

THE CASE OF THE JONESBORO TORNADO

SCRIPT

1: Now that our inductive loop is set up, we're going to see how inductive loops can help solve real-world problems by looking at The Case of the Jonesboro Tornado.

2: Now to introduce you to the Bower family. John and Alex are a lawyer and software engineer, respectively. They have lived in Jonesboro proper for over 10 years and have two little girls, Amelia and Madeline, who attend the public school down the road. The Jonesboro tornado swept through their neighborhood destroying their home and displacing them.

3: This video, courtesy of the Arkansas Department of Transportation, is actual footage of the tornado that swept through Jonesboro.

4: When people and businesses are displaced due to natural disasters, it can take months, even years, to have their homes rebuilt. While people and organizations should up from all over the country to lend help, rebuilding cannot occur until there are sufficient supplies to do so, all the way down to the most fundamental materials for structures such as sand and gravel which are two main ingredients in concrete used to build foundations for homes and other buildings. Sand and gravel is transported through the waterways in the state of Arkansas.

5: So how does this gravel and sand get to us when we need it?

COMMENTARY

1: No commentary

2: No commentary

3: This video should start from the beginning and is only 46 seconds long. Press escape a single time at the end of the video to get back to the presentation.

4: No commentary

5: No commentary

6: I mentioned a couple slides ago that the waterways are used as the network to transport gravel and sand, which means that these building materials are loaded onto boats or barges. This video shows how sand is loaded onto a barge at a port.

6: The video should play from the beginning and is 16 seconds long. Press escape a single time at the end of the video to get back to the presentation.

7: So now we know that the sand and gravel is loaded onto barges at ports. These barges travel through the waterway to other ports to be unloaded. Sand and gravel could either be delivered to The Port of Little Rock or The Port of Memphis to service the Jonesboro area – they are equidistant – so how do we choose? We must look at a variety of factors such as the roadway network, the railway network, the port's capacity, and more to determine which would be the best option.

7: No commentary

8: While Jonesboro has been recovering for many months, it has been estimated they still need approximately 200 more tons of gravel and 100 more tons of sand to finish rebuilding. This sand and gravel will travel by barge either to the Port of Little Rock or to the Port of Memphis. It is your job today to recommend which port to use so that families like The Bowers might have their homes rebuilt as quickly and efficiently as possible. Today we will be examining a concept called capacity, which refers to how many trucks are present at a port compared to how many the port is able to service at any given time. Comparing the capacities of the Port of Little Rock and the Port of Memphis will help determine which port should be utilized.

8: No commentary

9: This can get complicated because ports don't just transport sand and gravel – they transport a variety of other goods that both Jonesboro and the rest of the state of Arkansas still need, so we need a way to identify without inspecting each truck individually which trucks are carrying sand

9: No commentary

and gravel and which are carrying other goods. This can be done by using the inductive loop we learned about earlier. Since different style trucks carry sand and gravel, the unique body style and axle configuration of the truck will generate a specific signature when passing over the inductive loop.

10: On this slide, we are comparing what graphs for each truck might look like when passing over an inductive loop.

11: Now that we understand how to tell commodities apart based on truck styles, we can sit in an office on a computer anywhere in the world observing graphs from multiple inductive loops at any one time. We have recently received new graphs from both The Port of Little Rock and The Port of Memphis and need to determine which port is the best option to service Jonesboro during this crisis.

Here we see The Port of Little Rock can service 90 trucks per day while The Port of Memphis can service 130 trucks per day.

While it appears that Memphis might be the best option at the onset since it services more trucks, we do not know how many trucks are already using each port. That is what the graphs from the inductive loops will help tell us.

12: Now that we know what we're looking for, let's give it a try.

13: *Everyone* and *everything* is affected by transportation engineering – on a big scale all the way down to each individual house in your neighborhood. Next time, you might be shipping textbooks to your school or

10: Consider engaging the students asking them to tell you the difference between the graphs. Correct answers are the size, the general shape, whether there are bumps, etc.

11: After telling students how many trucks can be serviced each day by each port, consider asking them which port they think is the best option.

12: No commentary

13: No commentary

medical supplies to the hospital in town.
Your work as a transportation engineer can
make a lasting impact on your community,
whether you're filling sandboxes or
rebuilding your community.