B2W SOFTWARE

B2W FLEET MAINTENANCE & MANAGEMENT
BEST PRACTICES SERIES:

ESTABLISHING AN EFFECTIVE FLEET NUMBERING SYSTEM

CONTENTS

Jennifer Angrisano has helped organizations improve maintenance practices in the heavy construction sector for more than 15 years. Before joining B2W Software as business analyst, she was a total process management consultant. Previously, she led the conversion to a software based program for a heavy highway construction enterprise with a fleet of more than 300 pieces of equipment, turning a $1.3 million loss in the shop into a $200,000 gain in a single year.

Mike Vorster is the founder of C.E.M.P Central, a teaching, training and consulting organization that has helped numerous companies advance the management of construction equipment fleets. He is also professor emeritus at Virginia Tech, where he has taught in the Construction Engineering and Management Program, and the author of the industry-standard guide and reference text Construction Equipment Economics. He works with B2W Maintain users to help them improve asset utilization while cutting ownership and maintenance costs.

Scope

Equipment fleets consist of a large number of individual units that vary tremendously in terms of their form, function, size, weight, productive capacity and cost. This makes it impossible to collect meaningful statistics without an efficient way to sort units according to their key characteristics and produce performance statistics at levels defined by:

Business Units are responsible for managing the company's activities.

Category of equipment used by the **Business Unit**.

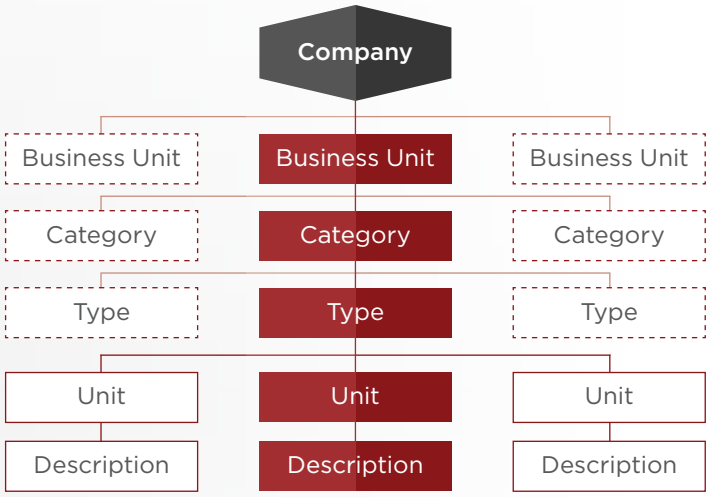
Type of equipment that falls within a given **Category**.

Units that fall within a the given **Type**.

A fleet numbering system is critical to success, as it is impossible to produce meaningful statistics within **B2W MAINTAIN** without a well-structured, logical and rational numbering system that uses the capabilities provided by the software.

Resources

B2W MAINTAIN is able to implement a fleet numbering system based on the Company Business Unit, Category, Type and Unit structure shown in Figure 1.



All fields other than Category are entered in the New Equipment setup screen as shown in Figure 2, where the user is able to enter:

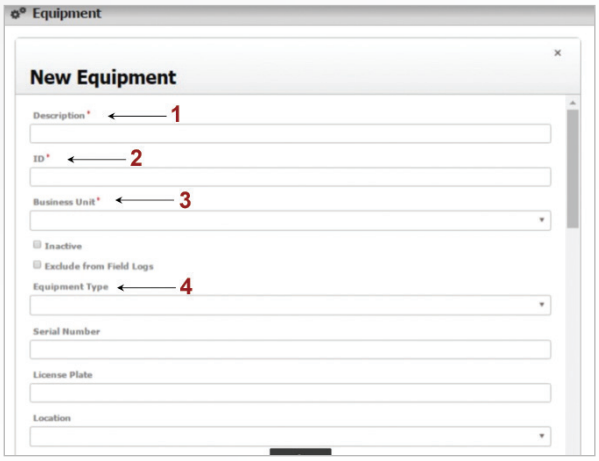


FIGURE 2

1 A free-form description of the unit

2 The Unit ID number that uniquely identifies the asset

3 The Business Unit

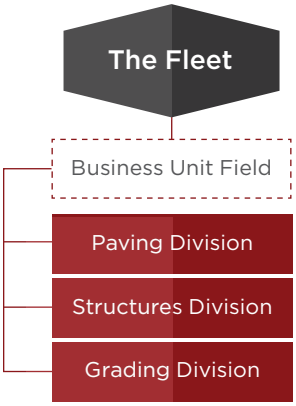
4 The equipment Type

Details and examples of possible entries into these fields are given in the Methodology section of this document.

