
Enhancing Patronage Estimation and Line Performance Monitoring Procedures

Final Report

Prepared for:

Southern California Rapid Transit District

January 1988

Multisystems, Inc.*

1050 Massachusetts Avenue

Cambridge, Massachusetts 02138

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Refreshing Ride Checks with Point Checks Data

1. Overview of Task 2

For the last several years, it has been SCRTD's policy to conduct a full day ride check of every line once a year, for the weekday schedule at least. The ride check program is quite expensive, and the purpose of this task is to explore the feasibility of updating ride checks using point checks. Point checks, at one or many points, provide partial information about the load profile of a trip, and combining this information with past ride check data can produce an estimated ride check that incorporates the up-to-date point check information, and is based on the pattern of the old ride checks.

The updating methodology described in the original proposal has been refined somewhat, and tested on several SCRTD lines to determine its accuracy.

2. Updating Methodology

The most recent set of ride checks is used to generate a seed O-D matrix upon which the estimate is based. The O-D matrix is then altered by a procedure known as Iterative Proportional Fit (IPF), which alternately factors up or down blocks of cells in the O-D matrix that correspond to observed load and on/off activity at the checkpoints to make them match observed load, ons, and offs. From the adjusted matrix, ons and offs are calculated by taking row and column totals, producing an estimated ride check. A more technical description of the algorithm is found in Appendix A.

Two changes from the methodology as originally proposed have been implemented. The first is needed when updating based on multiple point checks because, unlike in some IPF applications, some cells in the O-D matrix are factored more often than others in the course of an iteration. The cells factored more often are those corresponding to long trips, which are observed at all the checkpoints, as opposed to short trips, which may be observed at only one checkpoint. Accordingly, an "outer loop" was added to achieve internal consistency by essentially factoring the seed matrix up or down until the total number of trips in the factored matrix equals the total number of trips in the estimate. With this change, scaling the seed matrix up or down will leave the results unchanged.

The second change was how to update the number of passenger trips that do not pass a checkpoint. These passenger trips are not observed by the point checks and therefore are not affected by IPF. We had proposed factoring them up or down according to how much total boardings in the rest of the route was estimated to go up or down. The procedure we have instead used is more sensitive to growth on route segments. It factors up the travel within a between-checkpoint segment according to the estimated level of growth in intersegment activity (boarding and alightings) between that segment and other segments.

3. Applying the Procedure -- Technical Details

Implementing the updating procedure required us to resolve some technical issues, which we discuss here.

First, it became obvious that each branch needs its own seed. To make the seeds reflect changing travel patterns throughout the day, we created a separate seed for each branch-time period combination. The day was broken into time periods with the following time boundaries: 6 a.m., 9 a.m., 2 p.m., 6:30 p.m., and 3 a.m. The seed matrix for a branch-period combination was found by first accumulating branch-period on/off totals by stop from the seed data (the prior set of ride checks), and then generating an O-D matrix from this period profile.

When a branch-period combination has only a few trips in the seed data, it may be unwise to rely exclusively on those few trips for the seed matrix. Therefore, we devised a method to incorporate information from trips on other branches in that time period that served many of the same stops as the branch in question. We generated an O-D matrix for every trip in the seed data, and accumulated these O-D matrices by period, summing over all branches. The period O-D matrices were then normalized to reflect the activity between each O-D pair per bus trip serving that O-D pair. When a branch-period combination contained too few trips, its seed matrix was generated by extracting from the normalized period O-D matrix the cells served by that branch. Branch-period combinations with no trips in the seed data were not analyzed.

Point check data was simulated by extracting on, off, and thru volume at designated checkpoints from a set of more recent ride checks ("new data"). (Thru volume equals arriving load minus offs, or (equivalently) departing load minus ons. Using arriving or departing load provides the same information as using thru volume (assuming ons and offs are also used), but allows for quicker, cleaner processing because on, off, and thru volumes do not overlap in an O-D matrix). For each line, checkpoints were chosen by SCRTD staff in order of priority so that we could simulate point checks done at one, two, or three or more stops.

Existing SCRTD ride check and line description computer files were used without modification. Branches whose stop lists had changed significantly between the seed data (generally 1985) and the new data (1986) were excluded from the analysis.

4. Evaluation Procedures

We used old (generally 1985) ride check data to generate seeds, and new (1986) ride check data to supply point check data to update the seeds. Because we had complete ride check data for the 1986 trips, we could compare the estimated ride check profile to the true profile, and thereby assess the accuracy of the updating procedure.

4.1 Items Compared

Ride check data are used to measure several items, and we recognized that the updating procedure might measure some items more accurately than others. Furthermore, for some items a high level of accuracy is desired. The following items were compared.

Item

Total boardings
Segment Boardings
Maximum load
Passenger-miles

A segment here is the set of stops between a timepoint. A timepoint is a stop that the SCRTD route files designate as a timepoint; they are spaced about one mile apart.

It should be emphasized that "maximum load" is the greatest load on a trip, regardless of where it occurs, and differs from "peak load", which is the load at the point of highest average volume. We did not assess the accuracy of measuring peak load since the point checks are nearly always done at the peak load point, and so peak load will be estimated without error.

The items are compared at both the trip level and at the period level. A high degree of randomness attaches to trip level data. More reliable is period-level data, and we hoped that the period-level estimates would agree well with the true period-level values.

4.2 Measuring Accuracy

The measure of error for trip-level quantities is the standard error, which is essentially the same as standard deviation, except that it accounts for any possible bias in the estimates. It is the square root of the mean squared error, which is the average of the squared deviations between the estimated value (of, say, boardings) and the true value, averaged over all trips in the new dataset lying in a given line/direction/time period (L/D/TP). In order to make the error measures dimensionless, we divided the standard errors by the mean of the item, yielding a relative standard error, which is the quantity we report. Relative standard error is the same as coefficient of variation, except that it accounts for estimation bias.

For period-level measures there is only one estimated-to-true comparison for each item, and so there is no standard error as such. We report the actual error, divided by the true value, as the relative error.

4.3. Averaging Accuracy Measures

In order to provide meaningful summaries, accuracy measures have been aggregated at several levels. The general rules we have followed in aggregating are as follows: (1) to get an average relative standard error for

trip-level quantities, we averaged standard errors and means separately, and then took their ratio; (2) to get average relative error for period-level items, we averaged errors and means separately and took their ratio; and (3) to get average relative absolute error for period-level items, we averaged absolute errors and means separately and took their ratio. The finest level of reporting errors in segment boardings is the L/D/TP level, meaning that the segments of a route have been averaged together. In order to provide a little more detail, however, we grouped segments into the strata, major and minor. A major segment is one that is in the upper .25 percentile of boardings for its line/direction/time period.

5. Numerical Results

Comparisons between estimated and actual route profiles were made for the following lines in both directions:

<u>Line</u>	<u>Dir</u>	<u>Line</u>	<u>Dir</u>
30	both	152	both
45	both	200	both
53	both	209	both
92	both	260	both
117	both		

Computability problems between old and new stop lists prevented us from successfully making comparisons for lines 4, 10, 60, 96, 111, 207, 210, 480, and 560. Such a problem could occur if, for instance, stops had been eliminated or timepoints had moved to a stop not on the old stop list. Most of these difficulties will not affect SCRTD's application of the procedure, since in normal application there will not be a new stop list; the estimated ride checks will have the stop list of the seed data. When minor stop list changes have occurred, interpretation of a line profile using an old stop list will not pose any difficulty to planning and scheduling staff.

5.1 Comparisons for a Line/Direction/Time Period

Comparisons by line, direction and time period are shown in the tables of Appendix B. A typical result, displayed here as Table 1, is that for Line 53, time period 2 (6 a.m. - 9:30 p.m.), which is discussed for illustration's sake. The Line 53 seeds were taken from 1984 ride checks; the comparison of estimated vs. true is based on 1985 ride checks. In the 1985 data, there were 23 trips in direction 1 (north) and 13 in direction 3 (south). (Trips on branches that had no 1984 seed, because that branch was not used in 1984 in that time period, are omitted, if any.) In direction 1, average boardings per trip was 121. The estimates, using 1, 2, and 3 points of point check data, are 127, 119, and 115. In direction 3, true average boardings is 146; the estimates using 1, 2, and 3 points are 162, 157, and 144. A comparison of these L/D/TP averages results in the relative errors shown in the table. If we average the two directions, the relative absolute errors based on 1, 2, and 3 points are 8%, 4.5%, and 4%. The prediction of average maximum load is quite precise for both directions with 1, 2, or 3 points; relative errors vary

TABLE 1
 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 53 / DIRECTION: 1 / TIME PERIOD: 2 NO. TRIPS: 23

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	121.09	384.62	64.57	64.57	28.41	5.12
	1	126.65	430.15	62.09	66.18	30.69	4.94
	2	119.45	405.23	61.32	65.37	29.12	4.58
	3	114.72	384.36	61.27	65.31	27.90	4.43
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.05	.12	-.04	-.04	.08	-.04
	2	-.01	.05	-.05	.01	.03	-.11
	3	-.05	.00	-.05	.01	-.02	-.14
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.05	.12	.04	.04	.08	.04
	2	.01	.05	.05	.01	.03	.11
	3	.05	.00	.05	.01	.02	.14
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.26	.24	.09	.09	.07	.33
	2	.22	.16	.08	.07	.06	.33
	3	.16	.07	.08	.07	.04	.33
	4	.	.	.	.	.	.

RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 53 / DIRECTION: 3 / TIME PERIOD: 2 NO. TRIPS: 13

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	145.69	403.14	53.54	53.54	30.44	9.06
	1	161.88	496.58	55.56	59.23	34.60	9.68
	2	157.38	474.92	55.32	58.97	33.19	9.64
	3	140.96	416.95	51.07	54.44	27.94	9.52
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.11	.23	.04	.04	.14	.07
	2	.08	.18	.03	.10	.09	.06
	3	-.03	.03	-.05	.02	-.08	.05
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.11	.23	.04	.04	.14	.07
	2	.08	.18	.03	.10	.09	.06
	3	.03	.03	.05	.02	.08	.05
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.27	.29	.22	.22	.14	.19
	2	.17	.24	.13	.17	.10	.19
	3	.14	.11	.09	.08	.08	.21
	4	.	.	.	.	.	.

from -5% to +3%. The comparison of average passenger-miles, which indicates how well load all along the route is estimated, shows the advantage of using multiple points. Using 1, 2, and 3 points, the relative absolute errors, averaging over both directions, drop from 17.5% to 11.5% to 1.5%.

The trip-level relative standard errors for boardings in direction 1, using 1, 2, and 3 points, are 26%, 22%, and 16%. Using a normal approximation, these figures represent 68% confidence intervals, and doubling them will yield 95% confidence intervals. That is, using 3 points to estimate boardings, 68% of the time the estimated boardings figure is within 16% of the true value, and 95% of the time the estimated figure is within 32% of the true figure. These accuracy levels are far worse than those found for the period-level averages, as expected. However, considering that individual trips vary from day to day with a relative standard error (coefficient of variation) of around 20%-70%, being off by 16% or 26% in estimating the activity of a single trip on a single day will only increase the overall error by a small to moderate amount. Trip-level relative standard errors in direction 1 for maximum load are, using 1, 2, and 3 points, 9%, 8%, and 8%. These very accurate estimates are probably due to the fact that maximum loads for this L/D/TP occur at or very near the checkpoints where load is observed. The trip-level relative standard errors for passenger-miles in direction 1 are, using 1, 2, and 3 points, 24%, 16%, and 7%, showing very good predictive accuracy for the 3-point estimate.

Suprisingly, the segment-level items are predicted with equal or better accuracy than route-level quantities. In direction 1, boardings on a "typical" major segment is estimated with relative standard errors of 7%, 6%, and 4% using 1, 2, and 3 points. The "typical" major segment has 28 boardings. The "typical" minor segment, with only 5 boardings on average has relative standard errors of 33%, using 1, 2, or 3 points. At the period-level, the estimation errors for the "typical" major segment are 8%, 3%, and 2% using 1, 2, and 3 points; for minor segments, these errors are 4%, 11%, and 14%.

The figures given above are simply for illustration's sake; different lines and time periods display different characteristics. Summary comparisons, aggregated over all L/D/TP's, follow below.

5.2 Comparison Summaries

5.2.1 Period-Level Estimates: Relative Error

Table 2 shows summaries, over all lines, directions, and time periods, of the statistics reflecting the accuracy of estimates of period-level quantities (such as average boardings per trip for a L/D/TP). Of primary importance are the relative errors. To the degree they differ significantly from zero, they indicate a bias, i.e., an overall tendency to under- or over-estimate. For route boardings, the relative errors using 1, 2, and 3 points are 3%, 3%, and 2%, indicating almost no bias. For passenger-miles, the relative errors again show a slight tendency to overestimate, and improve with each additional point used for the estimation.

TABLE 2
RIDE CHECK UPDATING -- SUMMARY TABLE

NO. TRIPS: 1501

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ LOAD	MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	90.58	298.90	40.06	40.06	40.06	18.11	6.62
	1	93.65	308.09	36.59	39.01	40.06	18.83	6.32
	2	93.59	308.35	37.98	40.48	40.06	18.95	6.38
	3	91.69	300.22	37.79	40.28	40.06	18.55	6.28
	4	115.10	377.43	41.34	44.07	40.06	16.29	5.29
RELATIVE ERROR	1	.03	.03	-.09	-.09	-.09	.04	-.05
	2	.03	.03	-.05	.01	.01	.05	-.04
	3	.02	.02	-.05	.02	.02	.04	-.04
	4	.03	.03	-.03	.04	.04	.06	-.06
RELATIVE ABSOLUTE ERROR	1	.12	.10	.12	.12	.12	.13	.14
	2	.08	.06	.07	.06	.06	.10	.12
	3	.06	.05	.07	.05	.05	.08	.10
	4	.08	.05	.05	.05	.05	.12	.15
RELATIVE STANDARD ERROR	1	.31	.27	.25	.25	.25	.14	.27
	2	.22	.17	.16	.16	.16	.10	.24
	3	.18	.13	.13	.13	.13	.09	.22
	4	.19	.13	.12	.13	.13	.11	.26

The relative errors for maximum load, however, show a negative bias. This phenomenon is expected since the updating procedure predicts the "most likely" route profile for each trip, and thus tends to avoid high peaks that randomly occur. Users of this updating procedure should recognize this phenomenon, and expect that actual load on an individual trip will be at some points higher and at other points lower than what is predicted, and that consequently maximum load will tend to be underpredicted by about 7%.

Segment-level boardings, like route-level boardings, show little or no bias.

5.2.2 Period Level Estimates: Relative Absolute Error

Relative absolute errors of estimates of L/D/TP-level averages, displayed in Table 2, can be roughly interpreted as the C.O.V. of the average for a "typical" L/D/TP. For route boardings, the relative absolute errors using 1, 2, and 3 points are 12%, 8%, and 6%. The figures suggest that the updating procedure is quite accurate at estimating time period-level boardings. The passenger-mile figures are also quite good.

The average absolute error for maximum load is comparable to those for boardings and passenger-miles. However, if this bias is accounted for by factoring up the predicted maximum load figures by 7%, the relative absolute errors fall slightly to 12%, 6%, and 5% for 1, 2, and 3 points.

5.2.3 Trip-Level Estimates: Relative Standard Error

Also displayed in Table 2 are the relative standard errors of items estimated at the trip level. For route boardings, averaged over all lines and time periods, the RSE's are 31%, 22%, and 18% using 1, 2, and 3 points. As stated in Section 5.1, these figures can be considered as 68% confidence intervals (double them to get 95% confidence intervals) for the estimate of boardings on a single trip in a "typical" L/D/TP. These figures show that it would be improper to place much confidence in an estimate of boardings for a single trip. Indeed, accuracy at this level of detail cannot be expected from any updating procedure using only one day of observation because of the high degree of randomness in passenger activity at the trip level from day to day. However, by doing point checks on several days and averaging the results at the trip level, a more reliable estimate of trip-level activity can be obtained at moderate cost, as discussed in Section 5.3.

The relative standard errors of passenger-miles are 27%, 17%, and 13%, for 1, 2, and 3 points. The benefit of each additional point is obvious. Again, trip-level estimates for a single day cannot be made with a high degree of confidence; only averages over several days or several trips will be accurate.

The relative standard error for unadjusted maximum load is lower than for boardings and comparable to that for passenger-miles. When estimated maximum loads are routinely factored up by 7%, the relative standard errors of the adjusted estimate were found to be virtually unchanged at 25%, 16%, and 13%, based on 1, 2, and 3 points.

The relative standard errors for segment-level boardings are lower for major segments and somewhat higher than for other measures for the minor segments.

5.2.4 Peak Period Comparisons

Table 3 shows the same set of figures calculated from peak period data only. The results are similar, appearing to be a little bit better on the whole.

5.2.5 Accuracy of Low/Medium/High Volume Service

Line/direction/time periods were grouped according to their average trip boardings (below 50, between 50 and 100, and above 100) to see if any one group was estimated with better or worse accuracy. The results are shown in Table 3A.

For estimates of boardings based on 3 points, there is little significant difference between the groups in overall relative error (2% for the below 50 group, 3% for the 50-100 group, and 2% for the 100+ group), in average absolute error for a L/D/TP (10%, 7% and 5% respectively), and in standard error for a single trip (19%, 18% and 18% respectively). Other route-level measures (pass-mi., load) show the same magnitude of differences.

Group 1 has a higher error for estimates based on only 1 or 2 points. In absolute terms, however, the group 1 error in overall boardings using two points (11% of about 33, or +3.4) is about the same as it is for group 2 (3% of about 76, or +2.3) and group 3 (3% of about 130, or +3.9). Relative accuracy in predicting segment-level boardings improves with higher volumes, but this is no surprise since the average boardings for group 1 is only 6 passengers on a major segment and 2 passengers on a minor segment.

5.2.6 Accuracy of Twenty-Minute Estimates

Since the Scheduling Department bases headways on 20-min averages, estimates were made for the 20-min periods between 6 a.m. and 9 a.m. on Line 45 in both directions. No trips were observed in one direction in one of the 20-min periods, yielding a total of 17 cases. The results are reported in detail in Appendix C, and are summarized in Table 3B. The quantity of primary concern, maximum load, is estimated very well with both 3 and 4 points of point check data; the maximum error in the 20-min period average for the 17 cases is 13%, and all but two cases had errors below 10%. Passenger-miles is estimated almost as well; boardings is estimated a little worse, with a few cases having errors above 15%. The estimates based on two point checks are somewhat worse.

Estimates based on a single point check are clearly unreliable, with the maximum load for one period being estimated at 29.9 when the true value (averaged over two trips) is 67, indicating a very different ridership pattern in this 20-min period versus the a.m. peak as a whole. The one-point

TABLE 3
RIDE CHECK UPDATING -- PEAK PERIOD SUMMARY TABLE

NO. TRIPS: 850

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ LOAD	MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	115.12	367.08	49.51	49.51	49.51	22.20	8.50
	1	119.15	379.33	44.63	47.57	47.57	23.78	8.23
	2	119.13	377.34	46.72	49.80	49.80	24.02	8.26
	3	118.23	372.71	47.27	50.39	50.39	23.60	8.27
	4	144.47	445.88	51.63	55.04	55.04	21.47	6.61
RELATIVE ERROR	1	.03	.03	-.10	-.10	-.10	.05	-.03
	2	.03	.03	-.06	.01	.01	.05	-.03
	3	.03	.02	-.05	.02	.02	.03	-.03
	4	.04	.03	-.03	.03	.03	.07	-.08
RELATIVE ABSOLUTE ERROR	1	.09	.08	.11	.11	.11	.12	.13
	2	.07	.05	.07	.05	.05	.10	.12
	3	.05	.04	.06	.05	.05	.08	.10
	4	.06	.04	.04	.04	.04	.07	.16
RELATIVE STANDARD ERROR	1	.31	.29	.25	.25	.25	.10	.20
	2	.23	.18	.17	.17	.17	.08	.18
	3	.19	.14	.14	.14	.14	.07	.17
	4	.19	.12	.11	.12	.12	.08	.19

TABLE 3A

RIDE CHECK UPDATING -- SUMMARY TABLE

NO. TRIPS:		AVG BRD GROUP : ≤ 50					
MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	33.31	134.61	19.02	19.02	6.10	2.02
	1	36.97	148.09	18.85	20.10	6.97	2.07
	2	37.00	146.94	19.36	20.64	7.00	2.11
	3	31.86	122.59	17.38	18.53	6.22	1.78
RELATIVE ERROR	1	.11	.10	-.01	-.01	.14	.02
	2	.11	.09	.02	.09	.15	.04
	3	.02	-.03	-.04	.03	.08	-.06
RELATIVE ABSOLUTE ERROR	1	.15	.13	.08	.08	.20	.22
	2	.14	.13	.11	.13	.20	.21
	3	.10	.09	.11	.10	.13	.12
RELATIVE STANDARD ERROR	1	.34	.26	.19	.19	.23	.39
	2	.27	.19	.15	.18	.21	.37
	3	.19	.12	.13	.14	.21	.35
NO. TRIPS: 541		AVG BRD GROUP : 51 - 100					
MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	76.29	247.84	37.78	37.78	18.05	6.91
	1	79.59	255.30	35.01	37.32	18.33	6.73
	2	78.63	250.84	35.63	37.99	18.55	6.72
	3	78.43	249.00	35.80	38.16	18.60	6.72
RELATIVE ERROR	1	.04	.03	-.07	-.07	.02	-.03
	2	.03	.01	-.06	.01	.03	-.03
	3	.03	.00	-.05	.01	.03	-.03
RELATIVE ABSOLUTE ERROR	1	.11	.08	.12	.12	.10	.13
	2	.08	.05	.06	.04	.08	.10
	3	.07	.04	.06	.05	.08	.09
RELATIVE STANDARD ERROR	1	.27	.25	.22	.22	.12	.29
	2	.21	.16	.14	.14	.09	.26
	3	.18	.12	.12	.12	.07	.24
NO. TRIPS: 856		AVG BRD GROUP : > 100					
MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	130.46	425.51	51.10	51.10	22.93	8.08
	1	133.03	435.10	45.50	48.50	24.83	7.50
	2	134.01	441.64	48.15	51.33	25.06	7.66
	3	133.14	437.67	48.85	52.07	24.65	7.67
RELATIVE ERROR	1	.02	.02	-.11	-.11	.06	-.07
	2	.03	.04	-.06	.00	.06	-.05
	3	.02	.03	-.04	.02	.04	-.05
RELATIVE ABSOLUTE ERROR	1	.12	.11	.14	.14	.16	.14
	2	.07	.06	.08	.06	.11	.12
	3	.05	.04	.07	.05	.08	.11
RELATIVE STANDARD ERROR	1	.33	.29	.28	.28	.15	.23
	2	.22	.17	.17	.17	.10	.21
	3	.18	.14	.14	.15	.09	.19

Table 3B

Accuracy of Twenty-Minute Period Estimates

Line 45, 6 a.m. - 9 a.m.

