

Memo

DATE: February 15, 2018

TO: Mayor Poe and City Commissioners

VIA: Anthony Lyons, City Manager
Dan Hoffman, Assistant City Manager

FROM: David McIntire, Emergency Management Coordinator

SUBJECT: Hurricane Irma After-Action Report (AAR)

The focus of this memo is to provide an executive summary of our lessons learned from the preparation efforts beginning about one week in advance of Hurricane Irma, the actual storm period and the after-effects of the storm. Before this period of time the City has also made significant investments to prepare for events such as this, including funding for an emergency management coordinator. This AAR is meant to provide insights on areas in which we performed well and areas in which we can improve.

Prior to this storm the Mayor declared a State of Emergency for the City to prepare for hurricane Irma. The storm was projected to make landfall as a category 5 storm on September 10, 2017. The system had a 500-mile diameter which would encompass the entire state including Gainesville with a path projected to bisect the state from the south to the north.

A storm of this magnitude has not impacted Florida in recorded history and the state has not prepared for a storm of this nature in any models or annual hurricane exercises. This allowed local governments throughout the state to evaluate their storm responses and to be better prepared for the next time such a historic, precedent-setting catastrophic storm is predicted.

Background and Approach

This AAR benefited from the use of an outside subject matter expert (SME) in disaster to assist and guide the preparation, response and mitigation assessment. This also included a review of documents, reports, survey responses, and informational sessions with City of Gainesville employees. Citizens also played a major role in this report. Through interviews, emails and a survey citizens made their voices heard. The unbiased and diverse representation provided valuable input on the response of the City to keep citizens safe during Irma.

This memo specifically targets the City's actions and response to hurricane Irma. The basis of the report is the national standard of emergency management. This is a cyclic process of mitigation, preparedness, response, and recovery. In addition, the foundation of the actions are formulated by the National Incident Management System (NIMS) and the National Response Framework.

Soon after operations resumed to normal, a *hot wash* was conducted by the individual departments to gather more immediate feedback. In addition, five sessions were conducted later by the SME to get feedback from a cross-section of all departments.

Two sessions were conducted with our personnel who were out on the streets performing duties prior, during, and after the storm. No supervisors were present during those sessions. A session was conducted with mid-level supervisors; another session with personnel that were sent home prior to the storm and did not return until notified; and a final session was conducted with emergency operations center (EOC) personnel.

Overall, the employees interviewed noted positive comments. Those comments highlight their pride in the city and in being an employee of the city of Gainesville. The employees took great pride in touting that there were no injuries reported from any city employee during the event. The employees interviewed were proud of how well the city and county staff, and the residents, all worked together during this event. The SME commented on the undertaking with an overall positive impression of the City's performance:

"...the City performed very well during Irma and it should be praised for following up with such a thoughtful look at its performance."

Themes Gathered from Feedback

During the course of the various feedback sessions and surveys several themes emerged. These themes are focused on the response and operational impact of the storm. Within each theme we note both the "Observations" and the "Lessons Learned."

Theme: *Scheduling mechanisms for public safety personnel*

Observation: Normally, Gainesville Fire Rescue (GFR) shift personnel work 24-hours on/48-hours off. During this event the Fire Department changed the schedule of personnel to increase the number who could be deployed by combining the three shifts (A, B, C) into two (A, B). The creation, an Alpha/Bravo schedule, brings to bear a maximum sustainable strength and allows flexibility for the alternating 12 or 24 hour relief shifts, depending on the demand for services. Gainesville Police Department (GPD) uses this scheduling and it is common practice. However, an overwhelming objection to this schedule was voiced by some of the firefighters on this approach. In interviews with staff, this schedule was viewed as confusing and unnecessary, though it may have been more related to the implementation pace due to the change in timing of this storm.

As the time-of-impact for Gainesville was updated, it conflicted with the scheduled shift change for personnel to begin at 0700 across the spectrum of the city. The storm arrived right at shift change, which made coming/leaving hazardous and compromised the planning. Crews were not able to change shifts on Sunday morning as planned and GFR's shifts went to an extended 36-hour rotation versus the preferred 24-hour rotation. This caused some of the confusion that came into play with staffing for this storm. The primary concern was the duration of the shift was too long and created a potential safety issue. However, the department was cognizant of the impacts and assured rest periods and crew rotation plans were in-place. No injuries or violations of safety standards were reported.

