M E M O R A N D U M

TO: Mayor and Council

FROM: Victoria J. Li, P.E., Director
Watershed Protection Department

DATE: August 27, 2014

SUBJECT: Staff Report - Resolution No. 20140515-064 – Investment in flood prevention, protection and preparedness for properties city-wide

On May 15, 2014, Council passed Resolution No. 20140515-064 directing the City Manager to provide fiscal year 2014 – 2015 budget options for investment in flood prevention, protection and preparedness for properties city-wide. The resolution requires a report identifying options including:

- Early warning infrastructure and emergency communication systems,
- Items addressing the rising costs of flood insurance appropriate to Austin such as a deductible sharing program or local flood insurance voucher or tax credit program for low-income households,
- Public education efforts regarding flood risks and flood prevention as well as mitigation and insurance programs available, and
- Improved road signage and warnings at low water crossings and other driver education efforts.

Early Warning infrastructures and Emergency Communication Systems:

Flood Warning System Improvements

The Watershed Protection Department's Flood Early Warning System (FEWS) monitors rain events and works with a variety of other Department's to provide warning to the public of potential flood hazards. FEWS uses many tools to accomplish this task including, rain and stream level gauges, software programs, and field observations. FEWS continually maintains and upgrades its tools in order to improve their ability to warn the public of flood hazards. WPD has identified several options that would improve the City's ability to protect lives and property. The estimated funding requirements for the proposed improvements total approximately $1,135,000. The individual improvements are listed below along with the estimated costs. The attached Exhibit A provides a more detailed description and the benefits associated with each item.

Improve the Reliability of the Flood Early Warning System (FEWS) Radio Network	$100,000
Hardening Existing USGS Gauges	$75,000
Install Additional USGS Gauges	$100,000
Flood Early Warning System Evaluation Study	$400,000
Flood Monitoring Software Dashboard Enhancements	$300,000
Install Additional Traffic Cameras to Monitor Low Water Crossings and Flood Risk Areas	$150,000
Improve FEWS Back-End Database Server Hardware	$10,000
Total	$1,135,000

Addressing the Rising Costs of Flood Insurance:

Council Resolution No. 20140515-064 directed the City Manager to identify options for addressing the rising costs of flood insurance, appropriate to Austin, such as a deductible sharing program, local flood insurance vouchers, or a tax credit program for low-income households.

The options listed above assume the increased costs of flood insurance stem from the recent Biggert-Waters Act of 2012 (BW-12). The Biggert-Waters Act of 2012 intended to phase out flood insurance subsidies for non-primary residences, for business properties and for severe repetitive loss properties where claims payments exceed fair market value. It also required that new policies be issued at full-risk rates under the following circumstances:

- Upon the sale/purchase of a property
- Upon a lapse in insurance coverage
- For substantially damaged/improved
- For properties uninsured as of BW-12 enactment
- As new or revised Flood Insurance Rate Maps are issued (Grandfathered rates planned to be phased out over 5 years)

On March 21, 2014, President Obama signed the Homeowner Flood Insurance Affordability Act of 2014 into law. This Act repeals certain provisions of BW-12, makes additional flood insurance program changes, and leaves some parts of BW-12 intact for older business properties insured with subsidized rates, older non-primary residences insured with subsidized rates, and severe repetitive loss properties insured with subsidized rates. For Austin's flood area residents, the full-risk rates have been shown to be equal or more than mortgage payments for their homes, with some also having been substantially damaged. However, the new Law requires gradual increases to properties with subsidized rates instead of immediate increases to full-risk rates. As FEMA actively analyzes and prioritizes implementation of the new Act, some of its key priorities include: refunds, rates, surcharges, mapping, promoting mitigation and the creation of a new Flood Insurance Advocate.

