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MISSION

The committee's mission, as commissioned by the Board of Trustees:

"To learn about the causes and extent of the August 20, 2018, flash flood that impacted over 80 Village homes, numerous Village businesses, many Village assets and the railroad, and to recommend actionable steps the Village could take to prevent the extent of any future such flash flood events. To offer public input sessions, perhaps at the start of its work and then towards the end of its work when its draft recommendations to the Village Board are being finalized. The goal for the Committee will be to make two reports to the Village Board: a status report and any initial recommendations by no later than May 1, 2019, followed by a final report and final recommendations by no later than November 1, 2019. The term of this Committee will be one year, subject to potential extension by the Board."

MEMBERS

Dave Benforado, Chair

Gloria Beach

Carolyn Benforado

Greg Brauer

Peter Hans

Mark Mandel

Eric Riedner

SCOPE

This report is intended to provide the Board of Trustees with a baseline understanding of the issues that contributed to recent flooding within the Village and to present a focused range of actions for consideration. While several technical experts were consulted in the process of preparing this document, the concepts, interpretations and recommendations included below are those of citizen members of the Stormwater Committee, most of us not being experts in flood control planning and stormwater infrastructure design. The Committee assumes the Board will ultimately use this document to guide the solicitation of expertise necessary to obtain a higher level of certainty and expand on the findings and recommendations herein.

UNDERSTANDING OF RECENT EVENTS

1. June 16, 2018 event

[Text - Narrative of what occurred; water levels at various times; extent of damage if any.]

[The following bullet points are intended to identify what we know so far and what we still need to investigate/refine/confirm. A more refined summary can be developed as further information becomes available.]

- Approximately 2.5 inches of rainfall fell during a 3-hour period in the late night, early morning hours. [According the USGS rain gage in Middleton. Reported rainfall totals varied significantly across local gages. 2.9 inches was recorded at the Charmany Farms gage located SW of the watershed. Nearly 5 inches was recorded at the rain gage in the Arboretum. Eric: I'll work with Karl to try and obtain the Village's rain gage data that public works staff noted had been collected at our last mtg.]
- Radar imagery shows a multicell line storm that moved in the north to south direction impacting most of SE Wisconsin.
- Approximately a 5- to 10-year recurrence interval event at the 2- and 3- hour durations [based on Middleton gauge data].
- Flooding was observed primarily south of the RR tracks with nearly two feet (?) of flooding observed at the Midvale-University and Shorewood-University intersections. [Karl or Brian may have a more complete summary of the extent of flooding]
- Damages to structures: Whole Foods... [Again, Karl or Brian may have a more complete summary of the impacted structures]
- What type of event was it. -- List NOAA ATLAS 14 data. Guess of 10 yr event.

2. August 20, 2018 event

[Text - Narrative of what occurred; water levels at various times; extent of damage (personal property, commercial property, and Village property; federal disaster).]

- The storm of record for our area. Willow Creek Watershed received 10 inches in an 8-hour period (per the City of Madison Engineer) over the evening of the 20th into the early morning of the 21st.
- Radar imagery and NWS rainfall total maps indicate a SW to NE trending system that delivered significantly more rainfall west of Shorewood than to the east.

- Statistically this storm was well above a 100-year event for durations between 1 and 24 hours. List NOAA ATLAS 14 data. 200+ yr event?
 - Overtopped the railroad tracks at Shorewood Blvd
 - Overtopped Garden Homes flood wall
- Significant flooding occurred along the University Avenue corridor and for the first time on record significant flooding also occurred in the residential portion of the Village north of the RR tracks. [Include and discuss flood inundation maps prepared by Brian and possibly include an appendix of photos for the record.]
- Inventory number of impacted structures including breakdown between residential, commercial, and municipal as well as provide an estimate of financial impacts [Karl?]. If spatial data is available provide a map of impacted properties.

BACKGROUND INFORMATION AND CONSIDERATIONS

Willow Creek drainage basin/watershed

Most of the Village of Shorewood Hills is part of the Willow Creek drainage basin. This basin also drains from the City of Madison; 16% of the basin is in Shorewood Hills, and 84% is in Madison. Therefore, an area much larger than the Village (how much?) drains to University Avenue.

[Describe the basin, empties to Willow Creek. Include map.]

