REPETITIVE LOSS AREA ANALYSIS

South Miami, Florida

Public Version

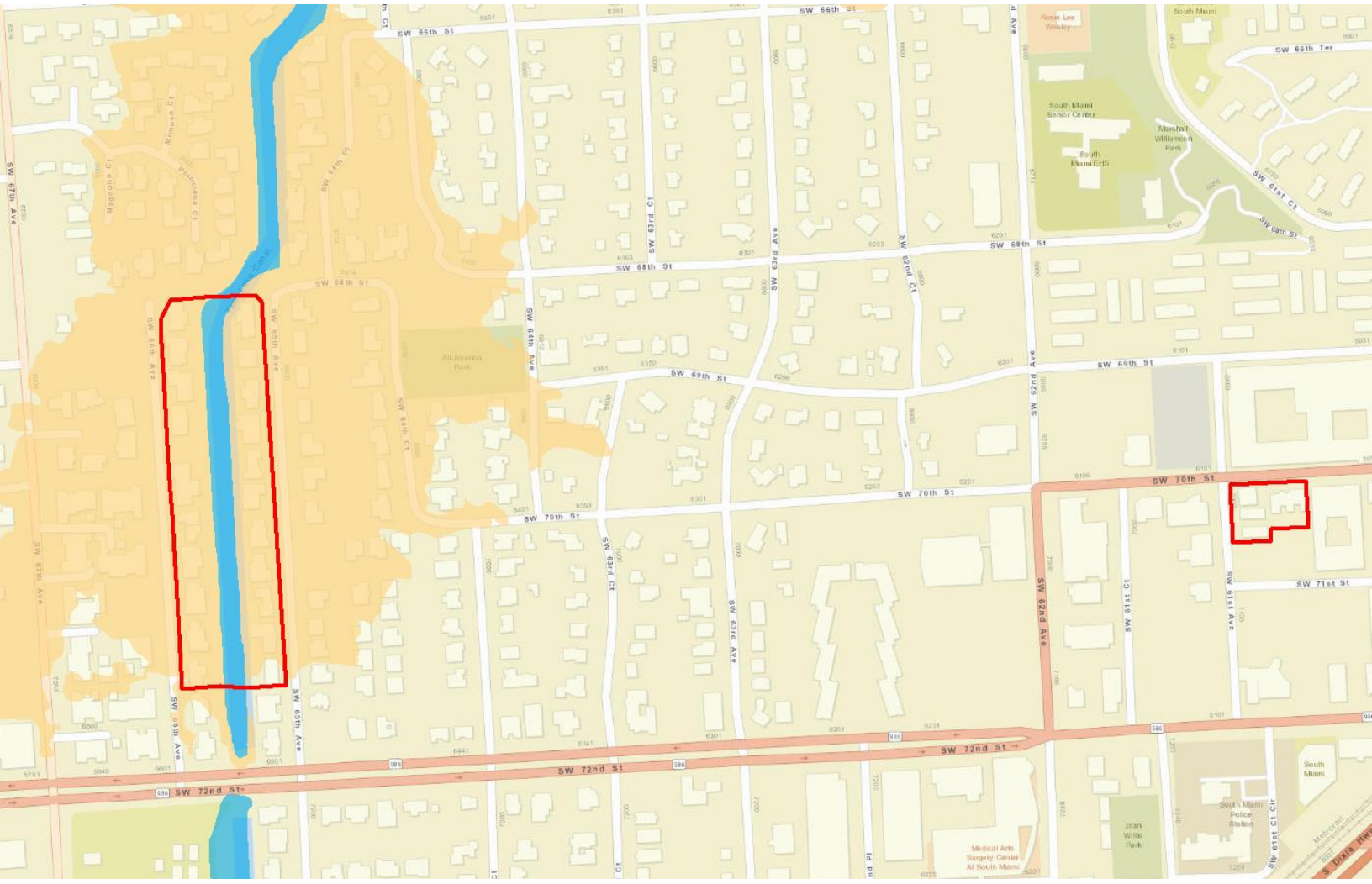


Table of Contents

List of Tables

List of Figures

1 Repetitive Loss Area Analysis

Background

Flooding is the most common natural hazard in the United States. More than 20,000 communities experience floods and this hazard accounts for more than 70 percent of all Presidential Disaster Declarations. In the United States, over 8 million residential and commercial structures are currently built in areas at risk to flooding. The cost of recovery is spread over local, state and federal governments and the victims themselves, who are directly affected by these disasters.

The National Flood Insurance Program (NFIP) is continually faced with the challenge of balancing the financial soundness of the program with the competing expectation of keeping premiums affordable. Repetitive loss properties are one of the two largest obstacles to achieving financial soundness of the NFIP. Since the inception of the NFIP, almost $9 billion have been paid to repetitive loss properties, about one-fourth of all NFIP payments. While the NFIP has resulted in forty years of successful floodplain management, and many of these structures are no longer insured, repetitive loss properties are still a drain on the NFIP. Currently, repetitive loss properties represent 1.3% of all policies, but are expected to account for 15% to 20% of future losses.

Private insurance companies faced with high losses have several options to keep turning a profit. They can raise income through premium rate increases, decrease payments to insurers or reduce the exposure to the hazard. Unfortunately, the NFIP can only do what is allowed by statute. If losses increase, the Federal Emergency Management Agency (FEMA) is authorized by Congress to make incremental adjustments to increase the premium rates and reduce overall coverage. FEMA is not permitted to eliminate coverage for any policy holder including high-risk properties. Actuarial rates cannot be charged to buildings built before State and local floodplain management regulations went into effect. Since repetitive flood claims must be paid, FEMA has no choice but to spread these costs among all policyholders.

Sometimes floodplain management regulations mitigate repetitive flood losses when a building is substantially damaged. A structure where the cost to repair is equal to or exceeds 50 percent of the building's value is considered substantially damaged. A substantially damaged building must be brought up to the same flood protection level as a new building under a community's floodplain management ordinance. Many repetitive loss buildings are not in a regulated floodplain or they do not get substantially damaged and remain at risk to future damage.

Many owners of properties that experience repetitive flooding are not aware of the magnitude of damage they are exposed to because they either purchased the property after the last flood or the seller or lender did not disclose the flood hazard. Disclosure of repetitive flooding is a problem due to the fact that repetitive loss areas are not shown on Flood Insurance Rate Maps (FIRMs) but instead must be identified and mapped by local communities.

The City of South Miami (CID-120658) has been a regular participant in the NFIP since September 29, 1972. In addition to meeting the basic requirements of the NFIP, the South Miami has completed additional floodplain management activities to participate in the Community Rating System (CRS) program, which rewards local communities with insurance premium discounts for taking actions to reduce flood risk and vulnerability. The City of South Miami is currently a CRS Class 7 which rewards all policyholders in the SFHA with a 15 percent reduction in their flood insurance premiums. Non-SFHA policies (Standard X Zone policies) receive a 5% discount, and preferred risk policies receive no discount. South Miami entered the CRS program on May 1, 2013.

859
NFIP Policies

$254+ million
in insurance coverage

As of March 30, 2017, there are 859 NFIP Polices in force in the City with insurance coverage of over $254 million. The City has a total of 88 paid losses, which have resulted in a total payout of $1,222,364.14. Included among these losses, there has been one substantial damage claim since 1978.

A repetitive loss property does not have to currently be carrying a flood insurance policy to be considered a repetitive loss property or a severe repetitive loss property. In some cases, a community will find that properties on its repetitive loss list are not currently insured. An insured property with claims on that property will make it a repetitive loss property. Once it is designated as a repetitive loss property, that property remains as a repetitive loss property from owner to owner; insured policy to no policy; and even after that property has been mitigated with flood protection. One third of repetitive loss buildings in the City of South Miami are currently insured, and 25 percent have been mitigated (see the Repetitive Loss Requirement Section).

TERMINOLOGY

REPETITIVE LOSS: Any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling 10-year period, since 1978. Two of the claims paid must be more than 10 days apart but, within 10 years of each other. A repetitive loss property may or may not be currently insured by the NFIP.

SEVERE REPETITIVE LOSS: As defined by the Flood Insurance Reform Act of 2004, SRLs are 1-4 family residences that have had four or more claims of more than $5,000 or at least two claims that cumulatively exceed the building's value. The Act creates new funding mechanisms to help mitigate flood damage for these properties.

According to January 2017 repetitive loss data from FEMA, and accounting for input from City officials on completed mitigation of properties, there are a total of 6 unmitigated and 2 mitigated repetitive loss properties within the City of South Miami. The 2017 CRS Coordinator's Manual states that any community with at least 1 but less than 50 repetitive loss properties—considered a "Category B Community"—must map repetitive loss areas, describe its repetitive loss problem, and undertake outreach to all addresses in the repetitive loss areas that have insurable buildings. In an effort to take greater responsibility for these repetitive loss properties and encourage mitigation, the City has opted to complete a Repetitive Loss Area Analysis (RLAA) using the 2017 CRS Coordinator's Manual. The RLAA will benefit the City by examining potential mitigation measures for specific repetitive loss areas and increasing its credit in the CRS Program.