<u>Deductible Sharing Program</u>

Research indicates that the intent of a deductible sharing program is to encourage flood insurance applicants below a certain income level to seek a high deductible, thus making flood insurance premiums lower and more affordable (means-tested deductible sharing). A means test is an evaluation and determination of whether an individual or family meets criteria for government assistance, based upon whether the individual or family possesses the means to do without that help. Should a flood disaster occur, communities would offer deductible-sharing funds to these policy holders. The City would have to budget or set-aside the deductible-sharing funds on a rolling basis. Raising one's deductible from the typical $500 to $1000 will make one eligible for a lower premium; but with approximately 12,000 structures located within the

floodplains of Austin, a significant citywide storm event could cause a severe financial hit to CIP funds that may be better used for "avoidance" strategies or "resistance" strategies to reduce flood risk. These strategies are the only two options that cities have to reduce flood risk. A deductible sharing program is not recommended at this time at the local level. Note that FEMA is still looking at a deductible sharing program for implementation at the federal level so our residents may still be able to benefit from this strategy once FEMA settles on the best affordability framework.

Local Flood Insurance Voucher

This program refers to a new methodology to provide flood insurance vouchers from the federal or local government for flood insurance policy holders whose rates would increase to full-risk rates under the Biggert-Waters Act of 2012. The one trigger in the Biggert-Waters Act of 2012 that was the most troublesome across the country was the trigger to full-risk rates upon the sale of a home or purchase of a new flood insurance policy.

Under a means-tested voucher or rebate program, policy holders would be required to pay a certain portion of the total amount. The University of Pennsylvania (Penn) suggests an amount equal to 5% of the policy holder's income. The locally subsidized voucher would pay for the difference between the increased flood insurance premiums less the expected flood insurance policyholder's contribution. This amount can be further reduced if the policyholder provides flood mitigation solutions that would elevate the structure and reduce the flood risk. Penn shows that the voucher amount can be eliminated if low-interest loans can be offered by governments to provide for the mitigation, thus lowering the flood insurance premiums significantly.

Others go further by suggesting that the two programs be tied together: vouchers only provided upon take-up of a low-interest loan to mitigate or elevate the structure above the base flood elevation. Fiscal impacts will result as the City would have to budget for low-interest loan amounts and/or for the cost of the flood insurance vouchers if this is done at the local level only. The City's most recent study for elevating a slab-on-grade house estimated the cost to be around $200,000 per structure. When the overall costs of raising structures with contingencies approaches the fair market value, the avoidance strategy of property buyout becomes more feasible. FEMA is currently studying similar affordability measures. Results are expected from that study in December 2014. Staff recommends waiting on the results of that study before moving forward with implementation with any similar programing at the local level.

Tax Credit Program

Under a tax credit program, research discovered State tax credits were given for the cost of flood insurance itself. However, these tax credits were credited against state income taxes, thus would not be applicable in Texas. In addition, homeowners are not eligible to deduct flood insurance costs on federal tax returns, although, landlords can deduct those costs as a business expense. Those who suffered flood damage are eligible to claim casualty losses on their federal tax return.

Staff did identify an example of a local tax credit program in Tennessee. The State of Tennessee enacted legislation allowing for sales tax credit for replacement of household furniture, appliances and automobiles destroyed during a flood disaster. City consideration of a similar program would require a change in Texas state law.

Signage and warnings at low water crossings and other driver education efforts:

Flash flooding is Austin's most common weather emergency. Since 75 percent of flood fatalities in Texas occur in vehicles and even minor floods can be deadly, it is imperative that residents and visitors to Austin are warned of the dangers that flash floods pose along roads.

Within the City of Austin, there are approximately 400 roadway crossings that would be flooded

during a 100-year flood event. Current signage and warnings include:

- Signs with flashing warning lights at 20 low water crossings
- Automatic barricades at 2 low water crossings (one gate arm pair closes Spicewood Springs Road with 7 low water crossings)
- Staff gauges at 25 locations, and
- "Watch for Water over Road" signs at approximately 40 locations.

As the City annexes land, we may add signage to roadways that are at risk of flooding.