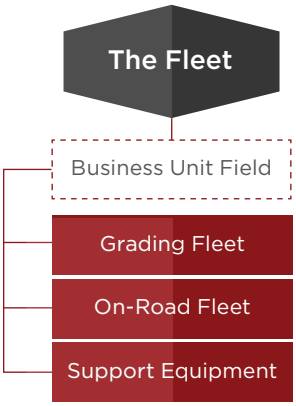
QUICK TIP

The Category field in **B2W MAINTAIN** is not exposed in the Equipment Module but is tied to the equipment Type. Categories are set up in the back end under **Setup > Categories > Equipment Category**.

FIGURE 3



A mix of equipment is the focused responsibility of a General Manager



Specialized groups of assets supporting company operations

Methodology

Practice regarding the use of the fleet numbering fields will vary substantially, and client companies are likely to have existing systems that need to be modified to fit the methodology and terminology used in **B2W MAINTAIN**.

This will be particularly true when it comes to the unit number, which is almost invariably tied to historical costs and performance records in existing systems. Any problems arising can be overcome by carrying existing unit numbers over into the **B2W MAINTAIN** Unit ID field and using the **B2W MAINTAIN** Business Unit, Category and Type fields as searchable reportable fields that will then form a prefix to the existing numbers.

The following notes can be seen as good practice guidelines for the use of each field.

Business Unit

This field is most commonly used to summarize results and performance statistics that are seen as the responsibility of a clearly identified Vice President or General Manager. Business units are defined either geographically (e.g. Northern Division, Utah Operations) or by business line (Paving Division, Structures Division, Grading Division).

Another recommended use for the Business Unit field is to use it to divide a single large fleet into a number of sub fleets of very different equipment in order to summarize results and statistics for parts of the whole. When this is done, the field is used to define sub fleets such as the grading fleet, the on road fleet and support equipment.

The distinctions are shown in Figure 3.

Methodology *continued*

Category

This field is most commonly used to identify units by their basic form and function. Definitions can be made at a fairly high level as the equipment type field remains available to further divide and define the category. Three things characterize the units in a given category:

1. All units in the category will have the same form and/or function, but probably not the same size and productive capacity.

2. All units in the category will have a common set of business rules defining how they are charged to jobs and how job costs are calculated. (Heavy duty trucks are charged on a mileage basis, dozers and excavators are charged on an hourly basis, water pumps are charged on a weekly basis.)

3. All units will have the same "engine" to drive scheduled maintenance programs. (Heavy duty trucks will have two service types and will be serviced every 5,000 miles, dozers and excavators will have four service types and will be serviced every 250 hours, water pumps will be inspected and serviced monthly.)

Type

This field is used to divide equipment categories into "families" of similar machines all of which have the same fundamental function and productive capacity. Class 8 tractors all pull trailers of a certain capacity, all similarly equipped 200 to 300 horse power dozers all perform essentially the same function.

The measure used to distinguish between types varies with the equipment category and can be descriptive (tri axle dump trucks) or quantitative (200 to 300 Hp). See examples in the sidebar.

EXAMPLES OF TYPES & THEIR UNITS OF MEASURE

- **Highway trucks** descriptive and by standard FHWA class
- **Dozers** by engine power range
- **Excavators** by weight range
- **Pumps** by diameter
- **Cranes** descriptive and by capacity

Methodology *continued*

Type continued

Most users will have between three and five equipment types in a given category. Distinctions are often made between dozers or graders that are/aren't fitted with GPS blade control, in that they perform different functions and, in most cases, will have different rates.

Machines on short-term rental provide an interesting example of the distinction between categories and types. If rental units are charged to jobs or maintained outside the norms established for the fleet then they are separated from owned units at a category level. If they are charged to jobs or maintained within the norms established for the fleet then they are separated from owned units at a type level.

The classification of the fleet into clearly defined equipment types is extremely important for three reasons:

1. All units in a given type will share the same hourly, weekly or monthly rate. This means that estimators are "blind" as to which unit of a given type will actually be sent to the job to perform the work. Units of a given type all "cost" the same and do the same work.

2. The vast majority of fleet management decisions are based on values for deployment, utilization, availability, reliability and cost established at the type level.

