Harvey Highlights Houston MUD Bond Development Funding

By Laila Assanie and Michael Weiss

ABSTRACT: Historic flooding from Hurricane Harvey struck many Houston housing developments whose infrastructure was funded with municipal utility district (MUD) bonds. The tax-exempt debt has been widely used in the Houston area, and in the storm's aftermath, MUD bond issuance has come under review with the possibility investors may seek greater future compensation.

As the months pass following Hurricane Harvey's inundation of southeast Texas, the costs of the epic storm continue to accumulate. The deluge from the slow-moving system exceeded 50 inches over parts of Houston and Galveston from Aug. 25 to Aug. 30, producing record rainfall totals along 46 percent of river forecast points in the region.[1]

Direct damage from Harvey has been estimated at $73 billion as the ripple effects continue.[2] While hurricane-force winds devastated communities near the Coastal Bend—notably, Port Aransas, Rockport and Victoria—the storm's flooding rains in the Houston area provided some of the most dramatic images. Harris County, the most-populous county in the state, expects property tax receipts to decline in the coming year as homeowners seek reappraisals that reflect lower values for flooded properties.

The cost of building new housing in many areas is sure to rise as officials recalibrate regulations following the storm. A less-visible financial consequence could involve the costs of new infrastructure financed with tax-exempt municipal utility district (MUD) bonds.

The Houston City Council, which has historically avoided limitations on construction, approved regulations that will require new homes built in a 500-year floodplain—with a presumed 0.2 percent likelihood of flooding in a given year—be elevated 2 feet off the ground.[3]

Harris County also implemented new construction guidelines, including one for properties within the 100-year floodplain. The policy will likely increase the cost of new construction both within the city of Houston and in unincorporated areas of Harris County. For instance, raising a slab foundation 1 foot above grade at initial construction using fill dirt runs roughly $13,000 to $14,000, according to a National Association of Home Builders estimate.[4]

Other cost pressures may appear more gradually. These include the MUDs that have been a cornerstone of Houston residential development. Although MUDs are found statewide, they are most prominent in the Houston metro area, where developers use them and their authority to issue tax-exempt debt—for which investors expect compensation for risk—to provide water, sewer and drainage infrastructure and services for new tracts.

Harvey's massive flooding heightened awareness of hazards that may prompt investors to seek a greater risk premium for future MUD bond issues. Among the concerns is rising mortgage delinquency rates that could lead to foreclosure, affecting property inside and outside of MUDs.[5]

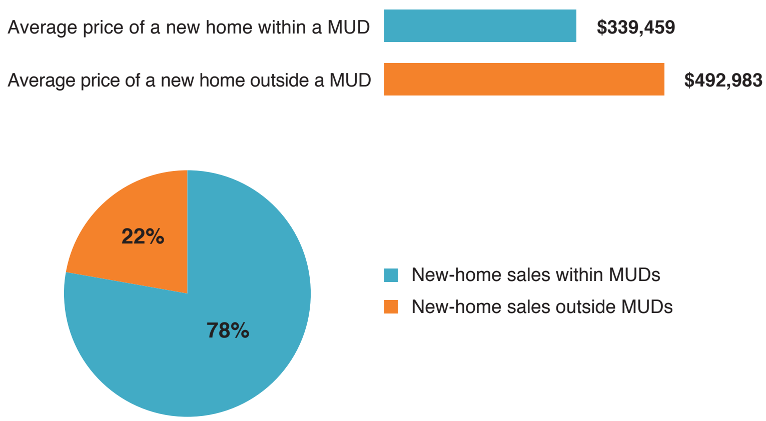
The extensive use of MUD bonds, often repaid over 10 or more years, underscores characteristics that differentiate residential construction in Houston from other areas, such as Dallas. MUDs provided the means to more quickly develop then-distant, massive parcels of land into master-planned communities such as The Woodlands, Kingwood and First Colony that were sometimes far from existing utility services.

By comparison, established North Central Texas water utilities and the more established suburban communities have created a more structured framework for providing basic utilities in new residential projects.[6] Developers in Houston, working through the MUDs they help form, operate with many fewer strictures and can set some of their own rules.

