Washington, D.C., Metropolitan Area Foreclosure Monitor
Technical Appendix
NeighborhoodInfo DC
April 2010

The primary data on the performance of residential mortgages presented in the Foreclosure Monitor were provided by PS Applied Analytics, Inc. LPS receives their data directly from the servicers and offers them services to improve mortgage processing, risk management, and data integration. The LPS database covers more than 40 million active first mortgages and 5 million second mortgages, spanning the spectrum of loan products. The company offers data at the loan level and summary files for geographies such as ZIP codes and counties. This database contains more than 80 loan attributes, including product type detail, geographic detail down to ZIP level, detail on adjustable-rate mortgages, credit scores, document type, property value, occupancy type, property type, loan purpose and loan size. For more information, see their web site at http://www.lpsvcs.com/LossMit/DandA/Pages/default.aspx.

Universe of Data

For this analysis, we purchased monthly data by loan grade for January 2007 to December 2009 for the ZIP codes in the Washington, D.C., metropolitan area. The data covered loans on owner- and renter-occupied units in 1–4 unit properties (including condominiums).

LPS added new servicers to the data we received for October 2009 and later months, which increased the total number of loans reported by 11 percent from September to October (table 1). It also increased their representation of subprime loans, moving from 4.2 percent subprime to 5.0 percent subprime.

Table 1. Comparison of Total Loans in LPS Data before and after Universe Change in October 2009

	Count of Loans				Percent Change in Count		
grade	Aug-09	Sep-09	Oct-09*	Nov-09*	Aug-Sept 09	Sept-Oct 09	Oct-Nov 09
AgencyPrime	467,455	468,055	556,654	553,194	0.1	18.9	-0.6
Alt-A	50,803	50,032	56,873	54,780	-1.5	13.7	-3.7
Government	78,266	81,236	96,236	98,281	3.8	18.5	2.1
Non-AgencyPrime	119,117	116,519	126,930	123,375	-2.2	8.9	-2.8
Other**	103,762	102,752	59,182	64,164	-1.0	-42.4	8.4
Subprime	34,745	34,537	49,565	48,329	-0.6	43.5	-2.5
Total	854,148	853,131	945,440	942,123	-0.1	10.8	-0.4

*Data includes larger universe of servicers.
**The "Other" category is excluded from our analysis. The large change is number is due to the pre-October data including second-lien loans as well as first lien mortgages of unknown grade.

The weighting methodology below uses external controls for both the total number of loans and for the share of subprime so the impact of universe change would be minimal if the profile of the new loans added was similar to the previous group of loans. Unfortunately, our analysis showed that the foreclosure inventory rate for subprime loans rose 3.0 percentage points between September and October, well out of proportion with shifts in other grades or between other months. This suggests that the newly-added servicers have foreclosure policies significantly different than the previous group of servicers (see outlined cells in table 2). For this reason, we believe the numbers and rates of foreclosure for data after September should not be compared to earlier data.

Table 2. Comparison of Foreclosure Inventory Rate in LPS Data before and after Universe Change

	Foreclosure Inventory Rate by Grade				Pct. Point Change in Foreclosure Rate		
grade	Aug-09	Sep-09	Oct-09*	Nov-09*	Aug-Sept 09	Sept-Oct 09	Oct-Nov 09
AgencyPrime	1.0	1.0	1.1	1.1	0.0	0.1	0.0
Alt-A	7.4	7.4	8.2	8.2	0.0	0.9	0.0
Government	0.7	0.7	0.6	0.5	0.1	-0.1	-0.1
Non-AgencyPrime	1.9	2.0	2.2	2.2	0.1	0.2	0.0
Other	1.5	1.5	2.7	2.9	0.0	1.2	0.1
Subprime	12.2	**11.9**	**14.8**	14.5	-0.3	**2.9**	-0.3
Total	2.0	2.0	2.5	2.4	0.0	0.4	0.0

*Data includes larger universe of servicers.
**The "Other" category is excluded from our analysis as explained below.

We also saw some shifts in the rates of delinquency for subprime loans, but the magnitude was comparable to changes seen in other months. This makes sense since lender policies do not affect the delinquency rate, and there is no reason to believe the borrowers covered by the newly added servicers would be any different than other borrowers.

