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SIMULATION OF THE RAILWAY COMPONENT OF INTERMODAL TRANSPORTATION

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16. Abstract

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INTRODUCTION

Business logistics is a rapidly growing industrial concern and is becoming an increasingly fertile research area. Businesses are recognizing that in increasingly global manufacturing and distribution settings, and in environments with decreasing life cycles for products, the need for competitive logistics systems is critical for success. The growing need for better logistics system designs and improvements in transportation infrastructure and information systems has led to changes in strategy for both manufacturers and transportation providers. One of the most notable strategies for improved logistics systems is that of intermodal transportation. Over the past few years, intermodal transportation has been a rapidly growing segment of the transportation and logistics business. This growth is largely due to some of the readily apparent advantages of intermodal transportation, such as reduced cost for long-haul truckload traffic. The rate of growth in this industry has, however, out-paced the growth in understanding by researchers with respect to the design and management of intermodal transportation systems. In this report, the authors address system design and evaluation considerations in truckload-rail intermodal transportation.

The intermodal combination of truckload trucking and rail operations clearly presents some advantages in terms of utilization of existing rail infrastructure to provide savings over trucking costs for long moves. Because of the relatively obvious benefits, truckload-rail intermodal operations are becoming prolific. Many of the considerations necessary to design and manage these systems have not, however, been systematically addressed. While significant literature on truckload operations and intermodal rail operations does exist, the rate of growth in this industry indicates that new and additional research is needed.

The research detailed in this report addresses concerns related to the integration of rail operations with truckload distribution. The next chapter provides a discussion of some of the key literature dealing with intermodal transportation systems with particular attention paid to truckload and rail systems. Included in this review is a discussion of previous research by the authors which focuses on truckload trucking operations. Following the review of related literature, a discussion of current research efforts by the authors is outlined and the fit of that research into the existing body of knowledge is discussed.

LITERATURE REVIEW

As more and more freight is shipped via intermodal networks, it has become imperative that new and innovative ways be found to better manage, evaluate, and improve on these systems. Members of both the academic and business sectors have published a number of papers on these and other issues related to the railroad component of intermodal transportation.

Overview of the Industry

There is a substantial amount of literature available in periodicals addressing both the benefits of and the concerns surrounding intermodal transportation. Richardson (1993) discusses the growing popularity of intermodal, noting that in the previous year there was a greater move of traffic from truck to intermodal than the reverse. It is also noted that performance, though steadily showing improvement, seems to be best for those hauls greater than 500 miles. Welty (1994) addresses the growing number of rail/truck partnerships, which he believes to be the key to the increasing use of intermodal transportation. Presented in Welty's work are the results of the Intermodal Index, a market research survey sponsored by the Intermodal Association of North America and the National Industrial Transportation League. The survey found that most shippers expect their truckload carriers to provide intermodal services in the future, that most intermodal users see performance as improving and expect that it will continue to do so, and that intermodal market share is increasing and will continue to increase. More details of this same research are presented in Thomas (1995), including the statement that while the dominant criteria for selecting either a mode or carrier is service, only 32% of the shippers surveyed had a measurement system to evaluate service performance. The same article also notes that performance varies by region with Western US shippers reporting the best service, and Eastern Canada, Mexico, and the Northeast US rating the poorest intermodal performance.

Much of the available literature focuses on the benefits of the current trend toward intermodal transportation. Clark, et al. (1996) studied the effects of rail-highway intermodalism on highway accident rates. In "Finding a Home for Orphan Waste" (1993) the author discusses the unique ability of intermodal rail in the transporting and disposing of waste, especially that originating in areas with landfills which are already at capacity. Another advantage of intermodal transit is the reduction of loss and damage payout, which was down 11.55% in 1990 according to "The Proof is in the Payout" (1991).

With this sudden growth in intermodal transportation, there has also been some concern about how the current infrastructure will be able to support it. Melbin (1995) discusses the need for lane balancing and how Electronic Data Interchange (EDI) is vital for growth in the industry if a competitive advantage is to be maintained. The current state of terminal operations is addressed in Evert (1994). It is suggested that if major railroads are to maintain timely service, perhaps independent contractors should be utilized to provide unbiased feedback concerning terminal performance. John C. Taylor (1993) looks at some of the concerns of the National Commission on Intermodal Transportation (NCIT) which was created by the Intermodal Surface Transportation Efficiency Act (IS-TEA). Some of the issues facing NCIT include equipment standardization, improvements in intermodal infrastructure, and new technologies. Intermodal facilities improvement is also an issue in Europe, as noted by Muller (1997). This article notes Germany's plan to either begin construction or build extensions on 12 terminals in the coming years as part of a capital spending program.

Intermodal Railroad Terminal Simulation

Because intermodal terminals are such a critical component in the total intermodal freight transportation process, their efficiency must be optimized if they are to remain competitive. In Ferreira and Sigut (1995), two different types of terminals are simulated: the conventional road/rail container transfer facility, and a proposed system named the RoadRailer terminal facility.

Boese (1983) notes that the future demands that are to be placed on intermodal transportation systems will require substantial investments in existing and new terminal facilities. In order to optimize the operations of these terminals, computer modeling of these sites is imperative. The model developed by Boese has several program modules simulating different functions of the terminal in question. The simulation of the daily train operations reflects given cargo volume fluxes, types of load units, train schedules, selected rail operational strategies, and equipment capacities. The road counterpart utilizes a Monte Carlo simulation of the stochastic properties of truck arrivals at the terminal, according to different truck operating patterns. The core module simulates the single movements and actions of the transshipment equipment. A dispatch control module decides on the transshipment sequences prescribed by train operation and truck arrivals, while simultaneously trying to maximize equipment productivity and minimize truck waiting times. The presented simulation provides some information concerning terminal economies, operational strategies, and control systems.

A trailer-on-flatcar (TOFC) terminal simulation model (TSM) is discussed in a paper by Golden and Wood (1983). This model provides information about productivity and throughput of trains and trailers at an intermodal facility using a detailed simulation. Work units are defined in this model as material that flows through any simulation, and are characterized by type and identity. For this simulation, flatcars are either loaded or unloaded, trains are identified by symbol and date (in simulation), and trailers, the basic work unit, are either inbound (from street to train) or outbound (from train to street), and are further distinguished by a destination point. The model is written in such a way as to allow for various terminal configurations, equipment types, and train service and traffic patterns.

Sarosky and Wilcox (1994) utilize a SLAMSYSTEM model to examine the feasibility of eliminating a terminal from Conrail's intermodal network and shifting the remaining traffic volume to an alternate facility. Described in the paper is the problem of optimal terminal size in the construction and operation of an intermodal terminal. The terminal must be large enough to handle peaks in volume without causing overflow and delays, but the costs associated with terminal construction are extremely high, therefore capacity should be no larger than necessary. According to the author, there are three factors that determine the capacity of any given terminal: the track capacity, which relates to the number and length of loading/unloading tracks in addition to storage tracks; the gate capacity, which is the number of trucks which can be processed through the gate during a certain time period; and the parking capacity, which is the number of trailers, containers, and chassis that can be stored in the terminal before exiting by rail or by truck. The two major components of input for this model are train schedule information and operational information. The train schedule information is used by the simulation model to create inbound trains at their scheduled times and to create the individual loads to arrive for the trains. It also determines the size and makeup of the trains. Operational information holds the order of the activities (such as spotting trains, loading and unloading units, positioning units within the yard, and queuing and processing trucks at the gate) that must occur so that the intermodal terminal may operate. This model is capable of generating a wide range of statistical output on the performance of the entire terminal, including process time information such as loading and unloading of trains, capacity requirement information such as the number of units in parking, and bottleneck information, for instance, the number of drivers in the gate queue and the number of rail cars waiting for track.

Mazzuchelli et al. (1996) present a paper in which their efforts are focused on two different issues: the organization of a multi-modal transportation network, and the management of a single intermodal freight transportation node. A discrete event simulation tool based on a state automaton model is discussed. Features of this simulation include an input interface which pre-processes both static (e. g. layout) and dynamic data (e. g. arrival and departure schedules); static and dynamic databases; a simulation kernel consisting of an event scheduler, two state transition function modules, and a resource scheduler; and an output interface which could be equipped with a performance evaluator.

TRANSNODE, The Simulator of Intermodal Transportation Terminals, is a data-driven simulation model presented in a paper by Kondratowicz (1990). This approach is different from traditional simulation modeling that combines data, knowledge, and control programming. Instead, this model treats data and control logic as separate parts. An advantage of this approach is that a user without specific knowledge in simulation may make modifications to the program by simply changing the input data. The model presented contains two main parts: a knowledge base, which describes the simulated objects and the relationships and interactions between them; and a simulator, which contains the general algorithms for controlling and guiding the simulation processes of the movement of trucks, cargo handling and storage, and the discrete time advance from event to event. The objects and relations for this model can be categorized into the following five broad classes: terminal resources (service equipment), storage facilities, cargoes, means of transportation, and rules of system functioning. The simulation is then performed by the two main groups of algorithms: those that simulate terminal operations and movement of trucks to and from the terminal according to the input, and those algorithms that control the simulation process as a whole.

Weigel (1994) uses a discrete event simulation to model operations at intermodal railroad facilities, specifically to develop a flexible capacity-planning model at Union Pacific Railroad. The effects on terminal performance of train schedules, facility design, and availability of equipment are used to estimate capacity. The Intermodal Capacity Planning Model provides information on several capacity-related issues such as equipment utilization, parking requirements, and train schedule performance. Performance measures of key areas are based on the ability of the terminal to meet schedules that have been established. These include train arrival time versus train placement, actual load grounding versus planned grounding, and outbound cut-off time to train departure. Failure to meet minimum performance measures in these areas could be an indication of a potential capacity problem.

Simulating Rail Terminals

In a paper by Klima and Kavicka (1996), simulation is used to model marshalling yards in railway networks. The costly technology and high complexity of the operations performed require a great degree of coordination and control. Because of the intricacy of the system, the only suitable tool for evaluating conditions in this system is believed to be a simulation model. One of the features of the Klima and Kavicka model is the ability of the user to plan some standard activities such as interruption, termination, snapshots of the system state, etc., prior to initiation of the simulation run.

Dessouky and Leachman (1995) present a detailed computer simulation modeling methodology that can be used to analyze the increased traffic burden on rail track networks and delays to trains caused by congestion. This methodology is not only insensitive to the size of the rail network, but can also consider both double-track and single-track lines. In this paper, movement from Downtown Los Angeles to the San Pedro Bay ports is considered.

Simulating Truckload Trucking Networks

Much research has been undertaken to examine the effects of hub and spoke (H&S) networks, similar to those utilized in less-than-truckload (LTL) and airline settings. See Taha et al.

(1996), or Taha and Taylor (1994) for information about this problem, and for information about the HUBNET simulation tool developed for and employed in this analysis.

Subsequently, the HUBNET simulation system was used to attempt the optimization of H&S layout configurations in TL trucking. A sizable factorial experiment was formulated to examine the effects of various hub location methodologies, the number of hubs utilized, the rules guiding acceptable tour lengths, the allowable circuitry constraints, and the number of drivers in the system. The findings indicate that while tremendous savings are possible in terms of driver tour length, the improvement comes at the expense of miles per driver per day, circuitry, and first dispatch empty miles. So, while the tour length improvements are interesting and important, H&S networks have not proven to be effective in the truckload trucking industry from a capacity utilization standpoint. See Taylor et al. (1995) for more information regarding experimentation with the HUBNET system.

The results of experimentation with H&S networks and HUBNET have led to the conclusion that limited implementation seems to be the best alternative for H&S usage in the TL environment. This implementation can be in the form of full networks carrying part of the freight or in terms of partial networks. Partial networks seem to provide the best alternatives conceptually. Furthermore, it would appear that not all loads are viable for such networks. Substantial research investigating delivery methodologies addressing these issues has been performed. Taylor et al. (1998) detail the development and testing of regional delivery lanes and zone hubs for use by a major TL carrier. These delivery methodologies have provided a good compromise in performance criteria deemed critical to the TL industry, driver retention and service metrics.

Terminal Operations and Capacity

The research and development of optimization and simulation tools in the operations planning of an Australian freight rail system is discussed in a paper by Ferreira (1997). The author claims that the market share for rail freight is greatly determined by the level of service, especially in terms of transit times and the reliability of arrivals. These, in turn, are largely associated with track infrastructure design and maintenance schedules. Summarized in the paper are requirements for planning track maintenance and a description of a model to optimize the placement of sidings along a single-track corridor.

Howard (1983) presents findings of research in Great Britain and West Germany on the cost effectiveness of terminals smaller than those traditionally thought of as being the optimal size. In many countries, the largest flow of traffic is that which travels a distance of less than 400 miles. In these situations, the road costs, such as collection and delivery, account for as much as one-third or one-half of the overall cost of transportation. The research here suggests that a denser network of small terminals could substantially reduce these costs.

Non-Simulation Methods

Substantial literature discussing work-using techniques other than simulation to examine rail yards also exists. For example, Feo and Gonzalez-Velarde (1995) use a mathematical model to optimally assign highway trailers to rail car hitches in intermodal transportation terminals. An integer-linear programming formulation that allows problems to be effectively solved by use of general-purpose branch-and-bound code is constructed. This formulation also provides a basis for Feo's development of a Greedy Randomized Adaptive Search Procedure (GRASP). This heuristic methodology is an extremely fast way to find the optimal solution to problem instances furnished by Consolidated Rail Corporation over a two-year period.

Crainic and Rousseau (1986) describe an algorithm based on decomposition and column generalization principles to examine the freight transportation problem that occurs when the same authority plans and controls both the supply of transportation services and the routing of freight. This general modeling framework is based on a network optimization model and can be useful in the tactical and strategic planning process for a multi-commodity, multi-mode freight transportation system.

Other Related Issues

As mentioned earlier in this literature review, Thomas (1995) reports that while service remains a critical element in the transportation decision-making process, only 32% of those shippers surveyed have an effective means of measuring carrier performance. From the carrier's perspective, though, Ferreira and Sigut (1993) address the need to reduce freight transportation costs and improve customer service through a means of quantifying the performance of intermodal freight terminals. The methodology presented involves using computer simulation to determine those factors which may affect customer satisfaction, such as the mean waiting times for loading and unloading of containers, in addition to terminal productivity measures such as lifting equipment utilization.

An area of interest frequently overlooked in much of the literature is the impact of road traffic patterns in the surrounding area on a freight terminal's operations, as well as the impact the activities at the terminal on the local traffic levels and congestion patterns. Pope et al. (1995), at the request of the Virginia Center for World Trade, developed a model to examine these issues at the marine cargo terminal in the port of Hampton Roads, Virginia. Examined in the study were the impact of opening a new section of interstate highway, one terminal's projected doubling of container traffic, and a daily unit train in the neighborhood of another terminal.

Apffel et al. (1996) discuss a statewide intermodal transportation planning effort by the state of Louisiana. The primary focus of the paper was on assessment of system capacity, but low cost procedures for achieving improvements in system performance were also examined. This study concludes that while statewide intermodal planning can provide structure at the state and local levels of system-wide priority areas, it is not to replace private sector project feasibility analysis and planning.

Louisiana's development of an intermodal transportation plan was further discussed by Movassaghi and Parlee (1995). A geographic information system (GIS) was relied upon to expedite data management and to perform various analyses. While GIS can be a powerful instrument in the planning of a transportation system, an effective system requires that attention be carefully focused during initial preparation stages. Cited is the Federal Highway Administration's 4-C definition that "an intermodal plan should provide for choices, connections, competition, and coordination."

Although most of the research discussed thus far has been focused on rail-truck intermodal transportation terminals, Asher (1991) discusses the Port of Portland with its diverse array of transportation modes, including ship, rail, truck, barge, and air, since it is also responsible for the operation of Portland International Airport. In an attempt to attract intermodal rail traffic, the facility began a $4 million expansion in 1987 to more than double its rail yard to 34 acres. The installation of modern equipment has also added to the port's shared regional dominance with Seattle and Tacoma.

In order to remain competitive, intermodal shippers must be able to minimize total transportation costs through determining minimum cost routing (Barnhart, 1993). This paper describes the intermodal routing problem, rail transportation costs per trailer with a shortest path solution procedure, rail transportation costs per flatcar with a matching solution procedure, model extensions involving schedule and flatcar restrictions, and an alternative modeling scheme using b-matching.

Nierat (1997) examines a spatial theory which can compare the location of access points for both road and rail transport networks, and then uses this information to define zones for which each mode is the most competitive. Also discussed are those factors that influence the intermodal market area, namely the number of operations per driver-day and the empty kilometers driven per driver-day.

Holcomb and Jennings (1995) seek to expand the definition of intermodalism by including a second type of intermodal freight transportation strategy, the transload option, which involves multi-modal movement of non-containerized freight. Transloading is the transfer of a product from one mode of transportation to another and the physical transfer from one type of containing device to another. The significant disadvantage of this would be the limitation of the ability of the various modes to coordinate and the commodities' physical characteristics. However, the goal would be to create a seamless transportation system that would be able to meet the needs of both the public and private sectors.

Although the focus of much of the literature reviewed thus far has been on the intermodal movement of freight, there have also been a number of articles examining intermodal passenger transportation. Many of the principles that hold true for one application also hold true for another. In Di Febbraro et al. (1994), the authors propose an approach for the synchronization and control of an intermodal passenger transportation system. The whole network is modeled as a discrete event dynamic system. These systems are discrete in time and space, asynchronous, and modular. Moreover, they may include control strategies and communication systems, which would enable the signaling of observable events between module pairs. The simulation tool developed consists of three fundamental blocks: an input interface, a passenger information system, and a block that uses a discrete event simulation kernel to create statistics of the system behavior and to design suitable control strategies. In closing, the author notes that work is in progress to generalize the model to include representation of a communication system (possibly wireless) fundamental to the transportation network itself.

Di Febbraro and Sacone (1996) continue the discussion of intermodal passenger transportation systems. Considered is a model of an oriented graph, whose fundamental elements are nodes, macronodes, and links. A node is defined as a station for a single mode of transportation. It exists only as a part of a macronode. A macronode is an internal station where people can enter/leave the transportation network or change mode of transportation. By definition a macronode is composed of one or more nodes. Links are unidirectional paths that connect two macronodes. Each is devoted to a single mode of transportation. Entities in this model are those components in the system requiring explicit representation, such as macronodes, nodes, links, and modes of transportation. Static quantities (parameters) and dynamic quantities (state variables) are associated with each entity. The model also includes events that are instantaneous occurrences that may produce change in the system. Events may fall into one of two classes: those that describe the nominal traffic conditions and those that represent unpredictable conditions affecting the system.

Di Febbraro et al. (1996) presents further work in this area. In that paper, INTRANET (INtegrated TRAnsportation NETwork), an urban traffic simulation program, is discussed. It is designed to perform two major functions, somewhat independently of each other. The first is validation of integrated timetables for the various transportation modes in such a way that the different transportation services are considered part of a whole intermodal transportation system. The second function of INTRANET is to give the users of the transportation network real-time updated information about the state of the network. The authors propose that the advantage of the system described is that by simulating and analyzing the behavior of the system at the same time, the planners and managers would have access to valuable information not available through other means.

MOTIVATION AND CURRENT RESEARCH

The literature discussed above clearly indicates that there is interest within the logistics industry for a greater understanding of the dynamics of truckload-rail intermodal transportation. Significant efforts have been made to address the modeling of rail yards and truckload networks. An issue that is, however, lacking from most of the literature is that of the integration of truckload trucking and intermodal rail yard operations. The research discussed herein seeks to address this need. As with much of the research discussed above, current research efforts have centered on the simulation of intermodal systems. The simulation tools developed during this research address the operations of both the rail yard and the truckload distribution networks associated with it. These simulation tools provide the ability to address individual rail yard design considerations such as size and intra-yard load handling capacity, regional design considerations related to the location of rail yards and trucking operations, and demand distribution as well.

The work presented herein is most similar to that of Sarosky and Wilcox (1994). The specific research advances made over that work, and our primary contribution to the published literature, is in three areas; a broader consideration of activities within the terminal including hostling (inter-yard movements) and train-building activities, a more in-depth consideration of drayage activities, and the fact that our simulator allows for the explicit modeling of multiple terminals concurrently.