17 cases with trips observed (each case is a 20-min period in one direction)

Mean number of trips per 20-min period in one direction = 3.35; maximum = 6,
minimum = 1

<u>Item: Boardings</u>	<u>Cases with Error - 10%</u>	<u>Cases with Error - 15%</u>	<u>Worst Case Absolute Error</u>
Using 4 points	14	16	24%
Using 3 points	11	14	23%
Using 2 points	9	10	26%
Using 1 point	4	6	42%
 <u>Item: Pass.-mi</u>			
Using 4 points	15	17	15%
Using 3 points	15	17	14%
Using 2 points	14	15	20%
Using 1 point	7	11	36%
 <u>Item: MaxLoad</u>			
Using 4 points	15	17	13%
Using 3 points	16	17	13%
Using 2 points	13	15	35%
Using 1 point	11	12	55%

estimates had errors over 10% in 6 cases (out of 17) for peak load, in 10 cases for passenger-miles, and in 13 cases for boardings.

5.3 Comparison of Accuracy of Estimates Based on Point Checks versus Ride Checks

The low loss of point checks points to the possibility of doing point checks for several days and making an estimate of average passenger activity based on the average of estimates made for those days. Averaging together samples taken on n days will reduce random error components inversely to the square root of n ; systematic error or bias components will be unaffected.

Most of the error in a period-level estimate can be attributed to systematic error (since averaging over many trips eliminates most of the random error), while error in trip-level estimates is a combination of systematic and random estimation error. A reasonable and conservative judgment is to attribute 80% of the period-level squared error to systematic error. The balance of period-level and trip-level error is then the random element of error in period-level and trip-level estimates, respectively.

A second source of random error is day-to-day variation. Based on studies of many transit systems, day-to-day variation of trip-level boardings yields a C.O.V. of around 0.20 or higher while the day-to-day C.O.V. of period-level boardings is around 0.10. The same figures can be applied to passenger-miles.

Based on these assumptions, and using the figures for a typical L/D/TP from Table 2, expected standard errors based on multiple days of updating with point checks using two and three points are calculated for selected items and displayed in Tables 4 and 5. Also displayed for comparison are the standard errors expected from a day of ride checks, i.e., an error-free measurement from a single day used as a daily average.

The results of Tables 4 and 5 show that a single day's estimate using the updating procedure is generally somewhat worse than a single day's measurement using a full ride check, taking a second day of point checks and updating will produce a more accurate estimate in most cases. It should be noted that the differences between one day of ride checks and one day of point checks are relatively small at this aggregate level, especially with three points. For routes that are stable (i.e., with few stop or schedule changes), the accuracy achieved with one day of point checks may nearly equal that with one day of ride checks.

These results permit a cost comparison of ride check refreshing vs. doing a new ride check. A full ride check requires one checker per bus. This requirement is the same whether a ride check is desired for one direction or both. The checker requirement for point checks depends on the extent to which a checker can monitor multiple lines and two directions. Because of the width of Los Angeles streets and the heavy bus volumes in many locations, it is common for checkers to monitor only one direction. Making the conservative assumption that only one line will be monitored at a time, point checks require one checker per point per day per direction. To do point checks at 3

TABLE 4
 EXPECTED STANDARD ERROR FROM MULTIPLE DAY UPDATES USING THREE POINTS

	Sytematic Error	Random Est'n Error	Ride chk C.O.V. = Day-to- day Error	Total Random Error	Expected std error		
					1 day	2 days	3 days
Period Boardings	0.054	0.027	0.080	0.084	0.100	0.080	0.072
Trip Boardings	0.054	0.080	0.200	0.216	0.222	0.162	0.136
Period Pass.-Mi	0.045	0.022	0.080	0.083	0.094	0.074	0.066
Trip Pass.-Mi	0.045	0.058	0.200	0.208	0.213	0.154	0.128
Period Maj. Seg. Brdgs	0.072	0.036	0.120	0.125	0.144	0.114	0.102
Trip Maj. Seg. Brdgs	0.072	0.040	0.400	0.402	0.408	0.293	0.243
Period Min. Seg. Brdgs	0.089	0.045	0.200	0.205	0.224	0.170	0.148
Trip Min. Seg. Brdgs	0.089	0.098	0.500	0.510	0.517	0.371	0.308

* Note: All errors are relative.

TABLE 5
 EXPECTED STANDARD ERROR FROM MULTIPLE DAY UPDATES USING TWO POINTS

	Sytematic Error	Random Est'n Error	Ride chk C.O.V. = Day-to- day Error	Total Random Error	Expected std error		
					1 day	2 days	3 days
Period Boardings	0.072	0.036	0.080	0.088	0.113	0.095	0.088
Trip Boardings	0.072	0.098	0.200	0.223	0.234	0.173	0.147
Period Pass.-Mi	0.054	0.027	0.080	0.084	0.100	0.080	0.072
Trip Pass.-Mi	0.054	0.076	0.200	0.214	0.221	0.161	0.135
Period Maj. Seg. Brdgs	0.089	0.045	0.120	0.128	0.156	0.127	0.116
Trip Maj. Seg. Brdgs	0.089	0.045	0.400	0.402	0.412	0.298	0.249
Period Min. Seg. Brdgs	0.107	0.054	0.200	0.207	0.233	0.182	0.161
Trip Min. Seg. Brdgs	0.107	0.107	0.500	0.511	0.523	0.377	0.314

* Note: All errors are relative.

points on two days will therefore require up to 6 checkers for a peak direction ride check and up to 12 for ride checks in both directions. The resulting estimates will be more accurate, and will cost less if the line uses more than 12 buses during the time period of interest, or 6 buses if only a peak direction profile is needed. A single day of multiple point checks will yield slightly worse accuracy than a ride check, but at a lower cost as long as the line uses more than 6 buses (3 buses if only a peak direction profile is needed). On lines and during time periods when only a few buses are operated, a ride check will be more cost-effective. At times and locations where a checker's safety is of serious concern, ride checks can continue to be the main source of data.

Besides offering a less expensive way to acquire ride check data, this method offers an inexpensive way to get better use out of point check data that are now routinely collected. Schedule makers often compare point check data with the most recent ride check, and do the "mental gymnastics" of fitting the point check data to the ride check. This exercise is extremely difficult to do well in one's head, and the refreshing methodology provides a mechanism to reconcile these different sources of data into a profile that will be useful to schedule makers.

5.4 Accuracy Versus Number of Points

Estimation accuracy was tested on Line 30 using from 1 to 9 points of point check data to update. The points were selected in order of priority by SCRTD staff. The data encompasses 315 trips over an entire day in both directions. Figure 1 shows that this overall bias is small (within +5%) for any number of points; there is little improvement after the fourth point. Oddly, the passenger-mile bias worsens beyond four points; however, it never goes below -5%.

Figure 2 shows how trip-level standard errors improve with the number of points. The biggest gain is in the first four points, although improvement continues until about the seventh point, where the standard errors are between one-half and one-quarter of the size of the standard errors based on a single point.

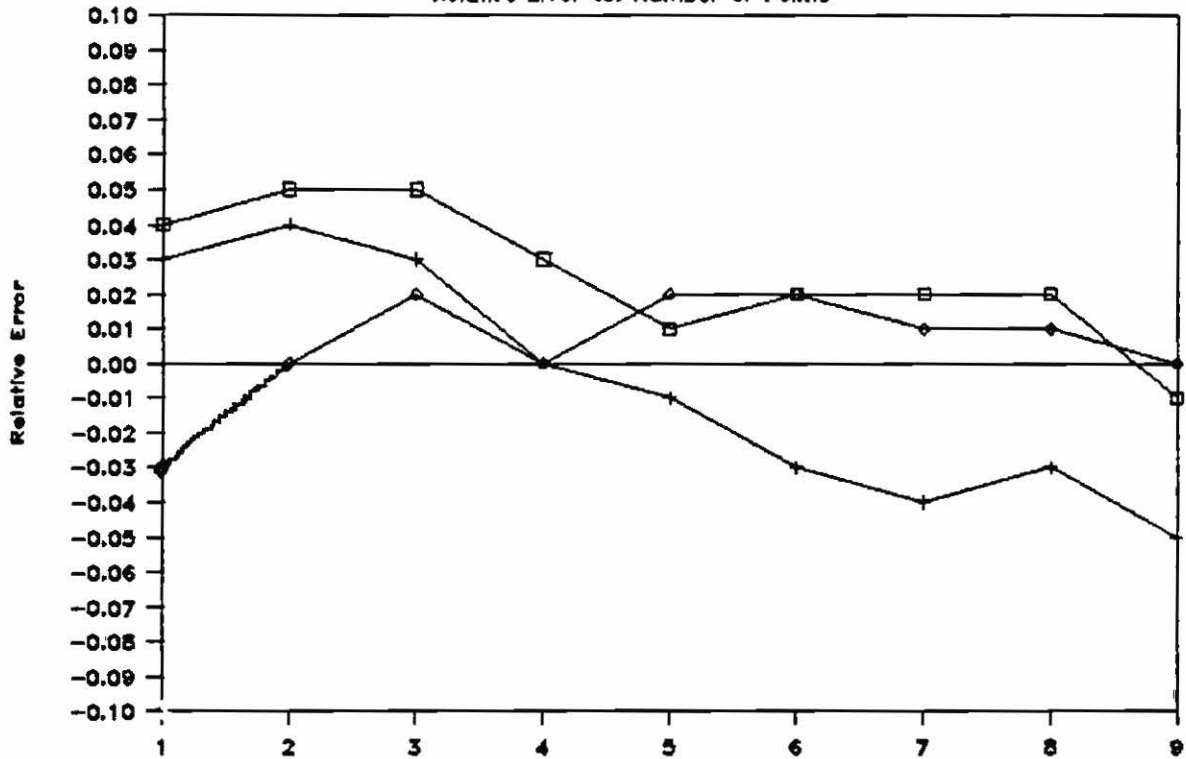
These two figures together indicate that the systematic component of error is rather small, while the random component, which tends to balance out when averaged over many trips, reduces with more information about each trip, making individual trip estimates and estimates of the average of small groups of trips more reliable.

It is hard to generalize these results into guidance for how many points ought to be counted. A general rule is to not allow significantly sized markets to go unobserved; translating this rule into a number of checkers depends on the route in question. Since the average unlinked trip length on the system is between 3 and 4 miles, it seems reasonable to station checkers about 3 to 4 miles apart or many passengers will not be counted at any checkpoint. On route segments where average trip distance is smaller (larger), and passenger activity more (less) variable in its distribution, closer (farther) spacing is warranted.

Figure 1

RIDE CHECK UPDATING

Relative Error vs. Number of Points

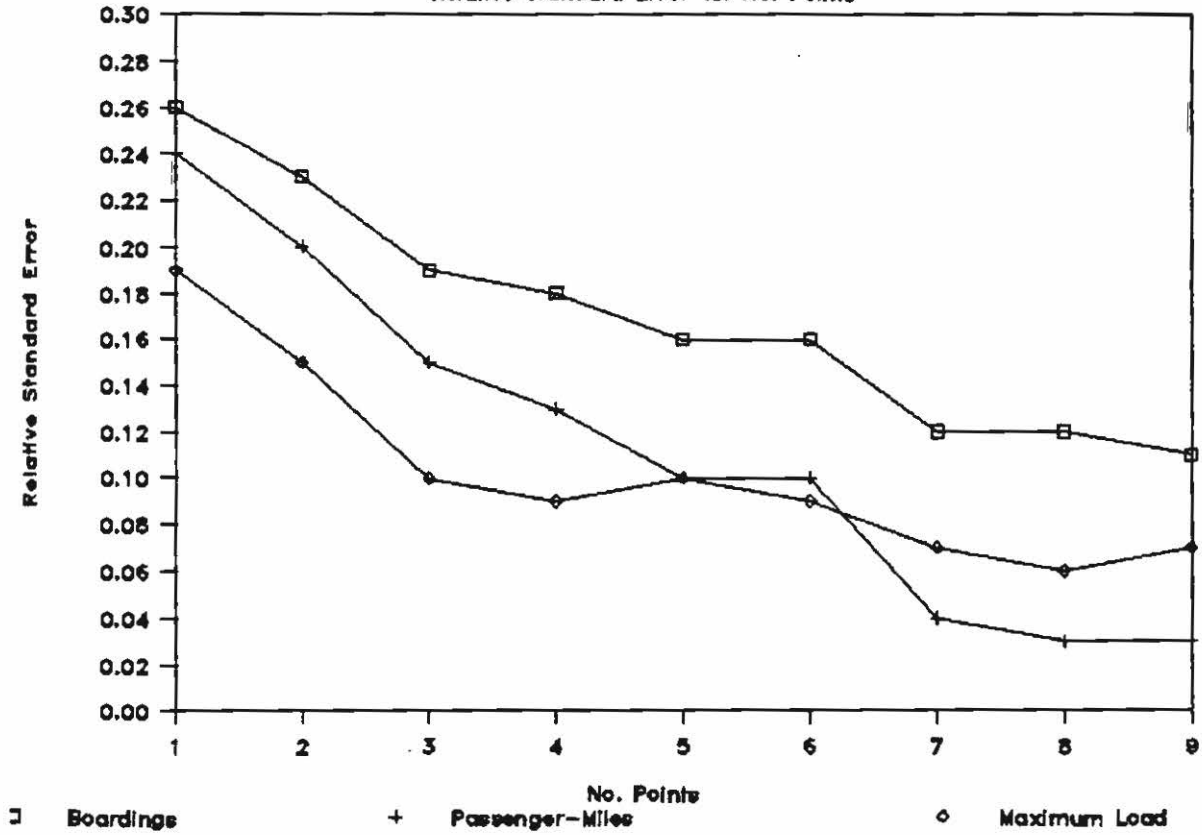


□ Boardings + Passenger-Miles ◇ Maximum Load

Figure 2

RIDE CHECK UPDATING

Relative Standard Error vs. No. Points



5.5 Effect of Point Check Measurement Error

One problem with a point check based methodology is that errors in the movement of load can be significant. Tables 4a and 5a show the expected level of accuracy of a point check based estimate, accounting for measurement error as well as the error sources used in Tables 4 and 5. The assumptions underlying this adjustment are as follows:

- Standard error for load measurement of an individual trip is 13% (as reported in a study by Robert Jackson and Jesse Simon).
- Averaged over many trips and all checkers, loads are systematically under- or overcounted; the direction of the bias is unknown (otherwise SCRTD could simply adjust load figures accordingly), but we used a magnitude of 3%.
- Each individual checker, averaged over many trips, has a different systematic error. We assumed an average systematic error of 6%.
- When a point check is done at m points for n days, we assume that the same checker will be assigned to a point for the n days. (The alternative assumption, i.e. that checkers change location from day to day, would lead to better accuracy estimates.)
- Error components for a given checker are assumed independent.

The results are only slightly worse than those displayed in Tables 4 and 5 (which ignore measurement error). The same conclusions apply, that two or three days of multiple point check updating will generally yield the same or better accuracy as a 1-day complete ride check.

6. Updating Computer Program and Numerical Example of Updating Procedures

The updating procedure has been programmed and resides in SCRTD's computer. Relevant files are:

MRPMP. MSI.FORT (UPRIDE)	FORTTRAN source code
MRPMP. MSI.CNTL (UPRIDE)	JCL to compile UPRIDE
MRPMP. MSI.CNTL (RUNUPR)	JCL to run UPRIDE
MRPMP.MSI.CNTL (L03ONTST)	Hypothetical point check data for Line 30N in proper format

The updating algorithm is described in Appendix A. Summary and detailed flowcharts of the main program and of each of the major subroutines are found in Appendix D. Comments are generously spread throughout the program.

An example of the updating algorithm's execution is shown in Appendix E.

TABLE 4A
 EXPECTED STANDARD ERROR FROM MULTIPLE DAY UPDATES USING THREE POINTS
 ACCOUNTING FOR POINT CHECK MEASUREMENT ERROR

	Pt chk sys bias	Pt chk indiv bias	Pt chk indiv total error	Std err from 1 day ride chk	Expected std error for N days of pt check updating		
					1	2	3
Period Boardings				0.08	0.092	0.081	0.077
Trip Boardings	0.03	0.06	0.13	0.20	0.158	0.122	0.107
Period Pass.-Mi				0.08	0.086	0.075	0.071
Trip Pass.-Mi	0.03	0.06	0.13	0.20	0.152	0.116	0.101
Period Maj. Seg. Brdgs				0.12	0.124	0.110	0.104
Trip Maj. Seg. Brdgs	0.03	0.06	0.13	0.40	0.259	0.195	0.168
Period Min. Seg. Brdgs				0.20	0.164	0.139	0.129
Trip Min. Seg. Brdgs	0.03	0.06	0.13	0.50	0.321	0.239	0.205

* Note: All errors are relative.

TABLE 5A
 EXPECTED STANDARD ERROR FROM MULTIPLE DAY UPDATES USING TWO POINTS

	Pt chk sys bias	Pt chk indiv bias	Pt chk indiv total error	Std err from 1 day ride chk	Expected std error for N days of pt check updating		
					1	2	3
Period Boardings				0.08	0.104	0.089	0.084
Trip Boardings	0.03	0.06	0.13	0.20	0.188	0.142	0.123
Period Pass.-Mi				0.08	0.099	0.084	0.078
Trip Pass.-Mi	0.03	0.06	0.13	0.20	0.182	0.137	0.118
Period Maj. Seg. Brdgs				0.12	0.136	0.117	0.110
Trip Maj. Seg. Brdgs	0.03	0.06	0.13	0.40	0.311	0.230	0.195
Period Min. Seg. Brdgs				0.20	0.186	0.152	0.139
Trip Min. Seg. Brdgs	0.03	0.06	0.13	0.50	0.385	0.283	0.239

* Note: All errors are relative.

7. Conclusions

The purpose of this study has been to evaluate and validate a methodology for updating ride checks with point checks. The study, based on a sample of 9 routes and over 1500 trips, offers the following conclusions.

First, the methodology is sound. It is founded on respected theories of travel behavior and statistical estimation. It is internally consistent, does not rely on parameters that must be repeatedly or locally estimated, and converges in virtually all cases to a unique solution. The final results passes the test of reasonableness, and satisfy the optimization criterion of maximizing likelihood and of minimizing the distance (as measured by an information-theory metric) between a seed matrix and the estimated matrix.

Second, the estimates are accurate. The methodology includes direct observation of ons, offs, and load at a few key points, thereby assuring near perfect accuracy (limited only by measurement error) of these items at key points in which SCRTD has a prior interest. At the time period level, at which most planning and many scheduling decisions are made, average boardings per trip is estimated with no significant estimation bias and with an expected absolute error of 6% with three points. Passenger-mile estimates show similarly small errors when based on three points. Average maximum load (as distinct from peak point load) has a natural underestimation bias of about 7%; after accounting for this, one can expect an absolute error of only 5%, with three points, in estimating average maximum load per trip over a time period when using three points. Segment-level and trip-level estimates display the same absence of significant bias. Their level of error is comparable with other sources of error such as measurement error and day-to-day variation.

Third, the methodology is cost-effective. Multiple point checks will, in many cases, produce estimates that are more accurate than those achieved by the current ride check program at less cost. This conclusion applies to both trip level and period level estimates.

Fourth, the methodology can be easily implemented. Most of the data the programs rely on currently reside in SCRTD computer files, and can be used without modification. The updating algorithms program is up on the District's mainframe. The only new files needed are point check data. For now, these files will have to be entered and edited manually. However, compared with manual entry of ride check data (which the District did until hand-held devices came into use), the coding burden will still be only moderate since point checks produce only a few data items per trip (ons, offs, arriving and departing load, time, and identifiers), as compared with ride checks that can potentially produce several data items at each stop. When electronic data collectors become capable of collecting point check data, as the District is now trying to do, the cost will decline further still.

There appear to be two drawbacks to implementing this procedure on a wide scale. The first is that the estimates will of necessity follow the stop list in effect at the time of the seed ride check. Minor changes in stop list can be accomodated by the users of the estimates with little difficulty, or programs can be written to rewrite a ride check fom one stop list to another similar stop list. More significant changes will require that a new ride

check be done; however, ride checks are usually done after significant route changes anyway. Second, the seeds must be updated periodically. Our study used one year old seeds. Using older seeds will probably worsen accuracy levels. This raises the question, then, of how often a ride check should be done to keep the seed current. A similar study done in Pittsburgh suggested that a new baseline (seed) is needed at least every four or five years, and more frequently if a route experiences significant service or ridership pattern changes. Ride checks may be needed more often than this for monitoring run times. A further study of this issue might be useful. Another possible cost-saving idea, not explored in this study, is to combine a sample of ride checks (not a complete ride check) with point check updasting to produce a ride check estimate based on a fresh seed. The sample size could be controlled by that needed to yield reliable run time estimates. It may be a complete ride check on low volume routes, but a one-half or one-third sample may suffice on heavy routes.

It should also be pointed out that SCRTD's ride check file is one of the richest sources of trip-level data in the country, and that it supports a host of planning and scheduling activities at the District. Using accurate estimates holds the potential for preserving this database in the face of budget cuts. However, an estimate is still just an estimate, and some information will be lost. It is important, then, that estimates be so noted in the database, and that the accuracy of the estimates be carefully monitored so that the quality of the database does not deteriorate.

APPENDIX A

ALGORITHMS FOR REFRESHING A RIDE CHECK WITH POINT CHECK

General Algorithm

1. Estimate O-D matrix from prior ride checks (Subalgorithm 1).
2. Create a compressed O-D matrix by consolidating the stops between each pair of checkpoints into one stop. The checkpoints remain unaffected. Thus, if there are m checkpoints, there will be 2m+1 stops in the consolidated matrix, assuming neither checkpoint is an endpoint. The checkpoints will be even-numbered stops; the segments between checkpoints will be odd-numbered stops. Along the diagonal, even-numbered cells, representing trips beginning and ending at the same stop, are zero. Odd-numbered diagonal cells are not necessarily zero, representing intra-segment travel.
3. Let $TOTINC_0$ = total boardings in the above diagonal cells of the compressed O-D matrix, multiplied by an adjustment factor (default=1). Store the original compressed O-D matrix.
4. (Initial factoring of O-D matrix). Factor the O-D matrix up or down so that the sum of on, off, and thru passengers summed over all checkpoints agrees with the total observed by the point check. (This step can be omitted; it helps the algorithm converge more quickly.)
5. Apply iterative proportional fit (Subalgorithm 2) to make the compressed O-D matrix match the observed on, off, and thru volumes at the checkpoints.
6. Let $TOTINC'$ = total boardings in the above diagonal cells of the (now revised) compressed O-D matrix. Multiply the compressed O-D matrix by the ratio $R = TOTINC'/TOTINC_0$.
7. STOP iterating and go to 8 if R equals 1 (to an acceptable tolerance). Otherwise set $TOTINC_0$ equal to $TOTINC'$, and go to 5.
8. Calculate a compressed O-D matrix of factors. For the above diagonal cells, divide each entry of the estimated compressed O-D matrix by the corresponding entry of the original compressed O-D matrix. For the odd-numbered diagonal cells, which represent intrasegment travel, the factors are the ratio of the estimated to original activity (total boardings plus alightings) on the segment, as follows:

$$(fac)_{jj} = \frac{\sum_{k>j}^{k>j} (est)_{jk} + \sum_{i<j}^{i<j} (est)_{ij}}{\sum_{k>j}^{k>j} (orig)_{jk} + \sum_{i<j}^{i<j} (orig)_{ij}} \quad \text{for } j \text{ odd}$$

where $(fac)_{jj}$ is a factor on the diagonal, and $(est)_{ij}$ and $(orig)_{ij}$ are entries in the estimated and original consolidated O-D matrix, respectively.

9. Multiply each cell of the original (unconsolidated) O-D matrix by the factor in the factor matrix corresponding to that cell. The results are the estimated O-D matrix.
10. Reduce the estimated O-D matrix to row and column totals to produce estimated ons and offs at each stop.

Subalgorithm 1 (Generating an O-D Matrix from On-Off Counts)

Described in Jesse Simon and Peter G. Furth, "Generating a Bus Route O-D Matrix from On-Off Data", Journal of Transportaion Eng., v. 111, n. 6, pp. 583-593, 1985.

Subalgorithm 2 (Iterative Proportional Fit)

Each point check supplies three observations: on, off, and thru volume at a point. Each of these observations corresponds to a block of cells in the matrix. Loop over all checkpoints. For each checkpoint, factor, in turn, the blocks of cells corresponding to on, off, and thru volumes to match the observed volumes. At the end of the loop, STOP if the on, off, and thru volumes in the matrix equal (to a specified tolerance) the point check observations at all points. Otherwise, repeat looping over all checkpoints until convergence.

APPENDIX B

LINE / DIRECTION / TIME PERIOD REPORTS

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 30 / DIRECTION: 1 / TIME PERIOD: 1 NO. TRIPS: 11

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	52.36	144.19	33.45	33.45	9.36	1.84
	1	58.59	159.98	32.91	35.08	10.49	1.79
	2	56.05	150.95	32.65	34.80	10.28	1.65
	3	52.72	140.66	32.77	34.94	10.26	1.32
	4	52.65	142.65	32.75	34.91	10.25	1.32
RELATIVE ERROR	1	.12	.11	-.02	-.02	.12	-.03
	2	.07	.05	-.02	.04	.10	-.11
	3	.01	-.02	-.02	.04	.10	-.28
	4	.01	-.01	-.02	.04	.09	-.28
RELATIVE ABSOLUTE ERROR	1	.12	.11	.02	.02	.12	.03
	2	.07	.05	.02	.04	.10	.11
	3	.01	.02	.02	.04	.10	.28
	4	.01	.01	.02	.04	.09	.28
RELATIVE STANDARD ERROR	1	.48	.41	.14	.14	.19	.60
	2	.22	.11	.06	.06	.16	.50
	3	.13	.08	.06	.06	.16	.49
	4	.14	.09	.06	.06	.12	.49

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 30 / DIRECTION: 3 / TIME PERIOD: 1 NO. TRIPS: 9

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	33.22	100.16	16.89	16.89	6.00	1.61
	1	38.00	104.60	17.04	18.16	7.13	2.25
	2	39.17	108.27	18.35	19.56	7.14	2.65
	3	28.29	74.30	14.36	15.30	5.82	1.80
	4	37.97	103.16	19.57	20.86	8.02	2.59
RELATIVE ERROR	1	.14	.04	.01	.01	.19	.40
	2	.18	.08	.09	.16	.19	.65
	3	-.15	-.26	-.15	-.09	-.03	.12
	4	.14	.03	.16	.24	.34	.61
RELATIVE ABSOLUTE ERROR	1	.14	.04	.01	.01	.19	.40
	2	.18	.08	.09	.16	.19	.65
	3	.15	.26	.15	.09	.03	.12
	4	.14	.03	.16	.24	.34	.61
RELATIVE STANDARD ERROR	1	.78	.48	.65	.65	.21	.47
	2	.58	.27	.36	.40	.21	.29
	3	.27	.22	.29	.29	.20	.26
	4	.27	.08	.29	.37	.09	.31

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 30 / DIRECTION: 1 / TIME PERIOD: 3 NO. TRIPS: 45

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ LOAD	MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	114.89	269.78	40.64	<=	40.64	17.12	5.57
	1	107.98	246.74	33.36		35.57	16.88	4.16
	2	113.94	263.96	36.74		39.16	17.13	4.67
	3	110.24	256.65	36.74		39.17	17.19	4.27
	4	114.45	262.72	38.13		40.65	18.20	4.29
RELATIVE ERROR	1	-.06	-.09	-.18		-.18	-.01	-.25
	2	-.01	-.02	-.10		-.04	.00	-.16
	3	-.04	-.05	-.10		-.04	.00	-.23
	4	.00	-.03	-.06		.00	.06	-.23
RELATIVE ABSOLUTE ERROR	1	.06	.09	.18		.18	.01	.25
	2	.01	.02	.10		.04	.00	.16
	3	.04	.05	.10		.04	.00	.23
	4	.00	.03	.06		.00	.06	.23
RELATIVE STANDARD ERROR	1	.28	.23	.25		.25	.08	.22
	2	.19	.13	.14		.12	.08	.19
	3	.19	.13	.14		.12	.08	.19
	4	.15	.10	.11		.10	.06	.18

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 30 / DIRECTION: 3 / TIME PERIOD: 3 NO. TRIPS: 46

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ LOAD	MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	105.24	234.12	36.61	<=	36.61	15.46	5.65
	1	103.76	226.75	29.51		31.46	12.79	5.74
	2	104.48	228.70	31.31		33.38	12.81	5.92
	3	104.46	223.24	31.23		33.29	13.53	5.65
	4	106.30	226.82	33.28		35.47	14.30	5.65
RELATIVE ERROR	1	-.01	-.03	-.19		-.19	-.17	.02
	2	-.01	-.02	-.14		-.09	-.17	.05
	3	-.01	-.05	-.15		-.09	-.13	.00
	4	.01	-.03	-.09		-.03	-.08	.00
RELATIVE ABSOLUTE ERROR	1	.01	.03	.19		.19	.17	.02
	2	.01	.02	.14		.09	.17	.05
	3	.01	.05	.15		.09	.13	.00
	4	.01	.03	.09		.03	.08	.00
RELATIVE STANDARD ERROR	1	.33	.30	.37		.37	.11	.12
	2	.22	.16	.24		.22	.11	.10
	3	.21	.15	.24		.21	.10	.10
	4	.15	.10	.17		.15	.06	.10

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 30 / DIRECTION: 1 / TIME PERIOD: 5 NO. TRIPS: 23

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	73.61	173.52	29.57	29.57	12.93	2.47
	1	67.94	163.31	22.33	23.80	12.36	1.86
	2	71.20	171.55	24.70	26.33	12.57	2.10
	3	69.94	168.56	24.76	26.39	12.61	1.96
	4	70.73	169.65	26.27	28.00	12.83	1.95
RELATIVE ERROR	1	-.08	-.06	-.24	-.24	-.04	-.25
	2	-.03	-.01	-.16	-.11	-.03	-.15
	3	-.05	-.03	-.16	-.11	-.03	-.21
	4	-.04	-.02	-.11	-.05	-.01	-.21
RELATIVE ABSOLUTE ERROR	1	.08	.06	.24	.24	.04	.25
	2	.03	.01	.16	.11	.03	.15
	3	.05	.03	.16	.11	.03	.21
	4	.04	.02	.11	.05	.01	.21
RELATIVE STANDARD ERROR	1	.31	.32	.44	.44	.12	.59
	2	.26	.20	.34	.32	.12	.60
	3	.25	.19	.32	.30	.12	.60
	4	.14	.08	.20	.16	.09	.60

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 30 / DIRECTION: 3 / TIME PERIOD: 5 NO. TRIPS: 27

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	65.07	165.39	32.67	32.67	9.50	3.38
	1	69.27	167.67	29.16	31.09	9.61	3.86
	2	67.00	161.74	29.24	31.17	9.69	3.53
	3	66.21	155.86	29.13	31.05	9.82	3.36
	4	69.00	161.08	31.42	33.49	10.20	3.52
RELATIVE ERROR	1	.06	.01	-.11	-.11	.01	.14
	2	.03	-.02	-.10	-.05	.02	.04
	3	.02	-.06	-.11	-.05	.03	-.01
	4	.06	-.03	-.04	.03	.07	.04
RELATIVE ABSOLUTE ERROR	1	.06	.01	.11	.11	.01	.14
	2	.03	.02	.10	.05	.02	.04
	3	.02	.06	.11	.05	.03	.01
	4	.06	.03	.04	.03	.07	.04
RELATIVE STANDARD ERROR	1	.31	.30	.19	.19	.12	.28
	2	.23	.20	.19	.17	.11	.29
	3	.24	.19	.19	.17	.08	.30
	4	.17	.11	.08	.08	.06	.29

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 45 / DIRECTION: 1 / TIME PERIOD: 2 NO. TRIPS: 42

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	112.24	363.22	57.83	57.83	14.50	6.35
	1	105.01	366.24	54.78	58.40	17.04	5.07
	2	109.87	373.79	54.79	58.41	17.04	5.76
	3	107.85	365.37	55.23	58.87	17.04	5.35
	4	108.01	361.30	56.19	59.90	17.03	5.37
RELATIVE ERROR	1	-.06	.01	-.05	-.05	.18	-.20
	2	-.02	.03	-.05	.01	.18	-.09
	3	-.04	.01	-.05	.02	.18	-.16
	4	-.04	-.01	-.03	.04	.17	-.15
RELATIVE ABSOLUTE ERROR	1	.06	.01	.05	.05	.18	.20
	2	.02	.03	.05	.01	.18	.09
	3	.04	.01	.05	.02	.18	.16
	4	.04	.01	.03	.04	.17	.15
RELATIVE STANDARD ERROR	1	.23	.16	.09	.09	.07	.19
	2	.24	.16	.09	.08	.07	.16
	3	.19	.12	.08	.07	.07	.15
	4	.19	.12	.06	.08	.07	.14

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 45 / DIRECTION: 3 / TIME PERIOD: 2 NO. TRIPS: 24

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	137.96	367.70	57.00	57.00	21.26	6.82
	1	114.87	308.85	43.21	46.06	.	4.59
	2	124.85	331.41	49.80	53.09	.	4.75
	3	133.90	350.29	56.38	60.10	.	4.73
	4	137.31	356.49	56.73	60.48	.	5.12
RELATIVE ERROR	1	-.17	-.16	-.24	-.24	.	-.33
	2	-.10	-.10	-.13	-.07	.	-.30
	3	-.03	-.05	-.01	.05	.	-.31
	4	.00	-.03	.00	.06	.	-.25
RELATIVE ABSOLUTE ERROR	1	.17	.16	.24	.24	.	.33
	2	.10	.10	.13	.07	.	.30
	3	.03	.05	.01	.05	.	.31
	4	.00	.03	.00	.06	.	.25
RELATIVE STANDARD ERROR	1	.35	.28	.40	.40	.	.32
	2	.30	.20	.30	.30	.	.29
	3	.19	.15	.16	.18	.	.29
	4	.22	.15	.16	.19	.	.27

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 45 / DIRECTION: 1 / TIME PERIOD: 4 NO. TRIPS: 34

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	151.32	427.83	57.50	57.50	16.57	9.24
	1	151.96	460.14	51.03	54.40	.	6.78
	2	142.18	430.39	50.49	53.82	.	6.01
	3	145.33	430.39	53.87	57.42	.	6.62
	4	147.95	429.61	54.23	57.81	.	6.74
RELATIVE ERROR	1	.00	.08	-.11	-.11	.	-.27
	2	-.06	.01	-.12	-.06	.	-.35
	3	-.04	.01	-.06	.00	.	-.28
	4	-.02	.00	-.06	.01	.	-.27
RELATIVE ABSOLUTE ERROR	1	.00	.08	.11	.11	.	.27
	2	.06	.01	.12	.06	.	.35
	3	.04	.01	.06	.00	.	.28
	4	.02	.00	.06	.01	.	.27
RELATIVE STANDARD ERROR	1	.42	.38	.37	.37	.	.20
	2	.24	.21	.19	.17	.	.23
	3	.19	.14	.11	.10	.	.11
	4	.14	.08	.11	.10	.	.10

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 45 / DIRECTION: 3 / TIME PERIOD: 4 NO. TRIPS: 41

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	122.98	370.77	57.39	57.39	18.07	6.62
	1	107.05	379.83	52.67	56.15	.	3.69
	2	112.56	388.17	53.50	57.03	.	3.69
	3	112.77	387.07	53.86	57.42	.	3.62
	4	130.64	398.93	53.83	57.38	.	4.54
RELATIVE ERROR	1	-.13	.02	-.08	-.08	.	-.44
	2	-.08	.05	-.07	-.01	.	-.44
	3	-.08	.04	-.06	.00	.	-.45
	4	.06	.08	-.06	.00	.	-.31
RELATIVE ABSOLUTE ERROR	1	.13	.02	.08	.08	.	.44
	2	.08	.05	.07	.01	.	.44
	3	.08	.04	.06	.00	.	.45
	4	.06	.08	.06	.00	.	.31
RELATIVE STANDARD ERROR	1	.25	.17	.14	.14	.	.18
	2	.22	.16	.12	.11	.	.18
	3	.20	.14	.12	.11	.	.17
	4	.20	.13	.11	.11	.	.14

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 53 / DIRECTION: 1 / TIME PERIOD: 1 NO. TRIPS: 6

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	60.17	238.45	45.67	45.67	15.22	2.07
	1	55.35	237.92	44.52	47.45	14.26	1.80
	2	55.83	238.90	44.72	47.67	14.44	1.79
	3	55.75	235.32	44.72	47.67	14.49	1.75
	4	.	.	.	.	.	.
RELATIVE ERROR	1	-.08	.00	-.03	-.03	-.06	-.13
	2	-.07	.00	-.02	.04	-.05	-.14
	3	-.07	-.01	-.02	.04	-.05	-.15
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.08	.00	.03	.03	.06	.13
	2	.07	.00	.02	.04	.05	.14
	3	.07	.01	.02	.04	.05	.15
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.14	.08	.05	.05	.13	.48
	2	.11	.07	.05	.07	.11	.48
	3	.11	.03	.05	.07	.07	.49
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 53 / DIRECTION: 3 / TIME PERIOD: 1 NO. TRIPS: 5

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	67.40	253.04	28.00	28.00	14.07	4.20
	1	59.38	255.64	27.82	29.66	12.07	3.86
	2	54.04	223.74	25.78	27.48	10.37	3.82
	3	59.28	239.02	28.90	30.81	12.05	3.86
	4	.	.	.	.	.	.
RELATIVE ERROR	1	-.12	.01	-.01	-.01	-.14	-.08
	2	-.20	-.12	-.08	-.02	-.26	-.09
	3	-.12	-.06	.03	.10	-.14	-.08
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.12	.01	.01	.01	.14	.08
	2	.20	.12	.08	.02	.26	.09
	3	.12	.06	.03	.10	.14	.08
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.33	.29	.43	.43	.20	.84
	2	.25	.13	.21	.22	.21	.90
	3	.17	.12	.07	.13	.12	.85
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 53 / DIRECTION: 1 / TIME PERIOD: 3 NO. TRIPS: 13

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	135.00	417.45	55.69	55.69	33.00	5.14
	1	136.26	428.28	47.70	50.85	34.53	4.67
	2	146.65	461.21	54.60	58.20	37.09	5.05
	3	133.71	425.20	53.70	57.24	33.39	4.79
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.01	.03	-.14	-.14	.05	-.09
	2	.09	.10	-.02	.05	.12	-.02
	3	-.01	.02	-.04	.03	.01	-.07
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.01	.03	.14	.14	.05	.09
	2	.09	.10	.02	.05	.12	.02
	3	.01	.02	.04	.03	.01	.07
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.24	.21	.30	.30	.10	.33
	2	.22	.16	.18	.19	.08	.33
	3	.14	.07	.07	.06	.06	.32
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 53 / DIRECTION: 3 / TIME PERIOD: 3 NO. TRIPS: 11

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	123.73	407.94	51.00	51.00	25.24	8.00
	1	145.75	452.76	47.46	50.60	31.43	8.58
	2	141.37	433.75	47.75	50.90	30.04	8.54
	3	136.14	410.75	48.56	51.77	28.41	8.49
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.18	.11	-.07	-.07	.25	.07
	2	.14	.06	-.06	.00	.19	.07
	3	.10	.01	-.05	.02	.13	.06
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.18	.11	.07	.07	.25	.07
	2	.14	.06	.06	.00	.19	.07
	3	.10	.01	.05	.02	.13	.06
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.26	.19	.13	.13	.12	.18
	2	.26	.15	.13	.13	.11	.19
	3	.17	.10	.09	.08	.09	.19
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 53 / DIRECTION: 1 / TIME PERIOD: 5 NO. TRIPS: 13

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	60.46	203.45	28.62	28.62	15.33	2.24
	1	59.81	213.53	25.82	27.52	15.31	.49
	2	61.28	215.62	26.94	28.72	15.79	.49
	3	68.50	238.88	28.28	30.15	19.30	.49
	4	.	.	.	.	.	.
RELATIVE ERROR	1	-.01	.05	-.10	-.10	.00	-.78
	2	.01	.06	-.06	.00	.03	-.78
	3	.13	.17	-.01	.05	.26	-.78
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.01	.05	.10	.10	.00	.78
	2	.01	.06	.06	.00	.03	.78
	3	.13	.17	.01	.05	.26	.78
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.15	.18	.21	.21	.14	.53
	2	.16	.19	.11	.09	.15	.53
	3	.18	.23	.03	.07	.04	.53
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 53 / DIRECTION: 3 / TIME PERIOD: 5 NO. TRIPS: 13

