

Bridge Deck Inspection Using Small Unmanned Aircraft Systems Based Airborne Imaging Techniques Dataset

Dataset available at: https://digitalcommons.lsu.edu/transet_data/96/

(This dataset supports report **Bridge Deck Inspection Using Small Unmanned Aircraft Systems Based Airborne Imaging Techniques**)

This U.S. Department of Transportation-funded dataset is preserved by the Transportation Consortium of South-Central States (TRAN-SET) in the LSU Digital Commons Repository (<https://digitalcommons.lsu.edu>), and is available at https://digitalcommons.lsu.edu/transet_data/96/

The related final report **Bridge Deck Inspection Using Small Unmanned Aircraft Systems Based Airborne Imaging Techniques**, is available from the National Transportation Library's Digital Repository at <https://rosap.ntl.bts.gov/view/dot/56620>

Metadata from the LSU Digital Commons Repository record:

Document Type: Data Set

Publication Date: 11-2020

Abstract: As one of critical components of a transportation infrastructure system, bridges are very important to a country's economy because they provide passage over physical obstacles to substantially reduce travel time and travel cost. Similar to other types of transportation infrastructure, bridges deteriorate over time. Therefore, bridges should be routinely inspected to ensure their serviceability, capacity, and safety under current traffic. Subsequently, transportation agencies at all levels (e.g., federal, state, local, and tribal) dedicate large amounts of time and money to routinely monitor and inspect bridge conditions as part of their infrastructure asset management programs. These transportation agencies use the collected data to make maintenance, repair, and construction decisions. As one important component of bridge inspection, bridge deck inspection ensures the serviceability and safety of everything above, on, and in bridge decks. Traditionally, bridge deck inspection is performed on the ground by having inspectors either visually inspect surface conditions or interpret the acoustic feedback from hammer sounding or chain dragging to determine subsurface conditions. These traditional methods have many limitations, including but not limited to, expensive, labor-intensive, time-consuming, can exhibit a high degree of variability, requiring specialized staff on a regular basis, and unsafe. Recent advancements in remote sensing, especially small-unmanned aircraft systems (S-UAS) based airborne imaging techniques and object based image analysis techniques, have shown promise in improving bridge deck inspection. This project explored the utility of S-UAS based airborne imaging techniques and object based image processing techniques in developing a complete data acquisition and analysis system to accurately and rapidly detect and assess bridge deck wearing surface and subsurface distresses at a low cost. This project developed a guidebook for the implementation of the proposed S-UAS based inspection system to assist transportation agencies with workforce development and professional training.

Comments: Tran-SET Project: 19STUNM04

Recommended citation:

Zhang, S., Baros, S., & Bogus, S. (2020). Bridge Deck Inspection Using Small Unmanned Aircraft Systems Based Airborne Imaging Techniques. Retrieved from https://digitalcommons.lsu.edu/transet_data/96

Dataset description:

This dataset contains 1 file collection described below.

Bridge Deck Inspection Using Small Unmanned Aircraft Systems Based Airborne Imaging Techniques Dataset.zip:

- TranSET_Final_Report_Data Folder
 - Documentation.docx
 - SfM_Products
 - Ortho_UltraHigh_Quality_DM_RTK_PP.tif
 - DEM_UltraHigh_Quality_DM_RTK_PP.tif
 - Crack_Mesasurements
 - Crack_Width_Measurements.xlsx
 - Crack_Length_Measurements.xlsx
 - Aerial_Photos
 - Contains 92 .jpg files titled DJI_(0171 – 0262).JPG, i.e. DJI_0252.JPG.

.docx: The .docx file is a Microsoft Word file, which can be opened with Word and other free word processor programs, such as Kingsoft Writer, OpenOffice Writer, and ONLYOFFICE.

The tif file extension is traditionally used for Tagged Image File Format - one of the most widely supported lossless (does not lose information during compression) file formats for storing bit-mapped images (for more information on .tif files and associated software please visit <https://www.file-extensions.org/tif-file-extension>).

The .xlsx file type is a Microsoft Excel file, which can be opened with Excel, and other free available software, such as OpenRefine.

.jpg: The jpg file extension is associated with JPEG (Joint Photographic Experts Group) file format, (for more information on .jpg files and software, please visit <https://www.file-extensions.org/jpg-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/96/ on 2021-07-23. 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.