The roadway signage is effective at raising awareness of flood risk and actively indicating risk at roads with flashing light signs and barricades; however, WPD does not rely solely on the signs as a warning mechanism during floods. Field Operations staff also places barricades to close the roads to traffic.

In addition, our public outreach efforts help raise awareness of the risks of flooding as well as alert the public to specific hazards. Our current efforts at driver education are budgeted at $24,000. Although the FY 2014-15 budget requests an increase to $73,000, an increase to $224,000 would allow us to reach significantly more people with the driver safety message. The attached Exhibit B provides a more detailed description of what is covered by the current funding level and what would be included if funding was increased.

Public education efforts regarding flood risks and flood prevention as well as mitigation and insurance programs available:

Everyone in Austin is subject to flood risks posed by flooded roadways, trails, playing near flooded creeks and drainage infrastructure. But the homeless population and those living in floodplains or subject to localized flooding have a greater risk of property damage and personal danger. Public education efforts can help these populations be aware of their risks as well as measures they can take to protect themselves, their families and properties.

<u>Public Education on Flood Risks, Prevention and Insurance (Unfunded $140,000+)</u>
WPD's outreach to those in floodplains has generally been in association with changes to the floodplain. During the current floodplain mapping efforts, we have sent out postcards/letters, run advertising and sent out news releases to inform residents of changes to the floodplains. When appropriate, we also hold public meetings to explain the changes and how residents may comment or appeal the proposed changes. These efforts have occurred with budget savings from other areas.

WPD could greatly increase public education efforts to those in the floodplain. Although many activities would consist of staff time such as news releases, a web portal specifically for flooding, workshops for real estate agents, other items need to be budgeted. The following activities, estimated at $140,000, would greatly enhance the outreach to those living in floodplains:

- Postcard to announce ATXFloods Alerts
- Floodplain notification (Note: more than 40% of people living in a floodplain are not aware of it.)
- Flood safety and preparation flyer
- Flyers to be handed out as needed on what to do after a flood, children's safety and building restrictions
- Flood safety videos
- Community meetings
- Social media
- Outreach to real estate agents
- Outreach to the homeless population

A significant portion of the requested funds would be used on a flyer about flood safety to be distributed to all individuals in the floodplain. This flyer would include information on ATXfloods Alerts, sheltering in place, disaster kits, flood insurance and other ways to protect properties. The flyer would be in English and Spanish.

Signage in parks and along trails is another item that should be considered. Such signage would help alert users that the area is subject to flash flooding. However, more research is needed to determine the number of signs, placement and budget.

Please contact Jose Guerrero, Assistant Director, Watershed Protection Department, should you have any detailed questions or concerns at (512) 974-3386 or via e-mail at Jose.Guerrero@austintexas.gov.

Attachments

Cc: Marc A. Ott, City Manager
Sue Edwards, Assistant City Manager
Joe Pantalion, P.E., Deputy Director, Watershed Protection Department
Jose M. Guerrero, P.E., Assistant Director, Watershed Protection Department

