

9-24-2002

Repair Time Standards for Transit Vehicles: Transit Database User's Manual

Grisselle Centeno

Follow this and additional works at: https://scholarcommons.usf.edu/cutr_reports

Scholar Commons Citation

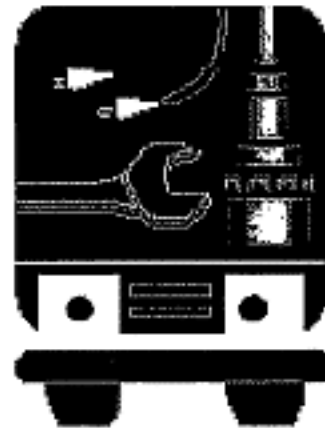
Centeno, Grisselle, "Repair Time Standards for Transit Vehicles: Transit Database User's Manual" (2002).
CUTR Research Reports. 427.

https://scholarcommons.usf.edu/cutr_reports/427

This Technical Report is brought to you for free and open access by the CUTR Publications at Scholar Commons. It has been accepted for inclusion in CUTR Research Reports by an authorized administrator of Scholar Commons. For more information, please contact scholarcommons@usf.edu.

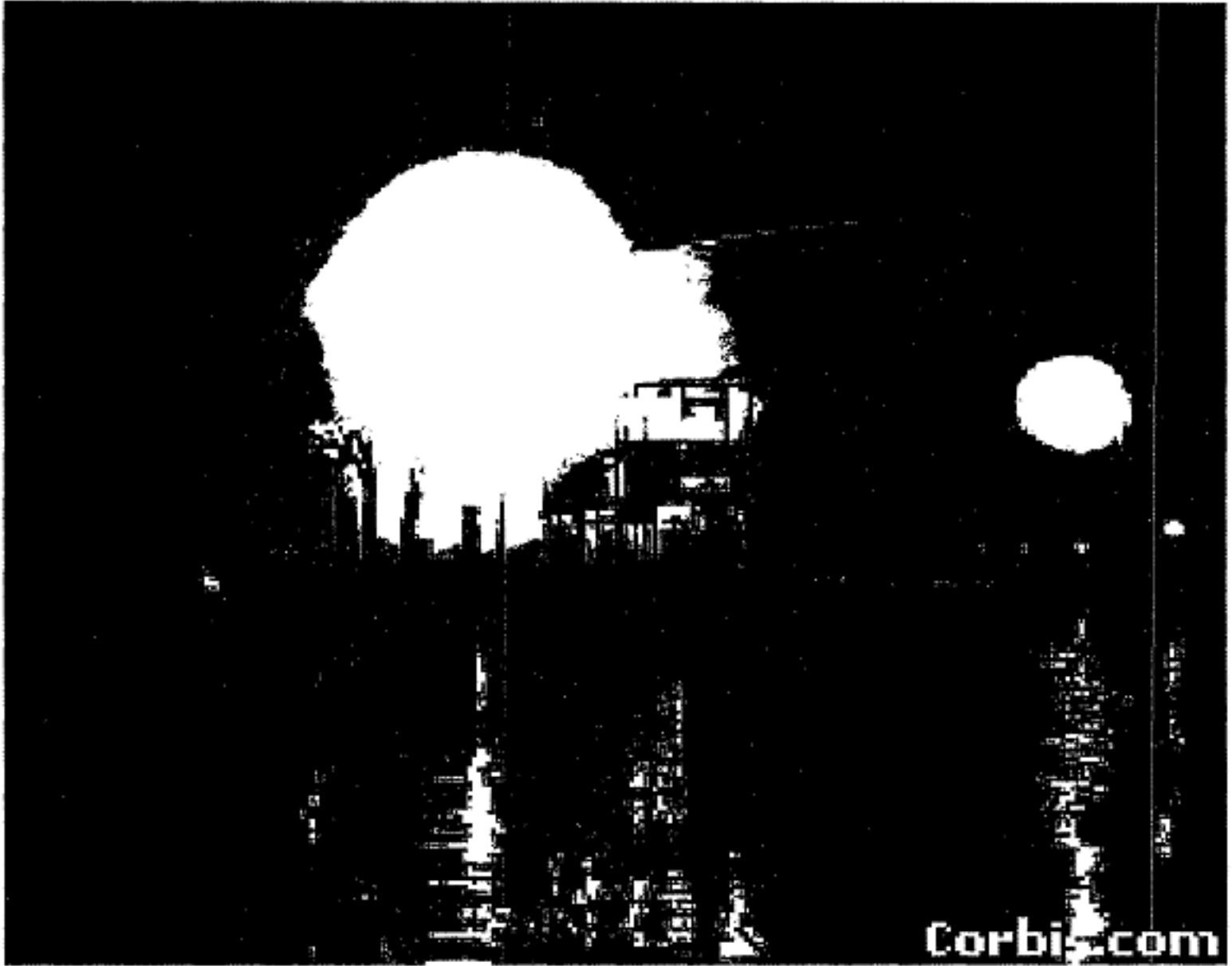
**REPAIR TIME STANDARDS
FOR TRANSIT VEHICLES
TRANSIT DATABASE
USER'S MANUAL**

SEPTEMBER 24, 2002



Submitted by: Grisselle Centeno, Ph. D.
Industrial and Management Systems Engineering Department
University of South Florida

FDOT Project BC137-RPW032
CUTR Account 2117-473-LO



TRANSIT DATABASE USER'S MANUAL

TABLE OF CONTENT

1.0	WELCOME!!	3
2.0	INTRODUCTION	3
3.0	SYSTEM REQUIREMENTS	3
4.0	BACK-UPS	3
5.0	ICONS.....	4
6.0	MENUS.....	4
6.1	Sub-Menus.....	5
6.1.1	Forms Sub-Menu.....	5
6.1.2	Reports Sub-Menu	6
7.0	REPORTS.....	7
7.1	Work Flow Report.....	7
7.2	Work Log Report	8
7.3	Performance Level Report	9
8.0	RELATIONSHIP BETWEEN DATA.....	10
9.0	HOW TO'S FOR TRANSIT DATABASE.....	11
10.0	TRANSIT DATABASE DICTIONARY	12

1.0 WELCOME!!

