

Energy Harvesting for Self-Powered Sensors for Smart Transportation Infrastructure Dataset

Dataset available at: <https://doi.org/10.5281/zenodo.5557677>

(This dataset supports report **Energy Harvesting for Self-Powered Sensors for Smart Transportation Infrastructures**)

This U.S. Department of Transportation-funded dataset is preserved in the Zenodo Repository (<https://zenodo.org/>), and is available at <https://doi.org/10.5281/zenodo.5557677>

The related final report **Energy Harvesting for Self-Powered Sensors for Smart Transportation Infrastructures**, is available from the National Transportation Library's Digital Repository at <https://rosap.ntl.bts.gov/view/dot/60745>.

Metadata from the Zenodo Repository record:

Title: Energy Harvesting for Self-Powered Sensors for Smart Transportation Infrastructure

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Description: This research aims to develop an innovative approach for energy harvesting from transportation infrastructures and demonstrate the feasibility of the approach through laboratory testing and field demonstration. The proposed innovative approach of energy harvesting, termed as electromagnetic energy harvesting system (EMEHSs), can be used to power wireless sensors commonly used for health monitoring of bridges. This EMEHS has expected to be simple, but effective in harvesting kinetic energy and converting it to electric power for wireless sensors. Practical and economic feasibility and field implementation of the device on a bridge will also be investigated in this work. Based on detailed numerical simulations and modeling, a larger-scale device will be first tested in the laboratory and then will be installed on a bridge to demonstrate the technology and its effectiveness in powering typical health monitoring sensors.

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Communities: C2SMART Connected Cities with Smart Transportation

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Dataset description:

This dataset contains 1 file collection described below.

EMEH_Phase1.zip:

- File_P1_0_Read Me.xlsx

- File_P1_1_Mechanical drawings.dwg
- File_P1_2_Specimen.JPG
- File_P1_3_TestSetup in Field.JPG
- File_P1_3_TestSetup in Lab.JPG
- File_P1_4_Accl_FieldTest.CSV
- File_P1_4_Cf1k1m1b.CSV
- File_P1_4_Cf1k2m2.TXT
- File_P1_4_Cf2k1m1b.CSV
- File_P1_4_Cf2k2m2.TXT
- File_P1_4_Cf3k1m1b.CSV
- File_P1_4_Cf3k2m2.TXT
- File_P1_4_Cf4k1m1b.CSV
- File_P1_4_Cf4k2m2.TXT
- File_P1_4_Cf5k1m1b.CSV
- File_P1_4_Cf5k2m2.TXT
- File_P1_4_Vemf_FieldTest.txt
- File_P1_5_1_TEST_Acc_Filter.m
- File_P1_5_2_TEST_Voltage_Filter.m
- File_P1_5_3_TEST_Voltage.m
- File_P1_5_4_ANL_MODEL.m

File Type Descriptions:

- The .xlsx and .xls file types are Microsoft Excel files, which can be opened with Excel, and other free available software, such as OpenRefine.
- The dwg file extension is associated with AutoCAD, a CAD software for Microsoft Windows and Apple Mac developed by Autodesk, Inc. The dwg (drawing) file format is a proprietary format used to store two or three dimensional data with any other metadata, (for more information on .dwg files and software, please visit <https://www.file-extensions.org/dwg-file-extension>).
- The .jpg file extension is associated with JPEG (Joint Photographic Experts Group) file format. JPEG is a lossy image compression algorithm that significantly reduces the file size of the original image at the cost of quality. The higher the compression ratio the lower the quality of the .jpg file (for more information on .jpg files and software, please visit <https://www.file-extensions.org/jpg-file-extension>).
- 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>).
- The .txt file type is a common text file, which can be opened with a basic text editor. The most common software used to open .txt files are Microsoft Windows Notepad, Sublime Text, Atom, and TextEdit (for more information on .txt files and software, please visit <https://www.file-extensions.org/txt-file-extension>).

- The file extension .m is associated with the Objective-C, a general-purpose, object-oriented programming language based on Smalltalk language developed by Apple, Inc (for more information on the .m file type and associated software, please visit <https://www.file-extensions.org/m-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://doi.org/10.5281/zenodo.5557677> on 2022-05-18. 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.