Setting

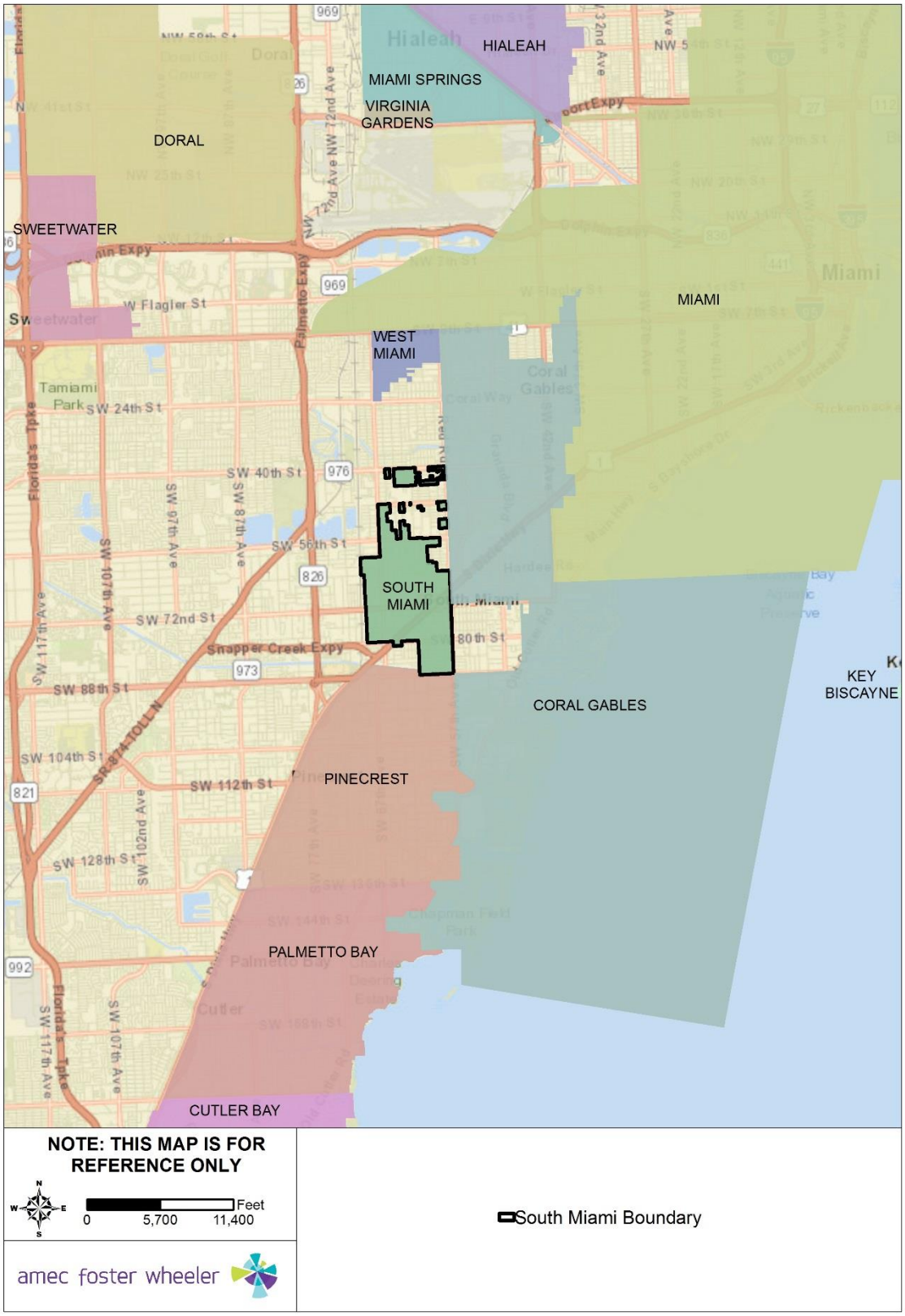
The City of South Miami is located in Miami-Dade County in southeastern Florida. The City has a total land area of approximately 2.3 square miles of land area as well as several canals totaling 0.04 square miles of water area. The City sits within the C-2 drainage basin and drains to the Biscayne Bay via the C-2 Snapper Creek Canal.

The City sits approximately 1.5 miles inland from the coast of Biscayne Bay. The majority of the City falls within Miami-Dade County's Storm Surge Evacuation Zone C, which is at greatest risk for Category 3 storms and higher, according to the County's Office of Emergency Management.

The City is served by US Route 1, Florida 976 (SW 40th Street), and Florida 826 (Palmetto Expressway). US-1 runs through the southern portion of the City, northeast to Coral Gables and southwest to Pinecrest. FL-976 runs along the northern border of the City between US-1 to the east and Ronald Reagan Parkway to the west. FL-826 runs to the west of the City, connecting south to US-1 and north toward Miami International Airport. As of 2015, according to the American Community Survey (ACS) 2011-2015 5-Year Estimates, the population was 12,156.

Figure 1.1 reflects the City of South Miami's location within Miami-Dade County and in relation to the surrounding cities and towns.

Figure 1.1 – City of South Miami Location Map



Repetitive Loss Requirement

Repetitive loss data must be maintained and updated annually in order to participate in the CRS. Since a disproportionate number of losses under the NFIP come from repetitively flooded properties, addressing these properties is a priority for participating in the CRS Program. Depending on the severity of the repetitive loss problem, a CRS community has different responsibilities.

- **Category A**: A community with no unmitigated repetitive loss properties. No special requirements from the CRS.
- **Category B**: A community with at least one, but fewer than 50, unmitigated repetitive loss properties. Category B communities are required by the CRS to research and describe their repetitive loss problem, create a map showing the showing the location of all repetitive loss properties (areas) and complete an annual outreach activity directed to repetitive loss properties.
- **Category C**: A community with 50 or more unmitigated repetitive loss properties. Category C communities are required to do everything in Category B and prepare either a floodplain management plan that covers all repetitive loss properties (areas) or prepare a RLAA for all repetitive loss areas.

As of the latest repetitive loss data obtained from FEMA from January 1, 2017, the City of South Miami contains a total of eight unmitigated repetitive loss properties, therefore the City is designated as a Category B repetitive loss community. The City noted that two of these properties have since been mitigated through demolition. All eight repetitive loss properties are summarized in Table 1.1.

Table 1.1 – Summary of Repetitive Loss Properties

Flood Zone[1]	Building Type		Building Count		Losses	Total Building Payment	Total Content Payment	Total Paid
	Non-Residential	Residential	Insured	Uninsured				
X	x			x	3	114,056.92	40,476.09	154,533.01
AE		x	x		2	5,776.94	8,171.19	13,948.13
AE		x		x	2	12,538.81	951.52	13,490.33
A		x	x		2	8,401.69	2,853.28	11,254.97
X	x			x	2	35,011.70	0.00	35,011.70
AE		x		x	2	40,039.42	8,310.10	48,349.52
AE		x		x	2	12,028.64	0.00	12,028.64
AE		x		x	2	116,698.71	49,979.33	166,678.04
Total	**2**	**6**	**2**	**6**	**17**	**$344,552.83**	**$110,741.51**	**$455,294.34**

Source: NFIP Repetitive Loss Data, 1/31/2017

[1]Flood Zone is based on historical FIRM when first loss occurred. These zones do not reflect the current Effective FIRM zone for each property.

Mapping Repetitive Loss Areas

There were 4 Repetitive Loss Areas identified within the City of South Miami in accordance with the principles outlined in the CRS guidance titled *Mapping Repetitive Loss Areas* dated August 15, 2008. The 4 Repetitive Loss Areas include the 6 unmitigated repetitive loss properties as well as historic claims properties (those with one paid claim against the NFIP), plus additional surrounding properties that have the same or similar flood conditions but have not had any claims paid against the NFIP. A total of 47 properties were included within the RLAA.

For reporting purposes, the Repetitive Loss Areas were broken into two subareas based on the type of flooding they typically experience. Subarea 1 contains repetitive loss areas prone to overbank flooding

from lakes and canals, and Subarea 2 contains repetitive loss areas prone to localized/stormwater flooding. The subareas and repetitive loss areas within these general flooding areas are summarized below.

Subarea 1: Overbank Flooding

- Area 1
- Area 2
- Area 4

Subarea 2: Localized/Stormwater Flooding

- Area 3

A detailed map of each Repetitive Loss Area is provided in Section 2. An overview map of the City of South Miami Repetitive Loss Areas grouped into subareas is shown in Figure 1.2 on the following page. Figure 1.3 shows the Repetitive Loss Areas in relation to the FEMA Flood Zones.