Welcome to the Transit Database. The following is a Users' Manual created to help a layman learn to understand and operate the database with ease, and generate customized Reports for viewing.

2.0 INTRODUCTION

This database provides information on the time standards for the repair of the braking systems of the transit vehicles. The database would also give the work elements required to do the repair jobs on the transit vehicles along with the standard time required to do the job. The database is intended to help the managers to evaluate the relative productivity or the combined productivity of all employees. In addition, it allows managers to schedule specific tasks to employees and to obtain an estimate of ending time of those tasks according to the standards previously determined. Other functions provided by database are explained further in other sections.

3.0 SYSTEM REQUIREMENTS

To use the Transit database, minimum system requirements are listed below:

- Intel Pentium processor, AMD Duron or equivalent (500 MHz system speed)
- 64 MB RAM
- At least 50 MB of free hard disk space (8 GB HDD preferred)
- Microsoft Office 2000, Professional edition.
- Microsoft Windows 2000 operating system
- CD ROM (16x preferred)

4.0 BACK-UPS

It is recommended that a back-up of the database be made very week in order to have the latest and current information stored in case of machine failure. Back-ups must be stored on a separate machine preferably, on FTP Programs (Remote disk space) or on CD if a CD Burner is available.

5.0 ICONS

The following are the various icons used within the database, and their function is explained briefly.