Table 3. Comparison of Delinquency Rate in LPS Data before and after Universe Change

	Total Delinquency Rate by Grade				Pct. Point Change in Delinquency Rate		
grade	Aug-09	Sep-09	Oct-09*	Nov-09*	Aug-Sept 09	Sept-Oct 09	Oct-Nov 09
AgencyPrime	2.1	2.3	2.6	2.8	0.2	0.3	0.2
Alt-A	8.0	8.6	9.6	10.4	0.6	0.9	0.8
Government	1.9	1.7	1.7	1.6	-0.2	0.0	-0.1
Non-AgencyPrime	2.3	2.4	2.7	3.1	0.1	0.3	0.4
Other**	7.2	7.5	5.1	5.4	0.3	-2.4	0.3
Subprime	21.5	22.8	21.8	23.6	1.4	-1.0	1.8
Total	3.9	4.1	4.1	4.4	0.2	0.0	0.3

*Data includes larger universe of servicers.
**The "Other" category is excluded from our analysis as explained below.

File Contents

The following counts were included:

- *Total mortgages*
- *Delinquent loans* exclude loans in pre-sale or post-sale foreclosure, that is, they are mutually exclusive. Categories include 30 to 59 days, 60 to 89 days, and 90 days or more.
- *Loans in pre-sale foreclosure* are the current inventory of loans going through the foreclosure process (litigation in Maryland) but a sheriff sale has not occurred yet. These should not be confused with "foreclosure starts," which would indicate the number of loans beginning the foreclosure process each month.
- *Post-Sale/Real Estate Owned Mortgage Loans* are all loans that have completed the litigation process. This means that (1) a sheriff sale has occurred; (2) the loan is awaiting transfer to government product; (3) a third party has acquired the title, entitling certificate, or title subject to redemption; (4) the loan is a post-sale REO. We think this indicator significantly underestimates the real estate owned properties because it excludes properties with loans that are no longer reported to LPS Applied Analytics as part of their active loan portfolio. However, experts believe the LPS REO indicators are a valuable representation of the relative level of REOs across a region, and of the growth of REOs across time. A comparison of the LPS REO counts to the local administrative data for ZIP codes in the District of Columbia supports this—the two had a correlation of 98 percent.

All of these are inventory numbers, meaning that a loan would be present in the data from month to month until the loan is "liquidated" through either an involuntary payoff (foreclosure completion) or if the loan is paid off (voluntary completion). The analysis does not include completion counts.

We requested these counts for each ZIP code by the following loan grades:

- *Agency Prime* loans are Grade A loans with either Fannie Mae (FNMA) or Freddie Mac (FHLMC) as the investor.

- *Non-Agency Prime* loans include Grade A loans which have a private or portfolio investor and FICO scores greater than or equal to 720 or FICO scores between 680 and 719 with full documentation.

- *Subprime* loans are those with Grade B or C or loans with Grade A and FICO scores less than 620 and an investor other than Ginnie Mae (GNMA).

- *Alt-A* loans are Grade A loans with private or portfolio investors, incomplete documentation, and FICO scores between 620 and 719.

- *Government* loans are Grade A and have Ginnie Mae (GNMA) as the investor.

The REO and Delinquency risk categories displayed in the Monitor were defined in relation to the average rate of the given indicator for all ZIP codes with more than 500 loans. We only used larger ZIP codes because the rates for smaller ZIP codes were much more volatile quarter to quarter.

Minimal: ZIP codes with values from 0 to 0.5 standard deviations below the mean

Moderate: ZIP codes with values from 0.5 standard deviations below the mean to the mean.

High: ZIP codes with values from the mean to 1.5 standard deviations above the mean

Highest: ZIP codes with values greater than 1.5 standard deviations above the mean

Weighting Methodology

The LPS Applied Analytics does not cover the entire mortgage market, and in particular under-represents subprime loans. The following data sources were used to adjust the raw mortgage data for these known shortcomings.[1]

- American Community Survey estimates by county of the owner-occupied housing units with mortgages, and of 1-4 unit rental units (2007 and 2008);

[1] For other examples of analysis of LPS Applied Analytics data, see LISC and Dan Immergluck, "Intra-metropolitan Patterns of Foreclosed Homes: ZIP Code Level Distributions of Real-Estate-Owned (REO) Properties during the U.S. Mortgage Crisis," *Community Affair Discussion Paper* 01(09) (Atlanta: Federal Reserve Bank of Atlanta, 2009), http://www.frbatlanta.org/filelegacydocs/dp_0109.pdf.

