

## Appendix E - Other NBMD Software

Work on NCHRP project 14-15 has produced software utilities in addition to the four applications delivered as products of the project. These other software utilities were used in preparation of NBMD data tables, and may be useful to further development and deployment of NBMD. However, users (DOTs) may have other and better methods for producing equivalent results. These utilities are not needed by users who access completed NBMD datasets. Instead these utilities, or the functions performed by these utilities, would be of interest to users engaged in the preparation of NBMD data tables from DOT sources.

The utilities and their functions are outlined here.

### NBMD *Assembly*

The *Assembly* utility combines multiple DOT work records into total costs and production for maintenance events. The utility combines multiple records of resource use into sums of quantities and costs for identical resources, or sums for each resource category.

To use *Assembly*, DOT work records are first collected into the NBMD headings for *Production\_Table* and *Resource\_Table*. This is usually performed with the *Build* utility (see below). The collected data may have multiple records, usually crew day cards, for a single maintenance event at a bridge. The *Assembly* utility sums work records to get total quantities and costs.

The user selects an input data file using the *Data* button (Figure A5- 5). In the *Mapping* listbox, the user identifies data fields to match. *Assembly* will sum all records that match on all designated data fields. So a selection of *NBMD\_Event\_ID* will sum all records for each maintenance work type at each bridge. The *Units* listbox allows users to update the input measurement units to form standard units. The *Dates* listbox allows users to specify input date fields; *Assembly* will report the earliest and latest dates among work records that contribute to each maintenance event. The *Series Sums* boxes perform sums of values in selected data fields. Usually, quantity fields and cost fields are selected. The *Multiplication::Division* boxes perform operations on summed fields. These are used to compute unit costs (total cost divided by total quantity) for maintenance events.

### NBMD *Build* Utility

The NBMD *Build* utility prepares the initial, un-summed versions of NBMD data tables. *Build* directs DOT data fields into NBMD data tables and fields using the data correspondences shown in Table 33 through Table 45.

Running *Build*, users identify an input *Data* file; this is a raw file from a DOT source (Figure A5- 1). A data *Map* is selected that directs DOT data fields to NBMD data fields. The list boxes permit users to change assignments of DOT data fields to NBMD data fields as necessary. Users can introduce constant strings into selected data fields. Constants are used for dataset identifiers. NBMD identifiers for Event, Bridge,

Element and Resource involve concatenation of other data fields. These manipulations are performed in the *Mash* boxes in *Build*.

### **NBMD Inspection Cross**

The *Inspection Cross* utility operates with *Production\_Table* and *Inspection\_Event\_Table* to identify the inspections that occur before and after maintenance events. The output is the *Inspection\_Cross\_Reference\_Table* for a dataset. The version of *Inspection\_Event\_Table* used here is developed directly from Pontis *inspevnt* table, and contains all inspections recorded in a Pontis bridge database. Later, after the NBMD *Inspection\_Cross\_Reference\_Table* is generated, the *Inspection\_Event\_Table* stored in a dataset contains only the inspections related to maintenance events in the dataset.

To use *Inspection\_Cross*, the user identifies a *Production\_Table* using *Event*, and an *Inspection\_Event\_Table* using *Inspection* (Figure A5- 2). Data fields are identified automatically and displayed in the selection boxes in *Events* and *Inspection*. The boxes allow users to change data field identifications, if necessary.

### **NBMD NBI Reader Utility**

The NBMD *NBI Reader* creates tab-delimited flat text fields from National Bridge Inventory files available from FHWA (Figure A5- 3). *NBI Reader* operates with a list of data field names and positions. The data field names are fixed by users, but usually are the same as data field names in the NBI record. The positions are those of the NBI data record, identified in Appendix E of the *Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges* (Ref 42).

### **NBMD PDI Reader Utility**

The *PDI Reader* utility creates delimited text files from Pontis Data Interchange (PDI) files (Figure A5- 4). The *Reader* scans a PDI file, identifies the Pontis tables in the file, allows the user to select a table to extract as a delimited flat file, and allows the user to specify the delimiter to use between data fields in the output file. Delimiters can be any character, but commas and tabs are often used. The output file has a delimited column format in plain text with data field headings in the first line.

