Hurricane Harvey, Community Development Block Grant – Disaster Recovery (CDBG-DR) Funding

Attachment 2 – LBAP MOD Detail

I. 80% Local Buyout/Acquisition Program Allocation Group Required by HUD in the Federal Register of February 9, 2018, and the GLO in the Draft State Action Plan (SAP).

a. Unmet Need

Unmet need was calculated for each geography (county, city, or ZIP code) using HUD defined damage severity categories and FEMA data on the number of housing units experiencing damage in each of the three damage severity categories, cross classified by county, and cross classified by renter versus homeowner.

i. Homeowner Unmet Need

The HUD method provided the following unmet need multiplier for homeowners in each of the three severity categories:

- Major-Low Damage Severity - $58,956,
- Major-High Damage Severity - $72,961, and
- Severe Damage category - $102,046.

Assuming "Severe" damage corresponded to approximately 100% damage, this allowed translation of the unmet need multipliers in each damage severity category into a Damage to Structure Value (DTSV) percentage estimate for residential units within each category. This helps the distribution methodology account for differing median home values across impacted areas.

The DTSV percentage, or unmet need, was determined for each of the three severity categories in the following manner:

- Major-Low Damage Severity - $58,956/$102,046 = 57.8%.
- Major-High Damage Severity - $72,961/$102,046 = 71.5%.
- Severe Damage $102,046/$102,046 = 100%

These DTSV percentage estimates were then applied to the median price of housing in each county, city, or ZIP code, and multiplied by the count of damaged homeowner occupied properties in each damage severity category to obtain a dollar estimate of unmet needs for homeowners in each county, city, and ZIP code per damage severity category. These are then summed to arrive at estimated total dollars of unmet needs for homeowners in the county, city, or ZIP code.

ii. Renter Unmet Need

A similar procedure was used for renters. The HUD method provides damage category thresholds for renters based on the renter's FEMA Verified Loss (FVL). FVL is based on a renter's personal property loss. The HUD method does not, however, specify a multiplier for the damage severity

categories for renters. Thus, the DTSV percentage estimates used for homeowners were also applied to renter damage severity categories (57.8% for the Major-Low Damage Severity category, 71.5% for the Major-High Damage Severity category, and 100% for the Severe Damage category). For renters, in contrast to using the median value of a damaged home as the basis of the calculation, the construction cost of providing an 861 square feet rental unit with a footprint of 24'×35' was utilized. This construction cost has a nationwide range of $64,575 to $86,100 per unit. The midpoint of $75,337.50 was used to represent the value of a total loss for a rental unit and the percentage in each severity category was applied to this value. The percentage multiplied by the rental unit construction cost values were then multiplied by the count of renters in the severity category to obtain an unmet need value for renters in each of the severity categories. Summing over severity categories yielded an estimate of unmet need to renters in the county, city, or ZIP code. The sum of unmet needs for homeowners and renters represents the total unmet need value for a county, city, or ZIP code.

b. Resiliency

A 15% resiliency factor on unmet needs was added to all counties, cities, ZIP code, and eligible entity entries. The resiliency factor represents enhancements, improvements, or other components integrated into a structure to increase its capacity to respond to, or recover from, a disaster more quickly than if these components had not been integrated. This factor was utilized by the GLO in its distribution methodology allocating funds to regions across the affected area.

c. Damage Data – County-ZIP Code Overlap

For counties in the 80% allocation group that had both the county and a ZIP code with parts overlapping with the county designated as highly impacted in the Federal Register, the ZIP code level data were split into ZIP code-county pairs and the unmet need plus resiliency for the county was combined with the ZIP code county pair data for that county to obtain a single combined entity for the county. ZIP code county pair data that involved the same county were also combined into a single entity.

d. Social Vulnerability

Both HUD and the GLO recommended the use of a social vulnerability factor in determining the distribution of CDBG-DR funding. Thus, GCRPC has utilized the same Social Vulnerability Index data utilized by the GLO in its distribution of HUD CDBG-DR funds to the Hurricane Harvey impacted regions in Texas. The raw Social Vulnerability Index indices utilized by the GLO in its distribution of HUD funds to the 49 impacted counties were obtained from Dr. Christopher Emrich at the University of Central Florida, a leading expert in the development of the Social Vulnerability Index (SoVI). The Social Vulnerability Index (SoVI), was created by Cutter et al. (Cutter, S. L., Boruff, B. J., & Shirley, W. L. (2003). "Social vulnerability to environmental hazards," Social Science Quarterly, 84(2), 242–261). The idea behind social vulnerability, and its relevance in the context of the distribution methodology presented here, is that social vulnerability arises from certain geographically identifiable population groups who have limited access to political power and resources; have certain physical limitations; or are bound by customs, social capital, beliefs, and characteristics of the built environment (such as density and infrastructure type, building age

and stock, etc.). The idea of social vulnerability is that it makes the socially vulnerable people (here, counties, cities, or ZIP codes) more susceptible and less resilient to catastrophic events. Vulnerable groups are less likely to have the ability to respond and recover from catastrophic events on their own. The index is useful to quantify, describe, and understand the social burdens of risks, such as catastrophic natural disasters.