REPORT BUTTON



FORM BUTTON



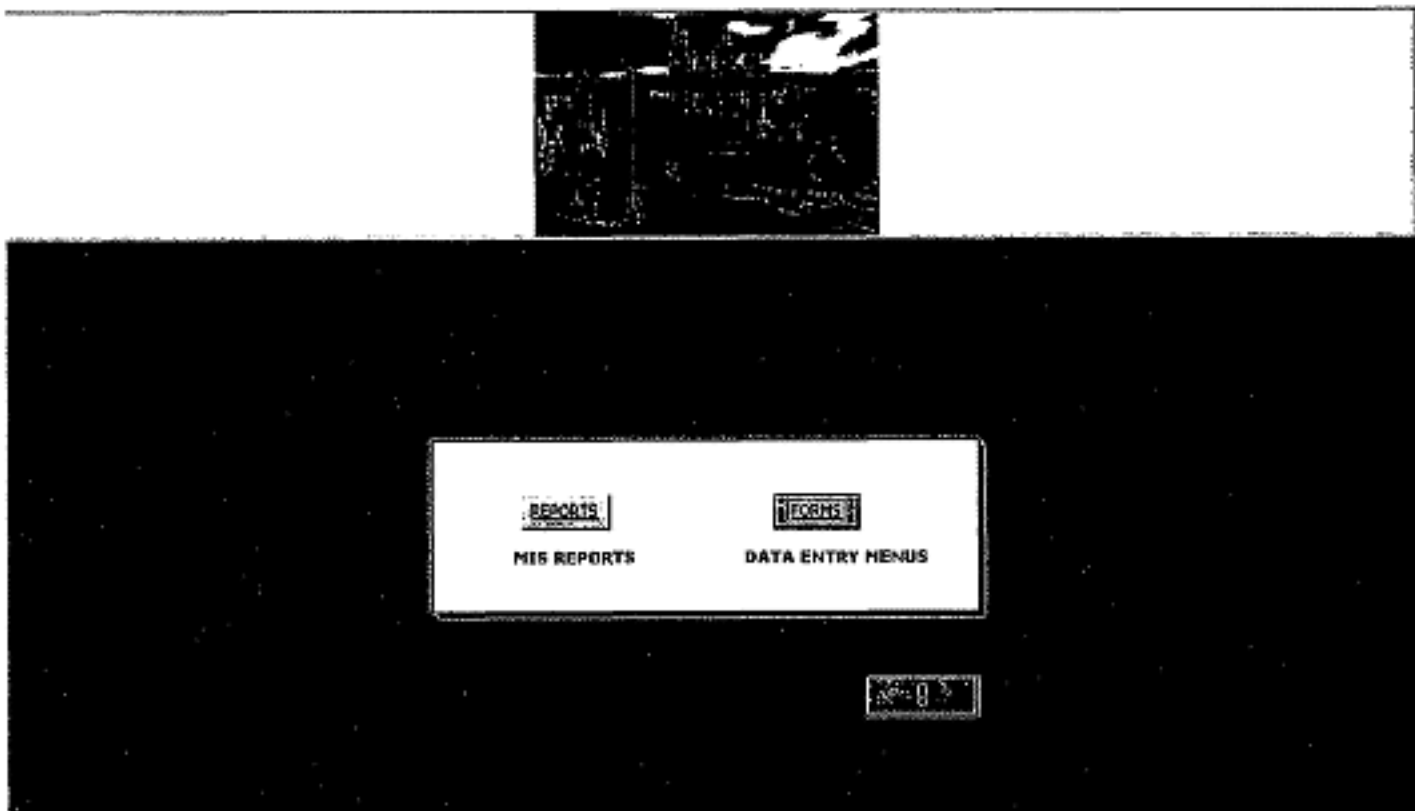
'BACK' NAVIGATION BUTTON



'EXIT MENU' BUTTON

6.0 MENUS

The Main Menu is provided with two buttons: one for Data Entry (Forms) and another to view/customize Reports There is an Exit button at the bottom to close this page.



