

**1F. Standard and Green infrastructure utilization; impacts, regulations, and management of impervious cover; master planning and studies underway (4/14/2016)**

The following regulatory and planning mechanisms are recommended. These recommendations are intended to be adopted as soon as possible to send a strong message to local residents that the City of Austin takes seriously its responsibility to minimize the risks to public safety posed by flooding.

**Planning and Regulatory Recommendations:**

1. WPD should engage in a comprehensive planning process regularly (e.g. every five years, perhaps in concert with the Drainage Master Plan) that addresses land use, transportation, utilities, and drainage concerns to map known and potential flood problem areas and determine:
  - a. A maximum amount of total impervious cover for flood-prone neighborhoods that must be considered prior to issuing any building permits.
  - b. Where onsite detention is required for proposed new and redevelopment.
  - c. Where flooding problems remain unresolved, new development or densification is discouraged.
  - d. Where, in areas to be annexed, potential flooding concerns and the cost for improvements are identified prior to annexation. For example, staff currently asks residents in an area to be annexed about flooding but examples show that, although none reported flooding, it may just be due to lack of a recent large rain event.
  - e. Where flood problems are severe, do not issue permits for new development, redevelopment, infill and auxiliary structures until the flood problems are mitigated or the following conditions apply (no exceptions):
    - i. the developer provides a certified engineering study that proves no adverse downstream impact, or
    - ii. onsite mitigation is included in the development, or
    - iii. downstream infrastructure is improved by the development
2. Strengthen the City of Austin Land Development Code (LDC) regarding flood mitigation requirements for new development and redevelopment.
  - a. Known loopholes (as identified by staff) should be eliminated.
  - b. Existing code has provisions that would allow for the regulation of redevelopment but this code is not enforced. Identify, clarify and strengthen these provisions and provide a timeline and funding necessary for enforcement.
  - c. Determine whether the 1% annual exceedance probability (AEP) event should be replaced by a larger, less frequent event (perhaps only in certain watersheds) or if 'freeboard' requirements should be increased (freeboard is a factor of safety usually expressed in feet above a flood level for purposes of floodplain management).
  - d. Enforce stormwater discharge limit requirements in the COA LDC and Drainage Criteria Manual, Section 8.1.0., which requires that storm water management for peak rates of runoff shall provide for a temporary storage of stormwater runoff. Runoff is then released at a controlled rate which cannot exceed the capacities of

- the existing downstream drainage systems, or the pre-developed peak runoff rate of the site at each discharge point, whichever is less.
- e. Require that all new or remodeled commercial and residential structures added to existing lots (e.g. Accessory dwelling units) comply with impervious cover limits.
  - f. Enforce requirements that all proposed land development projects, whether new or redevelopment, demonstrate no adverse downstream impacts. Onsite (and any necessary offsite) stormwater controls must be modeled to simulate proposed condition discharges and their impact on the city storm drain system, including the receiving waters of each watershed.
  - g. Require that commercial and residential redevelopment reduce post development peak rates of discharge to match peak rates of discharge for undeveloped conditions instead of existing predevelopment conditions. Undeveloped conditions are assumed to be grassland unless otherwise demonstrated by the applicant.
  - h. Require that all objects such as, but not limited to, dumpsters and commercial use furniture (benches, picnic tables, etc.) in floodplains be anchored to the ground so as not to block storm drains, bridges and floodways during a flood. Food trailers should be transported offsite prior to flooding. Educate and enforce compliance during annual health inspections or similar routine inspections.
3. Implement City policies, programs, staffing levels, training opportunities and interdepartmental collaboration to enhance flood mitigation and preparedness.
- a. Ensure that Development Review staff is aware of 2013 amendments in the LDC related to Watershed Protection Ordinance (Resolution No.20131017-046) with special attention to enforcement of Article 4 Section 30-4-151.
  - b. Ensure a system and process exists such that the Development Services Department's One Stop Shop can easily check to see if proposed new or redevelopment is in or near any known flood problem areas. Advise applicant, staff, and the Neighborhood Plan Contact Team (NPCT) of this data during the building and/or site plan review, and include this data in the Development Viewer.
  - c. Resolve flood-related Code enforcement problems in a timely manner. Immediately remedy problems such as blocked drainage easements that create safety hazards.
  - d. If any existing stormwater infrastructure that is designed and/or constructed by entities other than the City of Austin requires corrective measures, those fixes shall be paid for by the responsible developer or contractor.
  - e. Implement a rapid licensing/approval process for flood restoration contractors in preparation for future flood events. This will provide assurance to homeowners and businesses that contractors are aware of current city regulations and that liability is assured.
  - f. Increase commercial inspection and enforcement efforts to disallow the storage of chemicals and hazardous materials in flood-prone areas. Ensure that inspectors in applicable City programs (e.g. WPD Pollution Prevention and Reduction Program, Code Enforcement, and others) are aware of flood problem areas.
4. Actively seek and participate in Public-Private Partnerships where the City can leverage private development activities to increase investment in new or updated flood mitigation infrastructure.

5. Implement a benefit-cost analysis for CIP projects to determine whether the use of smaller ‘design storms’ (e.g. less than 100-year flood protection) are more cost effective. This will help determine project viability, make it easier to seek funding, and stretch limited resources.

### **Green Infrastructure Recommendations**

Green infrastructure for stormwater management reduces impacts from built environments using landscape features and engineered systems that mimic natural processes to control the quantity and quality of runoff. Green stormwater infrastructure (GSI) often includes elements such as rainwater harvesting, rain gardens and pervious pavement. These features typically detain small volumes of water and therefore aren’t always considered effective flood mitigation measures. However, when implemented on a widespread basis throughout a neighborhood they can provide essential benefits (see the Geosyntec/CoA Brentwood Study). To that end, green infrastructure projects on private land offer a way for community-minded residents to reduce their flood footprint for their own benefit and that of their downstream neighbors.

#### Recommendations

1. Incentivize onsite retrofit floodwater management measures for private property owners.
  - a. Enhance outreach opportunities particularly for those who have suffered losses due to local flooding. Promote in specific neighborhoods (e.g., Brentwood).
  - b. WPD should partner with Austin Water Utility’s existing Rainwater Harvesting and WaterWise Rainscape rebate programs to:
    - i. Enhance program guidance information regarding landscape elements that mitigate local flood impacts.
    - ii. Contribute rebate dollars when onsite solutions provide flood detention (e.g. rainwater harvesting volumes over 1,000 gallons).
    - iii. Consider increasing the rebate amount for systems that use a smart controller to ensure that detention volume is available when needed.
    - iv. Consider rebating professional drainage design guidance where local flooding problems exist.
    - v. Consider administrative costs (e.g. operational, maintenance, inspection and enforcement activities) associated with green stormwater infrastructure-related incentives and implement only those program elements that are cost-effective.
2. Consider offering one-time discounts to the City Drainage Fee for flood detention facilities that exceed regulatory requirements (consider location, size/capacity thresholds and possible cap on reduction values).
3. Collaborate in cost-sharing opportunities that integrate green infrastructure and flood detention with other projects, such as:
  - a. Other City CIP projects

- b. Public-Private Projects
- c. Interlocal jurisdictions and entities (see Section 4)
- 4. Integrate green stormwater infrastructure with standard CIP solutions (gray infrastructure) when it can serve a vital role, such as:
  - a. to offset potential increases in peak flow created as a result of more efficient drainage conveyance (see figure \_\_ below)
  - b. redirecting runoff away from structures

Figure \_\_ Hydrograph: Urban vs. Undeveloped