Figure 1.2 – City of South Miami Repetitive Loss Areas

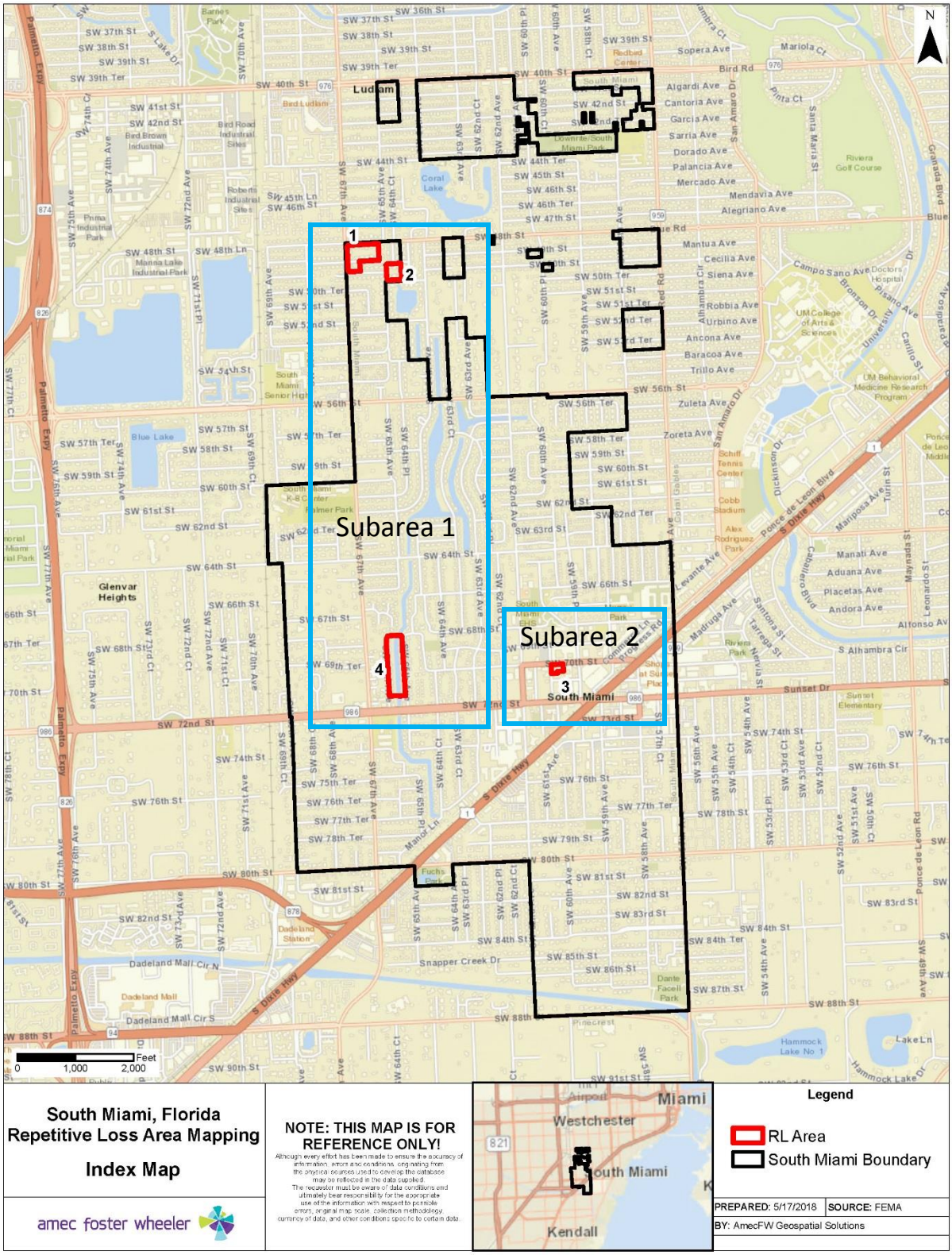
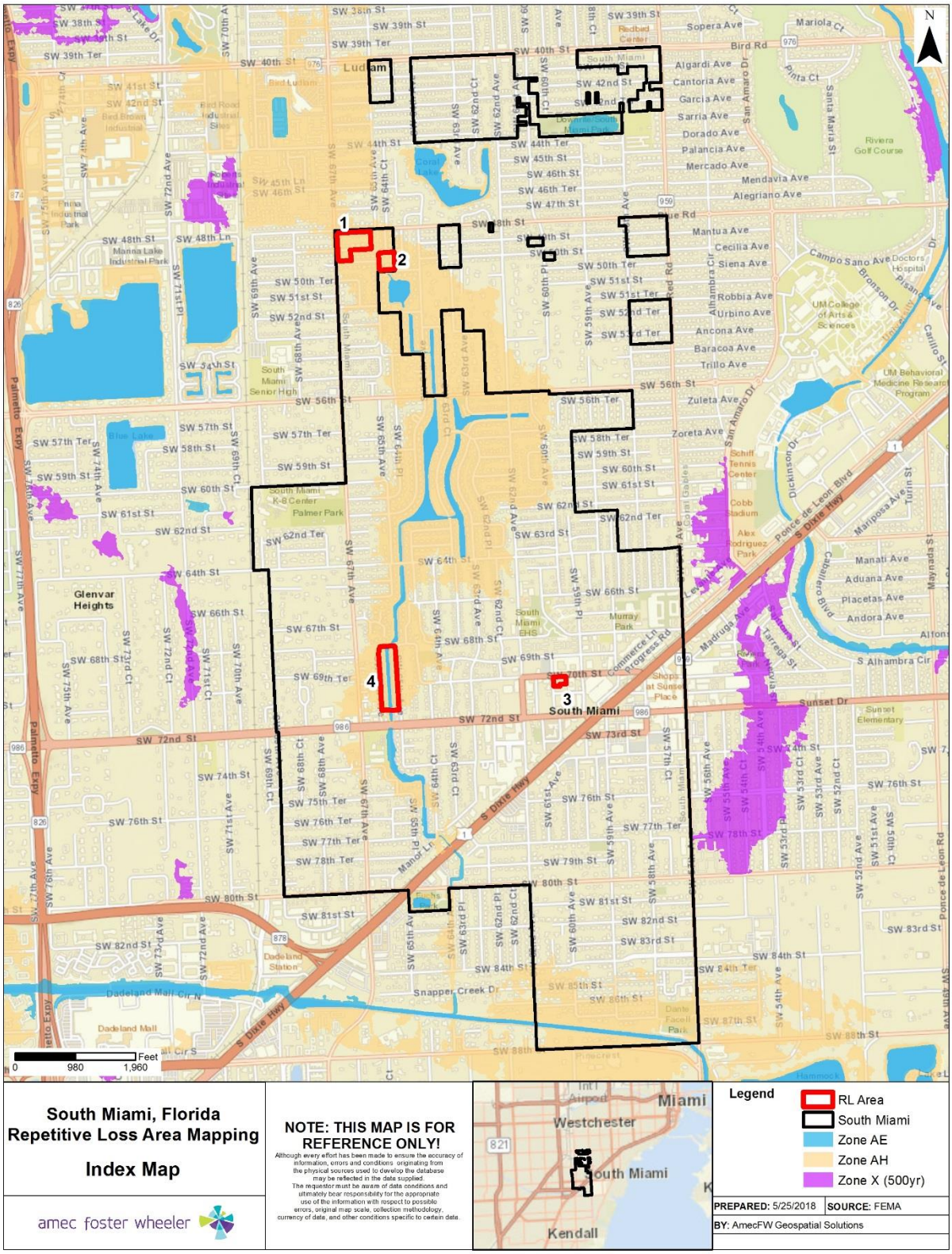


Figure 1.3 – City of South Miami Repetitive Loss Areas and FEMA Flood Zones



2 The RLAA Process

The RLAA planning process incorporated requirements from Section 510 of the 2017 *CRS Coordinator's Manual*. The planning process also incorporated requirements from the following guidance documents: 1) FEMA publication *Reducing Damage from Localized Flooding: A Guide for Communities,* Part III Chapter 7; 2) CRS publication *Mapping Repetitive Loss Areas* dated August 15, 2008; and 3) Center for Hazards Assessment Response and Technology, University of New Orleans draft publication *The Guidebook to Conducting Repetitive Loss Area Analyses*. Most specifically, this RLAA included all five planning steps included in the 2013 *CRS Coordinator's Manual*:

Step 1: Advise all the properties in the repetitive loss areas that the analysis will be conducted and request their input on the hazard and recommended actions.

Step 2: Contact agencies or organizations that may have plans or studies that could affect the cause or impacts of the flooding. The agencies and organizations must be identified in the analysis report.

Step 3: Visit each building in the repetitive loss area and collect basic data.

Step 4: Review alternative approaches and determine whether any property protection measures or drainage improvements are feasible.

Step 5 Document the findings. A separate analysis report must be prepared for each area.

Beyond the 5 planning steps, additional credit criteria must be met:

1. The community must have at least one repetitive loss area delineated in accordance with the criteria in Section 503.
2. The repetitive loss area must be mapped as described in Section 503.a. A Category "C" community must prepare analyses for all of its repetitive loss areas if it wants to use RLAA to meet its repetitive loss planning prerequisite.
3. The repetitive loss area analysis report(s) must be submitted to the community's governing body and made available to the media and the public. The complete repetitive loss area analysis report(s) must be adopted by the community's governing body or by an office that has been delegated approval authority by the community's governing body.
4. The community must prepare an annual progress report for its area analysis.
5. The community must update its repetitive loss area analyses in time for each CRS cycle verification visit.

STEP 1. Advise All Property Owners

Before field work began on the RLAA, individual letters were mailed to property owners within the 4 identified Repetitive Loss Areas. Figure 2.1 on the following page shows an example of the property owner notification letter. Letters were mailed to add properties within each area, including repetitive loss properties, historical claims properties (those with one paid claim against the NFIP), and additional properties with similar flooding conditions but which have no claims paid against the NFIP. In total, 47 notification letters were mailed to property owners; three of these letters were returned as undeliverable. The letters were sent out on July 19, 2018. Copies of all mailed letters are maintained on file with the City of South Miami Planning and Zoning Department. In accordance with the Privacy Act of 1974, the letters will not be shared with the general public.

Mailed Questionnaire

A property owner questionnaire was included with each letter mailed to building owners. The questionnaire asks about the type of foundation and if the building has a basement, if the building has experienced any flooding and the type of flooding, cause of flooding, flood protection measures and whether the owner has flood insurance. The Flood Protection Questionnaire is shown in Figures 2.2 and 2.3 on the following pages.

Website Announcement

The completed document will be made available for review on the City's website. This gives property owners an opportunity to review the general findings of the analysis and provide feedback to the City to further improve the City's and property owner's knowledge of flood issues.

[DATE]

[NAME]
[ADDRESS]
[CITY], FL

Property Address: XXXXXX **Parcel Number: XXXXXXXXX**

Dear Property Owner:

As part of the City of South Miami's participation in the National Flood Insurance Program's (NFIP) Community Rating System (CRS), the Planning & Zoning Department is evaluating properties that have experienced repetitive flood damage. This analysis will include the review of all previous flood data and studies conducted in these locations.

The repetitive loss analysis involves the collection of the following property level data elements:

- Building permit records (including application and associated records)
- Structure and site elevation information (elevation certificate if available)
- Tax ID and lot and parcel number
- Building property value on record (assessed value, replacement value or both)
- Land property value on record
- Building codes/floodplain development regulations exceeding minimum standards
- Historical flood event information (when events occurred, amount of damage to property, etc.)

In addition, the City of South Miami and its contractor will visit each property to survey the flood risk and to take photographs. Property owners are encouraged to provide any relevant flooding information. The survey crews will be looking at the type and condition of the foundation, drainage patterns on the lot and whether outside mechanical equipment is elevated.

The results of the repetitive loss area analysis will include a review of alternative approaches for property protection measures or drainage improvements where feasible. Once the analysis is complete, a copy of the report can be obtained from the Planning & Zoning Department or by calling (305) 663-6326.

You can help us perform this analysis by **completing this questionnaire and returning to me** at **City of South Miami Planning and Zoning Department, 6130 Sunset Drive, South Miami, FL 33143.** If you have any questions, please call me at (305) 663-6326.