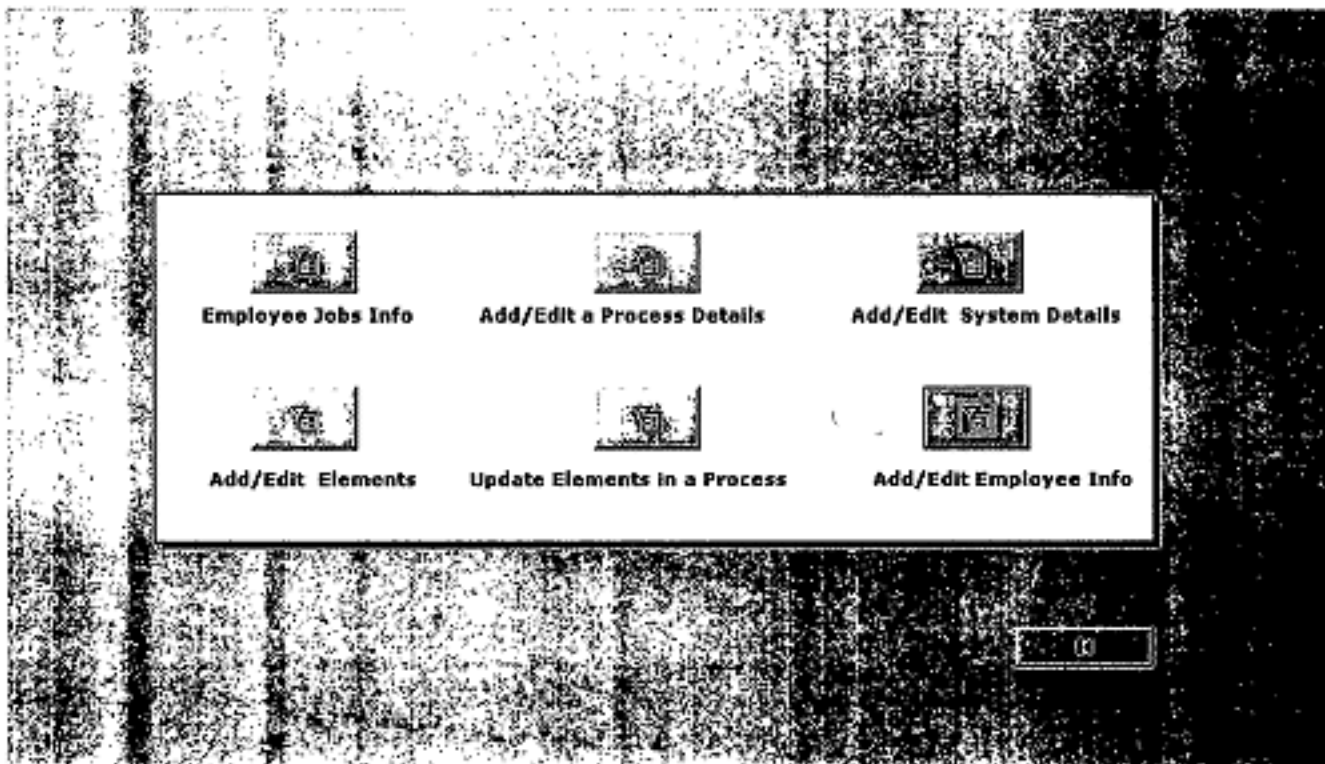
6.1 Sub-Menus

Every sub-menu has clearly marked buttons for accessing various Forms or Reports. For Example, within the Reports Menu, we have a Work Flow Report, for viewing the flow of various processes in a Brake Job.

6.1.1 Forms Sub-Menu

Forms are meant for data entry, updating, editing and deleting records of transactions, clients, order in information, etc. It is through these forms that the database will be populated. Keeping in mind user convenience, the menus are created in such a way that the user can move from one related form to another with in a single click. For example, for entering employee data for a new employee, the Employee Details Form needs to be updated. So when the user fills out the Employee Form, the next for in the sequence can be accessed by one click as shown in the screen shot below. To access the forms simply select the required form from the Forms Menu.

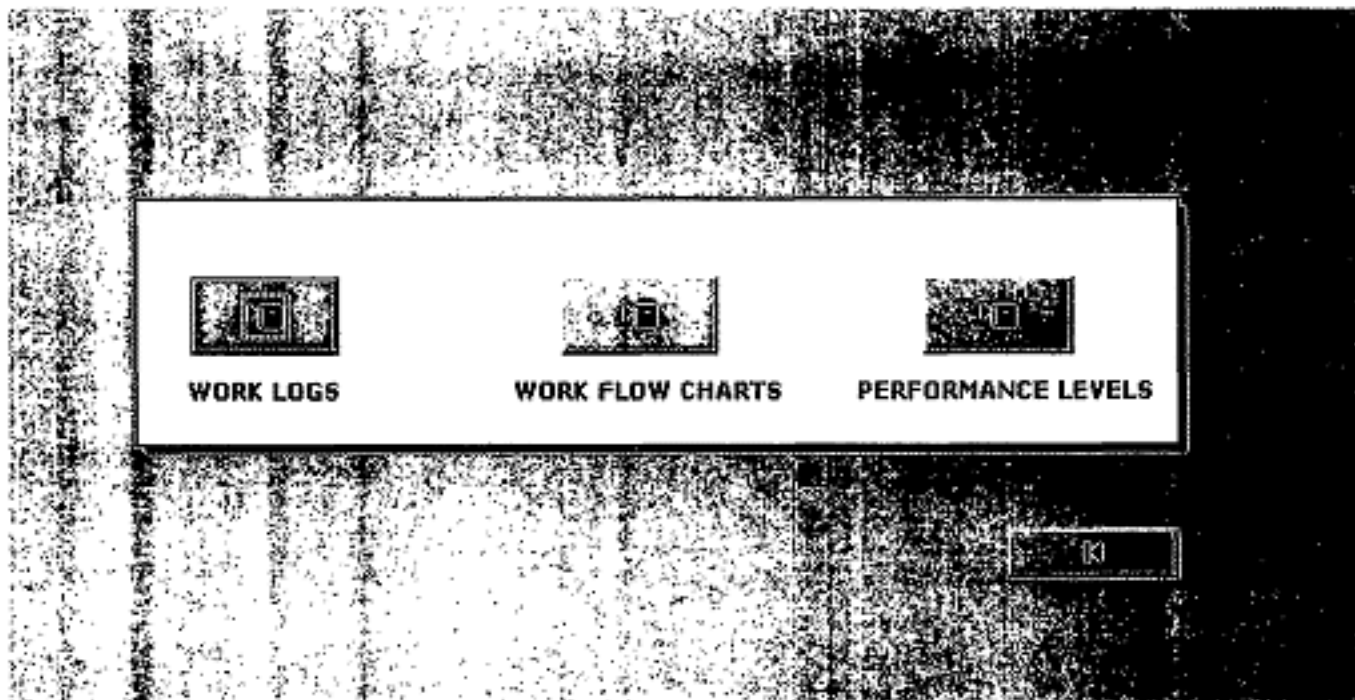
As shown below, there are several buttons to access various forms. These Forms are used to enter/update data in the tables of the database. The formats and parameters for entering data in forms are shown in the Data Dictionary at the end of the manual.



