



City of Pasadena, Texas

Floodplain Management Plan's Progress Report

October 2011 to September 2012

INTRODUCTION:

Being a National Flood Insurance Program (NFIP) partner and participating in the Community Rating System (CRS), Federal Emergency Management Agency (FEMA) required the City of Pasadena to adopt and develop a Floodplain Management Plan in 2010. A Resolution 2010-86 was approved by the city council adopting the plan on November 9, 2010. Government body accepted the City of Pasadena's Floodplain Management Plan as a guidance document for various departments and to maintain the Community Rating System score of seven (7) or Lower, in order to reduce the potential for personal/property losses in flood prone areas and ensure lowest possible flood insurance premiums for City of Pasadena residents.

In October of 2011, the City submitted in the report of the Floodplain Management Plan, developed from October 2010 to September 2011. The plan helped to keep activities organized and coordinated. In order to improve the development of the plan and its activities, the City Flood Plain Manager called to a general City Department meeting in February 6, 2012. During the meeting, the CRS activities and data reporting were explained, doubts were clarified and questions answered. In addition, some changes from the new manual were announced and the necessary paperwork to comply was instructed.

One of the new requirements for outreach credit was the formation of a PPI, Program for Public Information. The City Flood Plain Manager organized a PPI Committee formed by stakeholders, important leaders of the community as well as government representatives. As a result, a PPI program was put together to organize and coordinate on outreach and public involvement activities, that the City has developed for many years.

The Community Rating System (CRS) from the NFIP (National Flood Insurance Program) grades the various Community Floodplain Management Programs and the points scored in CRS is directly proportional to the reduction in flood insurance premiums in those communities that meet their requirements. In order to reduce the potential for personal property losses in flood prone areas and to ensure the lowest possible flood insurance premiums for our residents, the Environmental Services Division continue developing and improving the Floodplain Management Plan activities.

BACKGROUND:

City of Pasadena is a coastal City that is affected by storm surge along its Galveston Bay coastline at El Jardin, El Cary subdivisions, and riverine flooding from five bayous: Vince Bayou, Little Vince Bayou, Armand Bayou, Cotton Patch Bayou, and Boggy Bayou.

The last major storm surge was from Hurricane Ike in 2008 and highest levels of flooding across the City were from Tropical Storm Allison in 2001.

Base flood elevations have been calculated in the Tropical Storm Allison Recovery Project Study (TSARP) for Harris County and Special Flood Hazard Areas (SFHA) are published in the Flood Insurance Rate Map (FIRM) dated June 18, 2007. Heavy rains and high intensity storms produce most of the flood damage. Coastal flooding caused by tropical storms, hurricanes and unusually high tides combined with strong westerly or northwesterly winds also poses continuing threat to the City.

ASSESSING THE HAZARDS:

City of Pasadena's primary sources of flooding are caused by tropical storms, subtropical events that are associated with extremely heavy rains, and hurricanes. As of 2010, best estimates indicated that there were over 12,659 properties had flood insurance in the City, an increase from 6,577 in 2000. As of August 2012, there were 11,450 policies. According to information provided by Ms. Donnie Walsh, Natural Hazards Program Specialist from FEMA Region VI, more than 10,000 policies were on properties located in B, C or X (low risk) zones, an increase from last year when it was under 10,000. As is known, the mandatory purchase requirement does not apply to B, C or X zones. Only about 1,240 policies are for properties located in AE zones; a small increase in the number of policies in 2012 from 2011 when they were 1200.

With FEMA information and the City of Pasadena GIS Department an analysis on the number of buildings in different flood zones, versus the number of flood insurance policies in each of them was condensed in the following table:

2012 Number of Buildings and Flood Insurance Policies By Flood Zone

Zone	Residential	Mobile Homes	Commercial	Industrial	Total	Insured
X Shaded (500 yr)	1003	33	5925	97	7058	731
A	12	0	10	0	22	21
AE (100 yr)	1889	7	1029	56	2981	1256
AO (Pondind depht)	1	0	2	6	9	0
VE (Coastal)	91	0	7	0	98	4
X Unshaded (Preferred Zone)	24548	415	4846	126	29935	9438
Total	27544	455	11819	285	40103	11450

This table shows the Preferred Zone (outside the floodplain) has 9438 flood insurance policies, which is very good and only 4 policies are in the VE zone where 91 buildings should be insured. In zone AE there are 1256 flood policies where there are 2981 buildings. This number helps the Program for Public Education Team to concentrate in its outreach efforts in these zones. Residents, businesses and industry should be aware of the need of having this type of insurance to protect them from flooding risk.