Testing of the simulation tools has been performed using data from rail yard operations at the Burlington Northern - Santa Fe (BNSF) Railroad facilities in the Chicago, Illinois area. BNSF is an important intermodal transportation partner with J.B. Hunt Transport, Inc., another supporter of current research efforts.

The following is a brief discussion of the simulator developed, its capabilities, and the nature of information that it provides. Next is a discussion of the case study problems used to test the simulator and to demonstrate its capabilities.

Simulation Development and Case Study Analysis

Discrete event simulation is a powerful tool for the evaluation of existing and proposed logistics systems. Previous research efforts by the authors have used simulation to address a variety of concerns in truckload trucking. The importance of intermodal transportation has lead to the development of simulation tools to address intermodal rail yard and distribution networks. The simulation tools developed for this research provide the ability to model the concurrent operation of multiple intermodal rail yards in a relatively large geographic region. These rail yards are characterized by the number of available tracks for unloading/loading, the distribution of load types processed (intermodal double stack containers and trailer on flat car loads), the capacity of intra-yard trailer handling capacity (hostling) and the rates of arrival for trains and outgoing loads. A significant feature of this simulator is that rather than modeling only the operations of the rail yard, it models the hauling (drayage) of loads to and from regional destinations as well. In so doing, this simulator simultaneously addresses issues related to rail yard capacity, rail yard location, and distribution network design.

The simulation tools developed have been tested using a case study intermodal system located in the Chicago, Illinois area. Currently, the case study environment consists of three intermodal rail yards. Two of these yards are located near downtown Chicago with the third being located in a nearby suburb. The two yards near downtown are named Corwith and Cicero with the third being named Willow Springs. Their locations in the Chicago area are indicated in Figure 1. At present, the system in question needs to add capacity and is therefore considering the addition of another rail yard. This new rail yard would serve to increase total system capacity as well as to alleviate overloading at the two central Chicago yards. The Corwith and Cicero yards were not originally designed for intermodal operations. Consequently, even though retrofits have made the sites very functional, they are not optimal with respect to intermodal operations. The Willow Springs facility is a modern, state-of-the-art, dedicated intermodal facility. If a new yard is to be constructed, it should have the capacity and capability to absorb much of the traffic at the two older yards.

A significant concern with respect to the location of a new yard is the impact on the total drayage incurred throughout the regional network. Currently, the location under consideration is located approximately 30 miles to the southwest of Chicago in Joliet, Illinois. Before committing the substantial funds and resources necessary to construct a rail yard, it must be known if the capacity benefits of the new yard will outweigh any costs incurred due to increased drayage miles. Each of the existing rail yards services 6 regions for both incoming (destinating) and outgoing

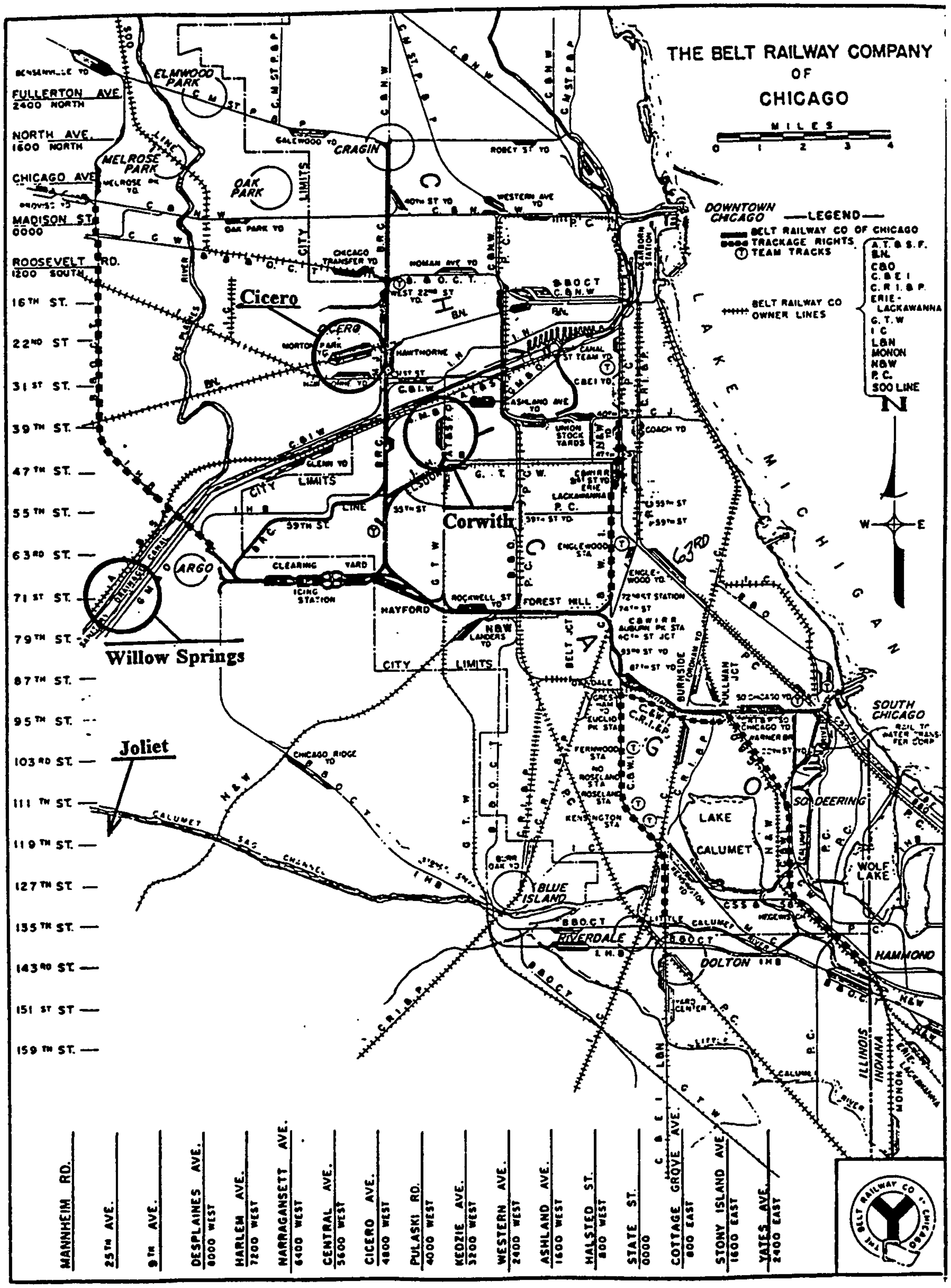

Figure 1. Chicago Area Rail Yards.

(originating) intermodal traffic. These regions are named Illinois, Wisconsin, Michigan, NorthEast, Ohio and Indiana. For experimental purposes, and to protect proprietary data, the freight density centroids of these regions are arbitrarily assumed to be in Chicago, IL, Milwaukee, WI, Lansing, MI, Cleveland, OH, Columbus, OH, and Indianapolis, IN, respectively. The locations of these regional centroids, like the location of the rail yards, can be easily altered in the simulation models

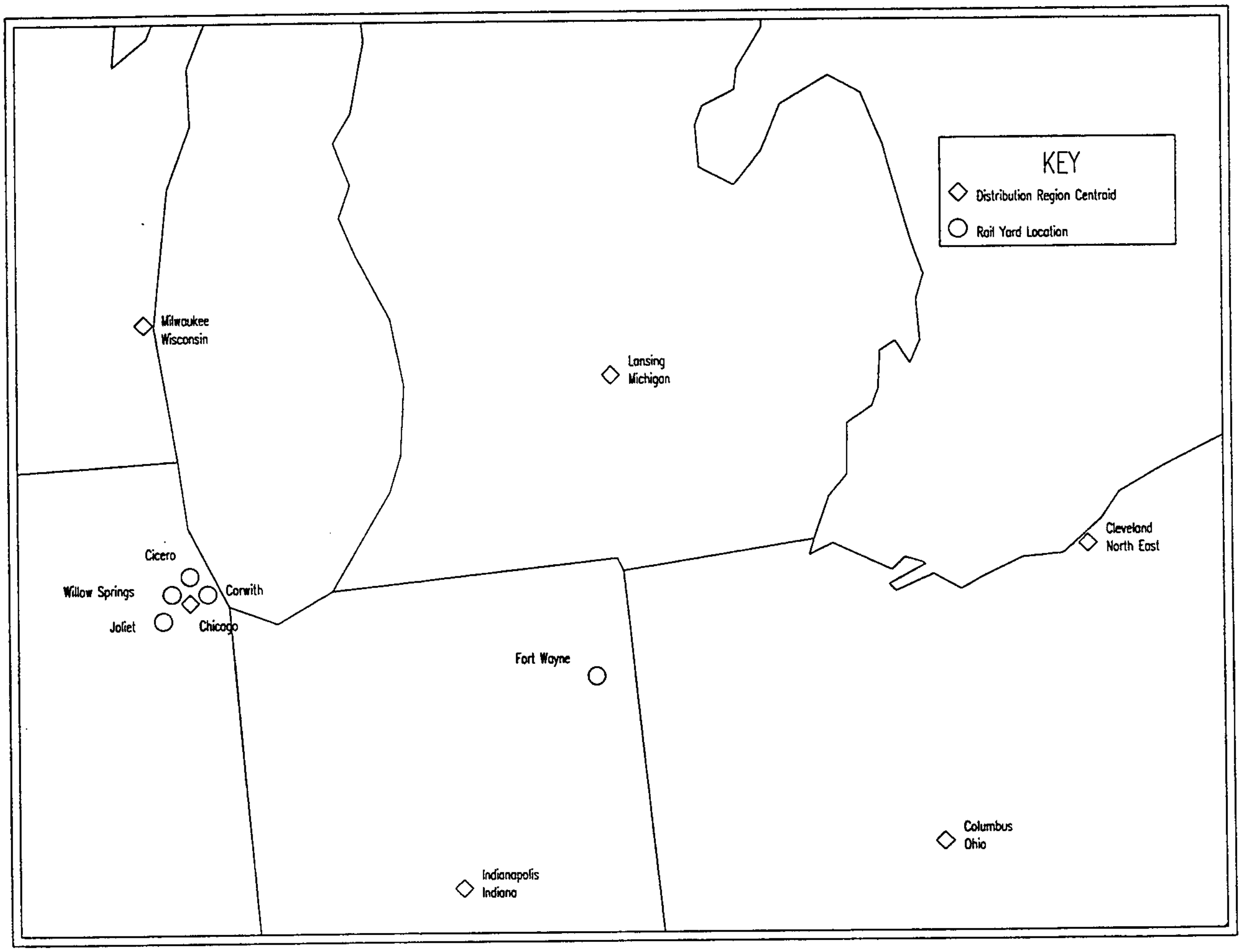

Figure 2. Yard Locations and Assumed Freight Centroids.

constructed. Figure 2 provides a graphical representation of all yard locations and assumed freight centroids used in this study.

A simulation experiment that addresses network design issues has been developed. First, the existing three-yard system has been simulated using existing data for train arrival and departure frequencies, truckload arrival frequencies and originating regions, truckload departure frequencies and destination regions, and rail yard capacity data. Yard capacity data includes the number of loading and unloading tracks at the yard, the number of loading/unloading vehicles, and the quantity of hostling vehicles (intra-yard trucking). Simulation of the existing system is performed and includes ten independent replications of 24 hours each. These results provide baseline values for a number of performance measures including total drayage distance, average dray length and utilization of hostlers and other rail yard components. Many of the individual statistics provided by the simulator will be discussed in greater detail later in this report.

Once baseline intermodal network performance has been established, simulation runs, which seek to address the performance of the system with an additional yard, are performed. The "new" yard, located in Joliet, IL, is assumed to be identical to the Willow Springs facility. It is likely that the new yard, if constructed, would differ in many respects from Willow Springs but this assumption is sufficient for current research efforts for several reasons. First, the Willow Springs facility is state-of-the-art and, therefore, many features of any additional facility would likely be very similar. Second, no design exists for a new facility at this point. Clearly, any railyard design effort carries with it substantial cost and this research is intended to determine whether or not a yard located in Joliet is a viable option before this cost is incurred. Third, the simulation tools developed allow for rapid reconfiguration of critical yard size, capacity and operational parameters. This operational flexibility has been designed into the simulator to permit the user to test several alternative yard designs relatively rapidly. As such, it is not necessary to define an optimal yard design at this time. It is our goal to introduce a tool that allows the consideration of both railyard and intermodal network design.

Like the yard design itself, it is not known at this time exactly what portion of the Chicago area intermodal traffic would be re-routed to any new facility. The simulation tools have been developed with this in mind to permit simple alteration to the distribution of loads between yards and geographic regions. For experimental purposes, historical regional source and destination data as well as data regarding the freight distribution among rail yards is used. For comparison with the baseline scenario, two additional scenarios using the proposed Joliet yard have been simulated. One of these scenarios reallocates to the Joliet yard those loads which were previously processed at the Cicero yard in the baseline model. Similarly the other scenario moves the processing of loads from the Corwith yard to the Joliet yard. In this manner, the impact of the redistribution of a substantial proportion of the Chicago area intermodal traffic to the Joliet region can be investigated.

Subsequent experimentation addresses the robustness of the simulator through a similar analysis using alternative load sourcing and destination profiles and through investigation of a new yard location in Fort Wayne, Indiana rather that Joliet, Illinois. The experiments are performed both to address concerns of the case study partner and to demonstrate the efficacy of the simulation tools developed.

The following tables summarize the distribution of loads between the three existing yards and regions for the baseline scenario. Table 1 presents destinating traffic information. Table 2 presents originating traffic information. Note that information is provided in terms of percentages instead of actual volumes to protect proprietary BNSF data.

Table 1. Distribution of Destinating Traffic for Baseline Scenario.

	Region					
Yard	Illinois	Wisconsin	Michigan	Northeast	Ohio	Indiana
Corwith	69.0%	5.3%	5.9%	3.6%	7.1%	9.1%
Cicero	52.9%	12.2%	7.5%	5.2%	11.8%	10.4%
Willow Sp.	50.5%	12.3%	6.1%	6.9%	12.8%	11.4%
Joliet	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Table 2. Distribution of Originating Traffic for Baseline Scenario.

	Yard				Percent of All Loads
Region	Corwith	Cicero	Willow Sp.	Joliet	Originating in this Region
Illinois	34.83%	25.73%	39.44%	0.0%	79.75%
Wisconsin	60.45%	14.84%	24.71%	0.0%	3.25%
Michigan	72.23%	6.90%	20.87%	0.0%	2.45%
Northeast	35.65%	32.82%	31.53%	0.0%	4.63%
Ohio	52.13%	16.96%	30.91%	0.0%	6.26%
Indiana	79.47%	10.55%	9.98%	0.0%	3.66%

To model the impact of the inclusion of a new yard in Joliet, Illinois, the following originating and destinating load distributions have been developed. Tables 3 and 4 reflect load distributions with all of the traffic currently visiting the Corwith yard relocated to Joliet. Tables 5 and 6 reflect a similar redistribution of loads from Cicero to Joliet.

Table 3. Distribution of Destinating Traffic for Joliet Replacing Corwith.

	Region					
Yard	Illinois	Wisconsin	Michigan	Northeast	Ohio	Indiana
Corwith	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cicero	52.9%	12.2%	7.5%	5.2%	11.8%	10.4%
Willow Sp.	50.5%	12.3%	6.1%	6.9%	12.8%	11.4%
Joliet	69.0%	5.3%	5.9%	3.6%	7.1%	9.1%

Table 4. Distribution of Originating Traffic for Joliet Replacing Corwith.

	Yard			
Region	Corwith	Cicero	Willow Springs	Joliet
Illinois	0.0%	25.73%	39.44%	34.83%
Wisconsin	0.0%	14.84%	24.71%	60.45%
Michigan	0.0%	6.90%	20.87%	72.23%
Northeast	0.0%	32.82%	31.53%	35.65%
Ohio	0.0%	16.96%	30.91%	52.13%
Indiana	0.0%	10.55%	9.98%	79.47%

Table 5. Distribution of Destinating Traffic for Joliet Replacing Cicero.

Yard	Region					
	Illinois	Wisconsin	Michigan	Northeast	Ohio	Indiana
Corwith	69.0%	5.3%	5.9%	3.6%	7.1%	9.1%
Cicero	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Willow Sp.	50.5%	12.3%	6.1%	6.9%	12.8%	11.4%
Joliet	52.9%	12.2%	7.5%	5.2%	11.8%	10.4%

Table 6. Distribution of Originating Traffic for Joliet Replacing Cicero.

Region	Yard			
	Corwith	Cicero	Willow Springs	Joliet
Illinois	34.83%	0.0%	39.44%	25.73%
Wisconsin	60.45%	0.0%	24.71%	14.84%
Michigan	72.23%	0.0%	20.87%	6.90%
Northeast	35.65%	0.0%	31.53%	32.82%
Ohio	52.13%	0.0%	30.91%	16.96%
Indiana	79.47%	0.0%	9.98%	10.55%

The arrival rate of trains to the rail yards is based directly upon historical data, as are the arrival rates of originating traffic from the regional sources. Similarly, the distribution of container types (trailer or double stacked containers) arriving on a given train are based directly upon historical data. Table 7 summarizes the distribution of load types handled in each existing yard for both originating and destinating traffic.

Table 7. Distribution of Container Types Handled at Existing Yards

	Load Type	
Yard	Container	Trailer
Corwith	84.77%	15.23%
Cicero	54.77%	45.23%
Willow Springs	5.80%	94.20%

In scenarios which involve the reallocation of traffic from one yard to another (i.e. Corwith to Joliet) the container and trailer percentages from the existing yard are applied to the new yard.

Each of the scenarios outlined in the above tables has been simulated for 10 independent replications of 1440 minutes (24 hours). While the simulation system has been constructed with the ability to gather several statistics related to both yard operation and drayage network, the measure of performance currently of greatest interest to the industrial partner is the impact of new or proposed yard locations on average dray lengths. Accordingly, this report will focus on results related to this important metric.

Simulation of the baseline intermodal network has resulted in an average dray length of 79.15 miles for all loads. By moving the traffic currently processed through the Cicero yard to a proposed Joliet facility, the average dray length increases slightly to 84.37 miles. Alternately reallocating the traffic currently processed in the Corwith yard to Joliet results in an average dray length of 90.58 miles. These increases in drayage are equivalent to 6.6% and 14.4% of the existing average dray length. While not particularly substantial, both of these increases are statistically significant at the 95% confidence level. In addition, the dray length of mean 90.58 miles resulting from the reallocation of loads from the Corwith facility is significantly greater, at the 95% confidence level, than the associated mean of 84.37 miles resulting from the relocation of Cicero's traffic to Joliet. Although significant increases in average dray length due to the introduction of the Joliet facility do exist, this fact in and of itself may not discount the viability of a Joliet facility. It is possible that, due to the relatively high traffic congestion within the Chicago area that a facility located somewhat outside the city could have increased dray distance associated with it without a substantial increase in average drayage time. It is possible that service could actually improve under this alternative.

The relatively small increases in average dray length resulting from the inclusion of the Joliet facility and the possibility of traffic avoidance eliminating much of the negative impact of this increased distance has motivated additional investigation of the impact of another yard location on average dray length. The location for this new experimental yard is Fort Wayne, Indiana. Fort Wayne was selected because of its location near the freight density centroid of the distribution network. For comparison, the Table 8 lists the centroid-to-centroid distances for the various yard locations and the network regions.

Table 8. Yard Location to Region Centroid Distances in Miles.

From/To	Illinois	Wisconsin	Michigan	North East	Ohio	Indiana
Corwith	1	98	215	364	354	186
Cicero	7	93	221	371	360	192
Willow	13	101	223	374	360	192
Joliet	37	121	227	378	358	190
Fort Wayne	166	259	126	224	165	127

As can be seen above, while Joliet represents relatively modest increases in distance to most regions over either Corwith or Cicero, the distances from Fort Wayne to these locations differ substantially with respect to existing yards. Relative to both Corwith and Cicero, the distance from Fort Wayne is greater to both Illinois and Wisconsin but substantially less to Michigan, North East, Ohio and Indiana.

Simulation experimentation, which alternately moves demand from Corwith to Fort Wayne and from Cicero to Fort Wayne, was performed in exactly the same manner as was performed with respect to the proposed Joliet location. Recall that the average dray length for the baseline scenario was 79.15 miles. Moving traffic from Corwith to Fort Wayne Results in an average dray length of 116.39 miles - a 47.05% increase. Similarly, the reallocation of traffic from Cicero to Fort Wayne results in an average dray length of 100.99 miles, or a 27.59% increase in mileage. As was the case in previous experimentation, these increases in mileage are statistically significant at the 95% confidence level. Figure 3 illustrates the results for both the Joliet and Fort Wayne experimentation.

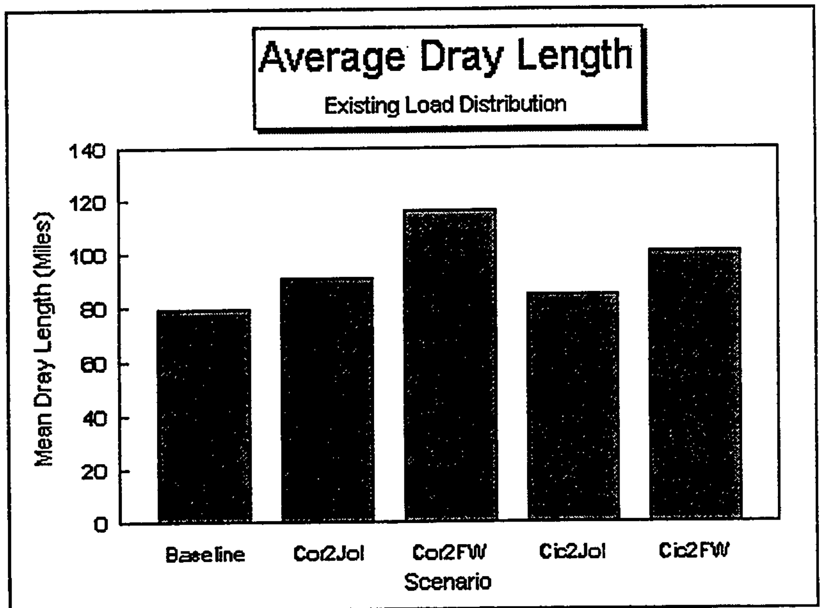

Figure 3. Comparison of Average Dray Lengths for Baseline and Alternate Yard Scenarios

Additional Experimentation

It is clear in Figure 3 that the Joliet yard location is superior to the Fort Wayne location in terms of average dray length. This result is due, in part, to the relatively high percentage of loads travelling to and from the Illinois area. This observation has motivated investigation of the impact of an alternative demand profile. If the mix of loads were to change such that a greater percentage were travelling to and being sourced from regions more distant from the Chicago area, then it is possible that a location other than Joliet, such as Fort Wayne, might prove advantageous. To investigate this possibility, and to further demonstrate the robustness of the simulation tools developed, additional experimentation has been performed. This additional experimentation follows the same approach as that discussed above but addresses a new fictitious distribution of originating and destinating traffic where the Northeast and Ohio regions each account for 25% of the total loads. The traffic allocated to the other regions is proportional to that in the original experimentation. Tables 9 and 10 summarize the new load distributions.

Table 9. Distribution of Destinating Traffic for Alternative Baseline Scenario.

	Region					
Yard	Illinois	Wisconsin	Michigan	Northeast	Ohio	Indiana
Corwith	38.7%	3.0%	3.3%	25.0%	25.0%	5.0%
Cicero	31.9%	7.3%	4.5%	25.0%	25.0%	6.3%
Willow Sp.	31.5%	7.6%	3.8%	25.0%	25.0%	7.1%
Joliet	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Table 10. Distribution of Originating Traffic for Alternative Baseline Scenario.

	Yard				Percent of All Loads
Region	Corwith	Cicero	Willow Sp.	Joliet	Originating in this Region
Illinois	34.83%	25.73%	39.44%	0.0%	44.80%%
Wisconsin	60.45%	14.84%	24.71%	0.0%	1.80%
Michigan	72.23%	6.90%	20.87%	0.0%	1.40%
Northeast	35.65%	32.82%	31.53%	0.0%	25.00%
Ohio	52.13%	16.96%	30.91%	0.0%	25.00%
Indiana	79.47%	10.55%	9.98%	0.0%	2.00%

The distribution of container types handled in each yard (see Table 7) remains unchanged for this analysis. It is important to note in Table 10 that the distribution of loads from a given region to each of the rail yards has not changed while the percentage of all loads originating in each region has changed to reflect the new assumptions regarding the Northeast and Ohio regions. This decision supports the use of the container distributions presented in Table 7. The yard to region distances presented in Table 8 are also maintained during this additional experimentation.

Analysis of the impact of yard location was performed for this new load distribution data in exactly the same manner as was used in the initial experimentation. Simulation of the baseline scenario with the new mix yields an average dray length of 200.65 miles. As is expected with the new distribution of loads, this value is substantially higher than the original baseline of 79.15 miles. Reallocation of traffic from Corwith to Joliet results in an average dray length of 207.98 miles, an increase of 3.65% over the new baseline. Replacing the Cicero yard with the proposed Joliet facility results in an average dray length of 203.80 miles or a 1.57% increase in drayage miles. Both of these increases in dray length over the new baseline are statistically significant at the 95% level of confidence.

When the Fort Wayne location is considered with the new mix of traffic the results are somewhat different than was experienced in the initial experimentation. For the new load distribution data, the replacement of the Corwith facility with a facility in Fort Wayne results in an average dray length of 191.25 miles. This figure is a 4.68% reduction in average dray length over the new baseline. Reallocation of traffic from Cicero to Fort Wayne results in an average dray length of 196.01 miles, a 2.31% reduction. Both of these reductions in dray length are statistically significant at the 95% confidence level.

Given the alternative load distribution profile which includes a substantially greater percentage of loads in the easternmost regions than the existing profile, the Fort Wayne facility provides reduction in average dray length while the Joliet location does not. The results of this additional experimentation are presented graphically in Figure 4.

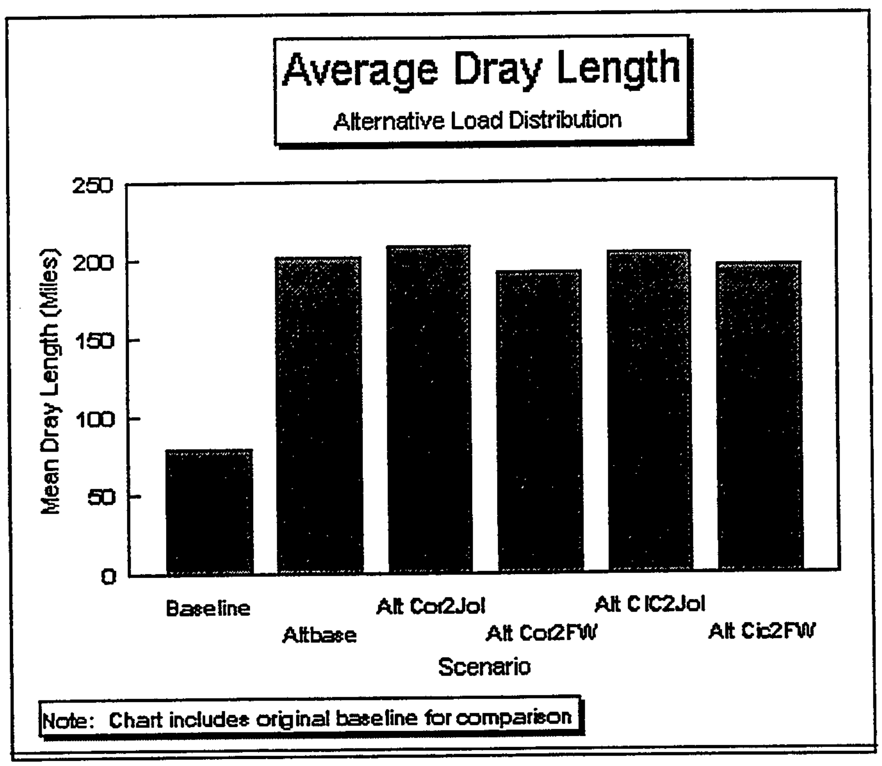

Figure 4. Comparison of Average Dray Lengths Under Alternative Load Distribution Assumptions.

MODEL DEVELOPMENT AND FEATURES

In addition to the network design capabilities highlighted through the case study example, the simulation tools developed have been designed to allow the study of rail yard size and capacity simultaneous with the study of distribution network design issues. The following is a brief discussion of the simulation models developed, their function and the results that they produce. Appendix A contains a code listing for the baseline scenario and some data generation code. Appendix B contains output from the model. Figure 5 is an illustration of the architecture of the simulation models developed. The discussion in this section focuses on the baseline model as all subsequent models use exactly the same code with the exception of the load distribution and yard location data.

The intermodal simulation model is designed to be able to make use of actual train arrival data or data generated by another program. For this experimentation, data was generated using a second simulation. This simulation is noted as mkdat.sim in Figure 5. Mkdat.sim generates train arrival profiles that fit data loosely provided by the industrial partner. The generated data includes arrival time for a given train and its composition in terms of container and trailer loading. The generated data also contains information regarding the destination yard for each train.

Once a data file containing train arrivals is generated, the primary simulation model (train.sim in Figure 5) is run. This simulation model consists of six major sections. Four of these sections deal with incoming trains and the drayage of destinating loads. The other two sections

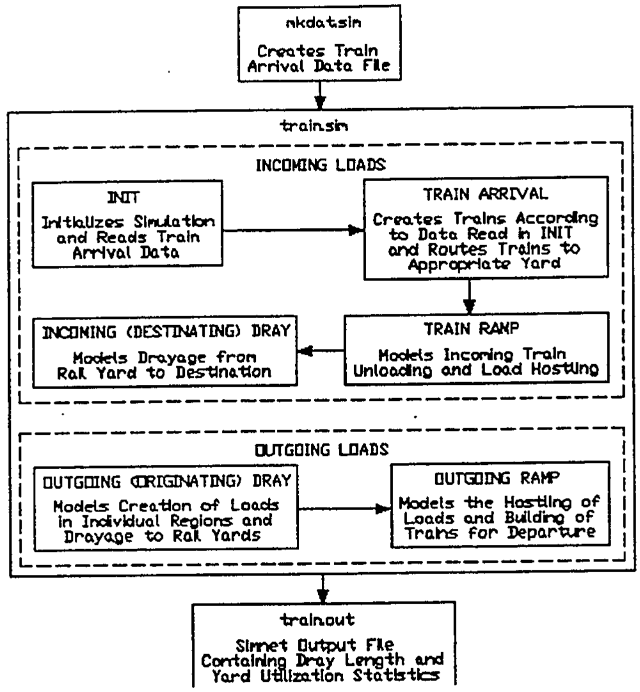

Figure 5. Simulation System Architecture.

handle the drayage of originating loads from the distribution regions and the operations related to building of trains for departure.

The first major code section is model initialization code that reads the data from the train arrival data file. Once the data for a train is read, another major section of code creates and routes an entity representing the train to the appropriate rail yard.

The third section is the train ramp model which models the unloading of trains at each of the rail yards. Upon arrival at a rail yard, a train is assigned to the first available strip track for unloading. The user can control the number of strip tracks available in a given yard. In this manner the simulation allows the modeling of any size rail yard. After arriving at a strip track, the train is unloaded and the individual loads are moved by the hostler fleet. The number of hostling tractors available in the yard is user configurable.

The last section of code dealing with incoming loads addresses the drayage of loads to their final destinations. In this code, individual trailer or container loads are parked until they are retrieved by an over the road tractor. The arrival rate of tractors to remove loads is user configurable as is the distribution of incoming loads to the various regional destinations.

The two remaining code sections handle originating loads. The first of these sections models the creation of loads in each of the service regions and the drayage of those loads to the rail yards. The distribution of loads travelling from a given region to each of the rail yards is user configurable as is the frequency of loads originating in a region.

Upon arrival at a rail yard, an originating load is parked until it can be moved to the train ramp for loading. This is modeled in the final section of code. The hostling tractors used in this portion of the model are drawn from the same resource pool as those used in the incoming load code. Again, the number of hostlers in a given yard is user configurable. After hostling to the ramp is completed, the individual carriers are loaded onto a train. When a departing train achieves a user defined number of loads it departs.

The final component of the simulation model depicted in Figure 5 is the simulation output. This output report contains several default and user defined statistics of interest. In addition to the average dray length statistics discussed in the case study analysis, the simulation output contains statistical summaries of the following metrics.

- Flow time for incoming (destinating) loads.
- Flow time for outgoing (originating) loads.
- Average incoming load dray length.
- Average outgoing load dray length.
- Total drayage distance per run.
- Average incoming dray distance from each yard to all service regions.

- Average outgoing dray distance from each service region to all rail yards.
- Average incoming dray distance from all yards to each service region.
- Average outgoing dray distance for all service regions to each yard.
- Utilization of hostlers at each yard.
- Minimum, maximum and average lengths for simulation queues representing parking.
- Minimum, maximum and average utilizations for simulation facilities representing loading and unloading on strip tracks.

CONCLUSIONS

With the increased emphasis in recent years upon intermodal transportation as a key business logistics strategy, it has become important for researchers to develop tools that address the design of intermodal systems. In this paper, the authors have investigated the current status of research in intermodal transportation and have presented a simulation-based methodology that addresses the functions of both intermodal rail yards and associated truckload distribution networks. Using a case study example based upon existing operations and data from a major intermodal rail carrier, the authors have demonstrated the efficacy of this approach.

In addition to the network design capabilities highlighted through the case study example, the simulation tools developed have been designed to allow the study of rail yard size and capacity simultaneous with the study of distribution network design issues. The simulation tools developed are unique in that they address both the design and operation of intermodal rail facilities and the integration of those facilities with a truckload distribution network.

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APPENDIX A

SAMPLE SIMNET II INPUT MODEL

```
$PROJECT;BNSF,05/11/98,TIM MEINERT:
$DIMENSION;ENTITY(5000),A(4),DIST(4,6),NSTRIP(4),LDF(4,20),ULF(4,20),
          PCNTCON(4),LSTRIP(4),TODEST(4),TOYARD(6),FROMYARD(6),
          FROMALL(4):

!Attribute uses in 'INIT' code!
!A(1)=DELAY UNTIL TRAIN ARRIVAL
!A(2)=# OF CONTAINER CARS (1/2 # OF CONTAINERS)
!A(3)=# OF TRAILER CARS (= * OF TRAILERS)
!A(4)=DESTINATION YARD (1=CORWITH, 2=CICERO, 3=WILLOW, 4=JOLIET)

!Attribute use in TRAIN ARRIVAL code!
!A(1)=TRAIN SERIAL #
!A(2)=# OF CONTAINER CARS (1/2 # OF CONTAINERS)
!A(3)=# OF TRAILER CARS (= # OF TRAILERS)
!A(4)=DESTINATION YARD (1=CORWITH, 2=CICERO, 3=WILLOW, 4=JOLIET)

!Attribute use in TRAIN RAMP code!
!A(1)=FINAL DESTINATION 1=ILL, 2=WISC, 3=MICH, 4=NE, 5=OH, 6=IND
!A(2)=TYPE OF LOAD, CONTAINER =1  OR TRAILER =2
!A(3)=TIME OF ARRIVAL
!A(4)=STRIP TRACK THEN CURRENT YARD

!Attribute use in INCOMING DRAY code!
!A(1)=FINAL DESTINATION 1=ILL, 2=WISC, 3=MICH, 4=NE, 5=OH, 6=IND
!A(2)=TYPE OF LOAD, CONTAINER =1  OR TRAILER =2
!A(3)=TIME OF ARRIVAL
!A(4)=STRIP TRACK THEN CURRENT YARD

!Attribute use in OUTGOING DRAY code!
!A(1)=SOURCE LOCN 1=ILL, 2=WISC, 3=MICH, 4=NE, 5=OH, 6=IND
!A(2)=TYPE OF LOAD, CONTAINER =1  OR TRAILER =2
!A(3)=TIME OF CREATION
!A(4)=DESTINATION YARD

!Attribute use in OUTGOING HOSTLING code!
!A(1)=STRIP TRACK
!A(2)=TYPE OF LOAD, CONTAINER =1  OR TRAILER =2
!A(3)=TIME OF CREATION
!A(4)=CURRENT YARD
! -------------------- DEFINITIONS SEGMENT ---------------------- !
$VARIABLES:SYST_IN;;TRANSIT(3):
          SYST_OUT;;TRANSIT(3):
          AVGDRAY;;DRAYLEN:
          INDRAY;;INLEN:
          OUTDRAY;;OUTLEN:
          TOTDRAY;RUN.END;TOTDIST:

          COR2DEST;;TODEST(1):
          CIC2DEST;;TODEST(2):
          WIL2DEST;;TODEST(3):
          JOL2DEST;;TODEST(4):

          IL2YARD;;TOYARD(1):
          WI2YARD;;TOYARD(2):
          MI2YARD;;TOYARD(3):
          NE2YARD;;TOYARD(4):
          OH2YARD;;TOYARD(5):
          IN2YARD;;TOYARD(6):

          YARD2IL;;FROMYARD(1):
```

```
          YARD2WI;;FROMYARD(2):
          YARD2MI;;FROMYARD(3):
          YARD2NE;;FROMYARD(4):
          YARD2OH;;FROMYARD(5):
          YARD2IN;;FROMYARD(6):

          ALL2COR;;FROMALL(1):
          ALL2CIC;;FROMALL(2):
          ALL2WIL;;FROMALL(3):
          ALL2JOL;;FROMALL(4):
!$SWITCHES:
$RESOURCES:HOSTLER1;63(HOSTL1(1),HOSTL1(2),HOSTL1(3),HOSTL1(4),
HOSTL1(5),HOSTL1(6),HOSTL1(7),HOSTL1(8),HOSTL1(9),HOSTL1(10),
HOSTL1(11),HOSTL1(12),HOSTL1(13),HOSTL1(14),HOSTL1(15),HOSTL1(16),
HOSTL1(17),HOSTL1(18),HOSTL1(19),HOSTL1(20),OGHL1(1),OGHL1(2),
OGHL1(3),OGHL1(4),OGHL1(5),OGHL1(6),OGHL1(7),OGHL1(8),OGHL1(9),
OGHL1(10),OGHL1(11),OGHL1(12),OGHL1(13),OGHL1(14),OGHL1(15),
OGHL1(16),OGHL1(17),OGHL1(18),OGHL1(19),OGHL1(20)):

HOSTLER2;22(HOSTL2(1),HOSTL2(2),HOSTL2(3),HOSTL2(4),HOSTL2(5),
HOSTL2(6),HOSTL2(7),HOSTL2(8),HOSTL2(9),HOSTL2(10),OGHL2(1),
OGHL2(2),OGHL2(3),OGHL2(4),OGHL2(5),OGHL2(6),OGHL2(7),OGHL2(8),
OGHL2(9),OGHL2(10)):

HOSTLER3;27(HOSTL3(1),HOSTL3(2),HOSTL3(3),HOSTL3(4),HOSTL3(5),
OGHL3(1),OGHL3(2),OGHL3(3),OGHL3(4),OGHL3(5)):

HOSTLER4;27(HOSTL4(1),HOSTL4(2),HOSTL4(3),HOSTL4(4),HOSTL4(5),
OGHL4(1),OGHL4(2),OGHL4(3),OGHL4(4),OGHL4(5)):
! --------------------- MODEL LOGIC SEGMENT ---------------------- !
$BEGIN:
!*****  INIT  *****!
SINIT     *S;/L/LIM=1:
ARV       *A;A(1):
          *B;ARV;/A/A(1)=CNT,
                    IF,CUR.TIME<>0,THEN,
                      LAST(QD1)=TRANS,
                    ENDIF,
                    CNT=CNT+1,
                    READ(49+run)=(NT,A(2),A(3),A(4)),
                    IF,NT<>999,THEN,
                      A(1)=NT*60-CUR.TIME,
                    ELSE,
                      A(1)=(RUN.LEN+1)-CUR.TIME,
                    ENDIF%:
!*****  TRAIN ARRIVAL  *****!
QCHECK    *Q:
ACHECK    *A;10:
QD1       *Q:
AD1       *A:
QTRARV    *Q:
          *B;TERM;/A/CLIM=A(2),TLIM=A(3),
                     DESTYARD=A(4),
                     CURSTP=0,
                     IF,DESTYARD=1,THEN,            !CORWITH
                       MINSTP=99999,
                       FOR,I=1,TO,NSTRIP(A(4)),DO,
                         TLEN=LEN(HOSTQ1(I))+LEN(STRPQ1(I)),
                         TLEN=TLEN+LEN(STRPF1(I)),
                         IF,TLEN<MINSTP,AND,ULF(DESTYARD,I)=0,THEN,
                           IF,LDF(DESTYARD,I)=0,THEN,
                             CURSTP=I,
                             MINSTP=TLEN,
                           ENDIF,
                         ENDIF,
                       NEXT,
                       A(4)=CURSTP,
                       IF,CURSTP>0,THEN,
                         ULF(DESTYARD,CURSTP)=1,
                         FOR,I=1,TO,CLIM,DO,
```

```
      A(2)=1,
      A(3)=CUR.TIME,
      LAST(CORQ)=TRANS,
      LAST(CORQ)=TRANS,
    NEXT,
    FOR,I=1,TO,TLIM,DO,
      A(2)=2,
      A(3)=CUR.TIME,
      LAST(CORQ)=TRANS,
    NEXT,
  ELSE,
    LAST(QCHECK)=TRANS,
  ENDIF,
ENDIF,

IF,DESTYARD=2,THEN,            !CICERO
  MINSTP=99999,
  FOR,I=1,TO,NSTRIP(A(4)),DO,
    TLEN=LEN(HOSTQ2(I))+LEN(STRPQ2(I)),
    TLEN=TLEN+LEN(STRPF2(I)),
    IF,TLEN<MINSTP,AND,ULF(DESTYARD,I)=0,THEN,
      IF,LDF(DESTYARD,I)=0,THEN,
        CURSTP=I,
        MINSTP=TLEN,
      ENDIF,
    ENDIF,
  NEXT,
  A(4)=CURSTP,
  IF,CURSTP>0,THEN,
    ULF(DESTYARD,CURSTP)=1,
    FOR,I=1,TO,CLIM,DO,
      A(2)=1,
      A(3)=CUR.TIME,
      LAST(CICQ)=TRANS,
      LAST(CICQ)=TRANS,
    NEXT,
    FOR,I=1,TO,TLIM,DO,
      A(2)=2,
      A(3)=CUR.TIME,
      LAST(CICQ)=TRANS,
    NEXT,
  ELSE,
    LAST(QCHECK)=TRANS,
  ENDIF,
ENDIF,

IF,DESTYARD=3,THEN,            !WILLOW
  MINSTP=99999,
  FOR,I=1,TO,NSTRIP(A(4)),DO,
    TLEN=LEN(HOSTQ3(I))+LEN(STRPQ3(I)),
    TLEN=TLEN+LEN(STRPF3(I)),
    IF,TLEN<MINSTP,AND,ULF(DESTYARD,I)=0,THEN,
      IF,LDF(DESTYARD,I)=0,THEN,
        CURSTP=I,
        MINSTP=TLEN,
      ENDIF,
    ENDIF,
  NEXT,
  A(4)=CURSTP,
  IF,CURSTP>0,THEN,
    ULF(DESTYARD,CURSTP)=1,
    FOR,I=1,TO,CLIM,DO,
      A(2)=1,
      A(3)=CUR.TIME,
      LAST(WILQ)=TRANS,
      LAST(WILQ)=TRANS,
    NEXT,
    FOR,I=1,TO,TLIM,DO,
      A(2)=2,
      A(3)=CUR.TIME,
```

```
                LAST(WILQ)=TRANS,
              NEXT,
            ELSE,
              LAST(QCHECK)=TRANS,
            ENDIF,
          ENDIF,

          IF,DESTYARD=4,THEN,             !JOLIET
            MINSTP=99999,
            FOR,I=1,TO,NSTRIP(A(4)),DO,
              TLEN=LEN(HOSTQ4(I))+LEN(STRPQ4(I)),
              TLEN=TLEN+LEN(STRPF4(I)),
              IF,TLEN<MINSTP,AND,ULF(DESTYARD,I)=0,THEN,
                IF,LDF(DESTYARD,I)=0,THEN,
                  CURSTP=I,
                  MINSTP=TLEN,
                ENDIF,
              ENDIF,
            NEXT,
            A(4)=CURSTP,
            IF,CURSTP>0,THEN,
              ULF(DESTYARD,CURSTP)=1,
              FOR,I=1,TO,CLIM,DO,
                A(2)=1,
                A(3)=CUR.TIME,
                LAST(JOLQ)=TRANS,
                LAST(JOLQ)=TRANS,
              NEXT,
              FOR,I=1,TO,TLIM,DO,
                A(2)=2,
                A(3)=CUR.TIME,
                LAST(JOLQ)=TRANS,
              NEXT,
            ELSE,
              LAST(QCHECK)=TRANS,
            ENDIF,
          ENDIF%:

!*****  TRAIN RAMP (Corwith) *****!

CORQ      *Q:
          *B;INSERT1:
          *PROC(1-20):
INSERT1   *A;*STRPQ1(A(4)):
STRPQ1()  *Q:
          *B;STRPF1():
STRPF1()  *F;;FFUN(1,A(2)):
          *B;HOSTQ1();/A/A(1)=DI(1)%:
HOSTQ1()  *Q:
          *B;HOSTL1():
HOSTL1()  *F;;UN(5,25);63;;HOSTLER1(1,0,1,0):
          *B;DEPWAIT1;/A/A(4)=1,
                    X=IBLIND,
                    Y=LEN(STRPQ1(X))+LEN(STRPF1(X)),
                    Y=Y+LEN(HOSTQ1(X))+LEN(HOSTL1(X)),!ADD TO
                    IF,Y<=1,THEN,                     !OTHER YARDS
                      ULF(1,X)=0,                     !WHEN DONE
                    ENDIF%:
          *ENDPROC:
DEPWAIT1  *Q:
          *B;TERM/1;CUR.TIME<0?:

SDRAY1    *S;EX(.77):
          *B;TERM;/A/IF,LEN(DEPWAIT1)>0,THEN,
                      LAST(QTRAV)=FIRST(DEPWAIT1),
                   ENDIF%:

!*****  TRAIN RAMP (Cicero) *****!  FFUN 2

CICQ      *Q:
```

```
         *B;INSERT2:
         *PROC(1-10):
INSERT2  *A;*STRPQ2(A(4)):
STRPQ2() *Q:
         *B;STRPF2():
STRPF2() *F;;FFUN(2,A(2)):
         *B;HOSTQ2();/A/A(1)=DI(2)%:
HOSTQ2() *Q:
         *B;HOSTL2():
HOSTL2() *F;;UN(15,20);22;;HOSTLER2(1,0,1,0):
         *B;DEPWAIT2;/A/A(4)=2,
                    X=IBLIND,
                    Y=LEN(STRPQ2(X))+LEN(STRPF2(X)),
                    Y=Y+LEN(HOSTQ2(X))+LEN(HOSTL2(X)),
                    IF,Y<=1,THEN,
                      ULF(2,X)=0,
                    ENDIF%:
         *ENDPROC:
DEPWAIT2 *Q:
         *B;TERM/1;CUR.TIME<0?:

SDRAY2   *S;EX(1.3):
         *B;TERM;/A/IF,LEN(DEPWAIT2)>0,THEN,
                     LAST(QTRAV)=FIRST(DEPWAIT2),
                   ENDIF%:

!*****  TRAIN RAMP (Willow) *****!  FFUN 3

WILQ     *Q:
         *B;INSERT3:
         *PROC(1-5):
INSERT3  *A;*STRPQ3(A(4)):
STRPQ3() *Q:
         *B;STRPF3():
STRPF3() *F;;FFUN(3,A(2)):
         *B;HOSTQ3();/A/A(1)=DI(3)%:
HOSTQ3() *Q:
         *B;HOSTL3():
HOSTL3() *F;;UN(15,20);27;;HOSTLER3(1,0,1,0):
         *B;DEPWAIT3;/A/A(4)=3,
                    X=IBLIND,
                    Y=LEN(STRPQ3(X))+LEN(STRPF3(X)),
                    Y=Y+LEN(HOSTQ3(X))+LEN(HOSTL3(X)),
                    IF,Y<=1,THEN,
                      ULF(3,X)=0,
                    ENDIF%:
         *ENDPROC:
DEPWAIT3 *Q:
         *B;TERM/1;CUR.TIME<0?:

SDRAY3   *S;EX(.94):
         *B;TERM;/A/IF,LEN(DEPWAIT3)>0,THEN,
                     LAST(QTRAV)=FIRST(DEPWAIT3),
                   ENDIF%:

!*****  TRAIN RAMP (Joliet) *****!  FFUN 4

JOLQ     *Q:
         *B;INSERT4:
         *PROC(1-5):
INSERT4  *A;*STRPQ4(A(4)):
STRPQ4() *Q:
         *B;STRPF4():
STRPF4() *F;;FFUN(4,A(2)):
         *B;HOSTQ4();/A/A(1)=DI(4)%:
HOSTQ4() *Q:
         *B;HOSTL4():
HOSTL4() *F;;UN(15,20);27;;HOSTLER4(1,0,1,0):
         *B;DEPWAIT4;/A/A(4)=4,
                    X=IBLIND,
```

```
                    Y=LEN(STRPQ4(X))+LEN(STRPF4(X)),
                    Y=Y+LEN(HOSTQ4(X))+LEN(HOSTL4(X)),
                    IF,Y<=1,THEN,
                      ULF(4,X)=0,
                    ENDIF%:
          *ENDPROC:
DEPWAIT4  *Q:
          *B;TERM/1;CUR.TIME<0?:

SDRAY4    *S;EX(.94):
          *B;TERM;/A/IF,LEN(DEPWAIT4)>0,THEN,
                      LAST(QTRAV)=FIRST(DEPWAIT4),
                    ENDIF%:

!****  INCOMING DRAY (RAIL TO DEST)  *****!
QTRAV     *Q:
          *B;TRAVEL;/A/D=DIST(A(4),A(1)),
                     TODEST(A(4))=D,
                     FROMYARD(A(1))=D,
                     DRAYLEN=D,
                     INLEN=D,
                     TOTDIST=TOTDIST+D,
                     COLLECT=AVGDRAY,
                     COLLECT=INDRAY,
                     IF,A(4)=1,THEN,
                       COLLECT=COR2DEST,
                     ENDIF,
                     IF,A(4)=2,THEN,
                       COLLECT=CIC2DEST,
                     ENDIF,
                     IF,A(4)=3,THEN,
                       COLLECT=WIL2DEST,
                     ENDIF,
                     IF,A(4)=4,THEN,
                       COLLECT=JOL2DEST,
                     ENDIF,
                     IF,A(1)=1,THEN,
                       COLLECT=YARD2IL,
                     ENDIF,
                     IF,A(1)=2,THEN,
                       COLLECT=YARD2WI,
                     ENDIF,
                     IF,A(1)=3,THEN,
                       COLLECT=YARD2MI,
                     ENDIF,
                      IF,A(1)=4,THEN,
                       COLLECT=YARD2NE,
                     ENDIF,
                     IF,A(1)=5,THEN,
                       COLLECT=YARD2OH,
                     ENDIF,
                     IF,A(1)=6,THEN,
                       COLLECT=YARD2IN,
                     ENDIF%:

                     !COLLECT DRAY DISTANCE ETC HERE.  IF
                     !DRAY DISTANCES ARE TO BE STOCHASTIC,
                     !THEN ADD AN ATTRIBUTE (OR USE A(3) IF
                     !SYSTIME PROVES TO BE OF NO INTEREST)
                     !AND SET IT ON THIS BRANCH AND MAKE THE
                     !DELAY TERM IN TRAVEL BE THAT ATTRIBUTE
                     !
                     !I SUPPOSE THAT AVG DRAY LENGTH OVERALL,
                     !AVG DRAY LENGTH FROM A GIVEN YARD AND
                     !AVG DRAY LENGTH TO A GIVEN DEST ARE OF
                     !INTEREST.

TRAVEL    *A;60*DIST(A(4),A(1))/SPEED:
          *B;TERM;/V/SYST_IN%:
```

```
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!

!*****  OUTGOING DRAY (SOURCE TO RAIL)  *****!
SIL     *S;0.52;;3:      !
        *B;QDRAY;;A(1)=1,A(4)=DI(5)%:

SWI     *S;12.77;;3:     !
        *B;QDRAY;;A(1)=2,A(4)=DI(6)%:

SMI     *S;16.96;;3:     !
        *B;QDRAY;;A(1)=3,A(4)=DI(7)%:

SNE     *S;8.97;;3:      !
        *B;QDRAY;;A(1)=4,A(4)=DI(8)%:

SOH     *S;6.64;;3:      !
        *B;QDRAY;;A(1)=5,A(4)=DI(9)%:

SIN     *S;11.35;;3:     !

        *B;QDRAY;;A(1)=6,A(4)=DI(10)%:

QDRAY   *Q:
        *B;DRAY;/A/D=DIST(A(4),A(1)),
                     FROMALL(A(4))=D,
                     TOYARD(A(1))=D,
                     DRAYLEN=D,
                     OUTLEN=D,
                     TOTDIST=TOTDIST+D,
                     COLLECT=AVGDRAY,
                     COLLECT=OUTDRAY,
                     IF,A(4)=1,THEN,
                       COLLECT=ALL2COR,
                     ENDIF,
                     IF,A(4)=2,THEN,
                       COLLECT=ALL2CIC,
                     ENDIF,
                     IF,A(4)=3,THEN,
                       COLLECT=ALL2WIL,
                     ENDIF,
                     IF,A(4)=4,THEN,
                       COLLECT=ALL2JOL,
                     ENDIF,
                     IF,A(1)=1,THEN,
                       COLLECT=IL2YARD,
                     ENDIF,
                     IF,A(1)=2,THEN,
                       COLLECT=WI2YARD,
                     ENDIF,
                     IF,A(1)=3,THEN,
                       COLLECT=MI2YARD,
                     ENDIF,
                      IF,A(1)=4,THEN,
                       COLLECT=NE2YARD,
                     ENDIF,
                     IF,A(1)=5,THEN,
                       COLLECT=OH2YARD,
                     ENDIF,
                     IF,A(1)=6,THEN,
                       COLLECT=IN2YARD,
                     ENDIF%:

                     !COLLECT DRAY DISTANCE ETC HERE.  IF
                     !DRAY DISTANCES ARE TO BE STOCHASTIC,
                     !THEN ADD AN ATTRIBUTE (OR USE A(3) IF
                     !SYSTIME PROVES TO BE OF NO INTEREST)
                     !AND SET IT ON THIS BRANCH AND MAKE THE
                     !DELAY TERM IN DRAY BE THAT ATTRIBUTE
```

```
                    !
                    !I SUPPOSE THAT AVG DRAY LENGTH OVERALL,
                    !AVG DRAY LENGTH FROM A GIVEN YARD AND
                    !AVG DRAY LENGTH TO A GIVEN DEST ARE OF
                    !INTEREST.

DRAY      *A;60*DIST(A(4),A(1))/SPEED:
          *B;INCOR/1;A(4)=1?:
          *B;INCIC/1;A(4)=2?:
          *B;INWIL/1;A(4)=3?:
          *B;INJOL/1;A(4)=4?:



!*****  OUTGOING HOSTLING AND RAMP (Corwith) *****!

INCOR     *A:
          *B;CORCON/1;RND<=PCNTCON(A(4))?;
                      A(2)=1%:
          *B;CORTRL/L;;A(2)=2%:

QDEL1     *Q:
DEL1      *A;10:
          *B;CORCON/1;A(2)=1?:
          *B;CORTRL/1;A(2)=2?:


CORCON    *Q;;2(LO(3)):
          *B;TERM;/A/IF,LSTRIP(A(4))>0,THEN,
                          Z=LSTRIP(A(4)),
                          FLEN=LEN(QOGHL1(Z))+LEN(OGHL1(Z)),
                          FLEN=FLEN+LEN(QMKTN1(Z))+LEN(MKTN1(Z)),
                          FLEN=FLEN+LEN(QTN1(Z)),
                          IF,FLEN>=60,THEN,
                            LSTRIP(A(4))=0,
                          ENDIF,
                        ENDIF,
                        IF,LSTRIP(A(4))=0,THEN,
                          FOR,I=1,TO,NSTRIP(A(4)),DO,
                            IF,ULF(A(4),I)=0,THEN,
                              IF,LDF(A(4),I)=0,THEN,
                                IF,LEN(INSTN1(I))=0,THEN,
                                  LSTRIP(A(4))=I,
                                  LDF(A(4),I)=1,
                                  I=999,          !LOOP=BREAK,
                                ENDIF,
                              ENDIF,
                            ENDIF,
                          NEXT,
                        ENDIF,
                        A(1)=LSTRIP(A(4)),
                        IF,A(1)=0,THEN,
                          LAST(QDEL1)=TRANS,
                        ELSE,
                          LAST(QCORINPT)=TRANS,