- U.S. Census Bureau estimates by county of the total number of owner-occupied housing units with a mortgage (2000); and
- U.S. Census Bureau estimates by county for the number of housing units (2007 and 2008); and
- Mortgage Bankers Association's National Delinquency Survey reports on numbers of total and subprime mortgages by state (2007–2009, quarterly).

The steps below describe the adjustments to the original mortgage analysis file:

(1) Restricted ZIP code level LPS Analytics data to first-lien mortgages with known grade.

Our LPS Applied Analytics data includes counts for each loan grade (agency prime, non-agency prime, subprime, alt-a, government, and other). The data in the "other" category provided to the Urban Institute for the months in January 2007 to September 2009 accounted for 12 percent of the loans in the raw data and included first-lien loans of unknown grade and all second-lien loans. Beginning in October 2009, the "other" category only included first-lien loans of unknown grade and made up about 6.8 percent of the loans in the December 2009 raw data file. For all months, we created a "total" loan category that excluded the loans classified as "other," assuming for purposes of this analysis that the loans with unknown grade were evenly distributed across the other grades. To simplify presentation, we also combined the two prime loan categories.

(2) Weighted number of loans from LPS Applied Analytics data to correct for the undercounting of outstanding mortgages.

The servicers that contribute data to LPS Analytics do not represent the entire mortgage market. To correct for this, we first identified the county for each ZIP code through a U.S. Postal Service ZIP Code-to-county crosswalk. We next calculated the number of mortgages in each year for each county by averaging the monthly LPS totals. We then created county-level weights by dividing the estimated number of housing units with a mortgage based on data from the U.S. Census Bureau by the LPS annual averages of that year.

The American Community Survey (ACS) and Decennial Census publish the number of owner-occupied units with a mortgage (Table B25081), but do not publish a parallel table for rental units. To estimate the number of rental units with a mortgage, we multiplied the number of rental units in one-to-four unit buildings (Table B25032) by 44 percent, the estimated share of rental units with a mortgage as published in the Residential Housing Finance Survey in 2001.

For the housing unit data, we used single-year ACS county-level estimates for 2007 or 2008 when available. In cases where estimates were not available for single-year data, we used the three year estimates (2005–2007 or 2006–2008 as appropriate). As a last resort (in four cases) when single year or three-year estimates were unavailable, the counts from the 2000 Census

were multiplied by the percent change in the number of housing units from 2000 to 2007 or 2008 using the Housing Units Estimates. Table 4 lists which source was used for each county. Since the 2009 ACS has not been released, we compared the 2008 ACS data to the 2009 LPS annual average to create the 2009 weights.

We then applied the county-level weights to the loan counts across ZIP codes, assuming equal weights for all loan grades. The December 2009 LPS raw total mortgage loan count is approximately 78 percent of the 2009 ACS total mortgage count (based off of the 2008 ACS) which was used to weight the data.

Table 4. Source for Total Number of Mortgages

ACS One year	
	District of Columbia
	Charles County, MD
	Frederick County, MD
	Montgomery County, MD
	Prince George's County, MD
	Alexandria city, VA
	Arlington County, VA
	Fairfax County, VA
	Loudoun County, VA
	Prince William County, VA
ACS Three year	
	Calvert County, MD
	Fairfax city, VA
	Fauquier County, VA
	Stafford County, VA
	Warren County, VA
	Jefferson County, WV
Decennial Census/Housing Unit Estimates	
	Clarke County, VA
	Falls Church city, VA
	Fredericksburg city, VA
	Manassas city, VA
	Manassas Park city, VA
	Spotsylvania County, VA

(3) Adjusted weighted subprime loan counts from Step 2 based on counts from the Mortgage Bankers Association (MBA)

The MBA's National Delinquency Survey data is a better representation of the share of subprime lending in the mortgage market, so we use it to adjust for the underrepresentation of subprime loans in the LPS data. NDS is published at the state level, so the general step would be to create a weight by comparing the LPS subprime share to the MBA subprime share for each state.

Since our ZIP code data for the metropolitan area only covered the portions of Maryland, Virginia, and West Virginia, a different LPS source was used to calculate the state-level LPS totals.

