CHAPTER I

INTRODUCTION

1.1 Background of The Research

Human resource is an important factor for the successes of any business. Companies need main to persuade effective people with high capability to join them. Main items to attract them are interested benefits and welfares. A common benefit and welfare is providing them with shuttle bus service such a service that is convenient and comfortable can also help improving employees' productivity. Providing shuttle bus service to employees can be costly and need proper planning.

The company under study is one of the leading automotive manufacturers in Thailand. Welfare and benefits are offered to employees including shuttle bus service. However, there are some problems with the service there are too many buses for the number of employees, some arrivals at the company are late and some routes are repeated that makes employee confusing.

With 3,000 employees at Samrong plant, the company provide pick-up and send-off service around 1,000 employees who request for it. However, routes and number of buses are designed with no theoretical basis. This causes the following problems:

The problems may be listed below:
1. The number of shuttle buses is more than necessary.
2. In some routes, bus capacity is less than the number of passengers while other routes, there are vacant seats. This reason shows that the routing management is not efficient enough.
3. Some buses cannot arrive at office on time. If we change the departure time earlier, this might make some employees unsatisfied.

4. Moreover, the late arrival in item 3 severely affects the production line and working time also.

5. Buses stop at the same points, which makes employees confused and sometimes there are some employees remain left over in some routes.

1.2 Objectives

The purpose of this thesis is to develop the shuttle bus system by minimizing the number of shuttle buses, which deliver all employees up from many designated places to the case study company by designing appropriated routes under condition of bus capacity and travelling time constraint.

1.3 Scope of the Research and Assumptions

The research involved only the study of shuttle buses for a company's employees at Samrong plant, who live in Samut Prakarn province. The assumptions may be listed as below.

1. In each point, only one bus can stop for picking passenger up.
2. All employees must be available at each point.
3. All employees cannot move to another point.
4. There is no accident during transportation.
5. There is no stop time during transportation.

1.4 Research Procedure

The procedure for this case study starts from collecting all data with real situation including pickup point, the number of employees using shuttle bus service, travelling time between each pickup point, wasted time during picking employees up. Average speed of 30 km/h was selected because of traffic condition in designated area. This will be used for creating the designed model. Details can be described as follows.

1. Study and collect all concerned data such as location of pickup points, employees' demands for shuttle buses, transportation time between points including load time, bus capacity and limitation during transportation and also advantages and disadvantages of current transportation for improvement.

2. Study theoretical basis and method dealing with routing design and transportation problems from any books, journals and technical documents for designing the proper method for this case study.

3. Design the model for this case study and find routes for all buses applied from the basis of Vehicle Routing Problem (VRP) and calculated from the basis of Saving Algorithm and finding the solution. Limitations can be shown below.

> Number of employees for shuttle bus service can be used from survey data 1 times a year, which can be changed if needed.
> All 6-wheel buses are used for transportation with same capacity.
> Transportation time cannot be over than designated value.

4. Test the design model, do sensitivity analysis and evaluate the result from the model

5. Conclude from the result evaluation and suggest for future research.

1.5 Expected Benefits

This research develops shuttle bus service system for employee's transportation, which expected benefits can conclude as below.

1. Reducing the cost of managing shuttle buses.

2. Ability control efficiency of shuttle bus service by using a program computer, which can easily update data as follow actual employee's data.

3. The result is a useful guidance for other plants of the company to follow.