3. All units in a given type have their costs summarized at a type level and "work together" to achieve their budgets and balance their books. One type – dozers – cannot be allowed to subsidize the cost of another type – excavators.

QUICK TIP

One type of equipment – such as dozers – cannot be allowed to subsidize the cost of another type – such as excavators.

Unit

The unit field identifies the particular asset. It is the "anchor" of the whole system in that costs, histories and all other performance statistics are collected at a unit level. Work requests are initiated at a unit level, work orders are created at a unit level and data entered into B2W TRACK is done at a unit level.

Clients often carry over a legacy unit numbering system because of its association with historical records. When this is not done, it is recommended that a simple four digit number is used with the first two numbers being the year of purchase and the last two being a series number for the assets purchased in the year.

GOOD PRACTICE REQUIRES 2 THINGS

1. A degree of standardization; “Volvo artic” is different from “30 ton Volvo”
2. A measure of brevity

Methodology *continued*

Description

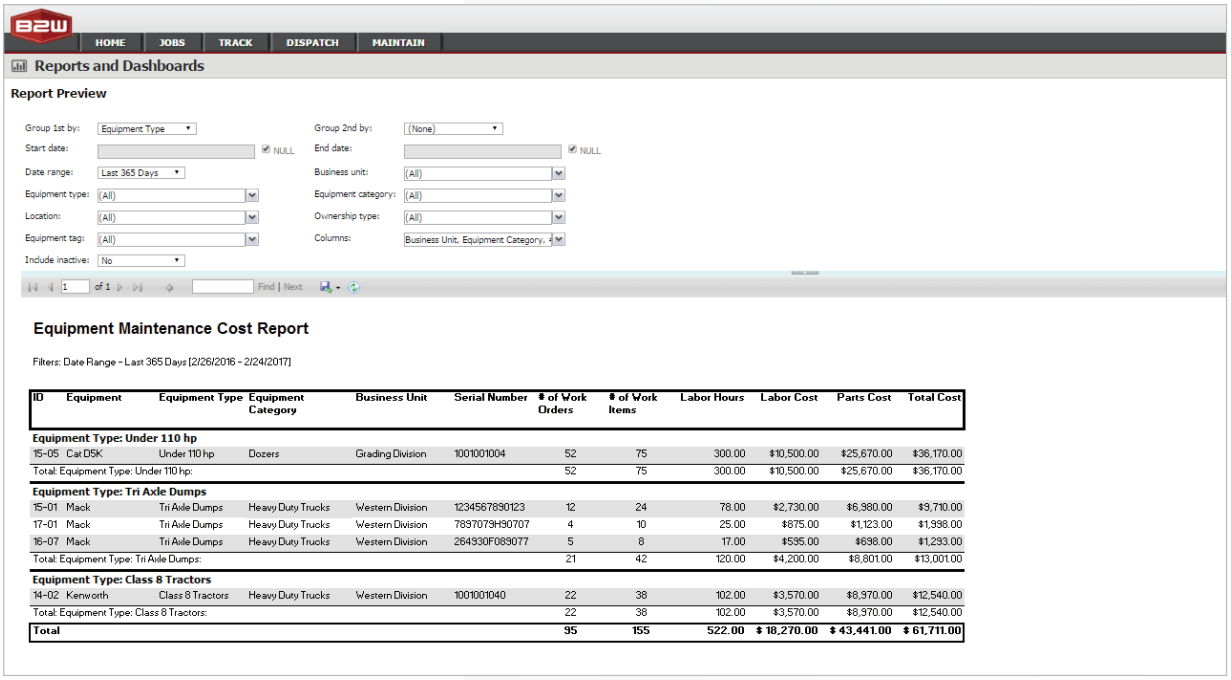
This field is available to add depth and character to the unit number. While frequently reported, it is purely descriptive and plays no role in selecting, sorting or summarizing records.

Below are examples of some units classified within the numbering system.