The City of Pasadena identified 11 goals to meet the Floodplain Management Plan requirements and departments within the City are continued to work towards these goals:

Goal 1 — Provide leadership in protecting residents and properties from the impact of flooding.

- The Engineering Department continues working and developing resident information activities being available for consultations not only at the Engineering office, but also at community events. This Department shows property owners where they are located in reference to the Special Flood Hazard Boundary. In addition, preparedness information for adults and kids are distributed in letters, during events and presentations, as well as published in website and other articles. In 2012, 13 letters were sent to those requiring information about the location of buildings in the Flood Insurance Rate Map. 81 letters were sent to those requiring information on Utility Availability, which

includes, flood plain determination of the property, water, sanitary sewer and drainage connections availability. The data showing phone inquiries on properties were also maintained.

- **Enforcing the Flood Protection Ordinance.** During the permit stage of a project, the City makes sure that ordinances are enforced. Inspectors visit construction sites, waterways, detention basins to check that they are maintained.
- **Maintaining elevation certificates for new and substantial improved buildings.** The Engineering Department maintained the data of 127 elevation certificates for all residential and commercial buildings, during the reporting year.
- **Maintaining, creating and using digitized maps of the floodplains on Geographical Information System (GIS).** Other maps for improvement, maintenance and outreach purposes have been developed, such as watershed maps, detention basins map and outfalls map.

Goal 2 - Preventing new development in the floodplain from increasing runoff in the floodplain. The City continues:

- **Reviewing development plans in accordance with the Flood Protection ordinance and regulating development in Special Flood Hazard Areas including Construction and Post-Construction ordinances for sustainable development.** The City handed construction and pos-construction BMPs flyers to all permit packages handed to builders for new and substantial improved constructions. The City issued 13 permits for new construction and substantial improvements in the Special Flood Hazard in the last year.
- **Partnering with Harris County to protect areas prone to flooding, such as those in Armand Bayou Watershed. Through the use of retention/detention ponds (over 500 acres) constructed in this bayou and maintained by Harris County Flood Control District. Other projects were also developed by HCFCD in Pasadena, such as buy outs. From October 2011 to September 2012, Harris County Flood Control District capital projects active within the City of Pasadena limits were:**
 - **B100-00-00-H003: Brandywood Apartments Buyout- Acquisition and removal of severe repetitive loss properties to avoid additional flood insurance claims. Coordination with Precinct 2 and the City of Pasadena on future use of the property.**
 - **B500-04-00-E002: Red Bluff Stormwater Detention Basin Excavation and Removal - Excavation in advance of a final project to construct a stormwater detention basin without major capital**

- expenditures. Excavation and removal of soil is based on market needs for the material.
- B513-02-00-E001: Baywood Stormwater Detention Basin Environmental Remediation - Remove and dispose of soils previously impacted by former oil and gas production facilities.
- B513-02-00-E002 – Baywood Stormwater Detention Basin Excavation and Removal – Excavation in advance of a final project to construct a stormwater detention basin without major capital expenditures. Excavation and removal of soil is based on market needs for the material. (Anticipate start in Sept. 2012)

Currently, the only plans for HCFCD in 2013 include the continuation of activities at the Baywood Stormwater Detention Basin.