The UF Home Football Game scheduled for Saturday, September 9, 2017 required significant number of resources from Gainesville Police, Fire Rescue, and Public Works personnel. GPD was preparing to work the event. The game, originally scheduled for 1930 hours, was cancelled on September 7, 2017. This enabled GPD to focus on preparations for Irma instead of focusing on the large number of visitors expected in Gainesville for the game. GPD staff was notified on September 6, 2017 that the Alpha/Bravo shift scheduling would be implemented on September 9, 2017 at 1900 hours. The Alpha/Bravo scheduling consists of Bravo personnel working from 1900 – 0700 hours and Alpha personnel working from 0700-1900 hours. There were no voiced complaints from GPD personnel on their shift schedule. This schedule also allowed for personnel to ride with partners which was well received.

Lesson Learned: The standard of practice has been evolving to a 12-hour work period rotation during disasters, in order to allow personnel adequate rest time while maintaining a continuous work period for 24 hours. Many local governments used the A/B scheduling model for all departments during the storm and for a set period prior to and after the storm. This included members of the EOC/command staff, who also require rest periods. In the future, consideration should be taken to create a schedule in advance of major events. The schedule should take into consideration task force concepts, storm preparation, storm recovery, and the needs of the City. In many instances, simply communicating the intended schedule further in advance will

assist in the concerns. Prior to the coming storm season the City will plan and communicate potential schedule changes should a storm event occur.

Theme: *Internal Communications*

Observation: Based on feedback from staff and the resident survey, departments worked well together and made great progress through the event. This should be received as a positive and a strength for future events.

One potential area for improvement involved the participation of relevant staff. In interviews with staff, some felt as though that department leadership did not feed down all information. In interviews there was a difference in the perception of GPD, GFR, and Public Works (PW) employees versus other departments. Some other department staff did not feel as involved in preparation and unsure of their role based on the recurring planning meetings.

Those that had specific roles to play during the event such as GPD, GFR, and PW and had experience from past storms, felt like they better understood the City's goals and expectations. In contrast, those that were not part of prior responses did not understand the process as well and were not clear what the expectations were for them. It also appeared that those personnel who are accustomed to a set regular hour staffing of 8-5 were unsure what was expected or what was going to happen with the shift in work times. Those who were not as accustomed to the alternate schedule were in doubt about when to be off work, when to report back, what happens during such an event, or if and how they would be part of the event.

Lesson Learned: Personnel, overall, staff did believe the city leadership and management properly communicated the roles and functions of the various departments and staff. In order to close a potential communication gap perceived in some areas, city leadership will put an emphasis on mandatory meetings (or sending designees when needed) and distribution of the information to all employees. The City Emergency Operations Plan (CEOP) is a document that has most of this information already spelled out. This document should be reviewed and edited as needed and could be distributed in a training session to enhance the communication of the roles of departments and personnel.

Theme: *City Emergency Operations Plan*

Observation: The City adopted the revised CEOP on September 11, 2014. The plan appears to be comprehensive and detailed for events such as Irma, and some portions should be updated to reflect the lessons of this report. Specifically the Volunteer Services Group, Exercises and Training, and the Services Branch portions of the plan should be reviewed. The plan is a great tool to be able to communicate the role and responsibility of the City down to each employee, but there are many City employees who are not familiar with this document.

Lesson Learned: The first issue to resolve would be to assure that all employees are aware and familiar with it. This would have resolved a number of the concerns voiced by employees confused about the roles of the different positions and departments.

One option being explored is to create an emergency operations *field-guide* to be developed and distributed to all employees. The CEOP needs to be updated annually, reflect the lessons learned from events and experiences, and exercised annually. If the City opts to develop the field guide, it should be issued to every current employee and every new employee. A field guide is a job-aid that is compact enough for a person to maintain on themselves that has relevant information in order to help them do their job more efficiently and effective like procedures not typically performed or contact information of certain individuals or resources.

Theme: *External Communications*

Observation: External communication was an area that, based on community and employee feedback, the City performed particularly well. A survey was conducted that was targeted at residents and those who work within the city. It indicated that most were familiar with the Alachua County Emergency Management Website and a majority were not familiar with SafeGNV. Despite this, a strong majority felt they could easily get the emergency information they needed. When asked if the City effectively communicated pre-storm information,

closures and the severity of the storm approximately three quarters of respondents gave the City an either 4 or 5 rating¹. A large majority were aware of the telephone town hall and would participate in the future. Telephone town halls were implemented to answer citizen questions. They were conducted by EOC personnel, the City Manager, and elected officials. Three such town halls were implemented and an average of 2,145 people participated each day either by listening or asking questions via telephone. This was the first time such a tool was utilized for a disaster event and was well received. In addition, *tens of thousands of people used Facebook Live* to watch the telephone hall.