6.1.2 Reports Sub-Menu

Reports provide specific business information in a printable format. Some of the reports can be generated based on criteria like time period. Every report created for the Transit Database has a specific business function like Employee Performance tracking or Work Flow. Details of all the Reports are given below.

As shown next, the Reports sub-menu has three buttons to access the respective Reports. The Work Order Report takes user inputs for Report start and end dates.



7.0 REPORTS

Reports provide specific business information in a printable format. Some of the reports can be generated based on criteria like time period. Every report created for the Transit Database has a specific business function like Employee Performance tracking or Work Flow. Details of all the Reports are given below.

7.1 Work Flow Report

As shown below, this report shows at a glance the processes involved in a brake job, their Standard Times and a brief description of the processes. This can be handed to a worker along with the Flow Chart provided with the database to use as a guideline. The Management can also add/edit processes through the Forms, and all changes will automatically be reflected in the Reports.

Work Flow

System Name **brakes**

Process Name	Std Time Minutes	Description
Bus Arrangement	5	Raise bus and back up brakes
Remove Tires	8	Remove RHS and LHS wheels
Axle Removal	10	Removing axles on either side with assembly
Drum Disassembly	15	Dissambling the drums
Mount Shoe Brake	21	Mounting the shoe brake
Mount Hub And Drum	18	Mounting the hub and drum on either side
Mount Axle	15	Mounting the axle assembly back on either side
Bus adjustment	14	Receding the brakes
Tire Mounting	24	Mounting wheels on both sides back

Grand Total

130

7.2 Work Log Report

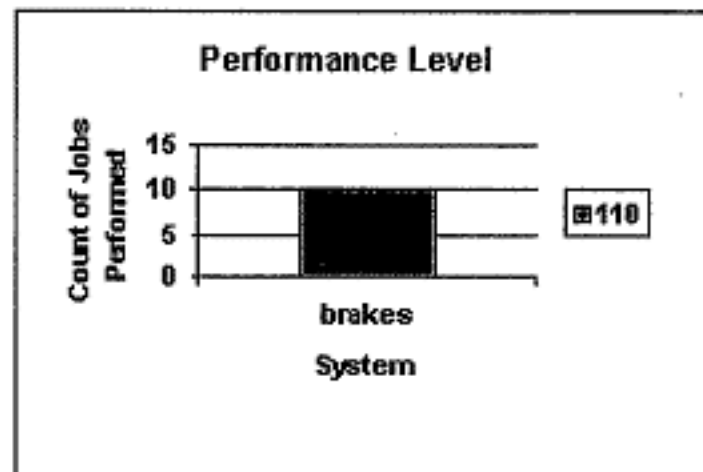
For this report the user needs to enter start and end dates for which the Report is generated. This Report shows which job was performed by which employee and on what date. It also provides comparison between Operator and Standard times. Report is shown below. This Report keeps a track of worker performance and can be used for performance evaluation, identifying training needs and assessing scientific grounds for promotion of employees.