Sincerely,

Marcus Lightfoot
Senior Planner
City of South Miami Planning & Zoning Department

Figure 2.1 – Example RLAA Property Notification Letter

CITY OF SOUTH MIAMI
FLOOD PROTECTION QUESTIONNAIRE

Name: _____

Property Address: _____

1. How many years have you occupied the building at this address?
   - ☐ Less than 1
   - ☐ 1-5 years
   - ☐ 5-10 years
   - ☐ 10+ years

2. Do you rent or own this building?
   - ☐ Rent
   - ☐ Own

3. What type of foundation does the building have?
   - ☐ Slab
   - ☐ Crawl Space
   - ☐ Basement
   - ☐ Other: _____

4. Has this **building** ever been flooded or had a water problem?
   - ☐ Yes
   - ☐ No

5. Has this **property** ever been flooded or had a water problem?
   - ☐ Yes
   - ☐ No

6. In what year(s) did the building or property flood? _____

7. Where did you get water and how deep did it get?
   - ☐ In basement; Depth: _____
   - ☐ In crawl space; Depth: _____
   - ☐ Over 1st floor; Depth: _____
   - ☐ In yard; Depth: _____
   - ☐ Water was kept out of building by sandbagging, sewer valve, or other protective measure

8. What was the longest time that water stayed in the building or on the property? _____

9. What do you feel was the cause of your flooding? Check all that affect your building or property.
   - ☐ Storm sewer backup
   - ☐ Sanitary sewer backup
   - ☐ Standing water next to house/building
   - ☐ Drainage from nearby properties
   - ☐ Saturated ground / leaks in basement walls
   - ☐ Flooding from ditch/creek/river: _____
   - ☐ Other: _____

10. Have you taken any of these flood protection actions on the property?

	Yes	No
Installed sump pump		
Waterproofed the outside wall		
Re-graded yard to keep water away		
Moved things out of basement		

	Yes	No
Installed backup power system / generator		
Sandbagged		
Other:		

Page **1** of **2**

Figure 2.2 – RLAA Survey, Page 1

FLOOD PROTECTION QUESTIONNAIRE
(CONTINUED)

11. Which flood protection measures (checked in question 10) worked?

_____

_____

_____

12. Is this building located in a FEMA floodplain?
    - ☐ Yes
    - ☐ No
    - ☐ I don't know

13. Do you have flood insurance for this building?
    - ☐ Yes
    - ☐ No
    - ☐ I don't know

14. Please include any additional information and comments you may have about flooding on this property or the surrounding area:

_____

_____

_____

_____

_____

_____

_____

For more information on flood protection measures for your buildings or property, please contact Marcus Lightfoot, info below.

Please help us by completing this survey by August 17, 2018 and returning it to:

Marcus Lightfoot, Senior Planner
City of South Miami
6130 Sunset Drive
South Miami, FL 33143
Phone (305) 663-6331

Surveys can also be emailed to mlightfoot@southmiamifl.gov

Page **2** of **2**

Figure 2.3 – RLAA Survey, Page 2

Of the 47 mailed notification letters and questionnaires, the City of South Miami received 14 responses which corresponds to a response rate of approximately 30 percent. The questionnaire responses are summarized below. Note: Respondents may have skipped questions and/or provided more than one response to a question.

Q1. How many years have you occupied the building at this address?

Answer Choices	Percentage	Number Responding
Less than 1	0	0
1-5	21.4	3
5-10	7.1	1
10+	71.4	10
Total		**14**

Q2: Do you rent or own this building?

Answer Choices	Percentage	Number Responding
Rent	0	0
Own	100	14
Total		**14**

Q3: What type of foundation does the building have?

Answer Choices	Percentage	Number Responding
Slab	92.3	12
Crawl Space	0	0
Basement	0	0
Other	7.7	1
Total		**13**

If other: Unknown

Q4: Has this building ever been flooded or had a water problem?

Answer Choices	Percentage	Number Responding
Yes	14.3	2
No	85.7	12
Total		**14**

Q5: Has this property ever been flooded or had a water problem?

Answer Choices	Percentage	Number Responding
Yes	21.4	3
No	78.6	11
Total		**14**

Q6: In what year(s) did the building or property flood?

- More than 10 years ago
- "No Name" storm in 2007 and one time previous to that
- Can't recall

Q7: Where did you get water and how deep did it get?

Answer Choices	Flood Depths	Percentage	Number Responding
In basement	garage depth	25.0	1
In crawl space		0	0
Over 1st floor	6”	25.0	1
In yard only	more than 12”; covered back yard and pool entirely	50.0	2
Water was kept out of house by sandbagging, sewer valve, or other protective measure		0	0
Total			**4**

Q8: What was the longest time that water stayed in the building or on the property?

- Receded within day
- 2-3 days
- About one week

Q9: What do you feel was the cause of your flooding? Check all that affect your building or property.

	Percentage	Number Responding
Storm sewer backup	50.0	2
Sanitary sewer backup	0	0
Standing water next to house/building	0	0
Drainage from nearby properties	0	0
Saturated ground / leaks in basement walls	25.0	1
Flooding from ditch/creek/river: _____	0	0
Other	25.0	1
Total		**4**

Ditch/creek/river flood source:

Other:

- I think it was fixed - last years no problem yet
- flooding from heavy rains entering through back yard (from 48th street)

Q10: Have you taken any of these flood protection actions on the property?

Answer Choices	Percentage “Yes”	Number Responding “Yes”
Installed sump pump	0	0
Waterproofed the outside walls	0	0
Re-graded yard to keep water away	0	0
Moved things out of basement	0	0
Installed backup power system / generator	33.3	1
Sandbagged	33.3	1
Other	0	0
None	33.3	1
Total		**3**

Other:

Q11: Which flood protection measures (checked in question 10) worked?

- I am pretty sure the City fixed the drainage problem on our block, but to reinforce security I always sandbag front door and garage doors during hurricane. Large rains which can cause flooding have not been a problem for the last few years.
- Problem went away when they no longer allowed water to accumulate in dykes

Q12: Is your home located in a Federal Emergency Management Agency (FEMA) floodplain?

Answer Choices	Percentage	Number Responding
Yes	57.1	8
No	0	0
I don't know	42.9	6
Total		**14**

Q13: Do you have flood insurance?

Answer Choices	Percentage	Number Responding
Yes	92.9	13
No	7.1	1
I don't know	0	0
Total		**14**

Q14: Please include any additional information and comments you may have about flooding in your area:

- I also live near a small lake and flooding could have been a problem from this and the canals backing up
- This property is just inside flood zone AH (tan on SMIA Flood Map). Before we purchased it in 1981 I checked with NOAA's surge modelers and was told that the worst case was 30 cm of water above flood grade. Current estimates (?) are plausibly (?) less optimistic.
- This property is on a canal in South Miami and I have lived here since 1984. Except for the water rising once to about 1 foot from the edge during a very rainy hurricane we have never had so much as a concern for water levels in 34 years.
- Some years ago drainage systems were installed along 48th Street & 49th Street, alleviating any flooding tremendously.

The following trends in survey responses should be considered when evaluating mitigation measures:

- A very high percentage (nearly 92%) of survey respondents say they have flood insurance policies. This includes most respondents who say they have never had a flooding problem in their building or on their property.

STEP 2. Contact Agencies and Organizations

The City of South Miami contacted external agencies and internal departments that have plans or studies that could affect the cause or impacts of flooding within the identified repetitive loss areas. The data collected was used to analyze the problems further and to help identify potential solutions and mitigation measures for property owners. Those reports which were analyzed and reviewed included:

- City of South Miami Comprehensive Plan, Updated December 2010
- City of South Miami Code of Ordinances, Updated June 2017
    - *Flood Damage and Prevention*
- City of South Miami Land Development Code, Updated June 2017
    - *Zoning Regulations*
    - *Subdivision Regulations*
- City of South Miami Capital Improvements Program, FY 2014 through FY 2018
- City of South Miami Stormwater Master Plan, June 2012
- Miami-Dade County Comprehensive Development Master Plan
    - *Adopted 2020 and 2030 Land Use Plan Map, Updated January 2016*
    - *Parks Conservation and Vacant Land Map*
- Miami-Dade County Local Mitigation Strategy, January 2017
- FEMA Community Information System Data
- FEMA Flood Insurance Study, Miami-Dade County, Effective September 11, 2009
- FEMA/ISO – Repetitive Loss and Flood Insurance Data

Summary of Studies and Reports

FEMA Flood Insurance Study, Effective September 11, 2009

FEMA's Effective FIS for Miami-Dade County, FL, including the City of South Miami, is dated September 11, 2009. The FIS also includes revised Flood Insurance Rate Maps (FIRMs) released on the same date.

Flood Insurance Claims Data

The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of flood insurance policy and claims data to the public. This information can only be released to state and local governments for the use in floodplain management related activities. Therefore, all claims data in this report are only discussed in general terms.

City of South Miami Comprehensive Plan, updated December 2010

The 2010 City of South Miami Comprehensive Plan is the City's framework for growth and development. The plan addresses future land use, transportation, housing, infrastructure, conservation, recreation and open space, intergovernmental coordination, and capital improvement. For each element addressed, the plan identifies specific goals as well as objectives and policies to meet those goals. Flooding is addressed in the future land use and infrastructure elements. Specifically, the plan calls for the preservation of the Special Flood Hazard Area (SFHA) by transferring allowable density to a Transit-Oriented Development District. Additionally, the plan sets a level of service standard of protection from the 1%-annual-chance-flood for the stormwater drainage system.

City of South Miami Flood Damage and Prevention Ordinance, updated June 2017

The City of South Miami Flood Damage and Prevention ordinance establishes provision for flood hazard reduction. Specific standards include requiring that new construction be elevated to the base flood elevation and that enclosures below the lowest floor not be used for living space.

City of South Miami Land Development Code, updated June 2017

The City of South Miami Land Development Code stipulates where and how development can occur in the City. The Code outlines the zoning use districts and purposes and establishes requirements for new development. The Land Development Code does not specifically address flooding but is an important regulatory tool through which flood protection can occur in conjunction with the Comprehensive Plan and the Flood Damage and Prevention ordinance.

City of South Miami Capital Improvements Program, 2014-2018

The Capital Improvement 5-Year Plan for 2014-2018 identifies and budgets for seven drainage improvement projects. Four projects were budgeted in fiscal year 2013, two were budgeted through 2014, and one multi-phase, citywide project was budgeted through 2018. Funding sources for drainage improvements include the Stormwater Drain Trust Fund, the South Miami CRA, and the Local Option Gas Tax. Planned and budgeted projects include addressing drainage issues along 59th Avenue, SW 74th Terrace, and additional locations identified in the Stormwater Master Plan.

City of South Miami Stormwater Master Plan, June 2012

The 2012 Stormwater Master Plan assesses the hydrologic and hydraulic conditions in the City, identifies problem areas, and makes recommendations for drainage improvements and flood protection.

Miami-Dade County Comprehensive Development Master Plan (CDMP), updated January 2016

The Miami-Dade County CDMP sets goals, objectives, and policies for the development and conservation of land and natural resources over the next 10 to 20 years. The 2020 and 2030 Land Use Map illustrates the general land use categories planned throughout the County and shows the expected expansion of the County's Urban Development Boundary, setting a growth strategy.