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	76.92	295.72	46.92	46.92	16.41	4.62
	1	83.74	328.80	45.38	48.38	18.20	4.86
	2	80.37	307.72	46.28	49.33	17.37	4.71
	3	82.37	308.39	46.39	49.45	17.54	4.96
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.09	.11	-.03	-.03	.11	.05
	2	.04	.04	-.01	.05	.06	.02
	3	.07	.04	-.01	.05	.07	.07
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.09	.11	.03	.03	.11	.05
	2	.04	.04	.01	.05	.06	.02
	3	.07	.04	.01	.05	.07	.07
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.22	.29	.08	.08	.12	.24
	2	.15	.15	.03	.07	.09	.25
	3	.12	.07	.03	.07	.07	.23
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 92 / DIRECTION: 3 / TIME PERIOD: 2 NO. TRIPS: 18

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	88.83	436.26	51.11	51.11	15.74	4.31
	1	96.08	417.05	47.32	50.44	17.34	4.42
	2	94.71	409.36	47.30	50.42	16.66	4.36
	3	95.89	405.86	49.04	52.28	16.83	4.34
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.08	-.04	-.07	-.07	.10	.03
	2	.07	-.06	-.07	-.01	.06	.01
	3	.08	-.07	-.04	.02	.07	.01
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.08	.04	.07	.07	.10	.03
	2	.07	.06	.07	.01	.06	.01
	3	.08	.07	.04	.02	.07	.01
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.46	.38	.31	.31	.08	.42
	2	.41	.30	.31	.31	.09	.40
	3	.37	.23	.17	.17	.09	.45
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 92 / DIRECTION: 1 / TIME PERIOD: 3 NO. TRIPS: 18

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	90.11	403.96	39.06	39.06	13.96	6.05
	1	100.83	418.19	36.81	39.24	16.40	5.95
	2	91.76	384.65	35.26	37.59	14.92	5.14
	3	95.86	399.47	35.61	37.96	15.02	6.29
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.12	.04	-.06	-.06	.17	-.02
	2	.02	-.05	-.10	-.04	.07	-.15
	3	.06	-.01	-.09	-.03	.08	.04
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.12	.04	.06	.06	.17	.02
	2	.02	.05	.10	.04	.07	.15
	3	.06	.01	.09	.03	.08	.04
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.26	.15	.12	.12	.09	.18
	2	.21	.15	.14	.11	.08	.19
	3	.20	.08	.12	.09	.08	.15
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 92 / DIRECTION: 3 / TIME PERIOD: 4 NO. TRIPS: 18

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	97.50	434.78	43.67	43.67	17.30	4.89
	1	100.93	413.62	38.47	41.01	11.94	3.27
	2	102.07	418.43	39.03	41.61	12.09	3.29
	3	101.54	413.69	39.43	42.04	12.03	3.28
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.04	-.05	-.12	-.12	-.31	-.33
	2	.05	-.04	-.11	-.05	-.30	-.33
	3	.04	-.05	-.10	-.04	-.30	-.33
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.04	.05	.12	.12	.31	.33
	2	.05	.04	.11	.05	.30	.33
	3	.04	.05	.10	.04	.30	.33
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.27	.31	.27	.27	.13	.30
	2	.28	.32	.27	.26	.13	.30
	3	.25	.25	.23	.22	.12	.29
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 92 / DIRECTION: 1 / TIME PERIOD: 5 NO. TRIPS: 11

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	33.73	189.17	22.73	22.73	6.48	1.51
	1	36.94	212.78	22.98	24.50	7.35	1.06
	2	37.55	214.47	23.19	24.72	7.48	1.11
	3	35.56	198.78	22.88	24.39	7.34	.76
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.10	.12	.01	.01	.13	-.30
	2	.11	.13	.02	.09	.15	-.27
	3	.05	.05	.01	.07	.13	-.50
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.10	.12	.01	.01	.13	.30
	2	.11	.13	.02	.09	.15	.27
	3	.05	.05	.01	.07	.13	.50
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.19	.24	.13	.13	.20	.36
	2	.22	.17	.14	.16	.20	.37
	3	.21	.14	.13	.15	.20	.62
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 117 / DIRECTION: 2 / TIME PERIOD: 2 NO. TRIPS: 15

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	62.93	180.13	29.07	29.07	13.73	7.09
	1	70.77	183.25	26.41	28.15	16.02	7.75
	2	74.13	193.12	27.45	29.26	15.44	8.65
	3	73.07	189.39	27.53	29.35	15.41	8.45
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.12	.02	-.09	-.09	.17	.09
	2	.18	.07	-.06	.01	.12	.22
	3	.16	.05	-.05	.01	.12	.19
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.12	.02	.09	.09	.17	.09
	2	.18	.07	.06	.01	.12	.22
	3	.16	.05	.05	.01	.12	.19
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.22	.10	.12	.12	.09	.15
	2	.24	.10	.11	.10	.09	.11
	3	.26	.10	.11	.10	.09	.12
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 117 / DIRECTION: 4 / TIME PERIOD: 2 NO. TRIPS: 16

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	88.06	282.81	46.50	46.50	14.13	9.97
	1	79.12	235.97	32.60	34.75	12.50	9.02
	2	90.35	268.99	42.88	45.71	14.81	10.12
	3	92.54	272.96	42.88	45.71	14.85	10.47
	4	.	.	.	.	.	.
RELATIVE ERROR	1	-.10	-.17	-.30	-.30	-.11	-.10
	2	.03	-.05	-.08	-.02	.05	.02
	3	.05	-.03	-.08	-.02	.05	.05
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.10	.17	.30	.30	.11	.10
	2	.03	.05	.08	.02	.05	.02
	3	.05	.03	.08	.02	.05	.05
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.19	.21	.39	.39	.12	.12
	2	.11	.08	.13	.09	.08	.10
	3	.12	.06	.13	.09	.08	.09
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 117 / DIRECTION: 2 / TIME PERIOD: 4 NO. TRIPS: 20

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	105.70	323.95	47.90	47.90	26.15	10.68
	1	105.59	309.10	38.32	40.85	24.56	11.29
	2	109.85	321.07	43.17	46.02	26.01	11.56
	3	109.66	320.56	43.16	46.01	25.99	11.53
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.00	-.05	-.20	-.20	-.06	.06
	2	.04	-.01	-.10	-.04	-.01	.08
	3	.04	-.01	-.10	-.04	-.01	.08
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.00	.05	.20	.20	.06	.06
	2	.04	.01	.10	.04	.01	.08
	3	.04	.01	.10	.04	.01	.08
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.17	.17	.26	.26	.09	.11
	2	.15	.08	.13	.09	.04	.10
	3	.15	.08	.13	.09	.04	.09
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 117 / DIRECTION: 4 / TIME PERIOD: 4 NO. TRIPS: 17

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	94.92	262.88	41.78	41.78	18.85	9.54
	1	114.01	273.71	38.77	41.33	19.90	12.37
	2	115.67	276.51	41.34	44.07	19.91	12.64
	3	116.21	277.20	41.28	44.00	20.01	12.70
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.20	.04	-.07	-.07	.06	.30
	2	.22	.05	-.01	.05	.06	.33
	3	.22	.05	-.01	.05	.06	.33
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.20	.04	.07	.07	.06	.30
	2	.22	.05	.01	.05	.06	.33
	3	.22	.05	.01	.05	.06	.33
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.33	.19	.15	.15	.05	.13
	2	.29	.11	.05	.08	.05	.11
	3	.27	.09	.05	.08	.05	.09
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 152 / DIRECTION: 2 / TIME PERIOD: 1 NO. TRIPS: 1

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	58.00	287.90	22.00	22.00	10.75	1.50
	1	97.00	408.00	50.00	53.30	18.37	2.35
	2	67.40	320.40	25.00	26.65	11.87	1.99
	3	64.80	297.00	25.00	26.65	12.02	1.67
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.67	.42	1.27	1.27	.71	.57
	2	.16	.11	.14	.21	.10	.33
	3	.12	.03	.14	.21	.12	.11
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.67	.42	1.27	1.27	.71	.57
	2	.16	.11	.14	.21	.10	.33
	3	.12	.03	.14	.21	.12	.11
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.67	.42	1.27	1.27	.36	.48
	2	.16	.11	.14	.21	.17	.50
	3	.12	.03	.14	.21	.18	.39
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 152 / DIRECTION: 4 / TIME PERIOD: 1 NO. TRIPS: 1

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	41.00	265.60	35.00	35.00	12.33	.80
	1	62.80	349.30	39.70	42.32	16.97	2.38
	2	62.80	349.30	39.70	42.32	16.97	2.38
	3	44.90	252.90	31.60	33.69	13.33	.98
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.53	.32	.13	.13	.38	1.97
	2	.53	.32	.13	.21	.38	1.97
	3	.10	-.05	-.10	-.04	.08	.22
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.53	.32	.13	.13	.38	1.97
	2	.53	.32	.13	.21	.38	1.97
	3	.10	.05	.10	.04	.08	.22
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.53	.32	.13	.13	.34	.70
	2	.53	.32	.13	.21	.34	.70
	3	.10	.05	.10	.04	.31	.43
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 152 / DIRECTION: 2 / TIME PERIOD: 3 NO. TRIPS: 9

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ LOAD	MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	96.78	357.52	33.67	<=	33.67	12.28	4.77
	1	101.59	362.46	28.26		30.12	13.23	4.87
	2	99.98	363.50	29.59		31.54	12.64	4.94
	3	97.21	354.26	29.36		31.29	12.01	4.92
	4	.	.	.		.	.	.
RELATIVE ERROR	1	.05	.01	-.16		-.16	.08	.02
	2	.03	.02	-.12		-.06	.03	.04
	3	.00	-.01	-.13		-.07	-.02	.03
	4	.	.	.		.	.	.
RELATIVE ABSOLUTE ERROR	1	.05	.01	.16		.16	.08	.02
	2	.03	.02	.12		.06	.03	.04
	3	.00	.01	.13		.07	.02	.03
	4	.	.	.		.	.	.
RELATIVE STANDARD ERROR	1	.16	.14	.31		.31	.16	.26
	2	.14	.10	.28		.25	.16	.26
	3	.16	.07	.28		.25	.15	.26
	4	.	.	.		.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 152 / DIRECTION: 4 / TIME PERIOD: 3 NO. TRIPS: 9

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ LOAD	MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	85.67	355.41	30.22	<=	30.22	14.96	4.53
	1	94.22	355.63	24.34		25.95	16.72	4.90
	2	87.23	334.76	24.50		26.12	15.51	4.52
	3	89.83	349.37	25.17		26.83	15.74	4.73
	4	.	.	.		.	.	.
RELATIVE ERROR	1	.10	.00	-.19		-.19	.12	.08
	2	.02	-.06	-.19		-.14	.04	.00
	3	.05	-.02	-.17		-.11	.05	.04
	4	.	.	.		.	.	.
RELATIVE ABSOLUTE ERROR	1	.10	.00	.19		.19	.12	.08
	2	.02	.06	.19		.14	.04	.00
	3	.05	.02	.17		.11	.05	.04
	4	.	.	.		.	.	.
RELATIVE STANDARD ERROR	1	.26	.21	.37		.37	.10	.32
	2	.23	.20	.36		.34	.08	.33
	3	.24	.12	.36		.34	.08	.33
	4	.	.	.		.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 152 / DIRECTION: 2 / TIME PERIOD: 5 NO. TRIPS: 7

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	54.57	302.90	26.00	26.00	6.46	2.87
	1	71.01	343.07	22.51	24.00	9.36	3.36
	2	68.84	333.43	22.69	24.18	9.36	3.14
	3	62.17	302.17	22.01	23.47	8.04	3.00
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.30	.13	-.13	-.13	.45	.17
	2	.26	.10	-.13	-.07	.45	.09
	3	.14	.00	-.15	-.10	.24	.05
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.30	.13	.13	.13	.45	.17
	2	.26	.10	.13	.07	.45	.09
	3	.14	.00	.15	.10	.24	.05
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.62	.39	.42	.42	.20	.44
	2	.53	.37	.42	.41	.20	.39
	3	.23	.16	.36	.33	.16	.39
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 152 / DIRECTION: 4 / TIME PERIOD: 5 NO. TRIPS: 7

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	52.43	272.90	20.71	20.71*	11.10	2.16
	1	56.91	296.23	20.61	21.97	12.24	2.26
	2	50.24	267.91	19.41	20.70	10.29	2.17
	3	49.09	258.89	19.27	20.54	10.18	2.08
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.09	.09	.00	.00	.10	.05
	2	-.04	-.02	-.06	.00	-.07	.00
	3	-.06	-.05	-.07	-.01	-.08	-.04
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.09	.09	.00	.00	.10	.05
	2	.04	.02	.06	.00	.07	.00
	3	.06	.05	.07	.01	.08	.04
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.31	.27	.32	.32	.19	.36
	2	.17	.10	.14	.12	.10	.34
	3	.17	.10	.14	.12	.10	.35
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 200 / DIRECTION: 1 / TIME PERIOD: 2 NO. TRIPS: 23

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ LOAD	MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	90.22	129.24	49.70	49.70	49.70	34.35	18.62
	1	87.39	130.60	45.91	48.94	48.94	32.34	18.35
	2	87.67	129.83	47.99	51.16	51.16	34.17	17.83
	3	88.03	129.62	48.08	51.26	51.26	34.16	17.96
	4	.	.	.	.	.	.	.
RELATIVE ERROR	1	-.03	.01	-.08	-.08	-.08	-.06	-.01
	2	-.03	.00	-.03	.03	.03	-.01	-.04
	3	-.02	.00	-.03	.03	.03	-.01	-.04
	4	.	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.03	.01	.08	.08	.08	.06	.01
	2	.03	.00	.03	.03	.03	.01	.04
	3	.02	.00	.03	.03	.03	.01	.04
	4	.	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.16	.17	.13	.13	.13	.04	.09
	2	.10	.08	.06	.07	.07	.03	.07
	3	.08	.07	.05	.06	.06	.03	.06
	4	.	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 200 / DIRECTION: 3 / TIME PERIOD: 2 NO. TRIPS: 20

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ LOAD	MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	97.20	124.58	50.65	50.65	50.65	42.45	18.25
	1	96.69	135.20	48.15	51.33	51.33	43.58	17.70
	2	95.35	129.79	49.32	52.58	52.58	43.58	17.26
	3	94.09	128.01	49.71	52.99	52.99	41.47	17.54
	4	.	.	.	.	.	.	.
RELATIVE ERROR	1	-.01	.09	-.05	-.05	-.05	.03	-.03
	2	-.02	.04	-.03	.04	.04	.03	-.05
	3	-.03	.03	-.02	.05	.05	-.02	-.04
	4	.	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.01	.09	.05	.05	.05	.03	.03
	2	.02	.04	.03	.04	.04	.03	.05
	3	.03	.03	.02	.05	.05	.02	.04
	4	.	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.13	.16	.09	.09	.09	.05	.08
	2	.12	.09	.04	.06	.06	.05	.07
	3	.07	.06	.04	.06	.06	.01	.06
	4	.	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 200 / DIRECTION: 1 / TIME PERIOD: 4 NO. TRIPS: 31

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	123.06	164.99	61.68 (=	61.68	55.97	22.37
	1	118.70	158.64	57.33	61.12	54.32	21.46
	2	118.92	157.31	60.42	64.40	56.65	20.75
	3	121.33	159.22	61.08	65.12	56.83	21.50
	4	.	.	.	.	.	.
RELATIVE ERROR	1	-.04	-.04	-.07	-.07	-.03	-.04
	2	-.03	-.05	-.02	.04	.01	-.07
	3	-.01	-.04	-.01	.06	.02	-.04
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.04	.04	.07	.07	.03	.04
	2	.03	.05	.02	.04	.01	.07
	3	.01	.04	.01	.06	.02	.04
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.16	.19	.10	.10	.03	.10
	2	.13	.12	.06	.08	.02	.09
	3	.10	.09	.05	.08	.02	.07
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 200 / DIRECTION: 3 / TIME PERIOD: 4 NO. TRIPS: 31

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	122.52	155.48	60.55 (=	60.55	50.52	24.00
	1	118.66	149.35	55.58	59.25	44.91	24.59
	2	119.60	151.49	57.65	61.45	44.90	24.90
	3	123.50	155.39	58.81	62.69	50.40	24.37
	4	.	.	.	.	.	.
RELATIVE ERROR	1	-.03	-.04	-.08	-.08	-.11	.02
	2	-.02	-.03	-.05	.01	-.11	.04
	3	.01	.00	-.03	.04	.00	.02
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.03	.04	.08	.08	.11	.02
	2	.02	.03	.05	.01	.11	.04
	3	.01	.00	.03	.04	.00	.02
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.14	.14	.13	.13	.05	.07
	2	.11	.10	.08	.07	.05	.06
	3	.10	.07	.06	.06	.00	.05
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 209 / DIRECTION: 1 / TIME PERIOD: 1 NO. TRIPS: 1

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	24.00	107.00	16.00	16.00	4.00	2.00
	1	28.60	101.70	16.90	18.02	5.20	2.17
	2	28.90	98.90	16.90	18.02	5.00	2.32
	3	27.00	98.20	16.90	18.02	4.67	2.17
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.19	-.05	.06	.06	.30	.08
	2	.20	-.08	.06	.13	.25	.16
	3	.12	-.08	.06	.13	.17	.08
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.19	.05	.06	.06	.30	.08
	2	.20	.08	.06	.13	.25	.16
	3	.12	.08	.06	.13	.17	.08
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.19	.05	.06	.06	.27	.36
	2	.20	.08	.06	.13	.28	.37
	3	.12	.08	.06	.13	.34	.34
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 209 / DIRECTION: 3 / TIME PERIOD: 1 NO. TRIPS: .

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	.	.	.	<=	.	.
	1	.	.	.	.	.	.
	2	.	.	.	.	.	.
	3	8.30	21.80	5.30	5.65	2.53	.23
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.	.	.	.	.	.
	2	.	.	.	.	.	.
	3	.66	.11	.06	.13	.52	.
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.	.	.	.	.	.
	2	.	.	.	.	.	.
	3	.66	.11	.06	.13	.52	.
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.	.	.	.	.	.
	2	.	.	.	.	.	.
	3	.66	.11	.06	.13	.67	1.00
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 209 / DIRECTION: 1 / TIME PERIOD: 3 NO. TRIPS: 12

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	30.75	78.60	13.92	13.92	4.81	2.72
	1	28.27	73.27	9.67	10.30	5.10	2.16
	2	31.16	83.09	10.77	11.48	5.51	2.44
	3	28.76	75.11	10.84	11.56	4.96	2.32
	4	.	.	.	.	.	.
RELATIVE ERROR	1	-.08	-.07	-.31	-.31	.06	-.21
	2	.01	.06	-.23	-.18	.15	-.10
	3	-.06	-.04	-.22	-.17	.03	-.15
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.08	.07	.31	.31	.06	.21
	2	.01	.06	.23	.18	.15	.10
	3	.06	.04	.22	.17	.03	.15
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.36	.19	.46	.46	.13	.37
	2	.31	.13	.41	.39	.10	.34
	3	.31	.13	.41	.39	.08	.37
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 209 / DIRECTION: 3 / TIME PERIOD: 3 NO. TRIPS: 13

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	35.85	99.28	16.46	16.46	7.05	2.45
	1	38.83	115.96	15.46	16.48	7.53	2.71
	2	36.85	108.03	15.38	16.40	7.15	2.56
	3	35.74	101.87	15.65	16.69	7.11	2.40
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.08	.17	-.06	-.06	.07	.11
	2	.03	.09	-.07	.00	.01	.05
	3	.00	.03	-.05	.01	.01	-.02
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.08	.17	.06	.06	.07	.11
	2	.03	.09	.07	.00	.01	.05
	3	.00	.03	.05	.01	.01	.02
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.43	.35	.17	.17	.15	.33
	2	.26	.21	.11	.09	.12	.33
	3	.22	.12	.09	.07	.11	.34
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 209 / DIRECTION: 1 / TIME PERIOD: 5 NO. TRIPS: 5

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	21.40	68.94	11.60	11.60	3.87	1.63
	1	21.26	71.72	9.72	10.36	4.29	1.40
	2	21.98	73.00	11.08	11.81	4.33	1.50
	3	19.58	61.34	11.08	11.81	3.97	1.28
	4	.	.	.	.	.	.
RELATIVE ERROR	1	-.01	.04	-.16	-.16	.11	-.14
	2	.03	.06	-.04	.02	.12	-.08
	3	-.09	-.11	-.04	.02	.03	-.22
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.01	.04	.16	.16	.11	.14
	2	.03	.06	.04	.02	.12	.08
	3	.09	.11	.04	.02	.03	.22
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.22	.16	.18	.18	.30	.56
	2	.23	.20	.07	.05	.31	.53
	3	.20	.14	.07	.05	.25	.59
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 209 / DIRECTION: 3 / TIME PERIOD: 5 NO. TRIPS: 5