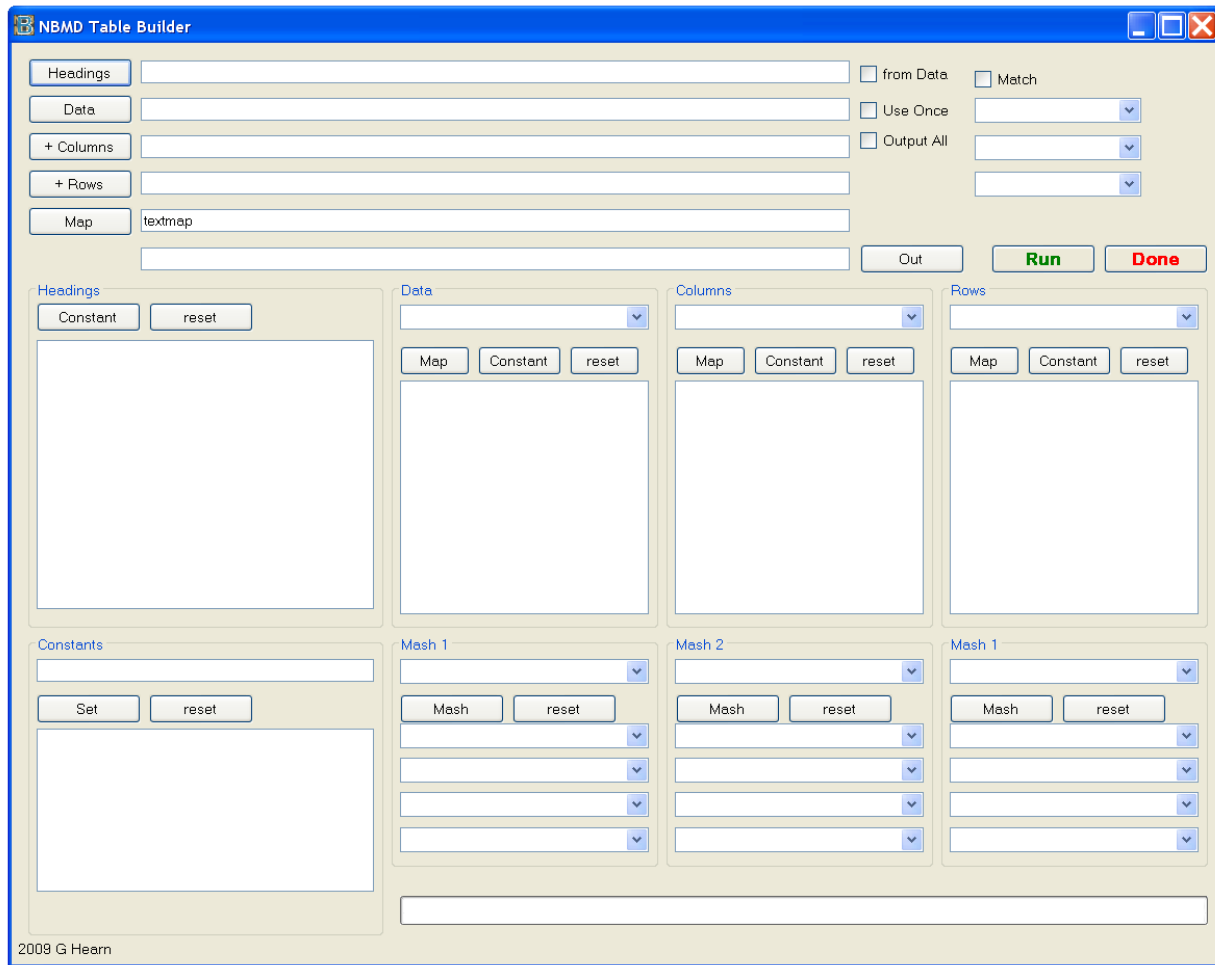


Figure A5- 1 NBMD Build Utility

The screenshot shows a software window titled "Bridge Inspection Cross Table". At the top, there are two input fields labeled "Event" and "Inspection". Below these is an "Output" button. The main area is divided into two sections: "Events" and "Inspection".

