location or path of addresses followed (maps or description that allows us to create maps), carrier identification number (used to determine if different carriers follow the same route but different days; ID numbers are preferred, if possible, rather than full names of carriers).

- General information on how routes are followed by carriers and policies regarding their routes, date/time data on when carriers are on break, practices for walking versus vehicle delivery (when are the carriers outside of their vehicles).

- Data on incidents reported by postal carriers while on the job (date, time, location, incident type) -- we are looking for incidents in the neighborhoods that are witnessed by postal carriers or victimization that occurs while delivering mail; victimization data would need to be de-identified so that we know the address of where it occurred, but not the carrier's name (identification number would be best to match with the route).

- Information (date, time, location, carriers impacted) on the areas that experienced some change in practice (e.g., related to Interim Route Adjustment Process) for Washington, DC; information on how the change was implemented (all routes altered at the same time, phased implementation); timeline of events that could have influenced whether a carrier was following the route (interruption notices).

- Access to up to nine carriers for interviews to confirm their route, schedule, habits while on the job, and any other information that will assist us in determining how to interpret the data and routine of the carriers.

Assessment of Data Availability and Next Steps

PRC was able to provide us with some information on changes in postal routes that were provided by USPS in response to Chairman's Information Requests (CHIRs). This included a summary of changes for the entire "Capital" district that did not include route-by-route data. PRC also shared a spreadsheet provided by USPS In response to a CHIR requesting total daily Delivery Operation Information System (DOIS) data on number of routes, volumes, and costs at the beginning and end of FY2009. This information looks promising for categorizing routes and identifying changes, but we will need to work with USPS to better understand the data and obtain more detail about specific routes in DC. We also learned from the material provided by PRC that the carrier Optimal Routing Program (COR) was a tool used to perform the individual route adjustments, which allowed for the elimination of routes. However, USPS indicates that the COR is proprietary and complicated. In sum, use and interpretation of these data requires working directly with USPS.

PRC informed USPS about our study and provided the name of a contact at USPS. We provided a description of the study and our data needs, as described above, to USPS. Our request was referred to another individual at USPS who responded promptly. We were informed that the times that carriers are out delivering mail and when they return to the office are fairly standard across the US. Times will vary depending upon the volume of mail to be delivered, which may change daily. Some of this information may be qualitative in nature and best provided by someone who is familiar specifically with DC operations. For quantitative data, USPS needs to understand as much as possible about our data needs so that they do not do computer runs or other time consuming tasks that are not used. We also made a similar request to a contact at the National Association of Letter Carriers, but have not received a response.

Next Steps

Based on our limited investigation to-date, we continue to believe that research on the relationship between the presence of postal personnel in neighborhoods and crime rates would be a valuable contribution to PRC's efforts to measure and document the social benefits of postal services. We have refined the study design and identified specific data needs. Should funding become available to proceed with this study we suggest the following steps:

1. Actively pursue data acquisition from USPS and NALC. PRC can assist in this process by emphasizing that the purpose of the research is to measure and document social benefits of postal services. Providing the data needed for this study will require time on the part of USPS and NALC staff, both to assemble data and to describe the data to Urban Institute researchers. We have not actively followed up on our data requests because it would have been inappropriate to burden USPS and NALC with this task when funding is uncertain.

2. Determine the need for a research agreement for DC crime data. We have a substantial amount of DC data on hand, and substantial data are publicly available, but it is quite possible that upon receipt of the data on postal route changes, we will determine that we need to request additional data from the DC government due to inconsistencies in the way the datasets account for time or other issues. If this is the case, we will need to execute a research agreement with the appropriate DC agency. In our experience this process takes about 60 days.

3. Through USPS or NALC, arrange to contact nine carriers for interviews to confirm their route, schedule, habits while on the job, and any other information that will assist us in determining how to interpret the data and routine of the carriers.

4. Prepare a request to obtain approval for the research from the Urban Institute's Institutional Review Board (IRB). We have not yet prepared this request due to uncertainties about the data to be used and availability of funding.

5. Conduct the analysis as described above.