Work Log

First Name	Last Name	Job Type	Std Time	Operator Time	Date
Raj	Chaudhary	brakes	300	32	8/29/2002
		brakes	300	333	7/31/2002
		brakes	300	340	7/31/2002
		brakes	300	265	7/31/2002
		brakes	300	753	9/1/2002
Vik	Bhide	brakes	300	410	8/12/2002
		brakes	300	285	8/12/2002
		brakes	300	340	8/12/2002
		brakes	300	245	8/12/2002
		brakes	300	30	9/15/2002

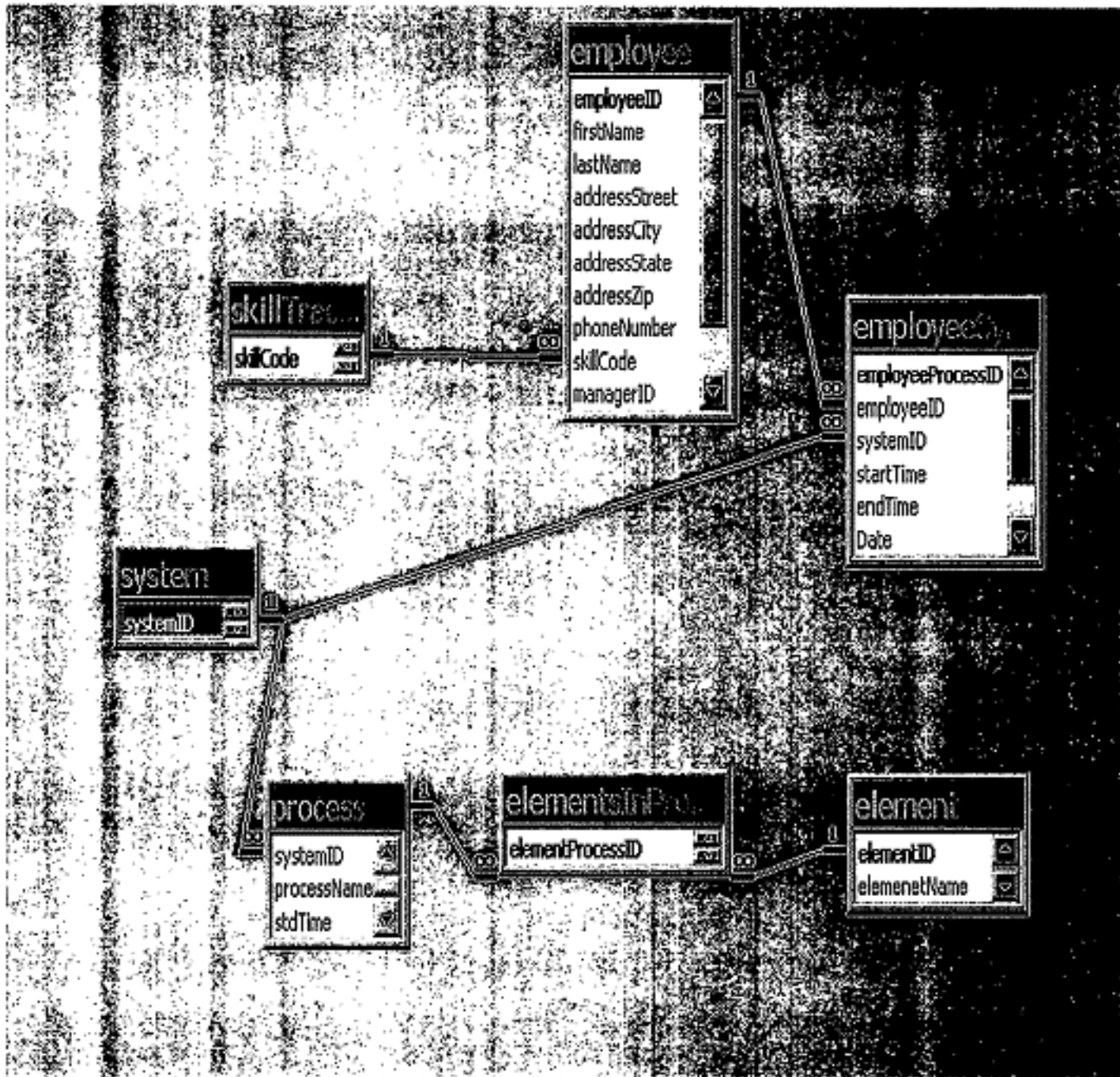
7.3 Performance Level Report

This is a graphical Report and shows at a glance the number of jobs worked on, the average Performance level for the jobs. This allows Management to find out the preparedness of the facility to do brake jobs. See picture below.