MUDs count on homeowners in the new developments to repay the costs

CHART 1

Metro Houston Favors MUDs for Housing Construction

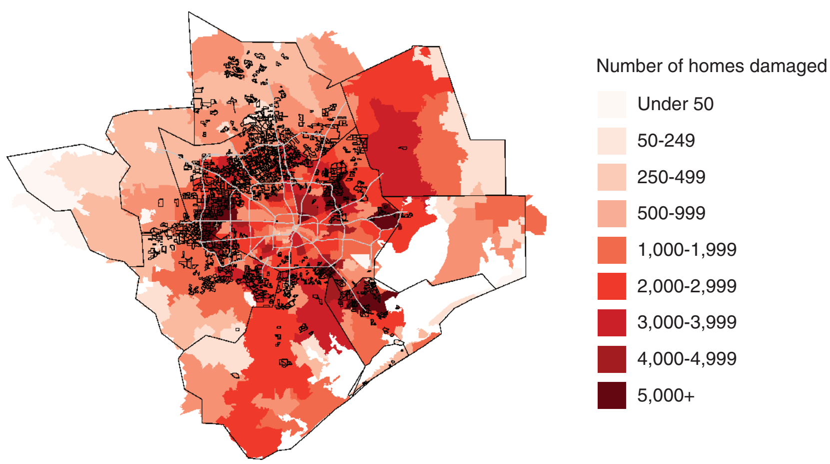


NOTES: MUDs are municipal utility districts. The quality and size of homes compared may vary somewhat. Location of the home may also affect pricing.

SOURCE: "Impact of Harvey on Houston MUDs," Texas Association of Water Board Directors, Meyers Research, April 2018.

MAP 1

Flooding Causes Widespread Damage to Homes in Houston Metro Area



NOTES: Flooding data are compiled at the ZIP code level. Black outlines represent active municipal utility districts (MUDs).

SOURCES: Federal Emergency Management Agency; Texas Commission on Environmental Quality.

of infrastructure, which by virtue of the lack of economies of scale can be pricier than bigger-city projects.[7] That said, homes in MUDs are typically cheaper, which makes up for the larger initial tax bill (*Chart 1*). Although the MUDs are government entities—much like park and school districts—they are initially governed by boards on which the developer's interests are represented.

Of the 968 active MUDs statewide, 662 are in metropolitan Houston.[8] The high concentration of MUDs in the Houston area may expose this financing model to new risks—those associated with more frequent and catastrophic flooding events.

While MUDs will likely remain a vital part of the developer's toolkit, this type of debt could become costlier and raise home prices in residential developments. And rising costs for homeownership might diminish one of the Houston area's traditional selling points: affordability.

Tracing Harvey's Impact

Damage claims filed with the Federal Emergency Management Agency (FEMA) provide an overview of the storm's effects on Houston (*Map 1*).[9] FEMA data, compiled at the ZIP code level, show pockets of damage around the periphery of the metro Houston area that directly resulted from the torrential rainfall and those from storm-related releases of water from the Addicks and Barker reservoirs in the northwest and western reaches of the city three days into the deluge.

A good portion of central Houston sustained relatively less Harvey damage, particularly away from the area's bayous. Buffalo Bayou—running generally west to east—handled runoff from Addicks and Barker reservoirs and other collection points, moving it to the Houston Ship Channel and eventually to the Gulf of Mexico.

Creating Housing Developments

Developers in Houston extensively used MUDs as the metropolitan area expanded outward. The districts provide an alternative to annexation by neighboring jurisdictions, which could build necessary infrastructure. MUDs help cities sidestep the potential of incurring additional service costs, and developers can avoid some municipal regulations.

The Texas Commission on Environmental Quality administers the creation of water districts, a class of special utility districts including MUDs, though not their day-to-day operation. Creating a MUD is relatively easy. Filing an application to establish a MUD costs $700 and can be completed within 120 days with approval by the state environmental commission. Alternatively, the Legislature can authorize a district through the legislative process. Local MUD boards, often including developer and resident representatives, oversee management.

MUDs are legal entities with taxing powers. A MUD sells municipal bonds to investors based on the assumption that as new houses are purchased, their owners will pay MUD taxes to retire the debt incurred for subdivision improvements. Prior to the bond sale, the developer bears the upfront cost of this infrastructure.