                        ENDIF%:


DA1       *A:
CORTRL    *Q:
          *B;TERM;/A/IF,LSTRIP(A(4))>0,THEN,
                          Z=LSTRIP(A(4)),
                          FLEN=LEN(QOGHL1(Z))+LEN(OGHL1(Z)),
                          FLEN=FLEN+LEN(QMKTN1(Z))+LEN(MKTN1(Z)),
                          FLEN=FLEN+LEN(QTN1(Z)),
                          IF,FLEN>=60,THEN,
                            LSTRIP(A(4))=0,
                          ENDIF,
                        ENDIF,
```

```
                    IF,LSTRIP(A(4))=0,THEN,
                      FOR,I=1,TO,NSTRIP(A(4)),DO,
                        IF,ULF(A(4),I)=0,THEN,
                          IF,LDF(A(4),I)=0,THEN,
                            IF,LEN(INSTN1(I))=0,THEN,
                              LSTRIP(A(4))=I,
                              LDF(A(4),I)=1,
                              I=999,            !LOOP=BREAK,
                            ENDIF,
                          ENDIF,
                        ENDIF,
                      NEXT,
                    ENDIF,
                    A(1)=LSTRIP(A(4)),
                    IF,A(1)=0,THEN,
                      LAST(QDEL1)=TRANS,
                    ELSE,
                      LAST(QCORINPT)=TRANS,
                    ENDIF%:
QCORINPT  *Q:
          *B;CORINPT;/A/WRITE(79)=("(F10.4)",CUR.TIME)%:

          *PROC(1-20):
CORINPT   *A;*QOGHL1(A(1)):
QOGHL1()  *Q:
OGHL1()   *F;;UN(5,25);63;;HOSTLER1(1,0,1,0):
QMKTN1()  *Q:
MKTN1()   *F;;FFUN(5,A(2)):
QTN1()    *Q;;60(LO(3)):
          *B;INSTN1();/A/IF,LSTRIP(A(4))=IBLIND,THEN,
                           LSTRIP(A(4))=0,
                         ENDIF%:
INSTN1()  *F;;45:
          *B;EXCOR:
          *ENDPROC:
EXCOR     *A:
          *B;TERM;/A/LDF(A(4),A(1))=0%;SYST_OUT%:


!*****  OUTGOING HOSTLING AND RAMP (Cicero) *****!

INCIC     *A:
          *B;CICCON/1;RND<=PCNTCON(A(4))?;
                      A(2)=1%:
          *B;CICTRL/L;;A(2)=2%:

QDEL2     *Q:
DEL2      *A;10:
          *B;CICCON/1;A(2)=1?:
          *B;CICTRL/1;A(2)=2?:

CICCON    *Q;;2(LO(3)):
          *B;TERM;/A/IF,LSTRIP(A(4))>0,THEN,
                       Z=LSTRIP(A(4)),
                       FLEN=LEN(QOGHL2(Z))+LEN(OGHL2(Z)),
                       FLEN=FLEN+LEN(QMKTN2(Z))+LEN(MKTN2(Z)),
                       FLEN=FLEN+LEN(QTN2(Z)),
                       IF,FLEN>=60,THEN,
                         LSTRIP(A(4))=0,
                       ENDIF,
                     ENDIF,
                     IF,LSTRIP(A(4))=0,THEN,
                       FOR,I=1,TO,NSTRIP(A(4)),DO,
                         IF,ULF(A(4),I)=0,THEN,
                           IF,LDF(A(4),I)=0,THEN,
                             IF,LEN(INSTN2(I))=0,THEN,
                               LSTRIP(A(4))=I,
                               LDF(A(4),I)=1,
                               I=999,            !LOOP=BREAK,
                             ENDIF,
```

```
                    ENDIF,
                  ENDIF,
                NEXT,
              ENDIF,
              A(1)=LSTRIP(A(4)),
              IF,A(1)=0,THEN,
                LAST(QDEL2)=TRANS,
              ELSE,
                LAST(QCICINPT)=TRANS,
              ENDIF%:


DA2       *A:
CICTRL    *Q:
          *B;TERM;/A/IF,LSTRIP(A(4))>0,THEN,
                Z=LSTRIP(A(4)),
                FLEN=LEN(QOGHL2(Z))+LEN(OGHL2(Z)),
                FLEN=FLEN+LEN(QMKTN2(Z))+LEN(MKTN2(Z)),
                FLEN=FLEN+LEN(QTN2(Z)),
                IF,FLEN>=60,THEN,
                  LSTRIP(A(4))=0,
                ENDIF,
              ENDIF,
              IF,LSTRIP(A(4))=0,THEN,
                FOR,I=1,TO,NSTRIP(A(4)),DO,
                  IF,ULF(A(4),I)=0,THEN,
                    IF,LDF(A(4),I)=0,THEN,
                      IF,LEN(INSTN2(I))=0,THEN,
                        LSTRIP(A(4))=I,
                        LDF(A(4),I)=1,
                        I=999,            !LOOP=BREAK,
                      ENDIF,
                    ENDIF,
                  ENDIF,
                NEXT,
              ENDIF,
              A(1)=LSTRIP(A(4)),
              IF,A(1)=0,THEN,
                LAST(QDEL2)=TRANS,
              ELSE,
                LAST(QCICINPT)=TRANS,
              ENDIF%:

QCICINPT  *Q:
          *B;CICINPT:

          *PROC(1-10):
CICINPT   *A;*QOGHL2(A(1)):
QOGHL2()  *Q:
OGHL2()   *F;;UN(5,25);22;;HOSTLER2(1,0,1,0):
QMKTN2()  *Q:
MKTN2()   *F;;FFUN(6,A(2)):
QTN2()    *Q;;60(LO(3)):
          *B;INSTN2();/A/IF,LSTRIP(A(4))=IBLIND,THEN,
                  LSTRIP(A(4))=0,
                ENDIF%:
INSTN2()  *F;;45:
          *B;EXCIC:
          *ENDPROC:
EXCIC     *A:
          *B;TERM;/A/LDF(A(4),A(1))=0%;SYST_OUT%:

!*****  OUTGOING HOSTLING AND RAMP (Willow) *****!

INWIL     *A:
          *B;WILCON/1;RND<=PCNTCON(A(4))?;
                   A(2)=1%:
          *B;WILTRL/L;;A(2)=2%:

QDEL3     *Q:
```

```
DEL3      *A;10:
          *B;WILCON/1;A(2)=1?:
          *B;WILTRL/1;A(2)=2?:

WILCON    *Q;;2(LO(3)):
          *B;TERM;/A/IF,LSTRIP(A(4))>0,THEN,
                          Z=LSTRIP(A(4)),
                          FLEN=LEN(QOGHL3(Z))+LEN(OGHL3(Z)),
                          FLEN=FLEN+LEN(QMKTN3(Z))+LEN(MKTN3(Z)),
                          FLEN=FLEN+LEN(QTN3(Z)),
                          IF,FLEN>=60,THEN,
                            LSTRIP(A(4))=0,
                          ENDIF,
                        ENDIF,
                        IF,LSTRIP(A(4))=0,THEN,
                          FOR,I=1,TO,NSTRIP(A(4)),DO,
                            IF,ULF(A(4),I)=0,THEN,
                              IF,LDF(A(4),I)=0,THEN,
                                IF,LEN(INSTN3(I))=0,THEN,
                                  LSTRIP(A(4))=I,
                                  LDF(A(4),I)=1,
                                  I=999,           !LOOP=BREAK,
                                ENDIF,
                              ENDIF,
                            ENDIF,
                          NEXT,
                        ENDIF,
                        A(1)=LSTRIP(A(4)),
                        IF,A(1)=0,THEN,
                          LAST(QDEL3)=TRANS,
                        ELSE,
                          LAST(QWILINPT)=TRANS,
                        ENDIF%:


DA3       *A:
WILTRL    *Q:
          *B;TERM;/A/IF,LSTRIP(A(4))>0,THEN,
                          Z=LSTRIP(A(4)),
                          FLEN=LEN(QOGHL3(Z))+LEN(OGHL3(Z)),
                          FLEN=FLEN+LEN(QMKTN3(Z))+LEN(MKTN3(Z)),
                          FLEN=FLEN+LEN(QTN3(Z)),
                          IF,FLEN>=60,THEN,
                            LSTRIP(A(4))=0,
                          ENDIF,
                        ENDIF,
                        IF,LSTRIP(A(4))=0,THEN,
                          FOR,I=1,TO,NSTRIP(A(4)),DO,
                            IF,ULF(A(4),I)=0,THEN,
                              IF,LDF(A(4),I)=0,THEN,
                                IF,LEN(INSTN3(I))=0,THEN,
                                  LSTRIP(A(4))=I,
                                  LDF(A(4),I)=1,
                                  I=999,           !LOOP=BREAK,
                                ENDIF,
                              ENDIF,
                            ENDIF,
                          NEXT,
                        ENDIF,
                        A(1)=LSTRIP(A(4)),
                        IF,A(1)=0,THEN,
                          LAST(QDEL3)=TRANS,
                        ELSE,
                          LAST(QWILINPT)=TRANS,
                        ENDIF%:
QWILINPT  *Q:
          *B;WILINPT:

          *PROC(1-5):
WILINPT   *A;*QOGHL3(A(1)):
```

```
QOGHL3()   *Q:
OGHL3()    *F;;UN(5,25);27;;HOSTLER3(1,0,1,0):
QMKTN3()   *Q:
MKTN3()    *F;;FFUN(7,A(2)):
QTN3()     *Q;;60(LO(3)):
           *B;INSTN3();/A/IF,LSTRIP(A(4))=IBLIND,THEN,
                            LSTRIP(A(4))=0,
                          ENDIF%:
INSTN3()   *F;;45:
           *B;EXWIL:
           *ENDPROC:
EXWIL      *A:
           *B;TERM;/A/LDF(A(4),A(1))=0%;SYST_OUT%:

!*****  OUTGOING HOSTLING AND RAMP (Joliet) *****!

INJOL      *A:
           *B;JOLCON/1;RND<=PCNTCON(A(4))?;
                       A(2)=1%:
           *B;JOLTRL/L;;A(2)=2%:

QDEL4      *Q:
DEL4       *A;10:
           *B;JOLCON/1;A(2)=1?:
           *B;JOLTRL/1;A(2)=2?:

JOLCON     *Q;;2(LO(3)):
           *B;TERM;/A/IF,LSTRIP(A(4))>0,THEN,
                           Z=LSTRIP(A(4)),
                           FLEN=LEN(QOGHL4(Z))+LEN(OGHL4(Z)),
                           FLEN=FLEN+LEN(QMKTN4(Z))+LEN(MKTN4(Z)),
                           FLEN=FLEN+LEN(QTN4(Z)),
                           IF,FLEN>=60,THEN,
                             LSTRIP(A(4))=0,
                           ENDIF,
                         ENDIF,
                         IF,LSTRIP(A(4))=0,THEN,
                           FOR,I=1,TO,NSTRIP(A(4)),DO,
                             IF,ULF(A(4),I)=0,THEN,
                               IF,LDF(A(4),I)=0,THEN,
                                 IF,LEN(INSTN4(I))=0,THEN,
                                   LSTRIP(A(4))=I,
                                   LDF(A(4),I)=1,
                                   I=999,           !LOOP=BREAK,
                                 ENDIF,
                               ENDIF,
                             ENDIF,
                           NEXT,
                         ENDIF,
                         A(1)=LSTRIP(A(4)),
                         IF,A(1)=0,THEN,
                           LAST(QDEL4)=TRANS,
                         ELSE,
                           LAST(QJOLINPT)=TRANS,
                         ENDIF%:


DA4        *A:
JOLTRL     *Q:
           *B;TERM;/A/IF,LSTRIP(A(4))>0,THEN,
                           Z=LSTRIP(A(4)),
                           FLEN=LEN(QOGHL4(Z))+LEN(OGHL4(Z)),
                           FLEN=FLEN+LEN(QMKTN4(Z))+LEN(MKTN4(Z)),
                           FLEN=FLEN+LEN(QTN4(Z)),
                           IF,FLEN>=60,THEN,
                             LSTRIP(A(4))=0,
                           ENDIF,
                         ENDIF,
                         IF,LSTRIP(A(4))=0,THEN,
                           FOR,I=1,TO,NSTRIP(A(4)),DO,
```

```
                              IF,ULF(A(4),I)=0,THEN,
                                IF,LDF(A(4),I)=0,THEN,
                                  IF,LEN(INSTN4(I))=0,THEN,
                                    LSTRIP(A(4))=I,
                                    LDF(A(4),I)=1,
                                    I=999,           !LOOP=BREAK,
                                  ENDIF,
                                ENDIF,
                              ENDIF,
                            NEXT,
                          ENDIF,
                          A(1)=LSTRIP(A(4)),
                          IF,A(1)=0,THEN,
                            LAST(QDEL4)=TRANS,
                          ELSE,
                            LAST(QJOLINPT)=TRANS,
                          ENDIF%:

QJOLINPT  *Q:
          *B;JOLINPT:

          *PROC(1-5):
JOLINPT   *A;*QOGHL4(A(1)):
QOGHL4()  *Q:
OGHL4()   *F;;UN(5,25);27;;HOSTLER4(1,0,1,0):
QMKTN4()  *Q:
MKTN4()   *F;;FFUN(8,A(2)):
QTN4()    *Q;;60(LO(3)):
          *B;INSTN4();/A/IF,LSTRIP(A(4))=IBLIND,THEN,
                           LSTRIP(A(4))=0,
                         ENDIF%:
INSTN4()  *F;;45:
          *B;EXJOL:
          *ENDPROC:
EXJOL     *A:
          *B;TERM;/A/LDF(A(4),A(1))=0%;SYST_OUT%:

$END:

! --------------------- CONTROL SEGMENT -------------------------- !
$RUN-LENGTH=1440:
!$TRACE=7404.1-7500:
!$TRANSIENT-PERIOD=:
$RUNS=10:
!$OBS/RUN=:
!$PRINT=OBS:

! --------------------- INITIAL DATA SEGMENT --------------------- !
$DISCRETE-PDFS:1-10/6/1,.690;2,.053;3,.059;4,.036;5,.071;6,.091:!COR
                    6/1,.529;2,.122;3,.075;4,.052;5,.118;6,.104:!CIC
                    6/1,.505;2,.123;3,.061;4,.069;5,.128;6,.114:!WIL
                    6/1,.575;2,.099;3,.065;4,.052;5,.106;6,.103:!JOL* !#

                    4/1,.3483;2,.2573;3,.3944;4,0: !IL - original     !#
                    4/1,.6045;2,.1484;3,.2471;4,0: !WI - original     !#
                    4/1,.7223;2,.0690;3,.2087;4,0: !MI - original     !#
                    4/1,.3565;2,.3282;3,.3153;4,0: !NE - original     !#
                    4/1,.5213;2,.1696;3,.3091;4,0: !OH - original     !#
                    4/1,.7947;2,.1055;3,.0998;4,0: !IN - original     !#

!                    4/1,0;2,.290;3,.429;4,.281: !IL - original
!                    4/1,0;2,.179;3,.292;4,.529: !WI - original  !move all from
!                    4/1,0;2,.087;3,.257;4,.656: !MI - original  !Corwith to Joliet
!                    4/1,0;2,.369;3,.345;4,.286: !NE - original
!                    4/1,0;2,.202;3,.354;4,.444: !OH - original
!                    4/1,0;2,.137;3,.129;4,.734: !IN - original

!                    4/1,.281;2,.290;3,.214;4,.215: !IL - new*
!                    4/1,.264;2,.179;3,.292;4,.265: !WI - new*
!                    4/1,.328;2,.087;3,.257;4,.328: !MI - new*
```

```
!                    4/1,.286;2,.184;3,.345;4,.185: !NE - new*
!                    4/1,.222;2,.202;3,.354;4,.222: !OH - new*
!                    4/1,.367;2,.137;3,.129;4,.367: !IN - new*

!$INITIAL-ENTRIES:
!$TABLE-LOOKUPS:
$ARRAYS:DIST;1-10/NS/1,98,215,364,354,186;   !Corwith to dest
                     7,93,221,371,360,192;   !Cicero to dest
                    13,101,223,374,360,192;   !Willow to dest
                    37,121,227,378,358,190:  !Joliet to dest
               !   166,259,126,224,165,127:   !Fort Wayne to dest
        NSTRIP;1-10/NS/20,10,5,5:            !COR,CIC,WIL,JOL NUM STRIP TRACKS
        PCNTCON;1-10/NS/.8477,.5477,.058,.15:  ! # COR,CIC,WIL,*JOL PERCENT CONTAINERS (OUTGOING)
$CONSTANTS:1-10/SPEED=45: !AVG MPH, CAN MAKE LOCN DPDNT IF NCSRY *
$FUNCTIONS:1-10/UN(1,1.5),UN(0.75,1);;   !COR unload time con,trl*
                UN(1,1.5),UN(0.75,1);;   !CIC unload time con,trl*
                UN(1,1.5),UN(0.75,1);;   !WIL unload time con,trl*
                UN(1,1.5),UN(0.75,1);;   !JOL unload time con,trl*
                UN(1,1.5),UN(0.75,1);;   !COR load time con,trl*
                UN(1,1.5),UN(0.75,1);;   !CIC load time con,trl*
                UN(1,1.5),UN(0.75,1);;   !WIL load time con,trl*
                UN(1,1.5),UN(0.75,1):    !JOL load time con,trl*

!$PRE-RUN:

! --------------------- POST EXECUTION SEGMENT -------------------- !
!$POST-RUN:
!$PLOT=:
$STOP:

! Created:  Thu Mar 12 09:56:04 CST 1998
! Last Edited:  Fri Mar 20 11:03:55 CST 1998
```

```
$PROJECT;bnsf_datamaker,3/19/98,TIM MEINERT:
$DIMENSION;ENTITY(5),A(2),pctcon(4),ntrain(4):
!$ATTRIBUTES:

! --------------------- DEFINITIONS SEGMENT ---------------------- !
!$VARIABLES:
!$SWITCHES:
!$RESOURCES:

! --------------------- MODEL LOGIC SEGMENT ---------------------- !
$BEGIN:
ss *s;/l/lim=1:
   *b;term;;for,k=1,to,10,do,
              trains=0,
              for,i=1,to,3,do,           !3, or use 4 to include JOL  #
                trains=trains+ntrain(i), !use correct array below     #
              next,
              t=0,
              for,i=1,to,trains,do,
                yard=rnd,
                if,yard<=.325,then,        !1=Corwith                 #
                   yard=1,
                else,
                  if,yard<=.575,then,      !2=Cicero                  #
                    yard=2,
                  else,
                    if,yard<=1,then,        !3=Willow                 #
                      yard=3,
                    else,
                      yard=4,              !4=Joliet
                    endif,
                  endif,
                endif,
                t=t+(un(.5,.7)),                                !     #
                nc=0,
                nt=0,
                for,j=1,to,60,do,
                  if,rnd<=pctcon(yard),then,
                    nc=nc+1,
                  else,
                    nt=nt+1,
                  endif,
                next,
                write(49+k)=("(f6.2,f5.0,f5.0,f5.0)",t,nc,nt,yard),
              next,
              x=999,
              write(49+k)=("(f4.0,f5.0,f5.0,f5.0)",x,x,x,x),
            next%:


$END:

! --------------------- CONTROL SEGMENT -------------------------- !
$RUN-LENGTH=1:
!$TRACE=:
!$TRANSIENT-PERIOD=:
!$RUNS=:
!$OBS/RUN=:
!$PRINT=OBS:

! --------------------- INITIAL DATA SEGMENT --------------------- !
!$DISCRETE-PDFS:
!$INITIAL-ENTRIES:
!$TABLE-LOOKUPS:
$ARRAYS:PCTCON;1-10/NS/.8689,.5535,.096,.15:   !#
        !         ntrain;1-10/ns/20,23,20,20:
                 ntrain;1-10/ns/13,10,17,16:   !#
!$CONSTANTS:
!$FUNCTIONS:
```

```
!$PRE-RUN:

! --------------------- POST EXECUTION SEGMENT -------------------- !
!$POST-RUN:
!$PLOT=:
$STOP:

! Created:  Thu Mar 19 22:33:41 CST 1998
```