8.0 RELATIONSHIP BETWEEN DATA

All the tables within the database are connected to one another in some way, such that data can be viewed using the Reports in any manner. The relationships are shown below in the Entity-Relationship diagram. Explanation of each table is covered in the data dictionary.



9.0 HOW TO'S FOR TRANSIT DATABASE

1. How to enter a new Element in a Process?

Two forms need to be entered, the Element Details form, which adds a new element into the database and the ElementsinProcess form, which corresponds this element to a particular Process/es.

2. How to evaluate employee performance?

Use the 'Work Log' report by entering the period for which performance measurement is needed. Then check the employees Performance Rating, and compare improvement/progress.

3. How to add Processes to a system?

Use the Process details form to create a new Process and match it to a system via the SystemID.

IMPORTANT: *When adding new process times, give additional 15% allowance to the times for fatigue, standing, etc. by multiplying the time by 1.15.*

4. How to generate a Work Order?

Use the Work Flow report to enlist Standard Times and processes in the system to be worked on, and use the 'Proposed Flow Chart' to check detailed method.

5. How to measure System time?

After the set up is complete and the work order is given, start the time measurement.

Stop the clock for foreign elements, and restart after it is resolved.

Stop the clock when work order is returned.

6. How to delete incorrect entries?

Go to the concerned form, scroll to the incorrect entry using scroll bars at the bottom, and when the desired record appears, delete entry or delete entire record.

10.0 TRANSIT DATABASE DICTIONARY

System: This refers to the various jobs like brakes, air conditioning, etc within the facility.

Process: A system is made up of several 'Processes' as shown in the Process table. Each Process is unique and corresponds to some System via the System ID.

Element: This is smallest defined work element. Many elements together make a Process or entire System, e.g., Remove Nuts from wheel. The database contains over 200 Elements corresponding to Brake Jobs.

The following tables summarizes and describes each of the entity sets of the database. For each entity sets and related attributes the data type along with the description for each attribute is provided.

DATA DICTIONARY			
TABLE NAME	ATTRIBUTE	DATA TYPE	DESCRIPTION
element			Records all element that constitute a process
	elementID (PK)*	Auto Number	Automatically generated number
	elementName	Text	Records the name of the element
	stdTime	Number	Records the standard time of the elements
	description	7	Records the classification of the elements
elementsInProcess			Establishes relationship between elements and processes
	elementProcessID (PK)*	Auto Number	Automatically generated number
	processID	Number	Records the ID assigned to each process
	elementID	Number	Records number given to each element
employee			Employee information
	employeeID (PK)*B41	AutoNumber	Automatically generated number
	firstName	Text	Records employee name
	lastName	Text	Records employee last name
	addressStreet	Text	Records employee address
	addressCity	Text	Records employee city
	addressState	Text	Records employee state
	addressZip	Text	Records employee zip code
	phoneNumber	Text	Records employee phone number
	skillCode	Number	Records employee skill code
	managerID	Text	Records managers ID
	department	Text	Records the name of the department
	companyName	Text	Records the name of the facility
employeeSystem			Gives the processes performed by the employees
	employeeProcessID (PK)*	AutoNumber	Automatically generated number
	systemID	Number	Record Systems ID
	startTime	Date/Time	Records time that the system was started
	endTime	Date/Time	Records time that the system was completed
	Date	Date/Time	Records the date of operation
	operationTime	Number	Records the total time for the operation
	efficiency	Number	Records the efficiency (100 - normal)
process			List of all processes
	processID (PK)*	AutoNumber	
	systemID	Number	Records the systems ID
	processName	Text	Records the process name
	stdTime	Number	Records the standard time
	description	Text	Records the description of the processes
skillTracker			Gives the range of percentage time and skill code per operator
	skillCode (PK)*	Number	Records the skill code for the operator
	rangeStart	Number	Predefined scale for performance evaluation
	rangeEnd	Number	Predefined scale for performance evaluation
system			Gives the systems information
	systemID (PK)*B29	AutoNumber	Automatically generated number
	systemName	Text	Records the system name
	stdTime	Number	Records the total time to work on the system

* (PK) - Primary Key