Goal 3 - Developing public awareness programs that inform property owners in the flood zones that they are located in a flood zone. The City has developed a Program for Public Information with the help and guidance of the 2012 CRS Manual. The steps followed in the process have helped the City to organize and coordinate outreach and public involvement annual activities that had developed for several years. The following are some of the methods used:

- Mail-outs — annual letters are continued to be mailed to residents who are in the floodplain and adjacent to 100 year floodplain. The City sent bilingual letters (English and Spanish) with flood information to 33,768 homes, targeting all the households in the City of Pasadena area. In addition, the City sent 579 bilingual letters to all the RLA (Repetitive Losses Areas), being only 274 Repetitive Losses properties and the others are properties surrounding the buildings. This means, 365 properties have not flooded but have the potential to flood. The letter makes home owners aware of the danger, and gives possible solutions to mitigate this potential problem. The City offers its flood information services as well as other sources of information/help. Also, all the businesses and residential areas owning a detention pond are inspected and if care is needed, an educational letter is sent requiring maintenance of the pond and the reasons for it, including flood prevention.

- Public Events - The City continues presenting flood information at Public Events by setting up booths and displaying the flood map as well as distributing flyers/brochures about flood risks. Some of these events are being organized to create awareness among the public. All types of materials are continued to be used to overcome social and economic barriers. Skits, displays, coloring pages, flyers, etc. have been created and distributed. Spanish Radio interviews, local TV shows, and articles in newsletter or newspaper were instrumental in public awareness. Examples can be seen in the event program schedule. The TFMA (Texas Flood Plain Managers Association) has allowed the City to use their flood

model for education purposes and the City has been taking it to several events and schools. This tool is exceptionally helpful, since it grabs the attention of children and adults.

- **Program for Public Information Committee - Partnering with stakeholders, such as Insurance Agents, Business groups, Realtors, School District, etc., to educate the public on the importance of knowing their flood risk. Leaders of the community or stakeholders step forward to help with outreach. Examples of partnerships are found on the Program for Public Information.**
- **Other Partnerships - Partnering with other organizations to develop environmental campaigns such as the Galveston Bay Estuary Program (TCEQ Branch), with their program "Back the Bay". The City is also member of The Armand Bayou Watershed Partnership, which promotes flood hazard awareness among residents in the area, as well as education on measures that can be taken in the protection of the environment, life and property from natural disasters. Armand Bayou Nature Center, long time partner, has continuous environmental outreach year round. A new event was organized by other partners: Ducks Unlimited and the School District; this event was called Walk the Watershed. The third one, Strawberry Stroll was organized by the North Pasadena Business Association. There are many partners like this, working on outreach and this can be observed in the attached PPI table.**
- **Educational Materials – Another way of public awareness was leaving written information at public buildings such as Public Libraries, City Hall, Chamber of Commerce, Convention Center and different Departments in the City. People can take the information as needed, and it is found besides flood information, contact numbers and e-mail addresses for any questions. The supply of material is checked every two weeks and that supply is recorded in PPI data base.**

Goal 4 - Providing advice and assistance to property owners concerning the protection of their properties from flooding, local drainage and sewer back-up problems. The City continues with:

- **Action-Line receives complaints and provides service request to the corresponding department within the City and manages thru the successful completion of request; this activity is continued to be implemented.**
- **Public awareness/information are continued to be provided at several public events within the City. The City provides information about the FIRM, Elevation certificates, flood mitigation, flood preparedness, flood insurance, etc. Stakeholders volunteer to help with education and outreach. The City has record 21 repetitive annual events, in addition other presentations, new events, e-mails, local TV programming, and some other venues were used for education.**

Goal 5 – Continue working on mitigation programs for which funding was available.

- Continue working with mitigation programs, in partnership with Harris County Flood Control. One example was the one in Brandywood apartments buyouts program in 2012.

Goal 6 - Continue existing programs to acquire wetland areas for recreation while providing watershed volume storage and maintain buffer areas from the floodplain.

- Continue to coordinate with Harris County Flood Control District and Core of Engineers to accomplish these tasks. In addition the city is part of the Armand Bayou Watershed Partnership. The partnership is improving the quality of life in our community and making the watershed area a great place to live, work and play, by enhancing and restoring the ecological integrity and natural benefits of the Armand Bayou Watershed.