Homebuilders gain a sales advantage through a lower cost for lots that reflects the improvements financed with tax-exempt municipal bonds rather than pricier bank or corporate debt. Homeowners may benefit from the lower house prices, requiring a lower down payment. While house prices are generally less than they might otherwise be, homeowners' monthly payments are comparable when often more-expensive MUD-related property taxes are factored in.

Growing MUD Reach

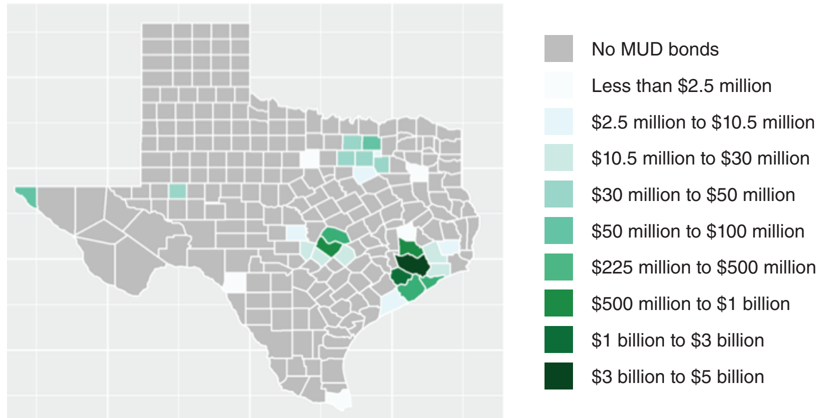
While the flourishing MUD system has allowed developers to readily supply housing to meet the demands of Houston's rapid growth, the expansion has been largely piecemeal. There are 394 active MUDs in Harris County alone. Almost four-fifths of new Houston homes sold in 2016 were in a MUD, according data compiled by Meyers Research, a market research and consulting firm.[10]

In the rapidly growing western suburbs in Fort Bend County, 149 MUDs are in operation; to the north, in Montgomery County (which includes a portion of The Woodlands), 85 MUDs are similarly active.

Outstanding MUD debt volume as of April 1, 2018, totaled $10.1 billion statewide, 84 percent of which was tied to districts in the Houston metro area (*Map 2*).[11] Harris County led the pack, with nearly $5 billion in outstanding MUD debt. Fort Bend County was next with $1.9 billion, followed by Montgomery County with $757 million.[12]

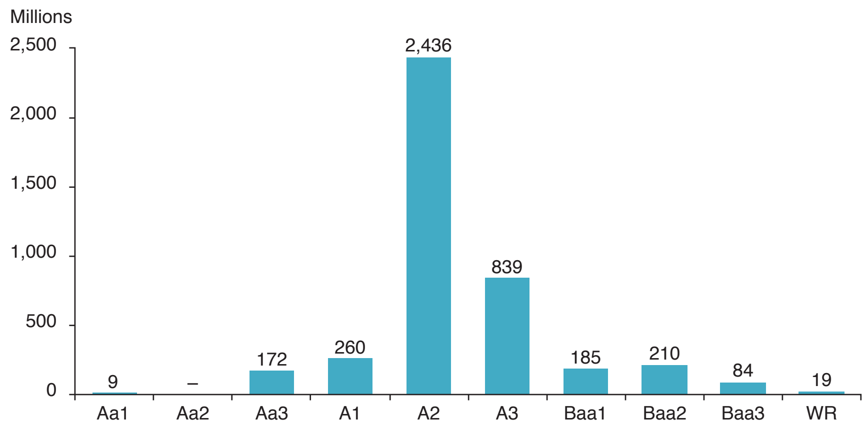
Travis County, the most-populated county in the Greater Austin area, was fourth with $594 million in MUD debt. Other large Texas counties, such as Dallas and Tarrant, had more modest levels at $47.9 million and $40.8 million, respectively.

MAP 2 Outstanding MUD Bond Volumes in Texas Highest in Houston Metro Area



NOTES: MUD refers to municipal utility districts. There were no counties with total MUD bonds in the $100 million-to-$225 million range.
SOURCE: Bloomberg.