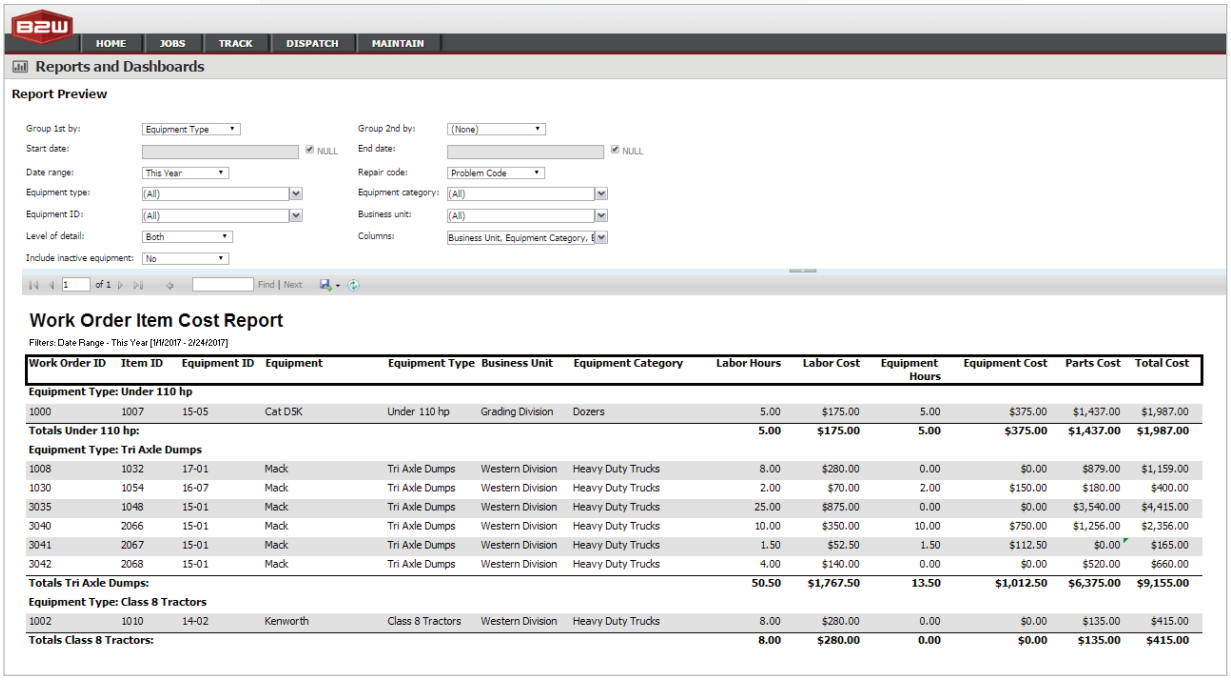
Business Unit	Category	Type	Unit	Description
Western division	Heavy duty trucks	Class 8 tractors	14-02	Kenworth
		Tri axle dumps	15-01	Mac
	Water pumps	Over 6”	12-16	Honda
		Under 6”	10-03	Briggs and Stratton
	Conex boxes	Full length	01-15	K. Smith tools
		Half length	01-02	Cables and slings
Grading division	Dozers	Under 110 hp	15-05	Cat D5K
			18-06	Deere 650K
		110 to 200 hp	16-07	Cat D6N
			14-04	Deere 850K
	Excavators	50k to 100k lbs	18-09	Deere 350GLC
		100k to 150k lbs	18-25	Cat 345 DL

Results

The fleet numbering system makes it possible to sort, select and summarize all reports produced in **B2W MAINTAIN** and ensure that information is relevant to the issue at hand.



ID	Equipment	Equipment Type	Equipment Category	Business Unit	Serial Number	# of Work Orders	# of Work Items	Labor Hours	Labor Cost	Parts Cost	Total Cost
Equipment Type: Under 110 hp											
15-05	Cat D5K	Under 110 hp	Dozers	Grading Division	1001001004	52	75	300.00	$10,500.00	$25,670.00	$36,170.00
Total: Equipment Type: Under 110 hp:						52	75	300.00	$10,500.00	$25,670.00	$36,170.00
Equipment Type: Tri Axle Dumps											
15-01	Mack	Tri Axle Dumps	Heavy Duty Trucks	Western Division	1234567890123	12	24	78.00	$2,730.00	$6,980.00	$9,710.00
17-01	Mack	Tri Axle Dumps	Heavy Duty Trucks	Western Division	7897079H90707	4	10	25.00	$875.00	$1,123.00	$1,998.00
16-07	Mack	Tri Axle Dumps	Heavy Duty Trucks	Western Division	264930F089077	5	8	17.00	$595.00	$698.00	$1,293.00
Total: Equipment Type: Tri Axle Dumps:						21	42	120.00	$4,200.00	$8,801.00	$13,001.00
Equipment Type: Class 8 Tractors											
14-02	Kenworth	Class 8 Tractors	Heavy Duty Trucks	Western Division	1001001040	22	38	102.00	$3,570.00	$8,970.00	$12,540.00
Total: Equipment Type: Class 8 Tractors:						22	38	102.00	$3,570.00	$8,970.00	$12,540.00
Total						**95**	**155**	**522.00**	**$ 18,270.00**	**$ 43,441.00**	**$ 61,711.00**