Goal 7 – Continue Funding capital projects to mitigate flood impacts in those areas of the City experiencing significant flooding problems. The City continues:

- Through City's Capital Improvements Program (CIP), will continue implementing annual drainage contracts to resolve drainage problems. As an example, in 2011-2012, Cotton Patch drainage project helped to mitigate the problems in neighboring areas. In the past, water was not draining fast enough and 3 feet of water were standing in the bayou. With the work done and for the first time, Cotton Patch got its channel bed completely dry, and the streets and homes around it don't face the flooding potential as was happening before this improvement.

Goal 8 - Training Personnel to review capital projects in terms of comprehensive analysis of hazard mitigation opportunities.

City personnel was trained to do outreach during their daily routine and field work among residents, while keeping good BMPs themselves to protect the storm drain. Another City personnel training included record keeping and reporting procedure. Certified Floodplain Managers (CFMs) attend conferences, meetings, and presentations to keep knowledge up to date with the changes of the 2012 Manual.

Goal 9 – Continue developing the hazard mitigation plan for the City and review new development requests establishing priority for hazard mitigation projects. The City is in constant contact with residents and the leaders of the community looking for ways to improve the standard of life in the City.

At the same time, there is a research for solutions and for funding to reach those goals. As an example, The Assistant Director of Public works was part of working groups in the country, looking for solutions to help all the communities, called Resilient Neighbors Network.

Goal 10 - Reviewing the effects and locations of areas that experience flooding and continue to prepare and mitigate future problem areas.

Based on National Flood Insurance Program (NFIP) data, there have been rain events that have flooded structures at least nine times in the past 25 years. Based on flood data for Tropical Storm Allison, approximately 831 residences were flooded with flood depths of as much as four to six feet. The most recent historical data is available for Tropical Storm Allison in June 2001. The City is allocating funds to improve drainage facilities to alleviate flooding problems.

Goal 11 – Continue to update the list of Realtor, Lenders and Insurance Agents servicing City residents and to remind them of the services the City offer in order for them to serve better the citizens of Pasadena. A new list has been developed since many businesses have moved, closed or opened new ones due to the economical instability.

REPETITIVE LOSSES:

The City of Pasadena has been identified under the National Flood Insurance Program (NFIP) with a Community Rating System (CRS) of 7, by the Federal Emergency Management Agency.

A repetitive loss is defined as properties with two (2) or more insurance claims in excess of \$1,000 each. Because repetitive loss properties represent approximately one third of the flood insurance claims processed by FEMA, they have made the adoption of a plan to address the specific properties in this classification a mandatory requirement for participation in the Community Rating System (CRS).

The possible activities that could be undertaken to reduce potential flooding to repetitive loss properties must be balanced with the rights of the land owners, the ability of the City to finance various activities and the potential benefits of those activities. Considering these variables, the City has undertaken the following:

- i The Engineering and Planning Departments continue identifying repetitive loss properties within the City and shall monitor these structures closely to ensure they do not receive building permits for “significant improvements” as defined in the Flood Damage Control Regulations.

2 The City's Floodplain Administrator (Director of Public Works) continues ensuring that each repetitive loss property is sent a flood information letter. This letter explains that homes are susceptible to flooding and included information on retrofitting, elevation, relocation and stormwater protection.

3 The Engineering Department didn't inspect any new repetitive loss properties, since no flood occurred in the last year. But they constantly look for the cause of flooding and suggest possible methods to prevent future flooding of repetitive loss properties or recommend elevating/relocating the structures.

4 The Floodplain Administrator worked with Harris County to buy out Brandywood Apartment Complex. The buy out consisted of 60 building complexes. Properties that were mitigated were removed from the mail out list.

DEVELOPMENT OF ACTION PLAN:

Due to the continuation of fiscal constraints experienced world-wide, including the City of Pasadena, and the operating budgets of various City departments, the following actions were practiced for a balanced and comprehensive program to mitigate and manage the impact of developmental activity in the floodplain.

1. PREVENTION:

Engineering plans were reviewed by both the Planning and Engineering Departments and the management of development in the floodplain was given a highest priority.

Stormwater Management Plan for City of Pasadena was enforced through the City's Phase I MS4 Permit. The Storm water Management Plan directed the activities the City pursues to meet the permit.