CHART 2 Texas MUD Bonds Rated by Moody's Mostly Mid-Grade Debt

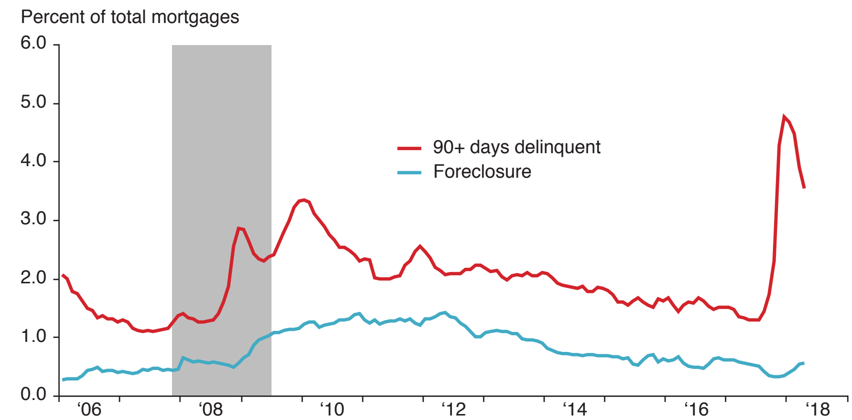


NOTES: Municipal utility district (MUD) bond ratings, listed from highest to lowest, show distribution of investment-grade issuance. WR indicates withdrawn rating. Data are as of April 1, 2018.
SOURCES: Bloomberg; Moody's Investors Service.

Ratings attached to bonds attempt to grade the risk to investors. The ratings affect the interest rate investors will demand to purchase and hold the debt. MUD bonds have traditionally been rated lower relative to the debt of Texas cities, for example, while at the same time carrying many of the same assurances of payment that come from being able to levy taxes on property owners. MUD-funded projects tend to be confined to the district and, unlike city-built projects, possess little extra capacity for later expansion.[13]

Ratings vary among issuers, based on the underlying creditworthiness, including default risk (*Chart 2*). As a group, MUD bonds are in the middle of the rating scales of the two principal ratings firms, Standard & Poor's and Moody's Investors Service, with 11 percent rated at a lower investment grade.[14] Those with "Baa" ratings "may be characteristically unreliable over any great length of time" and have "speculative characteristics," according to Moody's. By comparison, the Fort Bend County city of Sugar Land,

CHART 3 Houston Metro Mortgage Delinquencies Spike Following Harvey



NOTES: Shaded area represents the Great Recession. Hurricane Harvey struck in August 2017.
SOURCE: Black Knight McDash Data.

an 88,000-population community with many MUDs in the vicinity and whose population has more than doubled since 1990, boasts an Aa1 rating—"high quality by all standards."

Some MUDs are created with the expectation that nearby communities will annex them once they are built out and homeowners have taken responsibility for virtually all of the bonds' outstanding debt. When annexation occurs, the city usually takes responsibility for any outstanding MUD bonds. Most cities' relatively higher credit ratings are conferred on the assumed MUD debt.[15] Thus, the MUD ratings in Chart 2 appear more creditworthy than if only the debt of free-standing districts were depicted. Some MUD bond issues may also carry insurance, helping to boost their ratings and protect investors.

In the days following Harvey, Moody's placed under review for downgrade the debt of 32 MUD districts where a large number of homes suffered flood-related damage.[16] S&P issued a negative outlook for three additional MUDs, stating that the significant damage to homes in these districts could lead to a reduction in assessed value, subsequently impacting tax revenue.[17]

Though ratings of most of those under review by Moody's were confirmed—meaning there was no change in investor risk—a handful were downgraded.[18] Subsequent storm-remediation actions by various municipalities, including amended building codes and ordinances, suggest concern about an upswing in weather events. Harvey was the fourth major flooding episode in Greater Houston since 2008.[19]

Many of the MUDs whose creditworthiness was reassessed were located in suburban Houston and in areas affected by overflow from the reservoirs—the same locations that sustained the most serious damage from the storm, as shown in Map 1.

More immediately, the volume of new MUD issues in Houston between September 2017 and March 2018 declined 11 percent compared with the same prior-year period, in part because the area was at a standstill for nearly two weeks due to Harvey. Other potential issuers likely sought to gauge market receptivity before proceeding with new bond sales.