The mathematical development of the original SoVI began by identifying social characteristics consistently seen, in research literature, as contributing to social vulnerability. A literature review process was used by the inventors of SoVI to distill the universe of possible vulnerability measures down to a subset of variables including, wealth, proportion of elderly residents in a county, race, social status variables, Hispanic ethnicity, percent of residents without health insurance, persons with special needs, service industry employment, Native American population, and gender, etc.. These variables are entered into a statistical principal component factor analysis resulting in 11 components that explains 76.4% of the variance in social vulnerability relative to the original data set. The resultant SoVI index for a county is a linear combination of the factors derived. The latest SoVI index now uses 29 variables and synthesizes socioeconomic variables obtained from data sources primarily from the United States Census Bureau. A more extensive discussion and presentation of SoVI is given at http://artsandsciences.sc.edu/geog/hvri/sovi%C2%AE-0.

For purposes of these analyses, a SoVI scale was needed to compare social vulnerability across affected eligible entities in the GCRPC region (7 Counties). The SoVI scale utilized for this distribution methodology is a duplicate of the scale used by the GLO. The GLO's SoVI analysis utilized 48 impacted counties since Harris County was identified for individual funding separately from these analyses.

Dr. Christopher Emrich completed the SoVI computations and supplied the SoVI scores for all of the 49 declared disaster counties to the GLO. Dr. Emrich is the Boardman Endowed Associate Professor of Environmental Science and Public Administration and a member of the National Center for Integrated Coastal Research at the University of Central Florida.

For the purpose of utilizing the SoVI score as a part of the allocation process, an adjustment of the raw SoVI was needed to make it positive. This was accomplished for each eligible entity by subtracting the minimum raw SoVI value among all counties in the region from the particular county SoVI value, and then adding one to the result. This makes all SoVI values greater than or equal to one.

e. Unmet Need Per Capita

An Unmet Need Per Capita factor was calculated to help represent the ability of a county, city, or ZIP code, population to sustain and/or recover from the disaster by raising or utilizing their own funds. This factor also helps account for differences in population between rural and urban areas. For each county, city, or ZIP code the unmet need per capita was calculated by dividing the unmet need amount (plus resiliency factor) developed by severity level by the population size.

f. Distribution of Funds

The allocation of funds to eligible entities involved a weighted combination of 1) the unmet needs per county (or ZIP code), 2) the positive SoVI, and 3) the per capita unmet need for each county (or ZIP code). To facilitate this, a separate distribution percentage was determined for each of these three factors providing the distribution percentages that would be applicable (were this factor the only factor in consideration). These factor distributions in turn were subsequently combined to present a single percentage allocation distribution across all entities. The distributions for the 80% allocation and the 20% allocations were determined separately with the 80% group and the 20% group delineated by the Federal Register and the GLO's Draft State Action Plan. Thus, for the 80% allocation group the distribution percentage based on unmet need plus resiliency was calculated for each eligible entity by taking the county or ZIP code's unmet need plus resiliency score and dividing it by the sum of the unmet need plus resiliency scores over all eligible entities in the 80% allocation group.

Similarly, for the SoVI based distribution percentage of 1+(Raw SoVI - Min(Raw SoVI)), the 1+(Raw SoVI -Min(Raw SoVI)) value for the county was divided by the sum of the 1+(Raw SoVI -Min(Raw SoVI)) scores over all counties in the 80% allocation group which gives the distribution percentage for the positive SoVI scores. Likewise, for the distribution percentage based on unmet needs per capita, the county or ZIP code per capita unmet need plus resiliency for a county or ZIP code was divided by the sum of the unmet need per capita value across all counties and ZIP codes in the 80% allocation group. An analogous process was used for the 20% allocation group of counties only. This methodology determines the percent allocation to each eligible entity that would ensue (were that factor to be the only factor in consideration). That is, the first unmet need factor, determines the percentage allocation distribution that would apply if unmet need were the only factor; the SoVI factor presents the percentage allocation distribution that would apply if social vulnerability of the distressed population were the only factor, etc.

These factor considerations are not viewed in isolation as the three need to be combined to produce a single number. Combining the unmet needs plus resiliency distribution, and the positive SoVI distribution, and the unmet need plus resiliency per capita distribution was achieved by using a 50-40-10 model that takes a weighted combination of the three distributions with 50% weight given to the unmet needs plus resiliency percentage distribution, 40% weight to the positive SoVI distribution, and 10% weight to the per capita unmet need plus resiliency distribution. This 50-40-10 weighting determines a funding allocation percentage for each county by using the Unmet need for the county or city, the SoVI index for the county, and the per capita unmet need for the county/city. A weighting of the three components: Unmet need, SoVI, and Per capita unmet need via the final percentage contribution weighting for each factor of 50%-40%-10% was used in previous disaster relief efforts. The dollar allocation amounts obtained using the 50-40-10 model without imposing any constraints on the amount of funding were calculated using the percentage distribution values for the county or ZIP code to the total dollar amount to be allocated (80% of the available funds in the 80% group and 20% of the funds in the 20% group).