Drainage System Maintenance - The City continued to take appropriate actions to maintain the City's stormwater drainage system. The Public Works Department, through its standard operating procedure (SOP) funded by its operating budget, maintains the stormwater conveyance systems to ensure that flooding impacts are minimized.

The City takes on ownership of operating and maintenance of City's stormwater drainage system, Harris County Flood Control District owns, operates and maintains the large waterways. Public volunteer programs such as Adopt-A-Waterway, Adopt-A-Park, Adopt-A-Street, Mark-Stormdrains and Walk the Waterway are used to keep clean the drainage system, complementing the work of the Public Works department.

Due to the continuation of hot weather and dry condition, not only in the City but all the State, the City continues keeping their crews working continuously maintaining the

infrastructure. The City continues maintaining, improving or replacing any part of the drainage system as needed.

The City inspected every pond in the City, privately, County or City owned. Letters were sent to those owners which ponds needed maintenance, information and inspection form provided, and follow up visits were made.

2. PROPERTY PROTECTION:

Acquisition - The City continues to develop as part of the County's Hazard Mitigation program that can be used to acquire properties that have experienced repetitive losses due to flooding. Harris County Flood Control District (HCFCD) & City of Pasadena demolished Apartment Complex Brandywood at the beginning of 2012. HCFD will send paperwork of such action to FEMA and the City.

Building Elevation - Through the enforcement of the City's Flood Protection Ordinance and in conjunction with its participation in the National Flood Insurance Plan's Community Rating System and in association with Harris County Flood Control, structures located in floodplains were identified for elevation/relocation in flood prone areas.

Insurance - The City continued to actively participate in the National Flood Insurance Program. As part of the program, the City recognized that a major emphasis should be placed on the education of those property owners who are located in the floodplain that they should secure flood insurance. Given the fact that FEMA indicates that the City participate in the NFIP and that annual informative letters are sent to the property owners within the flood hazard boundary, the residents are educated about the importance of flood insurance.

3. EMERGENCY SERVICES:

The coordination of emergency services during flooding continues through the Emergency Management Department. The Emergency Management Department also includes the Emergency Operations Center (EOC). In the Galveston Bay area, the Emergency Management is pervasive and connected with municipalities and industries working together during any emergency. Emergency training and drill participation are continuous practices in the City and the region.

Flood Warning - When the National Weather Service issues flood watch or warnings, The EOC initiates those activities appropriate to the potential threat of the event.

Flood Response - Through the EOC, the Street and Drainage Department and other critical crews are activated to help residents deal with rising water.

The Community Awareness and Emergency Response (CAER) Line is an industry-run hot line designed to provide citizens with information on active chemical release emergencies or active maintenance issues such as flaring, drills, and other incidents. The program was established in 1986 by the East Harris County Manufacturer's Association which continues to direct it. Citizens and the media can call this telephone hotline to hear recorded messages from EHCMA member and non-member facilities or local Offices of Emergency Management. Messages can provide emergency information about facility, rail car, tanker truck, or pipeline incidents or general information about flaring, smoke, noise, odors, firefighter training, or minor incidents not requiring public protective action. Facilities can also post messages in Spanish for their Hispanic employees, contractors and community residents. Callers can also report nuisance odors to EHCMA's Odor Network and Harris County Public Health and Environmental Services. The CAER Line can be reached by calling either area codes 713 or 281 then dialing either 476-CAER (2237) or 476-CARE (2373).

In addition, there are three weather monitoring stations within the City of Pasadena. These stations allow us to track weather events, severe winds, and lightning strikes from the Emergency Operations Center. The stations also allow access to real-time weather data via the internet, which will be useful in all our MS4 monitoring and inspections. The following are links to real-time readings from the three weather stations:

North Pasadena – Pasadena Police Department (PD)/EOC:

<http://www.aws.com/FlashDisplay.asp?id=PSDMP>

Pasadena Convention Center:

<http://www.aws.com/FlashDisplay.asp?id=PSDCC>

South Pasadena - Fire Station #6 (1200 Kirby):

<http://www.aws.com/FlashDisplay.asp?id=HSPMG>

The above links are one format available. There are other formats varying from comprehensive reports including radar images to mostly text-based data.

