

STAT SURVEY: VESSEL PER



**US Army Corps  
of Engineers**

Engineer Institute for  
Water Resources

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# **A Statistical Survey of Vessel Performance and Configuration Characteristics on Inland Waterways**

**FEBRUARY 1983**

**RESEARCH REPORT 83R-1**

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| 18. SUPPLEMENTARY NOTES<br>The source survey for this report was conducted before the Performance Monitoring System (PMS) was available system wide. More complete and recent statistics can now be retrieved through PMS for tow speeds and sizes but not for delays. Also PMS is only applicable to canalized waterways.  |  |   |
| 19. KEY WORDS (Continue on reverse side if necessary and identify by block number)  |  |   |
| Statistical Survey  | Transit Time   |   |
| Vessel Performance  | Annual Velocity  |   |
| Study Design  | Input Data   |   |
| Tow Speeds  | Navigation Improvement   |   |
| Average Delays  | Barge Rates  |   |
| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number)   |  |   |
| This report provides information about tow characteristics for the Mississippi River, its tributaries and the Gulf Intracoastal Waterway. It will allow for consistent input data to be used in the evaluation of navigation improvements. The performance and characteristics of tows on the waterways are important determinants of barge rates and inputs into waterway cost models. |  |   |

A STATISTICAL SURVEY OF  
VESSEL PERFORMANCE AND CONFIGURATION CHARACTERISTICS  
ON INLAND WATERWAYS

by  
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NAVIGATION ANALYSIS CENTER  
INSTITUTE FOR WATER RESOURCES  
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## I. INTRODUCTION

### Background

1. An important aspect of the benefit-cost analysis performed by the Corps of Engineers in its evaluation of navigation improvements is the physical performance of tows throughout the inland navigation system. The performance and characteristics of tows on the waterways are important determinants of barge rates, and inputs into waterway cost models.

### Purpose

2. The purpose of this report is to provide information about tow characteristics for the Mississippi River, its tributaries and the Gulf Intracoastal Waterway. This will allow for consistent input data for use in the evaluation of navigation improvements utilizing system-analytic techniques.

### Data Collection Responsibility

3. The data collected in the survey was for calendar year 1978, and was obtained by St. Louis District personnel between July 1979 and January 1980.

## II. STUDY DESIGN

### Statistical Approach

4. To determine operating characteristics of the towing industry such as towboat and barge utilization and tow speeds a sampling procedure was necessary. Established statistical techniques and methods were used to obtain inputs and outputs. Specification error and other common statistical errors were investigated to insure reliable output.

### Data Sources

5. Alternatives. At the time of this study there were three potential sources for input data:

- o Performance Monitoring System (PMS)
- o Carrier Survey
- o Vessel Master Logs

6. PMS. The Performance Monitoring System (PMS) data contains vessel and tow information as well as lock processing times. The most recent PMS data available (at the time of this study) was for the year 1976 which was the second year of data gathering under PMS. However, the data collected by the Corps at that time was incomplete. In addition to PMS not being system-wide in 1976, three other characteristics prevented its application.

7. The problem of computing underway speed by subtracting out locking times does not account for delays incurred other than at locks. Therefore, the resultant underway speed would be incorrect. Delays such as weather, fleeting, repairs, supply or other delays as expressed in this report are not identifiable when using PMS.

8. The absence of locks on the lower Mississippi River preclude using PMS to determine speeds or vessel characteristics for that region.

9. Carrier Survey. Carrier surveys are a source of input but are subject to bias and misinterpretation in responses from carriers surveyed. It may be in the interest of those interviewed to overestimate delays and underway speed and to under-estimate transit time.

10. The Vessel Logs. The source of data chosen was the vessel master logs maintained by the vessel captains. Vessels are required to report their position at least every six hours as well as to list the dock of origin and destination, fleeting stops, lockings and all delays by time and type. Barge numbers and tow configuration are also listed. The comprehensive nature of information at the time of this study allowed for the most complete and accurate reporting of the required information.

11. Accuracy of the Vessel Logs. The logs are kept by the firms which operate the vessels. Their accuracy is necessarily high because insurance procedures require log audits in order to pay off claims.

#### Sample Design

12. Sample Source. There are approximately 3,250 vessels which operate along the Mississippi River basin and its tributaries. Approximately one-half of these do not make through movements on the inland river system, being either harbor vessels, work vessels or passenger boats. The remainder of the vessels, slightly more than 1,500, are those which make through movements and, thus, comprise the universe for data collection. These vessels are described in the Inland River Record (Waterways Journal) which lists vessels, their characteristics, owners and operators.

13. Stratifying the Sample. The sample was stratified into ranges of horsepower based upon the tonnage moved by towboats of a given horsepower range. For example, if vessels in the 5000-6000 horsepower range carry ten percent of tonnage on the system during a certain period, then ten percent of the sample was composed of vessels from that range. 1976 PMS data was used to determine this stratification.

14. Sample Size. One hundred vessels were considered to be the minimum sample size.

15. Vessel Selection. The second part of the sample selection involved the choice of vessels. As mentioned above, the source used for the vessels was the Inland River Record. Vessels could have been chosen by owner, by name, or by assigning a random number to each vessel. The choice of vessel by random number avoided potential biases.

16. The Random Number Process. Each vessel was assigned a random number of five digits. The random numbers were then listed in order of horsepower from lowest to greatest. Vessels of equal horsepower could be distinguished only by their random number.

17. This list was then broken up into nine horsepower groups, according to the groups specified in the stratification data, and listed in Table 1. The number of vessels desired from each group was determined, based upon the stratification data. A vessel from each interval was selected by random number. The remaining vessels were selected from each interval at equidistant spacing. For example, suppose a given interval contained 25 vessels, and five vessels were needed from this interval. Each of these vessels would be numbered from 1 to 25 and a random number generated would be generated from this set of vessel numbers, say 17. The vessels selected from this interval then, would be numbers 17, 22, 2, 7 and 12. These numbers were decoded to determine the vessel name and owner.

TABLE 1  
VESSEL STRATIFICATION  
by  
Horsepower and Number

| Class | Horsepower | No. of Vessels |
|-------|------------|----------------|
| A     | 600-1600   | 24             |
| B     | 1600-2200  | 19             |
| C     | 2200-2800  | 17             |
| D     | 2800-3800  | 34             |
| E     | 3800-4800  | 25             |
| F     | 4800-5400  | 18             |
| G     | 5400-6200  | 4              |
| H     | 6200-7500  | 4              |
| I     | 7500-9000  | 1              |
| J     | 9000-10500 | 1              |
| TOTAL |            | 150            |

18. Non-Operating Vessels. In a few instances, vessels did not operate during part or parts of the sampled period (January, April, July and October of 1978). When this occurred, no sample replacement was made.

19. Non-Replacement. When a vessel did not operate due to drydocking operations or was used as a harbor vessel, the timing of such operations was important and relevant to the study. For instance, needed repairs may have been held off until January in anticipation of ice delays which might detain the voyage anyway. Replacement of these vessels infers that the timing of these operations is arbitrary. Therefore replacement was not made.

20. The Four Month Data Scheme. A four-month period of information was obtained from each vessel log. A month was picked at random (so as not to

bias the sample) and that and each subsequent third month was selected to provide input data. January, April, July and October were chosen. This reduced the data collection effort while allowing for seasonal analysis.

21. The Data Collection Process. All data for any trip which occurred during any part of the sample period was recorded. For instance, if a trip began in December, but extended into January, it was recorded. Trips which extended beyond the end of the sample month were treated similarly.

### Errors

22. Sampling and Non-Sampling Error. Generally, possible errors in estimates of universe parameters may be classified as being associated with the sampling process (sampling error) in a sample survey, and/or related to the data collection and processing (non-sampling error). In practice, sampling errors are more likely, while non-sampling errors are more readily controlled so that the total error is approximated by the measure of sampling error.

23. Exclusion Errors. The principle possibilities for non-sampling errors occur via exclusion of sampled items and in processing. Exclusion can occur by inability to locate the vessel logs, or from respondent noncooperation. There was no incidence of inability to locate the vessel logs, though there were two whose owners refused to cooperate. In these instances as explained previously, no replacement took place.

24. Processing Errors. Processing errors were primarily human errors in coding, transcribing, and key punching data. Close double checking and computer programs written for the purpose of checking errors reduced these errors with no discernable bias.

25. Sampling Errors. Sampling errors result from the fact that the statistics presented in this report are estimated from a sample. The particular sample that was selected is one of the large number of all possible samples of the same size that could have been selected using the sample design. Estimates derived from the different samples would differ from each other and from the results of a complete collection of the universe of data using the same procedures.

## III. STUDY RESULTS

### Tow Speeds

26. Introduction. Tow speeds determined from the vessel logs of the 150 chosen towboats for the months January, April, June and October 1978 are presented in Tables 2 through 4. These tables show speeds (in miles per hour) as a function of trip type, direction, season, waterway and horsepower.

27. Data Accuracy. Tow speeds were derived directly from the vessel logs. Interpolation was necessary for inter-system movements (trips traversing more than one river) whenever the logs did not specify the time at which the tow changed (entered or exited) rivers.

28. Definitions. Underway speed is, as the name implies, speed while moving. Weighted average speed is the sum of the mileage in a given aggregation divided by the amount of time taken to travel that mileage and places more weight on longer trips than shorter trips. This figure is probably more representative of the correct speeds because shorter trips tend to have extreme ranges in speed especially when they occur totally between constraints (i.e., locks).

29. Table 2. Table 2 presents average tow speeds on a given waterway by direction, with and without delays and as a function of inter or intra movements with respect to the subject waterway. This table does not allow for determination of tow size, configuration or draft. Nor does it provide towboat horsepower or the tonnage moved. All of these would influence speed. The variability of these parameters is greater in some rivers than others. However, a proper sample would reflect these parameters in a representative manner.

30. Inter and Intra-System Movements. The differences between the inter-system and intra-system figures imply various things about the usage of those waterways. The faster speeds, larger tows and greater occurrence of inter-system movements on a certain waterway would imply its use mostly as a feeder waterway and that most trips begin or end before a major constraint point. One example would be the termination of many trips entering the Upper Mississippi River at mile 0 (Cairo, Il) and ending at St. Louis, or beginning southbound at St. Louis and avoiding Locks and Dam No. 26.

31. Figures 1 - 4. Figures 1 through 4 show the average annual weighted tow velocities for each waterway by direction with and without delays. The highest downstream underway velocities are recorded in the lower Mississippi and Missouri Rivers, respectively. Because these two rivers are open channel, the current velocities are generally higher, which helps to account for the higher tow speeds in the downstream direction and also helps to account for the Missouri showing the lowest upstream underway velocity.

32. The large difference between upstream and downstream underway velocity (Figure 1) on these two rivers when compared to the canalized rivers is also reflective of their higher current velocities.

33. Figures 2 - 4 show the relative effect of delays on tow speeds. Delays are of three major types: weather, traffic and carrier (i.e., frequency of loading).

34. Table 3. Table 3 subdivides the data presented in Table 2 into seasonal values. The percentage usage is the ratio of miles traveled on that waterway for that season (sampled month) to the total miles traveled on that waterway for all seasons (sampled months).

35. As would be expected, ice and weather conditions lowered usage numbers on several rivers during the winter. The Missouri is closed to winter navigation explaining the absence of winter observations. In the case of the Black Warrior - Tombigbee River System, low winter usage was the result of a coal strike during the sample period.

36. Open Pass Conditions. The lower four locks (50, 51, 52 and 53) on the Ohio River were not used except during the fall of 1978 because river stages were sufficient to allow open pass operation. Tow speeds in the fall show the effects of having to lock through the additional four locks.

37. Standard Deviations. The statistics contained in Table 4 are the sample standard deviations by waterway and direction for speeds with and without delays.

38. Table 5. Table 5 lists median speeds for each river. Testing revealed no significant skewness in the speed distributions.

#### Average Number of Barges Per Tow

39. Introduction. Tables 6 and 7 present a breakdown of tow sizes in terms of the number of barges by waterway, direction, and season, for all barges, loaded or empty, regardless of commodity types. In some cases the average number of barges per tow presented is misleading. Based upon the vessel logs, the average number of barges is largest on the Monongahela and fourth largest on the lower Mississippi. Apparently the numbers presented for the Monongahela represents trips below the lowest pool on the river. There is a fleeting area just below the first lock at river mile 11.2. The number of barges obviously represent those tows that were just coming off or just going onto the Ohio River. There are a large number of intersystem movements between the mines and the power plants and these tows are much smaller. The same probably applies to the Allegheny River tow sizes presented. The relatively low average number of barges listed for the lower Mississippi results from the fact that about 50% of the tows sampled were carrying petroleum only. In general, liquid cargo (tank) barges are much larger than dry cargo barges and therefore it takes far fewer barges to achieve the same payload as tows containing dry cargo barges.

40. One cannot make a direct comparison of tow size between river systems based on average number of barges because of the range in dimensions of barges. This would also inhibit being able to correlate speeds as a function of tow size. Despite the above problems, the average number of barges per tow as presented represent the tows sampled from which tow speeds were derived.

#### Percent Backhaul Empty

41. Backhaul. One half of all the barges on a given trip are considered to be on the front haul, that is, the trip to which this movement is dedicated. The rest are, therefore, defined as returning or on the backhaul. Based upon

this, the percentage of empty backhaul barges was calculated considering only 50% of the number of barges per tow as the base number. All empty barges up to 50% of the total number of barges in the tow are assigned to the backhaul category and are ratioed to the number of barges defined numerically as backhaul. Due to the definition whenever there is a calculated 100% empty backhaul, one cannot determine whether or not the front hauls are all loaded.

42. Example. For example, if an aggregation has 10 barges, 8 of which are full then five of the loaded barges are on the front haul. The remaining three loaded barges are on the backhaul. This means that 60 percent of the backhaul is full, and the backhaul figure (percentage empty) reported would thus be 40%. See Tables 8 and 9.

#### Waterway Lock Transiting Times

43. Tables 10 and 11 present the annual and seasonal average lock transiting times for a given waterway. These times are composed of the waiting and processing times that tows incur at each lock. To determine these values all of the processing and waiting times for all locks traversed on a given waterway were summed. This value was then divided by the product of the lock density (locks per mile) and summation of miles traversed. Therefore these numbers apply to each waterway as a whole and are not indicative of the actual times at individual locks.

#### Average Delays, by Type

44. Introduction. Tables 12-15 report on delays by waterway and type. The probability of occurrence is the chance of the vessel stopping for that reason on a given trip. The mean delay is the average delay when that type of delay occurs. The mean delay per trip is then the product of these numbers.

45. Classifications.

The delays are classified as follows:

Weather - all weather related stops, except fog and ice

Fog - self explanatory

Locking - includes awaiting lockages

Repairs - self explanatory

Ice - self explanatory

Crew Change - awaiting new crew (while stopped)

Supplies - includes fueling stops, but not fueling while underway

Awaiting Orders - stops to await order change (during a voyage)

Vessel Assisting - assisting other vessels

Awaiting Berth - at fleet point with no dock space

Bridge Wait - self explanatory

Fleeting - dropping and adding barges to tow and associated shifts.

46. Method. Each reported delay is the sum of that type of delay per voyage. Mean Delays are expressed in hours.

47. Insufficient Data. In Tables 14 and 15, no statistics are reported for the Allegheny, Arkansas, Port Allen to Morgan City Route and Monongahela Rivers due to insufficient data.

#### IV. CONCLUSIONS

48. The tow speeds, average number of barges, lock transit times and delay types and times presented show the operational characteristics of the various waterways.

49. Based upon data presented the reader cannot correlate tow speeds with water currents, horsepower, or number, load, configuration and draft of barges.

50. The average number of barges for the Monongahela and Allegheny Rivers seem high and may reflect an insufficient sample size.

51. The average number of barges per tow per waterway does not allow for calculating tow dimensions or arrangement.

#### V. RECOMMENDATIONS

52. Now that PMS is well established it could be used to verify speeds presented (except for the Lower Mississippi and Missouri River) as well as allow for a more comprehensive analysis.

53. This study should be extended to include tow speeds as a function of load. This can be done through PMS.

54. The average tow size should be evaluated on a pool basis and should include average load, number of barges, dimension of tow and associated horsepower.

TABLE 2

AVERAGE ANNUAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                        |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|------------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Allegheny River</u> |                               |              |                         |                         |
| Downriver              | Average, Underway             | 7.58         | SAMPLE SIZE TOO SMALL   |                         |
|                        | Average, with Delays          | 4.69         |                         |                         |
|                        | Weighted Average, Underway    | 7.82         |                         |                         |
|                        | Weighted Average, with Delays | 4.49         |                         |                         |
| Upriver                | Average, Underway             | 5.66         | SAMPLE SIZE TOO SMALL   |                         |
|                        | Average, with Delays          | 3.67         |                         |                         |
|                        | Weighted Average, Underway    | 5.31         |                         |                         |
|                        | Weighted Average, with Delays | 3.40         |                         |                         |
| Total                  | Average, Underway             | 6.62         | SAMPLE SIZE TOO SMALL   |                         |
|                        | Average, with Delays          | 4.18         |                         |                         |
|                        | Weighted Average, Underway    | 6.29         |                         |                         |
|                        | Weighted Average, with Delays | 3.86         |                         |                         |

Sample Size = 15 trips

TABLE 2 (continued)

AVERAGE ANNUAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                       |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|-----------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Arkansas River</u> |                               |              |                         |                         |
| Downriver             | Average, Underway             | 6.76         | SAMPLE SIZE TOO SMALL   |                         |
|                       | Average, with Delays          | 4.37         |                         |                         |
|                       | Weighted Average, Underway    | 6.12         |                         |                         |
|                       | Weighted Average, with Delays | 4.21         |                         |                         |
| Upriver               | Average, Underway             | 7.04         | SAMPLE SIZE TOO SMALL   |                         |
|                       | Average, with Delays          | 4.79         |                         |                         |
|                       | Weighted Average, Underway    | 6.09         |                         |                         |
|                       | Weighted Average, with Delays | 4.89         |                         |                         |
| Total                 | Average, Underway             | 6.35         | SAMPLE SIZE TOO SMALL   |                         |
|                       | Average, with Delays          | 4.62         |                         |                         |
|                       | Weighted Average, Underway    | 5.99         |                         |                         |
|                       | Weighted Average, with Delays | 4.65         |                         |                         |

Sample Size = 18 trips

TABLE 2 (continued)

AVERAGE ANNUAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|   |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|---|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Black Warrior-Tombigbee River System</u> |                               |              |                         |                         |
| Downriver                                   | Average, Underway             | 6.70         | 6.76                    | 5.01                    |
|   | Average, with Delays          | 5.54         | 5.75                    | 4.10                    |
|   | Weighted Average, Underway    | 6.59         | 6.62                    | 4.99                    |
|   | Weighted Average, with Delays | 5.35         | 5.59                    | 4.08                    |
| Upriver                                     | Average, Underway             | 5.32         | 5.13                    | 5.61                    |
|   | Average, with Delays          | 4.38         | 4.39                    | 4.34                    |
|   | Weighted Average, Underway    | 5.24         | 5.06                    | 5.56                    |
|   | Weighted Average, with Delays | 4.31         | 4.31                    | 4.31                    |
| Total                                       | Average, Underway             | 5.96         | 5.89                    | 5.34                    |
|   | Average, with Delays          | 4.92         | 5.02                    | 4.23                    |
|   | Weighted Average, Underway    | 5.74         | 5.63                    | 5.25                    |
|   | Weighted Average, with Delays | 4.70         | 4.78                    | 4.21                    |

Sample Size = 69 trips

TABLE 2 (continued)

AVERAGE ANNUAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                         |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|-------------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Cumberland River</u> |                               |              |                         |                         |
| Downriver               | Average, Underway             | 8.33         | 8.22                    | 8.36                    |
|                         | Average, with Delays          | 6.58         | 6.95                    | 6.47                    |
|                         | Weighted Average, Underway    | 8.01         | 7.28                    | 9.31                    |
|                         | Weighted Average, with Delays | 5.81         | 5.43                    | 6.49                    |
| Upriver                 | Average, Underway             | 5.76         | 4.72                    | 5.95                    |
|                         | Average, with Delays          | 4.67         | 4.39                    | 4.72                    |
|                         | Weighted Average, Underway    | 4.29         | 4.76                    | 4.25                    |
|                         | Weighted Average, with Delays | 3.61         | 4.43                    | 3.55                    |
| Total                   | Average, Underway             | 6.94         | 6.72                    | 6.99                    |
|                         | Average, with Delays          | 5.55         | 5.85                    | 5.48                    |
|                         | Weighted Average, Underway    | 5.57         | 6.23                    | 4.58                    |
|                         | Weighted Average, with Delays | 4.45         | 5.07                    | 5.81                    |

Sample Size = 37 trips

TABLE 2 (continued)

AVERAGE ANNUAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                                   |                            | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|-----------------------------------|----------------------------|--------------|-------------------------|-------------------------|
| <u>Gulf Intracoastal Waterway</u> |                            |              |                         |                         |
| Eastern Portion                   |                            |              |                         |                         |
| (New Orleans to                   | Average, Underway          | 6.45         | 5.91                    | 7.17                    |
| Pensacola)                        | Average, with Delays       | 5.01         | 5.01                    | 5.01                    |
|                                   | Weighted Average, Underway | 6.04         | 5.67                    | 6.90                    |
|                                   | Weighted Average, w/Delays | 4.32         | 4.33                    | 4.30                    |
| Sample Size = 63                  |                            |              |                         |                         |
| Western Portion                   |                            |              |                         |                         |
| (Houston to                       | Average, Underway          | 7.02         | 6.27                    | 7.74                    |
| New Orleans)                      | Average, with Delays       | 5.51         | 5.02                    | 5.76                    |
|                                   | Weighted Average, Underway | 6.83         | 5.74                    | 6.93                    |
|                                   | Weighted Average, w/Delays | 5.26         | 4.54                    | 5.23                    |
| Sample Size = 72 trips            |                            |              |                         |                         |

TABLE 2 (continued)

AVERAGE ANNUAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles Per Hour)

|                       |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|-----------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>ILLINOIS RIVER</u> |                               |              |                         |                         |
| Downriver             | Average, Underway             | 5.45         | 4.88                    | 6.29                    |
|                       | Average, with Delays          | 3.28         | 2.72                    | 4.02                    |
|                       | Weighted Average, Underway    | 4.94         | 4.16                    | 5.69                    |
|                       | Weighted Average, with Delays | 2.74         | 2.34                    | 3.16                    |
| Upriver               | Average, Underway             | 4.17         | 4.52                    | 5.35                    |
|                       | Average, with Delays          | 2.94         | 2.34                    | 3.87                    |
|                       | Weighted Average, Underway    | 4.03         | 3.52                    | 5.22                    |
|                       | Weighted Average, with Delays | 2.51         | 2.06                    | 3.41                    |
| Total                 | Average, Underway             | 5.06         | 4.69                    | 5.75                    |
|                       | Average, with Delays          | 3.10         | 2.51                    | 3.93                    |
|                       | Weighted Average, Underway    | 4.42         | 3.76                    | 5.39                    |
|                       | Weighted Average, with Delays | 2.61         | 2.17                    | 3.31                    |

Sample Size = 184 trips

TABLE 2 (continued)

AVERAGE ANNUAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|   |                               | <u>TOTAL</u> | <u>INTRA</u><br><u>SYSTEM</u> | <u>INTER</u><br><u>SYSTEM</u> |
|---|-------------------------------|--------------|-------------------------------|-------------------------------|
| <u>Illinois Waterway System North of Lockport, IL</u><br>(including Calumet-Saginaw, Chicago Sanitary and Ship Canal and Chicago River) |                               |              |                               |                               |
| Downriver   | Average, Underway             | 5.76         | SAMPLE SIZE TOO SMALL         |                               |
|   | Average, with Delays          | 2.45         |                               |                               |
|   | Weighted Average, Underway    | 5.15         |                               |                               |
|   | Weighted Average, with Delays | 2.39         |                               |                               |
| Upriver   | Average, Underway             | 4.17         | SAMPLE SIZE TOO SMALL         |                               |
|   | Average, with Delays          | 2.07         |                               |                               |
|   | Weighted Average, Underway    | 3.67         |                               |                               |
|   | Weighted Average, with Delays | 2.16         |                               |                               |
| Total   | Average, Underway             | 4.94         | SAMPLE SIZE TOO SMALL         |                               |
|   | Average, with Delays          | 2.25         |                               |                               |
|   | Weighted Average, Underway    | 4.26         |                               |                               |
|   | Weighted Average, with Delays | 2.27         |                               |                               |

SAMPLE SIZE = 89 trips

TABLE 2 (continued)

AVERAGE ANNUAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                                |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--------------------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Lower Mississippi River</u> |                               |              |                         |                         |
| Downriver                      | Average, Underway             | 11.68        | 11.91                   | 10.53                   |
|                                | Average, with Delays          | 10.16        | 10.56                   | 9.17                    |
|                                | Weighted Average, Underway    | 11.64        | 11.37                   | 9.57                    |
|                                | Weighted Average, with Delays | 9.59         | 9.37                    | 8.34                    |
| Upriver                        | Average, Underway             | 5.61         | 5.53                    | 5.81                    |
|                                | Average, with Delays          | 5.08         | 5.09                    | 5.08                    |
|                                | Weighted Average, Underway    | 5.39         | 5.30                    | 5.47                    |
|                                | Weighted Average, with Delays | 4.77         | 4.76                    | 4.78                    |
| Total                          | Average, Underway             | 8.63         | 8.54                    | 7.95                    |
|                                | Average, with Delays          | 7.62         | 7.76                    | 7.43                    |
|                                | Weighted Average, Underway    | 7.39         | 7.07                    | 9.63                    |
|                                | Weighted Average, with Delays | 6.38         | 6.19                    | 6.64                    |

Sample Size = 369 trips

TABLE 2 (continued)