The shortfall column displays the unmet need plus resiliency factor for a county or ZIP code versus the amount they would receive using the unconstrained 50-40-10 model dollar allocation. This

column presents how much under or over their unmet need the county or ZIP codes is by using the unconstrained 50-40-10 weighting allocation process.

Practicality dictates that there be a minimum allocation amount for counties since it is costly to apply for funding and to create the policies, administrative procedures, and personnel to implement the processing and distribution of the HUD funds. This minimum allocation amount was set at $1,000,000 and applied to all allocation decisions in the Local Buyout and Acquisition Program spreadsheet for both the 80% allocation and 20% allocation groups.

Over-allocating funds to a county far beyond their unmet needs is not reasonable, especially if other counties have not yet received their unmet need. Accordingly, a maximum allocation amount constraint is imposed with a cap being set at 100% of the unmet needs plus resiliency amount for the funding of counties. These two numbers (cap and floor) provide constraints on the funding an eligible entity can receive in a given allocation. If an eligible entity reached its maximum allocation, then any funds ascribed to them by the 50-40-10 rule, above and beyond their maximum, were available for reallocation and distribution to other counties or ZIP codes not having reached their maximum.

This reallocation process will be performed in a sequential process of future CDBG-DR allocations.

As the spreadsheet shows, all eligible entities in the 80% allocation group did not reach their maximum in the first allocation.

Regarding the future CDBG-DR funding distribution process, as was done for the first distribution, an allocative percentage distribution had to be developed to apply to the amount available for distribution in order to direct the fund allocation. Here, however, zero percent additional allocation was given to those entities (counties or ZIP codes) that had already obtained their maximum allocation according to the formula. To achieve additional future allocations, the original 50-40-10 distribution probabilities for the counties that had not yet reached their maximum were renormalized to create an allocative percentage distribution for future funding. This was done by dividing the original percentages by the sum of the percentages of the areas remaining below their cap, with the goal of allocating 100% of unmet need in future funding allocations if possible.

g. Overlap – Avoiding Double Allocation

Because funding was allocated to counties, cities, a ZIP code, and other entities with eminent domain authority and because overlap with either an 80% allocation county or a 20% allocation county, care had to be taken to avoid the structural issue of double allocation (double counting) due to this overlap. Any overlap had to be subtracted out from the county to avoid over counting.

This process involved using the actual damage data by ZIP code and breaking the data into ZIP code county pairs. The population count total for the county was also adjusted to remove population of the county that had already been counted in the ZIP code population. This process

eliminated double counting when there was overlap in county, city, and ZIP data. This process was used for all overlaps. The same process was used to remove the effect of overlap of ZIP code allocation and county allocation in the 20% not most heavily impacted allocation subgroup.

The distribution methodology for the 80% Allocation group allocated amounts below the minimum required allocation to eligible entities ($1,000,000 per entity) due to the total number of eligible entities (Total of 11 eligible entities) and the amount of funds allocated to GCRPC for the Local Buyout and Acquisition Program ($8,606,577). The GCRPC region would require a minimum funding allocation of $11,000,000 for the Local Buyout and Acquisition Program alone in order to meet the GLO's minimum funding requirements. As a result, the distribution methodology allocated funding to eligible entities according to each entity's 50-40-10 Distribution Percentage.

II.   **20% Local Buyout/Acquisition Program Allocation Group Required by HUD in the Federal Register of February 9, 2018, and the GLO in the Draft SAP.**

The process for the 20% State Homeowner Assistance Program and Local Buyout/Acquisition Program allocation counties was the same as described for the 80% allocation to eligible entities. Namely a minimum allocation amount was determined and after that, any residual funds were allocated in future allocations with maximum allocations imposed at each additional allocation. The minimum allocation amount for the 20% Local Buyout/Acquisition required a reasonable determination for that group separately as there was not enough money available to give all 62 entities a minimum of $1,000,000. This was accomplished by using a buildup approach that incorporated necessary administration costs for a buyout, unmet needs for the most impacted county, and the likely buyout percentage of houses in the most impacted county for the 20% Local Buyout/Acquisition group.

Under the GLO's Draft SAP, known administrative costs are that program (2%) and project (10%) administrative costs equal 12% of the money in a buyout grant award (total grant award). This is the basis for the $1,000,000 minimum distribution to each eligible entity. The county with the largest unmet need in this group is Calhoun County with $3,686,209 of unmet need. Calhoun County also has the largest number of damaged residences (55 total) and the largest total number of properties in the Major-High and Severe Damage categories (19 total).

The distribution methodology for the 20% Allocation group allocated amounts below the minimum required allocation to eligible entities ($1,000,000 per entity) due to the high number of eligible entities (Total of 62 eligible entities) and the amount of funds allocated to GCRPC for the Local Buyout and Acquisition Program ($9,824,070). The GCRPC region would require a minimum funding allocation of $62,000,000 for the Local Buyout and Acquisition Program alone in order to meet the GLO's minimum funding requirements.