Miami-Dade County Local Mitigation Strategy, January 2017

The Miami-Dade Local Mitigation Strategy (LMS) is a multi-hazard mitigation plan for the county. The plan devotes a chapter to flooding, the NFIP, and the CRS, which assesses the flood hazard risk and vulnerability throughout the county and identifies mitigation projects that have been and/or can be implemented.

STEP 3. Building Data Collection

The on-site field survey for this analysis was conducted on July 24, 2018. The National Tool Limited View was not utilized in this effort, but most of the information required by the National Tool was incorporated into a mobile application survey. The data collection forms generated by the mobile application are included in Appendix A. (Note: In accordance with the Privacy Act of 1974, Appendix A will not be shared with the general public).

In addition, multiple site photos were taken of each structure on the property. Photos were also taken of current drainage features and mitigation and floodproofing measures if evident from street or parking lot views. The following information was recorded for each property:

- Existing mitigation observed
- Type and condition of the structure and foundation
- Number of stories
- Height above street grade and height above site grade
- Presence and type of appurtenant structures
- Likely areas and severity of damage on property
- Presence of any HVAC units that would be vulnerable

Data was also gathered, when possible, through conversations with property owners and/or residents. These conversations provided detail on the extent of flooding, potential causes of flooding, and recollections from past flood events, which help to better understand flooding issues for these areas.

Data was also incorporated from off-site research, including a review of FEMA Flood Insurance Rate Maps and the location of the Repetitive Loss Areas in relation to FEMA flood zones.

Table 2.1 details the percentage of each repetitive loss area that falls within the 100-year, 500-year or Unshaded Zone X flood zone.

Table 2.1 – Repetitive Loss Area Percentage by Flood Zone

Repetitive Loss Area	Percentage of Area		
	Zone AE 100-yr	Zone AH 100-yr	Zone X Unshaded
1	0.0%	100.0%	0.0%
2	0.0%	100.0%	0.0%
3	0.0%	0.0%	100.0%
4	20.5%	77.7%	1.8%

Source: 9/11/2009 FIRM

Problem Statement 1:

Areas of Overbank Flooding

Of the four identified Repetitive Loss Areas in the City of South Miami, three are in areas vulnerable primarily to overbank flooding from nearby drainage features. The areas include locations along the City's secondary canal system and near a stormwater retention pond. These areas are all located within the 100-year floodplain.

The primary flood source in these areas is overbank flooding, resulting from prolonged rains that oversaturate the soil and eventually overwhelm the capacity of the drainage system. Losses have occurred in these areas as a result of hurricanes and tropical storms; specifically, Hurricane Katrina in 2005, Tropical Storm Leslie in 2000, and Hurricane Irene in 1999 resulted in flood insurance claims. The last hurricane or tropical storm to have a major flooding impact on the City of South Miami was Hurricane Wilma in October 2005.

Additionally, these areas are also likely subject to periodic flash flooding from heavy rains and localized stormwater flooding. Flash flooding can occur if conveyance is obstructed by debris, sediment, and other materials that limit the volume of drainage. Tidal influences can also exacerbate flash flooding in South Miami when heavy rains fall during a high tide, which prevents the primary canal system from draining floodwaters as quickly to the Biscayne Bay.

The approach to reducing repetitive flooding in these areas will require a combination of floodproofing techniques, drainage improvement projects, and education.

Subarea 1

Repetitive Loss Area 1 is located completely within the 100-yr floodplain. This area is residential with single family homes. Most structures are on minimal fill and elevated between 0-2 feet above grade; however, three structures are at grade and one structure is below street grade. The structures in this area have slab-on-grade foundations. All buildings in Area 1 were built between 1950 and 1977; only three were built prior to the community's first FIRM, dated 1972. During field survey of the area, which was conducted after a rain event, standing water was noted along SW 49th Street and in several driveways. Additionally, it was observed that a drainage inlet on 49th Street is higher than the adjacent blacktop, which may contribute to stormwater flooding in the area. Drainage inlets are located in front of three houses on SW 48th Street, and in front of one house on SW 49th Street, but none were observed on SW 67th Avenue or SW 49th Terrace. Most HVAC units were not visible during field survey, however three were seen elevated to the B.F.E, one had some elevation, and one home had a window air conditioning unit. Four residents of this area completed flood protection questionnaires and two responded that they have had issues with flooding but that the problem was abated by drainage improvements and maintenance.

Repetitive Loss Area 2 is located completely within the 100-yr floodplain. This area is single family residential with slab on grade foundations and concrete construction. All six homes are built on minimal fill, with three elevated between 0-1 foot above grade and three elevated between 1-2 feet above grade. All six structures were built in 1980. Only one HVAC unit was visible during field survey, and it was not elevated. Three properties had drainage inlets in front of them, with one in the property's driveway; a fourth property had a drainage inlet located across the street. Two of the properties had no guttering. One resident of this area completed a flood protection questionnaire and reported flooding issues that have since been solved by drainage improvements.

Repetitive Loss Area 4 is located almost entirely within the 100-yr floodplain. A canal runs north-south through this area along the back of the properties. This area is residential with single family homes. The homes in this area were built between 1958 and 1978; all but three were built prior to the community's first FIRM, dated 1972. Most foundations are slab on grade and all but one of the structures is of masonry construction. Most of the structures were built either at grade or only 0-1 foot above grade. Several structures lack guttering. During field survey, standing water was noted along the street and in the driveways and yards of several properties. Nine residents of this area completed flood protection questionnaires, and all responded that they have not had any issues with flooding.

Table 2.2 – Repetitive Loss Area Overview for Subarea 1

Repetitive Loss Area	# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
1	2	4	10	16	SW 67th Ave, SW 48th St, SW 49th St
2	2	0	4	6	SW 50th St, SW 49th St
4	1	1	20	22	SW 66th Ave, SW 65th Ave
Total	**5**	**5**	**34**	**44**	

Note: Additional data on buildings within each repetitive loss area is located on the field survey forms in Appendix A.

Subarea 1 contains a total of 44 properties.