4. STRUCTURAL PROJECTS:

The City's Phase I Stormwater Program was permitted in 1997. A permit renewal was reviewed; preliminary decision and final review were issued. A major change has taken place in permit that will increase the safety of the storm system. Adding Post-construction requirements, typically demanded from Phase II communities, Best Management Practices in this activity are being implemented by the City. Another new requirement was the mapping of all outfalls in every bayou in the City. Even though every outfall in dry and wet weather conditions will be inspected in the 5 year life of the permit, mapping them aid the inspection and maintenance of the system. These requirements have been implemented in 2012. The Stormwater permit does not address the flooding issue, but is focused on the quality rather than the quantity aspects of storm water. At the same time, these requirements aid the purpose of the CRS program.

Storm Sewers - The City continues to provide funding for the reconstruction of obsolete storm sewer systems. This activity includes the replacement of storm pipes, manholes, end walls, culverts and conveyance systems. The City also continues to provide cleaning and maintenance of storm sewers within the City. Inspections and public involvement through the City Action Line aid the maintenance of the sewer system and protection of storm system.

The City also informs developers about the detention ponds requirements within the City and reviews construction/building plans to ensure the requirements are met. After construction, the City inspects the ponds yearly to be sure they are functional according to design. Harris County Flood Control District owns, operates and maintains the major bayous and waterways within the City. Outfalls into their facilities are maintained and improved by them with little or no input from the City. In addition, HCFCFD has bought large areas of land in the Armand Bayou watershed and constructed large regional detention/retention ponds in an effort to protect more neighborhoods from flooding.

5. PUBLIC INFORMATION:

The City has undertaken various activities that advise property owners concerning the hazards and potential mitigating activities associated with building in the floodplains. One of the big changes in 2012 was the formation of a PPI Committee to evaluate the current outreach program. The PPI program helped by the City Needs Assessment and stakeholders input, has been improve during the present reporting year. Since the City of Pasadena was the first community developing this program in the country, the CRS program wants to use it as a model community in the whole country. The program is still in working progress with the support of NFIP Coordinators.

Map information - Residents can access information relating to the floodplains at the Engineering Department. Floodplain determinations can be requested that provide an official determination of where the property is located, fully or partially within a floodplain. Additionally, the City has mapped the floodplains on its Geographical Information System (GIS), as well as watersheds, outfalls & ponds.

Insurance and Elevation certificate Information – Besides the letter sent to all residents, living in the 100 year floodplain & to those living in properties and areas adjacent, repetitive losses property owners and the city also sent notice to Insurance agents, Realtors and Lenders: the City keeps a display with this information not only at events but also at the public library. 12 specific FEMA publication books are cataloged in the community's public library and are displayed during environmental events organized at this site. The following is the list of material that can be found at the library:

1. Coastal Construction Manual (3 volumes) - R 643.99 COAS
2. Protecting manufactured homes from floods and other hazards – R 693.8 PROT

3. Protecting Floodplain resources - R 363.34936 PROT
4. Elevated Residential structures - R 693.892 ELEV
5. Above the flood: elevating your floodprone home - R 693.892 ABOV
6. Homeowners guide to retrofitting: six ways to protect your home from flooding- R 693.8 HOME
7. Protecting building utilities from flood damage - R 363.3493 PROT
8. Answers to questions about substantially damaged buildings - R 368.122 ANSW
9. Mitigation of flood and erosion damage to residential buildings in coastal areas - R 693.892 MITI
10. Taking shelter from the storm: building a safe room inside your house - R 693.89 TAKI

In addition, flood maps for the City of Pasadena are available for our patrons to view in the Reference section at the Central Library.

GETTING READY FOR 2012 CRS MANUAL CHANGES THAT ARE EFFECTIVE IN 2013:

The City of Pasadena has been preparing for the 2012 manual changes that are taking effect in 2013. For this, the City is following floodplain management steps. The City CFM team attended all the free webcast training offered by CRS, and has been training employees internally on outreach, activities procedure and data reporting. Stakeholders have been invited to participate on the formation of a program for public information. The GIS Department has developed maps to facilitate hazard assessment and infrastructure maintenance in the City.