AVERAGE ANNUAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                       |                               | <u>TOTAL</u> | <u>INTRA</u><br><u>SYSTEM</u> | <u>INTER</u><br><u>SYSTEM</u> |
|-----------------------|-------------------------------|--------------|-------------------------------|-------------------------------|
| <u>Missouri River</u> |                               |              |                               |                               |
| Downriver             | Average, Underway             | 9.27         | SAMPLE SIZE TOO SMALL         |                               |
|                       | Average, with Delays          | 6.73         |                               |                               |
|                       | Weighted Average, Underway    | 9.34         |                               |                               |
|                       | Weighted Average, with Delays | 6.09         |                               |                               |
| Upriver               | Average, Underway             | 4.00         | SAMPLE SIZE TOO SMALL         |                               |
|                       | Average, with Delays          | 3.57         |                               |                               |
|                       | Weighted Average, Underway    | 3.98         |                               |                               |
|                       | Weighted Average, with Delays | 3.53         |                               |                               |
| Total                 | Average, Underway             | 6.55         | SAMPLE SIZE TOO SMALL         |                               |
|                       | Average, with Delays          | 5.10         |                               |                               |
|                       | Weighted Average, Underway    | 5.42         |                               |                               |
|                       | Weighted Average, with Delays | 4.38         |                               |                               |

Sample Size = 31 trips

TABLE 2 (continued)

AVERAGE ANNUAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION

(Miles per Hour)

|                          |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--------------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Monongahela River</u> |                               |              |                         |                         |
| Downriver                | Average, Underway             | 8.29         | SAMPLE SIZE TOO SMALL   |                         |
|                          | Average, with Delays          | 5.30         |                         |                         |
|                          | Weighted Average, Underway    | 8.07         |                         |                         |
|                          | Weighted Average, with Delays | 5.23         |                         |                         |
| Upriver                  | Average, Underway             | 6.15         | SAMPLE SIZE TOO SMALL   |                         |
|                          | Average, with Delays          | 4.25         |                         |                         |
|                          | Weighted Average, Underway    | 5.74         |                         |                         |
|                          | Weighted Average, with Delays | 4.10         |                         |                         |
| Total                    | Average, Underway             | 7.27         | SAMPLE SIZE TOO SMALL   |                         |
|                          | Average, with Delays          | 4.80         |                         |                         |
|                          | Weighted Average, Underway    | 6.88         |                         |                         |
|                          | Weighted Average, with Delays | 4.68         |                         |                         |

Sample Size = 47 trips

TABLE 2 (continued)

AVERAGE ANNUAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|  |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Morgan City to Port Allen Route</u> |                               |              |                         |                         |
| Downriver                              | Average, Underway             | 6.68         | SAMPLE SIZE TOO SMALL   |                         |
|  | Average, with Delays          | 4.72         |                         |                         |
|  | Weighted Average, Underway    | 5.88         |                         |                         |
|  | Weighted Average, with Delays | 4.13         |                         |                         |
| Upriver                                | Average, Underway             | 5.45         | SAMPLE SIZE TOO SMALL   |                         |
|  | Average, with Delays          | 4.64         |                         |                         |
|  | Weighted Average, Underway    | 5.45         |                         |                         |
|  | Weighted Average, with Delays | 4.64         |                         |                         |
| Total                                  | Average, Underway             | 6.61         | SAMPLE SIZE TOO SMALL   |                         |
|  | Average, with Delays          | 4.72         |                         |                         |
|  | Weighted Average, Underway    | 5.85         |                         |                         |
|  | Weighted Average, with Delays | 4.16         |                         |                         |

Sample Size = 18 trips

TABLE 2 (continued)

AVERAGE ANNUAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                   |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|-------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Ohio River</u> |                               |              |                         |                         |
| Downriver         | Average, Underway             | 9.02         | 8.26                    | 9.51                    |
|                   | Average, with Delays          | 6.04         | 5.56                    | 6.98                    |
|                   | Weighted Average, Underway    | 8.78         | 7.51                    | 9.78                    |
|                   | Weighted Average, with Delays | 4.91         | 4.67                    | 5.40                    |
| Upriver           | Average, Underway             | 6.48         | 6.25                    | 6.64                    |
|                   | Average, with Delays          | 4.39         | 4.22                    | 4.87                    |
|                   | Weighted Average, Underway    | 6.14         | 5.59                    | 6.84                    |
|                   | Weighted Average, with Delays | 3.87         | 3.71                    | 4.40                    |
| Total             | Average, Underway             | 7.76         | 7.19                    | 8.28                    |
|                   | Average, with Delays          | 5.22         | 4.84                    | 6.07                    |
|                   | Weighted Average, Underway    | 7.27         | 6.35                    | 8.30                    |
|                   | Weighted Average, with Delays | 4.34         | 4.10                    | 4.93                    |

Sample Size = 401 trips

TABLE 2 (continued)

AVERAGE ANNUAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION:  
(Miles per Hour)

|                        |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|------------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Tennessee River</u> |                               |              |                         |                         |
| Downriver              | Average, Underway             | 8.86         | 6.40                    | 9.07                    |
|                        | Average, with Delays          | 5.36         | 4.42                    | 5.44                    |
|                        | Weighted Average, Underway    | 7.99         | 6.40                    | 8.29                    |
|                        | Weighted Average, with Delays | 5.17         | 4.39                    | 5.32                    |
| Upriver                | Average, Underway             | 6.19         | 7.43                    | 5.91                    |
|                        | Average, with Delays          | 3.74         | 4.83                    | 3.49                    |
|                        | Weighted Average, Underway    | 6.53         | 7.46                    | 6.17                    |
|                        | Weighted Average, with Delays | 4.11         | 4.79                    | 3.85                    |
| Total                  | Average, Underway             | 7.60         | 7.08                    | 7.68                    |
|                        | Average, with Delays          | 4.60         | 4.70                    | 4.58                    |
|                        | Weighted Average, Underway    | 7.27         | 7.05                    | 7.31                    |
|                        | Weighted Average, with Delays | 4.64         | 4.64                    | 4.64                    |

Sample Size = 68 trips

TABLE 2 (continued)

## AVERAGE ANNUAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION

(Miles per Hour)

|                                |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--------------------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Upper Mississippi River</u> |                               |              |                         |                         |
| Downriver                      | Average, Underway             | 8.49         | 7.34                    | 9.06                    |
|                                | Average, with Delays          | 4.16         | 3.57                    | 4.61                    |
|                                | Weighted Average, Underway    | 7.51         | 6.66                    | 8.51                    |
|                                | Weighted Average, with Delays | 3.15         | 3.31                    | 2.74                    |
| Upriver                        | Average, Underway             | 6.04         | 6.19                    | 5.82                    |
|                                | Average, with Delays          | 3.22         | 3.84                    | 2.66                    |
|                                | Weighted Average, Underway    | 5.49         | 5.38                    | 4.93                    |
|                                | Weighted Average, with Delays | 2.90         | 3.23                    | 2.18                    |
| Total                          | Average, Underway             | 7.24         | 6.82                    | 7.45                    |
|                                | Average, with Delays          | 3.68         | 3.70                    | 3.64                    |
|                                | Weighted Average, Underway    | 6.33         | 6.04                    | 6.44                    |
|                                | Weighted Average, with Delays | 3.01         | 3.27                    | 2.46                    |

Sample Size = 414 trips

TABLE 3

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION

(Miles per Hour)

|   |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|---|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Black Warrior-Tombigbee River System</u> |                               |              |                         |                         |
| Fall (Usage 16%)                            |                               |              |                         |                         |
| Downriver                                   | Average, Underway             | 5.05         | 4.93                    |                         |
|   | Average, with Delays          | 3.72         | 3.71                    |                         |
|   | Weighted Average, Underway    | 5.12         | 5.00                    |                         |
|   | Weighted Average, with Delays | 3.64         | 3.60                    |                         |
| Upriver                                     | Average, Underway             | 5.76         | 5.60                    |                         |
|   | Average, with Delays          | 4.06         | 4.12                    |                         |
|   | Weighted Average, Underway    | 5.67         | 5.55                    |                         |
|   | Weighted Average, with Delays | 3.96         | 4.00                    |                         |
| Total                                       | Average, Underway             | 5.43         | 5.30                    |                         |
|   | Average, with Delays          | 3.90         | 3.93                    |                         |
|   | Weighted Average, Underway    | 5.46         | 5.36                    |                         |
|   | Weighted Average, with Delays | 3.84         | 3.80                    |                         |

SAMPLE SIZE TOO SMALL

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION

(Miles per Hour)

|   |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|---|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Black Warrior-Tombigbee River System</u> |                               |              |                         |                         |
| Spring (Usage 37%)                          |                               |              |                         |                         |
| Downriver                                   | Average, Underway             | 7.52         | 7.79                    |                         |
|   | Average, with Delays          | 6.34         | 6.54                    |                         |
|   | Weighted Average, Underway    | 7.32         | 7.66                    |                         |
|   | Weighted Average, with Delays | 6.19         | 6.53                    |                         |
| Upriver                                     | Average, Underway             | 5.02         | 4.96                    |                         |
|   | Average, with Delays          | 4.27         | 4.24                    |                         |
|   | Weighted Average, Underway    | 4.94         | 4.89                    |                         |
|   | Weighted Average, with Delays | 4.21         | 4.18                    |                         |
| Total                                       | Average, Underway             | 6.17         | 6.25                    |                         |
|   | Average, with Delays          | 5.22         | 5.28                    |                         |
|   | Weighted Average, Underway    | 5.76         | 5.81                    |                         |
|   | Weighted Average, with Delays | 4.90         | 4.93                    |                         |

SAMPLE SIZE TOO SMALL

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION

(Miles per Hour)

|   |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|---|-------------------------------|--------------|-------------------------|-------------------------|
| <b>BLACK WARRIOR-TOMBIGBEE RIVER SYSTEM</b> |                               |              |                         |                         |
| Summer (Usage 43%)                          |                               |              |                         |                         |
| Downriver                                   | Average, Underway             | 6.67         | 6.98                    | SAMPLE SIZE TOO SMALL   |
|   | Average, with Delays          | 5.61         | 5.86                    |                         |
|   | Weighted Average, Underway    | 6.55         | 6.96                    |                         |
|   | Weighted Average, with Delays | 5.46         | 5.76                    |                         |
| Upriver                                     | Average, Underway             | 5.39         | 5.43                    |                         |
|   | Average, with Delays          | 4.63         | 4.67                    |                         |
|   | Weighted Average, Underway    | 5.34         | 5.38                    |                         |
|   | Weighted Average, with Delays | 4.59         | 4.62                    |                         |
| Total                                       | Average, Underway             | 6.17         | 6.17                    |                         |
|   | Average, with Delays          | 5.22         | 5.24                    |                         |
|   | Weighted Average, Underway    | 5.81         | 5.99                    |                         |
|   | Weighted Average, with Delays | 4.94         | 5.07                    |                         |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION

(Miles per Hour)

|   |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|---|-------------------------------|--------------|-------------------------|-------------------------|
| <b>Black Warrior-Tombigbee River System</b> |                               |              |                         |                         |
| <b>Winter (Usage 4%)</b>                    |                               |              |                         |                         |
| Downriver                                   | Average, Underway             | 8.20         | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
|   | Average, with Delays          | 6.67         |                         |                         |
|   | Weighted Average, Underway    | 8.20         |                         |                         |
|   | Weighted Average, with Delays | 6.67         |                         |                         |
| Upriver                                     | Average, Underway             | 5.03         |                         |                         |
|   | Average, with Delays          | 4.18         |                         |                         |
|   | Weighted Average, Underway    | 5.03         |                         |                         |
|   | Weighted Average, with Delays | 4.18         |                         |                         |
| Total                                       | Average, Underway             | 6.61         |                         |                         |
|   | Average, with Delays          | 5.42         |                         |                         |
|   | Weighted Average, Underway    | 6.23         |                         |                         |
|   | Weighted Average, with Delays | 5.14         |                         |                         |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                         |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|-------------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Cumberland River</u> |                               |              |                         |                         |
| Fall                    |                               |              |                         |                         |
| Downriver               | Average, Underway             | 9.66         | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
|                         | Average, with Delays          | 5.82         |                         |                         |
|                         | Weighted Average, Underway    | 9.58         |                         |                         |
|                         | Weighted Average, with Delays | 5.69         |                         |                         |
| Upriver                 | Average, Underway             | 5.86         |                         |                         |
|                         | Average, with Delays          | 5.86         |                         |                         |
|                         | Weighted Average, Underway    | 5.86         |                         |                         |
|                         | Weighted Average, with Delays | 5.86         |                         |                         |
| Total                   | Average, Underway             | 7.76         |                         |                         |
|                         | Average, with Delays          | 5.84         |                         |                         |
|                         | Weighted Average, Underway    | 8.20         |                         |                         |
|                         | Weighted Average, with Delays | 5.73         |                         |                         |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION

(Miles per Hour)

|                         |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|-------------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Cumberland River</u> |                               |              |                         |                         |
| <u>Spring</u>           |                               |              |                         |                         |
| Downriver               | Average, Underway             | 8.51         | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
|                         | Average, with Delays          | 6.84         |                         |                         |
|                         | Weighted Average, Underway    | 8.04         |                         |                         |
|                         | Weighted Average, with Delays | 6.06         |                         |                         |
| Upriver                 | Average, Underway             | 5.45         |                         |                         |
|                         | Average, with Delays          | 4.82         |                         |                         |
|                         | Weighted Average, Underway    | 3.61         |                         |                         |
|                         | Weighted Average, with Delays | 3.30         |                         |                         |
| Total                   | Average, Underway             | 6.76         |                         |                         |
|                         | Average, with Delays          | 5.68         |                         |                         |
|                         | Weighted Average, Underway    | 4.65         |                         |                         |
|                         | Weighted Average, with Delays | 4.05         |                         |                         |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                         |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|-------------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Cumberland River</u> |                               |              |                         |                         |
| Summer                  |                               |              |                         |                         |
| Downriver               | Average, Underway             | 7.89         |                         |                         |
|                         | Average, with Delays          | 6.46         |                         |                         |
|                         | Weighted Average, Underway    | 7.48         | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
|                         | Weighted Average, with Delays | 5.60         |                         |                         |
| Upriver                 | Average, Underway             | 6.51         |                         |                         |
|                         | Average, with Delays          | 4.19         |                         |                         |
|                         | Weighted Average, Underway    | 5.41         |                         |                         |
|                         | Weighted Average, with Delays | 3.70         |                         |                         |
| Total                   | Average, Underway             | 7.25         |                         |                         |
|                         | Average, with Delays          | 5.40         |                         |                         |
|                         | Weighted Average, Underway    | 6.39         |                         |                         |
|                         | Weighted Average, with Delays | 4.56         |                         |                         |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                         |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|-------------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Cumberland River</u> |                               |              |                         |                         |
| Winter                  |                               |              |                         |                         |
| Downriver               | Average, Underway             | 8.05         | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
|                         | Average, with Delays          | 7.57         |                         |                         |
|                         | Weighted Average, Underway    | 8.05         |                         |                         |
|                         | Weighted Average, with Delays | 7.57         |                         |                         |
| Upriver                 | Average, Underway             | 4.81         | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
|                         | Average, with Delays          | 4.61         |                         |                         |
|                         | Weighted Average, Underway    | 4.70         |                         |                         |
|                         | Weighted Average, with Delays | 4.43         |                         |                         |
| Total                   | Average, Underway             | 5.62         | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
|                         | Average, with Delays          | 5.35         |                         |                         |
|                         | Weighted Average, Underway    | 5.23         |                         |                         |
|                         | Weighted Average, with Delays | 4.93         |                         |                         |

TABLE 3 (continued)

AVERAGE SEASONAL TWO SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|   |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|---|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Gulf Intracoastal Waterway - Eastern Portion</u> |                               |              |                         |                         |
| Fall (Usage 36%)                                    |                               |              |                         |                         |
| Total   | Average, Underway             | 6.85         | 6.44                    | 7.31                    |
|   | Average, with Delays          | 5.61         | 6.14                    | 5.02                    |
|   | Weighted Average, Underway    | 6.33         | 6.15                    | 6.68                    |
|   | Weighted Average, with Delays | 5.35         | 5.73                    | 4.76                    |
| Spring (Usage 17%)                                  |                               |              |                         |                         |
| Total   | Average, Underway             | 6.74         | 6.20                    | 7.59                    |
|   | Average, with Delays          | 4.95         | 5.40                    | 4.42                    |
|   | Weighted Average, Underway    | 6.29         | 5.69                    | 8.72                    |
|   | Weighted Average, with Delays | 3.96         | 3.96                    | 3.97                    |
| Summer (Usage 15%)                                  |                               |              |                         |                         |
| Total   | Average, Underway             | 6.83         | 6.74                    | 6.87                    |
|   | Average, with Delays          | 5.56         | 6.10                    | 5.34                    |
|   | Weighted Average, Underway    | 6.07         | 5.59                    | 6.30                    |
|   | Weighted Average, with Delays | 4.36         | 4.56                    | 4.27                    |
| Winter (Usage 32%)                                  |                               |              |                         |                         |
| Total   | Average, Underway             | 5.18         | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
|   | Average, with Delays          | 3.67         |                         |                         |
|   | Weighted Average, Underway    | 5.35         |                         |                         |
|   | Weighted Average, with Delays | 3.48         |                         |                         |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|   |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|---|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Gulf Intracoastal Waterway - Western Portion</u> |                               |              |                         |                         |
| Fall (Usage 24%)                                    |                               |              |                         |                         |
| Total   | Average, Underway             | 8.39         | 7.66                    | 7.67                    |
|   | Average, with Delays          | 6.69         | 6.10                    | 6.25                    |
|   | Weighted Average, Underway    | 7.35         | 6.78                    | 7.03                    |
|   | Weighted Average, with Delays | 6.24         | 5.62                    | 5.95                    |
| Spring (Usage 38%)                                  |                               |              |                         |                         |
| Total   | Average, Underway             | 7.58         | 6.82                    | 8.13                    |
|   | Average, with Delays          | 5.75         | 5.09                    | 6.00                    |
|   | Weighted Average, Underway    | 7.15         | 6.27                    | 6.86                    |
|   | Weighted Average, with Delays | 5.16         | 4.61                    | 5.01                    |
| Summer (Usage 14%)                                  |                               |              |                         |                         |
| Total   | Average, Underway             | 6.52         | 6.39                    | 6.65                    |
|   | Average, with Delays          | 5.82         | 5.47                    | 5.70                    |
|   | Weighted Average, Underway    | 5.95         | 6.41                    | 5.73                    |
|   | Weighted Average, with Delays | 5.05         | 4.91                    | 4.86                    |
| Winter (Usage 24%)                                  |                               |              |                         |                         |
| Total   | Average, Underway             | 5.92         | 4.89                    | 8.16                    |
|   | Average, with Delays          | 4.43         | 4.00                    | 5.19                    |
|   | Weighted Average, Underway    | 6.23         | 4.46                    | 7.99                    |
|   | Weighted Average, with Delays | 4.57         | 3.59                    | 5.15                    |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION

(Miles per Hour)

|                       |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|-----------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Illinois River</u> |                               |              |                         |                         |
| Fall (Usage 41%)      |                               |              |                         |                         |
| Downriver             | Average, Underway             | 5.59         | 5.40                    | 6.41                    |
|                       | Average, with Delays          | 3.45         | 3.09                    | 4.18                    |
|                       | Weighted Average, Underway    | 5.71         | 5.47                    | 6.24                    |
|                       | Weighted Average, with Delays | 3.48         | 3.10                    | 4.08                    |
| Upriver               | Average, Underway             | 5.09         | 4.87                    | 5.71                    |
|                       | Average, with Delays          | 3.01         | 2.39                    | 4.00                    |
|                       | Weighted Average, Underway    | 4.57         | 4.32                    | 5.57                    |
|                       | Weighted Average, with Delays | 2.70         | 2.32                    | 3.50                    |
| Total                 | Average, Underway             | 5.31         | 5.10                    | 5.98                    |
|                       | Average, with Delays          | 3.20         | 2.69                    | 4.07                    |
|                       | Weighted Average, Underway    | 5.04         | 4.73                    | 5.80                    |
|                       | Weighted Average, with Delays | 3.02         | 2.59                    | 3.70                    |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                       |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|-----------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <b>ILLINOIS RIVER</b> |                               |              |                         |                         |
| Spring (usage 20%)    |                               |              |                         |                         |
| Downriver             | Average, Underway             | 5.78         | 4.71                    | 6.97                    |
|                       | Average, with Delays          | 3.51         | 2.32                    | 4.55                    |
|                       | Weighted Average, Underway    | 5.37         | 4.48                    | 6.86                    |
|                       | Weighted Average, with Delays | 3.35         | 2.34                    | 4.47                    |
| Upriver               | Average, Underway             | 4.24         | 4.29                    | 4.20                    |
|                       | Average, with Delays          | 2.80         | 2.30                    | 3.24                    |
|                       | Weighted Average, Underway    | 4.30         | 4.18                    | 4.41                    |
|                       | Weighted Average, with Delays | 2.76         | 2.29                    | 3.17                    |
| Total                 | Average, Underway             | 5.03         | 4.29                    | 5.68                    |
|                       | Average, with Delays          | 3.16         | 2.30                    | 3.91                    |
|                       | Weighted Average, Underway    | 4.76         | 4.18                    | 5.27                    |
|                       | Weighted Average, with Delays | 3.02         | 2.29                    | 3.66                    |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                           |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|---------------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <b>Illinois River</b>     |                               |              |                         |                         |
| <b>Summer (Usage 23%)</b> |                               |              |                         |                         |
| Downriver                 | Average, Underway             | 6.18         | 5.79                    | 7.01                    |
|                           | Average, with Delays          | 3.88         | 3.07                    | 5.59                    |
|                           | Weighted Average, Underway    | 5.81         | 5.36                    | 6.61                    |
|                           | Weighted Average, with Delays | 3.14         | 2.61                    | 4.45                    |
| Upriver                   | Average, Underway             | 5.09         | 4.51                    | 5.84                    |
|                           | Average, with Delays          | 3.37         | 2.36                    | 4.52                    |
|                           | Weighted Average, Underway    | 3.85         | 2.61                    | 5.35                    |
|                           | Weighted Average, with Delays | 2.55         | 1.66                    | 3.68                    |
| Total                     | Average, Underway             | 5.64         | 5.22                    | 6.29                    |
|                           | Average, with Delays          | 3.62         | 2.76                    | 4.94                    |
|                           | Weighted Average, Underway    | 4.60         | 3.79                    | 5.72                    |
|                           | Weighted Average, with Delays | 2.80         | 2.13                    | 3.91                    |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                    |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--------------------|-------------------------------|--------------|-------------------------|-------------------------|
| Illinois River     |                               |              |                         |                         |
| Winter (Usage 16%) |                               |              |                         |                         |
| Downriver          | Average, Underway             | 4.09         | 2.37                    | 5.09                    |
|                    | Average, with Delays          | 2.14         | 1.66                    | 2.43                    |
|                    | Weighted Average, Underway    | 3.51         | 1.92                    | 4.31                    |
|                    | Weighted Average, with Delays | 1.70         | 1.10                    | 1.94                    |
| Upriver            | Average, Underway             | 4.29         | 4.81                    | 4.57                    |
|                    | Average, with Delays          | 2.58         | 2.29                    | 3.33                    |
|                    | Weighted Average, Underway    | 3.45         | 3.33                    | 4.39                    |
|                    | Weighted Average, with Delays | 2.12         | 1.73                    | 2.95                    |
| Total              | Average, Underway             | 4.21         | 3.91                    | 4.78                    |
|                    | Average, with Delays          | 2.39         | 2.05                    | 2.96                    |
|                    | Weighted Average, Underway    | 3.48         | 2.74                    | 4.36                    |
|                    | Weighted Average, with Delays | 1.91         | 1.48                    | 2.45                    |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                                |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--------------------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Lower Mississippi River</u> |                               |              |                         |                         |
| Fall (Usage 27%)               |                               |              |                         |                         |
| Downriver                      | Average, Underway             | 10.80        | 10.69                   | 10.74                   |
|                                | Average, with Delays          | 9.70         | 9.59                    | 9.49                    |
|                                | Weighted Average, Underway    | 10.81        | 10.43                   | 11.07                   |
|                                | Weighted Average, with Delays | 9.40         | 9.04                    | 9.59                    |
| Upriver                        | Average, Underway             | 5.71         | 5.29                    | 6.05                    |
|                                | Average, with Delays          | 5.12         | 4.67                    | 5.48                    |
|                                | Weighted Average, Underway    | 5.66         | 5.31                    | 5.94                    |
|                                | Weighted Average, with Delays | 4.84         | 4.53                    | 5.09                    |
| Total                          | Average, Underway             | 8.23         | 7.57                    | 8.76                    |
|                                | Average, with Delays          | 7.39         | 6.75                    | 7.91                    |
|                                | Weighted Average, Underway    | 7.59         | 6.76                    | 8.26                    |
|                                | Weighted Average, with Delays | 6.54         | 5.80                    | 7.14                    |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                                |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--------------------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <b>Lower Mississippi River</b> |                               |              |                         |                         |
| <b>Spring (Usage 30%)</b>      |                               |              |                         |                         |
| <b>Downriver</b>               | Average, Underway             | 12.62        | 13.17                   | 11.01                   |
|                                | Average, with Delays          | 10.49        | 11.40                   | 8.54                    |
|                                | Weighted Average, Underway    | 12.25        | 11.74                   | 12.35                   |
|                                | Weighted Average, with Delays | 9.85         | 9.48                    | 9.84                    |
| <b>Upriver</b>                 | Average, Underway             | 5.92         | 5.93                    | 5.91                    |
|                                | Average, with Delays          | 5.27         | 5.39                    | 5.13                    |
|                                | Weighted Average, Underway    | 5.27         | 5.25                    | 5.31                    |
|                                | Weighted Average, with Delays | 4.74         | 4.78                    | 4.74                    |
| <b>Total</b>                   | Average, Underway             | 9.27         | 9.61                    | 8.62                    |
|                                | Average, with Delays          | 7.88         | 8.45                    | 6.94                    |
|                                | Weighted Average, Underway    | 7.39         | 7.22                    | 7.55                    |
|                                | Weighted Average, with Delays | 6.41         | 6.29                    | 6.48                    |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                                |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--------------------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <b>Lower Mississippi River</b> |                               |              |                         |                         |
| <b>Summer (Usage 23%)</b>      |                               |              |                         |                         |
| <b>Downriver</b>               | Average, Underway             | 11.37        | 12.12                   | 10.26                   |
|                                | Average, with Delays          | 10.53        | 11.17                   | 9.42                    |
|                                | Weighted Average, Underway    | 11.65        | 12.21                   | 11.06                   |
|                                | Weighted Average, with Delays | 10.57        | 11.03                   | 10.02                   |
| <b>Upriver</b>                 | Average, Underway             | 5.43         | 5.68                    | 5.30                    |
|                                | Average, with Delays          | 5.07         | 5.40                    | 4.84                    |
|                                | Weighted Average, Underway    | 5.49         | 5.63                    | 5.38                    |
|                                | Weighted Average, with Delays | 5.00         | 5.24                    | 4.82                    |
| <b>Total</b>                   | Average, Underway             | 8.55         | 8.96                    | 8.10                    |
|                                | Average, with Delays          | 7.94         | 8.34                    | 7.42                    |
|                                | Weighted Average, Underway    | 7.35         | 7.61                    | 7.14                    |
|                                | Weighted Average, with Delays | 6.69         | 7.02                    | 6.42                    |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                                |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--------------------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Lower Mississippi River</u> |                               |              |                         |                         |
| Winter (Usage 21%)             |                               |              |                         |                         |
| Downriver                      | Average, Underway             | 12.03        | 12.11                   | 11.97                   |
|                                | Average, with Delays          | 9.74         | 9.34                    | 10.06                   |
|                                | Weighted Average, Underway    | 12.19        | 12.22                   | 12.17                   |
|                                | Weighted Average, with Delays | 8.52         | 8.19                    | 8.79                    |
| Upriver                        | Average, Underway             | 5.28         | 5.41                    | 5.13                    |
|                                | Average, with Delays          | 4.79         | 4.95                    | 4.61                    |
|                                | Weighted Average, Underway    | 5.14         | 5.33                    | 4.88                    |
|                                | Weighted Average, with Delays | 4.45         | 4.67                    | 4.17                    |
| Total                          | Average, Underway             | 8.40         | 8.37                    | 7.83                    |
|                                | Average, with Delays          | 7.08         | 6.89                    | 6.98                    |
|                                | Weighted Average, Underway    | 7.17         | 7.24                    | 7.11                    |
|                                | Weighted Average, with Delays | 5.81         | 5.84                    | 5.75                    |

TABLE 3 (continued)

AVERAGE SEASONAL TWO SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                       |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|-----------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Missouri River</u> |                               |              |                         |                         |
| Fall (Usage 41%)      |                               |              |                         |                         |
| Downriver             | Average, Underway             | 8.82         | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
|                       | Average, with Delays          | 5.42         |                         |                         |
|                       | Weighted Average, Underway    | 8.94         |                         |                         |
|                       | Weighted Average, with Delays | 5.54         |                         |                         |
| Upriver               | Average, Underway             | 4.34         |                         |                         |
|                       | Average, with Delays          | 3.91         |                         |                         |
|                       | Weighted Average, Underway    | 4.12         |                         |                         |
|                       | Weighted Average, with Delays | 3.69         |                         |                         |
| Total                 | Average, Underway             | 6.58         |                         |                         |
|                       | Average, with Delays          | 4.66         |                         |                         |
|                       | Weighted Average, Underway    | 5.57         |                         |                         |
|                       | Weighted Average, with Delays | 4.39         |                         |                         |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                       |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|-----------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Missouri River</u> |                               |              |                         |                         |
| Spring (Usage 25%)    |                               |              |                         |                         |
| Downriver             | Average, Underway             | 10.01        | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
|                       | Average, with Delays          | 7.33         |                         |                         |
|                       | Weighted Average, Underway    | 10.64        |                         |                         |
|                       | Weighted Average, with Delays | 5.83         |                         |                         |
| Upriver               | Average, Underway             | 3.90         |                         |                         |
|                       | Average, with Delays          | 3.63         |                         |                         |
|                       | Weighted Average, Underway    | 3.88         |                         |                         |
|                       | Weighted Average, with Delays | 3.55         |                         |                         |
| Total                 | Average, Underway             | 6.93         |                         |                         |
|                       | Average, with Delays          | 5.48         |                         |                         |
|                       | Weighted Average, Underway    | 5.13         |                         |                         |
|                       | Weighted Average, with Delays | 4.18         |                         |                         |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                       |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|-----------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Missouri River</u> |                               |              |                         |                         |
| Summer (Usage 35%)    |                               |              |                         |                         |
| Downriver             | Average, Underway             | 9.60         | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
|                       | Average, with Delays          | 7.40         |                         |                         |
|                       | Weighted Average, Underway    | 9.55         |                         |                         |
|                       | Weighted Average, with Delays | 7.07         |                         |                         |
| Upriver               | Average, Underway             | 3.88         |                         |                         |
|                       | Average, with Delays          | 3.30         |                         |                         |
|                       | Weighted Average, Underway    | 3.99         |                         |                         |
|                       | Weighted Average, with Delays | 3.34         |                         |                         |
| Total                 | Average, Underway             | 6.93         |                         |                         |
|                       | Average, with Delays          | 5.48         |                         |                         |
|                       | Weighted Average, Underway    | 5.61         |                         |                         |
|                       | Weighted Average, with Delays | 4.52         |                         |                         |

Winter (There were no winter observations on the Missouri River)

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                   |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|-------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Ohio River</u> |                               |              |                         |                         |
| Fall (Usage 25%)  |                               |              |                         |                         |
| Downriver         | Average, Underway             | 7.96         | 7.35                    | 8.51                    |
|                   | Average, with Delays          | 3.78         | 3.79                    | 3.77                    |
|                   | Weighted Average, Underway    | 7.25         | 7.01                    | 7.59                    |
|                   | Weighted Average, with Delays | 3.23         | 3.42                    | 3.02                    |
| Upriver           | Average, Underway             | 6.71         | 6.78                    | 6.52                    |
|                   | Average, with Delays          | 3.25         | 3.28                    | 3.17                    |
|                   | Weighted Average, Underway    | 6.30         | 6.15                    | 6.85                    |
|                   | Weighted Average, with Delays | 2.89         | 2.89                    | 2.88                    |
| Total             | Average, Underway             | 7.32         | 6.99                    | 7.84                    |
|                   | Average, with Delays          | 3.51         | 3.47                    | 3.57                    |
|                   | Weighted Average, Underway    | 6.76         | 6.50                    | 7.33                    |
|                   | Weighted Average, with Delays | 3.06         | 3.10                    | 2.97                    |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                    |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Ohio River</u>  |                               |              |                         |                         |
| Spring (Usage 34%) |                               |              |                         |                         |
| Downriver          | Average, Underway             | 9.63         | 9.23                    | 10.92                   |
|                    | Average, with Delays          | 7.49         | 6.84                    | 9.30                    |
|                    | Weighted Average, Underway    | 9.79         | 9.38                    | 12.10                   |
|                    | Weighted Average, with Delays | 7.39         | 6.81                    | 9.92                    |
| Upriver            | Average, Underway             | 6.43         | 6.12                    | 7.39                    |
|                    | Average, with Delays          | 5.20         | 4.95                    | 5.96                    |
|                    | Weighted Average, Underway    | 6.05         | 5.73                    | 7.68                    |
|                    | Weighted Average, with Delays | 4.69         | 4.40                    | 6.22                    |
| Total              | Average, Underway             | 8.06         | 7.62                    | 9.42                    |
|                    | Average, with Delays          | 6.37         | 5.86                    | 7.88                    |
|                    | Weighted Average, Underway    | 7.53         | 7.03                    | 9.90                    |
|                    | Weighted Average, with Delays | 5.77         | 5.29                    | 8.07                    |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                    |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Ohio River</u>  |                               |              |                         |                         |
| Summer (Usage 27%) |                               |              |                         |                         |
| Downriver          | Average, Underway             | 9.38         | 8.80                    | 10.15                   |
|                    | Average, with Delays          | 6.51         | 6.03                    | 7.17                    |
|                    | Weighted Average, Underway    | 9.26         | 8.47                    | 10.26                   |
|                    | Weighted Average, with Delays | 5.95         | 5.42                    | 6.61                    |
| Upriver            | Average, Underway             | 6.48         | 6.92                    | 5.81                    |
|                    | Average, with Delays          | 4.72         | 4.85                    | 4.54                    |
|                    | Weighted Average, Underway    | 6.32         | 6.53                    | 5.95                    |
|                    | Weighted Average, with Delays | 4.43         | 4.59                    | 4.14                    |
| Total              | Average, Underway             | 7.94         | 7.85                    | 8.07                    |
|                    | Average, with Delays          | 5.63         | 5.43                    | 5.91                    |
|                    | Weighted Average, Underway    | 7.59         | 7.30                    | 8.02                    |
|                    | Weighted Average, with Delays | 5.12         | 4.94                    | 5.37                    |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                    |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Ohio River</u>  |                               |              |                         |                         |
| Winter (Usage 14%) |                               |              |                         |                         |
| Downriver          | Average, Underway             | 8.97         | 7.97                    | 9.57                    |
|                    | Average, with Delays          | 6.22         | 4.29                    | 7.39                    |
|                    | Weighted Average, Underway    | 8.98         | 8.35                    | 9.36                    |
|                    | Weighted Average, with Delays | 4.04         | 3.32                    | 4.47                    |
| Upriver            | Average, Underway             | 6.14         | 6.62                    | 5.85                    |
|                    | Average, with Delays          | 4.30         | 3.75                    | 4.63                    |
|                    | Weighted Average, Underway    | 5.77         | 6.20                    | 5.51                    |
|                    | Weighted Average, with Delays | 3.63         | 3.14                    | 3.93                    |
| Total              | Average, Underway             | 7.65         | 6.62                    | 8.27                    |
|                    | Average, with Delays          | 5.32         | 3.75                    | 6.27                    |
|                    | Weighted Average, Underway    | 7.12         | 6.20                    | 7.68                    |
|                    | Weighted Average, with Delays | 3.89         | 3.14                    | 4.34                    |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                        |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|------------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Tennessee River</u> |                               |              |                         |                         |
| Fall                   |                               |              |                         |                         |
| Downriver              | Average, Underway             | 8.14         | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
|                        | Average, with Delays          | 5.56         |                         |                         |
|                        | Weighted Average, Underway    | 6.22         |                         |                         |
|                        | Weighted Average, with Delays | 4.48         |                         |                         |
| Upriver                | Average, Underway             | 5.41         |                         |                         |
|                        | Average, with Delays          | 3.63         |                         |                         |
|                        | Weighted Average, Underway    | 5.70         |                         |                         |
|                        | Weighted Average, with Delays | 3.51         |                         |                         |
| Total                  | Average, Underway             | 7.09         |                         |                         |
|                        | Average, with Delays          | 4.81         |                         |                         |
|                        | Weighted Average, Underway    | 6.03         |                         |                         |
|                        | Weighted Average, with Delays | 4.14         |                         |                         |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                        |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|------------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Tennessee River</u> |                               |              |                         |                         |
| Spring                 |                               |              |                         |                         |
| Downriver              | Average, Underway             | 10.04        | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
|                        | Average, with Delays          | 5.49         |                         |                         |
|                        | Weighted Average, Underway    | 8.65         |                         |                         |
|                        | Weighted Average, with Delays | 5.61         |                         |                         |
| Upriver                | Average, Underway             | 7.56         |                         |                         |
|                        | Average, with Delays          | 4.86         |                         |                         |
|                        | Weighted Average, Underway    | 8.00         |                         |                         |
|                        | Weighted Average, with Delays | 5.21         |                         |                         |
| Total                  | Average, Underway             | 8.74         |                         |                         |
|                        | Average, with Delays          | 5.16         |                         |                         |
|                        | Weighted Average, Underway    | 8.25         |                         |                         |
|                        | Weighted Average, with Delays | 5.37         |                         |                         |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                        |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|------------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Tennessee River</u> |                               |              |                         |                         |
| Summer                 |                               |              |                         |                         |
| Downriver              | Average, Underway             | 7.87         | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
|                        | Average, with Delays          | 5.04         |                         |                         |
|                        | Weighted Average, Underway    | 7.87         |                         |                         |
|                        | Weighted Average, with Delays | 5.29         |                         |                         |
| Upriver                | Average, Underway             | 5.39         | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
|                        | Average, with Delays          | 2.61         |                         |                         |
|                        | Weighted Average, Underway    | 5.49         |                         |                         |
|                        | Weighted Average, with Delays | 3.08         |                         |                         |
| Total                  | Average, Underway             | 6.74         | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
|                        | Average, with Delays          | 3.94         |                         |                         |
|                        | Weighted Average, Underway    | 6.95         |                         |                         |
|                        | Weighted Average, with Delays | 4.34         |                         |                         |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                        |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|------------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Tennessee River</u> |                               |              |                         |                         |
| Winter                 |                               |              |                         |                         |
| Downriver              | Average, Underway             | 9.83         | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
|                        | Average, with Delays          | 5.49         |                         |                         |
|                        | Weighted Average, Underway    | 9.27         |                         |                         |
|                        | Weighted Average, with Delays | 5.27         |                         |                         |
| Upriver                | Average, Underway             | 5.95         |                         |                         |
|                        | Average, with Delays          | 3.83         |                         |                         |
|                        | Weighted Average, Underway    | 6.27         |                         |                         |
|                        | Weighted Average, with Delays | 4.08         |                         |                         |
| Total                  | Average, Underway             | 7.89         |                         |                         |
|                        | Average, with Delays          | 4.66         |                         |                         |
|                        | Weighted Average, Underway    | 7.58         |                         |                         |
|                        | Weighted Average, with Delays | 4.64         |                         |                         |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                                |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--------------------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Upper Mississippi River</u> |                               |              |                         |                         |
| Fall (Usage 32%)               |                               |              |                         |                         |
| Downriver                      | Average, Underway             | 7.95         | 7.64                    | 8.34                    |
|                                | Average, with Delays          | 4.37         | 4.23                    | 4.53                    |
|                                | Weighted Average, Underway    | 7.76         | 7.62                    | 8.09                    |
|                                | Weighted Average, with Delays | 4.24         | 4.20                    | 4.31                    |
| Upriver                        | Average, Underway             | 6.61         | 6.74                    | 6.38                    |
|                                | Average, with Delays          | 3.94         | 4.08                    | 3.69                    |
|                                | Weighted Average, Underway    | 5.97         | 5.92                    | 5.17                    |
|                                | Weighted Average, with Delays | 3.48         | 3.49                    | 3.42                    |
| Total                          | Average, Underway             | 7.26         | 7.14                    | 7.42                    |
|                                | Average, with Delays          | 4.14         | 4.15                    | 4.13                    |
|                                | Weighted Average, Underway    | 6.68         | 6.62                    | 6.88                    |
|                                | Weighted Average, with Delays | 3.84         | 3.80                    | 3.99                    |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                                |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--------------------------------|-------------------------------|--------------|-------------------------|-------------------------|
| <u>Upper Mississippi River</u> |                               |              |                         |                         |
| Spring (Usage 27%)             |                               |              |                         |                         |
| Downriver                      | Average, Underway             | 7.95         | 7.64                    | 8.34                    |
|                                | Average, with Delays          | 4.37         | 4.23                    | 4.53                    |
|                                | Weighted Average, Underway    | 7.76         | 7.62                    | 8.09                    |
|                                | Weighted Average, with Delays | 4.24         | 4.20                    | 4.31                    |
| Upriver                        | Average, Underway             | 6.61         | 6.74                    | 6.38                    |
|                                | Average, with Delays          | 3.94         | 4.08                    | 3.69                    |
|                                | Weighted Average, Underway    | 5.97         | 4.92                    | 5.17                    |
|                                | Weighted Average, with Delays | 3.48         | 3.49                    | 3.42                    |
| Total                          | Average, Underway             | 7.26         | 7.14                    | 7.42                    |
|                                | Average, with Delays          | 4.14         | 4.15                    | 4.13                    |
|                                | Weighted Average, Underway    | 6.68         | 6.62                    | 6.88                    |
|                                | Weighted Average, with Delays | 3.84         | 3.80                    | 3.99                    |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                         |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|-------------------------|-------------------------------|--------------|-------------------------|-------------------------|
| Upper Mississippi River |                               |              |                         |                         |
| Summer (Usage 37%)      |                               |              |                         |                         |
| Downriver               | Average, Underway             | 9.00         | 8.33                    | 10.08                   |
|                         | Average, with Delays          | 4.73         | 3.84                    | 6.19                    |
|                         | Weighted Average, Underway    | 8.22         | 8.07                    | 8.81                    |
|                         | Weighted Average, with Delays | 3.78         | 3.68                    | 4.18                    |
| Upriver                 | Average, Underway             | 5.83         | 6.04                    | 5.33                    |
|                         | Average, with Delays          | 3.30         | 3.41                    | 3.03                    |
|                         | Weighted Average, Underway    | 5.60         | 5.73                    | 5.04                    |
|                         | Weighted Average, with Delays | 3.11         | 3.14                    | 2.95                    |
| Total                   | Average, Underway             | 7.30         | 7.04                    | 7.82                    |
|                         | Average, with Delays          | 3.96         | 3.60                    | 4.68                    |
|                         | Weighted Average, Underway    | 6.59         | 6.59                    | 6.61                    |
|                         | Weighted Average, with Delays | 3.40         | 3.37                    | 3.53                    |

TABLE 3 (continued)

AVERAGE SEASONAL TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|                         |                               | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|-------------------------|-------------------------------|--------------|-------------------------|-------------------------|
| Upper Mississippi River |                               |              |                         |                         |
| Winter (Usage 4%)       |                               |              |                         |                         |
| Downriver               | Average, Underway             | 6.32         | 5.62                    | 6.25                    |
|                         | Average, with Delays          | 2.05         | 2.17                    | 2.07                    |
|                         | Weighted Average, Underway    | 4.36         | 3.89                    | 7.63                    |
|                         | Weighted Average, with Delays | 0.94         | 1.03                    | 0.88                    |
| Upriver                 | Average, Underway             | 5.39         | 5.42                    | 5.38                    |
|                         | Average, with Delays          | 2.14         | 3.82                    | 1.45                    |
|                         | Weighted Average, Underway    | 4.22         | 5.05                    | 3.85                    |
|                         | Weighted Average, with Delays | 1.29         | 2.18                    | 1.04                    |
| Total                   | Average, Underway             | 5.91         | 5.57                    | 5.76                    |
|                         | Average, with Delays          | 2.09         | 2.60                    | 1.72                    |
|                         | Weighted Average, Underway    | 4.31         | 4.18                    | 5.13                    |
|                         | Weighted Average, with Delays | 1.06         | 1.22                    | 0.95                    |

TABLE 4  
STANDARD DEVIATIONS OF TOW SPEEDS  
(miles per hour)

| <u>WATERWAY</u>                         | <u>UNDERWAY</u> |             | <u>WITH DELAY</u> |             |
|---|-----------------|-------------|-------------------|-------------|
|   | <u>UP</u>       | <u>DOWN</u> | <u>UP</u>         | <u>DOWN</u> |
| ARKANSAS RIVER                          | 4.54            | 1.83        | 1.75              | 0.84        |
| BLACK WARRIOR-TOMBIGBEE                 | 0.78            | 1.60        | 0.66              | 1.47        |
| CUMBERLAND RIVER                        | 2.75            | 1.41        | 2.09              | 1.72        |
| GULF INTRACOASTAL WATERWAY <sup>c</sup> |                 |             |                   |             |
| EASTERN PORTION                         | 2.29            |             | 2.56              |             |
| WESTERN PORTION                         | 3.28            |             | 2.55              |             |
| ILLINOIS RIVER                          | 2.56            | 1.95        | 1.42              | 1.68        |
| LOWER MISSISSIPPI RIVER                 | 2.28            | 3.16        | 2.23              | 3.21        |
| MISSOURI RIVER                          | 0.77            | 1.59        | 0.83              | 2.63        |
| OHIO RIVER                              | 2.34            | 2.82        | 2.06              | 2.92        |
| PORT ALLEN ROUTE                        | 1.73            |             | 1.66              |             |
| TENNESSEE RIVER                         | 1.98            | 3.37        | 1.56              | 2.32        |
| UPPER MISSISSIPPI RIVER                 | 2.71            | 3.39        | 1.59              | 3.02        |

TABLE 5

MEDIAN TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|   |             | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|---|-------------|--------------|-------------------------|-------------------------|
| <u>Arkansas River</u>                       |             |              |                         |                         |
| Downriver                                   | Underway    | 5.93         |                         |                         |
|   | With Delays | 4.38         |                         |                         |
| Upriver                                     | Underway    | 6.62         | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
|   | With Delays | 5.56         |                         |                         |
| Total                                       | Underway    | 6.17         |                         |                         |
|   | With Delays | 4.98         |                         |                         |
| <u>Black Warrior-Tombigbee River System</u> |             |              |                         |                         |
| Downriver                                   | Underway    | 6.98         | 7.14                    | 4.93                    |
|   | With Delays | 5.87         | 6.04                    | 4.10                    |
| Upriver                                     | Underway    | 5.40         | 5.39                    | 5.69                    |
|   | With Delays | 4.52         | 4.54                    | 4.41                    |
| Total                                       | Underway    | 5.76         | 5.82                    | 4.99                    |
|   | With Delays | 4.79         | 4.91                    | 4.30                    |

TABLE 5 (continued)

MEDIAN TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION  
(Miles per Hour)

|   |             | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|---|-------------|--------------|-------------------------|-------------------------|
| <u>Cumberland River</u>                             |             |              |                         |                         |
| Downriver   | Underway    | 8.39         | 7.60                    | 8.42                    |
|   | With Delays | 6.67         | 6.80                    | 6.80                    |
| Upriver   | Underway    | 5.44         | 4.31                    | 5.54                    |
|   | With Delays | 4.61         | 3.95                    | 5.05                    |
| Total   | Underway    | 6.74         | 6.85                    | 6.53                    |
|   | With Delays | 5.57         | 6.03                    | 5.56                    |
| <u>Gulf Intracoastal Waterway - Eastern Portion</u> |             |              |                         |                         |
|   | Underway    | 6.21         | 5.52                    | 6.70                    |
|   | With Delays | 4.49         | 4.50                    | 4.46                    |
| <u>Gulf Intracoastal Waterway - Western Portion</u> |             |              |                         |                         |
|   | Underway    | 6.73         | 6.29                    | 7.47                    |
|   | With Delays | 5.26         | 4.85                    | 5.27                    |

TABLE 5 (continued)

MEDIAN TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION

(Miles per Hour)

|                                |             | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--------------------------------|-------------|--------------|-------------------------|-------------------------|
| <u>Illinois River</u>          |             |              |                         |                         |
| Downriver                      | Underway    | 5.58         | 5.32                    | 6.30                    |
|                                | With Delays | 3.23         | 2.34                    | 3.74                    |
| Upriver                        | Underway    | 4.19         | 3.87                    | 4.99                    |
|                                | With Delays | 2.59         | 2.24                    | 3.58                    |
| Total                          | Underway    | 4.87         | 4.18                    | 5.52                    |
|                                | With Delays | 2.76         | 2.25                    | 3.67                    |
| <u>Lower Mississippi River</u> |             |              |                         |                         |
| Downriver                      | Underway    | 11.87        | 12.35                   | 10.86                   |
|                                | With Delays | 10.43        | 10.68                   | 9.71                    |
| Upriver                        | Underway    | 5.50         | 5.60                    | 5.12                    |
|                                | With Delays | 4.70         | 5.11                    | 4.60                    |
| Total                          | Underway    | 7.05         | 6.54                    | 7.55                    |
|                                | With Delays | 6.18         | 6.14                    | 6.18                    |

TABLE 5 (continued)

MEDIAN TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION

(Miles per Hour)

|                       |             | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|-----------------------|-------------|--------------|-------------------------|-------------------------|
| <u>Missouri River</u> |             |              |                         |                         |
| Downriver             | Underway    | 9.68         | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
|                       | With Delays | 6.49         |                         |                         |
| Upriver               | Underway    | 3.89         |                         |                         |
|                       | With Delays | 3.54         |                         |                         |
| Total                 | Underway    | 5.78         |                         |                         |
|                       | With Delays | 4.29         |                         |                         |
| <u>Ohio River</u>     |             |              |                         |                         |
| Downriver             | Underway    | 8.97         | 12.08                   | 10.03                   |
|                       | With Delays | 5.91         | 8.42                    | 6.52                    |
| Upriver               | Underway    | 6.38         | 6.14                    | 6.84                    |
|                       | With Delays | 5.63         | 4.17                    | 5.76                    |
| Total                 | Underway    | 7.48         | 7.26                    | 8.11                    |
|                       | With Delays | 4.93         | 4.65                    | 5.76                    |

TABLE 5 (continued)

MEDIAN TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION

(Miles per Hour)

|                         |             | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|-------------------------|-------------|--------------|-------------------------|-------------------------|
| <u>Port Allen Route</u> |             |              |                         |                         |
| Downriver               | Underway    | 6.50         |                         |                         |
|                         | With Delays | 4.48         |                         |                         |
| Upriver                 | Underway    | 5.45         |                         |                         |
|                         | With Delays | 4.64         |                         |                         |
| Total                   | Underway    | 6.45         | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
|                         | With Delays | 4.56         |                         |                         |
| <u>Tennessee River</u>  |             |              |                         |                         |
| Downriver               | Underway    | 7.99         |                         |                         |
|                         | With Delays | 5.15         |                         |                         |
| Upriver                 | Underway    | 5.92         |                         |                         |
|                         | With Delays | 3.89         |                         |                         |
| Total                   | Underway    | 7.09         |                         |                         |
|                         | With Delays | 4.74         |                         |                         |