- The source of flooding is the Willow Creek watershed covering approximately 2,000 acres as shown on [include figure] and extending south nearly to Odana Rd, west to Whitney Way, north to Eagle Heights, and as far east as Babcock Hall on the UW Campus.
- Immediately upstream from the Midvale-University intersection the watershed drains 1,100 acres increasing to 1,600 acres at the intersection of UBD-University.
- Runoff is primarily conveyed through an underground storm drain system with the one notable exception being the reach of Willow Creek between Campus Dr and Lake Mendota.
- Include map of the storm drain system servicing the University Ave corridor including labels of trunk line dimensions.
- Potentially discuss key features in the storm drain system in the format of a timeline. 1950's University Ave and Village undergrounding project. 2010 University Ave project between Midvale and Shorewood Blvd. 2013 University Ave project along Campus Drive. Introduce potential upcoming University Ave project between Shorewood Blvd and UBD.

Precipitation intensity and frequency

NOAA ATLAS 14 storm levels

List what makes a 10-yr, 100-yr, etc. storm. Explain how these are calculated with a bell curve of rain over the duration listed, and therefore more intense storms are more severe.

How do we account for the apparent increased frequency of “extreme” rainfall in planning? What are other municipalities doing to plan? Feb 2019 model from Madison was “conservative” and that may be one mechanism to provide us some buffer.

Lake levels

The lake levels increased in part as a result of the increased rainfall. As lake levels rose this caused a dramatic threat to nearby areas, including on the isthmus and in Monona. However, this had no effect on stormwater damage in Shorewood Hills. The damage in Shorewood Hills resulted solely from rain water and drainage in the drainage basin that was unable to exit the drainage basin quick enough. Therefore, future planning for the village (including when to sand bag) should not be impacted by lake levels. [is there consensus on this?]

Stormwater utility

[describe it; discuss the Equivalent residential unit (ERU) fee on utility bill]

PREVIOUS REPORTS ON THIS ISSUE

Strand, AES, previous village committees, 1950s?

Need a brief summary and key points from each.

POTENTIAL SHORT-TERM SOLUTIONS

Trapping water (there is a better name for this)

Rain Gardens, “bathtubs”, vaults... useful but not game changers.

Cleaning out the area North of the railroad tracks

Last done in 2013.

NFIP flood insurance

The Village is now enrolled and residents can purchase through many insurance agents.

Sand bagging

How to get sand bags; how to know if water levels are sufficiently high that this is needed.

If we learned that a similar rain was likely tomorrow, what would our emergency plan be?
Sandbagging along the tracks in vulnerable areas? Helping individual homes sandbag? How soon could this be put together?

POTENTIAL LONG-TERM SOLUTIONS

What options should we consider? A combination of the following...

Do we want to discuss TIF district? Probably not in detail but perhaps note in briefly?

0. Options discussed that the committee does not recommend.

???

1. Box culvert along university avenue.

[describe current drainage along University Ave; highlight local altitude minima]

DOT 2021 project, coordinated by City of Madison.

- The city engineering website describes the project as going from “Shorewood Boulevard/Hill St to University Bay Drive/Farley Ave” (<https://www.cityofmadison.com/engineering/projects/university-avenue>). However, there seems to be significant question as to whether the full length of this road will

Concerns to be resolved:

- Cost
- Potential for negative effects on some intersections.
- Above depend on detailed planning still to be conducted.

Expect a major focus for the committee will be to understand this project and figure out what we should advocate for.

2. Tunnel from Midvale & University to Lake Mendota (under the golf course)

A tunnel from the vicinity of University & Midvale, under the Blackhawk Country Club golf course, that would drain directly into Lake Mendota near the Shorewood Hills Marina.

Concerns about the proposed solution (these were notes from before the Feb 2019 committee meeting):

- How much would this help? How can we get accurate assessments?
- Cost. How can we get a good cost estimate?
- Can this be rolled into the University Ave project? How do we pursue this?
- Ecological at Lake Mendota. This was raised in the past, but all of this water makes it to the lake eventually. Providing a direct conduit would enable the water to drain without bringing significant organic material with it.
- What are other concerns?

3. Building of retention area(s)

Partially addressed in the Strand report. Also raised at the Feb 2019 committee meeting by the Madison engineering consultant.

4. Improve drainage within the neighborhood.

How much would this help? I.e., if water drained immediately from a specific road (e.g., Tallyho Lane), how much would this help in the context of a catastrophic event? Would it save 1 inch? 3 inches?

What are the priorities?

Interface with Public Works committee. This was repeatedly raised in the public comment.

5. Are there any solutions we are missing?

Any pie-in-the-sky ideas? Run drainage in place of the train tracks? Let's bring them up now so we have time to do research on them, even if they seem crazy.