Figure 2.4 – Repetitive Loss Area 1

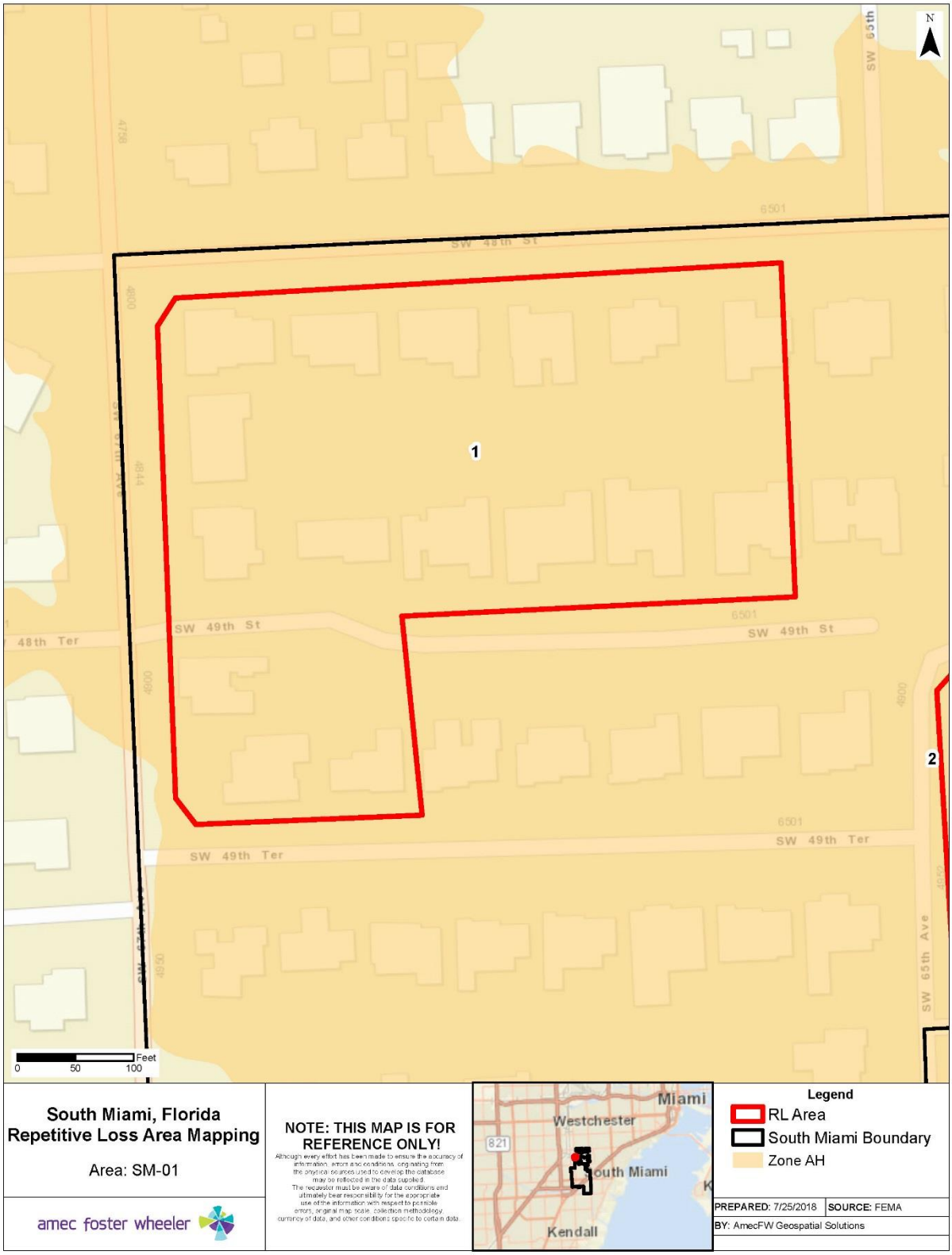


Figure 2.5 – Repetitive Loss Area 2

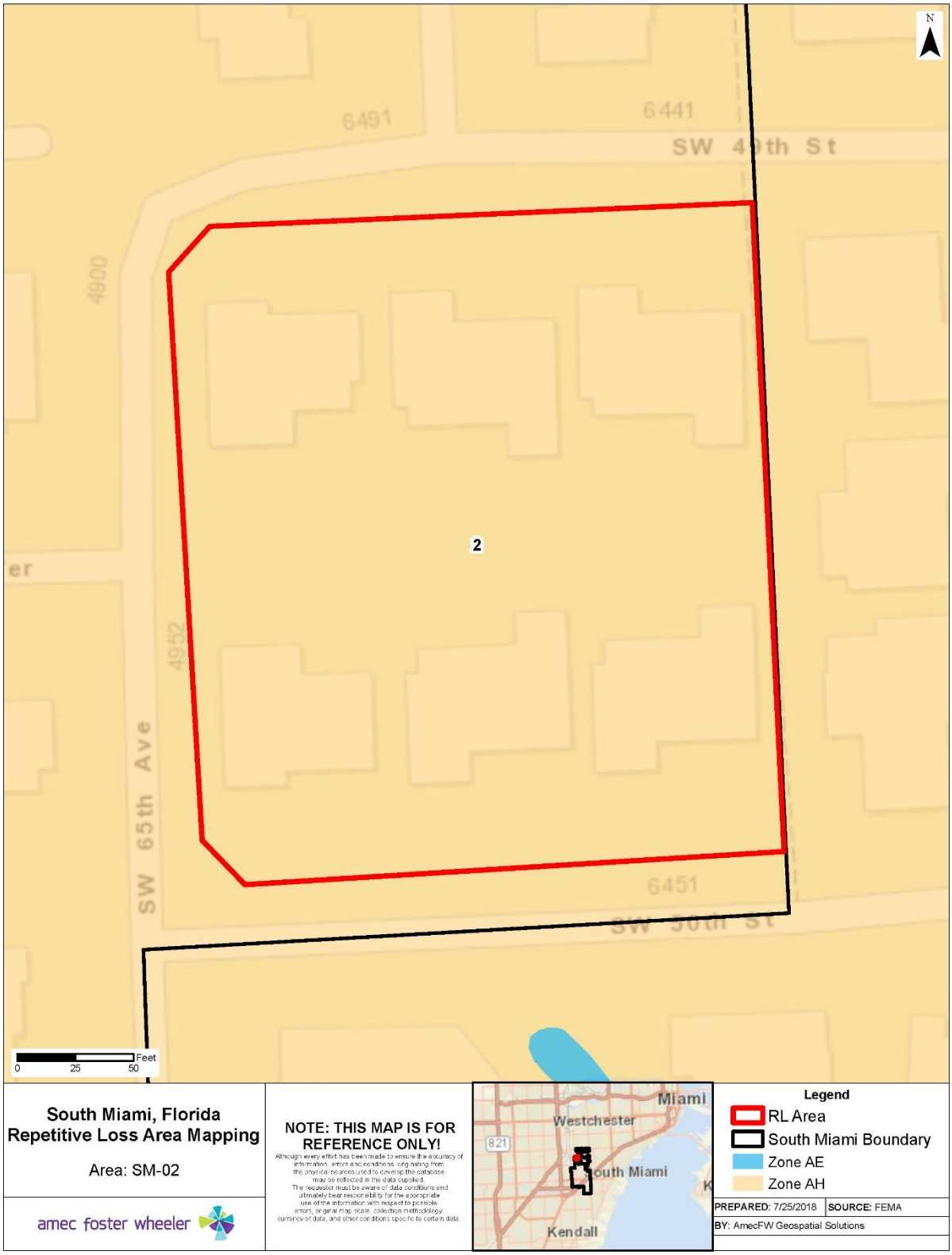
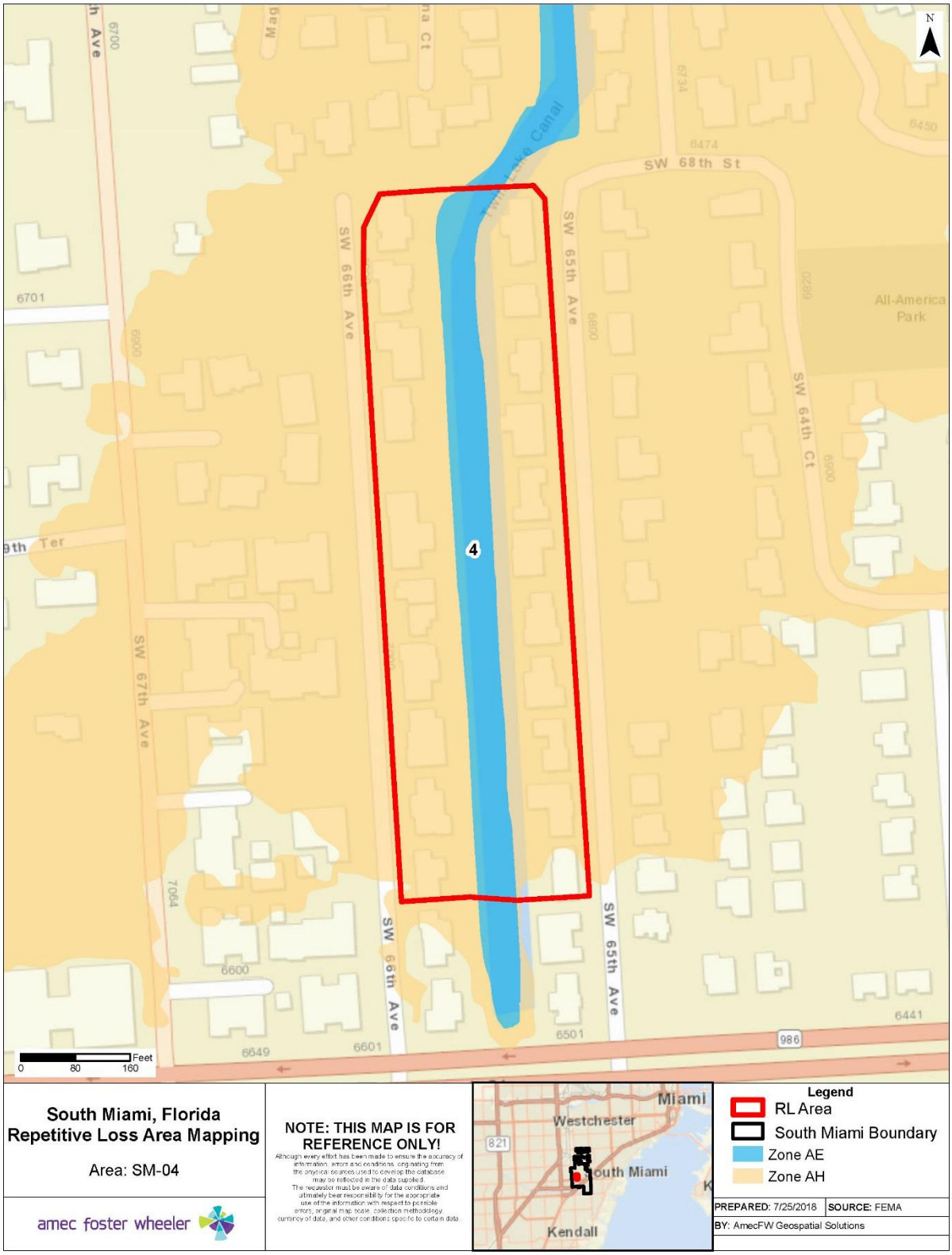


Figure 2.6 – Repetitive Loss Area 4



Example Properties in Area 1

HVAC Unit not elevated above slab

Standing water in front of house

Water ponded in driveway and sidewalk

Drainage inlet higher than surrounding blacktop

Example Properties in Area 2

Drainage inlet in front of house

Debris in front of drainage way

House elevated on fill

Example Properties in Area 4

Standing water in driveway

Standing water in driveway

Driveway slopes toward garage

HVAC unit not elevated

Problem Statement 2:

Areas of Stormwater/Localized Flooding

Of the four identified Repetitive Loss Areas, one is located entirely outside the 1-percent annual chance floodplain and away from the City's major drainage features. This area is primarily subject to periodic flooding from heavy rains and localized stormwater drainage problems. Losses have occurred in these areas as a result of hurricane and tropical storm rains; specifically, Hurricane Katrina in 2005 and Hurricane Irene in 1999 resulted in flood insurance claims.

Most repetitive loss flooding in this area is considered flash flooding that causes damage to residential and commercial buildings as well as street closures due to floodwaters overtopping the roadway. Flash flooding can occur when the capacity of the stormwater system is exceeded or if conveyance is obstructed by debris, sediment, and other materials that limit the volume of drainage. The approach to reducing repetitive flooding in these areas will require a combination of floodproofing techniques and drainage improvement projects.

Subarea 2

Repetitive Loss Area 3 is located completely outside the 100-yr floodplain in the unshaded Zone X. This is a commercial area with a mix of concrete and masonry construction types. One structure is elevated 6-8 feet and has a basement with a walkout. An occupant of this building noted that the street drain has clogged and caused flooding of the basement area. The HVAC unit for one structure were elevated above the first floor elevation, but another structure did not have its HVAC unit elevated. There were no responses to the flood protection questionnaire from this area.

Table 2.3 – Repetitive Loss Area Overview for Subarea 2

Repetitive Loss Area	# of RL Properties	# of Historic Claims Properties	# of Additional Properties	Total # of Properties in RL Area	Road Names
3	1	0	2	3	SW 70th St, SW 61st Ave

Note: Additional data on buildings within each repetitive loss area is located on the field survey forms in Appendix A.

Subarea 2 contains a total of 3 properties.

Figure 2.7 – Repetitive Loss Area 3

Example Properties in Area 3

Storm drain inlet located adjacent to structure with walkout basement

Structure with walkout basement

Structure with minimal elevation

Structure at grade

STEP 4. Review Alternative Mitigation Approaches

Mitigation Alternatives

According to the 2017 CRS Coordinator's Manual, mitigation measures should fall into one of the following floodplain management categories:

- Prevention
- Property Protection
- Natural Resource Protection
- Emergency Services
- Structural Projects
- Public Information and Outreach

Property protection is essential to mitigating repetitive loss properties and reducing future flood losses. There are many ways to protect a property from flood damage. Property protection measures recognized in the 2017 CRS Coordinator's Manual include relocation, acquisition, building elevation, retrofitting, sewer backup protection, and insurance. Different measures are appropriate for different flood hazards, building types and building conditions. Figure 2.8 below, found in the 2017 CRS Coordinator's Manual, lists typical property protection measures.