TABLE 5 (continued)

MEDIAN TOW SPEEDS BY WATERWAY, TYPE AND DIRECTION

(Miles per Hour)

|                                |             | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--------------------------------|-------------|--------------|-------------------------|-------------------------|
| <u>Upper Mississippi River</u> |             |              |                         |                         |
| Downriver                      | Underway    | 8.49         | 7.89                    | 9.31                    |
|                                | With Delays | 3.81         | 3.84                    | 6.84                    |
| Upriver                        | Underway    | 5.72         | 5.92                    | 5.29                    |
|                                | With Delays | 3.31         | 3.56                    | 2.38                    |
| Total                          | Underway    | 6.65         | 6.65                    | 6.55                    |
|                                | With Delays | 3.48         | 3.64                    | 2.74                    |

TABLE 6

## AVERAGE NUMBER OF BARGES PER TOW

|   | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|---|--------------|-------------------------|-------------------------|
| <u>Allegheny River</u>                      |              |                         |                         |
| Downriver                                   | 8.31         | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
| Upriver                                     | 9.92         |                         |                         |
| Total                                       | 9.14         |                         |                         |
| <u>Arkansas River</u>                       |              |                         |                         |
| Downriver                                   | 3.78         | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
| Upriver                                     | 3.56         |                         |                         |
| Total                                       | 3.60         |                         |                         |
| <u>Black Warrior-Tombigbee River System</u> |              |                         |                         |
| Downriver                                   | 4.31         | 4.07                    | 6.00                    |
| Upriver                                     | 4.27         | 4.00                    | 6.00                    |
| Total                                       | 4.29         | 4.03                    | 6.00                    |
| <u>Cumberland River</u>                     |              |                         |                         |
| Downriver                                   | 9.06         | 7.75                    | 8.93                    |
| Upriver                                     | 8.75         | 7.00                    | 9.06                    |
| Total                                       | 8.89         | 7.43                    | 9.00                    |

TABLE 6 (continued)

AVERAGE NUMBER OF BARGES PER TOW

|   | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|---|--------------|-------------------------|-------------------------|
| <u>Gulf Intracoastal Waterway - Eastern Portion</u><br>(New Orleans to Pensacola)   | 2.84         | 2.19                    | 3.70                    |
| <u>Gulf Intracoastal Waterway - Western Portion</u><br>(Houston to New Orleans)   | 2.99         | 2.53                    | 3.90                    |
| <u>Illinois River</u>   |              |                         |                         |
| Downriver   | 10.71        | 11.09                   | 10.29                   |
| Upriver   | 11.03        | 11.30                   | 9.77                    |
| Total   | 10.88        | 11.20                   | 9.99                    |
| <u>Illinois Waterway System North of Lockport, IL</u><br>(including Calumet-Saginaw, Chicago Sanitary and Ship Canal and Chicago River) |              |                         |                         |
| Downriver   | 8.31         | SAMPLE SIZE TOO SMALL   |                         |
| Upriver   | 9.92         |                         |                         |
| Total   | 9.14         |                         |                         |

TABLE 6 (continued)

## AVERAGE NUMBER OF BARGES PER TOW

|  | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--|--------------|-------------------------|-------------------------|
| <u>Lower Mississippi River</u>         |              |                         |                         |
| Downriver                              | 10.15        | 10.08                   | 9.12                    |
| Upriver                                | 11.48        | 10.37                   | 12.50                   |
| Total                                  | 10.82        | 10.23                   | 10.56                   |
| <u>Missouri River</u>                  |              |                         |                         |
| Downriver                              | 4.67         | SAMPLE SIZE TOO SMALL   |                         |
| Upriver                                | 4.88         |                         |                         |
| Total                                  | 4.77         |                         |                         |
| <u>Monongahela River</u>               |              |                         |                         |
| Downriver                              | 12.25        | SAMPLE SIZE TOO SMALL   |                         |
| Upriver                                | 11.32        |                         |                         |
| Total                                  | 11.80        |                         |                         |
| <u>Morgan City to Port Allen Route</u> |              |                         |                         |
| Downriver                              | 4.18         | SAMPLE SIZE TOO SMALL   |                         |
| Upriver                                | 4.00         |                         |                         |
| Total                                  | 4.17         |                         |                         |

TABLE 6 (continued)

## AVERAGE NUMBER OF BARGES PER TOW

|                                | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--------------------------------|--------------|-------------------------|-------------------------|
| <u>Ohio River</u>              |              |                         |                         |
| Downriver                      | 9.90         | 11.52                   | 7.78                    |
| Upriver                        | 11.07        | 12.04                   | 9.06                    |
| Total                          | 10.48        | 11.80                   | 8.29                    |
| <u>Tennessee River</u>         |              |                         |                         |
| Downriver                      | 9.64         | 12.67                   | 9.36                    |
| Upriver                        | 11.84        | 10.33                   | 12.19                   |
| Total                          | 11.90        | 11.11                   | 10.61                   |
| <u>Upper Mississippi River</u> |              |                         |                         |
| Downriver                      | 10.93        | 10.30                   | 11.32                   |
| Upriver                        | 11.62        | 11.16                   | 12.20                   |
| Total                          | 11.28        | 10.69                   | 11.75                   |

TABLE 7

AVERAGE NUMBER OF BARGES PER TOW  
(by seasons of the year)

|   | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|---|--------------|-------------------------|-------------------------|
| <u>Black Warrior-Tombigbee River System</u> |              |                         |                         |
| Fall (Usage 16%)                            |              |                         |                         |
| Downriver                                   | 3.38         | 3.40                    |                         |
| Upriver                                     | 4.00         | 3.67                    |                         |
| Total                                       | 3.92         | 3.55                    |                         |
| Spring (Usage 37%)                          |              |                         |                         |
| Downriver                                   | 4.18         | 4.00                    |                         |
| Upriver                                     | 4.31         | 4.17                    |                         |
| Total                                       | 4.25         | 4.09                    |                         |
| Summer (Usage 43%)                          |              |                         |                         |
| Downriver                                   | 4.64         | 4.42                    |                         |
| Upriver                                     | 4.44         | 4.08                    |                         |
| Total                                       | 4.25         | 4.24                    |                         |
| Winter (Usage 4%)                           |              |                         |                         |
| Downriver                                   | 4.00         | SAMPLE SIZE TOO SMALL   |                         |
| Upriver                                     | 3.00         |                         |                         |
| Total                                       | 3.50         |                         |                         |

SAMPLE SIZE TOO SMALL

TABLE 7 (continued)

AVERAGE NUMBER OF BARGES PER TOW  
(by seasons of the year)

|                         | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|-------------------------|--------------|-------------------------|-------------------------|
| <u>Cumberland River</u> |              |                         |                         |
| Fall                    |              |                         |                         |
| Downriver               | 2.50         |                         |                         |
| Upriver                 | 10.50        |                         |                         |
| Total                   | 6.50         |                         |                         |
| Spring                  |              |                         |                         |
| Downriver               | 7.33         |                         |                         |
| Upriver                 | 6.25         |                         |                         |
| Total                   | 6.71         |                         |                         |
| Summer                  |              |                         |                         |
| Downriver               | 11.88        |                         |                         |
| Upriver                 | 10.86        |                         |                         |
| Total                   | 11.40        |                         |                         |
| Winter                  |              |                         |                         |
| Downriver               | 10.00        |                         |                         |
| Upriver                 | 9.33         |                         |                         |
| Total                   | 9.50         |                         |                         |

SAMPLE SIZE TOO SMALL

SAMPLE SIZE TOO SMALL

TABLE 7 (continued)

AVERAGE NUMBER OF BARGES PER TOW  
 \* (by seasons of the year)

|   | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|---|--------------|-------------------------|-------------------------|
| <u>Gulf Intracoastal Waterway - Eastern Portion</u> |              |                         |                         |
| Fall (Usage 36%)                                    |              |                         |                         |
| Total   | 2.94         | 2.00                    | 4.00                    |
| Spring (Usage 17%)                                  |              |                         |                         |
| Total   | 3.33         | 2.00                    | 4.86                    |
| Summer (Usage 15%)                                  |              |                         |                         |
| Total   | 3.06         | 3.60                    | 2.83                    |
| Winter (Usage 32%)                                  |              |                         |                         |
| Total   | 1.93         | SAMPLE SIZE TOO SMALL   |                         |
| <u>Gulf Intracoastal Waterway - Western Portion</u> |              |                         |                         |
| Fall (Usage 24%)                                    |              |                         |                         |
| Total   | 3.07         | 2.57                    | 3.83                    |
| Spring (Usage 38%)                                  |              |                         |                         |
| Total   | 3.04         | 2.63                    | 4.33                    |
| Summer (Usage 14%)                                  |              |                         |                         |
| Total   | 2.54         | 2.09                    | 3.33                    |
| Winter (Usage 24%)                                  |              |                         |                         |
| Total   | 3.08         | 2.59                    | 3.88                    |

TABLE 7 (continued)

AVERAGE NUMBER OF BARGES PER TOW  
(by seasons of the year)

|                       | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|-----------------------|--------------|-------------------------|-------------------------|
| <u>Illinois River</u> |              |                         |                         |
| Fall (Usage 41%)      |              |                         |                         |
| Downriver             | 10.76        | 11.80                   | 9.20                    |
| Upriver               | 11.35        | 11.55                   | 10.25                   |
| Total                 | 11.09        | 11.66                   | 9.85                    |
| Spring (Usage 20%)    |              |                         |                         |
| Downriver             | 11.40        | 12.50                   | 12.33                   |
| Upriver               | 12.68        | 11.39                   | 10.92                   |
| Total                 | 12.02        | 11.39                   | 11.63                   |
| Summer (Usage 23%)    |              |                         |                         |
| Downriver             | 13.59        | 13.80                   | 13.14                   |
| Upriver               | 12.04        | 12.84                   | 11.00                   |
| Total                 | 12.82        | 13.37                   | 11.83                   |
| Winter (Usage 16%)    |              |                         |                         |
| Downriver             | 6.58         | 5.00                    | 7.50                    |
| Upriver               | 8.58         | 8.33                    | 7.71                    |
| Total                 | 7.73         | 7.10                    | 7.62                    |

TABLE 7 (continued)

AVERAGE NUMBER OF BARGES PER TOW  
(by seasons of the year)

|                                | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--------------------------------|--------------|-------------------------|-------------------------|
| <u>Lower Mississippi River</u> |              |                         |                         |
| Fall (Usage 27%)               |              |                         |                         |
| Downriver                      | 11.43        | 10.82                   | 11.00                   |
| Upriver                        | 11.68        | 10.27                   | 13.27                   |
| Total                          | 11.56        | 10.50                   | 11.94                   |
| Spring (Usage 30%)             |              |                         |                         |
| Downriver                      | 11.98        | 12.00                   | 10.89                   |
| Upriver                        | 12.29        | 12.78                   | 11.75                   |
| Total                          | 12.14        | 12.38                   | 11.29                   |
| Summer (Usage 23%)             |              |                         |                         |
| Downriver                      | 8.34         | 6.77                    | 9.00                    |
| Upriver                        | 8.34         | 7.72                    | 14.79                   |
| Total                          | 9.78         | 7.24                    | 11.53                   |
| Winter (Usage 21%)             |              |                         |                         |
| Downriver                      | 8.22         | 11.13                   | 5.14                    |
| Upriver                        | 10.17        | 10.89                   | 9.35                    |
| Total                          | 9.27         | 11.00                   | 7.02                    |

TABLE 7 (continued)

AVERAGE NUMBER OF BARGES PER TOW  
(by seasons of the year)

|  | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--|--------------|-------------------------|-------------------------|
| <u>Missouri River</u>  |              |                         |                         |
| Fall (Usage 41%)   |              |                         |                         |
| Downriver  | 5.60         |                         |                         |
| Upriver  | 5.40         |                         |                         |
| Total  | 5.50         |                         |                         |
| Spring (Usage 25%)   |              |                         |                         |
| Downriver  | 2.00         | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
| Upriver  | 4.25         |                         |                         |
| Total  | 3.50         |                         |                         |
| Summer (Usage 35%)   |              |                         |                         |
| Downriver  | 4.75         |                         |                         |
| Upriver  | 4.86         |                         |                         |
| Total  | 4.80         |                         |                         |
| Winter (There were no winter observations on the Missouri River) |              |                         |                         |

TABLE 7 (continued)

AVERAGE NUMBER OF BARGES PER TOW  
(by season of the year)

|                    | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--------------------|--------------|-------------------------|-------------------------|
| <u>Ohio River</u>  |              |                         |                         |
| Fall (Usage 25%)   |              |                         |                         |
| Downriver          | 10.55        | 12.92                   | 8.43                    |
| Upriver            | 11.20        | 11.63                   | 9.93                    |
| Total              | 10.88        | 12.12                   | 8.93                    |
| Spring (Usage 34%) |              |                         |                         |
| Downriver          | 11.69        | 13.25                   | 10.92                   |
| Upriver            | 11.82        | 12.28                   | 10.43                   |
| Total              | 11.76        | 12.75                   | 9.27                    |
| Summer (Usage 27%) |              |                         |                         |
| Downriver          | 8.66         | 9.47                    | 7.56                    |
| Upriver            | 10.64        | 12.43                   | 7.91                    |
| Total              | 9.64         | 10.97                   | 7.73                    |
| Winter (Usage 14%) |              |                         |                         |
| Downriver          | 7.81         | 9.61                    | 5.57                    |
| Upriver            | 10.18        | 10.63                   | 7.82                    |
| Total              | 8.92         | 10.63                   | 6.56                    |

TABLE 7 (continued)

AVERAGE NUMBER OF BARGES PER TOW  
(by season of the year)

|                        | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|------------------------|--------------|-------------------------|-------------------------|
| <u>Tennessee River</u> |              |                         |                         |
| Fall                   |              |                         |                         |
| Downriver              | 8.12         |                         |                         |
| Upriver                | 11.60        |                         |                         |
| Total                  | 9.46         |                         |                         |
| Spring                 |              |                         |                         |
| Downriver              | 10.44        |                         |                         |
| Upriver                | 11.80        | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
| Total                  | 11.16        |                         |                         |
| Summer                 |              |                         |                         |
| Downriver              | 10.08        |                         |                         |
| Upriver                | 12.70        |                         |                         |
| Total                  | 11.27        |                         |                         |
| Winter                 |              |                         |                         |
| Downriver              | 9.57         |                         |                         |
| Upriver                | 10.86        |                         |                         |
| Total                  | 10.21        |                         |                         |

TABLE 7 (continued)

AVERAGE NUMBER OF BARGES PER TOW  
(by season of the year)

|                                | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--------------------------------|--------------|-------------------------|-------------------------|
| <u>Upper Mississippi River</u> |              |                         |                         |
| Fall (Usage 32%)               |              |                         |                         |
| Downriver                      | 12.57        | 12.32                   | 12.88                   |
| Upriver                        | 11.57        | 9.87                    | 14.50                   |
| Total                          | 12.05        | 10.97                   | 13.64                   |
| Spring (Usage 27%)             |              |                         |                         |
| Downriver                      | 10.71        | 9.61                    | 12.32                   |
| Upriver                        | 11.51        | 11.50                   | 11.52                   |
| Total                          | 11.13        | 10.62                   | 11.93                   |
| Summer (Usage 37%)             |              |                         |                         |
| Downriver                      | 11.22        | 10.64                   | 12.18                   |
| Upriver                        | 12.46        | 11.81                   | 14.00                   |
| Total                          | 11.89        | 11.30                   | 13.05                   |
| Winter (Usage 4%)              |              |                         |                         |
| Downriver                      | 8.48         | 8.76                    | 7.65                    |
| Upriver                        | 10.10        | 12.67                   | 9.04                    |
| Total                          | 9.18         | 9.79                    | 8.44                    |

TABLE 7  
PERCENT BACKHAUL EMPTY

|   | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|---|--------------|-------------------------|-------------------------|
| <u>Allegheny River</u>                      |              |                         |                         |
| Downriver                                   | 92           |                         |                         |
| Upriver                                     | 90           |                         |                         |
| Total                                       | 91           |                         |                         |
| <u>Arkansas River</u>                       |              |                         |                         |
| Downriver                                   | 67           |                         |                         |
| Upriver                                     | 100          |                         |                         |
| Total                                       | 89           | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
| <u>Black Warrior-Tombigbee River System</u> |              |                         |                         |
| Downriver                                   | 55           | 67                      | 0                       |
| Upriver                                     | 43           | 6                       | 100                     |
| Total                                       | 49           | 35                      | 100                     |
| <u>Cumberland River</u>                     |              |                         |                         |
| Downriver                                   | 100          | 100                     | 100                     |
| Upriver                                     | 17           | 10                      | 18                      |
| Total                                       | 89           | 100                     | 87                      |

TABLE 7 (continued)

## PERCENT BACKHAUL EMPTY

|   | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|---|--------------|-------------------------|-------------------------|
| <u>Gulf Intracoastal Waterway - Eastern Portion</u><br>(New Orleans to Pensacola)   | 100          | 100                     | 98                      |
| <u>Gulf Intracoastal Waterway - Western Portion</u><br>(Houston to New Orleans)   | 100          | 87                      | 100                     |
| <u>Illinois River</u>   |              |                         |                         |
| Downriver   | 87           | 100                     | 29                      |
| Upriver   | 53           | 35                      | 71                      |
| Total   | 69           | 81                      | 53                      |
| <u>Illinois Waterway System North of Lockport, IL</u><br>(including Calumet-Saginaw, Chicago Sanitary and Ship Canal and Chicago River) |              |                         |                         |
| Downriver   | 100          | SAMPLE SIZE TOO SMALL   |                         |
| Upriver   | 28           |                         |                         |
| Total   | 68           |                         |                         |

TABLE 7 (continued)

PERCENT BACKHAUL EMPTY

|  | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--|--------------|-------------------------|-------------------------|
| <u>Lower Mississippi River</u>         |              |                         |                         |
| Downriver                              | 66           | 75                      | 66                      |
| Upriver                                | 73           | 54                      | 94                      |
| Total                                  | 70           | 64                      | 80                      |
| <u>Missouri River</u>                  |              |                         |                         |
| Downriver                              | 23           |                         |                         |
| Upriver                                | 72           |                         |                         |
| Total                                  | 49           |                         |                         |
| <u>Monongahela River</u>               |              |                         |                         |
| Downriver                              | 100          | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
| Upriver                                | 18           |                         |                         |
| Total                                  | 77           |                         |                         |
| <u>Morgan City to Port Allen Route</u> |              |                         |                         |
| Downriver                              | 100          |                         |                         |
| Upriver                                | 100          |                         |                         |
| Total                                  | 100          |                         |                         |

TABLE 7 (continued)

## PERCENT BACKHAUL EMPTY

|                                | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--------------------------------|--------------|-------------------------|-------------------------|
| <u>Ohio River</u>              |              |                         |                         |
| Downriver                      | 82           | 77                      | 93                      |
| Upriver                        | 69           | 66                      | 72                      |
| Total                          | 75           | 71                      | 83                      |
| <u>Tennessee River</u>         |              |                         |                         |
| Downriver                      | 100          | 100                     | 100                     |
| Upriver                        | 23           | 32                      | 21                      |
| Total                          | 81           | 67                      | 84                      |
| <u>Upper Mississippi River</u> |              |                         |                         |
| Downriver                      | 28           | 18                      | 41                      |
| Upriver                        | 100          | 84                      | 100                     |
| Total                          | 65           | 49                      | 72                      |

TABLE 8

## PERCENT BACKHAUL EMPTY BY SEASON

|   | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|---|--------------|-------------------------|-------------------------|
| <u>Black Warrior-Tombigbee River System</u> |              |                         |                         |
| Fall (Usage 16%)                            |              |                         |                         |
| Downriver                                   | 17           | 24                      |                         |
| Upriver                                     | 64           | 27                      |                         |
| Total                                       | 43           | 26                      |                         |
| Spring (Usage 37%)                          |              |                         |                         |
| Downriver                                   | 70           | 80                      | SAMPLE SIZE TOO SMALL   |
| Upriver                                     | 21           | 0                       |                         |
| Total                                       | 43           | 36                      |                         |
| Summer (Usage 43%)                          |              |                         |                         |
| Downriver                                   | 62           | 75                      |                         |
| Upriver                                     | 54           | 4                       |                         |
| Total                                       | 62           | 40                      |                         |
| Winter (Usage 4%)                           |              |                         |                         |
| Downriver                                   | 0            |                         | SAMPLE SIZE TOO SMALL   |
| Upriver                                     | 0            |                         |                         |
| Total                                       | 0            |                         |                         |

TABLE 8 (continued)

PERCENT BACKHAUL EMPTY BY SEASON

|                         | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|-------------------------|--------------|-------------------------|-------------------------|
| <u>Cumberland River</u> |              |                         |                         |
| Fall                    |              |                         |                         |
| Downriver               | 0            |                         |                         |
| Upriver                 | 0            |                         |                         |
| Total                   | 0            |                         |                         |
| Spring                  |              |                         |                         |
| Downriver               | 100          | SAMPLE SIZE TOO SMALL   | SAMPLE SIZE TOO SMALL   |
| Upriver                 | 36           |                         |                         |
| Total                   | 96           |                         |                         |
| Summer                  |              |                         |                         |
| Downriver               | 100          |                         |                         |
| Upriver                 | 8            |                         |                         |
| Total                   | 99           |                         |                         |
| Winter                  |              |                         |                         |
| Downriver               | 100          |                         |                         |
| Upriver                 | 21           |                         |                         |
| Total                   | 63           |                         |                         |

TABLE 8 (continued)

PERCENT BACKHAUL EMPTY BY SEASON

|  | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--|--------------|-------------------------|-------------------------|
| Gulf Intracoastal Waterway - Eastern Portion<br>Fall (Usage 36%) | 100          | 100                     | 100                     |
| Spring (Usage 17%)   | 100          | 100                     | 88                      |
| Summer (Usage 15%)   | 100          | 100                     | 94                      |
| Winter (Usage 32%)   | 100          | SAMPLE SIZE TOO SMALL   |                         |

TABLE 8 (continued)

## PERCENT BACKHAUL EMPTY BY SEASON

|   | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|---|--------------|-------------------------|-------------------------|
| <u>Gulf Intracoastal Waterway - Western Portion</u> |              |                         |                         |
| Fall (Usage 24%)                                    | 100          | 56                      | 100                     |
| Spring (Usage 38%)                                  | 100          | 100                     | 100                     |
| Summer (Usage 14%)                                  | 100          | 100                     | 100                     |
| Winter (Usage 24%)                                  | 100          | 77                      | 100                     |

TABLE 8 (continued)

PERCENT BACKHAUL EMPTY BY SEASON

|                       | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|-----------------------|--------------|-------------------------|-------------------------|
| <u>Illinois River</u> |              |                         |                         |
| Fall (Usage 41%)      |              |                         |                         |
| Downriver             | 100          | 100                     | 33                      |
| Upriver               | 39           | 19                      | 68                      |
| Total                 | 78           | 88                      | 55                      |
| Spring (Usage 20%)    |              |                         |                         |
| Downriver             | 56           | 22                      | 23                      |
| Upriver               | 32           | 60                      | 37                      |
| Total                 | 43           | 60                      | 29                      |
| Summer (23%)          |              |                         |                         |
| Downriver             | 95           | 100                     | 24                      |
| Upriver               | 72           | 51                      | 94                      |
| Total                 | 84           | 94                      | 64                      |
| Winter (Usage 6%)     |              |                         |                         |
| Downriver             | 37           | 29                      | 40                      |
| Upriver               | 75           | 56                      | 78                      |
| Total                 | 61           | 56                      | 62                      |

TABLE 8 (continued)

PERCENT BACKHAUL EMPTY BY SEASON

|                                | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--------------------------------|--------------|-------------------------|-------------------------|
| <u>Lower Mississippi River</u> |              |                         |                         |
| Fall (Usage 27%)               |              |                         |                         |
| Downriver                      | 57           | 49                      | 65                      |
| Upriver                        | 83           | 68                      | 100                     |
| Total                          | 70           | 60                      | 84                      |
| Spring (Usage 30%)             |              |                         |                         |
| Downriver                      | 70           | 85                      | 44                      |
| Upriver                        | 75           | 48                      | 100                     |
| Total                          | 69           | 66                      | 75                      |
| Summer (Usage 23%)             |              |                         |                         |
| Downriver                      | 73           | 93                      | 64                      |
| Upriver                        | 79           | 34                      | 100                     |
| Total                          | 76           | 62                      | 85                      |
| Winter (Usage 21%)             |              |                         |                         |
| Downriver                      | 82           | 63                      | 100                     |
| Upriver                        | 46           | 61                      | 28                      |
| Total                          | 61           | 39                      | 61                      |

TABLE 8 (continued)

PERCENT BACKHAUL EMPTY BY SEASON

|                    | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--------------------|--------------|-------------------------|-------------------------|
| <u>Ohio River</u>  |              |                         |                         |
| Fall (Usage 25%)   |              |                         |                         |
| Downriver          | 75           | 76                      | 74                      |
| Upriver            | 72           | 57                      | 100                     |
| Total              | 73           | 65                      | 91                      |
| Spring (Usage 34%) |              |                         |                         |
| Downriver          | 90           | 88                      | 100                     |
| Upriver            | 77           | 75                      | 88                      |
| Total              | 84           | 81                      | 94                      |
| Summer (Usage 27%) |              |                         |                         |
| Downriver          | 76           | 61                      | 100                     |
| Upriver            | 70           | 75                      | 57                      |
| Total              | 73           | 69                      | 80                      |
| Winter (Usage 14%) |              |                         |                         |
| Downriver          | 88           | 74                      | 100                     |
| Upriver            | 43           | 61                      | 28                      |
| Total              | 64           | 61                      | 68                      |