EXHIBIT A

Early Warning infrastructure and Emergency Communication Systems Cost Estimates

Item	Description	Cost Estimate
Improve the Reliability of the Flood Early Warning System (FEWS) Radio Network	Accurate flood warning depends on the FEWS receiving timely rainfall and stream level data from many sources, including the City's system, the United States Geological Survey (USGS), and the LCRA. The City's system of more than 140 rain and stream level gauges communicates to our predicted flooding map application via radio transmissions. As our gauge system has grown, the reliability of receiving timely data has diminished. We have made internal modifications to the system to improve performance. However, as our predicted floodplain map application has expanded, we have continued to realize data transmission issues. Improving the FEWS radio network would eliminate the data transmission issues and allow the predicted floodplain map application to produce more reliable flood risk maps. FEWS is currently evaluating the use of the LCRA radio system to transmit data from the City rain and stream gauge network. Once the evaluation is complete, the next steps include completing an inter-local agreement with the LCRA; purchase and installation of new radios for the City's gauges; and purchase of a new computer base station to receive and process the data. The cost identified above is for the purchase and installation of the new radios and the new computer base station. The total cost is about $400,000 of which a portion is currently funded within the FEWS budget. Annual maintenance costs for the City and operating costs through the LCRA would be funded by the FEWS annual operating budget.	$100,000
Hardening Existing USGS Gauges	FEWS staff is working with the USGS to "harden" USGS gauges that provide data to the flood warning group. The goal of gauge hardening is to make the gauges more flood resistant so that they continue to operate under more extreme flooding conditions. However, these gauges must monitor water level, which means that equipment has to be installed at the bottom of the creeks. This makes them susceptible to damage from flood debris and bridge failures in extreme storm events. The USGS and City of Austin have a long-term contractual agreement to have the USGS provide full range rating stations (flow and depth monitoring gauges) as well as perform water quality sampling at specified locations within the City. After the Halloween Flood, when the Twin Creeks gauge was damaged and the US 183 gauge stopped reporting, the City entered into a single purchase contract with the USGS to provide "hardening" to four of its gauges, including Onion Creek at US Highway 183; Onion Creek at Twin Creeks Road; Williamson Creek at Manchaca; and Shoal Creek at 12th Street. The USGS has completed this work. The	$75,000

	supplemental funding would allow additional gauges to be "hardened".	
Install Additional USGS Gauges	The City and USGS have a long-term contractual agreement to have the USGS provide 29 full range rating stations (flow and depth monitoring gauges) as well as perform water quality sampling at specified locations within the City. This proposal would add three full-range rating stations to supplement the current gauges. These gauges would be installed and maintained by the USGS. The data from these gauges would be used in the predicted floodplain map application to predict flood risks.	$100,000
Flood Early Warning System Evaluation Study	In 2007, the FEWS group completed an evaluation study to identify system improvements to be implemented. FEWS has implemented many of the recommendations from this study that have enhanced our ability to predict flood hazards and warn the public. Since 2007, technology has evolved significantly and now offers a wide range of choices for computer software and other products that could further enhance the flood warning system in Austin. FEWS proposes to request statements of qualifications from consultants in the flood warning field to prepare an updated evaluation study. We will use the results of this study as a road map for future improvements to our program.	$400,000
Flood Monitoring Software Dashboard Enhancements	One of the advancements in the FEWS toolbox was the creation of the predicted floodplain map application. This software processes the results of our predicted floodplain models and displays the results on a map that indicates the extent of flooding and the time when that flooding is expected to occur. Our intent is to expand the software to improve the interface for the existing information and to enhance the information that it could provide. An application that combines the data from the various sources and displays them on a map would make it much easier for FEWS personnel to quickly spot and react to potential issues. The application should also include alarms to alert users when certain flood warning levels have been exceeded. This application would preferably be web-based and hosted on a dedicated server for improved speed and reliability. A dashboard system should be developed to provide a more reliable and efficient way to notify FEWS staff of predicted flood hazards.	$300,000
Install Additional Traffic Cameras to Monitor Low Water Crossings and Flood Risk Areas	Technological advancements in flood warning have significantly improved the FEWS group's ability to predict flood hazards and warn the public. However, we continue to rely on field observations to verify the data from our gauges. This "boots on the ground" information primarily comes from the Watershed Protection Department Field Operations Division. We also rely on other partnering Departments in addition to citizen reports.	$150,000

