# 2020 Case Study Competition Round 0

# Bridge Repair and Replacement

Gefyrachora, a fictional country with close ties to Canada, has approximately 54,000 bridges. Ms. Jane M. Muller, the new Gefyrachora minister of transportation has hired your team to help her understand how frequently Gefyrachora’s bridges will need structural repairs.

Structural repairs include widening, replacing beams or other support structures, and re-building or replacing the entire bridge. Operational maintenance and repair, such as re-surfacing, painting, replacing guard rails and other similar repairs are excluded from this project.

## Deliverables

Ms. Muller expects the following three deliverables:

1. Using the provided database, develop a set of probabilities that bridges will need structural repair or replacement in any given year.
2. Outline your process for developing the probabilities, including any assumptions that you made. Include the rationale for your decisions and assumptions.
3. Identify any shortcomings of or questions about the data that you encountered, as well as any assumptions that you made as a result and your rationale for the assumptions.

## Bridges Assessment in Gefyrachora

Gefyrachora’s bridges vary in design, material, size, age and condition. Gefyrachora’s engineers assess their structural condition according to the following categories:

1. Excellent: no apparent structural damage or significantly exceeds desirable standards
2. Good: structural damage present but meets desirable standards
3. Fair: structural damage present sufficient to weaken bridge safety rating but clearly exceeds minimum standards
4. Poor: barely meets minimum standards
5. Needs structural repair: currently meets minimum standards but anticipate unsafe rating within 2 years; can be restored to fair or better with structural repair
6. Needs replacement: currently meets minimum standards but anticipate unsafe rating within 2 years; replacement is most efficient means of repair
7. Closed: unsafe or inoperable

The engineers estimate the following about the bridges:

* Since the 1960’s, new bridges have typically been built to last, on average, about 30–35 years without structural repair.
* Bridges typically last about 75 years before needing to be replaced, although actual bridge lifetimes can vary greatly.

## About the Database

The database has been provided in an Excel workbook. The tabs named for a year show the experience in that year of all the bridges you are studying, to the extent that data are available. All tabs named for a year share the same data layout.

The “Data Layout” tab identifies the database elements and relevant codes.

Note that recently, the Gefyrachora federal office of transportation database was hacked, and data for some bridges were corrupted or deleted.

## Deliverable Requirements

Submit your results in two files:

1. Provide the probabilities in an Excel workbook, summarized and formatted so they are easy to read.
2. Provide your process outline and list of data issues in one file in PDF format.
   1. Your process outline should be one or two pages (minimum 11-point font with normal margins).
   2. Your list of data issues should be one or two pages (minimum 11-point font with normal margins) in PDF format.

Should your team advance in the competition, the language that you use for Round 0 must also be used in subsequent rounds. In addition, your Round 0 work will become an integral part of your Round 1 analysis.

Submit your Round 0 results to [asna.casecompetition@gmail.com](mailto:asna.casecompetition@gmail.com) no later than 11:59 pm Eastern time on Tuesday, October 1, 2019.