TABLE 8 (continued)

## PERCENT BACKHAUL EMPTY BY SEASON

|                        | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|------------------------|--------------|-------------------------|-------------------------|
| <u>Tennessee River</u> |              |                         |                         |
| Fall                   |              |                         |                         |
| Downriver              | 100          |                         |                         |
| Upriver                | 14           |                         |                         |
| Total                  | 93           |                         |                         |
| Spring                 |              |                         |                         |
| Downriver              | 100          |                         |                         |
| Upriver                | 17           |                         |                         |
| Total                  | 66           |                         |                         |
| Summer                 |              |                         |                         |
| Downriver              | 100          |                         |                         |
| Upriver                | 14           |                         |                         |
| Total                  | 86           |                         |                         |
| Winter                 |              |                         |                         |
| Downriver              | 100          |                         |                         |
| Upriver                | 53           |                         |                         |
| Total                  | 85           |                         |                         |

TABLE 8 (continued)

## PERCENT BACKHAUL EMPTY BY SEASON

|                                | <u>TOTAL</u> | <u>INTRA<br/>SYSTEM</u> | <u>INTER<br/>SYSTEM</u> |
|--------------------------------|--------------|-------------------------|-------------------------|
| <u>Upper Mississippi River</u> |              |                         |                         |
| Fall (Usage 32%)               |              |                         |                         |
| Downriver                      | 32           | 22                      | 43                      |
| Upriver                        | 94           | 85                      | 100                     |
| Total                          | 63           | 53                      | 73                      |
| Spring (Usage 27%)             |              |                         |                         |
| Downriver                      | 21           | 16                      | 25                      |
| Upriver                        | 100          | 100                     | 98                      |
| Total                          | 65           | 69                      | 59                      |
| Summer (Usage 37%)             |              |                         |                         |
| Downriver                      | 31           | 14                      | 55                      |
| Upriver                        | 100          | 100                     | 100                     |
| Total                          | 78           | 72                      | 88                      |
| Winter (Usage 4%)              |              |                         |                         |
| Downriver                      | 25           | 21                      | 45                      |
| Upriver                        | 61           | 40                      | 73                      |
| Total                          | 42           | 28                      | 62                      |

TABLE 9

## AVERAGE TRANSIT TIME FOR EACH LOCK TRAVERSED BY WATERWAY

| <u>WATERWAY</u>                             | <u>TRANSIT TIME<br/>(HOURS)</u> |
|---|---------------------------------|
| ARKANSAS RIVER                              | .68                             |
| BLACK WARRIOR-TOMBIGBEE                     | .75                             |
| CUMBERLAND                                  | .75                             |
| GULF INTRACOASTAL WATERWAY, EASTERN PORTION | 7.58                            |
| GULF INTRACOASTAL WATERWAY, WESTERN PORTION | 1.60                            |
| ILLINOIS RIVER                              | 4.86                            |
| OHIO RIVER                                  | 2.81                            |
| PORT ALLEN ROUTE                            | 1.02                            |
| TENNESSEE RIVER                             | 3.36                            |
| UPPER MISSISSIPPI RIVER                     | 3.20                            |

TABLE 10

## AVERAGE TRANSIT TIME FOR EACH LOCK TRAVERSED BY WATERWAY AND SEASON

| <u>WATERWAY</u>                                   | <u>TRANSIT TIME<br/>(HOURS)</u> |
|---|---------------------------------|
| <u>BLACK WARRIOR-TOMBIGBEE RIVER SYSTEM</u>       |                                 |
| FALL  | 1.17                            |
| SPRING  | 0.65                            |
| SUMMER  | 0.68                            |
| WINTER  | 0.31                            |
| <u>GULF INTRACOASTAL WATERWAY/WESTERN PORTION</u> |                                 |
| FALL  | 1.15                            |
| SPRING  | 1.23                            |
| SUMMER  | 0.86                            |
| WINTER  | 2.21                            |
| <u>ILLINOIS RIVER</u>                             |                                 |
| FALL  | 4.90                            |
| SPRING  | 4.75                            |
| SUMMER  | 5.51                            |
| WINTER  | 2.38                            |
| <u>OHIO RIVER</u>                                 |                                 |
| FALL  | 6.32                            |
| SPRING  | 1.14                            |
| SUMMER  | 2.27                            |
| WINTER  | 2.56                            |
| <u>UPPER MISSISSIPPI RIVER</u>                    |                                 |
| FALL  | 2.13                            |
| SPRING  | 2.72                            |
| SUMMER  | 2.80                            |
| WINTER  | 9.37                            |

TABLE 11

## AVERAGE DELAYS BY WATERWAY - ALL MOVEMENTS

|                                      | DOWNRIVER                       |                          | UPRIVER                         |                          | BOTH                            |                          |
|--------------------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|
|                                      | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
| ARKANSAS RIVER                       |                                 |                          |                                 |                          |                                 |                          |
| WEATHER                              | .22                             | 3.12                     | .22                             | 7.25                     | .22                             | 5.19                     |
| FOG                                  | .33                             | 12.36                    | .33                             | 2.36                     | .33                             | 7.36                     |
| LOCKING                              | 1.00                            | 12.34                    | 1.00                            | 6.91                     | 1.00                            | 9.62                     |
| REPAIRS                              | .11                             | 2.00                     | .33                             | 0.61                     | .22                             | 0.96                     |
| ICE                                  | .33                             | 6.50                     | .11                             | 12.75                    | .22                             | 8.06                     |
| CREW CHANGE                          | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| SUPPLIES                             | ----                            | ----                     | .11                             | 0.75                     | .11                             | 0.75                     |
| CHANNEL DELAY                        | .56                             | 8.40                     | .78                             | 1.14                     | .67                             | 4.16                     |
| AWAITING ORDERS                      | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| VESSEL ASSISTING                     | ----                            | ----                     | .11                             | 0.92                     | .11                             | 0.92                     |
| AWAITING BERTH                       | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| BRIDGE WAIT                          | .56                             | 1:55                     | .33                             | 0.69                     | .44                             | 1.23                     |
| FLEETING                             | .11                             | 1:67                     | .56                             | 2.05                     | .33                             | 1.99                     |
| BLACK WARRIOR-TOMBIGBEE RIVER SYSTEM |                                 |                          |                                 |                          |                                 |                          |
| WEATHER                              | .03                             | 0.50                     | .03                             | 3.25                     | .03                             | 1.88                     |
| FOG                                  | .42                             | 5.62                     | .38                             | 8.84                     | .39                             | 7.29                     |
| LOCKING                              | .97                             | 5.83                     | 1.00                            | 6.15                     | .99                             | 6.00                     |
| REPAIRS                              | .25                             | 6.86                     | .27                             | 7.24                     | .27                             | 7.07                     |
| ICE                                  | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CREW CHANGE                          | ----                            | ----                     | .03                             | 0.42                     | .01                             | 0.42                     |
| SUPPLIES                             | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CHANNEL DELAY                        | .16                             | 1.78                     | .14                             | 1.52                     | .14                             | 1.65                     |
| AWAITING ORDERS                      | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| VESSEL ASSISTING                     | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| AWAITING BERTH                       | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| BRIDGE WAIT                          | .03                             | 8.50                     | ----                            | ----                     | .01                             | 8.50                     |
| FLEETING                             | .59                             | 1.85                     | .81                             | 4.28                     | .71                             | 3.34                     |

TABLE 11 (continued)

## AVERAGE DELAYS BY WATERWAY - ALL MOVEMENTS

|                  | DOWNRIVER                       |                          | UPRIVER                         |                          | BOTH                            |                          |
|------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|
|                  | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
| CUMBERLAND RIVER |                                 |                          |                                 |                          |                                 |                          |
| WEATHER          | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| FOG              | .35                             | 6.71                     | .20                             | 2.56                     | .27                             | 4.72                     |
| LOCKING          | .94                             | 1.93                     | .75                             | 2.68                     | .84                             | 2.29                     |
| REPAIRS          | .06                             | 0.50                     | .10                             | 0.29                     | .08                             | 0.36                     |
| ICE              | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CREW CHANGE      | .06                             | 0.25                     | .10                             | 0.66                     | .08                             | 0.53                     |
| SUPPLIES         | .06                             | 2.00                     | .15                             | 1.78                     | .11                             | 1.84                     |
| CHANNEL DELAY    | ----                            | ----                     | .05                             | 0.33                     | .03                             | 0.33                     |
| AWAITING ORDERS  | .06                             | 0.25                     | ----                            | ----                     | .03                             | 0.25                     |
| VESSEL ASSISTING | ----                            | ----                     | .15                             | 0.86                     | .08                             | 0.86                     |
| AWAITING BERTH   | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| BRIDGE WAIT      | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| FLEETING         | .53                             | 2.71                     | .55                             | 2.56                     | .54                             | 2.63                     |

TABLE 11 (continued)

## AVERAGE DELAYS BY WATERWAY - ALL MOVEMENTS

|   | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
|---|---------------------------------|--------------------------|
| GULF INTRACOASTAL WATERWAY, EASTERN PORTION |                                 |                          |
| WEATHER                                     | .14                             | 12.05                    |
| FOG   | .08                             | 12.06                    |
| LOCKING                                     | .42                             | 7.58                     |
| REPAIRS                                     | .08                             | 2.22                     |
| ICE   | ----                            | ----                     |
| CREW CHANGE                                 | .03                             | 0.50                     |
| SUPPLIES                                    | .03                             | 0.67                     |
| CHANNEL DELAY                               | .06                             | 1.66                     |
| AWAITING ORDERS                             | ----                            | ----                     |
| VESSEL ASSISTING                            | .08                             | 11.11                    |
| AWAITING BERTH                              | .06                             | 1.96                     |
| BRIDGE WAIT                                 | ----                            | ----                     |
| FLEETING                                    | .28                             | 3.21                     |
| GULF INTRACOASTAL WATERWAY, WESTERN PORTION |                                 |                          |
| WEATHER                                     | .09                             | 7.21                     |
| FOG   | .22                             | 5.84                     |
| LOCKING                                     | .69                             | 7.63                     |
| REPAIRS                                     | .12                             | 5.01                     |
| ICE   | ----                            | ----                     |
| CREW CHANGE                                 | .03                             | 1.50                     |
| SUPPLIES                                    | .15                             | 2.06                     |
| CHANNEL DELAY                               | .27                             | 3.44                     |
| AWAITING ORDERS                             | .03                             | 1.12                     |
| VESSEL ASSISTING                            | .09                             | 1.60                     |
| AWAITING BERTH                              | .07                             | 12.16                    |
| BRIDGE WAIT                                 | .11                             | 4.69                     |
| FLEETING                                    | .26                             | 2.49                     |

TABLE 11 (continued)

## AVERAGE DELAYS BY WATERWAY - ALL MOVEMENTS

|                         | DOWNRIVER                    |                          | UPRIVER                      |                          | BOTH                         |                          |
|-------------------------|------------------------------|--------------------------|------------------------------|--------------------------|------------------------------|--------------------------|
|                         | PROBABILITY<br>OF OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
| ILLINOIS RIVER          |                              |                          |                              |                          |                              |                          |
| WEATHER                 | .15                          | 5.76                     | .04                          | 7.42                     | .09                          | 6.15                     |
| FOG                     | .14                          | 4.46                     | .13                          | 4.10                     | .14                          | 4.28                     |
| LOCKING                 | .80                          | 13.45                    | .81                          | 16.94                    | .81                          | 15.33                    |
| REPAIRS                 | .15                          | 2.49                     | .11                          | 5.96                     | .13                          | 4.08                     |
| ICE                     | .13                          | 25.51                    | .10                          | 14.10                    | .11                          | 20.08                    |
| CREW CHANGE             | .03                          | 0.89                     | .02                          | 1.46                     | .03                          | 1.12                     |
| SUPPLIES                | .02                          | 6.25                     | .12                          | 1.62                     | .08                          | 2.28                     |
| CHANNEL DELAY           | .29                          | 2.92                     | .70                          | 3.03                     | .51                          | 3.00                     |
| AWAITING ORDERS         | .03                          | 43.92                    | .01                          | 2.00                     | .02                          | 33.44                    |
| VESSEL ASSISTING        | .23                          | 6.34                     | .20                          | 5.89                     | .22                          | 6.11                     |
| AWAITING BERTH          | .01                          | 0.67                     | ----                         | ----                     | .01                          | 0.67                     |
| BRIDGE WAIT             | .19                          | 1.29                     | .07                          | 2.58                     | .13                          | 1.68                     |
| FLEETING                | .74                          | 8.22                     | .56                          | 6.25                     | .65                          | 7.31                     |
| LOWER MISSISSIPPI RIVER |                              |                          |                              |                          |                              |                          |
| WEATHER                 | .07                          | 4.53                     | .04                          | 5.95                     | .05                          | 5.06                     |
| FOG                     | .26                          | 9.22                     | .22                          | 7.53                     | .24                          | 8.44                     |
| LOCKING                 | ----                         | ----                     | ----                         | ----                     | ----                         | ----                     |
| REPAIRS                 | .08                          | 5.96                     | .16                          | 6.59                     | .12                          | 6.38                     |
| ICE                     | ----                         | ----                     | ----                         | ----                     | ----                         | ----                     |
| CREW CHANGE             | .04                          | 1.08                     | .04                          | 1.55                     | .04                          | 1.33                     |
| SUPPLIES                | .16                          | 2.38                     | .18                          | 2.27                     | .17                          | 2.32                     |
| CHANNEL DELAY           | .11                          | 1.54                     | .62                          | 4.52                     | .37                          | 4.08                     |
| AWAITING ORDERS         | .01                          | 0.25                     | .01                          | 4.09                     | .01                          | 2.17                     |
| VESSEL ASSISTING        | .20                          | 2.28                     | .20                          | 3.55                     | .20                          | 2.93                     |
| AWAITING BERTH          | .02                          | 3.84                     | .01                          | 1.00                     | .01                          | 3.27                     |
| BRIDGE WAIT             | .02                          | 11.00                    | .03                          | 0.79                     | .03                          | 4.88                     |
| FLEETING                | .43                          | 8.44                     | .42                          | 7.79                     | .43                          | 8.12                     |

TABLE 11 (continued)

## AVERAGE DELAYS BY WATERWAY - ALL MOVEMENTS

|                  | DOWNRIVER                       |                          | UPRIVER                         |                          | BOTH                            |                          |
|------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|
|                  | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
| MISSOURI RIVER   |                                 |                          |                                 |                          |                                 |                          |
| WEATHER          | .20                             | 17.72                    | ----                            | ----                     | .10                             | 17.72                    |
| FOG              | .40                             | 6.83                     | .38                             | 5.11                     | .39                             | 5.97                     |
| LOCKING          | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| REPAIRS          | .13                             | 2.88                     | .13                             | 3.95                     | .13                             | 3.41                     |
| ICE              | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CREW CHANGE      | .13                             | 0.50                     | .13                             | 0.58                     | .13                             | 0.54                     |
| SUPPLIES         | .27                             | 1.58                     | .31                             | 2.07                     | .29                             | 1.85                     |
| CHANNEL DELAY    | ----                            | ----                     | .44                             | 3.94                     | .23                             | 3.94                     |
| AWAITING ORDERS  | ----                            | ----                     | .06                             | 0.58                     | .03                             | 0.58                     |
| VESSEL ASSISTING | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| AWAITING BERTH   | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| BRIDGE WAIT      | .20                             | 5.89                     | .19                             | 4.75                     | .19                             | 5.32                     |
| FLEETING         | .67                             | 9.18                     | .81                             | 4.09                     | .74                             | 6.31                     |
| OHIO RIVER       |                                 |                          |                                 |                          |                                 |                          |
| WEATHER          | .03                             | 9.32                     | .03                             | 14.04                    | .03                             | 11.68                    |
| FOG              | .24                             | 7.29                     | .18                             | 8.98                     | .21                             | 8.00                     |
| LOCKING          | .89                             | 24.50                    | .88                             | 24.60                    | .89                             | 24.55                    |
| REPAIRS          | .10                             | 3.02                     | .11                             | 10.04                    | .10                             | 6.53                     |
| ICE              | .04                             | 67.85                    | .04                             | 41.73                    | .04                             | 55.66                    |
| CREW CHANGE      | .06                             | 0.66                     | .07                             | 1.19                     | .06                             | 0.93                     |
| SUPPLIES         | .18                             | 1.89                     | .22                             | 2.06                     | .20                             | 1.98                     |
| CHANNEL DELAY    | .07                             | 1.49                     | .26                             | 2.12                     | .16                             | 1.98                     |
| AWAITING ORDERS  | .01                             | 1.88                     | .01                             | 58.25                    | .01                             | 30.06                    |
| VESSEL ASSISTING | .09                             | 3.45                     | .11                             | 2.91                     | .10                             | 3.16                     |
| AWAITING BERTH   | .01                             | 1.00                     | ----                            | ----                     | ----                            | ----                     |
| BRIDGE WAIT      | .01                             | 5.66                     | .01                             | 0.50                     | .01                             | 3.94                     |
| FLEETING         | .61                             | 8.89                     | .66                             | 8.93                     | .64                             | 8.91                     |

TABLE 11 (continued)  
 AVERAGE DELAYS BY WATERWAY - ALL MOVEMENTS

|                         | DOWNRIVER                 |                    | UPRIVER                   |                    | BOTH                      |                    |
|-------------------------|---------------------------|--------------------|---------------------------|--------------------|---------------------------|--------------------|
|                         | PROBABILITY OF OCCURRENCE | MEAN DELAY (HOURS) | PROBABILITY OF OCCURRENCE | MEAN DELAY (HOURS) | PROBABILITY OF OCCURRENCE | MEAN DELAY (HOURS) |
| <b>PORT ALLEN ROUTE</b> |                           |                    |                           |                    |                           |                    |
| WEATHER                 | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| FOG                     | .12                       | 3.78               | ----                      | ----               | .11                       | 3.76               |
| LOCKING                 | 1.00                      | 3.12               | 1.00                      | 1.50               | 1.00                      | 3.03               |
| REPAIRS                 | ----                      | ----               | 1.00                      | 0.58               | .06                       | 0.58               |
| ICE                     | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| CREW CHANGE             | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| SUPPLIES                | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| CHANNEL DELAY           | .12                       | 1.38               | ----                      | ----               | .11                       | 1.38               |
| AWAITING ORDERS         | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| VESSEL ASSISTING        | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| AWAITING BERTH          | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| BRIDGE WAIT             | .29                       | 1.80               | ----                      | ----               | .28                       | 1.80               |
| FLEETING                | .18                       | 2.33               | ----                      | ----               | .17                       | 2.33               |
| <b>TENNESSEE RIVER</b>  |                           |                    |                           |                    |                           |                    |
| WEATHER                 | .08                       | 13.17              | .03                       | 8.08               | .06                       | 11.90              |
| FOG                     | .17                       | 2.18               | .31                       | 8.44               | .24                       | 6.09               |
| LOCKING                 | .94                       | 9.22               | .97                       | 10.03              | .96                       | 9.61               |
| REPAIRS                 | .11                       | 3.36               | .06                       | 1.75               | .09                       | 2.82               |
| ICE                     | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| CREW CHANGE             | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| SUPPLIES                | .08                       | 1.19               | .06                       | 1.38               | .07                       | 1.27               |
| CHANNEL DELAY           | .06                       | 1.62               | .13                       | 0.88               | .09                       | 1.12               |
| AWAITING ORDERS         | .03                       | 0.50               | ----                      | ----               | .01                       | 0.50               |
| VESSEL ASSISTING        | .14                       | 4.77               | .09                       | 3.97               | .12                       | 4.47               |
| AWAITING BERTH          | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| BRIDGE WAIT             | .08                       | 0.94               | .03                       | 0.25               | .06                       | 0.77               |
| FLEETING                | .67                       | 5.04               | .63                       | 7.44               | .65                       | 6.13               |

TABLE 11 (continued)

## AVERAGE DELAYS BY WATERWAY - ALL MOVEMENTS

|                         | DOWNRIVER                       |                          | UPRIVER                         |                          | BOTH                            |                          |
|-------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|
|                         | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
| UPPER MISSISSIPPI RIVER |                                 |                          |                                 |                          |                                 |                          |
| WEATHER                 | .11                             | 7.40                     | .07                             | 5.74                     | .09                             | 6.73                     |
| FOG                     | .22                             | 7.55                     | .17                             | 5.98                     | .19                             | 6.86                     |
| LOCKING                 | .82                             | 43.02                    | .79                             | 40.48                    | .81                             | 41.75                    |
| REPAIRS                 | .11                             | 9.08                     | .06                             | 4.30                     | .08                             | 7.39                     |
| ICE                     | .05                             | 41.92                    | .02                             | 39.38                    | .04                             | 41.24                    |
| CREW CHANGE             | .01                             | 0.56                     | .06                             | 1.76                     | .04                             | 1.52                     |
| SUPPLIES                | .06                             | 2.10                     | .09                             | 2.22                     | .08                             | 2.17                     |
| CHANNEL DELAY           | .18                             | 4.25                     | .53                             | 2.89                     | .36                             | 3.22                     |
| AWAITING ORDERS         | .01                             | 5.33                     | .02                             | 12.00                    | .02                             | 9.50                     |
| VESSEL ASSISTING        | .19                             | 3.59                     | .17                             | 2.91                     | .18                             | 3.26                     |
| AWAITING BERTH          | ----                            | ----                     | .01                             | 3.08                     | .01                             | 2.50                     |
| BRIDGE WAIT             | .14                             | 1.88                     | .14                             | 1.09                     | .14                             | 1.48                     |
| FLEETING                | .60                             | 6.86                     | .59                             | 6.31                     | .60                             | 6.59                     |

TABLE 12

## AVERAGE DELAYS BY WATERWAY FOR WITHIN SYSTEM MOVEMENTS

|   | DOWNRIVER                       |                          | UPRIVER                         |                          | BOTH                            |                          |
|---|---------------------------------|--------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|
|   | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
| <b>BLACK WARRIOR-TOMBIGBEE RIVER SYSTEM</b> |                                 |                          |                                 |                          |                                 |                          |
| WEATHER                                     | .04                             | .50                      | ----                            | ----                     | .02                             | 0.50                     |
| FOG   | .37                             | 6.21                     | .38                             | 9.30                     | .37                             | 7.89                     |
| LOCKING                                     | 1.00                            | 5.33                     | 1.00                            | 5.28                     | 1.00                            | 5.30                     |
| REPAIRS                                     | .26                             | 7.77                     | .28                             | 7.69                     | .27                             | 7.73                     |
| ICE   | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CREW CHANGE                                 | ----                            | ----                     | .03                             | 0.42                     | .02                             | 0.42                     |
| SUPPLIES                                    | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CHANNEL DELAY                               | .07                             | 1.38                     | .09                             | 2.25                     | .08                             | 1.90                     |
| AWAITING ORDERS                             | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| VESSEL ASSISTING                            | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| AWAITING BERTH                              | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| BRIDGE WAIT                                 | .04                             | 8.50                     | ----                            | ----                     | .02                             | 8.50                     |
| FLEETING                                    | .67                             | 1.90                     | .88                             | 4.53                     | .78                             | 3.50                     |

TABLE 12 (continued)

AVERAGE DELAYS BY WATERWAY FOR WITHIN SYSTEM MOVEMENTS

|  | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
|--|---------------------------------|--------------------------|
| GULF INTRACOASTAL WATERWAY - EASTERN PORTION |                                 |                          |
| WEATHER                                      | .14                             | 11.62                    |
| FOG  | .06                             | 10.29                    |
| LOCKING                                      | .49                             | 8.02                     |
| REPAIRS                                      | .10                             | 13.38                    |
| ICE  | ----                            | ----                     |
| CREW CHANGE                                  | .03                             | 1.00                     |
| SUPPLIES                                     | .08                             | 1.33                     |
| CHANNEL DELAY                                | .08                             | 1.70                     |
| AWAITING ORDERS                              | ----                            | ----                     |
| VESSEL ASSISTING                             | .06                             | 8.84                     |
| AWAITING BERTH                               | .03                             | 1.96                     |
| BRIDGE WAIT                                  | .01                             | 0.83                     |
| FLEETING                                     | .25                             | 3.56                     |

GULF INTRACOASTAL WATERWAY - WESTERN PORTION

|                  |     |      |
|------------------|-----|------|
| WEATHER          | .18 | 8.78 |
| FOG              | .14 | 6.01 |
| LOCKING          | .68 | 4.49 |
| REPAIRS          | .13 | 3.32 |
| ICE              | .01 | 3.00 |
| CREW CHANGE      | .03 | 1.34 |
| SUPPLIES         | .07 | 2.10 |
| CHANNEL DELAY    | .26 | 2.61 |
| AWAITING ORDERS  | .01 | 0.25 |
| VESSEL ASSISTING | .10 | 4.05 |
| AWAITING BERTH   | .04 | 9.08 |
| BRIDGE WAIT      | .18 | 5.97 |
| FLEETING         | .29 | 3.48 |

TABLE 12 (continued)