Lesson Learned: Overall, the city performed well and will look to continue to build upon this area of strength. A city-wide training exercise may be of value to get everyone on the same page and increase awareness; and public education is always an area that can be improved upon. In general, public perception was good in regard to pre-storm and during-storm communications, however work needs to be done on post-storm communications. Staff intend to look at improvements to and increase awareness of the SafeGNV site prior to the coming storm season as well.

Theme: *Sandbag Distribution*

Observation: Prior to a significant storm event sandbags are distributed to residents. Typical distribution of sandbags in previous events did not exceed 5,000. During this event over 25,000 sandbags were distributed from the Public Works main facility in NE Gainesville. Sandbags have typically been limited to this location. There were limited resources throughout the county for acquiring sandbags. The county had one location, at its Public Works department. There were also sites at Micanopy, Hawthorne, and High Springs. Each resident was limited to 10 sandbags. The rationale for the limitation is not a validated number, rather an arbitrary decision. The distribution of sandbags created a focused concern among staff distributing sandbags up through city administration.

In this event, a second location on the east side of Gainesville was established. This took a toll on personnel and supply. Creating two locations brought on its own unique dilemmas because additional staff was required to facilitate the second location. Personnel had to work long hours to monitor and assist at both locations, which increased the tension and the wear on staff. They were not able to leave early enough each day in order to prepare their personal property and family. This theme echoed from the staff who were assigned in these roles.

Lesson Learned: For future storm events staff will spend additional time planning sandbag distribution in order to distribute the appropriate number of sandbags and allow for rotation of personnel. Staff will also research procurement of a sandbag machine. Caution should be exercised in exploring these options and consideration given to the number of locations, educating the public on use of sandbags, obtaining sandbags, etc. Limiting sandbags to locations that have a history of flooding may not be the best action. Past incidents, including Hurricane Harvey in Houston, Texas proved that predicting flooding may not always be accurate. Locations that previously flooded did not flood during this event and the areas that did not flood previously, did flood. Like in many disasters, one home may flood while the home next door may not.

Theme: *Consistent Terminology*

Observation: During the interview sessions, staff shared several examples of terminology creating confusion. The first term, *volunteer*, brought concern and confusion with the non-assigned city staff. Many of the staff members were sent home on paid leave only to be called and asked to volunteer in local shelters. Many times the term *volunteer* is associated with an activity or assignment that is unpaid.

The second term that caused some misunderstanding was *Operations*. Here, the terms are used in two different areas of the response. The first being field operations and the other being the Operations Section within the CEOC. The first consists of the actual first responders conducting tasks to meet the objectives of the operational period. The latter is established to provide the development of the tactics and coordinate with the Logistics Section to make sure we have all the resources needed to complete the tasks.

¹ Survey asked residents to answer on a scale of 1 to 5 with 5 being the highest rating and 1 being the lowest.

Lastly, the use of plain text is best practice under NIMS. During day-to-day operations, GPD utilizes ten-codes as their method of communications which creates confusion to those that do not. In the height of activity it caused a communication break-down between the primary public safety departments.

Lesson Learned: NIMS was created after September 11, 2001 to rectify such communication issues. NIMS creates a unified communication system throughout all agencies to define terminology that is unified. There are online training programs tailored for various departments and staff to train personnel on the use of NIMS. Every city employee should complete the appropriate NIMS training for their area of employment. The City has done this in the past and will revive this practice as part of our emergency management program. This should be a mandatory training and the only cost is the time the employee spends taking the training, about an hour. All training and manuals should reflect the terminology for consistency of NIMS.

Theme: *Logistics during Events*

Observations: The use of the Public Works Administration building as the emergency operations center works on smaller events that may not require a full activation. The design and limited configuration of the building to use as an emergency operations center during a full activation, is very difficult. As this incident increased in size and complexity the number of personnel assigned to the emergency operations center also increased. The GPD's main building is usually the primary emergency operations location, however, due to facility issues such as a leaking roof and a noted generator deficiency, the secondary location at Public Works was utilized.