	We currently have several traffic cameras that are part of the Austin Transportation Department's system that allow FEWS to monitor low-water crossings during storm events. With additional funding, we would like to expand our network of cameras on the current system and stand-alone cameras. This would improve our flood warning ability in addition to freeing up field crews to respond to the most critical areas that require roads to be closed. Traffic cameras are an extremely low-cost and quick-to-implement way to dramatically improve the ability of our field crews to cover and barricade flooded roads.	
Improve FEWS Back-End Database Server Hardware	We recommend the purchase of a high-end workstation computer to host historical gauge data and the related applications database (WISKI). Currently this information is hosted remotely in various locations, so the data is difficult to access. This is a low-cost way to improve the security and availability of FEWS data, and facilitates advances in forecast modeling and mapping that would improve FEWS' ability to provide timely and accurate flood warning.	$10,000
Flood Warning Sirens	A cost for a flood warning siren system is not included since this type of system is not recommended as an option for Austin. FEWS staff has discussed siren systems with vendors and staff in the Homeland Security and Emergency Management Department. With advances in cell phone technology, in particular the Integrated Public Alert & Warning System (IPAWS), we believe that our current approach to warning the public about disasters in general and floods in particular is more effective that warning sirens. If desired, an interdepartmental discussion with emergency personnel (APD, AFD, HSEM) needs to take place regarding the usefulness and operation of a siren system. Sirens are extremely effective in issuing tornado warnings, mainly because there is one action that a citizen needs to take – TAKE SHELTER IMMEDIATELY. However, sirens may not be able to deliver a more detailed message for flood warning, where the difference between the actions to seek shelter or to evacuate is critical. For example, if citizens hear the siren and attempt to evacuate, they may move to a more dangerous situation in their vehicles (the vast majority of flood related fatalities in Texas are in vehicles).	

EXHIBIT B

Signage and warnings at low water crossings and other driver education efforts

Item	Description	Cost Estimate
Driver Education (Current Budget)	Over the past 12 years, WPD has partnered with other City departments, the National Weather Service, the U.S. Geological Survey, the Texas Floodplain Management Association and other organizations to promote flood safety to drivers and the community at large. The current budget has allowed WPD to use several methods to increase awareness. These methods include the ATXfloods web site, the Save Yourself! Turn Around – Don't Drown advertising campaign and news conferences, PowerPoint slides for driver education programs, youth education programs and a poster contest, community outreach at weather or science-oriented fairs and events, and miscellaneous promotional items. A 2013 survey of Austin residents indicated approximately 85% have heard the Turn Around – Don't Drown slogan. Last year, the web site, www.ATXfloods.com, became an important component of the driver education efforts. The web site has already received 686,492 visitors and is regularly used by news media to warn drivers of flooded roads during storms. In addition, WPD runs public safety radio advertisements during storms. Staff also promotes the ATXfloods web site and the ATXfloods Alerts! notification system to warn the public about flooded road hazards. Staff is also working with companies such as Google to have the flooded roadways incorporated onto mapping products that the public uses for route finding.	$24,000
Driver Education (Proposed FY14-15 Budget)	With an increased advertising budget of $73,000, which is included in the proposed FY14-15 budget, WPD can continue all the current activities and run two additional campaigns to increase the effectiveness. In some years, these campaigns have occurred with budget savings from other programs. <u>Emergency Advertising, $24,000</u> When storms are imminent, WPD will run radio and mobile ads and increases its presence on social media with flood safety emergency messages. The emergency messages promote the web site, ATXFloods.com, with real-time information about flooded roads and closures. This budget is based on four storms with $6,000 spent on ads per storm. <u>Fall Advertising Campaign, $25,000</u> WPD will run radio and online ads in the fall about the dangers of driving across flooded roads. The campaign is timed to coincide with the most active period of	$73,000

	hurricane activity and the beginning of classes at universities with the corresponding influx of new people to the community.	
Driver Education (Unfunded)	According to a recent survey, about 70% of Austin residents prefer to receive flood warnings on the television. However, the current budget is not sufficient for TV advertising. With additional advertising funds, WPD could incorporate all of the activities above and also lengthen the advertising campaigns to approximately 12 weeks, add television advertising, expand social media advertising and explore other innovative advertising such as CapMetro buses, cabs, cinemas, etc. This broadened campaign would reach more than 3 million people with almost 80 million gross impressions.	$151,000