Work Order ID	Item ID	Equipment ID	Equipment	Equipment Type	Business Unit	Equipment Category	Labor Hours	Labor Cost	Equipment Hours	Equipment Cost	Parts Cost	Total Cost
Equipment Type: Under 110 hp												
1000	1007	15-05	Cat D5K	Under 110 hp	Grading Division	Dozers	5.00	$175.00	5.00	$375.00	$1,437.00	$1,987.00
Totals Under 110 hp:							**5.00**	**$175.00**	**5.00**	**$375.00**	**$1,437.00**	**$1,987.00**
Equipment Type: Tri Axle Dumps												
1008	1032	17-01	Mack	Tri Axle Dumps	Western Division	Heavy Duty Trucks	8.00	$280.00	0.00	$0.00	$879.00	$1,159.00
1030	1054	16-07	Mack	Tri Axle Dumps	Western Division	Heavy Duty Trucks	2.00	$70.00	2.00	$150.00	$180.00	$400.00
3035	1048	15-01	Mack	Tri Axle Dumps	Western Division	Heavy Duty Trucks	25.00	$875.00	0.00	$0.00	$3,540.00	$4,415.00
3040	2066	15-01	Mack	Tri Axle Dumps	Western Division	Heavy Duty Trucks	10.00	$350.00	10.00	$750.00	$1,256.00	$2,356.00
3041	2067	15-01	Mack	Tri Axle Dumps	Western Division	Heavy Duty Trucks	1.50	$52.50	1.50	$112.50	$0.00	$165.00
3042	2068	15-01	Mack	Tri Axle Dumps	Western Division	Heavy Duty Trucks	4.00	$140.00	0.00	$0.00	$520.00	$660.00
Totals Tri Axle Dumps:							**50.50**	**$1,767.50**	**13.50**	**$1,012.50**	**$6,375.00**	**$9,155.00**
Equipment Type: Class 8 Tractors												
1002	1010	14-02	Kenworth	Class 8 Tractors	Western Division	Heavy Duty Trucks	8.00	$280.00	0.00	$0.00	$135.00	$415.00
Totals Class 8 Tractors:							**8.00**	**$280.00**	**0.00**	**$0.00**	**$135.00**	**$415.00**

Interactions

The fleet numbering system established in **B2W MAINTAIN** impacts every element of the **B2W ONE platform**.

ESTIMATE

The rates used are defined by **Type**.

TRACK

Data is entered by **Unit**. Charges are calculated according to the rules in the **Category** definition and the rates in the **Type** definition.

SCHEDULE

Resources are scheduled by Unit with deployment and availability of required resources summarized by **Type**.

QUICK TIP

All the elements of the **B2W ONE Platform** use the fleet numbering system which must, of necessity, interface directly with any general ledger based fleet costing system used by a client company.

Definitions

Term	Definition
Business unit	The organizational unit responsible for the performance of the work and the management of the equipment assets used within the organizational unit. Can also be used to divide a large single fleet into a series of sub fleets according to sort and summarize performance statistics for significantly different equipment types or applications.
Category of equipment	Broad categorization of equipment in the fleet by form and function. All units in a category normally have a common set of business rules defining how job costs are calculated. All units in a category normally have a common ”engine” that defines the sequence and timing of programed maintenance actions.
Description	A free form field defined at a Unit level that adds depth to the information in and understanding of the unit number.
Type	A narrow categorization of equipment in the fleet by similar machines all of which have the same fundamental function and productive capacity. Criteria such as weight, power, key dimension and capacity are used to define type. All units of a given type will share the same hourly, daily weekly or monthly internal transfer price (rental rate). The hourly, daily weekly or monthly internal transfer price (rental rate) for a given type is used in estimating.

The following can be used to illustrate the relationship between fields.

One	Can contain or manage many
Company	Business units
Business unit	Categories
Category	Types
Type	Units
Unit has one description	

Watch **B2W Maintain** introduction video: