

Inverse Logistics and Recycling Facilities Network Evaluation System

Youichi Yoshinaga*, Yoshiaki Nishina*, Masakuni Inoko**, Satoshi Saito*** and Tetsuo Tsuyuguchi****

* Senior Research Engineer, Sensing and Control Research Dept., Applied Technology Research Center

** Chief Manager, Planning and Coordination Department

*** Environmental and Energy Research Center

**** Manager, Environmental Solutions Center

We have developed the Inverse Logistics and Recycling Facilities Network Evaluation System for evaluating and optimizing a network composed of inverse logistics operations and waste recycling facilities by using actual operational data. An inverse logistics and recycling facilities network is evaluated by virtual engineering using this simulation system before constructing and operating the network and a high performance network can be designed. The system was applied to planning and evaluating a network for collecting and recycling waste plastics in Kawasaki City.

1. Introduction

The advanced socio-economic system of today's affluent society based on mass production, mass consumption, and mass disposal is being reexamined in view of the various problems it has caused, including destruction of the natural environment and ecological system, depletion of mineral resources, and shortage of waste disposal sites. A recycling-oriented society is being promoted for securing sustainable growth by reducing the consumption of natural resources and the burden on the environment.

For defining the basic legal framework, the Basic Law

optimize the total system by evaluating all the steps from waste collection to recycling as a whole.

NKK is providing diverse solutions related to the environment and recycling for establishing a recycling-oriented society. In order to assist clients in planning, constructing, and managing inverse logistics systems efficiently, the Company developed the Inverse Logistics and Recycling

Fig.3 Example of simulation model screen

3. Case study

This evaluation system was used to evaluate an actual recycling project in Kawasaki City¹⁾.

Kawasaki City is conducting various activities toward

Table 2 shows the simulation results for this recycling facilities network. It was found that the collection effi-