## AVERAGE DELAYS BY WATERWAY FOR WITHIN SYSTEM MOVEMENTS

|                         | DOWNRIVER                       |                          | UPRIVER                         |                          | BOTH                            |                          |
|-------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|
|                         | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
| ILLINOIS RIVER          |                                 |                          |                                 |                          |                                 |                          |
| WEATHER                 | .16                             | 4.15                     | .06                             | 7.56                     | .10                             | 5.17                     |
| FOG                     | .09                             | 5.23                     | .17                             | 3.41                     | .13                             | 3.97                     |
| LOCKING                 | .93                             | 14.56                    | .96                             | 19.54                    | .95                             | 17.31                    |
| REPAIRS                 | .11                             | 2.45                     | .07                             | 8.10                     | .09                             | 4.96                     |
| ICE                     | .07                             | 18.33                    | .06                             | 18.86                    | .06                             | 18.60                    |
| CREW CHANGE             | -----                           | -----                    | .02                             | 2.00                     | .01                             | 2.00                     |
| SUPPLIES                | -----                           | -----                    | .09                             | 1.87                     | .05                             | 1.87                     |
| CHANNEL DELAY           | .20                             | 1.96                     | .65                             | 2.44                     | .44                             | 2.35                     |
| AWAITING ORDERS         | .04                             | 3.50                     | .02                             | 2.00                     | .03                             | 2.17                     |
| VESSEL ASSISTING        | .18                             | 10.13                    | .28                             | 5.96                     | .23                             | 4.71                     |
| AWAITING BERTH          | -----                           | -----                    | -----                           | -----                    | -----                           | -----                    |
| BRIDGE WAIT             | .07                             | 1.50                     | .07                             | 0.64                     | .07                             | 1.01                     |
| FLEETING                | .69                             | 6.51                     | .48                             | 6.98                     | .55                             | 6.73                     |
| LOWER MISSISSIPPI RIVER |                                 |                          |                                 |                          |                                 |                          |
| WEATHER                 | .03                             | 1.81                     | .04                             | 6.42                     | .04                             | 4.44                     |
| FOG                     | .26                             | 9.36                     | .25                             | 6.68                     | .26                             | 7.99                     |
| LOCKING                 | .05                             | 5.12                     | .03                             | 22.66                    | .04                             | 11.70                    |
| REPAIRS                 | .10                             | 7.55                     | .21                             | 5.10                     | .16                             | 5.84                     |
| ICE                     | -----                           | -----                    | -----                           | -----                    | -----                           | -----                    |
| CREW CHANGE             | .01                             | 3.75                     | .03                             | 0.94                     | .02                             | 1.64                     |
| SUPPLIES                | .11                             | 3.31                     | .17                             | 2.66                     | .14                             | 2.96                     |
| CHANNEL DELAY           | .08                             | 2.59                     | .64                             | 4.02                     | .37                             | 3.88                     |
| AWAITING ORDERS         | .01                             | 0.25                     | .01                             | 4.09                     | .01                             | 2.17                     |
| VESSEL ASSISTING        | .26                             | 2.70                     | .21                             | 3.94                     | .23                             | 3.28                     |
| AWAITING BERTH          | .03                             | 4.06                     | .01                             | 1.00                     | .02                             | 3.29                     |
| BRIDGE WAIT             | .03                             | 14.08                    | .04                             | 0.67                     | .04                             | 6.42                     |
| FLEETING                | .44                             | 9.14                     | .43                             | 8.33                     | .43                             | 8.72                     |

TABLE 12 (continued)

## AVERAGE DELAYS BY WATERWAY FOR WITHIN SYSTEM MOVEMENTS

|                  | DOWNRIVER                       |                          | UPRIVER                         |                          | BOTH                            |                          |
|------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|
|                  | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
| MISSOURI RIVER   |                                 |                          |                                 |                          |                                 |                          |
| WEATHER          | .20                             | 17.72                    | ----                            | ----                     | .10                             | 17.72                    |
| FOG              | .40                             | 6.83                     | .38                             | 5.11                     | .39                             | 5.97                     |
| LOCKING          | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| REPAIRS          | .13                             | 2.88                     | .12                             | 3.95                     | .13                             | 3.41                     |
| ICE              | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CREW CHANGE      | .13                             | 0.50                     | .12                             | 0.58                     | .13                             | 0.54                     |
| SUPPLIES         | .27                             | 1.58                     | .31                             | 2.07                     | .29                             | 1.85                     |
| CHANNEL DELAY    | ----                            | ----                     | .44                             | 3.94                     | .23                             | 3.94                     |
| AWAITING ORDERS  | ----                            | ----                     | .06                             | 0.58                     | .03                             | 0.58                     |
| VESSEL ASSISTING | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| AWAITING BERTH   | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| BRIDGE WAIT      | .20                             | 5.89                     | .19                             | 4.75                     | .19                             | 5.32                     |
| FLEETING         | .67                             | 9.18                     | .81                             | 4.09                     | .74                             | 6.31                     |
| OHIO RIVER       |                                 |                          |                                 |                          |                                 |                          |
| WEATHER          | .03                             | 6.47                     | .04                             | 16.45                    | .03                             | 12.71                    |
| FOG              | .26                             | 6.12                     | .18                             | 8.22                     | .22                             | 7.07                     |
| LOCKING          | 1.00                            | 21.15                    | .99                             | 23.24                    | 1.00                            | 22.27                    |
| REPAIRS          | .14                             | 3.13                     | .13                             | 11.96                    | .13                             | 7.68                     |
| ICE              | .06                             | 77.26                    | .04                             | 47.56                    | .05                             | 63.55                    |
| CREW CHANGE      | .08                             | 0.69                     | .08                             | 1.31                     | .08                             | 1.03                     |
| SUPPLIES         | .18                             | 1.01                     | .24                             | 2.42                     | .21                             | 1.86                     |
| CHANNEL DELAY    | .05                             | 0.80                     | .26                             | 1.69                     | .17                             | 1.57                     |
| AWAITING ORDERS  | .01                             | 0.50                     | .01                             | 58.25                    | .01                             | 39.00                    |
| VESSEL ASSISTING | .11                             | 2.83                     | .10                             | 3.67                     | .11                             | 3.27                     |
| AWAITING BERTH   | .01                             | 1.00                     | ----                            | ----                     | ----                            | ----                     |
| BRIDGE WAIT      | ----                            | ----                     | .01                             | 0.50                     | ----                            | ----                     |
| FLEETING         | .75                             | 9.65                     | .72                             | 8.90                     | .74                             | 9.25                     |

TABLE 12 (continued)

AVERAGE DELAYS BY WATERWAY FOR WITHIN SYSTEM MOVEMENTS

|                         | DOWNRIVER                 |                    | UPRIVER                   |                    | BOTH                      |                    |
|-------------------------|---------------------------|--------------------|---------------------------|--------------------|---------------------------|--------------------|
|                         | PROBABILITY OF OCCURRENCE | MEAN DELAY (HOURS) | PROBABILITY OF OCCURRENCE | MEAN DELAY (HOURS) | PROBABILITY OF OCCURRENCE | MEAN DELAY (HOURS) |
| UPPER MISSISSIPPI RIVER |                           |                    |                           |                    |                           |                    |
| WEATHER                 | .12                       | 6.31               | .08                       | 7.79               | .10                       | 6.93               |
| FOG                     | .28                       | 6.38               | .21                       | 6.06               | .24                       | 6.24               |
| LOCKING                 | .91                       | 41.86              | .87                       | 41.74              | .89                       | 41.80              |
| REPAIRS                 | .13                       | 11.29              | .07                       | 5.50               | .10                       | 9.20               |
| ICE                     | .08                       | 38.66              | ----                      | ----               | .04                       | 38.66              |
| CREW CHANGE             | .03                       | 0.56               | .08                       | 1.07               | .05                       | 0.95               |
| SUPPLIES                | .07                       | 2.03               | .10                       | 1.44               | .09                       | 1.66               |
| CHANNEL DELAY           | .21                       | 4.43               | .55                       | 2.66               | .38                       | 3.13               |
| AWAITING ORDERS         | .03                       | 5.33               | .02                       | 16.61              | .02                       | 10.97              |
| VESSEL ASSISTING        | .23                       | 3.28               | .20                       | 3.20               | .21                       | 3.24               |
| AWAITING BERTH          | .01                       | 0.75               | .02                       | 3.08               | .02                       | 2.50               |
| BRIDGE WAIT             | .27                       | 1.72               | .24                       | 1.09               | .23                       | 1.39               |
| FLEETING                | .75                       | 6.89               | .71                       | 7.62               | .73                       | 7.25               |

TABLE 13

## AVERAGE DELAY BY WATERWAY FOR INTERSYSTEM MOVEMENTS

|   | DOWNRIVER                       |                          | UPRIVER                         |                          | BOTH                            |                          |
|---|---------------------------------|--------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|
|   | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
| <b>BLACK WARRIOR-TOMBIGBEE RIVER SYSTEM</b> |                                 |                          |                                 |                          |                                 |                          |
| WEATHER                                     | ----                            | ----                     | .20                             | 3.25                     | .11                             | 3.25                     |
| FOG   | .75                             | 3.67                     | .40                             | 6.08                     | .56                             | 4.63                     |
| LOCKING                                     | 1.00                            | 9.25                     | 1.00                            | 11.72                    | 1.00                            | 10.62                    |
| REPAIRS                                     | .25                             | 0.50                     | .20                             | 3.17                     | .22                             | 1.84                     |
| ICE   | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CREW CHANGE                                 | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| SUPPLIES                                    | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CHANNEL DELAY                               | .75                             | 2.06                     | .40                             | 0.42                     | .56                             | 1.40                     |
| AWAITING ORDERS                             | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| VESSEL ASSISTING                            | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| AWAITING BERTH                              | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| BRIDGE WAIT                                 | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| FLEETING                                    | .25                             | 0.92                     | .40                             | 0.75                     | .33                             | 0.81                     |
| <b>CUMBERLAND RIVER</b>                     |                                 |                          |                                 |                          |                                 |                          |
| WEATHER                                     | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| FOG   | .46                             | 7.00                     | .24                             | 7.56                     | .33                             | 5.23                     |
| LOCKING                                     | 1.00                            | 2.18                     | .71                             | 3.74                     | .83                             | 2.69                     |
| REPAIRS                                     | .08                             | 0.50                     | .12                             | 0.58                     | .10                             | 0.36                     |
| ICE   | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CREW CHANGE                                 | ----                            | ----                     | .12                             | 0.66                     | .07                             | 0.66                     |
| SUPPLIES                                    | ----                            | ----                     | .18                             | 1.78                     | .10                             | 1.78                     |
| CHANNEL DELAY                               | ----                            | ----                     | .06                             | 0.33                     | .03                             | 0.33                     |
| AWAITING ORDERS                             | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| VESSEL ASSISTING                            | ----                            | ----                     | .18                             | 0.86                     | .10                             | 0.86                     |
| AWAITING BERTH                              | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| BRIDGE WAIT                                 | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| FLEETING                                    | .54                             | 2.01                     | .47                             | 3.33                     | .50                             | 2.72                     |

TABLE 13 (continued)

AVERAGE DELAY BY WATERWAY FOR INTERSYSTEM MOVEMENTS

|  | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
|--|---------------------------------|--------------------------|
| GULF INTRACOASTAL WATERWAY - EASTERN PORTION |                                 |                          |
| WEATHER                                      | .15                             | 11.08                    |
| FOG  | .04                             | 5.00                     |
| LOCKING                                      | .56                             | 7.73                     |
| REPAIRS                                      | .11                             | 24.53                    |
| ICE  | ----                            | ----                     |
| CREW CHANGE                                  | .04                             | 1.50                     |
| SUPPLIES                                     | .15                             | 1.50                     |
| CHANNEL DELAY                                | .11                             | 1.72                     |
| AWAITING ORDERS                              | ----                            | ----                     |
| VESSEL ASSISTING                             | .04                             | 2.00                     |
| AWAITING BERTH                               | ----                            | ----                     |
| BRIDGE WAIT                                  | .04                             | 0.83                     |
| FLEETING                                     | .22                             | 4.15                     |

GULF INTRACOASTAL WATERWAY - WESTERN PORTION

|                  |      |      |
|------------------|------|------|
| WEATHER          | .31  | 9.27 |
| FOG              | .14  | 5.75 |
| LOCKING          | .97  | 4.95 |
| REPAIRS          | .17  | 2.72 |
| ICE              | ---- | ---- |
| CREW CHANGE      | .03  | 0.50 |
| SUPPLIES         | .07  | 0.92 |
| CHANNEL DELAY    | .28  | 1.86 |
| AWAITING ORDERS  | ---- | ---- |
| VESSEL ASSISTING | .14  | 5.36 |
| AWAITING BERTH   | ---- | ---- |
| BRIDGE WAIT      | .34  | 5.22 |
| FLEETING         | .38  | 3.80 |

THERE IS NO CURRENT ON THE GULF INTRACOASTAL WATERWAYS

TABLE 13 (continued)

## AVERAGE DELAY BY WATERWAY FOR INTERSYSTEM MOVEMENTS

|                  | DOWNRIVER                       |                          | UPRIVER                         |                          | BOTH                            |                          |
|------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|
|                  | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
| ILLINOIS RIVER   |                                 |                          |                                 |                          |                                 |                          |
| WEATHER          | .15                             | 7.62                     | .02                             | 7.00                     | .07                             | 7.54                     |
| FOG              | .20                             | 4.08                     | .11                             | 5.17                     | .14                             | 4.55                     |
| LOCKING          | .66                             | 11.74                    | .72                             | 18.23                    | .69                             | 15.65                    |
| REPAIRS          | .20                             | 2.51                     | .14                             | 4.27                     | .16                             | 3.39                     |
| ICE              | .20                             | 28.21                    | .16                             | 10.65                    | .17                             | 18.91                    |
| CREW CHANGE      | .07                             | 0.89                     | .04                             | 1.84                     | .05                             | 1.27                     |
| SUPPLIES         | .05                             | 6.25                     | .19                             | 1.12                     | .13                             | 1.91                     |
| CHANNEL DELAY    | .39                             | 3.46                     | .77                             | 3.34                     | .61                             | 3.37                     |
| AWAITING ORDERS  | .02                             | 124.75                   | ----                            | ----                     | .01                             | 124.75                   |
| VESSEL ASSISTING | .29                             | 3.81                     | .16                             | 11.28                    | .21                             | 7.01                     |
| AWAITING BERTH   | .02                             | 0.67                     | ----                            | ----                     | .01                             | 0.67                     |
| BRIDGE WAIT      | .32                             | 1.24                     | .11                             | 3.12                     | .19                             | 1.83                     |
| FLEETING         | .80                             | 9.82                     | .63                             | 5.00                     | .70                             | 7.30                     |

TABLE 13 (continued)

## AVERAGE DELAY BY WATERWAY FOR INTERSYSTEM MOVEMENTS

|                         | DOWNRIVER                       |                          | UPRIVER                         |                          | BOTH                            |                          |
|-------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|
|                         | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
| LOWER MISSISSIPPI RIVER |                                 |                          |                                 |                          |                                 |                          |
| WEATHER                 | .08                             | 5.71                     | .03                             | 5.33                     | .06                             | 5.61                     |
| FOG                     | .22                             | 8.83                     | .18                             | 8.86                     | .21                             | 8.84                     |
| LOCKING                 | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| REPAIRS                 | .06                             | 120.94                   | .11                             | 9.12                     | .08                             | 55.17                    |
| ICE                     | ----                            | ----                     | ----                            | ----                     | .01                             | 43.00                    |
| CREW CHANGE             | .05                             | 0.64                     | .06                             | 1.92                     | .05                             | 1.22                     |
| SUPPLIES                | .17                             | 1.81                     | .21                             | 2.15                     | .19                             | 1.97                     |
| CHANNEL DELAY           | .15                             | 0.94                     | .60                             | 6.15                     | .34                             | 4.87                     |
| AWAITING ORDERS         | .01                             | 6.67                     | ----                            | ----                     | .01                             | 6.67                     |
| VESSEL ASSISTING        | .13                             | 10.08                    | .18                             | 3.05                     | .15                             | 6.45                     |
| AWAITING BERTH          | .01                             | 3.17                     | ----                            | ----                     | .01                             | 3.17                     |
| BRIDGE WAIT             | .04                             | 1.80                     | .02                             | 1.04                     | .03                             | 1.58                     |
| FLEETING                | .38                             | 7.10                     | .43                             | 6.94                     | .40                             | 7.02                     |
| OHIO RIVER              |                                 |                          |                                 |                          |                                 |                          |
| WEATHER                 | .02                             | 10.42                    | .02                             | 2.00                     | .02                             | 7.61                     |
| FOG                     | .23                             | 7.78                     | .17                             | 10.73                    | .21                             | 8.83                     |
| LOCKING                 | .72                             | 30.99                    | .65                             | 28.59                    | .68                             | 30.02                    |
| REPAIRS                 | .06                             | 2.65                     | .08                             | 1.58                     | .07                             | 2.12                     |
| ICE                     | .01                             | 2.00                     | .03                             | 4.62                     | .02                             | 3.75                     |
| CREW CHANGE             | .03                             | 0.56                     | .03                             | 0.50                     | .03                             | 0.53                     |
| SUPPLIES                | .16                             | 2.88                     | .17                             | 1.00                     | .17                             | 2.05                     |
| CHANNEL DELAY           | .10                             | 1.94                     | .25                             | 3.05                     | .17                             | 2.65                     |
| AWAITING ORDERS         | .01                             | 3.25                     | ----                            | ----                     | .01                             | 3.25                     |
| VESSEL ASSISTING        | .08                             | 4.25                     | .14                             | 1.45                     | .11                             | 2.68                     |
| AWAITING BERTH          | .01                             | 1.00                     | ----                            | ----                     | .01                             | 1.00                     |
| BRIDGE WAIT             | .02                             | 5.66                     | ----                            | ----                     | .02                             | 5.66                     |
| FLEETING                | .42                             | 6.69                     | .52                             | 8.87                     | .46                             | 7.75                     |

TABLE 13

(continued)

## AVERAGE DELAY BY WATERWAY FOR INTERSYSTEM MOVEMENTS

|                         | DOWNRIVER                       |                          | UPRIVER                         |                          | BOTH                            |                          |
|-------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|
|                         | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
| TENNESSEE RIVER         |                                 |                          |                                 |                          |                                 |                          |
| WEATHER                 | .06                             | 18.38                    | .04                             | 8.08                     | .05                             | 14.94                    |
| FOG                     | .12                             | 2.56                     | .23                             | 9.67                     | .17                             | 6.82                     |
| LOCKING                 | .94                             | 8.60                     | .96                             | 9.10                     | .95                             | 8.83                     |
| REPAIRS                 | .09                             | 2.56                     | .08                             | 1.75                     | .08                             | 2.83                     |
| ICE                     | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CREW CHANGE             | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| SUPPLIES                | .06                             | 1.54                     | .08                             | 1.38                     | .07                             | 1.46                     |
| CHANNEL DELAY           | .03                             | 0.25                     | .08                             | 1.38                     | .05                             | 1.00                     |
| AWAITING ORDERS         | .03                             | 0.50                     | ----                            | ----                     | .01                             | 0.50                     |
| VESSEL ASSISTING        | .15                             | 4.77                     | .08                             | 4.96                     | .12                             | 4.82                     |
| AWAITING BERTH          | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| BRIDGE WAIT             | .09                             | 0.94                     | .04                             | 0.25                     | .07                             | 0.77                     |
| FLEETING                | .67                             | 4.51                     | .58                             | 7.31                     | .63                             | 5.64                     |
| UPPER MISSISSIPPI RIVER |                                 |                          |                                 |                          |                                 |                          |
| WEATHER                 | .09                             | 9.30                     | .06                             | 1.65                     | .07                             | 6.36                     |
| FOG                     | .15                             | 10.17                    | .09                             | 5.68                     | .12                             | 8.46                     |
| LOCKING                 | .70                             | 46.15                    | .68                             | 39.00                    | .69                             | 42.66                    |
| REPAIRS                 | .07                             | 3.21                     | .03                             | 0.69                     | .05                             | 2.37                     |
| ICE                     | .01                             | 74.50                    | .05                             | 39.38                    | .03                             | 46.40                    |
| CREW CHANGE             | ----                            | ----                     | .02                             | 5.25                     | .01                             | 5.25                     |
| SUPPLIES                | .06                             | 2.20                     | .08                             | 3.69                     | .07                             | 3.07                     |
| CHANNEL DELAY           | .14                             | 3.84                     | .49                             | 3.21                     | .31                             | 3.35                     |
| AWAITING ORDERS         | ----                            | ----                     | .02                             | 5.08                     | .01                             | 5.08                     |
| VESSEL ASSISTING        | .13                             | 4.36                     | .13                             | 2.24                     | .13                             | 3.30                     |
| AWAITING BERTH          | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| BRIDGE WAIT             | .03                             | 2.78                     | ----                            | ----                     | .02                             | 2.78                     |
| FLEETING                | .39                             | 6.60                     | .43                             | 3.21                     | .41                             | 4.83                     |

TABLE 14

## AVERAGE DELAY BY WATERWAY AND SEASON

|                                      | DOWNRIVER                       |                          | UPRIVER                         |                          | BOTH                            |                          |
|--------------------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|
|                                      | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
| BLACK WARRIOR-TOMBIGBEE RIVER SYSTEM |                                 |                          |                                 |                          |                                 |                          |
| FALL                                 |                                 |                          |                                 |                          |                                 |                          |
| WEATHER                              | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| FOG                                  | .80                             | 8.21                     | .50                             | 21.25                    | .64                             | 13.80                    |
| LOCKING                              | 1.00                            | 7.35                     | 1.00                            | 7.47                     | 1.00                            | 7.42                     |
| REPAIRS                              | .20                             | 13.00                    | .50                             | 9.06                     | .36                             | 10.04                    |
| ICE                                  | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CREW CHANGE                          | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| SUPPLIES                             | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CHANNEL DELAY                        | ----                            | ----                     | .17                             | 2.00                     | .18                             | 2.00                     |
| AWAITING ORDERS                      | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| VESSEL ASSISTING                     | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| AWAITING BERTH                       | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| BRIDGE WAIT                          | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| FLEETING                             | .80                             | 1.58                     | 1.00                            | 5.00                     | .82                             | 3.48                     |
| SPRING                               |                                 |                          |                                 |                          |                                 |                          |
| WEATHER                              | .10                             | 0.50                     | ----                            | ----                     | .05                             | 0.50                     |
| FOG                                  | .30                             | 3.81                     | .58                             | 6.12                     | .45                             | 5.43                     |
| LOCKING                              | 1.00                            | 4.89                     | 1.00                            | 4.36                     | 1.00                            | 4.60                     |
| REPAIRS                              | .40                             | 4.81                     | .25                             | 8.08                     | .32                             | 6.21                     |
| ICE                                  | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CREW CHANGE                          | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| SUPPLIES                             | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CHANNEL DELAY                        | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| AWAITING ORDERS                      | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| VESSEL ASSISTING                     | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| AWAITING BERTH                       | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| BRIDGE WAIT                          | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| FLEETING                             | .60                             | 0.77                     | .83                             | 3.21                     | .73                             | 2.29                     |

TABLE 14 (continued)  
 AVERAGE DELAY BY WATERWAY AND SEASON

|                                      | DOWNRIVER                 |                    | UPRIVER                   |                    | BOTH                      |                    |
|--------------------------------------|---------------------------|--------------------|---------------------------|--------------------|---------------------------|--------------------|
|                                      | PROBABILITY OF OCCURRENCE | MEAN DELAY (HOURS) | PROBABILITY OF OCCURRENCE | MEAN DELAY (HOURS) | PROBABILITY OF OCCURRENCE | MEAN DELAY (HOURS) |
| BLACK WARRIOR-TOMBIGBEE RIVER SYSTEM |                           |                    |                           |                    |                           |                    |
| SUMMER                               |                           |                    |                           |                    |                           |                    |
| WEATHER                              | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| FOG                                  | .25                       | 5.94               | .15                       | 2.50               | .20                       | 4.57               |
| LOCKING                              | .92                       | 5.06               | 1.00                      | 5.33               | .96                       | 5.21               |
| REPAIRS                              | .17                       | 11.09              | .15                       | 7.29               | .16                       | 9.18               |
| ICE                                  | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| CREW CHANGE                          | ----                      | ----               | .08                       | 0.42               | .04                       | 0.42               |
| SUPPLIES                             | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| CHANNEL DELAY                        | .17                       | 1.38               | .15                       | 2.38               | .16                       | 1.88               |
| AWAITING ORDERS                      | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| VESSEL ASSISTING                     | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| AWAITING BERTH                       | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| BRIDGE WAIT                          | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| FLEETING                             | .67                       | 2.92               | .92                       | 4.96               | .80                       | 4.14               |
| WINTER                               |                           |                    |                           |                    |                           |                    |
| WEATHER                              | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| FOG                                  | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| LOCKING                              | 1.00                      | 2.50               | 1.00                      | 2.42               | 1.00                      | 2.46               |
| REPAIRS                              | ----                      | ----               | 1.00                      | 3.25               | .50                       | 3.25               |
| ICE                                  | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| CREW CHANGE                          | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| SUPPLIES                             | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| CHANNEL DELAY                        | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| AWAITING ORDERS                      | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| VESSEL ASSISTING                     | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| AWAITING BERTH                       | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| BRIDGE WAIT                          | 1.00                      | 8.50               | ----                      | ----               | .50                       | 8.50               |
| FLEETING                             | ----                      | ----               | 1.-0                      | 10.33              | .50                       | 10.33              |

TABLE 14            (continued)  
 AVERAGE DELAY BY WATERWAY AND SEASON

|  | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
|--|---------------------------------|--------------------------|
| GULF INTRACOASTAL WATERWAY - EASTERN PORTION |                                 |                          |
| FALL   |                                 |                          |
| WEATHER                                      | ----                            | ----                     |
| FOG  | ----                            | ----                     |
| LOCKING                                      | .33                             | 4.50                     |
| REPAIRS                                      | .22                             | 2.92                     |
| ICE  | ----                            | ----                     |
| CREW CHANGE                                  | ----                            | ----                     |
| SUPPLIES                                     | .11                             | 0.67                     |
| CHANNEL DELAY                                | .11                             | 0.33                     |
| AWAITING ORDERS                              | ----                            | ----                     |
| VESSEL ASSISTING                             | ----                            | ----                     |
| AWAITING BERTH                               | ----                            | ----                     |
| BRIDGE WAIT                                  | ----                            | ----                     |
| FLEETING                                     | .22                             | 1.21                     |
|  |                                 |                          |
| SPRING                                       |                                 |                          |
| WEATHER                                      | .12                             | 11.75                    |
| FOG  | .12                             | 5.00                     |
| LOCKING                                      | .38                             | 16.39                    |
| REPAIRS                                      | .12                             | 0.83                     |
| ICE  | ----                            | ----                     |
| CREW CHANGE                                  | ----                            | ----                     |
| SUPPLIES                                     | ----                            | ----                     |
| CHANNEL DELAY                                | ----                            | ----                     |
| AWAITING ORDERS                              | ----                            | ----                     |
| VESSEL ASSISTING                             | .12                             | 0.50                     |
| AWAITING BERTH                               | ----                            | ----                     |
| BRIDGE WAIT                                  | ----                            | ----                     |
| FLEETING                                     | .38                             | 0.56                     |