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	28.60	97.74	14.80	14.80	6.73	1.40
	1	23.46	90.38	14.00	14.92	5.89	.96
	2	23.24	87.22	13.64	14.54	5.91	.92
	3	24.90	92.02	13.82	14.73	6.03	1.13
	4	.	.	.	.	.	.
RELATIVE ERROR	1	-.18	-.08	-.05	-.05	-.12	-.31
	2	-.19	-.11	-.08	-.02	-.12	-.34
	3	-.13	-.06	-.07	.00	-.10	-.19
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.18	.08	.05	.05	.12	.31
	2	.19	.11	.08	.02	.12	.34
	3	.13	.06	.07	.00	.10	.19
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.30	.14	.25	.25	.20	.61
	2	.24	.16	.10	.09	.16	.60
	3	.20	.06	.09	.08	.15	.42
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 260 / DIRECTION: 3 / TIME PERIOD: 2 NO. TRIPS: 6

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	165.53	606.78	48.62	48.62	21.53	8.82
	1	143.17	538.15	40.90	43.60	20.57	6.77
	2	171.87	680.63	48.93	52.16	23.87	8.49
	3	171.10	670.10	51.85	55.27	23.61	8.52
	4	160.10	611.22	49.10	52.34	22.76	7.67
RELATIVE ERROR	1	-.14	-.11	-.16	-.16	-.04	-.23
	2	.04	.12	.01	.07	.11	-.04
	3	.03	.10	.07	.14	.10	-.03
	4	-.03	.01	.01	.08	.06	-.13
RELATIVE ABSOLUTE ERROR	1	.14	.11	.16	.16	.04	.23
	2	.04	.12	.01	.07	.11	.04
	3	.03	.10	.07	.14	.10	.03
	4	.03	.01	.01	.08	.06	.13
RELATIVE STANDARD ERROR	1	.48	.44	.41	.41	.26	.45
	2	.36	.20	.19	.21	.16	.26
	3	.26	.16	.07	.14	.12	.26
	4	.22	.09	.14	.16	.11	.32

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 260 / DIRECTION: 1 / TIME PERIOD: 3 NO. TRIPS: 14

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	129.86	464.14	34.21	34.21	17.21	7.00
	1	239.06	739.02	56.16	59.86	29.53	8.63
	2	171.02	555.16	39.67	42.29	17.71	8.37
	3	162.05	546.16	39.64	42.25	17.71	7.34
	4	169.09	555.13	40.99	43.69	20.06	7.53
RELATIVE ERROR	1	.84	.59	.64	.64	.72	.23
	2	.32	.20	.16	.24	.03	.20
	3	.25	.18	.16	.23	.03	.05
	4	.30	.20	.20	.28	.17	.08
RELATIVE ABSOLUTE ERROR	1	.84	.59	.64	.64	.72	.23
	2	.32	.20	.16	.24	.03	.20
	3	.25	.18	.16	.23	.03	.05
	4	.30	.20	.20	.28	.17	.08
RELATIVE STANDARD ERROR	1	1.08	.74	.84	.84	.14	.23
	2	.39	.30	.24	.31	.19	.23
	3	.30	.29	.24	.31	.19	.18
	4	.39	.25	.28	.35	.09	.19

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 260 / DIRECTION: 3 / TIME PERIOD: 4 NO. TRIPS: 10

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ LOAD	MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	162.29	557.87	44.78	44.78	44.78	22.22	8.16
	1	161.62	551.23	38.52	41.06	41.06	21.84	8.25
	2	163.73	559.19	40.79	43.48	43.48	22.23	8.31
	3	165.59	564.87	40.72	43.41	43.41	22.43	8.43
	4	168.16	566.55	43.18	46.03	46.03	22.92	8.50
RELATIVE ERROR	1	.00	-.01	-.14	-.14	-.14	-.02	.01
	2	.01	.00	-.09	-.03	-.03	.00	.02
	3	.02	.01	-.09	-.03	-.03	.01	.03
	4	.04	.02	-.04	.03	.03	.03	.04
RELATIVE ABSOLUTE ERROR	1	.00	.01	.14	.14	.14	.02	.01
	2	.01	.00	.09	.03	.03	.00	.02
	3	.02	.01	.09	.03	.03	.01	.03
	4	.04	.02	.04	.03	.03	.03	.04
RELATIVE STANDARD ERROR	1	.29	.25	.40	.40	.40	.14	.26
	2	.22	.19	.18	.17	.17	.12	.25
	3	.25	.21	.18	.17	.17	.11	.25
	4	.17	.11	.06	.06	.06	.07	.22

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 260 / DIRECTION: 1 / TIME PERIOD: 5 NO. TRIPS: 4

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ LOAD	MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	96.00	489.27	31.50	31.50	31.50	12.50	4.60
	1	64.45	454.07	20.62	21.99	21.99	9.38	2.69
	2	73.02	511.07	25.30	26.97	26.97	10.66	3.04
	3	76.60	524.87	26.07	27.80	27.80	10.78	3.35
	4	72.25	490.97	25.00	26.65	26.65	10.16	3.16
RELATIVE ERROR	1	-.33	-.07	-.35	-.35	-.35	-.25	-.41
	2	-.24	.04	-.20	-.14	-.14	-.15	-.34
	3	-.20	.07	-.17	-.12	-.12	-.14	-.27
	4	-.25	.00	-.21	-.15	-.15	-.19	-.31
RELATIVE ABSOLUTE ERROR	1	.33	.07	.35	.35	.35	.25	.41
	2	.24	.04	.20	.14	.14	.15	.34
	3	.20	.07	.17	.12	.12	.14	.27
	4	.25	.00	.21	.15	.15	.19	.31
RELATIVE STANDARD ERROR	1	.44	.41	.46	.46	.46	.37	1.79
	2	.27	.23	.27	.24	.24	.27	1.53
	3	.26	.26	.27	.24	.24	.27	1.47
	4	.30	.23	.32	.29	.29	.29	1.27

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 260 / DIRECTION: 3 / TIME PERIOD: 5 NO. TRIPS: 4

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
-----	-----	-----	-----	-----	-----	-----	-----
MEAN	OBS	68.70	238.75	26.40	26.40	8.79	3.72
	1	69.02	206.37	18.72	19.96	8.99	3.67
	2	79.02	240.65	24.35	25.96	11.12	3.84
	3	83.52	254.42	26.75	28.52	12.81	3.59
	4	88.07	266.62	26.40	28.14	13.31	3.87
RELATIVE ERROR	1	.00	-.14	-.29	-.29	.02	-.01
	2	.15	.01	-.08	-.02	.27	.03
	3	.22	.07	.01	.08	.46	-.04
	4	.28	.12	.00	.07	.51	.04
RELATIVE ABSOLUTE ERROR	1	.00	.14	.29	.29	.02	.01
	2	.15	.01	.08	.02	.27	.03
	3	.22	.07	.01	.08	.46	.04
	4	.28	.12	.00	.07	.51	.04
RELATIVE STANDARD ERROR	1	.35	.27	.46	.46	.30	.60
	2	.45	.16	.19	.19	.24	.53
	3	.32	.11	.04	.09	.25	.42
	4	.38	.17	.04	.07	.25	.30

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 260 / DIRECTION: 3 / TIME PERIOD: 3 NO. TRIPS: 5

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	161.80	653.24	39.60	39.60	21.20	8.56
	1	147.62	576.74	33.28	35.48	20.42	7.32
	2	158.40	617.54	36.50	38.91	21.93	7.85
	3	165.32	642.66	36.50	38.91	22.01	8.59
	4	175.24	687.56	41.12	43.83	23.40	9.07
RELATIVE ERROR	1	-.09	-.12	-.16	-.16	-.04	-.14
	2	-.02	-.05	-.08	-.02	.03	-.08
	3	.02	-.02	-.08	-.02	.04	.00
	4	.08	.05	.04	.11	.10	.06
RELATIVE ABSOLUTE ERROR	1	.09	.12	.16	.16	.04	.14
	2	.02	.05	.08	.02	.03	.08
	3	.02	.02	.08	.02	.04	.00
	4	.08	.05	.04	.11	.10	.06
RELATIVE STANDARD ERROR	1	.24	.24	.32	.32	.24	.28
	2	.07	.10	.12	.10	.15	.24
	3	.08	.10	.12	.10	.15	.22
	4	.15	.16	.15	.19	.16	.19

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 260 / DIRECTION: 1 / TIME PERIOD: 4 NO. TRIPS: 16

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	177.13	630.86	51.88	51.88	23.18	10.32
	1	167.45	685.36	43.22	46.08	24.57	7.88
	2	166.26	671.77	43.44	46.30	23.75	7.77
	3	181.07	706.10	50.14	53.45	23.75	10.83
	4	181.97	686.76	50.51	53.85	24.58	10.91
RELATIVE ERROR	1	-.05	.09	-.17	-.17	.06	-.24
	2	-.06	.06	-.16	-.11	.02	-.25
	3	.02	.12	-.03	.03	.02	.05
	4	.03	.09	-.03	.04	.06	.06
RELATIVE ABSOLUTE ERROR	1	.05	.09	.17	.17	.06	.24
	2	.06	.06	.16	.11	.02	.25
	3	.02	.12	.03	.03	.02	.05
	4	.03	.09	.03	.04	.06	.06
RELATIVE STANDARD ERROR	1	.37	.53	.49	.49	.17	.46
	2	.25	.28	.35	.34	.14	.45
	3	.18	.30	.25	.25	.14	.24
	4	.17	.24	.23	.24	.14	.22

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 260 / DIRECTION: 3 / TIME PERIOD: 1 NO. TRIPS: 1

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	183.00	1052.9	63.00	63.00	30.25	6.89
	1	123.80	815.80	43.60	46.48	17.17	6.12
	2	174.60	1128.3	64.20	68.44	26.95	7.42
	3	178.70	1143.0	64.20	68.44	26.97	7.87
	4	159.10	997.10	63.30	67.48	23.32	7.31
RELATIVE ERROR	1	-.32	-.23	-.31	-.31	-.43	-.11
	2	-.05	.07	.02	.09	-.11	.08
	3	-.02	.09	.02	.09	-.11	.14
	4	-.13	-.05	.00	.07	-.23	.06
RELATIVE ABSOLUTE ERROR	1	.32	.23	.31	.31	.43	.11
	2	.05	.07	.02	.09	.11	.08
	3	.02	.09	.02	.09	.11	.14
	4	.13	.05	.00	.07	.23	.06
RELATIVE STANDARD ERROR	1	.32	.23	.31	.31	.83	.32
	2	.05	.07	.02	.09	.25	.29
	3	.02	.09	.02	.09	.25	.20
	4	.13	.05	.00	.07	.37	.23

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 260 / DIRECTION: 1 / TIME PERIOD: 2 NO. TRIPS: 11

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	160.82	750.17	57.00	57.00	20.27	8.27
	1	191.84	795.10	57.51	61.30	.	8.60
	2	179.96	734.99	52.44	55.90	.	8.48
	3	182.95	744.18	52.32	55.77	.	8.74
	4	190.99	786.04	55.55	59.21	.	8.92
RELATIVE ERROR	1	.19	.06	.01	.01	.	.04
	2	.12	-.02	-.08	-.02	.	.03
	3	.14	-.01	-.08	-.02	.	.06
	4	.19	.05	-.03	.04	.	.08
RELATIVE ABSOLUTE ERROR	1	.19	.06	.01	.01	.	.04
	2	.12	.02	.08	.02	.	.03
	3	.14	.01	.08	.02	.	.06
	4	.19	.05	.03	.04	.	.08
RELATIVE STANDARD ERROR	1	.35	.23	.26	.26	.	.27
	2	.21	.12	.14	.12	.	.26
	3	.22	.12	.14	.12	.	.28
	4	.24	.10	.05	.06	.	.28

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 209 / DIRECTION: 1 / TIME PERIOD: 4 NO. TRIPS: 14

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	61.29	186.46	26.50	26.50	11.17	4.86
	1	64.14	187.94	24.12	25.72	11.51	4.94
	2	67.65	199.20	26.21	27.94	12.28	5.13
	3	60.66	179.18	26.90	28.68	10.50	5.08
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.05	.01	-.09	-.09	.03	.02
	2	.10	.07	-.01	.05	.10	.06
	3	-.01	-.04	.02	.08	-.06	.05
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.05	.01	.09	.09	.03	.02
	2	.10	.07	.01	.05	.10	.06
	3	.01	.04	.02	.08	.06	.05
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.15	.25	.25	.25	.17	.32
	2	.17	.21	.19	.22	.16	.31
	3	.24	.16	.40	.43	.16	.35
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 209 / DIRECTION: 3 / TIME PERIOD: 4 NO. TRIPS: 12

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	82.75	241.84	37.92	37.92	17.61	4.99
	1	92.70	270.42	35.87	38.24	18.46	6.22
	2	89.03	256.99	36.65	39.07	18.02	5.83
	3	85.78	248.48	37.22	39.67	17.98	5.31
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.12	.12	-.05	-.05	.05	.25
	2	.08	.06	-.03	.03	.02	.17
	3	.04	.03	-.02	.05	.02	.06
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.12	.12	.05	.05	.05	.25
	2	.08	.06	.03	.03	.02	.17
	3	.04	.03	.02	.05	.02	.06
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.31	.28	.17	.17	.10	.32
	2	.18	.13	.06	.07	.07	.29
	3	.08	.05	.04	.07	.07	.31
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 209 / DIRECTION: 1 / TIME PERIOD: 2 NO. TRIPS: 11

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	80.27	239.97	40.09	40.09	14.30	6.23
	1	92.68	280.16	39.48	42.09	16.82	7.03
	2	83.87	253.85	38.24	40.76	14.35	6.81
	3	81.16	249.73	38.58	41.13	13.95	6.55
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.15	.17	-.02	-.02	.18	.13
	2	.04	.06	-.05	.02	.00	.09
	3	.01	.04	-.04	.03	-.02	.05
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.15	.17	.02	.02	.18	.13
	2	.04	.06	.05	.02	.00	.09
	3	.01	.04	.04	.03	.02	.05
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.22	.24	.09	.09	.10	.39
	2	.13	.14	.09	.07	.09	.38
	3	.07	.06	.08	.07	.06	.37
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 209 / DIRECTION: 3 / TIME PERIOD: 2 NO. TRIPS: 10

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	69.10	213.83	30.40	30.40	11.30	5.87
	1	78.05	224.03	30.54	32.56	13.59	6.21
	2	77.76	227.73	31.54	33.62	13.45	6.24
	3	68.81	204.70	27.07	28.86	11.38	5.78
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.13	.05	.00	.00	.20	.06
	2	.13	.07	.04	.11	.19	.06
	3	.00	-.04	-.11	-.05	.01	-.01
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.13	.05	.00	.00	.20	.06
	2	.13	.07	.04	.11	.19	.06
	3	.00	.04	.11	.05	.01	.01
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.50	.48	.47	.47	.15	.25
	2	.46	.33	.36	.39	.16	.22
	3	.23	.11	.15	.11	.12	.20
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 200 / DIRECTION: 1 / TIME PERIOD: 5 NO. TRIPS: 14

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN QTH SEG
MEAN	OBS	67.43	100.39	40.71	40.71	33.79	11.21
	1	71.87	101.56	37.40	39.87	34.71	12.39
	2	70.22	97.90	38.90	41.47	35.84	11.46
	3	70.76	97.76	38.88	41.44	35.89	11.62
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.07	.01	-.08	-.08	.03	.10
	2	.04	-.02	-.04	.02	.06	.02
	3	.05	-.03	-.05	.02	.06	.04
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.07	.01	.08	.08	.03	.10
	2	.04	.02	.04	.02	.06	.02
	3	.05	.03	.05	.02	.06	.04
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.17	.15	.14	.14	.05	.11
	2	.11	.08	.08	.07	.04	.09
	3	.13	.06	.08	.07	.04	.09
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 200 / DIRECTION: 3 / TIME PERIOD: 5 NO. TRIPS: 14

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN QTH SEG
MEAN	OBS	84.86	110.51	45.79	45.79	40.43	14.81
	1	83.78	110.59	43.28	46.13	37.59	15.40
	2	81.99	109.36	43.85	46.74	37.59	14.80
	3	84.97	112.00	45.65	48.66	40.65	14.77
	4	.	.	.	.	.	.
RELATIVE ERROR	1	-.01	.00	-.05	-.05	-.07	.04
	2	-.03	-.01	-.04	.02	-.07	.00
	3	.00	.01	.00	.06	.01	.00
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.01	.00	.05	.05	.07	.04
	2	.03	.01	.04	.02	.07	.00
	3	.00	.01	.00	.06	.01	.00
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.18	.12	.13	.13	.07	.10
	2	.14	.08	.13	.14	.07	.10
	3	.11	.07	.08	.12	.01	.09
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 200 / DIRECTION: 1 / TIME PERIOD: 3 NO. TRIPS: 27

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	83.07	106.22	41.00	41.00	38.52	14.85
	1	80.54	99.76	36.08	38.46	39.69	13.62
	2	82.66	102.76	38.57	41.12	40.51	14.05
	3	84.74	105.35	38.62	41.17	40.67	14.69
	4	.	.	.	.	.	.
RELATIVE ERROR	1	-.03	-.06	-.12	-.12	.03	-.08
	2	.00	-.03	-.06	.00	.05	-.05
	3	.02	-.01	-.06	.00	.06	-.01
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.03	.06	.12	.12	.03	.08
	2	.00	.03	.06	.00	.05	.05
	3	.02	.01	.06	.00	.06	.01
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.14	.15	.16	.16	.03	.08
	2	.08	.07	.09	.07	.02	.06
	3	.07	.05	.09	.07	.02	.05
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 200 / DIRECTION: 3 / TIME PERIOD: 3 NO. TRIPS: 27

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	82.52	103.43	41.74	41.74	31.37	17.05
	1	79.30	97.68	38.00	40.50	31.91	15.80
	2	81.90	100.15	39.73	42.36	31.91	16.66
	3	81.84	100.24	39.72	42.34	31.53	16.77
	4	.	.	.	.	.	.
RELATIVE ERROR	1	-.04	-.06	-.09	-.09	.02	-.07
	2	-.01	-.03	-.05	.01	.02	-.02
	3	-.01	-.03	-.05	.01	.00	-.02
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.04	.06	.09	.09	.02	.07
	2	.01	.03	.05	.01	.02	.02
	3	.01	.03	.05	.01	.00	.02
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.18	.20	.14	.14	.03	.08
	2	.12	.07	.08	.07	.03	.06
	3	.11	.06	.08	.07	.01	.05
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 200 / DIRECTION: 1 / TIME PERIOD: 1 NO. TRIPS: 2

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ LOAD	MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	84.00	121.90	51.00	<=	51.00	35.00	16.33
	1	68.30	110.10	50.70		54.05	33.90	11.47
	2	74.10	122.65	50.70		54.05	33.05	13.68
	3	68.40	114.20	47.35		50.48	32.40	12.00
	4	.	.	.		.	.	.
RELATIVE ERROR	1	-.19	-.10	-.01		-.01	-.03	-.30
	2	-.12	.01	-.01		.06	-.06	-.16
	3	-.19	-.06	-.07		-.01	-.07	-.27
	4	.	.	.		.	.	.
RELATIVE ABSOLUTE ERROR	1	.19	.10	.01		.01	.03	.30
	2	.12	.01	.01		.06	.06	.16
	3	.19	.06	.07		.01	.07	.27
	4	.	.	.		.	.	.
RELATIVE STANDARD ERROR	1	.22	.13	.12		.12	.04	1.06
	2	.16	.09	.12		.15	.05	.70
	3	.19	.06	.07		.01	.06	.73
	4	.	.	.		.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 200 / DIRECTION: 3 / TIME PERIOD: 1 NO. TRIPS: 1

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ LOAD	MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	64.00	99.60	45.00	<=	45.00	35.00	9.67
	1	49.00	91.90	34.60		36.88	25.50	7.83
	2	60.20	104.20	45.00		47.97	35.40	8.27
	3	64.20	111.00	45.00		47.97	35.70	9.50
	4	.	.	.		.	.	.
RELATIVE ERROR	1	-.23	-.08	-.23		-.23	-.27	-.19
	2	-.06	.05	.00		.07	.01	-.14
	3	.00	.11	.00		.07	.02	-.02
	4	.	.	.		.	.	.
RELATIVE ABSOLUTE ERROR	1	.23	.08	.23		.23	.27	.19
	2	.06	.05	.00		.07	.01	.14
	3	.00	.11	.00		.07	.02	.02
	4	.	.	.		.	.	.
RELATIVE STANDARD ERROR	1	.23	.08	.23		.23	.37	.56
	2	.06	.05	.00		.07	.01	.63
	3	.00	.11	.00		.07	.02	.32
	4	.	.	.		.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 152 / DIRECTION: 2 / TIME PERIOD: 4 NO. TRIPS: 17

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	120.53	502.29	44.65	44.65	14.84	7.38
	1	138.20	606.29	39.38	41.98	23.64	7.83
	2	137.14	575.67	53.09	56.59	.	7.35
	3	137.02	575.94	53.82	57.38	.	7.37
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.15	.21	-.12	-.12	.59	.06
	2	.14	.15	.19	.27	.	.00
	3	.14	.15	.21	.29	.	.00
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.15	.21	.12	.12	.59	.06
	2	.14	.15	.19	.27	.	.00
	3	.14	.15	.21	.29	.	.00
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.36	.24	.37	.37	.09	.19
	2	.40	.31	.84	.91	.	.21
	3	.37	.30	.84	.91	.	.22
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 152 / DIRECTION: 4 / TIME PERIOD: 4 NO. TRIPS: 12