Lesson Learned: Maintaining communication in one physical location and then dispersing it to all departments can be a lifesaving difference. This is considered a standard of practice for EOCs throughout the country. By having personnel in various rooms, spread throughout the building and at different locations in the city, it created the opportunity for miscommunication and a disjointed effort for the command staff and operations. Personnel from the EOC described situations where runners had to communicate information between the rooms, which in some cases created confusion. Although the EOC, when based at the Public Works functioned for this event, greater efficiencies could be gained by having the EOC based in a room such as the Hall of Heroes at GPD.

Theme: *Shelter Management and Volunteers*

Observations: There were 25,000 spaces in shelters with 2,500 being occupied. Eighty percent of these were occupied by people from outside Alachua County. The City and Alachua County may be out of harm's way; however, residents from surrounding areas may still need to be housed in the local shelters. Non-assigned personnel were asked to "volunteer" with the staffing of local shelters through a formal request from the Alachua County Emergency Management. This created a set of concerns that were confusing and may have hampered personnel from agreeing to participate in the duties of working in a shelter. There were mixed messages of whether personnel were going to be compensated for their time, the rate of compensation, what the duties were, where supplies were located, etc. Clear communication of pay and how non-assigned personnel are going to be compensated need to be addressed prior to future events.

Lesson Learned: Municipalities like Alachua County and agencies like GRU already have established guidelines and expectations for all employees during emergency events. This helps establish roles and pay prior to the event should staff be activated for their emergency duty. It reduces the contentions of employees and establishes the need of all employees being a part of an event. This is something general government will consider in the future to facilitate "all hands on deck" events such as Irma.

The topic of shelters needs to be discussed with guidelines established between the City and the County. A contingency plan should be implemented for future events with a clear set of expectations. The individuals who staffed the shelters expressed concern over what their roles were; what supplies or equipment were available; what resources were allowed to be used at the shelter; and why resources that could have been used were not at the shelter (ex., showers, rooms that had activities for keeping young kids active, etc.). The City should communicate to the County that in order to properly support it in future events, more resources and coordination is required if they expect City staff to help fulfill responsibilities that belong to the County.

Theme: *Generators*

Observations: Generators were adequate except for police headquarters and portions of the Public Works building. The Public Works generator does not power critical areas of the building. If the proper areas were powered then there would have been showers available for personnel and was noted by GPD personnel during the interview sessions. There was a portable generator brought in for this event, however, it had mechanical issues and did not provide adequate power as noted by the GPD personnel during the interview sessions.

The IT room at Public Works does not have backup power. When the building lost power, it shut down all IT systems. The carbon monoxide units were also an issue when power was lost. A solution has already been implemented by Facilities and we do not expect this particular issue to present a problem in the future.

Lesson Learned: Generators need to be evaluated to assure they are in working condition. The generator needs to power the critical components of the building. This evaluation should occur well in advance of hurricane season in order to make proper preparation and corrections. In 2017 a generator study was started through facilities to evaluate the additional generator need for the GPD building. A thorough analysis of this study, once completed, should occur so that the planning phase of upgrading the generator capacity at this location can commence. There is also the need to place a generator at the MLK Center to provide back-up power to that facility during shelter operations. The grant given to the City of Gainesville will only fund the electrical connection and switches for a generator. Funding for generators through FEMA should be considered through the Fundable Project by the Hazard Mitigation Grant Program and Pre-Disaster Mitigation Program.

Theme: *Finance and Budget*

Observation: The Payroll division anticipated power outages from the storm and as a result they requested payroll from departments early. The payroll was completed early and cleared with distribution of pay on September 14, 2017 as scheduled. This proved to be a successful effort. Purchase orders were issued prior to the storm in order to make necessary purchases for storm purchases. In addition purchase-card limits were increased for the purpose of storm purchases. This all proved to be a positive action.

Lesson Learned: As a result of the efficiency prior to the storm, the need for a finance person at the EOC did not prove to be necessary. This is something that should be considered carefully as there may be unforeseen circumstances in future events. Utilizing these personnel in other roles, if not needed, may be a better option than not having them there. There is a need to stand up the Finance Section, as this section is responsible for tracking and documenting all financial related activities. The need for this has been less apparent over the last two years due to the overall impact of the storms and the shorter duration of full activations of the city emergency operations center. In the case of an extended activation associated with a larger scale incident, the use of this section would be more apparent.

In future events, Finance will work closely with Human Resources in order to improve the efficiency of scheduling and payroll processes. There is a need for improvement in completing the FEMA forms. It is imperative to complete ICS form 214 in order to receive full and timely reimbursement. This seems to be a theme throughout the city and training should be sought in order to improve this process.