TABLE 14 (continued)

AVERAGE DELAY BY WATERWAY AND SEASON

|  | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
|--|---------------------------------|--------------------------|
| GULF INTRACOASTAL WATERWAY - EASTERN PORTION |                                 |                          |
| SUMMER                                       |                                 |                          |
| WEATHER                                      | .20                             | 5.25                     |
| FOG  | ----                            | ----                     |
| LOCKING                                      | .20                             | 11.58                    |
| REPAIRS                                      | ----                            | ----                     |
| ICE  | ----                            | ----                     |
| CREW CHANGE                                  | ----                            | ----                     |
| SUPPLIES                                     | ----                            | ----                     |
| CHANNEL DELAY                                | .20                             | 3.00                     |
| AWAITING ORDERS                              | ----                            | ----                     |
| VESSEL ASSISTING                             | .20                             | 0.67                     |
| AWAITING BERTH                               | ----                            | ----                     |
| BRIDGE WAIT                                  | ----                            | ----                     |
| FLEETING                                     | .40                             | 5.62                     |
| WINTER                                       |                                 |                          |
| WEATHER                                      | .21                             | 14.42                    |
| FOG  | .14                             | 15.58                    |
| LOCKING                                      | .57                             | 4.94                     |
| REPAIRS                                      | ----                            | ----                     |
| ICE  | ----                            | ----                     |
| CREW CHANGE                                  | .07                             | 0.50                     |
| SUPPLIES                                     | ----                            | ----                     |
| CHANNEL DELAY                                | ----                            | ----                     |
| AWAITING ORDERS                              | ----                            | ----                     |
| VESSEL ASSISTING                             | .07                             | 32.17                    |
| AWAITING BERTH                               | .14                             | 1.96                     |
| BRIDGE WAIT                                  | ----                            | ----                     |
| FLEETING                                     | .21                             | 5.58                     |

TABLE 14 (continued)

## AVERAGE DELAY BY WATERWAY AND SEASON

|  | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
|--|---------------------------------|--------------------------|
|--|---------------------------------|--------------------------|

GULF INTRACOASTAL WATERWAY - WESTERN PORTION  
FALL

|                  |      |      |
|------------------|------|------|
| WEATHER          | ---- | ---- |
| FOG              | .36  | 3.73 |
| LOCKING          | .79  | 7.48 |
| REPAIRS          | .07  | 1.84 |
| ICE              | ---- | ---- |
| CREW CHANGE      | .07  | 0.83 |
| SUPPLIES         | .21  | 1.89 |
| CHANNEL DELAY    | .07  | 1.32 |
| AWAITING ORDERS  | .07  | 0.25 |
| VESSEL ASSISTING | .07  | 5.25 |
| AWAITING BERTH   | ---- | ---- |
| BRIDGE WAIT      | .14  | 4.29 |
| FLEETING         | ---- | ---- |

## SPRING

|                  |      |       |
|------------------|------|-------|
| WEATHER          | .11  | 13.33 |
| FOG              | .26  | 4.18  |
| LOCKING          | .78  | 7.85  |
| REPAIRS          | .15  | 1.96  |
| ICE              | ---- | ----  |
| CREW CHANGE      | ---- | ----  |
| SUPPLIES         | .15  | 1.14  |
| CHANNEL DELAY    | .48  | 2.45  |
| AWAITING ORDERS  | .04  | 2.00  |
| VESSEL ASSISTING | .15  | 1.08  |
| AWAITING BERTH   | .04  | 29.83 |
| BRIDGE WAIT      | .15  | 6.46  |
| FLEETING         | .44  | 2.98  |

TABLE 14 (continued)

## AVERAGE DELAY BY WATERWAY AND SEASON

|  | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
|--|---------------------------------|--------------------------|
| GULF INTRACOASTAL WATERWAY - WESTERN PORTION |                                 |                          |
| SUMMER                                       |                                 |                          |
| WEATHER                                      | .18                             | 0.29                     |
| FOG  | ----                            | ----                     |
| LOCKING                                      | .55                             | 10.82                    |
| REPAIRS                                      | .18                             | 6.08                     |
| ICE  | ----                            | ----                     |
| CREW CHANGE                                  | ----                            | ----                     |
| SUPPLIES                                     | ----                            | ----                     |
| CHANNEL DELAY                                | .09                             | 24.00                    |
| AWAITING ORDERS                              | ----                            | ----                     |
| VESSEL ASSISTING                             | .18                             | 0.80                     |
| AWAITING BERTH                               | .09                             | 6.00                     |
| BRIDGE WAIT                                  | ----                            | ----                     |
| FLEETING                                     | .18                             | 1.42                     |
| WINTER                                       |                                 |                          |
| WEATHER                                      | .09                             | 4.96                     |
| FOG  | .18                             | 11.38                    |
| LOCKING                                      | .59                             | 5.93                     |
| REPAIRS                                      | .09                             | 11.62                    |
| ICE  | ----                            | ----                     |
| CREW CHANGE                                  | .04                             | 2.17                     |
| SUPPLIES                                     | .18                             | 3.09                     |
| CHANNEL DELAY                                | .23                             | 2.30                     |
| AWAITING ORDERS                              | ----                            | ----                     |
| VESSEL ASSISTING                             | ----                            | ----                     |
| AWAITING BERTH                               | .14                             | 8.33                     |
| BRIDGE WAIT                                  | .09                             | 1.54                     |
| FLEETING                                     | .23                             | 1.73                     |

TABLE 14 (continued)

## AVERAGE DELAY BY WATERWAY AND SEASON

|                       | DOWNRIVER                       |                          | UPRIVER                         |                          | BOTH                            |                          |
|-----------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|
|                       | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
| <b>ILLINOIS RIVER</b> |                                 |                          |                                 |                          |                                 |                          |
| <b>FALL</b>           |                                 |                          |                                 |                          |                                 |                          |
| WEATHER               | .20                             | 4.55                     | ----                            | ----                     | .09                             | 4.55                     |
| FOG                   | .20                             | 6.19                     | .25                             | 4.57                     | .23                             | 5.17                     |
| LOCKING               | 1.00                            | 14.97                    | 1.00                            | 24.59                    | 1.00                            | 20.47                    |
| REPAIRS               | .07                             | 0.50                     | .05                             | 9.50                     | .06                             | 5.00                     |
| ICE                   | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CREW CHANGE           | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| SUPPLIES              | ----                            | ----                     | .05                             | 5.75                     | .03                             | 5.75                     |
| CHANNEL DELAY         | .20                             | 1.22                     | .65                             | 1.58                     | .46                             | 1.51                     |
| AWAITING ORDERS       | .07                             | 2.50                     | ----                            | ----                     | .03                             | 2.50                     |
| VESSEL ASSISTING      | .07                             | 3.83                     | .20                             | 8.88                     | .14                             | 7.87                     |
| AWAITING BERTH        | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| BRIDGE WAIT           | ----                            | ----                     | .15                             | 0.61                     | .09                             | 0.61                     |
| FLEETING              | .47                             | 4.15                     | .40                             | 2.06                     | .43                             | 3.04                     |
| <b>SPRING</b>         |                                 |                          |                                 |                          |                                 |                          |
| WEATHER               | .13                             | 4.08                     | .10                             | 6.50                     | .11                             | 5.29                     |
| FOG                   | .13                             | 2.33                     | ----                            | ----                     | .06                             | 2.33                     |
| LOCKING               | 1.00                            | 13.98                    | 1.00                            | 21.93                    | 1.00                            | 18.39                    |
| REPAIRS               | .25                             | 5.00                     | .10                             | 2.67                     | .17                             | 4.22                     |
| ICE                   | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CREW CHANGE           | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| SUPPLIES              | ----                            | ----                     | .10                             | 0.42                     | .06                             | 0.42                     |
| CHANNEL DELAY         | .25                             | 0.88                     | .80                             | 2.16                     | .56                             | 1.90                     |
| AWAITING ORDERS       | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| VESSEL ASSISTING      | .25                             | 2.42                     | .20                             | 5.63                     | .22                             | 4.02                     |
| AWAITING BERTH        | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| BRIDGE WAIT           | .13                             | 0.17                     | ----                            | ----                     | .06                             | 0.17                     |
| FLEETING              | .63                             | 10.37                    | .90                             | 4.17                     | .78                             | 6.38                     |

TABLE 14 (continued)

## AVERAGE DELAY BY WATERWAY AND SEASON

|                  | DOWNRIVER                       |                          | UPRIVER                         |                          | BOTH                            |                          |
|------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|
|                  | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
| ILLINOIS RIVER   |                                 |                          |                                 |                          |                                 |                          |
| SUMMER           |                                 |                          |                                 |                          |                                 |                          |
| WEATHER          | .07                             | 2.33                     | .08                             | 2.00                     | .07                             | 2.16                     |
| FOG              | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| LOCKING          | .87                             | 19.38                    | .83                             | 19.59                    | .85                             | 19.47                    |
| REPAIRS          | .13                             | 0.88                     | .08                             | 4.33                     | .11                             | 2.03                     |
| ICE              | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CREW CHANGE      | ----                            | ----                     | .08                             | 2.00                     | .04                             | 2.00                     |
| SUPPLIES         | ----                            | ----                     | .08                             | 0.42                     | .04                             | 0.42                     |
| CHANNEL DELAY    | .13                             | 1.00                     | .75                             | 1.12                     | .41                             | 1.10                     |
| AWAITING ORDERS  | .07                             | 4.50                     | ----                            | ----                     | .04                             | 4.50                     |
| VESSEL ASSISTING | .07                             | 0.67                     | .17                             | 1.88                     | .11                             | 1.57                     |
| AWAITING BERTH   | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| BRIDGE WAIT      | .13                             | 2.17                     | ----                            | ----                     | .07                             | 2.17                     |
| FLEETING         | .93                             | 5.24                     | .25                             | 7.23                     | .67                             | 5.68                     |
| WINTER           |                                 |                          |                                 |                          |                                 |                          |
| WEATHER          | .29                             | 4.50                     | .08                             | 14.17                    | .16                             | 7.72                     |
| FOG              | ----                            | ----                     | .33                             | 1.96                     | .21                             | 1.96                     |
| LOCKING          | .86                             | 3.85                     | 1.00                            | 9.09                     | .95                             | 7.34                     |
| REPAIRS          | ----                            | ----                     | .08                             | 15.92                    | .05                             | 15.92                    |
| ICE              | .43                             | 18.33                    | .25                             | 18.86                    | .32                             | 18.60                    |
| CREW CHANGE      | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| SUPPLIES         | ----                            | ----                     | .17                             | 1.38                     | .11                             | 1.38                     |
| CHANNEL DELAY    | .29                             | 5.13                     | .42                             | 7.55                     | .37                             | 6.86                     |
| AWAITING ORDERS  | ----                            | ----                     | .08                             | 2.00                     | .05                             | 2.00                     |
| VESSEL ASSISTING | .57                             | 17.93                    | .58                             | 5.55                     | .58                             | 10.05                    |
| AWAITING BERTH   | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| BRIDGE WAIT      | ----                            | ----                     | .08                             | 0.75                     | .05                             | 0.75                     |
| FLEETING         | .71                             | 9.52                     | .42                             | 19.73                    | .53                             | 14.62                    |

TABLE 14 (continued)

## AVERAGE DELAY BY WATERWAY AND SEASON

|                         | DOWNRIVER                       |                          | UPRIVER                         |                          | BOTH                            |                          |
|-------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|
|                         | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
| LOWER MISSISSIPPI RIVER |                                 |                          |                                 |                          |                                 |                          |
| FALL                    |                                 |                          |                                 |                          |                                 |                          |
| WEATHER                 | .05                             | 1.50                     | ----                            | ----                     | .02                             | 1.50                     |
| FOG                     | .32                             | 5.43                     | .43                             | 4.08                     | .38                             | 4.55                     |
| LOCKING                 | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| REPAIRS                 | .05                             | 1.75                     | .23                             | 7.74                     | .15                             | 6.99                     |
| ICE                     | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CREW CHANGE             | .05                             | 3.75                     | .03                             | 1.00                     | .04                             | 2.38                     |
| SUPPLIES                | .14                             | 1.77                     | .17                             | 1.72                     | .15                             | 1.74                     |
| CHANNEL DELAY           | .23                             | 2.52                     | .83                             | 5.96                     | .58                             | 5.38                     |
| AWAITING ORDERS         | .05                             | 0.25                     | ----                            | ----                     | .02                             | 0.25                     |
| VESSEL ASSISTING        | .27                             | 2.83                     | .20                             | 2.38                     | .23                             | 2.60                     |
| AWAITING BERTH          | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| BRIDGE WAIT             | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| FLEETING                | .50                             | 5.56                     | .47                             | 5.60                     | .48                             | 6.11                     |
| SPRING                  |                                 |                          |                                 |                          |                                 |                          |
| WEATHER                 | .04                             | 2.50                     | ----                            | ----                     | .02                             | 2.50                     |
| FOG                     | .29                             | 4.98                     | .19                             | 4.03                     | .24                             | 4.62                     |
| LOCKING                 | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| REPAIRS                 | .11                             | 12.64                    | .11                             | 2.83                     | .11                             | 7.74                     |
| ICE                     | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CREW CHANGE             | ----                            | ----                     | .04                             | 0.83                     | .02                             | 0.83                     |
| SUPPLIES                | .07                             | 0.46                     | .04                             | 5.19                     | .11                             | 3.61                     |
| CHANNEL DELAY           | .04                             | 3.25                     | .48                             | 2.56                     | .25                             | 2.61                     |
| AWAITING ORDERS         | ----                            | ----                     | .04                             | 4.09                     | .02                             | 4.09                     |
| VESSEL ASSISTING        | .18                             | 1.73                     | .37                             | 4.92                     | .27                             | 3.86                     |
| AWAITING BERTH          | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| BRIDGE WAIT             | .11                             | 14.08                    | .07                             | 0.38                     | .09                             | 8.60                     |
| FLEETING                | .43                             | 9.67                     | .48                             | 10.61                    | .45                             | 10.16                    |

## AVERAGE DELAY BY WATERWAY AND SEASON

|                         | DOWNRIVER                      |                          | UPRIVER                        |                          | BOTH                           |                          |
|-------------------------|--------------------------------|--------------------------|--------------------------------|--------------------------|--------------------------------|--------------------------|
|                         | PROBABILITY<br>OF<br>OCCURENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURENCE | MEAN<br>DELAY<br>(HOURS) |
| LOWER MISSISSIPPI RIVER |                                |                          |                                |                          |                                |                          |
| SUMMER                  |                                |                          |                                |                          |                                |                          |
| WEATHER                 | ----                           | ----                     | .04                            | 0.50                     | .02                            | 0.50                     |
| FOG                     | .04                            | 3.00                     | ----                           | ----                     | .02                            | 3.00                     |
| LOCKING                 | ----                           | ----                     | ----                           | ----                     | ----                           | ----                     |
| REPAIRS                 | .04                            | 0.75                     | .32                            | 4.03                     | .18                            | 3.66                     |
| ICE                     | ----                           | ----                     | ----                           | ----                     | ----                           | ----                     |
| CREW CHANGE             | ----                           | ----                     | .04                            | 1.00                     | .02                            | 1.00                     |
| SUPPLIES                | .12                            | 2.92                     | .16                            | 1.69                     | .14                            | 2.21                     |
| CHANNEL DELAY           | ----                           | ----                     | .60                            | 3.21                     | .29                            | 3.21                     |
| AWAITING ORDERS         | ----                           | ----                     | ----                           | ----                     | ----                           | ----                     |
| VESSEL ASSISTING        | .27                            | 2.25                     | .08                            | 1.75                     | .18                            | 2.14                     |
| AWAITING BERTH          | .12                            | 4.06                     | ----                           | ----                     | .06                            | 4.06                     |
| BRIDGE WAIT             | ----                           | ----                     | ----                           | ----                     | ----                           | ----                     |
| FLEETING                | .35                            | 5.21                     | .28                            | 7.14                     | .31                            | 6.06                     |
| WINTER                  |                                |                          |                                |                          |                                |                          |
| WEATHER                 | .07                            | 1.42                     | .16                            | 8.39                     | .12                            | 6.65                     |
| FOG                     | .53                            | 17.97                    | .37                            | 13.39                    | .44                            | 15.83                    |
| LOCKING                 | ----                           | ----                     | ----                           | ----                     | ----                           | ----                     |
| REPAIRS                 | .27                            | 6.89                     | .16                            | 4.08                     | .21                            | 5.69                     |
| ICE                     | ----                           | ----                     | ----                           | ----                     | ----                           | ----                     |
| CREW CHANGE             | ----                           | ----                     | ----                           | ----                     | ----                           | ----                     |
| SUPPLIES                | .13                            | 9.04                     | .16                            | 0.81                     | .14                            | 4.10                     |
| CHANNEL DELAY           | .07                            | 2.33                     | .58                            | 2.42                     | .35                            | 2.42                     |
| AWAITING ORDERS         | ----                           | ----                     | ----                           | ----                     | ----                           | ----                     |
| VESSEL ASSISTING        | .40                            | 3.89                     | .16                            | 5.25                     | .26                            | 4.34                     |
| AWAITING BERTH          | ----                           | ----                     | .05                            | 1.00                     | .03                            | 1.00                     |
| BRIDGE WAIT             | ----                           | ----                     | .11                            | 0.96                     | .06                            | 0.96                     |
| FLEETING                | .53                            | 16.02                    | .42                            | 10.61                    | .47                            | 13.32                    |

TABLE 14 (continued)

## AVERAGE DELAY BY WATERWAY AND SEASON

|                  | DOWNRIVER                       |                          | UPRIVER                         |                          | BOTH                            |                          |
|------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|
|                  | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
| MISSOURI RIVER   |                                 |                          |                                 |                          |                                 |                          |
| FALL             |                                 |                          |                                 |                          |                                 |                          |
| WEATHER          | .20                             | 37.67                    | ----                            | ----                     | .10                             | 37.67                    |
| FOG              | .80                             | 9.33                     | .60                             | 7.50                     | .70                             | 8.55                     |
| LOCKING          | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| REPAIRS          | .40                             | 2.88                     | .20                             | 3.32                     | .30                             | 3.02                     |
| ICE              | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CREW CHANGE      | .20                             | 0.50                     | .20                             | 0.92                     | .20                             | 0.71                     |
| SUPPLIES         | .40                             | 1.83                     | .40                             | 1.66                     | .40                             | 1.75                     |
| CHANNEL DELAY    | ----                            | ----                     | .60                             | 1.31                     | .30                             | 1.31                     |
| AWAITING ORDERS  | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| VESSEL ASSISTING | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| AWAITING BERTH   | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| BRIDGE WAIT      | .20                             | 1.17                     | ----                            | ----                     | .10                             | 1.17                     |
| FLEETING         | .40                             | 10.84                    | .80                             | 3.67                     | .60                             | 6.06                     |
| SPRING           |                                 |                          |                                 |                          |                                 |                          |
| WEATHER          | .50                             | 8.75                     | ----                            | ----                     | .17                             | 8.75                     |
| FOG              | ----                            | ----                     | .25                             | 2.25                     | .17                             | 2.25                     |
| LOCKING          | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| REPAIRS          | ----                            | ----                     | .25                             | 4.58                     | .17                             | 4.58                     |
| ICE              | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CREW CHANGE      | ----                            | ----                     | .25                             | 0.25                     | .17                             | 0.25                     |
| SUPPLIES         | .50                             | 0.83                     | .50                             | 2.58                     | .50                             | 2.00                     |
| CHANNEL DELAY    | ----                            | ----                     | .50                             | 0.42                     | .33                             | 0.42                     |
| AWAITING ORDERS  | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| VESSEL ASSISTING | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| AWAITING BERTH   | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| BRIDGE WAIT      | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| FLEETING         | 1.00                            | 24.79                    | .75                             | 4.29                     | .83                             | 12.87                    |

TABLE 14 (continued)

## AVERAGE DELAY BY WATERWAY AND SEASON

|                  | DOWNRIVER                      |                          | UPRIVER                        |                          | BOTH                           |                          |
|------------------|--------------------------------|--------------------------|--------------------------------|--------------------------|--------------------------------|--------------------------|
|                  | PROBABILITY<br>OF<br>OCCURENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURENCE | MEAN<br>DELAY<br>(HOURS) |
| MISSOURI RIVER   |                                |                          |                                |                          |                                |                          |
| SUMMER           |                                |                          |                                |                          |                                |                          |
| WEATHER          | .12                            | 6.75                     | ----                           | ----                     | .07                            | 6.75                     |
| FOG              | .25                            | 1.83                     | .29                            | 2.96                     | .27                            | 2.40                     |
| LOCKING          | ----                           | ----                     | ----                           | ----                     | ----                           | ----                     |
| REPAIRS          | ----                           | ----                     | ----                           | ----                     | ----                           | ----                     |
| ICE              | ----                           | ----                     | ----                           | ----                     | .07                            | 0.50                     |
| CREW CHANGE      | .12                            | 0.50                     | ----                           | ----                     | .13                            | 1.83                     |
| SUPPLIES         | .12                            | 1.83                     | .14                            | 1.83                     | .13                            | 11.42                    |
| CHANNEL DELAY    | ----                           | ----                     | .29                            | 0.58                     | .07                            | 0.58                     |
| AWAITING ORDERS  | ----                           | ----                     | ----                           | ----                     | ----                           | ----                     |
| VESSEL ASSISTING | ----                           | ----                     | ----                           | ----                     | ----                           | ----                     |
| AWAITING BERTH   | ----                           | ----                     | ----                           | ----                     | ----                           | ----                     |
| BRIDGE WAIT      | .25                            | 8.25                     | .43                            | 4.75                     | .33                            | 6.15                     |
| FLEETING         | .75                            | 3.43                     | .86                            | 3.96                     | .80                            | 3.70                     |

THERE WERE NO SAMPLE OBSERVATIONS FOR WINTER TRIPS ON THE MISSOURI RIVER AS THE WATERWAY WAS CLOSED.

