

Geared UP! Research Skit on the dangers of road flooding on Rt 15 and Goose Creek V5

Scene 1

Narrator: Hi! We're Team 20, Geared Up! Our research presentation is on road flooding endangering people traveling in automobiles in the Goose Creek area of Virginia. According to NOAA, more people die in flooding than any other natural disaster, and half of those fatalities involved vehicles. This is because many people do not understand how dangerous moving water can be. Even superheroes can underestimate the power of Nature's Fury.

Batman and Robin are driving down Rt. 15 in Loudoun County, looking for Joker's evil lair.
(Batman theme song in background here)

Robin: Holy Thunder clouds, Batman! Goose Creek is flooding right over the road.

Batman: But we must catch Joker, it's only a few inches of water.

(Captain Gear appears holding a sign with TURN AROUND, DON'T DROWN)

Captain Gear: Halt citizen!

Robin: Do we have to?

Captain Gear: Yes-we close the roads when there are 2" of water. Each foot of water can lift 1500 pounds of a vehicle's weight. Small vehicles and pedestrians can be swept off the road in as little as 6 inches of moving water and floodwaters can hide eroded roads. You could be driving into a huge hole!!

Robin: Surely that doesn't include us-- we have the Batmobile!

Captain Gear: Everyone thinks they're the exception. That's why so many people die each year. Flash floods claim the most lives of any natural disaster. According to NOAA 64% of these deaths occur in cars. In fact, Virginia is the 4th most flood prone state, according to USGS. The Goose Creek Watershed is one of the worst areas in our region. Just last year, during Hurricane Sandy, it rose 18 feet.

Robin: Holy H²O Batman! That's a lot of water.

Batman: If it's such a big problem, why isn't anyone doing anything about it?

Captain Gear: Actually, We are! Let's go back to the Gear Box and I will tell you more.

Scene 2

Narrator: Back at the Gear Box Captain Gear introduces Batman and Robin to team Geared UP.

(See several scientist gathered around a chart)

Robin: So what is your solution?

Captain Gear: Currently there are only 3 ways to identify flooded roads, stream gauges, 911 calls and patrols by the Sheriff.

Robin: What's a stream gauge?

Hydrologist: I can help you there. I am a hydrologist and a Stream Gauge measures water by using a float.

Robin: Why bother with the 911 calls and patrols if the stream gauges work so well?

Core of Engineers: At the Core of Engineers, we thought about using them in more places, but at \$1-\$2,000 a unit, they didn't pass our cost analysis. Unfortunately the Goose Creek and Route 15 intersection doesn't have one. We try to use historical data from other locations to make predictions here.

Captain Gear: Those predictions are not as accurate as they used to be due to new construction, and we still need officers to visually inspect the roads.

Robin: So, who puts this all together?

Director of OEM: At the Office of Emergency Management or OEM, we analyze and coordinate the response to a number of natural disasters, including flooding. The OEM both advises and coordinates the response between the State Police, Sheriff's Office, VDOT, and other agencies and informs the public with news releases.

Batman: None of these methods sound very effective.

Captain Gear: We have something new we are working on to help with that.

SCENE 3

(Walk over to innovation Station and look at warming system)

Captain Gear: Guys, Batman and Robin are here to learn about our Automatic Staged Alert System.

Scientist 1: Oh, you mean the ASAS.

Scientist 2: We developed this innovative 3-stage flood alert system to warn drivers about the amount of water on the road surface.

Scientist 1: At 6" of water stage 1 activates with a spinning yellow and black beacon that is visible both day and night. This is the level that can lift most small cars.

Scientist 2: At 12" stage 2 activates a 108-decibel dual tone siren. This is the level that will carry away all cars.

Scientists 1 and 2: And at the final stage, at 18", a high intensity LED beam is activated. This is the point at which a car can be flipped over by moving water.

Batman: So what you developed is a multi-stage system to warn drivers of flooded roads by becoming progressively more noticeable as the hazard increases and since it is automatic it will reduce the number of deputies needed to investigate road closures that saves time.

Scientist 1 and 2: Exactly!

Robin: But how does it work?

Scientist 2: Each stage is activated when the water level rises to complete that circuit. The circuits are wired in parallel, creating a failsafe, so if one circuit fails, the others can still activate. The LEDs make it energy efficient, and since it is all powered by solar cells it can be placed anywhere.

Batman: How much would it cost to implement?

Scientist 1: Well, we use low cost materials that can be purchased anywhere. The rechargeable batteries and solar cells cut down on maintenance costs and its easy assembly makes replacement and repairs a snap. (snaps fingers) We estimate the ASAS can be built for under \$200.

Scientist 2: Due to this low cost, we can install multiple systems along any flood prone road like Rt. 15.

Batman: Well, it looks like your innovative solution will save a lot of lives!

Robin: Holy Mechanical Marvels, Batman! You're right this will save tons of lives!

Batman: Thank you Captain Gear. Without your timely arrival, I don't want to think about what might have happened to us.

Narrator: We want to thank you for watching our presentation. We would also like to thank the scientists and engineers we spoke with at the NOAA Weather Station, the OEM, the USGS, and the Corps of Engineers. We shared our solution with VDOT, and at a public presentation at the Ashburn Library, as well as on YouTube.

Cast:

Narrator- Ananya	Cpt. Gear- Vishnu	Batman- Jonathan	Hydrologist- Andrew	Corp Eng- Neil
Dir OEM- Pranav	Robin- Mihir	Scientist 1- Alison	Scientist 2- Ritvik	