Since we have District of Columbia data from the LPS state-level and our LPS ZIP code level file, we could test the comparability of the two LPS data files. The subprime share resulting from the state-level file was generally about 0.7 to 0.9 percentage points lower than the subprime share calculated from our ZIP code level file. Ideally, we would be able to calculate and correct for this difference for each state, but this was not possible without the ZIP code source data for the other states. Since we believed it was important to correct for the difference, we chose to apply the percentage difference between the District of Columbia subprime rate from the state-level file and the District of Columbia subprime rate from the ZIP code level file to all ZIP codes in the metropolitan area.

To create a state level weight for each quarter data from 2007 to 2009 for subprime loans, we had three steps:[2]

- We divided the MBA state share of subprime loans by the subprime share from the LPS state-level source.
- We then multiplied the result by the percentage gap between the District of Columbia subprime shares calculated from the LPS ZIP code and state-level sources
- Finally, we applied the appropriate state-level subprime weight to the subprime loan count in each ZIP code.

[2] Mortgage Bankers Association data for 2007 and 2008 were not available for West Virginia, so the first quarter 2009 weight was applied to West Virginia ZIP codes for the 2007 and 2008 data.

Subprime Loan Adjustment for Each Zip Code =

$$NumSubprime_{ACSLPS} \times \left(\frac{\text{Pct Subprime}_{MBA}}{\text{Pct Subprime}_{LPSState}} \right) \times \left[1 + \left(\frac{\text{Pct SubprimeDC}_{LPSZip} - \text{Pct SubprimeDC}_{LPSState}}{\text{Pct SubprimeDC}_{LPSState}} \right) \right]$$

Where:

$\text{NumSubprime}_{ACSLPS}$ = Number of Subprime Loans from LPS Data weighted to ACS totals (as described above)

$\text{Pct Subprime}_{MBA}$ = Percent of all loans in a given state that are subprime according to the MBA

$\text{Pct Subprime}_{LPSState}$ = Percent of all loans in a given state that are subprime according to the LPS state-level source

$\text{Pct SubprimeDC}_{LPSState}$ = Percent of all loans in the District of Columbia in a given state that are subprime according to the LPS state-level source

$\text{Pct SubprimeDC}_{LPSZip}$ = Percent of all loans in the District of Columbia in a given state that are subprime according to the LPS ZIP code level source

$\text{Pct SubprimeDC}_{LPSState}$ = Percent of all loans in a given state that are subprime according to the LPS state-level source

In order to preserve the total loan count represented in the weighted LPS data, we reduced the prime, Alt-A, and government loan counts in each ZIP code by a commensurate percentage. The delinquency and foreclosure shares for each loan grade remained unchanged. Within each loan grade, we used the original LPS Applied Analytics delinquencies, foreclosures, and post-sale/REOs shares to recalculate the new troubled loan counts based on the final weighted loan total for each ZIP code.

Overall, this shifted the December 2009 share of subprime loans from 5 percent of metropolitan area mortgages to 10 percent.

(4) Summarized ZIP code level adjusted data to larger geographic levels.

For the last step, we summarized the ZIP code level data for the metropolitan area, subareas, and counties.

Contributors: Liza Getsinger, Leah Hendey, Kathryn L.S. Pettit, Peter Tatian, and Ashley Williams

About NeighborhoodInfoDC: NeighborhoodInfo DC is a partnership between the Urban Institute and the Washington, D.C. Local Initiatives Support Corporation to provide community-based organizations and citizens in the District of Columbia and the Washington region with local data and analysis they can use to improve the quality of life in their neighborhoods.

About the Metropolitan Washington Council of Governments (COG): COG is a regional organization comprised of 21 local governments surrounding our nation's capital, plus area members of the Maryland and Virginia legislatures, the U.S. Senate, and the U.S. House of Representatives. COG provides a focus for action and develops sound regional responses to such issues as the environment, affordable housing, economic development, health and family concerns, human services, population growth, public safety, and transportation.

About Fannie Mae: This publication was funded through a grant from Fannie Mae. Fannie Mae exists to expand affordable housing and bring global capital to local communities in order to serve the U.S. housing market. Fannie Mae has a federal charter and operates in America's secondary mortgage market to enhance the liquidity of the mortgage market by providing funds to mortgage bankers and other lenders so that they may lend to homebuyers.

For More Information: Electronic versions of the *Foreclosure Monitor* and its *Technical Appendix* are available online at www.mwcog.org and www.NeighborhoodInfoDC.org. To learn more about foreclosure prevention activities in the region, visit the Capital Area Foreclosure Network (CAFN) at www.CapitalAreaForeclosureNetwork.org.