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	139.83	519.12	50.67	50.67	23.65	8.65
	1	149.84	569.83	36.36	38.76	24.06	8.63
	2	140.32	522.22	43.91	46.81	24.14	8.41
	3	139.08	518.62	45.43	48.43	24.11	8.27
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.07	.10	-.28	-.28	.02	.00
	2	.00	.01	-.13	-.08	.02	-.03
	3	-.01	.00	-.10	-.04	.02	-.04
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.07	.10	.28	.28	.02	.00
	2	.00	.01	.13	.08	.02	.03
	3	.01	.00	.10	.04	.02	.04
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.30	.32	.37	.37	.19	.32
	2	.20	.17	.21	.17	.13	.30
	3	.18	.13	.18	.15	.13	.28
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 152 / DIRECTION: 2 / TIME PERIOD: 2 NO. TRIPS: 10

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ LOAD	MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	114.60	480.59	46.30	<=	46.30	17.25	4.56
	1	140.10	530.83	40.06		42.70	20.68	5.74
	2	130.54	499.69	42.98		45.82	18.78	5.54
	3	129.73	495.06	44.26		47.18	19.15	5.31
	4	.	.	.		.	.	.
RELATIVE ERROR	1	.22	.10	-.13		-.13	.20	.26
	2	.14	.04	-.07		-.01	.09	.22
	3	.13	.03	-.04		.02	.11	.16
	4	.	.	.		.	.	.
RELATIVE ABSOLUTE ERROR	1	.22	.10	.13		.13	.20	.26
	2	.14	.04	.07		.01	.09	.22
	3	.13	.03	.04		.02	.11	.16
	4	.	.	.		.	.	.
RELATIVE STANDARD ERROR	1	.62	.38	.52		.52	.21	.25
	2	.28	.16	.19		.19	.11	.24
	3	.22	.09	.08		.08	.10	.22
	4	.	.	.		.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 152 / DIRECTION: 4 / TIME PERIOD: 2 NO. TRIPS: 10

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ LOAD	MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	150.10	696.51	56.80	<=	56.80	23.33	8.90
	1	145.29	670.10	41.53		44.27	22.68	8.58
	2	147.46	675.79	44.68		47.63	23.14	8.67
	3	150.98	699.30	44.62		47.56	23.53	8.93
	4	.	.	.		.	.	.
RELATIVE ERROR	1	-.03	-.04	-.27		-.27	-.03	-.04
	2	-.02	-.03	-.21		-.16	-.01	-.03
	3	.01	.00	-.21		-.16	.01	.00
	4	.	.	.		.	.	.
RELATIVE ABSOLUTE ERROR	1	.03	.04	.27		.27	.03	.04
	2	.02	.03	.21		.16	.01	.03
	3	.01	.00	.21		.16	.01	.00
	4	.	.	.		.	.	.
RELATIVE STANDARD ERROR	1	.32	.25	.40		.40	.15	.25
	2	.18	.14	.33		.30	.10	.24
	3	.14	.09	.33		.30	.09	.22
	4	.	.	.		.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 117 / DIRECTION: 2 / TIME PERIOD: 5 NO. TRIPS: 16

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	58.13	201.08	27.06	27.06	15.56	5.40
	1	60.82	205.91	24.86	26.50	16.18	5.69
	2	61.09	204.89	26.07	27.79	16.31	5.69
	3	60.61	200.29	26.21	27.94	16.30	5.60
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.05	.02	-.08	-.08	.04	.05
	2	.05	.02	-.04	.03	.05	.05
	3	.04	.00	-.03	.03	.05	.04
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.05	.02	.08	.08	.04	.05
	2	.05	.02	.04	.03	.05	.05
	3	.04	.00	.03	.03	.05	.04
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.20	.16	.12	.12	.09	.19
	2	.16	.09	.06	.07	.05	.19
	3	.15	.06	.05	.06	.05	.17
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 117 / DIRECTION: 4 / TIME PERIOD: 5 NO. TRIPS: 12

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	48.97	157.90	23.61	23.61	6.92	5.85
	1	53.72	169.82	24.91	26.55	9.30	5.85
	2	49.65	154.85	23.09	24.62	8.22	5.54
	3	50.52	158.84	23.27	24.81	8.08	5.73
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.10	.08	.06	.06	.34	.00
	2	.01	-.02	-.02	.04	.19	-.05
	3	.03	.01	-.01	.05	.17	-.02
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.10	.08	.06	.06	.34	.00
	2	.01	.02	.02	.04	.19	.05
	3	.03	.01	.01	.05	.17	.02
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.24	.22	.11	.11	.14	.14
	2	.15	.08	.07	.09	.11	.12
	3	.13	.04	.06	.09	.11	.10
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 117 / DIRECTION: 2 / TIME PERIOD: 3 NO. TRIPS: 19

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	81.79	210.67	30.79	30.79	14.26	10.65
	1	84.39	211.38	27.27	29.07	16.63	10.23
	2	81.63	204.25	26.89	28.67	15.54	10.11
	3	83.63	208.85	27.04	28.82	15.58	10.49
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.03	.00	-.11	-.11	.17	-.04
	2	.00	-.03	-.13	-.07	.09	-.05
	3	.02	-.01	-.12	-.06	.09	-.01
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.03	.00	.11	.11	.17	.04
	2	.00	.03	.13	.07	.09	.05
	3	.02	.01	.12	.06	.09	.01
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.25	.19	.21	.21	.10	.10
	2	.17	.13	.20	.17	.07	.10
	3	.14	.08	.19	.16	.07	.09
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 117 / DIRECTION: 4 / TIME PERIOD: 3 NO. TRIPS: 20

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	84.53	232.07	33.58	33.58	13.57	9.56
	1	90.65	237.90	29.83	31.80	16.25	9.69
	2	91.61	236.59	31.14	33.20	16.34	9.82
	3	90.34	233.05	31.21	33.28	16.30	9.62
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.07	.03	-.11	-.11	.20	.01
	2	.08	.02	-.07	-.01	.20	.03
	3	.07	.00	-.07	-.01	.20	.01
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.07	.03	.11	.11	.20	.01
	2	.08	.02	.07	.01	.20	.03
	3	.07	.00	.07	.01	.20	.01
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.21	.15	.15	.15	.09	.10
	2	.17	.10	.09	.07	.07	.09
	3	.13	.08	.09	.07	.07	.07
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 92 / DIRECTION: 3 / TIME PERIOD: 5 NO. TRIPS: 7

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	36.14	197.80	17.71	17.71	6.82	1.61
	1	42.66	241.90	18.66	19.89	8.88	1.40
	2	38.84	217.94	17.74	18.91	8.01	1.44
	3	32.68	173.60	15.16	16.16	8.11	1.38
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.18	.22	.05	.05	.30	-.13
	2	.07	.10	.00	.07	.17	-.10
	3	-.10	-.12	-.14	-.09	.19	-.14
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.18	.22	.05	.05	.30	.13
	2	.07	.10	.00	.07	.17	.10
	3	.10	.12	.14	.09	.19	.14
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.34	.43	.16	.16	.23	.54
	2	.16	.19	.14	.17	.19	.48
	3	.17	.16	.13	.13	.16	.38
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 117 / DIRECTION: 4 / TIME PERIOD: 1 NO. TRIPS: 4

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	80.00	292.75	54.82	54.82	17.44	7.52
	1	72.32	262.75	45.67	48.69	16.15	6.67
	2	74.52	269.60	49.05	52.29	17.14	6.71
	3	75.52	275.05	49.05	52.29	17.16	6.87
	4	.	.	.	.	.	.
RELATIVE ERROR	1	-.10	-.10	-.17	-.17	-.07	-.11
	2	-.07	-.08	-.11	-.05	-.02	-.11
	3	-.06	-.06	-.11	-.05	-.02	-.09
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.10	.10	.17	.17	.07	.11
	2	.07	.08	.11	.05	.02	.11
	3	.06	.06	.11	.05	.02	.09
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.14	.13	.23	.23	.21	.24
	2	.07	.09	.12	.07	.12	.24
	3	.06	.07	.12	.07	.12	.22
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 92 / DIRECTION: 3 / TIME PERIOD: 3 NO. TRIPS: 17

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	91.12	408.60	39.00	39.00	14.21	4.86
	1	102.10	435.78	37.05	39.49	13.35	3.13
	2	103.78	442.15	37.38	39.84	13.37	3.19
	3	103.87	442.51	37.64	40.13	13.20	3.20
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.12	.07	-.05	-.05	-.06	-.36
	2	.14	.08	-.04	.02	-.06	-.34
	3	.14	.08	-.03	.03	-.07	-.34
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.12	.07	.05	.05	.06	.36
	2	.14	.08	.04	.02	.06	.34
	3	.14	.08	.03	.03	.07	.34
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.31	.25	.12	.12	.10	.23
	2	.32	.24	.13	.13	.10	.22
	3	.33	.25	.12	.13	.10	.22
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 92 / DIRECTION: 1 / TIME PERIOD: 4 NO. TRIPS: 27

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	95.22	494.70	49.78	49.78	16.20	5.15
	1	122.54	575.79	53.14	56.65	18.09	7.80
	2	102.43	499.73	47.65	50.79	23.27	5.74
	3	100.21	488.37	47.63	50.78	23.27	5.36
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.29	.16	.07	.07	.12	.51
	2	.08	.01	-.04	.02	.44	.12
	3	.05	-.01	-.04	.02	.44	.04
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.29	.16	.07	.07	.12	.51
	2	.08	.01	.04	.02	.44	.12
	3	.05	.01	.04	.02	.44	.04
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.51	.32	.13	.13	.10	.21
	2	.31	.17	.10	.10	.07	.23
	3	.23	.11	.08	.08	.07	.23
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 92 / DIRECTION: 3 / TIME PERIOD: 1 NO. TRIPS: 4

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	56.50	268.80	49.25	49.25	11.81	1.42
	1	59.47	276.05	47.97	51.14	11.45	.92
	2	59.47	275.67	47.97	51.14	11.45	.92
	3	59.42	274.10	47.97	51.14	11.45	.91
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.05	.03	-.03	-.03	-.03	-.35
	2	.05	.03	-.03	.04	-.03	-.35
	3	.05	.02	-.03	.04	-.03	-.36
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.05	.03	.03	.03	.03	.35
	2	.05	.03	.03	.04	.03	.35
	3	.05	.02	.03	.04	.03	.36
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.16	.08	.14	.14	.39	.26
	2	.16	.07	.14	.14	.39	.25
	3	.16	.07	.14	.14	.39	.28
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 92 / DIRECTION: 1 / TIME PERIOD: 2 NO. TRIPS: 13

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	100.54	516.18	51.38	51.38	15.25	6.12
	1	99.89	462.87	45.98	49.01	16.17	5.38
	2	110.75	517.91	49.18	52.43	16.74	6.85
	3	107.42	500.80	48.84	52.06	16.75	6.28
	4	.	.	.	.	.	.
RELATIVE ERROR	1	-.01	-.10	-.11	-.11	.06	-.12
	2	.10	.00	-.04	.02	.10	.12
	3	.07	-.03	-.05	.01	.10	.03
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.01	.10	.11	.11	.06	.12
	2	.10	.00	.04	.02	.10	.12
	3	.07	.03	.05	.01	.10	.03
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.30	.22	.18	.18	.13	.27
	2	.24	.06	.11	.11	.11	.21
	3	.24	.09	.10	.11	.11	.22
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 53 / DIRECTION: 1 / TIME PERIOD: 4 NO. TRIPS: 25

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	114.14	317.92	51.86	51.86	25.75	5.52
	1	140.26	354.70	44.27	47.19	47.02	1.75
	2	136.04	343.84	49.10	52.34	45.43	1.75
	3	124.29	308.69	49.15	52.39	38.47	1.75
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.23	.12	-.15	-.15	.83	-.68
	2	.19	.08	-.05	.01	.76	-.68
	3	.09	-.03	-.05	.01	.49	-.68
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.23	.12	.15	.15	.83	.68
	2	.19	.08	.05	.01	.76	.68
	3	.09	.03	.05	.01	.49	.68
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.31	.32	.24	.24	.09	.37
	2	.27	.24	.12	.13	.08	.36
	3	.22	.09	.12	.12	.06	.36
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 53 / DIRECTION: 3 / TIME PERIOD: 4 NO. TRIPS: 32

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	112.47	337.59	55.70	55.70	23.57	7.42
	1	103.41	344.77	53.24	56.76	20.33	7.61
	2	105.29	346.32	54.84	58.46	20.83	7.68
	3	103.53	340.22	54.93	58.55	20.87	7.30
	4	.	.	.	.	.	.
RELATIVE ERROR	1	-.08	.02	-.04	-.04	-.14	.02
	2	-.06	.03	-.02	.05	-.12	.03
	3	-.08	.01	-.01	.05	-.11	-.02
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.08	.02	.04	.04	.14	.02
	2	.06	.03	.02	.05	.12	.03
	3	.08	.01	.01	.05	.11	.02
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.34	.24	.12	.12	.11	.16
	2	.27	.16	.06	.09	.09	.15
	3	.22	.08	.06	.09	.08	.15
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 53 / DIRECTION: 1 / TIME PERIOD: 2 NO. TRIPS: 23

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	121.09	384.62	64.57	64.57	28.41	5.12
	1	126.65	430.15	62.09	66.18	30.69	4.94
	2	119.45	405.23	61.32	65.37	29.12	4.58
	3	114.72	384.36	61.27	65.31	27.90	4.43
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.05	.12	-.04	-.04	.08	-.04
	2	-.01	.05	-.05	.01	.03	-.11
	3	-.05	.00	-.05	.01	-.02	-.14
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.05	.12	.04	.04	.08	.04
	2	.01	.05	.05	.01	.03	.11
	3	.05	.00	.05	.01	.02	.14
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.26	.24	.09	.09	.07	.33
	2	.22	.16	.08	.07	.06	.33
	3	.16	.07	.08	.07	.04	.33
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 53 / DIRECTION: 3 / TIME PERIOD: 2 NO. TRIPS: 13

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	145.69	403.14	53.54	53.54	30.44	9.06
	1	161.88	496.58	55.56	59.23	34.60	9.68
	2	157.38	474.92	55.32	58.97	33.19	9.64
	3	140.96	416.95	51.07	54.44	27.94	9.52
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.11	.23	.04	.04	.14	.07
	2	.08	.18	.03	.10	.09	.06
	3	-.03	.03	-.05	.02	-.08	.05
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.11	.23	.04	.04	.14	.07
	2	.08	.18	.03	.10	.09	.06
	3	.03	.03	.05	.02	.08	.05
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.27	.29	.22	.22	.14	.19
	2	.17	.24	.13	.17	.10	.19
	3	.14	.11	.09	.08	.08	.21
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 45 / DIRECTION: 1 / TIME PERIOD: 5 NO. TRIPS: 16

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ LOAD	MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	48.13	169.43	21.06	<=	21.06	5.84	2.51
	1	53.34	184.86	19.37		20.65	5.74	3.05
	2	48.06	164.12	16.92		18.04	4.97	2.82
	3	46.41	155.07	17.58		18.74	4.82	2.72
	4	53.54	177.77	20.03		21.35	5.76	3.05
RELATIVE ERROR	1	.11	.09	-.08		-.08	-.02	.22
	2	.00	-.03	-.20		-.14	-.15	.13
	3	-.04	-.08	-.17		-.11	-.18	.09
	4	.11	.05	-.05		.01	-.02	.22
RELATIVE ABSOLUTE ERROR	1	.11	.09	.08		.08	.02	.22
	2	.00	.03	.20		.14	.15	.13
	3	.04	.08	.17		.11	.18	.09
	4	.11	.05	.05		.01	.02	.22
RELATIVE STANDARD ERROR	1	.27	.21	.24		.24	.18	.29
	2	.20	.20	.32		.29	.18	.32
	3	.19	.17	.28		.25	.18	.32
	4	.20	.16	.25		.23	.15	.29

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 45 / DIRECTION: 3 / TIME PERIOD: 5 NO. TRIPS: 18

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ LOAD	MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	66.94	247.59	40.00	<=	40.00	10.08	2.43
	1	76.92	272.02	37.13		39.58	10.99	2.58
	2	77.89	273.18	38.09		40.61	12.52	2.55
	3	77.06	271.40	38.08		40.60	12.57	2.55
	4	76.93	271.02	38.41		40.95	12.57	2.55
RELATIVE ERROR	1	.15	.10	-.07		-.07	.09	.06
	2	.16	.10	-.05		.02	.24	.05
	3	.15	.10	-.05		.01	.25	.05
	4	.15	.09	-.04		.02	.25	.05
RELATIVE ABSOLUTE ERROR	1	.15	.10	.07		.07	.09	.06
	2	.16	.10	.05		.02	.24	.05
	3	.15	.10	.05		.01	.25	.05
	4	.15	.09	.04		.02	.25	.05
RELATIVE STANDARD ERROR	1	.25	.17	.10		.10	.12	.26
	2	.25	.18	.07		.05	.07	.23
	3	.24	.14	.07		.05	.07	.24
	4	.25	.14	.07		.06	.07	.23

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 45 / DIRECTION: 1 / TIME PERIOD: 3 NO. TRIPS: 36

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	107.39	278.17	40.19	40.19	10.38	7.75
	1	98.24	266.62	33.05	35.23	10.91	6.22
	2	104.52	275.78	36.59	39.01	11.70	6.76
	3	104.77	277.26	37.72	40.21	11.72	6.39
	4	103.48	270.45	37.50	39.97	11.76	6.26
RELATIVE ERROR	1	-.09	-.04	-.18	-.18	.05	-.20
	2	-.03	-.01	-.09	-.03	.13	-.13
	3	-.02	.00	-.06	.00	.13	-.18
	4	-.04	-.03	-.07	-.01	.13	-.19
RELATIVE ABSOLUTE ERROR	1	.09	.04	.18	.18	.05	.20
	2	.03	.01	.09	.03	.13	.13
	3	.02	.00	.06	.00	.13	.18
	4	.04	.03	.07	.01	.13	.19
RELATIVE STANDARD ERROR	1	.26	.20	.27	.27	.07	.32
	2	.16	.15	.18	.17	.06	.28
	3	.13	.10	.11	.09	.06	.27
	4	.12	.08	.11	.09	.05	.18

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 45 / DIRECTION: 3 / TIME PERIOD: 3 NO. TRIPS: 36

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	108.11	276.89	40.14	40.14	14.87	5.98
	1	93.06	277.52	31.42	33.49	17.32	4.78
	2	99.47	289.04	35.30	37.63	19.56	4.88
	3	99.90	287.82	37.48	39.96	19.34	4.90
	4	100.83	285.82	38.50	41.04	19.32	4.79
RELATIVE ERROR	1	-.14	.00	-.22	-.22	.17	-.20
	2	-.08	.04	-.12	-.06	.32	-.18
	3	-.08	.04	-.07	.00	.30	-.18
	4	-.07	.03	-.04	.02	.30	-.20
RELATIVE ABSOLUTE ERROR	1	.14	.00	.22	.22	.17	.20
	2	.08	.04	.12	.06	.32	.18
	3	.08	.04	.07	.00	.30	.18
	4	.07	.03	.04	.02	.30	.20
RELATIVE STANDARD ERROR	1	.32	.27	.30	.30	.11	.62
	2	.23	.23	.22	.20	.08	.61
	3	.14	.13	.13	.12	.06	.62
	4	.13	.09	.10	.10	.06	.61

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 45 / DIRECTION: 1 / TIME PERIOD: 1 NO. TRIPS: 8

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	34.75	133.26	24.00	24.00	4.84	1.76
	1	33.80	127.01	22.84	24.34	4.62	1.21
	2	34.74	130.70	23.19	24.72	4.62	1.33
	3	35.67	134.87	23.17	24.70	4.62	1.52
	4	39.47	149.07	25.27	26.94	5.67	1.87
RELATIVE ERROR	1	-.03	-.05	-.05	-.05	-.05	-.31
	2	.00	-.02	-.03	.03	-.05	-.24
	3	.03	.01	-.03	.03	-.05	-.14
	4	.14	.12	.05	.12	.17	.06
RELATIVE ABSOLUTE ERROR	1	.03	.05	.05	.05	.05	.31
	2	.00	.02	.03	.03	.05	.24
	3	.03	.01	.03	.03	.05	.14
	4	.14	.12	.05	.12	.17	.06
RELATIVE STANDARD ERROR	1	.17	.18	.09	.09	.28	.82
	2	.18	.16	.08	.07	.28	.83
	3	.13	.14	.08	.07	.28	.67
	4	.06	.09	.08	.07	.17	.54

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 45 / DIRECTION: 3 / TIME PERIOD: 1 NO. TRIPS: 4

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	16.50	85.10	13.50	13.50	3.57	.44
	1	18.90	81.85	13.87	14.79	2.65	.25
	2	28.05	120.35	21.75	23.19	5.75	.46
	3	27.75	117.60	21.70	23.13	5.65	.47
	4	.	.	.	.	.	.
RELATIVE ERROR	1	.15	-.04	.03	.03	-.26	-.44
	2	.70	.41	.61	.72	.61	.03
	3	.68	.38	.61	.71	.58	.05
	4	.	.	.	.	.	.
RELATIVE ABSOLUTE ERROR	1	.15	.04	.03	.03	.26	.44
	2	.70	.41	.61	.72	.61	.03
	3	.68	.38	.61	.71	.58	.05
	4	.	.	.	.	.	.
RELATIVE STANDARD ERROR	1	.25	.13	.08	.08	.36	.69
	2	.19	.15	.06	.17	.25	.65
	3	.17	.16	.05	.16	.27	.62
	4	.	.	.	.	.	.

