

Eagles Flock Leaf River Alarm System Design and Order of Magnitude Cost

Notes on an Eagles Flock / Leaf River Corridor Flood Alarm System — Design and Order-of-Magnitude Cost

From: Michael Hoffman, North Star Group, Inc. **To:** Nathan Satcher — Senior Planner and Floodplain Administrator, City of Hattiesburg **Date:** April 18, 2026
Re: Companion note to the flood warning infrastructure concept

A companion note to give the warning-infrastructure concept enough shape and number to be useful in further conversation. All figures below are planning-level. Costs will move once final design, siting, and quotation happen, and your experience with this kind of infrastructure in the Hattiesburg area is going to be more reliable than anything I can estimate from outside.

1. What the system would consist of

Three layers.

Sensing. Water level gauges on the Leaf River at the site and at the corridor points, with rainfall monitoring stations that pick up heavy rain early in the watershed. The gauges send continuous data — every few minutes, typically — to a central controller over the cellular network, with radio as a backup when cellular is compromised. The gauges tie into the U.S. Geological Survey’s stream-gauge network and the National Weather Service’s river forecasting data where it already exists.

Processing. A small weatherproof controller with a cellular connection and battery-plus-solar power reads the sensor data continuously. It compares the readings against stage thresholds set in coordination with the City’s floodplain program — typically a two-stage structure: a watch threshold that raises awareness, and a warning threshold that triggers full alerting. The controller also publishes the live river level data to a public-facing web page so residents, businesses, and emergency responders can see conditions themselves.

Alerting. When a warning threshold is crossed, the system reaches people through four channels in parallel:

- Sirens with strobe lights at the site and at the corridor points — outdoor, audible in adjacent areas, with the option of recorded voice instructions where useful
- Digital message signs at the site’s access points and at the downtown bridge — so drivers see warnings before they approach the corridor
- Cell phone alerts delivered through the federal wireless emergency alert system — every phone in the affected cell-tower footprint receives the alert, no opt-in required, authorized through the City’s emergency management office
- A direct notification to the development’s homeowners association management and to the City’s emergency dispatch, so organized evacuation can start immediately

2. How it's sized for Eagles Flock and the Leaf River corridor

The site itself carries the engineering backbone: the main controller, the on-site gauges, the weather station, a pair of sirens and two access-point message signs, and the cellular and power infrastructure. That backbone is the fixed cost of having a system at all. Once it exists, each additional corridor point — a siren, a gauge, a sign — extends the system at a marginal cost that is substantially lower than the backbone. That's the architectural reason the corridor extension is possible without enlarging the overall capital logic.

3. Order-of-magnitude capital cost

Planning-level ranges. Final numbers depend on final siting, pole and power access at each location, and whether the corridor points get signs plus gauges or just sirens.

On-site backbone at Eagles Flock:

- Three to four water level gauges with cellular transmission: commonly \$60,000-\$140,000
- Two rainfall and weather stations: commonly \$10,000-\$30,000
- Controller, enclosure, server software, cellular and backup power: commonly \$30,000-\$70,000
- Two or three sirens with strobe lights: commonly \$70,000-\$200,000
- Two digital message signs at access points: commonly \$60,000-\$180,000
- Installation — poles, concrete foundations, wiring, mounting, programming, testing: commonly \$150,000-\$350,000
- First-year commissioning, training, and threshold calibration: commonly \$25,000-\$60,000

Subtotal, on-site backbone: commonly **\$400,000-\$1,000,000** at a reasonable order of magnitude.

Each additional corridor point:

- One siren with strobe lights at the point: commonly \$30,000-\$75,000
- One digital message sign at the point, where warranted: commonly \$30,000-\$90,000
- One gauge at the point, where warranted: commonly \$20,000-\$40,000
- Installation and integration back to the central controller: commonly \$25,000-\$70,000

Per additional corridor point: commonly **\$60,000-\$250,000**, depending on which of gauge, sign, and siren are added.

Full concept, backbone plus four corridor points:

Adding four corridor points on top of the on-site backbone: commonly **\$240,000-\$1,000,000** in additional capital.

Combined capital range: commonly **\$650,000-\$2,000,000** at a reasonable order of magnitude.

The spread is wide because the scope is genuinely variable. A lean version with sirens only at the corridor points and one sign at the downtown bridge lands near the bottom of that range. A more complete version with gauges, signs, and sirens at every corridor point lands near the top.

4. Ongoing operations cost

Cellular data plans, annual inspections and calibrations, software subscriptions, spare parts, routine maintenance, and a replacement reserve. For systems in this category, annual operating cost commonly runs in the range of **5 to 10 percent of the installed capital per year**. For the capital range above, that suggests annual operating cost commonly in the **\$30,000-\$200,000 range**, depending on final scope and service level.

This is the line item the long-term funding conversation would need to cover, in whatever form the City eventually chooses to structure it.

5. What is not in these numbers

- Upgrades to the City's own emergency dispatch systems, where the City already has infrastructure in place
- The federal wireless phone alert channel itself — that operates on federal infrastructure and has no installation cost to the City or the development, though it does require authorization through emergency management (which the City already has)
- Right-of-way acquisition, easements, or permitting fees at off-site locations
- Any coordination cost with Forrest County or with the National Weather Service's local office
- Third-party engineering design once the concept moves to detailed design

Each of those would be scoped separately by whoever carries that piece of the work.

6. Reference points

Kerr County, Texas is the most recent publicly documented point of comparison. Kerr County has estimated its planned county-wide flood warning system — sirens, rain gauges, a public web dashboard, and flashing signs at river crossings — at approximately **\$5 million**.¹ That is a larger and more distributed system than what's described here, covering a county-wide Guadalupe River watershed. An earlier, narrower Kerr County proposal for upgraded river gauges and crossing warnings was dimensioned at approximately **\$1 million**.² The small community of Comfort, Texas has a recently installed two-siren system at a smaller scale.³

Roseville, California has operated a flood early warning system since the mid-1990s that has been expanded several times and remains the most cited reference for outcomes in a small-city setting.⁴

Every community sizes these systems differently. The ranges in this note are built around what a system sized for Eagles Flock plus four corridor points along the Leaf River would look like at typical current pricing.

Closing

Sharing this to put a reasonable cost shape around the concept, so any further conversation has real numbers to work with rather than placeholders. If your office has data from other Mississippi communities or from recent Hattiesburg procurements that would refine these ranges, happy to fold it in.

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Footnotes

¹ Texas Tribune, *Kerr County seeks state money to build flood warning system*, December 18, 2025 (Kerr County system estimated at up to \$5 million, including sirens, rain gauges, public website, and flashing flood signs at river crossings). <https://www.texastribune.org/2025/12/18/texas-water-development-board-kerr-flood-warning-system/>

² NPR, *Kerr County struggled to fund a flood warning system. It's all too common*, July 10, 2025 (earlier Kerr County proposal for approximately \$1 million for upgraded river gauges and road-crossing warnings). <https://www.npr.org/2025/07/10/nx-s1-5461091/texas-flooding-warning-system-fema>

³ NBC News, *In deadly Texas floods, one town had what Kerr County didn't: Wailing warning sirens*, July 9, 2025 (Comfort, Texas two-siren system). <https://www.nbcnews.com/news/us-news/deadly-texas-floods-one-town-warning-siren-rcna217202>

⁴ Federal Emergency Management Agency case study, *Community Rating System Saves Dollars, Property and Lives*, City of Roseville, California. <https://www.fema.gov/case-study/community-rating-system-saves-dollars-property-and-lives>