Theme: *Fleet Management*

Observation: There was only one significant issue with vehicles. The Dodge Chargers utilized by GPD were found to not be ideal in flood situations. It was discovered that the air intake of these vehicles are pointed down and were more susceptible to drawing in water. This caused the engine heads to blow and the cars had to be placed out of service. There were five vehicles affected during the event.

Lesson Learned: Prior to future events reminders will be issued so personnel are aware of the capabilities and limitations of their vehicles.

Theme: *Use of Task Forces*

Observation: A task force is any combination of resources assembled to support a specific mission or operational need. All resource elements within a task force must have common communications and a designated leader. This was the first event that task forces were used to this extent. The task force consisted of GPD, GFR, PW, and GRU. The concept was well received from all parties involved. In the midst of this event, there were only two task forces in the city and during interviews some did indicate that adding an additional task force would have aided in response times. Even with this in mind, PW identified they were able to get to incidents quicker than without the task force concept and were able to perform work without interference from others.

Lesson Learned: The response was overwhelming to maintain this concept for future events, but improve the process. Those involved with the task force, voiced a unified concern that in order for the teams to be more effective, the makeup of the team needed to include a GRU bucket truck. Task force communication could be improved upon. The crews were receiving directions from multiple sources. Personnel on the team also need to know the capabilities of other parts of the team.

Theme: *Management Software and Bandwidth*

Observation: A variety of software platforms are used during large scale emergency events such as Irma. In this case the different platforms presented issues for responding departments. There are multiple systems which can cause duplications of response to calls. Some calls were noted to have been repeated multiple times as a result of the different systems. It would be more effective to implement a software system that would provide better communications and reduce the duplicity. The dispatch system needs to be re-evaluated to increase efficiency and decrease the frustration of all personnel.

The amount of bandwidth for the city was a resounding issue and something that needs to be evaluated and improved upon. The amount of bandwidth available to the City could not handle the volume of data. In addition, the ability to video stream is not possible in various locations. Hence, the monitoring of the weather and local news cannot be maintained. This is critical during these events to maintain situational awareness.

Lesson Learned: The City is currently researching options for incident management software. The bandwidth allocation for the City has already been increased for daily operations as well as events.

Theme: *Debris Management*

Observation: On September 12, 2017, the day after the storm, Public Works began picking up debris on residential streets that could be manually loaded using all the available yard trash trucks from our residential garbage contractor, WCA. The Solid Waste Division had given a "Notice to Proceed" to our debris removal contractor Ashbritt and our debris monitoring contractor Witt/O'Brien's on September 8th in anticipation of significant hurricane damage, and those assets (two claw trucks) were onsite by September 13, 2017.

Since Witt/O'Brien's was just beginning to hire local people to work as debris monitors, the City provided all the monitors for the first few days of the cleanup using Public Works employees. It quickly became apparent that due to the enormous number of communities that had been impacted by Hurricanes Harvey and Irma from Texas to Key West, Ashbritt was going to have difficulty providing a suitable amount of heavy equipment for loading storm debris. Exacerbating that problem was the fact that the existing contracts executed by Alachua County and the City had very low rates for debris hauling; which normally would be very desirable, but became problematic under these circumstances.

Our lower contracted rates made it more difficult to attract self-employed claw truck operators who could choose to go to south Florida where there was a much greater amount of debris to clean up at significantly higher rates per cubic yard. The result of this was that two weeks after the hurricane hit we only had 4 claw trucks to work with, when the scope of the damage called for 16-20 trucks. This pattern continued throughout the cleanup effort. In weeks three and four we had 6 trucks, and our equipment peaked in week five with 9 trucks, but tapered off steadily in the following weeks until we were back down to 5 trucks by week eight.

To augment our resources we turned to our garbage contractor WCA who agreed to split the 2 claw trucks they own between the City and the County, giving us one additional claw truck every day from the first week

until we released it from service on November 6th. We also requested assistance from the Public Works Operations crew and they provided two crews of 14 cubic yard dump trucks and loading equipment which we were able to use nearly every day from September 22nd through October 15th. The City Operations crews worked very quickly, effectively and conscientiously; and hauled a total of 12,192 cubic yards of tree debris for us even though their trucks were considerably smaller than the equipment being provided by Ashbritt.

