

Residual Life and Reliability Assessment of Underground RC Sanitary Sewer Pipelines Under Uncertainty Dataset

Dataset available at: https://digitalcommons.lsu.edu/transet_data/126

(This dataset supports report **Residual Life and Reliability Assessment of Underground RC Sanitary Sewer Pipelines Under Uncertainty**)

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The related final report **Residual Life and Reliability Assessment of Underground RC Sanitary Sewer Pipelines Under Uncertainty**, is available from the National Transportation Library's Digital Repository at <https://rosap.ntl.bts.gov/view/dot/61833>.

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Abstract: Prioritization of limited funding for pipelines maintenance is a major issue that concerns municipalities nationwide. Conducting a probabilistic assessment can provide a complete characterization of the performance of structural elements and systems along with optimizing the limited resources. The most widely used probabilistic performance indicator is reliability, a measure of the probability of failure corresponding to a particular limit state (e.g., ultimate strength or serviceability). Reliability methods can be used to identify which pipeline sections within a particular system require the most urgent inspection or repair. To this end, an automated data-driven framework for large diameter reinforced concrete pipes (RCPs) is developed that converts the raw unfiltered inspection readings to data that is used for estimating residual life and further reliability assessment purposes. In the current work, initially, the wall thickness erosion is determined based on the inspection data collected using Light Detection and Ranging (LiDAR). Furthermore, the best fit among several probability distribution functions for the wall thickness loss is obtained, which is integrated with a serviceability limit state that defines failure as the complete loss of 1-in concrete cover caused by environmental conditions such as sulfide-induced erosion. Considering this limit state and a prescribed probability of exceedance threshold, a reliability-based prediction of the remaining service life is proposed. The developed framework requires minimal user interference and is, therefore, less time consuming and more consistent compared to previous research. From an asset management point of view, the most vulnerable pipeline sections are identified that will require further inspection and attention. This will provide decision makers crucial information regarding the current state of the pipeline network, to better allocate the already scarce maintenance funding of these pipelines.

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Dataset description:

This dataset contains 1 file collection, described below.

Numerical_Modeling_Data.zip:

- This file collection contains 642 files, organized into multiple folders.

File Type Descriptions:

- The .csv, Comma Separated Value, file is a simple format that is designed for a database table and supported by many applications. The .csv file is often used for moving tabular data between two different computer programs, due to its open format. The most common software used to open .csv files are Microsoft Excel and RecordEditor, (for more information on .csv files and software, please visit <https://www.file-extensions.org/csv-file-extension>).

National Transportation Library (NTL) Curation Note:

As this dataset is preserved in a repository outside U.S. DOT control, as allowed by the U.S. DOT's Public Access Plan (<https://ntl.bts.gov/public-access>) Section 7.4.2 Data, the NTL staff has performed *NO* additional curation actions on this dataset. NTL staff last accessed this dataset at https://digitalcommons.lsu.edu/transet_data/126 on 2022-05-24. If, in the future, you have trouble accessing this dataset at the host repository, please email NTLDataCurator@dot.gov describing your problem. NTL staff will do its best to assist you at that time.