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 30 / DIRECTION: 1 / TIME PERIOD: 4 NO. TRIPS: 59

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	131.25	319.70	50.37	50.37	18.12	6.88
	1	134.52	307.50	41.17	43.89	20.22	5.47
	2	137.90	315.73	43.25	46.11	20.38	5.73
	3	133.45	307.58	42.54	45.35	19.83	5.50
	4	138.19	314.14	44.92	47.88	20.84	5.57
RELATIVE ERROR	1	.02	-.04	-.18	-.18	.12	-.21
	2	.05	-.01	-.14	-.08	.12	-.17
	3	.02	-.04	-.16	-.10	.09	-.20
	4	.05	-.02	-.11	-.05	.15	-.19
RELATIVE ABSOLUTE ERROR	1	.02	.04	.18	.18	.12	.21
	2	.05	.01	.14	.08	.12	.17
	3	.02	.04	.16	.10	.09	.20
	4	.05	.02	.11	.05	.15	.19
RELATIVE STANDARD ERROR	1	.33	.28	.37	.37	.08	.16
	2	.22	.13	.22	.19	.07	.14
	3	.21	.14	.21	.18	.06	.14
	4	.17	.09	.15	.12	.05	.14

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 30 / DIRECTION: 3 / TIME PERIOD: 4 NO. TRIPS: 65

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	117.94	260.26	51.43	51.43	18.73	5.71
	1	120.62	262.51	47.14	50.25	17.14	7.61
	2	121.87	262.60	47.64	50.78	17.16	7.68
	3	121.19	257.09	47.74	50.89	18.05	7.23
	4	123.83	259.99	49.30	52.56	19.10	7.23
RELATIVE ERROR	1	.02	.01	-.08	-.08	-.08	.33
	2	.03	.01	-.07	-.01	-.08	.35
	3	.03	-.01	-.07	-.01	-.04	.27
	4	.05	.00	-.04	.02	.02	.27
RELATIVE ABSOLUTE ERROR	1	.02	.01	.08	.08	.08	.33
	2	.03	.01	.07	.01	.08	.35
	3	.03	.01	.07	.01	.04	.27
	4	.05	.00	.04	.02	.02	.27
RELATIVE STANDARD ERROR	1	.31	.27	.14	.14	.08	.12
	2	.24	.15	.12	.11	.08	.09
	3	.23	.14	.12	.11	.08	.09
	4	.18	.10	.07	.07	.05	.09

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 30 / DIRECTION: 1 / TIME PERIOD: 2 NO. TRIPS: 54

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ LOAD	MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	110.87	252.89	55.30	<=	55.30	19.67	4.03
	1	112.16	253.20	53.87		57.43	20.48	3.39
	2	113.05	256.70	53.98		57.54	20.49	3.53
	3	110.80	252.11	53.94		57.50	20.49	3.31
	4	112.76	254.03	54.17		57.74	20.95	3.32
RELATIVE ERROR	1	.01	.00	-.03		-.03	.04	-.16
	2	.02	.02	-.02		.04	.04	-.12
	3	.00	.00	-.02		.04	.04	-.18
	4	.02	.00	-.02		.04	.07	-.18
RELATIVE ABSOLUTE ERROR	1	.01	.00	.03		.03	.04	.16
	2	.02	.02	.02		.04	.04	.12
	3	.00	.00	.02		.04	.04	.18
	4	.02	.00	.02		.04	.07	.18
RELATIVE STANDARD ERROR	1	.19	.26	.05		.05	.07	.23
	2	.17	.17	.05		.06	.07	.21
	3	.16	.14	.04		.06	.07	.21
	4	.15	.09	.04		.06	.06	.21

 RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 30 / DIRECTION: 3 / TIME PERIOD: 2 NO. TRIPS: 50

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ LOAD	MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	115.58	276.83	50.38	<=	50.38	22.66	5.21
	1	135.63	336.63	52.09		55.52	23.45	5.70
	2	130.97	323.98	51.64		55.05	22.87	5.53
	3	130.06	320.11	51.21		54.59	22.73	5.39
	4	133.67	325.51	51.88		55.31	23.59	5.43
RELATIVE ERROR	1	.17	.22	.03		.03	.03	.09
	2	.13	.17	.03		.09	.01	.06
	3	.13	.16	.02		.08	.00	.03
	4	.16	.18	.03		.10	.04	.04
RELATIVE ABSOLUTE ERROR	1	.17	.22	.03		.03	.03	.09
	2	.13	.17	.03		.09	.01	.06
	3	.13	.16	.02		.08	.00	.03
	4	.16	.18	.03		.10	.04	.04
RELATIVE STANDARD ERROR	1	.38	.37	.40		.40	.08	.11
	2	.23	.18	.20		.21	.07	.09
	3	.21	.15	.19		.19	.07	.09
	4	.20	.12	.16		.18	.05	.09

APPENDIX C

Twenty-Minute Period Reports for Line 45

Note: Period 1 begins at 6 a.m., period 2 at 6:30 a.m., and so forth. The latest period is period 9, beginning at 8:40 a.m.

RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 45 / DIRECTION: 1 / TIME PERIOD: 1 NO. TRIPS: 6

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ LOAD	MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	85.00	316.90	56.17	<=	56.17	11.71	4.67
	1	91.32	333.02	53.82		57.37	14.19	4.16
	2	85.92	313.00	53.82		57.37	14.19	3.39
	3	90.42	322.90	53.82		57.37	14.18	4.11
	4	87.72	293.98	52.72		56.20	12.37	4.40
RELATIVE ERROR	1	.07	.05	-.04		-.04	.21	-.11
	2	.01	-.01	-.04		.02	.21	-.28
	3	.06	.02	-.04		.02	.21	-.12
	4	.03	-.07	-.06		.00	.06	-.06

LINE: 45 / DIRECTION: 1 / TIME PERIOD: 2 NO. TRIPS: 5

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ LOAD	MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	154.40	501.24	77.00	<=	77.00	19.15	9.05
	1	137.80	490.58	73.14		77.97	20.11	7.08
	2	136.42	471.16	73.14		77.97	20.12	6.83
	3	152.60	507.94	73.50		78.35	20.11	9.23
	4	157.22	534.40	78.20		83.36	22.73	9.24
RELATIVE ERROR	1	-.11	-.02	-.05		-.05	.05	-.22
	2	-.12	-.06	-.05		.01	.05	-.25
	3	-.01	.01	-.05		.02	.05	.02
	4	.02	.07	.02		.08	.19	.02

LINE: 45 / DIRECTION: 1 / TIME PERIOD: 3 NO. TRIPS: 6

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ LOAD	MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	121.17	386.37	62.33	<=	62.33	13.50	7.90
	1	115.83	405.82	58.90		62.79	16.37	7.04
	2	122.03	420.90	58.87		62.75	16.36	7.99
	3	121.25	423.02	61.60		65.67	16.37	7.61
	4	121.30	417.72	61.42		65.47	16.29	7.98
RELATIVE ERROR	1	-.04	.05	-.06		-.06	.21	-.11
	2	.01	.09	-.06		.01	.21	.01
	3	.00	.09	-.01		.05	.21	-.04
	4	.00	.08	-.01		.05	.21	.01

LINE: 45 / DIRECTION: 1 / TIME PERIOD: 4 NO. TRIPS: 4

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	137.00	486.35	69.75<=	69.75	19.44	6.77
	1	124.67	433.70	65.65	69.98	19.99	5.59
	2	148.80	495.30	65.65	69.98	19.97	8.48
	3	130.87	450.65	65.65	69.98	19.97	5.91
	4	130.57	458.05	67.55	72.01	20.46	5.47
RELATIVE ERROR	1	-.09	-.11	-.06	-.06	.03	-.18
	2	-.09	.02	-.06	.00	.03	-.25
	3	-.04	-.07	-.06	.00	.03	-.13
	4	-.05	-.06	-.03	.03	.05	-.19

LINE: 45 / DIRECTION: 1 / TIME PERIOD: 5 NO. TRIPS: 4

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	144.00	476.00	72.00<=	72.00	22.50	6.00
	1	145.50	488.45	71.92	76.67	22.38	6.52
	2	156.95	518.55	71.87	76.62	22.37	7.95
	3	138.40	463.62	71.92	76.67	22.37	5.65
	4	136.50	459.27	72.75	77.55	22.12	5.72
RELATIVE ERROR	1	.01	.03	.00	.00	-.01	.09
	2	.09	.09	.00	.06	-.01	.33
	3	-.04	-.03	.00	.06	-.01	-.06
	4	-.05	-.04	.01	.08	-.02	-.05

LINE: 45 / DIRECTION: 1 / TIME PERIOD: 6 NO. TRIPS: 4

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	108.75	291.00	50.25<=	50.25	15.50	5.34
	1	91.10	312.62	46.25	49.30	15.99	3.70
	2	86.77	294.00	46.27	49.33	15.99	3.03
	3	83.40	280.60	46.27	49.33	15.99	2.60
	4	82.57	271.60	46.72	49.81	14.66	2.81
RELATIVE ERROR	1	-.16	.07	-.08	-.08	.03	-.31
	2	-.20	.01	-.08	-.02	.03	-.43
	3	-.23	-.04	-.08	-.02	.03	-.51
	4	-.24	-.07	-.07	-.01	-.05	-.47

LINE: 45 / DIRECTION: 1 / TIME PERIOD: 7 NO. TRIPS: 1

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	116.00	357.10	45.00	45.00	14.00	6.00
	1	87.30	303.80	40.20	42.85	13.50	3.33
	2	95.60	334.30	40.20	42.85	13.52	4.15
	3	95.30	323.00	40.20	42.85	13.47	4.14
	4	100.80	338.20	43.60	46.48	14.70	4.20
RELATIVE ERROR	1	-.25	-.15	-.11	-.11	-.04	-.45
	2	-.18	-.06	-.11	-.05	-.03	-.31
	3	-.18	-.10	-.11	-.05	-.04	-.31
	4	-.13	-.05	-.03	.03	.05	-.30

LINE: 45 / DIRECTION: 1 / TIME PERIOD: 8 NO. TRIPS: 3

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	116.67	340.87	52.33	52.33	15.50	6.83
	1	95.23	327.73	48.97	52.20	15.08	4.18
	2	110.17	358.37	49.17	52.41	15.08	6.60
	3	101.40	314.87	49.13	52.38	15.08	5.19
	4	107.63	332.30	50.63	53.98	17.58	4.97
RELATIVE ERROR	1	-.18	-.04	-.06	-.06	-.03	-.39
	2	-.06	.05	-.06	.00	-.03	-.03
	3	-.13	-.08	-.06	.00	-.03	-.24
	4	-.08	-.03	-.03	.03	.13	-.27

LINE: 45 / DIRECTION: 1 / TIME PERIOD: 9 NO. TRIPS: 2

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	79.50	204.35	32.00	32.00	6.75	5.83
	1	60.40	208.80	28.70	30.59	12.42	2.21
	2	73.00	233.55	28.65	30.54	12.45	3.97
	3	76.15	231.30	28.65	30.54	12.42	4.03
	4	77.50	229.15	29.55	31.50	11.55	4.17
RELATIVE ERROR	1	-.24	.02	-.10	-.10	.84	-.62
	2	-.08	.14	-.10	-.05	.84	-.32
	3	-.04	.13	-.10	-.05	.84	-.31
	4	-.03	.12	-.08	-.02	.71	-.29

RIDE CHECK UPDATING -- LINE / DIRECTION / TIME PERIOD REPORT

LINE: 45 / DIRECTION: 3 / TIME PERIOD: 1 NO. TRIPS: 2

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	222.00	802.80	80.50	80.50	29.50	9.45
	1	252.20	702.30	78.30	83.47	34.86	10.25
	2	260.90	721.85	85.65	91.30	36.37	10.49
	3	248.25	690.35	78.50	83.68	33.19	10.50
	4	245.10	681.30	78.40	83.57	33.11	10.24
RELATIVE ERROR	1	.14	-.13	-.03	-.03	.18	.08
	2	.18	-.10	.06	.13	.23	.11
	3	.12	-.14	-.02	.04	.12	.11
	4	.10	-.15	-.03	.04	.12	.08

LINE: 45 / DIRECTION: 3 / TIME PERIOD: 2 NO. TRIPS: 3

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	181.00	454.43	80.67	80.67	27.00	10.34
	1	151.33	381.27	73.97	78.85	.	5.76
	2	175.47	444.80	83.03	88.51	.	6.19
	3	169.07	429.80	83.03	88.51	.	6.27
	4	183.90	460.43	83.90	89.44	.	7.17
RELATIVE ERROR	1	-.16	-.16	-.08	-.08	.	-.44
	2	-.03	-.02	.03	.10	.	-.40
	3	-.07	-.05	.03	.10	.	-.39
	4	.02	.01	.04	.11	.	-.31

LINE: 45 / DIRECTION: 3 / TIME PERIOD: 3 NO. TRIPS: 3

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	171.33	385.90	64.67	64.67	26.44	9.52
	1	122.33	339.57	52.53	56.00	.	4.70
	2	127.53	353.43	56.40	60.12	.	4.85
	3	144.10	383.53	66.00	70.36	.	4.95
	4	151.63	398.80	65.93	70.28	.	6.00
RELATIVE ERROR	1	-.29	-.12	-.19	-.19	.	-.51
	2	-.26	-.08	-.13	-.07	.	-.49
	3	-.16	-.01	.02	.09	.	-.48
	4	-.11	.03	.02	.09	.	-.37

LINE: 45 / DIRECTION: 3 / TIME PERIOD: 4 NO. TRIPS: 2

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	135.00	341.40	64.50	64.50	24.25	4.75
	1	78.90	218.80	31.10	33.15	12.82	3.45
	2	101.55	274.30	42.00	44.77	16.44	4.47
	3	135.25	342.45	64.50	68.76	25.45	4.18
	4	138.50	343.35	64.50	68.76	25.46	4.58
RELATIVE ERROR	1	-.42	-.36	-.52	-.52	-.47	-.27
	2	-.25	-.20	-.35	-.31	-.32	-.06
	3	.00	.00	.00	.07	.05	-.12
	4	.03	.01	.00	.07	.05	-.04

LINE: 45 / DIRECTION: 3 / TIME PERIOD: 5 NO. TRIPS: 4

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	148.50	346.72	58.00	58.00	25.08	6.70
	1	95.85	274.50	36.87	39.31	.	3.94
	2	118.27	320.85	51.50	54.90	.	4.38
	3	134.57	360.47	61.47	65.53	.	4.41
	4	134.10	350.27	61.45	65.51	.	4.27
RELATIVE ERROR	1	-.35	-.21	-.36	-.36	.	-.41
	2	-.20	-.07	-.11	-.05	.	-.35
	3	-.09	.04	.06	.13	.	-.34
	4	-.10	.01	.06	.13	.	-.36

LINE: 45 / DIRECTION: 3 / TIME PERIOD: 6 NO. TRIPS: 2

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	131.00	334.80	67.00	67.00	21.00	6.05
	1	90.35	221.95	28.05	29.90	16.85	4.01
	2	142.60	325.30	54.65	58.26	25.95	6.29
	3	145.00	334.95	63.75	67.96	26.47	5.85
	4	140.45	321.25	63.70	67.90	26.37	5.45
RELATIVE ERROR	1	-.31	-.34	-.58	-.58	-.20	-.34
	2	.09	-.03	-.18	-.13	.24	.04
	3	.11	.00	-.05	.01	.26	-.03
	4	.07	-.04	-.05	.01	.26	-.10

LINE: 45 / DIRECTION: 3 / TIME PERIOD: 7 NO. TRIPS: 4

MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	93.75	221.35	36.75	36.75	13.87	4.39
	1	69.62	186.82	21.82	23.27	10.62	3.15
	2	69.37	185.45	22.40	23.88	10.39	3.09
	3	86.47	221.60	32.25	34.38	14.24	3.12
	4	87.95	225.57	32.27	34.41	14.24	3.38
RELATIVE ERROR	1	-.26	-.16	-.41	-.41	-.23	-.28
	2	-.26	-.16	-.39	-.35	-.25	-.30
	3	-.08	.00	-.12	-.06	.03	-.29
	4	-.06	.02	-.12	-.06	.03	-.23

N/A

LINE: 45 / DIRECTION: 3 / TIME PERIOD: 9 NO. TRIPS: 2

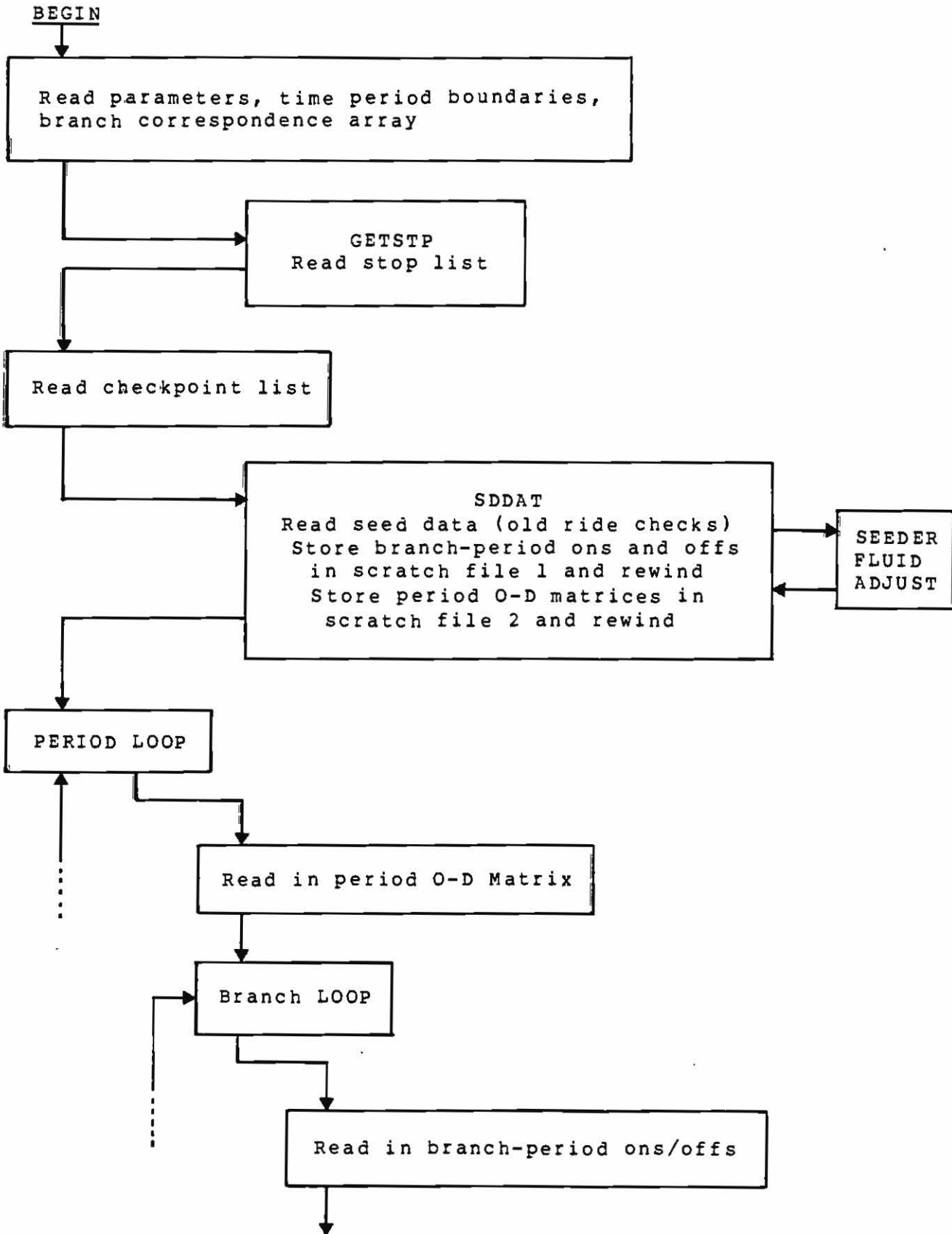
MEASURE	NO. POINTS	BRDGS	PASS MILES	MAX LOAD	ADJ MAX LOAD	BRD IN MAJ SEG	BRD IN OTH SEG
MEAN	OBS	65.00	151.90	29.00	29.00	12.40	4.53
	1	82.65	198.95	30.75	32.78	.	5.87
	2	59.20	152.40	28.25	30.11	.	4.32
	3	60.55	154.25	28.25	30.11	.	4.32
	4	58.20	147.10	26.45	28.20	.	3.96
RELATIVE ERROR	1	.27	.31	.06	.06	.	.29
	2	-.09	.00	-.03	.04	.	-.05
	3	-.07	.02	-.03	.04	.	-.05
	4	-.10	-.03	-.09	-.03	.	-.13