APPENDIX B

SAMPLE SIMNET II OUTPUT

```
System array utilization:    C-array = 14%   G-array =  2%   AZ-array = 53%


                      ****************************************
                      *                                      *
                      *   S I M N E T  II OUTPUT REPORT      *
                      *                                      *
                      ****************************************


 PROJECT: BNSF               RUN LENGTH =     1440.00          NBR RUNS =  10
 DATE: 05/11/98              TRANSIENT PERIOD =        .00     OBS/RUN =   1
 ANALYST: TIM MEINERT        TIME BASE/OBS =     1440.00


        ***   G L O B A L   S T A T I S T I C A L   S U M M A R Y   ***
                    (REPLICATION METHOD - NBR OF OBS = 10)

                                 ---------------------
                                    Q U E U E S
                                 ---------------------
           CAPA-   IN:OUT  AV./S.D.  MIN/MAX/   AV./S.D.   AV./S.D.  % ZERO-WAIT
           CITY    RATIO   LENGTH    LAST LEN  DELAY(ALL) DELAY(+VE) TRANSACTION
QCHECK     ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QD1        ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTRARV     ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
CORQ       ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ1 1   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ1 2   ****     1: 1      16.15  0/116/ 94     67.24      67.84          .00
                               6.33                 5.47       5.51

           95% Lower CL=      11.62                63.33      63.90
           95% Upper CL=      20.67                71.15      71.79

STRPQ1 3   ****     1: 1      17.06  0/116/  0     67.08      67.69          .00
                               5.69                 4.46       4.50

           95% Lower CL=      12.99                63.89      64.47
           95% Upper CL=      21.14                70.28      70.91

STRPQ1 4   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ1 5   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ1 6   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ1 7   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ1 8   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ1 9   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ1 10 ****      1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ1 11 ****      1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ1 12 ****      1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ1 13 ****      1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ1 14 ****      1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ1 15 ****      1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ1 16 ****      1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ1 17 ****      1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ1 18 ****      1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ1 19 ****      1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ1 20 ****      1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ1 1   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ1 2   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ1 3   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
```

```
HOSTQ1 4  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ1 5  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ1 6  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ1 7  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ1 8  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ1 9  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ1 10 ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ1 11 ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ1 12 ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ1 13 ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ1 14 ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ1 15 ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ1 16 ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ1 17 ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ1 18 ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ1 19 ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ1 20 ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
DEPWAIT1  ****     1: 1       62.63  0/335/ 50      56.22      56.22          .00
                              52.83                 42.12      42.12

          95% Lower CL=       24.83                 26.09      26.09
          95% Upper CL=      100.42                 86.34      86.34

CICQ      ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ2 1  ****     1: 1        7.05  0/101/  0      55.19      55.78         1.00
                               2.85                  4.55       4.60

          95% Lower CL=        5.01                 51.93      52.49
          95% Upper CL=        9.09                 58.44      59.07

STRPQ2 2  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ2 3  ****     1: 1        8.99  0/100/  0      53.52      54.10         1.00
                               4.30                 10.29      10.40

          95% Lower CL=        5.91                 46.16      46.66
          95% Upper CL=       12.06                 60.88      61.54

STRPQ2 4  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ2 5  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ2 6  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ2 7  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ2 8  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ2 9  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ2 10 ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ2 1  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ2 2  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ2 3  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ2 4  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ2 5  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ2 6  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ2 7  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ2 8  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ2 9  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ2 10 ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
DEPWAIT2  ****     1: 1       43.46  0/274/ 80      61.77      61.77          .00
                              43.01                 43.61      43.61

          95% Lower CL=       12.69                 30.57      30.57
          95% Upper CL=       74.23                 92.96      92.96

WILQ      ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ3 1  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ3 2  ****     1: 1        6.27  0/ 71/  0      32.69      33.20         1.00
                               1.35                  1.55       1.56

          95% Lower CL=        5.30                 31.59      32.08
          95% Upper CL=        7.24                 33.80      34.31

STRPQ3 3  ****     1: 1        5.40  0/ 70/  0      31.07      31.55         1.00
                               2.76                  3.31       3.35
```

```
         95% Lower CL=      3.43                    28.71       29.16
         95% Upper CL=      7.38                    33.44       33.95

STRPQ3 4  ****     1: 1     3.57  0/ 69/  0     26.36       26.77          .00
                            2.06                    10.41       10.57

         95% Lower CL=      2.10                    18.92       19.21
         95% Upper CL=      5.05                    33.80       34.33

STRPQ3 5  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ3 1  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ3 2  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ3 3  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ3 4  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ3 5  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
DEPWAIT3  ****     1: 1    11.34  0/ 79/  0     17.63       17.63          .00
                            3.55                     5.28        5.28

         95% Lower CL=      8.80                    13.85       13.85
         95% Upper CL=     13.88                    21.41       21.41

JOLQ      ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ4 1  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ4 2  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ4 3  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ4 4  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPQ4 5  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ4 1  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ4 2  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ4 3  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ4 4  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
HOSTQ4 5  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
DEPWAIT4  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTRAV     ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QDRAY     ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QDEL1     ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
CORCON    ****     2: 1      .51  0/  2/  0       .68        1.35        50.00
                             .01                      .01         .03

         95% Lower CL=       .50                      .67        1.33
         95% Upper CL=       .51                      .69        1.37

CORTRL    ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QCORINPT  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL1 1  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL1 2  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL1 3  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL1 4  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL1 5  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL1 6  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL1 7  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL1 8  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL1 9  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL1 10 ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL1 11 ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL1 12 ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL1 13 ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL1 14 ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL1 15 ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL1 16 ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL1 17 ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL1 18 ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL1 19 ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL1 20 ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN1 1  ****     1: 1      .09  0/ 11/  0       .53        1.05        50.00
                             .04                      .11         .21

         95% Lower CL=       .06                      .46         .91
         95% Upper CL=       .12                      .61        1.20
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```
QMKTN1 2  ****    1: 1        .09  0/   7/  0          .64        1.17        46.00
                              .04                      .20         .26

          95% Lower CL=       .06                      .50         .98
          95% Upper CL=       .12                      .78        1.36

QMKTN1 3  ****    1: 1        .06  0/   9/  7          .57        1.03        30.00
                              .03                      .20         .36

          95% Lower CL=       .04                      .43         .77
          95% Upper CL=       .08                      .71        1.29

QMKTN1 4  ****    1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN1 5  ****    1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN1 6  ****    1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN1 7  ****    1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN1 8  ****    1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN1 9  ****    1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN1 10 ****    1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN1 11 ****    1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN1 12 ****    1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN1 13 ****    1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN1 14 ****    1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN1 15 ****    1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN1 16 ****    1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN1 17 ****    1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN1 18 ****    1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN1 19 ****    1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN1 20 ****    1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN1   1  ****   60: 1      10.40  0/ 60/  0        60.73       61.67         1.00
                             3.64                    3.35        3.40

          95% Lower CL=      7.80                   58.33       59.24
          95% Upper CL=     13.00                   63.12       64.10

QTN1   2  ****   60: 1       8.08  0/ 60/  0        59.25       60.25         1.00
                             2.73                    5.61        5.70

          95% Lower CL=      6.13                   55.24       56.17
          95% Upper CL=     10.04                   63.26       64.33

QTN1   3  ****   60: 1       5.53  0/ 60/  5        53.85       54.72          .00
                             2.80                   17.94       18.26

          95% Lower CL=      3.53                   41.02       41.66
          95% Upper CL=      7.53                   66.68       67.78

QTN1   4  ****   60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN1   5  ****   60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN1   6  ****   60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN1   7  ****   60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN1   8  ****   60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN1   9  ****   60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN1   10 ****   60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN1   11 ****   60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN1   12 ****   60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN1   13 ****   60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN1   14 ****   60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN1   15 ****   60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN1   16 ****   60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN1   17 ****   60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN1   18 ****   60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN1   19 ****   60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN1   20 ****   60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QDEL2     ****    1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
CICCON    ****    2: 1        .49  0/   2/  0        1.67        3.34        50.00
                              .03                     .09         .18

          95% Lower CL=       .48                    1.61        3.21
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          95% Upper CL=        .51                  1.73       3.46

CICTRL     ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QCICINPT   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS).
QOGHL2 1   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL2 2   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL2 3   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL2 4   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL2 5   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL2 6   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL2 7   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL2 8   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL2 9   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL2 10  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN2 1   ****     1: 1           .09  0/ 56/  0       .65        1.37        61.00
                                   .08                  .64        1.03

          95% Lower CL=        .03                  .19        .63
          95% Upper CL=        .15                  1.10       2.11

QMKTN2 2   ****     1: 1           .09  0/ 27/  0       1.07       1.81        44.00
                                   .10                  1.35       1.70

          95% Lower CL=        .02                  .11        .59
          95% Upper CL=        .17                  2.04       3.03

QMKTN2 3   ****     1: 1           .07  0/ 25/ 25       1.03       1.88        39.00
                                   .09                  .83        1.37

          95% Lower CL=        .01                  .43        .90
          95% Upper CL=        .13                  1.62       2.86

QMKTN2 4   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN2 5   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN2 6   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN2 7   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN2 8   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN2 9   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN2 10  ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN2    1  ****    60: 1         14.08  0/ 60/  0      97.71      99.33         1.00
                                  4.07                 29.13      29.60

          95% Lower CL=      11.16                 76.87      78.16
          95% Upper CL=      16.99                118.54     120.50

QTN2    2  ****    60: 1          7.21  0/ 60/  0      78.56      79.49         1.00
                                  4.78                 33.23      33.26

          95% Lower CL=       3.79                 54.78      55.70
          95% Upper CL=      10.63                102.33     103.28

QTN2    3  ****    60: 1          6.97  0/ 60/  7     101.05     102.68         1.00
                                  4.50                 43.93      44.72

          95% Lower CL=       3.76                 69.63      70.69
          95% Upper CL=      10.19                132.47     134.66

QTN2    4  ****    60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN2    5  ****    60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN2    6  ****    60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN2    7  ****    60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN2    8  ****    60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN2    9  ****    60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN2    10 ****    60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QDEL3      ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