Climbing Mortgage Delinquencies

With tens of thousands of homes flooded by Harvey, some affected homeowners have struggled financially. Mortgage loan delinquencies in the Houston metro area climbed in the months following Harvey and remain elevated.

The share of mortgages 90 days or more delinquent rose from a low of 1.3 percent in July 2017 to a high of 4.8 percent in December 2017, according to Black Knight McDash Data (*Chart 3*). This share has ticked down, to 3.5 percent in April (the latest estimate available), but remains somewhat elevated compared with levels seen during the financial crisis that began in 2008.

Meanwhile, the share of mortgages 90 days or more past due in the rest of the state (excluding the Houston metro area) ticked up from 1.2 percent in July 2017 to 1.6 percent in December. After peaking in December, the rate dipped to 1.3 percent in April, similar to its year-ago level.

While the receipt of flood-insurance payments and disaster aid may further pare delinquency rates in affected areas, their significant increase has prompted some concern that a wave of foreclosures could occur in coming months.

Delinquencies, plotted by ZIP code, exceeded the average increase for Houston as a whole in many of the same areas most severely affected by flooding (*Map 3*). Areas shaded in red are those where the increase in the delinquency rate was higher than the average increase for Houston from July to December 2017, while areas shaded in green saw either a decline in the delinquency rate or a smaller increase relative to Houston during the same period.

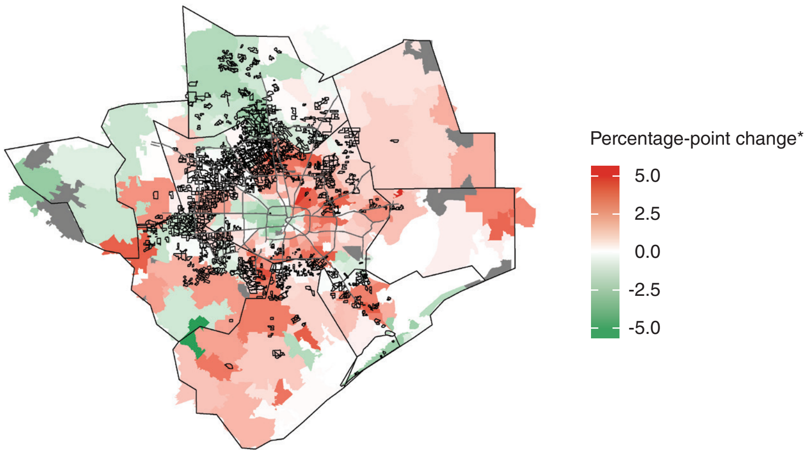
In ZIP codes where more than 1,000 homes flooded, according to disaster claims data provided by FEMA, the average increase in the delinquency rate for mortgages 90 days past due was 4.9 percentage points, compared with a 3.5 percentage-point increase for all of Houston in the July–December period. The average increase was even higher (6.2 percentage points) in ZIP codes that had more than 4,000 homes with reported damage.

As the map indicates, the rise in the delinquency rate was greater to the northeast of Houston as well as to the west in areas located near the Addicks and Barker reservoirs and along the Buffalo Bayou.

Foreclosures had steadily declined in Houston following the financial crisis and even during most of the latest energy bust and were at a recent low of 0.3 percent of total mortgages in October

MAP 3

Delinquency Rate Rises Sharply in Parts of Houston Metro Area Most Impacted by Flooding



*Change in delinquency rate relative to the change in Houston rate overall from July to December 2017.

NOTE: Delinquency data are compiled at the ZIP code level; black outlines represent active municipal utility districts in the Houston metro area. Gray shaded areas indicate insufficient data.

SOURCES: Black Knight McDash Data; Texas Commission on Environmental Quality.

2017.[20] But there was an uptick of 0.2 percentage points in the foreclosure rate from October through April 2018.

Longer-Term Reckoning

Given the magnitude of the Harvey flooding, many purchasers of Houston-area MUD bonds may have been unaware of specific flooding risks in areas that had never before experienced a major event. In those flooded areas with significant property damage and little flood insurance, the recovery will be lengthy and property valuations are likely to sink, at least temporarily impacting tax revenue.