Using State Road 441 as a dividing line, we removed debris zone by zone beginning in the northernmost zone west of 441 and in the southernmost zone east of 441. With the equipment available to us, it took until November 5th to complete a first pass of every residential city street. Due to the huge number of households that were setting out yard trash and tree debris each week and the fact that we had to share the yard trash trucks with the County, it was impossible to complete yard trash routes each day for the first eight weeks after the hurricane, so we used the yard trash crews directed by solid waste inspectors every day to augment the cleanup effort as much as they could. On November 6th the City was able to resume normal yard trash collection operations for the first time since September 11th. The second pass went much more quickly and was completed November 12th. The City completed the third pass on December 16 and redirected its attention to remaining debris work in city parks (such as leaning trees and hanging limbs); and mopping up some scattered locations that still had construction & demolition debris or other eligible debris that we had not collected yet. After coordinating with GRU regarding the biomass plant we directed Ashbritt to focus on finishing the reduction of vegetative debris at our various disposal sites by grinding it; and to begin hauling it to the biomass plant for use as fuel.

At this point the City has removed more than 92,283 cubic yards from city property and residential right-of-ways; the vast majority of it being tree debris. The tree debris was reduced to 33,541 cubic yards by grinding it, and all of the ground material was delivered to the biomass plant to generate electricity for GRU customers. According to information provided by GRU and the U.S. EPA website, the hurricane debris collected by the City and its contractor will provide enough fuel to generate the electricity needed for at least 500 homes for a year.

Lesson Learned: The nature of the multiple storms affecting the southeastern United States and Texas along with the entire state of Florida having been affected, created a unique situation. The lack of resources could not have been anticipated to this magnitude. The same contractors being contracted by both the City and the County created an even greater issue as the contractors could not provide the level of services to the large geographic area in a timeline that was acceptable. Due to the demand the contractors went the contracts that were higher pay in their prioritization process.

Thought needs to be given to contracting future debris removal. The resources necessary for the service contracted in this region needs to be considered. If the demand for services exceed the resources, other contractors should be considered. In addition, low bid for contracted services may not result in the best contractor to utilize. The combination of these two items should provide a better response and service for any future events for debris removal. In the same aspect, this methodology should be considered for other supply and demand issues.

Theme: *Fuel Use and Planning*

Observations: Although the City had sufficient fuel reserves to handle emergency operations and RTS service, requests from other entities (County, GRU, and private requests) had the potential to deplete those resources. Although the issue was eventually resolved without incident, the communication and coordination between these entities regarding fuel requests and fuel planning was highlighted as an area for improvement.

Lesson Learned: The City adequately planned for and had sufficient fuel supplies. Several issues appeared to drive the concerns around fuel. First, the scale of this storm created a unique situation in which fuel supplies were limited statewide. This is obviously outside of the control of the City. Second, because of the demand levels it may be helpful for other parts of the City to diversify fuel suppliers in emergency situations. Finally, much of the confusion around fuel supplies stemmed from the communication from requesting entities. If the City is going to be expected to supply fuel reserves for other purposes (power plants, shelters, senior living facilities) this needs to be clearly communicated in advance and made part of the CEOP.

Financial Ramifications

Hurricane Irma presented the City with challenges that tested its ability to manage an emergency management event from a financial perspective. As indicated before, Finance, Budget, and Payroll all took proactive measures and as a result, the storm did not negatively impact payment processes. A high level breakdown of the costs are below:

Category	Category Name	Amount
A	Debris Removal	2,136,436
B	Emergency Protective Measures	600,000
C	Roads	580,000
D	Watershed Facilities	3,148,000
		<u>6,464,436</u>

Categories A and B are costs already expended. Although we anticipate that approximately 85% of these costs will be reimbursed, it may take years to receive the payment. Categories C and D are future repair and mitigation projects stemming from the storm that have not yet been expended. Projects in category C would include replacing and repairing streets, culverts and damaged roadway improvements. This also includes sidewalks that were damaged due to trees root balls pulling them up or flood waters underpinning either the sidewalk or the roadway. Projects category D would include removing silt from retention and detention basins and creek restoration in public areas. It also includes repairing berms and removing trees and debris impacting the flow of water in the creek channel. These costs can also be reimbursed. In future budgets, it would be advisable to create an emergency event contingency fund to better prepare for the financial impact of future events.

Conclusion

The process of continual improvement and self-assessment is critical to emergency management. Although this memorandum identifies lessons from Hurricane Irma, it should not be interpreted that the City's performance was subpar. In fact, it is quite the opposite. Our external consultant found that ***"the City performed very well during Irma and that it should be praised for following up with such a thoughtful look at its performance."*** As the City continues to build out its emergency management capabilities we intend to learn from every event and incorporate those lessons into our program.