WILCON     ****     2: 1           .52  0/  2/  1      10.41      20.65        49.00
                                   .04                  1.61       3.20

          95% Lower CL=        .49                  9.26      18.36
          95% Upper CL=        .55                 11.56      22.94
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WILTRL	****	1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)					
QWILINPT	****	1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)					
QOGHL3 1	****	1: 1	.93	0/ 33/ 0	3.21	27.63	95.00
			.77		2.74	18.09	
	95% Lower CL=		.37		1.25	14.70	
	95% Upper CL=		1.48		5.17	40.57	
QOGHL3 2	****	1: 1	.94	0/ 33/ 0	4.65	35.15	89.00
			1.06		5.10	31.39	
	95% Lower CL=		.18		1.00	12.69	
	95% Upper CL=		1.70		8.30	57.60	
QOGHL3 3	****	1: 1	1.30	0/ 33/ 0	10.10	55.21	72.00
			1.11		8.88	63.36	
	95% Lower CL=		.50		3.75	9.89	
	95% Upper CL=		2.09		16.46	100.53	
QOGHL3 4	****	1: 1	3.64	0/ 33/ 0	35.69	93.88	69.00
			2.63		28.70	59.72	
	95% Lower CL=		1.75		15.16	51.16	
	95% Upper CL=		5.52		56.21	136.60	
QOGHL3 5	****	1: 1	3.14	0/ 33/ 0	40.22	81.16	45.00
			1.80		32.03	60.86	
	95% Lower CL=		1.85		17.31	37.62	
	95% Upper CL=		4.43		63.13	124.70	
QMKTN3 1	****	1: 1	.43	0/ 21/ 11	1.49	2.30	37.00
			.12		.47	.70	
	95% Lower CL=		.35		1.15	1.80	
	95% Upper CL=		.52		1.82	2.80	
QMKTN3 2	****	1: 1	.33	0/ 52/ 10	1.67	2.46	28.00
			.10		.54	.87	
	95% Lower CL=		.26		1.28	1.84	
	95% Upper CL=		.40		2.05	3.08	
QMKTN3 3	****	1: 1	.18	0/ 34/ 0	1.34	1.93	21.00
			.15		.96	1.11	
	95% Lower CL=		.07		.65	1.14	
	95% Upper CL=		.29		2.02	2.73	
QMKTN3 4	****	1: 1	.33	0/ 19/ 0	3.20	3.96	44.00
			.12		1.35	1.34	
	95% Lower CL=		.24		2.24	3.00	
	95% Upper CL=		.41		4.16	4.92	
QMKTN3 5	****	1: 1	.21	0/ 59/ 34	2.17	2.58	30.00
			.16		1.54	1.69	
	95% Lower CL=		.09		1.07	1.37	
	95% Upper CL=		.32		3.27	3.79	
QTN3 1	****	60: 1	13.71	0/ 60/ 37	46.71	47.48	1.00
			2.84		8.66	8.82	
	95% Lower CL=		11.67		40.51	41.17	
	95% Upper CL=		15.74		52.90	53.78	
QTN3 2	****	60: 1	9.35	0/ 60/ 49	50.92	51.74	1.00

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                            1.78                    14.61     14.83

               95% Lower CL=   8.08                 40.47     41.13
               95% Upper CL=  10.63                 61.37     62.35

QTN3    3  ****    60: 1     10.28  0/ 60/  0       77.86     78.97          1.00
                              6.39                  36.57     36.96

               95% Lower CL=   5.71                 51.71     52.53
               95% Upper CL=  14.85                104.02    105.40

QTN3    4  ****    60: 1      6.69  0/ 60/  0       59.40     60.33          1.00
                              4.80                  33.50     33.98

               95% Lower CL=   3.26                 35.44     36.02
               95% Upper CL=  10.12                 83.36     84.63

QTN3    5  ****    60: 1      3.55  0/ 60/ 25       57.09     57.84           .00
                              1.74                  26.14     26.35

               95% Lower CL=   2.30                 38.40     38.99
               95% Upper CL=   4.79                 75.79     76.68

QDEL4      ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
JOLCON     ****     2: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
JOLTRL     ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QJOLINPT   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL4 1   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL4 2   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL4 3   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL4 4   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QOGHL4 5   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN4 1   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN4 2   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN4 3   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN4 4   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QMKTN4 5   ****     1: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN4    1  ****    60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN4    2  ****    60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN4    3  ****    60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN4    4  ****    60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
QTN4    5  ****    60: 1 (Invalid GLOBAL statistics-No updates in at least 1 OBS)
                                   ---------------------
                                    F A C I L I T I E S
                                   ---------------------
            NBR  MIN/MAX/     AV./S.D. AV./S.D.  AV./S.D.   AV./S.D. AV./S.D.
            SRVRS LAST UTILZ   UTILIZ  BLOCKAGE  BLKGE TIME IDLE TIME BUSY TIME
STRPF1 1     1   (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPF1 2     1    0/  1/  1     .2756    .0000        .00     331.24    158.99
                                .1078    .0000        .00     142.33     23.44

                 95% Lower CL=  .1986    .0000        .00     229.43    142.22
                 95% Upper CL=  .3527    .0000        .00     433.05    175.76

STRPF1 3     1    0/  1/  0     .2951    .0000        .00     272.43    141.23
                                .0956    .0000        .00      90.93      5.20

                 95% Lower CL=  .2267    .0000        .00     207.39    137.52
                 95% Upper CL=  .3634    .0000        .00     337.48    144.95

STRPF1 4     1   (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPF1 5     1   (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPF1 6     1   (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPF1 7     1   (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPF1 8     1   (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPF1 9     1   (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPF1 10    1   (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPF1 11    1   (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPF1 12    1   (Invalid GLOBAL statistics-No updates in at least 1 OBS)
STRPF1 13    1   (Invalid GLOBAL statistics-No updates in at least 1 OBS)
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STRPF1	14	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
STRPF1	15	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
STRPF1	16	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
STRPF1	17	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
STRPF1	18	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
STRPF1	19	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
STRPF1	20	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL1	1	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL1	2	63	0/ 18/ 0	3.3670	.0000	.00	251.24	12.32
				1.3223	.0000	.00	104.28	1.03
			95% Lower CL=	2.4211	.0000	.00	176.65	11.58
			95% Upper CL=	4.3128	.0000	.01	325.83	13.06
HOSTL1	3	63	0/ 20/ 0	3.5568	.0000	.04	223.71	12.43
				1.1107	.0001	.08	61.19	.60
			95% Lower CL=	2.7623	.0000	-.02	179.94	12.00
			95% Upper CL=	4.3513	.0001	.10	267.48	12.86
HOSTL1	4	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL1	5	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL1	6	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL1	7	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL1	8	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL1	9	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL1	10	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL1	11	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL1	12	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL1	13	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL1	14	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL1	15	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL1	16	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL1	17	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL1	18	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL1	19	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL1	20	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
STRPF2	1	1	0/ 1/ 0	.1401	.0000	.00	481.68	115.50
				.0562	.0000	.00	158.84	25.27
			95% Lower CL=	.0999	.0000	.00	368.06	97.43
			95% Upper CL=	.1803	.0000	.00	595.30	133.58
STRPF2	2	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
STRPF2	3	1	0/ 1/ 0	.1790	.0000	.00	464.67	103.86
				.0891	.0000	.00	358.86	30.52
			95% Lower CL=	.1152	.0000	.00	207.97	82.03
			95% Upper CL=	.2427	.0000	.00	721.36	125.70
STRPF2	4	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
STRPF2	5	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
STRPF2	6	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
STRPF2	7	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
STRPF2	8	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
STRPF2	9	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
STRPF2	10	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL2	1	22	0/ 22/ 0	2.2206	.0977	1.14	166.97	16.20
				.9007	.0618	.20	68.83	1.07
			95% Lower CL=	1.5764	.0536	.99	117.73	15.44
			95% Upper CL=	2.8649	.1419	1.29	216.20	16.97
HOSTL2	2	22	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL2	3	22	0/ 22/ 0	3.9398	1.2334	8.87	206.81	30.20
				2.1356	.9067	6.00	195.13	13.01
			95% Lower CL=	2.4122	.5848	4.58	67.23	20.90
			95% Upper CL=	5.4674	1.8820	13.17	346.40	39.51

HOSTL2	4	22	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL2	5	22	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL2	6	22	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL2	7	22	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL2	8	22	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL2	9	22	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL2	10	22	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
STRPF3	1	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
STRPF3	2	1	0/ 1/ 0	.1817	.0000	.00	235.86	62.51
				.0413	.0000	.00	53.17	2.37
			95% Lower CL=	.1522	.0000	.00	197.83	60.82
			95% Upper CL=	.2113	.0000	.00	273.90	64.21
STRPF3	3	1	0/ 1/ 0	.1570	.0000	.00	317.59	63.21
				.0813	.0000	.00	160.70	4.90
			95% Lower CL=	.0988	.0000	.00	202.64	59.71
			95% Upper CL=	.2151	.0000	.00	432.53	66.72
STRPF3	4	1	0/ 1/ 0	.1054	.0000	.00	341.85	56.11
				.0603	.0000	.00	180.30	20.18
			95% Lower CL=	.0623	.0000	.00	212.88	41.68
			95% Upper CL=	.1486	.0000	.00	470.82	70.55
STRPF3	5	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL3	1	27	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL3	2	27	0/ 27/ 0	3.5569	.1970	1.21	118.89	17.28
				.8340	.1374	.80	27.72	1.64
			95% Lower CL=	2.9604	.0987	.63	99.06	16.10
			95% Upper CL=	4.1535	.2952	1.78	138.72	18.45
HOSTL3	3	27	0/ 27/ 0	3.3023	.3925	2.45	168.29	18.00
				1.8406	.3410	1.93	99.14	2.98
			95% Lower CL=	1.9857	.1486	1.07	97.37	15.87
			95% Upper CL=	4.6188	.6364	3.83	239.21	20.13
HOSTL3	4	27	0/ 27/ 0	2.5651	.6160	4.69	222.83	22.57
				1.5030	.4841	3.53	127.88	11.01
			95% Lower CL=	1.4901	.2698	2.17	131.35	14.70
			95% Upper CL=	3.6402	.9623	7.22	314.30	30.44
HOSTL3	5	27	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
STRPF4	1	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
STRPF4	2	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
STRPF4	3	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
STRPF4	4	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
STRPF4	5	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL4	1	27	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL4	2	27	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL4	3	27	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL4	4	27	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
HOSTL4	5	27	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL1	1	63	0/ 16/ 0	2.5692	.0000	.01	297.33	11.62
				.8929	.0000	.02	82.34	1.06
			95% Lower CL=	1.9305	.0000	-.01	238.43	10.86
			95% Upper CL=	3.2079	.0000	.02	356.23	12.37
OGHL1	2	63	0/ 15/ 0	2.0716	.0000	.00	365.09	11.05
				.7257	.0000	.00	141.61	1.60
			95% Lower CL=	1.5526	.0000	.00	263.79	9.91
			95% Upper CL=	2.5907	.0000	.00	466.39	12.20
OGHL1	3	63	0/ 14/ 0	1.3811	.0000	.00	514.96	9.22

				.6589	.0000	.00	266.63	2.98
			95% Lower CL=	.9098	.0000	.00	324.24	7.09
			95% Upper CL=	1.8525	.0000	.00	705.69	11.35
OGHL1	4	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL1	5	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL1	6	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL1	7	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL1	8	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL1	9	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL1	10	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL1	11	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL1	12	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL1	13	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL1	14	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL1	15	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL1	16	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL1	17	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL1	18	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL1	19	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL1	20	63	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
MKTN1	1	1	0/ 1/ 0	.1957	.0000	.00	10.66	2.30
				.0686	.0000	.00	4.34	.14
			95% Lower CL=	.1466	.0000	.00	7.56	2.20
			95% Upper CL=	.2448	.0000	.00	13.76	2.40
MKTN1	2	1	0/ 1/ 0	.1580	.0000	.00	16.34	2.51
				.0549	.0000	.00	11.51	.37
			95% Lower CL=	.1187	.0000	.00	8.10	2.25
			95% Upper CL=	.1973	.0000	.00	24.57	2.78
MKTN1	3	1	0/ 1/ 1	.1079	.0000	.00	55.51	2.48
				.0530	.0000	.00	107.14	.25
			95% Lower CL=	.0700	.0000	.00	-21.12	2.30
			95% Upper CL=	.1458	.0000	.00	132.15	2.66
MKTN1	4	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
MKTN1	5	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
MKTN1	6	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
MKTN1	7	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
MKTN1	8	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
MKTN1	9	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
MKTN1	10	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
MKTN1	11	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
MKTN1	12	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
MKTN1	13	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
MKTN1	14	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
MKTN1	15	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
MKTN1	16	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
MKTN1	17	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
MKTN1	18	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
MKTN1	19	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
MKTN1	20	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN1	1	1	0/ 1/ 1	.1143	.0000	.00	302.31	45.80
				.0421	.0000	.00	98.08	2.21
			95% Lower CL=	.0842	.0000	.00	232.15	44.22
			95% Upper CL=	.1444	.0000	.00	372.46	47.38
INSTN1	2	1	0/ 1/ 0	.1028	.0000	.00	337.82	46.01
				.0357	.0000	.00	141.67	3.19
			95% Lower CL=	.0773	.0000	.00	236.48	43.73
			95% Upper CL=	.1284	.0000	.00	439.15	48.29
INSTN1	3	1	0/ 1/ 0	.0634	.0000	.00	392.17	41.18

				.0296	.0000	.00	175.21	14.63
			95% Lower CL=	.0423	.0000	.00	266.85	30.72
			95% Upper CL=	.0846	.0000	.00	517.50	51.64
INSTN1	4	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN1	5	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN1	6	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN1	7	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN1	8	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN1	9	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN1	10	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN1	11	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN1	12	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN1	13	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN1	14	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN1	15	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN1	16	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN1	17	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN1	18	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN1	19	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN1	20	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL2	1	22	0/ 22/ 0	4.1520	1.9455	33.24	115.80	27.86
				2.0518	2.1599	24.85	20.57	16.28
			95% Lower CL=	2.6843	.4005	15.47	101.08	16.22
			95% Upper CL=	5.6197	3.4905	51.01	130.51	39.51
OGHL2	2	22	0/ 22/ 0	2.9799	1.5788	34.38	232.78	31.61
				1.7720	1.4220	23.73	111.73	18.30
			95% Lower CL=	1.7124	.5617	17.41	152.86	18.52
			95% Upper CL=	4.2474	2.5960	51.35	312.70	44.70
OGHL2	3	22	0/ 22/ 0	2.4490	1.3882	39.28	261.20	34.33
				1.5031	1.5461	45.01	94.73	30.87
			95% Lower CL=	1.3738	.2823	7.08	193.43	12.25
			95% Upper CL=	3.5241	2.4941	71.47	328.96	56.42
OGHL2	4	22	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL2	5	22	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL2	6	22	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL2	7	22	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL2	8	22	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL2	9	22	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL2	10	22	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
MKTN2	1	1	0/ 1/ 0	.1465	.0000	.00	10.34	1.73
				.0206	.0000	.00	2.94	.27
			95% Lower CL=	.1317	.0000	.00	8.24	1.54
			95% Upper CL=	.1613	.0000	.00	12.45	1.93
MKTN2	2	1	0/ 1/ 0	.0924	.0000	.00	29.46	2.25
				.0437	.0000	.00	26.90	1.22
			95% Lower CL=	.0612	.0000	.00	10.22	1.38
			95% Upper CL=	.1237	.0000	.00	48.71	3.12
MKTN2	3	1	0/ 1/ 1	.0729	.0000	.00	34.23	2.11
				.0346	.0000	.00	21.31	.54
			95% Lower CL=	.0481	.0000	.00	18.99	1.73
			95% Upper CL=	.0976	.0000	.00	49.47	2.50
MKTN2	4	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
MKTN2	5	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
MKTN2	6	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
MKTN2	7	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
MKTN2	8	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					

MKTN2	9	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
MKTN2	10	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN2	1	1	0/ 1/ 0	.1049	.0000	.00	303.32	45.87
				.0149	.0000	.00	35.47	2.76
			95% Lower CL=	.0943	.0000	.00	277.95	43.90
			95% Upper CL=	.1156	.0000	.00	328.69	47.85
INSTN2	2	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN2	3	1	0/ 1/ 0	.0500	.0000	.00	573.75	45.00
				.0264	.0000	.00	165.00	.01
			95% Lower CL=	.0311	.0000	.00	455.72	44.99
			95% Upper CL=	.0688	.0000	.00	691.78	45.01