Amid rising costs directly attributable to new market realities in the aftermath of Harvey, the longer-term effects will likely favor areas where the perceived flooding risk is smaller. More difficult to immediately gauge will be investor sentiment and the price at which investors will be willing to invest in and hold MUD debt.

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Notes

1 "Hurricane Harvey Info," National Weather Service, Houston/Galveston Weather Forecast Office, accessed April 12, 2018, www.weather.gov/hgx/hurricaneharvey.

2 "Hurricane Harvey's U.S. Cost: An Update," Moody's Analytics, Oct. 2, 2017.

3 "Houston City Council Adopts Stricter Development Rules for Houston's Floodplains," by Rebecca Elliott, *Houston Chronicle*, April 4, 2018.

4 See "The House of the Future Is Elevated," by Amanda Kolson Hurley, *Citylab*, Dec. 8, 2017.

5 Disasters heighten investor perceptions of risk and can increase the premia demanded, particularly among smaller municipal bond issuers, even well beyond an area immediately impacted. See "Accounting for Natural Disasters: The Impact of Earthquake Risk on California Municipal Bond Pricing," by Jacob Fowles, Gao Liu and Cezar Brian Mamaril, *Public Budgeting & Finance*, vol. 29, no. 1, 2009, pp. 68–83. Special district size constraints and the impact on debt ratings are discussed in "Local Government Risk Assessment: The Effect of Government Type on Credit Rating Decisions in Texas," by Robert A. Greer, *Public Budgeting & Finance*, vol. 36, no. 2, 2016, pp. 70–90.

6 "The Economics of Municipal Utility Districts for Land Development," by Richard B. Peiser, *Land Economics*, vol. 59, no. 1, 1983, pp. 43–57.

7 "Land Development Regulation: A Case Study of Dallas and Houston, Texas," by Richard B. Peiser, *Real Estate Economics*, American Real Estate and Urban Economics Association, vol. 9, no. 4, 1981, pp. 397–417.

8 Data are from Texas Commission on Environmental Quality's Water Districts Database, www14.tceq.texas.gov/iwud/index.cfm. The Houston metro area encompasses Austin, Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery and Waller counties.

9 See "FEMA to Play Long-Term Role in Recovery from Harvey," by Jesse Thompson and Rachel Brasier, Federal Reserve Bank of Dallas *Southwest Economy*, Second Quarter, 2018.

10 See "Impact of Harvey on Houston MUDs," Texas Association of Water Board Directors, Meyers Research and Municipal Information Services, April 2018.

11 Bond volume data are from Bloomberg as of April 1, 2018.

12 MUD property tax rates for homeowners in newer subdivisions sometimes run one-half or more of those of local school districts, which typically command the highest rate for an individual tax bill.

13 Some MUDs built within city limits, for example, anticipate that as homeowners occupy the district, the city will annex the MUD and create the opportunity to improve the initial infrastructure.

14 Bond issuers, in this case the MUDs, pay the ratings firms to evaluate their creditworthiness. Bonds may also be sold without a rating if the issuer chooses to do so. Some jurisdictions purchase bond insurance, which is designed to guarantee repayment should the issuer be unable to do so. Such "credit enhancements" are reflected in bond ratings.

15 See "Moody's Upgrades Fort Bend County MUD No. 111's, TX GOULT to Aa1 from A2 After Assumed by City of Sugar Land, TX," Moody's, Jan. 26, 2018.

16 See "Moody's Places 37 Texas Municipalities Under Review for Downgrade," Moody's, Sept. 22, 2017.

17 See "Outlook Turns Negative for Five Texas Utility Districts in Harvey's Wake," by Richard Williamson, *The Bond Buyer*, Oct. 18, 2017.

18 See "Moody's Confirms the Ratings of 18 Texas Municipal Utility Districts," Moody's, Nov. 10, 2017.

19 Major flooding events were Hurricane Ike in 2008, the Memorial Day floods of 2015, the Tax Day floods of 2016 and Hurricane Harvey in 2017. The 2015 and 2016 episodes were categorized as 500-year floods, Harvey as a 1,000-year flood.

20 The share of mortgages in foreclosure increased from 0.5 percent in July 2015 to 0.7 percent in October 2015 and remained close to that level until March 2016. Data are from Black Knight McDash.