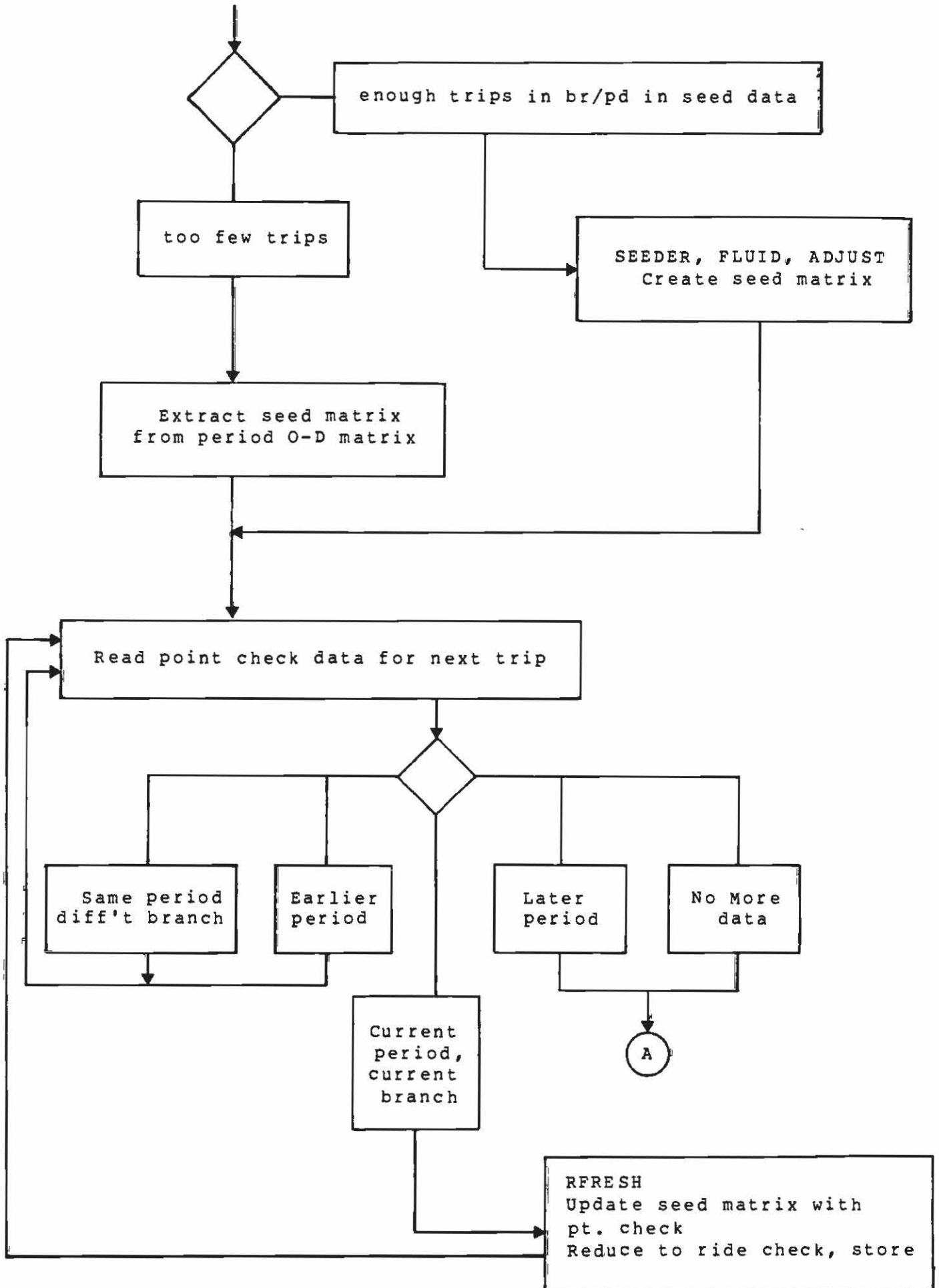
APPENDIX D

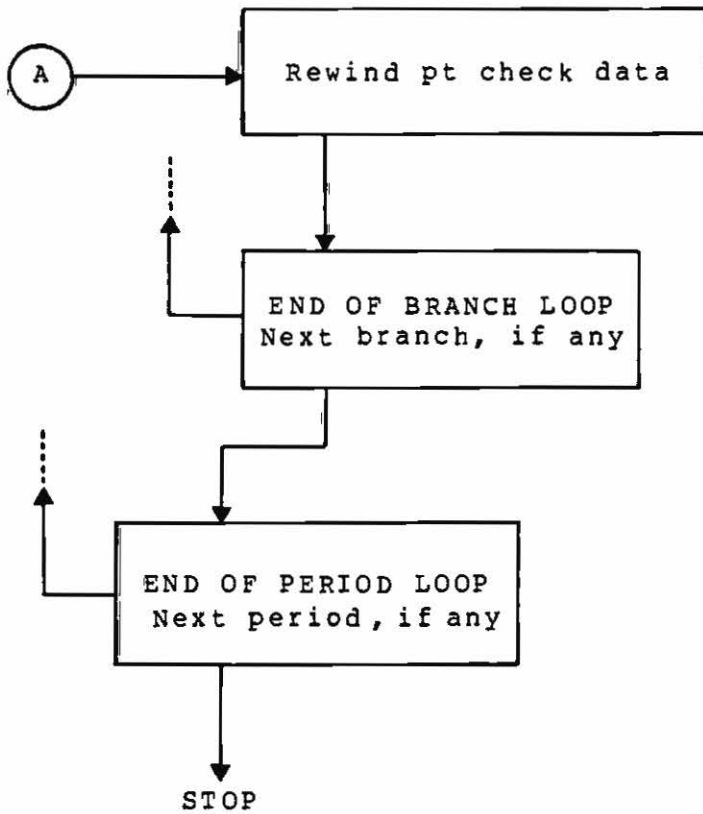
Flowcharts for Program UPRIDE



UPRIDE FLOWCHART







(Note: subroutine PRINTOD is never called, but is included for debug purposes.)

PROGRAM UPRIDE

Main

REF.

3 Input and Initialization
1952 - Parameters
10 - Time Period Boundaries
12 - Branch Correspondence (ride check data to pt check data)
1977 - Stop list (subroutine GETSTP); each stop gets an internal index
1914 - Checkpoint list
15 - Count checkpoints
25 - Translate checkpoints to stop indices
9030 - Ride check data (subroutine SDDAT)

90 LOOP LEVEL 1 - over periods
111 Read in period seed (average per trip over all branches)
94 LOOP LEVEL 2 - over branches
110 Read in branch-period on-off averages
9108 Create branch-period seed from these on-off averages if branch-period has enough trips (call SEEDER)
113 Otherwise, extract O-D matrix from period seed (accept a cell if it is served by branch)

100 READ POINT CHECK TRIP - 3 records (loads, ons, and offs)
If we arrived at later period, go to 180 (end of loop level 2). Otherwise ...
Count trip. If it's not on branch now being processed, or if it's in an earlier period, skip this trip by returning to 100. Otherwise continue.

CREATE AND STORE RIDE CHECK FOR THE TRIP (call RFRESH)

Get next trip - go back to 100

180 REWIND PT CHECK FILE (prepare for next branch)
199 LOOP 2 END
200 LOOP 1 END

OUTPUT SECTION - write estimated ride check records in order that point check records were received.

ERROR SECTION

END

SUBROUTINE RFRESH

Input - Point check data and Seed Matrix

Intermediate - Estimates new matrix using Iterate Proportional Fit to match point check data

Output - Row and Column totals of new matrix are new ride check

REF.

```
20  Create new list of valid point checks (point check with
    observations for this trip).  Out of NPTS checkpoints, only
    NEX are valid for this trip.  KX is the point-point
    correspondence.
50  Compress Seed Matrix so that there are 2(NEX)+1 "superstops".
80  The even stops are the checkpoints, the odd stops are the
    segments in between.  Compressed matrix is also written below
    diagonal to preserve original.
95  Compute OLD TIB = above diagonal total

90  OUTER LOOP of IPF
    100  INNER LOOP of IPF - loop over checkpoints
    115  Adjust ons to match pt check ons at current checkpoint
    125  Adjust offs to match pt check offs
    135  Adjust load to match pt check load
    150  END OF INNER IPF loop
    -   If it didn't converge, return to 100 (unless iteration count
        is exceeded - then quit via 500)
    -   If it converged, continue at 300
300  END OF OUTER LOOP.  NEW TIB = new above diagonal total
    -   If it didn't converge (NEW TIB.NE.OLD TIB), set OLD TIB =
        NEW TIB and return to 90 (unless iteration count is too
        high - then quit via 501)
    -   If it converged, continue.

    TURN COMPRESSED MATRIX INTO A SET OF FACTORS FOR UPDATING
    ORIGINAL SEED MATRIX
310  Calculate factors for odd diagonal cells (intra-segment
    travel).
        factor (i,i) = (new row i total + new column i total)
                       / (old row i total + old column i total)
        where totals are from above diagonal only
320  Calculate factors for above diagonal.  factor = new/old

350  EXPAND COMPRESSED O-D MATRIX - Multiply each cell of original
    seed matrix by the factor that this cell contributed to in the
    compressed matrix
370  Compute ons and offs (row and column totals)
    RETURN

500  RETURN with IWORKED = -1.
501  RETURN with IWORKED = -1.
```

SUBROUTINES SEEDER AND FLUID

(FLUID is called from SEEDER)

Input - ons and offs by stop

Output - O-D matrix estimated by fluid analogy

REF.

- 5 Create packed on and off arrays by excluding steps not on branch; NSTB = reduced number of stops; NSTOP = original number of stops
Initialize FSTOP and LSTOP and be sure total ons = offs (call ADJUST)
- 40 Set FSTOP and LSTOP arrays based on minimum distance parameter. FSTOP(i) = first stop where a person boarding at i is eligible to alight; LSTOP(j) = last stop at which a person alighting at j was eligible to have boarded.
- 101 Relax FSTOP and LSTOP as needed to insure that cumulative eligible ons exceeds cumulative offs at every stop. At limit, people can be eligible to alight after 1 stop. If the process still doesn't converge, it means the on/off data include a negative thru load.

FLUID CREATE O-D MATRIX (this is subroutine FLUID)
Initialize array of eligible passengers on board; ELIGIB(i,j) = 0 except where j = FSTOP(i) - there ELIGIB(i,j) = BOARD(i).

LOOP OVER ALIGHTING STOPS j
RATIO = (offs at j)/(total eligibles on board at j)
For all i, set OD(i,j) = eligibles(i,j) * ratio
Reduce eligibles: For all i, set
eligibles(i,j+1) = eligibles(i,j)-OD(i,j)
END OF LOOP

(return from FLUID)

140-150 Convert NSTB x NSTB matrix to NSTOP x NSTOP matrix by inserting 0's into all the cells not served by this branch

END

0332R

Appendix E

Execution of Updating Algorithm

Route Configuration. The route has 6 stops. Point checks are done at stops 2 and 4.

Point Check Data. See A in calculations. Note that the load shown is thru load. Thru load is departing load at a stop minus ons at the stop.

Seed Ride Check Data. See B in calculations.

Seed O-D Matrix. Developed using fluid analogy. See C in calculations. The ons at each stop (row totals) and off at each stop (column totals) agree with the seed ride check. Thru load at each point likewise agrees with the ride check. Thru load at stop j is the total of the rectangle northeast of cell (j,j) . For example, thru load at stop 4 is the sum of the 6 numbers lying northeast of cell $(4,4)$: $4.2+4.2+7.2+5.2+5.2+9.0 = 35$.

Compressed Original O-D Matrix. See D in calculations. The even numbered cells (cells 2 and 4) correspond to the points that are point checked (in this case, stops 2 and 4). The odd numbered cells correspond to the segments between the checkpoints, as follows:

<u>cell in compressed O-D matrix</u>	<u>original stops</u>
1	1
3	3
5	5 and 6

The only difference for this simple example between the stop-level matrix and the compressed matrix is that rows 5 and 6 have been compressed into a single row (row 5), and columns 5 and 6 have likewise been compressed to a single column (column 5).

First Step of Iterative Proportional Fit. See E in calculations. The even rows of the compressed matrix have been factored so that the row total matches the point check observed ons at corresponding checkpoint.

Second Step of IPF. See F in calculations. The even columns have been factored so that their totals matched the point check observed offs at the corresponding checkpoint.

Third Step of IPF, Part a. See G in calculations. The rectangle northeast of cell (2,2) represents passengers going thru the first checkpoint. Cells lying in this rectangle are factored so that their total matches observed thru load there. That is, the numbers (7.5, 7.1, and 9.4) from row 1 of matrix F, which sum to 24.0, are factored up in matrix G so that their total becomes 30, in agreement with the observed thru load at the first checkpoint.

Third Step of IPF, Part b. See H in calculations. The rectangle northeast of cell (4,4) represents passengers going thru the second checkpoint. Cells lying in this rectangle are factored so that their total matches observed thru load there. That is, the numbers (11.8, 7.5, and 16.2) from matrix G, which sum to 35.5, are factored up in matrix H so that their total becomes 60, in agreement with the observed thru load at the second checkpoint.

First Convergence of IPF. The above three steps represent the first iteration of IPF. These steps are repeated again and again until the values don't change any more. The results are shown in I.

Comparing Estimated Total Observed Passengers. See J. The total of the above diagonal cells in I is 140; this is the estimated total numbers of passengers, not counting those who couldn't be observed at a checkpoint. (Those who couldn't be observed are the intrasegment trips, in this case trips from stop 5 to stop 6, which are represented by cell (5,5) of the consolidated matrix.) However, in the original compressed matrix (see D), that total was 95. Because these numbers don't agree, matrix I is multiplied by the ratio (140/95). The result becomes a new seed matrix, shown in K. The estimated total observed passengers (ETOB) for this matrix is 208.

Second Convergence of IPF. Rows, columns, and thru load rectangles have been iteratively factored to match the point check on, off, and thru load observations. The result is shown in L. This time the ETOB (above diagonal total) is 138, which does not agree with the ETOB of the most recent seed (208, from K). The entire matrix must be factored by the ratio (new ETOB)/(old ETOB), and the process repeated, until the new ETOB equals the most recent old ETOB (i.e., the ETOB of the seed upon which it was based).

Final Convergence of IPF. Shown in M. Row totals and column totals for the even rows and columns (2 and 4) agree with ons and offs at the two checkpoints. The rectangle totals northeast of the even diagonal cells ((2,2) and (4,4)) agree with thru load at the two checkpoints. The ETOB is 135.9, which equals the ETOB of the seed upon which this convergence was based.

Calculating Factors for Odd Diagonal Cells. See N. Cell (5,5) is the only nonzero diagonal cell. It represents travel within the segment made up of stops 5-6. Its expansion factor is the ratio (final row 5 total + column 5 total)/(original row 5 total + column 5 total), where the total is from above the diagonal only. The original matrix (compressed) is D. For cell (5,5) the ratio is $(0+90)/(0+45) = 2.0$.

Converting Above Diagonal Cells to Factors. See O. The factor for each above diagonal cell is the ratio (final cell value)/(original cell value). For example, the factor for cell (1,4) is $5.9/8.1 = 0.73$.

Final Stop-Level O-D Matrix. See P. Each cell of the original stop-level O-D matrix (see C in calculations) is multiplied by the corresponding factor of the compressed factor matrix (see O). For example, since row 5 of the compressed matrix corresponds to stops 5 and 6, row 5 factors from the compressed matrix multiply rows 5 and 6 of the stop-level matrix, and column 5 factors from the compressed matrix multiply columns 5 and 6 of the stop-level matrix.

Final Estimated Ride Check. See Q. The row and column totals of the final stop-level O-D matrix (see P) are the final estimated ride check.

CALCULATIONS FOR APPENDIX E

Point Check Data

Stop	board	alight	thru load
2	20	10	30
4	30	25	60

(A)

Ride Check Data

Stop	board	alight	thru load
1	30		
2	25	5	25
3	30	15	35
4	10	30	35
5	15	20	25
6		40	

(B)

Seed OD Matrix

From	To	1	2	3	4	5	6	board	thru load
1	0.0	5.0	7.5	8.1	4.2	5.2	30.0		
2		0.0	7.5	8.1	4.2	5.2	25.0	25.0	
3			0.0	13.8	7.2	9.0	30.0	35.0	
4				0.0	4.4	5.6	10.0	35.0	
5					0.0	15.0	15.0		
alight	0.0	5.0	15.0	30.0	20.0	40.0			

(C)

Compressed OD Matrix

From	To	1	2	3	4	5	board	thru load
1	0.0	5.0	7.5	8.1	9.4	30.0		
2		0.0	7.5	8.1	9.4	25.0	25.0	
3			0.0	13.8	16.2	30.0	35.0	
4				0.0	10.0	10.0	35.0	
5					15.0	15.0		
alight	0.0	5.0	15.0	30.0	60.0			

(D)

From	To	board					thru load	obs load	obs brd
	1	2	3	4	5				
1	0.0	5.0	7.5	8.1	9.4	30.0	0		
2		0.0	6.0	6.5	7.5	20.0	25.0	30	
3			0.0	13.8	16.2	30.0	30.0		
4				0.0	30.0	30.0	30.0	60	
5					15.0	15.0			
alight	0.0	5.0	15.0	30.0	60.0				
obs alight		10		25					

(E)

From	To	board					thru load	obs load	obs brd
	1	2	3	4	5				
1	0.0	10.0	7.5	7.1	9.4	34.0	0		
2		0.0	6.0	5.7	7.5	19.2	24.0	30	
3			0.0	12.2	16.2	28.3	29.8		
4				0.0	30.0	30.0	33.1	60	
5					15.0	15.0			
alight	0.0	10.0	13.5	25.0	78.1				
obs alight		10		25					

(F)

From	To	board					thru load	obs load	obs brd
	1	2	3	4	5				
1	0.0	10.0	9.4	8.9	11.8	40.0	0		
2		0.0	6.0	5.7	7.5	19.2	30.0	30	
3			0.0	12.2	16.2	28.3	33.9		
4				0.0	30.0	30.0	35.5	60	
5					15.0	15.0			
alight	0.0	10.0	15.4	26.8	80.5				
obs alight		10		25					

(G)

From	To	board					thru load	obs thru load	obs brd
	1	2	3	4	5				
1	0.0	10.0	9.4	8.9	19.9	48.1	0		
2		0.0	6.0	5.7	12.8	24.4	38.1	30	
3			0.0	12.2	27.3	39.5	47.2		
4				0.0	30.0	30.0	60.0	60	
5					15.0	15.0			
alight	0.0	10.0	15.4	26.8	105.0				
obs alight		10		25					

(H)

From	To	1	2	3	4	5	board	thru load	obs load	obs brd
1	0.0	10.0	7.7	8.3	14.0	40.0				
2		0.0	7.7	6.3	6.1	20.0	30.0	30	20	
3			0.0	10.4	40.0	50.4	34.6			
4				0.0	30.0	30.0	60.0	60	30	
5					15.0	15.0				
alight	0.0	10.0	15.4	25.0	105.0					
obs alight		10		25						

(I)

Estimated Total Observed Boardings

Seed 95.0
Adjusted 140.4

(J)

From	To	1	2	3	4	5	board	thru load
1	0.0	14.8	11.4	12.3	20.7	59.1		
2		0.0	11.4	9.3	8.9	29.6	44.4	
3			0.0	15.4	59.1	74.5	51.2	
4				0.0	44.4	44.4	88.7	
5					15.0	15.0		
alight	0.0	14.8	22.8	37.0	148.1			

(K)

From	To	1	2	3	4	5	board	thru load	obs load	obs brd
1	0.0	10.0	6.4	6.9	16.7	40.0				
2		0.0	6.4	4.6	9.0	20.0	30.0	30	20	
3			0.0	13.5	34.3	47.8	37.2			
4				0.0	30.0	30.0	60.0	60	30	
5					15.0	15.0				
alight	0.0	10.0	12.8	25.0	105.0					
obs alight		10		25						

(L)

From	To					board	thru load	obs load	obs brd
	1	2	3	4	5				
1	0.0	10.0	5.5	5.9	18.7	40.0			
2		0.0	5.5	5.2	9.4	20.0	30.0	30	20
3			0.0	14.0	32.0	45.9	39.1		
4				0.0	30.0	30.0	60.0	60	30
5					15.0	15.0			
alight	0.0	10.0	10.9	25.0	105.0				
obs alight		10		25					

(M)

From	To				
	1	2	3	4	5
1	0.00	2.00	0.73	0.73	1.98
2			0.73	0.64	0.99
3				1.01	1.98
8					3.00
5					2.00

(N)

From	To				
	1	2	3	4	5
1	0.00	2.00	0.73	0.73	1.98
2			0.73	0.64	0.99
3				1.01	1.98
8					3.00
5					2.00

(O)

From	To					board	thru load	obs thru load	obs brd
	1	2	3	4	5	6			
1	0.0	10.0	5.5	5.9	8.3	10.4	40.0		
2		0.0	5.5	5.2	4.2	5.2	20.0	30.0	30
3			0.0	14.0	14.2	17.8	45.9	39.1	
4				0.0	13.3	16.7	30.0	60.0	60
5					0.0	30.0	30.0		30
alight	0.0	10.0	10.9	25.0	40.0	80.0			
		10		25					

(P)

Estimated (New) Ride Check Data

Stop	board	alight	thru load
1	40		
2	20	10	30
3	46	11	19
4	30	25	32
5	30	40	15
6		80	

(Q)