INSTN2	4	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN2	5	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN2	6	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN2	7	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN2	8	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN2	9	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
INSTN2	10	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					
OGHL3	1	27	0/ 27/ 0	7.6156	3.1495	17.64	69.05	27.11
				1.4738	1.3375	7.64	9.88	5.67
			95% Lower CL=	6.5614	2.1928	12.18	61.99	23.05
			95% Upper CL=	8.6698	4.1062	23.11	76.12	31.16
OGHL3	2	27	0/ 27/ 0	5.7440	2.8584	25.01	113.37	30.65
				1.1611	1.1494	12.61	21.91	8.11
			95% Lower CL=	4.9135	2.0362	15.98	97.70	24.85
			95% Upper CL=	6.5746	3.6805	34.03	129.04	36.45
OGHL3	3	27	0/ 27/ 0	5.5207	3.5795	36.30	184.33	45.51
				1.6537	1.4571	15.95	62.58	16.01
			95% Lower CL=	4.3378	2.5372	24.90	139.56	34.06
			95% Upper CL=	6.7036	4.6218	47.71	229.09	56.96
OGHL3	4	27	0/ 27/ 0	7.1105	5.5023	57.05	240.17	85.84
				3.6614	3.5146	31.01	83.13	51.62
			95% Lower CL=	4.4914	2.9883	34.87	180.71	48.91
			95% Upper CL=	9.7296	8.0164	79.23	299.63	122.76
OGHL3	5	27	0/ 27/ 0	5.4947	4.4412	66.54	378.94	94.42
				2.4112	2.2438	39.50	136.07	45.01
			95% Lower CL=	3.7700	2.8362	38.29	281.61	62.23
			95% Upper CL=	7.2195	6.0462	94.80	476.28	126.62
MKTN3	1	1	0/ 1/ 1	.2594	.0000	.00	7.14	2.50
				.0193	.0000	.00	1.12	.27
			95% Lower CL=	.2456	.0000	.00	6.34	2.31
			95% Upper CL=	.2731	.0000	.00	7.94	2.69
MKTN3	2	1	0/ 1/ 1	.1682	.0000	.00	13.62	2.74
				.0275	.0000	.00	2.63	.44
			95% Lower CL=	.1485	.0000	.00	11.73	2.42
			95% Upper CL=	.1879	.0000	.00	15.50	3.05
MKTN3	3	1	0/ 1/ 0	.1131	.0000	.00	21.77	2.63
				.0328	.0000	.00	10.89	.90
			95% Lower CL=	.0897	.0000	.00	13.98	1.99
			95% Upper CL=	.1365	.0000	.00	29.56	3.28

MKTN3	4	1	0/ 1/ 0	.0942	.0000	.00	53.55	5.08
				.0286	.0000	.00	38.05	2.97
			95% Lower CL=	.0737	.0000	.00	26.33	2.96
			95% Upper CL=	.1147	.0000	.00	80.77	7.21
MKTN3	5	1	0/ 1/ 1	.0611	.0000	.00	84.15	5.08
				.0275	.0000	.00	74.22	3.79
			95% Lower CL=	.0414	.0000	.00	31.06	2.37
			95% Upper CL=	.0808	.0000	.00	137.24	7.79
INSTN3	1	1	0/ 1/ 0	.2103	.0000	.00	152.45	46.66
				.0164	.0000	.00	13.20	2.89
			95% Lower CL=	.1985	.0000	.00	143.01	44.60
			95% Upper CL=	.2220	.0000	.00	161.89	48.73
INSTN3	2	1	0/ 1/ 0	.1288	.0000	.00	251.80	45.25
				.0227	.0000	.00	45.07	.57
			95% Lower CL=	.1125	.0000	.00	219.56	44.85
			95% Upper CL=	.1450	.0000	.00	284.04	45.66
INSTN3	3	1	0/ 1/ 0	.0844	.0000	.00	375.75	45.00
				.0296	.0000	.00	86.53	.00
			95% Lower CL=	.0632	.0000	.00	313.86	45.00
			95% Upper CL=	.1056	.0000	.00	437.64	45.00
INSTN3	4	1	0/ 1/ 0	.0750	.0000	.00	405.45	45.00
				.0219	.0000	.00	74.52	.00
			95% Lower CL=	.0594	.0000	.00	352.14	45.00
			95% Upper CL=	.0906	.0000	.00	458.76	45.00
INSTN3	5	1	0/ 1/ 0	.0469	.0000	.00	491.62	40.50
				.0266	.0000	.00	222.49	14.23
			95% Lower CL=	.0279	.0000	.00	332.48	30.32
			95% Upper CL=	.0659	.0000	.00	650.77	50.68

OGHL4	1	27	(Invalid GLOBAL statistics-No updates in at least 1 OBS)
OGHL4	2	27	(Invalid GLOBAL statistics-No updates in at least 1 OBS)
OGHL4	3	27	(Invalid GLOBAL statistics-No updates in at least 1 OBS)
OGHL4	4	27	(Invalid GLOBAL statistics-No updates in at least 1 OBS)
OGHL4	5	27	(Invalid GLOBAL statistics-No updates in at least 1 OBS)
MKTN4	1	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)
MKTN4	2	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)
MKTN4	3	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)
MKTN4	4	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)
MKTN4	5	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)
INSTN4	1	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)
INSTN4	2	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)
INSTN4	3	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)
INSTN4	4	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)
INSTN4	5	1	(Invalid GLOBAL statistics-No updates in at least 1 OBS)

V A R I A B L E S

	GLOB. AV.	GLOB. S.D.	GLOB. MIN	GLOB. MAX	95% LOWER CL	95% UPPER CL
SYST_IN	231.92	20.13	8.80	911.58	217.53	246.32
SYST_OUT	574.24	11.50	149.23	1345.17	566.02	582.47
AVGDRAY	79.15	1.91	1.00	374.00	77.79	80.52
INDRAY	100.35	4.54	1.00	374.00	97.10	103.60
OUTDRAY	60.59	.06	1.00	374.00	60.55	60.64
TOTDRAY	516769.91	20736.53	488478.00	546503.00	501936.91	531602.87
COR2DEST	73.41	4.29	1.00	364.00	70.34	76.48
CIC2DEST	115.96	2.41	7.00	371.00	114.24	117.69
WIL2DEST	125.84	6.97	13.00	374.00	120.85	130.83

JOL2DEST	(Invalid global statistics-No updates in at least 1 OBS)					
IL2YARD	7.31	.08	1.00	13.00	7.25	7.36
WI2YARD	98.04	.20	93.00	101.00	97.90	98.18
MI2YARD	217.20	.38	215.00	223.00	216.92	217.47
NE2YARD	369.30	.31	364.00	374.00	369.08	369.52
OH2YARD	356.83	.20	354.00	360.00	356.69	356.98
IN2YARD	187.21	.25	186.00	192.00	187.03	187.39
YARD2IL	5.45	.67	1.00	13.00	4.97	5.92
YARD2WI	97.49	.47	93.00	101.00	97.15	97.83
YARD2MI	219.25	.61	215.00	223.00	218.81	219.68
YARD2NE	369.82	.51	364.00	374.00	369.45	370.18
YARD2OH	358.13	.53	354.00	360.00	357.76	358.51
YARD2IN	189.59	.61	186.00	192.00	189.16	190.02
ALL2COR	74.10	1.68	1.00	364.00	72.89	75.30
ALL2CIC	52.00	1.63	7.00	371.00	50.84	53.17
ALL2WIL	51.64	1.90	13.00	374.00	50.28	53.00
ALL2JOL	(Invalid global statistics-No updates in at least 1 OBS)					

R E S O U R C E S

	INITIAL LEVEL	MIN/MAX/ LAST LVL	AV./S.D. GROSS USAGE	AV./S.D. TRANSIT UNITS	AV./S.D. TRANSIT TIME	AV./S.D. TIME IN USE	AV./S.D. IDLE TIME
HOSTLER1	63.0000	.0000	22.4620	.0000	.00	14.87	28.04
		63.0000	3.7429	.0000	.00	.14	8.29
		63.0000					
	95%	Lower CL=	19.7847	.0000	.0000	14.77	22.11
	95%	Upper CL=	25.1393	.0000	.0000	14.97	33.97
HOSTLER2	22.0000	.0000	15.9735	.0000	.00	16.11	6.85
		22.0000	3.1588	.0000	.00	.30	4.37
		22.0000					
	95%	Lower CL=	13.7140	.0000	.0000	15.90	3.73
	95%	Upper CL=	18.2330	.0000	.0000	16.33	9.98
HOSTLER3	27.0000	.0000	23.1492	.0000	.00	15.75	2.64
		27.0000	.8749	.0000	.00	.28	.67
		27.0000					
	95%	Lower CL=	22.5234	.0000	.0000	15.56	2.16
	95%	Upper CL=	23.7750	.0000	.0000	15.95	3.12
HOSTLER4	27.0000	(Invalid GLOBAL statistics-No updates in at least 1 OBS)					

*** TRANSACTIONS COUNT AT T = 1440.0 OF RUN 10:

NODE	IN	OUT	RESIDING	SKIPPING (BLOCKED)	UNLINKED/LINKED (DESTROYED)	TERMINATED
*S:						
SINIT		1			(0)	0
SDRAY1		1911			(0)	1911
SDRAY2		1155			(0)	1155
SDRAY3		1459			(0)	1459
SDRAY4		1506			(0)	1506
SIL		2770			(0)	0
SWI		113			(0)	0
SMI		85			(0)	0
SNE		161			(0)	0
SOH		217			(0)	0
SIN		127			(0)	0
*Q:						
QCHECK	0	0	0	2	0/ 0	0
QD1	0	0	0	42	0/ 0	0
QTRARV	0	0	0	42	0/ 0	42
CORQ	0	0	0	1686	0/ 0	0
STRPQ1 1	113	113	0	1	0/ 0	0
STRPQ1 2	330	236	94	3	0/ 0	0
STRPQ1 3	561	561	0	5	0/ 0	0
STRPQ1 4	445	445	0	4	0/ 0	0
STRPQ1 5	109	109	0	1	0/ 0	0

STRPQ1 6	113	113	0	1	0/	0	0
STRPQ1 7	0	0	0	0	0/	0	0
STRPQ1 8	0	0	0	0	0/	0	0
STRPQ1 9	0	0	0	0	0/	0	0
STRPQ1 10	0	0	0	0	0/	0	0
STRPQ1 11	0	0	0	0	0/	0	0
STRPQ1 12	0	0	0	0	0/	0	0
STRPQ1 13	0	0	0	0	0/	0	0
STRPQ1 14	0	0	0	0	0/	0	0
STRPQ1 15	0	0	0	0	0/	0	0
STRPQ1 16	0	0	0	0	0/	0	0
STRPQ1 17	0	0	0	0	0/	0	0
STRPQ1 18	0	0	0	0	0/	0	0
STRPQ1 19	0	0	0	0	0/	0	0
STRPQ1 20	0	0	0	0	0/	0	0
HOSTQ1 1	0	0	0	114	0/	0	0
HOSTQ1 2	0	0	0	238	0/	0	0
HOSTQ1 3	0	0	0	566	0/	0	0
HOSTQ1 4	0	0	0	449	0/	0	0
HOSTQ1 5	0	0	0	110	0/	0	0
HOSTQ1 6	0	0	0	114	0/	0	0
HOSTQ1 7	0	0	0	0	0/	0	0
HOSTQ1 8	0	0	0	0	0/	0	0
HOSTQ1 9	0	0	0	0	0/	0	0
HOSTQ1 10	0	0	0	0	0/	0	0
HOSTQ1 11	0	0	0	0	0/	0	0
HOSTQ1 12	0	0	0	0	0/	0	0
HOSTQ1 13	0	0	0	0	0/	0	0
HOSTQ1 14	0	0	0	0	0/	0	0
HOSTQ1 15	0	0	0	0	0/	0	0
HOSTQ1 16	0	0	0	0	0/	0	0
HOSTQ1 17	0	0	0	0	0/	0	0
HOSTQ1 18	0	0	0	0	0/	0	0
HOSTQ1 19	0	0	0	0	0/	0	0
HOSTQ1 20	0	0	0	0	0/	0	0
DEPWAIT1	1591	0	50	0	1541/	0	0
CICQ	0	0	0	819	0/	0	0
STRPQ2 1	86	86	0	1	0/	0	0
STRPQ2 2	181	175	6	2	0/	0	0
STRPQ2 3	269	269	0	3	0/	0	0
STRPQ2 4	187	141	46	2	0/	0	0
STRPQ2 5	87	87	0	1	0/	0	0
STRPQ2 6	0	0	0	0	0/	0	0
STRPQ2 7	0	0	0	0	0/	0	0
STRPQ2 8	0	0	0	0	0/	0	0
STRPQ2 9	0	0	0	0	0/	0	0
STRPQ2 10	0	0	0	0	0/	0	0
HOSTQ2 1	0	0	0	87	0/	0	0
HOSTQ2 2	1	1	0	175	0/	0	0
HOSTQ2 3	41	41	0	231	0/	0	0
HOSTQ2 4	80	80	0	62	0/	0	0
HOSTQ2 5	66	66	0	22	0/	0	0
HOSTQ2 6	0	0	0	0	0/	0	0
HOSTQ2 7	0	0	0	0	0/	0	0
HOSTQ2 8	0	0	0	0	0/	0	0
HOSTQ2 9	0	0	0	0	0/	0	0
HOSTQ2 10	0	0	0	0	0/	0	0
DEPWAIT2	765	0	80	0	685/	0	0
WILQ	0	0	0	917	0/	0	0
STRPQ3 1	127	127	0	2	0/	0	0
STRPQ3 2	190	190	0	3	0/	0	0
STRPQ3 3	457	457	0	7	0/	0	0
STRPQ3 4	0	0	0	0	0/	0	0
STRPQ3 5	129	129	0	2	0/	0	0
HOSTQ3 1	0	0	0	129	0/	0	0
HOSTQ3 2	0	0	0	193	0/	0	0
HOSTQ3 3	18	18	0	446	0/	0	0
HOSTQ3 4	0	0	0	0	0/	0	0
HOSTQ3 5	38	38	0	93	0/	0	0
DEPWAIT3	917	0	0	0	917/	0	0

JOLQ	0	0	0	0	0/	0	0
STRPQ4 1	0	0	0	0	0/	0	0
STRPQ4 2	0	0	0	0	0/	0	0
STRPQ4 3	0	0	0	0	0/	0	0
STRPQ4 4	0	0	0	0	0/	0	0
STRPQ4 5	0	0	0	0	0/	0	0
HOSTQ4 1	0	0	0	0	0/	0	0
HOSTQ4 2	0	0	0	0	0/	0	0
HOSTQ4 3	0	0	0	0	0/	0	0
HOSTQ4 4	0	0	0	0	0/	0	0
HOSTQ4 5	0	0	0	0	0/	0	0
DEPWAIT4	0	0	0	0	0/	0	0
QTRAV	0	0	0	3143	0/	0	0
QDRAY	0	0	0	3473	0/	0	0
QDEL1	0	0	0	0	0/	0	0
CORCON	1066	533	0	0	0/	0	533
CORTRL	0	0	0	200	0/	0	200
QCORINPT	0	0	0	733	0/	0	0
QOGHL1 1	0	0	0	360	0/	0	0
QOGHL1 2	0	0	0	240	0/	0	0
QOGHL1 3	0	0	0	13	0/	0	0
QOGHL1 4	0	0	0	60	0/	0	0
QOGHL1 5	0	0	0	60	0/	0	0
QOGHL1 6	0	0	0	0	0/	0	0
QOGHL1 7	0	0	0	0	0/	0	0
QOGHL1 8	0	0	0	0	0/	0	0
QOGHL1 9	0	0	0	0	0/	0	0
QOGHL1 10	0	0	0	0	0/	0	0
QOGHL1 11	0	0	0	0	0/	0	0
QOGHL1 12	0	0	0	0	0/	0	0
QOGHL1 13	0	0	0	0	0/	0	0
QOGHL1 14	0	0	0	0	0/	0	0
QOGHL1 15	0	0	0	0	0/	0	0
QOGHL1 16	0	0	0	0	0/	0	0
QOGHL1 17	0	0	0	0	0/	0	0
QOGHL1 18	0	0	0	0	0/	0	0
QOGHL1 19	0	0	0	0	0/	0	0
QOGHL1 20	0	0	0	0	0/	0	0
QMKTN1 1	179	179	0	181	0/	0	0
QMKTN1 2	128	128	0	112	0/	0	0
QMKTN1 3	9	2	7	4	0/	0	0
QMKTN1 4	26	26	0	34	0/	0	0
QMKTN1 5	30	30	0	30	0/	0	0
QMKTN1 6	0	0	0	0	0/	0	0
QMKTN1 7	0	0	0	0	0/	0	0
QMKTN1 8	0	0	0	0	0/	0	0
QMKTN1 9	0	0	0	0	0/	0	0
QMKTN1 10	0	0	0	0	0/	0	0
QMKTN1 11	0	0	0	0	0/	0	0
QMKTN1 12	0	0	0	0	0/	0	0
QMKTN1 13	0	0	0	0	0/	0	0
QMKTN1 14	0	0	0	0	0/	0	0
QMKTN1 15	0	0	0	0	0/	0	0
QMKTN1 16	0	0	0	0	0/	0	0
QMKTN1 17	0	0	0	0	0/	0	0
QMKTN1 18	0	0	0	0	0/	0	0
QMKTN1 19	0	0	0	0	0/	0	0
QMKTN1 20	0	0	0	0	0/	0	0
QTN1 1	360	6	0	0	0/	0	0
QTN1 2	240	4	0	0	0/	0	0
QTN1 3	5	0	5	0	0/	0	0
QTN1 4	60	1	0	0	0/	0	0
QTN1 5	60	1	0	0	0/	0	0
QTN1 6	0	0	0	0	0/	0	0
QTN1 7	0	0	0	0	0/	0	0
QTN1 8	0	0	0	0	0/	0	0
QTN1 9	0	0	0	0	0/	0	0
QTN1 10	0	0	0	0	0/	0	0
QTN1 11	0	0	0	0	0/	0	0
QTN1 12	0	0	0	0	0/	0	0

QTN1 13	0	0	0	0	0/	0	0
QTN1 14	0	0	0	0	0/	0	0
QTN1 15	0	0	0	0	0/	0	0
QTN1 16	0	0	0	0	0/	0	0
QTN1 17	0	0	0	0	0/	0	0
QTN1 18	0	0	0	0	0/	0	0
QTN1 19	0	0	0	0	0/	0	0
QTN1 20	0	0	0	0	0/	0	0
QDEL2	0	0	0	0	0/	0	0
CICCON	418	209	0	0	0/	0	209
CICTRL	0	0	0	364	0/	0	364
QCICINPT	0	0	0	573	0/	0	0
QOGHL2 1	10	10	0	230	0/	0	0
QOGHL2 2	38	38	0	142	0/	0	0
QOGHL2 3	4	4	0	89	0/	0	0
QOGHL2 4	11	11	0	49	0/	0	0
QOGHL2 5	0	0	0	0	0/	0	0
QOGHL2 6	0	0	0	0	0/	0	0
QOGHL2 7	0	0	0	0	0/	0	0
QOGHL2 8	0	0	0	0	0/	0	0
QOGHL2 9	0	0	0	0	0/	0	0
QOGHL2 10	0	0	0	0	0/	0	0
QMKTN2 1	92	92	0	148	0/	0	0
QMKTN2 2	100	100	0	80	0/	0	0
QMKTN2 3	56	31	25	37	0/	0	0
QMKTN2 4	38	38	0	22	0/	0	0
QMKTN2 5	0	0	0	0	0/	0	0
QMKTN2 6	0	0	0	0	0/	0	0
QMKTN2 7	0	0	0	0	0/	0	0
QMKTN2 8	0	0	0	0	0/	0	0
QMKTN2 9	0	0	0	0	0/	0	0
QMKTN2 10	0	0	0	0	0/	0	0
QTN2 1	240	4	0	0	0/	0	0
QTN2 2	180	3	0	0	0/	0	0
QTN2 3	67	1	7	0	0/	0	0
QTN2 4	60	1	0	0	0/	0	0
QTN2 5	0	0	0	0	0/	0	0
QTN2 6	0	0	0	0	0/	0	0
QTN2 7	0	0	0	0	0/	0	0
QTN2 8	0	0	0	0	0/	0	0
QTN2 9	0	0	0	0	0/	0	0
QTN2 10	0	0	0	0	0/	0	0
QDEL3	0	0	0	183	0/	0	0
WILCON	87	43	1	0	0/	0	43
WILTRL	0	0	0	1329	0/	0	1329
QWILINPT	0	0	0	1189	0/	0	0
QOGHL3 1	22	22	0	447	0/	0	0
QOGHL3 2	39	39	0	321	0/	0	0
QOGHL3 3	33	33	0	87	0/	0	0
QOGHL3 4	55	55	0	125	0/	0	0
QOGHL3 5	33	33	0	27	0/	0	0
QMKTN3 1	292	281	11	177	0/	0	0
QMKTN3 2	257	247	10	103	0/	0	0
QMKTN3 3	94	94	0	26	0/	0	0
QMKTN3 4	100	100	0	80	0/	0	0
QMKTN3 5	42	8	34	18	0/	0	0
QTN3 1	457	7	37	0	0/	0	0
QTN3 2	349	5	49	0	0/	0	0
QTN3 3	120	2	0	0	0/	0	0
QTN3 4	180	3	0	0	0/	0	0
QTN3 5	25	0	25	0	0/	0	0
QDEL4	0	0	0	0	0/	0	0
JOLCON	0	0	0	0	0/	0	0
JOLTRL	0	0	0	0	0/	0	0
QJOLINPT	0	0	0	0	0/	0	0
QOGHL4 1	0	0	0	0	0/	0	0
QOGHL4 2	0	0	0	0	0/	0	0
QOGHL4 3	0	0	0	0	0/	0	0
QOGHL4 4	0	0	0	0	0/	0	0
QOGHL4 5	0	0	0	0	0/	0	0

QMKTN4	1	0	0	0	0	0/	0	0
QMKTN4	2	0	0	0	0	0/	0	0
QMKTN4	3	0	0	0	0	0/	0	0
QMKTN4	4	0	0	0	0	0/	0	0
QMKTN4	5	0	0	0	0	0/	0	0
QTN4	1	0	0	0	0	0/	0	0
QTN4	2	0	0	0	0	0/	0	0
QTN4	3	0	0	0	0	0/	0	0
QTN4	4	0	0	0	0	0/	0	0
QTN4	5	0	0	0	0	0/	0	0
*F:								
STRPF1	1	114	114	0	(0)	(0)		0
STRPF1	2	239	238	1	(0)	(0)		0
STRPF1	3	566	566	0	(0)	(0)		0
STRPF1	4	449	449	0	(0)	(0)		0
STRPF1	5	110	110	0	(0)	(0)		0
STRPF1	6	114	114	0	(0)	(0)		0
STRPF1	7	0	0	0	(0)	(0)		0
STRPF1	8	0	0	0	(0)	(0)		0
STRPF1	9	0	0	0	(0)	(0)		0
STRPF1	10	0	0	0	(0)	(0)		0
STRPF1	11	0	0	0	(0)	(0)		0
STRPF1	12	0	0	0	(0)	(0)		0
STRPF1	13	0	0	0	(0)	(0)		0
STRPF1	14	0	0	0	(0)	(0)		0
STRPF1	15	0	0	0	(0)	(0)		0
STRPF1	16	0	0	0	(0)	(0)		0
STRPF1	17	0	0	0	(0)	(0)		0
STRPF1	18	0	0	0	(0)	(0)		0
STRPF1	19	0	0	0	(0)	(0)		0
STRPF1	20	0	0	0	(0)	(0)		0
HOSTL1	1	114	114	0	(1)	(0)		0
HOSTL1	2	238	238	0	(1)	(0)		0
HOSTL1	3	566	566	0	(3)	(0)		0
HOSTL1	4	449	449	0	(1)	(0)		0
HOSTL1	5	110	110	0	(2)	(0)		0
HOSTL1	6	114	114	0	(1)	(0)		0
HOSTL1	7	0	0	0	(0)	(0)		0
HOSTL1	8	0	0	0	(0)	(0)		0
HOSTL1	9	0	0	0	(0)	(0)		0
HOSTL1	10	0	0	0	(0)	(0)		0
HOSTL1	11	0	0	0	(0)	(0)		0
HOSTL1	12	0	0	0	(0)	(0)		0
HOSTL1	13	0	0	0	(0)	(0)		0
HOSTL1	14	0	0	0	(0)	(0)		0
HOSTL1	15	0	0	0	(0)	(0)		0
HOSTL1	16	0	0	0	(0)	(0)		0
HOSTL1	17	0	0	0	(0)	(0)		0
HOSTL1	18	0	0	0	(0)	(0)		0
HOSTL1	19	0	0	0	(0)	(0)		0
HOSTL1	20	0	0	0	(0)	(0)		0
STRPF2	1	87	87	0	(0)	(0)		0
STRPF2	2	177	176	1	(0)	(0)		0
STRPF2	3	272	272	0	(0)	(0)		0
STRPF2	4	143	142	1	(0)	(0)		0
STRPF2	5	88	88	0	(0)	(0)		0
STRPF2	6	0	0	0	(0)	(0)		0
STRPF2	7	0	0	0	(0)	(0)		0
STRPF2	8	0	0	0	(0)	(0)		0
STRPF2	9	0	0	0	(0)	(0)		0
STRPF2	10	0	0	0	(0)	(0)		0
HOSTL2	1	87	87	0	(1219)	(0)		0
HOSTL2	2	176	176	0	(2004)	(0)		0
HOSTL2	3	272	272	0	(1804)	(0)		0
HOSTL2	4	142	142	0	(800)	(0)		0
HOSTL2	5	88	88	0	(454)	(0)		0
HOSTL2	6	0	0	0	(0)	(0)		0
HOSTL2	7	0	0	0	(93)	(0)		0
HOSTL2	8	0	0	0	(0)	(0)		0
HOSTL2	9	0	0	0	(0)	(0)		0

HOSTL2	10	0	0	0	(	0)	(	0)		0
STRPF3	1	129	129	0	(	0)	(	0)		0
STRPF3	2	193	193	0	(	0)	(	0)		0
STRPF3	3	464	464	0	(	0)	(	0)		0
STRPF3	4	0	0	0	(	0)	(	0)		0
STRPF3	5	131	131	0	(	0)	(	0)		0
HOSTL3	1	129	129	0	(	1114)	(	0)		0
HOSTL3	2	193	193	0	(	2329)	(	0)		0
HOSTL3	3	464	464	0	(	2086)	(	0)		0
HOSTL3	4	0	0	0	(	1596)	(	0)		0
HOSTL3	5	131	131	0	(	1296)	(	0)		0
STRPF4	1	0	0	0	(	0)	(	0)		0
STRPF4	2	0	0	0	(	0)	(	0)		0
STRPF4	3	0	0	0	(	0)	(	0)		0
STRPF4	4	0	0	0	(	0)	(	0)		0
STRPF4	5	0	0	0	(	0)	(	0)		0
HOSTL4	1	0	0	0	(	0)	(	0)		0
HOSTL4	2	0	0	0	(	0)	(	0)		0
HOSTL4	3	0	0	0	(	0)	(	0)		0
HOSTL4	4	0	0	0	(	0)	(	0)		0
HOSTL4	5	0	0	0	(	0)	(	0)		0
OGHL1	1	360	360	0	(	1)	(	0)		0
OGHL1	2	240	240	0	(	0)	(	0)		0
OGHL1	3	13	13	0	(	0)	(	0)		0
OGHL1	4	60	60	0	(	1)	(	0)		0
OGHL1	5	60	60	0	(	0)	(	0)		0
OGHL1	6	0	0	0	(	0)	(	0)		0
OGHL1	7	0	0	0	(	0)	(	0)		0
OGHL1	8	0	0	0	(	0)	(	0)		0
OGHL1	9	0	0	0	(	0)	(	0)		0
OGHL1	10	0	0	0	(	0)	(	0)		0
OGHL1	11	0	0	0	(	0)	(	0)		0
OGHL1	12	0	0	0	(	0)	(	0)		0
OGHL1	13	0	0	0	(	0)	(	0)		0
OGHL1	14	0	0	0	(	0)	(	0)		0
OGHL1	15	0	0	0	(	0)	(	0)		0
OGHL1	16	0	0	0	(	0)	(	0)		0
OGHL1	17	0	0	0	(	0)	(	0)		0
OGHL1	18	0	0	0	(	0)	(	0)		0
OGHL1	19	0	0	0	(	0)	(	0)		0
OGHL1	20	0	0	0	(	0)	(	0)		0
MKTN1	1	360	360	0	(	0)	(	0)		0
MKTN1	2	240	240	0	(	0)	(	0)		0
MKTN1	3	6	5	1	(	0)	(	0)		0
MKTN1	4	60	60	0	(	0)	(	0)		0
MKTN1	5	60	60	0	(	0)	(	0)		0
MKTN1	6	0	0	0	(	0)	(	0)		0
MKTN1	7	0	0	0	(	0)	(	0)		0
MKTN1	8	0	0	0	(	0)	(	0)		0
MKTN1	9	0	0	0	(	0)	(	0)		0
MKTN1	10	0	0	0	(	0)	(	0)		0
MKTN1	11	0	0	0	(	0)	(	0)		0
MKTN1	12	0	0	0	(	0)	(	0)		0
MKTN1	13	0	0	0	(	0)	(	0)		0
MKTN1	14	0	0	0	(	0)	(	0)		0
MKTN1	15	0	0	0	(	0)	(	0)		0
MKTN1	16	0	0	0	(	0)	(	0)		0
MKTN1	17	0	0	0	(	0)	(	0)		0
MKTN1	18	0	0	0	(	0)	(	0)		0
MKTN1	19	0	0	0	(	0)	(	0)		0
MKTN1	20	0	0	0	(	0)	(	0)		0
INSTN1	1	6	5	1	(	0)	(	0)		0
INSTN1	2	4	4	0	(	0)	(	0)		0
INSTN1	3	0	0	0	(	0)	(	0)		0
INSTN1	4	1	1	0	(	0)	(	0)		0
INSTN1	5	1	1	0	(	0)	(	0)		0
INSTN1	6	0	0	0	(	0)	(	0)		0
INSTN1	7	0	0	0	(	0)	(	0)		0
INSTN1	8	0	0	0	(	0)	(	0)		0
INSTN1	9	0	0	0	(	0)	(	0)		0

INSTN1	10	0	0	0	(	0)	(	0)		0
INSTN1	11	0	0	0	(	0)	(	0)		0
INSTN1	12	0	0	0	(	0)	(	0)		0
INSTN1	13	0	0	0	(	0)	(	0)		0
INSTN1	14	0	0	0	(	0)	(	0)		0
INSTN1	15	0	0	0	(	0)	(	0)		0
INSTN1	16	0	0	0	(	0)	(	0)		0
INSTN1	17	0	0	0	(	0)	(	0)		0
INSTN1	18	0	0	0	(	0)	(	0)		0
INSTN1	19	0	0	0	(	0)	(	0)		0
INSTN1	20	0	0	0	(	0)	(	0)		0
OGHL2	1	240	240	0	(	663)	(	0)		0
OGHL2	2	180	180	0	(	618)	(	0)		0
OGHL2	3	93	93	0	(	457)	(	0)		0
OGHL2	4	60	60	0	(	467)	(	0)		0
OGHL2	5	0	0	0	(	255)	(	0)		0
OGHL2	6	0	0	0	(	142)	(	0)		0
OGHL2	7	0	0	0	(	0)	(	0)		0
OGHL2	8	0	0	0	(	0)	(	0)		0
OGHL2	9	0	0	0	(	0)	(	0)		0
OGHL2	10	0	0	0	(	0)	(	0)		0
MKTN2	1	240	240	0	(	0)	(	0)		0
MKTN2	2	180	180	0	(	0)	(	0)		0
MKTN2	3	68	67	1	(	0)	(	0)		0
MKTN2	4	60	60	0	(	0)	(	0)		0
MKTN2	5	0	0	0	(	0)	(	0)		0
MKTN2	6	0	0	0	(	0)	(	0)		0
MKTN2	7	0	0	0	(	0)	(	0)		0
MKTN2	8	0	0	0	(	0)	(	0)		0
MKTN2	9	0	0	0	(	0)	(	0)		0
MKTN2	10	0	0	0	(	0)	(	0)		0
INSTN2	1	4	4	0	(	0)	(	0)		0
INSTN2	2	3	3	0	(	0)	(	0)		0
INSTN2	3	1	1	0	(	0)	(	0)		0
INSTN2	4	1	1	0	(	0)	(	0)		0
INSTN2	5	0	0	0	(	0)	(	0)		0
INSTN2	6	0	0	0	(	0)	(	0)		0
INSTN2	7	0	0	0	(	0)	(	0)		0
INSTN2	8	0	0	0	(	0)	(	0)		0
INSTN2	9	0	0	0	(	0)	(	0)		0
INSTN2	10	0	0	0	(	0)	(	0)		0
OGHL3	1	469	469	0	(	2607)	(	0)		0
OGHL3	2	360	360	0	(	1802)	(	0)		0
OGHL3	3	120	120	0	(	1461)	(	0)		0
OGHL3	4	180	180	0	(	1350)	(	0)		0
OGHL3	5	60	60	0	(	1049)	(	0)		0
MKTN3	1	458	457	1	(	0)	(	0)		0
MKTN3	2	350	349	1	(	0)	(	0)		0
MKTN3	3	120	120	0	(	0)	(	0)		0
MKTN3	4	180	180	0	(	0)	(	0)		0
MKTN3	5	26	25	1	(	0)	(	0)		0
INSTN3	1	7	7	0	(	0)	(	0)		0
INSTN3	2	5	5	0	(	0)	(	0)		0
INSTN3	3	2	2	0	(	0)	(	0)		0
INSTN3	4	3	3	0	(	0)	(	0)		0
INSTN3	5	0	0	0	(	0)	(	0)		0
OGHL4	1	0	0	0	(	0)	(	0)		0
OGHL4	2	0	0	0	(	0)	(	0)		0
OGHL4	3	0	0	0	(	0)	(	0)		0
OGHL4	4	0	0	0	(	0)	(	0)		0
OGHL4	5	0	0	0	(	0)	(	0)		0
MKTN4	1	0	0	0	(	0)	(	0)		0
MKTN4	2	0	0	0	(	0)	(	0)		0
MKTN4	3	0	0	0	(	0)	(	0)		0
MKTN4	4	0	0	0	(	0)	(	0)		0
MKTN4	5	0	0	0	(	0)	(	0)		0
INSTN4	1	0	0	0	(	0)	(	0)		0
INSTN4	2	0	0	0	(	0)	(	0)		0
INSTN4	3	0	0	0	(	0)	(	0)		0
INSTN4	4	0	0	0	(	0)	(	0)		0

INSTN4 5	0	0	0	(0)	(0)	0
*A:						
ARV	42	41	1		(0)	0
ACHECK	2	2	0		(0)	0
AD1	42	42	0		(0)	0
INSERT1	1686	1686	0		(0)	0
INSERT2	819	819	0		(0)	0
INSERT3	917	917	0		(0)	0
INSERT4	0	0	0		(0)	0
TRAVEL	3143	2838	305		(0)	2838
DRAY	3473	3281	192		(0)	0
INCOR	1266	1266	0		(0)	0
DEL1	0	0	0		(0)	0
DA1	0	0	0		(0)	0
CORINPT	733	733	0		(0)	0
EXCOR	11	11	0		(0)	11
INCIC	782	782	0		(0)	0
DEL2	0	0	0		(0)	0
DA2	0	0	0		(0)	0
CICINPT	573	573	0		(0)	0
EXCIC	9	9	0		(0)	9
INWIL	1233	1233	0		(0)	0
DEL3	183	183	0		(0)	0
DA3	0	0	0		(0)	0
WILINPT	1189	1189	0		(0)	0
EXWIL	17	17	0		(0)	17
INJOL	0	0	0		(0)	0
DEL4	0	0	0		(0)	0
DA4	0	0	0		(0)	0
JOLINPT	0	0	0		(0)	0
EXJOL	0	0	0		(0)	0

E N D   O F   S I M U L A T I O N   S E S S I O N

Simulation Ended at Wed Aug 26 12:05:23 CDT 1998