TABLE 14 (continued)

## AVERAGE DELAY BY WATERWAY AND SEASON

|                  | DOWNRIVER                       |                          | UPRIVER                         |                          | BOTH                            |                          |
|------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|
|                  | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
| OHIO RIVER       |                                 |                          |                                 |                          |                                 |                          |
| FALL             |                                 |                          |                                 |                          |                                 |                          |
| WEATHER          | ----                            | ----                     | .05                             | 1.62                     | .03                             | 1.62                     |
| FOG              | .40                             | 7.98                     | .34                             | 11.80                    | .36                             | 10.21                    |
| LOCKING          | 1.00                            | 48.70                    | 1.00                            | 46.21                    | 1.00                            | 47.15                    |
| REPAIRS          | .08                             | 4.00                     | .15                             | 13.22                    | .12                             | 10.92                    |
| ICE              | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CREW CHANGE      | .20                             | 0.67                     | .10                             | 1.60                     | .14                             | 1.08                     |
| SUPPLIES         | .12                             | 0.75                     | .15                             | 4.72                     | .14                             | 3.40                     |
| CHANNEL DELAY    | .08                             | 0.46                     | .27                             | 3.63                     | .20                             | 3.14                     |
| AWAITING ORDERS  | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| VESSEL ASSISTING | .04                             | 1.00                     | .02                             | 0.92                     | .03                             | 0.96                     |
| AWAITING BERTH   | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| BRIDGE WAIT      | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| FLEETING         | .80                             | 11.75                    | .61                             | 8.10                     | .68                             | 9.72                     |
| SPRING           |                                 |                          |                                 |                          |                                 |                          |
| WEATHER          | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| FOG              | .08                             | 4.06                     | .09                             | 1.81                     | .08                             | 2.77                     |
| LOCKING          | 1.00                            | 8.40                     | .98                             | 8.84                     | .99                             | 8.62                     |
| REPAIRS          | .20                             | 2.56                     | .14                             | 15.39                    | .17                             | 8.06                     |
| ICE              | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CREW CHANGE      | ----                            | ----                     | .09                             | 0.54                     | .05                             | 0.54                     |
| SUPPLIES         | .15                             | 1.15                     | .19                             | 2.09                     | .17                             | 1.69                     |
| CHANNEL DELAY    | .05                             | 0.46                     | .26                             | 0.98                     | .16                             | 0.90                     |
| AWAITING ORDERS  | ----                            | ----                     | .02                             | 115.75                   | .01                             | 115.75                   |
| VESSEL ASSISTING | .10                             | 1.56                     | .07                             | 1.14                     | .08                             | 1.38                     |
| AWAITING BERTH   | .03                             | 1.00                     | ----                            | ----                     | .01                             | 1.00                     |
| BRIDGE WAIT      | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| FLEETING         | .78                             | 7.69                     | .79                             | 8.24                     | .78                             | 7.98                     |

TABLE 14 (continued)

## AVERAGE DELAY BY WATERWAY AND SEASON

|                  | DOWNRIVER                      |                          | UPRIVER                        |                          | BOTH                           |                          |
|------------------|--------------------------------|--------------------------|--------------------------------|--------------------------|--------------------------------|--------------------------|
|                  | PROBABILITY<br>OF<br>OCCURENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURENCE | MEAN<br>DELAY<br>(HOURS) |
| OHIO RIVER       |                                |                          |                                |                          |                                |                          |
| SUMMER           |                                |                          |                                |                          |                                |                          |
| WEATHER          | ----                           | ----                     | ----                           | ----                     | ----                           | ----                     |
| FOG              | .26                            | 4.65                     | .14                            | 2.73                     | .20                            | 3.90                     |
| LOCKING          | 1.00                           | 15.89                    | 1.00                           | 16.85                    | 1.00                           | 16.37                    |
| REPAIRS          | .06                            | 0.88                     | .09                            | 3.83                     | .07                            | 2.65                     |
| ICE              | ----                           | ----                     | ----                           | ----                     | ----                           | ----                     |
| CREW CHANGE      | .09                            | 0.39                     | .06                            | 2.83                     | .07                            | 1.36                     |
| SUPPLIES         | .21                            | 0.99                     | .40                            | 1.27                     | .30                            | 1.17                     |
| CHANNEL DELAY    | .03                            | 2.50                     | .29                            | 0.83                     | .16                            | 0.98                     |
| AWAITING ORDERS  | .03                            | 0.50                     | ----                           | ----                     | .01                            | 0.50                     |
| VESSEL ASSISTING | .09                            | 0.70                     | .14                            | 2.42                     | .12                            | 1.77                     |
| AWAITING BERTH   | ----                           | ----                     | ----                           | ----                     | ----                           | ----                     |
| BRIDGE WAIT      | ----                           | ----                     | .03                            | 0.50                     | .01                            | 0.50                     |
| FLEETING         | .68                            | 8.87                     | .74                            | 9.52                     | .71                            | 9.21                     |
| WINTER           |                                |                          |                                |                          |                                |                          |
| WEATHER          | .17                            | 6.47                     | .18                            | 26.33                    | .17                            | 16.40                    |
| FOG              | .44                            | 6.23                     | .12                            | 9.62                     | .29                            | 6.91                     |
| LOCKING          | 1.00                           | 21.16                    | 1.00                           | 16.56                    | 1.00                           | 18.93                    |
| REPAIRS          | .22                            | 4.96                     | .12                            | 10.04                    | .17                            | 6.65                     |
| ICE              | .39                            | 77.26                    | .35                            | 47.56                    | .37                            | 62.55                    |
| CREW CHANGE      | .06                            | 1.75                     | .06                            | 0.17                     | .06                            | 0.96                     |
| SUPPLIES         | .28                            | 1.02                     | .24                            | 3.64                     | .26                            | 2.18                     |
| CHANNEL DELAY    | .06                            | 0.50                     | .24                            | 0.50                     | .14                            | 0.50                     |
| AWAITING ORDERS  | ----                           | ----                     | .06                            | 0.75                     | .03                            | 0.75                     |
| VESSEL ASSISTING | .28                            | 5.50                     | .24                            | 6.98                     | .29                            | 6.24                     |
| AWAITING BERTH   | ----                           | ----                     | ----                           | ----                     | ----                           | ----                     |
| BRIDGE WAIT      | ----                           | ----                     | ----                           | ----                     | ----                           | ----                     |
| FLEETING         | .77                            | 12.27                    | .78                            | 10.88                    | .77                            | 11.60                    |

TABLE 14 (continued)  
AVERAGE DELAY BY WATERWAY AND SEASON

|                                | DOWNRIVER                 |                    | UPRIVER                   |                    | BOTH                      |                    |
|--------------------------------|---------------------------|--------------------|---------------------------|--------------------|---------------------------|--------------------|
|                                | PROBABILITY OF OCCURRENCE | MEAN DELAY (HOURS) | PROBABILITY OF OCCURRENCE | MEAN DELAY (HOURS) | PROBABILITY OF OCCURRENCE | MEAN DELAY (HOURS) |
| <b>UPPER MISSISSIPPI RIVER</b> |                           |                    |                           |                    |                           |                    |
| <b>FALL</b>                    |                           |                    |                           |                    |                           |                    |
| WEATHER                        | .03                       | 2.50               | ----                      | ----               | .01                       | 2.50               |
| FOG                            | .48                       | 6.63               | .26                       | 7.73               | .36                       | 7.07               |
| LOCKING                        | .97                       | 32.93              | .95                       | 34.25              | .96                       | 33.65              |
| REPAIRS                        | .03                       | 1.75               | .03                       | 13.00              | .03                       | 7.38               |
| ICE                            | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| CREW CHANGE                    | .06                       | 0.46               | .b1                       | 1.33               | .09                       | 1.04               |
| SUPPLIES                       | .13                       | 1.73               | .16                       | 1.52               | .14                       | 1.60               |
| CHANNEL DELAY                  | .29                       | 2.69               | .50                       | 1.92               | .41                       | 2.17               |
| AWAITING ORDERS                | ----                      | ----               | .05                       | 1.79               | .03                       | 1.79               |
| VESSEL ASSISTING               | .19                       | 5.30               | .21                       | 2.44               | .20                       | 3.67               |
| AWAITING BERTH                 | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| BRIDGE WAIT                    | .26                       | 0.68               | .29                       | 0.78               | .28                       | 0.74               |
| FLEETING                       | .90                       | 6.12               | .76                       | 7.17               | .83                       | 6.65               |
| <b>SPRING</b>                  |                           |                    |                           |                    |                           |                    |
| WEATHER                        | .18                       | 9.68               | .12                       | 16.15              | .15                       | 12.56              |
| FOG                            | .11                       | 4.58               | .09                       | 4.14               | .10                       | 4.36               |
| LOCKING                        | .89                       | 37.15              | .91                       | 48.04              | .90                       | 43.00              |
| REPAIRS                        | .21                       | 4.90               | .09                       | 10.84              | .15                       | 6.90               |
| ICE                            | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| CREW CHANGE                    | ----                      | ----               | .06                       | 1.34               | .03                       | 1.34               |
| SUPPLIES                       | .04                       | 3.00               | .06                       | 0.62               | .04                       | 1.42               |
| CHANNEL DELAY                  | .07                       | 3.38               | .44                       | 4.26               | .27                       | 4.15               |
| AWAITING ORDERS                | .04                       | 1.50               | ----                      | ----               | .01                       | 1.50               |
| VESSEL ASSISTING               | .25                       | 2.00               | .19                       | 2.94               | .22                       | 2.44               |
| AWAITING BERTH                 | ----                      | ----               | ----                      | ----               | ----                      | ----               |
| BRIDGE WAIT                    | .32                       | 0.77               | .19                       | 0.90               | .25                       | 0.82               |
| FLEETING                       | .89                       | 8.20               | .81                       | 5.41               | .85                       | 6.78               |

TABLE 14

(continued)

## AVERAGE DELAY BY WATERWAY AND SEASON

|                         | DOWNRIVER                       |                          | UPRIVER                         |                          | BOTH                            |                          |
|-------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|---------------------------------|--------------------------|
|                         | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) | PROBABILITY<br>OF<br>OCCURRENCE | MEAN<br>DELAY<br>(HOURS) |
| UPPER MISSISSIPPI RIVER |                                 |                          |                                 |                          |                                 |                          |
| SUMMER                  |                                 |                          |                                 |                          |                                 |                          |
| WEATHER                 | .14                             | 0.87                     | .13                             | 2.22                     | .13                             | 1.61                     |
| FOG                     | .28                             | 3.87                     | .28                             | 3.79                     | .28                             | 3.82                     |
| LOCKING                 | 1.90                            | 43.35                    | .91                             | 40.68                    | .95                             | 41.90                    |
| REPAIRS                 | .19                             | 19.31                    | .09                             | 0.83                     | .13                             | 12.59                    |
| ICE                     | ----                            | ----                     | ----                            | ----                     | ----                            | ----                     |
| CREW CHANGE             | .03                             | 0.75                     | .06                             | 0.67                     | .05                             | 0.69                     |
| SUPPLIES                | .06                             | 2.16                     | .09                             | 1.71                     | .07                             | 1.86                     |
| CHANNEL DELAY           | .28                             | 2.84                     | .66                             | 2.48                     | .49                             | 2.57                     |
| AWAITING ORDERS         | ----                            | ----                     | .02                             | 46.25                    | .01                             | 46.25                    |
| VESSEL ASSISTING        | .28                             | 2.50                     | .21                             | 3.67                     | .24                             | 3.08                     |
| AWAITING BERTH          | .03                             | 0.75                     | ----                            | ----                     | .01                             | 0.75                     |
| BRIDGE WAIT             | .25                             | 3.46                     | .28                             | 1.44                     | .27                             | 2.26                     |
| FLEETING                | .69                             | 6.54                     | .70                             | 9.79                     | .70                             | 8.39                     |
| WINTER                  |                                 |                          |                                 |                          |                                 |                          |
| WEATHER                 | .12                             | 11.03                    | ----                            | ----                     | .09                             | 11.03                    |
| FOG                     | .20                             | 11.77                    | .11                             | 24.75                    | .18                             | 13.93                    |
| LOCKING                 | .72                             | 60.28                    | .22                             | 107.92                   | .59                             | 65.04                    |
| REPAIRS                 | .08                             | 7.12                     | .11                             | 0.50                     | .09                             | 4.92                     |
| ICE                     | .40                             | 38.66                    | ----                            | ----                     | .29                             | 38.66                    |
| CREW CHANGE             | ----                            | ----                     | .11                             | 0.67                     | .03                             | 0.67                     |
| SUPPLIES                | .04                             | 2.00                     | .11                             | 1.50                     | .06                             | 1.75                     |
| CHANNEL DELAY           | .16                             | 12.83                    | .55                             | 2.12                     | .26                             | 6.88                     |
| AWAITING ORDERS         | .08                             | 7.25                     | ----                            | ----                     | .06                             | 7.25                     |
| VESSEL ASSISTING        | .16                             | 4.44                     | .11                             | 6.25                     | .15                             | 4.80                     |
| AWAITING BERTH          | ----                            | ----                     | .11                             | 6.00                     | .03                             | 6.00                     |
| BRIDGE WAIT             | .04                             | 3.00                     | ----                            | ----                     | .03                             | 3.00                     |
| FLEETING                | .48                             | 6.68                     | .11                             | 6.67                     | .38                             | 6.68                     |

TOW SPEEDS  
WEIGHTED AVERAGE ANNUAL VELOCITY  
UNDERWAY

DOWNSTREAM



UPSTREAM

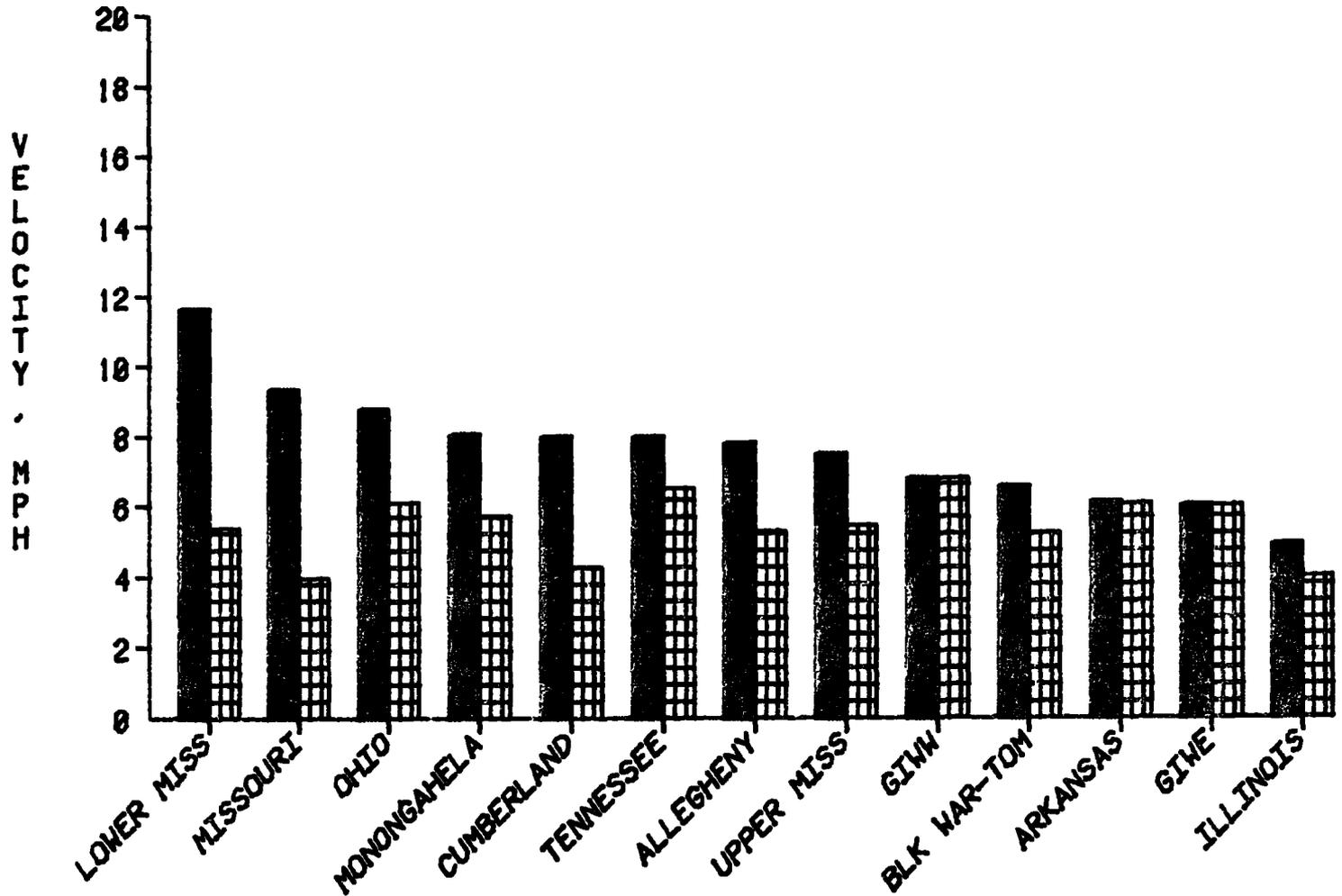


Figure 1

TOW SPEEDS  
WEIGHTED AVERAGE ANNUAL VELOCITY  
DOWNSTREAM

UNDERWAY 

DELAYS 

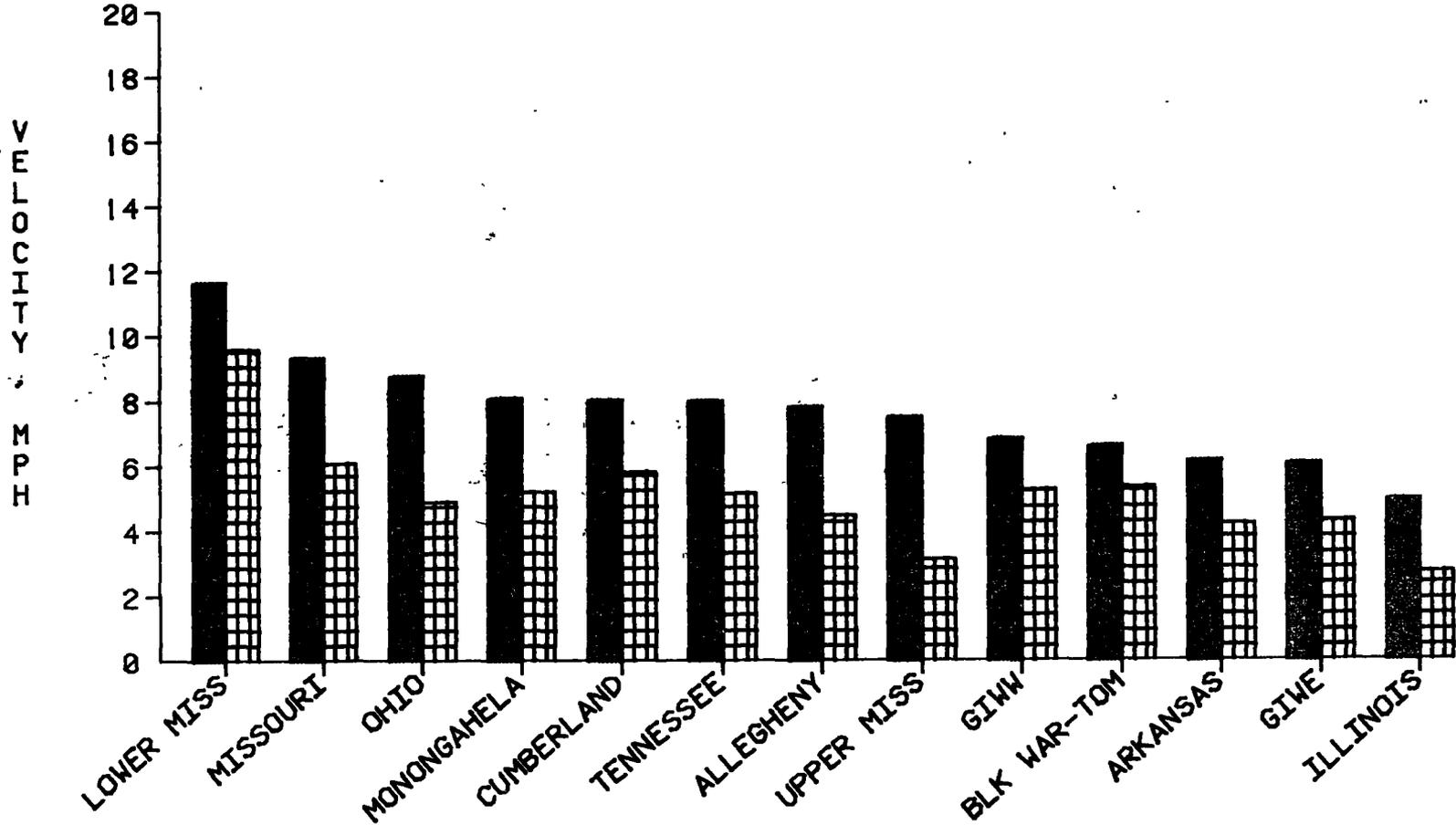


Figure 2

TOW SPEEDS  
WEIGHTED AVERAGE ANNUAL VELOCITY  
UPSTREAM

UNDERWAY 

DELAYS 

VELOCITY, MPH

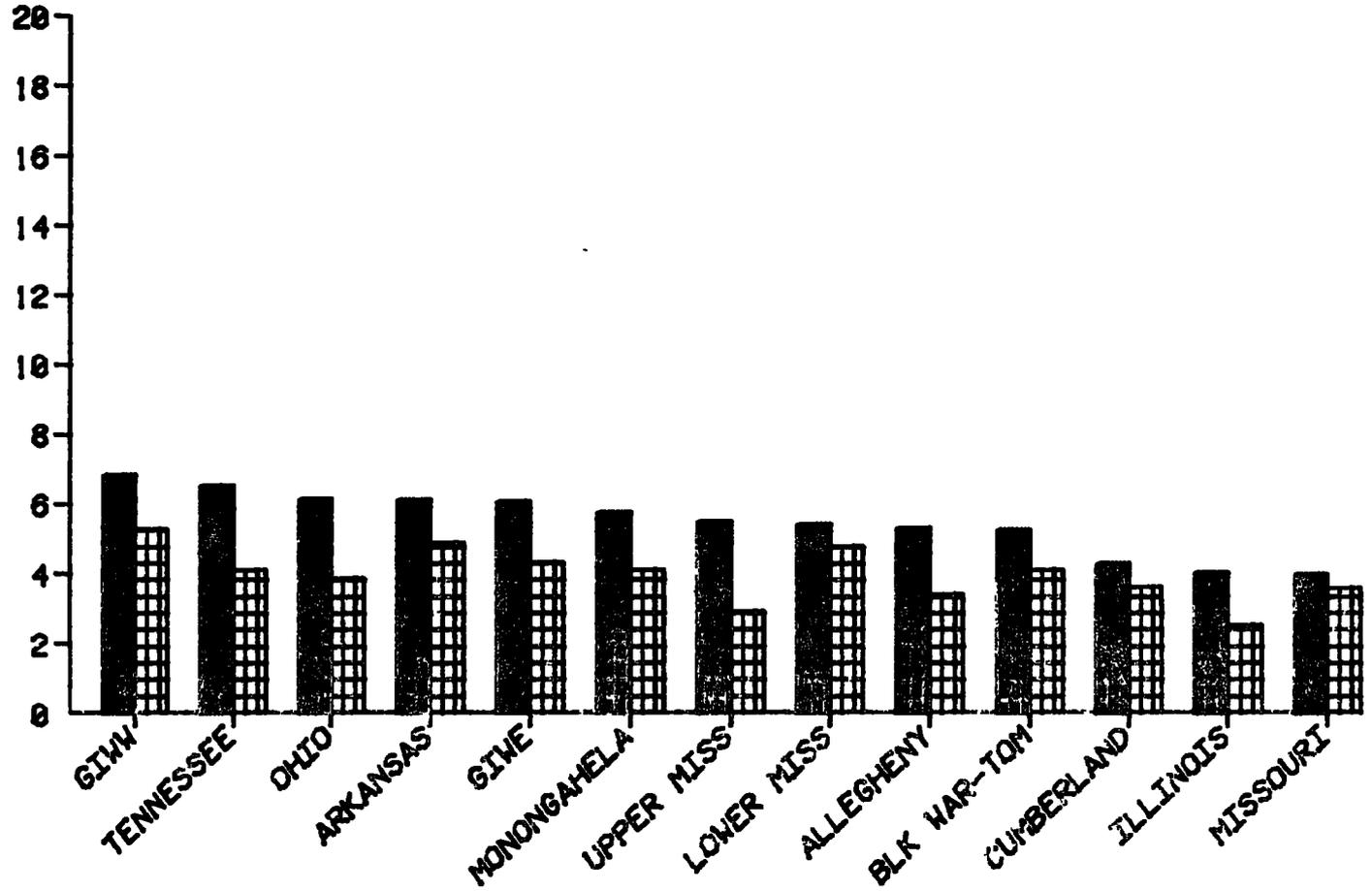


Figure 3

TOW SPEEDS  
WEIGHTED AVERAGE ANNUAL VELOCITY  
WITH DELAYS

DOWNSTREAM 

UPSTREAM 

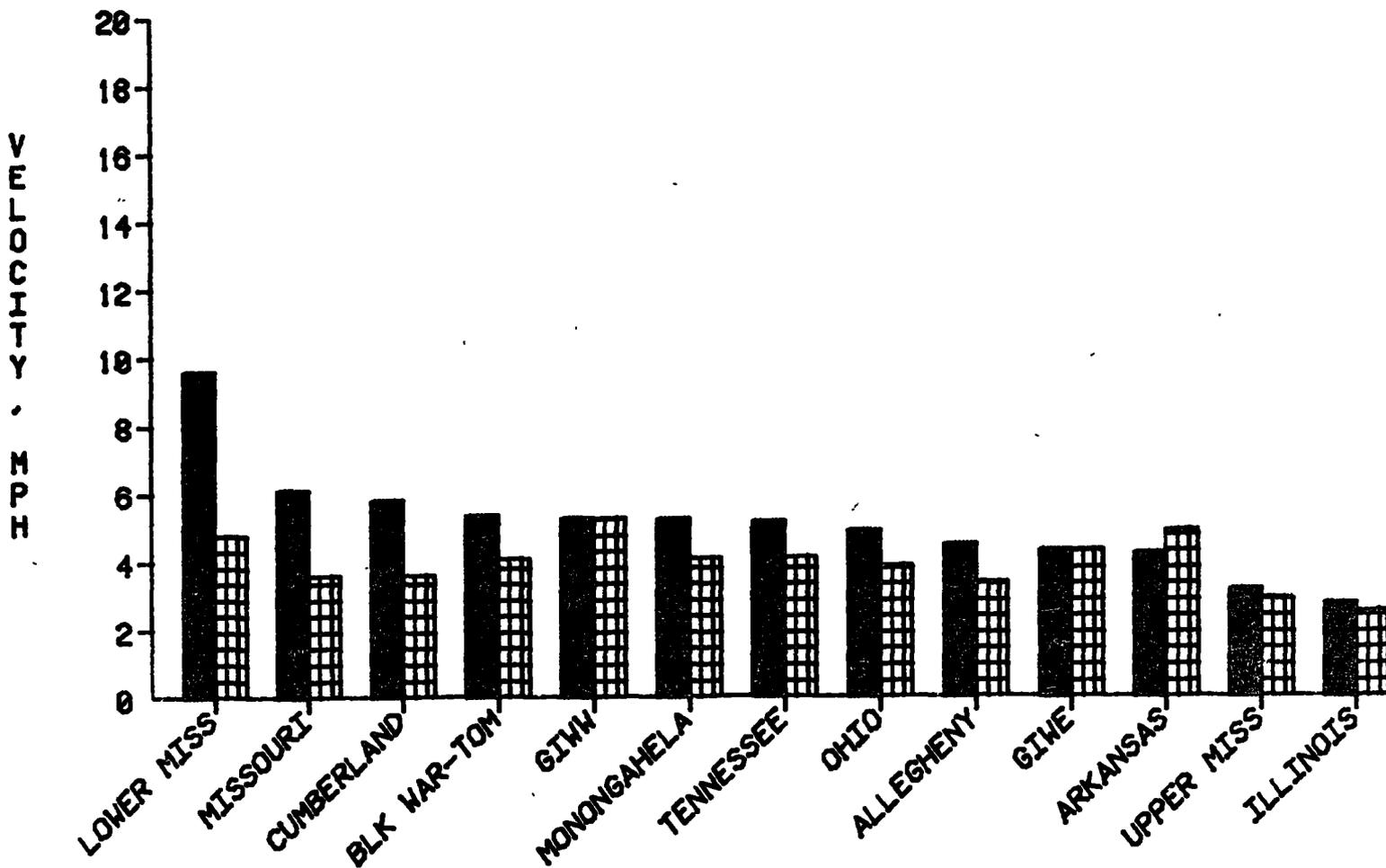


Figure 4