- Demolish the building or relocate it out of harm's way.
- Elevate the building above the flood level.
- Elevate damage-prone components, such as the furnace or air conditioning unit.
- Dry floodproof the building so water cannot get into it.
- Wet floodproof portions of the building so water won't cause damage.
- Construct a berm or redirect drainage away from the building.
- Maintain nearby streams, ditches, and storm drains so debris does not obstruct them.
- Correct sewer backup problems.

Source: 2017 CRS Coordinators Manual.

Figure 2.8 – Typical Property Protection Measures

Improving the stormwater drainage system and storage capacity throughout the City of South Miami can eliminate some building damage and road closures in these areas. Similarly, improving drainage outfalls can reduce stormwater flooding from heavy rains. These structural methods require large capital expenditures and cooperation from private property owners. Promoting floodproofing techniques and flood insurance and increasing public education and awareness of the flood hazards can be the next best alternative for property owners in this area. The City's websites, e-mail distribution lists, press releases and variable message boards can help get these messages out to business owners and residents.

Mitigation Funding

There are several types of mitigation measures, listed in Table 2.4, which can be considered for each repetitive loss property. Each mitigation measure qualifies for one or more grant programs. Depending on the type of structure, severity of flooding and proximity to additional structures with similar flooding conditions, the most appropriate measure can be determined. In addition to these grant funded projects, several mitigations measures can be taken by the homeowner to protect their home. Please note, the Biggert-Waters 2012 National Flood Insurance Reform Act eliminated the previously available Repetitive Flood Claims grant program.

Table 2.4 – Mitigation Grant Programs

Types of Projects Funded	HMGP	FMA	PDM	SRL	IIC	SBA
Acquisition of the entire property by a gov't	X	X	X	X		
Relocation of the building to a flood free site	X	X	X	X	X	X
Demolition of the structure	X	X	X	X	X	X
Elevation of the structure above flood levels	X	X	X	X	X	X
Replacing the old building with a new elevated	X			X	X	X
Local drainage and small flood control projects	X			X		
Dry floodproofing (non-residential buildings only)		X	X	X	X	X
Percent paid by Federal program	75%	75%	75%	75%	100%	0
Application Notes	1,2	1	1	1	3	2,4

Application notes:

1. Requires a grant application from your local government
2. Only available after a Federal disaster declaration
3. Requires the building to have a flood insurance policy and to have been flooded to such an extent that the local government declares it to be substantially damaged. Pays 100% up to $30,000
4. This is a low interest loan that must be paid back

Potential Mitigation Measures

Structural Alternatives	Non-Structural Alternatives
Dry floodproofing. Commercial structures and even residential structures are eligible for dry floodproofing; however, in many instances this requires human intervention to complete the measure and ensure success. For example, installing watertight shields over doors or windows requires timely action by the homeowner; especially in a heavy rainfall event.	Provide public education through posting information about local flood hazards on Town websites, posting signs at various locations in neighborhoods or discussing flood protection measures at local neighborhood association meetings.
Wet floodproofing. Wet floodproofing a structure involves making the uninhabited portions of the structure resistant to flood damage and allowing water to enter during flooding. For example, in a basement or crawl space, mechanical equipment and ductwork would not be damaged.	Implement volume control and runoff reduction measures in the Town's Stormwater Management Ordinance.
For basements, especially with combined storm sewer and sewer systems, backflow preventer valves can prevent storm water and sewer from entering crawlspaces and basements.	Consider expanding riparian impervious surface setbacks.
Acquire and/or relocate properties/target abandoned properties.	Relocate internal supplies, products/goods above the flooding depth.
Elevate structures and damage-prone components, such as the furnace or air conditioning unit, above the BFE.	Promote the purchase of flood insurance.
Construct engineered structural barriers, berms, and floodwalls (Note: Assuming lot has required space for a structural addition).	Improve the Town's floodplain and zoning ordinances
Increase road elevations above the BFE of the 100-year floodplain.	
Implement drainage improvements such as increasing capacity in the system (up-sizing pipes) and provide additional inlets to receive more stormwater.	
Improve stormwater system maintenance program to ensure inlets and canals are free of clogging debris.	

Current Mitigation Projects

Capital Improvements Plan Drainage Improvements

In the City's Capital Improvement 5-Year Plan for 2014-2018, six drainage improvement projects were identified and three were assigned funding, including phase 6 and phases 7-10 of South Miami's Citywide Drainage Improvements as identified in the City's Stormwater Master Plan. Funding is assigned through the City's Stormwater Drain Trust Fund.

Acquisition and Demolition

The City of South Miami has already mitigated two of the properties on its repetitive loss list through acquisition and demolition of the structures.

Advantages and Disadvantages of Mitigation Measures

Seven primary mitigation measures are discussed here: acquisition, relocation, barriers, floodproofing, drainage, elevation, and insurance. In general, the cost of acquisition and relocation will be higher than other mitigation measures but can completely mitigate risk of any future flood damage. Building small barriers to protect single structures is a lower cost solution, but it may not be able to offer complete protection from large flood events and may impact flood risk on other properties. Where drainage issues are the source of repetitive flooding, drainage improvements can provide flood mitigation benefits to multiple properties. Each of these solutions is discussed in greater detail below.

Acquisition:

Property acquisition and/or relocation are complex processes requiring transferring private property to property owned by the local government for open space purposes. Acquisition is a relatively expensive mitigation measure, but it provides the greatest benefit in the lives and property are protected from flood damage. The major cost for the acquisition method is for purchasing the structure and land. The total estimated cost for acquisition should be based on the following:

- Purchase of Structure and land
- Demolition
- Debris removal, including any landfill processing fees
- Grading and stabilizing the property site
- Permits and plan review

Table 2.5 – Advantages and Disadvantages of Acquisition

Advantages	Disadvantages
• Permanently removes problem since the structure no longer exists. • Allows a substantially damaged or substantially improved structure to be brought into compliance with the community's floodplain management ordinance or law. • Expands open space and enhances natural and beneficial uses. • May be fundable under FEMA mitigation grant programs.	• Cost may be prohibitive. • Resistance may be encountered by local communities due to loss of tax base, maintenance of empty lots, and liability for injuries on empty, community-owned lots.

There are 3 criteria that must be met for FEMA to fund an acquisition project:

- The local community must inform the property owners interested in the acquisition program that the community will not use condemnation authority to purchase their property and that the participation in the program is strictly voluntary,
- The subsequent deed to the property to be acquired will be amended such that the landowner will be restricted from receiving any further Federal disaster assistance grants, the property shall remain in open space in perpetuity, and the property will be retained in ownership by a public entity, and,
- Any replacement housing or relocated structures will be located outside the 100-year floodplain.

Relocation:

Relocation involves lifting and placing a structure on a wheeled vehicle and transporting that structure to a site outside the 100-year floodplain and placed on a new permanent foundation. Like acquisition, this is one of the most effective mitigation measures.

Table 2.6 – Advantages and Disadvantages of Relocation

Advantages	Disadvantages
• Removes flood problem since the structure is relocated out of the flood-prone area. • Allows a substantially damaged or substantially improved structure to be brought into compliance with a community's floodplain management ordinance. • May be fundable under FEMA mitigation grant programs.	• Cost may be prohibitive. • Additional costs are likely if the structure must be brought into compliance with current code requirements for plumbing, electrical, and energy systems.

The cost for relocation will vary based on the type of structure and the condition of the structure. It is considerably less expensive to relocate a home that is built on a basement or crawl space as opposed to a structure that is a slab on grade. Additionally, wood sided structures are less expensive to relocate than structures with brick veneer. Items to consider in estimating cost for relocation include the following:

- Site selection and analysis and design of the new location
- Analysis of existing size of structure
- Analysis and preparation of the moving route
- Preparation of the structure prior to the move
- Moving the structure to the new location
- Preparation of the new site
- Construction of the new foundation
- Connection of the structure to the new foundation
- Restoration of the old site

Barriers:

A flood protection barrier is usually an earthen levee/berm or a concrete retaining wall. While levees and retaining walls can be large spanning miles along a river, they can also be constructed on a much smaller scale to protect a single home or group of homes.

Table 2.7 – Advantages and Disadvantages of Barriers

Advantages	Disadvantages
• Relative cost of mitigation is less expensive than other alternatives. • No alterations to the actual structure or foundation are required. • Home owners can typically construct their own barriers that will complement the style and functionality of their house and yard.	• Property is still located within the floodplain and has potential to be damaged by flood if barrier fails or waters overtop it. • Solution is only practical for flooding depths less than 3 feet. • Barriers cannot be used in areas with soils that have high infiltration rates.

The cost of constructing a barrier will depend on the type of barrier and the size required to provide adequate protection. An earthen berm will generally be less expensive compared to an equivalent concrete barrier primarily due to the cost of the materials. Another consideration is space; an earthen barrier requires a lot of additional width per height of structure compared to a concrete barrier to ensure proper stability. Key items to consider for barriers:

- There needs to be adequate room on the lot
- A pump is required to remove water that either falls or seeps onto the protected side of the barrier
- Human intervention will be required to sand bag or otherwise close any openings in the barrier during the entire flood event

Floodproofing:

Wet floodproofing a structure consists of modifying the uninhabited portions (such as a crawlspace or an unfinished basement) to allow floodwaters to enter and exit. This ensures equal hydrostatic pressure on the interior and exterior of the structure which reduces the likelihood of wall failures and structural damage. Wet floodproofing is practical in only a limited number of situations.

Table 2.8 – Advantages and Disadvantages of Wet Floodproofing

Advantages	Disadvantages
• Often less costly than other mitigation measures. • Allows internal and external hydrostatic pressures to equalize, lessening the loads on walls and floors.	• Extensive cleanup may be necessary if the structure becomes wet inside and possibly contaminated by sewage, chemicals and other materials borne by floodwaters. • Pumping floodwaters out of a basement too soon after a flood may lead to structural damage. • Does not minimize the potential damage from a high-velocity flood flow and wave action.

A dry floodproofed structure is made watertight below the level that needs flood protection to prevent floodwaters from entering. Making the structure watertight involves sealing the walls with waterproof coatings, impermeable membranes, or a supplemental layer of masonry or concrete; installing watertight shields over windows and doors; and installing measures to prevent sewer backup.

Table 2.9 – Advantages and Disadvantages of Dry Floodproofing

Advantage	Disadvantages
• Often less costly than other retrofitting methods • Does not require additional land. • May be funded by a FEMA mitigation grant program.	• Requires human intervention and adequate warning to install protective measures. • Does not minimize the potential damage from high-velocity flood flow and wave action. • May not be aesthetically pleasing.