**Events Section:**

- event: dropdown menu
- DataSet: dropdown menu
- Start D: dropdown menu
- End Date: dropdown menu
- Bridge ID: dropdown menu
- brkey: dropdown menu

**Inspection Section:**

- brkey: dropdown menu
- Element Done: dropdown menu
- inspkey: dropdown menu
- UW Done: dropdown menu
- inspdate: dropdown menu
- FC Done: dropdown menu
- NBI done: dropdown menu
- O / Sp Done: dropdown menu

On the right side of the "Inspection" section, there are three buttons: "Reset", "Run", and "Done". At the bottom left, there is a copyright notice "2009 G Hearn" and a long empty text input field.

Figure A5- 2 NBMD Inspection Cross Reference Utility

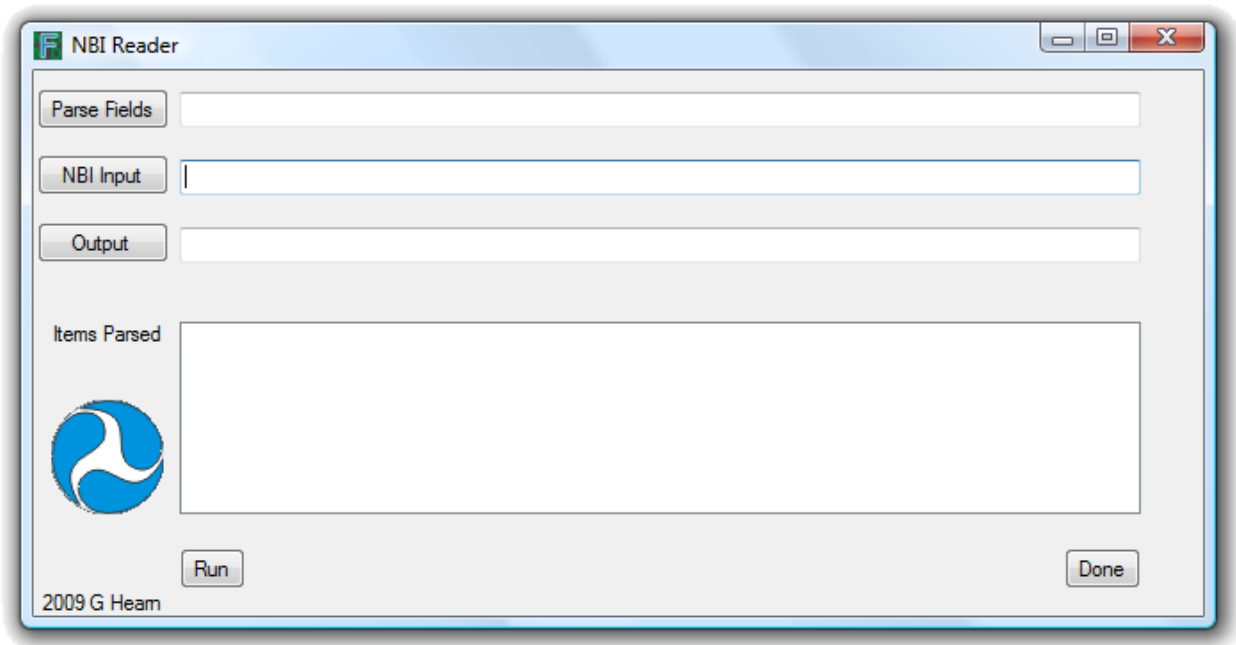


Figure A5- 3 NBMD NBI Reader Utility

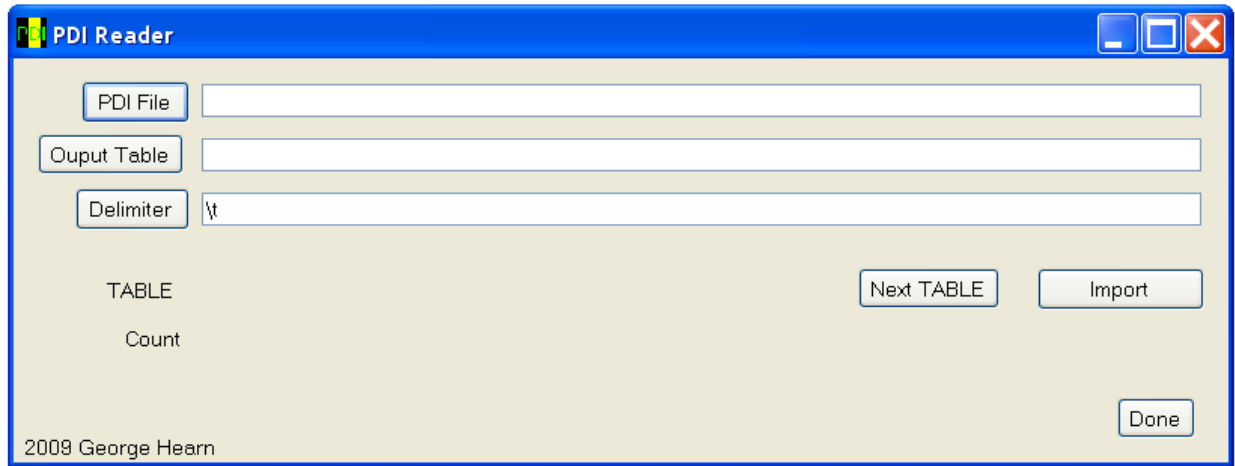


Figure A5- 4 NBMD PDI Reader Utility

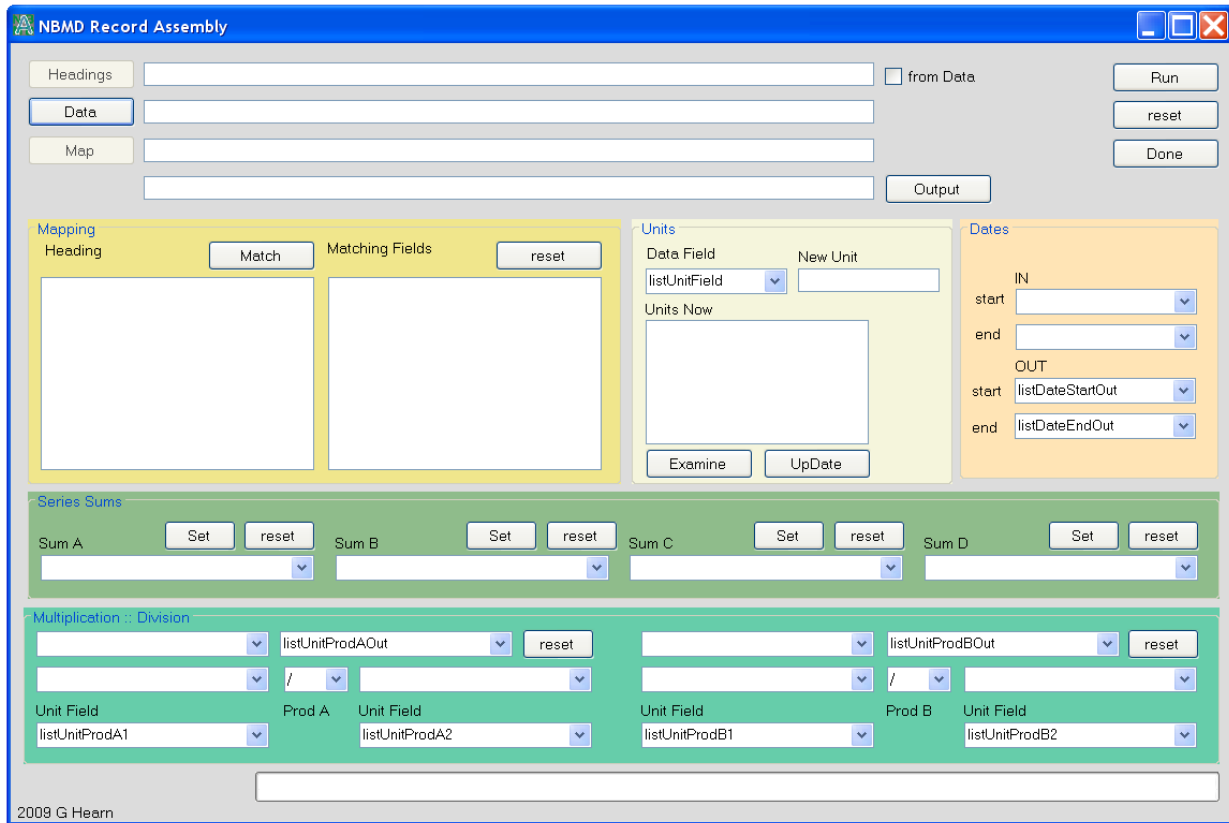


Figure A5- 5 NBMD Assembly Utility