



COUNCIL COMMITTEE REPORT
COMMITTEE ON OPEN SPACE, ENVIRONMENT AND SUSTAINABILITY

Date: May 26, 2016

Agenda Item #: 3

Agenda Item: Briefing and discussion regarding identifying flood risk in Austin.

Vote No vote was taken.

Sponsors/Department: Watershed Protection Department

Presenters: Kevin Shunk, Floodplain Administrator, Watershed Protection Department, and Joe Pantalione, Director, Watershed Protection Department.

Summary of Discussion

- Kevin Shunk, Floodplain Administrator with the Watershed Protection Department (WPD) explained that Austin is within an area called “Flash Flood Alley,” which is an area nationally known for creating significant rainfall. This designation is primarily due to a combination of meteorological and geologic conditions. It is an area where different weather patterns converge. Moisture coming off the gulf meets fronts coming down from the north and winds coming from the pacific side, creating conditions for record rainfalls. In addition to these meteorological conditions, geological conditions exacerbate flood risk because of a thin soil layer and steep terrain in portions of Austin. All these factors create significant flood hazards, which then creates floodplains.
- In general terms, a floodplain is the area where water will rise when it can’t flow just in the channel. It is the area likely to be under water when the creek overtops its banks. In a sense, the floodplain is the full extension of the creek.
- WPD uses historical rainfall data to develop the statistical measurements of rainfall that estimate the probability that a given rainfall will happen in year. Statistically-derived rainfall data give us the 1% annual chance rainfall (commonly called the 100-year rainfall), which can occur multiple times per year. The statistically-derived rainfall data also give us the other regulatory rainfalls such as the 2-year (50%), 10-year (10%), 25-year (4%), and 500-year (0.2%) rainfalls. City of Austin regulations are based on the 100-year and 25-year rainfall events.
- To put recent storms into perspective, Mr. Shunk explained that the October 20, 2015 storm was much greater than a 500-year event—the 14 inches of rain over a 6 hour period was essentially outside of what hydrologists can statistically quantify given the limited

record of rainfall. It is important to remember that both depth and duration (intensity) are significant.

- Mr. Shunk explained that runoff is also important to understanding flood risk. Runoff is the portion of rainfall that is not absorbed into the ground. It sheds off the land and flows into the creeks. The amount of runoff generated is dependent on land use (specifically the impervious cover), soils, and the slope of the basin.
- There is a distinct difference between FEMA and the City of Austin regarding their floodplain study methods. FEMA bases its floodplain studies on existing land use conditions, while the City of Austin bases its floodplain studies on fully-developed conditions. This assumes full build out of the land according to its zoning designation.
- It is also important to consider the timing of the flood wave. Rain falling in the upper portion of Onion Creek will take 6 – 9 hours before it reaches the lower portion of the watershed. But if that rain falls further down in the watershed, areas with some flood risk have less time to react. Large-scale regional detention ponds can affect flood wave timing when placed in the upper portion of the watershed, since it lets the lower two thirds flush out before the detention pond releases its runoff.
- Mr. Shunk further explained that once WPD has an understanding of how much rainfall is falling on the watershed, then the study of hydraulics uses topographic, channel shape, roughness, and obstructions (e.g. bridges, culverts, buildings) data to determine how high the water is going to get in the channel and to map where the water goes.
- Floodplain mapping is key to indicating flood risk such that the community can see if they have flood risk to their homes or on their route to work. The Watershed Protection Department provides an online tool called FloodPro that indicates the City of Austin 100-year and 25-year floodplains, as well as the FEMA 100-year and 500-year floodplains. WPD also has a predictive floodplain mapping program to enable the department to provide warnings to public safety agencies and road barricade crews in real time.
- Within the City of Austin, approximately 5,100 buildings and 400 roadways are within the 100-year floodplain. These were primarily built before development regulations, which aim to eliminate additional risk that may be caused by development.
- Using the floodplain models and maps developed through this process, WPD staff identify and prioritize flood risk problems according to problem severity. Potential flood mitigation solutions are then identified and evaluated according to feasibility and costs. Buyouts are just one of the potential flood mitigation tools considered for implementation.
- Council Member Zimmerman asked whether WPD calculates detention requirements differently depending on the soil types throughout the City. Mr. Shunk replied that general soils data is taken into account during the modeling process.
- Council Member Zimmerman expressed an interest evaluating flood risk based on both financial risk and personal safety risk, prioritizing personal safety risk over financial risk.

Mr. Shunk replied that WPD does take other factors into account such as timing and velocity.

- Vice Chair Garza asked why Austin develops their floodplain maps differently than FEMA (using fully-developed land use conditions). Mr. Shunk replied the City's method is a higher standard than FEMA's minimum standards. In order to better protect its citizens, WPD uses this higher standard because of the significant flood risk faced Flash Flood Alley. All of the City of Austin development regulations are tied into his fully-developed conditions floodplain.

Speakers

None.

Direction

None.

Recommendation

There was no recommendation to the full Council.