Drainage Improvements:

Methods of drainage improvements include overflow channels, channel straightening, restrictive crossing replacements, and runoff storage. Modifying the channel attempts to provide a greater carrying capacity for moving floodwaters away from areas where damage occurs. Whenever drainage improvements are considered as a flood mitigation measure, the effects upstream and downstream from the proposed improvements need to be considered.

Table 2.10 – Advantages and Disadvantages of Drainage Improvements

Advantages	Disadvantages
• Could increase channel carrying capacity through overflow channels, channel straightening, crossing replacements, or runoff volume storage. • Minor projects may be fundable under FEMA mitigation grant programs.	• May help one area but create new problems upstream or downstream. • Channel straightening increases the capacity to accumulate and carry sediment. • May require property owner cooperation and right-of-way acquisition.

Elevation:

Elevating a structure to prevent floodwaters from reaching living areas is an effective and one of the most common mitigation methods. Elevation may also apply to roadways and walkways. The goal of the elevation process is to raise the lowest floor of a structure or roadway/walkway bed to or above the required level of protection.

Table 2.11 – Advantages and Disadvantages of Elevation

Advantages	Disadvantages
• Elevating to or above the BFE allows a substantially damaged or substantially improved house to be brought into compliance. • Often reduces flood insurance premiums. • Reduces or eliminates road closures due to overtopping. • May be fundable under FEMA mitigation grant programs.	• Cost may be prohibitive. • The appearance of the structure and access to it may be adversely affected. • May require property owner cooperation and right-of-way acquisition. • May require road or walkway closures during construction.

NOTE: Elevating a structure with a slab-on-grade foundation can cost over 30 percent more than elevating a structure on a crawlspace foundation. Many of the properties located in South Miami's Repetitive Loss Areas have slab-on-grade foundations, which may mean this mitigation alternative will be cost-prohibitive.

Flood Insurance:

Insurance differs from other property protection activities in that it does not mitigate or prevent damage caused by a flood. However, flood insurance does help the owner repair and rebuild their property after a flood, and it can enable the owner to afford incorporating other property protection measures in that process. Insurance offers the advantage of protecting the property, as long as the policy is in force, without requiring human intervention for the measure to work.

Table 2.12 – Advantages and Disadvantages of Flood Insurance

Advantages	Disadvantages
• Provides protection outside of what is covered by a homeowners' insurance policy. • Can help to fund other property protection measures after a flood through increased cost of compliance (ICC) coverage. • Provides protection for both structure and contents. • Can be purchased anywhere in a community, including outside of a flood zone.	• Cost may be prohibitive. • Policyholders may have trouble understanding policy and filing claims. • Does not prevent or mitigate damage.

STEP 5. Conclusion and Recommendations

Conclusion

Based on the field survey and collection of data, the analysis of existing studies and reports, and the evaluation of various structural and non-structural mitigation measures, the City of South Miami has identified several projects that should be implemented for these Repetitive Loss Areas, detailed below under Recommendations. Table 2.13 examines past and current mitigation actions in these areas.

Table 2.13 – Past and Current Mitigation Actions

Past and Current Mitigation Actions	
1	Property owners have documented flooding and identified flooding concerns in returned questionnaires from this analysis.
2	Property owners are aware of flooding causes. Some property owners have undertaken specific floodproofing measures at their own expense. Others note that drainage improvements made by the City have resolved their flooding problems.
3	The City has developed a Stormwater Master Plan which identifies areas of stormwater flooding and has undertaken capital improvement projects to improve drainage throughout the City.
4	The City has already mitigated two properties on the repetitive loss list through acquisition and demolition. The City targeted the two properties with the highest value of paid losses for this mitigation in order to maximize the benefit-cost ratio.

Prioritization

In order to facilitate the implementation of the following recommended mitigation actions, a prioritization schedule is included based on the following:

- Cost
- Funding Availability
- Staff Resources
- Willingness of Property Owner to Participate
- Additional Planning Requirements

The priority rating for the following mitigation actions is summarized in Table 2.14. Each of the above prioritization variables was rated on a scale of 1 to 5, with 5 indicating the greatest difficulty for implement. The weight of each variable is indicated in the prioritization table. Those mitigation actions with the lowest overall priority scores should be implemented first. An overall priority rating of high, medium, or low is assigned to each recommended action, using the following scale:

- High Priority: Score of 0.00 – 1.99
- Medium Priority: Score of 2.00 – 3.99
- Low Priority: Score of 4.00 – 5.00

Recommendations

The City will encourage property owners to use floodproofing measures to help protect lower levels of their property. The City will also increase its public education efforts to increase awareness of flood preparedness and flood protection measures including moving valuable items to above the flood elevation and permanently elevating vulnerable HVAC units. At the same time, the City will work with

property owners, citizens, the state and other regional and federal agencies to implement capital improvement projects which will help to eliminate flooding in the repetitive loss areas.

Mitigation Action 1: Flood Insurance Promotion

Property owners should obtain and keep a flood insurance policy on their structures (building and contents coverage). The City will continue on an **annual basis** to target all properties in the repetitive loss areas reminding them of the advantages to maintaining flood insurance through its annual outreach effort. Repetitive Loss Areas are noted as a target area in the City's Program for Public Information (PPI).

Responsibility: The City's Planning & Zoning Department will provide the most relevant up-to-date flood insurance information to all property owners within the repetitive loss areas through annual outreach and other efforts.

Funding: The cost will be paid for from the City's operating budget.

Priority: High

Target Area: Subarea 1 & Subarea 2

Mitigation Action 2: Preferred Risk Policy Promotion

As part of the annual outreach to the repetitive loss areas, the City will provide specific information on the availability of Preferred Risk Policies for property owners in the low-risk Zone X.

Responsibility: The City's Planning & Zoning Department will provide the most relevant up-to-date flood insurance information to all property owners within the repetitive loss areas through annual outreach and other efforts.

Funding: The cost will be paid for from the City's operating budget.

Priority: High

Target Area: Subarea 2

Mitigation Action 3: Property Protection Information

Property owners should not store personal property in basements since personal property is not covered by a flood insurance policy without contents coverage. The City will increase its outreach efforts on an **annual basis** for the identified repetitive loss areas to include this specific information in the outreach materials.

Responsibility: The City's Planning & Zoning Department will provide the most relevant up-to-date information to all property owners within the repetitive loss areas.

Funding: The cost will be paid for from the City's operating budget.

Priority: High

Target Area: Subarea 2

Mitigation Action 4: Floodproofing

When appropriate, commercial property owners should consider floodproofing measures such as flood gates or shields, flood walls, hydraulic pumps, and elevating electrical services including electrical outlets.

Responsibility: The City's Planning & Zoning Department will promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such

measures in an **on-going** program.

Funding: The cost will be paid for by individual property owners. Advice and assistance will require staff time. Promotion of existing floodproofing measures may require some additional funds from the City's operating budget.

Priority: Medium

Target Area: Subarea 2

Mitigation Action 5: Acquisition & Demolition

The City will continue acquisition and/or demolition mitigation of high-risk flood-prone properties. The highest priorities are properties at the greatest flood risk and where drainage improvements will not provide an adequate level of protection. Acquisition and demolition has already been used to mitigate two properties on the repetitive loss list, one in Zone AE and one in Zone X.

Responsibility: The City's Planning & Zoning Department will continue to target properties for acquisition and demolition.

Funding: The acquisition and demolition can be paid for using FEMA's Hazard Mitigation Grant Program (HMGP). Staff time to develop the list of target properties will require funds from the City's operating budget.

Priority: Low

Target Area: Subarea 1 & Subarea 2

Mitigation Action 6: CIP Drainage Improvements

Prioritize CIP projects to focus on drainage improvement projects in the drainage basins which contain the identified repetitive loss areas.

Responsibility

The City's Public Works Department.

Funding

The cost will be paid for by the City's Stormwater Drain Trust Fund.

Priority: Medium

Target Area: Subarea 1 & Subarea 2

Mitigation Action 7: Elevate Mechanical Equipment

HVAC units were found to be not elevated in all repetitive loss areas. The City will encourage property owners to elevate inside and outside mechanical equipment above the BFE.

Responsibility: The City's Planning & Zoning Department will promote effective flood protection measures and provide advice and assistance to property owners who may wish to implement such measures in an on-going program.

Funding: The cost will be paid for by individual property owners. Advice and assistance will require staff time. Promotion of existing floodproofing measures may require some additional funds from the City's operating budget.

Priority: Medium

Target Area: Subarea 1 & Subarea 2

Mitigation Action 8: Contents Coverage for Renters

The City's parcel data suggests that several properties in the repetitive loss areas are renter-occupied. Renters typically have less power to implement physical changes to mitigate flooding, but they do have the ability to protect themselves with flood insurance. Therefore, the City's Planning & Zoning Department will encourage renters to purchase flood insurance for their contents.

Responsibility: The City's Planning & Zoning Department along with local insurance agents will promote the benefits of renter's insurance.

Funding: The cost will be paid for by the City's operating budget.

Priority: Medium

Target Area: Subarea 2 & Area 4

Prioritization Table

Table 2.14 – Prioritization of Recommended Mitigation Actions

Mitigation Action #	Prioritization Variables (Weight)					Total
	Cost (30%)	Funding Availability (25%)	Property Owner Willingness (20%)	Staff Resources (15%)	Planning Needs (10%)	
1: Ongoing outreach to promote flood insurance	2	2	1	1	1	**1.55**
2: Promote availability of Preferred Risk Policies (PRP)	2	2	1	1	1	**1.55**
3: Ongoing outreach about personal property protection	2	2	1	1	1	**1.55**
4: Promote and advise on floodproofing	2	3	4	2	2	**2.65**
5: Continue acquisition and demolition	5	4	5	4	4	**4.50**
6: Prioritize drainage-related CIP projects	4	2	2	3	4	**2.95**
7: Encourage property owners to elevate mechanical equipment	2	2	3	2	1	**2.10**
8: Encourage renters to purchase flood insurance	2	2	3	2	2	**2.20**

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Appendix A – Building Survey Data

Note: In accordance with the Privacy Act of 1974, Appendix A will not be shared with the general public.